Wildlife response preparedness

Good practice guidelines for incident management and emergency response personnel


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Figure 3 (page 17) adapted from C. J. Camphuysen, personal communication on the use of effort-corrected data on seabirds at sea from the European Seabirds at Sea (ESAS) database 4.1 (maintained by the Joint Nature Conservation Committee (JNCC) in Aberdeen, Scotland).

Figure 4 (page 18) adapted from ICES (2005).

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Preface

This publication is part of the IPIECA-OGP Good Practice Guide Series which summarizes current views on good practice for a range of oil spill preparedness and response topics. The series aims to help align industry practices and activities, inform stakeholders, and serve as a communication tool to promote awareness and education.

The series updates and replaces the well-established IPIECA 'Oil Spill Report Series' published between 1990 and 2008. It covers topics that are broadly applicable both to exploration and production, as well as shipping and transportation activities.

The revisions are being undertaken by the OGP-IPIECA Oil Spill Response Joint Industry Project (JIP). The JIP was established in 2011 to implement learning opportunities in respect of oil spill preparedness and response following the April 2010 well control incident in the Gulf of Mexico.

The original IPIECA Report Series will be progressively withdrawn upon publication of the various titles in this new Good Practice Guide Series during 2014–2015.

Note on good practice

'Good practice' in the context of the JIP is a statement of internationally-recognized guidelines, practices and procedures that will enable the oil and gas industry to deliver acceptable health, safety and environmental performance.

Good practice for a particular subject will change over time in the light of advances in technology, practical experience and scientific understanding, as well as changes in the political and social environment.

Contents

Introduction

How to use this guide

This guide to wildlife response preparedness is envisaged as a course manual for personnel whose job is to develop the oiled wildlife preparedness of their company or country and who have only a passing knowledge of wildlife response. Rather than serve as a template for response plan development, it aims to provide an understanding of the principles of oiled wildlife preparedness and response and a logical path to the achievement of good practice in mitigating the impacts of oil spills on wildlife. As such, it will be of value to those preparing to respond to an oiled wildlife incident as well as those who are tasked with evaluating preparedness efforts.

The document provides an overview of the key concepts and solutions in oiled wildlife response preparedness, and explains how a higher level of integrated preparedness can be achieved. The guidelines do not, however, replace the need for experienced wildlife response professionals to be involved in oiled wildlife preparedness and response efforts. Instead, it is hoped that by providing an introduction to some of the subtleties and complexities related to the field of wildlife response, a greater appreciation can be developed for the value of those that have dedicated themselves to its mastery. While this document speaks directly of the knowledge and experience gained in responding to spills of crude and fuel oils over several decades, many of the same techniques, policies and operating procedures can be applied to spills of other chemicals that are transported by ship, train or pipeline and that may affect wild animals. This document will therefore also be of value to planners tasked with preparing for events involving those products.

What is oiled wildlife response?

Legally mandated integration of oiled wildlife planning, e.g. in the USA, has provided increased opportunities for NGOs to improve animal care protocols and professionalize their services.

Oiled wildlife response, often too narrowly regarded as synonymous with oiled wildlife rehabilitation, is one of the least understood and most underestimated aspects of an oil spill response. It can be more accurately defined as the combination of activities that aim to minimize the impacts of an oil spill on wildlife (such as birds, mammals and reptiles) by both prevention of oiling where possible and mitigating the effects on individuals when oiling has taken place. Response activities include the assessment of wildlife risks in time and space, real-time monitoring of the whereabouts of wildlife in relation to the oil, protection of nesting/haul-out sites, hazing and deterrence (scaring animals away from oil), pre-emptive capture and collection of un-oiled animals and their offspring/eggs, collection and analysis of corpses, euthanasia, rehabilitation of live oiled animals, their release to the wild and, finally, monitoring of post-release survival.

For decades, wildlife response activities existed separately from the mainstream oil spill response preparedness and R&D systems, and made ad hoc appearances only as carried out by whoever was nearest and alert enough to get involved. However, thanks to professionally operating non-governmental organizations (NGOs) and some pioneering universities,

oiled wildlife rehabilitation protocols have improved, especially in countries where legislation now places an explicit value on the mitigation and restoration of damage to nature. In recent decades, incidents that have taken place across the world have demonstrated that wildlife response has matured as a professional activity and can be successfully integrated into oil spill response.

This recognition, together with the opportunities provided by visionary authorities and industry groups, have led to the development of new concepts and solutions for minimizing damage to wild animals and their populations. Depending on the parameters of the planning process as well as the goals set for oiled wildlife preparedness and response, a range of operations can now be considered, which take place either in the field or under controlled conditions in a facility.

Why prepare?

Any oiling incident has the potential to impact on wildlife. These impacts may have significant legal, economic, cultural, political or public perception consequences for industry and government. Although existing regulations may not require a wildlife response, the public may demand that professional action is taken, especially when threats or damage to wildlife are reported by the media.

Importantly, the scale of the impacts on wildlife does not correlate with the amount of oil spilled. Rather, it is dependent on many other factors including the timing and location of an incident, the product type, oceanographic and weather patterns, and the corresponding movements of species that feed, nest or generally inhabit a particular area. A release of even a small volume of oil may have a large impact in areas of high wildlife abundance, or could threaten individuals, the offspring or the habitat of species that are protected for their national or international conservation value.

If animals become threatened or oiled, this will likely capture the interest and concerns of the media and the public. If the recovery of affected wildlife is not legally mandated, not occurring in an effective manner, or not occurring at all, concerned individuals or organizations may decide to organize their own rescue efforts. Without a pre-planning effort that is integrated sufficiently into the overall incident management system (IMS), these efforts will, at best, prove only marginally beneficial. More likely, they may threaten the health and safety of people and animals, and may have a negative impact on the operational efficacy and public perception of the incident response.

Alternatively, a pre-planned, professional and fully integrated wildlife response effort led by experienced oiled wildlife response managers allows for a response effort that is aligned with broader health, safety and operational objectives. In considering the potential for impacts on wildlife in advance of a potential oil spill, response options can be assessed and objectives defined. Furthermore, a unity of effort can be achieved among multiple stakeholders, ensuring that the brief window of opportunity for responding to live wildlife casualties can be used effectively and appropriately.

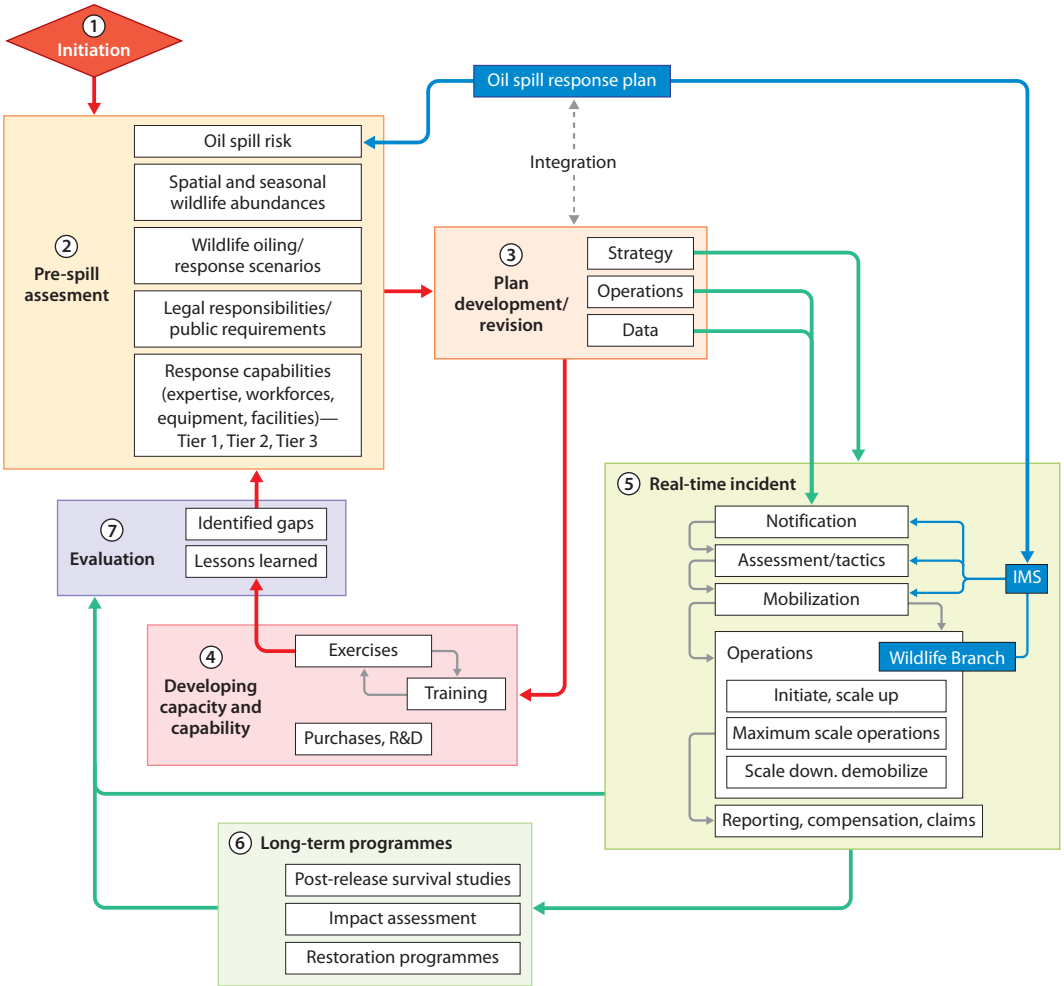
The Tricolor *spill (Belgium, 2002) was relatively small in terms of volume but had an impact on a large number of seabirds; more than 2000 live oiled birds were received by Belgian wildlife organizations within the first week of the response.*

The preparedness cycle

When a country, company or organization is considering the development of a level of wildlife response preparedness, it can often be difficult to see how it can be achieved and where to start. Figure 1 shows how wildlife response preparedness can be built through a series of consecutive steps—assessment, planning, implementation and evaluation—that form a continuous, cyclical process.

If an incident occurs, the developed oiled wildlife response plan will provide guidance for the different phases of the response. Evaluation of that response will bring the experience back into the preparedness cycle and lead to further improvements in the future. In developing an oiled wildlife response plan it is assumed that an oil spill response plan is in place which provides an analysis of oil spill risk and the related environmental sensitivities as a basis to work from. The oil spill response plan will provide the structure and establishment of an incident management system in case of an incident.

Figure 1 *The cycle for developing oiled wildlife response preparedness*



The red cycle is the chain of regular activities that lead to comprehensive preparedness. The green cycle is the chain of activities that should roll out in the immediate aftermath of an incident that threatens wildlife (discussed in the following sections of this guidance). Appendices 1 and 2 provide additional details on operational considerations for wildlife response.

Where to start

Developing a wildlife response plan

A wildlife response plan aims to provide a defined and integrated structure for those undertaking wildlife response activities, and the objectives, strategy, tactical guidance and information needed to fulfil that task successfully. When fully integrated into an oil spill response plan, the wildlife response can be directed and coordinated as part of the incident management structure so that priorities can be set in relation to other aspects of the response, and resources can be made available as needed and appropriate.

The development of a wildlife response plan must be based on a proper assessment of wildlife risks, scenarios and available response capabilities. Its objectives and strategic set-up must reflect the identified legislative requirements for the envisaged response activities and the social, economic, cultural and emotional values that wildlife represents, as perceived by the local community.

The process by which the wildlife response plan is developed may vary as necessary to meet the needs of the body or agency that will own and manage it. The deepest characteristic of a wildlife plan is that it has to bring a wide variety of specific knowledge and information together, a large part of which sits with scientists, universities and NGOs, all of whom are stakeholders. It has been proven that the most effective wildlife plans are those which ensure key stakeholder groups are consulted and play a role.

Stakeholder meetings are normally organized during the assessment phase. Once the various stakeholder interests have been clarified and balanced, the actual plan writing can begin. This may be carried out by an experienced oiled wildlife response expert or expert team, under supervision of a project group of main stakeholders which assists by providing key information.

Once agreed and approved, the plan must be formally signed and adopted. Revisions of any plan are also needed on a regular basis to keep data up to date and to allow modification of the plan to reflect and incorporate new and recent insights, e.g. learnings from a spill or exercise, changes in the positions or commitments of signatories, or new experiences and scientific insights from elsewhere. See the section on plan evaluation (pages 48–49) for more details.

Although the signing and formal adoption of the plan is a great milestone, it is at that stage still just an intention written on paper. To fully develop its value, a multi-year implementation programme is needed; the elements of such a programme are discussed in the section on 'How to make the plan operational' on page 30.

Defining plan philosophy and scope

Understanding and incorporating stakeholder values into the scope, objectives and strategy of a wildlife response plan will help to get broader support from local communities. Furthermore, there is a legal mandate for conservation and animal welfare in most countries, which needs to be respected and included in the planning process. On a tactical level, consideration of these factors

also allows for faster decision making in the aftermath of a real incident, particularly when such decisions involve difficult choices concerning potentially sensitive issues.

Response managers need to know if certain response options may be considered inappropriate for use in a specific response or within a plan. Such awareness saves time and allows them to concentrate on the tools that are considered acceptable. A good example in oiled wildlife response is euthanasia, the use and method of which is largely influenced by cultural values. Some cultures value life above all, and euthanasia in any form is not an option. Others may value the relief of suffering above all, and mass euthanasia may be the preferred option. If these local or cultural values conflict with the plan holder and response strategy, they should be resolved through considered discussion well before the incident. Postponing their resolution until a spill occurs will only increase the difficulty of resolution and decrease the likelihood of a mutually acceptable response.

Public reactions do not always provide the best leading principles for a response, but should nevertheless be considered as a gauge of cultural values that may influence the wildlife response strategy and the perception of a particular approach. Values that humans and human communities (such as the general public, elected officials, NGOs and Indigenous Peoples) associate with wildlife may be wide ranging. Those responsible for planning wildlife response activities should be aware of such values and feelings, and ensure that they are acknowledged, respected and, where possible, accommodated in the planning process. Table 1 on page 9 provides an overview of principles and values that are important in deciding upon the response actions.

Legal framework

Before assigning responsibilities for operations and decision making in an oiled wildlife response, it is important to be aware of the local legislative requirements. Important aspects to consider include conservation and species protection (licences to touch and handle, priority species), animal welfare, game, food safety, worker safety, environmental protection, and public access laws and regulations. Certain agencies, ministries or departments will have statutory authority over the various aspects of the wildlife response and are therefore best involved at an early stage. It may be necessary for a number of these authorities to be involved in order to give appropriate consideration to all aspects of the response. Issues of overlapping, undefined or even denied competence may arise, with conflicting opinions between agencies. The roles and responsibilities of the various authorities should be recognized and respected in the development of a plan. The greater their involvement in the planning process, the better the plan will reflect the most appropriate and acceptable command structure and approach.

Political decisions

One of the most challenging aspects of the planning process is to make sure that the plan and the underlying preparedness system has the broadest political support. This will provide a strong starting point for training and investment, and will ultimately help to achieve the best expected outcomes with regard to the identified objectives, including public expectations and achieving a net environmental benefit, especially when areas at risk transcend local, regional or national boundaries. Once the political decision making has been completed, the process of writing the plan can begin.

