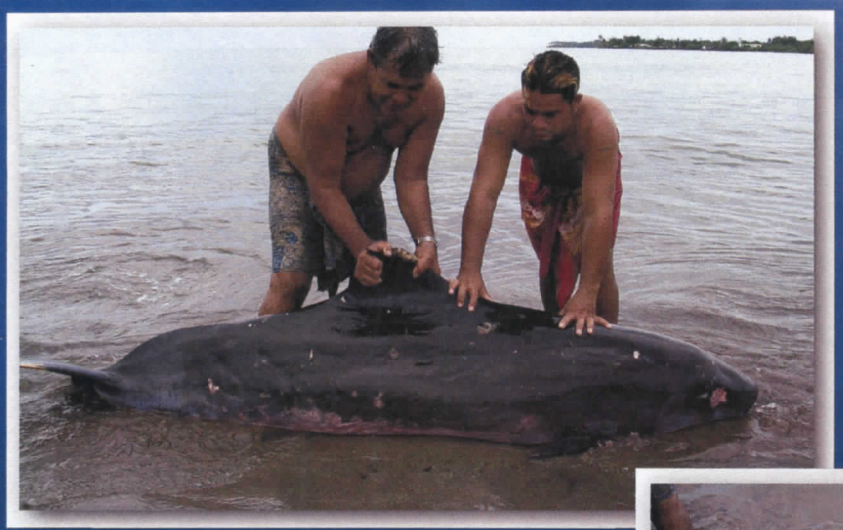
SAMOA CETACEAN STRANDING MANUAL



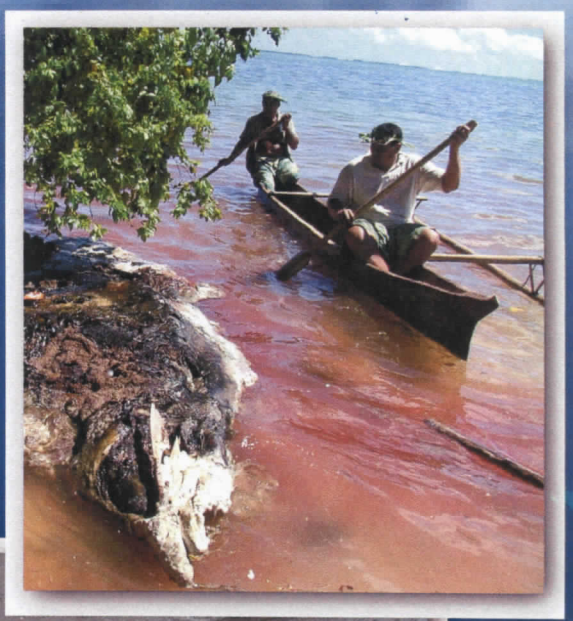


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TABLE OF CONTENTS

PREFACE

Cetacean stranding occurs throughout the Pacific region and every year, thousands of cetaceans strand, either in groups (mass stranding) or individually. The main cause of cetaceans stranding still remains unknown, however, scientists have developed theories in trying to understand why cetaceans strand.

Cetacean stranding have occurred in Samoa, most of them involved single animals that have been found dead on the beach. Although mass stranding is rare, there have been documented instances of large numbers of cetaceans stranded in the past.

For Samoa, cetacean stranding is largely under reported mainly because of the limited understanding and awareness on the animals. This makes it difficult to determine the occurrence of strandings. The development of Samoa's National Stranding Committee and its program will not only improve the knowledge and extent of stranding occurrences through reporting and the collection of information but would also improve awareness of these marine mammals.

The Samoa Cetacean Stranding Manual has adopted some of the materials from the Marine Mammals Ashore Field Guide for Strandings, Second Edition with the hope not to create new but to better use the existing information.

The manual provides guidance on what 'to do' and what 'not to do' when dealing with a stranded cetacean both alive and dead.
We hope that this manual will accomplish its purpose especially in saving the lives of the stranded animals.

Tu'u'u Dr. Ieti Taulealo
Chief Executive Officer
Ministry of Natural Resources & Environment

1. INTRODUCTION

Cetaceans are a group of marine animals that includes whales, dolphins and porpoises. This Manual deals specifically with whales and dolphins as they are the only cetacean species found in the waters of Samoa.

Whales and dolphins are an important component of the marine biological diversity of the Pacific Islands Region. Over half the world's known species of whales and dolphins are found in the region, and for some species, such as the humpback whale, the Region is a vital breeding area.

Many Pacific island cultures have legends, stories and traditional uses and values of marine mammals. These species are generally long-lived and have low reproductive rates. While cetaceans are part of our marine biodiversity, very little information is known about them locally.

There are 10 cetacean species known to occur in Samoan waters (Annex 5(iii)). These include the following:

Whales Species	
Whale species Confirmed To Occur in Samoa Waters	
Humpback whale	*Megaptera novaeangliae*
Minke whale	*Balaenoptera sp.*
Sperm whale	*Physeter macrocephalus*
Dwarf sperm whale	*Kogia sima*
Whale species likely to also occur in Samoan Waters	
Bryde's whale	*Balaenoptera edeni*
Killer whale	*Orcinus orca*
Curvier's beaked whale	*Ziphius cavirostris*
Blainville's beaked whale	*Mesplondon densirostris*
Dolphin Species	
Dolphin species Confirmed to Occur in Samoa Waters	
Bottlenose dolphin	*Tursiops truncatus*
Spinner dolphin	*Stenella longirostris*
Rough-toothed dolphin	*Steno bredanensis*
False killer whale	*Pseudorca crassidens*
Short-finned pilot whale	*Globicephala macrorhychus*
Melon-headed whale	*Peponocephala electra*
Dolphin species likely to also occur in Samoan Waters	
Pantropical spotted dolphin	*Stenella attenuata*
Striped dolphin	*Stenella coeruleoalba*
Risso's dolphin	*Grampus griseus*
Fraser's dolphin	*Lagenodelphis hosei*

1.1 CETACEAN STRANDING

1.1.1 Definition

A stranded cetacean is usually referred to an animal that has run aground. It also includes "any creature left in a helpless position, such as a marine mammal that falters ashore ill, weak or simply lost". While some refer to animals washed ashore dead as beaching, stranding in this document is used for any live or dead specimen. Thus cetacean stranding includes:

- Live cetaceans that run aground and unable to return unassisted to the water, or in the water, but unable to return to its natural habitat under its own power or without assistance or in apparent need of medical attention; or

- Dead cetaceans washed up on a beach or shore or floating in the water.

Every year, thousands of cetaceans are found stranded on coastlines around the world. Some animals die at sea and wash up, others strand alive and some becoming trapped in shallow waters.

Stranding can involve an individual animal or more animals of the same species; the latter is referred to as "mass-stranding".

1.1.2 Value

Cetacean strandings present opportunities to collect data/information "cheaply", which can contribute to regional and global information. Some of this information include:

- Diseases;
- Population connectivity through genetics etc;
- Impacts of human intervention on these animals;
- Impacts of natural phenomenon such as climate change.
- Species distribution/occurrence. New information have been obtained through stranding, e.g. the discovery on new records of occurrence. The occurrence of the dwarf sperm whale (Kogia sima), an unidentified beaked whale as well as the melon-headed whale (Peponocephala electra) in Samoan waters were only recorded through strandings. Two prior extensive "proper" scientific surveys did not record these three species.

1.1.3 Stranding Network

While cetaceans stranding are sometimes due to these animals being sick and therefore likely to face natural death anyway, a lot of strandings are attributed to human intervention and other human-induced phenomenon. Thus rescuing a live stranded cetacean that was not "suppose" to strand in the first place can actually help in biodiversity maintenance and ecological balance in our marine ecosystems.

The existence of an active national stranding programme would not only improve knowledge and extent of stranding occurrences through reporting etc but it would also improve awareness on these cetaceans. A national stranding network will improve national inter-agency collaboration amongst national agencies and the sharing of limited resources. Other spin-off benefits include national capacity development in other areas including databases and marine animals veterinary.

1.2 WHY CETACEANS STRAND

The cause of why cetaceans strand is not well understood especially when healthy animals swim ashore and aground themselves. However, several "theories" have been put forth, both natural and human related, in an attempt to explain this phenomenon, and include the following as extracted from various references:

Geraci, J.R., and V.J. Lounsbury. 2005. Marine Mammals Ashore: A Field Guide for Strandings, Second Edition. National Aquarium in Baltimore, Baltimore, MD.

- **Parasites:** Whales and dolphins often suffer from parasitic infections of the ear passages that are potentially very harmful. Because they rely heavily on their hearing to navigate in the aquatic environment, parasites impair echolocation and hearing leading to a breakdown in their navigation systems and cause stranding.

- **Biotoxins:** Biotoxins in the marine environment (e.g. dinoflagellates, etc.) are potentially harmful to whales and dolphins. The toxins themselves sometimes do not kill the cetaceans directly but get incapacitated and further results in navigational errors and stranding. In some cases, the toxins weaken the cetacean's immune system causing it to become vulnerable to other infections or may lead to sudden deaths at sea resulting in the animals stranding already dead.

- **Following Prey Ashore:** Some cetaceans strand by accidentally following their prey ashore in the confusion of the chase.

- **Magnetic Field Anomalies:** Cetaceans use the geomagnetic patterns in the seabed as a compass to guide their navigation especially on long journeys. Therefore, magnetic disturbances/shifts over time often confuse and cause them to make navigational errors, leading to stranding.

- **Physical factors of the environment (geography):** Topographic and oceanographic conditions of the environment explain why cetaceans are found stranded more often in some areas than in others. Some types of shore and some particular coastlines are more prone to strandings than others. Shallow, sloping shores made of soft sediments may confuse the echolocation used by cetaceans to find their way around and strandings are indeed particularly common on such coastlines.

- **Acoustic Testing:** Cetaceans depend heavily on the use of sound to survive in the ocean therefore the anthropogenic-induced noises in the ocean such as blasting, sonar and seismic testing, etc. affect cetacean navigational abilities, internal organs, etc. and may lead to stranding.

- **Social Bonds:** Social cohesion results in stranding where pod members follow a leader ashore as a result of social factors, such as responding to cries of distress, group feeding, protection of young, etc. This scenario often results in mass stranding when a lead animal becomes sick or wounded and leads the rest of its pod onto the shore, where most of them repeatedly beach themselves, strand and die. (This theory only concerns with specific cetacean species such as sperm whales and pilot whales).

- **Other factors:** Other factors contributing to stranding include:
  - o Diseases and viral infections;
  - o Ingestion of marine debris (plastics and other garbage) by cetaceans;
  - o Injuries resulting from interaction/entanglement with fishing gears, boat strikes; and
  - o Human predation and aggression (direct assault with guns, hunting and harpooning)

2. SAMOA NATIONAL CETACEAN STRANDING COMMITTEE/NETWORK

In an effort to rescue live stranded cetaceans where possible, improve reporting of stranding occurrences and take advantage of the opportunity to obtain data on these animals, the Samoa National Cetacean Stranding Committee has been set up comprising of relevant agencies including community representatives. This Committee is also the Network that provides:

- a mechanism that enables quick reporting of cetacean stranding incidences;
- a trained response team to attend to stranded animals reported;

- organised and standardised data collection and reporting procedures;
- logistic support and equipment for rescue and for other activities;
- a facility for necropsy of dead cetaceans by trained personnel.

However, a facility for medical treatment and rehabilitation in the case of live animals does not exist on island and thus this option will not be available.

2.1 MEMBERS

The Samoa National Cetacean Stranding Committee comprises of representatives from the following Government and other agencies/ organizations and community-based programmes. Details of contact persons within these agencies are listed under Annex 1:

- Division of Environment and Conservation, Ministry of Natural Resources and Environment;
- Fisheries Division, Ministry of Agriculture and Fisheries;
- Ministry of Police and Prison;
- Division of Internal Affairs (including Pulenu'u), Ministry of Women and Community Development;
- Livestock Division, Ministry of Agriculture and Fisheries;
- Samoa Tourism Authority;
- National University of Samoa;
- Marine Tour Operators;
- Aleipata and Safata Marine Protected Area Programmes;
- Secretariat of the Pacific Regional Environment Programme (SPREP);
- IFAW Pacific.

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Lead Agency: Division of Environment and Conservation, Ministry of Natural Resources and Environment. It is also the Operations Centre for all cetacean and cetacean stranding-related activities.

