Pinniped and Cetacean Oil Spill Response Guidelines

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Notice

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Acronyms Used in Guidelines

AC	Area Committee
ACP	Area Contingency Plan
ADD	Acoustic Deterrent Device
AHD	Acoustic Harassment Device
APHIS	Animal and Plant Health Inspection Service
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CoC	Chain of Custody
CPG	Care and Processing Group
CWA	Clean Water Act
DWBD	Deputy Wildlife Branch Director
DWH	*Macondo/Deepwater Horizon* Oil Spill
EPA	U. S. Environmental Protection Agency
ESA	Endangered Species Act
ESF	Emergency Support Function
ESI	Environmental Sensitivity Index
ESA	Endangered Species Act
EVOS	*Exxon Valdez* Oil Spill
FEMA	Federal Emergency Management Agency
FOSC	Federal On-Scene Coordinator
GC/FID	Gas Chromatography/Flame Ionization Detector
GC/MS	Gas Chromatography/Mass Spectroscopy
GIS	Geographic Information System
GPS	Global Positioning System
HAZCOM	Hazard Communication
HAZWOPER	Hazardous Waste Operations and Emergency Response
HPLC	High Performance Liquid Chromatography
IAP	Incident Action Plan
ICP	Incident Command Post
ICS	Incident Command System
ISB	In-situ Burning
JIC	Joint Information Center
MMHSRP	Marine Mammal Health and Stranding Response Program
MMPA	Marine Mammal Protection Act
MMSN	Marine Mammal Stranding Network
NCP	National Contingency Plan
NIMS	National Incident Management System
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NOAA-OLE	NOAA Fisheries Office of Law Enforcement
NOAA-GC	NOAA Fisheries Office of General Counsel
NOS	National Ocean Service
NPS	National Park Service
NRC	National Response Center

NRDA	Natural Resource Damage Assessment
NRF	National Response Framework
NRS	National Response System
NRT	National Response Team
OPA90	Oil Pollution Act of 1990
ORR-ARD	Response and Restoration, Assessment and Restoration Division
ORR-ERD	Response and Restoration, Emergency Response Division
OSC	On-Scene Coordinator
OSLTF	Oil Spill Liability Trust Fund
PAH	Polycyclic Aromatic Hydrocarbon
PIO	Public Information Officer
PFD	Personal Flotation Device
PRP	Potential Responsible Party
QA/QC	Quality Assurance/Quality Control
RCP	Regional Contingency Plan
RP	Responsible Party
RSC	Regional Stranding Coordinator
RPIC	Responsible Party Incident Commander
RRT	Regional Response Team
SARA	Superfund Amendments and Reauthorization Act
SCAT	Shoreline Cleanup Assessment Team
SPCC	Spill Prevention, Control and Countermeasure Plan
SSC	Scientific Support Coordinator
SSO	Site Safety Officer
SSP	Site Safety Plan
STL	Strike Team Leader
SOSC	State On-scene Coordinator
TPH	Total Petroleum Hydrocarbons
UC	Unified Command
USCG	U. S. Coast Guard
USFWS	U. S. Fish and Wildlife Service
WBD	Wildlife Branch Director
WHO	World Health Organization

Chapter 1 – Introduction

Background

Purpose of Guidelines

When oil spills occur in the marine environment, many species of wildlife in that ecosystem may be either directly or indirectly impacted. The impacts of spilled oil on birds have long been known (Jessup and Leighton, 1996; Leighton, 1993), with effects ranging from slight fouling requiring no treatment to acute mortality from hypothermia to acute/chronic toxicity from ingested petroleum. To help mitigate these impacts, significant investments have been made to develop protocols for the capture and care of avian species (Massey, 2006; Mazet et al., 2002; Tseng, 1999). While potentially less prevalent than birds during oil spills, marine mammals are also at risk from these incidents in coastal and offshore waters. Thus, the National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries Service (NMFS), Office of Protected Resources (OPR), Marine Mammal Health and Stranding Response Program (MMHSRP) has developed guidelines to direct and inform response activities for pinnipeds and cetaceans – guidelines that align themselves with response actions being taken for other wildlife species at risk. The first comprehensive set of Marine Mammal Oil Spill Response Guidelines (Guidelines) was created in 2006 (Johnson and Ziccardi, 2006) and brought together the experience and research to that point. The *Macondo 252/Deepwater Horizon* Spill (DWH) in 2010 was the first significant oil spill to utilize these Guidelines as the blueprint for how to organize the response to oiled marine mammals; the present document revises the original Guidelines to represent the lessons learned from that response, as well as information gleaned from other more recent responses and drills.

These Guidelines provide a foundation for coordination and communication between local, state and federal oil spill response agencies and the marine mammal conservation, research and welfare communities (including marine mammal stranding networks and research scientists). These Guidelines have been developed in consultation with NOAA's National Ocean Service, Office of Response and Restoration, Emergency Response Division (ORR-ERD), Assessment and Restoration Division (ORR-ARD), NOAA's Office of General Counsel (NOAA-GC), and NOAA Fisheries, Office of Law Enforcement (OLE) so that marine mammal response activities can meet the needs and mandates of each of these groups during a spill response.

More specifically, these Guidelines provide key information to, and standardize activities of, marine mammal responders to build and maintain oiled wildlife readiness at a national level, including:

- Outlining organizational and reporting structures/instructions so that wildlife professionals can effectively integrate and contribute to the oil spill response framework;
- Establishing standardized data collection techniques to support effective response activities (as well as subsequent natural resource damage assessment);
- Defining chain-of-custody protocols for animal collection, necropsy and sampling to help ensure integrity of samples and results, as well as their admissibility in any legal proceedings;
- Instituting training requirements for the protection of human and animal health during oil spill response; and
- Promoting the best achievable care for oiled marine mammals, including necessary readiness activities (e.g., training, equipment).

These Guidelines focus primarily on directed planning and response activities (e.g., rescue, sampling, and care in rehabilitation) for cetaceans and pinnipeds (excluding walrus, which is not a NOAA trust species). They are intended to be integrated as necessary with the activities of other participants in the Operations Section/Wildlife Branch under the Unified Command in an Incident Command during oil spill planning and response, including guidelines developed by NOAA Fisheries for sea turtles as well as those detailed by the Department of the Interior - US Fish and Wildlife Service (USFWS) for other marine mammal species (e.g., sea otters, polar bears, manatee and walrus). These Guidelines are also designed to work within the larger spill response structure and complement the significant emphasis that has historically been focused on migratory waterfowl and other bird species. Lastly, these Guidelines have been developed to integrate with other wildlife trustee responsibilities during oil spills, such as Endangered Species Act Section 7 consultation and Oil Pollution Act Natural Resource Damage Assessment, to reduce potential conflicts, enhance response effectiveness, and maximize data procurement.

Intended Uses of Guidelines

Oil spills responses, as a whole, differ widely depending upon many factors, including but not limited to, the size of the spill, type of product spilled, time of year, and location. Similarly, responses where marine mammals are at risk will vary greatly depending upon these factors, but the wildlife response will also rely on ecological aspects, such as species/taxa at risk, health/reproductive status of at-risk animals, and presence of areas where animals congregate (e.g., rookeries, haul-out areas), and not solely the volume of oil released. Spill responders (both general and marine mammal personnel) and pre-spill planners should recognize that the variability in degree of effort and complexity in marine mammal response can be significant when considering different scenarios – type of species impacted, overall numbers of animals exposed, and the number that are identified as candidates for rehabilitation will significantly change the marine mammal response. These Guidelines are provided by NOAA's MMHSRP for use by authorized marine mammal stranding network organizations (including rehabilitators), other natural resource management agencies, On-Scene Coordinators, and Potentially Responsible Parties (PRPs) as a guide to:

- Understand the complexities of oiled marine mammal response;
- Act as, or help in the development of, appropriate marine mammal sections of PRP Response Plans, Area Contingency Plans (ACPs) and/or Regional Contingency Plans (RCPs);
- Improve communication and documentation coordination between oil spill response planners and NOAA Fisheries;
- Design appropriate oil spill readiness activities (e.g., training programs and equipment caches), including the evaluation of marine mammal rehabilitation organization, center and regional capabilities;
- Streamline decision-making following the establishment of an incident command; and
- Collect relevant data and evidence for assessment of the impact of the spill on marine mammals.

These Guidelines highlight general procedures specific to oil spill response and focus on critical structural elements for national pinniped and cetacean response. For more information on general marine mammal rescue and rehabilitation, the reader should consult references such as *Marine Mammals Ashore* (Geraci et al., 2005) and the *CRC Handbook of Marine Mammal Medicine* (Dierauf and Gulland, 2001). Additionally, these Guidelines are designed to be paired with more specific Regional Annexes to address significant issues that may exist but are more appropriate to address at regional or state levels.

These Guidelines are a "living document" and are not intended for independent use as a training manual. They have been developed to serve as guidance for acquiring the best achievable recovery and care during an oil spill response and, as such, we plan to periodically review and update them as new information becomes available.

Impacts of Oil on Marine Mammals

Overview of Petroleum Compounds

Petroleum compounds are extremely complex mixtures, and a wide variety of effects have been noted in exposed organisms. Crude oils can contain thousands of different organic and inorganic compounds (Scholz et al., 1999) and can vary widely depending on the geographic areas, depths and methods used to extract them (Neff, 1990a). Once extracted, crude oils can be highly manipulated or distilled in order to be reformulated into different end products (Barber et al., 1996), presenting challenges in understanding the associated toxicity and determining the source of releases. Aromatics compounds (containing one or more rings of six carbons each connected by alternating carbon-carbon double bonds) are largely considered the most harmful compounds in oil (Neff, 1979), with smaller single ring aromatics, such as benzene, strongly associated with carcinogenicity, organopathies and even death at high exposure levels in vertebrates (ATSDR, 1995a). These single-ring compounds are also readily available to biological systems due to their relatively high water solubility; however, due to extreme volatility, they are often not found in large concentrations except immediately following a spill. Conversely, compounds containing two or more aromatic rings (also called polycyclic or polynuclear aromatic hydrocarbons, or PAHs) can cause carcinogenicity, reproductive failure and immunotoxicity in laboratory settings (ATSDR, 1995b) and are less volatile; they are often at comparatively low concentrations in oil products and are fairly insoluble in water but are of concern due to the potential injury to natural resources.

Overview of Detection Methods for Oiling of Marine Mammals

Determination of the degree of oil exposure in marine mammals can be a very difficult task to achieve, even if the animal is in hand after being collected during a spill event. In the field, the extent of external oiling can be difficult to assess in pinnipeds because of their dark pelts with a natural sleek sheen (Mazet et al., 1997) and, over a relatively short period of time, previously oiled pinnipeds can appear non-oiled due to molting and/or natural cleansing (Lowry et al., 1994). Cetacean skin can slough due to a rapid epidermal cell turnover rate (Hicks et al., 1985). Similarly, marine mammals may be internally exposed to oil without substantial indications from an external visual assessment and, should biological samples be taken, concentrations may fall below minimum detection limits using available analytical tools. Therefore, care should be taken when sampling marine mammals in order to accurately detect existing exposure, as well as report marine mammals as "oiled" or "unoiled" during oil spill events.

Several different laboratory methods can be used to determine oil exposure, with the choice of method being a function of sample type, the reason that analysis is needed (see below), and the timeline in which results are required (timelines for the various methods vary greatly). Duplicate samples are frequently warranted in order to perform several different types of analyses. In general, the preferred methods of analysis are as follows:

- For determining whether an external oil sample collected is from a particular source (e.g., oil "fingerprinting"), the sample should be tested with chemical methods (e.g., gas chromatography coupled with mass spectroscopy or flame ion detection).

- For determining internal oil exposure in marine mammals, less intensive methods (e.g., total paraffinic/petroleum hydrocarbons) of testing biological samples can be used.
- For establishing overall health of animals from potential oil exposure in order to make clinical decisions (but not needing exact oil identification), indirect methods (e.g., mixed function oxidase levels) may be useful.

Documented Oil Exposure in Marine Mammals

At present, there are few data available on PAH levels in marine mammals inhabiting North American coastal waters taken both during, as well as, outside of known oil spill situations. Studies have measured PAH levels in seals and whales from Eastern Canada (Hellou et al., 1990; Zitko et al., 1998) and harbor seals from the Northwest Pacific (Lake et al., 1995). Overall, the low concentrations of bioaccumulated PAHs in tissues from these marine mammals are fairly similar to those reported in atmospheric fallout PAHs from combustion sources (Zitko et al., 1998). During EVOS, control samples for comparisons were taken from animals inhabiting nearby non-oiled areas (Frost et al., 1995; Mulcahy and Ballachey, 1995). In an experimental exposure study (both immersion and ingestion) involving ringed seals (*Phoca hispida*), differences in detectability of PAHs in various tissues were noted (Engelhardt et al., 1977), with the highest levels in urine and bile, less elevated in blood and plasma, and lower in tissues (lowest in lung) at 2 days post-immersion. Tissue sampling in the ingestion study was limited to samples that could be collected from live animals either by venipuncture or biopsy: PAHs were highest in blood, and higher in liver and blubber compared to muscle. This study illuminates the importance of selecting appropriate tissues for PAH analysis, the need to collect samples during all oil spill responses involving marine mammals for baseline data, and has directed the sampling strategies developed in these Guidelines.

Overview of Effects of Oil on Marine Mammals

In comparison to marine birds, marine mammals in general (and pinnipeds and cetaceans in particular) have infrequently been documented as affected during oil spill incidents and comparatively little is known regarding the direct and indirect effects on these species (summarized in (Jessup and Leighton, 1996; St. Aubin and Geraci, 1990)). However, as these animals spend much or all of their time in the water (and especially at the air/water interface where oil is found floating), the risk of potential impacts is significant.

In general, most pinnipeds and cetaceans rely on thick blubber layers to maintain normal body temperature in their aquatic environments, therefore are at low risk to the acute thermoregulatory effects of external oiling when compared to seabirds. However, heavily furred marine mammals (e.g., sea otters, fur seals, pups with lanugo coats) have a dense pelage that traps a layer of air against the skin and provides insulation from cold marine waters. Upon exposure to oil products, this coat loses its ability to repel water, thereby decreasing insulation and buoyancy, and potentially leading to hypothermia and associated physiological problems. External oiling can also impede marine mammals' normal behaviors, including reducing abilities to float, ambulate/swim, and forage effectively. Lastly, direct contact of skin with petroleum products may result in irritation, burning, and/or ulceration especially in sensitive tissues such as the eyes (conjunctivitis and corneal edema) and mucous membranes, and may also interfere with hearing if accumulated in ear canals.

In addition to observable external effects, internal exposure (e.g., inhalation and ingestion) to petroleum compounds can result in both acute and chronic medical issues, with the subsequent toxicity being dependent on the chemical composition of the ingested oil (Neff, 1990b), as well as a variety of other factors discussed below. Marine mammals may be at particular risk from inhaling the

volatile components in oil due to their proximity to the air/water interface where volatiles are present at greatest concentrations, as well as the large tidal volumes of air exchanged with each breath and large accompanying force of inhalation. Inhaled oil components can cause direct damage (such as chemical pneumonitis), may lead to more chronic problems in the respiratory system (such as increased susceptibility to bacterial pneumonias), may cause central nervous system dysfunction, and can be an effective transfer point for volatiles to be systemically absorbed. Mammals may also ingest significant amounts of oil through or with prey species, grooming, and nursing, with aromatic and other low molecular weight petroleum hydrocarbons being rapidly absorbed and distributed to various target organs. Baleen whales may be at particular risk from ingested oil if baleen is fouled (Wursig, 1990). Injuries from internal exposure can include anemia and immunotoxicosis, gastrointestinal erosions/ulceration, hepatic/renal lipidosis and necrosis, adrenal gland dysfunction, reproductive dysfunction, and changes in acute phase proteins and cytokines.

It must be understood, however, that the number of individuals and species affected, as well as the degree of pathological impact of such exposure, will depend on many variables, such as the location and size of the spill, the characteristics of the oil (e.g. crude vs. refined, fresh vs. weathered), weather and water conditions, types of habitats affected, the time of year the spill occurs, as well as the physiology and natural history of the marine mammal (e.g., age and health status of the individual and mode and duration of exposure, which can be determined by foraging behavior, social behavior, migration patterns, and distribution).

Documented Effects of Oil on Pinnipeds

St. Aubin (1990) provides a comprehensive overview of all reported oil-exposed pinnipeds from the 1940's to 1990; however, documentation of oiling, species-specific sensitivity to oiling, and observed effects of oiling in pinnipeds has received relatively little attention in the scientific literature (see (Davis and Anderson, 1976; Engelhardt, 1982; Engelhardt et al., 1977; Geraci and Smith, 1976; St. Aubin, 1990). Small-scale field laboratory studies on the effects of oil have been conducted on ringed and harp seals (Geraci and Smith, 1976; St. Aubin, 1990); however most studies have been unable to correlate the degree of oiling with the type of effect and many of the observed lesions (including mortality) may be related as well to captivity stress or other underlying factors (Geraci and Smith 1976). Harbor seals (*Phoca vitulina*) and Steller sea lions (*Eumatopius jubatus*) were significantly exposed and studied during the EVOS (summarized in (Loughlin, 1995). Two months after the spill, 81% of harbor seals in Prince Williams Sound were classified as externally oiled but, interestingly, one year later, no seals showed any signs of external oiling. External oiling was not observed to disrupt seal locomotion or mother-pup interactions, and externally oiled harbor seal pups collected during EVOS appeared to be in normal physical condition (Davis and Anderson, 1976; Zimmerman et al., 1995). However, some harbor seals were observed exhibiting abnormally tame or lethargic behavior; behaviors most likely explained by brain lesions found in some oiled harbor seals and likely caused by the toxic systemic effects of inhaled hydrocarbons (Spraker et al., 1995). In 2015, 151 (n = 56 live, n = 95 dead) California sea lions (*Zalophus californianus*) and Northern elephant seals (*Mirounga angustirostris*) were collected as part of the Refugio oil spill off of Santa Barbara, CA, but a concurrent Unusual Mortality Event makes the effects of oil versus other processes unknown at the time of this writing. Between 5,000 and 6,000 South American fur seals (*Arctocephalus australis*) and sea lions (*Otaria flavescens*), primarily pups, were documented as being oiled and dying in the *San Jorge* oil spill off Punta del Este in Uruguay in 1997, though little information has been published on the impact (Mearns et al., 1999). Galapagos sea lions (*Zalophus wollebaeki*; n=79) were documented as being oiled during the *Jessica* oil spill in 2001 (Salazar, 2003), with animals observed having a high prevalence of conjunctivitis and burns, but no long-term negative impacts on the population were

noted. Grey seals (*Halichoerus gypus*) have been documented as being oiled from chronic pollution in Norway due to coastal shipping and discharges (Jenssen, 1996), but little mortality and minimal disturbance to the seals' behavior has been reported.

Documented Effects of Oil on Cetaceans

Similar to pinnipeds, relatively little is known about the effects of oil on cetaceans. Experimental studies have found that cetacean skin may be an effective barrier to petroleum compounds, with no observed acute effects from a 75-minute direct exposure of gasoline to dolphin skin and no substantial difference in healing ability of superficial cuts when massaged for 30 minutes with either crude oil or gasoline (Geraci, 1990). Additionally, early studies indicated that cetaceans may detect and actively avoid substantial slicks (greater than 6mm) on the surface of the water (Smith et al., 1983), (Geraci, 1990). However, in subsequent spills, this experimental finding has not been validated, as orca (*Orcinus orca*) did not avoid slicks during EVOS (Matkin et al., 1994a) and several cetacean species (including bottlenose dolphins, sperm whales, and striped dolphins) were observed in the slick during DWH. Sporadic reports (with little data) of cetaceans being "affected" by oiling prior to EVOS have included whales and dolphins after the Platform A blowout in Santa Barbara, CA in 1969 (Geraci, 1990) and six cetaceans following the *Amoco Cadiz* spill off of France in 1978 (Prieur and Hussenot, 1978). Following EVOS, orca, gray whales (*Eschrichtius robustus*), Dall's porpoises (*Phocoenoides dalli*) and harbor porpoises (*Phocoena phocoena*) were all observed either surfacing within slicks or with oil on their skin in the immediate aftermath of the spill (Harvey and Dahlheim, 1994; Loughlin, 1994; Zimmerman et al., 1995). Direct effects of the EVOS on these cetacean populations is still under debate, as few carcasses were found stranded and the results of necropsy and tissue analysis was inconclusive, but the AB and AT1 pods of orca experienced substantial population losses within the three years following EVOS, which lends evidence to the spill having either delayed or indirect effects (Matkin et al., 2008; Matkin et al., 1994b). Most notably, however, 122 cetaceans stranded or were reported dead offshore during the response phase of the DWH blowout in the Gulf of Mexico (30 April – 2 November 2010), with an additional 785 cetaceans found stranded in the region impacted by the spill from 3 Nov 2010 – 16 June 2013; this is significantly elevated over the historical baseline stranding rate and has been declared an Unusual Mortality Event by NOAA (see http://www.nmfs.noaa.gov/pr/health/mmume/cetacean_gulfofmexico.htm). One study published to date found that live dolphins captured in Barataria Bay, LA (a region found to have heavy and prolonged oiling during DWH) showed evidence of hypoadrenocorticism, were five-times more likely to have moderate to severe lung disease when compared to animals sampled as part of health assessment studies in Sarasota Bay, FL, a location which did not experience oiling during DWH. Additionally, 48% of the Barataria Bay animals sampled were considered in a guarded or worse condition, indicating that they were unlikely to survive (Schwacke et al., 2013). A subsequent study on dead stranded animals in Barataria Bay during this time showed chronic adrenal insufficiency, thin adrenal cortices, and increased risk of bacterial pneumonias (Venn-Watson et al., 2015). It is expected that DWH data will help address many of the data gaps on the effects of oil on cetaceans. Additionally, in March 2014, ~4,000 barrels of a marine fuel oil (RGM 380) were spilled into the Texas City Y Ship Channel following a collision between a deep draft vessel and a fuel barge. In the three weeks following the spill, 39 stranded cetaceans were recovered, of which four were visibly externally oiled. Findings from this response and subsequent damage assessment proceedings should also contribute to the understanding of impacts of oil on cetaceans.

Legal and Structural Framework

Laws Governing Oil Spill Response

There are a number of key pieces of legislation that govern how the planning and response to oil spill incidents will occur in the United States. These include:

- Clean Water Act (CWA): The CWA, enacted in 1948 but significantly reorganized and expanded in 1972, establishes the basic structure for regulating discharges of pollutants into the waters of the US. Under the CWA, the US Environmental Protection Agency (USEPA) has implemented pollution control programs and made it unlawful to discharge any pollutant (including petroleum products) from a point source into navigable waters unless a permit is obtained.
- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA): Commonly known as Superfund, CERCLA (enacted in 1980 and amended by the Superfund Amendments and Reauthorization Act, or SARA, in 1986) provides broad Federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment. CERCLA also enabled the revision of the National Contingency Plan (NCP; see below), which provides the guidelines and procedures needed to respond to releases and threatened releases of hazardous substances, pollutants, or contaminants.
- Oil Pollution Act (OPA90): OPA90, signed into law in 1990 largely in response to the EVOS, modified the CWA to expand the federal government's ability to prevent and respond to oil spills. While broad in approach, OPA90 provided three key planning and response elements not previously established in legislation. First, OPA90 developed new requirements for contingency planning by government and industry by expanding the NCP to a three-tiered system: 1) the federal government, through the National and Regional Response Team(s) (NRT and RRTs, respectively, see below) were now empowered to direct all public and private response efforts for certain types of spill events through their corresponding Response Plans; 2) Area Committees (composed of federal, state, and local government officials and stakeholders) were now required to develop detailed, location-specific Area Contingency Plans (ACPs); and 3) owners or operators of vessels and certain facilities that pose a serious threat to the environment must prepare their own Facility Response Plans. The OPA also created the Oil Spill Liability Trust Fund (OSLTF), which is managed by the US Coast Guard (USCG) and available to provide up to one billion dollars per spill incident should immediate funds be required by federal agencies to initiate response actions. Finally, the OPA increased the penalties for regulatory noncompliance, and established an extensive liability scheme that was designed to ensure that, in the event of a spill or discharge of oil, the responsible parties were liable for the removal costs and damages that result from the incident. Damages would be determined by appointed trustees through the development of natural resource damage assessments (NRDAs), and subsequent monetary settlements based on these damages would lead to restoration projects designed to return the trust resources, if possible, to pre-spill conditions.

National Oil Spill Planning Structure

In the United States, there exists an organized framework of national, regional, and local plans to prepare for potential oil spills, each of which work collectively to ensure the highest level of readiness. As an overarching structure, disaster management is led by the Department of Homeland Security - Federal Emergency Management Agency (FEMA) following what is known as the National Response Framework (NRF) – a structure mandated by the Homeland Security Act of 2002 and Homeland Security Presidential Directive-5. The NRF "presents the guiding principles that enable all response partners to prepare for and provide a unified national response to disasters

and emergencies," "defin(ing) the key principles, roles, and structures" and "describes how communities, tribes, States, the Federal Government, and private-sector and nongovernmental partners apply these principles for a coordinated, effective national response." The NRF is based on a series of Emergency Support Functions (ESFs), each of which direct one or more federal agencies to provide assistance, when necessary, to national disasters. Further, the management structure defined within the NRF is built on the template of the National Incident Management System (NIMS), a command-and-control system that defines a unified approach to incident management, a standard command and management structure (also known as the Incident Command System, or ICS), and an emphasis on preparedness, mutual aid and resource management.

When dealing with releases of oil and other hazardous materials, a more directed multi-layered system of local, state, and federal agencies make up a similar structure known as the National Response System (or NRS). This system allows individuals, teams and the federal government to "share expertise and resources to ensure that oil spill control and cleanup activities are timely, efficient, and minimize threats to human and environmental health" that are beyond the capabilities of local and state responders. At the heart of the system is the National Contingency Plan (NCP, or National Oil and Hazardous Substances Pollution Contingency Plan), which provides the framework for the NRS and establishes how the system works. If events are serious enough to be considered "Spills of National Significance" (or SONS), the NRF can be activated, and then works in conjunction with the NRS and NCP.

The NCP defines three key elements necessary for an effective national system - the first being the establishment of defined federal on-scene coordinators (FOSCs) that can coordinate all federal containment, removal, disposal efforts, and resources during an incident. These individuals are pre-designated by the EPA for inland areas and by the USCG for coastal or major navigable waterways and, in addition to response duties, also oversee area planning, provide access to the expertise of the NRS federal member agencies, and are valuable sources of support and information to the local response community. The FOSCs are assisted in their efforts by scientists from the EPA (the Environmental Response Team or ERT) and/or from NOAA's ORR-ERD (Scientific Support Coordinators or SSCs). These personnel act as Command Staff for the FOSC, and provide expertise in environmental and engineering issues, contingency planning and act as liaisons to the scientific community and the natural resource trustees.

Another key aspect of the NRS as defined by the NCP is the National Response Team (NRT), which is comprised of the 15 federal member agencies of the NRS, each with responsibilities and expertise in various aspects of emergency response to pollution incidents. Prior to an incident, the NRT provides policy guidance and assistance, including periodic review of the NRP and staffing of the National Response Center, a 24-hour communications hub for incident reporting. During an incident, the NRT may be activated if needed to provide national-level advice and assistance, as well as access to member agency resources that are best provided at a national level. This can also include the mobilization of funds from the OSLTF as necessary. The EPA serves as chair of the NRT, and the USCG serves as vice chair.

The third key planning element required by the NCP is a mechanism to provide more localized planning and response capabilities throughout the US. Oil spill response readiness is further broken down within the US into 13 Regional Response Teams (RRTs) - one for each of the ten regions, plus Alaska, the Caribbean, and Oceania. Similar to the NRT, the RRTs are comprised of representatives from the 15 federal NRS member agencies and are co-chaired by the EPA and

USCG, however each RRT also includes the appropriate state representatives. Each RRT develops and maintains a Regional Contingency Plan (RCP) that describes the policies and procedures for a quick and effective response to pollution incidents within their respective region, and provides more localized federal assistance when the NRT is not required to assist.

As stated above, the OPA also required the development of more localized area contingency plans (ACPs) for all coastal areas of the US through the establishment of Area Committees (composed of regional, federal, state, and local stakeholders). These plans are designed to be implemented in conjunction with the NCP, outline the roles and responsibilities of various agencies in response to oil spills, and, most importantly, define regional environmental and socio-economic resources that require priority protection through the establishment of Geographic Response Plans (GRPs). The boundaries of each ACP include those areas within the Area of Responsibility of the USCG's Marine Safety Office (MSO) for a region, known as the Captain of the Port (COTP) Zone.

The OPA also requires that a Fish and Wildlife and Sensitive Environment Plan be developed for the NCP, in consultation with the USFWS, NOAA, and other interested parties, including state fish and wildlife agencies (33 U.S.C. § 1321(d)(2)(M)). The NCP calls for Fish and Wildlife and Sensitive Environments Plans to be included in ACPs "in order to provide for coordinated, immediate and effective protection, rescue, rehabilitation of, and minimization of risk of injury to fish and wildlife resources and habitat." In 40 CFR Part 300, Section 300.210(c)(4), the requirements for this plan are set forth as an annex to Regional or Area Contingency Plans.

Laws Governing Marine Mammal Protection

There are two key pieces of legislation that govern interactions with marine mammals in the United States. These are:

- Marine Mammal Protection Act (MMPA): The MMPA, signed into law in 1972, prohibits the "take" of sea otters, seals, sea lions, walruses, whales, dolphins, and porpoises, which includes harassing or disturbing these animals, as well as actual harming or killing, unless such take is specifically exempted in the statute or authorized. The MMPA divides responsibility for marine mammal species between the Secretary of Commerce (overseeing NOAA and the NMFS) for cetaceans and pinnipeds with the exception of walrus, and the Secretary of the Interior (overseeing the USFWS) for walrus, polar bear, sea otter, and manatee. Title IV of the MMPA establishes the Marine Mammal Health and Stranding Response Program (MMHSRP) under NMFS (see Chapter 2 below).
- Endangered Species Act (ESA): The ESA, enacted in 1973, provides for the conservation of species that are listed as endangered (in danger of extinction) or threatened (at risk of becoming endangered in the foreseeable future). The ESA also contains a prohibition on "take" including harassment and disturbance as well as injuring and killing. There are approximately 2,095 species listed under the ESA with 1,475 found within the United States. Of these, NMFS has jurisdiction over 94 marine and anadromous species, with the remainder of the species under the USFWS (generally the terrestrial, avian, and freshwater species, but including the sea otter and polar bear, both of which are listed as threatened, and manatee, which is listed as endangered).

Wildlife Trustee Authority

Because of the MMPA and ESA, the NMFS and USFWS have trustee responsibility for marine mammals; therefore, the FOSC (and the Unified Command, or UC) is/are required to immediately consult with FWS or NMFS whenever an oil spill and its subsequent response may affect these

resources. The ESA and its implementing regulations provide special provisions for consultations during emergencies (such as oil spills) with FWS and/or NMFS for making recommendations to the FOSC to authorize incidental take of listed species, and these consultations may also identify required or recommended measures to avoid the taking of listed species or to otherwise reduce response-related impacts. This consultation would provide the authorization for take of listed marine mammals under the ESA. Similarly, Section 109(h) of the MMPA allows take by federal, state, or local governmental employees during their official duties, provided the take is for the welfare and protection of the animal or public health, therefore the FOSC/UC is authorized to take marine mammals during an oil-spill response to protect that animal. Section 112(c) of the MMPA allows NMFS and the USFWS to enter into cooperative agreements with outside entities to further the purposes of the Act, including Title IV. Stranding Agreements are issued under 112(c) between NMFS and stranding network participants to allow these members of the national stranding network to take marine mammals in order to carry out the purposes of the MMPA. To provide coverage for directed take of ESA-listed marine mammals, an enhancement permit has been issued under Section 10 of the ESA to the MMHSRP, with stranding network participants as Co-Investigators. Because of shared trust responsibilities, both federal and state agencies may be required to respond to spills, or potential spills, that may impact marine mammals. To facilitate efficient and effective coordination during an oil spill response, federal and state agencies may consider developing Memorandums of Agreement (MOA's) or Memorandums of Understanding (MOU's) that pre-designate regional primary points of contact, establish lead representatives, and define roles for natural resource emergency situations.

Chapter 2 – Readiness

Stranding Networks

National and Regional Structure

"Stranding", for the purposes of the MMPA, is defined as an event in the wild in which a marine mammal is:

(A) Dead and is either on a US beach or shore; or in waters under US jurisdiction (including any navigable waters); or

(B) Alive and is on a US beach or shore and unable to return to the water; on a US beach or shore and, although able to return to the water, is in need of apparent medical attention; or in waters under US jurisdiction (including any navigable waters), but is unable to return to its natural habitat under its own power or without assistance.

NOAA Fisheries' MMHSRP, formalized by amendments to the MMPA in 1992, was developed to help NOAA Fisheries accomplish key management goals related to marine mammal health, including the collection and dissemination of reference data on the health of marine mammals and health trends of marine mammal populations in the wild; investigation of unusual and regular mortality events; ongoing biomonitoring and tissue/serum banking; and analytical quality assurance for mammal programs (for the organizational structure of NOAA, please see Figure 1). The first of these mandates, collection of reference data on marine mammal health, has been addressed through the coordination of volunteer stranding networks, and is a critical element to all readiness and response activities related to oil spill response. Five regional networks have been established within US coastal states (see Figure 2), each consisting of numerous approved network participants [either

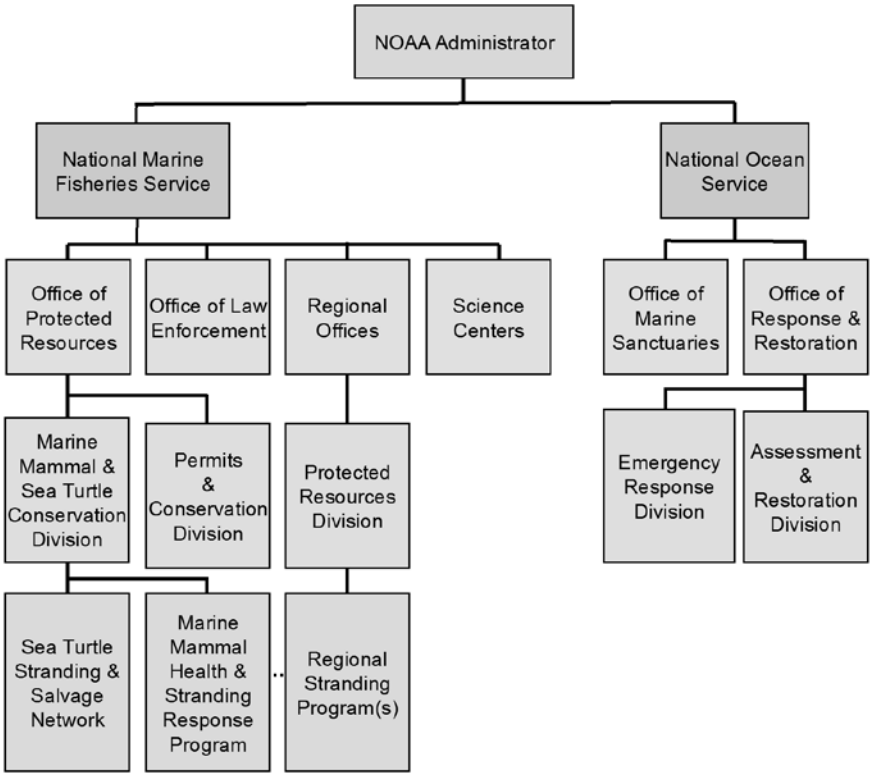

Figure 1: NOAA's Organization Structure as it relates to oil spill response

authorized through signed Stranding Agreements from the NMFS Regional Offices or Letters of Authorization from the USFWS, issued under MMPA Section 112(c)], or working under their MMPA Section 109h authority, and managed by a NMFS Regional Stranding Coordinator (RSC), all of which are overseen by the national MMSHRP Coordinator. In whole, the MMHSRP oversees, coordinates, and authorizes the activities of more than 120 organizations to respond to marine mammal strandings – some of which are strictly first responders (e.g., animal rescue only), some responding only to dead marine mammal strandings, and some of which are authorized to rehabilitate live stranded marine mammals. Network organizations include federal, state, and local governmental entities, non-profit organizations, academic institutions, museums, scientists, and managers, among others.

Because of these pre-existing authorizations and structure of the regional marine mammal stranding networks, all planning for oiled wildlife response in each Area or Region should include significant input from the appropriate RSC(s) and/or key stranding network participants to decrease unnecessary infrastructure re-establishment. In turn, through the inclusion of these individuals in planning efforts, responders can be assured of the involvement of organizations with experience related to live and dead animal stranding response for the local area and pre-existing authorization to handle, collect, and treat marine mammals. Additionally, RSCs can then establish priorities for necessary training of stranding network participants, determine equipment and supply needs, and ascertain the most effective way of including and using regional stranding network organizations during events. This can also help each region and network to identify deficiencies that might need to be filled during oil spill incidents from other regions and/or contractors, and what resources they can provide during large-scale spills.

Network Member Organizations

Categories of Organizations/Facilities

At a stranding network participant level, different organizations will have different levels of interest, capabilities and capacity to respond and take part in oil spill efforts. For effective planning to occur, within each region, established roles and responsibilities that are expected from each stranding network member should be identified and, if needed, added to their stranding agreement. As described above, there are three general classifications of organizations related to their stranding agreements. For the purposes of oil spill response planning, these can be delineated into five

Figure 2: NOAA's Marine Mammal Health and Stranding Response Regions; the Greater Atlantic (Northeast) Region covers Maine through Virginia; the Southeast Region covers North Carolina through Texas including the Caribbean; the West Coast Region covers California, Washington, and Oregon; the Alaska Region covers Alaska; and the Pacific Islands Region covers Hawaii and the US territories in the Pacific Ocean.

different classifications (with individual organizations having the capacity to fill one or more of the following categories):

1) Primary Care Organization/Facility: A stranding network organization that possesses the permits, appropriate facilities (either purpose-built, readily modifiable, or plans/materials on-hand to develop a temporary facility), necessary equipment, personal protective equipment, personnel and experience to receive live oiled pinnipeds and/or cetaceans (one or both taxa), stabilize, clean, and rehabilitate them until the animal(s) are deemed ready for release. This includes the ability to safely and effectively store and dispose of oiled hazardous waste, including wash water from oiled animals, as well as personnel that possess the appropriate OSHA training certification for working with oiled animals.
2) Secondary Care Organization/Facility: A stranding network organization with similar capabilities to a Primary Care Organization/Facility with the exception of not having the ability to handle/deal with oiled hazardous waste, therefore would not be able to clean animals that were recovered with external oil. These organizations can, however, take animals that are cleaned elsewhere (either at a Primary Care center or in the field) or unoiled animals for rehabilitation prior to release.
3) Processing Organization/Facility: A stranding network organization that possesses the permits, appropriate facilities, necessary equipment, personal protective equipment, personnel and experience to either conduct field sampling/necropsies within the oil spill area, or can do the same within their facility. This includes the ability to safely and effectively store and dispose of oiled hazardous waste, store samples in manner that preserves the chain of custody, as well as possess the appropriate OSHA training certification.
4) Field Collection Organization: A stranding network organization that possesses the permits, necessary equipment, personal protective equipment, personnel and experience to conduct field collection of live and/or dead stranded pinnipeds and cetaceans from within the oil spill area and transport these animals to the designated Primary Care, Secondary, or Processing Facility.
5) Personnel Organizations: A stranding network organization that cannot fulfill one of the four previous categories (due to conflicting priorities, size, lack of appropriate facilities, etc.) but that wishes to assist in a response by providing limited number of personnel to assist other regional organizations in the oil spill effort. Similarly, these may be organizations that provide discrete and specific skillsets (e.g., deterrence, observers, large whale euthanasia) to oil spill efforts. Personnel from non-stranding network members with appropriate training and expertise (e.g., staff of zoos and aquaria) may also be considered upon request by a stranding network member.

While organizations from within the region that the spill is occurring should be used first if possible, RSCs should clearly communicate with other regions to determine available resources should the spill exceed local capacity, as well as explore the opportunities for cross training and the building of depth for such emergencies. Similarly, there will likely be key contractors that will need to be brought in at the time of a spill to fill gaps in regional coverage, perform specific roles, and/or to augment existing staff. If at all possible, this should be limited to only those personnel that are necessary, as local assets should be prioritized when possible, and stranding network members from other regions will be considered next.

Criteria for Evaluating Organizations

In the development of oiled mammal response plans, organizations and individuals will need to be evaluated to determine the most appropriate and effective placement within the response structure. The following criteria should be used when considering and evaluating stranding network members:

- ✓ Holds all necessary permits, Stranding Agreements (NMFS) and Letter of Authorizations (USFWS) for marine mammal stranding and response activities
- ✓ Experience in the capture, treatment, and care of the species of marine mammals likely to be encountered
- ✓ Trained in the capture, treatment, and care of oiled marine mammals
- ✓ Knowledge of conducting marine mammal response activities within an Incident Command System structure, including appropriate communication and notification procedures
- ✓ Sufficiently trained (health/safety and animal care), equipped, and experienced supervisory staff (including a surge capacity plan to augment staff when needed)
- ✓ Ability to train and equip personnel and volunteers for marine mammal response during an emergency oil spill response
- ✓ Availability of appropriate equipment (and the ability to quickly mobilize it) to perform marine mammal capture, field evaluation, stabilization and transport (including to remote locations if necessary)
- ✓ Access to appropriate facilities for treating and housing oiled marine mammals (including adequate animal care, hazardous waste, and personnel infrastructure)
- ✓ Ability to establish and operate marine mammal intake, holding, and isolation areas within 12 - 24 hours of wildlife response activation
- ✓ Ability to establish and operate marine mammal cleaning and pre-release areas within 72 hours of wildlife response activation
- ✓ Agreement with a licensed veterinarian experienced in the treatment of marine mammals (and knowledgeable and, ideally, trained in the treatment of oiled marine mammals) to provide necessary medical care
- ✓ Commitment to use of best practices as outlined in the remainder of this document

Facility Requirements

General Considerations

The size of the spill, its location, and the number and species of animals oiled will help determine the type and location of a facility that can meet the required need. Not all spill responses will be in the vicinity of a permanent rehabilitation facility - facilities close to spill events will often need to be improved or retrofitted to allow for oiled marine mammal care. Temporary facilities that can care for oiled marine mammals in the short or long-term can be established in local, fixed structures, or mobile units can be brought to a spill location to serve as temporary facilities. However, it is critical that spill planners and responders recognize the degree of effort, the unique requirements of oiled wildlife care, and the complexity required to implement and establish an adequate facility. It must also be understood that, should facilities need to be constructed or modified at the start of a spill, those costs are considered appropriate costs to be borne by the Responsible Party – often at a significantly higher cost than if planned and built during non-spill periods. Pre-spill planning is strongly encouraged to achieve wildlife response systems that will adequately address the needs of small as well as large rescue efforts as rapidly as possible during a spill.

