POSOW

Preparedness for Oil-polluted Shoreline cleanup and Oiled Wildlife interventions

FISHERMEN'S SUPPORT IN OIL SPILL RESPONSE MANUAL

in partnership with

POSOW II is a project co-funded by the European Union under the Union Civil Protection Mechanism in cooperation with REMPEC, ISPRA, DG-MARINWA, FEPORTS and AASTMT and coordinated by Cedre.

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FISHERMEN'S SUPPORT IN OIL SPILL RESPONSE MANUAL

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Cover photo: Containment and recovery with a floating boom
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Presentation of the project

The POSOW II project (Preparedness for Oil-polluted Shoreline cleanup and Oiled Wildlife interventions), coordinated by the Centre of Documentation, Research and Experimentation on Accidental Water Pollution (Cedre, France), is a project co-funded by the European Commission (EC) under the Union Civil Protection Mechanism to improve preparedness and response to marine pollution in the Mediterranean region. It is a follow-up of POSOW I, run between 2012 and 2013, which was also co-financed by the EC.

POSOW II is implemented by Cedre and the following partners: the Regional Marine Pollution Emergency Response Centre for the Mediterranean Sea (REMPEC, Malta), the *Istituto Superiore per la Protezione e la Ricerca Ambientale* (ISPRA, Italy), the *Instituto Portuario de Estudios y Cooperacion de la Comunidad Valenciana* (FEPORTS, Spain), the Arab Academy for Science, Technology and Maritime Transport (AASTMT, Egypt) and the General Directorate of Maritime and Inland Waters (DG-MARINWA, Turkey).

By providing training courses and material to civil protection professionals and volunteers, in cooperation with local competent authorities, the project aims at improving the effectiveness of emergency response to shoreline pollution following an oil spill in Mediterranean countries. The material is available in several languages and can be downloaded from the POSOW website (www.posow.org).

Purpose of the manual

This manual is one of the 2 manuals produced in the framework of the POSOW II project - the other one addresses oil spill waste management - which will complete the initial set of 4 manuals produced in the framework of the POSOW I project and published in February 2013 (Oiled Shoreline Cleanup, Oiled Shoreline Assessment, Oiled Wildlife Response and Oil Spill Volunteer Management). This manual aims to provide fishermen and other sea professionals with guidance on how their expertise, fishing vessels and gear can be used in order to respond to oil pollution events affecting the coast and nearby waters.

The manual is divided into three parts.

Part 1: General principles of the involvement of local fishermen in oil spill response

Part 2: Practical datasheets for fishermen

Part 3: Further information

This manual is designed for volunteers involved in oil spill response in coastline waters.

Some categories of responders should however undergo more in-depth training or otherwise justify their experience for handling chemicals and for offshore operations.

The aforementioned manuals are also applicable to fishermen, especially with regards to the use of Personal Protective Equipment (PPE), worksite organisation and preparation, decontamination of personnel and equipment, some cleanup techniques and capture of oiled wildlife. Please refer to said manuals for more information.

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PART 1

GENERAL PRINCIPLES

Why involve fishermen in oil spill response?

Definitions of "fishermen" and "small vessels"

FISHERMEN

In general, a fisherman or fisher is someone who captures fish and other animals from a body of water, or gathers shellfish. In the context of this manual, fishermen ("commercial fishermen" according to the FAO) are those sea professionals dedicated to the business of capturing fish, gathering shellfish or to aquaculture.

In this manual, the word "fishermen" includes not only professional and recreational fishermen but all the sea professionals potentially involved by local, regional or national authorities in an oil spill response on the water near the shoreline.

SMALL VESSELS

In the context of this manual, "small vessels" are those vessels used by fishermen, generally 10-15 meters in length overall, which are used to operate near the coast. There are many different kinds of vessels used in commercial, artisanal and recreational fishing, which can be useful in responding to an oil spill before it reaches or is about to reach the coast. Moreover, vessels, other than sailing ships, which take onboard loads at sea from vessels engaged in catching or transporting living resources from the the sea, including fish and marine vegetation, can also be used as vessels of opportunity for oil spill response.

Small fishing vessels

Expected roles and tasks for fishermen in oil spill response strategies

Fishing is one of the first and most vulnerable sectors to be affected by oil pollution, given that oil spills threaten the fishermen's way of life. The latter know perfectly well that the quicker the response, the less harm to the marine environment and fishing grounds. Fishermen, shellfish collectors and other sea professionals can be very effective in coastal areas response due to their knowledge of the shoreline, the gear they are used to working with and their traditional ability to offer their collaboration during critical situations.

FISHING PROFESSIONALS' ROLES

Fishermen: may conduct techniques similar to some pollutant recovery techniques practiced offshore. They can deploy traditional fishing gear, as well as specific response means (such as booms and response trawl nets) to statically or dynamically contain and recover pollutants such as oil or oily debris.

Fish farmers (open sea aquaculture): may use ropes, bags, nets, cages, tanks and barges which could be useful to build oil recovery systems, transport waste or people, or prevent oil from reaching the shoreline.

Shellfish farmers: may drive flat-bottomed vessels (such as barges) which enable them to conduct surveys in shallow waters, set up protective systems on (ecologically or economically) sensitive sites, load and unload people and equipment, or even transport waste from areas difficult to access by land.

Kelp harvesters: may recover thick viscous oil using their onboard gear and store it onboard.

OTHER PROFESSIONALS' ROLES

Divers: may assist submerged slick recovery operations or set up boom mooring systems.

Pleasure boat managers: their vessels may be used to transport operators or observers.

Sand ship owners: their vessels may be used as logistical support for operations (transport of heavy machinery, small equipment, transport and deployment of containment and recovery equipment, storage and transport of waste).

Pilot boat skippers: pilot boats' lifting equipment (such as cranes and lifting arms) may be used for response operations to set up containment systems or as logistical support for cleanup operations.

Marine mineral extractors: their vessels (e.g. dredgers) and specialized on board means may be used to recover pollutant or conduct sounding/coring.

Professional pilots (of port craft, jet skis or semi-rigid vessels): their very manoeuvrable shallow draught vessels may be used for surveys.

Professionals who do not have the necessary nautical means to take part in response operations at sea, for instance shellfish harvesters, nevertheless know the shoreline extremely well and have tools that can prove effective for the manual recovery of pollutant. They can work from land to deploy protective systems for sensitive sites, water intakes and shellfish farms or can join crews. They can also be involved in shoreline assessment or cleanup.

In this guide the following are not taken into account: professionals managing vessels whose dimensions mean they cannot easily manoeuvre in coastal areas (port or offshore tugs for instance), or other companies specialised in litter collection or pollution response, which will be contracted and involved in response in the same way as on land cleanup companies.

Framework of the involvement of local fishermen

The term "second row" refers to response in the coastal area, between the shore and the zone where specialised vessels are working offshore, and/or in shallow areas. The term is more widely used to designate response efforts deployed to support those conducted by vessels representing the front line of response at sea.
This term was used during the *Prestige* oil spill and is used in the ARCOPOL manual.

When an oil spill occurs at sea, all efforts must be concentrated on recovering the pollutant before it reaches the coast and pollutes sites, to avoid tedious, costly and technically complex cleanup operations. Response operations at sea are largely dependent on the sea and weather conditions. These conditions affect the evolution of oil spills as they drift at sea. Oil can spread, evaporate, disperse, emulsify, become increasingly viscous, fragment and disseminate with currents over increasingly large surface areas.

The first response is usually a matter of specialised vessels and agencies working offshore, possible with the involvment of other means, such as aircraft. This is often considered as the frontline of the response at sea. Their work consists in monitoring the oil spill and its drift and implementing containment and recovery actions (by means such as booms, skimmers, etc). Occasionally, the use of dispersants or techniques such as mechanical agitation is advised in order to disperse the oil, depending on its properties. Sometimes, when the oil spill is too large and happens near the shoreline, or due to changing and difficult weather conditions, it may reach the coast, where first response means can barely operate due to shallow waters and the impossibility of working on land.

While high sea vessels specialised in spill response are efficient at responding to compact slicks offshore, they become unsuitable when the pollution fragments and moves closer to the coast (draught incompatible with shallow waters). Local fishermen, as sea professionals, and their vessels and gear can then be called upon to respond to the pollution before it reaches the coast.

In coastal areas, where the "second row" of actions is activated, small fishing vessels may play a very important role in order to prevent the slicks from reaching the coast or, once they have reached it, to access complicated areas and collaborate in assessment, cleanup and recovery tasks.

Of course, fishermen's engagement is functional if properly coordinated by the authorities under predefined plans.

The aim of this guide is to provide fishermen and fishery managers with organisational and technical solutions in order to implement an appropriate and efficient response to a spill of pollutant, whether crude or refined oil, using their small vessels and fishing gear.

Fishermen in the chain of command

Fishermen can be mobilised to take part in operations to respond to small, medium or large spills, at different levels in the response chain. Fishermen are much more effective in the so-called "second row" of the response. The main aim of this "second row" of the response is to form a protective line along the shoreline against slicks of oil which have not been completely recovered by oil spill response vessels.

Fishermen are usually integrated in the first response teams in coastal oil pollution episodes since they own, and are used to working with, different kinds of vessels and tools that allow them to act from the water side of the shoreline. Their roles can therefore be quite assorted. Fishermen are usually mobilised by fishing guilds or associations under the command of the local or regional Fisheries Department or Directorate.

Key elements to be defined

- Integration of fishermen within the chain of command
- Institution to which fishermen must refer
- Communication system among operators for unambiguous flow of information
- Definition of roles and responsibilities of fishermen
- Delivery of on-the-spot training courses
- Daily updates
- Payment and compensation

Fishermen being mobilised during the *Prestige* oil spill in 2002

Fishermen collecting oil from their boat during the *Prestige* oil spill in 2002

Examples of roles fishermen play in national response organisations

Fishermen are a cornerstone for responding to marine and coastal oil pollution in many regions. If adequately trained and prepared, they could have skills and means to detect oil slicks, evaluate the spread and even forecast their drift, besides having available, in some cases, suitable means for responding to such events. Hereunder are presented some examples of how fishermen are involved in national response plans to respond to coastal oil pollution in some Mediterranean countries of the POSOW II project.

SPAIN

Coastal pollution is a regional competence, so the involvement of fishermen is set out in the regional plans to respond to coastal oil pollution.

In the case of the Valencia Region and similarly to other Spanish regions, one of the official bodies with competences in coastal pollution is the Regional Department of Fishing, working with other departments such as Civil Protection and Emergencies, Coast and Ports, Health, Environment or Land Planning.

In the regional response organisation fishermen, are included in a "Basic Unit of Direct Intervention". See diagram below.

Fishermen are not fully involved in other direct intervention units such as safety, waste management, wildlife recovery, logistic support... However, it does not mean their support is not necessary to these units.

The main task assigned to fishermen in the Valencia Region Plan to respond to oil pollution is the cleanup of shoreline areas affected by a pollution episode and to provide support activities to the other intervention units, like collection and transport of floating waste.