Coordinator of National Cetacean Stranding Committee: The Principal Marine Conservation Officer, Division of Environment and Conservation, Ministry of Natural Resources and Environment.

2.2 OBJECTIVES [OF THE NATIONAL STRANDING COMMITTEE/ NETWORK]

The primary objectives of the Committee are as follows (as adapted from Geraci and Lounsbury, 2005 and UNEP, 2004):

(i) To allow the wider community to report strandings in an efficient and rapid way;
(ii) To provide rapid and effective action that will best serve the well being of the stranded animal(s);
(iii) To maximise the number of strandings recorded, in order to identify the causes of mortality, strandings and lesions;
(iv) To protect the public while acting on its concern;
(v) To collect and disseminate maximum scientific and operational data;
(vi) To enable long-term scientific studies which provide information to improve their conservation, management and biological knowledge;
(vii) To protect wild cetacean populations;
(viii) To increase public awareness of cetaceans.

2.3 RESPONSIBILITIES OF THE NATIONAL STRANDING COMMITTEE

The basic responsibilities of the Committee include the following as also adapted from Geraci and Lounsbury (2005):

- Provide contact telephone lines for stranding;
- Quick reporting of stranded cetaceans;
- Provide rapid response for stranding;
- Coordinate data collection including specimen sampling;
- Provide logistic support including provision of equipment;
- Perform effective necropsy of dead cetaceans;
- Coordinate with local authorities;
- Take actions necessary for the animals while ensuring public health and safety, providing information to the public and seek local assistance as needed,
- Reporting to the appropriate authorities or the Operations Centre.

Specific roles and responsibilities of certain members of the Cetacean Stranding Committee are as follow:

1. **Division of Environment and Conservation, MNRE**
- Lead agency for the cetacean stranding network,
- Conduct public awareness in collaboration with partners on cetacean conservation,
- Maintains a stranding database,
- Provides all network members with proper materials such as report forms, tissue sampling and rescue equipments, and safety gears during a rescue,
- Provides support for rescue operations through the use of equipments, vehicles and boats,
- Provides an effective communication channel for stranding sites in the country.

2. **Fisheries Division, Ministry of Agriculture and Fisheries**
- Provide support for rescue operations through the use of equipments, vehicles and boats;
- Seek the co-operation of local fishermen,

3. **Livestock Division**
- Assist in rescue operations through cetacean necropsy;
- Provide technical advise on appropriate actions for disease related undertakings during cetacean stranding;
- Assist with the decision making for euthanasia;
- Carry out euthanasia by injection.

4. **Internal Affairs Division**
- Contact communities whenever and wherever a stranding incident occurs;
- Assist in conducting community awareness programmes;

5. **Police Department**
- Assist in the collection of stranding information through the use of patrol boat;
- Control of the public at stranding incidences.
- Carrying out euthanasia by shooting

6. **Samoa Tourism Authority**
- Assist in reporting of stranding incidents by the tourists
- Assist in rescue operations

7. **National University of Samoa**
- Assist in conducting awareness programs
- Assist in rescue operations

8. **Marine Tour Operators**
- Assist in reporting of stranding incidents
- Assist in rescue operations

9. **Marine Protected Areas**
- Assist in reporting of stranding incidents
- Assist in rescue operations

10. **Secretariat of the Pacific Regional Environment Programme**
- Assist in dissemination of information on stranding
- Provide technical and funding support
- Assist in rescue operations

11. **IFAW Pacific**
- Assist in dissemination of information on stranding
- Provide technical and funding support
- Assist in rescue operations

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3: PROTOCOLS/PROCEDURES FOR CETACEAN STRANDING

3.1 POINT OF CONTACT

Cetacean stranding response and information gathering in Samoa is coordinated through the Division of Environment and Conservation of the Ministry of Natural Resources and Environment, with the cooperation of various national Government Departments and other agencies.

Telephone Contacts for reporting any cetacean stranding are as follows:
- Working hours:
  - o Division of Environment and Conservation
    - Telephones: 31197 or 31198 or 23800
    - Contact: Marine Conservation Unit
  - o Fisheries Division
    - Telephone: 20369 Ext 123
    - Contact: Inshore Unit
- After hours: Telephone: 20369 Ext 136 (Fisheries Base)

The list of collaborating Government Departments and other agencies, together with their corresponding contact details are provided in Annex 1. These agencies can be contacted in case of non-response from the coordination center.

3.2 ORGANIZATION OF A RESPONSE

When the Coordinator directly receives a call or message concerning a stranding, he/she will be responsible to immediately inform other Team Members and organize an urgent meeting or a response team as necessary.

When a member of the Team receives a call or message concerning a stranding, he/she shall immediately inform the Coordinator who will in turn immediately inform other Team Members and organize an urgent meeting or a response team as necessary.

3.3 ON SITE DECISIONS AND ACTIONS

3.3.1 Team Organization

It is extremely important that the Team attending a stranding is organized properly for various tasks. The Coordinator or designee assumes the responsibility to lead the "on-site" team in discussion of the situation and then organize the plan in dealing with a stranding including allocation of tasks.

3.3.2 Safety

In any stranding event, safety is a priority concern. People can get hurt from a live stranded animal, in the water or on the beach. Thus it is important not to be close to the tail of a live stranded animal as a lash from the tail can be fatal. There is also the potential for infectious agents to be transmitted from the stranded animal to anyone coming into physical contact with it. Wearing protective clothing such as overalls and rubber gloves, reduce the risk of infection. Eye and face protection (safety or sun glasses and face masks) also help. Open wounds should be properly covered and avoid making contact with animal fluids.

3.3.3 Determining if the Animal is Dead or still Alive

If it is not obvious, a stranded cetacean should be checked whether it is still alive or dead by first checking whether it is still breathing through its blowhole. Breathing is determined by watching for the opening or closing of the blowhole. Some large cetaceans can hold their breath for over 20 minutes. Secondly and in the case of large cetaceans, it may be necessary to test their reflexes to determine if they are alive. This is done by gently applying light pressure on the eyelid or the corner of the eye. If alive, the animal will close its eye. In addition the area round the blowhole can be lightly touched or the jaw can be gently opened. If alive, the animal will close the blowhole or resist attempts to open its mouth. (Marine Animal Response Society: www.marineanimals.ca/strandings/livecetacean_eng.html).

Normal breathing frequencies for cetaceans are as follows:

- Small cetaceans, e.g. common dolphin = 2-5 breaths per minute
- Medium cetaceans, e.g. pilot whale = 1 breath per minute
- Large cetaceans, e.g. sperm whale = 1 breath per 20 minutes

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3.4 WHAT TO DO FOR LIVE STRANDED CETACEANS

Annex 2 provides a guide to cetacean external anatomy and showing external features to distinguish the differences between male and female cetaceans.

3.4.1 Safety

When working with live stranded cetaceans, care must be taken to avoid accidents which can be fatal to people. The cetacean tail (fluke) in particular can be very dangerous when the animal thrashes it. Thus care must be taken around the tail/flute. Large stranded cetacean may also roll over on its side and can trap people. Always be cautious and ready move away fast when working around a live stranded animal. To avoid/minimize possibility of transmission of any disease agent, minimize contact with the stranded animal, use gloves and avoid inhaling the animals expired air.

3.4.2 Things to DO

The first thing to do when a cetacean stranding is found is to Contact (telephone etc) any member of the Stranding Committee for help as soon as possible (refer to **Annex 1** for contacts).
It is important to provide first aid for the live stranded animals at the stranding site.
This includes:

- Keeping the animal(s) cool and wet by providing shade and continuously splashing water over its body.
- Keeping the blowhole and eyes free from water and sand.
- If the animal is injured, place the animal in a stable, belly-down position to prevent further injury or discomfort, if possible.
- Turn the animal regularly if it persists in lying on its side to ensure blood circulation to the lower flipper.
- Scoop out sand from under the flippers to allow blood circulation (prevent heat build up).
- Apply water-soaked towels, sheets or cloths to as much of the body as possible to further prevent the heat build-up in the body or drying of the skin, leaving the blowhole and eyes uncovered.
- If the animal is extremely large, attempt to keep at least the flukes cool to aid in heat regulation.
- Minimize handling and disturbance of the animal as it is already undergoing considerable stress.
- When using a rope to handle the animal, place soft padding under the rope to avoid damage to the animal's sensitive skin.

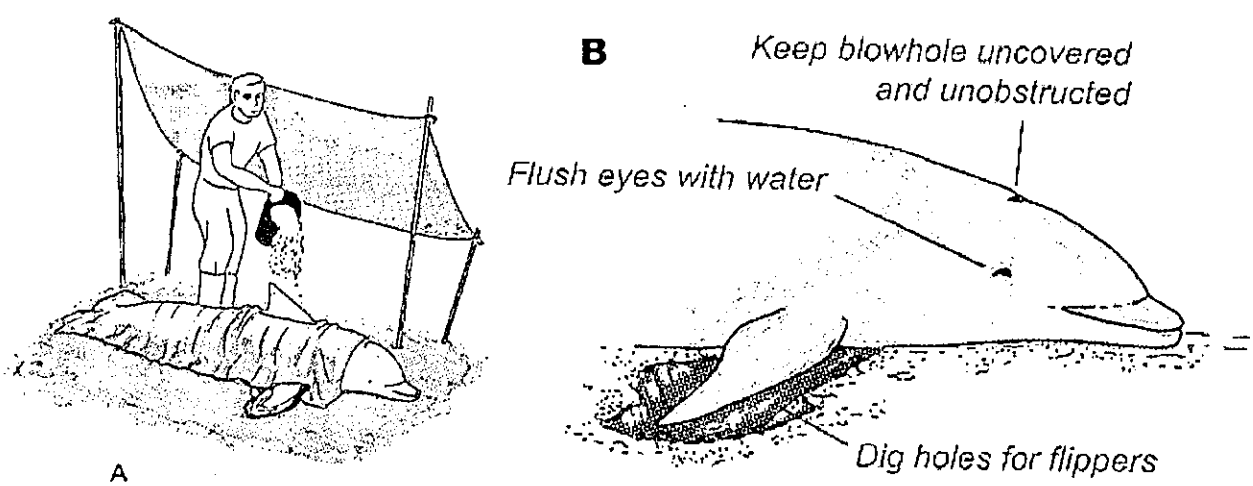


Figure 1: First aid measures for a stranded cetacean on the beach. A-provide shade, drape leaving dorsal fin exposed, and keep moist. B-Always keep blowhole unobstructed and eyes free from sand, allow flippers to assume a natural position, and minimize noise and disturbance (taken from Geraci and Lounsbury, 2005)

In the case of **mass stranding:**

- Deal with the animals in the water first by preventing them from coming out onto the beach.
- When moving the animals in the water, be as gentle as possible and push only the sides or at the base of the dorsal fin.
- Hold the animals bunched together in sheltered, shallow water in an upright position.
- If the animals persist in beaching themselves, allow them to remain and apply first aid (as to a single stranded animal).
- Scoop away the sand around the animals to form pools of water to reduce heat build up in the animal. Scoop more sand away from the flipper area so that the animals rest on their bellies and not on their flippers.
- Those animals already far up the beach should be dealt with individually (as that for single strandings) but focus more on those most active or alert as they stand a greater chance of survival.

3.4.3 Things NOT TO DO

- Do not stay close to the back tail flukes as stranded animals may thrash their tails around which can cause injury to a person in the way.
- Do not push the animal back out to sea as stranding is not normal for most marine animals.
- Do not rest the animal on its flippers as it impairs the blood circulation resulting in retention of body heat and subsequent death.
- Do not shine torch/lights or camera flash-lights directly in the animal's eyes at night as this can cause pain and damage to the sensitive part of the eye.
- Never push or pull the animal by the fins or flippers as it may cause considerable pain or severe injury. Rather, provide support under the chest and abdominal areas.
- Do not use crowbars and hooks to move the animal as it may inflict severe damage.
- In the case of **mass stranding**, Do not try to push the animals back into the open sea as it can result in scattering, then you will be dealing with many single strandings over many kilometres of the beach.

3.4.4 Making the Decision for the Course of Action to Take

There are basically 3 options as to the course of action to take concerning live stranded animals. The option depends on the state of the animals and surrounding circumstances. The three options are:

- Rescue and release the animal to sea, which can involve relocating the stranded animal to another site for release;
- Euthanasia or natural death;
- Rehabilitation – This option is not possible in Samoa.

