

A PROCEDURAL REVIEW OF THE MASS
PILOT WHALE STRANDING IN THE FLORIDA
KEYS, 2003

by

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ABSTRACT

On April 18, 2003, twenty-eight short-finned pilot whales stranded in the shallow waters near Content Keys Passage, about five miles north of Big Pine Key in the lower Florida Keys. Of the twenty-eight, 21 animals died at the site, were euthanized or moved back into deeper water and their whereabouts were unknown. Seven whales were moved to a rehabilitation site and after almost four months of care, four female juveniles and one male calf were released about 15 miles offshore in the Atlantic Ocean. The response, rehabilitation and release efforts during mass stranding events are challenging situations that require the cooperation of multiple organizations, including federal agencies, regional stranding networks, local marine mammal societies and volunteers. I examine the legislative and regulatory basis for stranding programs and the organizational structure that they establish, and evaluate conflicts that arose during this particular mass stranding of pilot whales. I use recommendations solicited from various professionals involved in all phases of the event to provide suggestions as to how this process could be improved upon during future events. I provide specific recommendations to address problems in communication among the multiple organizations, the lack of a clear chain of command, improper data collection and disagreements among veterinary staff as to the release of individual whales. Only by learning from previous experience and identifying strengths and weaknesses within current operations will stranding networks provide the care and support needed by animals under their care.

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1. Introduction

On April 18, 2003, twenty-eight short-finned pilot whales beached themselves in the shallow waters near Content Keys Passage, about five miles north of Big Pine Key in the lower Florida Keys (Figures 1 and 2). The whales, in two separate groups, included males and females, as well as calves. The reason for the stranding was not immediately known. Pilot whale pods are very gregarious, and often the entire pod will follow a single ill animal inshore.¹ As part of a mass stranding response, several local groups responded, including rescuers from the Coast Guard, Florida Keys National Marine Sanctuary, Florida Fish and Wildlife Commission, the Marine Mammal Rescue Team, the Marine Mammal Conservancy and volunteers from the surrounding communities.² Of the twenty-eight animals, seven died at the scene, five were euthanized, six were seen swimming in the Gulf of Mexico and three were unaccounted for. Necropsies performed on the dead whales revealed that many of them were emaciated and had empty stomachs, possibly meaning they had been away from their natural habitat for some time. Blood tests from these animals showed that some were suffering from anemia, dehydration, viral infections and possible liver and kidney problems.³

The surviving seven animals were moved to a temporary open water holding pen in the lower Keys. One of these animals died from complications resulting from the stranding and stormy weather conditions made it necessary to move the surviving six whales to a rehabilitation pen in a semi-enclosed boat basin behind the abandoned Mariners Cove Resort in Big Pine Key (Figures 3 and 4).⁴ Unfortunately, another of the rescued whales died shortly after transport to the rehabilitation site, presumably due to bacteriological

pneumonia.⁵ The remaining four female juveniles and one male calf were held at the rehabilitation site under the 24-hour care of hundreds of volunteers. Eventually, after blood tests showed they were healthy enough to return to the ocean, all five whales were fitted with VHF transmitters and four were also fitted with satellite tracking devices (Figure 5). On August 10, 2003, after 117 days of care, they were released approximately fifteen miles offshore on the Atlantic side of Little Palm Island in the Florida Keys (Figure 6). This was the first time that five whales from a single stranding were released simultaneously in the United States.⁶

The term mass stranding generally refers to a simultaneous stranding of two or more cetaceans other than a female and her calf. Only a few species of odontocetes typically mass strand in groups of 15 to 100 or more individuals, with pilot whales being one of these species.⁷ Short-finned pilot whales (*Globicephala macrorhynchus*) are found in all tropical, subtropical and warm temperate oceans where water temperatures range from 8-25° C (Figure 7). They are mainly a pelagic species, although they may enter shallow coastal waters in search of food. Pilot whales are gregarious animals and are rarely found alone. Groups range in size, up to several hundred animals, but more often they are found in pods of 15 to 30 individuals. Pods are composed of both males and females, spanning the entire range of age and reproductive status, and immature animals of both sexes. The cohesiveness of pilot whale schools is demonstrated by the frequency with which they are involved in mass strandings.⁷

The causes of marine mammal strandings, particularly mass strandings, are not clearly understood. When a single marine mammal strands, it may be due to anthropogenic

causes, such as fishing gear entanglement or boat strikes, while many animals strand because of illness or disease. Still others strand because of natural or anthropogenic toxins in the environment.⁸ Some strandings may be caused by disorientation or the confusion of sonar signals in shallow water.⁹ Less is known about the causes of mass strandings. In many cases, the animals show no obvious signs of health problems other than those resulting from being out of the water. Once a cetacean comes ashore, a cascade of physiological changes occurs, often resulting in shock and death. Because the species typically involved are extremely social, the bonds that hold groups together are perhaps strong enough to supercede the survival instincts of individual animals. This “leader” effect will cause the entire group to relentlessly follow one another ashore, even if there is clear access to open water.¹⁰ The behavioral and biological information gained from rescue efforts during mass stranding events are essential to expanding our basic understanding of marine mammals and the causes of strandings.