Basic Unit of Direct Intervention

FRANCE

In France, civil protection is planned and managed through the ORSEC organisation. A specific section of ORSEC, called POLMAR, deals with accidental marine pollution. Response at sea is the responsibility of the Maritime Prefect and response on the shoreline is the responsibility of the mayor (minor spill) or Land Prefect (major spill).

1. At sea operations

While specialised vessels may be effective for offshore operations in the response to compact slicks (dispersion operations and/or containment and pumping), they become unsuitable when pollution is fragmented and is close to the coast (draught too high). In this case, French authorities can implement the "second row" in coastal areas.

The Maritime Affairs (called DDTM/DML in France) are in charge of setting up the "second row", including mobilising local sea professionals and their knowledge of the environment to combat pollution under the responsibility of the Maritime Prefect before the oil reaches the shoreline.

Mobilization of fishermen in Bayonne (France) during *Prestige* oil spill

A national agreement is being developed for determining in particular the modalities of participation of fishing vessels in the response and a flexible schedule requisition according to the circumstances.

The recovery devices used in the framework of "second row" are mainly specialised surface trawls nets to recover very viscous pollutant bought and stored by the French Navy, but also improvised means developed by the fishermen.

2. Support for shoreline operations

In France sea professionals can also be mobilised for operations implemented by the Prefect on the shoreline. In particular during the *Erika* and *Prestige* oil spills, local fishermen were mobilized for transportation of response means to islands, transportation of waste from islands or from coastal areas without road access, boom deployment for the protection of sensitive areas...

In recent years, some "polluters" have mobilised fishermen on the shoreline or in estuaries for coastline survey, oiled floating debris trawling, boom deployment, transportation of response means along a river...

EGYPT

Fishermen in Egypt have played a crucial role in many oil spill incidents due to their normal and natural presence and activities at sea by being the first ones who notify the Egyptian Environmental Affairs Agency (EEAA) of the Ministry of Environment, where the Central Operations Room (COR) is located, to help the agency to start the response. Also because of their capabilities and knowledge of the area, they can help in mobilising or guiding the specialised teams and equipments to respond.

According to article 26 of the Egyptian Environmental Law (no. 4 of 1994), any participating party should be compensated for the actual costs they incurred due to their support and help in oil spill response.

Fishermen were compensated in many incidents for the damages which afflicted them, with the assistance of the Fishermen Association which follows the legal procedures and conducts the necessary documentation to protect their rights. Credible academic institutions such as the National Institute of Oceanography and Fisheries (NIOF) could assist significantly by providing more data, information and studies for the incident sites to prove the damages affected fishermen and their monetary valuation.

The proposed roles and rights of the fishermen/fishermen association in handling marine oil pollution incidents in National Oil Spill Contingency Plan (NOSCP):

- → notifications of oil spills (acting as the surveillance eyes for EEAA within their zones of activity at sea);
- → assisting in identifying the pollution sources;
- → providing assistance during the incidents by using their boats in combating activities in the shallow areas;
- → provide EEAA with the required data concerning the fish production to guide the compensation claim procedure.

TURKEY

With regard to oil spill response, a guideline named "Act on Guidelines for response to emergencies and compensation of losses in case of pollution of the marine environment from oil and other harmful substances" does not consider any specific role for fisherman involvement in the response activities.
However, aforementioned guidelines in the part of Section 4, Article 15 indicates that "In pollution caused by ships or shore facilities, the ships which are parties to the incident, and **ships nearby the incident (could be fishing boats)** and shore facilities nearby the incident, give the first limited response with their staff, equipment and materials they have, and comply with the instructions of the authorised emergency response team after the team's response to the incident".

Adapted from "US Coast Guard, 2011. Deepwater Horizon Oil Spill – Incident Specific Preparedness Review (ISPR) – Final report."

THE USE OF VOOS (VESSELS OF OPPORTUNITY) DURING DEEPWATER HORIZON INCIDENT (2010, USA)

During the Deepwater Horizon incident, the rapid mobilisation of a fleet of Vessels of Opportunity (VOOs) – fishing vessels (shrimp and oyster boats in particular) fitted out and adapted for pollution response – constitutes one of the key lessons in terms of their integration within the overall response at sea.

This mobilisation met several objectives:

→ to take benefit of local knowledge of the coastal waters;

→ to provide work for commercial fishermen and others impacted by the pollution;

→ to reduce political pressure from local governments to use local assets;

→ to supplement oil spill removal organisations' resources already on scene.

Because no VOO program existed in any of the areas prior to the spill, the oil spill response organisation rapidly launched a campaign to identify, hire, and train a VOO fleet.

A series of local community meetings were held in which British Petroleum representatives outlined the program, contract terms and the compensation to interested parties. To qualify for the program, VOOs had to pass a Coast Guard dockside inspection, have an adequate and qualified crew, and be willing to participate in a 4-hour course entitled "Marine Spilled Oil Response". VOOs involved in active oil recovery were required to take an additional 4-hour class ("Marine Health and Safety Class"). A trained 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) technician was also required on board each VOO.

Participants in the VOO program were paid on a tier system, which was based on vessel size (between $1,200/day and $3,000/day) and the number of crew provided ($200/day per person).

VOOs were segregated into offshore, near shore, and inshore groups, depending on their characteristics.

The offshore VOOs were primarily tasked with towing boom used for insitu burning (ISB) operations. The near shore VOOs were outfitted with oil recovery assets and were used to tow NOFI Current Buster systems and portable storage bladders. They were also used to perform a variety of support functions.

In addition to sentinel duties, many inland VOOs were effective in the collection of emulsified oil and contaminated debris using a variety of sorbent materials or nets.

A skimming system is deployed from a vessel of opportunity during the Deepwater Horizon oil spill

Fleet of VOOs

Response operations

Tasks that can be assigned to fishermen

Alert, surveying and sampling

Oiled shoreline assessment: fishermen may assume privileged position in assessing the state of the shoreline from their vessels, since they can easily approach areas which are difficult to access from land (refer to POSOW Oiled Shoreline Assessment Manual).

Response operations:

→ **Chemical dispersion, agitation**: by spraying dispersants or performing mechanical agitation to promote biodegradation and prevent emulsification of oil.

→ Containment: by deploying booms and specialised gear, fishermen may help with their vessels to contain spilt oil for its recovery.

→ **Recovery op**erations: mainly from vessels and barges to access difficult zones such as ripraps, breakwaters, cliffs, shallow waters... Fishermen can perform tasks such as pumping of floating oil, pressure washing of rocks and man-made structures, use of sorbents and collection nets... (refer to POSOW Oiled Shoreline Cleanup Manual).

→ Protection of the shoreline: sensitive areas and infrastructures can be protected by fishermen by deploying booms, adapted nets, geotextile canvas... The elements deployed can be also used to facilitate the recovery of the pollutant.

Waste storage and transportation: vessels, barges and small fishing vessels can approach the shoreline for collecting floating waste and oil using standard means or even by adapting their equipment such as shovels, scoop nets and other light collection tools, in order to operate efficiently from **onboard their vessel. Afterwards they can transport the waste in appropriate small containers and buckets to be stored at a temporary waste storage site. They can also transport waste produced by shoreline c**leanup operations from sites with difficult access.

Wildlife recovery and rescue: fishermen could be involved in recovering oiled wildlife at sea. The POSOW Oiled Wildlife Response Manual addresses the response performed if animals, dead or alive, come ashore during an oil spill, focusing mainly on birds as they are likely to be affected in larger numbers. Nevertheless the main premises on the collection and transport of animals contained in that manual are useful for recovering wildlife even offshore and near the shoreline

Logistical support: transportation of operators and response equipment, signposting tasks...

Collection of oily debris

Use of oyster barge for transportation of response equipment

Alert, surveying and sampling

Alert

An alert can be communicated by the polluter itself or by an external witness to an authority or rescue organisation. This alert will then be transmitted to the MRCC (in the case of a spill detected offshore). The MRCC will be in charge of transmitting the alert to the Maritime Authorities via a POLREP. Fishermen at work may play the role of initial witnesses. If so, they must alert the MRCC.

Surveying

Fishermen, through their knowledge of particular areas (currents, depth, drifts...), can efficiently and rapidly check specific information provided by other means. They can also participate in reconnaissance surveys aiming at assessing the extent of the spill and defining which sites should be treated as a priority, but cannot carry out these surveys by themselves. Fishing boats are not the best asset to assess the extent of a spill, it is better to use planes/helicopters. Some fishermen could be specifically mobilised for this task or could carry it out in addition to other tasks such as sampling or monitoring surveys.

Sampling

Samples to characterise the pollutant and its weathering are normally taken from spill response vessels. They can however occasionally be taken from fishing vessels which have the necessary equipment.

Samples for legal purposes however have to be taken by an onboard law officer.

One of the specific pollution detection systems used during the *Prestige* pollution consisted of positioning "sentry nets" at strategic locations on the shoreline or on difficult-to-access sites. In order to check for the presence or passage of pollutant in these areas, rounds were regularly performed by fishermen on these sites. The results of the observations conducted in the field were transmitted to the authorities responsible for defining response strategies in these areas.

Chemical dispersion, agitation

Chemical dispersion

Chemical dispersion fragments the oil into micro-droplets to promote the biodegradation and prevent emulsification. Fishermen may help by spraying dispersants on oil slicks. Dispersants are only applied after the analysis of experts who determine the possibility of conducting this operation in the response area. The application of dispersants depends on:

- → the results of a risk assessment (NEBA: Net Environmental Benefit Analysis);
- → pollutant features;
- → drift and behaviour;
- → window of opportunity, period after spill during (hours, days) which oil is considered "dispersible";
- → weather and sea state;
- → mobilisation time...

Fishing vessels of a reasonable size can be used to carry the necessary equipment for applying dispersants.

Agitation

Agitation is sometimes recommended for slicks of light oil and in the absence of a fire/explosion risk in the response area. This technique consists in accelerating the natural dispersion process of oil in the water column by artificially agitating the surface. Fishermen can conduct this technique on board vessels equipped with an inboard diesel engine, moving through the slick and agitating it with the movements of the engine's propeller. It can also be performed onboard larger vessels equipped with waterjets.

Spraying dispersant by boat

Containment, recovery

Containment and recovery operations can be performed by booms associated with skimmers and pumping systems but also by nets. Containment with booms controls the drift and limits the spread of an oil slick, concentrating and thickening it. Containment with booms can be conducted on fluid to viscous oils, but also on amalgams of oiled seaweed or oiled solid waste floating at sea.

Recovery by specific trawl or adapted mesh nets or gear is only possible if the oil is sufficiently viscous, or even solid.

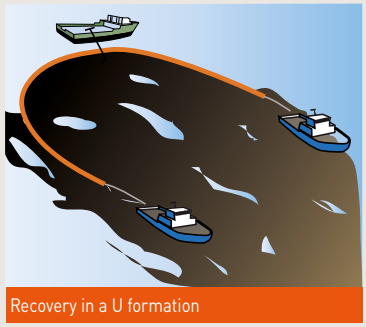
Nets and booms can be used dynamically or (quasi) statically.