In considering the most appropriate action to take, careful consideration should be made of the following criteria (adopted from Geraci and Lounsbury, 2005):

FACTORS TO CONSIDER				
RESCUE/RELEASE	yes	LOGISTIC SUPPORT AVAILABLE?	no	EUTHANASIA or NATURAL DEATH
	few	HOW MANY ANIMALS?	many	
	mother/calf in the water	CALF/MOTHER	mother/calf not observed	
		ENVIRONMENT CONDITIONS?		
	moderate	Temperature?	extreme	
	moderate/calm	Sea State?	extreme	
	favourable	Beach Condition?	difficult	
		ANIMAL CONDITION?		
	brief	Time since stranding?	long	
	good	Animal Health?	poor	
	young (but independent)	Age?	old	
	low	RISK TO WILD POPULATIONS?	high	
	low	RISK TO HUMAN SAFETY?	high	
		EASE OF HANDLING?		
	small	Size?	large	
	calm	Disposition?	uncontrollable	
		Manageable		
	no	CARE FACILITIES & RESOURCES AVAILABLE?	no	

3.4.5 Data Collection

Only limited data can be collected from live stranded cetaceans especially if rescue operation will be successful. Only Form 1 for Level 1 Data needs to be completed from live stranded cetacean. However, it may not be possible to fill all the fields of the form but an effort should be made to fill as many fields of the form as safely possible. Details concerning the collection data is discussed under **Section 4** on Data and Samples.

3.4.6 Rescue Operation

The decision to rescue a large whale or small mass-stranded will be determined almost entirely by the available logistic support. Rescuing a stranded cetacean may merely involve directing/maneuvering the animal back to sea and deeper waters (if the animal is in the sea) or if stranded on land/beach/reef, it may involve dragging/towing it or loading it onto a transport platform.

The option to rescue the stranded cetacean can be taken when:

- The animal is manageable and logistics support is adequate.
- Beach and environmental conditions are favourable.
- The animal is healthy and able to function normally.
- The animal presents no apparent risks to wild populations or public safety.

- There is reasonable chance that social requirements can be met (mother-young, social odontocetes).
- The area of release is within the natural range, suitable and navigable.

REMEMBER: Rescuers handling stranded animals must minimize noise and remain calm which are the key factors in giving a stranded cetacean the best chance of survival.

(i) Basic Equipment

Equipments and materials required for cetacean rescue are for moving and supporting the animals. Any specimen beyond the size of a small pilot whale will require heavy equipment. The basic equipment for rescuing small cetacean includes:

- Foam pads or mattresses;
- Sheets, towels or blankets;
- Shovels;
- Buckets;
- Tarpaulins/stretcher;
- Ropes;
- Inflatable rafts and pontoons where available

Refer to Section 3.3.2 for safety gears worn by rescuers.

(ii) Evaluating the event/situation

- Attempt to determine the species, the approximate size, distinguishing features, respiration rate, and look for other animals in the area and any signs of unusual behavior or conditions.
- If there is no obvious injury or disability i.e. the animal appears healthy, and that intervention is deemed necessary, the animal can be directed back to the sea (if still in the sea and close to shore) or handling it (if on land) as detailed under section (iv) below.
- The response in terms of the course of action to take will be dependent on animal size, health, available support, environmental conditions and the time since stranding occurred.
- Coastal species such as some populations of bottlenose dolphins usually strand singly only when ill or orphaned although they are occasional victims of outgoing tide. There is little chance of them surviving unless it is a case involving simple refloating.
- Nothing can be done to save a whale too large to handle, or one that has suffered prolonged exposure.

(iii) Approaching the animal

- Observe the animal's behavior.
- Approach calmly and cautiously from the front or side, and avoid loud sounds, abrupt movements, or bright lights.
- Allow the stranded animal to become gradually accustomed to your presence (only experienced/trained personnel should approach the animal, keeping well clear of the flukes and mouth). A mother separated from her calf or attempting to protect it may become aggressive. Likewise, a lone member of a social species may become frightened when separated from the pod. Consider the animal's possible response to your intended actions.

(iv) First aid

Section "3.4.2 Things to Do" above lists things that can be done to relieve distress and improve the stranded animal's chance of recovery. The key is to prevent further injury and keep the animal comfortable while minimizing handling and disturbance. If an animal is in the surf zone and is too large to move to deeper waters, shift it (if possible) so it is perpendicular to the water's edge, with the head facing the land. This minimizes resistance to the surf and the blowhole is as far from the water as possible.

(iv) Handling, lifting and moving

Most procedures are potentially injurious to both the animals and personnel. When in doubt, consider safety of the team first and the best interest of the animal.

- When rescuing smaller mass-stranded cetaceans, attention should be given first to:
  - younger, weaned, independent animals;
  - those in good health; and
  - those on the beach for the shortest time.
- Place or roll the animal onto a tarpaulin or stretcher then lift or drag it (dragging is an acceptable option when lifting is impossible). This process, including the general rescue sequence as well as positioning a cetacean on a tarpaulin or stretcher is provided in Annex 3(i) and 3(ii) respectively.
- Make sure no seams or creases press into the skin of the animal.

(v) Acclimating the animal

- Keep the animal on the beach wet and cool to avoid a quick change in temperature that might evoke a startle reaction.
- Once in the water, gently support the animal, keeping the blowhole above the surface.
- Acclimation is complete when the animal is able to surface on its own to breathe.
- A mother and its calf should be acclimated together.
- If the animal is suffering from muscle stiffness (curvature of the body) due to impaired blood circulation, it is necessary to gently rock the animal side-to-side keeping the blowhole above water. If the animal react violently (e.g. striped dolphins), abandon the procedure.

The process can be long putting the rescuers at risk of hypothermia. Thus proper gear (e.g. wetsuit) and a relief team must be available.

(vi) Herding and towing

Sometimes the cetacean may still need to be directed outward to sea after acclimation. In waters less than chest deep, this can be achieved by slapping the surface behind the animal. However swimming close by should be avoided. Kayaks, surfboard and jet boats can also be used.

Boats are the typical form of transport for deep-water releases. Once a boat reaches the destination, the animals are carefully returned to the water. Towing speed should not exceed 1-2 knots.

(vii) Stranding prevention and returning cetaceans to sea

If the animal is in shallow water and not yet land-stranded, or when returning a stranded cetacean, it can be directed back to the sea by using boats (ideally with propeller guards) with experienced operators and chains of people to herd the animal, by creating disturbance and underwater noise (e.g. slapping the water's surface or striking the objects together below it, or using the boat engine.

3.4.7 Euthanasia (for small cetaceans) or Natural Death (for large cetaceans)

Given certain circumstances, including safety reasons, it is not always possible to save stranded cetaceans. In the Samoan context, apart from other considerations, rescuing stranded cetaceans would also be largely dependent on resources, particularly equipment, available. When the decision is made that rescue is not possible, the options available are euthanasia for small cetaceans and probably natural death for large cetaceans.

Euthanasia is an option when:

- It is necessary to end suffering of an animal in irreversible poor conditions
- The action is permitted by all relevant agencies.
- The decision can be made and action directed by an experienced, qualified person.
- Essential materials and equipment are available.
- The procedure can be carried out humanely.
- No rehabilitation facility is available.
- Rescue is impossible
- Animals persistently re-strand.
- A distressed cetacean ashore is likely to attract others milling nearby to mass strand.
- Release endangers wild populations.
- Carcasses of animals euthanized by toxic agents can be disposed of in a manner that minimizes risk to potential scavengers.

A cetacean from 4 – 6 meters in length can be euthanized by injecting 180 – 230 ml of barbiturate (pentobarbital) into a vein of the flippers, dorsal fin, fluke (tail) or directly in the heart or abdominal cavity using an in-dwelling catheter if possible (Figure 2). The amount of barbiturate can be reduced if the cetacean was first sedated. The use of needles and euthanasia solutions may be handled only by the veterinarian with assistance from the members of the stranding committee.

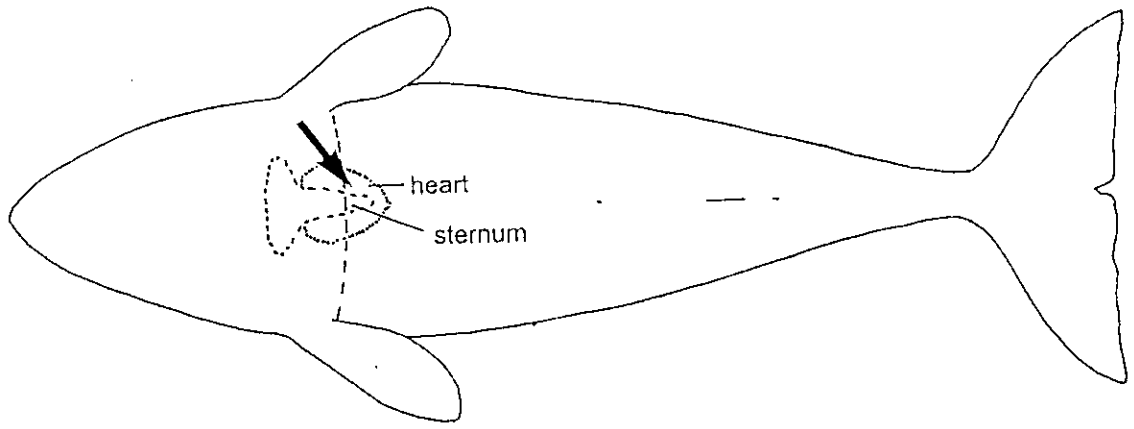


Figure 2: The base of the cetacean heart can be reached from either side of the sternum along a line connecting the base of the flippers (taken from Geraci and Lounsbury, 2005)

Shooting is probably the only practical means for dolphins and small whales up to 8 metres which must be done by a qualified person following established procedures. "Any high-powered rifle with standard bullets can be used for cetaceans less than 2 m. For cetaceans 2-8m, firearms with a large bore (.303 or greater) can be used. Figure 3 shows the target area to shoot. The gun should be fired about 1 meter from the animal's head (not directly against the skin). Aiming down and backward through the blowhole to an imaginary point joining the flippers is sometimes recommended. Alternatively, shoot from the side, about halfway between the posterior margin of the eyes and a point above the origin of the pectoral flipper. For added assurance, fire three shots in a line through the targeted area.

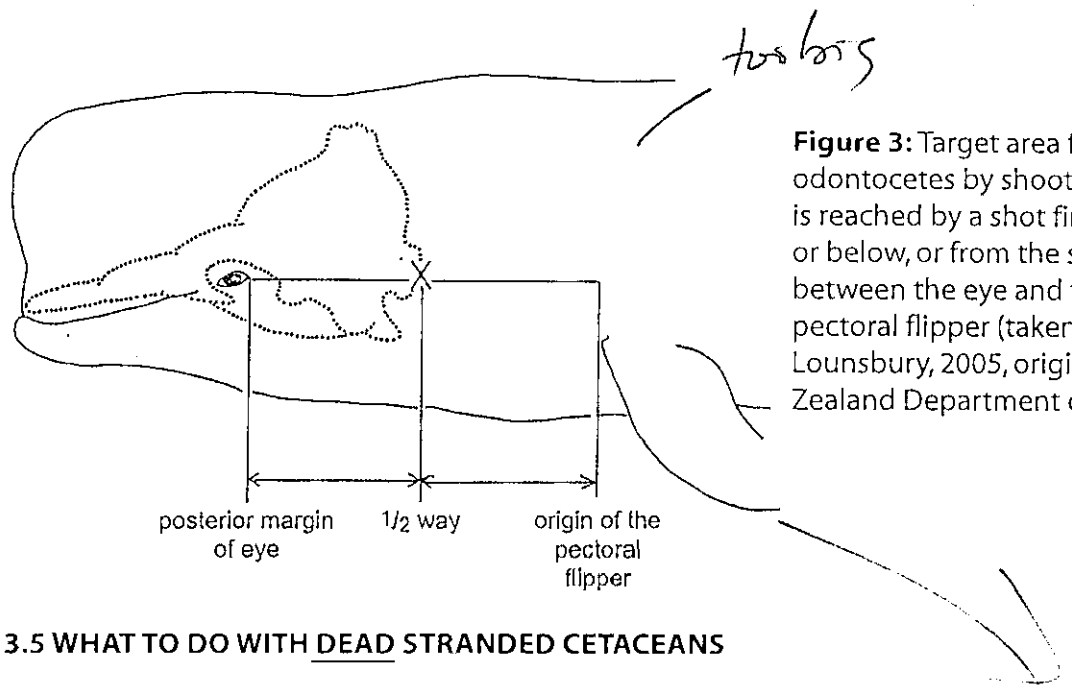


Figure 3: Target area for euthanizing odontocetes by shooting. The target X is reached by a shot fired from above or below, or from the side halfway between the eye and the origin of the pectoral flipper (taken from Geraci and Lounsbury, 2005, originally from New Zealand Department of Conservation)

3.5 WHAT TO DO WITH DEAD STRANDED CETACEANS

3.5.1 Safety

Marine animals harbour a variety of bacteria, viruses, fungi and parasites and it is thus a safe precaution to assume that any live or dead animal is a potential disease carrier. Some of these organisms are capable of being transferred to humans and have been transmitted from both live animals and carcasses. Some diseases are acquired by eating raw or undercooked tissue. The following precautions should be followed when dealing with a dead animal:

- If pregnant or easily susceptible to infections or diseases, avoid contact with stranded animals, carcasses, tissues, or fluids.
- Wear gloves (untorn) when handling animals, carcasses, tissues or fluids.
- Wear waterproof outerwear to protect clothing from contamination.
- Cover wounds with protective dressings.
- Wear face and/or eye protection when appropriate, e.g. during necropsies and close contact with diseased animals.
- Wash exposed skin and clothing after handling animals (or use hand sanitizer, e.g. Purell) in the field until washing facilities are available.
- Seek immediate medical attention for bites, cuts, and other injuries (inform medical attendant of the source of injury).
- Do not consume food or beverages in the vicinity of stranded animals or carcasses and then only after washing or using an appropriate hand sanitizer.