Table 1 *Examples of principles and values, and how they may lead to reactions and/or interference from the public if animals become oiled in an incident.*

Principle	Values that may be strongly held	Possible human reactions if animals become oiled	Correlating response actions
Animal welfare	Any individual animal represents intrinsic value (including religious or cultural values), and its well-being must be maximized if it is taken out of its natural environment.	• Live animals should be rescued so that they can be provided with appropriate care. • Oiled animals should not suffer if they cannot be rescued, and should therefore be euthanized.	• Proactive animal capture efforts to prevent oiling. • Rehabilitation or euthanasia after capture, using a humane method (acceptable to public).
Conservation	A wild animal represents a healthy, natural and undisturbed environment; it is an intrinsic part of the environment and should be preserved for that reason.	• The environment is damaged and this damage must be assessed and repaired; this includes the rehabilitation of oil-affected animals. • The polluter is liable and must compensate for damage to, and/or restoration of, wildlife populations. • If a certain species is in decline, it should be rescued as a priority.	• Capture, transport to facility, treatment in the facility, and release back into the natural environment away from the oil.
Non-intervention	A wild animal should not receive any form of human assistance; its survival should depend on natural conditions only.	• Animals should not be assisted, even though they may suffer and die without such assistance. • Money should not be spent on animals while the needs of so many humans are unmet.	• No field intervention is undertaken. • Ensure the health and safety of members of the public (prevent them from any action outside of the official response). • Monitor animals and assess mortality, if possible and appropriate.

The structure of a wildlife plan

The main challenge in the plan development process is to bring all aspects together into a document that:

- clearly explains what the plan aims to do, why, when, how and by whom;
- provides clear and straightforward operational instructions to enable managers and responders to respond quickly when instructed to do so; and
- provides the key data and supporting resources to enable efficient and effective decision making.

Ideally, the plan will therefore consist of three separate sections, i.e. strategy, operations and data. Table 2 on page 10 lists the key aspects that will need to be considered within each of these three sections.

Table 2 *Aspects that need to be considered within the strategy, operations and data sections of the 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 adverse conditions; tiered response • Strategy for health and safety • Strategy for preventing oil reaching wildlife, and for preventing wildlife from becoming 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
Equipment, supplies and services • Temporary facility equipment • Veterinary equipment • Capture and collection equipment • IT, office and communication equipment • Inspection, maintenance and testing
Management, human resources and training • Relationship with the Incident Management System • Wildlife response manager and supporting functional units • Incident organization chart • National (licensed) oiled wildlife responders • International oiled wildlife responders and advisers • Personnel availability (on-site, on-call) • Availability of additional labour (volunteers) • Training/safety schedules and drill/exercise programme
Communications and control • Wildlife Unit, Incident Management System • Permanent and temporary facilities • Field team communication equipment • Reports, manuals, maps, charts and incident logs (record keeping) • Website development

continued …

1. Strategy section (continued)

Activation, deactivation

Exercise, training, plan revision

Funding
- Financial controls
- Claims

2. Operations section

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

Operations, planning and mobilization procedure
- Assembling a full response team
- Identifying immediate response priorities
- Mobilizing an immediate response
- Identify/establish the wildlife facility
- Preparing the initial press statement
- Planning medium-term operations (24-, 48- and 72-hour)
- Deciding whether there is a need to escalate the response to a higher Tier
- Mobilizing, or placing on standby, the resources required
- Establishing beach search and collection teams, communication and transport

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

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

3. Data section

Maps/charts

- Coastal facilities, access roads, hotels, etc.
- Species distribution maps/atlases; 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)

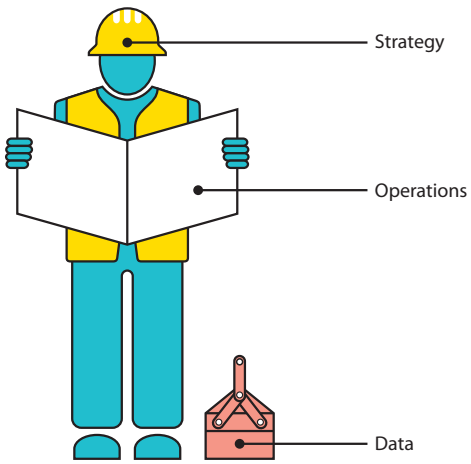
Lists

- 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; communications 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 organizations and their field(s) of responsibility: local and national government; animal welfare organizations; university departments; wildlife rehabilitation centres; etc. (including name of contact person, rank and responsibility, address, telephone, fax and email)
- Sources of personnel: veterinary doctors; veterinary nurses; wildlife rehabilitators; wildlife biologists; necropsy analysts; local authorities; caterers; security firms; volunteers (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 setting up the functional Units (Logistics, Administration, Finance, Planning, etc.)
- Triage criteria

Data

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

At the time of a response, the **operations** section provides clear instructions, like a road map,which allow responders to quickly initiate and maintain the key activities. The **data** section is like a toolbox that provides relevant information and decision support material, as logically required at any stage of the response, to maintain an optimal flow of operations. Responders should have the **strategy** in their minds (or in their back pocket), not in their hands. In a well-developed plan, the strategy is consistently reflected in the operations and data sections.



Integration

Integrating a wildlife response plan as part of an oil spill plan at the appropriate level ensures that the wildlife response will achieve the agreed-upon objectives consistent with the overall response. This integration is relevant both for incidents where oiled wildlife is discovered before a release is reported and also where free oil is observed in the environment, thereby providing support to the IMS even if oiled wildlife is the only response action required. Integration enables the wildlife response to benefit from existing national and international administrative arrangements for mutual assistance (tiered response). Some international agreements for oil spill response cooperation have now started to integrate wildlife response into their policy and arrangements.

Box 1 *Baltic States develop and adopt national oiled wildlife response plans*

The Baltic Sea States have integrated oiled wildlife preparedness into their marine pollution preparedness and response arrangements under the umbrella of the Baltic Marine Environment Protection Commission (or Helsinki Commission—HELCOM) Response Group.

States are obliged to develop and adopt their own national oiled wildlife response plans by 2016, which are supported by an agreed regional mechanism for reporting and requesting assistance in case of an oiled wildlife incident in the Baltic Sea Area.

Defining objectives and identifying planning challenges

The objective of any wildlife response plan will be to minimize the impact on animals, their populations and habitat. This will be achieved most cost-efficiently if oil can be kept away from the animals and their habitats, or if animals can be kept away from the oil. However, the circumstances of an incident may mean that little or no time is available to achieve either goal, and those operations may have a limited effect or might not be undertaken. If animals become oiled, the plan must clearly state all the potential operations and techniques that could be applied to minimize the impact of that oiling.

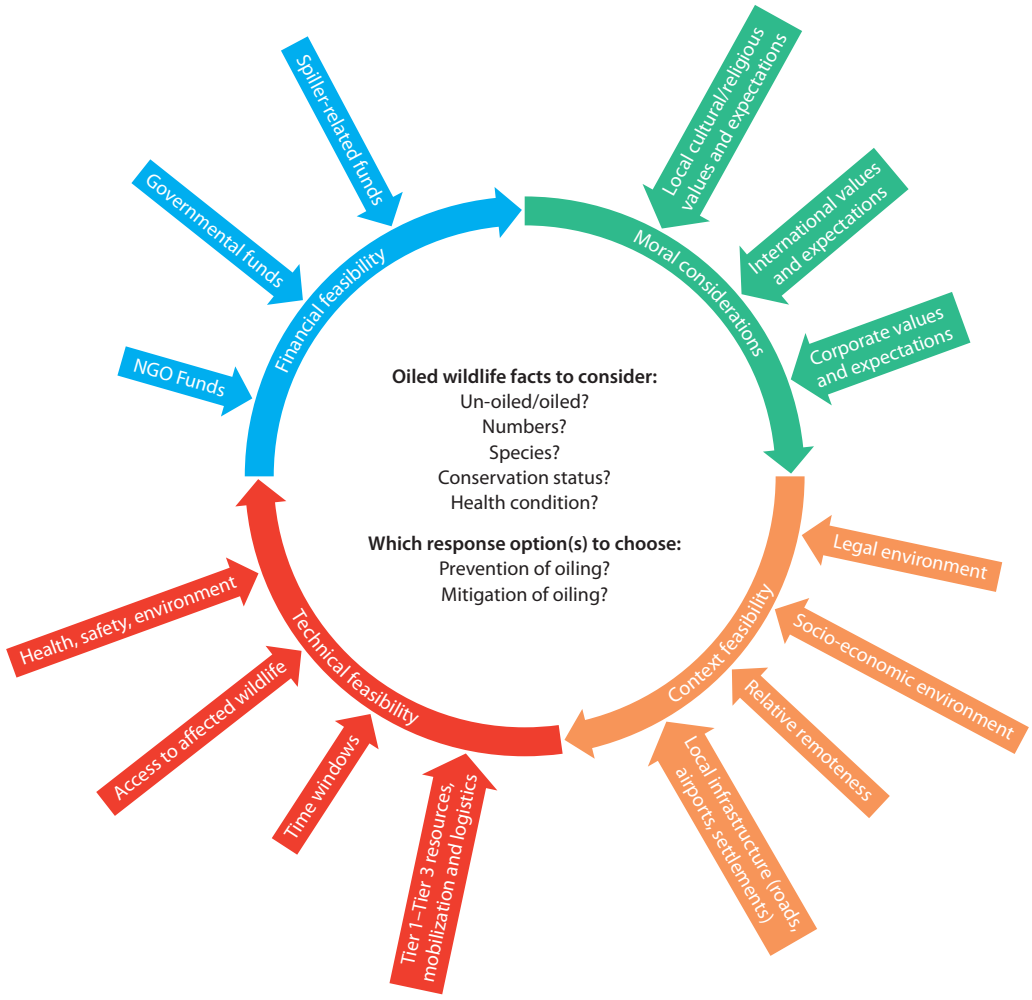
Wildlife adds a layer of complexity to any oil spill response scenario. In cases where oil is moving towards areas where animals are abundant, or where it has already started to affect wildlife, decisions have to be taken on what to do, how to do it, when and by whom. In a spill response, the decisions will have to be made quickly, because there is limited time to initiate effective action. Preventive actions must be taken quickly before animals become contaminated. Actions to mitigate the effects of oiling should be taken before animals become hypothermic, succumb to the toxic effects of the oil or lose critical body condition.

Although this seems simple, the decision-making process will need to take a large number of factors into account to assess the feasibility of different response options and their expected success in consideration of the specific conditions at stake (see Figure 2). This includes the context

of the spill (including local infrastructure and the legal framework), the technical feasibility of mounting a wildlife response (including the health and safety of responders), financial feasibility and any cultural values that may influence response options and objectives.

All these elements are best considered as part of a proactive planning process to ensure an efficient response and unity of effort should an incident occur.

Figure 2 *Factors affecting the feasibility of the different operations that may be considered during an oiled wildlife response*



The most important factors likely to influence the feasibility of different operations during an oiled wildlife response are presented here. The nature of many of these factors can be assessed before a spill incident occurs, and can be provided for at the planning stage. This will enable fast tactical decision making during an actual response.

Once the guiding principles have been established, the response planner should consider five key operational issues (see Table 3) that will lead to the definition of response objectives and the identification of specific planning challenges associated with each objective.

Table 3 *Overview of key issues, objectives and related challenges that need to be considered in wildlife response planning and preparedness. (See Appendix 1 for further details on operational objectives.)*

Operational questions	Objectives	Wildlife challenges
1. Can the oil be kept away from the animals?	• Keep pollution at, or close to, the source. • Recover oil quickly and efficiently. • Protect sensitive areas. • Know where the priorities are at any time.	• Is there timely capability to combat oil at the source/at sea? • Are sufficient data for a reliable risk assessment available? • Are seasonal sensitivity maps available as well as information on migration patterns and breeding behaviour of species? • Can real-time information of animal distributions be obtained in relation to the oil?

2. Can animals be kept away from the oil?	• Move animals (or, for turtles, their eggs/nests if appropriate) away from oil or a threatened location via:
	  • hazing/deterrence;
	  • pre-emptive capture or collection.
		• Is there timely capability for interaction with appropriate knowledge and understanding?
		• Which species are present?
		• How will animals react to methods (is there a potential for adverse impacts?)
		• What should be done with captured/collected animals: how can animals be kept alive and healthy during captivity; is there a safe place to move the animals to; where/when/how should they be released?
		• What measures are needed to follow up the release?

3. How should animals be treated when they are oiled?	• Collect/remove dead animals. • Treat live animals according to the most acceptable method (rescue/rehabilitation or euthanasia).	• Who will carry this out? • Can systematic and scientific methods for collection be established? • Are reliable and approved methods for rehabilitation of oiled wildlife available that define the (species-specific or quantitative) limits of these methods? • Have euthanasia methods been approved that are considered effective and acceptable (humane), and selective (i.e. not killing/disturbing animals that are not targeted)?
4. How can the response itself minimize damage to people, the environment and the animals?	• Prioritize human safety at all times (no or postponed response if considered unsafe). • Collect/remove dead animals (collect and store safely as these constitute valuable scientific data; avoid scavenging and collection for necropsy purposes). • Ensure animal welfare at all times. • Consider the net environmental benefit.	• Is there awareness of the potential damaging effects of a response (health and safety; secondary pollution; disturbance of unoiled animals; and unnecessary suffering or killing of animals) and do methods exist to avoid such effects? • Are there methods in place to discourage the public from undertaking activities on their own outside of the coordinated response?
5. How can the media and public be informed so that the response will be understood and supported?	• Communicate the response plan and immediate challenges. • Provide daily updates on the response. • Allow public to participate (allow volunteers; provide consumables such as towels). • Provide a public action perspective (what to do if an oiled animal is found). • Allow the media to report on the wildlife response.	• Are strategies for mass communication (e.g. using dedicated websites with a wealth of background information) developed and easily implemented? • Have lessons from past experiences been included in media information? • Do baseline data exist (e.g. population size and strength before the spill happened)?

Assessment as part of the planning process

To develop an effective wildlife response plan (and implement it if an incident should occur), a thorough evaluation of the pre-spill situation in terms of risk and response preparedness needs to be made so that the most effective strategy and tactics can be determined.

Such an assessment is best carried out by experienced oiled wildlife responders and local wildlife experts. They will need to collect, evaluate and incorporate information from a range of sources with varying formats and degrees of detail and veracity. These include oil spill risk, wildlife abundance and sensitivity data, coastal infrastructure, available facilities, equipment stockpiles, and the capabilities and level of training of local responders. This information gathering component can be most effectively carried out using a range of techniques, including (but not limited to) consulting with local, regional and species experts, reviewing available peer-reviewed literature, conducting thorough site visits, and meeting with available and interested oil spill response organizations with regional responsibilities and interests. Incident scenarios and response options need to be developed and discussed with local wildlife authorities and local response groups. The different elements of an assessment are explained in more detail below.