The response, rehabilitation and release efforts during mass stranding events are challenging situations that require the cooperation of multiple organizations, including federal agencies, regional stranding networks, local marine mammal societies and volunteers. In this paper, I will examine the legislative and regulatory basis for stranding programs through the Marine Mammal Protection Act and the organizational structure that is established in the Marine Mammal Health and Stranding Response Program. Secondly, I will evaluate conflicts that arose during this particular mass stranding of pilot whales, and using recommendations solicited from various professionals involved in all phases of the event, provide suggestions as to how this process could be improved upon during future events. I provide specific recommendations to address problems during

each phase of the event (first response, rehabilitation, release) including communication and coordination among the multiple organizations and along the chain of command, improper data collection and the controversial release of two of the whales. Only by learning from previous experience and identifying strengths and weaknesses within current operations will stranding networks provide the care and support needed by animals under their care.

2. Political Structure

2.1. Marine Mammal Protection Act

It is important to understand the governance structure that controls activities involving marine mammals. Under the Marine Mammal Protection Act, Both the Department of the Interior and the Department of Commerce are given responsibility for marine mammal protection. The Department of the Interior has the responsibility for polar bears, sea otters, walruses and manatees, which is administered by the U.S. Fish and Wildlife Service. Within the Department of Commerce, whales, dolphins, porpoises, seals and sea lions are the responsibility of the NOAA Fisheries Office of Protected Resources. This regulatory authority is of most relevance to stranded cetaceans, and therefore will be examined in more detail. The Marine Mammal Division of the Office of Protected Resources develops and administers policies and regulations that direct the conservation and management of marine mammal populations.¹¹ General guidance is provided by the Marine Mammal Protection Act and the Endangered Species Act. The Marine Mammal Division is involved in many projects, including the development of policies and regulations that will reduce interactions between marine mammals and fishing gear,

providing outreach materials to the public outlining the activities of the Marine Mammal Division and the requirements of the MMPA, directing agency science to focus on current and pressing marine mammal conservation and management issues, and coordinating the Marine Mammal Health and Stranding Response Program.¹¹

2.2. Marine Mammal Health and Stranding Response Program

The Marine Mammal Commission (MMC), created as an independent oversight agency under the MMPA, has served as a driving force in the organization of formal regional stranding networks. In 1977, a workshop coordinated by the MMC recommended the establishment of a National Stranding Alert Network with regional centers. To coordinate data collection and organize the dissemination of information between these centers, the workshop recommended that the NOAA Fisheries (NMFS) maintain a central data repository. This workshop served as the springboard for the formation of a national stranding plan in the U.S.⁷ This plan eventually became the Marine Mammal Health and Stranding Response Program (MMHSRP). The authority to conduct the MMHSRP is provided in the MMPA of 1972, 16 U.S.C. 1361-1407, as amended in Title IV by the Oceans Act of 1992. The primary purpose of this legislation is to protect and preserve marine mammals in order to maintain the health and stability of the marine ecosystem as a whole. The NMFS has the responsibility and authority for enforcing this act, except for those species that are the responsibility of the US Fish and Wildlife Service.¹² The goals of the MMHSRP are to facilitate the collection and dissemination of data on the health and health trends of marine mammals, correlate health with physical, environmental,

chemical and biological parameters and coordinate effective responses to strandings and unusual mortality events.¹²

The MMHSRP is a combination of marine mammal biology, scientific investigations and policy. It involves coordinating stranding response, data collection and dissemination, and investigations and workshops across the country. Research topics include monitoring of wild marine mammal populations, unusual mortality event investigations, the Prescott stranding grant program, the marine mammal stranding network, the large whale disentanglement network and rehabilitation and release guideline development.¹¹ There are five major components of the MMHSRP:

1. Stranding Networks – To respond to marine mammal strandings, volunteer stranding networks were established in all coastal states and are authorized a Letter of Agreement from the NMFS regional offices. NMFS is then responsible to oversee, coordinate and authorize activities relating to stranding events and provide training to personnel. NMFS also has the authority to collect and disseminate information, monitor species numbers, conditions and causes of illness and deaths of stranded marine mammals and collect other life history and other reference level data.¹¹

2. Biomonitoring – Due to the recently found accumulations of potentially toxic substances in marine mammals, researchers have begun to consider the accumulation of these substances in animals as a potential cause of mortality events. The biomonitoring program attempts to assess the health and contaminant levels of marine mammals.¹¹

3. The Analytical Quality Assurance – This aspect of the MMHSRP was designed to ensure accuracy, precision, level of detection and intercomparability of data in the chemical analysis of marine mammal tissue samples.¹¹
4. Response to Unusual Mortality Events – In response to the 1987-88 mass dolphin die-off, NMFS created the Working Group on Unusual Marine Mammal Mortality Events to develop criteria for determining when an unusual mortality event is occurring and help to direct responses to such events.¹¹
5. National Marine Mammal Tissue Bank – This program was established to provide protocols and techniques for the long-term storage of tissues from marine mammals for retrospective contaminant analysis.¹¹

