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A GUIDE TO OILED WILDLIFE RESPONSE PLANNING



International Petroleum Industry Environmental Conservation Association

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The document represents a unique stage on the road to integrated, consistent, oiled wildlife contingency planning, and has required many disparate organizations and agencies to reach a consensus on best practices, techniques and approaches for oiled wildlife response. The result is a tribute to the flexibility and cooperation of all the contributors, as well as the Sea Alarm Foundation for creating an environment in which this could occur.

Chris Morris
General Secretary, IPIECA

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CONTENTS

- 2 PREFACE
- 3 INTRODUCTION
- 5 EFFECTS OF OIL ON WILDLIFE
- 8 RESOURCES AT RISK
- 10 OBJECTIVES OF OILED WILDLIFE RESPONSE
- 13 RESPONSE ACTIVITIES
- 22 OPERATIONAL ASPECTS
- 30 HEALTH AND SAFETY
- 32 RESPONSE PLANNING
- 44 APPENDIX 1
- 45 APPENDIX 2
- 46 APPENDIX 3
- 48 ACKNOWLEDGEMENTS

PREFACE

Despite the steady reduction in the frequency and volume of oil spills over the past decade, an oiling incident may occur, without warning, anywhere in the world. The problem caused can be acute, e.g. from a damaged oil tanker, or chronic, resulting from an ongoing release and accumulation of oil. Regardless of the source or size of the incident, there is every likelihood that, as a result of a significant release of oil, there will be wildlife casualties. In some instances there may be a warning about the impending threat; in others none at all, the first evidence that something is wrong being the appearance of oiled wildlife casualties on the beaches. Whether the numbers of oiled casualties are few or counted in tens of thousands, the problem needs to be dealt with, both from a humanitarian and a conservation perspective.

Animals suffering from oil exposure or contamination need prompt and appropriate treatment, ranging from rehabilitation to euthanasia. Dead animals can reveal important information and need to be collected in a systematic way to allow for an impact assessment. Wildlife mortality can mobilize a myriad of groups and individuals, some of whom will assist while others will hinder rehabilitation efforts through protest. The media will tend to pay disproportionate attention to the wildlife problem in an oil spill incident.

When wildlife is impacted or threatened it is essential that a wildlife response plan designed to meet pre-spill defined objectives in a timely, effective and efficient way can be implemented immediately.

The importance of wildlife response planning is increasingly understood, creating a need for information and guidance.

This *Guide* provides an overview of the different components of oiled wildlife response. It focuses on critical planning issues and response options. The aim is to provide a useful reference document for oil spill managers, government officials, and industry representatives who may be called upon to make important decisions regarding the fate of wildlife in the immediate aftermath of an oil spill.

INTRODUCTION

Accidental oil spills, including oil tanker spills, non-tanker ship spills, pipelines, oil production platforms and tank farms, may cause serious problems for coastal and marine wildlife, especially birds, mammals and reptiles. On a worldwide scale, oiled wildlife incidents occur less frequently than oil spill incidents, simply because not every oil spill causes a wildlife problem. However, if a wildlife problem does occur as a consequence of the oil spill incident, the success of oiled wildlife rehabilitation, and an adequate assessment of environmental impacts, will depend on a comprehensive wildlife response plan.

Animals soaked in oil arriving on beaches tend to receive a lot of attention in the media and evoke an emotional reaction from the public, especially, if endangered species are involved, or if a unique and internationally protected habitat is threatened. Even a relatively small oil spill may attract international attention, especially if wildlife populations of high conservation value are impacted. Authorities responsible for critical habitats will be very sensitive to the year-round risks threatening those, as well as protected species. They may be confronted with an incident of scale and scope which exceeds their administration capability. All wildlife stakeholders need to be prepared for plausible worst case situations.

What are the key features of an effective oiled wildlife response?

1. Responders working safely.
2. Joint primary aims of the response to mitigate the impacts on wildlife welfare and conservation values threatened or impacted by the oil spill event.
3. Systematic objective data collection to facilitate impact studies where legislative and compensation regimes mandate such assessments.
4. Responsible utilization of resources, and auditable documentation of costs.
5. Cooperative and collaborative inclusion of wildlife and environmental stakeholders in planning and operations.
6. Utilization of widely accepted protocols and practices.
7. Minimization of the environmental impact of the wildlife response activities.
8. Adherence to legal permitting requirements for wildlife interactions, including capture, holding, marking and release of wildlife.
9. Wildlife response integrated into wider oil spill response effort.



A volunteer with an oiled bird

The planning of an effective oiled wildlife response needs serious attention and will require the inputs and cooperation of, for example, administrators, oiled wildlife response experts, oil spill response experts and relevant stakeholders. Owners of the wildlife response plans will need to test them through regular exercises and during incidents, and improve them through continual review.

This document aims to provide guidance for local stakeholders for the preparation of a functional and successful wildlife response plan.

It should not, however, be considered a blueprint that can be copied to any situation. Rather it is a rich source of information that can provide insight into the critical elements of a well organized, efficient oiled wildlife response in its broadest sense, and which provides some practical guidelines for the development of an effective plan.

The first chapters of this *Guide* provide a general introduction to a wildlife response. The *Effects of Oil on Wildlife* (page 5) describes the physical and population impacts on mammals, birds and reptiles that are exposed to spilt oil. *Resources at Risk* (page 8) describes how one can identify at local levels the species at risk from oil pollution, and describes how key information can best be presented in a response plan. The case that oiled wildlife response is not limited to the rehabilitation of animals is explained in *Objectives of Oiled Wildlife Response* (page 10) which also deals with some of the ethical dilemmas of a response to oiled wildlife. *Response Activities* (page 13) covers the activities typically employed in an oiled wildlife response, and describes the facilities that are needed. *Operational Aspects* (page 22) deals with the issues critical to the successful operation of an effective and cost-efficient response, and *Health and Safety* (page 30) emphasizes the risks to response personnel of injury and infection from wildlife, and how to minimize them. The final chapter, *Response Planning* (page 32) provides some guidelines for the planning process, and details critical issues to be addressed.

EFFECTS OF OIL ON WILDLIFE

When oil spills occur, there is likely to be an immediate impact on the environment and the wildlife present. Birds may be perceived by the media as the highest priority for response attention, but other groups of animals, including invertebrates, fish, reptiles and mammals, can also be affected. Currently, active rescue and rehabilitation efforts are only considered for birds, mammals and reptiles.

Specific effects of oil on wildlife vary depending on species vulnerability, the chemistry of the specific petroleum product or mixture, weather, time of contact, weathering of oil and many other factors. In general however, effects can be divided into those that are due to the toxicity of the various components of the oil in question and those due to the physical effects resulting from contact with the product. Across species, direct contact with oil may cause burns, and irritation of skin, eyes and mucous membranes. Ingestion may cause disruption of the gastro-intestinal and immune response systems along with damage to organs such as the liver and kidneys. Inhalation may lead to respiratory and neurological damage/disorders. Secondary effects related to captivity should not be overlooked and may include pressure sores, damage to feathers or skin, lack of appetite and spread of infectious diseases. Every effort should be made to avoid these secondary effects and minimize the time animals spend in captivity.

Birds

The first, and often most important, effect on birds is external contamination of the feathers from contact with oil. This can cause a disruption of the delicate feather structure which traps warm air next to the body and keeps cold air and water away from the skin. Oil contact temporarily disrupts this intricate structure of barbs and barbules, thus interfering with the bird's ability to thermo-regulate. Most animals in these circumstances quickly become hypothermic (or hyperthermic) and will seek shelter to stay alive. Those reaching shore are often unable to find food, because of the individual's inability to return to the sea to feed. They become dehydrated and hypoglycaemic and are prone to predation.

The internal effects of oil come mainly from ingestion through preening, feeding on oiled prey or vegetation, or drinking contaminated water. Such effects can be from the physical presence of oil in the gastro-intestinal tract, as well as the absorption of poisonous components of the petroleum product such as polycyclic aromatic hydrocarbons (PAHs).



A Common Guillemot oiled on the beach

Dehydration may result from decreased food consumption, increased metabolic demand due to hypothermia or hyperthermia, fluid loss through diarrhoea and decreased absorption due to irritation in the gastro-intestinal tract.

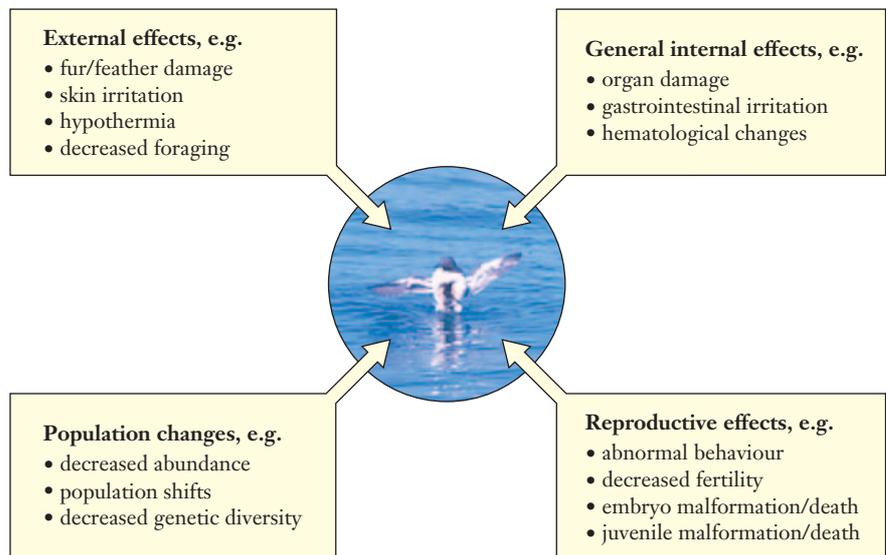
Gastro-intestinal impacts may include general irritation, ulceration and destruction of the microstructure of the actual tract. Ingestion of oil may also have toxic effects on the liver and other organs through detoxification and excretion of PAH metabolites, as well as leading to anaemia and suppressed immune system function by destruction and/or decreased production of avian blood cells. It should be noted that dehydration, starvation and stress may all contribute to anaemia and immuno-depression, and that the relationships between lesions on major organs in birds and hydrocarbons are not entirely clear.

Inhalation of volatile fumes can damage lungs and cause inhalant pneumonias, as well as neurological impairment such as ataxia. Long-term effects may include decreased reproduction through altered breeding behaviour, as well as adverse effects on eggs and embryos and impaired growth/malformations of hatchlings.

Mammals

Many of the effects on mammals are similar to those on birds. While many marine mammals depend on a layer of blubber to insulate them and maintain body temperature in a cold environment, some species, such as otters and fur seals, depend upon their fur in a similar fashion to birds’ dependence on their feathers. Oil can coat the fur on these animals and collapse the layer of air trapped within, quickly leading to hypothermia or hyperthermia as well as affecting their ability to swim. It also causes irritation to the eyes and skin, and ingestion or inhalation may damage the liver and kidneys as well as lead to

*Figure 1
The effects of oil on animals and their populations*



pneumonia. Adult seals do have the ability to metabolize and excrete some oil through the liver and kidneys but this is less developed in the young and is not effective in cases of high exposure.

During the *Exxon Valdez* and *Braer* oil spills, a number of seals were exposed to oil and a range of effects noted, for example, harbour seals (*Phoca vitulina*) exposed to oil changed their behaviour, with many becoming lethargic and unusually tame, allowing close approach. On necropsy (animal autopsy), some of these animals showed lesions in the brain. Both harbour and grey seals (*Halichoerus grypus*) showed respiratory distress. Clinical signs included conjunctivitis, corneal ulcers, skin ulceration and bleeding of the gastro-intestinal tract and lungs.

There is little documented evidence of effects of oiling on whales. Increased mortality and stranding rates sometimes happen during oil spill events but, normally, a link to oiling is difficult to make. Nevertheless, inhalation of oil droplets and fumes is a potential risk, if whales surface to breathe in a slick.

It should be noted that Phocidae ('true' seals) can tolerate a degree of oiling on their pelts which can be 'lost' at moult.

Effects on mammals can also include abnormal reproductive behaviour, increased embryonic death, lowered survival rates of young and increased rates of abandonment.

Reptiles

Sea turtles

Oiling may impact sea turtles in a variety of lethal and sub-lethal ways. Oil and tar balls have been found in the mouth, oesophagus and stomach associated both with oils spills (acute) as well as areas of chronic oiling. These species can pursue and swallow tar balls, and appear unable to detect, or unwilling to avoid, oil. It can adversely affect respiration, blood chemistry, energy metabolism, diving patterns and salt gland function. Oil close inshore or on beaches may affect both females travelling to their breeding ground to lay their eggs and newly emerged young attempting to reach the sea.

Marine iguanas and other species

There is a suggestion that oiling may affect the gastro-intestinal system of marine iguanas, thereby impairing their ability to digest the marine vegetation that is their food source. Other marine species, such as crocodiles and species exploiting the intertidal zone, are potentially at risk both from both oil on the beach and clean-up response activities.