Any illness that develops after being exposed to stranded cetaceans should be brought to the attention of a physician.

Pets and other animals should be kept well away from the stranding area as they may be susceptible to infections carried by the stranded cetacean, and vice versa.

3.5.2 Handling the dead animal

- Do not enter deep water to get to a carcass especially when the water visibility is poor. A floating carcass or terminally ill cetacean often attracts sharks to the area
- Handle the animal with care to avoid contamination (it could be a potential health hazard)
- Tie down or secure the carcass - preferably in the water so that it will remain cool, delaying decomposition, and will still be there when the stranding team arrives. Take into account the tidal activity to prevent the carcass from being washed out to sea.
- If it appears that the carcass will be swept away, try to get photographs and information on the circumstances of the stranding.

3.5.3 Taking data and samples

Data to be collected from dead stranded cetaceans includes those on both Form 1 (for Level 1 Data) and Form 2 (for Level 2 Data). Details are provided under Section 4.

3.5.4 Preservation of fresh carcasses

In case biopsy (to gain information to assess the likely cause of stranding) cannot be conducted in the field, it is necessary to keep the carcass fresh for later examination. The following steps help in maintaining freshness of the carcass:

- Ice the animal or cover it with wet cloths.
- If available, the carcass should be moved to a convenient facility for preservation, e.g. in the shade, cool room or freezer room.
- Prevent mutilation of the specimen by explaining to offenders the potential health hazards and loss of valuable scientific material.

3.5.5 Carcass disposal

The carcass can be disposed of in any of the following means:

- Let it lie: The carcasses can be left to decompose naturally where it was found - only if the area is not easily accessible by people or near households and the animal is too large to be moved.
- Bury it: If feasible, carcasses can be buried deep enough to prevent it from being dug up by scavengers. Mark the site with the GPS so that the carcass can be located later for identification.
- Move it: If it is not possible to bury the carcass at the site and that it is a nuisance, hazard, or public health risk, it would be necessary to move it to another site. In the case of a large carcass where heavy equipment is not available or other factors prevent moving the whole carcass, cutting it up may be the only option to make moving the carcass possible.
- Tow it out to sea: When possible and more convenient, a large carcass (or many small ones) can be towed out to sea (approximately 80km or more, i.e. far enough offshore so that the current and wind will not bring it back) after all the necessary data is obtained.

4: DATA AND SAMPLES

Cetacean stranding provides an opportunity to collect valuable data and information on cetaceans inhabiting our waters "cheaply". The information that can be obtained from cetacean stranding are mentioned under section 1.1.2.

4.1 PHOTOGRAPHS/PICTURES

The saying that a picture is worth a thousand words also applies to stranding, especially pictures taken properly.

If there is no camera, attempt to make detailed drawings. However, for photographs:

- Use digital camera, and check images
- Use date/time stamp
- Shoot perpendicular
- Use a label/slate
- Take lots of photos

When taking photographs, the following guidelines will help in producing useful ones. These are illustrated in **Annex 4**. Some of these may not be possible or difficult to do on live stranded cetaceans.

Thus for live stranded animals, take photographs that are only possible and not stressful to the animal and also not risky for the photographer, following the guidelines. For stranded animals still in the sea, the dorsal fins and head can be targets where possible.

All photograph shots should be taken perpendicular to the target area and should include a label. The main target areas for photographs are:

(i) Full body shots (if possible),
- Lateral, left and right sides
- Dorsal (top) and ventral (underside)

(ii) Head and Genital
- both sides
- dorsal
- ventral
- genital - ventral

(iii) Appendages
- Doral fin
- Flipper
- Flukes

(iv) Scars and marks
- Lesion, parasites
- Wounds, e.g. boat strikes, entanglement marks

4.2 LEVEL 1 DATA (CETACEAN STRANDING FORM 1)

Cetacean Stranding Form 1 for Level 1 Data **(Annex 5(i))** is to be used to record data and information for all live and dead stranded cetacean(s). The form comprises the following sections and a description of each section is contained in **Annex 5(ii):**

- Header: includes the Record Identification Number, Details of recorder(s) and Date and time of stranding discovery.
- Location of the stranding including description of the specific site
- Event Type: whether a single or mass-stranding and where exactly the stranded animal(s) was/were found.
- Numbers of animals involved and age categories.
- Information on the stranded cetacean:
  - Condition of the animal(s) at examination-live or dead and if dead the stage of decomposition.
  - Individual Identification particularly useful for mass stranding.
  - Species identified from available guides.
  - Human interaction: observations on the animal that indicate some form of human interaction such as propeller and fishing gear marks.
  - Other observations such as whether the animal looks ill or have any other abnormality.
  - Morphological data such as sex, age class, measurement (total length) which can be actual or estimated.
- Specimen/Tissue: if any specimen and tissue sample are collected.
- Animal disposition: what happens to live stranded cetacean.
- Carcass disposal: what happens to the carcass of a dead stranded cetacean.
- Additional Information: any other information that does not fit under the specific headings used on the form.

Annex 5(iii) is a species identification guide for cetaceans that occur and are likely to be found in Samoa waters.

4.3 LEVEL 2 DATA (CETACEAN STRANDING FORM 2)

Cetacean Stranding Form 2 (**Annex 6(1)**) is to be used to record all data and information for each stranding and individuals in a stranding where the cetaceans are dead. The form comprises the following sections and a description of each section is contained in **Annex 6(ii)**:

- Header: includes the Individual Animal Identification Number which should correspond to the number on Form 1, 4.2. All information here, including location should correspond to those in Form 1 for this particular animal. If the species and sex were undetermined on Form 1, detail examinations here should confirm.
- Measurements: a total of 13 different measurements, including the total length, are recommended as illustrated in **Annex 6(ii).**
- External Examination: this involves external examination of the dead animal on (i) a general inspection and recording of information on the features on the body and (ii) a detailed examination of any human interaction sign(s) to confirm what the origin of interaction is.
- Internal Examination: this includes examination of the digestive system including stomach content; reproductive system (pregnancy/fetus) and examination of other organs when time and resources are available.

4.4 SAMPLES AND SPECIMENS

4.4.1 Basic Equipment

- Latex gloves
- Data sheets
- Waterproof markers/permanent labeling pen and paper
- Knives & scalpels
- 10 – 20ml sample containers/vials
- 70 - 80% ethanol
- Plastic bags
- Cooler to store samples
- Paper towel (to wipe clean scalpels before using it to collect samples from another dead animal)
- Jars and plastic bags for storing larger samples
- Tweezers to collect large parasites

4.4.2 Collection of Tissue Samples from Live Stranded Animals

Tissue samples are only collected from live stranded cetaceans on the skin and thus important to sample the right thing. It is the live cell layer of skin that is best for the extraction of DNA. Skin samples for DNA extraction can be obtained from live stranded cetaceans by scraping the skin using a Velcro pad along its body to a depth of 1.5-3 mm. This ensures that live cells are sampled. A veterinary biopsy punch held at a low angle to the skin, a scalpel used very gingerly or a "cheese grater" built for the purpose can be used to obtain the sample." (Hale, 1996) The tissue samples collected are preserved in 70% ethanol and/or the Velcro pads with samples are stored in 10-20ml jars with 70% ethanol.

4.4.3 Collection of Tissue and Other Samples from Dead Stranded Cetaceans

(i) Tissue samples (skin/blubber/muscle) - for genetic analysis

Clean scalpels/blades are used to cut out pieces of tissue (2 x 2cm-size of your fingernail). Use a new blade when collecting from a different animals. However, in case of re-use of the same blade, it should be wiped clean with a new cloth and ethanol before collecting samples from another animal.

The samples are best kept frozen (wrapped in aluminum foil). However, they can also be placed in a labeled vial with 20% dimethylsulfoxide (DMSO) in saturated NaCl or preserved in 70 to 85% ethanol. [Note: Do not preserve tissue samples for DNA analysis in formalin].

(ii) Digestive contents

Cut the stomach open with a clean knife and pull the stomach compartment out of the body cavity. For small animals, collect the entire stomach and contents and put into a garbage bag and freeze for later analysis. Make sure that the bag containing stomach and its contents is labeled with the record number, the location and date.

If the stomach is too large to remove, cut open the stomach compartment (along the surface of the stomach) and scoop contents into a sieve. Gently wash the contents with fresh water or seawater. Preserve all contents in 70% ethanol. [Note: Do not preserve stomach contents in formaldehyde solution as they dissolve small fish bones]. Also note if the stomach was empty and therefore no contents were collected.

(iii) Skeleton and Teeth/Baleen

The skull, jaw and teeth/baleen (if not separated from the jaw) of stranded cetaceans should be collected and catalogued. The head/skull can be buried to allow for decomposition and catalogued later for identification.

(IV) Other Tissues

For contaminant/toxicology analysis, tissues should be collected from the blubber, kidney and liver. Two cm2 pieces should be cut and stored in fat-free foil and freeze or in formalin.

The entire gonads, uterus/ovaries or testes can be cut out and preserved in 10% formalin. The gonads are used to determine the animal state of sexual maturity and its reproductive state.

(v) Parasites

If you see any parasites collect as many as possible into a jar of fresh water noting where they were found. If they are imbedded, cut the surrounding tissue out, preserve in 70% ethanol and freeze. Put any associated lesions in 10% formalin (Higgins and Noad, 2006). Parasites collected are preserved in a solution of 70% ethanol with 5% glycerin. If the solution is not available, parasites can be stored in a 10% formaldehyde solution.

4.4.4 Tissue Sample Handling

(i) Labeling and Storage

All samples must be labeled. Each sample container/vial should have duplicate labeling, one inside and the other outside on the container/vial. Each sample should include the following data:

- Reference number designating the individual animal
- Species
- Country & locality
- Date (dd/mm/yr)
- Name of Organization that collected the samples

Samples are kept in labeled vials with 70% ethanol.

(ii) Shipping of Samples

For tissue samples intended for shipping overseas for genetic analysis, they should be kept frozen until they are ready to be packed and shipped. The tissues are packed and shipped in vials with DMSO. If tissues are stored in ethanol, the ethanol needs to drained and substituted with DMSO for shipping.

All cetacean samples (in vials) must be packed/placed in a styrofoam box or cooler (and the carrier holding all relevant documents/permits e.g. CITES permits, for inspection by authorities).

Permits are required to export cetacean samples out of the country. These can be obtained from the Ministry of Foreign Affairs and Trade.

The recipient country may require import permits, e.g. CITES permits for animals listed on CITES Appendices. Ensure that the recipient is notified and will be there to receive the samples.

Print the name, address and telephone numbers of both the shipper and recipient on the Styrofoam box. Declare all samples on the quarantine form when going through customs.