2.2.1 Stranding Networks

As part of the MMHSRP, Stranding Networks were established in each of the U.S.'s coastal regions; Northeast, Southeast, Northwest, Southwest, Alaska and the Pacific Islands. The purpose of stranding networks is to provide an immediate response to marine mammal strandings, humane treatment and medical care for live stranded marine mammals, gather the maximum amount of scientific information from both live and dead animals, and facilitate communication among Stranding Network partners for exchanges of information regarding medical care and rehabilitation of animals.¹² The essential elements of a network include emergency response to strandings with a veterinary component, logistic support and equipment for moving animals, a facility for medical treatment and rehabilitation, and a component of scientists able to collect, analyze and archive specimens and data.⁷

There are several levels of responsibility within the Stranding Network. The first of these is the National Stranding Coordinator, who resides at NMFS headquarters and who has the responsibility to define national stranding policy, standardize network operation and enhance the capabilities of network members. He or she also coordinates stranding network activities and ensures consistency among the regions.¹² Assisting the National Coordinator are Regional Stranding Coordinators in each of the NMFS geographic regions. The Regional Stranding Coordinators facilitate a rapid response to stranding events, contact local, state, and federal authorities when appropriate, provide guidance to responders on scene, assist financially in providing emergency care as needed and make the final decision on the disposition of live animals relying heavily on the expertise and opinion of the on-site coordinator and veterinary assessment. They consult with the National Stranding Coordinator and outside panel of experts when necessary.¹¹ During a stranding event, an On-Site Coordinator is appointed to direct immediate response efforts until the Regional or National Coordinators arrive, or in their absence. The direct response effort during a stranding event is carried out by volunteer organizations that hold a Letter of Agreement issued by NMFS Regional Offices.¹¹

2.2.2. Letter of Agreement

Because the MMPA prohibits the “take” (which includes harassment, hunting, touching, killing or molesting, or attempting any of these activities) of any marine mammal without proper authorization, the stranding network Regional Administrator provides written authorization to network volunteers in the form of a Letter of Agreement (LOA). A LOA is the mechanism by which qualified members of the public may receive authorization to

“take” a stranded marine mammal. LOA holders are volunteer organizations, including non-profit organizations, academic institutions, marine mammal scientists, wildlife rehabilitation experts, museums and veterinarians, among others.¹²

The LOA lays out the roles and responsibilities of the holder and of NMFS during a stranding event and the subsequent rehabilitation and release of the animal.¹³ In a LOA, the NOAA/NMFS region and the letter holder share the responsibility to implement Title IV of the MMPA, investigate the cause and impacts of unusual mortality events, determine if injuries and mortalities are due to human interactions, protect wild marine mammal health, collect reference data on marine mammal health, collect data on the frequency and causes of strandings and interpret findings and identify health trends.¹³

There over 400 LOA holders in the US authorized to respond to marine mammal strandings. Only 40-50 facilities have authorization to rehabilitate live stranded marine mammals under NMFS jurisdiction. To further increase coverage of the area and provide quick response, each LOA organization has qualified "designee" organizations. Designees must demonstrate experience and training in the rescue of stranded marine mammals, and must be qualified to assess and respond to stranding events. Local designees often provide first response to a stranding event, while other LOA organizations and volunteers gather equipment and support.¹⁴

2.2.3 Management Schemes

The diverse expertise and resources required by the MMHSRP make it necessary that several NMFS components as well as external organizations be involved in the conduct of the Program. Most mass strandings bring about a multi-organizational response, creating a system of both vertical and horizontal integration. Response efforts to such events typically include multiple stranding network organizations, general public, marine patrol, local police, coast guard, fire rescue and other state and federal agencies who all work cooperatively under the direction of the on-site coordinator and NMFS.¹² Vertically integrated management involves varying levels of government, from national to state and local governments. Stranding response efforts are usually controlled by local entities (LOAs). These LOAs are under the direction of the regional stranding network's Regional Administrator who reports to the Office of Protected Resources. This creates a type of "bottom-up" management scheme. LOAs must adhere to federal policies (MMPA and MMHSRP), yet are given immediate control over the stranding event. There is also horizontal integration between stakeholders during a stranding event. As a requirement of the MMHSRP, veterinary consent is required when determining the fate of stranded animals, whether they be euthanized at the scene, rehabilitated, released or kept in captivity. LOAs work with veterinary staff to assess the health and stability of the animals to determine what the best course of action would be. Mass strandings often bring together veterinarians from all over the country who specialize in marine mammals. Marine mammal strandings offer prime opportunities for scientific integration as well. Researchers use strandings to acquire information on the species, such as physical

characteristics, stomach contents for prey analysis, and blood work for analysis of health parameters.