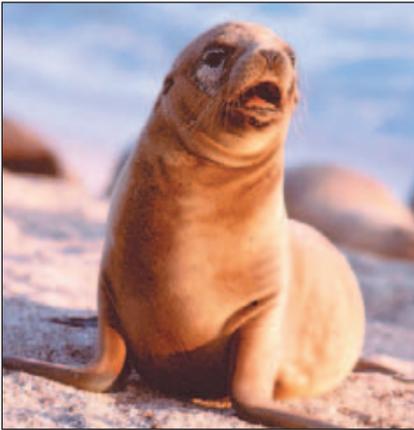


Oiled seal



Marine iguana

RESOURCES AT RISK



Galapagos Sea Lion pup

Any wildlife response plan needs an assessment regarding the species that occur within its geographic limits. This information is important in the pre-spill planning process, in real-time spill planning, and in the initiation of the wildlife response and its ongoing efforts. A wildlife plan should identify potential impacts of an oil spill, the resources at risk and the type of animals that may need protection or to enter rehabilitation. If fully integrated with the wider oil spill response plan it could identify whether the protection of various resources would require the use of, for example, protective booming, specialized hazing stockpiles, capture or rehabilitation equipment, or coating of shorelines with sorbents etc. All of this information should be presented in a user-friendly format that responders can readily access to quickly determine the environmentally important areas and species to protect.

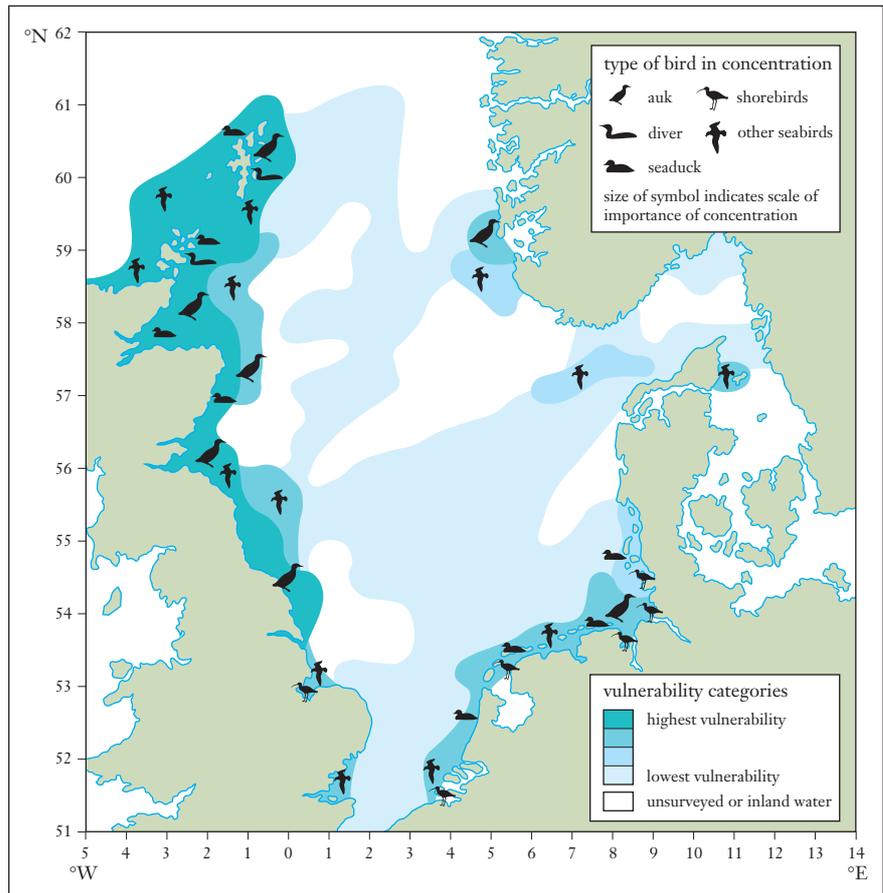


Figure 2
Example of an oil vulnerability map—
North Sea in June

General information regarding important habitats as well as groups of animals that utilize the areas and the seasons when they may be present should also be made available. This should identify areas and species of particular sensitivity and risk to oiling, and direct the responder to other more detailed sources of information that may be available, such as coastal sensitivity studies detailing shoreline types, access points, priority protection areas or species of special concern. Experts with local knowledge of wildlife populations and distributions near areas of potential impact, including at sea, should also be listed. This information may be conveyed in a variety of ways including tables, maps and lists.

Coastal sensitivity maps can provide a quick, general visual overview of the geographical areas threatened and the wildlife that may be present. Tables or lists are best for detailing information regarding species, seasons, specific use of habitats (feeding, resting, breeding), vulnerability to oiling (see Table 1), and response options. (See also *Sensitivity Mapping for Oil Spill Response—Volume 1* in the joint IMO/IPIECA Report Series).

Species of special concern

Special attention should be given to bird, mammal, reptile and amphibian species of special concern within the geographical scope of the plan. The critical information on any species (e.g. vulnerability to oiling, conservation status) is best collected by consulting local, national and international resources, but should be provided in a way that allows quick decision making in emergency situations.

*Table 1
Oil vulnerability index for North Sea birds
A proven way of expressing the vulnerability of individual species is the oil vulnerability index (OVI). The OVI, developed for birds, can be calculated by ranking 14 characteristics for each species in three main categories: Range (breeding, migration, wintering, marine orientation); Habits (roosting, foraging, escape, flocking, nesting density, specialization); and Exposure (spring, summer, autumn, winter). Each of these characteristics is ranked on a 6 point scale (0-5) and add up to provide the OVI. The table provides the 'top 15' ranking of seabirds from the Southern North Sea, and includes the exposure characteristics and the 'oil rate', i.e. the percentage in which the species tends to appear oiled in beached bird surveys. (Data from Camphuysen, 1998)*

Species	OVI	Oil rate	Exposure			
			Spring	Summer	Autumn	Winter
Razorbill (<i>Alca torda</i>)	64	83	5	5	5	5
Guillemot (<i>Uria aalge</i>)	62	82	5	5	5	5
Puffin (<i>Fratercula arctica</i>)	62	66	5	5	5	5
Eider (<i>Somateria mollissima</i>)	56	25	5	3	5	5
Gannet (<i>Sula bassana</i>)	54	86	5	5	5	5
Kittiwake (<i>Rissa tridactyla</i>)	54	80	5	5	5	5
Common scoter (<i>Melanitta nigra</i>)	52	75	5	1	5	5
Great black-backed gull (<i>Larus marinus</i>)	52	38	5	3	5	5
Velvet scoter (<i>Melanitta fusca</i>)	52	60	5	1	5	5
Little auk (<i>Plautus alle</i>)	51	44	3	0	3	5
Fulmar (<i>Fulmarus glacialis</i>)	50	64	5	5	5	5
Red-throated diver (<i>Gavia stellata</i>)	50	87	5	3	5	5
Great skua (<i>Stercorarius skua</i>)	48	60	5	3	5	3
Black-throated diver (<i>Gavia stellata</i>)	47	70	5	0	5	5
Lesser black-backed gull (<i>Larus fuscus</i>)	46	38	5	3	5	3

OBJECTIVES OF OILED WILDLIFE RESPONSE



Feeding an oiled bird (Prestige, 2002)

Human safety must always be considered first. If a wildlife response cannot be done safely, it should not be attempted. Each plan will have unique priorities that reflect the risk assessment; however, there are key components related to wildlife that should be considered in each plan as a minimum. Risk assessment of all actions associated with the oiled wildlife response during the pre-spill planning process can help to identify unacceptable risks and offer removal or mitigation actions to reach acceptable levels of risk.

The most important objective of any response to oil pollution is to minimize environmental impacts. This can be accomplished by:

- preventing oil reaching critical habitats by using protective booming and/or other response technologies;
- reducing the oiling of wildlife by preventing animals from entering the impacted environment; and
- if practical, the initiation of pre-emptive capture and removal of animals at risk.

If animals *are* oiled and the necessary resources are available, rehabilitation can be effective in minimizing the impact.

Dead and dying oiled wildlife attract and contaminate predators or scavengers, thus the prompt removal of oiled bodies will reduce secondary exposure. It must also be remembered that once oiled animals have been collected, carcasses and other oiled waste must be disposed of in accordance with national/local legislation.

Almost as important as minimizing environmental impacts of an oil spill is their assessment and documentation so that actual impacts can be identified. Such actions should include the documentation and identification of all collected individuals. These can provide valuable biological information (sex and age class, etc.) that is essential to evaluate more fully the impact of the spill on the affected population(s), as well as provide opportunities to collect collateral scientific data that would be otherwise unavailable. Although costs may be incurred in the collection of these data which are not recoverable, such data could assist in the determination of total mortalities, and to assess and document potential short- and long-term impacts on populations and habitats. There may be legal requirements for collection of samples and other evidence. Such requirements

Table 2

Rehabilitation of oiled wildlife: common arguments

Whether to attempt the rehabilitation of oil-affected wildlife has probably been debated since the moment the first oiled bird was found. Irrespective of personal beliefs, it is of value to have an understanding of some of the arguments presented both for and against the rehabilitation of oil-affected wildlife.

Basis for argument	Arguments for	Arguments against
Philosophical	<ul style="list-style-type: none"> ● Anthropogenic: oil spills are caused by humans and as such there is an ethical responsibility for humans to mitigate the damage to the environment and the individual animals who are impacted. ● We have the ability: this argues that we should alleviate the suffering and return animals harmed by oil spills to their natural habitat because we are able to do so. 	<ul style="list-style-type: none"> ● The rehabilitation of oiled wildlife causes stress and suffering. Those unlikely to survive should be euthanized.
Biological/ecological/conservation	<ul style="list-style-type: none"> ● When a significant percentage of a population of a threatened or endangered species is oiled successful rehabilitation can make a very real difference in that species' survival. ● The techniques developed working with oiled individuals of common species can be utilized when a spill threatens rarer species. 	<ul style="list-style-type: none"> ● Rehabilitation of oiled wildlife has no impact on the population. ● Oiled wildlife may not reproduce.
Legal	<ul style="list-style-type: none"> ● There are legal requirements for the rehabilitation of oil-affected animals in some countries. 	<ul style="list-style-type: none"> ● Some countries have legal requirements that strictly prohibit interference with wildlife.
Effectiveness	<ul style="list-style-type: none"> ● Post-release survival data are encouraging for a number of species. 	<ul style="list-style-type: none"> ● Survival records are bad for a number of species.
Public opinion	<ul style="list-style-type: none"> ● The public may demand that oiled wildlife be cared for and may attempt to do so themselves if an organized effort is not mounted. 	<ul style="list-style-type: none"> ● Unprofessional, clumsy interference with oiled animals will not be accepted by the public.
Financial	<ul style="list-style-type: none"> ● The cost of rehabilitation of oiled wildlife is a small percentage of the overall response. 	<ul style="list-style-type: none"> ● Rehabilitation of oiled wildlife is too expensive.



Humane euthanasia of severely oiled birds. Various environmental circumstances (extreme cold, inaccessible areas, etc.) may prevent the rapid capture and subsequent rehabilitation of oiled animals. In some countries, the shooting of oiled birds is considered the most humane alternative to minimizing animal suffering in the aftermath of a spill. Such a response may be considered questionable in other countries due to cultural differences; this can lead to misunderstanding, and is one example of how controversy can build around an oiled wildlife response.

should be determined as part of the planning process. Appropriate procedures and forms may be available from the overall oil spill plan, or should otherwise be included in the wildlife response plan.

A humanitarian objective of wildlife response is to minimize animal suffering. While some slightly oiled animals may survive, those more heavily oiled will die. Prompt initiation of an oiled wildlife response that quickly and effectively collects these animals and provides either a means for humane euthanasia or rehabilitation and release will minimize their suffering. This will also reduce the impact on preying or scavenging animals that may be contaminated by them. It should be recognized that this objective precludes the option of no response if oiled animals are present. In situations where resources are not available to provide effective rehabilitation, this objective still requires euthanasia and collection unless human safety prevents it.

Secondary objectives for an oiled wildlife response include the need for effective communications with the media and providing the opportunity for the local community volunteers to become directly involved in a response, for example, as volunteers. Local resources should be included in the planning process. Experience has shown local community input is critical to the success of many oiled wildlife responses. Often, providing care to oiled wildlife portrays the response operator's commitment for taking responsibility for the accident and for making the environment and the community whole again. Oiled wildlife and the associated reaction is the most photogenic of all aspects of the spill response and, thus, is most often the primary focus of media attention. If no organized response is present, pictures of impacted animals in the media will often stimulate members of the public to attempt to help the animals themselves, potentially putting their families and the animals at even greater risk. Conversely, an organized oiled wildlife response that is part of the wider incident management effort can provide opportunities for interested members of the public to become involved in, and safely contribute to, the response effort. A plan which allows for the inclusion of volunteers in the response can effectively channel the general public's energy safely while providing critical manpower resources to the wildlife response. But it should provide for careful management of these volunteers, including, for example, appropriate training and the supply of personal protective equipment.

Incident appraisal



Incident appraisal should involve the collection of the following key information:

- size of spill, type of oil, expected drift and weathering of oil released, etc.;
- location of oil in relation to sensitive wildlife areas;
- time of year/season (affects behaviour of animals and habitats they may be using);
- potential threat to wildlife at sea and on the shore;
- potential for further pollution;
- wildlife and habitat already impacted;
- estimate of the number of losses at sea (unreported casualties);
- resources available;
- need for external support;
- consideration of the need for triage/euthanasia.

Hazing techniques

Visual techniques include balloons, reflectors, flags, etc. Auditory techniques include loud noise and alarms or the use of wildlife distress calls. Occasionally, a combination of activities can be used, for example, a carefully prepared flight path before or after dispersant spraying can deter wildlife from impacted areas.

Incident assessment and monitoring

A competent incident assessment will be key to a successful response, and will help determine the magnitude and nature of the response needed.

Whereas strategic objectives should be clearly identified as part of the plan, priority actions are decided on the basis of incident assessments. These normally take place on a day-to-day basis throughout the operation. A wildlife response that is fully integrated into the overall contingency plan will benefit directly from information that is centrally collected, e.g. oil movements, weather forecasts. The routine aerial survey flights that track oil movements could also be accessed by wildlife responders. This can provide additional relevant information, such as the presence of wildlife in threatened areas or the number of oiled animals at sea.