(iii) Where to send for analysis and requirements

Tissue samples can be sent to the Division of Environment and Conservation of the Ministry of Natural Resources and Environment for the necessary permits required for export. In the case of CITES, the Ministry of Foreign Affair issues permits, with the Ministry of Natural Resource and Environment as the Scientific agency.

All tissue samples are sent for analysis to the:

School of Biological Sciences
University of Auckland
Private Bag 92019
Auckland,
New Zealand

References:

Geraci, J.R. and V.J. Lounsbury. 2005. Marine Mammals Ashore: A Field Guide for strandings, Second Edition. National Aquarium in Baltimore, Baltimore, MD.

Hale, 1996????

Higgins, Damien P and Noad, Michale J. 2006. Standardised protocols for the collection of biological samples from stranded cetaceans. Australian Government Department of the Environment and Heritage.

Marine Animal Response Society: www.marineanimals.ca/strandings/livecetacean_eng.html

Perrin, William. 2006. Necropsy or What to do with a dead cetacean. Southwest Fisheries Science Center La Jolla, California. Power point presentation at the Technical Meeting on Cetacean in the Pacific Islands, SPREP, Apia, Samoa.

Schofield, David, and Perry, Cynthia. 2005. Marine Animal Rescue Program-Reference Guide. Marine Animal Rescue Program (MARP) of the Conservation Department of the National Aquarium in Baltimore, Pier 3/501 East Pratt Street Baltimore, Maryland 21202-3194.

UNEP/ACCOBAMS. 2004. Guidelines for the Development of National Networks of Cetacean Strandings Monitoring. November 2004

ANNEXES

ANNEX 1: CONTACTS OF SAMOA COLLABORATING GOVERNMENT DEPARTMENTS AND OTHER AGENCIES FOR CETACEAN STRANDING

The following agencies are members of the Samoa Cetacean Stranding Network and can also be contacted during working hours in case one cannot get through to the numbers of the Coordination centre:

- Division of Environment and Conservation:
  - Contact person: Malama Momoemausu
  - Telephone: 31197, 31198 or 23800

- Fisheries Division:
  - Contact person: Toetu Pesaleli
  - Telephone: 20369 Ext 123

- Division of Internal Affairs:
  - Contact person: Atuaia Michael Liu-Kuey (Upolu) and Mulinuu Sua (Savaii)
  - Telephone: 23698 (Upolu) and 51174 (Savaii)

- Department of Police and Prison:
  - Contact person: Mulinuu Mulinuu
  - Telephone: 25418

- Livestock Division:
  - Contact person: Sina Taulealo
  - Telephone: 21052

- Samoa Visitors Bureau:
  - Contact person: Christina Leala
  - Telephone: 63500

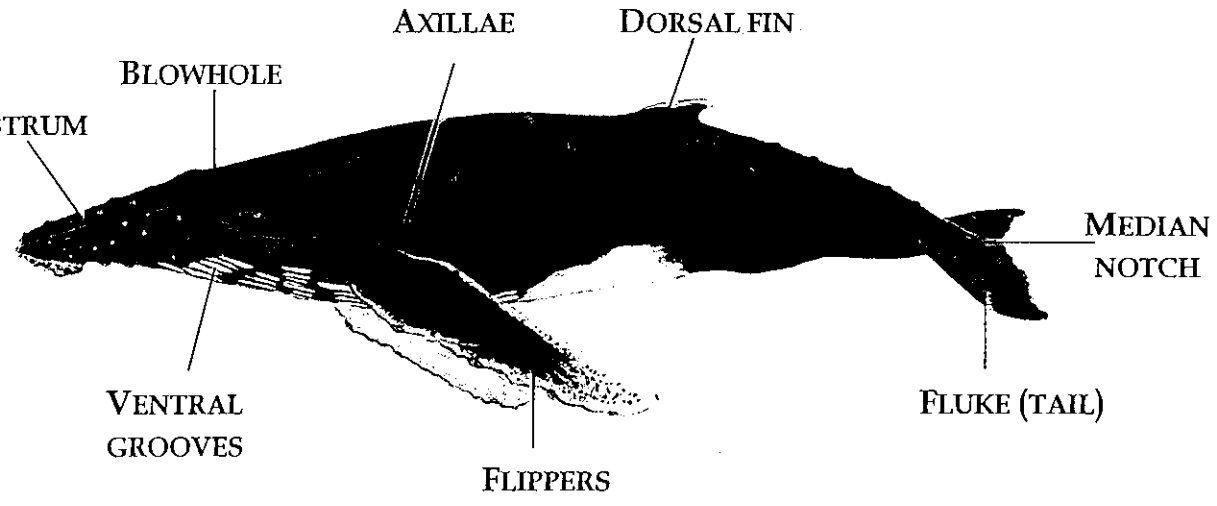
- National University of Samoa:
  - Contact person: Faainuaseamalie Latu
  - Telephone: 21428

- Aleipata and Safata Marine Protected Area Programme:
  - Contact person: Te'o Penaia (Aleipata) and Pauli Patolo (Safata)
  - Telephone:

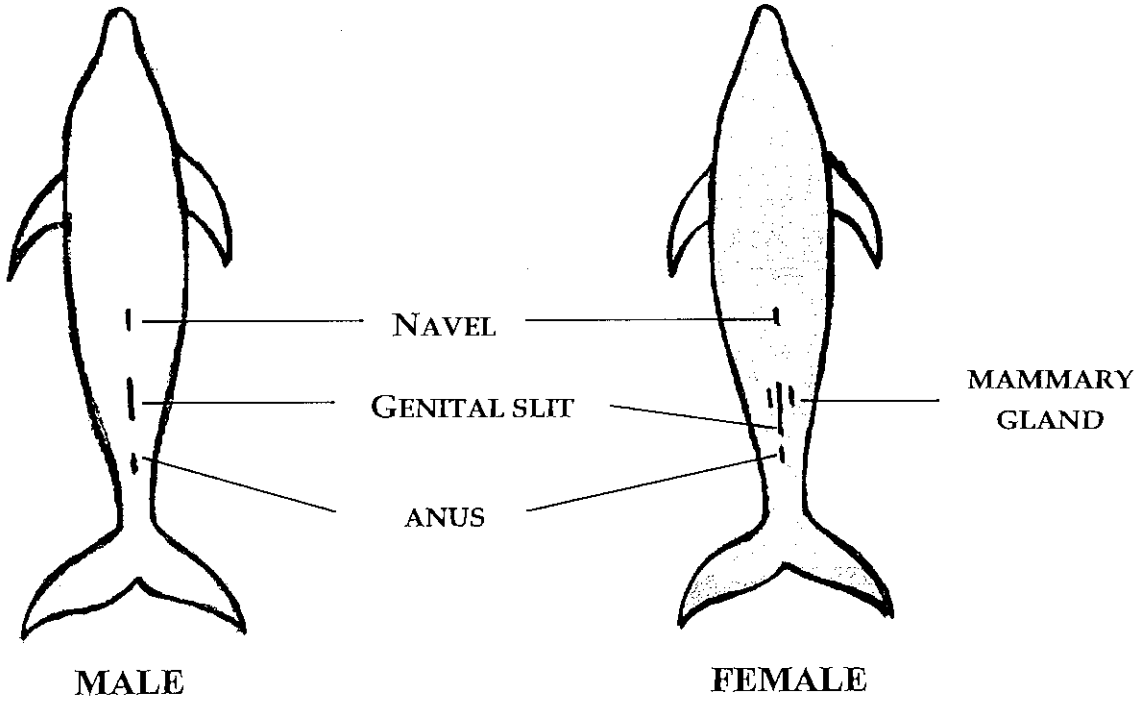
- Secretariat of the Pacific Regional Environment Programme (SPREP):
  - Contact person: Marine Species Officer or Associate Marine Species Officer.
  - Telephone: 21929

- IFAW Pacific
  - Contact person: Pacific Officer
  - Telephone: 66+++

ANNEX 2: GUIDE TO CETACEAN EXTERNAL ANATOMY



External features to distinguish the differences between male and female cetaceans



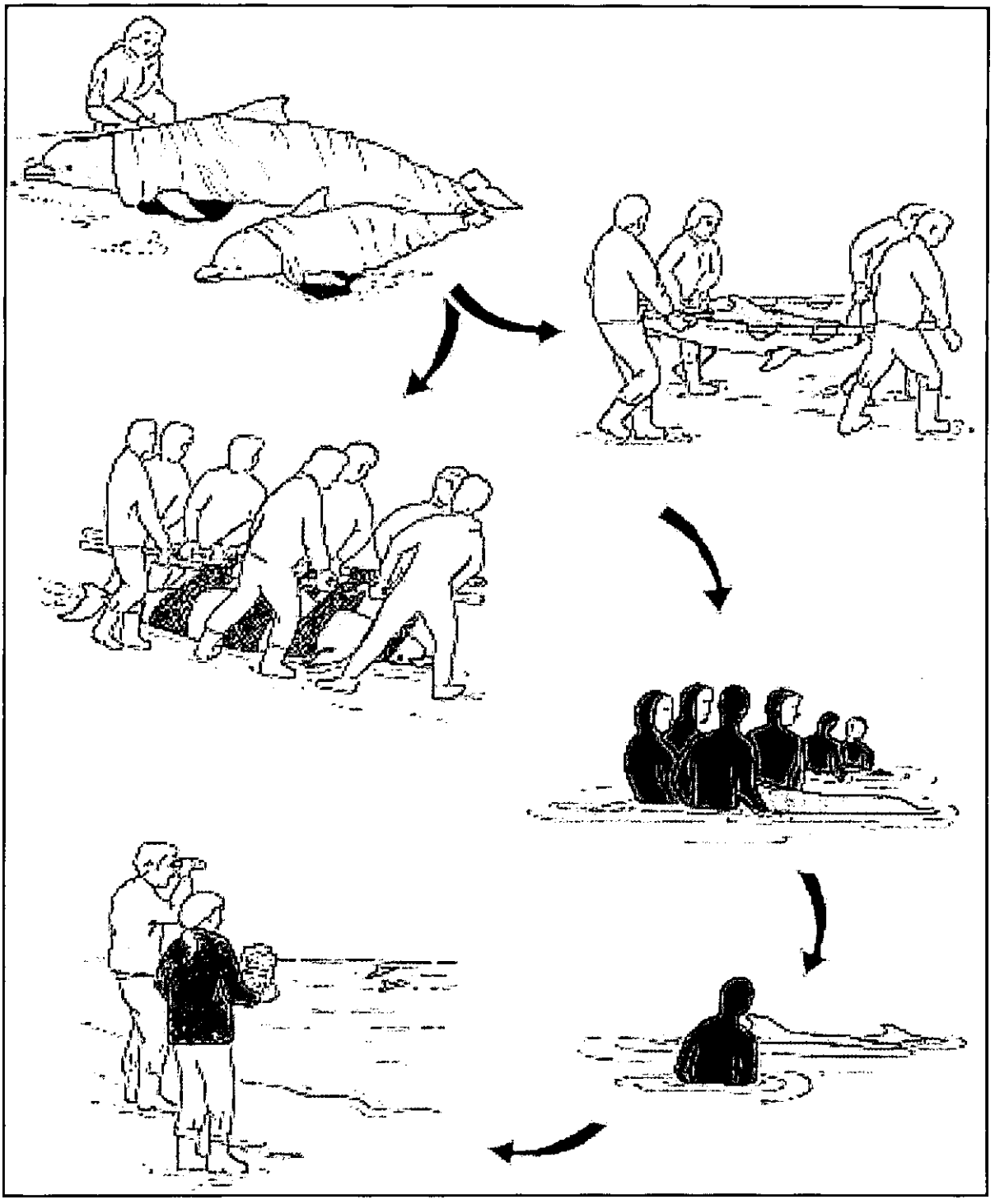
The underside features showing the differences between male and female cetaceans. The genital slit of a male cetacean is further away from the anus compared to the female cetacean. Female cetaceans also have mammary glands used to suckle their young with milk.

However, lack of mammary slits is not indicative of males as animals may be immature and have not yet developed mammary slits. For dead cetaceans, probing the urogenital opening can confirm the gender of the animal as for females, the direction of the opening is forward (towards the head) while that for males is toward the back (tail/flute).