In many ways, more important than integration between national agencies is the benefit received through sharing information internationally. Although the MMHSRP is concerned with marine mammals of US coastal waters, many of the species of concern are distributed throughout the world's oceans and many of the populations that occur in the US coastal waters migrate through the waters of several nations. Incidents of unusual mass strandings, die-offs, and occasions of pollutant incidents do not occur only within one national jurisdiction or national boundary, but are a world-wide occurrence. It is, therefore, important that the MMHSRP actively pursue international coordination and cooperation in its various avenues of monitoring and research.

3. Review of the Mass Pilot Whale Stranding

As a result of the hard work and effort of stranding and marine mammal organization personnel as well as numerous volunteers, five of the stranded pilot whales were released on August 10, 2003. As with any mass stranding event, unexpected challenges can arise and most of the rescuers involved in this event had never experienced a stranding of this degree that required the participation of such a large number of staff and volunteers. By recognizing constructive feedback from the multiple organizations involved, it is hoped that preparations can be made to enhance efforts during future events of this magnitude.

3.1 Methods

A public debriefing meeting was held on November 4, 2003, about three months after the release of the whales, to discuss the response, rehabilitation and release efforts. The meeting was open to the public and more than fifty stakeholders involved in all phases of the event participated, including representatives from NOAA Fisheries, Florida Keys National Marine Sanctuary, Florida Department of Environmental Protection, Office of Law Enforcement, Florida Fish and Wildlife Conservation Commission, County government, Marine Mammal Conservancy, Florida Keys Marine Mammal Rescue Team, Marine Animal Rescue Society, Marine Research Consultants, veterinarians, volunteers, media and private citizens.¹⁵ The objectives of the meeting were to: (1) debrief and evaluate the response, rehabilitation and release of the pilot whales, (2) receive input from stakeholders and the public on ways to improve for the future, (3) enhance relationships with partners and stakeholders in the program, (4) address public questions and comments and (5) identify specific actions to improve efforts.¹⁵

After attending this meeting, I solicited suggestions from various professionals involved in all phases of the event to obtain a more detailed explanation on some of the major issues discussed at the debriefing. I developed a questionnaire that focused on three main areas of concern: (1) communication and coordination, (2) veterinary response and care and (3) record keeping and training of volunteers. I also included an “other” section if the subject wanted to add additional comments. A sample questionnaire is included at the end of this document. The exact phrasing and number of questions in the questionnaire were altered, depending on the profession and level of involvement of the

participant. After receiving the completed questionnaires from the participants, I combined their responses with those given from the larger number of stakeholders at the debriefing. Using these, the three phases of the stranding event (first response, rehabilitation and release) are examined and both general recommendations and comments specific to situations during the Keys event are provided.

3.2. First Response

When a stranding occurs in the Florida Keys, the first point of contact for the public is usually the Florida Marine Patrol or other such law enforcement agency (Figure 8). The Marine Patrol then contacts the Southeast region stranding coordinator who contacts the closest stranding network organization to dispatch an LOA holder to the scene. The LOA holder is responsible for assessing the scene and reporting back to the stranding network. An on-site coordinator from the stranding network is appointed and consults with the Southeast regional office and veterinarians to make a determination as to the care of the animals.¹⁶ Unlike the stranding of an individual marine mammal, the first response effort during a mass stranding event often requires the support of multiple organizations, which can create both organizational and personnel conflicts. Some of the challenges during the response included communication, an unclear chain of command and confusion as to how the response effort should proceed when a veterinarian is not immediately available on-site.¹⁵

During the Keys event, an on-site coordinator was appointed and was immediately available at the site. However, the inaccessibility and spatial separation of the two sites

made it necessary to have one person on a boat communicating with land bases and other vessels about off-site activities and a second person coordinating in-water activities regarding the whales and volunteers.¹⁵ This may have been the basis for the confusion as to the exact chain of command. Establishing a clear chain of command immediately is essential to the effectiveness of the response. Upon arrival each participant should be made aware of the levels of authority and protocols should be set up for communication and logistics. With the large number of whales and participants at the scene, it was impossible for the on-site coordinator to be readily available, particularly when moving between the two separate groups. Due to the intensity of mass stranding events, it may be helpful to call for additional coordinators to lead teams responsible for each of the main elements of a response (i.e. veterinary care and support, equipment access, public information and media support, specimen and data collection, and volunteer organization).⁷ Some possible responsibilities of additional coordinators could include:

- A trained stranding coordinator or volunteer could act as a shore-side support supervisor to insure that the right personnel and equipment were getting to the stranding site as they arrived and that all resources were being used effectively and could be responsible for setting up the stabilization site
- A resource coordinator to obtain, rent or borrow the necessary equipment and resources needed during the rescue
- An evaluator or evaluation team, including a veterinarian if available, to triage animals and evaluate and color code them (with a grease pencil or zinc oxide) for transport, rehabilitation and if necessary euthanasia

- A coordinator of volunteers would be able to organize support staff to assist in record keeping and data collection, maintain a check-in/check-out system and help schedule and supervise revolving shifts⁷
- A transport team to prepare equipment, vessels, resources and animals for transport and transporting them to the stabilization site designated by the primary organization assigned to the area in which the stranding occurred
- A necropsy team to help move dead animals out of the stranding area as soon as possible to lessen the stress on both volunteers and the marine mammals they are caring for, as well as getting these animals to a designated area for the purposes of necropsy