These additional data will allow responders to anticipate and plan for an appropriate level of response and make the necessary adjustments (scaling up, scaling down).

Preventing wildlife from becoming oiled

Preventing wildlife from becoming oiled is not always possible. The incident command centre must separate what is feasible from what is not, based on a technical assessment of the situation, balanced with a realistic expectation for success and reasonable cost benefit. Some methods that can be used specifically to prevent wildlife from getting oiled are described below.

Deterrence/hazing

Sometimes it is possible to keep clean, healthy individuals away from the oil. In many instances, such efforts are only practical in 'near-perfect' conditions. A variety of deterrents—visual, auditory and sensory—can be used and are collectively referred to as *hazing*.

It should be noted that hazing at sea is more difficult than on land, especially with drifting oil. From time to time the technique applied to scare animals may need to be altered due to habituation. Hazing works best in small, well-defined spill areas such as small bays, harbours, narrow inlets etc., which can be surrounded by a variety of scaring devices. An attempt at hazing should be well planned and should be devised with input by those familiar with the local species and their habitat, the topography, and a variety of hazing techniques. There must be clean areas for animals to move to where they will not be disturbed. It is important to ensure that hazing efforts do not make the situation worse by inadvertently moving animals into the oiled area or causing oiled animals to scatter.

Pre-emptive capture

This strategy aims at capturing animals before they have the opportunity to become oiled. Such an undertaking, however, is complex and requires good pre-planning. Pre-emptive capture is best restricted to species that are relatively easy to capture or of particular interest, e.g. endangered animals. Before considering this approach, a complete plan including capture, transport, holding and release strategies and resources should be identified.

Record keeping, evaluation and reporting

Throughout the wildlife response operation, records should be kept for purposes of impact assessment, evaluation (lessons learnt) and submission of claims for compensation.

For the impact assessment, it is crucial that an estimate of the total number of animals affected (dead or alive when found on the beach), the species, their age structure and their (possible) origin are provided. Dead animals as well as live individuals washed ashore should be recorded and examined. The fate of the live creatures throughout the process of rehabilitation (euthanasia or death, rehabilitation, tagging and release) should be individually recorded and reported, ideally on a centralized database where all data are regularly collated. Pro-forma data collection forms should be agreed with stakeholders (scientific and other institutes, welfare organizations) in advance of any incident.

To be able to evaluate the response and the adequacy of the contingency plan, and to obtain compensation for money spent on rehabilitation efforts, it is important that records be kept of the response activities, the input of human and non-human resources, and the decision-making process at any stage of the response.

Dealing with dead casualties

Corpses provide essential information for an impact assessment and wider ecological interest. Therefore, the adequate and systematic collection and storage of dead oiled animals is essential. Each corpse must be individually labelled for later identification and analysis. Details should include location, date found and cause of death and, if the animal died in rehabilitation, any additional activity undertaken such as cleaning, blood sampling, feeding, etc.

Collected individuals are received and logged on arrival at the post-mortem centre. If numbers are large, labelled corpses should, wherever possible, be deep frozen. In the case of low numbers and adequate facilities, animals can be processed immediately. Dead specimens may be kept for later reference, evidence (a legal requirement in some countries) or scientific research and natural history collections. Processed carcasses must be disposed of properly.

How to assess impact

- Calculate numbers of affected animals per species, sex and age category.
- Identify colonies/populations of origin as accurately as possible.
- Report the information in an accessible format.
- Examine survival or population trends in potentially affected colonies (where monitoring data are available).

Incident reporting and publication

A report written on the incident and the response can be used for future reference. Such a report should include lessons learned and recommendations for modifications of the response plan.

Publication in an international peer-reviewed paper is also recommended so that the experience can be shared internationally.

Planning for drift experiments

- Drift blocks or representative corpses should be made available or prepared in advance.
- Samples should be put out at sea in a way that the natural die-off at sea is adequately mimicked.
- Search effort should stay identical during the drift experiments.

Beach surveys of oiled birds

Research on the search for, and recovery of, birds after an oil spill has demonstrated that a number of carcasses will not be recovered. These should, however, be taken into account when assessing the total mortality of the incident. Such losses can result from:

- rewash—birds that wash ashore, but refloat at a later tide;
- predation/scavenging;
- search efficiency—birds may be overlooked due to their colour and small size, as well as the search method (e.g. by foot, or vehicle); individuals may also travel considerable distances from water to seek shelter in dunes or vegetation;
- departure from the area—birds (in particular those that are lightly oiled) may leave the area and never be found;
- removal/burial by the public—it may be necessary to inform the public of the importance of reporting dead individuals.

Assessment of birds lost at sea

It is important to estimate total mortality rather than just numbers washed ashore. Therefore, an estimate may need to be made of the numbers of casualties lost at sea. Drift experiments will help determine how likely it is that oiled birds will be washed ashore. This is particularly useful for offshore spills. In near-shore incidents where most birds are still alive when arriving on shore, the losses at sea may be considered insignificant.

Necropsy

To clarify the species composition, the casualties may need to be identified by specialists. For many species, including heavily oiled specimens, necropsies are required for ageing and sexing, while the careful documentation of ringed individuals, plus the collection of the appropriate biometrics are needed to be able to assess the probable areas of origin of stranded birds. Tissue samples may also be required for analysis in some countries for litigation. Systematic examinations of carcasses should also accommodate the needs of any ongoing wildlife pathology or biology programmes normally operating in affected regions, where possible. It is recommended that the status of necropsy activities in the response is discussed with the oil spill management authorities beforehand, to ensure approval in relation to the recuperation of incurred costs.

Dealing with live casualties

The treatment of wild animals in captivity should always be considered as a 'last resort' activity after all efforts to keep them from being oiled have failed. Treatment, i.e. the physical handling, will need clear objectives and a carefully developed triage strategy which is agreed by all stakeholders, ideally as part of the response plan. If possible, triage should already start on the beach especially when animals are found which are not in a condition that merits collection and rehabilitation. These are best euthanized immediately by a qualified person.

To be successful in treating live oiled animals, there are a number of critical components and strategies. Components include facilities, human resources and equipment. Strategies include capture, transport, intake and stabilization, cleaning and conditioning, and release and post-release monitoring.

Left: a red-breasted merganser in oil

Right: necropsy lab at the University of A Coruña (Prestige, November 2002)



Facilities

If live casualties are to be handled, appropriate facilities, equipment and trained staff will be required. In a large incident these may include:

- beach collection points;
- forward collection, stabilization and initial care centres;
- stabilization centres (forward holding/distribution point);
- primary cleaning and rehabilitation centre;
- pre-release facility

Beach collection points

These are basic facilities which act as a focal point for beach collection on shores where high animal casualties are likely. Their design should offer short-term accommodation, rehydration, quiet and possibly contingency for initial triage. Casualties are then prepared for onward transport either to the forward collection points, or directly to the primary centre. Small numbers of staff are required to man these facilities. Physical requirements should include the ability to maintain a temperature in animal areas of at least 21 °C (70 °F), hot water for cleaning equipment, and good ventilation.

Forward collection/stabilization/initial care centre

A short-term first aid point; strategically located for good access to a range of affected beaches. Here casualties are given immediate care and stabilization prior to onward transport to purpose-built cleaning and rehabilitation centres. Casualties may stay for short periods (up to 24 hours) until fit for travel. It may be necessary to provide cleaning facilities but these are not essential (see *Cleaning* on page 20). Staff should include experienced rehabilitator(s) and should allow for regular (daily) veterinary visits. Physical requirements should include the ability to maintain a temperature in animal areas of at least 21 °C (70 °F), hot water for cleaning equipment, and good ventilation.

Primary (principal) cleaning and rehabilitation centre(s)

A facility designed to accommodate, clean and rehabilitate oil casualties. Ideally it should be centrally placed with good communications to other sites and centres. It can be a permanent or a temporary facility. (See boxes on '*Facility requirements*', pages 20 and 21). Staff, including volunteers will be required for all aspects of husbandry, cleaning, administration and back-up. Ancillary personnel will also be needed for support and maintenance. A large range of staff is required from administration to veterinarians, experienced rehabilitators and inexperienced volunteer staff. Requirements include adequate space to house species and numbers expected. Ventilation should provide 12 exchanges of air per hour in animal care areas. Adequate amounts of water under pressure (60–80 psi) should be available for cleaning animals and delivered at appropriate temperatures, i.e. circa 39 °C. Electrical power should be adequate; and there

Triage: allocating oiled wildlife casualties to appropriate treatment regimes

Triage is the principle or practice of sorting casualties in battle or disaster or other patients into categories of priority for treatment. (The Collins English Dictionary)

In practice, wildlife triage permits allocation of received oiled wildlife casualties to different treatment regimes on the basis of clinical needs or likelihood of positive outcomes.

However, when resources are limited, the triage process may be modified to prioritize treatment of individual animals of high conservation value, while animals of lower conservation value may be relegated to less resource-intensive treatments.

Euthanasia, or the humane killing of animals, may be perceived erroneously as 'failure'. However, a proportion of the animals may have a low probability of return to the free-living breeding population as a result of severity of exposure, pre-existing starvation or concurrent injury or disease. It is regarded as more humane to kill these individuals than to persevere with rehabilitation.

(See box, *Example of a triage regime*, overleaf.)

Administering first aid to a Gannet in an initial care centre (Prestige, 2002)





Capturing an oiled Eider Duck
(Rockness, 2004)

Example of a triage regime

In this example, establishing a triage regime for birds involves dividing the casualties into three categories, as follows:

Category 1 may include:

- birds that are physically fit; and/or
- with a temperature at, or above, a predetermined criterion; and/or
- are known breeding adults.

Category 2 may include:

- birds with a temperature at intake below a predetermined criterion; and/or
- are covered with additional and caustic substances; and/or
- are suffering from broken limbs.

Category 3 may include:

- birds that are below a predetermined weight criterion; and/or
- are suffering from multiple injuries; and/or
- are in need of care that is not readily available.

The process of triage involves making a veterinary decision as to how each individual casualty should be dealt with, e.g.:

1. euthanize if unlikely to survive (Category 3); or
2. invest professional care into selected casualties (Subcategory 2A) which may make suitable candidates for moving to Category 1—otherwise (Subcategory 2B) demote to Category 3 (euthanasia); or
3. attempt (early) cleaning and release with good prospects for long-term survival in the wild (Category 1).

should be sufficient space for the storage of supplies and food, as well as for human needs.

Satellite centre for rehabilitation care, conditioning and release preparation

Where space in the principal centre is, or is likely to become, limited, consideration should be given to additional areas or sites for pre-release conditioning and release preparation. Ideally, these are annexed to the principal centre, however, thought can be given to establishing a facility elsewhere, possibly near to a release point. Experienced staff are required at this unit.

Search and capture

The goal of search and capture is to collect as many live oiled animals as quickly as possible and in the best possible condition to maximize survival. Collection of oiled wildlife will in most situations take place primarily on the shoreline.

However there will be situations where on-water collection should be considered for the effective capture of oiled animals before they become so debilitated that their chance of survival is severely affected.

Direct liaison with the overall operational command is required to establish the appropriate level of health and safety equipment and procedures, access to beaches, and smooth integration with other activities within the oil spill response.

Casualties will have to be contained for removal from the beach either to appropriate transport or, in a larger incident, to a central beachhead collection point. Suitable containers will be required. Well ventilated, cardboard boxes are ideal for most bird species; however, mammals will require significantly stronger containers or purpose-designed transport, for example, stretchers for seals.

Personnel health and safety must be assured. Safe and efficient capture will require experience and practice in capture techniques and the use of the relevant safety equipment. Training may be required for the rescue and collection of some species for example, large birds or seals. If handling a large oiled animal is considered dangerous for any reason, then no attempt should be made to capture it.

Capture techniques will vary according to species but in most cases two people will be required for a successful capture. In general, the oil may have rendered birds flightless but only reduced their ability to dive and avoid being caught. Most mammals and birds will still be able to run or swim. A significantly weakened animal may move slowly and be fairly easy to catch; others may need to be trapped in a net or cornered for capture by hand. Chasing oiled casualties unnecessarily will add to the animals' stress and reduce their ability to recover and should be considered only as a last resort.

Preparation for transport to a predetermined centre, either for initial triage or stabilization, is critical and depends on the distances and terrain involved. Road transport is most often used but boats or aircraft are also suitable if the casualties are well prepared.

Transportation of live animals

Pre-planning and great care is essential if this area of work is to be a success. Transporting sick birds over any distance is stressful and losses can be significant if certain essential criteria are ignored.

Direct communication with the principal cleaning centre and the Wildlife Response Centre (WRC, see page 22) is essential. The transport plan should detail container guidelines, species space requirements including numbers per container, ventilation and temperature control, as well as treatment protocols prior to transport.

Additional legal paperwork may be necessary at border controls and, in some countries, requirements for domestic transport must also be met (e.g. a 'green card' in France). Consult with the incident command/government advisor/liaison for help in this regard.

Intake/triage

The physical condition of live animals which are admitted to the facilities may range from very weakened and completely oiled individuals to strong and lively ones which are only partly covered with oil. The process of triage enables the responder to prioritize and to select those animals that may have the best chance of surviving further treatment and, after their rehabilitation, a return to the wild to rejoin the breeding population. Other considerations for triage decisions may include species conservation value, age priority or the resources available. Low priority species with little chance of release should be considered for euthanasia. Triage is an ongoing process throughout treatment. It will usually be part of the initial intake evaluation where the animal is examined by qualified personnel and individually documented. The establishment of basic triage criteria is essential for good animal welfare as well as efficient use of limited resources. A basic set of criteria can always be adjusted to cope with specific circumstances (see box on page 18).