There are published standards for the design of facilities housing marine mammals in captivity. In the United States, these standards are published by the Department of Agriculture, Animal and Plant Health Inspection Service (APHIS, www.aphis.usda.gov) and are a requirement for facilities that wish to display animals to the public. They include such items as haul-out requirements, pool size and depth, water quality, number of animals to be kept in a particular environment, and strict

standards for food preparation areas and medications. In 2009, NMFS developed specific marine mammal rehabilitation facility guidelines (Policies and Best Practices for Marine Mammal Response, Rehabilitation, and Release, available at www.nmfs.noaa.gov/pr/pdfs/health/rehab_standards.pdf), which set minimum facility, husbandry, and veterinary standards for rehabilitating marine mammals. It should be noted that there are some differences between the two documents in that the latter was developed for temporary care and all age groups, and thus is more appropriate for use during oil spill responses. It should also be noted that temporary facilities that are established at the time of an oil spill response may not be able to follow every aspect outlined in these documents due to the emergent nature of the incident. Thus, oiled marine mammal temporary facilities should strive to follow these Policies and Best Practices as closely as possible, but to consult with the veterinary and husbandry staff to confirm necessary "trade-offs" and receive approval from the MMSHRP Coordinator (or his/her designee) where they differ.

Facility design for rehabilitation centers is an ongoing area of study and no perfect facilities exist to suit all needs for each species and age class of marine mammal. Notwithstanding, certain principles should be kept in mind when designing an oil spill response facility or when attempting to house oiled marine mammals in an existing facility (Davis and Davis, 1995). An ideal facility should include: intake/physical exam/evidence processing area; a veterinary hospital with isolation capabilities; indoor wildlife housing/caging areas; food storage and preparation facilities; animal washing and rinsing areas; drying areas; outdoor pool and pen areas; pathology facilities; volunteer training and eating areas (with restrooms); administrative offices with multiple phone/fax lines and conference space; storage for documents, data, photos, samples, and carcasses that is appropriate to preserve evidence for use in natural resource damage assessment or other legal claims (e.g., locked or controlled access, etc.); access to a large parking area; and contingency plans for animals in the event of a natural disturbance (e.g., hurricane). Minimizing stressors is an important aspect of creating a good rehabilitation environment; some considerations would include a low level of ambient noise and the ability to restrict access to the facility to only authorized personnel (e.g., no general public access). Specific animal needs must be taken into account when trying to provide adequate housing for animals during an oil spill. These needs may be affected by such factors as the animal's species, age, physical condition, degree of oiling, and nature of the product with which it was oiled.

Housing Requirements and Considerations

In addition to abiding by the Policies and Best Practices documents referenced above, indoor and outdoor housing should maximize safety to humans and the animals, provide an escape-proof enclosure, and minimize stress (auditory and visual, including human traffic). Within an oil spill response facility, housing should be set up so that there are appropriate areas for holding animals prior to intake, pre-wash assessment and stabilization, post-wash, quarantine, and longer term housing. Areas containing oiled mammals (e.g., intake and pre-wash) should be sited and equipped to ensure that cross-contamination of oil to clean animals does not occur. All areas will differ in the amount of access to the animals that is required, the space that each animal requires, the degree to which the environmental temperature can be controlled, and type (if any) of water requirements (fresh versus salt).

- Environmental Control: A finer degree of environmental temperature control is required for newly admitted animals, neonates, and animals that are compromised due to poor nutritional state, greater extent of secondary effects, or underlying disease. For pinnipeds, compromised animals require easy or limited access to water, haul-out areas, and heat sources such as heating pads and lamps. Severely debilitated pinnipeds may not be able to move away from heat sources, necessitating frequent observations by caregivers to prevent hyperthermia and burns. For

cetaceans, water temperature, air temperature, and water depth may all need to be monitored and regulated based upon the needs of the animal. Some animals may require more frequent handling for monitoring, sample collection, feeding or medicating. Housing should minimize stress but maximize accessibility and ease of monitoring (Tuomi et al., 1995).

- Ventilation: Adequate ventilation is an extremely important factor for maintaining marine mammals in captivity and is especially important in oil spill situations to protect against the toxic effects of volatile agents of the contaminant. Ten to fifteen air changes per hour has been recommended as adequate for inside animal holding (NRC, 2011) and should be adhered to if at all possible for oiled marine mammal facilities as well. Outdoor housing is ideal for maintaining ventilation in most marine mammals (aside from those at greatest risk from hypo- or hyperthermia) but drawbacks include lack of environmental control, potential discomfort for personnel working with the animals due to ambient temperatures, and more challenging access control by staff.
- Quarantine: The potential for the spread of disease is an important issue to consider for marine mammals in captivity. Newly captured animals, staff and volunteers may carry infectious agents without showing signs of disease and could pose a threat to other animals already at the rehabilitation facility. Staff should use effective quarantine protocols including foot baths containing appropriate antimicrobial solutions between housing areas, cleaning/disinfecting or changing protective clothing between animals, designating separate feeding and cleaning equipment for different areas, and minimizing movement of animals and personnel between areas. Extra care must be taken in areas where animals with infectious diseases are kept and when handling immunocompromised animals.
- Water Supply: Oiled wildlife care facilities require large quantities of water in all areas simultaneously (e.g., wash/rinse area, pool area, laundry). The quantity should be sufficient to provide at a minimum a continuous flow of 4 gallons/minute to all indoor valves and additional supply to fill, operate filtration and/or ozonation equipment, and provide overflows for pools. Washing and rinsing areas require temperature-controlled hot water (exact temperature species-specific, but ~98°F) to ensure hypothermia does not occur during the effort. Ideally, when washing heavily furred animals (e.g., fur seals), use of water at a hardness of 2-5 grains per gallon at pressure of 40-60 psi is desired to prevent hard water deposits from forming and allowing all soap residues to be rinsed from the pelage.
- Waste Water: Facilities must dispose of all oil and animal wastewater in accordance with appropriate Federal, State, and municipal regulations. Oil contaminated water often must be contained in separate holding tanks and not released into the normal sewer system.

Equipment and Supplies

Oiled wildlife response is a specialized field and, as such, requires a great deal of equipment and supplies to accomplish it effectively. The degree and extent of the necessary materials is directly dependent on a number of factors including species at risk, location, number of animals at risk, specific tasks for response (e.g., field processing, live animal rehabilitation), remoteness of operation/ease of acquiring needed supplies, and similar logistical concerns. Ideally, facilities and organizations taking part in oiled wildlife response planning will have a cache of supplies that will enable them to perform specific tasks for a pre-identified target readiness level (e.g., 10 live oiled cetaceans), with vendors and equipment lists established to allow for rapid renewal of that supply should either the target number of animals be exceeded or supplies be used over time. The stocking of hard-to-acquire items which may not be used in routine rehabilitation (e.g., specialized petroleum sampling supplies such as I-Chem bottles with Teflon-lined lids) is strongly encouraged, even if they

may not be needed for the initial portions of the spill response. Equipment and supplies used for oiled animals may not be able to be cleaned appropriately for subsequent use (and especially for unoiled animals to avoid contamination), and therefore multiple sets of some items may be needed.

While no equipment and supply list is complete and comprehensive, Appendix 8 includes a basis for possible items that should be considered for regional planning based on the organizational category (e.g., primary care, secondary care, recovery).

Personnel

Categories of Personnel

Similar to the different classifications of stranding network organizations, there are different levels of personnel involved in spill response – each of which has different requirements for skills, training, knowledge, abilities and responsibilities. While the specific details of each job function is more extensively detailed in the "Command Structure" chapter, these classifications roughly break down into the following:

- Group Supervisor – This classification is assigned to the upper manager for each of the key response functions during a response. This can include Recovery & Reconnaissance, Care & Processing, Hazing, and/or any other broad category where multiple organized functions (each with a Leader) fall under it. This position is responsible for developing the vision and direction of the Group, collating information from Task Force Leaders to move to the Wildlife Branch Director, and projecting operational needs into the next period.
- Task Force Leader – This classification is assigned to the lead staff member with a specific function and multiple personnel under him/her. This can include Capture, Field Processing, Facility Processing, Animal Care and other discrete functions. This position is responsible for enacting all protocols and procedures for the Task Force (and suggesting/implementing adjustments when necessary), and collating information from each Area for reporting to the Group Supervisor.
- Area Coordinator – This classification is assigned to key personnel within a Task Force that has, for ease and clarity of operation, been further subdivided into discrete elements. This can include Intake, Animal Cleaning, Veterinary, and other functions.
- Area Staff – This classification is assigned to personnel that, by benefit of the skills and knowledge, are assigned critical staff-level roles within the area, but are not responsible for the supervision of other staff.
- Technical Specialists – This classification is assigned to key personnel with specialized training and experience that fill individual roles within the response – often as a consultant or contractor. This can include deterrence, large whale euthanasia, or other key elements that may or may not be necessary within each spill response. Veterinarians with marine mammal experience may also be considered technical specialists within any of the Groups, Task Forces, or Areas. This may include assigning a veterinarian-of-record for the spill who will oversee all medical protocols.
- Volunteers – This classification is assigned to personnel that are not monetarily compensated for their roles during a spill effort. Typically, these individuals fall into two broad categories:
    - "Spontaneous" volunteers are those interested members of the public that express interest in assisting at the time of the event but have no previous association with the Stranding Network;
    - "Pre-Trained" volunteers or "Paraprofessionals" are those individuals that:

- Either possess, or work directly under a person possessing, an active permit or authorization related to the species to be worked on;
- Are affiliated with a wildlife organization working within the Wildlife Branch of the ICS structure, or are a staff member of a wildlife trustee agency;
- Agree to work under, and abide by, appropriate planning documents prepared by the Unified Command (such as Site Safety Plan, Incident Action Plan, public affairs requirements, etc.); and
- Have a working knowledge and experience (> three months) with the general protocols, procedures and safety hazards associated with working on the species of question.

It should be noted that some of the prior defined positions (Area Coordinators, Area Staff) may be filled by personnel during an oil spill response that may be volunteers, but are not normally paid staff, of pre-existing stranding network members. In these instances, it must be defined at the start of a response whether these people will continue to work as a volunteer during the response or if the Network member will employ them as staff during the response and bill for their time. Additionally, it should be reinforced to the Unified Command that most wildlife response programs regularly use volunteers (particularly at the rehabilitation facility) and that volunteers can be an effective and efficient means to provide the necessary manpower to mount effective wildlife efforts if managed directly by a Volunteer Coordinator within the appropriate Group. Furthermore, the inclusion of volunteers within an oil spill effort, if identified as a need by the stranding network facility and requested by the Deputy Wildlife Branch Director as a necessary source of personnel for oiled marine mammal operations, is a mechanism by which the public can feel empowered to do something about the disaster within their region, as well as gain an experience with animals they may not have been otherwise able to be associated with. The sociological benefits of inclusion of volunteers should not be minimized, and should be encouraged if at all possible within the oil spill response framework. That being said, wildlife response managers need to ensure that volunteers are appropriately trained, supervised, and informed of all hazards. A comprehensive volunteer management program is an essential component of an efficient wildlife response. This management program needs to address, at a minimum, volunteer safety, training, supervision, scheduling, conflict resolution, and liability.

Training

Depending on the role that the individual will be filling, different levels of training (both required and recommended) will be necessary (see Table 1). Some training requirements will directly relate to the tasks that the person will fill, including those directed at mastering specific marine mammal rescue and rehabilitation tasks. Others are mandated to ensure the safe accomplishment of activities, such as recognizing and minimizing the risk of injuries from oil-related and physical hazards associated with oil spill response operations. Training-hour requirements and specific courses vary with level of involvement, agency policy, and OSHA and state regulations.

Required Training

Personnel involved in oil spill response activities must comply with all applicable worker health and safety laws and regulations. The primary Federal regulations are the Occupational Safety and Health Administration (OSHA) standards for Hazardous Waste Operations and Emergency Response (HAZWOPER) published by the U.S. Department of Labor in Title 29 of the Code of Federal Regulations (CFR), section 1910.120 (www.osha.gov). Oiled marine mammal responders and rehabilitation centers are not specifically addressed by HAZWOPER and training to address risks associated with marine mammal stranding and oil spill response personnel may fall within the scope

and application of the Hazard Communication Standard (HAZCOM, 29 CFR 1910.1200(h)). However, for those personnel involved in activities within the Exclusion, or "Hot" Zone (e.g., collection of an animal from an area with oil in the environment), 24-hour HAZWOPER certification (24-hour initial training with annual 8-hour refresher courses) will most likely be required and it is recommended that stranding network organizations maintain a few trained individuals. During a spill, the OSHA field compliance or Safety Officer should be contacted to ascertain the worker training requirements (as there may be additional spill-specific needs) and develop an implementation plan to minimize the hazards of exposure to workers involved in cleanup operations. For maximum protection of the environment, OSHA has recognized the need to quickly clean up spilled oil and has empowered the OSHA Regional Response Team representative to reduce the training requirements for responders engaged in post-emergency response operations as directed by OSHA Instructions CPL 2-2.51 (www.osha.gov). State requirements that are more restrictive will preempt Federal requirements. Marine mammal stranding network organizations are responsible for training and certifying their employees and volunteers.

Recommended Training

In addition to the training required by federal regulations, further training is highly recommended for safe and efficient operations during a spill response. Internally, some training opportunities may be considered "required" for staff to fill certain roles to ensure full understanding of the processes and procedures required for that effort. This guidance is considered a minimum essential training for oiled marine mammal response personnel in accordance with the goal of establishing best practices. Regional requirements (and availability/scope of standard trainings such as first aid and boat safety) may differ and should be tailored to addressing those risks/elements present in that Region. These training opportunities may include:

- ICS 100 (or IS-100.b): Introduces ICS and provides the foundation for higher-level ICS training. This course describes the history, features and principles, and organizational structure of the Incident Command System. It also explains the relationship between ICS and the National Incident Management System (NIMS). Available at training.fema.gov/emiweb/is/is100b.
- ICS 200 (or IS-200.b): Designed to enable personnel to operate efficiently during an incident or event within ICS. ICS-200 provides training on and resources for personnel who are likely to assume a supervisory position within the ICS. Available at training.fema.gov/emiweb/is/is200b.
- Live Animal Handling: For personnel who will be in positions where the capture and care of live marine mammals will occur. Should include marine mammal-specific health and safety information (e.g., zoonotic diseases). Currently not available in a centralized location, but individual stranding networks/network members may have offerings available that can satisfy this requirement.
- "Oil Spill 101" Training: Personnel involved in oil spill responses should understand the basics of oil chemistry, spill response structure/incident command system, cleanup technologies, and the roles of each group within the response. This information allows wildlife professionals to speak with some common language to others within an effort. Both NOAA's ORR-ERD and the California Department of Fish and Wildlife offer Environmental Response courses that provide similar content.
- First Aid: For personnel involved with field activities or those in a supervisory role. Courses available through the American Red Cross (www.redcross.org/take-a-class) or the National Safety Council (www.nsc.org/products_training).

- Boat Safety: For personnel involved in field activities on boats. Courses may be offered through the USCG (http://www.uscgboating.org/safety/boating_safety_courses_) as well as other agencies (e.g., DOI).
- Rehabilitation: For facility personnel. Should include basic animal care protocols, procedures and best practices used within that Region, plus additional information related to oil-specific effects. Currently not available in a centralized location, but individual stranding networks/network members may have offerings available that can satisfy this requirement.
- Processing: For field and facility processing personnel. Should include appropriate documentation, sample collection and chain-of-custody information pertinent to oil spill response. Currently not available in a centralized location.
- Crisis Management and Media Relations: For field and facility personnel who are in supervisory positions and/or have the potential to address the media. Currently not available in a centralized location from NOAA, but many training/certificate programs are available through online and in-person vendors.

Table 1: Required and recommended training for oiled marine mammal personnel

	24-Hr HAZWOPER	4-Hr HAZCOM	ICS 100-200	Drill Participation	"Oil Spill 101"	First Aid	Boat Safety	Live Animal Handling	Rehabilitation	Processing	Crisis Management	Media Relations
Deputy Wildlife Branch Director	R		R	R	R	H					R	R
Network Member Director	R		R	R	R	H					R	R
Response Management	R		R	H	R	H	R	R	R	R	R	R
Collection Area Lead/Staff	R		H	H	R	R	R	R				H
Field Processing Area Lead/Staff	R		H	H	R	R	H	H		R		H
Facility Processing Area Lead/Staff	H	R	H	H	R	H		H	H	R		H
Primary Care Area Lead/Staff	H	R	H	H	R	H		R	R			
Secondary Care Area Lead/Staff	H	R	H	H	R	H		R	R			
Field Volunteers	R					H	H	R				
Facility Volunteers (Live Animal)		R				H		R	H	H		
Facility Volunteers (Organizational Support)		R				H		H	H	H		
R = Required training; H = Highly recommended for establishing best practices												

Safety and Human Health

Worker health and safety are of primary importance in any oiled marine mammal rescue and rehabilitation effort. The earliest phases of an oil spill are generally the most hazardous to human health and safety. Thus, safe practices during field collection of marine mammals must be a priority. Rescue programs should not be initiated unless personnel can conduct activities safely. As with all spill response activities, the marine mammal rescue and rehabilitation effort needs to be coordinated and monitored by the spill response command center operations, safety, and medical staffs. It is imperative that marine mammal response operations are organized and implemented within the Incident Command Structure. A written Site Safety Plan (SSP) must be developed and approved by the spill's Safety Officer for the rehabilitation facility. If field activities are on-going for marine mammal response, the site safety plan needs to be expanded to include these activities including any specialized equipment that will be used. All staff and volunteers working on the spill must be familiar with and sign the SSP prior to work.

Personal Protective Equipment

Personal protective equipment (PPE) must be used to protect wildlife response personnel from exposure to hazardous substances and dangers associated with animal care activities. To guard against injury from marine mammals, all workers should wear approved PPE appropriate to their task.

Recommended PPE for General Oiled Marine Mammal Activities

- ✓ Full eye protection, i.e., goggles, safety glasses, or face shield
- ✓ Oil resistant rain gear or oil protective clothing (coated Tyvek, Saranex, etc.)
- ✓ Gloves (neoprene or nitrile) that are oil resistant and waterproof
- ✓ Non-skid shoes/boots that are oil resistant and waterproof
- ✓ Ear protection (muff or ear plug type) when using pyrotechnic devices or operating machinery
- ✓ Appropriate Type personal flotation device (PFD) when working on or near water

Respiratory protection from organic vapor hazards may also be required for some operations. If respirators are used, training and fit testing are required. All workers must be trained on the proper use and limitations of all PPE prior to using the equipment.

Hazardous Substances

Rescue and rehabilitation workers may be exposed to spilled oil, and must be so informed. Prior to handling a contaminated marine mammal, the Safety Data Sheet (SDS) for the spilled material should be reviewed and all recommended precautions followed. The rehabilitation facility should be periodically monitored by the incident's Safety Officer to ensure air quality and other regulatory requirements are met. Ventilation in all work areas should prevent the buildup of airborne contaminants.

A portion of the rehabilitation facility should be designated for the storage of contaminated clothing, equipment, and medical waste until the items can be decontaminated or disposed of properly in accordance with the site safety plan and all local, state, and federal regulations.

Chapter 3 - Response

Incident Reporting and Resource Activation

When oil spills occur within navigable waters of the United States, there are specific reporting requirements mandated by the federal government (outlined in Figure 3). Specifically, any person in charge of a vessel or onshore/offshore facility is required to report to the National Response Center (NRC) "harmful quantities" of oil, defined as "any quantity of discharged oil that violates state water quality standards, causes a film or sheen on the water's surface, or leaves sludge or emulsion beneath the surface." There are certain facilities that are exempt from this requirement and must only report discharges greater than 42 or 1,000 gal (defined in the Spill Prevention, Control, and Countermeasures, or SPCC Rule), but most must report based on the aforementioned "sheen rule". These reports can also be made to the EPA's Regional Office or USCG's Marine Safety Office.

Once the NRC receives the report, notification is made to a USCG or EPA On-Scene Coordinator (OSC), who determines whether further federal action is required. If the OSC determines that federal involvement is required, he/she will assume control of all spill response operations at the site as part of the forming Incident Command System structure, and will obtain and direct all needed resources. If adequate personnel, equipment, and other necessary support are not available through the PRP, the OSC can activate additional spill contractors using funds from the Oil Spill Liability

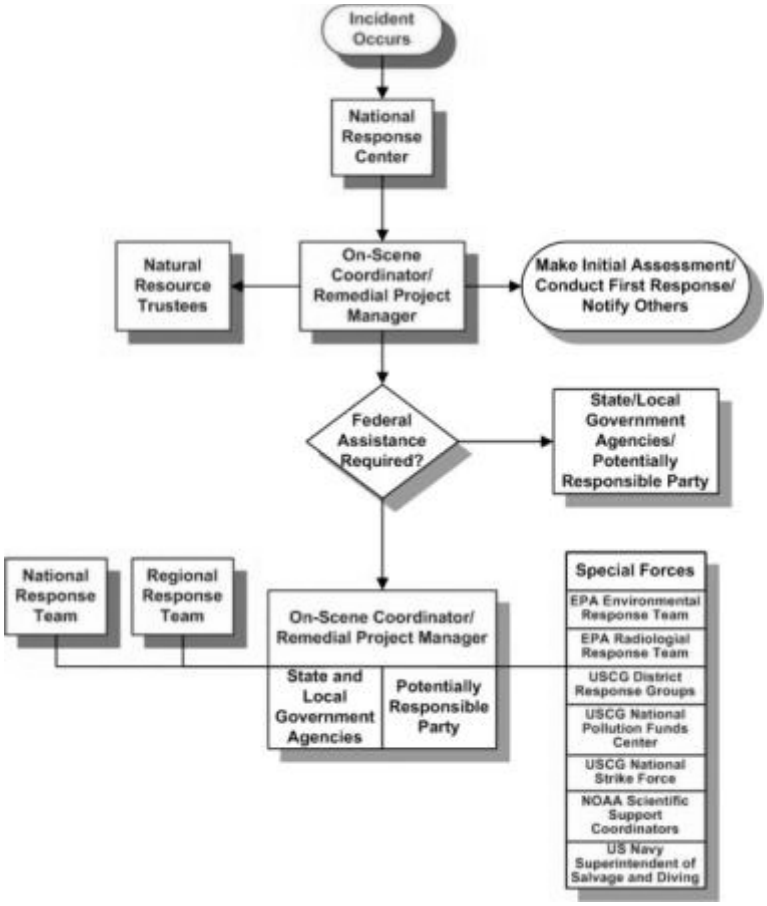

Figure 3: Initial federal notifications (Source: USEPA Website)

Trust Fund, as well as activate the Regional Response Team to provide broader technical advice, equipment, or manpower.

As part of this initial activation process, federal and state wildlife trustees should be notified about the potential impact to their assigned trust resources. This may be directly by the OSC, by NOAA's SSC providing directed support to the OSC, through the Liaison Officer, or through a party or mechanism designated within the RCP, ACP or RP's response plan (see Figure 4 below). Generally, the NMFS RSC will receive the notification via NOAA's SSC, and the stranding network will be mobilized via coordination with them and the Wildlife Branch Director (if activated). If a stranding network organization is contacted directly by an RP or their representative regarding a spill, they should contact the NMFS RSC to coordinate.

Note that the above reporting structure only details instances where oil spills are officially observed and declared by the local, state or federal agencies in charge of spill response. In some instances, individual animals may be observed by the public and/or wildlife professionals as oiled without a spill being reported (e.g., from natural seeps, animals entering waste facilities, non-petroleum oils from fishing activities, unreported spills). The presence of these oiled animals does not normally necessitate activation of the full spill response structure, yet the wildlife response community is often placed in a situation where recovery and rehabilitation is warranted. Additionally, these animals may be the first evidence that a spill is occurring, so these data may be important for subsequent response. Discussions within each Region and with the local Area Committee should take place to develop a plan for reporting and sampling these individually oiled animals such that critical information is shared in a time- and cost-sensitive manner. At a minimum, individually oiled animals should be reported to the NMFS RSC.

Incident Command System

All oil spill responses in the US are managed by following a defined Incident Command System (ICS) structure as standardized by the National Incident Management System (NIMS) and modified for oil and hazardous substance spill response by the National Response Team (Figure 4; see ICS-100b training detailed previously for more information). Leading the response is the Unified Command (UC), made up of a Federal On-Scene Coordinator (FOSC) (usually a Coast Guard Captain of the Port for the affected area), a State On-Scene Coordinator (SOSC), and a qualified individual from the Responsible Party (RP), if known. When appropriate, tribal or local government representatives can also be included in the UC. The FOSC has the ultimate responsibility for directing the oil spill response if a consensus cannot be reached among the members of the UC. Directly assisting the UC are several individuals or groups serving in Command Staff functions. These include:

- Information Officer: Responsible for developing and releasing information about the incident, often generated through a Joint Information Center (JIC) that he/she manages.
- Liaison Officer: Responsible for coordinating the input from, and delivering information to, those agencies that are not represented within the UC. This also includes functions that are not necessarily represented within the response structure, such as natural resource damage assessment, investigations, and natural resource trustees.
- Safety Officer: Responsible for developing and recommending measures for assuring personnel safety, including the drafting of Site Safety Plans (SSPs).

Key activities within the spill's ICS are broken down into four discrete Sections: Planning, Operations, Logistics, and Finance/Administration, with those Section Chiefs acting as the General Staff to the UC:

- Planning: Responsible for the collection, evaluation, dissemination and use of incident information, including maintaining status of assigned resources. This is primarily accomplished through the completion of Incident Action Plans (IAPs), which project plans and resources needed to the next operational period. The Environmental Unit is included within the Planning Section.
- Operations: Responsible for all tactical operations, including recovery/protection, air support, and wildlife operations. The Wildlife Branch is included within the Operations Section.
- Logistics: Responsible for providing facilities, services and material in support of the incident.
- Finance/Administration: Responsible for all financial, administrative and cost analysis aspects of the incident.

Wildlife Branch

Coordination of response activities directed at wildlife (including reconnaissance, hazing, capture, and care) usually occurs within the Wildlife Branch, which works under the Operations Section. Some actions that are related to wildlife or can help inform wildlife response efforts occur with the Environmental Unit of the Planning Section (e.g., identification of resources at risk, assessment of Section 6 and 7 issues, GIS/mapping, provision of trained wildlife observers on response equipment, and collection of shoreline information). Guidance for dealing with oiled wildlife is not specifically provided in the National Contingency Plan; therefore the Wildlife Branch operational

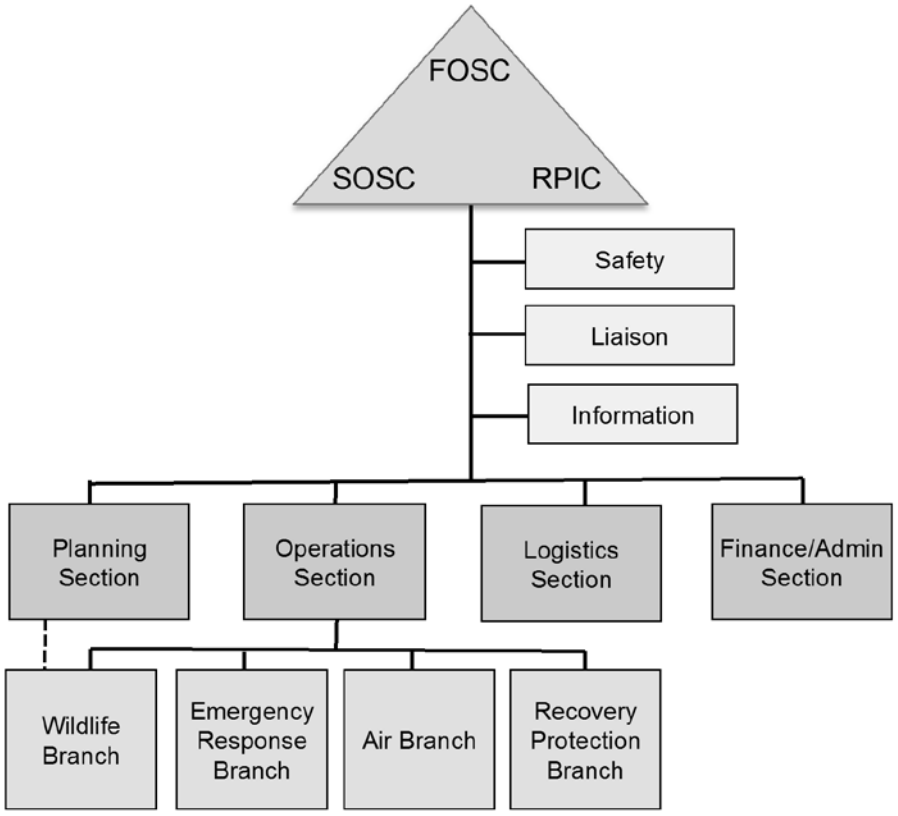

Figure 4: Standard Incident Command Structure for Oil Spill Response. Acronyms: FOSC = Federal On-Scene Coordinator, SOSC = State On-Scene Coordinator, RPIC = Responsible Party Incident Commander

plan is developed uniquely within each Regional and Area Contingency Plan based on the specific resources present locally and agency involvement (see Figure 5 for a generalized Wildlife Branch structure used in California). Under the direction of the Wildlife Branch Director (WBD), the principal objectives of the Wildlife Branch are to:

- Conduct all operations in a safe manner for people and animals;
- Minimize injuries to wildlife and habitats from the contamination;
- Minimize injuries to wildlife and habitats from the cleanup effort;
- Collect all data, samples and animals in a legally defensible manner;
- Document for the Unified Command (and potentially other efforts) the immediate impacts to wildlife of the oil spill and cleanup;
- Report to the Unified Command (via the Operations Section Chief) in a timely and complete manner all pertinent data and information necessary to ensure clarity of wildlife operations;
- Support the efforts of the Joint Information Center (JIC) in disseminating information (much of which may be real-time) to the media, public and other interested parties; and
- Provide the best achievable care to impacted and/or threatened wildlife.

To ensure these objectives are achieved with maximum efficiency, the WBD (in coordination with the Environmental Unit) manages the activities of the federal, state, and local agencies along with commercial and non-profit organizations responsible for wildlife protection and management who fall under the authority of the Unified Command during spill response. Early development and implementation of a wildlife response plan ensures timely mobilization of dedicated staff, equipment, and volunteers. The degree of the wildlife response effort is designed to be flexible and scalable to the size of the oil spill - only those positions necessary and appropriate for a specific spill incident are filled.

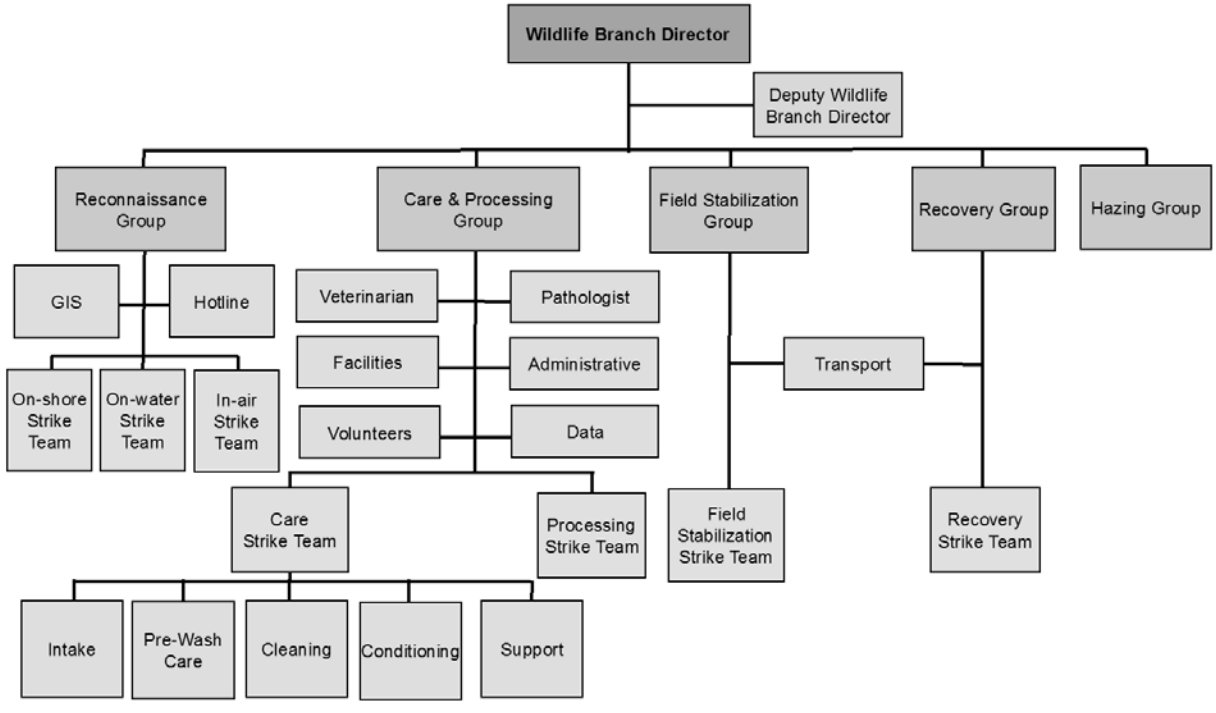

Figure 5: Example Wildlife Branch used for bird response in California (OWCN 2013)

Once the UC activates the Wildlife Branch, several components of oiled wildlife response can be initiated, including reconnaissance to determine what species and which areas are at greatest risk, the feasibility of hazing of animals to prevent oiling, search and collection for live and dead animals in the spill area, treatment and rehabilitation of visibly or suspected internally oiled animals, and release and monitoring of recovered animals. Wildlife contractors [if pre-identified within the spiller's, the Area, or the Regional contingency plan(s)] may be contacted and possibly deployed depending on the region and risk. The agencies, organizations, and individuals responsible for these functions should be outlined in the Area Contingency Plan.

Pinniped and Cetacean Operations

For effective coordination within the overall spill response structure (and the Wildlife Branch in particular), these Guidelines have established a working model of how pinniped and cetacean operations should be managed. As in any oil spill response, however, the number of positions on the organizational chart, and whether one individual fills single or multiple roles (including that of an entire group or task force), is entirely dependent on the scope and complexity of the event. For most

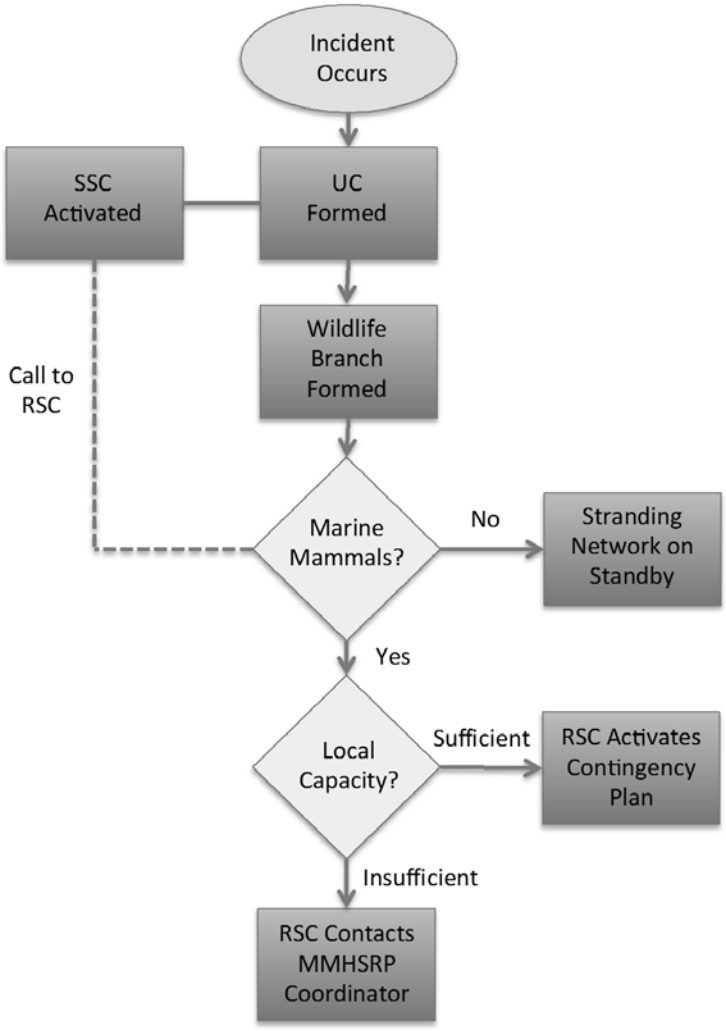

Figure 6: NOAA Marine Mammal Notifications. Acronyms: UC = Unified Command; SSC = Scientific Support Coordinator; RSC = Regional Stranding Coordinator

spill situations, a small number of individuals can successfully fill all of the necessary responsibilities; however, the basic tenets of ICS management (maintaining an appropriate span of control while keeping unity of command) should be exercised. Using this general framework, pre-identified personnel (with roles and responsibilities) and locations should be established for each Area/Region and documented within its specific Contingency Plan. These plans should be exercised regularly, with NOAA and MMHSRP staff/stranding network members taking part in larger exercises (such as National Preparatory, or NPREP, drills). This will decrease the time and confusion that can exist early in a response effort, as well as identify gaps in coverage that additional personnel, equipment or facilities are needed to fill.

In a spill incident where wildlife are at risk and/or known to be affected, a Wildlife Branch will likely be activated (see Figure 6). In areas where pinnipeds and/or cetaceans may be impacted, the WBD and/or the SSC should contact the RSC, as he/she will be most familiar with local assets that can be used when appropriate. Similarly, the Environmental Unit Leader and/or the SSC will likely be in contact with NOAA Fisheries' Regional Office for Section 7 (ESA) consultation. Initial discussions between the WBD/SSC and RSC should include whether pinnipeds and/or cetaceans are at risk, what assets have been made available by the UC and/or the RP, the regional capacity of the stranding network, whether the UC has approved the development of a Pinniped/Cetacean Group within the Wildlife Branch, and whether the response is large or complex enough to warrant the activation of a Deputy Wildlife Branch Director (DWBD) to focus on pinniped/cetacean issues. In most instances, the RSC can fill the DWBD role, but other marine mammal/response specialists from the MMHSRP and/or other professional wildlife organizations may also effectively fill this role if authorized/approved by the MMHSRP Coordinator. Once these initial discussions occur, the level, degree and staging of activation of resources can take place (as well as contacting other RSCs and the MMHSRP Program Coordinator to request additional assistance, as needed).

It must also be noted that the selection of individuals to fill specific roles within the ICS structure should be based on qualifications, not necessarily the position they fill during non-spill periods. Similarly, reporting structures and command/control decisions for spill information and actions should follow the organizational chart put into place for the spill by the DWBD operating within the Wildlife Branch, not those used for general non-response activities. Employment and availability information (and similar logistical issues) will likely need to be coordinated between the staff member and their employer but, once deployed to a spill and filling a specific role within the response structure, reporting and tasking should be from within the Incident Command System.

Pinniped and Cetacean Command Staff

The roles and responsibilities of each Strike Team and Area identified in the diagrams below will be further detailed in each chapter dedicated to those discrete protocols. However, there are a number of Command Staff (DWBD, volunteer coordinator, etc.) that may/will play shared roles across all groups within Pinniped/Cetacean Operations. Briefly, descriptions of these positions are as follows:

- Deputy Wildlife Branch Director: In situations where significant risks to pinniped/cetacean stocks are present and on-site activities are required, the WBD may choose to activate this position. This function may be filled by the NMFS RSC, but may also be filled by other Regional or non-Regional staff with significant spill experience and knowledge of local assets. Specific duties of the DWBD will depend on the spill event, but may include the following: playing a lead role in supervising the pinniped/cetacean-specific Groups within the Wildlife Branch (Hazing, Recovery, and Care & Processing); coordinating the logistical needs between the managed

Groups and the Logistics/Finance Sections to ensure proper documentation and timely processing of requests (e.g., completing ICS Resource Requests in no Logistics/Finance Coordinator is activated); updating the Unified Command (through the WBD) of spill-related wildlife statistics (e.g. numbers of dead/live oiled mammals); coordinating pinniped/cetacean-related activities with the various trustee agencies; coordinating the staffing and updating of oiled mammal and volunteer hotlines; and updating the Joint Information Center/media as requested by the Unified Command. The DWBD must have extensive experience, background and understanding of the capture and treatment of oiled pinnipeds and cetaceans during an oil spill event, understand the planning for and implementation of NOAA's Guidelines and Regional Response Plans, as well as possess oil spill/crisis management experience.

- Volunteer Coordinator: Under direction of the DWBD, this position organizes and schedules volunteers on a daily basis for all Groups. During larger responses, this position should be sited at the Command Post for ease of coordination with the DWBD and each individual Group Supervisor, with Deputies located at each facility and at staging areas for each Recovery Task Force. During smaller responses with a single facility activated, this position may be housed at the Primary Care Facility (and staffed by that facility's Volunteer Coordinator) and managed by the Care and Processing Group Supervisor if volunteers are not needed/approved for field deployment. Specific duties include scheduling and conducting orientations and safety trainings as needed; managing and reporting volunteer issues and problems as necessary; reporting pertinent volunteer-related issues up the chain of command; and addressing logistical needs for volunteers (e.g. volunteer meals).
- Logistics/Finance Coordinator: Under direction of the DWBD, this position coordinates financial and administrative matters relating to pinniped/cetacean spill response. During larger responses, this position will need to be sited at the Command Post for ease of coordination with the larger Logistics and Finance/Administration Sections, with Deputies located at each facility and at staging areas for each Recovery Task Force. In smaller incidents, the Coordinator role may be accomplished at the Primary Care Facility. Specific duties include assisting with completion of special forms (ICS Resource Requests, if sited at the Command Post), daily logs/reports, and daily cost accounting; ensuring logistical needs of Groups are met (e.g. travel arrangements, car rentals, hotels, staff and volunteer meals, supply ordering); compiling and reviewing invoices from stranding network members and contractors for accuracy; acquiring supplies as needed; coordinating with PRFA administrators for Federal employee costs; and assist with logistics when necessary.
- Data Coordinator: Under direction of the DWBD, this position ensures the proper collection of all pinniped/cetacean-related data during an oil spill event and organizes and collates information received from the different Task Forces and Facilities into a cohesive common operating picture. During larger responses, this position will need to be sited at the Command Post for ease of reporting to the Planning Section, the UC, and NOAA staff managing ERMA (Environmental Response Management Application), with Deputies located at each facility and at staging areas for each Recovery Task Force to review incoming data. In smaller incidents, the functions intrinsic to this position may be accomplished at the Primary Care Facility. Specific duties include ensuring all Groups and Areas are properly collecting data; conducting training when necessary to ensure appropriate data collection; reviewing all Chain of Custody procedures and interacting with NOAA-OLE and NOAA-GC (as appropriate) to ensure compliance; conducting data validation/quality control procedures; ensuring that the DWBD is appropriately briefed and informed about relevant numbers; and compiling daily summary reports for delivery of information to Situation Status and the UC (via the DWBD and Wildlife Branch Director)

when necessary. This position may be filled by the Processing Strike Team Leader in small- to moderate-sized spills.