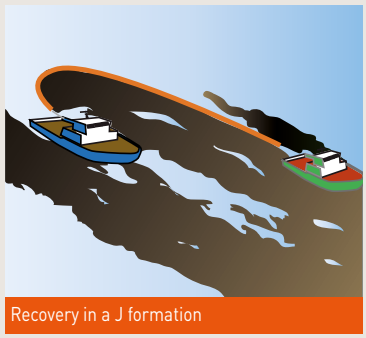
Shrimp vessels tow oil containment boom in Gulf of Mexico, in 2010

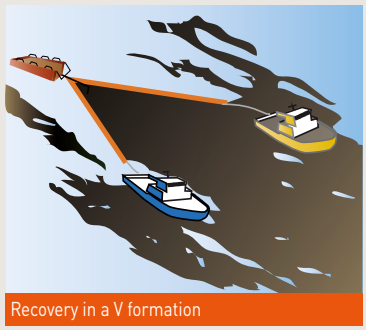
Dynamic recovery

Nets/booms are towed by one or more boats which recover the pollutant at the surface.
Operating in pairs, the vessels trawl with a lead boat and a support boat.
Conducted using a specific method for each type of vessel used, this technique requires solid coordination between vessels and good control of joint manoeuvres.
When the selected containment equipment is a manufactured boom, it can be towed in several different configurations: in a U, V or J formation.

Once oil is contained in the boom, it is recovered manually or mechanically to be stored in a tank (on board or in a floating tank).
When using trawls, the two wings concentrate oil and allow the congregation at the bottom of the net. They are often equipped with a removable cod end, which can be detached once it is full, either at sea to be recovered by another vessel, or on land at a predetermined and prepared site, for easier recovery with more suitable means. This avoids boarding pollutant onto non-specialised vessels.
The use of nets on a frame, or even trawl nets, booms or nets hung on a loading arm or a pole, enables fishing vessels to work alone. The positioning of this equipment on each side of the vessel makes them even more mobile and manoeuvrable in narrow or very shallow navigation areas.


Recovery in a U formation


Recovery in a J formation


Recovery in a V formation


Recovery by a single vessel fitted with a outrigger

© Cedre

Dynamic recovery with net on a frame


© Cedre

Dynamic recovery by a vessel of opportunity in Gulf of Mexico

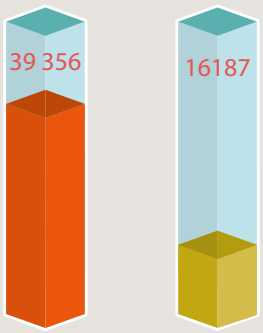

© USCG

Static recovery

The response principle is similar to that of dynamic recovery, but in this specific case, the pollution is left to drift under the influence of the wind and current where nets or booms have been positioned. When the current is too strong, the recovery vessel can be left to drift at a speed lower than that of the surface current. The pollutant can be recovered using manual tools (shovels, scoop nets, large nets) from fishermen's vessels moored head into the current.

Fishermen may, depending on the conditions, also be in charge of positioning static systems along the foreshore. These systems are hightly specialised and require prior consideration of the types of booms to be used, their positioning, the type of pollutant and the quantity to be contained. Ideally, this reflection should be conducted when establishing contingency plans.

THE *PRESTIGE* EXPERIENCE



Polluted waste recovered at sea during the *Prestige* spill (tonnes) – Source: Cedre

Experience of the *Prestige* pollution in the open sea, involving heavy fuel oil, demonstrated the usefulness of fishing vessels for the recovery of small scattered slicks. These vessels, of which hundreds may be made available in an emergency, can cover far larger areas than the few dozen specialised response vessels and barges existing in Europe. Equipped with simple recovery means, similar to their usual work tools (nets, hand skimmers, etc.), fishermen compensated for the low individual recovery capacity by their large number and motivation during response to the *Prestige* spill.

An exceptional performance

Response at sea to the *Prestige* spill lasted 6 months, compared to only 11 days in the case of the *Erika* spill, before a storm pushed the slicks onto the shore. Thirteen oil spill response vessels and more than 1,200 fishing vessels participated in the response, each crew with their own experience and tools. They recovered 55,500 tonnes of emulsion, containing around 23,400 tonnes of fuel oil: an unprecedented performance in the history of oil spills. The combination of specialised vessels, which were efficient on fresh slicks (thick and concentrated), and fishing vessels (which intervened later by skimming scattered patties and patches), is illustrated by the opposite diagram.

Manual recovery

Fishermen can be very effective in on-board recovery operations at sea near the shoreline by the use of small vessels and barges which may:

→ access areas larger and/or specialised vessels cannot enter;

→ help in collecting scattered patties and patches after specialised barges have removed fresh slicks.

Fishermen can use makeshift recovery devices or sorbents. Although manual recovery has a lower yield in comparison to trawling operations, it is a simple technique to implement and very mobile and can be very efficient if there is a relatively high number of vessels available.

■□ Manual recovery operations during the *Prestige* spill

□■ Meshed wire shovels used during the *Prestige* spill

Mechanical recovery

Fishermen can deploy their traditional fishing gear (trawls, nets) to recover viscous oil. When the oil is very viscous, or even solid, kelp harvesting vessels and other shallow draught vessels can be used to efficiently recover pollutant from the water surface using their hooks, buckets ... Also vessels equipped with a hydraulic arm can perform mechanical recovery. Dredgers can be useful also to recover sunken oil.

Hydraulic arm performing mechanical recovery during the *Prestige* spill

Protection of oyster farms by using mesh nets during *Prestige* oil spill at Arcachon

Protection of the shoreline

If the pollutant cannot be recovered in the coastal area, attempts should be made to control its drift, by setting up protective systems around sensitive sites or by deflecting it towards a predetermined site where access and recovery are easier. Thanks to their shallow draught vessels, shellfish farmers and other professionals working in sheltered areas can be mobilised to set up protective systems around harbours, marshes, streams and water intakes, such as manufactured booms, filter dams, fine mesh nets, etc. For these types of tasks, professionals must consider the currents and tides, both when planning and when laying the protective systems. In the case of manufactured booms, booming plans may usefully be defined in advance and appear in contingency plans.

Buckets and other small containers provided can be used from small fishing vessels if they can be properly closed with a lid or resistant plastic layer. They are transported under calm sea conditions near the shoreline.

Fishermen storing and transporting oil during the *Prestige* oil spill

Waste storage and transportation

When response operations are implemented, it is essential to consider the entire logistical chain: from containment to waste storage. In all cases, possible storage methods must be considered and appropriate containers must be provided in terms of:

→ type of waste recovered (liquids, solids, pastes...);
→ volume or quantity to be recovered (according to the technique used or to the vessel's storage capacity).

There are different storage solutions which can be applied to different types of fishing vessels:

→ use of big bags, containers, marine tanks;
→ use of temporary storage capacities, that can be towed or taken onboard;
→ use of vessel's holds with prior preparation.

Whatever the type of storage capacity considered, the containers must be:

→ resistant;
→ oil-tight and fitted with a lid;
→ equipped with a level control system (or be sufficiently transparent to enable visual control) to prevent overflow and anticipate their replacement;
→ fitted with a drain valve to carry out settling onboard;
→ attachable for obvious safety reasons; and
→ crane-liftable and transferable to facilitate loading and unloading.

The involvement of fishermen and their vessels depends *inter alia* on the above-mentioned criteria.

i For more information on waste management, please refer to the POSOW Oil Spill Waste Management Manual.

Wildlife survey and rescue

In addition to one or several of the previous activities, fishermen may help collect oiled seabirds and other animals. Their role is complementary with the rescue of oiled wildlife on land. Fishermen must have access to the minimum required means and suitable PPE for collecting and transporting oiled wildlife in safe conditions. Their work may indue both for recovering oiled living animals and picking up dead animals. Fish markets at ports prove to be good places to take collected live oiled seabirds and proceed with the first recovery steps, since they usually have fish washing facilities which can be suitable to treat certain oiled animals as well, providing they use suitable equipment and means and rely on trained personnel.

Bird rescue at sea in Gulf of Mexico

Oyster barge used for response equipment transfer during *TK Bremen* oil spill in France

i For more information on oiled wildlife response, please refer to the POSOW Oiled Wildlife Response Manual.

Logistical support

Fishermen's vessels can be suitable for response operations at sea and near the coast. They can be used for liaison activities: transporting operators, equipment or waste. Different shallow draught vessels or vessels able to land on the shore can play a role in temporary storage and transport of waste and pollutants collected during response operations on the shoreline, when access is difficult by land. Also signposting tasks can be performed by fishermen as logistical support.

Decontamination

During spill response operations, PPE, vessels and equipment become contaminated with the pollutant. As the rest of response teams, fishermen and their gear also need to be decontaminated before leaving the worksite, but they can also contribute to decontamination tasks. Fishing vessels and response equipment have to be decontaminated in dry docks properly adapted or prepared for this purpose.

Decontamination of vessel

Decontamination of equipment during Prestige oil spill in Spain

Response equipment

The administrations in charge of maritime or fishing affairs and/or local and regional representatives of fishermen associations keep up-to-date inventories of vessels declared for professional use, listing the precise characteristics of each one and in particular their class. Such lists prove to be useful when trying to identify means to respond to a pollution event.

Characterisation of fishing vessels and other available vessels

Response in coastal areas, in which currents, sometimes strong, and reefs are prevalent, requires the mobilisation of specific means, suitable for such constraints. The only real limitations for the vessels to be mobilised for response are:

→ their draught for working in shallow waters;

→ their classification which will determine the boat's capacity to work at a certain distance from the coast.

In accordance with the operations to be conducted, the following aspects may also be taken into consideration: length, width, power, storage capacity, payload and deck area, freeboard height, capacity and/or offset of mast crane, hull shape (flat, V-shaped etc.), propulsion type (outboard/inboard), fuel type...

The following table shows a non-exhaustive list of fishing vessels according to FAO's Fisheries and Aquaculture Department:

Trawlers
Beam trawlers
Otter trawlers
Pair trawlers
Side trawlers
Stern trawlers
Outrigger trawlers
Freezer trawlers
Wet-fish trawlers
Seiners
American seiners
European seiners
Drum seiners
Purse seiners
Seine netters
Tuna purse seiners
Dredgers
Gillnetters
Set netters

Lift netters
Line vessels
Jigger vessels
American type pole and line vessels
Pole and line vessels
Japanese style
Trollers
Longliners
Bottom longliners
Midwater longliners
Freezer longliners
Factory longliners
Wet-fish longliners
Trap setters
Trawler-purse seiners
Handliners
Multipurpose vessels

A selection of the main fishing vessels is described below, according to the FAO's Fisheries and Aquaculture Department; presenting their features and potential use during oil pollution response episodes near the shoreline or in shallow waters. Line vessels are not considered since they are usually large vessels operating offshore.