Each team leader should manage within their respective team and communicate their activities to the stranding coordinator. A briefing between the on-site coordinator and the team leaders every hour would keep everyone up to date on the activities of the other groups and help to determine subsequent actions. It is also recommended that identifying these key personnel with colored t-shirts, arm bands and/or hats would allow in the quick recognition of authority figures. To aid in the organization of numerous volunteers, an identification card could be given to each participant, coded to indicate the dates and degree of training. Those familiar with the equipment and animal handling can be quickly assigned to teams providing basic care and support. Others may be more qualified for staff support, communications, or administrative duties. Such a system will help to facilitate task assignments on-site.⁷

It is important to use all available resources during large events. Local police are invaluable participants in a stranding response. They have legal authority over all activities on the beach and can maintain order and protect animals by limiting access to the site, erecting barriers if necessary and controlling crowds and vehicles.⁷ A line of communication should be made with enforcement agencies, including contact information, so that immediate help can be attained along with a list of resources police are willing to provide. With this information, a single call from a predetermined group or individual would result in police assistance, relieving some pressure from the first response team. It is important that these groups understand the logistics of a stranding event, which may require training and education by the stranding network or local LOA organizations. Enforcement groups should also understand the chain of command and know who the on-site coordinator is.

During the Keys event, the remoteness and inaccessibility of the two sites made it hard to establish a land based command center. In cases such as this, having the on-site coordinator riding with the highest ranking law enforcement vessel available at the scene could improve communication problems, as everyone would know of their location. If for any reason this vessel would not be able to remain at the event for an extended period of time, it may be better to find another vessel during the early stages of the first response that could stay longer or mark the vessel with a flag or flashing lights that could be transferred as the on-site coordinator moved between boats. Law enforcement groups can also bring increased coordination through state of the art communication systems. Due to size of this stranding, both spatially and the need for large numbers of people, a

lack of VHF radios, satellite phones and poor cellular phone reception also amplified communication problems between the two separated whale groups. Taking advantage of law enforcement's technology and making them a partner in the effort would allow for better communication between sites, vessels and to the shore.

Many questions arose during this event about the role of the veterinarian for triage during a mass stranding and whether or not a veterinarian is needed on-site, as well as the sense that the response may have been delayed due to the late arrival of a veterinarian. In most cases, a local veterinarian with marine mammal training would be available to assist in such an event. The Keys stranding, however, occurred on Easter weekend and the veterinarians who would have normally been able to respond quickly were on holiday. A veterinarian from Miami was called in, but was then delayed due to holiday traffic. It is preferable to have an on-site veterinarian when determining the disposition of animals, although in a situation when this is not possible, LOA responders can assist with making determinations and the rescue must carry on until the veterinarian arrives. Some LOA holders also take it upon themselves to train local veterinarians in basic marine mammal medicine who can then consult with experts off-site in certain situations. These local veterinarians are willing to respond when need, though it may not be immediate, as their local practices come first. Most of the veterinary problems with the Keys stranding were situational, though access to more veterinarians may have been helpful. To aid in this, a list of local or regional "on-call" veterinarians could be developed to ensure that a veterinarian is always available for a quick response.

3.3. Rehabilitation

During the rehabilitation effort, several areas were identified for improvement: better supervision by establishing a clearer chain of command and communication among leaders of the two rehabilitation groups, increased briefings between shifts and providing more training to volunteers and staff on the importance of animal husbandry and record keeping.¹⁵ Rehabilitation serves as an excellent opportunity to enhance the scientific knowledge of marine mammals needed for conservation and management. Health assessments of animals during the rehabilitation process may alert us to some environmental or disease problems as well as provide valuable information on other biological and physiological parameters of a species.

In the vast majority of both single and even mass stranding events, one rehabilitation LOA holder is involved. At the time of the Keys stranding, the Florida Keys Marine Mammal Rescue Team held the LOA for the lower Keys and was active in the rehabilitation efforts. However, they were going through reorganization at the time and their incorporation papers were not filed until June, halfway through the rehabilitation. Because of this, the primary day to day caregivers were from the Marine Mammal Conservancy, who hold an LOA for the upper Keys.¹⁷ This created both organizational and personnel conflicts and raised questions as to which of the organizations is ultimately in charge. If the area LOA holder is unable to be the primary managers of the event, the team most able to provide for the best care of the animals should be given primary responsibility. Designating a shift leader and conducting daily briefings with LOA

personnel and volunteers could also help to improve communication between organizations.