- Hotline Coordinator: Under direction of the DWBD, this position manages a reporting system for collecting and distributing information from the public and other responders on pinnipeds and cetaceans affected or at risk during oil spills. In smaller incidents, this role may be accomplished within the Recovery Group. Specific duties include the establishment and staffing of a hotline system; and interaction with other regional emergency response systems to ensure appropriate information flow. In areas with a pre-existing stranding network member with their own hotline (which is likely well known in the local community), the Hotline Coordinator should work with the stranding organization to ensure that the reports received directly by the organization from members of the general public are collected and acted upon appropriately within the framework of the ICS.

Tiered Wildlife Response Planning

As mentioned above, each oil spill incident involving wildlife will be very different based on a number of different variables, including (but not limited to) spill dynamics (e.g., product, volume), time of year, location of spill, and oceanographic/meteorological status. Because of this dynamic state, no "one size fits all" organizational structure for marine mammal response can be applied to each and every response. At an industry level, oil spill planners have addressed this same issue using a Tiered system concept, where differing levels of readiness are defined based on extent of needed response. Typically, these tiers are broken down in the following manner:

- Tier 1: Spills that only have a local impact and require only local resources;
- Tier 2: Spills that have regional or national significance, and require resources from a larger area or across that nation; and
- Tier 3: Spills that have international significance, and require resources from multiple countries.

Note that this internationally-recognized structure for oil spill readiness is different than that recommended under NIMS to describe incident complexity. In the NIMS structure, a Type 1 response is the most complex, requiring national resources for implementation (likely equivalent to a Tier 3 response), and Types 2-5 are in decreasing order of resource needs (equivalent to Tier 2-1). For the purposes of marine mammal readiness within the United States, it has been determined that the international standard will be followed to allow for local/Regional planning, but also allow for assistance when needed across stranding networks. This revised concept is as follows:

- Tier 1 Marine Mammal Response (Local): A discrete spill occurring in a localized area where

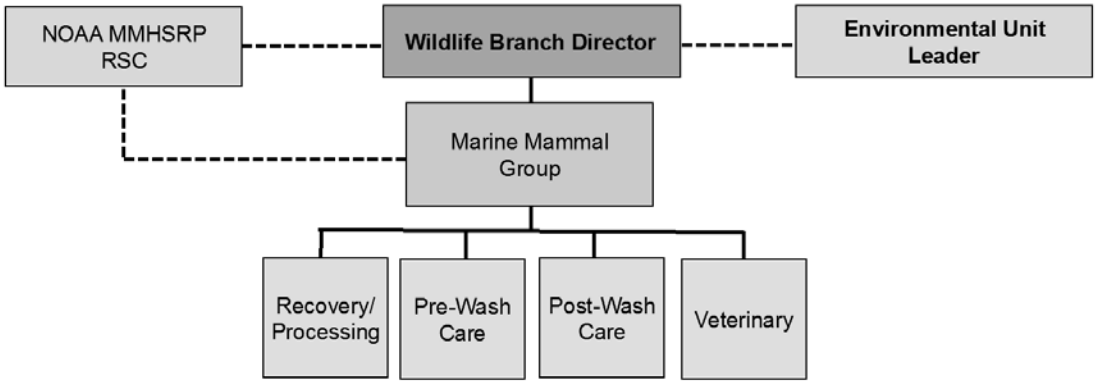

Figure 7: Tier 1 Pinniped/Cetacean Wildlife Branch Organization

the assets within a single stranding network member organization/facility can provide an appropriate response should mammals be affected. In this scenario, the RSC may not need to be physically present at either the Incident Command Post or at the Primary Care Center, but can be consulted via telephone or email should questions or concerns arise (see Figure 7). Due to the limited extent of the response, a single Marine Mammal Group can be deployed (which consists of recovery as well as rehabilitation), and operations can likely be focused from a single stranding network organization, primarily using their resources. If the most local facility does not have Primary Care capabilities, a Primary Care Facility will also be identified. Staff and volunteers from other organizations within that Regional Network may be activated or put on stand-by, but may not need to deploy personnel (aside from efforts for training and outreach purposes, which may not be reimbursed by the Responsible Party). Communications between the WBD/UC and marine mammal operations should flow back and forth via the RSC by phone and email, with the RSC ensuring that operational activities are captured within the Incident Action Plan and that appropriate resource requests are made to support the operation. It should be noted that, for many regions in the US, Tier 1 capacity may not be available due to lack of infrastructure, distance from key marine mammal facilities/organizations, or other reasons. In these situations, even small responses may require a Tier 2 response from the start of the spill.

- Tier 2 Marine Mammal Response (Regional): A more substantial spill (by volume, extent, or complexity of the response, as well as the size and species of marine mammal populations exposed) where the local stranding network member organization/facility's assets need to be supplemented by additional personnel and (potentially) other facilities from within that Regional stranding network (see Figure 8). In this scenario, the RSC/designee will either need to be physically present at the Primary Care Center acting as a Deputy Wildlife Branch Director with regular consultation and reporting occurring via telephone and email to the Wildlife Branch Director at the ICP, or present at the ICP with regular communication with the Care & Processing Group Supervisor stationed at the Primary Care Center. Due to the increasing complexity of the mammal response, Recovery and Care operations would be separated, with different Group Supervisors in charge of each. Operations can likely be focused from a single

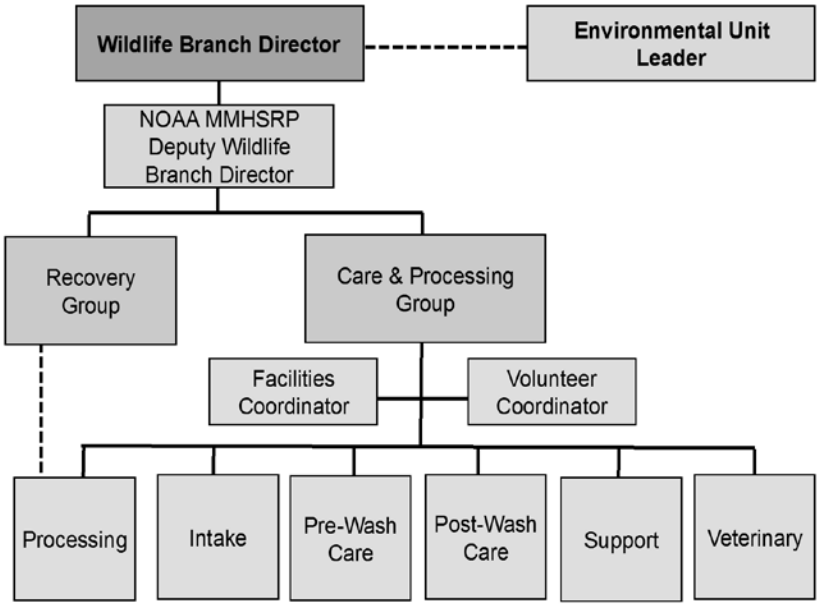

Figure 8: Tier 2 Pinniped/Cetacean Wildlife Branch Organization

Primary Care Center, but may require additional staging areas for recovery and (possibly) field stabilization and/or processing (necropsy) to occur. Resources (personnel, equipment and supplies) from multiple organizations within that stranding network will likely be needed, but staff and volunteers from other Regional Networks may not be necessary (aside from training and outreach purposes).

- Tier 3 Marine Mammal Response (National): A large/complex spill where the assets from multiple different Regional stranding networks are necessary to mobilize an effective response (see Figure 9). In this scenario, the RSC/designee where the incident has occurred will need to be physically present at the Incident Command Post acting as a Deputy Wildlife Branch Director, with regular communications occurring via telephone and email to each Group Supervisor. Command staff (Volunteer/Data/Administrative Coordinators) would likely be located with the DWBD at the Command Post, with Deputies, when appropriate and necessary, located at each Primary Care Facility and Recovery Staging Area. Due to the increasing complexity of the mammal response, Recovery and Care/Processing operations would be further divided into Strike Teams responsible for discrete functions within those groups. Similarly, formalized reconnaissance would be added to the tasking of the Recovery Group as a separate Strike Team, and hazing may be added to the mission of the Branch and initiated as a separate Group. There will likely be multiple Primary Care Facilities located in different areas throughout the spill site, each of which would contain separate Processing and Care Strike Teams. Similarly, there will likely be multiple Recovery Strike Teams in different regions

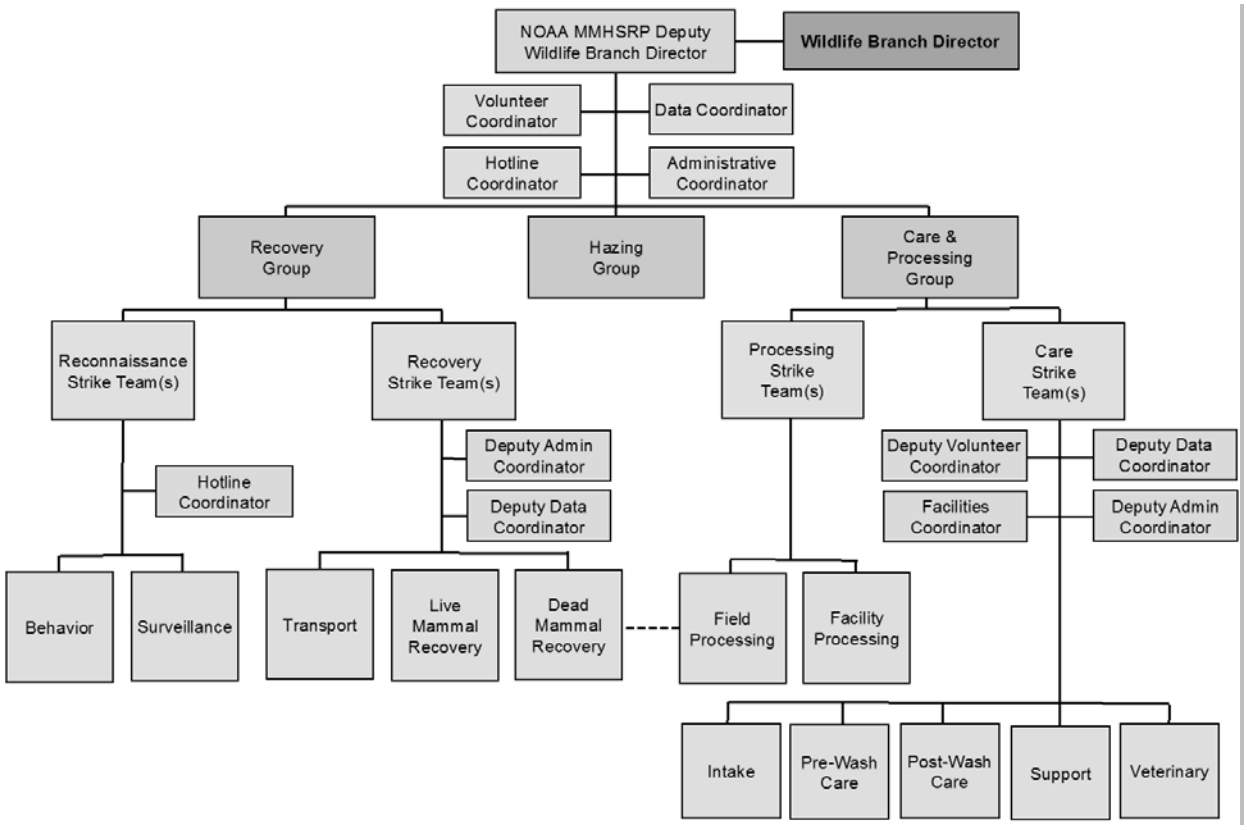

Figure 9: Tier 3 Pinniped/Cetacean Wildlife Branch Organization

throughout the area, all of which have Strike Team Leaders reporting to a single Recovery Group Supervisor. Resources (personnel, equipment and supplies) from multiple stranding networks will likely be needed to provide the depth of coverage and the longevity of the response.

For ease of presenting information within these Guidelines, all operational discussions will describe a Tier 3 response, as this would be the most elaborate and difficult to plan for and enact. For Tier 1 and 2 responses, while the overall duties and obligations would remain the same for each Group/Strike Team/Area, those obligations could be "collapsed" up the organizational chart so that one discrete unit can suffice for multiple tasks (e.g., the Recovery Area under the Marine Mammal Group in a Tier 1 response can cover the duties of the entire Recovery Group as described in the following text). However, it should be recognized that, as a spill evolves over time, a response may evolve to a higher tier (or conversely, devolve to a lower Tier); the concepts and practices of the Incident Command System allows for this change in an organized fashion.

Formal Transitioning Between Tiers

As described above, the scaling of a marine mammal response may need to transition between smaller and larger response efforts throughout the spill. At a minimum, the wildlife response must eventually be demobilized once rescue and rehabilitation efforts are concluded. This scaling, whether up or down, can be a very difficult process to both plan for within the Wildlife Branch as well as explain to the Operations Section and the UC. Therefore, a defined and written "Transition Plan" that specifies those activities (and associated resources) that will be needed based on meeting certain milestones during the response is highly recommended. "Transition Plans" should:

- Provide a tiered approach to the allocation, movement, demobilization or remobilization of resources (numbers and locations);
- Provide triggers (decision points) to guide changes to wildlife response, rehabilitation, assessment and monitoring activities based on:
    - Numbers, locations, and degree of oiling of rescued and recovered marine mammals;
    - Behavior and distribution of marine mammals;
    - Assessment of marine mammal habitat quality;
    - Best available environmental information, including:
        - Presence and extent of surface oil;
        - Presence and extent of subsurface oil;
        - Oceanographic conditions;
        - Meteorological data; and
    - Any other information deemed relevant by this Group; and
- Provide data reporting to the UC and Federal and State wildlife trustee agencies.

Ideally, the "Transition Plan" will have defined metrics (e.g., number of animals collected, number of animals still in care, number of days since the last oiled marine mammal was observed) that will assist in the decision-making process. Lastly, it must be understood that marine mammals often have protracted rehabilitation time requirements and that the ongoing care of these animals in rehabilitation is the obligation of the UC. Therefore, even if the decision is made to demobilize stranding response/field efforts and no new intakes will arrive at the facility, the care of animals collected during the response must continue and be adequately funded.

Overview of Data Management

Systematic reconnaissance, hazing, search and recovery, transportation, processing, and treatment of all oil-affected wildlife is critical for guiding response actions and gaining an understanding of the short-term and long-term consequences of oil spills to wildlife populations. In addition, these data can be used after the emergency response for natural resource damage assessment activities. In order to track the samples and collect data during oiled wildlife response, the trustee agencies and response organizations must adhere to pre-established chain-of-custody and animal identification procedures. During large-scale responses, pre-identified wildlife agency personnel or their agents may complete the necessary forms; however, field and rehabilitation responders should also be familiar with the documents and their completion for smaller-scale responses and for individual oiled animals that present to participating facilities independent of a spill response. In addition to the tracking of live animal data, all samples (carcasses, samples, photos, records) that may be used as evidence in legal proceedings must be tracked and secured at all times.

Quality assurance (QA) procedures are necessary to ensure that data are collected in a scientifically valid manner. During large-scale spills, this will ultimately be the responsibility of the Data Coordinator, but it is imperative that all supervisors throughout the response understand the importance of collecting and documenting complete information. It is important throughout any sampling and analysis program to maintain integrity of the sample from the time of collection, through the point of data reporting, to the final sample disposition. Proper chain-of-custody procedures allow the possession and handling of samples traced from collection to final disposition.

Details on completion of the discrete forms needed in each area are provided below in the appropriate chapter. When appropriate, use of waterproof paper is recommended to maintain the integrity of the form. Briefly, the documents needed to maintain proper chain-of-custody include:

- Search Effort Log: All pertinent information on field searches should be recorded on the Search Effort Log (Appendix 1-A). For tracking and chain-of-custody purposes, all live and dead animals recovered should be identified (tagged/marked) in the field and the identification noted on the Search Effort Log. For general field activities, personnel may choose to record efforts in a field logbook, then transcribe the pertinent information to the Search Effort form at a later time. The logbook should enable someone else to completely reconstruct the field activity without relying on the memory of the field crew. All entries should be made in indelible ink (preferably ballpoint), with each page signed and dated by the author, and a line drawn through the remainder of any page. All corrections must consist of permanent line-out deletions that are initialed.
- Animal Logs: At admittance to a wildlife care and processing facility, the animal must be logged into the Live Marine Mammal Data Log or Dead Marine Mammal Data Log (Appendices 1-D and 1-E) and all of the boxes on these forms must be completed. All dead and alive animals are given a unique log number and identifier (e.g. tag), as well as a Level A data field number, in order to track the individual animals through the capture/collection, processing, and, for live animals, the rehabilitation and release process.
- Sample Collection and Label: An oil sample and photo must be collected from each individual animal. A detailed protocol for the collection of evidence is provided in Appendices 2 and 3. Each sample must be identified with a waterproof label that is securely attached to the outside of each sample container. Labels must contain the oil spill name, date, species, intake log number and Level A data field number of that animal, animal capture location, and flipper tag color and number (if used)and then sealed with evidence tape or custody seals. Custody seals are used to

detect unauthorized tampering with the samples. Samples and photo must be properly stored in a secure location that has limited and controlled access.

- Intake Form: For live animals, the Oiled Marine Mammal Intake Form (Appendix 1-H) must be completed for each animal. This form contains important data about the extent of oiling, location and depth of oiling, as well as space for documenting physical examination findings. For evidence documentation, a photo of the animal and oil sample must be taken during intake and admission into the wildlife care and processing centers (see Intake and Admission Procedures). During rehabilitation, each animal must have individual records documenting its treatment and care of that animal. Authorization for cleaning and later release must be documented on this Form and signed by the authorizing authority (i.e. attending veterinarian). For resource damage assessment purposes, a photo of the animal with identification (i.e. card with animal log number and date) must be taken prior to release.
- Chain-of-Custody Forms: A chain-of-custody (CoC) form (Appendix 1-C) must accompany every animal collected during response activities. A CoC form will also need to be used for the transferring of samples taken from the animal **if that sample has been collected to prove oil exposure status and has not been collected/transferred for diagnostic purposes only**. Samples always requiring CoC include external oil swabs, photographs, tissues/samples taken during necropsy for histopathological/chemical analysis, and blood/other biomedical samples taken from live mammals to determine exposure status (e.g., whole blood for PAH analysis). In most cases, blood, bacterial/viral swabs and other biomedical samples that are collected only for diagnostic purposes may be sent to off-site diagnostic laboratories for evaluation without having to follow strict CoC procedures. However, if samples will be returned from the laboratory to the response, and those samples may later be used to assess exposure, CoC procedures must be followed. One simple rule to use in determining the necessity of following CoC procedures: if there is ever a possibility as to whether the laboratory results may be used in support of a claim for natural resource injuries associated with the oil spill (for example, used to show exposure to oil), it is better to err on the side of completing a CoC form versus not having one. The CoC initiation should start with collection of the animal or sample and show each transfer of the animal/sample to another individual. Both the person relinquishing custody of the sample(s) and the person receiving the sample(s) must sign the form and ensure that the samples and records are not left unattended unless secured properly. The trustee agency (NMFS, USFWS) that is acquiring custody of samples (such as oil swabs collected from animals during Processing) from a rehabilitation center should supply appropriate CoC forms. For samples taken from a carcass that is already under CoC, a "child" CoC form may be used to follow samples from the larger "parent" (see Appendix 1-C, Subsample Form).

Chapter 4 – Hazing Group

Introduction and Goals

The most effective means to protect pinnipeds and cetaceans from damage associated with oil spills is preventing them from being oiled in the first place. Much of the effort by which this can occur is directly related to oil clean up (or so-called "primary" response efforts), such as deflection booming, skimming, dispersing oil and in situ burning, which reduces the amount of the oil product in specific compartments of the environment (e.g., on the water surface, in the water column, or shorelines). However, "secondary" response efforts, including minimizing injuries to wildlife by attempting to keep animals away from oil and/or cleanup operations, can be equally effective in preventing species from requiring recovery and rehabilitation. Deterrence activities do not come without risks, as many techniques use potentially dangerous and regulated materials (e.g., pyrotechnics, sound generators, propane cannons), as well as there being a dearth of significant knowledge on how each method works on specific species. Additionally, deterrence actions only are effective when there are safe locations to drive animals to, when species do not have such strong site fidelity that they will not quickly return or are not able to be disbursed, and when the geographic area involved is small enough that it can be effectively controlled (e.g., hazing may be inappropriate for larger spills). Marine mammal hazing activities also typically require significant lead time for preparation, particularly in situations where equipment has not been "cached" and communication and coordination with non-stranding network local groups is needed, and therefore may not be able to implemented on the time scale of a spill response (within hours to the first few days following a release). Lastly, hazing activities must take place only under the authority and oversight of trustee agencies, in coordination with the UC, as such actions are designated as "harassment" or "take" by the MMPA and ESA.

Personnel

Only experienced personnel should staff the Hazing Group due to proper training in the use of hazing equipment, as well as significant experience using such techniques on the species at risk being required. It is likely that local stranding network members may not have this expertise or equipment, and therefore external personnel may be required (even for a Tier 1 response). Hazing activities, observations, and results are to be reported to the WBD, who will then pass this information on to the Planning Section's Environmental Unit Leader and to the UC as needed.

- **Hazing Group Supervisor** – This position is responsible for the deterring of live unoiled wildlife from environments where they may become impacted (see Figure 10). This Group, either through the Supervisor or through the Deputy WBD, should coordinate with the Situation Unit (Planning Section), Reconnaissance Group and Recovery Group (Wildlife Branch) to determine wildlife at risk in the vicinity of the spill. The Hazing Group Supervisor must have extensive background in marine mammal ecology and behavior, must be conversant and experienced with all

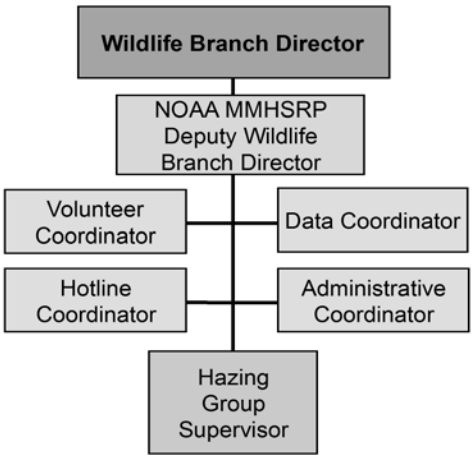

Figure 10: Hazing Group Organizational Chart

different deterrence equipment and techniques for marine mammals, and (when possible) have oil spill and crisis management experience.

- **Hazing Staff -** Hazing Staff assist the Hazing Group Supervisor with the deterring of live unoiled wildlife from environments where they may become impacted. Must have significant background in wildlife ecology, and different deterrence equipment and techniques.

Safety

Hazing of marine mammals during an oil spill event presents personnel with health and safety risks related both to the risk associated with the equipment used (e.g., pyrotechnics) as well as working outdoors under sometimes rugged conditions and/or in inclement weather for long hours. Therefore, only qualified personnel who have received the appropriate safety training should perform hazing of oiled mammals. Because hazing duties vary with each response and may involve more risk than other duties, the Safety Officer will communicate to the Wildlife Branch Director what level of equipment and training is appropriate for field response personnel; this training may include a 24-hour HAZWOPER training (Hazardous Waste Operations and Emergency Response), first aid/CPR, water safety, or boat safety courses (see Safety and Human Health). In general, however, safe practices can be maximized by following these steps:

- Maintain the level of OSHA health and safety certification required by the Safety Officer for oil spill response, which ensures that field staff members have been advised of the safety hazards associated with spill response and the many ways in which hazards can be minimized and safety maximized.
- Prior to initial deployment and/or as soon as it is available, all field staff must read and sign the Site Safety Plan prepared for the spill event by the Safety Officer, which ensures that field staff are aware of any specific safety issues he/she may face in responding to that particular spill and typically lists the nearest medical facilities (emergency rooms, clinics, temporary first aid stations, etc.).
- Field staff must wear proper personal protective equipment (PPE), as determined by the Safety Officer, at all times when hazing marine mammals. Proper PPE requirements will be dictated by their primary location of operations. Personnel deployed on boats within an Exclusion Zone may be required to wear safety glasses or goggles, Tyvek coveralls, nitrile or vinyl gloves, weather-appropriate personal flotation devices (PFDs), and skid-resistant boots. For personnel not in an exclusion zone, PPE requirements may be reduced to include only PFDs and appropriate footwear. For shore-based hazing personnel, similar PPE requirements may apply, though PFDs may only be necessary within a designated distance from the surf zone. If working with auditory deterrence methods, ear protection will be necessary. Use of pyrotechnic and propane cannons must follow a plan to minimize the risks from fire and may require proof of firearms safety training. Hazing personnel may encounter exposure hazards in inclement weather, so appropriate foul weather gear should be available to avoid cold exposure, as well as hats and sunscreen in hot weather. Additional PPE and safety plans may be required at the discretion of the Safety Officer or other staff.
- No in-person hazing efforts should take place after sunset (or civil twilight), by boat, or by off-road vehicle (e.g., all-terrain vehicle) unless specifically approved by the Wildlife Branch Director and directed by the Hazing Group Supervisor.
- Hazing personnel should carry a first-aid kit at all times while in the field, so that immediate care for an injury is achievable, prior to further medical attention as necessary.
- All injuries must be reported to the Recovery Group Supervisor, who will complete an injury report and communicate with the Wildlife Branch Director.

Documentation

Full documentation of methods deployed, reasons for choice of method, effects on observed species, and plans for alternate techniques should be collected in a methodical organized fashion for rapid dissemination to the other personnel within the Wildlife Branch. In most situations, data may be collected in Field Logs and later transcribed to appropriate Hazing Forms for clarity of information.

Hazing Procedures

Decision-Making

If pinnipeds or cetaceans are observed or are likely to be in the vicinity of a spill event at the start of an oil spill, the Wildlife Branch Director should consult with NOAA Marine Mammal Health and Stranding Program to consider whether to develop a hazing plan for those species. Several different factors must be taken into account before hazing is officially undertaken:

- ✓ What is the location and/or the extent of the spill?
- ✓ What are alternative areas that marine mammals can be hazed to?
- ✓ What species are present or likely to be at risk?
- ✓ What is the life history status of the mammals at risk (e.g., pregnant, with calf, juveniles vs. adults, etc.)? Are the species present migrating through the area or resident? What is their behavior in the area likely to be (e.g., foraging, resting with calves, etc.)?
- ✓ Who is available with experience and knowledge for hazing the species at risk?
- ✓ Are there techniques known to work on the species at risk?
- ✓ Are the necessary supplies and equipment to implement those techniques available or can they be obtained quickly?
- ✓ What are the environmental conditions?
- ✓ Can the hazing plan be enacted in a safe manner for people and wildlife?

In some situations, hazing and monitoring activities may be the only mitigation measures possible for marine mammals during an oil spill, as capture and rehabilitation of larger cetaceans is impracticable.

Hazing Plan

If it is decided to proceed with hazing of marine mammals, the Hazing Group Supervisor will develop a cohesive plan to deter wildlife from entering a spill area for UC approval, which will then be incorporated into the Incident Action Plan (IAP) before operational activities commence. The plan must deal with mammals habituating to hazing techniques over time, as well as the degree to which mammals may be attracted to an area (due to curiosity, transiting the region, attraction from possible increased food presence). Additionally, the plan must address the benefits of keeping mammals from entering the spill area relative to the risks to people and wildlife associated with hazing, as well as the costs and benefits associated with taking no hazing action. The plan should also address metrics and procedures for determining if implemented hazing techniques were effective. This might require the use of observers not involved with the hazing activity to assess the response of the marine mammals to the techniques being employed. The plan should also include a protocol for deciding if implemented techniques should be continued or modified. These metrics and decision trees will likely be case-specific depending upon the species involved, availability of different options, and the logistics of the situation.

Hazing Techniques

There are a number of potential deterrent options that can be used on marine mammals – each of which have associated positive and negative benefits. The hazing methods recommended (if any)

would be those that have the greatest chance of success depending on current conditions and information.

Close-Range Techniques

- Oikomi Pipes: Reverberant metal devices; 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. Numerous pipes can be used in multiple lines.
    - Advantages: Shown effective for some species of toothed whales and dolphins (in particular, orca); safe; little training or experience required; high public acceptance level.
    - Disadvantages: Not as efficacious for very large area; requires coordination of multiple vessels; could be dangerous at night or during poor sea conditions; not effective for all species of marine mammals.
- Seal Control Devices (seal bombs, underwater firecrackers, cracker shells): Explosive devices that put out a pulse of noise and an associated pressure wave, especially when detonated in the water.
    - Advantages: Work at a distance (1 mile); not very expensive; readily available.
    - Disadvantages: Concerns where highly volatile oil was present; can cause fish mortality; potential to cause marine mammal injury or mortality if not used properly; require more training by personnel to use.
- Acoustic Deterrent Devices (ADDs, or net pingers): ADDs make sound not loud enough to cause pain, but which is audible to some species of marine mammals.
    - Advantages: Relatively readily available; easily deployed on oil booms or vessels; demonstrated effective for several species of odontocetes when used on fishing gear.
    - Disadvantages: May not have sufficient power; marine mammals may habituate quickly; not effective for all species of marine mammals.
- Prerecorded Calls: Calls made by conspecifics or predators can be played from a small boat to theoretically attract mammals towards a safe area or deter them from entering an area, respectively.
    - Advantages: Calls and broadcasting equipment relatively readily available; when kept below certain species-specific threshold received levels, not likely to have the potential to cause injury
    - Disadvantages: Additional research needed; may attract animals or stimulate aggression; marine mammals may habituate quickly.
- Vessel Traffic: The noise and motion of boat traffic could be used to drive mammals from an area or deter them from entering one.
    - Advantages: Small boats are potentially available for this activity.
    - Disadvantages: Little value in long-range displacement.
- Aircraft: Helicopters can generate a fair amount of noise and wave movement at close range and could produce a startle or avoidance response.
    - Advantages: Might be very effective initially; can be quickly mobilized; could provide reconnaissance at same time; could simultaneously deploy additional deterrent devices.
    - Disadvantages: Safety issue; cost factor; little control of animal movement; marine mammals may be likely to habituate quickly.
- Fire Hoses: Fire hoses could be used to direct streams of water at whales on the surface at extremely close range.

  - Advantages: Can use available high-powered fire monitors mounted on some regional tug boats, therefore could be deployed on fairly short notice; effective at influencing whale behavior, causing animals to turn (Gulland et al., 2008).
  - Disadvantages: Limited to very close range (approximate 100 yards); little control of animal movement; limited availability.
- Experimental Methods: Theoretically, methods such as strobe lights, bubble curtains, and booms could provide a visual deterrent to marine mammals.
  - Advantages: Theoretically could fence off an area without risk of physical harm.
  - Disadvantages: No data available on effectiveness; light and other visual stimuli will not penetrate water very far; not currently readily available.

Longer-range techniques

- Acoustic Harassment Devices (AHDs): AHDs produce noise loud enough that they are likely to cause pain in animals at a certain range. Airmar AHDs have a source level of 195 dB re 1 μPa_{RMS} and their peak energy at 10 kHz with higher harmonics. These 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: Short training time; may deter cetaceans up to 3 km away; publicly acceptable at long range.
  - Disadvantages: Potential acoustic trauma at short range; repeated exposures could result in long-term displacement.
- Chemoattractants: There are reports that humpback whales in Alaska may be attracted to dimethyl sulfide (DMS) as an indicator of zooplankton prey (Straley et al., 2013). This method may have strong advantages in luring larger baleen whales from regions of high risk; however, it is preliminary and needs to be further developed before being operationally ready.
- 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; securing a ship to tow the array could be an issue; concern about acoustic impacts to species including fish; not readily available locally.
- 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: Unlikely to be used during a spill response. 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 orca 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.

Chapter 5 – Recovery Group: Recovery Strike Team

Introduction and Goals

Wildlife recovery focuses on the collection/capture of dead and live externally and internally oiled wildlife and their transport to processing centers. The determination of whether a marine mammal is oiled can be a difficult task in field conditions, as the primary route of oil exposure in most marine mammals is through ingestion or inhalation. Therefore, in order to collect live or dead stranded mammals that could possibly have been adversely affected from oil exposure, all stranded marine mammals in the "designated spill area" (see below for definitions) that appear injured, debilitated, or otherwise not normal will be collected if logistically possible, including all carcasses that are observed. In highly specialized circumstances (e.g., for ESA-listed species), the pre-emptive capture of unoiled individuals to prevent them from becoming oiled may be considered. Marine mammal collection during an oil spill response must be done under the direction of the UC, under the applicable agreements/permits from the appropriate management agencies (i.e., NMFS, FWS), and be accomplished with a view not only towards the immediate care of the affected animals but care to collect appropriate data and follow established chain of custody procedures. For most spills, the Recovery Group is the first Group mobilized (due to field operations being of paramount concern early in a response) therefore effective training and planning within Regional stranding networks should ensure that robust field operations can be mounted quickly.

During most oil spills, recovery activities requiring large-scale deployment of marine-mammal specific teams will not be necessary. If marine mammals are known to be in the vicinity, mammal recovery teams should be placed on stand-by should animals be reported through field teams deployed to search for and collect oiled birds, through the Hotline reports, or through activities of other spill response functions (e.g., SCAT, cleanup). However, these teams do not necessarily need to "deploy" or cease doing their other daily jobs. If teams encounter oiled wildlife during their operations outside of the "designated spill area," the team or their supervisor should immediately notify the Recovery Group Supervisor for further instructions. Another possible option would be to embed one or two marine mammal experts within select bird field teams. In these situations, should an oiled marine mammal be encountered, these individuals could then direct the capture operation. In both of these plans, a small number of marine-mammal-specific teams or personnel can be deployed within the structure of the Wildlife Branch without initiating a separate Marine Mammal Task Force.

During larger events where significant mammal operational activities are required, pinniped and cetacean field operations will take place within two discrete strike teams – one focused on recovery activities and one collecting detailed reconnaissance data (see Chapter 6 below for more detailed information on Reconnaissance Strike Team functions). Within the Recovery Strike Team, further division of activities may occur, placing teams of personnel responsible for at-sea collection and capture, land-based collection, and transport of collected marine mammals. Frequently, the most effective use of marine mammal recovery personnel will be to focus efforts on the collection of affected mammals by land capture on beaches and piers though, in certain situations (e.g., sea otter capture, collection of dead floating carcasses), on-water teams may be necessary. The land-based strike team may be further subdivided into teams focused on live animal assessment and capture and

those assigned to the collection and/or processing of carcasses of dead mammals. However, if this is the operational structure of this Group, those teams must be able to be deployed immediately upon contact and must be within a relatively close distance (1-2 hours) to ensure adequate speed of response. While every response is different, deployment of these recovery teams may follow a number of different approaches:

- "Small" Responses (or where risk to marine mammals is very low): Recovery teams (collecting and transporting both live and dead mammals) are placed on standby at a local stranding network member organization and deploy when notified by the Recovery Group Supervisor or DWBD (typically after a report of an affected animal is called into the Wildlife Hotline and/or observed by response field personnel).
- "Moderate" Responses (or where a few key areas are at greater risk, such as haul-out areas): Recovery teams will be deployed to regularly survey and provide active coverage of key discrete areas of highest risk, which may either be pre-determined or determined for each operational period. The remainder of the oil-affected areas will be passively covered, where teams are deployed upon direction by the Recovery Group Supervisor (or DWBD), typically after a report of an affected animal is received (e.g. called into the Wildlife Hotline). In this situation, most teams will be considered on-land (collecting both live as well as dead mammals), but it may be advisable to have on-water teams on standby should they become necessary (e.g., if a floating carcass is detected).
- "Large" Responses (or where large numbers of at-risk areas are affected): On-land (consisting of separate live and dead mammal teams) and on-water teams will be deployed to regularly and repeatedly cover a defined search area for affected mammals, with on-water teams with the ability to act in support roles for land-based teams if needed. Depending upon the terrain, aerial search efforts may also be effective for scanning shorelines for beach-cast stranded animals, and can cover large areas of water for floating carcasses. Should the scope of activities preclude Recovery teams from effectively transporting animals from their assigned area (e.g., if they need to continue their search efforts to cover the entire area in an operational period), separate Transport teams may be developed and assigned. Similarly, a separate Reconnaissance Strike Team may be activated based on the need for more detailed information on the presence and potential effects of oil on marine mammal stocks and the scope of Recovery Teams activities not allowing those data to be collected.

Personnel

The Recovery Group usually includes personnel from state and federal trustee agencies, approved contractors, and marine mammal stranding network and rehabilitation organizations. If at all possible, members of the Regional stranding network should be primarily used, with back-up and depth coming from other Regional networks as needed, to ensure local knowledge is used effectively. Trained, qualified volunteers can be utilized as long as OSHA and

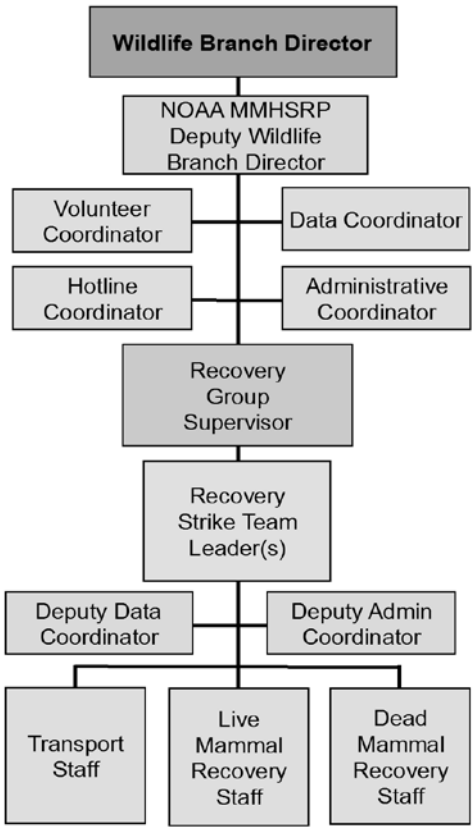

Figure 11: Recovery Strike Team Organizational Chart

other training requirements are met and adhered to. Any personnel responding to oiled marine mammals must be operating within the Incident Command System and cannot be operating independently of the other elements of the response. All responders must also be appropriately authorized to respond under the MMPA and ESA (if applicable).

- **Recovery Group Supervisor (RGS) -** This position is responsible for the surveillance for and recovery of dead and live impacted marine mammals and transport of them to field processing center(s) (or Primary Care centers if no field stabilization has been established)(see Figure 11). Specifically as it relates to Recovery Strike Team(s), the RGS is responsible for determining current and future recovery personnel and equipment needs, identifying needed capture techniques to use, needed equipment and supplies to implement those techniques, deployment and oversight of recovery personnel, ensuring the integrity of ongoing field data collection, working with the DWBD and/or Care & Processing Group Supervisor to ensure full coordination of animals from field to facility, and timely delivery of data to the Wildlife Branch Director. This Group Supervisor should closely coordinate activities, either directly or through the WBD/DWBD, with the Environmental Unit (Planning Section) and Reconnaissance and Hazing Groups (Wildlife Branch), as all have personnel with the ability to in conduct surveys of wildlife in the vicinity of the spill. The RGS must have oil spill and crisis management training/experience; extensive background in all aspects of oiled wildlife capture, care and response; a full understanding of the Incident Command System; familiarity with CoC and evidence preservation requirements; and knowledge/experience in how to manage media inquiries.
- **Recovery Strike Team Leader(s) (Recovery STLs) -** Recovery Strike Team Leader(s), under the direction of the RGS, is/are responsible for the search for and recovery of dead and live impacted pinnipeds and cetaceans. Duties include assisting the Recovery Group Supervisor in determining current and future recovery needs for their area of operation (e.g., on water or on land activities, required team size and special expertise/equipment), deployment and oversight of recovery personnel in their area, management of ongoing data collection and storage (including evidence preservation), insuring compliance with CoC requirements, working with the other Recovery STL(s) to ensure full coordination of animals from the field, and timely delivery of data to the RGS. The Recovery STL(s) must have oil spill and crisis management training/experience; background in all aspects of oiled wildlife capture and response; a full understanding of the Incident Command System; and knowledge/experience in how to manage media inquiries. Note: The activation of these discrete Strike Teams will be dependent on the dynamics of the spill, location impacted, species at risk, and other aspects of the response. In many instances, Strike Teams will not need to be divided into on-water or on-land; in other situations, all functions can be accomplished by a Recovery team under the direct supervision of the RGS without needing an intermediate Strike Team Leader. Similarly, for smaller responses, separate live mammal and dead mammal recovery teams may not be formed, with deployed personnel responding to both, should they be encountered.
- **Live/Dead Mammal Recovery Staff -** Recovery personnel within the Strike Teams enact the operational plan developed by the Recovery Strike Team Leader and/or the Recovery Group Supervisor to find and recover dead and/or live impacted wildlife. In smaller responses, both live and dead mammal recovery may be carried out by all teams but, during larger responses, these duties may be divided into specific groups. Recovery staff must be legally authorized under the MMPA (either Section 112c or Section 109h); have significant experience in wildlife capture; a full understanding of the Incident Command System; familiarity with evidence preservation and CoC requirements, and knowledge/experience in how to manage media inquiries.

- **Transport Staff -** Transport Staff assist the Recovery Strike Team Leader and/or the Recovery Group Supervisor with the transportation of live and dead animals from field settings to Primary Care centers. Transport staff must have general knowledge of oiled wildlife capture, care, response, and the Incident Command system.

Safety

Conducting recovery and transportation activities on marine mammals during an oil spill event presents personnel with health and safety risks related both to the inherent risk in handling wild animals as well as working outdoors under sometimes rugged conditions and/or in inclement weather for long hours. Therefore, capture and transportation of oiled mammals should be performed only by qualified personnel who have received the appropriate safety training as well as marine mammal handling and restraint training, and ideally have previous experience with the species likely to be encountered and using the capture techniques chosen for the spill response. Because recovery duties vary with each response and may involve more risk than other duties, the Safety Officer will communicate to the Wildlife Branch Director what level of equipment and training is appropriate for field response personnel; this training may include a 24-hour HAZWOPER training (Hazardous Waste Operations and Emergency Response), first aid/CPR, water safety, or boat safety courses (see Safety and Human Health). In general, however, safe practices can be maximized by following these steps:

- Maintain the level of OSHA health and safety certification required by the Safety Officer for oil spill response, which ensures that field staff have been advised of the safety hazards associated with spill response and the many ways in which hazards can be minimized and safety maximized;
- Prior to initial deployment and/or as soon as it is available, all field staff must read and sign the Site Safety Plan prepared for the spill event by the Safety Officer, which ensures that field staff are aware of any specific safety issues he/she may face in responding to that particular spill;
- Field staff must wear proper personal protective equipment (PPE), as determined by the Safety Officer, at all times when handling live and dead animals. Proper PPE requirements will be dictated by their primary location of operations. Personnel conducting recovery on-water within an Exclusion Zone may be required to wear safety glasses or goggles, Tyvek coveralls, nitrile or vinyl gloves, heavy outer gloves, weather-appropriate personal flotation devices (PFDs), and skid-resistant boots. Personnel that are required to enter the water should not do so in oiled environments unless specifically approved by the safety officer and wearing items that prevent oil from touching the skin (e.g., hip waters, dry suits). For personnel not in an exclusion zone, PPE requirements may be reduced to include only PFDs, gloves, and appropriate footwear. For shore-based recovery personnel, similar PPE requirements may apply, though PFDs may only be necessary within a designated distance from the surf zone. Recovery personnel may encounter exposure hazards in inclement weather, so appropriate foul weather gear should be available to avoid cold exposure, as well as hats and sunscreen in hot weather. Additional PPE and safety plans may be required at the discretion of the Safety Officer or other staff.
- Teams must remain in visual contact with at least one of their teammates at all times: at no time should teams split up in the interest of covering more area. If there is any doubt about the safety of a situation, field staff should err on the side of caution.
- Teams should agree upon a Communications Plan to determine regular check-ins between team members and ensure that team members have appropriate communications equipment (see Communications section below).
- Unless specifically approved by the Wildlife Branch Director and directed by the Recovery Group Supervisor, no field recovery efforts should take place after sunset. "Night ops" presents

personnel with additional potential hazards that must be anticipated and planned for prior to deployment.