Trawlers


© Will Randle

Characteristics

Depending on the area of operation and trawl used, trawlers range in size from open vessels, undecked, powered by outboard engines up to large freezer trawlers and factory trawlers which can fish in the most distant waters. Commercial trawling is carried out from very shallow waters up to a depth of 2,000 meters. These deep water vessels are provided with engines of sufficient power to tow the gear at the appropriate trawling speed. There are also "trawler-purse seiners" which combine trawling gear with the seiner.

Role in oil spill response

Due to their capacity to trawl in shallow waters and their power, these vessels can be used for almost every required task such as surveying and monitoring, logistical support, containment and recovery operations, waste transportation... depending on whether they are decked or undecked. Their trawls can be used for deploying booms or for collecting (oiled or unoiled) waste from the water.

Seiners


© NOAA'S Fisheries Col.

Characteristics

These vessels, which can be decked or undecked, use surrounding and seine nets and comprise a large group appearing in all sizes, ranging from open vessels, usually at least 10 meters in length, to ocean-going vessels. Seiners are normally used to catch aggregating pelagic species but there are special applications that target demersal species.

Role in oil spill response

This kind of vessels is ideal for deploying booms, surveying, monitoring and picking up oiled wildlife.

Dredgers


© Hans Hillewaert

Characteristics

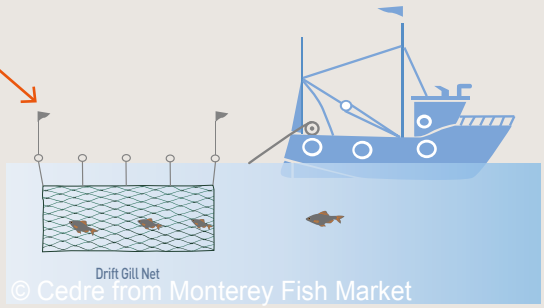
These vessels use a dredge for collecting molluscs from the bottom. The vessel drags the gear over the seabed digging the shellfish from the ground. The dredges are towed in a manner similar to beam trawlers. Large dredgers may work three or more dredges on each side. On other type of dredgers, heavy mechanical dredging units are operated by special gallows from the bow of the vessel.

Role in oil spill response

This kind of vessel can be very useful to collect samples below the water surface (sounding/coring tasks). They can also be used for other tasks such as monitoring, transport of waste, deploying booms or collecting seabirds. In case of sunken oil, dredgers could be used for its recovery.

Gillnetters

Dynamic gillnetting



Characteristics

The size of these (decked/undecked) vessels varies from open vessels up to large specialised drifters, operating on the high sea. Gillnets can be operated from vessels and canoes on inland waters and inshore, decked small vessels in coastal waters and medium sized vessels fishing offshore. In coastal waters it is very common for gillnetting to be used as a second fishing method carried out by trawlers or beam trawlers, according to the fishing season and targeted species.

Role in oil spill response

Since gillnetters operating in coastal waters are not normally decked, consisting simply open vessels, they are very useful for oil recovery operations in shallow waters near the shoreline, using manual or mechanical methods (using their gillnets).

Lift netters

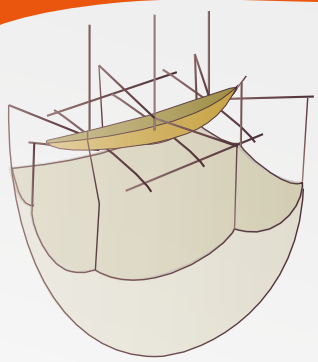
Characteristics

Lift netters are fishing vessels equipped to operate lift nets, which are held from the ship's side, raised and lowered by means of outriggers. These vessels will range from open vessels approximately 10 metres long to larger vessels with an open ocean capability. Liftnetters are generally low-powered vessels working on short trips.

Role in oil spill response

These vessels are suitable for operations near the shoreline in coastal waters. Their gear to raise and lower nets can be useful during response operations to set up containment systems or as logistical support for cleanup operations.

LIFT NETS



Lift nets are horizontal netting panels or bag shaped like a parallelepiped, pyramid or cone with the opening facing upwards which are submerged at a certain depth, left for a while, the time necessary for light or bait to attract fish over the opening, then lifted out of the water. Lift nets are hauled out by hand or mechanically through boom(s) and blocks. The handling (setting and hauling) of large lift nets normally requires, in addition, one or several winches.

Trap setters

Catching a lobster in Nova Scotia, Canada

© Created by Hartmut Inerle

Characteristics

These decked or undecked vessels are used for setting pots or traps to catch fish, lobsters, crabs, crayfishes and other similar species. Trap setters range from open vessels operating inshore up to larger decked vessels 20-50 meters long operating up to the edge of a continental shelf. Small trap setters have hydraulic or mechanical pot haulers fitted. Traps are operated in a very wide range of depths, in either inland, estuarine and/or sea waters. Large traps (stationary nets or barrages) are set in coastal waters: pots can be anywhere up to several hundred meters deep.

Role in oil spill response

Oyster, crab, lobster, and other traps and/or pots can be adapted to conduct mechanical recovery of very viscous oil/waste. These vessels can also perform other tasks depending on their specific features.

Handliners

Longlining for mackerel off Hopeman, UK

© Des Colhoun

Characteristics

Handliners are normally undecked vessels comprising canoes and other small or medium sized vessels without any special features for gear handling. Hand line vessels operate all over the world, in shallow waters but also until 300 metres of depth. Traditional handliners use neither winch nor gurdy.

Role in oil spill response

Due to their smaller size and capacity to work in very shallow waters, these vessels can access difficult-to-access coastal areas for performing assessment and monitoring tasks or even conducting manual oil recovery operations. Their hooks and lines can be adapted by hooking nets, traps, cages, handcrafted booms..., on them to efficiently recover very viscous, or even solid, pollutant from the water surface.

		Surveying sampling	Dynamic recovery	Static recovery	Manual recovery	Mechanical recovery	Protection of the shoreline	Waste storage and transportation	Wildlife survey and rescue	Logistical support
TYPE OF FISHING VESSEL	Trawlers	😀	😀	😀	😀	😀	😀	😀	😀	😀
	Seiners	😀	😐	😀	😀	😀	😀	😀	😀	😐
	Dredgers	😀	😐	😀	😀	😀	😀	😀	😀	😀
	Gillnetters	😀	😀	☹	😀	😀	😀	😐	😐	😐
	Lift netters	😀	☹	😐	😀	😀	😀	☹	😐	😀
	Trap setters	😀	😐	😀	😀	😀	😀	😀	😐	😀
	Handliners	😀	☹	😐	😀	😐	😐	😐	😐	😐

😀 Vessel ideal for the purpose 😐 Vessel suitable for the purpose ☹ Vessel not recommended for the purpose

When possible, due to the vessel's characteristics (hydraulic arm, sufficient storage capacities) as well as the training of the crew, sea professionals may be provided with specialised spill response mechanical recovery means (oleophilic or weir skimmers for instance).

OIL TRAWL

There are trawl nets designed for oil and waste collection. These trawl nets can be adapted and mounted on different trawlers and boats.


© Marinetech

Definition, adaptation and use of response tools

Many varied tools used by fishermen can be very efficient in response actions, whether they are manual or mechanical, specific to the daily activities of the sea professionals or adapted to spill response operations. Some of these tools are listed below:

- Manual tools (scoop nets, buckets, shovels, forks...)
- Longlines
- Hooks
- Trawl nets
- Lift nets
- Seine nets
- Gill nets
- Dredgers
- Brailers
- Traps...

These tools need correct use and maintenance in order to be used daily for long periods and to recover from their former use. A description of these tools is shown below, together with explanations on how they can be used in oil spill response.

Forks


© Cedre

Forks can be adapted by wrapping them with wire mesh or nylon fishing net to be capable of collecting floating debris and viscous oil.

Scoop nets


© Greenpeace Pedro Armestre

Hand nets can be adapted to collect floating waste and oiled waste.

Lift nets


© Joachim Müllerchen

Lift nets are ideal for collecting oiled waste and debris at a certain depth and brigging it up to the water surface.

Gillnets

Gillnet positioned at the sea bottom

This kind of net, if well positioned, can be very effective for containing and afterwards recovering viscous oil from the surface or the sea bottom, depending on the features of the pollutant.

Longlines

Longlines can be adapted to hook nets, cages..., for oil containment and recovery operations.

Hooks

Hooks can be used to hook nets, cages, etc, to efficiently recover very viscous, or even solid, pollutant from the water surface.

Seine nets

Seine nets can be used for containment and collecting floating oil.

Brailers

Brailers are nets used for transferring the catch of a deep sea seine after it has been brought alongside. It is operated either entirely by hand or partly by hand and partly by power. They are ideal for recovering oiled or solid waste, or very viscous oil.

Traps

These nets or traps, including drop nets, are usually cylindrical/prismatic-shaped nets with a rigid frame which can be used in a similar way to brailers to collect solid (oiled) waste or even very viscous oil.

Response preparedness

Boom deployment exercises with local fishermen in Guadeloupe (top) and Vendée, France (bottom)

Training of fishermen

In order for response operations to be conducted as well as possible, it is important to be able to rely on competent, trained personnel, informed of the precautions to be taken, according to the situation and the equipment to be deployed. Training of sea professionals as responders, in the same way as authorities and public services, remains a key factor in the preparation and success of response operations.

Training courses delivered before a spill occurs

Such courses are designed to train potential actors in contingency plan implementation and are generally divided into 2 parts:

→ a theory module: providing an initial approach to spill response: behavior and hazardous nature of the pollutant, response organisation, techniques and means used;

→ a practical module: enabling potential responders to deploy specific equipment.

Training courses delivered in the field in the event of a spill

The aim of such courses is to raise sea professionals' awareness of the problems and precautions to be considered before becoming involved in the response, to outline the procedures to be followed and to organise workforces.

Exercises

During exercises, it can be useful to involve all potential stakeholders (both public and private), and in particular sea professionals, so as to obtain an impression of their response capacity in different situations. Exercises provide fishermen with the opportunity to familiarise themselves with the equipment present in different stockpiles, to test it and to suggest improvements to any prototypes implemented.

During response exercises, it can be useful:

→ to organise the rotation of personnel involved so as to optimise the number of trained professionals;

→ to vary the vessels mobilised to assess their response capacities and give professionals with different specialities the chance to work together;

→ to deploy various types of equipment so as to define the most appropriate types according to the response situation and to confront operators with the different situations they may have to deal with;

→ to test all actions described in the contingency plans (from alert to incident closure) to ensure consistency and smooth running of all response operations.

i For additional information on on-scene training, please refer also to the specific paragraph in the POSOW Oil Spill Volunteer Management Manual, page 22.

USA

After the *Exxon Valdez* oil spill in Alaska (1989), the concept of Community-based Oil Spill Response (COSR) was developed when the Regional Citizens' Advisory Councils were established. COSR consists of local citizen teams, including fishermen, responding to oil spilled in their areas of responsibility. Fishing crews are trained each year in deploying and operating oil spill response equipment. Fishermen who have followed a training course are listed in a database and can therefore form response teams, available in the event of a spill.