During periods of extensive care of injured animals, volunteer support is critical. At the time of the Keys event, there was a lack of a trained volunteer base in the lower Keys, but with time this problem is being resolved as more volunteers become involved marine mammal organizations in the area. Volunteers that participate on a regular basis could be given further training and become a part of a core group of volunteers. Additional volunteers with no previous experience can be recruited and trained to provide extended support, and experienced personnel could be recruited from aquariums, research and academic institutions, veterinary clinics, and wildlife and conservation groups.⁷

Another critical requirement of any stranding event is record keeping. Record keeping is invaluable to our understanding of marine mammal species and *must* be made a priority. Records are a basic part of standard husbandry practices and help veterinarians know how to best treat injured animals, adjust medications and examine patterns and trends in health. Record keeping not only benefits the health of the recovering animal, but can be used to better guide future pilot whale stranding responses, as well as contributing to the basic scientific knowledge of marine mammals. During the initial phases of the event, the lack of trained personnel and the overwhelming amount of work required to care for the animals, kept record keeping from being given proper priority. It is the responsibility of the LOA rehabilitation group to keep accurate records on each animal and its importance should be stressed to staff and volunteers during training. Volunteers who are

not trained or for any other reason unable to help with in-water animal care should be directed to help with record keeping. The designation of a record keeper, either for the entire length of the stranding or at minimum one person per shift, could help to guarantee proper record keeping. Also, the development of standardized, user-friendly forms for all stranding events would aid in the ease of documentation and dissemination of data.

3.4. Release

After almost four months of care, five whales, four juveniles and one calf, were released approximately fifteen miles offshore on the Atlantic side of Little Palm Island in the Florida Keys. Release determinations are made by the LOA holder, after receiving authorization from the Regional Administrator who has consulted with regional stranding network personnel, the national stranding coordinator, the Office of Protected Resources, attending veterinarian(s) and, if necessary, an expert panel.¹⁶ All animals must be released in the home range of wild populations, if known, and must be tagged or marked for identification prior to release. Cooperation, teamwork, community resources and veterinary support were all essential to the near simultaneous release of the five whales. The transport of whales went well and the tracking was initially successful, thus yielding significant scientific information.¹⁵

Prior to the release of any stranded marine mammal, the animal must be cleared medically by a veterinarian. NMFS regulations state that “no animal will be authorized for release until it is determined that the animal poses no threat to wild populations and that the animal is healthy and likely to survive in the wild.”¹⁸ Criteria has been developed

to assess the releasability with four main areas of consideration: natural history, medical history, behavior and release. If some of the criteria are not met, the animal may not be a candidate for release, but decisions are made on a case-by-case basis to determine if the animal's release satisfies the two fundamental criteria of not posing a threat to wild populations and being likely to survive in the wild.¹⁸ In the case of the Keys stranding, the disposition of two of the animals were in question and advice was sought from a panel of experts on the appropriateness of releasing the whales. This panel included experts in the fields of cetacean biology, behavior and veterinary medicine.¹⁹

The first of these animals was #3, who was in question due to behavioral concerns. The behavioral considerations used in release decisions state that "if the cetacean is able to respire, swim, maneuver and dive normally and does not demonstrate any aberrant behavior, then it will be a candidate for release."¹⁸ This whale exhibited isolation behavior for the entire rehabilitation period and was aggressive with staff and the other animals, and because of this the expert panel expressed concerns that this whale might not do well socially after release.¹⁹ Assessing "aberrant behavior" can be difficult and the personnel handling the day to day care of the animal are often the best judges as to the condition of the animal. In situations where rehabilitation personnel are trained in animal behavior, they should be consulted when assessing behavioral concerns. In this situation it is thought that this female had little tolerance for humans and was probably the oldest of the group and had little patience for the play behavior of the other animals. Also being the last of the group to recover, she should not have been expected to exhibit the same behavioral characteristics of the other whales. Caretakers were led to believe that she

would still do well after release and her behavior to the present group was not a reflection of unreleasability.

The second animal was #7, a calf thought to be less than two years of age and not yet weaned at the time of stranding. When a calf strands without its mother, there are three options for its care :

1. Euthanize it at the rescue site which might have generated strong public resistance as this was an *apparently healthy animal*, although there may be no alternative *if* there are no options for placement in a permanent facility.
2. Rehabilitate it and find a permanent placement facility. During a workshop sponsored by the MMC and NMFS in 1991 addressing current practices in the rescue, rehabilitation and release of marine mammals, the panel noted that the improving success of raising orphaned dependent young argues against a policy to euthanize otherwise healthy calves and that euthanasia for non-medical reasons alone was considered unethical.²⁰ The statutory framework of the MMPA clearly recognizes the public display of marine mammals as a legitimate activity and NMFS policy prefers that unreleaseable stranded marine mammals be used to fulfill public display needs in lieu of authorized taking from wild populations. Therefore, if the determination is made that an animal is unable to be released into the wild, the preferred option is that, when possible, such animals be placed in permanent captivity.¹⁸ In this case, it is unclear whether or not permanent placement would have been a viable option.
3. The third option, followed in this case, is to rehabilitate the animal and release it. In the past, there has been very little success in releasing dependent calves, though clearly