- Recovery personnel should carry a first-aid kit at all times while in the field, so that immediate care for an injury is achievable, prior to further medical attention as necessary.
- All injuries must be reported to the Recovery Group Supervisor, who will complete an injury report and communicate with the Wildlife Branch Director.

Documentation

Documentation within the Recovery Group is extremely important to understand and follow from the onset of a deployment, as data collection is critical for a number of different spill functions: legal, investigations, NRDA, animal care, and planning for future deployments.

- Search Effort Log: For each team deployed into the field, the details of the search effort for each day must be captured from the start of the deployment via a Search Effort Log form (Appendix 1-A). These forms document areas searched, search methods, and mammals collected, and data must include the start and stop times and locations of each search effort segment (i.e. a beach or offshore identification) using coordinates determined by a hand-held GPS unit, observations of any oiled animals, and detailed info on the stranding and/or collection (location of capture, GPS decimal degree coordinates, reason for capture). For on-water deployment, vessel tracks may be recorded and downloaded to establish the entirety of the search effort. The Search Effort Log must be completed and turned in to the Recovery Group Supervisor/Strike Team Leader **at the end of each day**. If the team is not returning to the R&T center at the end of the day, the Beach Search Effort Log should be faxed or e-mailed the same evening.
- Level A Data Form: Field information necessary for completion of NOAAs Level A data form must be collected and, if possible, the form started before animals are handed over to Transport. This will include the assignation of a unique identifier (Field ID number per Regional stranding network protocols) that will be an ancillary identifier while in care. This form may be completed electronically via direct entry into the National Database.
- Evidence Collection: In addition to collection of field data, Recovery teams must start initial sampling for evidentiary purposes. The degree and scope of this sampling will be determined at the time of collection based on size/taxon of animal, safety for the personnel, and the eventual disposition of the mammal (e.g., to be processed in the field by the Field Processing team or taken to a rehabilitation center). At a minimum, photographs will need to be taken; additional procedures, such as field sampling for oil, may be required. If oil or medical samples are collected from the animal prior to reaching the Primary Care facility, make sure they are labeled properly with a unique field identification number for each animal. For further details on oil sample collection consult Appendix 3, Oil Sampling Protocol.
- Chain-of-Custody Form: If mammals are found and the decision is made to collect/sample them, a Chain of Custody form (Appendix 1-C) must be started and, once the animal/samples are handed over, signed by both parties involved; the Form remains with the animal/sample.

Recovery Procedures

Due to the intensive nature of marine mammal rescues, these Guidelines cannot cover every detail related to the capture of stranded animals. The reader is referred to the excellent reference *Marine Mammals Ashore: A Field Guide for Strandings* by Geraci and Lounsbury (2005) and additional references listed below for detailed descriptions of procedures to use in species of concern.

Recovery Teams

Teamwork is essential to safe, efficient collection of oiled marine mammals. Each on-land team must consist of a minimum of two people, although more will be required for certain species/age classes. Each team should be outfitted with the resources and equipment necessary to complete its assignment. On-water teams will require larger numbers of capture and support personnel, and necessitate greater logistical requirements. A plan of action should be developed and discussed among all search and collection personnel and approved by the Wildlife Branch Director prior to entering the search area. Upon finding a marine mammal that is deemed to require rescue (following the defined decision-making criteria, see below), the site should be evaluated and a capture strategy developed to suit the situation, including considerations for the terrain and species involved. This strategy should be communicated to all team personnel, and a plan agreed upon by all prior to implementation. Capture of affected animals should not be attempted if adverse weather, sea conditions, cliffs, or other physical and chemical hazards in the "hot zone" are present. Communication between the Recovery Group and Reconnaissance personnel (within the Operation Section or the Environmental Unit) is important to maximize the success of search effort. Domestic animals should not be permitted near the capture location nor should they come into contact with marine mammals. Domestic animals are not to be allowed in the transport vehicle and, if the vehicle has previously been used to transport domestic animals, it should be disinfected and cleaned prior to transporting marine mammals.

Equipment

Prior to mobilizing for a response, ensure that all equipment is ready and in working condition. Capture and recovery materials, depending on scope of activity, may include:

- ✓ Communication equipment - portable phones and/or radios
- ✓ Data recording equipment – GPS unit, maps, data forms, pens, labels
- ✓ Reconnaissance equipment – spotting scope, binoculars
- ✓ Specialized vehicles - 4-wheel drive with lifting tailgate or crane, adequate floor space, seats and seat belts for all team members, easily cleaned, and good ventilation
- ✓ Boats - capture vessel and support vessel
- ✓ Aircraft - fixed wing or helicopter for directing boats onto animals
- ✓ Nets - type varies by species and location of capture
- ✓ Cages and transport boxes - type varies by species, with frame and/or foam
- ✓ Stretchers and/or slings - specifically designed to support the species
- ✓ Large, body size garbage bags, body bags, or large pillowcases
- ✓ Cane pole or wooden stake/flagging tape (to mark the carcass, if needed- see below)
- ✓ Rope or other materials to secure carcass from refloating
- ✓ Water sprayers, buckets, sponges, towels, blankets, etc.
- ✓ Herding boards
- ✓ Animal medical kit - as directed by Vet staff
- ✓ Personal protection equipment (PPE) and a first aid kit for humans. In addition to PPE required by the Safety Officer to protect personnel from oil exposure, appropriate attire for capture teams includes closed-toed shoes or boots, long-sleeve shirts, long pants, rain gear, coveralls, and organizational identification (e.g., clothing labeled with insignia or logo). Depending on anticipated length of deployment, additional personal necessities may be required (e.g., water, snacks, hand warmers).

High cost and/or non-consumable items may be checked out to each team at the start of an operational period or for the period of time they will be on site. Consumable supplies, such as PPE,

paper bags, pens, labels, etc. will be available during a spill at the Recovery Staging Area or at a primary care center.

Communications

In order to ensure unity of command and to prevent field teams from being disrupted from accomplishing their assignments, the single point of contact for Recovery personnel during field operations should either be the appropriate Strike Team Leader or the Recovery Group Supervisor. Modes of communication will include in-person meetings, mobile or land telephones, or VHF radios. When VHF radios are used for communications, field staff will be advised as to the channel to monitor and utilize, and given a "name" for the R&T staging area (e.g. "R&T" or "base"). Staff should adhere to standard and traditional VHF radio protocols: the staff should first call out the Recovery Group Supervisor twice, identify him or herself once, and end each relay with "over". In general, communication times/details should include the following:

- Start/End of Day: Field staff will meet in person (or talk via phone) with their Recovery Group Supervisor/Strike Team Leader at the start of the day's field operations to discuss and confirm initial plans for the day, and at the end of the day's field operations to de-brief and make plans for the following day. When a field staff is working remotely from the Recovery Staging Area, or traveling long distances in order to arrive early at a field site, this initial or end-of-day communication can happen by telephone, radio, text message, email, or Skype at the Recovery Group Supervisor/Strike Team Leader's discretion.
- During Day: Field staff should also check in with their supervisor according to the communications schedule developed in the initial Recovery plan. Typically, this is when a team concludes a defined search segment (e.g., division or area) with no observations made, to report observations in the field, to arrange field transport of mammals in hand, and/or to propose major changes in field location or field plans for the day. Best efforts should be made to communicate according to the planned schedule, but it is recognized that field staff will not always be in cell phone or radio range, or have access to a land telephone at these times; in such cases, best efforts should be made to communicate with the Recovery Group Supervisor/Strike Team Leader as soon as is feasible. As the Recovery Group Supervisor/Strike Team Leader receives information of relevance to the field staff (e.g., a report into the hotline on an oiled animal, update on weather conditions or field operations), they will contact/leave messages on a regular, frequent basis to pass along the information.

Specialized communications protocols will likely be necessary for on-water operations occurring offshore, where aircraft are used to spot at-risk or affected animals and direct boats to the appropriate sites. Due to the risk associated with such activities, these communication details (in addition to emergency information and specific search/capture protocols) should be fully fleshed out within a capture plan that is reviewed and approved by the Wildlife Branch Director before the operation begins.

Geographic Margins of Collection for Marine Mammals and Area of Responsibility

Because the primary route of oil exposure in birds is typically external, animals tend to strand fairly close to the location of their oiling due to an inability to thermoregulate and ambulate effectively. For marine mammals, however, we must also be concerned about significant effects from internal exposure to petroleum products – typically through ingestion or inhalation at the air-sea interface. Thus, even highly exposed animals can travel long distances prior to succumbing to the adverse effects of petroleum intoxication. Therefore, in order to collect live or dead stranded mammals that could have been oiled, a geographic area that extends some distance away from the spill area of observed shoreline impacts should be fully covered by Recovery teams. This "Marine Mammal

Designated Spill Area" will be specified at a distance that affected mammals may plausibly travel after contacting the oil, will be a different size in each spill, and should be determined and periodically reviewed by the DWBD and WBD in consultation with other experts and as additional information about the spill and trajectory becomes available. Depending on the species at risk and the geographic/oceanographic details of the spill area, this may be a large expanse that could quickly tax the resources of the Recovery Group. In these instances, a fully deployed Reconnaissance Group scanning larger expanses of shoreline or waterways, with directed Recovery occurring either when animals are observed and/or in key habitats, may be the most efficient deployment model.

Once the "Designated Spill Area" (DSA) is determined, each Recovery Strike Team will be assigned a section of the spill response area by the Recovery Group Supervisor; teams should confine their recovery efforts to this area unless otherwise instructed by the Recovery Group Supervisor and/or Strike Team Leader. It should be the supervisor's and the field staff's mutual understanding that the Recovery Group Supervisor may need to redeploy the team to another area; at the same time, the field team should advise their supervisor if the assigned section of the spill response area requires more or less coverage by field teams, based on the numbers of oiled mammals observed. All-terrain vehicles (ATVs) or 4-wheel drive trucks may be used by some teams to expedite recovery efforts (e.g. to enable surveys of miles-long beaches), but only by experienced, trained personnel, only at the instruction of the Recovery Group Supervisor, and only in compliance with state and federal guidelines established to minimize impacts of ATVs on species of concern and on protected habitats.

We recognize that the typical geographic response area for a pre-existing marine mammal stranding response organization may not completely overlap with the DSA. Thus, a response organization may have a portion of their response area within the spill and a portion without. If a response team operating outside the DSA encounters an oiled marine mammal, they should immediately inform the Response Group Supervisor for instructions on how to proceed, which will include the use of the oil spill protocols. A reconsideration of the boundaries of the DSA is likely.

Reporting from Other Response Assets

During most oil spills, a variety of personnel will be transiting the response area conducting operations and surveillance key to the overall response. These will include cleanup operators (either shore-based beach cleanup or water-based booming and skimming personnel), SCAT (shoreline cleanup assessment technology) teams, NRDA (natural resource damage assessment) staff collecting ephemeral data, and others germane to the response effort. These personnel can act as excellent additional "eyes on the scene" to allow surveillance throughout a broader expanse without having to deploy either dedicated Reconnaissance or Recovery personnel. However, detailed procedures should be developed and formalized (in written documentation via a job aid pamphlet, "one-pager" or other similar materials) to be conveyed to supervisory staff of these areas stating what steps should be taken should a live or dead marine mammal be found. These procedures should include the following information:

- ✓ Contact Number: Sightings should be reported as quickly as possible to the Reporting Hotline or other dedicated personnel to assess information;
- ✓ Location Data: Location information (ideally latitude and longitude in decimal degrees, stranded on land or sighted in water);
- ✓ Sighting Data: Alive or dead? Species (If unknown, size, color, and physical characteristics)? Number of animals? Visibly oiled? Current environmental conditions (weather, sea state)?
- ✓ Contact Information: Cell number or radio code.

For dead marine mammals that are found in the water, it may be possible that the spill responder can anchor or tow the animal back to shore so that a full examination by Recovery or Field Processing staff can occur. If this action is not possible, the Marine Mammal Group (likely through the DWBD or Recovery Group Supervisor) may request spill personnel collect samples from the animal (and provide them with specific guidance on how to do so). For live and dead marine mammals stranded on the shoreline, it may be possible to have them kept shaded and as cool as possible. Non-Wildlife Branch response personnel should be specifically instructed not to attempt to move or push live animals off the beach and, if conditions are dangerous, not to attempt to approach the animal.

Live Mammal Team Procedures

All field staff involved in the capture of live marine mammals should have extensive previous professional experience. Individuals with wildlife experience (i.e. natural resource agency biologists, independent contractors, animal control officers, professional wildlife rehabilitators) who may not have sufficient experience specifically in capturing mammals may be teamed with a more knowledgeable individual to acquire first-hand experience with useful techniques for approaching and catching these species.

- General: Specific procedures for the capture of live oiled pinnipeds and cetaceans are beyond the scope of this document. Many excellent resources are available for different techniques that are effective for the species in question. The reader is referred to the *CRC Handbook of Marine Mammal Medicine* (Dierauf and Gulland, 2001), chapters on Marine Mammal Transport (Antrim and McBain, 2001), Cetacean Medicine (McBain, 2001) and Seals and Sea Lions (Gulland et al., 2001) for more specific information. These Guidelines will provide only a general overview and those specific aspects related to oil spill recovery. However, appropriate safety techniques listed above (PPE, PFDs) should be observed at all times. It is also important to note that, while the Live Mammal Recovery team's priority is the capture of live mammals, the identification and (at times) collection and sampling of dead oiled mammals is also of paramount concern and, in smaller spills, may be added to their tasking. At a minimum, should dead mammals be observed during a survey by the Live Mammal team, reporting to the Recovery Group Supervisor/Strike Team Leader should be done immediately, as well as recording the location, taking of photos, and the securing of the carcass to ensure it does not float away. In rare instances, a buoy or other marker may be attached to a floating carcass to aid in relocation of the animal.
- Decision-Making: Prior to the capture of any oiled marine mammals, a defined decision-making process should be followed and the decision to capture marine mammals as part of the spill response must be approved by the appropriate trustee agency (NMFS, FWS) prior to initiation (see Figures 12 and 13). Decision-making regarding individual animals may be delegated to the Field Recovery Team members, but must consider the following factors. First and foremost, captures should only be contemplated if they can be performed in a safe manner for personnel as well as the animals to be recovered. The potential benefits of capture of oil-affected mammals must outweigh potential negative consequences before the capture effort is initiated. In many instances, a small amount of oil on the fur (e.g., tarball on the external hair, 20 cm patch of fresh oil not on sensitive tissues) of most pinnipeds, in itself, will not warrant the capture of that animal. In general, no rescue should be initiated on free-swimming or beached pinnipeds in the vicinity of an oil spill unless the animal in question is in obvious distress (e.g., not behaving normally and/or exhibits signs of respiratory problems). Also, no active rescue on free-swimming cetaceans should ever be initiated in the vicinity of an oil spill where oiling is the primary problem unless that cetacean is moribund, the capture vessel can approach it slowly

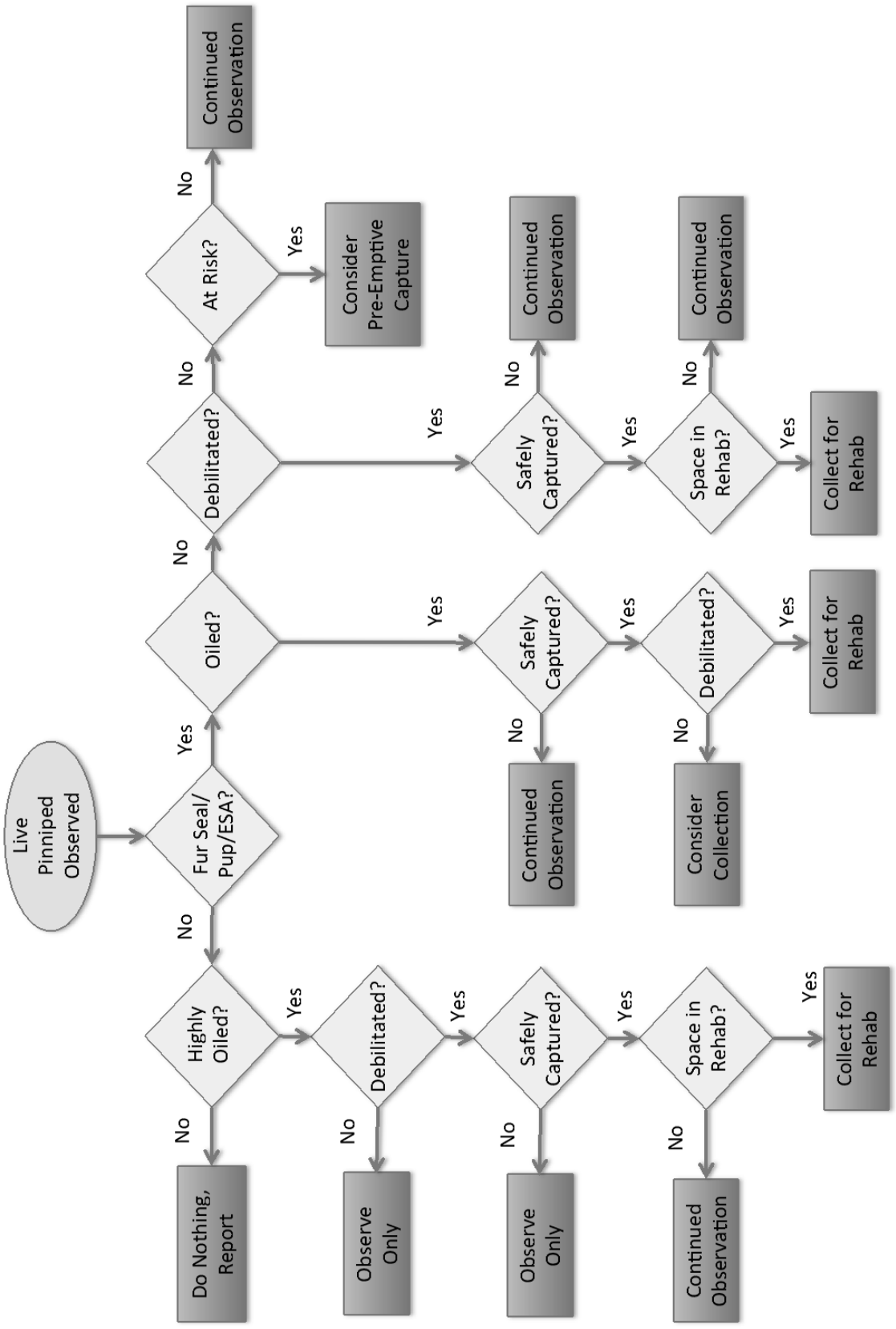

Figure 12: Example flow diagram for decision-making regarding capture of live pinnipeds during an oil spill

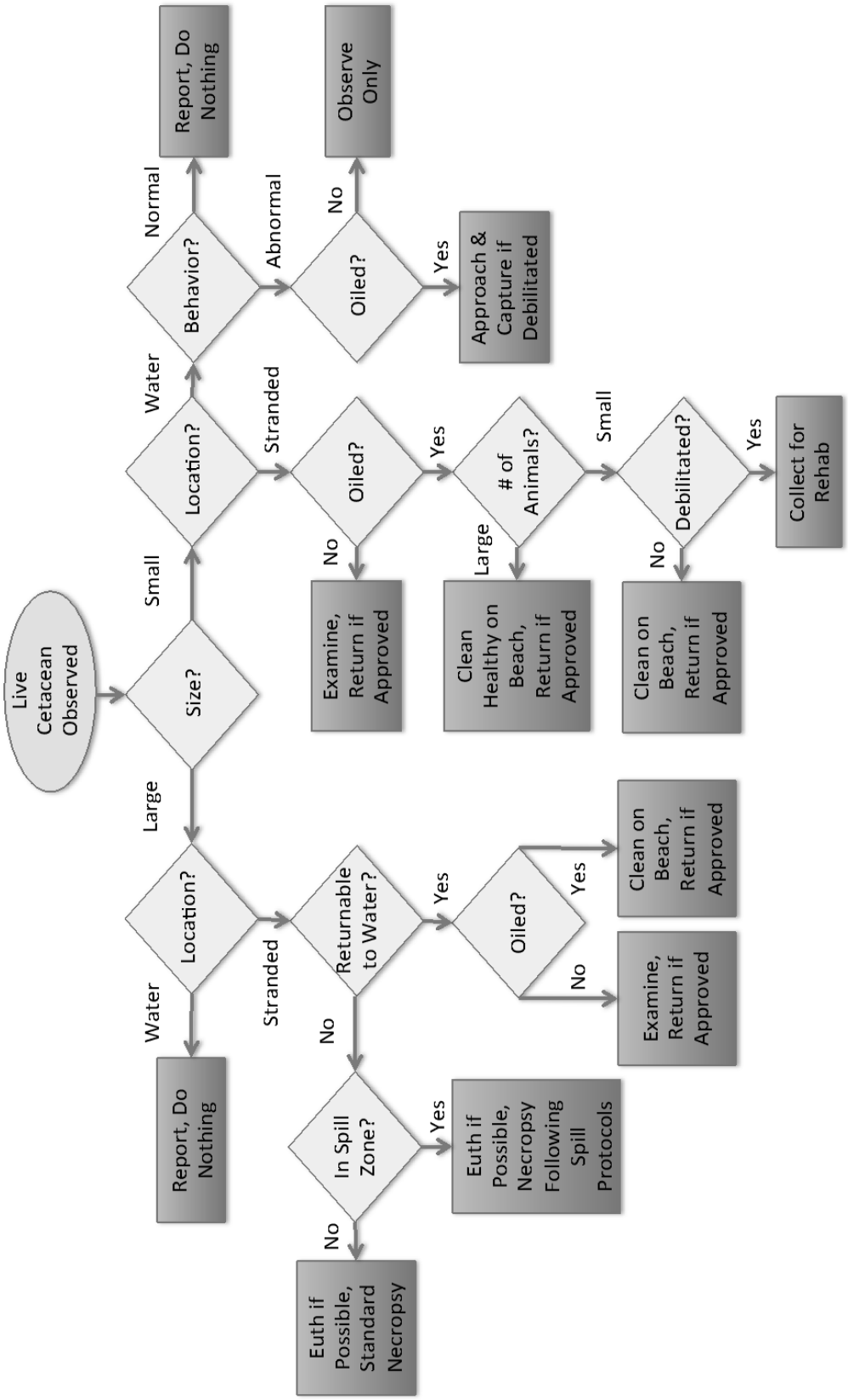

Figure 13: Example flow diagram regarding decision-making for capture of live cetaceans during an oil spill

without indication of avoidance behavior, and the capture vessel has the appropriate capabilities to take the cetacean on board safely for both personnel and animal (e.g., adequate deck space, low gunwales). Lastly, unless specifically authorized by appropriate trustee agencies, no non-debilitated/non-stranded live animals will be collected during spill incidents (with "debilitated" in this context meaning oiled for those species where oiling can cause significant injury and/or medically unfit and requiring capture and rehabilitation were there not an oil spill present). Preemptive captures to prevent the oiling of sensitive species may be considered only under dire circumstances (e.g., endangered marine mammal species where other response options are limited or unable to be successful) at the direction of the UC and trustee agencies and when adequate transport and holding facilities exist. A decision to capture should consider such factors as sex, age, reproductive state, and size of individual animal, and their location with respect to other marine mammals.

- *Euthanasia*: It is understood that, during oil spill responses, the euthanasia of marine mammals in the field may be the most humane consequence of being stranded. Marine mammal euthanasia procedures have been spelled out in the MMPA/ESA permit issued to the MMHSRP, as well as in two recent review papers for cetaceans (Barco et al., 2012; Moore, 2010) and a relatively new technique for large whales (Harms *et al.* 2013). Written criteria and protocols for the humane euthanasia of oiled marine mammals must be developed at the start of a response to be specific for the species and locations involved in the spill and approved by the Wildlife Branch Director and the UC; for species listed under the ESA, these criteria and protocols also need to be approved by the Principal Investigator of the MMHSRP's permit, and individual animals should also be discussed on a case-by-case basis if possible. Criteria used by the Northwest Marine Mammal Stranding Network can be found in Appendix 7, and criteria and details may be found in Geraci and Lounsbury (2005); however, in short, chemical euthanasia via intravenous administration of anesthetic agents and euthanasia preparations (with subsequent removal of the carcass to the facility for processing and necropsy and carcass disposal following appropriate methods) will generally be the preferred method.

- Capture Techniques
  - *Pinnipeds*: The method of capture of oiled pinnipeds may vary according to species and situation. Captures must only be undertaken when enough experienced personnel are available for restraint and transport, and the necessary equipment and supplies are at the ready. Captures should generally only be considered for isolated individuals on beaches, spits, tide flats or other relatively flat surfaces, using herding boards and nets (brail, hoop, breakaway or steel frame pole). Less often, captures may be attempted from rock jetties, piers, docks or even in the water for severely debilitated animals. Personnel will only be authorized to perform in water rescue if they possess significant previous experience with applicable techniques. Long-handled dip nets, floating bag nets, and a net gun have all been used with some success. Depending on the species involved, aquatic captures may use tangle nets, float nets, or Wilson traps. Chemical restraint of pinnipeds using remote delivery systems (e.g., dart guns) will typically not be used during oil spill response due to the inherent dangers associated with the practice. Typically, if a large pinniped is healthy enough to require chemical immobilization techniques upon capture, the subsequent care of that animal will be too great of a risk to personnel after recovery. However, under certain conditions (e.g., entanglement, animal creating a public hazard, listed species) and upon the approval from the Wildlife Branch Director, darting of pinnipeds can be attempted if highly

trained personnel are available, a capture plan is developed and approved, and sufficient equipment and manpower is available to safely undertake the operation.

- *Cetaceans*: Typically, only stranded (beached) live cetaceans will be considered for capture; free-swimming cetaceans will not be considered unless they are in distress, behaving abnormally, and no avoidance activity is noted upon approach. When approaching a stranded cetacean, a perimeter marker (e.g. tape) should be immediately set up to keep unnecessary people at a distance of at least 30 feet. The animal should be supported upright, holes dug for the pectoral fins, and the skin kept moist using wet light colored towels or blankets and misting. Once restrained and stabilized, an initial assessment should take place, estimating size (length & weight), species, age class, condition of body, injuries, state of nutrition, condition of the skin, and oiling status. **It is important to note that beached cetaceans should not be pushed back out to sea without first being examined by an NMFS-approved marine mammal veterinarian and the action approved by NMFS; if return to the open ocean is the approved course of action, cetaceans should be affixed with a NMFS approved tag to facilitate resightings or quick identification if the cetacean should restrand.**

- Field Sampling/Documentation: If live mammals are collected during recovery operations, documentation and initial sampling must begin as soon as possible, but also consistent with human health and safety concerns. At a minimum, field information necessary for completion of NOAAs Level A data form must be collected and, if possible, the form started before animals are handed over to Transport (see Appendix 1-B). This will include the assignation of a unique identifier (Field ID#, per Regional stranding network protocols) that will be an ancillary identifier while in care. The Level A form may be completed electronically via direct entry into the National Database. Additionally, the collection of the live mammal(s) must be indicated in the appropriate section of the Search Effort Log. Lastly, Recovery teams should start initial sampling/photo documentation for evidentiary purposes as early as possible in the collection process. The degree and scope of this sampling will be determined at the time of collection primarily based on the size/taxon of animal, safety for the personnel, and logistical support for the capture operation. For example, collecting an oil sample from a stranded live cetacean can be safely and effectively done, but collection of that same sample in an adult fur seal under manual restraint may not be able to be done in a safe manner. At a minimum, photographs will need to be taken by the Recovery team once the animal is under restraint. If oil or medical samples are collected from the animal prior to reaching the Primary Care facility, they must be labeled properly with a unique field identification number for each animal. For further details on oil sample collection consult Appendix 3, Evidence Collection Protocol. Remember that any live mammals and their associated samples must follow full chain of custody procedures that begin when the animal or sample is collected. The CoC is updated to reflect a transfer when handing over the animal or samples to transporters or at the Primary Care Center (form in Appendix 1-C), the Form must be signed by both parties involved, and the Form remains with the animal/sample.

Dead Mammal Team Procedures

- General: The collection of all dead animals, mammals or birds, oiled or unoiled, is important for an effective wildlife response for a number of reasons:
  - ✓ It reduces the level of contamination in the environment;
  - ✓ It reduces the risk of secondary contamination of scavengers and people;
  - ✓ If currently unoiled, it prevents secondary oiling of the carcass at a later date;

- ✓ It prevents re-evaluation of the same carcass in subsequent searches; and
- ✓ It provides essential data for determining the overall impact of the spill on wildlife resources.

Therefore, measures must be taken to ensure that **every marine mammal carcass, regardless of condition code**, is appropriately collected, identified, documented, and not disposed of until approved by the trustees. Most carcasses found in the Designated Spill Area should be collected, regardless of whether or not they are obviously oiled, and retained until no longer needed, as they are considered evidence. For smaller furred mammals (e.g., sea otters, fur seals), it may not always be feasible, reliable, or practical to attempt to discriminate between spill-related and non-spill-related casualties while conducting beach surveys, therefore all of these carcasses must be collected. In some cases, animals in advanced decomposition (Code 5) found above the waterline with no signs of oil and are clearly older than the spill can be left; however, all data must still be collected. For very large marine mammals (mysticetes, adult elephant seals, adult Steller sea lions), collection will be logistically complicated but should be the goal whenever possible; resources needed for these cases should be pre-identified whenever possible (e.g., flatbed trucks, cranes, numerous personnel).

- Decision-Making: If at all possible, oiled mammals should be collected and transported to a facility so that the Processing Strike Team (specifically the Facility Processing Team; see below) can conduct a full evaluation in more controlled conditions), regardless of the status and condition (i.e. degree of decomposition, degree of oiling). Size and condition of the carcass, resource availability (e.g., many or few Dead Mammal Teams, vehicle available for transport), and location of the carcass will help determine whether the animal can be transported effectively, or whether Field Processing must occur. If the carcass can be transported, initial sampling and data collection must occur on the beach then the animal should be transported to a facility for examination and sampling by a veterinarian. If the decision is made that the carcass must remain in the field until Field Processing can occur, carcasses should be examined and sampled and the carcass secured and visibly identified until the Field Processing team can arrive. Therefore, each Dead Mammal Recovery Team should have the necessary equipment to retrieve/transport carcasses, secure carcasses, and do beach assessments and sampling.
- Field Sampling/Carcass Securing: If the decision is made to deploy a Field Processing Team, the Dead Mammal Recovery team must do initial photo documentation, data collection (e.g., Level A data) and oil sampling prior to handing off carcass to Field Processing. This is to ensure that disturbance or secondary contamination of the carcass does not occur between initial discovery and necropsy. Specific procedures for field sampling are detailed in Appendices 2-4 (Oiled Marine Mammal Evidence Collection Protocol). Samples and data should be handed off to the transporter following appropriate Chain of Custody procedures if the carcass is to be taken to a Primary Care facility for full processing and the transporter arrives while the Recovery team is still present. If the animal is to remain in the field for processing and/or the transporter will not be able to meet the Recovery team, all samples and data should remain with the Dead Mammal Recovery team until returning from the daily deployment; they can then be handed off to the Recovery Group Supervisor (or Strike Team Leader). The carcass should be left with identifying information [collector's name, collection date/time, collection location (beach name and/or GPS coordinates), and temporary identification number (if assigned) from Level A data form] either by the attachment of a Collection Tag, a copy of the initial Level A data form, or written directly on the transport container (if left). Once sampling/documentation is complete and if the carcass is to remain, the Recovery team should identify the carcass as being initially sampled (either through marking via permanent markers or paint), cordoned off using stakes and caution

tape, and, if possible, secured above the tideline (by rope) so that the carcass does not float away on the high tide. Discussions should then occur between the Recovery Strike Team Leader/Recovery Group Supervisor and the Operations Section Chief to determine the most effective and safe means to dispose of the carcass (e.g., burying on site or towing to sea if minimally/not visibly oiled, disposal as part of the overall clean-up operation).

Transport Procedures

After capture and/or collection of oiled marine mammals, a cohesive and organized plan for transporting these animals quickly, safely and efficiently to a Primary Care Center (or Processing Facility) needs to be in place to ensure animals do not linger after collection. Transport can be accomplished directly by the Recovery Teams for small to medium spill events, as necessity for those teams to continue through a search area is not as time-dependent, or the dedicated Reconnaissance Team can cover the area appropriately. However, for larger events, dedicated transport personnel (working under and for the Recovery Group Supervisor or Strike Team Leader) may be necessary to allow efficient hand-off of affected animals and allow Recovery Teams to complete their primary mission.

- Field Stabilization: Prior to transport, field stabilization techniques should be considered for live marine mammals if it will be more than one or two hours until the animal reaches the rehabilitation facility. These techniques may involve assessing the animal for hypo- or hyperthermia and treating accordingly; administering oral electrolyte solution and subcutaneous fluids; removing large amounts of oil from the eyes and nares; and administering emergency medications (under the guidance of a veterinarian). Because of this, personnel with medical training and experience should either be part of the Live Mammal Recovery Teams or be available for consultation should field stabilization be warranted. Alternatively, for very large responses (or responses where lengthy transport of live marine mammals may be a frequent occurrence), the establishment of a separate Field Stabilization Group (similar in structure to California's organizational chart shown previously) or Field Stabilization Strike Team (under the Recovery Group) may be warranted. This Group/Strike Team can then be centrally located within the search area, staffed with medical professionals able to provide initial "first aid" to oiled animals, and act as the central point for transport from the field and to the Primary Care center. Details related to the specific care procedures to follow within this Group/Strike Team should follow a slight modification from the Care procedures detailed in subsequent sections.
- Transport Techniques: Similar to capture techniques above, specific transport methods for affected mammals are too detailed to list in these Guidelines. The reader is referred to the *CRC Handbook of Marine Mammal Medicine* (Dierauf and Gulland, 2001), chapters on Marine Mammal Transport (Antrim and McBain, 2001), Cetacean Medicine (McBain, 2001)and Seals and Sea Lions (Gulland et al., 2001) for more specific information.
    - *Pinnipeds*: After capture and field stabilization, smaller oiled animal(s) should be placed in a quiet, sheltered, well-ventilated area in a transport box, airline kennel, or cage (depending on pinniped species) for transport. For smaller pinnipeds, the cage should be large enough to allow the animal to lie down in a comfortable position. Only one animal per transport cage is recommended for the safety of the animals and to prevent cross-contamination of oil. Fur seal transport kennels should ideally be fitted with a raised bottom grate to avoid additional fur fouling. Females and their pups are most safely transported in separate cages, although they can be positioned so that they can hear, see, and smell each other. Pinnipeds less than 70 – 80 kg (145 - 175 lbs) can be transported in large airline sky kennels. Aluminum or other

lightweight material is recommended to minimize weight of cages designed for larger animals. Each cage must be firmly tied or secured in the vehicle.

- *Cetaceans*: After capture, the oiled cetacean should be placed on a stretcher appropriate for the species which allows for normal respiration, does not impinge on the mouth, pectoral flippers or fluke, and distributes weight equally across the surface to avoid pressure lesions. The animal should then be placed in the transport vehicle (usually a flatbed or pickup truck) on foam or other soft substrate to support its body weight for the duration of the move. Temperature control of the cetacean is of paramount concern; therefore planned transport at night is ideal in warm climates. If timing cannot be controlled, covering the mammal with light, wetted towels to prevent sunburn and desiccation is required.

- Transport Vehicles: Animals are generally transported in either a pick-up truck or an enclosed van-type vehicle. Adequate ventilation must be maintained to protect both humans and animals from inhaling fumes emitted by freshly oiled animals. Keep in mind that human comfort during transport may not be synonymous with or sufficient for the temperature and ventilation needs of the transported marine mammals. Additional PPE may be required for individuals involved in transport for climate control (personal cooling devices, or alternately, thicker jackets or other warm clothing). Personnel transporting animals between the field and the rehabilitation center must maintain contact with their supervisor at all times so that departure and arrival times may be anticipated.
- Monitoring: Animals must be monitored periodically on transports greater than one hour, as directed by a response veterinarian. In most cases, sedation during transport is not recommended. Critical cases (e.g., unstable, hypo- or hyperthermic animals) may require more frequent monitoring. Unless hypothermia is observed or suspected, keep animals damp and cool. The preferred air temperature for non-Arctic pinniped transport is 50-68°F (10-20°C) (Geraci et al., 2005). Fur seals whose coats are oiled or saturated, neonates of all species, and animals with extensive wounds or severe emaciation may require higher temperatures compared to minimally oiled animals or non-oiled, stranded animals. Arctic pinnipeds, particularly in winter, may need cooler air temperatures. Keep in mind that oiled, stressed, or injured seals are not able to regulate their body temperature effectively, and their conditions can change within minutes. Hyperthermic animals may be sprayed gently with water, ice cubes may be added to the top of the cage and allowed to drip onto the animal as it melts, or ice cubes may be placed under a plastic grate (if present) in the kennel. In order to prevent inhalation and subsequent drowning by unconscious animals, do not allow water to accumulate in the bottom of transport cages. Hypothermic animals should be placed in a sheltered location out of the wind, although good ventilation must be maintained to prevent animals and humans from inhaling petroleum fumes.

Chapter 6 – Recovery Group: Reconnaissance Strike Team

Introduction and Goals

Baseline information on the distribution of wildlife during an oil spill event is important for assessing which resources are at significant risk and for developing appropriate response actions. *A priori* historical information is most often available during a spill from the Environmental Unit of the Planning Section (via a trustee acting as a Resources at Risk Specialist), from published documents (e.g., Environmental Sensitivity Index maps, peer-reviewed literature, federal and state management reports), and from the record-keeping and "corporate knowledge" of local organizations, including stranding network members. Variations from historic conditions due to daily and seasonal movements of pinnipeds and cetaceans, however, necessitate rapid, real-time reconnaissance of wildlife presence in the spill area. Additionally, indirect effects of spills and their cleanup, such as alterations to behavior, can also be problematic to marine mammal species. In most instances, these data can be collected by the Recovery Strike Team through normal marine mammal collection activities. However, when oil spill incidents become very complex in either size or type of the spill and the habitats involved, the Recovery Strike Team may be challenged to both collect surveillance data in a methodical manner as well as respond to animals in crisis. Real-time data on both presence as well as behavior should then be collected actively via a Reconnaissance Strike Team within the Recovery Group using response personnel deployed as aircraft, boat, and/or ground teams, or more passively through manning a "hotline" to receive reports from the general public and from cleanup operators.

In certain situations, it may be determined that the deployment of trained wildlife observers on specific response operations (e.g., skimmers, *in* situ burn teams) may be necessary during a spill to determine the extent that protected species (under the MMPA and ESA) are being impacted, which needs to be documented for the Section 7 emergency consultation under the ESA and reporting requirements under Section 109(h) of the MMPA. This information is also of interest to the natural resource damage assessment. This function most often fits within the Environmental Unit of planning (in a similar manner to Shoreline Cleanup Assessment Technique, or SCAT, teams). However, in cases where limited operational capability is needed and the Wildlife Branch has the capability, select observer operations may fall under the Reconnaissance Strike Team. However, this should be the exception rather than the rule.

Personnel

Experienced personnel are essential for effective wildlife reconnaissance. Observers should be able to identify species, behavioral characteristics and patterns, and be knowledgeable about local ecological factors. Local trustee agency personnel, such as local USFWS refuge biologists, can be extremely valuable for timely reconnaissance. As was stated previously, for smaller spills, reconnaissance activities may be undertaken directly by Recovery personnel. Reconnaissance staff may also be integrated within Recovery teams for efficient deployment, with these combined team(s) surveying assigned areas fairly quickly but tasked to stop to collect any oiled marine mammals that are found (versus only noting and reporting locations and conditions of affected animals). Similarly, Reconnaissance teams may be comprised of both bird and mammal experts, with pertinent data transmitted to a single Reconnaissance Strike Team Leader, then upwards to the appropriate

Recovery Group Supervisor (e.g., Bird or Marine Mammal) as needed. Data collected by the Reconnaissance Strike Team are also important to informing the natural resource damage assessment. If specialized surveys for species are needed, additional wildlife specialists may be called in by the Reconnaissance Strike Team Leader, the Recovery Group Supervisor, or WBD. These specialists will advise the Branch Director and the UC about threats to listed species, the locations and numbers of oiled animals, and the potential need for pre-emptive capture, hazing or other protection strategies.

- **Recovery Group Supervisor (RGS) -** This position is responsible for the surveillance for and recovery of dead and live impacted marine mammals and transport of them to field processing center(s) (or Primary Care centers if no field stabilization has been established)(see Figure 14). Specifically as it relates to Reconnaissance Strike Team(s), the RGS is responsible for collecting and compiling all wildlife reconnaissance information and passing this information on to the Hazing and Care & Processing Group Supervisors in a timely manner to allow for effective tactical response. This Group Supervisor should closely coordinate activities, either directly or through the WBD/DWBD, with the Environmental Unit (Planning Section) and Reconnaissance and Hazing Groups (Wildlife Branch), as all have personnel with the ability to conduct surveys of wildlife in the vicinity of the spill. Must have oil spill and crisis management experience, extensive background in all aspects of oiled wildlife capture, care and response, a full understanding of the Incident Command System and how to manage media inquiries.
- **Reconnaissance Strike Team Leader (Reconn STL):** Reconnaissance STL(s), under the direction of the Recovery Group Supervisor, is/are responsible for the coordination of data collection related to animals at risk from, or affected by, an oil spill incident. This information will be used to help direct other Wildlife Branch field teams (e.g., hazing, recovery or field processing), will be used by the Planning Section to develop response strategies that minimize adverse effects on wildlife, and will keep the Unified Command informed regarding potential impacts. Duties include assisting the Recovery Group Supervisor in determining current and future recovery needs for their area of operation (e.g., behaviorists, aerial/water/land-based activities), deployment and oversight of reconnaissance personnel in their area, management of ongoing data collection, working with the other Reconn STL(s) to ensure full coordination, and timely delivery of data to the Recovery Group Supervisor. Reconn STL(s) must have oil spill and crisis management training/ experience; background in all aspects of oiled wildlife response; a full understanding of the Incident Command System; and know how to manage media inquiries. Note: The activation of these discrete Strike Teams will be dependent on the dynamics of the spill, location impacted, species at risk, and other aspects of the response. In most instances, all functions can be accomplished by Recovery teams under the direct supervision of the Recovery Group Supervisor.