Oil spill risk

The best assessment of oil spill risk will come out of the existing oil spill response plan. The different spill scenarios (shipping accidents, platform accidents) will help to identify the times and regions of risk for which the wildlife profile needs to be developed. Information on climate and weather conditions will also be required and can be provided by the operators of the plan. In addition, many oil spill response plans include sensitivity maps, which may be used as a basis for developing more detailed but compatible sensitivity maps for key species at risk.

Wildlife at risk

The data on wildlife abundances and activities in the planning area are often best collected through collaborations with local biologists and environmental specialists with relevant expertise, as well as with wildlife statutory authorities. Relevant data may also be available through national and international databases.

Left: Bird Island in Algoa Bay, South Africa is the largest Cape gannet colony in the world. Data on wildlife abundancies are essential for the accurate assessment of wildlife at risk.

Key elements

Space

Understanding what areas within a region are at greater or lesser risk in terms of the numbers of animals being affected allows for the effective staging of resources (e.g. facilities, equipment and personnel). Having facility arrangements close to where animals are at greatest risk, yet near to urban settings where a robust volunteer base and ready availability of necessary supplies exists, allows for the most efficient plan. Furthermore, identifying key areas of particular concern allows for the identification of existing organizations and systems (e.g. rehabilitation centres, governmental offices) that may reduce the need to establish new structures or retrofit existing ones. Lastly, by understanding geographic locations of greater risk, access points and staging areas for wildlife recovery teams (for both living and dead animals) and hazing efforts can be determined and pre-established within the plan.

Species

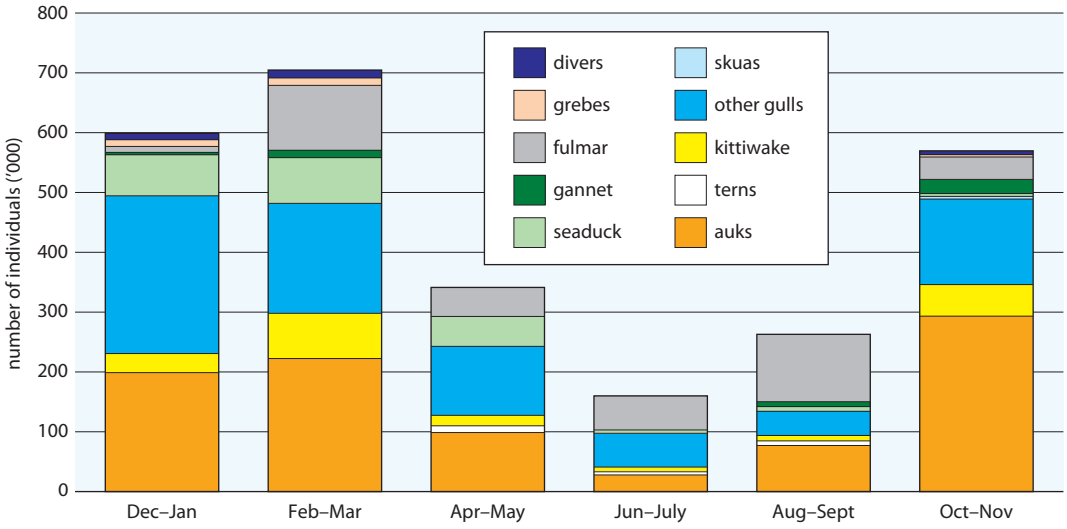
Identifying the taxa and species that are at risk in the region, and understanding their critical needs, will dictate the appropriate methods for reconnaissance, capture techniques and equipment, personnel requirements and facility infrastructure, as well as legal and governmental reporting requirements. For example, significant differences exist between the response needs related to live cetaceans (e.g. dolphins and porpoises) or reptiles (e.g. turtles or snakes) versus those for birds (pelagic, coastal, freshwater). Additionally, knowing each species' conservation status (e.g. threatened or endangered) allows for a prioritized response to those animals of greatest concern.

Time

Understanding the temporal nature of species numbers and activities in areas at risk, as well as when they are at the most sensitive life stage (e.g. juveniles, poor body condition, moulting) allows for readiness based on the degree of risk. For example, planning may include having additional resources available at certain times of the year based on the migration patterns or presence of species of greater ecological 'value' or at greater risk of the effects of oil.

Life-stage sensitivities such as moulting are a key factor in time considerations for wildlife planning and response.

Figure 3 *Bi-monthly fluctuations in seabird abundance in the Southern North Sea*



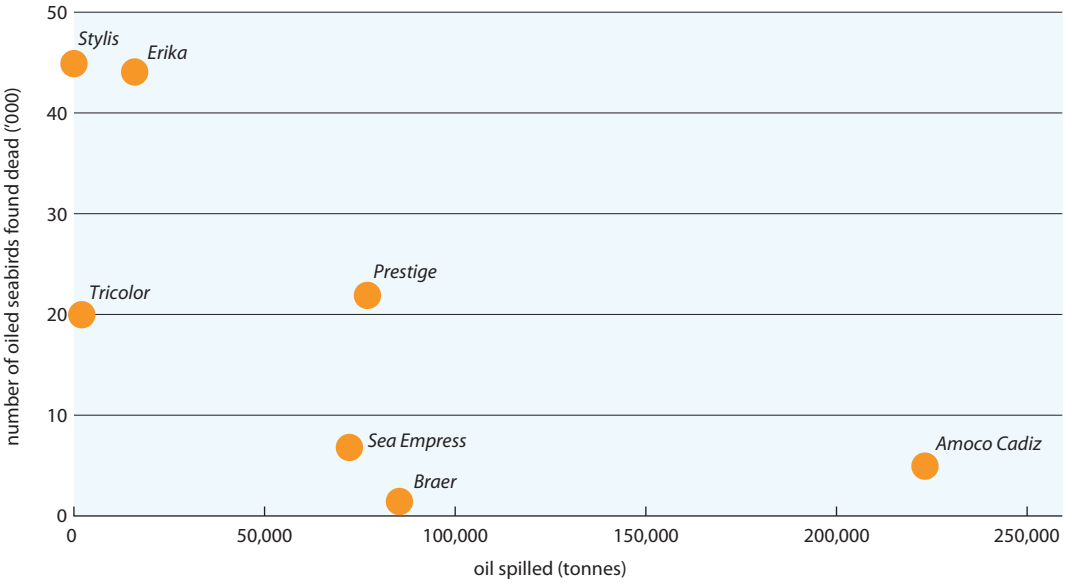
The seasonal abundance of sensitive species may vary considerably, and hence so will the probability that a spill may cause a large number of oiled casualties.

Wildlife oiling scenarios and critical factors

Potential scenarios for wildlife impacts can be projected by studying the anticipated environmental impact of an oil spill alongside the distribution of vulnerable species in time and by season, based on historical experience. Data demonstrate that there is no direct correlation between the amount of oil spilled and the number of wildlife casualties (see Figure 4).

Figure 4 *Comparison of the amount of oil spilled in an incident and the scale of the impact on wildlife*

The relationship between the amount of oil spilled in an incident and the scale of the impact on wildlife is not linear. Some of the largest wildlife incidents were caused by a relatively small amount of oil spilled.



The oiling of wildlife can take place in marine, freshwater or even terrestrial environments depending on the circumstances of the spill and the behaviour of species. Biologists who are familiar with the area where oil is spreading may be able to predict which species and their numbers are at risk of oiling at that time of year.

In marine spills, not all oiled animals will come ashore. Many may die and disappear at sea. The number that comes ashore, therefore, is a fraction of the total number of casualties.

An important characteristic of animals that come into contact with the oil and are still alive is that they may still be able to swim, walk or fly long distances before they become further debilitated. Winds and currents may have a different effect on the animals than on the oil, such that the animals will not necessarily follow the path of the oil slicks. This can result in tens or hundreds of oiled animals finding their way to areas where no oil pollution is visible, and may thus spread pollution into areas that may not have been targeted for clean-up.

Such movements may be difficult to predict, and wildlife reconnaissance operations in a response may therefore need to include considerable stretches of habitat far from where the main impact has been reported. Modelling the effects of current and wind on the movement of oiled animals as well as the oil slicks early in the incident may increase the efficiency of the collection teams.

As in other areas of an oil spill response, extreme and unexpected scenarios may present additional challenges for the wildlife response, especially if the incident occurs far from available resources and if large numbers of animals have become oiled. Oiled wildlife rehabilitation should take place within the limited window of opportunity to be successful before the effects of oiling have progressed too far. If the response is mounted too late, the opportunity for effective rehabilitation may be lost, leaving euthanasia as the only solution remaining for animal welfare purposes.

Assessment scenarios

A number of potential scenarios and their specific challenges are discussed below.

Scenario 1: Incident close to required resources

When developing regional strategies, a planner should assess areas of potential risk and identify resource needs in relation to the location of towns and cities as well as main roads. Locations for setting up an oiled wildlife rehabilitation facility in, or near to, these towns, can be selected on the basis of predetermined criteria. For example, the oil tanker MV *Sea Empress* ran aground within 10 road miles of the town of Milford Haven in the UK in 1996. Milford Haven had an active plan and predetermined facilities that could be converted with local labour (SEEEC, 1998).

Scenario 2: Remote incident

In remote areas, rehabilitation may disappear from the array of feasible response options. However, before rehabilitation is discarded as an option, the following two principal solutions should be considered:

1. Creation of a camp or settlement: this can be a temporary facility put in place using a wide range of functional mobile units, including water reservoirs, generators, canteens, etc., where operational staff and equipment can be brought in and supported for several weeks at a time. This technique was employed following the grounding of the MV *Oliva* on Nightingale Island in the Tristan da Cunha archipelago, the world's most remote inhabited islands. With no access by air, supplies, equipment and personnel were transported by sea from South Africa.
2. Capture, triage and stabilization of animals in the affected remote area: this may be followed by transport to rehabilitation facilities in the more developed parts of the country.

Logistical challenges are greatly increased in a remote incident. This remote rehabilitation facility was constructed in the Tristan da Cunha islands using supplies and trained personnel from South Africa.

In remote areas where the risks are considerable or resources vulnerable, a wildlife response plan and regular investments into response preparedness can ensure the most effective use of the window of opportunity for wildlife at risk.

Scenario 3: Extreme working conditions

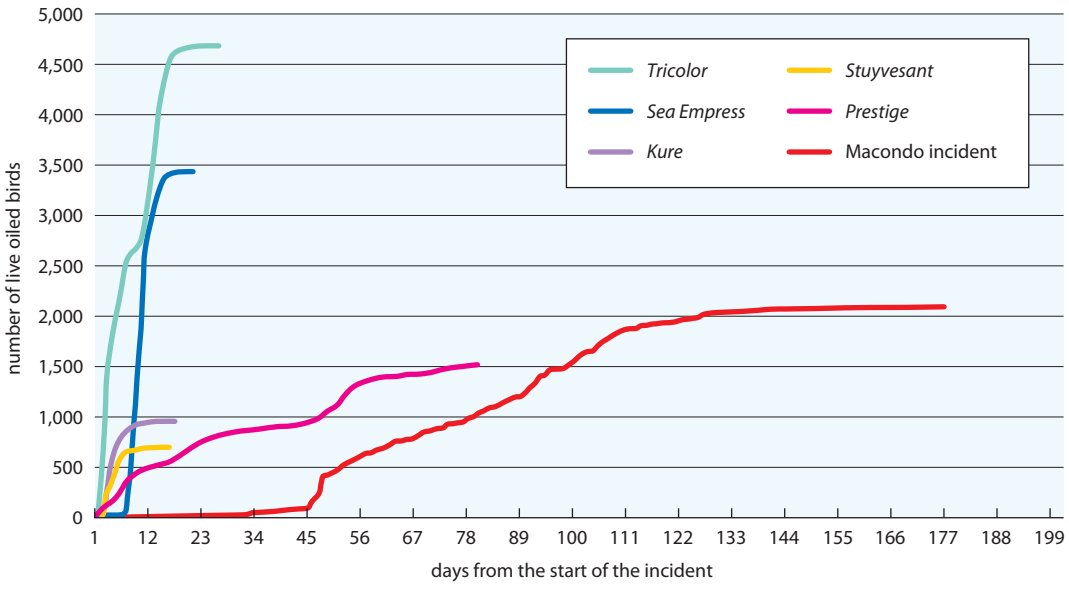
Even in an ideal situation where facilities can be set up near to the required resources, the weather or sea conditions may become too extreme for operations to be safe and successful. This may be anticipated in areas that are known for their extreme summer or winter temperatures, or their seasonal atmospheric fluctuations (e.g. monsoons). This may require seasonal strategies, or the development of critical threshold criteria on which the choice of alternative response options may depend. For example, the wildlife responses carried out during the Macondo incident (Gulf of Mexico, 2010) and *Selendang Ayu* (Alaska, 2004) incidents required many adjustments to field operations and facility locations due to extreme weather conditions, including low/high temperatures and arctic/tropical storms, respectively.

Scenario 4: Overwhelming number of casualties

Even the largest conceptual set-up for a rehabilitation facility may be overwhelmed by the number of live casualties that arrive from day to day in need of care. As was the case in the *Erika* and *Tricolor* spills (France, 1999 and 2002, respectively), it is possible that several thousand live animals may arrive in the first one or two days. While consideration can be given to extending the space and capacity of an existing facility, or to creating a second or third facility, at some point one or more of the critical factors relevant for the successful operation of the facility will not keep up with such expansion. These factors include personnel, water use, space, animal food or available budget. As long as such a scenario is anticipated via decision-making support criteria, such an overwhelming situation can be avoided. A triage system (see page 23 for the full definition of triage) should be put in place at the outset as the ultimate management tool to ensure the optimal use of resources, keeping in mind animal welfare, wildlife conservation, effectiveness and cost-efficiency. This does not mean that euthanasia will be an 'easy' and cheap option. Strategies involving the euthanasia of large numbers of animals may have to be considered but will need considerable logistics resources and the direct involvement of wildlife statutory authorities.

Figure 5 *Comparison of peak intake times for different spills*

Peak intake times differ significantly between spills



The success of a professional rehabilitation effort is strongly related to the level of integration with the oil spill response and its ability to mobilize resources efficiently in relation to the occurrence of animal casualties and their collection. The number of animals arriving for care can peak quickly or extend over weeks and is not dependent on the amount of oil spilled. The location of the release (i.e. offshore as in the Macondo incident in the Gulf of Mexico, or nearshore as in the *Rena* spill (New Zealand, 2011)) or speed and scale of field response can also influence peak intake times.

Animal intake numbers may stretch a facility's resources on any single day. Furthermore, keeping the system up and running over an extended period is also a significant challenge to human resources, logistics and finances. Because there is also a time period between the last animal intake and the last animal release, the rehabilitation facility may be among the last operations that can be demobilized.

Response capabilities

Last but not least, the capability and capacity of existing resources need to be assessed in relation to the possible scenarios. The capacity of any permanent facility is an important parameter to assess the optimal use of the facility in a response (as a stabilization centre, or full rehabilitation centre, or both but in different scenarios). Available equipment needs to be assessed by the responding organizations, and consideration given to how fast and by whom it can be mobilized and deployed. Human resources must be assessed for the level of specific knowledge, training and expertise of key individuals, as well as that of each potential response organization as a whole (number of staff, associated volunteers, their level of training and the capacity of the organization to play a role). The plan also needs to support successful integration when multiple entities are identified, to ensure an effective utilization of resources working together to achieve the goals of the plan and the response.