EXEMPLE OF FRANCE

In France, one at sea oil spill response exercise is organised for each maritime area (North Sea, Atlantic, Mediterranean, Polynesia, New Caledonia, Indian Ocean, Caribbean, Guyana...) every year. These exercises are combined with training activities. Most of the time, part of these training activities is dedicated to local fishermen. They are trained to use specialised oil recovery trawls bought by the French Navy.

The fishermen who have followed a training course are listed in a database and can therefore form response teams, available in the event of a spill.

Fishing vessels performing dynamic recovery with a specially adapted trawl

Training by Cedre for shoreline operations

These courses are designed to train potential actors in contingency plan implementation. The courses are organised in cooperation with local fishermen committees and are generally divided into two parts:

→ **A theoretical module**: providing an initial approach to spill response: behaviour and hazardous nature of the pollutant, French response organisation, techniques and means used;

→ **A practical module**: enabling potential responders to use PPE, non-specialised recovery system (forks, scoop nets...), sorbents, floating booms for harbour protection...:

- with real oil in Cedre's pools;
- without oil at natural sites.

Presentation of specialised trawl nets during fishermen training at Cedre in France

PART 2

PRACTICAL DATASHEETS FOR FISHERMEN

EACH DATASHEET CONTAINS SOME OF THE FOLLOWING ITEMS

- Aims and principles
- Resources required
- Safety and response limitations
- Observations
- Operational procedure/protocol
- Illustrations and tools

ALERT (1/2)

Aims and principles

✓To transmit information on an oil spill (source, location, type, volume...) as rapidly as possible.
✓To enable response authorities to rapidly define the characteristics of the spilt oil, its behaviour, extension..., and to determine the strategies to be adopted to respond to this spill.

Resources required

Equipment

- ☐ VHF, fax, phone, internet + directories of emergency numbers
- ☐ GPS, maps
- ☐ Standard information transmission sheet (see operational procedure overleaf)
- ☐ See illustrations and tools overleaf
- ☐ Camera

Human resources

- ☐ All fishermen able to transmit the relevant information

Observations

✓It is advantageous if the observer (fisherman) has been trained, even briefly, in pollution reconnaissance and has onboard a copy of the POSOW Oiled Shoreline Assessment Manual defining the basic principles of organising a field survey.
✓The alert chain must be regularly tested and implemented. The quicker and more accurately the alert is transmitted, the more rapid and appropriate the response will be.

Oil slick in a mussel farm in Spain

ALERT (2/2)

Operational procedure/protocol

→ Notice a spill at sea or on the shoreline

→ Alert the nearest navigational control centre (MRCC, port authorities...) as quickly as possible by VHF, phone ...

→ Convey the following information

i For complementary information on oiled shoreline assessment please refer to the POSOW Oiled Shoreline Assessment Manual.

✓Name of your vessel/calling code or your own name (if not on a vessel)

✓Time of observation

✓Position (coordinates)

✓Location
- ☐ Sea
- ☐ Shoreline

✓Sea and weather conditions on site

✓Type of pollutant
- ☐ Mineral oil (hydrocarbons)
- ☐ Oily birds or mammals
- ☐ Oily waste
- ☐ Other (specify if possible).....
- ☐ Unknown

✓Appearance/behaviour (whether on sea or on shore)
- ☐ Sheen/grey film
- ☐ Black/brown
- ☐ Tarballs
- ☐ Patties
- ☐ Patches
- ☐ Slicks
- ☐ Other

✓Behaviour (whether on sea or on shore)
- ☐ Odour
- ☐ Sinks: yes - no
- ☐ Floats: at surface / subsurface
- ☐ Presence of debris : yes - no

✓Viscosity
- ☐ Fluid
- ☐ Paste
- ☐ Solid

✓Quantity
- ☐ Estimated surface area: .....(specify units)
- ☐ Thickness:..... (specify units)

✓Drift (on sea)
- ☐ Direction
- ☐ Speed

SURVEYING (1/2)

Aims and principles

To confirm or reject the alert message. To provide the elements required to define the operations to be conducted:

- ✓ to identify affected areas;
- ✓ to define the type of pollution and its extent;
- ✓ to help to determine priority response sites (risks of remobilisation);
- ✓ to monitor the evolution of the situation: to establish situation reports throughout the crisis.

Resources required

Equipment

- ☐ Suitable clothing (soiling, weather, site)
- ☐ Mobile phone, VHF
- ☐ Shipping charts or GPS
- ☐ Note-taking: blank survey forms, notepad, waterproof folder, pencil
- ☐ Additionally: digital camera, spare batteries and memory card
- ☐ Binoculars, polarised sunglasses
- ☐ Watch and tide tables

Human resources

- ☐ All fishermen trained in surveying

Safety and response limitations

The safety instructions that apply to a field survey will depend on the sea/shoreline and weather conditions and the specific pollutant involved. They will be defined and provided by the authorities in charge of mobilising response personnel.

Observations

It is better if the observer is trained in pollution surveying and has on board a copy of the POSOW Oiled Shoreline Assessment Manual defining the basic principles of organising a field survey.

Operational procedure/protocol

Before setting out

- ✓ Define the sector to be covered by choosing the priority sites according to data from the alert, the latest aerial, nautical and/or terrestrial observations, as well as areas where waste naturally accumulates and circulates (in the case of a floating pollutant).
- ✓ Obtain the necessary navigation authorisations.
- ✓ Choose the right time (tides, transmission to response centre...).
- ✓ Gather the equipment (see resources required).

During the survey

- ✓ Fill in the survey form (see overleaf).
- ✓ Take photos and/or films.
- ✓ Transfer the information to the response centre.
- ✓ Carefully file and archive survey reports, images...

Survey carried out by fishermen during *Prestige* oil spill

© Cedre

Shoreline/Coastal Survey Form

i For complementary information on oiled shoreline survey, please refer to the POSOW Oiled Shoreline Assessment Manual.

General Information

Date:
Local time:
Name of observer:
Name of vessel:
Tel.:

Site

GPS coordinates:
Site polluted: ☐yes ☐no
☐Foreshore ☐Port (quay...)
☐Other (specify):.....

Description of the pollution

Type: ☐Oil ☐Oily birds/mammals ☐Oily waste ☐Mineral oil ☐Other (specify).....
☐Don't know

Appearance: ☐Fluid ☐Paste ☐Solid Color: ..... Odour : .....

Quantification:

Length (L) ..... m
Width (W) ..... m
Thickness (T) ..... m

Estimated total volume
L x W x T = ...m^3

Wildlife

☐Contaminated ☐Alive ☐Dead Number of individuals .....

Operational considerations

Target to be protected ☐Population ☐Activity ☐Environment ☐Water intakes ☐Other: ....
Storage, supply, unloading possibilities nearby (specify): .....
Foreseen difficulties (mixture of oil with seaweed or litter, viscosity, sea state, weather conditions...): .....
.....

Aims and principles

Sampling may be performed for two different purposes:

- ✓to identify the pollutant for administrative and legal purposes;
- ✓to analyse its physico-chemical characteristics for operational or scientific purposes (flash point, water content, toxicity...).

Sea professionals may be called upon to take samples for scientific or technical purposes, but not for legal purposes, except in the presence of an onboard law officer.

Resources required

Equipment

- ☐ Appropriate PPE
- ☐ Shallow draught vessels (in the case of sampling near the shore)
- ☐ Wide-neck glass bottle or jar
- ☐ Aluminium trays or foil
- ☐ Steel spatula or spoon
- ☐ Label and indelible marker
- ☐ Plastic bags
- ☐ Paper towels
- ☐ Life jacket

Human resources

- ☐ Vessel's crew
- ☐ Fishermen trained in sampling

(Onboard) law officer in the case of sampling for legal purposes.

Safety and response limitations

- ✓In the case of samples taken from below the water surface, tools such as bottom trawl nets, dredgers, hooks or arms are used.

Operational procedure/protocol

- ✓Locate a site that is representative of the pollution.
- ✓Focus the sampling on thick parts of the spill.
- ✓Wear gloves, a mask and goggles.
- ✓Take a glass jar and a spatula.
- ✓Choose an appropriate container according to the type of samples.
- ✓To assess operational characteristics take a 500 g sample and a 100 g sample for identification.
- ✓Place the pollutant sample in the container.
- ✓Place a sheet of aluminium foil between the container and the lid. Close the container.
- ✓Label the sample (see label template overleaf). Double label: a first label stuck to the jar and a second stuck to the plastic bag in which the jar is placed.
- ✓Store the sample in cold conditions (0-10°C) and take it to specialised personnel as soon as possible (8 days maximum).

The oil should never be in contact with plastic.

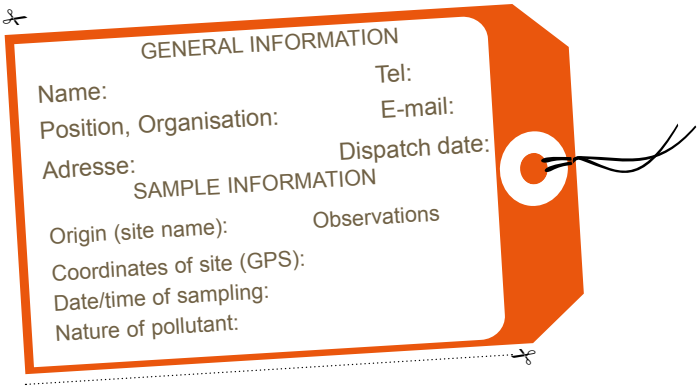
Fishermen preparing forks to collect oil/samples during the *Prestige* oil spill

© Colón de Cangas

Illustrations and tools

Sampling kit

© Cedre



4

Aims and principles

Spill response activities are not risk-free. All personnel involved in response must be equipped with appropriate Personal Protective Equipment (PPE) in terms of:

- ✓the pollutant;
- ✓the activities conducted;
- ✓the environment;
- ✓and the conditions (in particular the weather).

Instructions in terms of protective equipment will be given by decision-makers in charge of the fleet/teams of responders.

i For additional information on personal protective equipment, please refer to the POSOW Oil Spill Volunteer Management Manual, pages 32 to 35.

Resources required

Equipment

Depending on the situation, authorities in charge of the response may ask responders to use some or all of the following PPE:

- ☐ Disposable paper overalls and/or waterproofs
- ☐ Boots, waders or safety footwears
- ☐ Helmet or safety cap
- ☐ Gloves
- ☐ Mask (cartridge if necessary)
- ☐ Goggles or face shield
- ☐ Life jacket
- ☐ Ear protectors (plugs or muffs)
- ☐ Harness

Human resources

- ☐ Safety officer
- ☐ Crew

! Do not forget protection against the sun or cold!

Safety and response limitations

Do not conduct response actions when the risk (related to the activity, the sea and weather conditions or the type of pollutant) is too high.