ANNEX 3:

(i) GENERAL RESCUE SEQUENCE

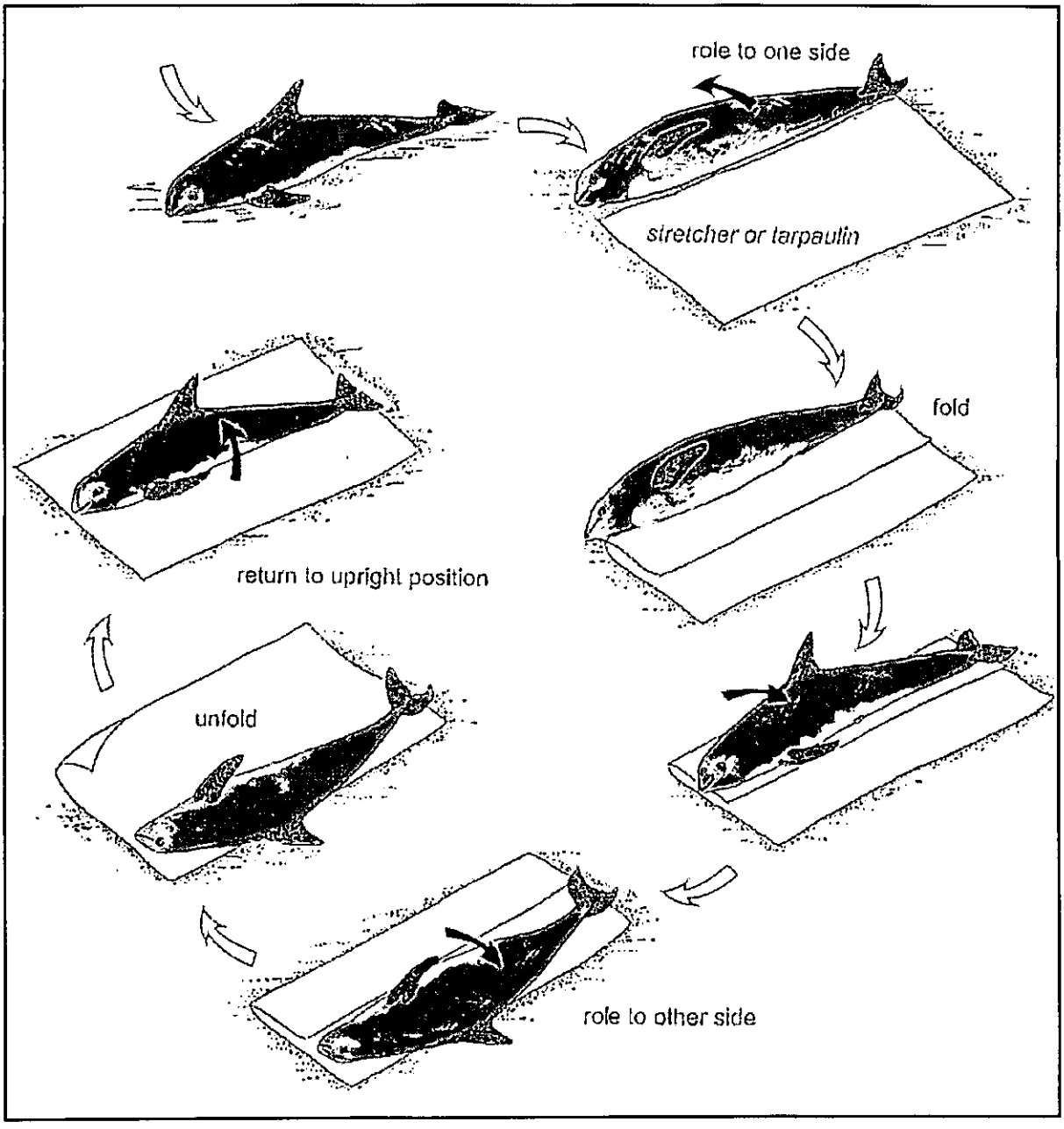
(Taken from Geraci and Lounsbury, 2005)



The general rescue sequence includes, (i) first aid and supportive measures; (ii) moving the animal to the water by lifting in a stretcher (or tarpaulin) or by dragging with a sling; (iii) support in the water with gradual acclimation; and (iv) observation and monitoring of released animal(s).

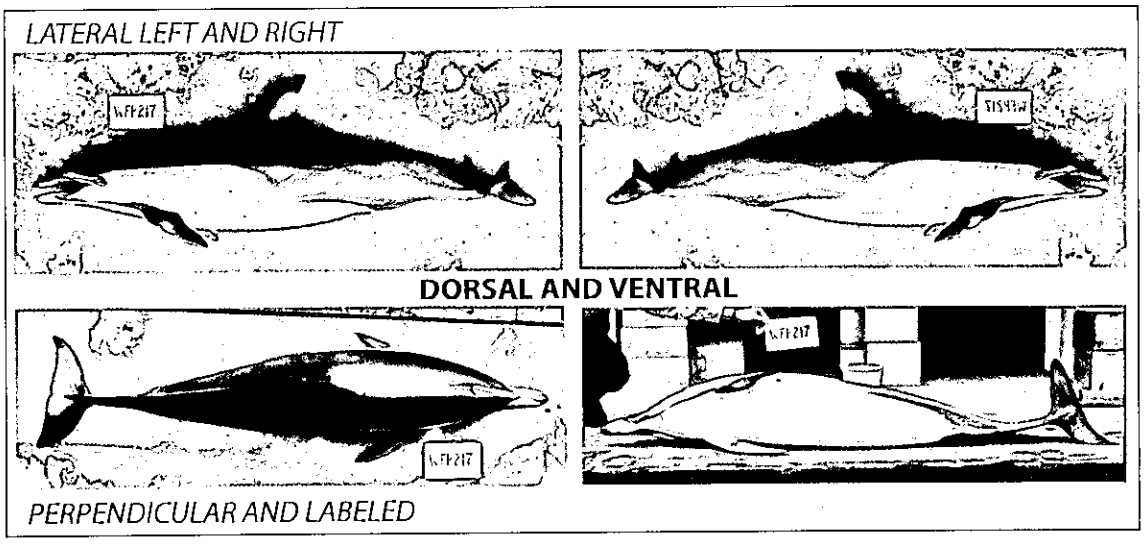
(ii) TECHNIQUE FOR POSITIONING HANDLING, LIFTING AND MOVING A LIVE STRANDED CETACEAN

(Taken from Geraci and Lounsbury, 2005)

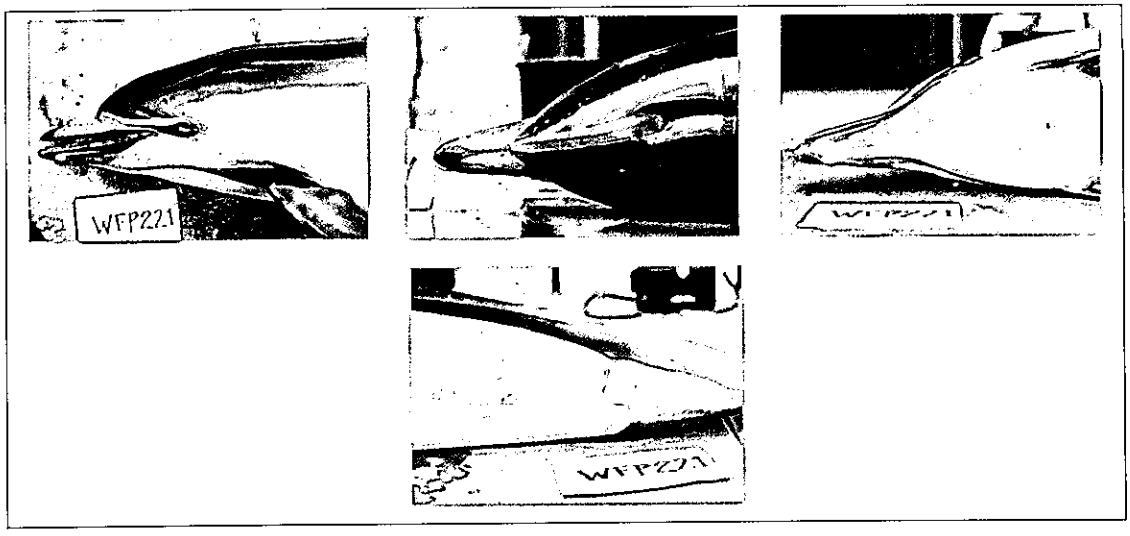


ANNEX 4: TAKING PHOTOGRAPHS OF STRANDED CETACEANS (Taken from Perrin, 2006)

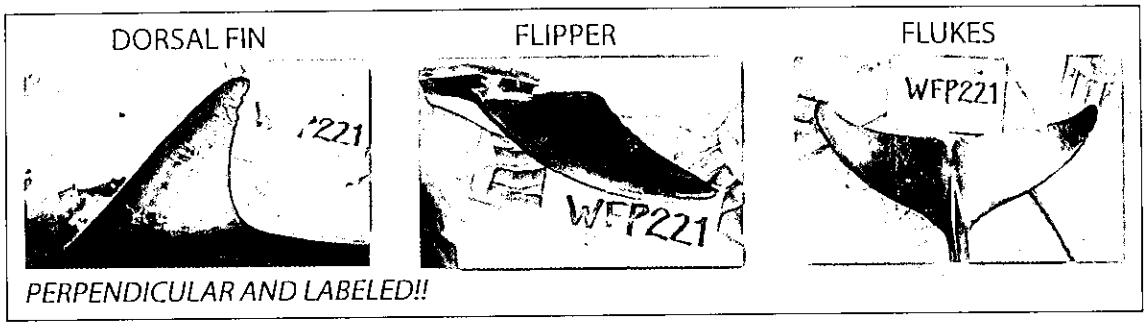
(i) Full Body Shots



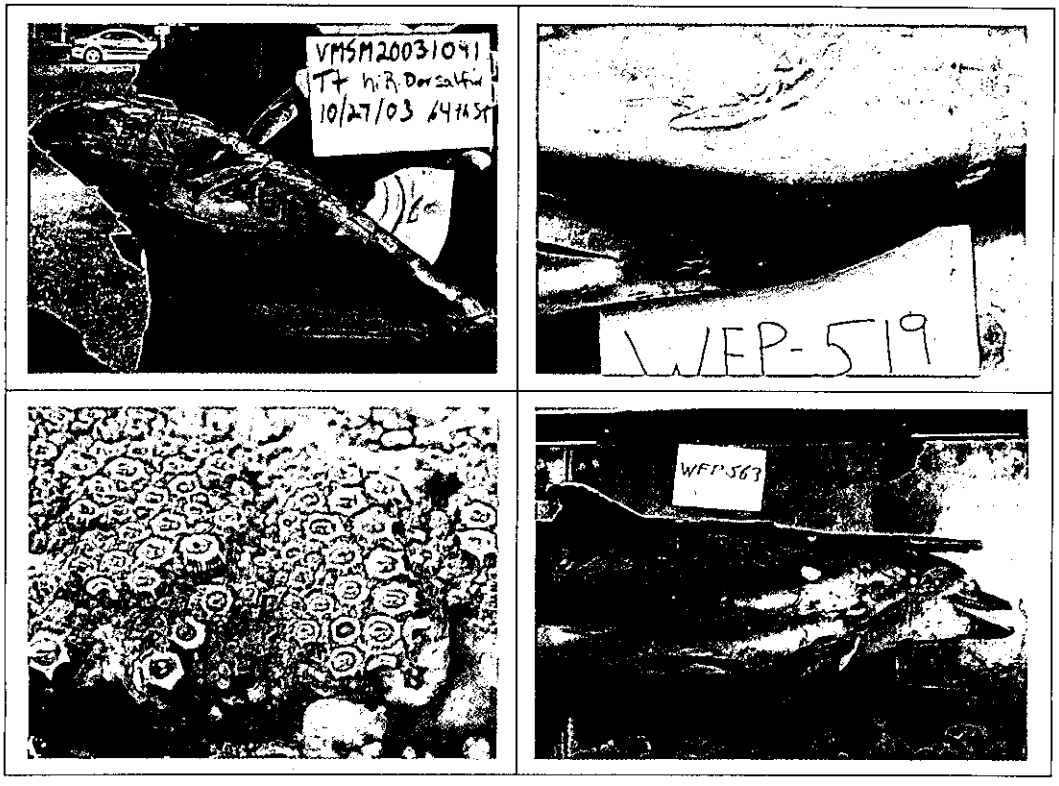
(ii) Head and Genitals



(iii) Appendages



(iv) Scars and Marks



ANNEX 5 (i): FORM 1 FOR LEVEL 1 DATA FOR LIVE AND DEAD STRANDED CETACEANS

CETACEAN STRANDING FORM 1

Record Identification #:	Examination Date:

Examiner(s)	Contact	Date Cetacean Found/Reported	Time Cetacean Found	Other

STRANDING & STRANDED CETACEAN(S) DETAILS

1. LOCATION OF STRANDING:

Village/District/Island:	GPS reading: Lat: Long:

Description of location including coastline description:

Pre-stranding/beaching information:

2. EVENT TYPE: Circle/tick the correct box(es) listed below. A maximum of two can be chosen, 1 from first 3 and 1 from last 2)

Beach or land	Floating	Swimming	Individual	Mass Stranding

3. NUMBERS: Enter actual number beside each age category listed below.

Adults:	Sub-adults:	Calves:	Unknown:	Total:

4. INFORMATION ON THE STRANDED CETACEAN(S)

4.1 Condition at Examination: Circle/tick correct box in first row below, and then add correct corresponding numbers in box below it.