Animals that die or are euthanized

Animals that die in care or those which are euthanized should be documented and kept for further analysis. A necropsy would be required to establish the cause of death because it is important to detect captivity-illnesses like aspergillosis. There may be legal stipulations placed on dead oiled animals. Discussions with local agencies with legal responsibility for animal welfare will identify any such stipulations and should be able to arrange for the issuing of any necessary permits, etc.

Essential requirements for transportation



- Good ventilation to every container; oil fumes can be toxic; a problem exacerbated by confinement.
- Keep animals at a reasonable temperature; neither too hot nor too cold.
- Ensure species contained together are compatible; fighting can break out even between individuals of the same species.
- Well constructed cardboard pet containers, to allow for all the above, plus portability; these are often flat-packed for storage. For larger animals, purpose-built containers may be required.
- Good ventilation of the vehicle.

Experienced veterinarians play an important role in the rehabilitation centre.



Facility requirements for rehabilitation of oiled birds

- One large central room (preferably gymnasium size) to house and treat oiled birds.
- Unlimited quantities of soft, warm water (39–41 °C/102–110 °F) of good pressure (60–80 psi) for cleaning birds.
- Means to dispose of used cleaning solution and rinse water, e.g. sink or shower drains to sewer system, or storage tanks for disposal.
- Means to dispose of medical and solid oily wastes, e.g. units for storage and transport of used syringes, oiled cleaning rags, bedding and transport boxes to approved disposal facilities.
- Good ventilation to prevent excessive oil fumes and humidity, and to help prevent diseases.
- Temperature control to maintain a draught free, warm environment (24–29 °C/ 75–85 °F).
- Electrical capability, min. 200 amps, 120/240 volts, single-phase service and (if possible) ground-fault interrupts.
- Communication system—at least one telephone line or other form of communication located away from wildlife and cleaning activities.
- One or more small rooms, to serve as functional areas.
- An adjacent outdoor area/campground for storing equipment and conducting activities such as preparing birds for release.
- Separate room for food storage and preparation.
- Reasonable security.
- Parking space.

Stabilization

Early stabilization will promote recovery. As casualties become settled and warmed, and stress levels are reduced, a routine of veterinary care, feeding and watering can begin. Simple quiet areas for further, more detailed assessment and triage can be provided. Cleaning of casualties is largely unnecessary at this early stage, but provision must be available to clean the worst covered individuals and/or to remove particularly toxic agents.

An environment capable of maintaining the affected animal at a normal body temperature is essential. Prevention of escape is also high on the list of requirements and therefore some kind of animal cages within the building will be necessary. Prefabricated cages, tanks and boxes can all be utilized, depending on the species and the nature of their condition. Caging should provide adequate ventilation and appropriate space for comfort, and should be easily cleanable or have disposable surfaces and visual barriers.

Good husbandry of the casualties is important for their long-term future. Food, water, cleanliness of the environment and identification of any significant deterioration in their condition are essential, as is early veterinary care. Experience in oiled animal management is paramount to a successful operation. Different species will require a range of management procedures to ensure good welfare.

Cleaning

As the condition of each animal improves, cleaning can be undertaken using trained and experienced cleaners. Facilities that provide continuous hot water at constant pressure and temperature are essential. Adequate supplies of a recognized quality oiled bird detergent (e.g. Fairy, Dawn, Dreft) need to be available. The facility must have the ability to properly contain and dispose of contaminated wastewater.

Continual assessment of the animals in care is essential, and experienced animal-management staff is crucial. Good hygiene and calm, quiet operation is demanded throughout for the successful recovery of these animals. The maintenance of a good environment suitable for the species and their recovery is therefore critical.

Once the animals are clean and considered physically fit, they should be moved to protected facilities where they can swim in clean water and have access to dry areas. Feeding remains a constant requirement and quality food is needed throughout. The aim is to allow birds to be as active as possible improving both the integrity of their plumage and their physical fitness.

Discrete and frequent observation of animals in these areas is important to assess their level of waterproofing, fitness, behaviour and readiness for release. Evaluation for release should be as rigorous as the initial intake examination, and each animal's recovery documented. Criteria commonly utilized include healed



Far left: the cleaning of a bird requires experienced washers—the plumage can easily be damaged.

Near left: before it is released, a bird should be ringed for scientific purposes.

injuries, haematological parameters, body condition and fitness, waterproofing, and behaviour.

Release and post-release monitoring

There are a number of considerations that should be included in planning for the release of animals on completion of rehabilitation. The natural history of the species, including foraging, migration and breeding habits; the clean up stage in and around the release area; and the weather forecast and time of day may all affect the likelihood of survival of wildlife after release. Consultation with species experts and local wildlife experts may be invaluable to balance the threat of re-oiling versus secondary problems related to further captivity. Wildlife plans should include contact information for organizations, agencies and individuals that should be contacted in the event of a spill to assist with or oversee release and post-release monitoring. These may include governmental wildlife agencies, universities, wildlife societies and environmental NGOs.

Each animal should be uniquely marked prior to release; ringing/banding groups are usually keen to assist in this process. Mammals can be marked using a variety of methods ranging from passive marking systems such as flipper tags or ear tags to sophisticated active devices such as radio transmitters and satellite tags.

If recognized marking techniques are used within official schemes, the data will be centrally recorded and a unique picture of response events can be captured. The breeding successes of African penguins (*Sphenicus demersis*) following the *Treasure* oil spill in 2000 are countered with the negative information about the poor survival of guillemots from some spills.

Quality of food

In captivity, wild animals should be given food that most closely matches their natural diet. Food should be fresh and nutritious. Rehabilitation success in birds, in particular with regard to waterproofing after washing, depends to a large extent on the fat content of the food given to them. Fat or oil from faeces will settle on the water surface of their swimming pool and can re-pollute the plumage of cleaned birds. A low-fat diet will therefore aid significantly the overall cleaning success.

Facility requirements for rehabilitation of seals

- Dry, draught-free, well ventilated space.
- Floors must be easily cleaned with water and detergent.
- Good waste water drainage and disposal.
- Possibility of keeping animals at a level which allows dirty water and faeces to drain away.
- It is better to use a small room for one seal than a bigger room for two.
- A small pool (1.2 m x 1.2 m x 1 m, or a bath tub) for one seal is more practical than one big pool for a larger number of animals.
- Movement of animals must be kept to a minimum.
- Heating is not always necessary, except to prevent water systems freezing. Seals can be kept warm with heat lamps and jugs of hot water.
- Facilities for the preparation of fish (for food), including a large freezer and sinks of sufficient size where frozen food can be easily thawed in warm running water.
- A clothes washing machine and dryer.
- Freezing facilities for keeping dead animals.
- Documentation required for the operation of the facility, including protocols (e.g. strict quarantine).

OPERATIONAL ASPECTS

When live animals are involved, time is a pressing factor. There is also the matter of public attention, which can be exacerbated by media interest. A number of operational aspects that need careful planning are summarized below and discussed in this chapter.

- Mobilization
- Coordinating wildlife response
- Moving from incident response to project management
- Management of animal care
- Geographical organization of facilities
- Planning
- Management of volunteers
- Minimizing waste and secondary pollution—waste management
- International management
- Wildlife operations and the media
- Demobilization

Mobilization

The primary response organization should be experienced, large enough and sufficiently funded to deal with an oiled wildlife incident of a specified size and nature. The initial assessment of the event should determine the scale at which the response activities are to be set up. In cases of doubt, it is better to start taking measures for the worst-case scenario. Scaling down an operation is easier than scaling up.

An oil incident may cause wildlife casualties to arrive on beaches without previous warning. In such instances, the only option is to deploy the response teams while the organization structure is being established. On many occasions, however, it takes some days before the first animals arrive, allowing responders time to action the contingency plan.

Coordinating wildlife response

The Wildlife Response Centre (WRC) is the place from where all oiled wildlife response activities are monitored and directed. It is the physical space where principal officers meet and where they can be contacted. A WRC is ideally integrated with the incident command centre.

*Meeting at the Wildlife Response Centre
(Prestige, 2002)*



The coordinating role of a Wildlife Response Centre

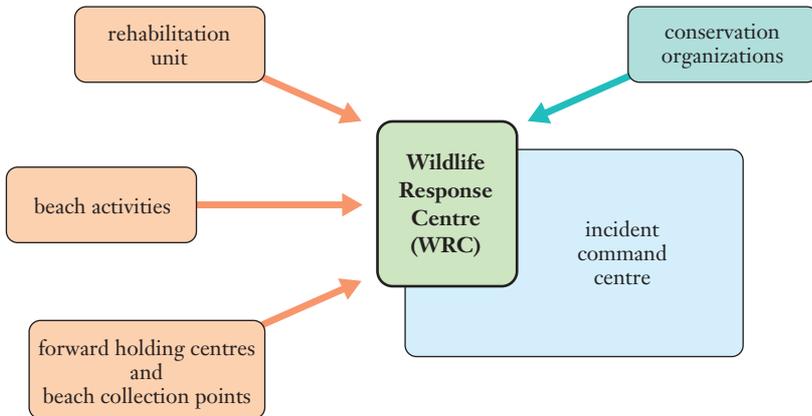


Figure 4

All oiled wildlife response activities are monitored and directed from the Wildlife Response Centre. Eventually a WRC may become part of a larger incident command system.

It is most important that the WRC has a display area (ideally a wall), which is readily accessible to all who work there, and where all relevant information can be displayed. This can provide staff with a quick overview of the current situation, bottlenecks and the effects of measures that have been taken.

Those running the WRC need to be aware of, and have access to, every level of the wider response organization. In turn, each actor in the response organization needs to know how the WRC can be contacted.

In order for the Wildlife Response Centre to become an effective coordinating unit, communication and reporting protocols must be established. All response units must report in accordance with an agreed time line and in a format which allows easy data processing.

Moving from incident response to project management

At the outset, people and equipment must be mobilized and facilities activated, built, expanded or adapted. In this emergency response phase, decisions should be guided by priorities that have been defined in the contingency plan.

Prescriptions of decision making processes, protocols, and agendas of the first meetings, etc. allow response managers to quickly perform their roles.

The second phase in the response will appear gradually, depending on the incident. During this time, facilities have been built or converted and running procedures established. The main influx of animals arriving will have passed and only minor peaks will occur depending on weather, movements of animals and oil, and occasionally on the degree of volunteer activity on beaches. Naturally, as the operation to contain and control the oil spill takes effect, fewer animals will be affected. At this stage, managers can start to move from emergency response management to project management.

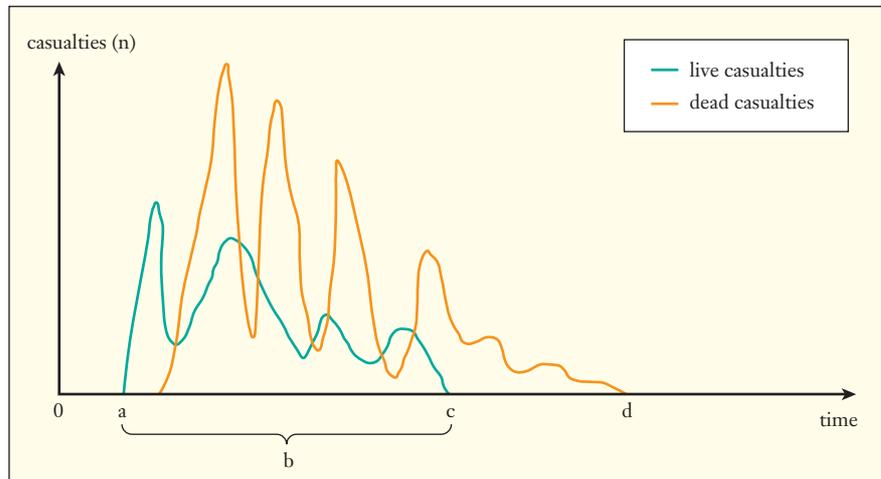
Information that could usefully be displayed on the walls of a Wildlife Response Centre

- A situation map, including updated maps of oil at sea and onshore, and sensitive areas for wildlife at risk.
- Incident facts update, including the latest breakdown of wildlife casualties.
- Weather forecast, tide and sunrise/sunset times.
- Health and safety protocols.
- Location and contact details for key staff.

Figure 5

A characteristic scenario for the development of an oiled wildlife problem.

After the oil spill ($t=0$) it normally takes a few days before the first live and dead casualties start to appear on beaches (a). That period will be shorter in near-shore incidents. The first peak of casualties mostly involves animals that were present near the place of the incident. After this first peak, additional peaks may follow during a period that may last several weeks (b). Each single peak is normally connected to a change of weather or wind direction. Peaks of live animals typically match those of dead animals, but are not synchronized: live animals may appear earlier as they will swim to a near coast. A declining daily admission of casualties may announce the end of the wildlife problem (c) although new peaks may occur. Search effort and beach access may also effect peaks; during the Nahodka spill (1997, Japan) peaks occurred on weekends because of availability of volunteers to go to remote beaches. Because of cost-efficiency, a wildlife operation might be terminated before the last casualties appear on the beach (d).



It should be the aim of any response manager to make the transition from emergency response to project management as quickly and as smoothly as possible. A well rehearsed contingency plan provides practical tools to enable this.

Management of animal care

If efforts to rehabilitate oiled animals are to be undertaken, the organization of the response activities should be optimized. The aim is that any live animal is only kept in care for a period of time that will benefit its survival in the wild.