Avoid wearing equipment that is not strictly necessary for the action conducted. While responder safety is the main concern, their ease of movement remains important.

In addition to personal protection, the following instructions must be followed:

- ✓organise toolbox talks
- ✓provide collective protection when appropriate (lifeline, raised freeboard);
- ✓never work alone, especially in the case of operations at sea;
- ✓provide a first aid kit on each vessel involved in response;
- ✓ensure a supply of water, food, spare clothing etc. onboard the vessels involved in response.

! The most common risk for responders is dehydration!

Illustrations and tools

Fishermen with PPE during *Prestige* oil spill - Spain

Aims and principles

The protection of the fishing vessels involved in response aims to:

- ✓reduce the risks of falling or slipping due to the presence of pollutant on deck
- ✓prevent damage to gear which could delay the resumption of sea professionals' normal activity
- ✓reduce final cleanup operations and consequently their cost.

Resources required

Equipment

- ☐ Tarpaulins
- ☐ Geotextiles
- ☐ Weights to hold protective coverings in place
- ☐ Warning signs and banners

Human resources

- ☐ Safety officer
- ☐ Crew

Safety and response limitations

- ✓Choose protective materials according to the type of pollutant and the activity conducted.
- ✓Prioritise the use of non-slip protective coverings.
- ✓Do not cover holes, ladders and obstacles on deck or access points and identify them to warn responders.

Observations

Rinsing or cleaning fishing vessels on a daily basis helps to reduce the penetration of oil into the vessels' hull. This regular cleanup may be conducted on the water or on land, while following the instructions provided. Particular attention must be paid to:

- ✓ the type of cleaning product used
- ✓the recovery of run-off from washing operations.

Operational procedure/protocol

- ✓Clear the deck: remove all equipment that is not required during response operations (fishing gear in particular).
- ✓Place a tarpaulin on the deck and attach it.
- ✓Place geotextile on the tarpaulin and attach it.
- ✓Identify access points, holes and obstacles by positioning signs or barricade tape.
- ✓Place plastic film or tarpaulins on the vessels' sides and gunnels.
- ✓Choose containers (both in terms of quality and capacity) according to the type and quantity of waste collected.
- ✓Only fill open storage containers for fluid waste 70-80% full to prevent the risk of overflowing due to the boats movements.

Illustrations and tools

Fishermen collecting oil during the *Prestige* oil spill. Note the black plastic canvas used to protect the deck and engine

MECHANICAL AGITATION

Aims and principles

To accelerate the natural dispersion of a light oil in the water column by artificially agitating the water surface, using fire hoses (using a solid water jet) from a vessel or using the propeller of a suitable vessel.

Resources required

Equipment

- ☐ Vessel with inboard diesel engine
- ☐ Fire hoses and waterjet
- ☐ Motor pumps
- ☐ Fuel for motor pumps
- ☐ Fire fighting equipment (preventative)

Human resources

- ☐ Crew
- ☐ 1 or 2 operators per hose

Safety and response limitations

✓Check with the response authorities that all fire/explosion risks have been eliminated before beginning operations.
✓Agitation can only be performed on very thin slicks of dispersible oil.

Observations

✓Only implement this type of operation upon the initiative of the authorities.
✓Aerial or nautical guidance enables responders to be directed towards the slick to be agitated.
✓During operations, maintain communication with the operation managers in order to keep them updated on the progress and effectiveness of the operation.

Operational procedure/protocol

Using a vessel

✓Identify or be guided towards the polluted area to be treated.
✓Ensure minimal protection of marine engine cooling system intakes to restrict pollutant (position a filter or net over the intakes or plug them until you have gone through the slick).
✓Cross the oil slick so that the rotation of the propeller agitates the surrounding water.
✓Repeat the operation until the sheen has disappeared.
✓Position yourself upwind of the slick.

Using fire hoses

✓Deploy and connect up the equipment (pump, handle and hose).
✓Check the fuel level in the motor pumps.
✓Start the pump once an operator is holding the hose.
✓Use a solid water jet directed towards the centre of the oil slick.
✓Continue to agitate the water until all sheen has disappeared.

IMPLEMENTING DISPERSION MEANS (1/2)

Aims and principles

- ✓To prevent the formation of an emulsion (incorporation of water in the oil) and therefore the "chocolate mousse" effect.
- ✓To break up the oil slick into micro-droplets in order to place the substance in suspension in the water so that it is diffused throughout the water column and can be more easily biodegraded by microorganisms.

Resources required

Equipment

- ☐ Appropriate PPE (masks, goggles)
- ☐ Vessel
- ☐ Spraying arms
- ☐ Approved dispersant (neat or diluted according to the instructions provided)
- ☐ Dispersant storage containers (tanks, drums...)
- ☐ Pumps
- ☐ VHF, phone

Human resources

- ☐ Crew
- ☐ A person in communication with the guidance aircraft or vessel
- ☐ Technical adviser

Safety and response limitations

- ✓Check with the response authorities that all fire/explosion risks have been eliminated before beginning operations.
- ✓Dispersant spraying operations may only be implemented by trained fishermen or sea professionals under the control of the maritime authorities in charge of the response.
- ✓This technique is sensitive to sea and weather conditions and can only be applied to oils with a viscosity < 5,000 cSt (after weathering).
- ✓The quantity of neat dispersants to be applied is equal to 5-10% of the spilt oil.
- ✓The presence of dispersant on the deck makes the surface very slippery.
- ✓Avoid contact with eyes, skin...

Observations

- ✓Only implement this type of operation upon the initiative of the authorities
- ✓Aerial or nautical guidance of the fishing vessel is highly recommended in order to correctly target the slicks to be treated.
- ✓The rate or speed of the fishing vessel can be adjusted to optimise the efficiency of the treatment.
- ✓Dispersion does not require the oil to be recovered and therefore does not produce waste.

Operational procedure/protocol

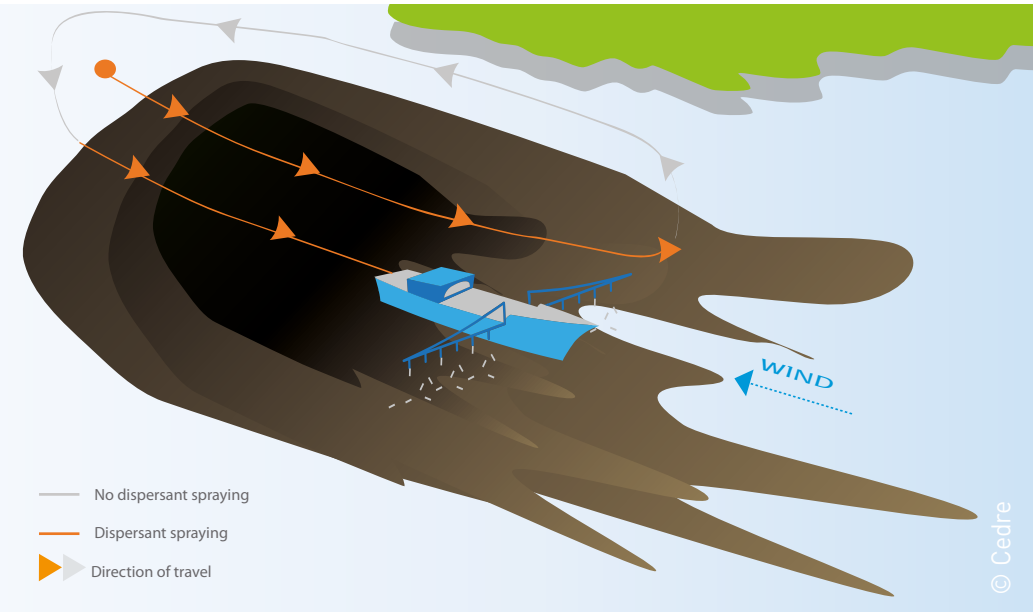
For more information see the Cedre operational guide "Using dispersant to treat oil slicks at sea".

- ✓Attach the spraying arms to each gunwale, as close to the bow as possible, to reduce the effect of the bow wave.
- ✓Position the jets as close as possible to the water surface to prevent interference from the wind.
- ✓Carefully adjust the spraying pressure so that the dispersant droplets do not pass through the slick but rather are deposited on top of the slick.
- ✓Maintain a slow speed between 4 and 6 knots.
- ✓Treat the slick by making several journeys in parallel bands in the same direction, into the wind (see diagram below).
- ✓During spraying, rinse the deck continuously to prevent risks of operators slipping and falling.
- ✓Rinse vessels with plenty of water after such an operation (dispersants contain solvents which can attack vessels' paint if they are not rinsed immediately after spraying operations).

7

Illustrations and tools

Dispersant spraying by boat



Aims and principles

To recover oil present at the water surface and in the water, by letting it drift under the influence of the wind and current towards containment and recovery systems.

Resources required

Equipment

- ☐ Coastal fishing vessels
- ☐ Fishing gear (nets...)
- ☐ Floating or sorbent booms
- ☐ Improvised means (scoop nets, shovels ...)
- ☐ Mooring/anchoring system
- ☐ Storage means (bins, big bags...)
- ☐ Vessel protection materials (geotextile...)

Human resources

- ☐ Crew
- ☐ Technical adviser

Safety and response limitations

✓Check with the response authorities that all fire/explosion risks have been eliminated before beginning operations.
✓The effectiveness of this technique remains very dependent on sea and weather conditions and on the behaviour of the pollutant.

Observations

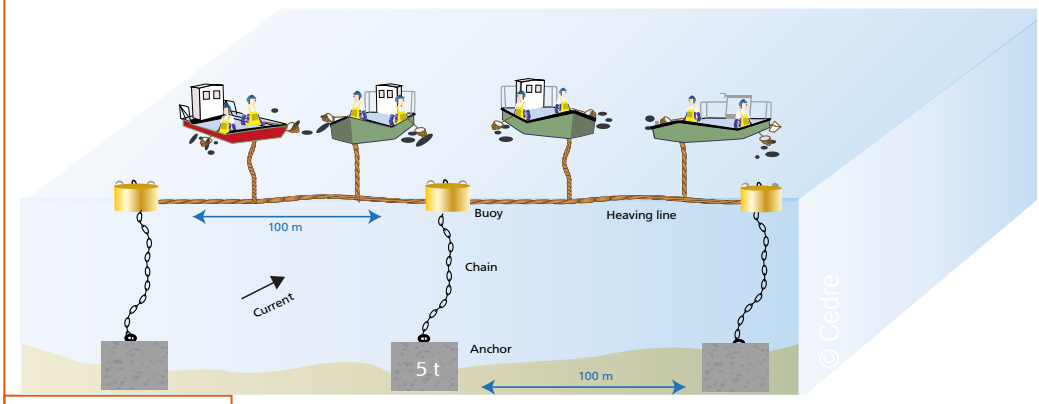
✓Only implement this type of operation upon the initiative of the authorities.
✓The contribution of fishermen during the planning and set-up of such containment and recovery systems is essential because, as field personnel, they are very familiar with the currents and specificities of the sites to be protected (bathymetry, areas of accumulation of floating waste...).