Incident challenges and response strategies

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 and the public.

Working with live or dead animals presents specific health and safety issues, such as the risk of injuries (bites, scratches) or zoonotic diseases. In addition, field activities related to wildlife response will have site-specific safety concerns that will need to be addressed, including weather, climate, water (i.e. tides and currents), hazardous material, terrain (e.g. rocky shorelines), equipment (e.g. boats and all-terrain vehicles (ATVs)) and other wildlife (e.g. bears). An effective wildlife readiness plan includes the requirement for a written safety plan to be developed and (ideally) signed by all participants so that their awareness of both general as well as incident-specific hazards is emphasized. Wildlife responders and volunteers can protect themselves by understanding the relevant health and safety issues relating to their work, and by using appropriate control measures.

Above: the use appropriate personal protective equipment (PPE) is an important control measure for helping to ensure the health and safety of response personnel in the field.

Effects of oil on wildlife

All potential operations in an oiled wildlife response are directed at either preventing oil from having an impact on animals, or mitigating the effects of oiling in the event that prevention fails. These operations are directly related to an understanding of the behaviour and movement of species at risk, and of the oil itself, as well as the effects of the oil on wildlife.

Birds are probably the most visible result of oil affecting the environment, and are often the first indicator of an impact on wildlife. They are also the most likely group of animals to be perceived as the area for priority action. However, many more animals may be affected for which a response can be mounted.

Each animal group, whether birds, mammals or reptiles, are affected in different ways. This may be due to a range of factors including oil type, weather, environmental conditions, and time and location of impact. The immediate physical effects on animals can be some of the most obvious.

Once birds or certain heavily-furred marine mammals (e.g. fur seals and sea otters) encounter oil it effectively breaks down the ability of the plumage or pelage to maintain body heat. In water, the animals quickly lose the ability to float and can become hypothermic. Animals that become unable to maintain body temperature and buoyancy may drown, while others may seek the relative safety of the shore. Dehydration and starvation add to their physical challenges.

In an effort to remove the oil, animals ingest the product causing internal problems in addition to the external damage. Dehydration, gastrointestinal problems and anaemia are all common complications found in oiled animals. Many of these can lead to long-term effects, some of which may be irreversible. The toxic effects of the ingested oil will affect the liver, volatile fumes will damage lungs and long-term effects can impair reproduction and the survival of eggs and young.

Some marine mammals and reptiles can tolerate a degree of external oiling, however the internal effects of ingesting oil and inhaling the fumes are just as debilitating as they are for birds.

Near right: oiled birds will often engage in excessive preening in an effort to remove oil, resulting in oil ingestion.

Far right: the internal effects of ingesting oil and inhaling fumes are just as debilitating for reptiles as they are for birds.

Triage—the effective use of resources

Depending on the numbers and species of animals affected and/or admitted to a rehabilitation facility, financial resources, available human capacity and the reasons for the animals being admitted, a system of selection, i.e. triage, may be necessary. This is a management process of selection, to ensure that the available resources can be used to provide the optimum results for the animals with the best chance of release and long-term survival, while also minimizing suffering of those with the least chance. Triage strategies, as well as guidelines for when euthanasia is the best option, should be developed within the planning process with the appointed veterinarian and with relevant wildlife statutory authorities to allow full participation without unnecessary delays during the incident. Implementation of specific strategies can be tailored to the incident.

Response options

Prevention measures

- *Field assessments*
  Field assessments can be undertaken on foot, by vehicle, by boat or by aircraft, and should be conducted across a) oiled areas and b) those areas at risk of becoming oiled, or c) where affected wildlife is likely to arrive on shore. Field assessments can serve to:
  - confirm and verify baseline information;
  - survey numbers of wildlife;
  - identify priority species and habitats;
  - locate oiled individuals; and
  - monitor oil spill impacts on wildlife through time, including impacts on animal behaviour.

  It is important to note that monitoring activities should continue for the duration of active wildlife response operations, not just in support of preventative measures.

Field assessments can be undertaken on foot, by vehicle, by boat or by aircraft.

- *Hazing/deterrence*
  Hazing and deterrence are terms used for activities that are undertaken to prevent wildlife from entering contaminated sites, and/or to make wildlife move away from areas that are likely to be affected by the spill. Techniques include:
  - human disturbance (the simple presence of people in the wildlife habitat);
  - vehicular disturbance (terrestrial vehicles, boats, aircraft);
  - visual disturbance (lights, reflectors, flags, effigies, balloons, etc.);
  - auditory disturbance (noise generators, biosonics, propane cannons);
  - pyrotechnics (gas bangers, flares); and
  - physical structures (fences, crowd barriers) to prevent wildlife accessing contaminated sites.

  Animals often quickly become habituated to the deterrent stimulus, at which point efficacy will decrease markedly and the deterrent should be changed accordingly. Hazing/deterrence is better undertaken by trained and experienced personnel as there are

This traditional propane-powered bird scaring device produces a periodic loud (but harmless) 'explosion', and is just one example of a range of available hazing techniques.

many factors to be considered, both before and during hazing. These include the geographical area (e.g. is there a suitable, un-oiled environment for the animals to relocate to) and species variation. Effective hazing requires the creativity of experts with a knowledge of species behaviour and their natural history so that the most appropriate methods can be applied. A significant consideration is the need to avoid methods that make animals move towards the oil instead of away from it.

- *Pre-emptive capture*
  As with hazing, this response option aims to prevent wildlife from becoming oiled in the first instance. Here, wildlife is captured before becoming oiled, and is either:
  - held in captivity until the risk of oiling has passed; or
  - relocated to an alternative habitat where no risk exists, or far enough away so that species with site fidelity only return after the risk has been eliminated.

  Pre-emptive capture can be logistically challenging because of the requirements for:
  - appropriate approvals from relevant agencies;
  - appropriate capture planning (techniques and personnel) to ensure animal welfare;
  - appropriate captive care arrangements (housing, husbandry, personnel expertise etc.); and
  - appropriate relocation solutions (release location, transport, site fidelity, predicted time to return, energetic costs of return, etc.).

A pre-emptive capture strategy was used effectively during the Rena *spill in New Zealand to protect rare New Zealand dotterels.*

The difficulty of capturing animals safely and maintaining their health in a captive environment or during relocation must not be underestimated. Any decisions to carry out pre-emptive capture must be taken with extreme care as the risks to wildlife can be high. The risks of oiling must be weighed against the risks of injury, disease or death of the animal during pre-emptive capture activities. Decisions should be based on the likelihood of animals becoming oiled—in situations where the probability of oiling is high, the advantages of pre-emptive capture may outweigh the risks. However, delayed decision making can be a limiting factor; in many cases there is a narrow temporal window in which pre-emptive capture can take place. Though pre-emptive capture is a complex undertaking with significant risks, it was used effectively during the *Treasure* spill (South Africa, 2000) to limit the potential costs of rehabilitation of large numbers of penguins, and during the *Rena* spill to ensure the survival of a significant portion of the New Zealand dotterel population.

Dealing with live casualties

- *Collection of oiled wildlife*
  Both live and dead oiled wildlife will need to be collected during an oil spill response operation. Live oiled wildlife is collected for subsequent assessment, treatment, rehabilitation or euthanasia. Collection techniques for live wildlife vary with species, habitat type, life history stage, access to

On-water search and collection efforts during the oiled wildlife response to the Macondo incident in the Gulf of Mexico.

specialist equipment/personnel, and the degree of oiling. Depending on these variables, basic stabilization (see page 27) may also be provided in the field. Some species may not come ashore until they are nearly dead. Collection should include on-water techniques whenever they can be safely executed.

- *Euthanasia as a strategic tool*

  The operational requirements for euthanasia as a strategic tool to be used in conjunction with, or as an alternative to, rehabilitation are often underestimated in the planning stage. Its use will require just as much planning as any other operational option. In a worst-case scenario the daily arrival of animals may amount to many hundreds or even thousands of live casualties a day. The wildlife plan should address the worst-case scenario and, based on the priorities and values set out in the plan, should provide alternatives for response managers to use, primarily or in combination, to meet the incident objectives.

  Euthanasia must be used within the laws and regulations governing the location of the incident, and methods should conform to international veterinary medical and animal welfare standards. The welfare of oiled animals should always take a high priority in any decision making.

- *Rehabilitation*

  The process of rehabilitation is, in technical terms, probably the most complex aspect of the whole array of wildlife operations, as many factors must be brought together in a specific combination and setting.

  The larger the scale of a rehabilitation effort, the more the operation will be driven by the existence of an effective logistical infrastructure—most often influenced by the location of the facilities. Larger efforts require more personnel (who need to eat, drink, sleep, commute between the facility and homes/hotels), a steady supply of animal food, substantial availability of utilities (water, electricity, propane/natural gas), and a wide array of consumables. This means that rehabilitation facilities are best located close to where these necessities can be provided, i.e. close to towns or cities. They do not need to be close to where the animals are collected as long as an effective transportation plan can be implemented.

Right: examples of bird rehabilitation and associated facilities

Rehabilitation methods have been developed that aim to effectively reverse the effect of oiling, and return the health of an oiled animal back to an assumed pre-oiling state. Although the principles of oiled wildlife rehabilitation methods are generic (stabilization > decontamination/ washing > conditioning > release), there are differences in the specifics of the methodology for individuals, related to, among other elements:

- species group (birds, reptiles, mammals);
- aquatic versus terrestrial;
- adult versus pre-adult; and
- behaviour in care (group or individual housing).

Different species groups will usually be separated within the rehabilitation facility or placed in separate facilities, and their care directed by personnel who are experienced with that particular species.

This helps to illustrate why rehabilitation is a complex challenge, especially if a wide range of species is admitted for treatment. Usually different species groups will be separated within the facility or even placed in separate facilities, with responders experienced with that group of species directing their care. Similarly, if many animals arrive each day, treatment of the animals is often managed in groups (herd health management) rather than individually, so as to apply the best treatment possible for the largest number of animals.

- *Clinical assessment and triage*

  Each oiled individual should undergo a thorough veterinary assessment and be prioritized for subsequent treatment. Triage is the process whereby resources are allocated strategically across many individuals to ensure the greatest net benefit (see page 23). Individuals are prioritized for treatment based on medical requirements, and/or conservation status, and/or life stage (i.e. breeding adults may be prioritized over juveniles). Animals that are determined to be candidates for euthanasia are also identified at this stage based on the recommendation of the response veterinarian, and according to animal welfare needs and/or triage protocols.

- *Stabilization*
  Animals contaminated by oil typically suffer from a range of well-documented physiological and traumatic effects. The stabilization phase of a response seeks to address the most debilitating of these effects and to prepare oiled wildlife for the physically exhausting process of decontamination. Typically, stabilization will address thermoregulatory distress, dehydration, nutritional support and the superficial removal of contaminant from sensitive mucous membranes (around the eyes, nostrils, mouth and vent). Stabilization will also allow oiled wildlife a period of rest, during which it is important that potential stressors are eliminated, or at least minimized. For some species (including marine mammals and turtles) this phase may be short, or completely eliminated.

- *Decontamination*
  Once stabilized, external oil is removed from the animals. The specific decontamination process varies somewhat between birds, mammals and reptiles, but typically consists of individuals being washed in a succession of baths of warm fresh water and a proven detergent. Once all traces of oil have been removed, the detergent is rinsed off thoroughly and, depending on the species, the animal is dried with warm air blowers or heat lamps, or is allowed to air dry.

Below (upper): Cape Gannets in conditioning pools during the wildlife response to the Kiani Satu *oil spill off South Africa, 2013.*

Below (lower): animals are prepared for release at a temporary rehabilitation facility.

- *Conditioning*
  Conditioning for release back to the wild is a fundamental tenet of oiled wildlife response, and should be a common objective for all oiled wildlife rehabilitation operations. Following decontamination, efforts focus on preparing animals for a successful return to the wild, ensuring that they are biologically and behaviourally normal, and as physically fit to survive and reproduce as they were (or as close as possible) before the oiling incident. An important part of rehabilitation for those animals that rely on fur or feathers for insulation is to encourage them to groom or preen. These activities help to realign the pelage or plumage and promote a waterproof surface, which is fundamental to the survival of heavily furred mammals and birds. It is essential that these animals have access to suitable rehabilitation pools, pens or aviaries during this phase.

- *Preparation for release*
  Before release, well-defined pre-release criteria must be developed. These include an assessment of the condition of the animal (including health, behaviour and waterproofing—see photo on right) as well as an assessment of the habitat (including cleanliness and risk of recontamination after release). Typically, the aim is to release animals in the vicinity of their collection location, so that they are: 1) returned to a habitat that is known to have adequate resources to support them; 2) returned to the

same population from which they were removed; and 3) have a degree of familiarization with the release site. Many species also exhibit strong site fidelity, meaning that they will return to their original habitat regardless of their release location.

Other considerations when planning a wildlife release include:

- the need for appropriate permits;
- banding/marking requirements;
- post-release follow-up measures;
- suitable release location (i.e. food sources, territoriality, conspecifics etc.);
- transport logistics;
- time of day;
- weather (including forecasts); and
- media/public involvement.

- *Collection of dead oiled wildlife*

Carcasses of oiled birds, mammals and turtles can provide essential information for an impact assessment and wider ecological interest. An effective protocol for the appropriate and systematic collection, evaluation and storage of dead oiled animals is therefore essential. Dead wildlife is collected to help evaluate the impact of the spill on affected populations, for veterinary and pathological information, and to remove contaminated carcasses from the environment/food chain. Necropsies of dead wildlife should be undertaken to assess pathological findings and enable a thorough documentation of oil-related mortalities.

Below left: necropsy facilities enable the assessment of pathological findings.

Below right: oiled birds with information tags awaiting a necropsy.

Supporting response options

Whatever response options are chosen for wildlife, certain support activities will always need to be addressed, including documentation and recordkeeping, and waste management.

- *Record keeping*

  Apart from being a legal requirement in some countries, record keeping and documentation is an extremely important routine that is an inevitable basis for internal communication during a spill, and for the development of reliable reports and analyses afterwards for a variety of purposes (claims, impact assessment, evaluation, etc.). Except for volunteers, each officer and responder should keep a personal log in which all key decisions and instructions received or provided are recorded, together with a note of the date and time of the respective event. In addition to this personal documentation, all critical data collected from the field and from the work floor should be captured. To this end the response plan should provide internally-consistent standard forms that are part of a strategic documentation plan, i.e. each form will provide data for use in the IMS. Each form should have its own communication protocols and reporting plan.

  For the impact assessment, it is crucial that an accurate accounting is provided of the total number of animals collected (dead or alive), the species, age and (possible) origin. Dead animals, as well as live individuals washed ashore, should be recorded and examined. The fate of live animals throughout the process of rehabilitation 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, and welfare organizations) in advance of any incident.