Geographical organization of facilities

Geographical organization of facilities needs different inputs of information. These might include:

- information on location of oil, weather, and distribution of animals in order to predict where animals will come ashore;
- access to these areas;
- principal road communications to enable swift access to main centres and other facilities;
- distribution of permanent rehabilitation centres; and
- distribution of other facilities (university labs, zoos, aquariums, industry zones with identified empty warehouses) that can be used.

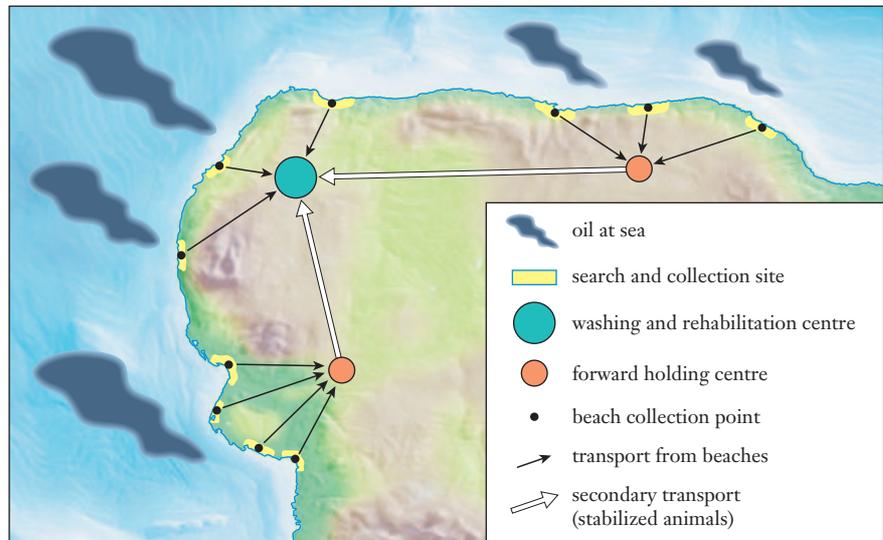
There is a great variability of coasts and coastlines. A national contingency plan should determine their relative vulnerability to oiling and identify areas of importance to wildlife and sensitive habitats. Understanding the trajectory of the oil will help predict where oiled animals may come ashore. It may be a relatively limited geographical area (e.g. if an incident happened close inshore), or an extended area (an oil incident far offshore). Close liaison and cooperation within a WRC will establish changing criteria of an operation and enable plans to be integrated as they develop.

Management constraint	Management objective
Oiled animals need professional care as soon as possible.	<ul style="list-style-type: none"> ● Minimize time between capture on the beach and arrival in a care centre. ● Regular transport between beach and forward holding centre is essential. ● Not too many animals per trip. ● Data recording needs to be optimized for highest value.
Once stabilized, oiled animals can survive; they need rest and care to regain an acceptable condition.	<ul style="list-style-type: none"> ● Provide enough holding capacity and resources to keep up with the speed that animals are brought in from beaches.
Only animals that have regained an acceptable condition are ready to go into the washing procedure.	<ul style="list-style-type: none"> ● Resist pressure from public, media or politicians who want to see animals being washed. Explain reasons (issued in a press statement if necessary). ● The response plan should have strict rules for triage. Too many animals in combination with limited resources or capacity should be managed by changing triage rules to respond to the situation, thus allowing the limited human and physical resources to deal successfully with those animals with the greatest chance of survival.
Washing should only start once post-wash treatment and facilities can be ensured; the daily quota of animals to be washed is determined by the capacity further down the chain until release.	<ul style="list-style-type: none"> ● Do not concentrate only on washing facilities; capacity further down the chain should also be developed before washing is started. ● Once washing has started, the process should not stop. Adjustments in throughput can be made to keep up with available space. ● Maintain the sequence of the process—intake, stabilization, cleaning, rehabilitation, pre-release and release programme.
Once rehabilitated, animals need to be released as soon as possible.	<ul style="list-style-type: none"> ● The environment on which the animals depend might still be oiled, therefore release in the safest possible area to optimize survival. Release also generates new space for other animals being washed. ● All released animals need to be marked to allow post release monitoring. Release times and locations should be chosen well in advance. Marking must be part of early planning. Follow-up measures must be agreed through pre-planning and applied diligently.

Table 3

Management of animal care: optimizing response activities means setting clear objectives to address each management constraint.

Figure 6
A geographic model of response organization



Primary facilities should be chosen and developed as close as possible to those beaches where animals are likely to be found, if reasonable. Concentrating resources in this way will facilitate decision making and operational planning.

Facilities for dead animals (collection points, necropsy labs) are not distance-dependent; those for live animals are. Body condition of live animals deteriorates dramatically the further they are transported.

In setting up a geographically sound operation, a manager should consider the following guidelines:

- The coastline should be divided into logical, manageable sections (clusters), each with a number of beaches and access points.
- Consideration should be given to the establishment of forward holding centres near to the most remote clusters. These should be relatively small units where animals can be given first aid and stabilized before transport to a washing and rehabilitation centre.
- A washing and rehabilitation centre needs to be operated by skilled personnel, which can be a limited human resource. Therefore it is better to have one big centre where all this expertise is concentrated, than a few smaller centres, (although a large or developing situation may require more than one such facility). From all the geographical options choose a location (temporary or permanent) which is readily accessible and where, among other things, capacity can easily be upgraded, services meet the operations requirements, and parking and additional storage is plentiful.

Information exchange between all stakeholders involved will increase the success of the response.



Choose the locations of the facilities in relation to the coastal sections, the highway routes and away from obstacles such as major towns, mountain roads, ferries, etc. If there is a probability that the oiled wildlife problem might extend to another part

of the country's coastline, then the initial choice should anticipate this. Rehabilitation facilities should be located near a city or town large enough to provide equipment and supplies, staff support and volunteers. In certain situations, cooperation with neighbouring countries might solve logistic or other problems, for instance, transporting animals across the border to existing facilities.

Planning

Short-term planning (days)

Continuous monitoring of relevant information as the incident develops from day to day allows for the best deployment of search and collection teams, and expert personnel, e.g. veterinarians and animal carers. It also allows an assessment of whether or not the capacity in the different facilities is adequate, and to which facilities oiled animals should be directed.

Mid-term planning (weeks)

In the mid-term, the response manager should ensure the availability of people and services, as well as logistics and equipment, and adjust the main strategy of the approach.

Long-term planning (months)

The long-term planning of the response deals with managing it as a project. Stabilized (low) influxes of new casualties and/or even dropping numbers will allow the manager to begin to assess how long the operation is likely to last, when and how to phase out different activities and temporary facilities, projected release strategies, etc.

Management of volunteers

The larger, more complicated type of wildlife response cannot do without the help of volunteers. The involvement of volunteers must be carefully managed by way of the following:

- A register of all volunteers must be maintained.
- All volunteers must fill in an initial form detailing their name, age, address, contact details and experiences (including first aid training), and list any medical condition which might affect their ability to work in the response team.
- All volunteers should receive orientation and safety training appropriate to their workplace and job.
- All volunteers must be made aware of the risks involved in the work they are undertaking, and must sign a form to confirm this. In certain circumstances, a collective insurance can be issued.
- A daily register of all volunteers must be kept, listing the time they started work, where they work and the time they finish work.
- The need for personal responsibility for their actions needs to be made aware to the volunteers, including their responsibility to report accidents and incidents.

Bird washing machines



A bird washing machine was designed in the 1990s in France and jointly developed by wildlife rehabilitators and the oil industry. Some of these machines work on a regular basis in several wildlife care centres in France and the Netherlands. Birds are placed into a metal basket, which is then put into the machine, head emerging. The animals undergo a succession of washing and rinsing cycles. The head is cleaned manually.

These machines are designed to save time and personnel, and to reduce stress. No scientific study exists so far on the subject, but the opinion of most centres using the machine is that this device does not induce more injuries in animals than manual washing; the birds do not seem more or less stressed when washed with the machines. The machines may not always make it possible to save time (birds are still washed one at a time) and energy but, when properly used in a well-organized centre, allow for a reduction in the number of personnel involved in clean-up operations: there is no need for anyone to hold the bird while it is cleaned. While some specialized centres have been successful in using the machine for cleaning birds, this success depends strongly on the training and experience of the operators. The machine is therefore not suitable for use by inexperienced personnel.

Left: although many volunteers would like to work with animals, many other activities need to be done, e.g. building pens.

Right: oiled birds with information tags awaiting a necropsy.



- Volunteers should only be allocated jobs for which they are trained/experienced and should not be allowed to move from job to job without authorization.
- While on beaches volunteers must be fully aware of the actions to be taken in the event of weather deterioration and should be familiar with the signs of possible ailments, both in themselves and in their working companions.
- Protocols need to be in place to deal with emergencies, for example, if people do not return at an allocated time, how is a search instigated, etc.
- Accommodation and catering for the volunteers should be sufficient to meet the needs of the response.
- Concerted efforts should be made to manage, care for, and appreciate volunteers, as the loss of able work staff after a single shift can significantly degrade capabilities.

Volunteers, in particular, can find the response operation very stressful. Their managers should be fully aware of this and monitor volunteer behaviour. The response plan should also detail periods over which the volunteers will work. For example, the daily hours and the number of days after which they must have a break.

Minimizing waste and secondary pollution—waste management

Each component of the wildlife response should aim to minimize waste and secondary pollution. This can be achieved by setting general guidelines for the behaviour of staff similar to those which apply to the wider oil spill response. The wildlife response will typically take oily waste (the animal) out of the polluted zone (beach). Before the animal is washed, its immediate environment (including boxes, cloths, pens, protective clothing of staff, etc.) will be polluted and waste created. Consideration should also be given to medical waste (e.g. syringes, gloves) and waste produced by humans (plastics, food wraps etc.). The washing itself will cause a waste water problem (oil with detergent) that has to be processed.

The response plan should identify the relevant national legislation and the authorities responsible for waste management. The plan should include procedures which ensure the speedy granting of the relevant licences and permits. Response

operations must comply with these regulations. It should be possible to integrate the arrangements for the disposal of wildlife response waste with similar arrangements made by the wider national oil spill response initiative.

International management

An oiled wildlife incident may affect different countries. In terms of logistics, resource planning and data collection, it is recommended that countries cooperate and harmonize their efforts to the highest extent possible. This will allow comparison of information and cost-saving approaches, and increase the quality of impact assessment. The necessary contacts are best established as a matter of pre-spill planning.

Wildlife operations and the media

After the safety of human life, the news media's next priority is the popularization of stories on animal welfare. A strategy for interacting with the media should be developed proactively. Local newspapers, and radio and television stations can make a positive contribution during an emergency oil spill event by providing information to the community on what to do if they encounter oiled wildlife. Providing WRC contact details and warning against the personal hazards of handling oiled wildlife are the most useful messages. Appeals for funding or personnel, or for the sourcing of materials must be handled carefully; the results can be unpredictable and can overwhelm or distract critical operations. News media representatives can themselves become a hindrance, especially if they are not adequately briefed. Reporters and film crews will normally behave appropriately if the welfare and safety implications of controlling access are properly explained. Negative stories may impact on responder morale or wildlife operational resourcing, but it is unusual for media to be unsympathetic to wildlife objectives. Preparing a media information pack at the spill response planning phase, especially covering human safety and the impacts of oil on wild animals, can facilitate good media relations during an event. Setting up an official website on the event will be welcomed, not only by the media as a first reliable source of information, but also by the wider audience. It is also essential that, where possible, there is proper and effective communication and coordination between the wildlife response centre and the overall incident response in relation to media activities and messaging.

Demobilization

In most situations where buildings have been provided for temporary or full rehabilitation facilities, these will need to be returned to operational readiness soon after the incident is over.

Cleaning and restoration are usually the main concerns but, in addition, there are often stockpiles of materials and equipment that has been provided, made, bought or otherwise acquired that will need to be sorted, evaluated, stored and/or returned to owners in their near original state.

HEALTH AND SAFETY

The first priority of an incident response, before consideration is given to oiled wildlife response activities, must be the health and safety of the people involved.

Working with animals

Wild animals are not used to being handled. Their natural response to human interference is aggression, as a means of protection, which can be prompted by sudden movements, capture and noise—in fact by anything that they might perceive as a ‘disturbance’. Beaks, claws, wings, etc. are all potential weapons and can cause severe damage to those handling the wildlife. Cuts, scratches, etc. should be treated immediately because these can be a source of infection.

Risks to working in a wildlife response

Outdoor (beaches, boats)

- Hyperthermia
- Hypothermia
- Falls—cuts, breaks, concussion, oil contamination
- Wildlife injuries—bites, cuts and scratches, stab wounds (sharp bills)
- Serious lacerations and broken bones (from mammals)
- Disease (zoonoses)
- Back damage (lifting heavy animals)
- Toxic fumes—early in incident in confined spaces
- Falling into sea
- Sunstroke

Handling and rehabilitating wildlife

- Wildlife injuries—bites, cuts and scratches, stab wounds (sharp bills)
- Serious lacerations and broken bones (from mammals)
- Disease (zoonoses)
- Back damage (lifting heavy animals)
- Chemical spillages and exposure to fumes
- Allergies
- Heat stress
- General slips/trips/falls
- Injuries from medical equipment (needles, syringes)
- Electrical injury and thermal burns

General

- Stress
- Fatigue

Zoonoses

These are diseases which can be transmitted from vertebrate animals to man, and include bacteria, viruses, fungi and parasites. For marine mammals, the two most important are salmonellosis and other bacterial infections due to direct contact, including bites. The former is unlikely if proper hygiene practices are followed, the cause being the accidental ingestion of faecal material from the animal—the symptoms are stomach disorders and diahorrea. Other bacterial infections can be more serious and are caused by exposure of open wounds to bacteria in animals’ fur/feathers, faeces, saliva, blood, etc. Both conditions should be treated immediately under medical supervision. Individuals with bacterial infections should be made aware of potential long-term problems and be advised to contact their own doctor immediately should symptoms occur after returning home. For birds, salmonellosis is also important, as well as respiratory infections.