Operational procedure/protocol

✓Moor vessels to a single anchoring arrangement (see diagram below) or using their own anchor.
✓Let the vessel position itself in the direction of the current.
✓Organise storage capacities onboard.
✓Protect the deck and freeboards (see datasheet 5).
✓Deploy collection equipment on the sides of the vessels.
✓Recover the pollutant and store the collected waste.
✓Stop operations before the storage capacities become saturated and unload the collected waste.

Illustrations and tools

Fishing vessels performing static recovery during the *Prestige* spill



Static recovery: system set up during the *Prestige* spill

DYNAMIC RECOVERY WITH A SINGLE BOAT (1/2)

Aims and principles

✓To recover slicks of pollutant using booms or nets by covering the polluted area.
✓To tow the trapped slicks towards a predefined, dedicated site, a recovery vessel further offshore or an unloading area.

Resources required

Equipment

- ☐ Manoeuvrable shallow draught vessel, sufficiently large and powerful for the equipment used
- ☐ Response equipment: specialised spill response trawl net, makeshift devices, floating boom, sorbent sock, sorbent boom with ballasted skirt
- ☐ Heaving line or hawser for towing, beam
- ☐ Communication means (VHF...)
- ☐ Storage means for the collected pollutants (tubs, big bags or skips)
- ☐ Nautical or aerial guidance means

Human resources

- ☐ Crew
- ☐ Technical adviser

Safety and response limitations

✓Check with the response authorities that all fire/explosion risks have been eliminated before beginning operations.
✓During operations, beware of floating debris which is liable to damage the system.

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Observations

✓Only implement this type of operation upon the initiative of the authorities and when all fire/explosion risks have been eliminated.
✓Work in a coordinated manner, guided by aerial or nautical means in the area.
✓To improve the retention of fluid pollutants, sorbents can be placed at the end of the containment area (pads or strands).
✓This type of operation can also be conducted using nets on frames fitted to the sides of the vessel.
✓Bottom trawl nets can be used by professional trawlers to recover subsurface pollutant once subsurface slicks have been located.

Operational procedure/protocol

✓Check the equipment (resistance/working order) before use.
✓Install a beam protruding by at least 3 metres either towards the front or the rear of the vessel according to attachment possibilities.
✓Attach each end of the beam to each end of the boom or trawl net using two tow lines. The length of the tow lines should be adjusted to obtain a U-configuration.
✓Tow the recovery system at a speed of no more than 1 knot in relation to the surface.
✓Reduce speed as soon as leaks appear in the wake of the boom.
✓When the system (sorbent or trawl net) is saturated, tow it at slow speed (0.7 knots) to the unloading area (at sea or on land) then store the oiled gear in tubs, skips or big bags.
✓When using a boom, if it has contained pollutant at the bottom of the U, maintain the configuration and conduct skimming operations before removing and replacing it.

Illustrations and tools

Dynamic recovery with fishing gear

Dynamic recovery of a small spill using a sorbent boom with a ballasted skirt

DYNAMIC RECOVERY WITH TWO VESSELS (1/2)

Aims and principles

✓To recover slicks of pollutant using booms or trawl nets by covering the polluted area.
✓To tow the trapped slick towards a predefined, dedicated site, a recovery vessel further offshore or an unloading area.

Resources required

Equipment

- ☐ 2 manoeuvrable shallow draught vessels, sufficiently large and powerful for the equipment used
- ☐ Response equipment: specialised spill response trawl net, floating boom, sorbent sock, sorbent boom with ballasted skirt
- ☐ Heaving line or hawser for towing, beam
- ☐ Communication means (VHF...)
- ☐ Storage means for the collected pollutants (tubs, big bags or skips)
- ☐ Nautical or aerial guidance means

Human resources

- ☐ Crew experienced in trawling manœuvres

Safety and response limitations

✓Check with the response authorities that all fire/explosion risks have been eliminated before beginning operations.
✓During operations, beware of floating debris which may be liable to damage the system.
✓Such operations are difficult to conduct when the sea is rough and on sites subject to major currents.

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Observations

✓Only implement this type of operation upon the initiative of the authorities and when all fire/explosion risks have been eliminated.
✓Maintain constant communication between the two vessels involved in recovery and with the aerial or nautical guidance means.
✓Trawl at a moderate speed to reduce risks of leakage and avoid fragmenting the slick.
✓A skimmer can be used when a boom is towed in a J-configuration (the lead boat recovers the pollutant – see diagram on the following page).
✓The use of bottom trawl nets or pelagic nets can help to detect and recover pollutant below the surface or on the bottom.

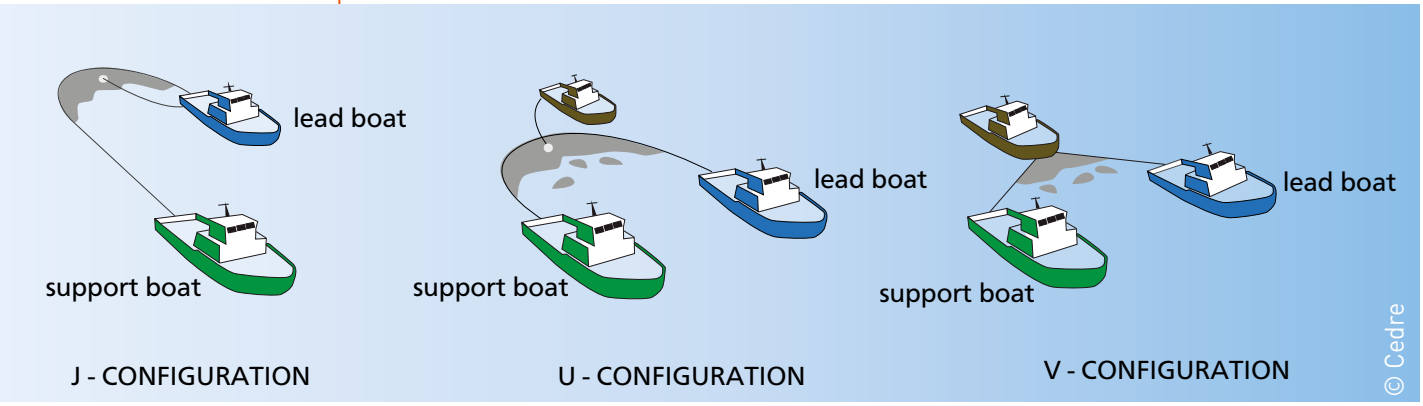
Operational procedure/protocol

✓Check the equipment (resistance/working order) before use.
✓Determine which is the lead boat and which is the support boat.
✓Manually deploy the boom or trawl net from the support boat (nose to the wind and at slow speed).
✓Attach the trawl net or boom and move the towline to the port side of the vessel.
✓Bring the net or boom along the port side of the vessel using the windlass.
✓Secure the system on the lead boat. To facilitate towing and traction manoeuvres, the length of the heaving line should be greater than 20 meters (and should be determined according to the length of boom deployed).
✓Position the support boat ahead of the lead boat to create a containment area (outside of the area of turbulence created by the propellers).
✓Trawl the slicks dynamically in a J, U or V-configuration (see diagram on the following page) at a speed of less than 1 knot in relation to the surface (or almost statically in the case of strong wind and rough sea conditions).
✓Where necessary, deploy a skimmer from the lead boat or from a third support boat.
✓Change the trawl net cod end when it is full (some cod ends can be detached and towed).

DYNAMIC RECOVERY WITH TWO VESSELS (2/2)

Illustrations and tools

Dynamic recovery configurations with vessels



Widespread antipollution exercise in the Bay of Vigo coordinated by the Galician coast guards and fishermen in 2014

Fishing vessels performing dynamic containment (J-configuration) and recovery with a floating boom

10

MANUAL RECOVERY

Aims and principles

To recover the pollutant manually from a vessel using improvised means, when the pollution is scattered or emulsified and mechanical recovery tools cannot or can no longer operate effectively.

Resources required

Equipment

- ☐ Appropriate PPE including a life jacket and safety lanyard or harness and rail
- ☐ Tools (shovels, scoop nets and makeshift means)
- ☐ Sorbents (see datasheet 12)
- ☐ Communication means (VHF...)
- ☐ Storage capacities for collected pollutant (tubs, big bags or skips)
- ☐ Protective means for the vessel (tarpaulin, geotextile)

Human resources

- ☐ Crew

Safety and response limitations

The main risk for this type of operation is the risk of falling when operators lean over to recover the pollutant. Operators must therefore be vigilant about wearing a life jacket and using the lifeline or harness and rail.

Observations

✓Low hourly yield compared to trawling operations but very effective on fragmented slicks.
✓The equipment used may be adapted to improve responders' comfort, for instance by:

- extending handles;
- piercing holes in shovels to let water drain off;
- reducing the diameter of sieves to make them lighter once they are loaded with pollutant;
- using suitable tools, possibly adapted locally (e.g. rimmed shovel, fork...) to prevent the pollutant from running off the sides;
- placing manufactured containment crates along the edges of the vessel to optimise collection.

Operational procedure/protocol

✓Protect the vessel and cover its side with plastic films, tarpaulins or geotextiles.
✓Organise storage on board (in drums, big bags, rigid bins...).
✓Ensure operators are wearing suitable PPE (especially life jacket and lifeline).
✓Head towards polluted areas (according to the information provided by aerial or nautical guidance means).
✓Adjust speed to drift at the same rate as the pollution.
✓Recover the pollutant and store the waste collected.
✓Stop operations before the storage capacities reach saturation point.
✓Unload the collected waste (unloading area, recovery vessel further offshore).

■☐ Fishermen collecting oil manually during the *Prestige* spill

☐■ Forks wrapped with plastic grid for manual recovery

USE OF SORBENTS

Aims and principles

Sorbents are solid products used to retain the pollutant by impregnation, in order to facilitate recovery. Sorbents are used:

- ✓to reduce the spread of the spilt oil;
- ✓to retain a pollutant by impregnation to facilitate its recovery for small spills;
- ✓to recover the pollutant from effluents generated by cleanup operations.

i For more information on the use of sorbents on shoreline, please refer to the Technical datasheet number 12 Use of sorbents in the POSOW Oiled Shoreline Cleanup Manual.

Resources required

Equipment

- ☐ Appropriate PPE (gloves, mask, goggles)
- ☐ Sorbents
- ☐ Air blower (only for spreading of bulk sorbents)
- ☐ Landing nets (recovery of saturated sorbents)
- ☐ Bins, barrels (storage of saturated sorbents)

Human resources

- ☐ Crew

Safety and response limitations

All sorbents deployed in the environment must be recovered, whether they are oiled or not, and disposed in a special plant dealing with hazardous waste.