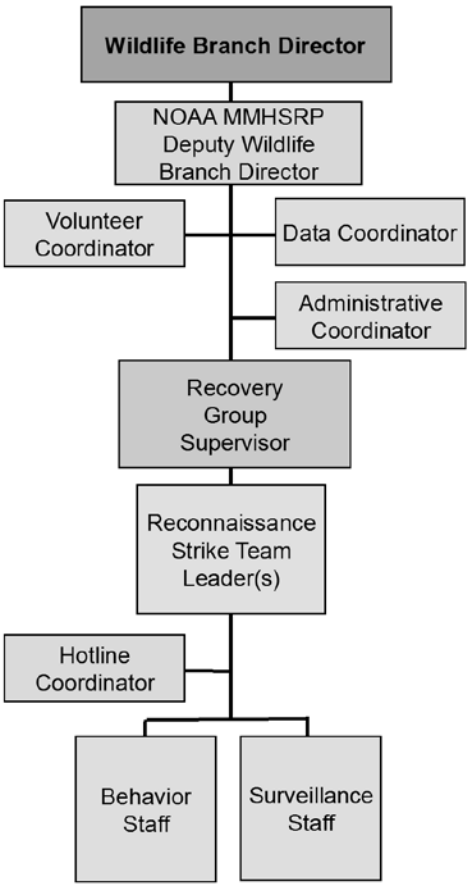

Figure 14: Reconnaissance Strike Team Organizational Chart

- **Surveillance Staff**: Surveillance personnel within Reconn ST(s) enact the operational plan developed by the Reconn STL and/or the Recovery Group Supervisor to evaluate the numbers, species, and locations of animals that could be or have been impacted by the spill. Teams may be divided into aerial, boat, and/or shoreline survey teams as necessary. For entry on any public or private land, the appropriate land manager should be contacted.
- **Behavior Staff**: Behavior staff within the Reconn ST are responsible for conducting assessments of individual or groups of marine mammals as necessary to determine whether spill response operations or oil exposure are causing impacts that require modification of activities. It is likely that these functions will largely be performed by technical specialists, as the skills necessary to conduct these operations are highly specialized.

Safety

The primary safety concerns for Reconnaissance personnel during an oil spill event are related to working outdoors under sometimes rugged conditions, in inclement weather for long hours and/or on a boat or plane. Because of these risks, the Safety Officer will communicate to the Wildlife Branch Director what level of equipment and training is appropriate for field response personnel; this training may include a 24-hour HAZWOPER training (Hazardous Waste Operations and Emergency Response), first aid/CPR, water safety, and/or boat/aircraft safety courses (see Safety and Human Health). In general, however, safe practices can be maximized by following these steps:

- Maintain the level of OSHA health and safety certification required by the Safety Officer for oil spill response, which ensures that field staff have been advised of the safety hazards associated with spill response and the many ways in which hazards can be minimized and safety maximized;
- For reconnaissance personnel in the Aerial Survey Unit, levels of aircraft safety training approved by the spill's Safety Officer and the staff member's employer must be met;
- Prior to initial deployment and/or as soon as it is available, field staff must read and sign the Site Safety Plan prepared for the spill event by the Safety Officer, which ensures that field staff are aware of any specific safety issues he/she may face in responding to that particular spill and typically lists the nearest medical facilities (emergency rooms or clinics);
- Field staff must wear proper personal protective equipment (PPE), as determined by the Safety Officer, at all times. Proper PPE requirements will be dictated by their primary location of operations. Personnel deployed on boats within an Exclusion Zone may be required to wear safety glasses or goggles, Tyvek coveralls, nitrile or vinyl gloves, weather-appropriate personal flotation devices (PFDs), and skid-resistant boots. For personnel not in an exclusion zone, PPE requirements may be reduced to include only PFDs (if on a boat or near the surf zone) and appropriate footwear. Reconnaissance personnel may encounter exposure hazards in inclement weather, so appropriate foul weather gear should be available to avoid cold exposure, as well as hats and sunscreen in hot weather. Additional PPE and safety plans may be required at the discretion of the Safety Officer or other staff.
- No field reconnaissance efforts should take place after sunset, by boat, or by off-road vehicle (e.g., all-terrain vehicle) unless specifically approved by the Wildlife Branch Director and directed by the Reconnaissance Group Supervisor.
- Field reconnaissance personnel should carry a first-aid kit at all times while in the field, so that immediate care for an injury is achievable, prior to further medical attention as necessary.
- If the nearest medical facilities have not been identified in the Site Safety Plan, the Reconnaissance Group Supervisor should identify the available options (walk-in clinic, emergency room, 911 coverage, etc.), in writing if possible.

- All injuries must be reported to the Recovery Group Supervisor, who will complete an injury report and communicate with the Wildlife Branch Director.

Documentation

Full documentation of observed species, including animal numbers, locations, survey method, and other pertinent data, should be collected in a methodical organized fashion for rapid dissemination to the other personnel within the Wildlife Branch. In most situations, data may be collected in Field logs and later transcribed to appropriate Reconnaissance forms for clarity of information.

Wildlife Hotline

For any spill that may involve oiled wildlife, a Wildlife Hotline should be established to allow the public (and responders) a means of reporting oiled wildlife. For smaller incidents, this Hotline may be staffed at the Incident Command Post and report directly to the WBD (if all species are reported to a single line) or to the DWBD (if a marine mammal hotline is activated separately from other species). However, for moderate to large responses where a Reconnaissance Strike Team is activated, this position is more appropriately housed within that Strike Team, with calls being immediately delivered to the appropriate field team.

During a spill response, the number should be provided in press releases, and a Hotline Operator should be assigned to monitor the line. A script should be developed to ensure consistent information collection. At a minimum, the information that should be noted by the operator includes:

- ✓ Date and time of call
- ✓ Caller's name and return phone number
- ✓ Date and time of observation
- ✓ Location of oiled animal(s), as specific as possible
- ✓ Type of animal (species, if known)
- ✓ Whether the animal is live or dead
- ✓ Whether the animal is in hand, on land or in the water
- ✓ What degree of oiling is visible
- ✓ If the animal is live, the behavior, and whether or not it appears to be catchable

The operator should request this information, and inform callers that they should not attempt to capture oiled wildlife themselves, for the safety of both the caller and the animal. The Hotline Operator(s) may be any qualified individual, such as staff of a trustee agency or a qualified volunteer. Preferred qualifications include local area knowledge (e.g., local beach names) and some biological knowledge (appearance and behavior of common species). Local Emergency Operations offices may be able to facilitate multiple parallel operators (facilitated through the Liaison Officer). The Hotline Operator should collate reports, and provide this information to the Reconnaissance Strike Team regularly (e.g., immediately for any live animal reports, or every 30 minutes for dead animals, depending on the number of reports).

If the stranding network organization has a pre-existing hotline, the operator for that effort should ask the same questions as that working under a spill response. Any reports received by the local stranding network hotline from within the DSA should be relayed immediately to the spill Hotline.

Reconnaissance Procedures

Surveillance Teams

In short, surveillance teams are deployed to locate and quantify wildlife at risk in real time in the area of the oil spill. These data may be used by the Recovery Group and the DWBD to scale and prioritize efforts.

- Aerial Survey Unit – In many instances during large-scale oil spill events, the most time- and cost-effective means to collect survey data on pinnipeds and cetaceans will be by fixed-wing aircraft or helicopter. Any observers used for aerial reconnaissance for wildlife should have previous training and experience regarding identification of marine mammals from the air, and knowledge of proper standardized survey techniques, including the use of GPS receivers to accurately map flight paths and determine locations of sightings and photographs. While in the air or immediately after landing, oral summaries of mammal observations are reported to the Strike Team Leader who relays the information to the Recovery Group Supervisor. Written files can be later conveyed via email to the Group Supervisor, who can then forward them on to the Environmental Unit (if requested). General aerial surveys can successfully be accomplished as part of operational overflights done for mapping oil if a qualified biologist can participate. However, these flights are typically conducted at relatively high altitudes making species identification difficult, so wildlife-specific flights involving two to three trained observers who each conduct line transects on either side of the plane at an altitude of 750-1000 ft. can provide much more detailed information.
- Boat Survey Unit – Similar to above, boat-based surveys can complement boat-based Recovery work as well as add important info to aerial surveys should fog or airspace issues limit aerial surveys from occurring. Exact survey methods will vary on a case-by-case basis, but surveyors will collect information on species present and their location and condition (live, dead, visibly oiled, and visibly unoiled); basic weather and sea conditions; and any other notable information that may be useful to response efforts. Survey methods, route, and transect design should be established just prior to the survey to accommodate the specific areas, issues, and species of concern for a particular spill. In all cases, at least one member of the team must be qualified to operate the boat, given the habitat, weather, and sea conditions. Other personnel must be qualified to observe and identify wildlife and determine oiling status. Depending on the boat and search area, two persons are a minimum crew. However, an optimal and preferable boat crew has three people for safety and search efficiency. In some cases, boat reconnaissance survey teams may also collect dead wildlife and catchable (e.g., moribund) live oiled animals, but personnel on board must have the necessary minimum qualifications, along with specialized training and equipment, needed to capture animals that might be found. Otherwise, sightings of recoverable wildlife must be relayed to the Reconnaissance Strike Team Leader for immediate follow-up and coordination with the Recovery Group.

Behavior Teams

During oil spills, there are often reports from the public and responders alike of marine mammals "acting strangely". These actions may be true effects of oiling (e.g., neurological symptoms resulting from inhalation of toxic vapors), a behavioral response to clean up activities, or natural behaviors observed by inexperienced personnel. In order to differentiate such responses, experienced teams of individuals should be deployed where reports of mammals in proximity to oil have been received, or where the trajectory of oil and known information about mammal abundance or distribution demonstrates a need for concern. Each team should consist of at least two personnel with experience in observing the behavior of the specific marine mammal species in question. Each team

will identify groups of mammals, record the location, take video/photographs appropriate for photo-identification (to be used to examine the condition of animals over time to identify if changes have occurred), and then conduct focal animal follows with a particular group for an extended period of time (but not to exceed four hours to prevent excessive harassment). Special attention should be paid to potential indications of distress or debilitation, including labored breathing or other respiratory distress, aberrant behavior such as listing to one side, non-responsiveness and lethargy, or a decline in body/skin condition over time in subsequent sightings. Information should also be recorded about the oil found in the area and the animals' behavior and proximity to the oil. If the animals are determined to be in distress, teams could either provide a credible alert to Recovery Group personnel that a rescue effort may be necessary, a notice to the Hazing Group that mammals are present that may be effectively deterred from the spill area, or perform the intervention or work in cooperation with other groups to expedite a solution where a relatively straightforward solution can be implemented. Field logs should be transcribed onto Reconnaissance forms at the end of a survey period and provided to the Reconnaissance Strike Team Leader via e-mail or fax, with hard copies to be retained and provided periodically.

Chapter 7 – Care & Processing Group: Processing Strike Team

Introduction and Goals

As discussed in the Recovery section above, extensive measures must be taken to ensure that all live and dead animals recovered during an oil spill incident are appropriately collected, identified, documented, and not released or disposed of until approved by the natural resource trustees. Legal staff should also be consulted to ensure that all requirements for the preservation of collected evidence are satisfied. Each oil spill incident has legal implications, with a number of different activities (such as investigation of cause, determination of environmental impacts, and effects on individual animals) requiring detailed data collected in a legally sufficient manner. This evidentiary and documentary portion of wildlife operations is collectively known as "Processing". While additional information is collected and used in each other area of the response, the information collected through the Processing Strike Team is key if questions should arise as to who is or is not the Responsible Party, whether animals were indeed oiled during the event, and whether samples were collected, analyzed and stored in an appropriate manner.

Due to the sensitivity of the information being collected, marine mammal processing during an oil spill response must be done under approval from the appropriate management agencies (i.e., NMFS, FWS) following procedures that are pre-established and pre-approved by the Agency's law enforcement and legal office/division. In certain instances, these procedures may be modified during a response to satisfy the UC and/or incident-specific needs. However, for most incidents, the methods and procedures detailed here will suffice.

Unlike the processing that occurs for birds affected by oil spills in the United States, a key element for pinniped/cetacean procedures involves the complete necropsy (or post-mortem evaluation) of all collected animals whenever possible as part of the response effort. Marine mammals (aside from heavily furred animals such as fur seals) are far less likely to succumb to acute injury or death due to external coating, but may have significant internal exposure (from ingestion or respiration) and damage that occurs without concurrent external signs. Therefore, a full internal examination may provide the only means to determine whether those animals found dead in the environment were indeed exposed (thereby assisting in defining margins of search effort and species at risk, among other factors), as well as critical medical information for rehabilitators on potential adverse effects from the oil (or clean-up methods used).

Processing of affected mammals may occur either at the Primary Care Facility or designated necropsy facility (the ideal situation, as data collection and sampling can occur under controlled conditions) or in the field (should the animal be too large or if it is logistically impossible to transport back to a facility). In either case, the Processing Strike Team must be able to fully sample and document any and all animals that are found. In most situations where field processing is required, staff from the Processing Strike Team located at the facility can be deployed to conduct necropsies/data collection on individual animals in an appropriate, albeit remote, manner. However, for larger responses and/or when animals are being found at great distance from processing facilities, a separate Field Processing Team may need to be formed and remain in a stand-by

condition, able to respond if needed. There may also need to be numbers of personnel identified and available in a stand-by fashion to augment Processing Strike Team(s) for response to mass strandings or large marine mammals, as these responses can be very labor intensive.

Personnel

- **Care & Processing Group Supervisor (CPGS)** - This position is responsible for coordinating the overall processing and rehabilitation resources and capabilities of the Wildlife Branch in order to provide optimum care and documentation of affected wildlife, including oversight and management of the Care and Processing Strike Teams (see Figure 15). Specifically as they relate to the Processing Strike Team, the CPGS's duties include call-out of personnel, activation of Primary Care Center(s) that have the capacity to fully process (e.g. necropsy) marine mammals, oversight of processing protocol(s) (including collection of evidentiary samples and data), regular reporting of pertinent information (number/type/species/disposition) to the Wildlife Branch Director, and implementation of the demobilization plan. The CPGS should have extensive experience, background and understanding of the evaluation and treatment of oiled wildlife during an oil spill event, as well as possess oil spill and crisis management experience.
- **Processing Strike Team Leader (Processing STL)**- The Processing STL, under the direction of the CPGS, is responsible for receiving and documenting all live and dead marine mammals collected, maintaining and reporting information on wildlife collected, and ensuring appropriate secure cataloged storage for dead animals. Under certain instances, the documentation and sampling of dead marine mammals may be divided into separate Field and Facility Processing Units, each led by a separate Unit Leader, should large mammals not be able to be physically transported to a Primary Care Center and field necropsies be necessary. Duties include assisting the CPG Supervisor in: determining current and future processing needs including personnel, equipment, and supplies; the establishment of central, and, if needed, ancillary, processing center(s) for receiving and documenting all collected mammals; deployment, administration and oversight of Processing Strike Team personnel; management of ongoing data collection and storage; and timely delivery of data to the CPG Supervisor. The Processing STL must have oil spill and crisis management training/experience; background in all aspects of oiled wildlife processing and response; and a full understanding of the Incident Command System.
- **Field/Facility Processing Staff -** Processing Staff assist the Processing STL with all aspects of mammal processing, including: receiving dead and debilitated mammals; assigning unique intake numbers to wildlife; ensuring complete Chain of Custody information is recorded for each individual; assessing oil data; taking oil samples; maintaining photographic record of all processed mammals; completing records of all aspects of data collection; conducting complete necropsies and tissue collection from dead mammals; maintaining supplies used for sample collection and identifying

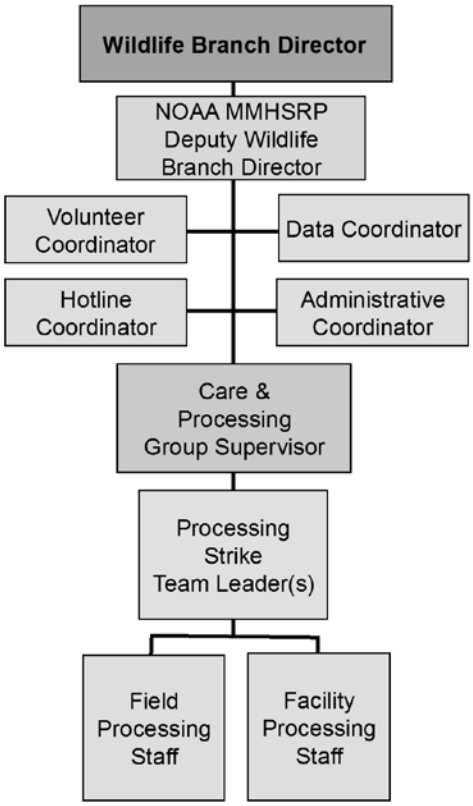

Figure 15: Processing Strike Team Organizational Chart

ordering needs; and organizing storage of carcasses, oil/tissue samples, and documentation. Necropsies of dead oiled marine mammals must either be conducted or supervised by personnel with extensive experience in conducting gross necropsies, collecting appropriate tissues, and instituting immediate diagnostics to assist in the assessment of animals collected during spills. Ideally, a veterinary pathologist with specialized training and experience with marine mammals will perform necropsies. If an appropriate veterinary pathologist is not available, a veterinarian with experience in necropsies of marine mammals can be asked to perform the necropsy. In situations where an experienced pathologist or veterinarian is not available to conduct the necropsy, a biologist with extensive necropsy experience may be approved by the response veterinarian and/or Care and Processing Group Supervisor to lead this effort.

Safety

Safety practices, including appropriate personal protective equipment (PPE), for Processing staff will be dictated by their primary location of operations and the techniques to be used. Because Field Processing may involve more risk than Facility duties, the Safety Officer will communicate to the Wildlife Branch Director what level of equipment and training is appropriate for field response personnel; this training may include a 24-hour HAZWOPER training (Hazardous Waste Operations and Emergency Response), first aid/CPR, water safety, or boat safety courses (see Safety and Human Health). For Facility Processing personnel, however, a 4-hour Hazardous Communication (HAZCOM) training specific to the risks associated with oiled wildlife processing and care, may suffice. In general, however, following these steps can maximize safe practices:

- Maintain the level of OSHA health and safety certification required by the Safety Officer for oil spill response, which ensures that field/facility staff have been advised of the safety hazards associated with spill response and the many ways in which hazards can be minimized and safety maximized;
- Prior to initial deployment and/or as soon as it is available, all staff must read and sign the Site Safety Plan prepared for the spill event by the Safety Officer, which ensures that personnel are aware of any specific safety issues he/she may face in responding to that particular spill;
- Field and facility staff must wear proper personal protective equipment (PPE), as determined by the Safety Officer, at all times when handling live and dead animals. Proper PPE requirements will be dictated by their primary location of operations. Personnel conducting field processing within an Exclusion Zone may be required to wear safety glasses or goggles, slickers, Tyvek coveralls, nitrile or vinyl gloves, personal flotation devices (PFDs), and skid-resistant boots. For facility personnel, PPE requirements may be reduced to not include PFDs. Field processing personnel may encounter exposure hazards in inclement weather, so appropriate foul weather gear should be available to avoid cold exposure, as well as hats and sunscreen in hot weather. Additional PPE and safety plans may be required at the discretion of the Safety Officer or other staff.
- As processing personnel will likely be involved with necropsies of dead marine mammals, care should be taken as it related to working with sharp instruments in slippery conditions.
- All injuries must be reported to the Recovery Group Supervisor, who will complete an injury report and communicate with the Wildlife Branch Director.

Additionally, handling stranded marine mammals should be done with care as they may carry known and unknown infectious agents (zoonoses). Please note the following:

- ✓ The viability of an infectious agent is variable and may be related to body temperature, need for a viable host, sunlight, effect of saltwater, and organismal (pathogen) characteristics.

- ✓ Live and freshly dead (Code 2) animals are likely to present the greatest risk of disease from infectious agents due to a concentrated pathogen load, viable pathogens in live animals, and possibly viable pathogens following death of the host.
- ✓ Decomposed carcasses may carry an infection risk from post-mortem bacteria if there are skin punctures or exposure to open wounds.
- ✓ The risk of infection is decreased by taking safety precautions for every dead animal (regardless of decomposition status), such as using appropriate PPE (e.g., gloves, eye protection), taking precautions to avoid skin puncture or exposure to open wounds, cleaning exposure sites immediately, reporting the occurrence of any injury or illness to a supervisor, and letting your physician know that you work with wildlife.

Documentation

The documentation generated within the Processing Strike Team is the most critical for the overall response effort, as it details (in a legally defensible manner) key data that is used to report animal numbers, species, collection locations, exposure status, and disposition to the UC (and, in turn, to the Joint Information Center and the public) as well as collects samples to establish that animals were exposed to the spill in question. Similarly, after the response is concluded, these data/samples will be used for other non-emergency aspects of the response, including Natural Resource Damage Assessment, investigations, and research. Therefore, it is extremely important that staff within the Processing Strike team understand and follow the documentary processes as outlined in these Guidelines **from the onset of a deployment**. Specific components of Processing documentation include:

- Level A Data Form: Field information necessary for completion of NOAA's Level A data form should have been collected by the Recovery Group and, if possible, the form started before animals are handed over to Processing. The Processing Strike Team is responsible for collecting the remainder of the data necessary to complete the form, and for ensuring the information is provided to the appropriate NOAA representative (generally, the Regional Stranding Coordinator). The Level A data form can be found in Appendix 1-B. This form may be completed electronically via direct entry into the National Database.
- Animal Log Forms: Upon admittance to a wildlife care facility (or upon processing of dead mammals at the facility, or in the field if too logistically difficult), each animal must be logged into either the Live Marine Mammal Data Log or Dead Marine Mammal Data Log for that facility (Appendix 1-D). All animals collected dead or alive are given a unique log number and identifier (e.g., Field ID # or tag) in order to track the individual animals through the capture/collection, processing, and, for live animals, the rehabilitation and release process (see below for more details on designating log numbers). At some point, a Level A Regional/National Database number will also be assigned and should be entered on the log when acquired. During Tier 3 responses (where multiple facilities may be deploying Processing Strike Teams), each Log Form must have the facility clearly indicated on the form so that a unique prefix can be added to each log number.
- Photo Log: Each marine mammal, live or dead, must be photo documented. Processing photos upon intake must be labeled (ideally using a dry erase board behind the animal) with: Spill Name, Date, Species, Log number, Capture Location, and Field ID number. Photos taken during necropsies should be labeled (ideally using an index card) with: Spill Name, Date, Species, Log and Field ID number, and should also include a size scale. Each photo should be recorded on the Photo Log, which helps to identify the photographer and date/time taken. If possible, date/time stamp capabilities of digital cameras should be used to imprint the date and time on

the photograph. Full instructions on the taking of photos for evidentiary purposes are detailed below and in Appendix 2.

- Necropsy Report: For dead mammals, complete necropsies should be conducted if at all possible (e.g., Code 2/3 carcasses). In doing so, full photo documentation and complete recording of all pertinent findings must be noted in a Necropsy Form (an example of such form can be found in Appendix 1-J). If the facility/necropsy staff member have necropsy forms that they are familiar with, alternate forms can be used if they collect all necessary data in an organized fashion Additionally, all tissue samples collected (following the protocol found in Appendix 4, Tissue Sampling Protocol) must be noted on the form.
- Chain-of-Custody (CoC) Form: Mammals that are found and collected must have a CoC form started in the field, and continued whenever the animal/samples are handed over. Both parties involved in a transfer must sign the form, and the original form must remain with the animal/sample. In situations where samples/tissues are collected from an animal that already has a single CoC form started on it, a "child" CoC form may be started delineating that the original "sample" was further "divided". The CoC form can be found in Appendix 1-C.

Processing Procedures

Defining Oiling Status of Stranded Marine Mammals

Determining the oiling status in lightly exposed pinnipeds and cetaceans can be extremely challenging when compared to assessment of birds and heavily furred mammals. Pinnipeds (except fur seals) and cetaceans are unlikely to have a thermoregulatory response to acute oiling; however, fur seals and sea otters may be observed hauling out more frequently in an attempt to stay warm. Additionally, light oil exposure would be less likely to be visually detected within the shorter hair and impenetrable skin of seals and cetaceans, and internal exposures may not be apparent without either extensive biomedical sampling (e.g., fecal or blood samples) or post-mortem evaluation. External exposure can, however, create damage to sensitive tissues such as eyes and mucous membranes, and internal exposures can create both acute as well as chronic lesions that can be life threatening. Therefore, marine mammals during oil spill events must be classified carefully to avoid implying that animals not appearing to be oiled on an initial evaluation are truly unoiled, and require oiling status ("visibly oiled" or "not visibly oiled" as defined below) be determined based on both external as well as internal gross evaluation. **Note that the determination of oiling status does not establish sub-apparent oil exposure or the cause of death**. This point is important to continually reinforce within the group, and also when dealing with other members of the Incident Command and the media, who are likely more familiar with the impacts of oil on birds. The determination of these types of impacts in marine mammals must come from further evaluation of the samples and other evidence, such as histopathological evaluation of tissues and/or PAH analysis of the biological samples. For the purposes of oiling status of marine mammals, the following categories should be used when classifying animals collected during an oil spill:

- ✓ Visibly Oiled: Based on
    a. Evidence of external oiling; or
    b. Evidence of internal oiling on initial exam (e.g., oil in oral cavity and/or gastrointestinal tract); or
    c. Evidence of internal oiling on necropsy (e.g., oil in esophagus, gastrointestinal tract and/or respiratory tract).
- ✓ Not Visibly Oiled: Do not meet criteria above.
    a. It must be noted that "not visibly oiled" does not imply that the mammal was not exposed to oil or that the cause of death is unrelated to the spill event.

- ✓ Pending: Full evaluation (physical exam or necropsy) not yet completed.

Decision-Making

As stated in the "Recovery" section above, when dead oiled pinnipeds or cetaceans are found during a declared oil spill, an initial decision must be made as to whether to transport that animal back to the facility to collect full information, or whether the specifics of that collection (e.g., size of animal, state of decomposition, resource availability) makes it more beneficial to process that mammal in the field. For the purposes of assessing decompositional state, the following codes will be used:

- Code 1 (Live Animals): Requires rapid triage and decision-making regarding the potential for rehabilitation, release, or humane euthanasia.
- Code 2 (Fresh Dead): Normal appearance, usually with little scavenger damage; fresh smell; minimal drying and wrinkling of skin, eyes and mucous membranes; eyes clear; carcass not bloated, tongue and penis not protruded; blubber firm and white; muscles firm, dark red, well-defined; blood cells intact, able to settle in a sample tube; serum unhemolyzed; viscera intact and well-defined, gut contains little or no gas; brain firm with no discoloration, surface features distinct, easily removed intact.
- Code 3 (Moderate Decomposition): The carcass is intact, bloating evident (tongue and penis protruded) and skin cracked and sloughing; possible scavenger damage; characteristic mild odor; mucous membranes dry, eyes sunken or missing; blubber blood-tinged and oily; muscles soft and poorly defined; blood hemolyzed, uniformly dark red; viscera soft, friable, mottled, but still intact; gut dilated by gas; brain soft, surface features distinct, dark reddish cast, fragile but can usually be moved intact.
- Code 4 (Advanced Decomposition): Carcass may be intact, but collapsed; skin sloughing; epidermis of cetaceans may be entirely missing; often severe scavenger damage; strong odor; blubber soft, often with pockets of gas and pooled oil; muscles nearly liquefied and easily torn, falling easily off bones; blood thin and black; viscera often identifiable but friable, easily torn, and difficult to dissect; gut gas-filled; brain soft, dark red, containing gas pockets, pudding-like consistency.
- Code 5 (Mummified/Skeletal Remains): Skin may be draped over skeletal remains, remaining tissues are desiccated, and no internal organs.

The initial evaluation will be done by the Recovery Group, and the decision as to whether to process in the field or facility (and, if done in the field, who will do so and to what degree) will be made in consultation with the Processing Group. All animals found within the "designated spill area" (e.g., all animals within a specified distance that affected mammals may travel or float after being affected; distance to be determined upon consultation with the Environmental Unit within the Planning Section and/or the NRDA Unit) will be assessed for sampling. Additionally, based on the spill dynamics, animals found in areas adjacent to the "designated spill area" may also be requested to be sampled and/or collected, but approval (and funding) of this will come from the Wildlife Branch Director upon agreement by the UC. For each animal found, the decision as to what course of action to follow includes the following options (in decreasing order of preference):

- Option 1 (Preferred): For every marine mammal stranding, the animal will be initially sampled and data collected on the beach by the Dead Mammal Recovery team (see Field Sampling section above) and then transported immediately to a facility for examination and more thorough sampling by the Facility Processing team.
- Option 2: In some cases, it will be impossible to immediately transport a carcass back to a facility at the time of the initial response for safety or logistical reasons (e.g., the seas may be too rough to load the carcass into the boat, the distance to carry or tow the carcass may be too great

to complete before night) but may be done at a later, safer time. In these situations, field sampling should be conducted by the Dead Mammal Recovery team (see Field Sampling section above) and the carcass appropriately marked so that additional Recovery or clean-up crews know the animal has been initially sampled but will be removed at a later time.

- Option 3: In situations where it will be impossible to remove the carcass from where it is found, initial sampling should be conducted by the Dead Mammal Recovery team (see Field Sampling section above) and full processing (including field necropsy) should be conducted by the Field Processing team. For full necropsy procedures, please see Appendix 9. Preferably, after the field necropsy is completed, the resulting portions of the carcass can be hauled out of the area by either the Field Processing team or by a clean-up crew working under the Operations Section. Before departing, you must mark the carcass so that the clean-up crews and others know the animal has been investigated and sampled.
- Option 4 (Least Preferred): If the carcass cannot be removed and field necropsy cannot be done (or will not provide important data, such as that attempted on Code 5 cetaceans), burying the carcass on scene after initial sampling being conducted by the Dead Mammal Recovery team (see Field Sampling section above) may be the only option to minimize effects on predators as well as prevent duplicate reporting of stranded animals. Burial must be coordinated with the NMFS Regional Stranding Coordinator and Deputy Wildlife Branch Director before departing for the beach to ensure there is not another logistical option to arrange carcass transport. Before departing, the carcass must be marked so that the clean-up crews and others know the animal has been investigated, sampled, and is ready to be buried. To do so, cane poles or wooden stakes with flagging (or other material) tied to their tops can be staked around the animal. As clean-up crews may not have plans to conduct operations on the same beach as the stranded animal, this is the least preferred outcome and should only be used as a measure of last resort. Note that carcass burial must be done in coordination with the landowner; for some entities (e.g., National Parks Service), arrangements should be made in advance.

Processing Procedures

Upon the arrival of oiled mammals (live or dead) at the Primary Care facility, Processing personnel should obtain all paperwork and samples that accompanied the animal on transport, and complete the accompanying CoC form. If the animal was transported without samples and/or paperwork (e.g., carcass where the Dead Mammal Recovery team had to continue their search) or if the Field Processing team was deployed to examine a stranded mammal, essential data [including collection location (beach name and/or GPS coordinates), Field ID number, collection date/time, and collector's name] must be acquired either by the transporter, from the collection tag/transport container, or from the Recovery Group Supervisor/Strike Team Leader for initial animal identification. In certain instances, the Recovery Group Supervisor/Strike Team Leader may be able to transmit all pertinent information via email, text, or fax to the facility, where either the Facility Processing personnel can begin to fill out appropriate forms, or Field Processing team members can compile those data prior to deployment. If the animal is transported to the facility, the transporter should not leave the facility until all necessary information has been transferred to processing personnel and the CoC form is complete.

Live Marine Mammal Facility Processing

While completing processing procedures on live mammals, it is important to collect all samples and data while minimizing the animal handling time and remaining safe. In many instances, it may be more efficient to conduct processing procedures at the same time as intake (see more in Chapter 9), as manual or chemical restraint may be required. If so, appropriate restraint measures (including

PPE) outlined in the Intake section below should be followed. Pinnipeds waiting for processing and intake should be held in their transport containers in a well-ventilated area with appropriate climate control (heaters if cold, fans if hot). The exception to this is if pinnipeds come in directly from the field in inappropriate containers or are medically unstable – these animals should be transferred to appropriate holding containers and/or processed immediately. For cetaceans, due to the risks associated with remaining in slings and/or transport crates for long periods, processing and intake should occur immediately upon arrival. When live and dead mammals arrive simultaneously and a separate dead Facility Processing team is not available, live mammals are always given priority. Live animal processing should be closely coordinated with the intake examination (Chapter 9) to reduce animal handling time. Once processing commences, the steps undertaken are as follows:

- Live Animal Data Log: Detailed information required to complete the Live Oiled Animal Data Log is contained in the Code Key for Oiled Mammal Data Log (Appendix 1-D). The pertinent animal data from field data (e.g., capture location, date/time, collector) and processing (Date/time, processor) should be entered on the appropriate Live Log, and then transcribed onto a blank Intake Form (Appendix 1-H). The Log is the master repository for information about collection, processing, and disposition of all animals collected during spill response. Separate logs are maintained for live and dead animals at each facility where processing takes place, with the first three letters of the facility's agreed-upon name being the prefix for that log. Each Field Processing team will be assigned a unique identifier designated as "FP" plus a numerical designation (e.g., FP1 being the first Field Processing team sent out). A log number should be assigned and recorded on the Data Log, Intake Form, Level A data form, and any other paperwork. Log numbers are sequential and unique (beginning with 0001) within each Primary Care facility, and are typically assigned in the order of admission. All evidence collected and all treatment provided will be referenced by the log and/or Field ID number, so it is critical that each animal is assigned a unique number and that it is clearly marked on all relevant forms. Live and dead animal log numbers are differentiated by the prefixes "L" and "D"; therefore the first live mammal processed during the spill will have the designation L-0001, with an additional prefix added to the log number if multiple facilities and/or field processing occurs. Note that log numbers **do not** correlate to field numbers assigned prior to arrival at the Primary Care facility.
- Animal Information: All mammals need to be identified to species and, when possible, age class (pup, yearling, subadult, adult) and sex. Consult charts on age estimation for pinnipeds from marine mammal guides such as Geraci and Lounsbury (1993), Reeves et al., (1992) and Ainley et al. (1980).
- Animal Identification: If multiple marine mammals are recovered during a spill and housed in shared enclosures, each must be tagged, marked or otherwise individually identified. The timing of this application depends on the species, method used and whether the animal is being restrained or anesthetized for other purposes at a later time. Identification in pinnipeds should be done with plastic livestock ear tags (e.g., Rototag, Temptag) attached through a flipper, by applying hair dye, using colored livestock markers, or by shaving a small patch of pelage on the flank in a recognizable pattern (e.g., Farrell or Alpha Angle System mark, used in phocids and sea lions only). Dye marking and clipping is not advisable for fur seals and may be difficult in other species depending on the location and extent of oiling. Pinnipeds may also be identified using a commercially available pet microchip inserted subcutaneously at the inguinal region. Cetaceans may be identified using physical characteristics (rake marks) or tags attached to the trailing edge of the dorsal fin. It is essential to ensure that there are no duplicate tags used during a spill response.

- Photograph: A digital photograph of each animal must also be taken. The photograph needs to include the entire animal, the oiled region on the body, and if possible, show the identification - flipper tag numbers, shave mark, or color pattern. The spill name, facility name, processing date, log number, Field ID number, and species should be written on a dry erase board behind or in front of the animal and be entirely visible within the photo. Each photo should be recorded on the Photo Log (Appendix 1-F), with mistakes not deleted on the card, but retaken and noted on the Log. Digital memory cards and photographs of mammals collected during processing are legal evidence; photographs must remain on the designated memory card and should not be modified in any way, including downloading to a computer hard drive. To prevent data loss, a daily back up of all memory cards should be performed using a stand-alone DVD recorder/burner that does not allow any form of modification to the photographs. When a memory card is full, it should be backed up and stored in a locked evidence cabinet. Memory cards should not be erased, even after backup. The enforcement officer of the appropriate trustee agency will provide any necessary changes to this protocol if necessary for securing digital photographs for evidentiary purposes.
- Oil Sample: For legal purposes, it is necessary to collect a sample to be analyzed for oil from each individual animal. A detailed protocol for the collection of evidence is provided in Appendix 3. Briefly, visible oil is scraped from the fur with a clean wooden spatula and placed into a chemically cleaned glass jar. For animals with no visible gross oiling, an affected area is rubbed with a 4x4 piece of fiberglass cloth or cotton gauze with forceps or hemostats that have been cleaned with isopropyl alcohol. Precautions must be taken to collect the sample without allowing nitrile gloves to touch the oil sample or the cloth it is collected on. The oil sample is placed in a glass container and labeled appropriately with the following information: the oil spill name, date, species, intake log number of that animal, animal capture location, and flipper tag color and number and then sealed with evidence tape and placed in secure freezer.
- Oiled Marine Mammal Intake Form: The Processing team must begin the Oiled Marine Mammal Intake form (Appendix 1-H), filling out the data that is captured on the Animal Log sheet. Intake information, such as degree and extent of oiling and biomedical findings, will be collected by the Intake team.

Dead Marine Mammal Facility Processing

Live animal processing necessarily takes priority over dead animal processing due to the need to immediately provide care for any live mammal recovered. However, in total, dead mammal processing often provides much more extensive information as to the extent and degree of oil effects on wild animals. The steps of processing a dead marine mammal are similar to those for a live animal (see above) with the exception that:

- ✓ No Intake Form is created;
- ✓ The Dead Animal Data Log contains additional oiling and other data (information that would have been collected on the Intake Form); and
- ✓ Carcasses do not have to be processed in the order received.

For each mammal, a log number is assigned and recorded on the Data Log, Level A data form, and any other paperwork. This number will begin with the prefix "D" (e.g., the first dead mammal processed during the spill will have the designation D-0001), with an additional prefix added to the log number if multiple facilities and/or field processing occurs (e.g., the first dead mammal processed by Field Processing team 1 would be designated "FP1-D-0001"). Information and sampling/photo documentation of dead mammals follow the same procedures as described above.

Dead Marine Mammal Field Processing

Under certain circumstances listed above, certain dead marine mammals will not be able to be transported back to the facility for processing. This can include the size of the mammal, condition of the carcass, or other logistical challenge to the procedure. In these circumstances, sending a team out to conduct sampling in the field and a necropsy will be the necessary course of action. The capability of the overall response effort to conduct field processing is important during the oil spill response to ensure that samples are collected in the timeliest manner possible. Field processing, however, is dependent upon several factors, including accessibility (e.g., location of animal, weather conditions, tide, and time of day, which may limit necropsy and sampling time) and the condition code of the animal. Field processing teams should be composed of trained stranding responders and/or veterinarians, plus additional personnel to help with the removal or burial of the carcass. In general, field procedures, forms, labeling, photographs, and field log instructions are the same as those listed above for dead mammal processing in the facility, therefore field teams should make sure that all equipment and supplies needed for these activities are in the vehicles before deploying. An equipment checklist can be found in Appendix 9.

Necropsy

As was mentioned previously, the response to all dead stranded marine mammals (as well as live mammals that die in care) during oil spill events will involve necropsy and focused sampling. There are a variety of reasons why this is a required response-related activity (versus one focused on within Natural Resource Damage Assessment (NRDA), including (but not limited to):

- ✓ To assist in the validation and, where necessary, modification of animal care protocols to address spill-specific pathology;
- ✓ To allow for accurate oiling assessment (e.g., sub-apparent oil exposure) through internal gross evaluation; and
- ✓ To determine if death was caused by human response-related interactions.

Additional information, such as determining whether petroleum exposure and/or natural conditions, contributed to the mortality may (and should) be better understood from these examinations but, as these are more in line with NRDA activities, additional costs associated with their exploration (e.g., costs of PAH analyses, histopathology on dead stranded mammals) may need to be acquired from non-response sources. Similarly, additional samples for non-spill-related research MAY be collected during these examinations, but this collection should NOT interfere with the primary purpose of the necropsy and those tissues must be held until the UC and NRDA representatives give clearance. Prior to performing a necropsy on an oiled marine mammal, permission to do so must be confirmed from UC and the appropriate NMFS/FWS enforcement officer. This permission should be forthcoming due to the requirements as outlined in these Guidelines; however, insurance that both the UC as well as the Regional Enforcement personnel are aware of these standard operating procedures is warranted.

Necropsy Procedures

Necropsy methods and techniques are diverse, but general procedures for marine mammal necropsies can be found in (Rowles et al., 2001), (Pugliares et al., 2007), and (Geraci et al., 2005). Specific protocols have also been developed for some marine mammal groups and species including phocids (Winchell and Laboratory, 1990), killer whales (Raverty and Gaydos, 2004), right whales (McLellan et al., 2004), and Hawaiian monk seals (Yochem et al., 2004). These species specific procedures should be followed whenever possible in order to maintain consistency with previous data. However, in general, components of a necropsy will include examination of organs and body

systems, recording of observations, collection of samples for microscopic examination, and reporting of findings. In the response to oil spills, focused sampling and sampling strategies for PAH analyses are a critical component of the necropsy.

Depending on carcass condition and accessibility, three different levels of necropsies can be undertaken: Full, limited, and minimal necropsies. These different necropsy types are necessary to ensure that field responses under varying conditions yield the most information possible. Although not preferable, based upon the situation encountered limited and minimal necropsies may be necessary for Code 2 and 3 animals. Note that no necropsy is conducted on Condition Code 5 carcasses.

- Full Necropsy –A full necropsy examines all organ systems possible under field or facility conditions. This includes extraction of the brain and examination of the ears and eyes, which may be challenging in the field.
- Limited Necropsy – In a limited necropsy, an examination of internal organs is conducted with all major organs (heart, lungs, kidney, liver, thoracic and/or abdominal lymph nodes, spleen, skin/blubber) examined and samples collected. Examination and collection of other organs is conducted as possible. In a field situation, the head may need to be removed and brought back to a facility for extraction of the brain, and examination of ears and eyes. Method of transport and size of the animal may make this impractical.
- Minimal Necropsy, Code 3 Carcasses -A minimal necropsy involves opening the body cavities, having a cursory examination of organs, and strategic sampling of abnormal organs, plus collection of samples of heart, lung, kidney, liver, spleen, and skin/blubber, if possible.
- Minimal Necropsy, Code 4 Carcasses -A minimal necropsy involves opening the body cavity and a cursory examination of organs. Samples may be collected of abnormal organs as warranted by carcass condition.

The spill response veterinarian-of-record should conduct or supervise (directly or remotely after specific direction/instruction) all necropsies, in consultation with the designated NMFS enforcement officer (either via telephone or the officer being present). Ideally, a veterinary pathologist with specialized training and experience with marine mammals will perform necropsies. If an appropriate veterinary pathologist is not available, a veterinarian with experience in necropsies of marine mammals can be asked to perform the necropsy. In situations where an experienced pathologist or veterinarian is not available to conduct the necropsy, a biologist with extensive necropsy experience may be approved by the response veterinarian and Care and Processing Group Supervisor to lead the effort. Necropsy reports are filed and all samples handled and stored using appropriate chain-of-custody protocols, as discussed previously (Data Collection) and provided by the trustee representative.