Working with wild animals can also result in hepatitis or tetanus. While these are rare, staff should be advised of the dangers and it is recommended that they have the necessary inoculations against these diseases. The best defence against zoonoses is good hygiene and common sense. People who are ill, pregnant and/or on prescribed drugs which might affect their natural immunity should not work with oiled wildlife.

Protective clothing

As a minimum, staff should be equipped with personal protective equipment (PPE) as follows:

- Field team: oil impermeable coveralls, rubber boots, hard hats, nitrile gloves
- Working with animals: oil impermeable coveralls, nitrile gloves, safety glasses
- Washing animals: waterproof clothing, nitrile gloves, safety glasses

Basic principles

The safety of individuals is based on an understanding and practice of five basic principles:

- the maintenance of safe working conditions and procedures;
- the understanding of occupational health;
- an understanding of potential hazards of working with oiled wildlife;
- the wearing of adequate personal protective clothing (PPE); and
- the practice of good personal hygiene.

Other important health and safety issues	
Legislation	In any plan it is important to be fully aware of, and fully understand, any local, national and international health and safety legislation.
Safe working conditions	Risk assessments need to be made for each part of the operation, resulting in a site safety plan covering each work site.
Training and safety instructions	Orientation to the worksite. Identification of potential dangers, including details of how to handle animals. Untrained volunteers should not be allowed to handle animals.
Stress	All people, especially those in authority, should be aware of signs of stress among the staff, and take appropriate action to alleviate it.
First aid and medical care	Each operation should have access to a first aider and first aid equipment. Medical facilities should be informed about the wildlife response in order that they can assess the risks (zoonoses, bites) and take precautionary measures, e.g. availability of vaccinations.
Liability	Every plan should clearly identify who has the ultimate responsibility (and liability) for the operation of the plan. This responsibility may not rest within the response team.
Insurance cover	It should be made clear who is responsible for ensuring that all people involved in the response have adequate insurance cover. Insurance cover need not be at the wildlife response level; there might be a ‘blanket’ cover for the whole operation which might offer better protection.

RESPONSE PLANNING

The importance of integrated plans

It is imperative that wildlife response plans should be fully integrated into the wider oil spill response plans. This is the only way to ensure:

- a recognized position for the wildlife operation in the overall response;
- the fast access to other resources and their efficient use;
- short lines of communication between key managers; and
- the effective sharing of up-to-date information.

The structure, prescriptions and approaches of any operational contingency plan will typically reflect specific cultural traditions and philosophies on how emergencies are best dealt with. It is therefore not possible to present here a ‘blueprint’ of a plan that can simply be copied and used in any local setting.

This chapter presents background information, examples and checklists for a number of critical sections that should appear in the plan. The starting point is the generally accepted tripartite structure for a contingency plan (See *A Guide to Contingency Planning to Oil Spills on Water*—Volume 2 in the IPIECA Report Series), which will be explained against the background of a wildlife incident. This structure provides a checklist for the contents of a wildlife response plan. A number of issues in this checklist, which are not covered elsewhere in this *Guide*, are presented in this chapter. Once completed, Appendix 1 can be used to check the response plan’s adequacy.

The benefits of a pre-spill plan

A pre-spill plan will:

- Quickly bring all relevant parties up to speed and ensure that their respective responsibilities are pre-determined and clear.
- Define the objectives of the wildlife response and the agreed way in which oiled animals shall be dealt with.
- Integrate the wildlife response into an overall spill response, so that access to logistic resources is best guaranteed.
- Provide clear understanding of the ‘best practices’ and protocols.
- Be a reaffirmation of local, national and international environmental priorities.
- Avoid discussion on strategy, techniques and policy, so that responsible officers will be able to quickly and fully concentrate on developing tactics.
- Provide a means by which the actual impact of the incident on wildlife populations can be determined.
- Inform any observers and any other interested parties which are not part of the response structure, on underlying strategy and rationale so that they will understand the tactics.
- Improve public and media understanding of the industry’s and government’s efforts to be a positive force in the protection of the environment.
- Help submit a compensation claim for reasonable expenditure, preferably as part of a centrally led operation.
- Provide a means whereby lessons learned can be incorporated into modifications of the plan.

The structure of the plan

An oiled wildlife response plan should be formatted in the same way as any other contingency plan:

1. **Strategy:** Index; Control (circulation, revision process, revision record); Introduction; Scope; Regulatory Environment; Organizations involved and their role; Risk Assessment; Response Policy; and Response Strategies.
2. **Operations:** Implementation instructions; Notification Procedure; Action Cards for each Responder Position; WRC Communications Plan.
3. **Data:** Ancillary information including: Contact Directory; Resource Inventories; Relevant Maps; Pro-formas; Information Sheets; Checklists, etc.

The Strategy section

This is the HOMEWORK section which contains all of the advance planning information. It should be consistent with the national policy for oil spill response, comply with local, national and possibly international regulations and readily interface with other plans. In drawing up the plan it is essential to ensure that it does not conflict, but links with other plans related to the incident.

The Strategy section should include an assessment of risks and the development of scenarios. These can be combined with a detailed data collection and analysis of species likely to be oiled and/or especially vulnerable to oiling. Scenarios discussed should take account of:

- the type of accident likely to occur: e.g. an oil spill at sea from a tanker; or a spill from land or shoreline facilities (pipeline, storage, refinery, harbour);
- the type and quantity of oil likely to be spilled;
- the behaviour of the oil according to weather conditions; and
- possible impacts.

This process is time consuming and can best be carried out with the help of specialized advisors. Historical spill data, where available, may allow for a quantitative assessment.

Once this phase is completed, it will be possible to set up a response philosophy and objectives, agreed by the various stakeholders and consistent with the national policy on oil spill response. Response options can then be chosen, e.g. using the experience from previous spills, and realistic strategies can be established. A critical issue to be addressed, defined and agreed by all interested parties is the extent to which rehabilitation will be attempted, and which guidelines or criteria for euthanasia will be applied. A waste management plan (which should include, for example, waste minimization, disposal of oiled carcasses, the disposal of medical waste, a waste water plan for rehabilitation facilities) is best set up in conjunction with the overall oil spill response plan. The equipment, supplies and services to be implemented should be listed, and the procedure and time needed to mobilize/acquire them should be thoroughly defined.

The three key sections of an oiled wildlife response plan

1. Strategy section

Introduction and scope

- Authorities and responsibilities, coordinating committee
- Statutory requirements (wildlife handling permits, rehabilitation permits, protected species, national and international transport of wildlife, waste management)
- Geographical limits of the plan
- Relevant administrative borders
- Interface with other plans/representation at joint control centres

Risk assessment

- Identification of activities and risks (tanker traffic, bad weather)
- Types of oil likely to be spilled
- Vulnerable species and habitats, seasonality
- Species abundance and their susceptibility to oiling, predominant species at risk
- Effects of oil on wildlife at risk
- Development of oiled wildlife scenarios
- Priority species for protection and/or rehabilitation
- Special local considerations

Spill response strategy

- Philosophy and objectives
- Limiting and averse conditions, tiered response
- Strategy for health and safety
- Strategy for preventing oil reaching wildlife and wildlife getting oiled
- Strategy for monitoring oiled wildlife (live and dead) at sea
- Strategy for oiled wildlife stranded alive (including triage)
- Strategy for oiled wildlife stranded dead
- Strategy for oiled waste (solid and wash water) storage and disposal

2. Operations section

Initial procedures

- Reporting incident, preliminary estimate of response Tier
- Notifying key team members and authorities
- Establishing and staffing control room
- Collecting information (oil type, location of oil, weather forecast, oiled species at sea, oiled species on beach)
- Identify species immediately at risk
- Estimate expected size of wildlife incident based on place, season of spill

Operations planning and mobilization procedures

- Assembling full response team
- Identifying immediate response priorities
- Mobilizing immediate response
- Identify/establish wildlife facility
- Preparing initial press statement
- Planning medium-term operations (24-, 48- and 72 hour)
- Deciding to escalate response to higher Tier
- Mobilizing, or placing on standby, resources required
- Establish beach search and collection teams, communication and transport

Equipment, supplies and services

- Temporary facility equipment
- Veterinary equipment
- Catching and collection equipment
- IT, office and communication equipment
- Inspection, maintenance and testing

Management, manpower and training

- Relationship with Unified/Incident Command System
- Wildlife response manager and supporting functional units
- Incident organization chart
- National (licensed) oiled wildlife responders
- International oiled wildlife responders and advisors
- Manpower availability (on-site, on-call)
- Availability of additional labour (volunteers)
- Training/safety schedules and drill/exercise programme

Communications and control

- Wildlife Unit, Unified/Incident Command System
- Permanent and temporal facilities
- Field team communication equipment
- Reports, manuals, maps, charts and incident logs (record keeping)
- Website development

Activation, de-activation

Exercise, training, plan revision

Funding

- Financial control
- Claim

Control of operations

- Establishing a management team with experts and advisors
- Updating information (weather forecasts, aerial surveillance, beach reports)
- Reviewing and planning operations
- Obtaining additional equipment, supplies and manpower
- Preparing daily incident log and management reports
- Preparing operations accounting and financing reports
- Preparing releases for public and press conferences
- Briefing local and government officials

Termination of operations

- Deciding critical levels of daily animal stranding below which search and collection will be terminated
- Standing down equipment, cleaning, maintaining, replacing
- Preparing formal detailed report
- Reviewing plans and procedures from lessons learned

3. Data section**Maps/charts**

- Coastal facilities, access roads, hotels, etc.
- Species distribution maps/atlasses, seasonality
- Risk locations and probable fate of oil
- Shoreline types and zones for search and collection strategies
- Area plans (in case of remote, complicated or vulnerable sites)

Lists

- Vulnerable species and their susceptibility to oiling, natural history, behaviour in captivity, expected rehabilitation success, most common diseases
- Equipment for shoreline search and collection: PPE, nets and other tools, plastic bags, labels, communication equipment (including manufacturer/supplier, type, size, location, transport, contact, delivery time, cost and conditions)
- Facilities: permanent rehabilitation centres, university labs, stock warehouses
- Support equipment: communications, catering, housing, transport, field sanitation, shelter, freezers and freeze houses, boat hire operators (including availability, contact, cost and conditions)
- Contact details for organizations and identified emergency officers

- Relevant organization and their field(s) of responsibility: local and national government, animal welfare organizations, university departments, wildlife rehabilitation centres, etc. (including name contact person, rank and responsibility, address, telephone, fax, telex)
- Sources of manpower: veterinary doctors and assistants, animal nurses, necropsy analysts, local authorities, caterers, security firms, volunteers (including availability, numbers, skills, contact, cost and conditions)
- Experts and advisors: professional oiled wildlife response teams, safety, (including availability, contact, cost and conditions)
- Checklists: staffing, veterinary kits, facility requirements, search and collection team kits, customs, waste management, safety briefings, etc.)
- Checklists for set up functional units (logistics, administration, finance, planning, etc.)
- Triage criteria

Data

- Wildlife handling instruction sheets
- Animal care and rehabilitation protocols
- Necropsy handbooks
- Billboards to inform public

The Operations section

This is the ACTION section that contains ‘must know’ information. Where possible refer to annexes in the Data section. Initial procedures are of the utmost importance since they can determine the success or failure of an oiled wildlife response. The information required to achieve an accurate evaluation of an incident is detailed and the procedure for the evaluation of the seriousness of the incident given.

The procedures by which wildlife responders receive notification from the authorities or industry must be in place in order for responders to reach the site as quickly as possible. An agreement should be drawn up so that those responsible for wildlife care receive regularly updated information on the incident. An arrangement for the immediate integration of a liaison person into the incident command should be seen as an integral part of both the wildlife response plan and the overall contingency response plan. Mobilization procedures should include regularly updated lists of contact numbers and must be regularly tested through exercises.

The Data section

This is the APPENDIX section that will contain ‘should know’ information.

Key issues in the planning process***Plan ownership***

There must be a single point of accountability for establishing and maintaining the plan. The party that initiates development of the plan may not necessarily be

Setting up and maintaining a temporary rehabilitation centre requires a level of logistics that can be easily underestimated.



Example: the integration of wildlife into the existing oil pollution plan in France

One of the lessons of the *Erika* oil spill in France was that there was a lack of coordination between administrations, authorities and wildlife conservation and care organizations (NGOs). This led to conflicts, problems, and birds 'lost' or counted twice or more times by several organizations. Hence the idea, for the drafting of future plans, to have all these parties working together.

In France, all Polmar Land plans (contingency plans for oil spill response on the shoreline; 26 such plans, written and implemented by departmental authorities exist in metropolitan France) should now include an 'oiled fauna contingency plan'. The coordinator of the Working Group in charge of drafting the plan is the DIREN (regional branch of the Ministry in charge of the Environment).

The members of the Working Group are: DIREN, local and national wildlife conservation and care associations, National Office of Hunting and Wildlife, Departmental Veterinary Services, Ifremer (French Oceanographic Institute), Cedre (technical advisor for French authorities in case of a spill), Conservatoire du Littoral (association in charge of coastal areas conservation) and the National Museum.