- *Waste management*

  Each component of the wildlife response should aim to minimize waste and secondary pollution whenever possible. This can be achieved by setting general guidelines for the behaviour of staff, similar to those that apply to the wider oil spill response. The wildlife response will typically take oily waste (the animal) out of the polluted zone. Before the animal is washed, its immediate environment (holding pen, carcass wrapping) will be polluted and waste created. Considerations should also be given to medical waste (such as syringes and gloves) and waste produced by humans (such as plastics and food wrap). The washing itself will cause a waste water problem (oil with detergent) that will need to be processed.

  The response plan should identify the relevant national legislation and the authorities responsible for waste management. The plan should include procedures that 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 spill response initiative.

How to make the plan operational

Once the scope and objectives of the wildlife response plan have been defined, a chain of activities should be pursued which aim to build the capacity of identified stakeholders and ensure that they have the means and appropriate training to be able to achieve the objectives as defined in the plan. This section describes those capacity building elements.

Developing capacity: a tiered approach

The tiered response system provides a solution for cost-efficiency in developing adequate preparedness for the full range of scenarios that may be imaginable, from an insignificant wildlife incident (a few animals threatened or affected) to a worst-case incident (e.g. thousands of animals, a mix of species groups, large stretches of complicated shorelines).

In a tiered response, assets are mobilized locally or from further afield according to the size and complexity of the incident and the availability of appropriate resources. In a Tier 1 response, assets are mobilized within hours of notification of the incident; they are sourced from pre-identified stocks located in the vicinity of the areas of greatest risk, to deal with an incident in its early stage of development. If a more complicated scenario begins to unfold, additional resources may be mobilized/cascaded from a nearby region if available (Tier 2), or from elsewhere in the world (Tier 3). Tier 1 capability is the foundation upon which all responses are built, and aims to ensure maximum use of the window of opportunity to mitigate the impacts of the spill.

The first step in developing wildlife response capacity is therefore to identify existing local, regional or international resources and their ability to collaborate in a response. Depending on the requirements of the situation, the public can also be incorporated into wildlife response efforts in a convergent volunteer capacity (see pages 32–33). In certain instances, issues of safety or liability may limit or prevent this option. In others, it can be widely supported and provide an effective method of involving local communities in response efforts. In some countries, systems have been developed which formally incorporate volunteers and which address issues of liability and indemnity insurance.

A plan holder in a country or region where relatively high risks have been identified could consider developing Tier 1 capability over the years if none exists. Depending on cost efficiency and level of exposure, this Tier 1 capability could be expanded via training and investment in equipment and supplies. This means that, over time, Tier 1 capability becomes less dependent on Tier 3 resources for dealing with larger-scale incidents. Tier 2 resources, if available, may provide for some preparedness needs at a regional (sub-global) scale (see Figure 6).

A Tier 1 capability is needed at the level that has been defined in the wildlife response plan on the basis of the most likely incident scenarios that have been considered. If an average scenario of a few tens of animal casualties is expected to result from an oil spill incident, a smaller Tier 1 capability will be needed than when hundreds of animals may be expected to arrive on a single day.

In a large geographical area of risk, it may be appropriate to arrange for more than a single Tier 1 unit, with each prepared to deal with a different subregion within the plan, and each acting as the others' Tier 2 assistance. Alternatively, a Tier 2 unit may be available from a neighbouring country (which, in that country, acts as a Tier 1 unit) or from another operator in the region.

Figure 6 *The concept of tiered response*

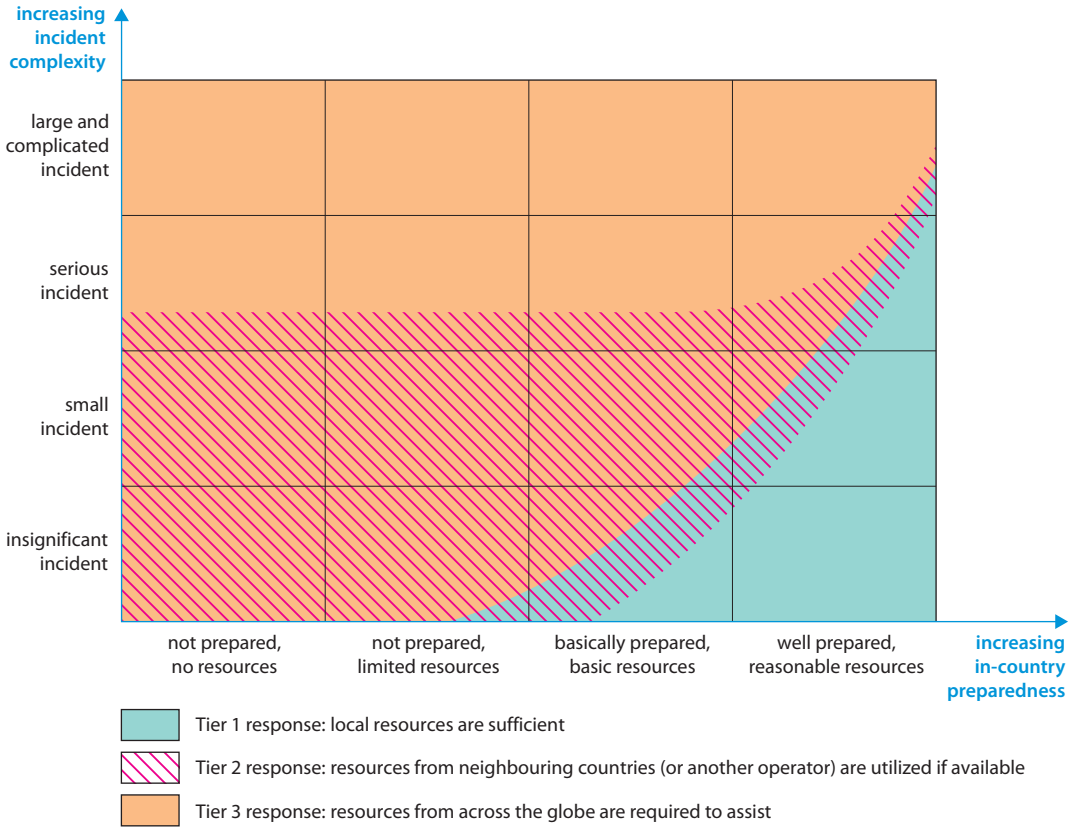


Figure 6 shows that a country that is not prepared and does not have resources will be Tier 2/Tier 3 dependent even for smaller-sized incidents. Countries that have invested in Tier 1 capability can deal with more significant incidents before having to call in Tier 2 or Tier 3 resources.

Tier 3 capability is provided through a network of highly specialized and accredited experts that incorporates Tier 1 resources and aims to provide wildlife response assistance for any incident scenario in any climate zone.

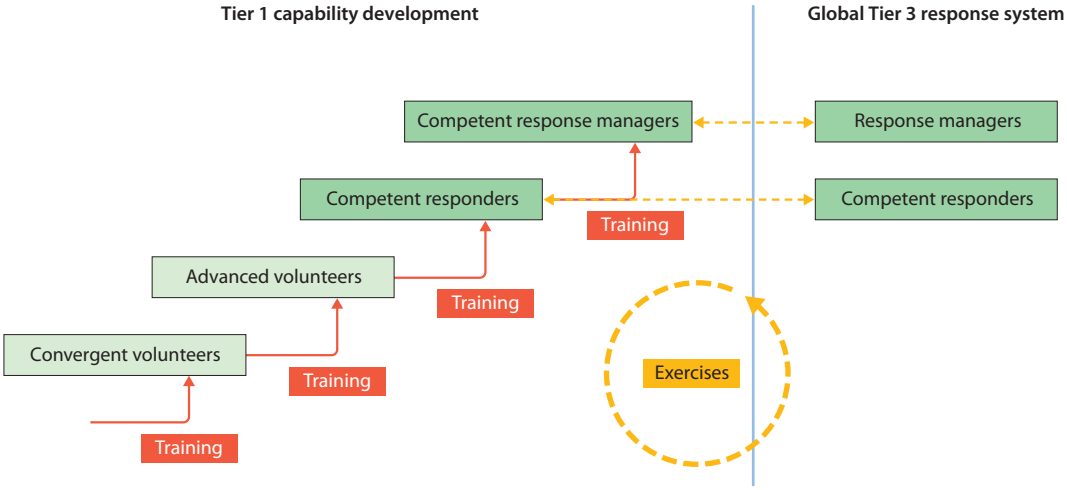
Establishing and training a Tier 1 hands-on response team

A Tier 1 response team can be of any size, but should at least be composed of those elements needed to fit the needs of local preparedness (first response) as defined in the response plan in relation to the risk assessment. In the most basic format, the team could consist of a small group of trained managers/coordinators who lead a larger number of advanced responders and convergent volunteers. In the event of their mobilization, this group should, as a minimum, be able to set up a system to start field operations (initial assessment of impacts and hazing/deterrence opportunities, collection of live and dead animals) and set up and operate stabilization facilities where collected live animals can be transported for their initial care. In this way, they can bridge the time gap between the activation of the plan and the time by which mobilized and more experienced Tier 2/Tier 3 responders will arrive, as required to match the scale of the incident.

Developing local Tier 1 capacity is best organized on the basis of global Tier 3 principles and standards. This will not only allow local responders to understand the whys and hows of internationally-developed insights and methodologies, but also allow them to develop skills and experience that lead to recognition as a Tier 2/Tier 3 resource. Exercises reinforce Tier 1 team training and IMS integration, but should also develop the integration of Tier 2 and Tier 3 resources.

Over time, the Tier 1 team (which may consist of organizations not involved in oiled wildlife response on a full-time basis) can develop its capability and experience through training and exercises, but also by attending spills outside their own region (see Figure 7).

Figure 7 *Developing local Tier 1 capacity*



Training programmes

To be effective in a wildlife response, specialist training is required to ensure a common understanding of basic oiled wildlife response principles. The potential decision makers in an oiled wildlife response should receive theoretical training to understand all the important aspects of a response in various scenarios. Wildlife scientists, conservation officers and veterinarians are good candidates to take leading and decision-making positions. They will need training (including table-top exercises) to have a good overview of all aspects of oil spill response, as well as special training in the various aspects of their particular roles, to understand their responsibilities individually and as a group.

Box 2 *Volunteers*

Members of the public may be allowed to volunteer in a wildlife response. For the purpose of this document, volunteers are those personnel that do not receive payment for labour. Employees of NGOs, scientific institutions or governmental bodies, who receive a salary during the time they work on a response, are not considered volunteers, regardless of whether their employer has offered their services on a voluntary basis or not.

Oiled wildlife response training

Training for oiled wildlife response is best organized at different levels of expected competency as indicated below.

Convergent volunteers (no competency)
Members of the public normally have an interest in getting involved when an incident occurs. The convergent volunteer provides for such involvement, and requires a basic level of training upon arrival at the incident. Convergent volunteers can support the hands-on work involved in caring for the oiled animals, and can also help in the provision of general support for the response, including duties such as cleaning, administrative work and the technical management of facilities.

As well as contributing additional personnel resources to a wildlife response operation, the use of volunteers can provide an important opportunity for community involvement.

Advanced volunteers (basic competency)
Individuals who have been through prior training, or who have volunteer experience of oiled wildlife response activities, including animal care experience, could be provided with advanced training to enable them to carry out certain tasks on their own with only limited need for supervision. This training would need a higher level of commitment from the candidate, and needs to be provided by competent responders.

Competent responders
Individuals who can dedicate a lot of time to training, and to the further development and practice of skills, can be trained to the level of competent responder. At this level, the person would be capable of filling key positions on the work floor of a response operation, leading groups of volunteers in a certain department, ensuring that work is delivered at the highest quality level, and fitting into the chain of command as a section head.

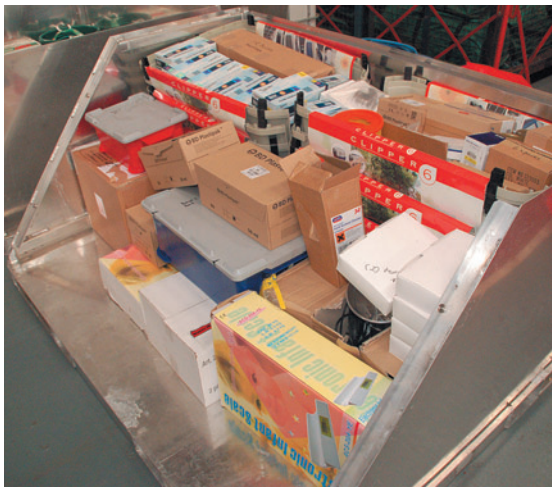
Competent response managers
Individuals who have gained broad experience as a competent responder, and who understand all the details of successful methodologies under different challenging scenarios, could be considered for key positions in the wildlife response, such as Wildlife Branch Director, Deputy Branch Director, Wildlife Recovery Group Supervisor, Field Stabilization Group Supervisor, Care and Processing Group Supervisor, Hazing Group Supervisor and Wildlife Care Unit Leader. This would require additional training, exercises and the development of leadership skills.

Equipment and facilities

In addition to trained and experienced personnel, two other key elements for a successful wildlife response are the availability of appropriate equipment and adequate facilities. There is a wide range of options for both, but it is important to remember that they are the tools that personnel will use to meet the objectives of the plan. It is crucial that the right tools are available at the right time. As previously mentioned, wildlife response is time-critical. The timely mobilization of these tools is key to ensuring that the 'window of opportunity' for a successful wildlife response is utilized most effectively.

Equipment

Within a tiered system, Tier 1 wildlife equipment should be stockpiled locally and be readily available on-site within a few hours. Tier 2 equipment should be widely available from identified suppliers and on-site within 24–48 hours. Tier 3 equipment should be regionally or globally available in stockpiles or by retail supplier, and capable of being on-site within 48–72 hours. While these parameters serve as general guidelines, the specific time requirements for the cascading of equipment resources may vary depending on the potential oiling scenarios.



A wildlife equipment stockpile at OSRL's UK base in Southampton.

A number of organizations hold wildlife equipment stockpiles[1] and initial ordering lists based on the needs of their plan or other plans in which they are a listed resource. Equipment stockpiles and lists should, however, always be tailored to the plan. Differences in climate, species and technique may render some equipment more or less relevant.

Facilities

Having the right facility that is ready to receive animals as soon as it is needed is key to the success of an oiled wildlife response; a gap in this area is one of the most common roadblocks to success. The requirements for appropriate facilities can be met by one or more of three different approaches—the use of permanent facilities, buildings of opportunity or mobile facilities—as required to best address the needs of a particular plan. Whichever approach is selected, facilities should include reliable systems for the supply of potable water, electricity, heating or cooling, and ventilation, that meet the specific requirements for wildlife[2].

[1] See Appendix 4 for information on existing wildlife equipment stockpiles

[2] See Appendix 4 for a list of real world examples of facility solutions for wildlife response preparedness

Permanent/turnkey facilities

Permanent or turnkey facilities are purpose-built or remodelled before a spill occurs, and are therefore available to satisfy the requirements for appropriate facilities as soon as they are needed to meet the rehabilitation goals of the plan. A turnkey option will generally incur a significant cost for building or remodelling and maintenance, but may provide savings during a response. A hybrid version of this approach can be a permanent facility designed to care for a certain number of animals, but which has a secondary expansion plan with temporary additions that can be rapidly implemented should the existing capacity be exceeded.