Sampling Procedures

Tissue samples for standard histopathology, disease profiling, and petroleum hydrocarbon analysis should be collected during all necropsies. While sampling is a component of any necropsy, it is given special priority due to the need for focused sampling for PAHs in an oil spill incident. Depending on the condition of the carcass, sampling should include:

- ✓ Protocol for PAH Analyses
    - External: Skin swabs or scraping (if tar present)

  - Internal: Organs and body fluids, focusing on bile collection for code 2 and early code 3 animals (see Tissue Sampling Protocols, Appendix 4)
- ✓ Biotoxins/Pathogens
  - Biotoxins: Feces, liver, urine, gastric/intestinal contents
  - Pathogens: Lung, spleen, lymph node plus additional samples if possible
- ✓ Histopathology (see Necropsy Procedures, Appendix 9)
  - All organs
- ✓ Life History
  - External: Skin
  - Internal: Gastric contents, teeth (lower left mandible), reproductive organs (testes/ovaries), muscle, skull (if possible)

The levels of sampling will vary based upon the condition of the animal and the environment and the logistics associated with responding to the carcass. The different sampling levels are:

- Complete Sampling: All samples detailed in Appendix 4.
- Limited Sampling, Code 2/3: External and internal (gastric contents, intestinal contents, urine, bile, whole blood-heart, liver, kidney, spleen, lung, muscle, blubber); life history samples.
- Limited Sampling, Code 4: External and internal (gastric contents, intestinal contents, plus any additional samples, if possible); life history samples.
- Minimal Sampling, Code 4/5: External only; life history samples.

Sampling for oil exposure must be performed under specific conditions detailed in Appendix 3, in order to prevent contamination of the sample. Laboratories performing the petroleum analysis must be contacted as soon as possible in order to verify that sampling protocols and sample sizes are consistent with that specific laboratory requirement. Considerations in choosing the lab should include details of forensic capabilities (ability to produce legally defensible results), quality assurance and quality control (QA/QC), and consistency with the analysis of other materials from the spill. Results can vary between labs and data should be comparable between the environmental and tissues of the different species sampled. Appendix 5 lists laboratories with expertise in petroleum hydrocarbon chemistry that can be contacted for oil spill sample collection and analysis information. Petroleum hydrocarbon analysis is a reimbursable response expenses if pre-approved by the UC.

Summary

The extent of the examination and sampling both at the facility as well as in the field will depend primarily on two key factors: accessibility to the stranded animal and the condition of the carcass, as summarized in this table.

	CARCASS CONDITION CODE	
	2/3	**4/5**

Full Accessibility (or Facility Processing)	• Full Necropsy (ideally in laboratory)
	• Complete Sampling
		• Early Code 4: Minimal necropsy
		• Limited Sampling
		  o External PAH
		  o Internal Limited, life history samples

Limited Accessibility	• Limited Necropsy
	• Limited Sampling
	  o External PAH
	  o Internal Limited, if possible, including life history samples
		• Early Code 4: Minimal necropsy, if possible
		• Limited Sampling
		  o External PAH
		  o Internal Limited, if possible, including life history samples

Minimal Accessibility	• Minimal Necropsy
	• Limited/Minimal Sampling
	  o External PAH
	  o Internal Limited, if possible, including life history samples
		• No necropsy
		• Minimal Sampling
		  o External PAH
		  o Life History samples, if possible

Chapter 8 - Care & Processing Group: Care Strike Team

Introduction and Goals

Live animals that are affected by petroleum must usually go through an extensive rehabilitation process to allow them to return to normal function. Typically this involves their capture from the environment and transport to a specially-prepared facility where they can be examined, stabilized, cleaned of oil, provided medical attention, given time and support to allow them to return to normal health, and then eventually released back into a clean environment. This rehabilitative care, for the purposes of oil spill response, is labeled as "Care".

The rehabilitation of oiled pinnipeds and cetaceans is a very labor- and resource-intensive operation. If at all possible, facilities should be in place and ready to care for the species at risk at the onset of a spill, as the development of temporary sites during an emergency is difficult without significant prior preparation. Therefore, the use of existing marine mammal care centers within the appropriate Regional stranding network will always be prioritized as a key response decision, with the NMFS Regional Stranding Coordinator making choices as to which facilities should play what roles, in consultation with the MMHSRP Coordinator(s) in Silver Spring, MD, and the Wildlife Branch Director. If the facilities available do not have oil spill-specific equipment and supplies pre-staged and available (which is the most likely case), each will be improved and supplemented as a response cost. All facilities will also be managed by organizations with the appropriate Stranding Agreements to either hold live mammals or collect samples/necropsy dead animals.

Facilities to be used during oil spill responses can have one of a number of different roles depending on their capacity, infrastructure, availability, closeness to the spill, and/or other factors. These facilities are designated as one of the following categories (with some facilities having the ability to meet multiple categories based on response needs):

- Primary Care: These facilities have the ability to receive live oiled marine mammals, conduct processing and intake procedures, clean them appropriately (and dispose of the oily waste water in a safe and legal manner), and hold them post-wash until they are cleared for release. These are typically larger facilities with full indoor and outdoor holding areas, cleaning space to de-oil mammals, the ability to zone the facility into "hot" and "cold" zones, and the necessary infrastructure (HVAC, water systems) to support spill operations.
- Secondary Care: These facilities do not have the ability (or interest) in receiving oiled animals (or to de-oil mammals) but could hold cleaned or non-externally oiled mammals for extended periods of time to allow for them to return to normal function. Often, zoos/aquaria can fill these roles if off-exhibit holding is available.
- Stabilization: These facilities have the ability to temporarily hold live oiled marine mammals and provide initial "first aid" before moving on to a Primary Care Center. Often, these are smaller facilities lacking sizable outdoor space and/or washing infrastructure but have the ability to hold oiled mammals within a "hot" zone. Alternatively, in cases where multiple facilities are necessary

(e.g., Tier 3 response), these may be larger facilities physically located closer to the spill area that are determined to be better used in this capacity than as a Primary Care Center.

- Processing: These facilities have the capacity to fully process/necropsy dead mammals (following appropriate protocols and sample storage requirements needed for evidentiary purposes). They may not have the ability or authorization to care for live animals, or it may be a strategic decision to use them for this purpose alone.

Due to the extensive nature of the care of oiled marine mammals (or, for that matter, the general rehabilitation of marine mammals), the Care Strike Team has been divided into many discrete components roughly translating to areas within a Primary Care Facility. These functional Areas are designated Intake, Pre-Wash Care, Cleaning, Post-Wash Care, Support and Veterinary Care, each of which contains a Coordinator, staff and volunteers (if needed). For smaller responses (Tier 1 and 2), these Areas may be collapsed into fewer functional elements (see Tiered Response above) but the duties and responsibilities as detailed in the following sections must be accomplished. The following information will provide a broad overview to the shared elements of each of these functional areas (Personnel, Safety and Documentation), but the specific procedures, as well as any specific requirements for that area, will be detailed in the following chapters.

Personnel

- **Care & Processing Group Supervisor (CPGS)** - This position is responsible for coordinating the overall processing and rehabilitation resources and capabilities of the Wildlife Branch in order to provide optimum care and documentation of affected wildlife, including oversight and management of the Care and Processing Strike Teams (see Figure 16). Specifically as they relate to the Care Strike Team, the CPGS's duties include call-out of personnel, activation of Primary Care or other Center(s) that have the capacity to receive and care for marine mammals, oversight of marine mammal care protocol(s), regular reporting of pertinent information (animal status while in care) to the Wildlife Branch Director, and implementation of the demobilization plan. The CPGS must have oil spill and crisis management training/experience; extensive background in all aspects of oiled mammal care, rehabilitation and response, a full understanding of the Incident Command System.
- **Care Strike Team Leader(s) (Care STL)** - The Care STL(s), under the direction of the CPGS, is/are responsible for overseeing the rehabilitation of all live marine mammals collected during the oil spill. In a situation where multiple Primary Care Centers are activated, each would have a STL assigned to manage that specific facility's operations. Duties include assisting the CPGS to

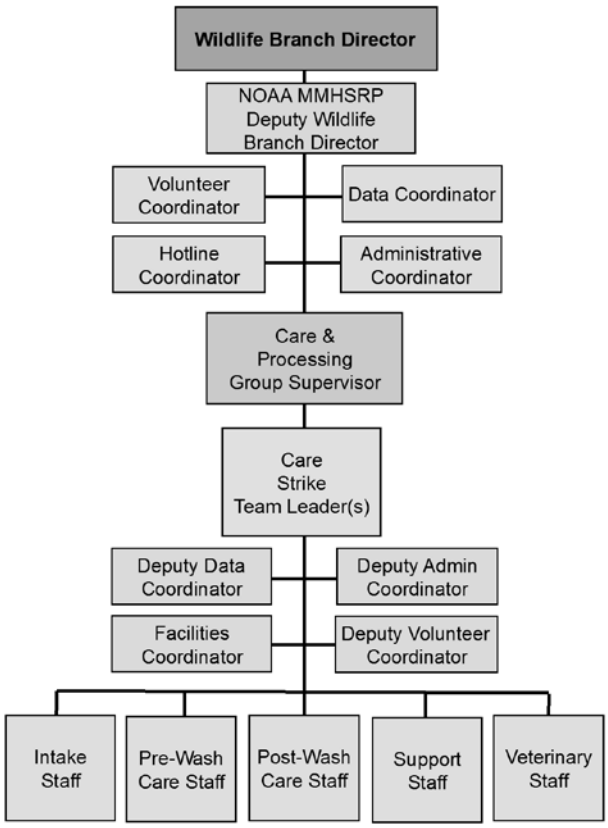

Figure 16: Care Strike Team Organizational Chart

determine current and future facility and rehabilitation needs, oversight of Area Coordinator(s) to ensure appropriate care, reviewing animal care protocols (and approving changes necessary to address spill-specific issues), ensuring the full recording of essential medical information detailing the triage, stabilization, treatment, and rehabilitation of oiled animals, and timely delivery of animal care information (numbers, species, and status of animals in care) to the CPGS. The Care STL must have oil spill and crisis management training/experience; extensive background in all aspects of oiled mammal care, rehabilitation and response, and a full understanding of the Incident Command System. In small-scale responses, this position may be filled directly by the CPG Supervisor.

- **Volunteer Coordinator:** Under direction of the DWBD and/or the CPGS, this position organizes and schedules volunteers on a daily basis for all Groups and/or functional areas. During smaller responses with a single facility, this position may be housed at the Primary Care Facility (and staffed by that facility's Volunteer coordinator) and managed by the CPGS if volunteers are not needed/approved for field deployment. Specific duties include scheduling and conducting orientations and safety trainings as needed; managing and reporting volunteer issues and problems as necessary; reporting pertinent volunteer-related issues up the chain of command; and addressing logistical needs for volunteers (e.g. volunteer meals). The Volunteer Coordinator should have oil spill and crisis management experience, the ability to work with a wide variety of individuals and organizations in a positive proactive manner, and have a working knowledge of marine mammal rehabilitation practices and the Incident Command system.
- **Facilities Coordinator -** Under direction of the CPGS, this position assures functionality of facilities and response equipment during oil spill events. Specific duties include working with the CPGS and Care STL to assess the capabilities of selected facilities to ensure proposed activities can be accomplished, making recommendations as to what improvements are necessary to conduct safe and effective operations at selected facilities, acquiring and installing needed upgrades to facility infrastructure (either permanent or temporary), and continually monitoring facility to identify and repair failing equipment and to make recommendations on necessary additional improvements. The Facilities Coordinator should have experience working with wildlife rehabilitation facilities in general (and marine mammal facilities specifically), capabilities to assess and modify indoor and outdoor machinery as needed, and have a working knowledge of oil spill response, marine mammal rehabilitation practices and the Incident Command system.
- **Care Area (Intake, Pre-Wash, Cleaning, Post-Wash, Support) Coordinator(s) -** Care Area Coordinators, under the direction of the Care STL, are responsible for overseeing care of oil-affected mammals within specific areas of an oiled wildlife response facility (e.g., intake, pre-wash care, cleaning, and post-wash care) or overseeing general support for wildlife rehabilitation activities. Specific duties include assisting the Care STL to determine rehabilitation/support needs within their area, establishment and maintenance of equipment and supplies necessary to provide specific care following Guidelines, communication with Area Coordinators in adjacent sections to ensure animals move through the system smoothly, provision of appropriate oversight of Staff and Volunteers to ensure Guidelines are followed and animals receive appropriate care, and coordination with Staff Coordinators (i.e., Volunteer, Facility) to make sure required resource requests are filled. The Area Coordinator should have oil spill and crisis management experience, must have extensive background in marine mammal wildlife care, rehabilitation and response, and a working understanding of the Incident Command system. In small-scale responses, Care Staff may fill these positions.
- **Veterinary Coordinator** – Under direction of the Care STL, the Veterinary Coordinator leads a team of veterinarians and animal health technicians (if needed) to conduct assessments and

procedures where trained medical intervention is required (e.g., anesthesia for intake exams). This position must be filled by a licensed veterinarians within the state where the oil spill occurred, or covered under an agreement that allow them to practice medicine while in that state (e.g., through a University appointment or emergency response article), or by a Federal veterinarian. The Veterinary Coordinator must have extensive experience, background and understanding of the treatment and rehabilitation of marine mammals (ideally oiled marine mammals), oil spill and crisis management experience, and have a working knowledge of the Incident Command system.

- **Care (Intake, Pre-Wash, Cleaning, Post-Wash, Support, Veterinary) Staff -** Care staff assist the appropriate Area Coordinator with the housing, washing, rinsing, nutrition, veterinary care, and general rehabilitation of marine mammals during a spill event. Specifically, Care staff must have experience and training in the handling and rehabilitation of oiled wildlife; if not, they should be classified as volunteers until that experience has been obtained. The Veterinary area must be staffed by licensed veterinarians within the state where the oil spill occurred, or covered under an agreement that allow them to practice medicine while in that state (e.g., through a University appointment), but also can be staffed by Registered Veterinary Technician where applicable.

Safety

Safety practices, including appropriate personal protective equipment (PPE), for Care staff will be dictated by the Area where they will be working. In many instances, facility personnel may only be required to attend a 4-hour Hazard Communication (HAZCOM) training specific to the risks associated with oiled wildlife processing and care, as the oil they will be exposed to is present only on the animal and not within the environment. The final determination of the safety training requirement will come from the Safety Officer, and it may include a 24-hour HAZWOPER training (Hazardous Waste Operations and Emergency Response) in addition to site-specific training. In general, following these steps can maximize safe practices:

- Maintain the level of OSHA health and safety certification required by the Safety Officer for oil spill response, which ensures that facility staff have been advised of the safety hazards associated with spill response and the many ways in which hazards can be minimized and safety maximized;
- Prior to initial deployment and/or as soon as it is available, all staff must read and sign the Site Safety Plan prepared for the spill event by the Safety Officer, which ensures that personnel are aware of any specific safety issues he/she may face in responding to that particular spill;
- Facility staff must wear proper personal protective equipment (PPE), as determined by the Safety Officer, at all times when handling live and dead animals. Proper PPE requirements will be dictated by their primary location of operations. Personnel conducting rehabilitation within "hot" (or Exclusion) zone (e.g., Intake, Pre-Wash) may be required to wear safety glasses or goggles, Tyvek coveralls, nitrile or vinyl gloves, heavy outer gloves, and skid-resistant boots. For personnel in "warm" (or Transition) zones (e.g., Cleaning, Support), PPE requirements may exchange Tyvek coveralls for impermeable aprons, rain slickers, or other more breathable items. For personnel in "cold" (or Support) zones, PPE requirements may be reduced to heavy gloves, rain slickers, and skid-resistant boots. Additional PPE and safety plans may be required at the discretion of the Safety Officer or other staff.
- Handling live marine mammals should be done with care as they may carry known and unknown infectious agents (zoonoses). Precautions must be taken to avoid skin puncture or exposure to open wounds, cleaning of exposure sites immediately, and letting your physician know that you work with wildlife.

- All injuries must be reported to the Recovery Group Supervisor, who will complete an injury report and communicate with the Wildlife Branch Director.

Documentation

- Intake Form: For live animals, the Oiled Marine Mammal Intake Form (Appendix 1-H) must be completed for each animal. This form contains important questions about the extent of oiling, location and depth of oiling, as well as a place for documenting physical examination findings. For evidence documentation, a photo of the animal and oil sample must be taken either during Processing or during Intake (depending on the protocols that work the best within the facility). During rehabilitation, each animal must have individual records documenting the treatment and care of that animal. Authorization for cleaning and later release must be documented on the Oiled Marine Mammal Intake Form and signed by the authorizing authority (i.e. attending veterinarian).
- Individual Animal Record: The ongoing treatments prescribed, results of examinations performed, issues that arise in care, feedings, and diagnostic tests/findings on each live marine mammal must be recorded within the animal record. These Guidelines have a standard Daily Progress Form (Appendix 1-I) that can be used to record these findings, but the rehabilitation facility's standard forms or electronic records system for stranded marine mammals can also be used provided that all information is clearly documented and assigned to the specific animal.

General Care Issues

- Mortalities/Euthanasia: All animals that die during an oil spill response must have disposition information recorded on their individual animal record as well as on the Live Marine Mammal Data Log (Appendix 1-D) and a NMFS Rehabilitation Disposition form. These deaths may be "natural" (e.g., unassisted) or, under certain circumstances, an oiled animal may need to be humanely euthanized in order to alleviate suffering. Euthanasia is appropriate for animals with injuries that will render them unable to survive in the wild or unsuitable for use in captivity. For each spill where marine mammal recovery and rehabilitation is undertaken, the Wildlife Branch must prepare a written euthanasia plan in consultation with the appropriate trustee representative (see Appendix 7). The carcass should be refrigerated or kept on ice until a necropsy is performed. If a necropsy cannot be performed within 24 hours of death, the carcass needs to be frozen. Protocols and forms for the collection of samples and tissues from dead animals are provided in Appendices 1-J, 4 and 9.

Chapter 9 – Care Strike Team: Intake Area

Introduction and Goals

Intake is the initial detailed physical examination and medical evaluation of live oiled animals that occurs immediately following Processing at the Primary Care Center. The examiners collect health data and create an initial treatment plan based on those findings. During intake, the examiner and medical staff triage animals based on factors including species status (e.g. threatened, endangered, of special concern), age class, historical success of that species/age class in rehabilitation, medical status (e.g. severe wounds, fractures), and characteristics of the spill response (e.g. size, caseload, available resources, product spilled). In short, "Intake" implies examination in a more traditional sense for a rehabilitation facility, while "Processing" entails legal evidence collection.

The intake portion of the facility should be located immediately adjacent to where animals will be dropped off by transport personnel. Ideally, this area will be large enough so that live animal processing can take place either immediately preceding intake or concurrently. If dead animal processing is occurring at the same facility, it should be near to intake as well for ease of processing personnel, for animal drop-off, and should live animals require euthanasia after initial intake examination. As this section will be receiving live oiled animals, it should be zoned as a "hot" (or Exclusion) zone, therefore "donning" and "doffing" areas for PPE should be incorporated as part of it. Appropriate lighting (for examinations) and heating/ventilation (for human and animal safety) should be considered.

Intake Procedures

While undertaking the intake of oiled marine mammals, it is important to be safe, perform a thorough evaluation, collect all samples and data, and minimize the animal handling time. All personnel performing intake procedures should work in teams of at least two (handler, examiner) or three (handler, examiner, recorder) in order to perform the intake in an efficient manner. For larger animals, more than one handler may be required. Physical restraint devices such as squeeze cages, herding boards, or restraint boxes may be needed for medium-sized pinnipeds, and some larger animals may require chemical restraint for safe handling and examination. A brief physical examination is performed upon admission of each individual oiled animal (see below) or, in the case of a late night admission, as soon as possible during the next operational period. A veterinarian or animal care specialist should conduct the examination and treat any conditions that are considered to be life threatening. The capture, transport, and intake process is extremely stressful and an oiled animal's condition may be very unstable. The intake area should be as dark and quiet as is practical and animals must be monitored closely during the examination and intake process. If an animal's condition deteriorates and a veterinarian is not participating in the examination, the examiner should seek veterinary advice immediately.

Physical Examination

The results of the initial examination must be fully documented on the Intake Form (Appendix 1-H). This record contains important questions about the extent, location and depth of oiling, as well as a place for documenting physical examination findings, and can be used as a general guide for conducting the examination. The Live Animal Log may contain some of this information gleaned

from the Recovery and Processing teams; if so, transcribe these data over to the Intake Form. In addition to the Intake Form, the rehabilitation facility's standard forms for stranded marine mammals can be used to record physical exam findings, laboratory values, treatments, and feedings, provided that all information is clearly documented and assigned to the specific animal. The extent of the physical examination will depend on the tractability of the animal, be it a species or size that allows for easy manual restraint or a larger more aggressive animal that may or may not require chemical restraint.

Each organization and stranding network will have different initial examination protocols and procedures that are used for standard marine mammal strandings. The purpose of these Guidelines is not to supplant existing procedures, but to ensure that key oil-related data (including findings that may be consistent with oil exposure) are collected in a systematic fashion. Elements that must be evaluated (or attempted to be examined) in an oil spill situation include the following:

- Samples: The Intake team should confirm that the Processing team has collected oil samples and photos; if not, these should be collected and indicated on the Intake form. Similarly, all animals must be tagged or marked for individual identification if not already done during Processing (see Animal Identification section in Processing section above).
- Oiling Evaluation: The degree and extent of oiling should be determined on each animal. Signs of oiling (oil visible, skin burns or smell of oil), the overall percentage of the animal oiled, the area where oil is found, and depth of oiling (deep = to the skin; surface = does not penetrate to the skin) should be noted on the record. For cetaceans, all oiling should be considered surface.
- Demographics: Animals need to be identified to species, age class (if possible) and sex (if possible), if not already done by Processing.
- Attitude: Assess activity level and alertness (BAR = bright, alert & responsive; QAR = quiet but alert & responsive). This can be done by observing the animal in the transport cage prior to handling (to evaluate locomotion and central nervous system status) or during restraint for examination.
- Body Condition: Assess body condition (normal, thin, emaciated) and, whenever logistically feasible, animals are also to be weighed.
- Morphometrics: Standard measurements should be taken on all mammals. For mammals that are not sedated or anesthetized, standard length may be all that can be safely recorded. On cetaceans and sedated or adequately restrained pinnipeds, standard length and axillary girth should be recorded at a minimum.
- Temperature: In sedated or restrained pinnipeds, body temperatures should be measured with an electronic thermometer with a flexible thermistor probe inserted into the rectum. Ideally, standard thermometers are not used, as they do not accurately measure core temperatures. Normal core temperature for most pinnipeds ranges from 98-102 °F (Dierauf and Gulland 2001). If the use of a thermometer is not possible, feel the flippers (e.g., icy cold or dry and hot) and observe the animal's behavior (e.g., shivering, agitation) in order to evaluate abnormally high or low body temperature.
- Hydration Status: Assess percent dehydration. Most stranded animals are at least slightly dehydrated (Mild <5%, demonstrated by decreased tear production and subdued behavior). More severely dehydrated animals (Moderate = 5-10%, demonstrated by lack of tear production, thick ocular mucus, "sunken" or crusty eyes, dry mucous membranes, skin tenting in otariids, curling of the vibrissae in phocids, and lethargic or depressed behavior) may need to be treated

with fluids prior to continuing the examination and intake procedures; however, it is preferable to obtain blood samples prior to hydration treatments.

- Physical Examination: A complete whole body examination should be conducted. All organ systems (particularly those that may be affected from oil exposure) should be assessed to the extent possible based on the ability to restrain the animal. In additional to standard physical exam procedures for stranded animals, this exam should include the following procedures specific to oil exposure and/or response-related injuries:
  - *Neurologic* – Continue neurologic exam started during Alertness evaluation.
  - *Head/Mouth* – Due to the risk of being bitten, a thorough oral exam is possible only in anesthetized, comatose, or small pinnipeds, but a visual inspection of the oral cavity may be possible opportunistically (e.g., during vocalization). Oral exams on cetaceans should be conducted to the extent possible, given the animal size and activity level. Look for any lesions, oiling, and determine mucus membrane color.
  - *Eyes/Ears* - Check for irritated conjunctiva and apparent lesions to the cornea. Depending on restraint, staining of cornea to determine chemical damage may be warranted.
  - *Heart/Lungs* – Note any asculted lung sounds, increased respiratory effort or apparent lesions. In cetaceans, note any abnormalities seen within the blowhole.
  - *Gastrointestinal* – Palpate the abdomen gently to detect masses, pregnancy, or fluid accumulation and observe the urogenital area for urine, feces, or abnormal discharges.
  - *Musculoskeletal* – Palpate the neck and thorax for evidence of subcutaneous emphysema and the musculoskeletal system for fractures, wounds, or swellings. Subcutaneous emphysema may be an indicator of severe pulmonary damage.
  - *Integument* – Check the skin for cuts, abrasions or evidence of human interaction (e.g., boat strike, net or line marks).

At the conclusion of the intake exam, the Intake Form must be signed by the examiner.

Routine Blood Sampling

Following the general examination, as soon as the animal's condition permits, blood samples should be drawn for hematology (collected in an EDTA anticoagulant, lavender-top tube; LTT) and chemistry panels (collected in a serum separator tube; SST, or red-top tube; RTT) and serum banking. In phocids (e.g., harbor seals, elephant seals), blood is generally drawn from the epidural sinus or ventral (plantar) interdigital veins (at the apex of the web between the inner digits) of the hind flippers. In otariids (sea lions and fur seals), the caudal gluteal vein, plantar network (dorsal or ventral surface of the hind flipper just medial to the lateral digit or just lateral to the medial digit), or brachial vein are used for blood collection. In cetaceans, blood is typically drawn from the central or lateral tail veins (caudal vascular bundle on the flukes), dorsal fin vein or pectoral flipper vein. Blood samples should generally be collected at least three times during the rehabilitation process: on admission/intake, immediately prior to washing, and prior to release. However, the collection on wash or release may not be necessary if performed within 48 hours of previous blood sampling or at the discretion of the response veterinarian. At these times, baseline blood work should include a complete blood count and standard serum chemistry tests. For more details on blood collection (including necessary supplies) and normal blood values for marine mammal species, please see (Bossart et al., 2001).

Standard Blood Tests

When possible, standard blood tests should be performed at the Primary Care Facility, as this will provide the most timely and interpretable results. If not possible, fee for service laboratories may be used.

Specific methodology will be dependent on the equipment available; however, the following are standard practices for most diagnostic equipment:

- Complete Blood Cell (CBC): A standard CBC will include the following - White cell blood count, red cell blood count, hemoglobin, hematocrit, mean corpuscular volume (MCV), mean corpuscular hemoglobin concentration (MCHC), mean corpuscular hemoglobin (MCH), a differential cell count, platelet and reticulocyte counts. One full lavender-top tube (EDTA) (1 or 3 ml) is taken and refrigerated until analysis.
- Chemistry Profile: Standard serum chemistry profiles will/should include albumin, alkaline phosphatase, bicarbonate, bilirubin (total and direct), BUN, calcium, chloride, cholesterol, CK, creatinine, globulin, glucose, phosphorus, potassium, total protein, sodium, AST (SGOT), ALT (SGPT), GGT, and ratios of albumin:globulin, BUN:creatinine, and sodium:potassium. Blood should be placed in a serum separator tube or red top tube, allowed to clot, centrifuged within two hours of collection, and refrigerated prior to analysis. Excess serum can be saved and banked (frozen) at the rehabilitation facility.

Special Biomedical Sampling Protocols

At times, additional protocols may be used that require additional blood samples for other tests (e.g., PAH estimation, immune function assays, serum protein electrophoresis, serological tests for infectious diseases). If blood is to be collected for PAH analyses, the following specialized sampling procedure must be followed:

- Option 1 (Preferred): Collect blood using a Vacutainer needle/holder system into a glass RTT with no gel (e.g., no anticoagulant). Remove the Vacutainer top and pour the whole blood into a 20 ml I-Chem bottle for freezing. Be careful not to touch the interior of the I-Chem bottle or lid or blood.
- Option 2 (Acceptable): Collect blood using a plastic syringe or extension set, and immediately transfer it into a 20 ml I-Chem bottle for freezing. Be careful not to touch the interior of the I-Chem bottle or lid or blood. Note on the Intake Form that a plastic syringe was used for blood collection. If you are using an I-Chem bottle with a septa lid (one that allows a needle to be inserted through it), do *not* insert the needle through the lid. Instead, carefully remove the lid and discharge the syringe directly into the glass bottle. Note that if this method is to be used, set aside a designated box of syringes with a single lot number for blood collection.

Keep an unused needle/holder systems and empty RTT as a reference to be submitted when frozen samples are shipped for analysis. If more than one lot number of needle/holder systems or RTTs are used during a response, note which samples were collected from each lot, and keep a reference for each.

Other biomedical samples (e.g., urine sample, fecal sample, microbiological swab, blubber biopsy) may also be collected at the discretion of the response veterinarian based on the medical needs of the patient. Remember if the samples are collected for health diagnostic purposes only, they may be sent to a consulting diagnostic lab without a Chain of Custody form. However, if ancillary samples are collected for exposure determination, assessment of endemic diseases, or other non-point of care reasons, they must be sent following CoC protocols.

Chapter 10 – Care Strike Team: Pre-Wash Care Area

Introduction and Goals

The goal of Pre-Wash Care is to ensure that oiled marine mammals are physiologically stable enough to endure the stress of washing. It is anticipated that many marine mammals will be deemed stable enough to be washed immediately after the intake examination is performed, as many animals will be "healthy" aside from the presence of oil on their skin/coat. In fact, for those animals that must be sedated or anesthetized for processing and intake procedures, cleaning immediately after intake is the preferred option, as it reduces the number of procedures that must be done. However, some animals may require more extensive pre-wash care to be able to withstand the stress of the cleaning process, as they will be suffering nutritional compromise, dehydration, hypothermia, and the stress of capture, transport, and handling. Initial care in this area is focused on addressing thermoregulatory problems, rehydration, and feeding so animals are no longer in a negative metabolic balance. The washing procedure is very stressful; therefore, prior to the procedure, the animal needs to have regained strength. For these mammals, a treatment plan should be developed immediately following intake by the Veterinary team, which will include any initial therapy, such as supportive fluids and medications, and biomedical criteria (including blood values and physical condition) will be used to track progress and determine when the mammal is ready for cleaning.

The Pre-Wash Care area of the facility should be immediately adjacent to the Intake area for ease of animal/data hand-off, as well as for zoning (as Pre-Wash Care is also a "hot" or Exclusion zone, thus full PPE and "donning"/ "doffing" areas must be planned for). Depending on the species collected, this area may either be outdoors (e.g., pools for cetaceans, dry pens for larger pinnipeds) or indoors (e.g., wall caging or pens for smaller pinnipeds); however, the area should be relatively quiet, free of extraneous stressors and (if possible) able to be temperature controlled. Similar to the Intake area, ventilation should be maximized, as fumes from oil-exposed animals will accumulate. Within this area, there must be close communication between Intake, Pre-Wash, Cleaning and Veterinary teams, as animals may be moving to different areas on different timetables depending on the animal's status.

Pre-Wash Care Procedures

Marine mammal rehabilitation organizations involved in oil spill response likely have general rehabilitation policies, practices, and protocols that they follow for non-oiled mammal care. The goals of these guidelines are not to replace these standardized practices but to augment them based on specific information related to the effects of oiling on marine mammals, as well as act as guidance on the most important aspects of marine mammal rehabilitation to emphasize when dealing with oiled animals. For most oil spill incidents where a single stranding network member is acting as a Primary Care Facility, those protocols should be followed if agreed upon by the Response Veterinarian and Care Strike Team Leader/Care & Processing Group Supervisor. In situations where multiple Facilities are activated and/or multiple stranding network members are involved, the Care & Processing Group Supervisor (with assistance from the veterinarians/Strike Team Leaders from each organization) should take steps to standardize practices wherever possible to decrease confusion should personnel or animals be shifted between operations.

Fluid Therapy

Total fluid requirements (maintenance fluids plus correction of fluid deficits) should be determined by the attending veterinarian, based on an evaluation of blood work, concurrent fluid losses, and assessment of the animal's condition. All oiled marine mammals are assumed to be at least 5% dehydrated if captured and transferred to a Primary Care facility. This amount should be added to the animal's daily maintenance fluid requirement (at least 40 ml/kg/day) and administered within the first 24 hours if possible. The route of fluid administration will depend on the tractability of the mammal, the size of the animal (as most adult animals are too large to be given fluids orally), the overall fluid requirement, and the health status of the animal in question. If possible, isotonic fluids should be administered to animals orally at a rate of 10-20 ml/kg per tubing. Animals that are chemically immobilized for intake procedures or are weak and obtunded should not be given oral fluids; subcutaneous or intraperitoneal fluids (e.g., lactated Ringer's solution), may be administered instead at 20-40 ml/kg. Severely depressed animals may require intravenous fluid administration and other medication in addition to isotonic fluids. If ingestion of highly volatile oil is suspected (e.g., fur seals during grooming, neonates during nursing, feeding on oiled prey), an activated charcoal (e.g., Toxiban) slurry at 6ml/kg MAY be administered via a stomach tube if oral fluids are being administered or just prior to anesthetic reversal (Williams and Sawyer, 1995). However, this treatment has not been proved to help adsorb ingested oil, and the risks associated with passing a stomach tube (and possible gastric reflux and aspiration) in obtunded or anesthetized animals must be weighed against the risks associated with continued exposure to ingested petroleum.

Nutritive Therapy

The dietary requirements of stranded marine mammals are generally grouped into two categories according to age and nutritional needs: Unweaned pups and weaned animals. Pups need special dietary formulas and feeding regimes based on species and age while free-feeding animals are generally fed a diet of good quality fish such as herring, smelt, anchovies, sardines and/or capelin (exact diet may vary depending upon what is commercially available and not cost prohibitive). Marine mammals also usually need to receive a supplemental multivitamin, vitamin E, and salt tablets (if appropriate) with amounts based on species and weight. Monitoring fecal production and hydration status is especially important when beginning any formula, switching diets, or weaning animals. Recommended diets change with continued research and experience and stranding network participants should collaborate in the development of dietary protocols for each species and facility, taking advantage of the lessons learned. More information can be obtained on marine mammal nutrition and energetics from (Worthy, 2001), and hand-rearing and artificial milk formulas from (Townsend and Gage, 2001).

Temperature Therapy

Due to the potential for hypo- and/or hyperthermia in oiled marine mammals, ongoing monitoring of body temperature (and adjustment of ambient conditions) should be done for all animals in care. Typically, behavioral observations will suffice for determining if animals are too cold (e.g., shivering, listless, floating, cold flippers) or too hot (e.g., panting, open-mouth breathing, hot flippers). For pinnipeds, pens should be established that have a normal ambient temperature but allow for a localized gradient of heat within the pen. Commercial electric livestock warming pads or ceramic heaters (located at a distance above the pen to ensure burning of tissues and combustibles within the pen do not occur) can be used very effectively to provide warmth, while shallow pans of water and/or ice, misters, or running water can provide cooling as needed. Animals should be monitored regularly to ensure they do not "flip" from hypo- to hyperthermia or vice versa. Temperature in

cetaceans may be impossible to control, though changing the temperature of pool water and/or holding within indoor pools where ambient temperatures can be controlled (if available) can help.

Ongoing Monitoring

During pre-wash care, the initial treatment plan developed by the Veterinary team (or Intake) should be followed and adjusted as needed. This will include addressing issues related to dehydration, thermoregulatory problems, and any significant findings from the initial exam. However, additional problems may arise after the original evaluation related to more chronic effects of oil (and/or masked by the stress of capture and transport), and should be closely looked for. These issues may include (but certainly are not limited to):

- ✓ Anemia
- ✓ Hypoproteinemia
- ✓ Respiratory problems
- ✓ Depression/other CNS issues
- ✓ Problems related to infectious diseases

All animals must be regularly monitored during this process via clinical observations, feeding observations (food consumption and/or preferences), and behavior, and should be recorded on the medical records. Body weight should also be monitored regularly (if possible) to determine whether feeding is adequate. Whenever medications are administered, the name of the drug, dose, route (oral, SQ, IM, IV), and time of administration should be recorded as well as the initials of the person who administered the medication. Medical records are viewed as potential evidence by Law Enforcement and must be carefully and completely filled out by animal caretakers and preserved.

Pre-Wash Evaluations and Criteria

For relatively healthy individuals, repeat physical examinations of animals in Pre-Wash Care should be scheduled for 48 to 72 hours after intake to determine if the animal is stable enough to clean. Pre-Wash and/or Veterinary teams should conduct a full physical examination, evaluation of alertness, strength and body condition, and assess blood parameters. These examinations may need to be conducted more or less frequently depending on the specific conditions of the animal under care, but should be done as soon as feasible to ensure the marine mammal can continue to progress through the oil spill rehabilitation process. All pertinent information from each examination (including results from diagnostic tests) must be recorded on individual medical records, and the examiner must sign the Intake Form in the appropriate section. For re-examined marine mammals, certain criteria must be met to ensure they are stable enough to withstand the rigors of that process. These criteria should include:

- ✓ Attitude: Animal should be bright, alert, and responsive;
- ✓ Blood Values: Animal should have CBC and serum chemistry values that indicate relative good health from a blood sample taken within 24-48 hours of the proposed wash. In particular, red blood cell parameters and serum protein values should be close the normal range for free-ranging animals of that species; and
- ✓ Physical Exam: The latest physical exam shows either a return to normal status for issues noted on intake (e.g., dehydration) or, at a minimum, the stabilization of those problems.

Exceptions to these criteria may be made by the Veterinary team under certain circumstances, such as when highly sensitive species are collected, caustic products (e.g., diesel or jet fuel) are present, or if the animal is deemed to be at greater risk if not moved forward in the process.

Chapter 11 – Care Strike Team: Cleaning Area

Introduction and Goals

The goal of cleaning marine mammals is to remove all external contamination in order to enable the animal to regain normal function. This can include the ability to regain its natural waterproofing (in fur seals), to ambulate normally (in pinnipeds), and to decrease the risk of oil ingestion and absorption (in all mammals). Contaminants include the original oil product, but can also include feces and fish oils acquired during pre-wash care, any compounds used to break up the oil (e.g., chemical dispersants), and the detergent used for wash. The overall cleaning process is one that uses a detergent (either directly on the skin/fur or diluted in a tub of water) to remove the oil, then clean rinse water to remove the soap. In heavily furred mammals (e.g., fur seals), an additional drying step will be necessary to allow a trapped layer of air to return in the undercoat. Failure to adequately wash and rinse oiled mammals can lead to incomplete recovery of waterproofing.

Facility requirements to support effective cleaning of oiled marine mammals can be extensive. The cleaning area should be designed to accommodate the variety of species that might be cared for at that facility. Each wash station must have adequate space for the animals, animal handlers, and restraint equipment that might be necessary. Water quality and quantity must also be taken into account when selecting an appropriate Primary Care location. Every oiled marine mammal requires a large volume of temperature controlled (80-98°F) warm water for wash and rinse, the volume necessary directly related to how oiled the animal is and how difficult it is to remove it. For fur seals, water hardness and water pressure are also important for complete cleaning, with 3-5 grains of hardness delivered at 40-60 psi being optimal conditions for birds (Clumpner, 1990). Wastewater storage, containment, and removal must also meet the requirements of the municipality, city, and county. Lastly, the cleaning area must be designed to minimize human health issues, as slips, trips and falls, as well as the potential for heat exhaustion, are high in this area.

Cleaning Procedures

General

Animals approved for cleaning should not be fed immediately (e.g., within 2-4 hours) before beginning the process to reduce the chance of regurgitation, but should ideally receive fluids subcutaneously to combat dehydration. At least two or three people usually wash and rinse animals as a team, with support personnel providing needed supplies. Communication between all members of the cleaning team is necessary for safe and effective washing and rinsing. Fur seals may require teams of four to six persons because the density of their fur requires much greater effort. Large animals such as elephant seals may require a washing team with three or four persons to properly restrain and wash the animal. Large animals, aggressive animals, and fur seals may require sedation/anesthesia and veterinary assistance for washing and cleaning. For these animals, either inhalant or injectable agents may be used, dependent on the species, available drugs, time necessary to complete procedure, and logistical support. If sedatives are used, supplemental oxygen should be provided either via facemask or endotracheal tube if possible, to ensure adequate oxygenation. Additionally, during sedation and cleaning, core temperatures must be monitored continuously

because mammals can become hypothermic or hyperthermic very quickly, and bags of crushed ice should be readily available and placed under the animal's neck and flippers if hyperthermia occurs. Recommended agents, required supplies, and recommended monitoring/support can be found in (Haulena and Heath, 2001) for species most likely to strand during oil spills in the US. Care should be taken with oil cleaning around the mouth, eyes, and nostrils.

There has been a great deal of research in oiled wildlife medicine regarding ideal cleaning agents to use during oil spills. While most of this work has focused on oiled birds, liquid dishwashing detergents have also been shown to be safe and effective for removing oil from the coats of sea otters and harbor seals (Davis and Hunter, 1995). In particular, Dawn dishwashing liquid has been proven to provide the best cleaning capabilities in oiled feathers when compared to other commercially available products (Miller et al., 2000). Depending on the species (see below), liquid dishwashing detergent is applied either directly on the animal or as a diluted solution (in water) and agitated manually on the skin/fur to remove the oil using gloved fingers. Soft scrub brushes, toothbrushes, cotton swabs, and water piks can also be helpful for removing oil in hard to clean areas (e.g., inside the mouth, around the eyes). It is important to be systematic when washing to ensure that all areas of the body are thoroughly exposed to the detergent solution.

If the oil is tarry or very weathered, "pre-treatment" of animals may be necessary to completely remove the petroleum product (Massey, 2006). Pre-treatment is accomplished by applying warmed (95-98°F) methyl soyate, methyl oleate, or vegetable oil to the affected region, and manually working the compound into the tarred areas for up to 30 minutes (or until the tar loosens and can be wiped off using an absorptive pad or towel). Tar removal is necessary for furred and non-furred marine mammals if the patch(es) are large, potentially interfering with thermoregulation, contribute to toxicity and result in clinical symptoms, or there is an ecosystem concern related to secondary toxicity in scavengers or predators. In other cases, tar removal is not recommended. Clipping away tar patches (with accompanying fur) can be done if the tar patch is small and the resulting bald patch would not negatively impact thermoregulation.

Fur Seals

In contrast to cetaceans and other pinnipeds, fur seals possess only a thin subcutaneous fat layer and utilize a thick pelage to thermally insulate them from cold ocean water (Riedman, 1990). Oiling 30% of a fur seal's coat has been shown to result in a 50% increase in heat loss (Kooyman et al., 1977). Since they rely more heavily on their pelage, fur seals must be washed carefully and completely in a similar fashion to otters. Fur seals are washed with multiple applications of diluted (5%) solution of Dawn dishwashing detergent. Ideally, washing tables are equipped with three or four well-aerated nozzles dispensing temperature controlled (~98°F), softened (3-5 gr.) fresh water. The water temperature affects the body temperature and needs to be continually monitored and, if need be, adjusted according to the fur seal's body temperature to prevent hyper or hypothermia. Four to six people are required per washing table, with one (with heavy gloves) specifically to hold the head if the fur seal is not anesthetized. The detergent is gently massaged into the oiled fur and then rinsed off under moderate pressure (30-40 psi) with a spray nozzle. Cleaning should consist of a wash, rinse, wash, rinse cycle until there is no indication of oil in the wash water and no petroleum odor on the fur. Depending on the degree of oiling, this cycle will usually take from 40-60 minutes. A final rinse with a spray nozzle with fresh, soft water under moderate pressure (30-40 psi) lasting an additional 40-60 minutes (until no oil is visible in the rinse water and no petroleum odor is detectable on the fur) is essential to thoroughly remove the detergent and restore the fur's water repellency. Fur seals should then be completely dried depending on the method of restraint. If

sedated or anesthetized, they can initially be hand dried with dry, clean, cotton terry cloth towels, then dried with commercial pet dryers that deliver a high volume of temperature controlled air. If the fur seal is manually restrained, it can be dried by placing in a drying enclosure that is warmed with an industrial pet dryer blowing room temperature air (68°F). Animals in drying pens must be monitored for dehydration, hyperthermia, hypothermia, and alertness, as they become increasingly prone to hyperthermia as their hair is drying. Once dry and alert, fur seals can be returned to their outdoor pens, but should be monitored regularly by qualified personnel familiar with normal fur seal behavior to ensure hypothermia post-wash due to lack of air insulation in washed fur does not occur.