more information is needed on post release behavior and survival to develop meaningful release criteria. Release guidelines state that “in the absence of empirical data on the survivorship of calves, no odontocete, which is nutritionally dependent at the time of stranding, should be released unless it can be released with its mother.”¹⁸ Young animals may not have developed the skills necessary to find and capture food, the social skills required to integrate successfully into wild groups, knowledge of home ranges and migratory routes or predator recognition and avoidance skills. They may also be more likely to “forget” any learned natural survival skills once released.¹⁸ The majority of the expert panel urged against the release of this animal for these reasons.¹⁹ On the other side, *rehabilitation* personnel felt that the calf appeared to be socially attached to three of the other group members and was hunting and eating live fish during training sessions. Despite the NOAA Fisheries draft criteria for the release and against the recommendations of the expert panel, the calf was released. The decision to release the animals was made under the assumptions that he had bonded to his podmates, would be protected by them after release and that he could be monitored by satellite tag and recaptured if necessary. The Regional Administrator considered all sides and looked to the guidelines for direction to determine what was in the best interest of this animal. The goal, according to the MMPA, should be to return stranded animals to the wild to be functioning parts of their marine ecosystem, and this is what helped guide the decision to release.

Even with objective guidelines for making a release determination, there will always be cases, such as this one, where the prospects of survival for an individual animal are

considered to be marginal. In such circumstances, the release of such an animal will be considered by the governing agency if scientific experts so advise and if an adequate monitoring program can be instituted.¹⁸ All five animals in the Keys stranding were tagged and monitored from the moment of release. Also, plans were developed for recapture if the animals did not appear to be faring well. Risks are always involved in the release of any animal and the release of borderline animals can provide information that will be valuable in creating better criteria for subsequent release decisions.

The major logistic challenge during the release was the need for a central communications person and the limiting of radio traffic. To communicate between vessels, a 16 type channel should be established to allow vessels to contact each other and then switch to an alternate channel to converse. In addition, to enhance communication between vessel captains, mandatory attendance should be required at a “captain’s” meeting prior to the release or written briefing notes could be provided. Each vessel should have a VHF radio and a back-up if possible. Other than these suggestions, the release went very well.

4. Conclusions

The Marine Mammal Protection Act is the basis for the protection of marine mammals in the U.S. The creation of the Marine Mammal Health and Stranding Response Program in the MMPA provides the foundation for the creation of stranding networks to direct the response, rehabilitation and release of stranded marine mammals. There are numerous

levels of management involved in the MMHSPR, mostly controlled through bottom-up processes, with the major acting parties in marine mammal strandings being volunteer organizations holding a Letter of Agreement. LOA holders are regulated by the MMHSRP and stranding coordinators at regional and national levels, but are primarily responsible for managing the care of animals at the scene. During future mass stranding events, there is a definite need to improve communication and coordination among group members and throughout the chain of command. The advanced communication technologies of local law enforcement should be used to the full extent and record keeping must be made a priority to both staff and volunteers during training. When questions arise regarding the behavior of animals, rehabilitation personnel that are with the animals on a day to day basis should be consulted about behavior. Also, it may be necessary to redefine the release criteria for calves to be more specific about conditions under which they should be released.

As of early March 2004, two of the animals are thought to be doing well, one is deceased and the whereabouts of two are unknown. Whales 4 and 6 appeared to be doing well because they stayed together during the entire tracking process. They were tracked as far north as North Carolina, then swung to the east about 500 miles seemingly to avoid hurricane Isabel in September. They then came back to a point off Florida where their transmitters came off. The whereabouts of whale #2 are unknown as she was released without a satellite tracking device. Once released, #3, the oldest female, did very well traveling an average of 50 miles per day. She traveled into the Gulf of Mexico where other pilot whales are known to hunt and travel. Researchers lost contact with her

transmitter about 400 miles south of Galveston, Texas. The calf was tagged and monitored, but did not appear to remain with the other whales after release. Unfortunately, 12 days after release the calf was seen by observers being attacked by bull sharks and his whereabouts are unknown. The observers were never able to get close enough to recapture the calf and a situational error with the recapture equipment prevented his recapture on the day of the attack.²¹ Risks are always involved in the release of any animal and it is hoped that this experience provided valuable information for future release decisions.

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5. Endnotes

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7. Figures



Figure 1. Pilot whale stranding (Content Keys Passage), rehabilitation and release (~ 15 miles offshore) sites in the lower Florida Keys.¹

¹ 28 pilot whales strand themselves in the Florida Keys; four die. (April 18, 2003). Retrieved from <http://www.bdmr.org.uk/pages/main.html>



Figure 2. Response efforts to the pilot whale stranding.²



Figures 3 and 4. Rehabilitation site in Big Pine Key.³

² Photo by Associated Press

³ Photo by AP Photo/Florida Keys News Bureau, Andy Newman. Retrieved from <http://animal.discovery.com/news/briefs/20030825/pilots.html#>



Figure 5. Prior to release, the whales were fitted with satellite tracking devices and VHF transmitters so that their locations could be monitored.⁴



Figure 6. Rescuers help four pilot whales swim to freedom August 10, 2003.⁵

⁴ Photo: Andy Newman/Florida Keys News Bureau. Retrieved from http://staugustinerecord.com/stories/081103/sta_1727070.shtml