The San Francisco Bay Oiled Wildlife Care & Education Center is one of two primary care facilities for oiled birds within California's Oiled Wildlife Care Network.

Buildings of opportunity

It may be possible to secure an appropriate building for oiled wildlife rehabilitation that is normally used for some other purpose but can be quickly transformed into a suitable facility. Examples may include warehouses, fairgrounds, community centres, etc. To utilize this option will require considerable planning and contracts with building owners, suppliers and tradesmen to ensure that the facility can be up and running within hours when needed, and is able to provide the required space, water, heating and ventilation necessary to meet the goals of the wildlife plan.

An example of a 'building of opportunity' utilized during the Macondo incident in the Gulf of Mexico, 2010.

Mobile facilities

Mobile facilities are comprised of modules (trailers, containers, tents, etc.) that can be easily transported and set up wherever they are needed. Infrastructure needs may vary, and potential settings could, for example, range from a large warehouse space with water and utilities to a level field or the deck of a barge or large ship. Such facilities may be used for field operations or all phases of rehabilitation. A wide variety of examples of mobile units exist that are intended for use as specific components or as a complete oiled wildlife rehabilitation facility.

This mobile wildlife rehabilitation facility was constructed during the Rena *Spill in New Zealand, using a combination of purpose-built units and tents.*

In addition to the equipment used by the response team, the plan must provide support resources needed to carry out the mission. These will include food and lodging, transport and personnel vehicles, waste disposal, communications and veterinary laboratory services.

Table 4 *The advantages and disadvantages of the different types of facility that may be available*

Facility type	Advantages	Disadvantages
Permanent/ turnkey	• Instantly available • Community awareness • Easily used for training and exercises • Simplifies planning	• High initial costs • Maintenance costs • Possibly distant from location where animals are collected • Size of facility may limit capacity and require expansion (which may or may not be feasible)
Building of opportunity	• No or low costs outside of a spill event • Lower maintenance • Flexibility	• Time to identify and set up • Additional cost in emergency • Location not known in community • If not pre-identified, the ideal building may not be available during the response
Mobile facilities	• Flexibility in location and configuration • Lower initial costs	• Some transport and set-up time • Planning complexity • Higher maintenance • Increased logistical and support needs, including background infrastructure requirements (water, electricity, etc.)

Exercises

Exercises play a critical role in testing wildlife response plans, identifying potential gaps or weaknesses and their possible solutions, and maximizing success when a real incident occurs. They are equally important tools for familiarizing personnel, both within the wildlife response and in the wider response, with the key issues specific to a plan or area that each might face in the event of a real incident. Exercises also provide excellent training opportunities for all personnel involved in areas that may not be regularly practiced, such as incident management, logistical and documentation procedures, the safe handling of hazardous materials, and multi-agency and organizational teamwork.

Exercises are most effective when there are clear objectives and relevant scenarios with realistic and detailed play. There is obvious value in integrating wildlife into large-scale oil spill response exercises, as this provides a better understanding, for both wildlife responders and oil spill

As well as developing an oiled wildlife response plan, the Dutch Government has implemented a multi-year exercise programme involving all stakeholders (including NGOs), to help ensure operational response readiness.

response managers, of the challenges they may face. This also encourages a greater appreciation of both the strengths and potential conflicts that wildlife responders and incident managers may bring to a response. Exercises provide an opportunity to identify alternative or compromise solutions under circumstances where there is much less pressure than in a real spill response operation. This will pay dividends over time, and the resultant enhanced professionalism and team building will be a significant advantage in a real event.

Exercises can take a variety of formats, depending on the goals of the exercise and the available participants. They include (in order of increasing complexity and inclusive of the prior exercise activities): notification exercises, tabletop exercises, equipment deployment drills, and incident management activities. Exercises focusing on wildlife operations can also be used to train or test specific portions of a wildlife response plan. Limiting the focus to wildlife response will also limit the costs and the complexity of planning and completing the exercise, although team-building opportunities with others in the wider incident management system will be lost.

Exercise planning

Exercises should have clear and specific goals. The initial stated goal(s) may be high level, but exercises should be broken down into specific activities during the exercise planning process to ensure that maximum value is achieved. It is also essential that the individual components of an exercise remain relevant to the overall aim(s). Exercise planners and evaluators should have extensive experience in oil spill and wildlife response so that a realistic scenario can be assured, together with effective coaching of participants. Planning to ensure a mix of experience levels among players can maximize learning opportunities.

Exercise implementation

Exercises should start with a briefing, and the identification and organization of roles and responsibilities. This is followed by initiating play, and maintaining the performance and momentum of the exercise at an appropriate pace to both challenge and teach the participants. Exercise play is then terminated, and a structured evaluation completed before bringing the overall exercise to a close.

Exercise evaluation and review

Evaluation of exercises should focus on building capacity, and on identifying strengths, weaknesses and potential solutions for all personnel involved, irrespective of their experience.

The review process should consider the exercise objectives and the degree of success in meeting them, and should identify gaps and new priorities. Lessons learned should be incorporated into the exercise programme and the wildlife response plan (see also the section on evaluation on page 48).

A good exercise programme is a living and continually evolving process. Its purpose is to meet the needs of the plan holder, government agencies, the responders and other stakeholders in building and demonstrating the capacity to successfully meet the challenges of responding to oiled wildlife.

Putting it to the test: incident response and plan evaluation

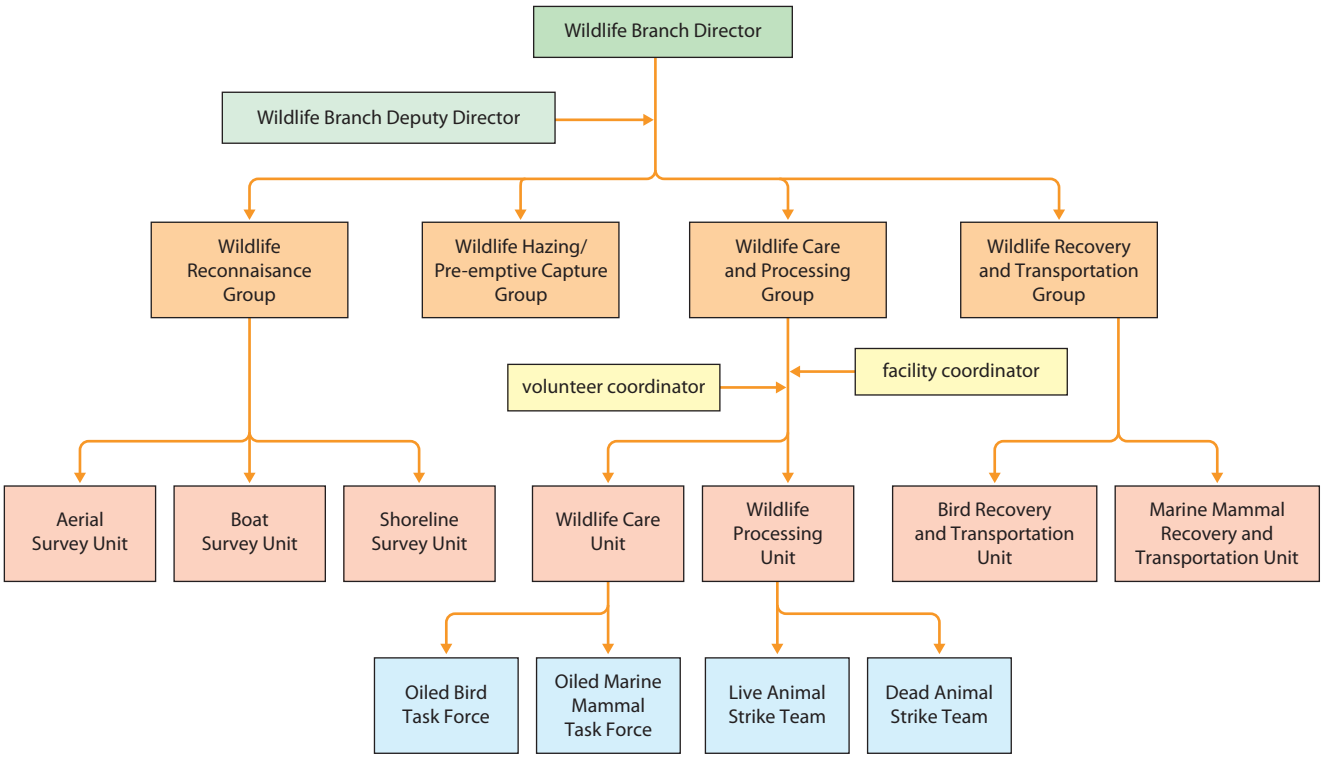
Incident response

In practice, an effective wildlife response plan should enable the best achievable response system to be set up in the event of an incident. This system should quickly reach efficiency via quality decision making, and allow defined objectives to be achieved, which in turn will provide confidence and a strong team spirit among all those involved, from managers to volunteers. The following general considerations should be borne in mind when developing an effective wildlife response plan.

Integrating wildlife response within the overall response plan

One of the keys to a successful wildlife response is strong support from the incident management team. This is best achieved when there is clear communication and understanding of the expectations and needs of the wildlife responders, and of the whole oil spill response system, of which wildlife is only one aspect. Wildlife issues should be represented within the IMS Planning Section, and planning-related decisions that may have an impact on the wildlife response must be communicated clearly to the responders on the ground.

Figure 8 *An example of the Wildlife Branch in an incident management system*



Wildlife response—critical window of opportunity

In a wildlife response, a delay today may mean that animals are oiled (and possibly dead) tomorrow. After animals have been oiled, a brief time period exists during which it is possible to successfully capture, rehabilitate and release the animals. If this window is missed, the opportunity to intervene successfully ceases to exist. It is therefore important that the activation of the wildlife plan is considered immediately after oil has been spilled to ensure the timely initiation of preventive and protective operations (hazing, pre-emptive capture), and the build-up of basic rehabilitation infrastructure before oiled animals begin to arrive. Notification of wildlife decision makers should therefore be integrated into the notification procedures of all oil spill response plans.

A response is an exercise event

Not every unfolding scenario will be a worst-case incident. Nonetheless, any response will test the capabilities of each responder and the response infrastructure as a whole. Human and system error is always possible and will certainly occur. Even a real-time incident will be a great learning opportunity, and in that sense could be considered as a full mobilization exercise in which the system as a whole can be tested. The more opportunities taken to exercise the plan and the current preparedness system, the better will be the response to an incident where animals are oiled. Scenarios are nevertheless unpredictable, and the response to new challenges may need to be directed by tactical decisions made at the time in the spirit of the plan's strategy. These decisions will, in turn, provide lessons for the future.

Response chronology

As with oil spill response activities, one can and should distinguish three phases of operational activities in the chronological order of events associated with a typical wildlife incident: emergency; project; and demobilization. The different phases are not always clearly defined, but they can and will be recognized during the spill response. Recognition that the different phases do exist and will appear is the core rationale of developing a response plan. The operational and data sections of the plan should be developed in such a way that they minimize the period between activation of the plan and entering into the project phase. In other words, guidance must aim to minimize the duration of the emergency phase. Ideally, the emergency phase will fade as soon as managers and response personnel have developed efficient routines, as communication systems work well, and as facilities are up and running with animals moving through. This project phase will be recognized by all involved, as the stress levels begin to recede and people begin to feel more relaxed and confident in their roles. In the absence of a wildlife response plan, the relatively ineffective emergency phase may be extended, possibly for the duration of the response, leaving people worn out, frustrated, angry and sad, with the feeling that they have failed in the response.

A typical chronological order of events for a wildlife response and the tasks to be carried out in each phase is described in Table 5 on the following page.

Table 5 *The different phases in a response, and the corresponding actions and tasks.*

Phase in the response	Action	Tasks
Activating the wildlife plan	Notification, assessment and mobilization	• Notify decision makers: determine whether the wildlife plan should be activated or not, and under which circumstances • Wildlife Branch integrated into the IMS • Alert Tier 1, 2 and/or Tier 3 responders • Make an assessment of reliable information on the spill situation, and carry out a field inspection to assess the potential scale of impact on various species/species groups • Decide which mobilization scale is needed (Tier 1, Tier 2, Tier 3) for each different response option that is considered • Ensure the mobilization of appropriate resources

Emergency management	Anticipate and react to the unfolding scenario	Quickly develop response system to the appropriate scale:
		• Liaise with the Planning/Logistics Section of the incident management team
		• Ensure functioning of communication systems and data flow
		• Develop a response action plan (24–48 hours), which is updated every day for each operational section
		• Continue field assessments to monitor potential changes in scale and new developments
		• Start operations at Tier 1 level:
		  • field operations
		  • wildlife facilities
		  • volunteer integration (if appropriate)
		• Integrate Tier 2 and/or Tier 3 on arrival
		• Scale up existing operations as necessary

Project management	Deliver on plan objectives	Ensure stability of operations, effectiveness, cost-efficiency: • Implement long-term personnel plans and routines • Confirm continued communication flows • Ensure efficient use of resources • Write long-term plans (including demobilization plan) • Ensure lower priority actions are carried out • Develop and initiate post-release monitoring plan
Demobilization	Scale back down to zero	Demobilization in phases (field operations decreasing; work to be finalized in facilities; Tier 1 resources last to demobilize): • Demobilization of personnel (field > facilities) • Demobilization of wildlife equipment (field > facilities) • Demobilization of wildlife facilities • Formal close of wildlife response • Dismantle IMS (Wildlife Branch) • 'Hot wash' evaluation
Post demobilization	• Reporting • Claims	• 'Cold wash' evaluation within 1–2 months • Classification and analysis of all data • Conclusions and recommendations • Financial round-up • Preparation and submission of claims

Activating the wildlife plan

Activation of the wildlife plan should be scheduled for the earliest possible opportunity when the risk of a spill incident is high (such as a ship grounding) or immediately after a spill has been reported. This allows wildlife experts and managers to assess the potential impact on wildlife, and to assess the level at which resources need to be mobilized, if at all.

The activation of the wildlife plan should not be linked to the activation of a shoreline response, as this may cause the window of opportunity to be missed; at a minimum, notification procedures should always be conducted.

Notification, assessment and mobilization

Once the wildlife plan is activated, the notification procedure ensures that all the appropriate authorities, decision makers and key stakeholders are informed of the details of the incident and the potential impact. By providing accurate and appropriate information during the notification process, the timely involvement of key role-players will ensure early action.

An assessment team is mobilized immediately after activation of the plan. The aim is to gather as much field information (e.g. baseline values, numbers of animals affected, species involved, etc.) as possible to ensure that the incident managers can make an informed decision on the type of response that will be required, based on realistic projections of wildlife impacts.

If it is clear early on that the spill is likely to have an impact on wildlife, the immediate mobilization of Tier 1 resources may take place, with Tier 2 and Tier 3 resources following as appropriate. In practice, the mobilization of tiered resources usually takes place in parallel with the assessment team's activities. Once incident managers have determined the appropriate options for wildlife response, the timely mobilization of oiled wildlife responders, response facilities and equipment will be critical to the success of the overall wildlife response operation.