The plan should include:

- the name(s) and contact points of NGO(s) responsible for coordinating wildlife rehabilitation operations in the area;

- sensitivity maps (developed by the working group)
- existing care centres and buildings potentially convertible if needed;
- alert, notification and mobilization procedures;
- lists of equipment needed for a centre to function;
- lists of providers;
- legal procedures (for transport of oiled live animals for instance);
- agreements between NGOs, administrations and authorities as regards food, energy and fluid supplies, safety visits, waste recovery and treatment;
- common procedures for impact assessment and follow-up; procedure for integration of NGOs in expert groups as regards clean-up operations, etc.

Such working groups have already met in some parts of France, and work together with success. Not only does this system allow them to draft an efficient plan, it also gives these various parties the opportunity to meet on a regular basis, get to know each other, develop confidence and should reduce the risk of conflicts in case of a crisis.

NGOs should also be invited to participate in exercises organized by authorities.

the most appropriate owner of the plan, i.e. the organization that takes responsibility for the planning process, and adopts and maintains the plan. Ownership is best taken by the party responsible for the wider oil spill response for the relevant area, for example, government, coastguard, port authority or terminal operator. This allows for the most effective deployment of the plan in case of an incident and its integration into the wider oil spill response.

Participants

A successful oiled wildlife response requires a wide range of skills and services, which can be offered by government authorities, industry, professional wildlife responders, NGOs, academic institutions and voluntary groups. Because of legal restrictions in many countries concerning the collection and treatment of wildlife, the response planning process will, as a minimum, require the involvement of agencies with legal responsibilities for the protection and treatment of wild animals and nationally licensed wildlife response experts. Oiled wildlife incidents usually evoke strong emotional reactions from the public and it is recommended that stakeholders from the public domain, like conservationists, animal welfare organizations and local wildlife rehabilitators are consulted early in the planning process. Inclusiveness is the best guarantee that a plan will be successful in practice.

The tiered response concept

Many different scenarios may create an oiled wildlife incident. Even small spills can result in a large number of casualties, and sometimes the arrival of oiled seabirds on beaches is the first indication that an incident has occurred.

Different scenarios should be considered by oiled wildlife response planners, in which the types of species, number of casualties, type of oil, length of coastline involved, and season are factors for a risk assessment.

The tiered response concept aims at adjusting the response capability to match the developing level of problem complexity in an incident which, in turn, is expressed by the number of casualties in relation to certain constraints (e.g. the availability of permanent facilities, logistics, available expertise and volunteer resources). There are different ways in which a tiered response for wildlife can be defined, for example:

- As a change of strategy in relation to limited sources of response capacity (e.g. tier 1: a local permanent facility near to the spill responds; tier 2: as tier 1 with assistance of other national facilities; tier 3: as in tier 2 with a large coordinated effort by local and national authorities and/or international expert groups).
- As a change of strategy in relation to the species involved (e.g. tier 1: euthanasia in the case of a few species from abundant populations; tier 2: rehabilitation if an endangered species is involved).

The Tiered Response

The Tiered Response is an industry concept which provides planners and responders with a framework to sort scenarios incidents by scale and severity. In some jurisdictions the Tiered system is used to demark specific levels of cost of response activities.

Commonly Tiers 1, 2 and 3 are used.

Tier 1: A situation that will only have local impact and require only local resources. The response strategy should be well-defined and documented.

Tier 2: A situation that has national significance. The response strategy will need to be aligned/developed according to national policy/regulations.

Tier 3: A situation that has international significance. The response strategy will need intergovernmental input.

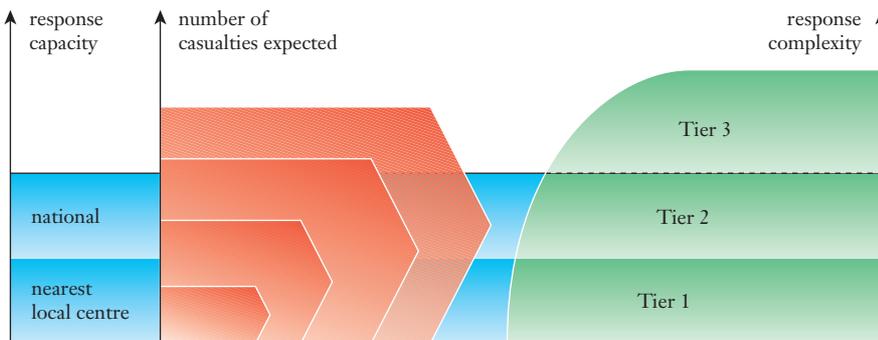


Figure 7
A tiered response model based on local rehabilitation capacity. The (expected) influx of oiled animals (red arrows) in relation to the local response national rehabilitation capacity (blue bars) in this model will determine the level of response (Tier 1, 2 or 3, in green).

	Number of casualties	Who deals with casualties?	How are casualties dealt with?
Tier 1	within the capacity of one or more local centres	local centres can handle	local area response plan
Tier 2	within national capacity	national centres can handle	national response plan, 'Tier 2'
Tier 3	beyond national capacity	international assistance required	national response plan, 'Tier 3'



Wildlife responders should be briefed by a response media liaison before giving an interview. (Tricolor, 2003)

- As a change of strategy in relation to a certain critical number of casualties in a remote area and/or difficult season (e.g. tier 1: a few casualties are euthanized by local vets; tier 2: too many casualties for euthanasia, rehabilitation by a national group or international contractor).
- Any combination of the above.

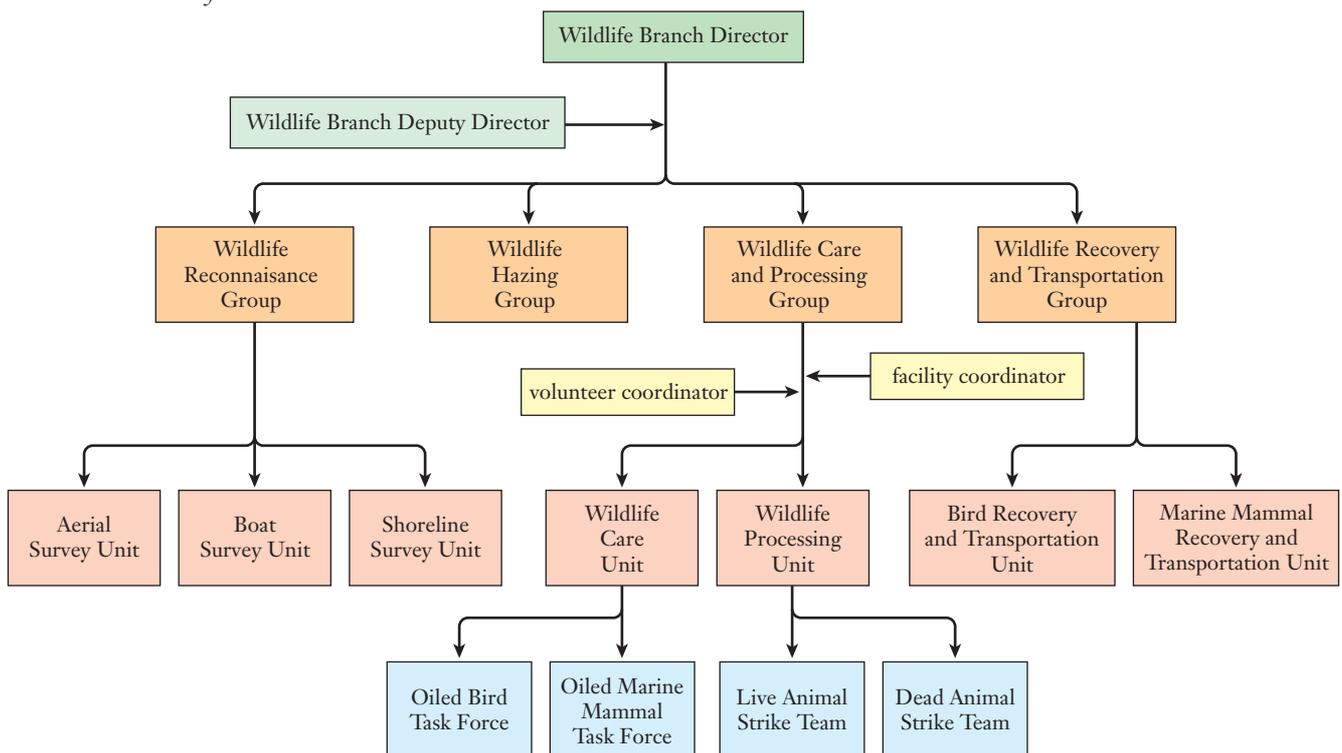
Planning for the response organization

How best to plan for the organization of an oiled wildlife response depends very much on local circumstances and resources. Most important is that the wildlife activities are recognized by, and integrated into, the wider oil spill response plan for the region to which the wildlife plan applies. If an oil spill occurs, a unified command will/should be set up to coordinate response operations. Wildlife operations are best embedded within this command structure.

Most of industry now responds using the Incident Command System (an incident management system which is mandated in US territory). The wildlife operation will appear as a unit in that system (see Figure 8).

Whatever system is used, incident response is all about completing tasks. These tasks can be presented in action cards for different functions in the response. See Appendix 2 for an example.

*Figure 8
An example of the Wildlife Branch in an Incident Command System*



Main categories	Key functions
The collection and treatment of animals (hands-on activities)	<ul style="list-style-type: none"> ● Shoreline collection, initial treatment, transport ● Live animals: management of the different facilities for birds, mammals, reptiles ● Dead animals: assessment, mortality at sea, labelling and registration of beached corpses, storage, analysis (necropsy)
Support and administrative functions	<ul style="list-style-type: none"> ● Public relations ● Logistics: planning and transport of goods, stocks and storage, suppliers ● Finances/legal: funding, financial administration, claim preparation ● Data management: data collection, analysis, impact assessment, data provision, i.e. to media, institutions etc. ● Human resources: health & safety, volunteers, insurance, travel and subsistence ● Facilities supervision: animal welfare, care and veterinary protocols, euthanasia guidelines ● Waste management: waste water treatment, solid waste, oiled corpses
Overall coordination	<ul style="list-style-type: none"> ● Situation unit ● Monitoring and control ● Overview and planning operations ● Liaison (with overall oil spill response, external groups, P&I Clubs) ● Report and evaluation

Table 4

An overview of the key functions which require attention in the oiled wildlife response

Selecting responsible officers and personnel

Key officers

In most cases, the departments, institutions or organizations with a statutory obligation to fulfil certain tasks in the response will be easy to identify. In addition, it is recommended that each body names the officers who will be charged with the described task and that these names appear in the plan, complete with their contact details (both business and private). This should include details of when they can be contacted (office hours or 24 hours, etc.). This will speed up the notification procedure, and has the advantage of allowing the identified people to prepare themselves, receive training to improve their skills, and participate in exercises. Contact may be speeded up if a cascading means of communication is established, for example, A contacts B, B contacts C & D etc.

Oiled wildlife responders

The handling and treatment of live oiled animals should only be undertaken by trained wildlife responders, preferably local oiled wildlife care experts. It is recommended that key personnel in the wildlife response plan receive training to

Points to consider in selecting an appropriate wildlife response organization

1. *Species at risk*
2. *Capabilities of the organization, specifically:*
 - a. management ability of rehabilitation programme
 - b. staff (full time and part-time, support, experience in oil spill response)
 - c. volunteers and their management
 - d. equipment capabilities
 - e. facility capabilities
 - f. response coverage area
 - g. permits
 - h. policies on euthanasia, chain of custody, etc
 - i. medical/veterinary capabilities
 - j. documentation/data tracking capabilities
 - k. availability to participate in drills and training
3. *Health and safety*

Source: www.nosenet.org

How do I increase the probability of compensation when responding to oiled wildlife incidents?***During the response:***

- Before you start spending money in a response, make sure that your activities are officially recognized by the centrally led organization.
- Aim at the most cost-efficient and justifiable solution for your expenses in any situation.
- Keep proof of authorization of expenses.
- Keep all receipts and invoices of your expenses.

After the response:

- Where and if possible, make your claim part of the centrally submitted claim.
- Justify each single receipt and invoice of your expenditure.
- Write an accessible claim, as simple and straightforward as possible following official guidelines.

internationally accepted standards. If experienced oiled wildlife care experts are not available on a local or national level, it is recommended that international experts or expert teams are contracted.

Funding and compensation

The plan must be adequately funded to be effective. It is recommended that an emergency budget is agreed and becomes available as soon as the plan is activated, subject to agreement between the plan owners and funders (if different). This budget should cover an initial response period of perhaps two weeks, and typically include costs of vehicle rentals, travel (including costs of international experts), equipment, accommodation and subsistence. In the course of these two weeks other sources of funding can be sought. It is unlikely that such a pre-allocated budget will be sufficient to also fund the establishment of an emergency centre for rehabilitation of oiled wildlife.

The exact procedure for claim submission and its success will differ from country to country and is also dependent on the circumstances under which the incident occurred (see Figure 9). The ITOPF/IPIECA report *Oil Spill Compensation* and the IOPC Fund's Claims Manual both provide additional information.