Alive	Fresh dead	Moderate decomposition	Advanced decomposition	Mummified/Skeletal
Numbers:	Numbers:	Numbers:	Numbers:	Numbers:

FOR MASS STRANDING, A SEPARATE FORM FOR THE FOLLOWING INFORMATION MUST BE FILLED FOR EACH INDIVIDUAL EXAMINED

4.2 Individual Identification:

4.3 Species: Use species id cards to aid		Not sure:

4.4 Human Interactions (HI): Circle/tick applicable box of any category listed below. Refer to Form 2, Part 4(ii)

Boat collision	Shot	Fishery interaction	Other HI	Injured	No HI	Could not be determined

4.5 Other Observations:	Illness	Skin	Injury type	Abnormalities
Comments:				

4.6 Morphological data: Circle/tick appropriate box under Sex and Age and enter length measurement

Sex/Gender:			Age Class:				Measurements:		
Male	Female	Unknown	Adult	S-adult	Calf	Unknown	Straight length:_____cm	Actual	Estimate

5. SPECIMEN/TISSUE ETC: Circle/tick appropriate box in first row below and enter info in box below it, e.g. who has sample etc

Specimen	Tissue Sample	Necropsy	Photographs	Other

6. ANIMAL DISPOSITION: Circle/tick the appropriate box in first row below and insert any other info e.g. numbers, in box below it.

Left at site	Released at site	Relocated	Disentangled	Died at Site	Euthanized	Used-Specify	Other

7. CARCASS: Circle/tick the appropriate box in first row below and insert any other info e.g. numbers, in box below it.

Left at site	Buried	Burnt	Towed	Sunk	Frozen for later examination	Unknown

ADDITIONAL INFORMATION

Please return Form to:
Principal Marine Conservation Officer
Division of Environment and Conservation
Ministry of Natural Resources and Environment
Apia, Samoa
Phone: 31197 Fax: ????

ANNEX 5(ii): DESCRIPTION OF SECTIONS OF FORM 1 FOR LEVEL 1 DATA

Header

Before conducting the external examination of individual animal(s), fill in the general information section of Form 1 concerning the stranding event:

- Record Identification Number: this is very important for referencing especially when Form 2 for necropsy will be filled. The recommended formula for this number is the village name and the date using (ddmmyy) e.g. Fagalii_13/6/08. This means the stranding was at Fagalii on 13 June 2008.
- Details of recorder (Name & Contact)
- Date (dd/mm/yy) and time of first discovery

1. Location

Location of stranding includes GPS reading (latitude and longitude, to 0.1 minute, where possible, village, district, island), a brief description of the area (eg, whether the beach is accessible to people or households) and its topography, which could be helpful in determining whether it contributes to the stranding. A description whether the animal(s) was/were observed first somewhere else will be useful.

2. Event Type

This section of the Form seeks information on how the animal(s) was/were found, stranded on the beach/land, floating in the sea or swimming in an area but cannot escape and whether it is an individual or mass stranding. Thus there are two choices which can be ticked, one from the first three options provided (beach or land, floating, and swimming) and one from the last two options (individual or mass stranding)

3. Numbers

This section needs to be filled for both an individual stranded animal and for a mass stranding as it requires placement of the animal(s) in appropriate age category as listed. For mass stranding, there is a possibility of the presence of a calf or calves with adult animals and the appropriate category should be filled with corresponding numbers.

4. Information on the stranded cetacean

4.1 Condition of animals at examination

Five categories describing the condition of the stranded animal is used (taken directly from Geraci and Lounsbury, 2005). For mass stranding, note the number of individuals under each category listed:

- **Live:** animal is breathing etc
- **Fresh dead:** carcass appears normal, with little scavenger damage, fresh odour, minimal drying and wrinkling of skin, eyes, or mucous membranes; eyes clear; carcass not bloated; tongue and penis not protruded; blubber firm, white and semi-translucent. ++?
- **Moderate decomposition:** carcass (and other organs) intact, bloating evident (tongue and penis protruded), and skin cracked and sloughing; possible scavenger damage; characteristic mild odour; mucous membranes dry, eyes sunken or missing; blubber blood-tinged and oily. ++
- Advanced decomposition: carcass may be intact but collapsed; skin sloughing; epidermis may be entirely missing; often severe scavenger damage; strong odour; blubber soft, often with pockets of gas and pooled oil; muscles nearly liquefied and easily torn, falling easily of bones.
- Mummified/skeletal: skin may be draped over skeletal remains; any tissues are desiccated.

For mass stranding, corresponding number of animals are recorded for each category observed.

4.2 Individual Identification:
In the case of mass stranding, where more than one individual is examined, the individual identifier is necessary for each individual examined. The recommended format of the Individual Identifier is the "Record Identification Number" used under the form Header and adding a number to indicate the number of the individual examined, e.g. Fagalii_13/6/08_2 is for the second animal recorded/examined for the stranding that occurred at Fagalii on 13 June 2008. Taking photographs with this identifier is needed for ease and accurate referencing.

4.3 Species
Species is determined using the IFAW or Whales & Dolphins of Samoa guides. Good photographs will help in the confirmation or identification of species where it is not possible to do so in the field. Photographs need to have the "Individual Identification" included as recorded for ease and accurate referencing as well as confirmation of species.

4.4 Human interaction
This section of the form records observations on the animal that indicate some form of human interaction (cuts or marks from propeller or fishing gear etc), that would be useful in determining the extent of these on cetaceans and which may link to the stranding itself. Seven options are used for recording human interaction. However, for dead stranded cetaceans, information resulting from detailed examination is recorded on Part 4(ii) of Form 2.

4.5 Other observations
Information included here include other observation, e.g. whether the animal looks sick with no external signs of injury, or if the animal has injuries and any other abnormality.

4.6 Morphological data
Sex determination: Female cetaceans usually have mammary glands (slits) present on both sides of the urogenital opening and that the urogenital opening is closer to the anus (refer Annex 2).

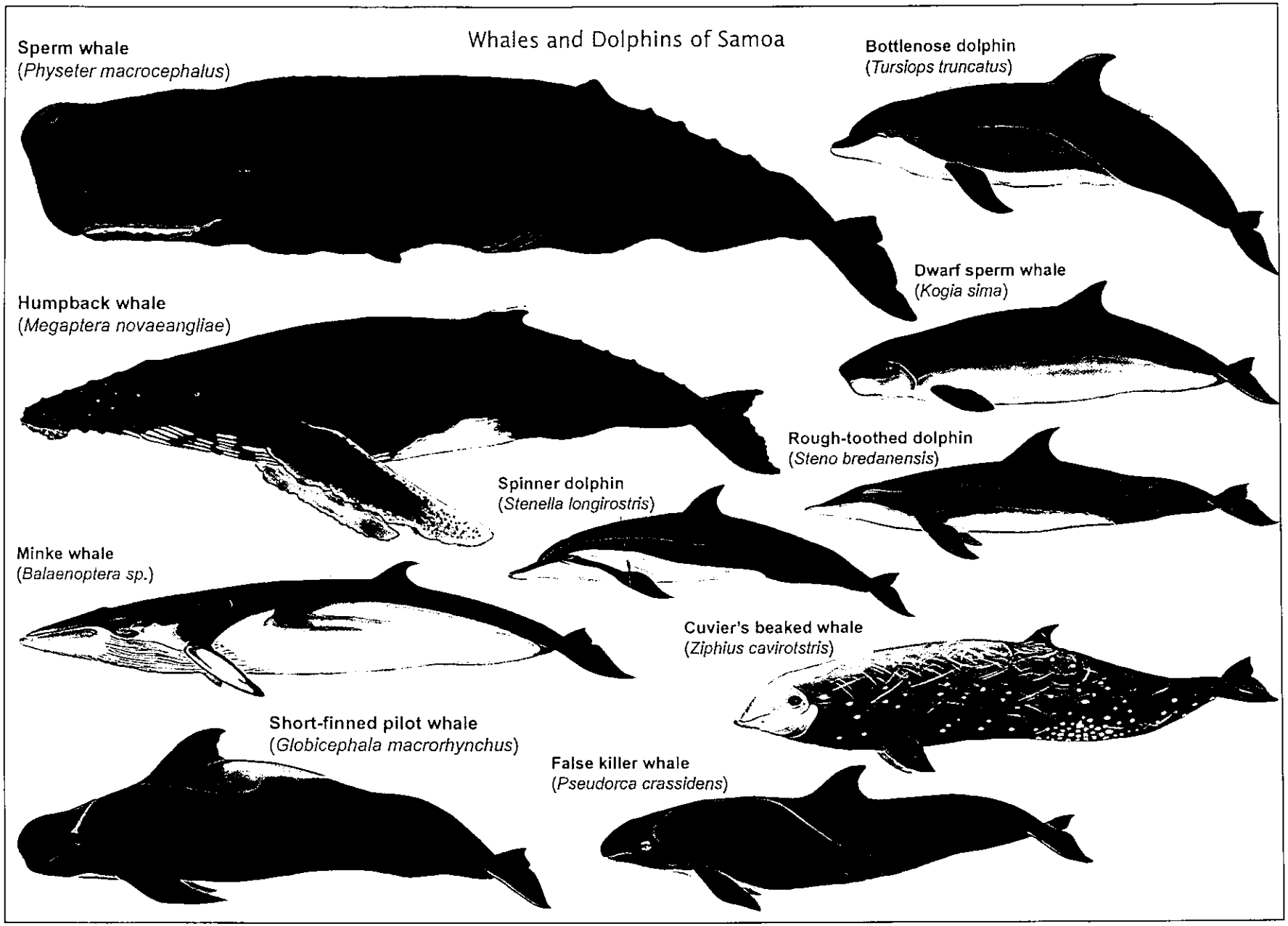
- **Age class:** Three age classes are used, Adult, Sub-adult, Calf. In case the age class cannot be classified, note it as Unknown.
- **Measurements:** The only measurement requirement as Level 1 data is the total straight length which is measured from tip of the upper jaw to deepest part of fluke notch. It must be noted whether the measurement recorded was actually conducted using a tape or whether it is only an estimate. If it is difficult or risky to take the actual measurement, make the best estimate possible.

5. Specimen/Tissue
This section of the form needs to be filled if specimens and tissue samples are collected for further analysis etc. Space is provided for information such as who has the sample etc.

6. Animal disposition
This section of the form refers to what happens to a cetacean that was stranded alive. Space is also provided for any additional information.

7. Carcass disposal (fate)
This records the fate of the carcass of a dead stranded cetacean. If a stranded cetacean died at site, this section also needs to be filled. Space is also provided for additional information.

8. Additional Information
Any additional information that cannot be fitted under specific headings in the front of Form 1 can be recorded at the back. If referring to a heading in the front of the form, make sure proper reference is made. Otherwise this space is provided for any additional information the recorded reckons is of importance.