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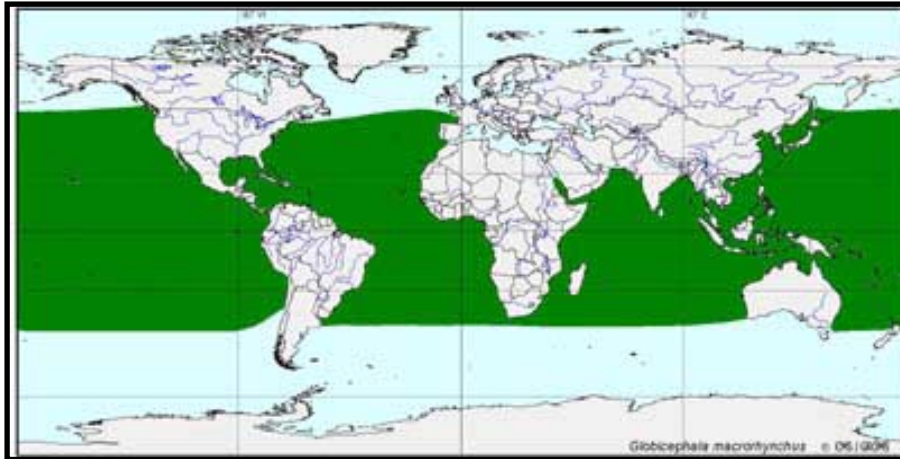


Figure 7. World distribution of short-finned pilot whales (*Globicephala macrorhynchus*).⁶

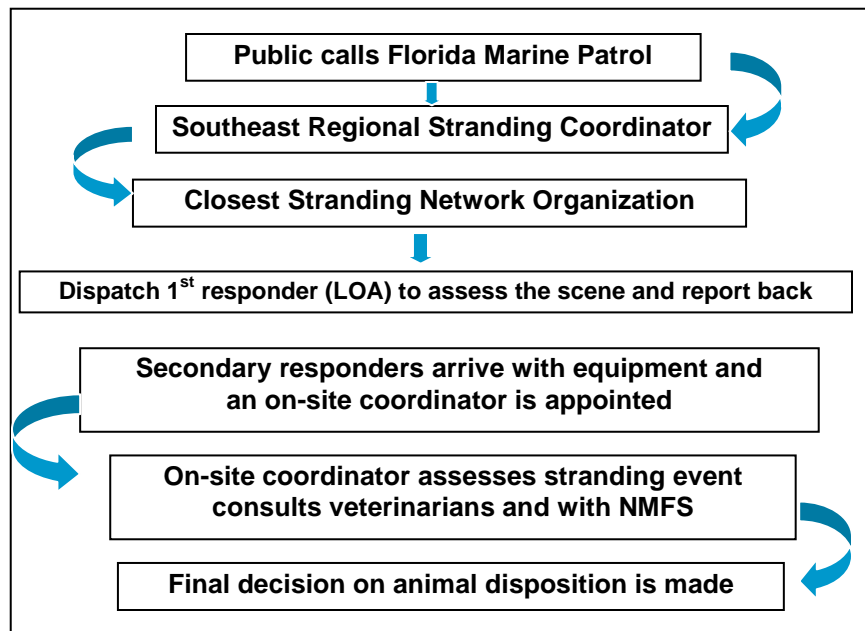


Figure 8. Response flow chart when a stranding occurs in the Florida Keys.⁷

⁶ Whales and Dolphins; *Globicephala macrorhynchus*. (n.d.) Retrieved from <http://www.wcmc.org.uk/cms>.

⁷ B. Mayes, personal communication, November 2003.

8. Sample Stranding Questionnaire

1. *Communication and Coordination*

- A. What types of communication issues do you feel hindered response and rehabilitation efforts, particularly since multiple organizations were involved?
- B. What would be some possible solutions to provide for better communication during the release (i.e. a mechanism for better communication between ships, ways to reduce radio traffic, etc)?
- C. Some questions have been raised as to the existence of a clear chain of command during the stranding event. Do you feel that you were unaware of who had authority or were key personnel clearly identified at all steps of the response and rehabilitation?

2. *Veterinary Response and Care*

- A. What would be the best way to ensure timely veterinary response to a stranding event (i.e. more veterinarians in closer proximity, a directory of qualified veterinarians)?
- B. Some discussion has been raised as to the disagreement among veterinarians concerning the release of two of the animals. If several veterinarians are consulted and disagree, what would be the best way to determine the course of action that should be taken?
- C. Would any of the animals benefit from being placed in captivity rather than being released (either temporarily or permanently)?

3. *Record Keeping and Training of Volunteers*

- A. Do you feel that there were problems associated with having too many people caring for the whales at one time?
- B. Record keeping appeared to be an area in which some believed improvements could be made. If you agree with this, what actions could be taken to create better record keeping protocols?
- C. Would it be helpful to develop a database of trained volunteers that could be called in to assist during a stranding event?

4. *Other*

- A. Are there any other major issues that were not discussed above that you feel should be addressed?
- B. What do you feel worked well during this stranding event?
- C. Overall, do you feel that this was a successful response and release?