A wildlife response has a good chance in principle to qualify for compensation for costs incurred if it is well set up and centrally coordinated, professionally carried out, cost-efficient and effective, well documented and fully integrated with overall response activities (e.g. beach clean-up). Close liaison with insurers and the authorities responsible for the wider clean-up strategy from the start of the incident is essential. If the response has been a coordinated, centrally led and administrated action, the submission of one central claim is recommended. In

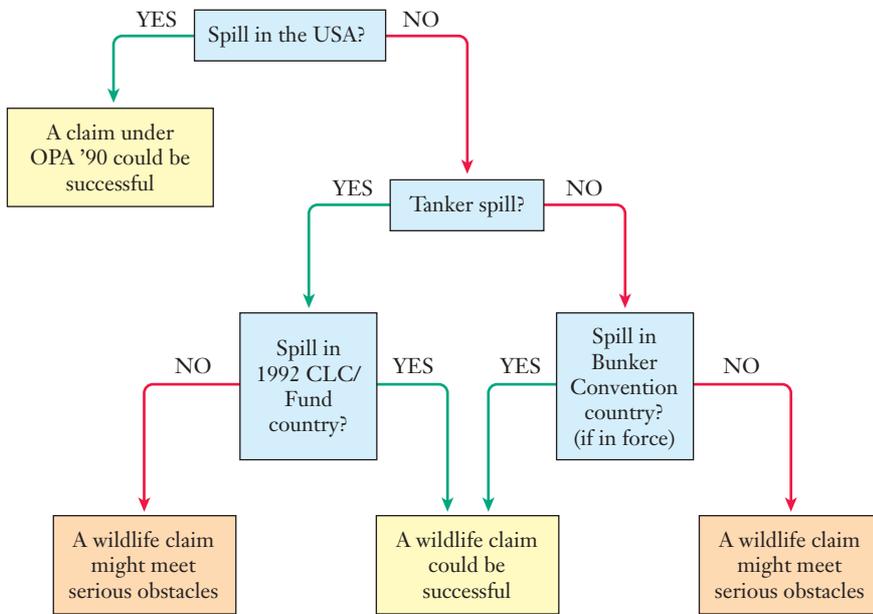


Figure 9
Whether or not a wildlife response qualifies for compensation very much depends on where and how it took place.

anticipation of such a submission, the response plan should note that the relevant P&I Club and/or 1992 Fund are to be contacted early on in an incident to seek advice on critical strategic operational decisions.

Training, exercises and review

Training

Key officers

Although it is unlikely to be a problem to find skilled officers capable of managing a wildlife emergency, it is less likely that these individuals will have experience of operating within a larger oil spill incident. It is therefore recommended that oiled wildlife response officers are invited to participate in oil spill training sessions or response exercises.

Wildlife rehabilitators

The same is true for wildlife rehabilitators. In many countries, those given the leading role in rehabilitation of oiled wildlife are not professional oil spill responders, but will have the relevant experience in animal welfare. They may have a wide knowledge of rehabilitating oiled wildlife from chronic pollution sources, but not with the special conditions and pressures under which one has to operate in an oil spill incident. Key individuals should be given the opportunity and encouragement to receive training from professional oiled wildlife responders, to complete a training course in oil spill management and to participate in oil spill response exercises.

Exercises

Oiled wildlife incident simulations, preferable as part of an oil spill exercise, are an excellent way to exercise and train personnel in their emergency roles and to test the wildlife response plan and its procedures. Valuable lessons can be learned not only by the responsible officers, but also by oil spill managers who will thus become aware of the procedures and strategy of an oiled wildlife response.

Exercises generally will ensure that:

- the plan and its procedures are tested;
- those involved in the response plan are familiar with it and develop a team spirit; and
- deficiencies of the plan can be discovered and modified so that it will function properly in a real incident.

Plan review

The planning process is not a one-off event. An oiled wildlife response plan is a contingency plan and requires periodic review and maintenance. Contact details and equipment listings must be kept up to date. Fundamental changes may have to be made in the light of experiences from exercises or incidents. It is clear that all plan holders need to be appraised of updates, and issued plans need to be subject to thorough document control procedures.

Oiled wildlife response planning in Shetland

The Shetland Wildlife Response Coordinating Committee (WRCC) was established in 1990. It was founded on the experience gained in assessing the environmental affects of two serious oil spills—the fuel oil spill in Sullom Voe in 1978 (the *Esso Bernicia*) and the *Braer* oil spill on the south coast of Shetland in 1993—and on the lessons learned from experiences of others, including the *Exxon Valdez* spill in Alaska in 1989.

The WRCC was set up under the auspices and Chairmanship of the Shetland Oil Terminal Environmental Advisory Group (SOTEAG), and its terms of reference include responsibility for policy and procedures for dealing with oiled wildlife casualties and corpses resulting from a significant spill.

Membership is formalized, and brings together all local organizations that would become involved with the wildlife aspects of a serious oil spill anywhere in Shetland, including: the Shetland Islands Council (SIC), the Terminal Operator (BP), the Scottish Society of the Protection of Cruelty to Animals (SSPCA), the Hillswick Wildlife Sanctuary (rehabilitation of marine mammals), the Scottish Natural Heritage (central government conservation body), the Royal Society for the Protection of Birds (RSPB) and the Shetland

Bird Club (national and local conservation bodies), the Scottish Environment Protection Agency (SEPA), the Shetland Biological Records Centre, a local veterinary practice and the local police. Formal links are also maintained with organizations outside Shetland which could provide expertise in an emergency.

The WRCC meets at least once a year to review and update the wildlife response plan for Shetland, taking account of experiences gained in local oil spill exercises, actual oil spills within Shetland or elsewhere, and changes in legislation. The wildlife response plan is incorporated into the two oil spill plans that exist for the whole coastline of Shetland, and specifically for Sullom Voe Harbour. One of the strengths of the WRCC is that all participants—industry, central and local government, government conservation agencies and NGOs—share the same objective of a controlled, safe, efficient and cost-effective response to a major oil spill. An added advantage is that Shetland is a relatively small community, so that key players know each other professionally—and even socially—between times of crisis.

The key to success in the *Treasure* spill

The activities to relocate more than 20,000 penguins and rehabilitate another 20,000 oiled during the *Treasure* incident (South Africa, 2000) are often referred to as a good example of successful wildlife response, although no pre-spill response plan existed. What were the keys to this success?

- The area affected and threatened by oil from the *Treasure* had been impacted by the *Apollo Sea* incident several years previously. Following this earlier spill, many lessons had been learnt on how to improve transport, and rehabilitate local species including the resident populations of African penguins. These lessons had been integrated into treatment protocols for wildlife responders.
 - A change in local legislation, which happened long before the *Apollo Sea*, incorporated the local wildlife response centre into the larger organization of general emergency and spill response.
 - Following earlier incidents, the local wildlife response centre had established working relationships with various national and provincial government departments. The assistance received from them was crucial for the successful organization of a response at an unprecedented scale.
 - While the local wildlife response centre did not have a contingency plan for oiled wildlife response, it employed a team of very committed staff, with experience in the day to day running of a response centre and practical experience of previous incidents.
 - As soon as the centre was notified of the potential oil spill from the *Treasure*, the staff carried out a 'dry run' to test procedures for dealing with some 500 African penguins. It became clear that the centre would be able to handle a maximum of 2,000 penguins, when the spatial and logistic limitations of the existing centre were discussed. In addition, only a limited number of experienced volunteers (40) were available at the outset. By giving each staff member a specific area of responsibility, necessary steps for 'mobilization' were identified and contingency arrangements developed in case the incident should escalate.
 - The local wildlife response centre had previously worked with a team of international oiled wildlife responders and experts, and had close contact with a large number of zoos and aquariums in the USA, Europe and Australia.
- Following requests for assistance, the existing good working relationships allowed the smooth integration of these experts into current activities after their arrival on site on day four.
- The outstanding experience of the international oiled wildlife responders was crucial to deal effectively with an incident of this size.
 - Strategic decisions were taken by the leading local staff, with international experts in an advisory role. The international team managed the rehabilitation process at the satellite centre, where the majority of the penguins were sent, when the existing wildlife response centre reached its maximum capacity. The satellite centre largely functioned as a separate unit but made its decisions in conjunction with the local wildlife response centre. In this way, the local centre took maximum advantage of expert advice, while keeping control over its own responsibilities, the use of resources etc.
 - There was a good exchange of information between the wildlife response team, the national authorities responsible for spill response and the stricken vessel's representatives. This resulted in the facilitation of an early emergency payment before the final claim for compensation for damage from oil pollution had been submitted, and in the smooth handling of claims thereafter.
 - The successful pre-emptive removal by the national agency, in cooperation with the lead local wildlife centre, of 20,000 un-contaminated penguins from the affected area greatly added to the success of the operation.
 - In summary, the success of the operation can be put down to pre-spill arrangements, a good communications network between key stakeholders, trained and experienced staff, and the links with experienced and internationally operating experts—integral parts of any wildlife contingency plan.

APPENDIX 1

Is the response plan adequate?

Ten questions for assessing the adequacy of the wildlife response plan (modified from ITOPF Technical Information Paper on Contingency Planning):

1. Has there been a realistic assessment of the nature and size of the possible threat, and of the wildlife resources most at risk, bearing in mind the probable movement of any oil spilled, and the habitats of protected species?
2. Have priorities for protection and rehabilitation been agreed and clearly explained, taking into account the viability of the various options, available expertise, and protected species?
3. Has the strategy (specifically on data collection, documentation, rehabilitation, triage, euthanasia) for an oiled wildlife response been agreed, and have the necessary protocols (treatment of dead and live casualties) been agreed and made part of the response plan?
4. Has the necessary organization been outlined, and have the responsibilities of all those involved been clearly stated with no 'grey areas'—i.e. will all who have a task to perform be aware of what is expected of them, and will they have received training to enable them to do it?
5. Are the levels of equipment, materials and manpower sufficient to deal with the anticipated size of the spill? If not, have back-up resources been identified and, where necessary, have mechanisms for obtaining their release and entry to the country been established?
6. Have permanent and temporary facilities and stock resources been identified?
7. Are the alerting and initial evaluation procedures fully explained, as well as the arrangements for continual review of the progress and effectiveness of the wildlife response?
8. Have the arrangements for ensuring effective communication between different operations within the wildlife response, and between the wildlife response and wider oil spill response, been defined?
9. Have all aspects of the plan been tested and nothing significant found lacking?
10. Is the plan compatible with plans for adjacent areas and other activities?

APPENDIX 2

Functional responsibilities (after example of the Shetland Wildlife Response Coordinating Committee (WRCC))

Function	Responsibilities
General management	<ul style="list-style-type: none"> ● Responsibility for all activities at the Wildlife Response Centre (WRC) ● Authorize WRC Expenditure ● Represent the WRCC on any relevant group or committee within the emergency response structure ● Convene daily meetings for key post personnel ● Act on WRC need for external assistance ● Control of external offers of assistance ● Represent WRCC at press conferences or, if necessary, delegate to the Media Liaison Coordinator ● Ensure Health, Safety and Environment (HS&E) requirements are in place
Administration	<ul style="list-style-type: none"> ● Maintain log of WRC activities and associated files ● Minute WRCC and key post staff meetings, and circulate minutes ● Identify need for additional personnel in administrative structure ● Supervise administration staff ● Oversee register of volunteers' contact details ● Maintain financial records ● Maintain log of staff time
Field operations	<ul style="list-style-type: none"> ● Organize teams to survey beaches for dead and live animals ● Plan daily field effort based on pollution surveillance reports, and weather conditions and forecasts ● Debrief and collect reports from beach survey teams on their return ● Evaluate need for additional external support ● Implement HS&E requirements
Animal welfare	<ul style="list-style-type: none"> ● Oversee all operations involving live birds, seals and others ● Direct link between WRC and rehabilitation centres ● Evaluate need for, and organize, temporary rehabilitation facilities ● Evaluate need for additional veterinary or field rescue expertise ● Evaluate need for, and advise on, transportation of live casualties
Scientific data	<ul style="list-style-type: none"> ● Ensure proper collection, identification, labelling and storage of specimens ● Maintain database of biological aspects of incident ● Daily summary and interpretation of field survey debrief forms ● Evaluate need for additional scientific expertise ● Coordinate requests for, and delivery of, biological material ● Organize any post-mortems of carcasses ● Initiate and supervise any surveys to detect vulnerable concentrations of birds in the likely path of oil slicks ● Supervise any drift experiments
Logistics	<ul style="list-style-type: none"> ● Establish telephone and fax communications at WRC ● Liaise with Field Operations Coordinator on requirement for field communication equipment ● Arrange all procurement and hiring of equipment and vehicles ● Organize catering and cleaning requirements at WRC ● Organize freight transport requirements ● Liaise with Administrator on financial control matters ● Liaise with owners of WRC building ● Organize any security requirements at WRC ● Set up internal e-mail systems exclusively for WRCC members ● Set up external e-mail facilities to facilitate internal/external communications for contact points ● Set up Internet resource for use by internal/external parties ● Maintain all resources for duration of incident
Media liaison	<ul style="list-style-type: none"> ● Liaise with the media, through channels identified by the incident control centre ● Initiate media appeals for volunteer assistance ● Maintain file of media coverage ● Assist Scientific Coordinator with synopses and casualty lists ● Brief field teams on appropriate response to approaches from the media ● Ensure photographic record of the incident ● Liaise with general management over information releases

APPENDIX 3

Resources and contact details

Oiled wildlife protocols

Best practices for migratory bird care during oil spill response. 2003. United States Fish and Wildlife Service.

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Planning

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The International Petroleum Industry Environmental Conservation Association (IPIECA) is comprised of oil and gas companies and associations from around the world. Founded in 1974 following the establishment of the United Nations Environment Programme (UNEP), IPIECA provides one of the industry's principal channels of communication with the United Nations. IPIECA is the single global association representing both the upstream and downstream oil and gas industry on key global social and environmental issues including oil spill preparedness and response; global climate change; health; fuel quality; biodiversity; and social responsibility.

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