In the wildlife plan activation stage:

The oil spill response plan should:

- notify personnel that a wildlife plan may need to be activated immediately after a reported spill incident
- provide a contact list of wildlife decision makers.

The operations section of the plan should:

- provide a flow diagram to define the steps that may need to be taken, from the announcement of a spill incident through to mobilization at the required level (Tier 1, 2 or 3).
- designate the personnel responsible for carrying out a field assessment and gather relevant data at the appropriate time.

The data section of the plan should provide:

- contact details for the suppliers of all identified resources (Tier 1, Tier 2, Tier 3)
- decision support criteria to help recognize scenarios and decide which expertise at which Tier level needs to be mobilized
- a description of the data/information system that should be available to IMS decision makers ('wildlife situation unit').

Emergency management phase

During this phase, the plan meets the reality of the incident. Initially, mobilized managers, wildlife responders and volunteers are 'parachuted' from their daily routines into the stressful environment of a spill incident. They need to quickly fit into their roles, connect to other personnel and their roles, and ensure that the response escalates to the appropriate scale to become both efficient and effective. The tools that have been identified in the plan must be quickly evaluated against the needs of the actual incident to ensure that there are adequate resources to enable a safe and effective response. This phase requires quick action to get the most appropriate resources in place and to set the course for the wildlife response by making

In the emergency management phase:

The operations section of the plan should provide:

- an organizational chart describing the structure of the Wildlife Branch (allowing for smooth expansion and contraction as appropriate)
- action cards for each function
- a decision support system for initiating response options
- an operational sheet for each response option.

In the emergency management phase *(continued):*

The data section of the plan should provide:

- maps
- facility layouts and development plan
- contact details of all identified providers of services for each response option
- IMS forms
- wildlife-specific forms
- wildlife treatment protocols (including euthanasia)
- media communication aids
- simple document templates and checklists including an agenda for the first meetings of the Wildlife Branch
- a system and forms for collecting and organizing all critical information in one place
- predefined procedures to obtain permits and licences for the handling and treatment (including euthanasia) of wildlife
- useful and up-to-date information from the data section.

In the project phase:

The strategy section of the plan should provide:

- clear objectives
- detailed requirements for demobilization and reporting.

Operations section of the plan:

- All aspects are in active use (see page 11)

Data section of the plan:

- All aspects are in active use (see page 12)

key decisions and putting protocols and procedures in place that will be used to guide the wildlife response to its conclusion. This phase is dynamic, and new information will be collected each day providing an opportunity to continually refine and adjust the daily plan to better achieve the wildlife response objectives.

Some of the key objectives of the emergency phase are to:

- determine how key decisions will be made within the Wildlife Branch;
- organize a wildlife team and assign appropriate personnel to roles;
- set up communications procedures with other elements of the incident management structure;
- identify incident-specific facility and equipment needs, procuring them and setting up for operation;
- evaluate opportunities to mitigate impacts on wildlife, including preventing oiling by developing and implementing appropriate methods;
- propose and agree on priorities for the wildlife response, including species priorities (based on the pre-spill assessment);
- set spill-specific animal care protocols, including release criteria and post release monitoring; and
- develop a written euthanasia policy that is agreed upon by responders, and appropriate governmental agencies and the responsible party (if the policy has not been predefined).

To streamline this process the wildlife plan should aim to help the managers make good decisions in a timely manner by providing tools and information that should be included in the decisions, e.g. templates, checklists, agendas for meetings, etc.

In this phase, investments in preparedness pay large dividends, e.g.:

- trained and exercised decision makers on hand;
- pre-identified oiled wildlife facilities available for quick activation; and
- training modules available that can be used for health and safety procedures and volunteer involvement (which could be applied to the entire response).

Project phase

This phase can only emerge if the emergency phase objectives have been achieved. The project phase of a response involves the ongoing, routine daily activities required by the wildlife response team after initial deployment and activation of operations. This part of the response is a continued execution of the wildlife plan, with changes made based on the dynamic nature of the specific incident. Unlike the emergency phase, rapid actions are less critical than methodical and well-planned activities designed to minimize chaotic and retrograde actions, both in the field and in facilities. The project phase is often the lengthiest of all phases of the

response, as well as being the most varied. Animals (and associated resources) will be in transition from initial capture and oiled animal holding early in the response to clean animal holding and release later in the event.

The less frantic situation that emerges in the project phase allows managers to refer to the strategy section of the plan to check whether the objectives have been adequately met and that nothing has been overlooked. It is important to maintain a readiness to scale up operations/facilities if required, and to use this opportunity to re-emphasize the need for efficient communications with both the incident managers and the public to maintain strong support, especially as other parts of the response may be winding down more quickly. Managers can use guidance from the strategy section to start preparing a demobilization plan and the required reports on the incident.

Demobilization phase

While the goal in every phase is to ensure that the appropriate level of resources is in place to accomplish the objectives of the Wildlife Branch, the demobilization phase is a strategic stepped reduction of operational activities based on a decreasing threat to wildlife. This will take place according to a plan that should be developed during the project phase. Of crucial importance in the demobilization plan is the need to define the specific circumstances that will trigger a reduction in the use of field activities such as hazing, collection or monitoring, as well as the point at which the closing down and dismantling of temporary field stabilization and rehabilitation facilities can take place. It should also provide for the possibility of a small number of animals requiring longer-term care before release, and for animals that are unable to reach release criteria. Finally, the plan should consider the changes in circumstances that would trigger a reactivation of the wildlife response (including how that would occur) as well as disposal or storage of materials and equipment.

Post demobilization—after-action reporting

Reporting will take place as part of the overall IMS reporting system, but will also be done by each stakeholder group and organization. As far as the IMS report is concerned, it is important that all collected data are presented in a format that will allow a useful evaluation and their subsequent use in legal procedures and claims. The data should contain the essential statistics, and reports of events and related tactical decisions, for which the information will be provided by personal logs and the log of the IMS/Wildlife Branch. Where reports are submitted by individual stakeholders, it is important that conclusions and recommendations are formulated that can be used for an evaluation by all stakeholders of the plan.

Post demobilization—claims and compensation

Wildlife response activities may be eligible for compensation. The potential sources of compensation for costs incurred during an oiled wildlife response will vary according to the nature and location of the incident. A number of potential claims scenarios are presented below.

Pollution from tanker vessels (cargo oil, crude oil)

In the event of a spill of persistent oil (e.g. crude oil, bunker oil or lube oil) from a ship transporting such oil as bulk cargo, or a spill of fuel oil from such a tanker, or from a tanker carrying residues of persistent oil cargo, that occurs within the Exclusive Economic Zone (EEZ) of a Contracting State, two compensation mechanisms may be applicable. These are the International Convention on Civil Liability for Oil Pollution Damage (1992 CLC) and International Fund for Compensation for Oil Pollution Damage (1992 Fund). Each of these compensation mechanisms use the guidelines from the International Oil Pollution Compensation Funds (IOPC Funds) *Claims Manual*, which explicitly addresses the compensation available for wildlife response. Compensation mechanisms may also exist in countries that are not parties to the CLC or Fund Conventions. Compensation for wildlife response may also be available from other sources, such as from domestic funds.

Non-tanker and 'mystery' spills

The 2001 International Convention on Civil Liability for Bunker Oil Pollution Damage (the 'Bunker Convention') governs compensation for pollution damages caused by spills of oil carried as fuel in the bunker tanks of non-tanker vessels. Similar admissibility criteria and 'reasonableness' concepts will apply as for the 1992 CLC and 1992 Fund. The term 'mystery spill' refers to an oil spill for which the source has not been identified. For the purposes of compensation for damages resulting from such spills they may be broadly divided into two categories: those that are deemed to be sourced from an unidentifiable tanker, and those that cannot be attributed to a tanker (e.g. from a non-tank vessel, a sunken wreck, a pipeline, a natural seep or another source). In cases where it can be shown that the oil has been sourced from a tanker (e.g. a large quantity of non-native crude oil washing up on a shoreline) and the country that has been affected is a party to the 1992 Fund, compensation may be available under the Bunker Convention. In mystery spill cases where the damage cannot be attributed to a tanker, there is no existing international legislation governing compensation, and costs would most likely be covered by the government of the country affected or by those undertaking the wildlife response operation.

Box 3 *Restoration*

In some countries (sometimes required by law) restoration programmes may include activities to recover damaged wildlife populations in order to compensate for losses, for example by providing new or improved habitats for wildlife that may have been injured. Projects need to be proposed and agreed with direct involvement of wildlife statutory authorities, and followed by a multi-year programme of action, monitoring and evaluations. Wildlife projects that have been funded through damage assessment settlements include:

- a project to replace nest boxes for rhinoceros auklets and cassin's auklets, and create nest sites for ashy storm petrels on the Farallon Islands, funded by damages from the *Cosco Busan* container ship spill in California, in 2007; and
- a project to protect the shearwater colony at Taiaroa Head, New Zealand, funded by damages from the *Luckenbach* spill in California.

Spills from offshore installations

The liability for damage caused by spills from offshore installations (which includes platforms and pipelines) lies with the platform operator. It is likely that a service system for damage compensation would be set up quickly in the event of a spill, and would begin evaluating and paying for claims pending the legal procedures, which may take many years.

Claims preparation and submission

The process of preparing a claim is generally undertaken in two stages, i.e.:

1. detailed record keeping at the time the costs are incurred; and
2. linking the records and costs with the rationale for the activity at the time the claim is compiled, usually when the response has been completed.

In the initial emergency phase, the need to record information necessary for the subsequent reimbursement of costs is commonly overlooked, as operational personnel will be otherwise occupied with other response tasks. Nevertheless, the importance of accurate records cannot be overemphasized. A claim that is considered to be well supported will usually include five generic types of information, i.e.:

- records of information received;
- records of meetings and decisions;
- records of activity;
- records of expenditure; and
- records of effectiveness and results of actions.

Successful claims: the importance of record keeping

Wildlife response operations facilities may require considerable resources and logistics. Comprehensive records should be kept of the scale of the operation, including: the personnel involved; any work undertaken to equip a facility; equipment purchased or damaged; and consumable goods used (protective clothing, medicines, food and water, etc. provided for the care of the wildlife and for the workers). An inventory of the animals, including animals handled by the facility, should also be maintained. Photographs provide an invaluable record of the work undertaken and the resources involved. Labelling images with the date, time and location will assist with subsequent cataloguing and identification of activities.

It is important to recognize that volunteer participation in oil spill response operations is not cost-free. Although volunteer labour is offered free of charge per se, each volunteer will require some level of personal protective equipment (PPE), food and transport to site, as well as competent supervision. Volunteers may be given a per diem payment to cover expenses, unless food and accommodation is provided separately. Liability insurance may also be required. A record of the names of each volunteer, their allocated work sites and activities undertaken, should also be kept. Mandatory signing in and out of worksites may facilitate accurate recording of this information.

Measuring the success of a response

If a wildlife response is considered feasible and is activated, the perception of success is dependent on many factors, including:

- the ability of efforts to protect animals from oiling, and to increase the welfare status of oiled animals by minimizing suffering and/or regaining life expectancy in the wild;
- the level of pre-spill planning and capability/capacity of Tier 1 responders (see definition on page 30) to quickly deal with the most immediate arrivals of animals and to operate basic stabilization facilities;
- the level of integration into the overall response, so that facilities are ready by the time animals arrive and the project phase becomes an integral part of the wider response effort;
- the involvement of internationally-accredited expertise in planning, preparedness and response, especially with regard to predicting worst-case scenarios and avoiding mistakes from false intuition;
- the availability of technical and logistical resources for setting up and running the facilities;
- in remote responses, the ability of the wildlife effort to capture and transport animals to resource hubs where facility operations can be more effective;
- the level of integration of local resources into the response; and
- the increased local response capacity and integration of local communities into ongoing preparedness and response efforts.

The success of an oiled wildlife response operation therefore has many parameters, allowing a detailed analysis and evaluation of areas where a response was considered successful. This goes beyond the count of rehabilitated and released animals, which has often been used as a biased and very limited indicator of success.

Pupils at Omanu Primary School in New Zealand assist with the release of little blue penguins after rehabilitation following the Rena *spill.*

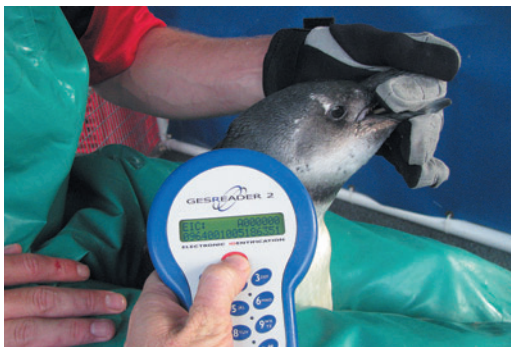
Long-term programmes

Post-release monitoring

Evaluation of response methods is critical in improving both methods and efficiency. In the case of oiled wildlife rehabilitation one key measure of success is survival and reproduction after release. Post-release monitoring can have a direct bearing on methodologies and practices involved in significant parts of the response process, and can have a direct affect on animal welfare. It can also provide guidance to the overall evaluation processes and influence future plans. It is possible that a plan holder may be asked to fund post-release monitoring during a spill, and this is something that spill response managers must consider, recognizing that additional funds and expertise will be required. Without such monitoring it is impossible to scientifically evaluate outcomes in relation to the ultimate objectives of response and rehabilitation, i.e. determining the fecundity and longevity of released animals.

Common techniques for post-release monitoring include:

- banding/ringing of birds, including the use of bands/rings that can be read in the field;
- tagging of marine mammals and marine reptiles;
- microchipping of penguins and marine mammals; and
- deployment of VHF/GPS satellite telemetry equipment on select individuals.



Implanting subcutaneous transponders (far left) and satellite tags (near left) are two methods used for post-release monitoring and tracking of wildlife after rehabilitation.

The deployment of these techniques on animals will require input from a range of disciplines, including veterinary and academic support. Many of them will require long-term active monitoring (sometimes with the support of a range of NGOs), and the majority of techniques will require government authorization for their deployment and use. Because there may be an array of individuals and groups involved in the monitoring process, planning and integration of these studies should be considered at an early stage and, ideally, should be part of the oil spill response plan.

Although an essential part of this monitoring is to establish the long-term survival rate of released animals, any results must be coupled with reference to the methodologies used to rehabilitate the animals in the first place. These studies, including the analysis of their results, should therefore be undertaken with the involvement of all players, and the rehabilitation practices from initial collection of the animals through to their release should be reviewed.

Evaluation

Evaluating an existing preparedness system for oiled wildlife response is of paramount importance. Any wildlife preparedness system is a dynamic, collective effort involving a multitude of participants, which only works well if it is actively maintained. Bringing participants together in meetings that allow a multidisciplinary evaluation of how a response went versus 'best practice' is an important element in building and firming up preparedness.