Other Pinnipeds (Harbor Seals, Elephant Seals, Sea Lions)

Sea lions, harbor seals and elephant seals rely on their thick blubber layer for insulation, making them less susceptible to hypothermia when they become externally oiled. Therefore, the advantages of cleaning lightly oiled pinnipeds (other than fur seals) and those having discrete tar patches on their fur must be weighed with the potential disadvantages of restraining (manually or chemically) and washing the animal. Criteria when weighing these options should include the freshness of the product, extent of oiling, overall health of the individual, available support for the procedure, and whether additional diagnostics/procedures are necessary that can be coupled with the wash effort. If the decision is made to clean the seal/sea lion, it can be washed with liquid dishwashing detergent in thermal-neutral (~ 98°F) water. Soap is applied and rubbed on the fur until the oil is visibly removed. The detergent can be made into a uniform solution by mixing it with water at a 1:1 ratio prior to applying thus making it easier to work into the hair and oil. Washing pinnipeds takes between 10-30 minutes depending on the extent and type of oil, species and health of the animal, and the proficiency of the staff. An initial quick rinse can be done at the wash station and then completed with the animal unrestrained in its pen using a pressure nozzle. This modified rinse procedure decreases the duration of manual restraint. In general, rinsing should be continued until there is no evidence of oil or detergent in the rinse water. Most pinnipeds are placed directly into their outdoor pens to dry.

Cetaceans

Very little information exists regarding methods and success of removing oil from the skin of cetaceans, as few documented cases during spills have occurred. As the epidermis of cetaceans is extremely thick, it is largely considered a barrier to the potential deleterious compounds found in oil (Geraci, 1990); therefore, lightly oiled animals will not be captured specifically for cleaning. If a live cetacean is deemed in need of rehabilitation for other reasons, however, cleaning of the skin should occur. Cleaning should be done in a similar fashion to non-fur seal pinnipeds, with a 1:1 liquid dishwashing detergent – water solution poured directly onto the skin and manually rubbed to remove the compound. Care should be taken with oil cleaning around the mouth, eyes, and blowhole. For stranded cetaceans that are candidates for immediate release (e.g., otherwise healthy, presents no apparent risks to population, social requirements can be met, environment is clean and within the animals natural range), beach cleaning of oil can be considered on a case-by-case basis. Portable decontamination booms, plastic sheeting, and sumps to collect wastewater could possibly be used to allow the effective cleaning of the animal without the need for transportation to a rehabilitation facility. However, approval from the Wildlife Branch Director, close coordination from cleanup personnel, and the availability of PPE and supplies to allow this to occur in a safe manner would be necessary to attempt this task.

Common Problems

In certain instances, cleaning staff may experience problems in completely removing contaminants from oiled animals. These issues may arise during the wash/rinse, or may be noticed after the cleaning process has occurred. Some of the more common issues (and their causes) are as follows:

- ✓ Oil is not coming off with Dawn
  - o Pretreatment with canola oil, olive oil, or methyl oleate is required.
- ✓ The animal's coat is not clean
  - o The animal may not have been washed or rinsed adequately. In either case, the animal may need to be re-washed or re-rinsed.
  - o The holding pool is not clean. Check whether the water is turbid or if there is fish oil or debris floating on the pool surface. Water flow may need to be increased or pool drained and cleaned.
- ✓ The wash or rinse water is too hard and mineral deposits are forming on the fur.
  - o Water hardness should be rechecked to make sure it is 3-5 grains.

Chapter 12 – Care Strike Team: Post-Wash Care Area

Introduction and Goals

The goal of Post-Wash Care (or "Pre-Release Conditioning") is to allow animals the time and support to regain normal physiological and behavioral function in anticipation for release back into the wild. Specific criteria must be met before marine mammals can be released; these have been developed to increase the likelihood that animals are healthy, in good body condition, have appropriate exercise tolerance, and have the ability to perform the full range of behaviors required for survival in the wild. For all intents and purposes, Post-Wash Care closely models the policies and practices of general marine mammal rehabilitation.

Facility requirements for post-wash care relate directly to the species needing rehabilitation. Pools or pens with access to water that are safe and appropriate for the animals to be held are necessary. All criteria laid out in the Policies and Best Practices for Marine Mammal Response, Rehabilitation and Release (Gage, 2009) should be closely adhered to. This being said, this document does provide for the case of emergency response as follows:

> "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."

Additional species-/taxon-specific information can be found in the appropriate chapters of Dierauf and Gulland (2001).

Post-Wash Procedures

General

Care of animals in the post-wash area will mimic that of general marine mammal rehabilitation, with appropriate fluid and nutritional support, medical treatments, diagnostic procedures, and antibiotic therapy given as needed. Key aspects of overall animal health that can be linked to potential oil exposure (e.g., skin, respiratory, ocular, and/or gastrointestinal problems) should be particularly looked for. More chronic effects of oiling (e.g., anemia, gastrointestinal damage, organ dysfunction) may present themselves while in Post-Wash Care. Exposure to petroleum can also cause immune dysfunction, so opportunistic infections and/or pneumonias may be of concern. Fluid therapy, nutritive therapy, and ongoing monitoring needed in Post-Wash Care closely follow those outlined in Pre-Wash Care (above), with the exception that fluid deficits should not be as prevalent (unless fluid loss is ongoing, such as the case with diarrhea). All clinical observations, feeding observations (food consumption and/or preferences), and behavioral abnormalities should be noted in the medical records and brought to the attention of the Veterinary team. If possible, body weight should also be monitored repeatedly during rehabilitation and recorded; if not, assessment of body condition should be continued. Whenever medications are administered, the name of the drug, dose and route (oral, SQ, IM, IV) should be recorded, as well as the initials of the person who

administered the medication. Any notation of care or treatment administered needs to be initialed by the provider.

Release

The goal in rehabilitating oiled marine mammals is to release healthy animals back into their natural environment. As such, certain criteria must be met prior to releasing marine mammals back into wild populations, and a number of tests, factors, and steps will need to be considered and conducted. Current recommendations are based largely on information derived from husbandry practices at aquaria and rehabilitation centers in the United States. NMFS and FWS have developed guidance and criteria for release based on optimizing the chances for survival and minimizing the risk to wild populations (Best Practices for Marine Mammal Stranding Response, Rehabilitation, and Release – Standards for Release, http://www.nmfs.noaa.gov/pr/pdfs/health/release_criteria.pdf) (Whaley and Borowski, 2009). These release criteria must be evaluated throughout the animal's rehabilitation during conference calls between the veterinary/ rehabilitation staff at the facility, NMFS personnel, and, if necessary, outside medical and behavioral experts. These criteria should be discussed prior to the submission of the Release Determination Recommendation letter (see below) by the Regional stranding network organization. Pre-release assessment for marine mammals must include the following steps and parameters:

- Historical Assessment: Collection of information from time of stranding to present, including current environmental issues, animal information (re-stranding, exposure to domestic animals, infectious disease exposure, human interaction).
- Developmental and Life History Assessment: Nursing status, reproductive status, body condition, age, social development and "ecological status".
- Behavioral Assessment and Clearance: Breathing/swimming/diving, locomotion (pinnipeds), aberrant behavior, auditory/visual function, prey capture, predatory avoidance (cetaceans), and social factors (cetaceans).
  - NOTE: Auditory evoked potential (AEP) diagnostic testing is recommended on dolphins undergoing rehabilitation and may be required prior to a release determination.
- Medical Assessment and Clearance: Results of diagnostic testing and treatment while in rehabilitation, physical exam results within 72 hours of release, and results of infectious disease testing prior to release.
  - NOTE: Cessation of antibiotics should occur two weeks prior to release to assure that the animal is no longer dependent on the medication. If this is not possible, a justification for the need to release the animal prior to the end of the antibiotic regimen should be included in the medical assessment by the veterinarian.

The attending veterinarian should make a written recommendation for release or non-release to the Regional Administrator. If recommending release, this Release Determination Recommendation Letter should include a description of the marine mammal (i.e., physical condition and estimated age), its stranding and medical history, and a signed statement from the attending veterinarian stating that the marine mammal is medically and behaviorally suitable for release in accordance with the Best Practices for Marine Mammal Stranding Response, Rehabilitation, and Release – Standards for Release. The letter should include a written release plan and timeline that contains the following:

- ✓ Date and location of intended release;
- ✓ Method and duration of transport prior to release;

- ✓ Justification of release location (e.g., reflect the natural history of their species, maximizes the likelihood for survival, ideally near those of the same genetic stock, little to no risk of becoming re-oiled);
- ✓ Justification of release timing (e.g., minimizes energetic and social demands, maximizes foraging success and ease of social acceptance);
- ✓ Detailed description of transport logistics, crowd control, and media coordination;
- ✓ Tagging plans (e.g., photo-identification, freeze branding, and/or flipper/dorsal fin tags);
- ✓ Post-release monitoring plan (e.g., visual observations from land, sea, or air, and/or radio or satellite-linked monitoring);
- ✓ Contingency plans for recovery should the release be unsuccessful; and
- ✓ Treatment, permanent care, and/or euthanasia plan if the animal is retrieved or restrands.

The NMFS Regional Administrator will review the recommendation and release plan and provide a signed written Letter of Concurrence or directions for alternate disposition to the stranding network participant, who will then provide this to the Wildlife Branch Director for Unified Command coordination. Upon approval by the Regional Administrator and the Unified Command, the mammal(s) may be released, with exit photos of each marine mammal taken and the specifics of the release (location, time, personnel) recorded for Natural Resource Damage Assessment purposes

For those animals that do not meet release criteria, several options are available including additional rehabilitation, euthanasia, or placement in a permanent care facility. Placement decisions will be made and arrangements coordinated by the Agency (NMFS or FWS).

Post-release monitoring

As part of the release plan, a full description of post-release monitoring methods must be provided before approval is acquired. Flipper/dorsal fin tags and/or freeze branding should be strongly considered, as this will allow for passive monitoring and identification of animals that have successfully completed rehabilitation. If at all possible, radio or satellite telemetry should be undertaken during marine mammal releases following oil exposure. This effort should focus on survival rates, behavior, and reproductive success following oil contamination and rehabilitation, thus enabling marine mammal responders to evaluate the efficacy of oiled marine mammal care. This being said, post-release monitoring is often not considered a response expense and must therefore be funded by the Regional stranding network participant, trustee agency or NRDA.

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Internet Resources

NOAA Fisheries, Marine Mammal Health and Stranding Response Program
http://www.nmfs.noaa.gov/pr/health/
NOAA, Office of Response and Restoration
http://response.restoration.noaa.gov/
U.S. Coast Guard - Homepage
http://www.uscg.mil
U.S. Coast Guard – Documentation
https://homeport.uscg.mil/
FEMA – Emergency Management Institute
http://training.fema.gov/IS/NIMS.aspx
U.S. Environmental Protection Agency - Oil Spill Program
http://www.epa.gov/oilspill/
National Response Team
http://www.nrt.org/
National Response Center
http://www.nrc.uscg.mil
U.S. Fish & Wildlife Service – Oil Spill Program
http://www.fws.gov/contaminants/Issues/OilSpill.cfm
UC Davis, Oiled Wildlife Care Network:
http://www.vetmed.ucdavis.edu/owcn

Appendices

- Appendices 1: Forms
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Appendix 1-A: Search Effort Log

Search Effort Log

Please record all beaches searched *even if no animals are found*.

Spill Name: _____ Date: _____
Searchers: _____

Note: Time should include all time spent on the beach, even when backtracking. North and south endpoints should be GPS pts. If not, please provide a good description of the area covered. For collected animals, put GPS location here.

	Beach Name	Start Time	End Time	North/West Extreme (Lat/Long)	South/East Extreme (Lat/Long)	Total Distance Searched	Method (by boat, foot, ATV, truck, scan)	Mammals Collected Note: (live/ dead, GPS, ID #)
A								
B								
C								
D								
E								
F								
G								
H								

Appendix 1-B: NOAA's Level A Data Form (Front)

MARINE MAMMAL STRANDING REPORT - LEVEL A DATA

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

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

EXAMINER Name: _____ Affiliation: _____

Address: _____ Phone: _____

Stranding Agreement or Authority: _____

LOCATION OF INITIAL OBSERVATION

State: _____ County: _____

City: _____

Body of Water: _____

Locality Details: _____

_____

Lat (DD): _____ . _____ N

Long (DD): _____ . _____ W

☐ Actual ☐ Estimated

How Determined: (check ONE)

☐ GPS ☐ Map ☐ Internet/Software

OCCURRENCE DETAILS ☐ Restrand GE# _____ (NMFS Use)

Group Event: ☐ YES ☐ NO

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

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

If Yes, Choose one or more: ☐ 1. Boat Collision ☐ 2. Shot ☐ 3. Fishery Interaction

☐ 4. Other Human Interaction: _____

How Determined (Check one or more): ☐ External Exam ☐ Internal Exam ☐ Necropsy

☐ Other: _____

Gear Collected? ☐ YES ☐ NO Gear Disposition: _____

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

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

How Determined (Check one or more): ☐ External Exam ☐ Internal Exam ☐ Necropsy

☐ Other: _____

INITIAL OBSERVATION

Date: Year: _____ Month: _____ Day: _____

First Observed: ☐ Beach or Land ☐ Floating ☐ Swimming

CONDITION AT INITIAL OBSERVATION (Check ONE)

☐ 1. Alive ☐ 4. Advanced Decomposition

☐ 2. Fresh dead ☐ 5. Mummified/Skeletal

☐ 3. Moderate decomposition ☐ 6. Condition Unknown

LEVEL A EXAMINATION ☐ Not Able to Examine

Date: Year: _____ Month: _____ Day: _____

CONDITION AT EXAMINATION (Check ONE)

☐ 1. Alive ☐ 4. Advanced Decomposition

☐ 2. Fresh dead ☐ 5. Mummified/Skeletal

☐ 3. Moderate decomposition ☐ 6. Unknown

INITIAL LIVE ANIMAL DISPOSITION (Check one or more)

☐ 1. Left at Site ☐ 6. Euthanized at Site

☐ 2. Immediate Release at Site ☐ 7. Transferred to Rehabilitation:

☐ 3. Relocated Date: Year:_____ Month:_____Day:___ Facility:_____

☐ 4. Disentangled ☐ 8. Died during Transport

☐ 5. Died at Site ☐ 9. Euthanized during Transport

☐ 10. Other:_____

CONDITION/DETERMINATION (Check one or more)

☐ 1. Sick 7. Location Hazardous

☐ 2. Injured ☐ a. To animal

☐ 3. Out of Habitat ☐ b. To public

☐ 4. Deemed Releasable ☐ 8. Unknown/CBD

☐ 5. Abandoned/Orphaned ☐ 9.Other_____

☐ 6. Inaccessible _____

MORPHOLOGICAL DATA

SEX (Check ONE)

☐ 1. Male

☐ 2. Female

☐ 3. Unknown

AGE CLASS (Check ONE)

☐ 1. Adult ☐ 4. Pup/Calf

☐ 2. Subadult ☐ 5. Unknown

☐ 3. Yearling

☐ Whole Carcass ☐ Partial Carcass

Straight length:_____ ☐ cm ☐ in ☐ actual ☐ estimated

Weight:_____ ☐ kg ☐ lb ☐ actual ☐ estimated

PHOTOS/VIDEOS TAKEN: ☐ YES ☐ NO

Photo/Video Disposition: _____

_____

TAG DATA Tags Were:

Present at Time of Stranding (Pre-existing): ☐ YES ☐ NO

Applied during Stranding Response: ☐ YES ☐ NO

ID#	Color	Type	Placement* (Circle ONE)	Applied	Present
			D DF L LF LR RF RR	☐	☐
			D DF L LF LR RF RR	☐	☐
			D DF L LF LR RF RR	☐	☐

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

CARCASS STATUS (Check one or more)

☐ 1. Left at Site ☐ 4. Towed: Lat_____Long_____ ☐ 7. Landfill

☐ 2. Buried ☐ 5. Sunk: Lat_____Long_____ ☐ 8. Unknown

☐ 3. Rendered ☐ 6. Frozen for Later Examination ☐ 9. Other_____

SPECIMEN DISPOSITION (Check one or more)

☐ 1. Scientific collection ☐ 2. Educational collection

☐ 3. Other:_____

Comments: _____

_____

NECROPSIED ☐ NO ☐ YES ☐ Limited ☐ Complete

☐ Carcass Fresh ☐ Carcass Frozen/Thawed

NECROPSIED BY: _____

Date: Year: _____ **Month:**_____ **Day:**_____

NOAA Form 89-864 (rev. 2007) OMB No.0648-0178; Expires 10/31/2010

PLEASE USE THE BACK SIDE OF THIS FORM FOR ADDITIONAL REMARKS

Appendix 1-B: NOAA's Level A Data Form (Back)

ADDITIONAL REMARKS

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

DISCLAIMER

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

DATA ACCESS FOR LEVEL A DATA

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

PAPERWORK REDUCTION ACT INFORMATION

PUBLIC REPORTING BURDEN FOR THE COLLECTION OF INFORMATION IS ESTIMATED TO AVERAGE 30 MINUTES PER RESPONSE, INCLUDING THE TIME FOR REVIEWING INSTRUCTIONS, SEARCHING EXISTING DATA SOURCES, GATHERING AND MAINTAINING THE DATA NEEDED, AND COMPLETING AND REVIEWING THE COLLECTION OF INFORMATION. SEND COMMENTS REGARDING THIS BURDEN ESTIMATE OR ANY OTHER ASPECT OF THE COLLECTION INFORMATION, INCLUDING SUGGESTIONS FOR REDUCING THE BURDEN TO: CHIEF, MARINE MAMMAL AND SEA TURTLE CONSERVATION DIVISION, OFFICE OF PROTECTED RESOURCES, NOAA FISHERIES, 1315 EAST-WEST HIGHWAY, SILVER SPRING, MARYLAND 20910. NOTWITHSTANDING ANY OTHER PROVISION OF THE LAW, NO PERSON IS REQUIRED TO RESPOND, NOR SHALL ANY PERSON BE SUBJECTED TO A PENALTY FOR FAILURE TO COMPLY WITH, A COLLECTION OF INFORMATION SUBJECT TO THE REQUIREMENTS OF THE PAPERWORK REDUCTION ACT, UNLESS THE COLLECTION OF INFORMATION DISPLAYS A CURRENTLY VALID OFFICE OF MANAGEMENT AND BUDGET (OMB) CONTROL NUMBER.

NOAA Form 89-864 (rev. 2007) OMB No. 0648-0178; Expires 10/31/2010

Appendix 1-C: NOAA's Chain of Custody Form (Front)

CHAIN OF CUSTODY RECORD

Case Number:

DATE AND TIME OF COLLECTION:	AGENCY/FACILITY AFFILIATION:	SEIZED/COLLECTED BY:

SOURCE OF EVIDENCE/PROPERTY (person and/or location) TAKEN FROM: RECEIVED FROM: FOUND AT:	DEFENDANT/COMPANY NAME AND REMARKS:

ITEM NO:	DESCRIPTION OF EVIDENCE/PROPERTY/SAMPLE (include seizure tag numbers, field/stranding identification numbers, facility identification name/number, and species)

ITEM NO:	FROM: (PRINT NAME, AFFILIATION)	RELEASE SIGNATURE	RELEASE DATE:	DELIVERED VIA: FEDEX U.S. MAIL IN PERSON OTHER:
	TO:(PRINT NAME, AFFILIATION)	RECEIPT SIGNATURE	RECEIPT DATE:	

ITEM NO:	FROM: (PRINT NAME, AFFILIATION)	RELEASE SIGNATURE	RELEASE DATE:	DELIVERED VIA: FEDEX U.S. MAIL IN PERSON OTHER:
	TO:(PRINT NAME, AFFILIATION)	RECEIPT SIGNATURE	RECEIPT DATE:	

Appendix 1-C: NOAA's Chain of Custody Subsample Form (Front)

SUBSAMPLE CHAIN OF CUSTODY RECORD				Reference Number of original evidence:
DATE OF SUBSAMPLE:		EVIDENCE/PROPERTY SUBSAMPLED BY:		
ITEM NO:	DESCRIPTION OF SUBSAMPLE (include Subsample reference numbers):			
ITEM NO:	FROM: (PRINT NAME, AGENCY)	RELEASE SIGNATURE:	RELEASE DATE:	DELIVERED VIA: U.S. MAIL IN PERSON OTHER:
	TO: (PRINT NAME, AGENCY)	RECEIPT SIGNATURE	RECEIPT DATE:	
ITEM NO:	FROM: (PRINT NAME, AGENCY)	RELEASE SIGNATURE:	RELEASE DATE:	DELIVERED VIA: U.S. MAIL IN PERSON OTHER:
	TO: (PRINT NAME, AGENCY)	RECEIPT SIGNATURE:	RECEIPT DATE:	

Appendix 1-C: NOAA's Chain of Custody Form (Back)

ITEM NO:	FROM: (PRINT NAME, AFFILIATION)	RELEASE SIGNATURE	RELEASE DATE:	DELIVERED VIA: FEDEX U.S. MAIL IN PERSON OTHER:
	TO:(PRINT NAME, AFFILIATION)	RECEIPT SIGNATURE	RECEIPT DATE:	
ITEM NO:	FROM: (PRINT NAME, AFFILIATION)	RELEASE SIGNATURE	RELEASE DATE:	DELIVERED VIA: FEDEX U.S. MAIL IN PERSON OTHER:
	TO:(PRINT NAME, AFFILIATION)	RECEIPT SIGNATURE	RECEIPT DATE:	
ITEM NO:	FROM: (PRINT NAME, AFFILIATION)	RELEASE SIGNATURE	RELEASE DATE:	DELIVERED VIA: FEDEX U.S. MAIL IN PERSON OTHER:
	TO:(PRINT NAME, AFFILIATION)	RECEIPT SIGNATURE	RECEIPT DATE:	
ITEM NO:	FROM: (PRINT NAME, AFFILIATION)	RELEASE SIGNATURE	RELEASE DATE:	DELIVERED VIA: FEDEX U.S. MAIL IN PERSON OTHER:
	TO:(PRINT NAME, AFFILIATION)	RECEIPT SIGNATURE	RECEIPT DATE:	
ITEM NO:	FROM: (PRINT NAME, AFFILIATION)	RELEASE SIGNATURE	RELEASE DATE:	DELIVERED VIA: FEDEX U.S. MAIL IN PERSON OTHER:
	TO:(PRINT NAME, AFFILIATION)	RECEIPT SIGNATURE	RECEIPT DATE:	
ITEM NO:	FROM: (PRINT NAME, AFFILIATION)	RELEASE SIGNATURE	RELEASE DATE:	DELIVERED VIA: FEDEX U.S. MAIL IN PERSON OTHER:
	TO:(PRINT NAME, AFFILIATION)	RECEIPT SIGNATURE	RECEIPT DATE:	
ITEM NO:	FROM: (PRINT NAME, AFFILIATION)	RELEASE SIGNATURE	RELEASE DATE:	DELIVERED VIA: FEDEX U.S. MAIL IN PERSON OTHER:
	TO:(PRINT NAME, AFFILIATION)	RECEIPT SIGNATURE	RECEIPT DATE:	
ITEM NO:	FROM: (PRINT NAME, AFFILIATION)	RELEASE SIGNATURE	RELEASE DATE:	DELIVERED VIA: FEDEX U.S. MAIL IN PERSON OTHER:
	TO:(PRINT NAME, AFFILIATION)	RECEIPT SIGNATURE	RECEIPT DATE:	

Appendix 1-C: NOAA's Chain of Custody Form (Directions)

Stranding Response: Guidelines for Chain of Custody and Evidence Handling (Draft 3.11.2011)

Introduction

Stranding responders may be asked to incorporate chain of custody (COC) and special sample and data handling procedures in cases or events that have potential legal implications. These guidelines are intended to provide instructions for common scenarios. Law enforcement from your federal or state agencies can assist with questions and should be consulted whenever necessary. Although the COC and evidence handling may seem daunting at first, the primary objectives are good record keeping and security, with the goal of preserving the integrity and validity of materials. These principles are good practices in stranding investigation regardless of the circumstances. There are two sections in these guidelines: chain of custody and handling of evidence.

I. Chain of custody

Chain of custody is a written record of the origin of evidence and provides a list of people that have had possession of that evidence. The COC record can be used for various purposes, such as to address concerns as to whether items were tampered with or otherwise altered in a manner that is relevant to a given case. Evidentiary items that stranding responders may encounter include: carcasses, biological/diagnostic samples, data sheets and electronic photographic data. Generally, any material collected from a case should be documented under COC. *If you are unsure if an item is considered to be evidence, be conservative and document it*. The best COC record is clearly written and thoroughly documents the history of an evidence item, starting with the collector or initial recipient, and as it passes from person to person, i.e. there are no "breaks" in the chain. Anyone that takes possession of evidence or alters evidence (such as someone who runs an analysis on a sample or performs a necropsy) should appear has having received that evidence on the COC record. The only exception is shipping of samples and couriers (e.g. FedEx delivery personnel), which is covered in a subsequent section. The COC passes from person to person, not facility to facility, e.g. it is not appropriate for one person within a facility to accept custody of an item and another person to release it. *The same person that is the last recipient must be the person who releases the item(s)*.

A COC record format has been developed for stranding response and blank forms are attached to this document. There are both written and electronic fill-in versions of two forms, a **Primary Form** and a **Subsample Form**. The **Primary Form** should be used to document the animal (alive or carcass) and any items collected in the field, such as external samples, fishing gear, field data sheets, and photographs. The **Subsample Form** is used for anything collected from items listed on the primary form, such as clinical samples or necropsy samples. Data sheets can be listed in either form as appropriate depending on when the datasheet is completed. Make sure the number of pages are indicated for each data sheet (see example below). Typically, an animal will have one primary form and one or more subsample forms. You may use the written or electronic forms, although electronic forms are preferred (for legibility purposes). Try to avoid combinations of written and typed entries for the descriptive fields (all except for the release/receipt fields). If you make a mistake, line through the error (single line) add the correction and initial the change. Never scratch out, erase, use white out, or otherwise obscure entries. This rule applies to COC records as well as any other documents, e.g. stranding forms, and is good scientific practice. Use a pen for all written entries, black or blue ink. *Write clearly and legibly*.

Who starts a Primary COC record? Ideally, it is the person who is the initial stranding responder. Subsample forms are started by a hospital manager, veterinarian, or person leading necropsy, i.e. someone primarily responsible for collecting samples/data. If an animal is collected by a member of the public or someone unfamiliar with COC, the person who receives the animal may initiate the COC and enter the relevant information in the "received from" field. **Only one person initiates the COC record.** The following are example forms to illustrate how to fill out a COC record. The first example is the Primary Form for a dead, stranded bottlenose dolphin.

CHAIN OF CUSTODY RECORD

Case Number:

DATE AND TIME OF COLLECTION:	AGENCY/FACILITY AFFILIATION:	SEIZED/COLLECTED BY:
12/12/2010, 1430	NOAA Fisheries, SE Fisheries Science Center	James Smith

SOURCE OF EVIDENCE/PROPERTY (person and/or location)

TAKEN FROM:

RECEIVED FROM:

FOUND AT: Grand Isle, Louisiana
29 degrees 14.437'N / 89 degrees 58.806'W

DEFENDANT/COMPANY NAME AND REMARKS:
BP Deepwater Horizon Spill Incident (MC252)

ITEM NO:	DESCRIPTION OF EVIDENCE/PROPERTY/SAMPLE (include seizure tag numbers, field/stranding identification numbers, facility identification name/number, and species)
1	JXM2010121201, Tursiops truncatus carcass
2	External swab collected from dorsum of carcass
3	External swab collected from ventrum of carcass
4	Field photographs (DVD) copy 1 of 2
5	Field photographs (DVD) copy 2 of 2
6	**Original data sheet (Level A Data – 2 pages)**

ITEM NO:	FROM: (PRINT NAME, AFFILIATION)	RELEASE SIGNATURE	RELEASE DATE:	DELIVERED VIA:
1-5	James Smith, NOAA Fisheries	*James Smith*	12/12/2010	FEDEX U.S. MAIL (IN PERSON) OTHER:
	TO:(PRINT NAME, AFFILIATION)	RECEIPT SIGNATURE	RECEIPT DATE:	
	Allison Doe, Ocean World	*Allison Doe*	12/12/2010	
ITEM NO:	FROM: (PRINT NAME, AFFILIATION)	RELEASE SIGNATURE	RELEASE DATE:	DELIVERED VIA:
				FEDEX U.S. MAIL IN PERSON OTHER:
	TO:(PRINT NAME, AFFILIATION)	RECEIPT SIGNATURE	RECEIPT DATE:	

Case number: This number is assigned by law enforcement, it is left blank unless otherwise instructed.
Date and time of collection: Enter the complete date and time (use military format or indicate am/pm)
Agency/affiliation: Affiliation of the person initiating the form.
Seized/Collected by: Person initiating the form. Do NOT enter multiple people.
Source of evidence/property: Includes any information relevant to the source of evidence. "Taken from" generally is left blank as it applies to a law enforcement action. "Received from" is filled out if some else was the primary source of the item, for example if a member of the public brought in an animal or item. "Found at" includes the physical location and coordinates of the stranding.
Defendant/Company name: For the Northern Gulf = "BP Deepwater Horizon Spill Incident (MC252)"
Item number: All items are given sequential individual numbers. If possible, avoid assigning items a single number.
Description of evidence: Include the stranding identification number, any other identifier applied, and species.

The shaded fields document any transfer of items and who released or received them. **IMPORTANT: The first person to release any items should be the same person as listed in the "Seized/collected by" field at the top of the form.** The numbers of items transferred are entered in the left column. In this simple example, all items were given from the initial responder, James Smith, to Allison Doe. The parties sign the form and the delivery method (in person) is circled.

The next action that may happen is submission of a sample for analysis. In the example above, the primary stranding responder, James Smith, has transferred everything to Allison Doe at a facility where necropsy is to be performed. Among the items were two external swabs that were collected to determine the identity of an unknown substance on the carcass. Allison needs to ship these samples to a laboratory. **The original primary COC record should remain with the main evidentiary item, typically the live animal or the carcass.** The COC is copied, and then the items are signed as released on both the original and copied forms. The signed copy is sent with the sample to the laboratory. A notation is then entered on the original COC record. This procedure is done the same for the Subsample Form, as shown in the next section. Here is what the bottom of the forms should look like:

Original (still at the same facility as the animal)

ITEM NO: 1-5	FROM: (PRINT NAME, AFFILIATION) James Smith, NOAA Fisheries	RELEASE SIGNATURE *James Smith*	RELEASE DATE: 12/12/2010	DELIVERED VIA: FEDEX U.S. MAIL ~~IN PERSON~~ OTHER:
	TO:(PRINT NAME, AFFILIATION) Allison Doe, Ocean World	RECEIPT SIGNATURE *Allison Doe*	RECEIPT DATE: 12/12/2010	
ITEM NO: 2,3	FROM: (PRINT NAME, AFFILIATION) Allison Doe, Ocean World	RELEASE SIGNATURE *Allison Doe*	RELEASE DATE: 12/20/2010	DELIVERED VIA: FEDEX U.S. MAIL IN PERSON OTHER:
	TO:(PRINT NAME, AFFILIATION) Shipped to Environmental labs	RECEIPT SIGNATURE	RECEIPT DATE: on 12/20/2010	

Copy signed for release (sent with sample and signed upon receipt)

ITEM NO: 1-5	FROM: (PRINT NAME, AFFILIATION) James Smith, NOAA Fisheries	RELEASE SIGNATURE *James Smith*	RELEASE DATE: 12/12/2010	DELIVERED VIA: FEDEX U.S. MAIL ~~IN PERSON~~ OTHER:
	TO:(PRINT NAME, AFFILIATION) Allison Doe, Ocean World	RECEIPT SIGNATURE *Allison Doe*	RECEIPT DATE: 12/12/2010	
ITEM NO: 2,3	FROM: (PRINT NAME, AFFILIATION) Allison Doe, Ocean World	RELEASE SIGNATURE *Allison Doe*	RELEASE DATE: 12/20/2010	DELIVERED VIA: FEDEX U.S. MAIL IN PERSON OTHER:
	TO:(PRINT NAME, AFFILIATION) Jane Johnson, Environmental Labs	RECEIPT SIGNATURE *Jane Johnson*	RECEIPT DATE: 12/21/2010	

The courier, FedEX in this example, does not sign for custody. Sealing of evidence will be covered in the next section. This is how the COC is split to accommodate sending items to various people/locations. The end result should be that the original COC has notations of where all items are or were sent. The copy sent out with sample now serves as the COC record for that specific sample. If the animal is transferred, then the original primary COC record goes with it and a copy is retained at the facility as the record for any samples remaining in-house. If the animal is released into wild, retained as a long-term captive, or if the carcass disposed of, keep the COC record with the animal's record unless otherwise instructed.

The **Subsample Form** is used whenever material is derived from an item on the Primary Form. Typical examples are clinical samples, e.g. blood, collected from a live animal, necropsy samples, or division of a sample into smaller quantities. Simply put, if you collect anything from a live or dead animal, initiate a Subsample COC. Continuing with the example of the dolphin, here is how the Subsample Form would be filled out when this animal is necropsied. A subsample form is started by the necropsy lead and all items collected at necropsy are entered.

CHAIN OF CUSTODY RECORD
SUBSAMPLE FORM

Case Number:

DATE AND TIME OF COLLECTION: 12/12/2010, 0800	AGENCY/FACILITY AFFILIATION: Ocean World	SEIZED/COLLECTED BY: Allison Doe
SOURCE OF EVIDENCE/PROPERTY: Necropsy samples collected from JXM2010121201, Tursiops truncatus		DEFENDANT/COMPANY NAME AND REMARKS: BP Deepwater Horizon Spill Incident (MC252)

ITEM NO:	DESCRIPTION OF EVIDENCE/PROPERTY/SAMPLE (include seizure tag numbers, field/stranding identification numbers, facility identification name/number, and species)
1.	Formalinized tissues set 1 of 2
2.	Formalinized tissues set 1 of 2
3.	Tissue samples in I-chem (bile, liver, kidney, blubber)
4.	Tissue samples in foil (liver, lung, kidney, heart)
5.	Stomach contents, enteric contents in I-chem
6.	Necropsy photographs (DVD) copy 1 of 2
7.	Necropsy photographs (DVD) copy 2 of 2
8	**Original data sheet (Necropsy form – 5 pages, Sample collection checklist – 1 page)**

ITEM NO:	FROM: (PRINT NAME, AFFILIATION)	RELEASE SIGNATURE	RELEASE DATE:	DELIVERED VIA:
1	Allison Doe, Ocean World	*Allison Doe*	12/13/2010	FEDEX / U.S. MAIL / IN PERSON / OTHER:
	TO:(PRINT NAME, AFFILIATION)	RECEIPT SIGNATURE	RECEIPT DATE:	
	Shipped to University Pathology on 12/13/2010			
ITEM NO:	FROM: (PRINT NAME, AFFILIATION)	RELEASE SIGNATURE	RELEASE DATE:	DELIVERED VIA:
3	Allison Doe, Ocean World	*Allison Doe*	12/15/2010	FEDEX / U.S. MAIL / IN PERSON / OTHER:
	TO:(PRINT NAME, AFFILIATION)	RECEIPT SIGNATURE	RECEIPT DATE:	
	Shipped to NIST Hollings Laboratory		12/15/2010	

Date and time of collection: Date and time of necropsy.

Collected by: Necropsy lead: veterinarian, pathologist, or biologist.

Source: Include any specific identifers for the animal and species.

As in the previous example, specific items are signed as released and their disposition is noted on the original COC subsample record (shown here) and a signed released copy (not shown) is sent with the sample(s). Based on this COC record, all items except for items 1 and 3 should still be in Allison Doe's possession. **The original COC subsample record should stay with the necropsy record at the facility unless otherwise instructed.**

A similar approach is used for clinical samples from a live animal. Here is an example if the dolphin above was a live rehabilitation case:

CHAIN OF CUSTODY RECORD
SUBSAMPLE FORM

Case Number:

DATE AND TIME OF COLLECTION: 12/12/2010	AGENCY/FACILITY AFFILIATION: Ocean World	SEIZED/COLLECTED BY: Dr. Eric Smith
SOURCE OF EVIDENCE/PROPERTY: Clinical samples collected from JXM2010121201, Tursiops truncatus, name "Dolphin."		DEFENDANT/COMPANY NAME AND REMARKS:

ITEM NO:	DESCRIPTION OF EVIDENCE/PROPERTY/SAMPLE (include seizure tag numbers, field/stranding identification numbers, facility identification name/number, and species)
1.	Serum sample
2.	Serum sample (cryovial)
3.	Blood smear (5x)
4.	Blow hole culture

ITEM NO:	FROM: (PRINT NAME, AFFILIATION)	RELEASE SIGNATURE	RELEASE DATE:	DELIVERED VIA:
1, 3 (1 of 5)	Dr. Eric Smith, Ocean World		12/12/2010	(FEDEX) U.S. MAIL IN PERSON OTHER:
	TO:(PRINT NAME, AFFILIATION)	RECEIPT SIGNATURE	RECEIPT DATE:	
	SHIPPED TO USA PATHOLOGY SERVICES			
ITEM NO:	FROM: (PRINT NAME, AFFILIATION)	RELEASE SIGNATURE	RELEASE DATE:	DELIVERED VIA:
4	Dr. Eric Smith, Ocean World		12/12/2010	(FEDEX) U.S. MAIL IN PERSON OTHER:
	TO:(PRINT NAME, AFFILIATION)	RECEIPT SIGNATURE	RECEIPT DATE:	
	SHIPPED TO USGS WILDLIFE HEALTH CENTER			

A subsample form can be used for individual samples, or multiple samples on a given day. **If the form includes a single sample that is to be sent out, then the original subsample form should be sent with the sample as no items on that form would be left in possession of the collector (a copy should be**

retained in the animal's record). Another possible exception is shown here. It is standard that some types of samples, such as blood smears or cytology slides, are collected in many replicates. It is acceptable to list the number of replicates and how many are released. In this example, serum and one blood smear are sent for clinical pathology, and one serum sample and four blood smear slides are retained at the facility. A live clinical case likely will have many subsample forms for its duration in rehabilitation.

In summary, here are the steps for COC and shipping items:

1. Copy the original COC record (Primary Form or Subsample Form) that has the item on it.
2. Sign a release of the sample on BOTH the copy AND the original.
3. Note where the item was shipped on the original form and keep the original.
4. Send the signed copy with the shipped sample(s).
5. The person receiving the sample signs the copy and keeps the COC as a the record for that sample(s).

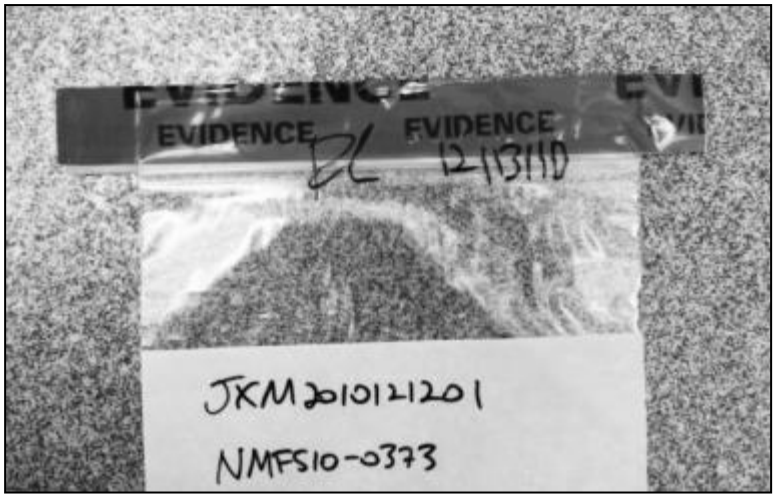
Helpful practices for COC records within facilities/organizations:

1. Have the fewest people possible serve as evidence custodians, and make sure that these individuals are familiar with the guidelines. Evidence can be signed over to one or two designated custodians within an organization, which facilitates transfer of custody.
2. Keep track of anyone who leaves your organization that is listed as a holder of evidence, especially if it will be difficult to reach them. Be sure that they sign over custody to another staff member before they leave. This measure is especially important when temporary personnel are brought in.
3. Do not create gaps in the COC record. **If you are not the last person to have custody of a sample, then you cannot release it.** Chain of custody is from individual to individual, not from organization to organization.
4. Be aware that anyone that assumes custody of evidentiary material is subject to be called upon for legal purposes, such as to verify custody and handling of a sample. This responsibility should not be taken lightly.

II. Handling of evidence

Sealing samples/evidence

When evidence is collected, it should be preserved in a way that ensures integrity during storage and shipment. All items should be clearly labeled/tagged with identifiers, contents, date of collection, and evidentiary item number. The collector that is the primary evidence holder, i.e. the person listed in the "seized/collected by" field of the COC should seal the sample using tamperproof tape as soon as possible after collection, and *before it is released to the next person*. Tamperproof tape is initialed and dated in manner that would be visibly disrupted if the item was opened/accessed. Here are some examples:



Plastic bags of all shapes and sizes are commonly used to hold evidentiary items/biological samples. The opening should be completely sealed as shown here, and initialed and dated along the edge. Any tampering would be clearly visible. Clean and dry the surface before applying tape. Take time to seal containers thoroughly, avoiding wrinkles, to reduce accidental loss of the seal.

If a sample is accessed, and the seal broken, it should be resealed and the action noted in laboratory notes. For bags, an unsealed part of the bag should be cut open, and then resealed. In this example, the bag was originally sealed on 12/13/2010 and then accessed and resealed on 3/2/11. The original seal is left intact. Note that the evidentiary item number is included on the container label.

Jars are sealed by wrapping tape around the lid or around the entire jar, as shown. The initials and date overlap an area that would be broken if opened.

Helpful practices for sealing evidence

1. Place small items and items that are difficult to seal, such as blood tubes and slides, in a bag and seal the bag.
2. Clean and dry surfaces thoroughly before applying tape and avoid wrinkles and exposed adhesive surfaces.
3. If sealed items are to be frozen, place them in a second bag before freezing. The second bag will reduce potential damage to the tape and the likelihood of accidental loss of the seal after freezing.
4. Use the red/black rolled evidence tape (shown in the photo examples) for frozen samples. The individual strips of tamperproof tape and other brands tend to come off during freezing.