Whales and Dolphins of Samoa
Sperm whale
(Physeter macrocephalus)
Bottlenose dolphin
(Tursiops truncatus)
Dwarf sperm whale
(Kogia sima)
Humpback whale
(Megaptera novaeangliae)
Rough-toothed dolphin
(Steno bredanensis)
Spinner dolphin
(Stenella longirostris)
Minke whale
(Balaenoptera sp.)
Cuvier's beaked whale
(Ziphius cavirotstris)
Short-finned pilot whale
(Globicephala macrorhynchus)
False killer whale
(Pseudorca crassidens)

ANNEX 6(i): FORM 2 FOR LEVEL 2 DATA FOR DEAD STRANDED CETACEANS

CETACEAN STRANDING FORM 2

NECROPSY

Examination date:

Record Identification #:	Individual Identification:

Recorders(s)	Contact	Other Info

1. LOCATION OF STRANDING:	
Village/District/Island:	Date of stranding:

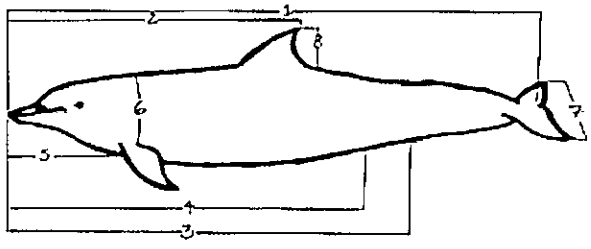
2. SPECIES:		
Scientific name:	Common name:	Not sure:

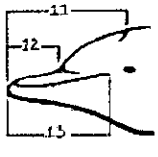
3. SEX:	Male	Female	Undetermined

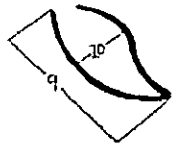
4. MEASUREMENTS

All measurements, with the exception of 6, should be taken in a straight line, not around the curve of the body. Measurements are to be in centimeters (cm). The numbers correspond to the numbers illustrated on the figures on the bottom of this page.

	Measurement	Length (cm)	Notes
1.	Total length (from tip of upper jaw to deepest part of fluke notch)		
2.	Tip of upper jaw to tip of dorsal fin		
3.	Tip of upper jaw to anus		
4.	Tip of upper jaw to genital slit		
5.	Tip of upper jaw to front of flipper		
6.	Axillary girth, immediately behind flippers. (do not measure if bloated)		
7.	Greatest width of tail (fluke)		
8.	Height of dorsal fin		
9.	Length of flipper		
10.	Width of flipper		
11.	Tip of upper jaw to blowhole		
12.	Length of rostrum		
13.	Length of gape (tip of lower jaw to corner of mouth)		
14.	Blubber thickness		







4. EXTERNAL EXAMINATION (reference: mammals ashore)

(1) General (refer to Cape cod's also)

General condition:

- Lesions (body sliced etc):
- Deformities/natural markings (scars, tooth rakes, unusual pigmentation etc):
- Appearance (including % skin missing):
- Colour:
- Gear/debris present on animal:

Parasites (pox, tattoo lesion, abscess, other):

Mouth/teeth:

Eyes:

Blowhole/nostrils:

Anus and urogenital openings:

Mammary slits/glands:

Fins/flukes/flippers (any missing, mutilated etc):

(ii) Detail Human Interaction Examination[1] (based on Cape Cod et al)

Anatomical area	Type of lesion					Comments	Origin of Lesion
	Impression/ laceration	Penetrating wound	Healed HI scar	abrasion	Other/CBD		
Rostrum							
Mandible/tongue							
Head							
Right flipper							
Right body							
Dorsal fin							
Left flipper							
Left body							
Ventrum							
Peduncle							
Fluke/tail							

5. INTERNAL EXAMINATION

System	Organ	Information/observation
Digestive	Stomach	
	Stomach (contents etc)	
Reproductive	Gonads	
	Pregnant/fetus	
Other		

[1] Refer to Protocol for Evaluating Stranded Cetaceans for Signs of Human Interaction

ANNEX 6(ii): DESCRIPTION OF SECTIONS OF LEVEL 2 DATA (CETACEAN STRANDING FORM 2)

HEADER

(i) Record Identification #
It is important that this number corresponds to the number on Form 1

(ii) Individual Animal Identification
It is important that this number corresponds to the number on Form 1, Section 4.2.

All other information in 1, 2 & 3 of the header, i.e. location, Species and Sex of Form 2 should correspond to those in Form 1 for this particular animal.

If the species and sex were undetermined on Form 1, detail examinations here should confirm these and then entered here.

4. Measurements

All measurements should be taken in a straight line, not around the curve of the body except 6. Measurements are to be in centimeters (cm). The numbers correspond to the numbers illustrated on the Figure 3 (i), (ii) and (iii) below and also printed on the bottom of Form 2.

1. Total length (from tip of upper jaw to deepest part of fluke notch)
2. Tip of upper jaw to tip of dorsal fin
3. Tip of upper jaw to anus
4. Tip of upper jaw to genital slit
5. Tip of upper jaw to front of flipper
6. Axillary girth (immediately behind flippers)
7. Greatest width of tail (fluke)
8. Height of dorsal fin
9. Length of flipper
10. Width of flipper
11. Tip of upper jaw to blowhole
12. Length of rostrum
13. Length of gape (tip of lower jaw to corner of mouth)

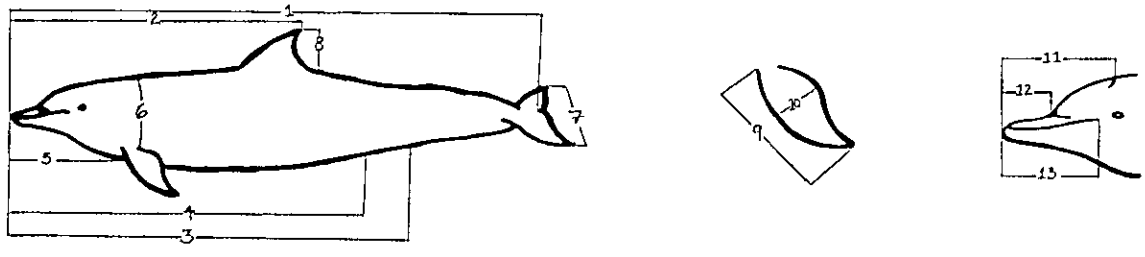


Figure 3: Measurements for cetaceans, (i) body measurements, (ii) flipper measurements, (iii) head measurements.

4. External Examination

The external examination of the dead animal involves (i) a general inspection and recording of information on the features on the body and (ii) a detailed examination of any human interaction sign(s) to confirm what the origin of interaction is.

(i) General

- General body condition
  - Lesions: Record any lesions and nature of the lesions e.g. whether body sliced with one or more cuts, and whether fresh or healed etc. Also note the area where lesions are on the animal body
  - Natural marks/Deformities: Record any scars, tooth rakes and bite marks, unusual pigmentation etc. Also note the area where these appear on the animal body
  - Appearance: Note the whole body appearance whether +++
  - Colour: +++
  - Gear/debris: Record any gear/debris is entangled on the animal and also note the type and area where they are stuck on the animal

- Parasites/External pathology?: Record any signs or lesions that seems to be related to diseases or any other unexplained lumps etc
- Mouth/teeth: Note parasites or abnormalities e.g. worn or broken/missing teeth, fractured or abraded baleen. Also note the number and position of teeth and degree of tooth wear or for baleen whales, the number colour and length of the longest baleen plate.
- Eyes: Examine eyes for clarity, surface lesions, injuries, and discharges.
- Blowholes: Note any parasites, discharges, or obstructions.
- Anus and urogenital openings:
- Mammary slits/glands: attempt to express milk, note colour and consistency.
- Fins/flukes/flippers: note any missing, and if mutilated in any way etc

(ii) Detailed Examination of any Human Interaction

- Type of lesion
  - Impression/laceration: An impression occurs when a line or net leaves an indentation but does not lacerate or abrade the skin/pelt. Impressions left by net or line usually wrap around the leading and/or trailing edges of a fin, flipper or fluke. Impressions on the leading edge of an appendage may line up with a similar mark on the trailing edge. A laceration occurs when the skin is cut. Net and line usually leave linear lacera tions. These lacerations may be evenly spaced along an appendage (indicating net) and may be accompanied by impressions
  - Penetrating wound: occurs when a foreign object punctures or deeply penetrates the body, generally characterized by a small external wound and a wound tract that extends deep into the tissue and often into the body cavity. Sources of penetrating wounds include gaff, knife stab, spear, arrow, gunshot (especially bullet), etc.
  - Healed HI scar: similar to a natural scar in pigmentation, but exhibits similar charac teristics to the other types of lesions (e.g. linear scars on leading edges of append ages consistent with entanglement, parallel scars consistent with prop strike, etc.). Evidence of HI, even if healed and not likely associated with the stranding event, should still be noted as HI under section 4 of this form and section 4.4 of Form 1.
  - Abrasion: occurs when gear or debris rubs an area and scrapes the skin/pelt without forming an obvious laceration. This often occurs with heavy line or twine entangle ment or when loose or trailing ends of gear/debris rub (abrade) parts of the body
  - Other/CBD (cannot be determined): for any other types of lesions and describe.

- Comments: Any comments concerning the type of lesion marked.
- Origin of Lesion: Based of the results of the examination, the decision as to the origin of the lesion(s) should be recorded. Origins of lesion for HI include (i) Gear, such as twine/line, net, monofilament, multifilament and other sources such as propeller and gunshot. Also note if the origin cannot be determined.

5. Internal Examination

The carcass should be placed on a plastic when opening it for internal examination. Place it on its side (preferably left side) and make the initial incisions as shown on Figure 4. The blubber and skin is removed to the level of the skeletal muscle along the lateral body wall. Figure 5 show internal organs from the side.

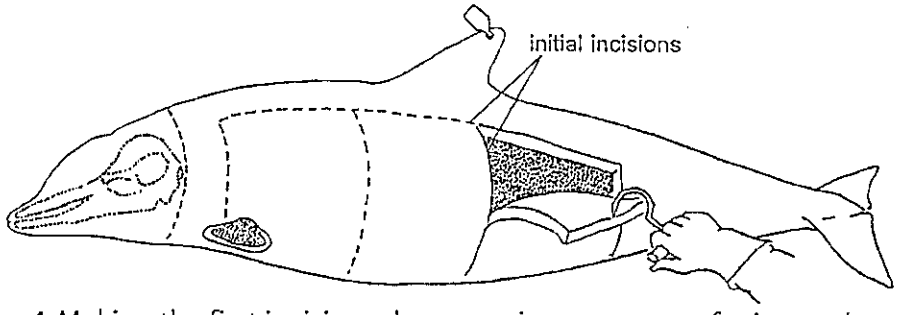


Figure 4: Making the first incision when opening a cetacean for internal examination (taken from Geraci and Lounsbury, 2005)

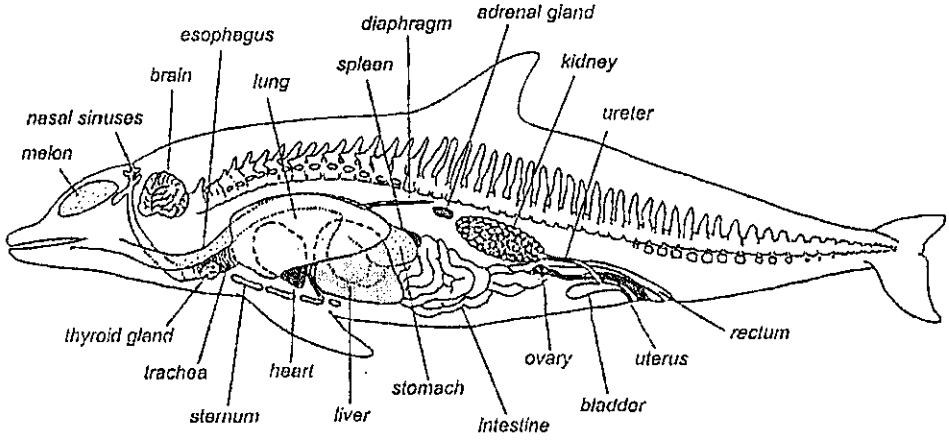


Figure 5: Cetacean internal organs seen from the side (taken from Geraci and Lounsbury, 2005)

(i) Digestive system

Dissect the gut free from the mesentery. If the examination will be done later, freeze the stomach and contents or cut and drain or flush (using fresh or saline) the contents into a plastic bag or bucket and freeze if necessary. For cetaceans

- Stomach: note any perforations or any odd observations.

- Stomach contents: note items that can be distinguished including their relative percentages. Also be sure to note any foreign objects such as plastics etc. Contents may include prey species, macerated flesh, skeletal fragments etc. [Note: in cetaceans, the contents needed for dietary analysis are in the first stomach).

(ii) Reproduction system

- Pregnant/fetus: note if pregnant, and if so and possible, weigh and take the length measure ment of the fetus. Note any other observation.

(iii) Other

Examination of other organs can be conducted if time and resources are available. Refer to other manuals for details.