Evaluation meetings can be organized either as scheduled routine events within the framework of a multiyear programme, or after a situation in which the system was tested, such as an exercise or incident. Evaluating a response is not an opportunity to ascribe blame, but rather a process to improve efficiencies and the effectiveness of future responses. Often, specific approaches are taken to carrying out evaluations (e.g. through a process commonly known as a 'hot wash'—a debriefing held immediately after a response, where participants share their perspectives in the presence of a facilitator) to ensure a constructive process. The purpose of such meetings, and how they will contribute to identifying the lessons learned and any gaps encountered, is explained in Table 6.

Table 6 *The importance of evaluation and its contribution to identifying lessons learned and gaps encountered*

	Scheduled programme evaluations	After an exercise	After a spill
When	• Once a year, at a minimum (e.g. in the form of an annual meeting of parties) • After completion of the multiyear programme; normally leading into a new programme	• Immediately after an exercise—a 'hot wash' evaluation, with all participants together • After a large exercise—some weeks after the exercise, with the key organizations	• 'Hot wash' evaluation of personnel as they are demobilized • Internal evaluation within each participating organization within weeks after demobilization • 'Cold wash' evaluation (within 1 to 2 months) • Formal evaluation of the partners of a plan within weeks rather than months. Sometimes more than one meeting may be necessary. Evaluations may be needed for different disciplines (e.g. financial, legal and claims issues).
Purpose	• Overseeing progress and achievements in the multi-year preparedness building programme	• Identify strengths and weaknesses in performances in relation to the section of the response plan that was the focus of the exercises	• Identify strengths and weaknesses in performances in relation to the real-time developments of an incident.

Lessons learned	• What was the outcome of training activities, for
	  • newly qualified officers;
	  • refresher courses; and
	  • new modules that were developed?
		• Exercises typically test the expectations that people have of a plan. Did the plan provide guidance for effective decision making, and lead key officers quickly into their expected role and responsibilities?	• In the evaluation, the response is best considered as a large-scale and complete exercise. The experience allows a thorough analysis and evaluation of strengths and weaknesses.

continued …

Table 6 The importance of evaluation and its contribution to identifying lessons learned and gaps encountered (continued)

	Scheduled programme evaluations	After an exercise	After a spill
Lessons learned (continued)	• Developments in organizational structure, officers that moved on, newly appointed officers and their training needs • Results from internal exercises • Lessons from incidents elsewhere • Lessons and new insights from conferences and international communications	• Exercises test individual officers and allow them to experience their own level of training in the simulated environment. • Exercises always help to reduce misperceptions of what organizations or officers can bring to the table. People will be better able to assess their own role in relation to that of others. • Exercises help to bridge gaps between organizations and people, and identify strengths and weaknesses. • Sometimes the exercise setup may be limited for practical reasons, and participants may bring up suggestions for future extension or improvements	• Because a real-time incident puts considerable pressure on the performance of all individuals involved, the consequences of mistakes may be more severe, or at least perceived as such. • It is therefore essential that a constructive atmosphere is created by the organizers and moderators of evaluation sessions. In the end it may appear that mistakes were not due to ignorance or misconduct, but were situation driven, or due to lack of guidance from the plan.

Gap analysis	• New insights from participants may point out flaws in the plan, expertise, equipment, facility set-up
	• Developments in neighbouring areas/countries/states may create opportunities to fill existing gaps via cooperation.
		• Gaps that can be identified are related to the specific part of the plan that was exercised, but could include, depending on the scale of the exercise:
		  • gaps in information that the plan should provide for officers to carry out their tasks and work together;
		  • lack of specific preparedness in regions, sometimes triggered by extrapolation from the exercise scenario; and
		  • gaps in facility space or equipment stockpiles.
		• Exercises typically last for one day, or for a few days at the most. They will not easily uncover gaps related to sustained response capability, although participants may be prompted to make extrapolations to that effect.
			• The experience gained from responding to an incident will lead to various new insights regarding potential scenarios and their effect on current response capabilities and the content of the underlying plan.
			• In extreme cases there may be reason to change the preparedness targets on the basis of the experience from the incident, and issue a complete reassessment of structures, expertise, training systems, equipment and facilities and a (partial) re-write of the wildlife response plan.

Evaluating long-term programmes

As the years pass, more data become available from long-term research programmes, for example on population recovery or post-release survival. When available, such data should be incorporated into the framework of lessons learned, and used in new assessments of the preparedness and effectiveness of response options.

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Appendix 1: Oiled wildlife response overview

Table A1 *Oiled wildlife response overview*

	Actions	Decisions	Planning and operational conditions	Resources: personnel	Resources: facilities and equipment

Initial impact assessment	• Assess wildlife at risk	• Develop response strategies
		• Determine response levels
		• Determine response resource needs, i.e.:
		  • personnel
		  • facilities
		  • equipment
			• IMS Wildlife Branch activation
			• Response team notification
			• Wildlife response team contacts
			• Authorization and planning for travel
			• Human health and safety plan
				• Wildlife reconnaissance teams
				• Wildlife planning team
					• Marine vessels, land vehicles, aircraft
					• Office and communication systems
					• GIS mapping resources
					• Oil spill trajectory modelling

Prevention measures (1)	• Oil containment and clean-up
	• Wildlife impact mitigation
		• Prioritize oil containment response actions:
		  • wildlife protection
		  • habitat protection
			• High priority wildlife habitat
			• Net environmental benefit analysis
			• Oil containment and clean-up response plan
				• Wildlife planning team
				• Data and document management team
				• Oil spill contaminant and clean-up response planning team
					• Office and communication systems
					• GIS resources
					• Oil spill trajectory modelling

Prevention measures (2)	• Hazing and deterrence
	• Pre-emptive capture and translocation
		• Develop hazing and deterrence plan
		• Develop pre-emptive capture plan for unimpacted wildlife at risk
		• Remote site/field stabilization facility procurement:
		  • location
		  • power and water resources
		  • transportation/Roads
		  • security
		• Determine translocation site for unoiled wildlife:
		  • alternate clean habitat
		  • captive environments
			• Regulatory agency hazing and deterrence authorization/ permits
			• Translocation approval authorization:
			  • translocation site
			  • translocation method
			• Oil spill trajectories:
			  • wildlife habitat
			  • wind
			  • weather
			  • current
			• Assessment of species at risk:
			  • threatened/endangered species
			  • migratory birds
			  • marine mammals
			  • aquatic/terrestrial mammals
			  • reptiles and amphibians
			• Remote site/field stabilization facility procurement authorization
				• Safety officer
				• Hazing and deterrence team
				• Wildlife capture team
				• Transport team
				• Field/remote site stabilization team
				• Local area subject matter experts
				• Biologists
				• Wildlife care team
					• Hazing and deterrence equipment:
					  • pyrotechnics
					  • cannons
					  • biosonics
					  • effigies
					  • aircraft
					  • boats
					  • acoustic
					  • exclusion devices
					• Capture equipment
					• Remote site stabilization facility and equipment
					• Husbandry equipment for unoiled wildlife
					• Veterinary medical supplies
					• Transport vehicles and equipment
					• Communication systems

continued …

Table A1 Oiled wildlife response overview (continued)

	Actions	Decisions	Planning and operational conditions	Resources: personnel	Resources: facilities and equipment
… Prevention measures (2) (continued)			• Activate wildlife response plan • Site safety and health plan • Dead wildlife collection authorization • Equipment procurement process • Health and safety training for volunteers • Wildlife care training for volunteers • Regulatory agency approval for release sites		• Office systems • Oil spill trajectory modelling

Dealing with live casualties	• Search and collection
	• Primary treatment
	• Remote site stabilization
	• Wildlife transport
	• Wildlife evidence processing:
	  • live wildlife
	  • dead wildlife
	• Medical examination and triage
	• Stabilization
	• Decontamination/ cleaning
	• Post-wash conditioning
	• Banding/ringing
	• Release
		• Develop wildlife response plan
		• Develop search and collection plan:
		  • teams
		  • sectors
		  • methods:
		  - on water
		  - land-based/shorelines
		  • equipment:
		  - boats
		  - vehicles
		• Rehabilitation facility procurement:
		  • location:
		  - fixed temporary facility
		  - mobile facility
		  - existing rehabilitation centre
		  • power and water resources
		  • roads
		  • security
			• Activate wildlife response plan
			• Site safety and health plan
			• Health and safety training for volunteers
			• Wildlife care training for volunteers
			• Dead wildlife collection authorization
			• Equipment procurement authorization
			• Facility procurement authorization
			• Bird banding authorization
			• Regulatory agency approval for release sites
				• Safety officer
				• Wildlife capture team
				• Transport team
				• Remote site stabilization team
				• Veterinarian
				• Oiled wildlife care team
				• Dead wildlife processing team
				• Wash team
				• Conditioning team
				• Volunteers
				• Volunteer manager
				• Logistics and finance liaison
				• Wildlife banders/taggers
				• Facilities manager/team
				• Local area subject matter experts
					• Capture equipment
					• Transport vehicle, equipment and communication system
					• Field stabilization facility
					  • Husbandry equipment
					  • Veterinary supplies
					• Rehabilitation centre
					  • Morgue necropsy
					  • ICU
					  • Laboratory
					  • Stabilization/ pre-wash holding
					  • Wash room, drying room
					  • Conditioning pools/pens
					  • Post-wash stabilization/holding
					  • Food preparation
					  • Volunteer areas
					  • Administrative areas

continued …

Table A1 Oiled wildlife response overview (continued)

	Actions	Decisions	Planning and operational conditions	Resources: personnel	Resources: facilities and equipment
… Dealing with live casualties (continued)		• Develop euthanasia policy • Develop care protocols • Volunteer management guidelines • Determine release criteria • Determine release sites and protocols • Activate post-release monitoring plan			• Husbandry equipment • Wash equipment • Veterinary supplies • Communication systems • Construction supplies • Waste and hazardous material disposal • Medical waste disposal
Demobilization	• Scaled demobilization of resources	• Develop demobilization plan and timeline: • personnel • equipment • facilities • services	• Assessment of current response levels resource needs	• All associated wildlife personnel in a staged manner	• All wildlife facilities, equipment and services in a staged manner
Post demobilization phase	• Post-release monitoring	• Develop post-release monitoring plan: • passive: - banding - pit tagging • active: - telemetry	• Monitoring scope and resources	• Post-release monitoring team • Data management team	• Post-release monitoring equipment

Appendix 2: Glossary of terms

Banding, ringing	The fitting of a ring or band to a bird to provide it with a unique identity. Generally recognized by international ornithological organizations that cooperate on a global scale to establish biological data about birds' lives.
Biosonics	The use of sounds to create a specific response. In this case audible distress or alarm calls to frighten birds (and occasionally other animals) away from areas or structures. (See also 'Hazing'.)
Fecundity	The ability to reproduce.
Gastrointestinal	Usually associated with the stomach and intestines, but also describes the structures from the mouth to the anus.
Hazing	The use of one or a number of devices or techniques used to scare animals (including birds) away from areas. (See also 'Biosonics'.)
Necropsy	An autopsy performed on an animal.
Pelage	The fur or hair of a mammal; usually making up the mammals 'coat'. (See also 'Plumage'.)
Pelagic	Inhabiting the open water as opposed to the sea bed or seashore
PIT-tagging	Application of a passive integrated transponder tag—a small electronic device placed internally to provide a unique identification; often likened to a barcode.
Plumage	A bird's covering of feathers. (See also 'Pelage'.)
Pre-emptive capture	The action of capturing animals (including birds) before oiling. The animals are either held in captivity or transported to alternative sites. See text for further details and provisos.
Preen	The actions of a bird to clean, realign and maintain its feathers and plumage to provide a waterproof structure. (Similar to grooming in a mammal.)
Rehabilitate	To restore to a previous condition; to repatriate an animal to the wild in such a physical and mental state that it is likely to survive.
Scavenging	The normal action of animals to feed on dead animals.
Sensitivity maps	Usually refers to maps produced to identify key areas where animals live during parts (or all) of their lives. Sensitivity maps provide an indication of the area's importance to animals and may include migration, feeding, conservation value, etc.
Site fidelity	An animal's natural desire to stay in, or return to, a familiar area.

Appendix 2: Glossary of terms *(continued)*

Taxa	Plural of taxon. A scientific term to referring to groups of animals, for example, in terms of their evolutionary, geographical or population relationship.
Telemetry	The use of wireless data transfer to establish a range of functions of (in this case) animals. Transfer may use satellite, infrared, VHF, telephone networks and others to transmit and receive data. Data received may include the animal's location, biological signs and activity patterns.
Triage	A programme to identify priority groups; to sort animals into groups for specific treatments.
Zoonotic diseases	Infectious diseases that can be transmitted from animals to humans, or vice versa.

Appendix 3: Abbreviations

EEZ	Exclusive Economic Zone
HELCOM	Helsinki Commission
IMS	Incident Management System
ICU	Intensive care unit
IFAW	International Fund for Animal Welfare
IOPC Funds	International Oil Pollution Compensation Funds
MSRC	Marine Spill Response Corporation
NGO	Non-governmental organization
OSRL	Oil Spill Response Limited
OWCN	Oiled Wildlife Care Network, Karen C. Drayer Wildlife Health Center, UC Davis
POLREP	Pollution report
PPE	Personal protective equipment
R&D	Research and development
SANCCOB	Southern African Foundation for the Conservation of Coastal Birds
UNEP	United Nations Environment Programme

Appendix 4: Equipment and facilities

A number of organizations have wildlife equipment stockpiles and initial ordering lists based on the needs of their plan or other plans in which they are a listed resource. Examples are presented below.

Organization	Purpose
Alaska Clean Seas	Tier 1 field response: stockpile capture and stabilization
IFAW	Wildlife response support
Clean Rivers Cooperative and MSRC	Tier 1 response (up to 15 live animals) individually Tier 2 (16–100 live animals) when combined
OWCN	Multiple local Tier 1 (1–200) stockpiles Centralized Tier 2/Tier 3 (200–1000) stockpile
OSRL	Multiple Tier 3 stockpiles for capture, stabilization, rehabilitation

A number of organizations/countries have met the facility needs for their plans in different ways. Examples are presented below.

Organization/country	Purpose
Alaska Clean Seas	Field stabilization—mobile container and warehouse
Clean Rivers Cooperative	Mobile Tier 1—combination of trailers and tent
Finland	Mobile—multiple containers
Massey University	Partial mobile—multiple containers (wash module, water system, equipment storage)
MSRC	Mobile Tier 1—multiple tents
OWCN	Turnkey Tier 1, 2, 3—multiple facilities located along the entire coastline

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IPIECA is the global oil and gas industry association for environmental and social issues. It develops, shares and promotes good practices and knowledge to help the industry improve its environmental and social performance; and is the industry's principal channel of communication with the United Nations. Through its member led working groups and executive leadership, IPIECA brings together the collective expertise of oil and gas companies and associations. Its unique position within the industry enables its members to respond effectively to key environmental and social issues.

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OGP represents the upstream oil and gas industry before international organizations including the International Maritime Organization, the United Nations Environment Programme (UNEP) Regional Seas Conventions and other groups under the UN umbrella. At the regional level, OGP is the industry representative to the European Commission and Parliament and the OSPAR Commission for the North East Atlantic. Equally important is OGP's role in promulgating best practices, particularly in the areas of health, safety, the environment and social responsibility.

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