Photographic evidence

Most photographic evidence is in a digital format. Use designated cameras and photo cards. A placard that includes identifiers, such as stranding number and pathology accession numbers, date, and a scale should appear in the photos. It is a good practice to begin each case with a photo placard labeled "start" and the time, and end the photographic series for a case with a placard labeled "end" and the time. **It is critical that photos remain unaltered and sequential.** While photos may be reviewed on the camera to ensure that necessary parts of the image were captured and are in focus, do not delete any photos on the camera (even if they do not provide useful evidence). The contents of the photocard should be transferred directly to a non-rewritable CD or DVD. The transfer must be direct. Do not transfer photos to a computer hard drive and then to a disk, and do not open the files prior to making copies. Most computers will do this with a card reader and CD/DVD burner. Transfer the complete contents of the disk, do not delete or alter photos for any reason. You can always note the relevant image numbers in the record. Make a minimum of two copies and check to make sure that the photos were successfully written onto the disc. The disks serve as the official photographic evidence. After these official copies have been made and confirmed, it is permissible to copy data onto a hard drive, print images, and format and reuse the electronic photo card.

Security

All items collected as evidence should be stored in a secure, locked area. Freezers containing evidence should be locked. Only keyed locks, not combination locks, should be used. It is best if three or fewer people are designated key holders and primary evidence custodians for a given facility.

Appendix 1-D: Oiled Marine Mammal Data Log – Live Animals (Front)

Oiled Marine Mammal Data Log: LIVE Animals

Oil Spill Name:					Facility:							
Intake Log Number (L-xxxx)	Date Collected (m/d/y)	Time Collected (24 hr)	Collector Name	Collection Location (Beach Name)	GPS Coordinates (N)	GPS Coordinates (W)	Level A/ Field #	Date Arrived (m/d/y)	Time Arrived (24 hr)	Species		

Front Side of Page _____ of _____

Last updated 1 June 2013

Appendix 1-D: Oiled Marine Mammal Data Log – Live Animals (Back)

Oiled Marine Mammal Data Log: LIVE Animal (continued from front side)

Oil Spill Name:					Facility:									
Intake Log Number (L-xxxx)	Date Processed (m/d/y)	Time Processed (24 hr)	Processor Name	Species	Level A Field #	Tag Color/#	% Oiled	Sample/ Photo Taken? (Y/N)	Disposition Date (m/d/y)	Disposition Status (R,D,E,T)	Release Tag #	Morgue ID

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Last updated 1 June 2013

Appendix 1-E: Oiled Marine Mammal Data Log - Dead Animals (Front)

Oiled Mammal Data Log: DEAD Animals

Oil Spill Name:				Facility:										
Intake Log Number (D-xxxx)	Date Collected (m/d/y)	Time Collected (24 hr)	Collector Name	Collection Location (Beach Name)	GPS Coordinates (N)	GPS Coordinates (W)	Level A/ Field #	Date Arrived (m/d/y)	Time Arrived (24 hr)	Date Processed (m/d/y)	Time Processed (24 hr)	Processor Name	Species

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Last updated 1 June 2013

Appendix 1-E: Oiled Marine Mammal Data Log - Dead Animals (Back)

Oiled Marine Mammal Data Log- DEAD Animals (continued from front side)

Oil Spill Name: | Facility:

Intake Log Number (D-xxxx)	Condition	Scavenging	Oiling Status	% Oiled	Depth Oiled	Sample/ Photo Taken? (Y/N)	Level A/ Field #	Tag #	Age	Sex	SL (cm)	AG (cm)	Morgue ID	Necropsy (Y/N)	Pathologist Name	Notes (any other observations; contamination by petroleum products such as plastic or another species)

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Last updated 1 June 2013

Appendix 1-F: NOAA's Photograph Log

Oiled Marine Mammal Photograph Log

Oil Spill Name:				Memory Card ID:		
Date (m/d/y)	Time (24 hr)	Log or Level A/ Field #	Photo #	Description	OK? (Y/N)	Photographer Name

Last updated 1 June 2013

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Appendix 1-G: Oiled Marine Mammal Evidence Log

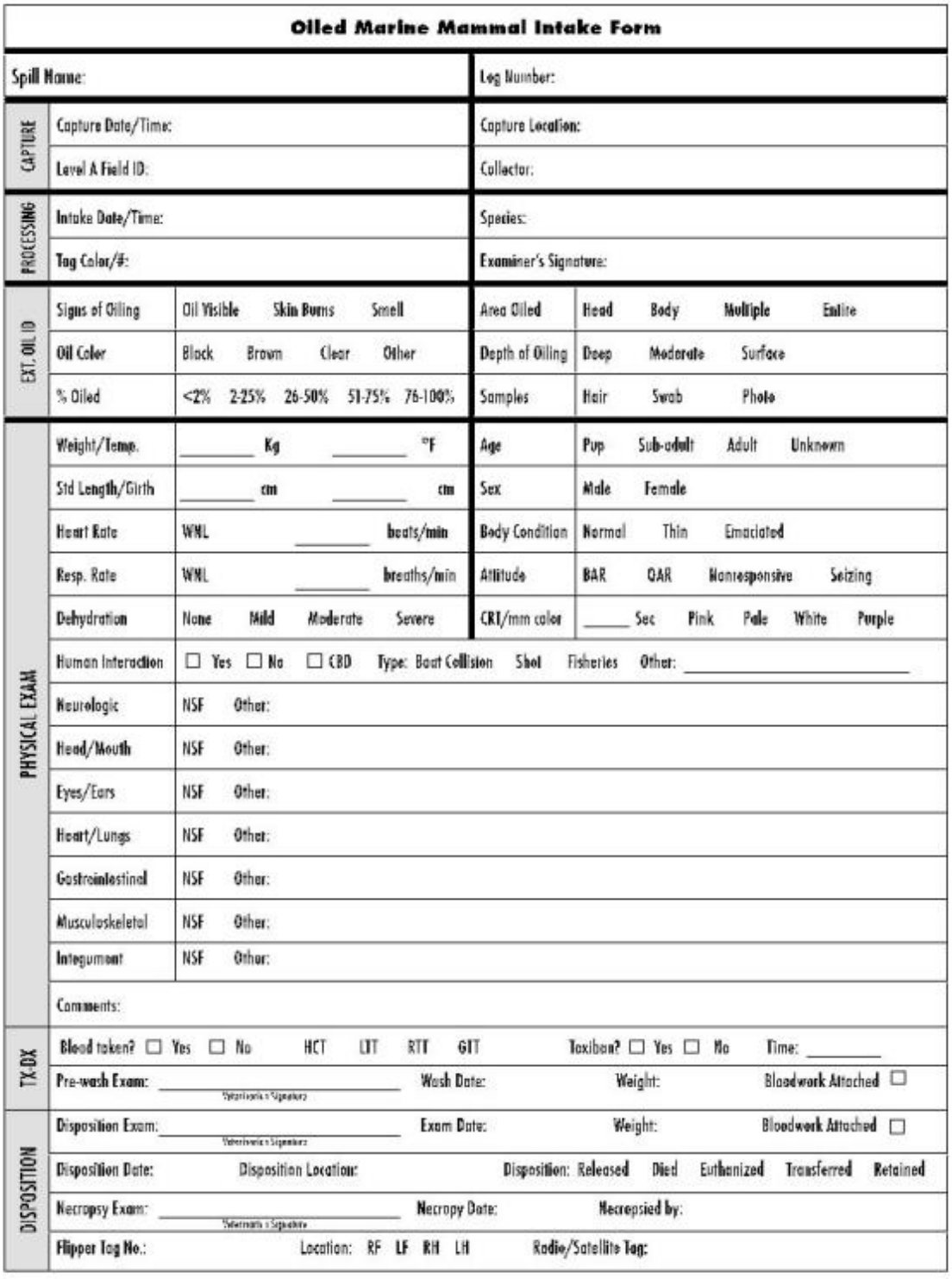
Oiled Marine Mammal Property Room Evidence Log

Oil Spill Name:				Facility:					
Entered		Removed		Seizure Information			Article Description	Disposition (Action)	Entered By (Name)
Date (m/d/y)	Time (24 hr)	Date (m/d/y)	Time (24 hr)	Level A/ Field #	Date (m/d/y)	Seized By (Name)			

Last updated 1 June 2013

Page _____ of _____

Appendix 1-H: Oiled Marine Mammal Intake Form



Oiled Marine Mammal Intake Form

Spill Name:			Log Number:		
CAPTURE	Capture Date/Time:		Capture Location:		
	Level A Field ID:		Collector:		
PROCESSING	Intake Date/Time:		Species:		
	Tag Color/#:		Examiner's Signature:		
EXT. OIL ID	Signs of Oiling	Oil Visible Skin Burns Smell	Area Oiled	Head Body Multiple Entire	
	Oil Color	Black Brown Clear Other	Depth of Oiling	Deep Moderate Surface	
	% Oiled	<2% 2-25% 26-50% 51-75% 76-100%	Samples	Hair Swab Photo	
PHYSICAL EXAM	Weight/Temp.	_____ Kg _____ °F	Age	Pup Sub-adult Adult Unknown	
	Std Length/Girth	_____ cm _____ cm	Sex	Male Female	
	Heart Rate	WNL _____ beats/min	Body Condition	Normal Thin Emaciated	
	Resp. Rate	WNL _____ breaths/min	Attitude	BAR QAR Nonresponsive Seizing	
	Dehydration	None Mild Moderate Severe	CRT/mm color	_____ Sec Pink Pale White Purple	
	Human Interaction	☐ Yes ☐ No ☐ CBD Type: Boat Collision Shot Fisheries Other: _____			
	Neurologic	NSF Other:			
	Head/Mouth	NSF Other:			
	Eyes/Ears	NSF Other:			
	Heart/Lungs	NSF Other:			
	Gastrointestinal	NSF Other:			
	Musculoskeletal	NSF Other:			
	Integument	NSF Other:			
	Comments:				
TX-DX	Blood taken? ☐ Yes ☐ No HCT LIT RTT GIT		Toxiban? ☐ Yes ☐ No	Time: _____	
	Pre-wash Exam: _____ Veterinarian's Signature		Wash Date:	Weight:	Bloodwork Attached ☐
DISPOSITION	Disposition Exam: _____ Veterinarian's Signature		Exam Date:	Weight:	Bloodwork Attached ☐
	Disposition Date:	Disposition Location:	Disposition: Released Died Euthanized Transferred Retained		
	Necropsy Exam: _____ Veterinarian's Signature		Necropsy Date:	Necropsied by:	
	Flipper Tag No.:	Location: RF LF RH LH	Radio/Satellite Tag:		

TAG #: _____ SPECIES: _____

Appendix 1-I: Oiled Marine Mammal Progress Form

Oiled Marine Mammal Daily Progress Form

Spill Name _____ Log # _____ Tag Color/# _____ Species _____

Date	Treatment and Progress Notes	Init.

Appendix 1-J: Oiled Marine Mammal Necropsy Form (EXAMPLE) – Can be used if processing facility doesn't have pre-existing form or system for necropsies

Oiled Marine Mammal
Gross Necropsy Report

Spill Name:				Form completed by:	Date:
Animal Log #				Enforcement Officer:	
Tag #				Strand/Capture location:	
Species:				Collecters Name:	
Sex:		Age:		Intake date:	Euthanasia
Weight:		kg. (estimate/actual)		Death date: Time:	☐ yes
SCH: emaciated 1 2 3 4 5 6 7 obese				Post mortem date: Time:	☐ no
Measurements: DFG cm		Blubber mm		Carcass Classification: Frozen: ☐ yes ☐ no	
SL cm	AG cm	UG cm	XG cm	2- fresh, 3-moderate decomp, 4-advanced decomp, 5- mummified	
				Photographs: ☐	
				Radiographs: ☐	

Clinical signs/diagnosis	
Antibiotics given	
Pertinent lab results	

GROSS NECROPSY ABNORMALITIES:

HYDROCARBON ANALYSIS SAMPLES			MICROBIOLOGY	SWABS: other
bile	kidney	blubber/fat	Lung ☐	
blood	muscle	other	Liver ☐	
urine	lung		other ☐	
liver	intestine			

HISTOLOGY SAMPLES

lung	thyroid	ileum	kidney	mammary gland	muscle	LYMPH NODES:	
trachea	tonsil	colon	ureter	adrenal	gonad	colonic	gastric
heart	tongue	pancreas	urinary bladder	skin	prostate	sublumbar	hepatic
aorta	esophagus	spleen	urethra	eye (L/R)	uterus	inguinal	mediastinal
pulmonary artery	stomach	liver	blubber	fat--site:	vagina	axillary	submandibular
thymus	duodenum	gall bladder	bone marrow		cervix	mesenteric	tracheobronchial
salivary gland	jejunum	brain	spinal cord	whole repro	penis	precapular	
other:							

Cause of death (preliminary diagnosis):

Examiner: Examiner's signature: Date:

Appendix 2: Oiled Marine Mammal Photography Protocol

Supplies

- ✓ Digital camera with dedicated memory card
- ✓ Dry erase board (or piece of paper)
- ✓ Dry erase marker (or Sharpie)
- ✓ NOAA Photograph Log

Procedure

1. List identifying information on dry erase board/paper
   a. Spill name
   b. Date/time of photograph
   c. Intake log number (or Level A/Field ID # if field processed)
   d. Other animal identification number if available (such as Field ID #/tag #/color)
   e. Species
   f. Name of facility (or beach name if field processed) where photo is taken
2. Take photo of the animal's entire body showing the best view of the oiled area(s)
   a. If the animal is too large to photograph in a single image, take a photo that clearly illustrates the area oiled and an identifying tag or other device
   b. Once a picture has been taken it must remain on the memory card and cannot be modified in any way (this includes downloading images from the card to a computer). **No photograph should be deleted from the memory card.**
3. Record the photo on the NOAA Photograph Log
   a. Include all photos taken on the Log, including mistakes and/or bad photos
4. Indicate photograph taken on Oiled Marine Mammal Data Log and Intake Form
5. Secure the camera and memory card in a locked evidence cabinet
   a. When the memory card is full, use a stand-alone DVD recorder (not a computer) to create a backup copy.
   b. Once a backup copy is created, place the memory card and DVD in an envelope labeled with the spill name and the range of log numbers for the animals imaged on the card
   c. Place new memory card into camera for additional use

Appendix 3: Oiled Marine Mammal Oil Sampling Protocol

Supplies

- ✓ Sampling instrument
  - o *Visibly Oiled* = Wooden spatula (e.g., individually paper-wrapped tongue depressor)
  - o *Not Visibly Oiled* = 4" x 4" fiberglass cloth or cotton cloth gauze, mosquito forceps, isopropyl alcohol
- ✓ Solvent-rinsed glass jar with a Teflon-lined lid (e.g, I-Chem 300 Series jars)
- ✓ Aluminum foil
- ✓ Waterproof labels (e.g., Avery 5522 weatherproof white labels)
- ✓ Evidence tape
- ✓ Permanent Sharpie marker
- ✓ Zip-lock baggies

Procedure

1. Take sample from fur/skin
   a. *Visibly Oiled* = Scrape visible oil from fur/skin with wooden spatula (tongue depressor)
   b. *Not Visibly Oiled* = Rub most likely affected area (e.g., skin, mouth, blowhole) with a 4x4 fiberglass or cotton cloth (or gauze) with sterile forceps or hemostats that have been cleaned with isopropyl alcohol.
2. Place sample in I-Chem jar and close lid
   a. *Visibly Oiled* = Break off spatula and discard un-oiled portion (avoid touching /contaminating oil sample with nitrile gloves)
   b. *Not Visibly Oiled* = Drop cloth into jar
   c. **NOTE:** If jar is not available, wrap sample/spatula in aluminum foil (dull side to sample)
3. List identifying information on waterproof label to place on the glass jar (or foil packet):
   a. Spill name
   b. Date/time of sampling
   c. Intake log number (or Level A/Field ID # if field processed)
   d. Other animal identification number if available (such as Field ID #/tag #/color)
   e. Species
4. Fill out Custody Seal and apply it across the lid of the jar and onto the sides of the glass
   a. If using foil, use the label to seal the folded ends of the packet, then place into Zip-lock bag
5. Lock sample in a -20°C (or colder) freezer
   a. If processed in the field, keep sample refrigerated or on ice until it can be stored
6. Fill out NOAAs Oiled Marine Mammal Freezer Log with sample information
7. Indicate oil sample collected on Oiled Marine Mammal Data Log and Intake Form

All evidence should be securely stored and refrigerated/frozen until the Wildlife Branch Director provides further instructions. If samples are to be sent for analysis, a Chain of Custody Form is required.

Appendix 4: Oiled Marine Mammal Tissue Sampling Protocol

Supplies

- ✓ Solvent-rinsed glass containers with Teflon-lined lids for tissues
- ✓ Solvent-rinsed Teflon sheets for tissues
- ✓ Aluminum foil (if Teflon sheets are not available)
- ✓ Sterile syringes and needles
- ✓ Amber glass vials or glass vials covered with foil with Teflon lids (for bile, urine)
- ✓ Teflon screw top vials (for blood storage and urine)
- ✓ Stainless steel scalpels, knifes, forceps
- ✓ Isopropyl alcohol (99.9% pesticide free IPA) to rinse instrument
- ✓ Wooden tongue depressors (can be used to handle tissues if necessary)
- ✓ Whirl-pak bags or Zip-lock freezer bags
- ✓ Permanent marker or pen (Industrial Sharpie)
- ✓ Evidence/Custody tape and labels

All instruments used in handling (e.g., scalpels, forceps, cutting boards) or storing (e.g., jars, foil) samples must be made of a non-contaminating material (stainless steel, glass, Teflon, or aluminum)

Comments on Tissue Collection for PAH Analysis

- Tissues to collect (in decreasing order of preference): Bile; urine; whole blood; stomach and intestinal contents; blubber/fat; liver; kidney; lung; intestine; brain; muscle
- Samples taken for analysis should only be collected from **alive** or **freshly dead animals**
  - If a necropsy cannot be performed within 24 hours, carcass should be frozen
- Recommended **minimum sample size** is **10-20 g of tissues** (approx. 1-2 tablespoons) and **5 ml for fluids** (blood, urine, bile, feces, stomach contents)
  - However, collect whatever amount is present
- Fluids such as blood, urine, and bile should be collected using sterile syringes or pipettes and transferred to Teflon vials (blood) or amber glass vials (bile, urine)
- Use powder-free nitrile gloves (vinyl gloves are an acceptable alternative)
- Cutting tools should be cleaned and rinsed with isopropyl alcohol between tissues
  - If heavily oiled, instruments can be cleaned with detergent (e.g., Dawn), rinsed with water, and then rinsed with alcohol.
- Samples are stored preferably in solvent-rinsed Teflon-lined glass jars, labeled, and secured with evidence tape/custody seal.
  - If glass jars are not available, samples can be placed in Teflon sheets or aluminum foil and stored in whirl-paks/freezer bags.
- If samples/tissues have come in contact with a contaminating material (e.g. plastic bag), collect and store a representative example of that material (e.g. plastic bag) using the above methods
- Duplicate hydrocarbon and histology samples whenever possible.
- Each sample/vial must be labeled with spill name, sampling date/time, log number (or Level A/Field ID # if field processed), other animal ID if available (e.g., Field ID #/tag #/color) and species
  - List identifying information on waterproof label to place on the glass jar (or sheet)
- Samples should be chilled immediately on ice then frozen ASAP in -20ºC in a locked freezer on return to facility

All evidence should be securely stored and refrigerated/frozen until the Wildlife Branch Director provides further instructions. If samples are transferred to a different location or sent for analysis, a Chain-of-Custody form is required.

Appendix 5: Oiled Marine Mammal Analytical Laboratories

Alpha Woods Hole Laboratories Peter Kane 375 Paramount Drive Raynham, MA 02767 (508) 822-9300	**TDI-Brooks International** Thomas McDonald 1902 Pinon College Station, TX 77845 (979) 693-3446, (979) 220-3821
Mote Marine Laboratory Dana Wetzel 1600 Ken Thompson Parkway Sarasota, FL 34236 (941) 388-4441, ext. 335	**Geochemical & Environmental Research Group (GERG)** Terry Wade Texas A&M University 833 Graham Road College Station, TX 77845 (979) 862-2323, ext. 134

The laboratory should be able to perform analysis of the 16 traditionally-studied, parent PAHs listed as priority pollutants by the Environmental Protection Agency (EPA) in addition to the 44 alkylated and heterocyclic PAHs and metabolites. Additional laboratories, including those managed by NOAA, may be selected during oil spill response.

Unified Command and trustee agencies will make final decision on laboratory use.

Appendix 6: Example Oiled Wildlife Best Management Practices (BMPs) – from Deepwater Horizon/MC-252 oil spill

Section 7 Federal Agency Action – Endangered Species Act

204s – Applicable BMPs to Fish, Wildlife, Habitat, Historical, and Cultural Resources

BMP – 1 Watch for and avoid collisions with wildlife and report all distressed or dead birds/marine mammals/turtle sightings/whale sharks/rays to Wildlife (866-557-1401)

BMP – 2 Retrieve injured/dead/oiled sea turtles using the sea turtle At-Sea Retrieval Protocol

BMP – 3 Avoid disturbing vegetation, marsh soils, or peat with foot traffic/boats/equipment or consult a qualified biologist to minimize impact

BMP – 4 Manage waste in compliance with the Waste Management Plan

BMP – 5 Maintain compliance with the Decontamination Plan where applicable

BMP – 6 All onshore work should be conducted during daylight hours except within 24 hours of projected oil landfall. If nights operations are necessary, confine operations to landward of the intertidal zone and follow ENV0009: *Minimizing Impacts to Wildlife during Nighttime Cleanup Operations*

BMP – 7 Observe a 10 foot buffer from marked sea turtle nests. If a nest area is contaminated/oiled, contact the onsite Wildlife Observer immediately. Follow the Wildlife Observer's direction for removing contaminated/oiled sand from within the nesting area.

BMP – 8 Utilize existing access/egress areas and roadways

BMP – 9 Verify turtle nesting activities with agency experts and begin onshore work after turtle nesting surveys/conservation activities are completed

BMP – 10 Use low-pressure tire vehicles (e.g. ATVs, Gaters) or consult with a qualified biologist to minimize impact

BMP – 11 If feasible and per appropriate guidance, restore beach topography, if altered, to natural beach profile by 2000 hours each day

BMP – 12 Minimize removal of clean sediments

BMP – 13 Avoid hovering or landing of aircraft near posted bird sites

BMP – 14 If skimming, avoid skimming sargassum that is not oiled or is only very lightly oiled

BMP – 15 If a sea turtle or marine mammal is observed trapped or entangled in a boom(s), open the boom carefully until the animal leaves on its own

BMP – 16 Install and monitor under water equipment/booms to prevent fish/wildlife entrapment

BMP – 17 Do not block major egress points in channels, rivers, passes, and bays

BMP – 18 A trained sea turtle observer is required for all operations

BMP – 19 Sea turtle observer on the ignition vessel will monitor 3 areas prior to the burn (the area in front of the trawlers, oil concentrated in the boom, and any oil trailing behind the boom).

BMP – 20 A survey should be conducted in the burn area after the burn is complete and all dead sea turtles should be counted and if possible collected

BMP – 21 Avoid burning unoiled/lightly oiled sargassum

BMP – 22 No flights below 500 feet over wildlife refuges/management areas

BMP – 23 No dispersant application within 2 nautical miles of sighted marine mammals/sea turtles

BMP – 24 Turtle excluder devices (TEDS) should be installed in all trawl nets

BMP – 25 Staging areas and waste collection areas should be examined prior to set up and should be located off beaches, dunes, scrub and other vegetated areas. Contact Env. Unit: 985-859-0552

BMP – 26 All heavy equipment should be as low on the beach as possible and avoid the high tide/wrack line while conducting clean-up activities. Keep heavy equipment away from wrack line unless oiled

BMP – 27 Activities that may require removal of forested and shrub or scrub habitat should be minimized

BMP – 28 If bears are observed during staging activities, contact Env. Unit: 985-859-0552

BMP – 29 Remove all trash or anything that would attract wildlife from work areas daily

BMP – 30 If a sea turtle is spotted, maintain at least 200 feet between the turtle and any beach cleanup activities

BMP – 31 Stakes or flagging should not be removed or destroyed anywhere on the beach or dune

Appendix 7: Northwest Region Euthanasia Protocol

(From Geraci and Lounsbury, 2005)

The Northwest Region recognizes two options for administrating euthanasia (humane killing); chemical euthanasia and ballistics (gunshot). Chemical euthanasia by injection must be administered by a veterinarian or an animal technician under direct or indirect supervision of a veterinarian (WAC 246-935-050). Ballistics must be carried out by accredited state, local, or federal law enforcement personnel and may take a marine mammal in the normal course of their duties as an official or employee, and no permit is required as long as it is accomplished in a humane manner and is for the protection or welfare of the animal or for the protection of the public health and welfare (50 CFR 216.22, Permit No. 932-1489-08). Steller Sea Lion covered under 50 CFR 223.202. Guadalupe Fur Seal covered under 50 CFR 223.201.

Chemical euthanasia or the dispatch of a marine mammal is an option when; it is necessary to end the suffering of an animal in irreversibly poor condition, the action is permitted by all relevant agencies, the procedure can be carried out humanely, no rehabilitation facility is available, the animal persistently strands, the animal is an immediate danger to public safety, a licensed veterinarian is not available for euthanasia, and the release of the animal endangers wild populations or public health. Please contact the Northwest Marine Mammal Stranding Network before dispatching any marine mammal, trained professionals are available for consultation. If possible, please take photos of the animal, this will assist the stranding network on determining species and overall health condition. If you believe an animal is moribund , contact the stranding network so we can assess the animal and determine an appropriate course of action. If there is an emergency situation and a decision needs to be made immediately, please use this protocol to make an educated decision.

If chemical euthanasia is impractical, larger animals (elephant seals and some sea lions and select cetaceans) are best dispatched by firing a high-velocity bullet into the brain. This technique requires skill, training, and legal authorization for the weapon and should not be considered an option on a busy beach. If dispatch is the only option on a busy beach please keep in mind one of the cardinal rules of gun safety: Be sure of your target and what is beyond and around it.

Chemical euthanasia for smaller cetaceans and natural death for large whales may be the most humane and practical option. Specific cases that clearly call for euthanasia or dispatch in cetaceans include; disabling injuries such as a dislocated or broken tailstock, penetrating wounds in the thorax or abdomen, hemorrhage from the mouth, blowhole, genital opening, or anus, blistering or sloughing of a major portion of the skin surface, loss of reflexes, or loss of jaw tone, or protruding penis. Suffocation by obstructing the blowhole is neither effective nor humane.

Dolphins and small whales (to 8 m) can be killed quickly by shooting. Any high-powered rifle with standard bullets can be used for cetaceans less than 2 m. For cetaceans 2-8 m in length, use a firearm with a large bore (.303 or greater) and high muzzle velocity, and 180-grain soft or solid round- nosed bullets. The gun should be fired approximately 1 meter from the animal's head; a firearm discharged directly against the skin may explode. Aiming down and backward through the blowhole to an imaginary point joining the flippers is sometimes recommended; however, if the shot is aimed to far backwards, the bullet must pass through the thickest part of the skull. Another option is to shoot from the side, about halfway between the posterior margin of the eye and a point above the origin of the pectoral flipper, for added assurance, fire three shots in a line through the targeted area. See the figure below to ensure you have the correct target area in mind. Shooting is not advised for euthanizing whales more than about 8 m in length or sperm whales of any size.

Appendix 8: Draft Supply List for Oiled Marine Mammal Response

Supply List for Collection of External Oil Samples		
Quantities reflected are per team to collect 50 samples (w/ 10% added for waste). Teams may be field or facility-based. Field teams need not carry all supplies with them on to the beach.		
Type	**Item**	**Amount**
Data Collection	Digital Camera	1 per team
Data Collection	Memory cards for digital camera	1 per team
Data Collection	Dry erase board	1
Data Collection	Dry erase markers	2
Data Collection	Waterproof copy paper, 8.5" x 11"	2 boxes/ 200 sheets
Data Collection	Clipboards	1
Data Collection	Sharpie marker, fine point	2
Marking	Paint stick	2
Marking	Rototags, Jumbotag, various colors	50
Marking	Rototag, Jumbotag applicator	1
PPE	Powder-free Nitrile gloves to fit team members	1 box (note: for pre-staged kits, 1 box L)
PPE	Tyvek suits to fit team members	2 each person (note: for pre-staged kits, 5 XL)
Sample Collection	Wooden tongue depressors 6in	55
Sample Collection	Sterile cotton gauze individually wrapped squares	55
Sample Collection	Mosquito forceps	1
Sample Collection	Reclosable plastic bags, 5"x8"	55
Sample Collection	Tyvek tags, blank, white, 3" x 4" approx.	55
Sample Collection	Aluminum foil food grade	55 sheets or 1 roll
Sample Collection	Evidence strips 6 1/2" x 1 1/4", 100 strips or 1 roll	1 pack/100 strips or 1 roll

Supply List for Dead Recovery			
Quantities reflected are collect 50 carcasses. The Staging Area/Kit reflects 3 teams simultaneously deployed, with the "w/Team" amounts being what would be carried into the field. Assumes supplies can be refilled as used – this is the immediate needs kit for the first few days. Some items may need to be modified for the geographic region/species that are possible to be encountered.			
Type	**Item**	**Amount w/Team**	**Amount at Staging Area/Kit**
All	100 piece multi-color cable ties	1 bag/100	3 bags/100
All	1/2" braided rope	100 ft	500 ft
Animal Recovery	Heavy duty Polyethylene tarps, 16' x 20'	2	6 ea
Animal Recovery	Heavy duty Polyethylene tarps, 20' x 30'	1	3 ea
Animal Recovery	Heavy duty Polyethylene tarps, 12' x 16'		3 ea
Animal Recovery	Cotton sheets	2-3	50 ea
Animal Recovery	Heavy duty body bags, 36" x 96" long, w/straps, weight 800 lbs	1	1 case (10 bags)
Animal Recovery	Heavy duty body bags, 48" x 100" long, w/straps, weight 450 lbs	1	1 case (6 bags)
Data Collection	Digital Camera	1	5 (1 per team +2 extra)
Data Collection	Memory cards for digital camera	1	6 (1 per team +3 extra)
Data Collection	Waterproof copy paper 8.5" x 11", 200 sheets	as appropriate	2 boxes/ 200 sheets
Data Collection	Clipboards	1	3 ea
Data Collection	Sharpie marker, fine point	3	5 boxes/12
Data Collection	Open-reel measuring tape 100'/30 M	1	3 ea
Marking	Paint stick	2	1 box/10
PPE	Powder-free Nitrile gloves to fit team members	Equivalent to 1 box	3 boxes ea of M, L, XL
PPE	Tyvek suits to fit team members	2 each person	2 cases/25 of M, L, XL
PPE	Steel toe rubber boots to fit team members	1 each person	

Supply List for Live Recovery

Quantities reflected are per team to collect 5 pinnipeds or 1 cetacean (estimated daily max). The Staging Area/Kit reflects 3 teams simultaneously deployed, with the "w/Team" amounts being what would be carried into the field. Assumes supplies can be refilled as used – this is the immediate needs kit for the first few days. Some items may need to be modified for the geographic region/species that are possible to be encountered.

Type	Item	Amount w/ Team	Amount at Staging Area
All	100 piece multi-color cable ties	2 bags/100	
All	1/2" braided rope	100 ft	
Animal Rescue	Foam sheet, closed cell, 2" thick, 4ft x 10 ft (cetaceans)	1	3 (if cetaceans)
Animal Rescue	XL dog crates (pinnipeds)	5	15 (if pinnipeds)
Animal Rescue	Nets	2	6
Data Collection	Digital Camera	1	5 (1 per team +2 extra)
Data Collection	Memory cards for digital camera	1	6 (1 per team + 3 extra)
Data Collection	Waterproof copy paper 8.5" x 11", 200 sheets	20 sheets	2 boxes/ 200 sheets
Data Collection	Clipboards	1	3
Data Collection	Sharpie marker, fine point	3	5 boxes/12
Marking	Paint stick	2	box/10
PPE	Powder-free Nitrile gloves to fit team memberes	Equivalent to 1 box	3 boxes ea of M, L, XL
PPE	Tyvek suits to fit team members	2 each person	2 cases/25 of M, L, XL
PPE	Steel toe rubber boots to fit team members	1 each person	

Supply list for Rehabilitation Facility

Quantities reflected are per facility to serve as primary care facility - de-oiling, etc. Additional supplies will be needed for rehabilitation that are not included on this list. Species-specific supplies will be needed for each animal. Assumes external oil sample has already been taken. Assumes supplies can be refilled as used – this is the immediate needs kit for the first few days. If personnel are pre-identified or will provide their own PPE supplies (e.g., boots, slickers), those amounts may be modified/reduced.

Type	Item	Amount
Animal Treatment	Kiddie pools- large blue, or appropriate shallow water pools (pinnipeds)	20 ea
Animal Treatment	Large, deep pool (e.g., K-D pool) (pinnipeds or sm cetaceans)	2
Animal Treatment	Toxiban suspension, 240 ml	1 case/12
Animal Treatment	Isotonic oral fluids, 1 l bottles	36
Animal Treatment	Foal stomach tube, 3/8" OD x 7' long	2
Animal Treatment	Non-irritating surgical lubricant 4.5 oz tube	2
Animal Treatment	Dawn soap	1 case
Data Collection	Digital camera	2
Data Collection	Dry erase board	2
Data Collection	Dry erase markers	3
Data Collection	Memory cards for digital camera	5
Data Collection	Waterproof copy paper, 8.5" x 11", 200 sheets	2 boxes/ 200 sheets
Data Collection	Clipboards	3 ea
Data Collection	Sharpie marker, fine point	3 boxes/12
Facility	Trash bags, 6 mil, 55 gal, BLACK for unoiled solid waste	2 boxes/50
Facility	Trash bags, 6 mil, 55 gal, CLEAR for oiled solid waste	2 boxes/50
Facility	5 gallon buckets, w/lid	2 ea
Marking	Paint stick	1 box/10
Marking	Rototags, Jumbotag, various colors	30 tags
Marking	Rototag, Jumbotag applicator	2 ea
PPE	Powder-free Nitrile gloves, small	1 case
PPE	Powder-free Nitrile gloves, medium	1 case
PPE	Powder-free Nitrile gloves, large	1 case
PPE	Tyvek suits, medium	2 cases/25
PPE	Tyvek suits, Large	2 cases/25
PPE	Tyvek suits, XL	2 cases/25
PPE	Rubber boots- size 5	2 pair
PPE	Rubber boots- size 7	2 pair
PPE	Rubber boots- size 9	2 pair
PPE	Rubber boots- size 11	2 pair
PPE	Rubber boots- size 13	2 pair
PPE	Yellow rain slickers-small	3 ea
PPE	Yellow rain slickers-medium	3 ea
PPE	Yellow rain slickers - large	3 ea

PPE	Yellow rain slickers - X Large	3 ea
PPE	Yellow rain slickers- XX large	3 ea
PPE	N95 particulate respirator mask	1 case (12 boxes of 20)
PPE	Goggles	20 ea
Sample Collection	2 ml freestanding cryule (cryovial) w/cap, sterile, w/ white block	1 case
Sample Collection	RNAlater RNA stabilization reagent	50 ml
Sample Collection	Viral transport media	2 boxes of 50 vials
Sample Collection	Blood tubes, glass, Red/gray tiger serum, 10 ml	1 flat of 100 tubes
Sample Collection	Blood tubes, glass, green sodium heparin, 10 ml	1 flat of 100 tubes
Sample Collection	Blood tubes, glass, lavender whole blood w/EDTA, 5 ml	1 flat of 100 tubes
Sample Collection	Sharps containers, large (2+ gallon)	1 ea
Sample Collection	Sharps containers, small (5 quarts or more)	1 ea
Sample Collection	Sterile syringes, 10ml	50 ea
Sample Collection	Sterile syringes, 20 ml	50 ea
Sample Collection	Sterile syringes, 60 ml	20 ea
Sample Collection	Mechanical pencils	2 boxes/10
Sample Collection	Hypodermic needles 18 G x 1 ½"	1 box/100
Sample Collection	Hypodermic needles 20G x 1 ½"	1 box/100
Sample Collection	Hypodermic needles 22G x 1 ½"	1 box/100
Sample Collection	Hypodermic needles 23G x 1"	1 box/100
Sample Collection	Butterfly catheter infusion sets, 19G x 3/4" needle, luer adapter	1 box/50
Sample Collection	Butterfly catheter infusion sets , 22G x 3/4" needle, luer adapter	1 box/50
Sample Collection	Culture swab plus Amies gel w/o charcoal	1 box/50
Sample Collection	Culture swabs - with sponge	1 box/50
Sample Collection	Sterile swabs	1 box/50
Sample Collection	5 ' folding table	3 ea
Sample Collection	Hemostat forceps	3 ea

Supply List for Necropsy		
Quantities reflected are per team and should be enough for multiple animals; assumes external oil sample has already been taken by oil sample team. Assumes supplies can be refilled as used – this is the immediate needs kit for the first few days. If personnel are known or have own PPE supplies (e.g., boots, slickers), those amounts may be modified/reduced.		
Type	**Item**	**Amount**
All	100 piece multi-color cable ties	2 bags/100
All	1/2" braided rope	100 ft
Animal Recovery	Heavy duty body bags, 36" x 96" long, w/straps, weight 800 lbs	1 case (10 bags)
Animal Recovery	Heavy duty body bags, 48" x 100" long, w/straps, weight 450 lbs	1 case (6 bags)
Data Collection	Digital camera	1 per team
Data Collection	Dry erase board	1 per team
Data Collection	Dry erase markers	3 per team
Data Collection	Memory cards for digital camera	10
Data Collection	Waterproof copy paper, 8.5" x 11"	2 boxes/ 200 sheets
Data Collection	Clipboards	3 ea
Data Collection	Sharpie marker, fine point	5 boxes/12
Facility	Trash bags, 6 mil, 55 gal, RED for animal waste	box/50
Facility	Trash bags, 6 mil, 55 gal, BLACK for unoiled solid waste	2 boxes/50
Facility	Trash bags, 6 mil, 55 gal, CLEAR for oiled solid waste	2 boxes/50
Facility	100 quart ice chest	1 ea
Facility	70 quart ice chest	2 ea
Facility	5 gallon buckets, w/lid	10 ea
PPE	Powder-free Nitrile gloves, small	1 case
PPE	Powder-free Nitrile gloves, medium	1 case
PPE	Powder-free Nitrile gloves, large	1 case
PPE	Tyvek suits, medium	2 cases/25
PPE	Tyvek suits, Large	2 cases/25
PPE	Tyvek suits, XL	2 cases/25
PPE	Rubber boots- size 5	2 pair
PPE	Rubber boots- size 7	2 pair
PPE	Rubber boots- size 9	2 pair
PPE	Rubber boots- size 11	2 pair
PPE	Rubber boots- size 13	2 pair
PPE	Yellow rain slickers-small	3 ea
PPE	Yellow rain slickers-medium	3 ea
PPE	Yellow rain slickers - large	3 ea
PPE	Yellow rain slickers - X Large	3 ea
PPE	Yellow rain slickers- XX large	3 ea
PPE	N95 particulate respirator mask, reg	1 case (12 boxes of 20)

PPE	Goggles	20 ea
Sample Collection	Reclosable white block bags, 5"x8"	case 1000
Sample Collection	Reclosable white block bags, 9" x 12"	case 1000
Sample Collection	Reclosable bag, 13" x 18"	case 500
Sample Collection	Whirlpak write-on clear sampling bags, 4 oz	1 pack/500
Sample Collection	Tyvek tags, blank, white, 3" x 4" approx.	5 packs/100
Sample Collection	Aluminum foil food grade double matte sided, 12" x 1000 ft	1 roll
Sample Collection	Evidence strips 6 1/2" x 1 1/4", 100 strips or 108' tape roll	1 pack/100 or 1 roll
Sample Collection	Evidence box sealing tape, 3" wide	1 roll
Sample Collection	2 ml freestanding cryule (cryovial) w/cap, sterile, w/ white block	1 case
Sample Collection	RNAlater RNA stabilization reagent	50 ml
Sample Collection	Viral transport media	2 boxes of 50 vials
Sample Collection	Biopsy punches	2 boxes/50
Sample Collection	Scalpel blades, size #60	2 boxes/500
Sample Collection	Scalpel handles/dissecting blade handle size #8	1 box/5
Sample Collection	Blood tubes, glass, Red/gray tiger serum, 10 ml	1 flat of 100 tubes
Sample Collection	Blood tubes, glass, green sodium heparin, 10 ml	1 flat of 100 tubes
Sample Collection	Blood tubes, glass, lavender whole blood w/EDTA, 5 ml	1 flat of 100 tubes
Sample Collection	Glass, closed-top jar w/teflon lid, 250 ml solvent rinsed	100 ea
Sample Collection	Teflon screwtop vials with snap-in tabs 15ml	100 ea
Sample Collection	40ml amber borosilicate Closed-cap vials 300series	1 case 72
Sample Collection	Conical vials 15ml	4 flats/50
Sample Collection	Sharps containers, large (2+ gallon)	1 ea
Sample Collection	Sharps containers, small (5 quarts or more)	1 ea
Sample Collection	Plumber's teflon tape	3 rolls
Sample Collection	Sterile syringes, 10ml	50 ea
Sample Collection	Sterile syringes, 20 ml	50 ea
Sample Collection	Sterile syringes, 60 ml	20 ea
Sample Collection	Dichloromethane	2L (x2)
Sample Collection	Sharpie marker, fine point	5 boxes/12
Sample Collection	Sharpie marker, extra fine point	5 boxes/12
Sample Collection	Mechanical pencils	2 boxes/10
Sample Collection	Hypodermic needles 18 G x 1 ½"	1 box/100
Sample Collection	Hypodermic needles 20G x 1 ½"	1 box/100
Sample Collection	Hypodermic needles 22G x 1 ½"	1 box/100
Sample Collection	Hypodermic needles 23G x 1"	1 box/100
Sample Collection	Butterfly catheter infusion sets, 19G x 3/4" needle, luer	1 box/50

	adapter	
Sample Collection	Butterfly catheter infusion sets , 22G x 3/4" needle, luer adapter	1 box/50
Sample Collection	Culture swab plus Amies gel w/o charcoal	1 box/50
Sample Collection	Culture swabs - with sponge	1 box/50
Sample Collection	Sterile swabs	1 box/50
Sample Collection	Knives 9" blade, plastic handle	5 ea
Sample Collection	Knives 12" blade, plastic handle	3 ea
Sample Collection	Electric knife sharpener	1 ea
Sample Collection	Gator I folding saw, 10"	1 ea
Sample Collection	5 ' folding table	3 ea
Sample Collection	Formalin 10% buffered, 5 gal cube	1 ea
Sample Collection	Biohazard tags, 3 1/4" x 6" vinyl, pkg 25	3pk/25
Sample Collection	5 " dissecting forceps	5 ea
Sample Collection	Scissors, 5 1/2" straight	5 ea
Sample Collection	Scissors, poultry shears	3 ea
Sample Collection	6" flexible plastic english/metric ruler	3 ea
Sample Collection	Sani-safe boning hook w/orange handle	3 ea
Sample Collection	Hemostat forceps	3 ea