Observations

- ✓During inshore cleanup operations in rocky areas, to recover oiled effluents, use pillows, sorbent pads, sorbent rolls or mops.
- ✓To recover small quantities of oil on the water, use sorbent sheets or bulk sorbents.
- ✓To wipe oiled rocks or structures, use sorbent pads.
- ✓To protect a surface from being oiled, use rolls of sorbent.
- ✓When spreading bulk sorbent, wait a few minutes to allow absorption to take place, stirring the sorbent using a hand dip net.
- ✓When using sorbent pads, turn them over to use both sides.

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Illustrations and tools

Use of sorbent booms and pads for the recovery of diesel oil spilled from a trawler

Deployment of sorbent boom

Recovery with a dinghy boat and boom

WASTE STORAGE ONBOARD AND TRANSPORTATION

For more information, please refer to the POSOW Waste Management and Volunteer Management Manuals.

Aims and principles

✓To store the pollutant and waste collected in appropriate storage containers.
✓To sort the waste by type: oil, oiled litter and debris, household waste...

Resources required

Equipment

- ☐ Skips, big bags, rigid bins, airtight tubs for solids and pastes
- ☐ Tank, drum or rigid watertight tubs for liquids
- ☐ Possibly towed floating flexitanks
- ☐ Geomembranes, plastic films or tarpaulins
- ☐ Signs and labels

Human resources

- ☐ Crew

Safety and response limitations

Ensure that the vessel's stability is not disturbed by organising storage to ensure a balanced load.

Observations

The storage containers must be:

- ✓resistant;
- ✓oiltight and fitted with a lid or cover;
- ✓equipped with a level control system (or be sufficiently transparent to enable visual control) to prevent overflow and anticipate the replacement of these capacities;
- ✓fitted with a drain valve to carry out settling on board;
- ✓attachable;
- ✓ideally, crane-liftable and transferable to facilitate loading and unloading.

Operational procedure/protocol

- ✓Take onboard suitable containers according to:
  - the type and quantity of waste to be collected;
  - the surface area available on deck;
  - the vessel's maximum load;
  - the mechanical resistance of the deck.
- ✓Cover the deck with a protective layer (geotextile) and attach it (see datasheet 5).
- ✓Arrange and attach the storage containers.
- ✓Ensure that the storage containers are oiltight.
- ✓Organise waste sorting by identifying each type of waste and clearly labelling the containers.
- ✓Once the storage means are three quarters full, cover them with a tarpaulin or plastic film.
- ✓Once all the storage containers are covered, head to the unloading area.
- ✓Unload them carefully.

Illustrations and tools

■□□ Barge equipped with a crane lifting a bigbag containing oil residues

□■□ Big bag onboard a fishing vessel to store collected oil and debris

□□■ Buckets overloaded with oil during recovering operations following the *Prestige* oil spill. Despite using protective plastic layers, the oil will overflow

SHORELINE PROTECTION: DEPLOYMENT OF BOOMS, NETS AND OTHER MEANS (1/2)

Aims and principles

✓To retain or deflect pollutant that has not been recovered during cleanup operations using specialised means and facilitate its recovery.
✓To redirect the slick towards a favourable, possibly sacrificed, area to facilitate recovery of the pollutant.
✓To protect the different sites and infrastructures present on the shoreline to reduce the ecological and economic impacts.
✓To reduce the volume of waste and cost of cleanup.

Resources required

Equipment

- ☐ Shallow draught or flat-bottomed boats (e.g. oyster-farming barges)
- ☐ Spill response booms:
  - ✓Manufactured (floating or shore-sealing);
  - ✓Makeshift: natural or industrial oleophilic and hydrophobic materials trapped in a fine-mesh net or chicken wire;
  - ✓Fishing nets.
- ☐ Anchoring and attachment systems (anchors and buoys, mooring blocks, stakes, ropes...)
- ☐ Sorbents, protective sheeting

Human resources

- ☐ Crew
- ☐ Technical adviser

Safety and response limitations

✓This type of system can only be set up when the tidal range in the area and the currents remain limited.
✓Technical advisers should be consulted to determine the feasibility of containment, the means required and the moorings.

Observations

To ensure rapid deployment, the mooring plans for this type of containment system should be included in the contingency plans and tested during exercises.

Operational procedure/protocol

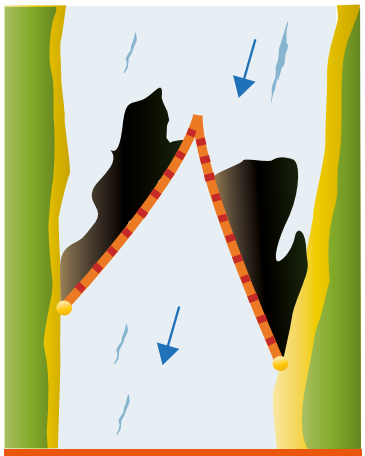
✓Consult the mooring plans available in the contingency plans covering the coastal or estuarine sites to be protected.
✓Call upon a technical adviser to define, according to currents, swell, tides etc.: the system's feasibility, the type of equipment to deploy, the angle of the system, the sites that may potentially be sacrificed and the moorings to be used.
✓Load the equipment required onto the vessels at the loading/unloading area.
✓Where necessary, protect the most sensitive banks with protective sheeting or sorbents.
✓Position the mooring points.
✓With the help of the professionals involved in response, coordinated during operations by a technical adviser, deploy the chosen systems according to the procedure defined by the authorities.
✓Where necessary, position intermediate mooring points.
✓Patrol the site regularly to check that the system is correctly held in place.
✓In the case of makeshift booms, ensure they are regularly maintained.

SHORELINE PROTECTION: DEPLOYMENT OF BOOMS, NETS AND OTHER MEANS (2/2)

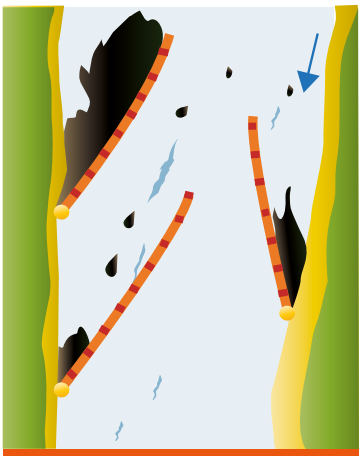
Illustrations and tools

Position of deflection booms in different configurations

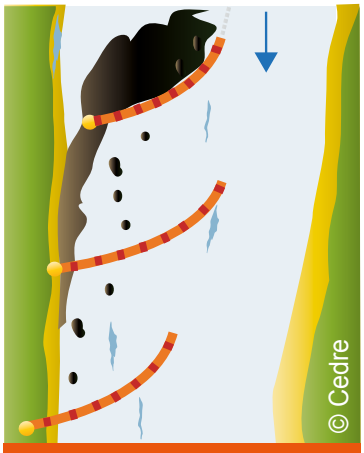
Oblique configuration in series



Chevron configuration



Herringbone configuration (on each side of the river)



Cascade configuration

- Boom deployment with the help of a barge
- Protection of shoreline by sorbent booms deployed by local fishermen during Deepwater Horizon oil spill
- Protection of shoreline by sorbents

For more information, please refer to the POSOW Waste Management and Volunteer Management Manuals.

Aims and principles

- ✓To define and prepare an area for unloading waste in order to facilitate its storage, sorting, and possible repacking and subsequent transfer to intermediate storage sites or identified disposal channels.
- ✓To define and organise the logistical area where fishermen can obtain tools, PPE, fuel.
- ✓To organise a rest area where fishermen can get changed, eat and wash themselves when they arrive back from working areas.

Resources required

Equipment

- ☐ Watertight skips, big bags for solid waste, litter and debris
- ☐ Tanks for liquids
- ☐ Crane, lifting arm for loading
- ☐ Geotextiles and tarpaulins
- ☐ Barricade tape and signposts

Human resources

- ☐ Facility manager
- ☐ Crew
- ☐ Technical adviser

Safety and response limitations

- ✓Ensure that waste storage sites are watertight.
- ✓Protect responders against the risks related to lifting and ensure that they wear suitable PPE in terms of the activities conducted in this area.

Observations

- ✓Unloading areas should be predefined in the contingency plans.
- ✓Personnel on land should be ready to take over from fishermen teams.

Operational procedure/protocol

- ✓Define the unloading site before beginning any operations.
- ✓Prepare and protect the mooring site (position tarpaulins and geotextiles along facilities).
- ✓Mark out routes towards the unloading area.
- ✓Organise the unloading area and ensure it is watertight.
- ✓Define waste storage areas, logistical and rest areas and base camps where responders are provided with food, drinks, changing rooms and sanitary facilities.
- ✓Organise the waste storage area by identifying the sorting categories: pure or emulsified pollutant, contaminated litter and debris, household waste, vegetal matter and seaweed...
- ✓Provide suitable containers in terms of the type and quantity of pollutant and ensure they are replaced before reaching their full capacity.
- ✓Unload the different types of waste and containers stored onboard using a crane or lifting arm or unload by hand (buckets...).

Illustrations and tools

■☐☐ Oily trawl net unloading during *TK Bremen* spill

☐■☐ Unloading area in the port of Saint-Jean-de-Luz during *Prestige* oil spill

☐☐■ Fishermen rest area during *Prestige* oil spill

Aims and principles

✓To transport equipment, people and provisions to and from inaccessible areas or to vessels in operation whose movements are limited.
✓To temporarily store and transport waste collected on the water or on land from difficult access sites to unloading areas.

Resources required

Equipment

- ☐ Suitable PPE (life jackets)
- ☐ Oyster-farming barges and other shallow draught vessels able to ground and equipped with wide flat decks cleared to transport equipment and waste
- ☐ Boats/fishing vessels for transporting personnel, equipment and waste
- ☐ Trawlers, lift netters, trap setters, dredgers..., equipped with cranes, lifting arms or clamshell buckets to recover trawl net cod ends at sea or transport heavy equipment

Human resources

- ☐ Fishermen with a suitable vessel for the transportation of equipment, personnel or waste

Observations

✓Rapid vessels will be prioritised for this type of operation.
✓The transportation of passengers, waste and equipment should be distinguished wherever possible for safety reasons.

Illustrations and tools

16 Small fishing boat used to transport responders during the *Prestige* spill. Note the absence of life jackets against recommendations

Loading response equipment on a barge

High pressure cleanup with the support of two boats

For more information on rescue of oiled wildlife, please refer to the POSOW Oiled Wildlife Response Manual.

Aims and principles

- ✓To assess the number and state of oiled animals.
- ✓To manage the recovery of oiled wildlife, especially birds, and take them to the relevant centre.

Resources required

Equipment

- ☐ Gloves
- ☐ Skips
- ☐ Plastic bags for dead birds
- ☐ Cardboard boxes for live birds

Human resources

- ☐ Crew
- ☐ Rescue centre

Safety and response limitations

- ✓Handle birds carefully and beware of them pecking.
- ✓Do not attempt to clean them in any way.

Operational procedure/protocol

- ✓Place newspaper in the bottom of a cardboard box.
- ✓Pierce a few breathing holes (dangerous when the bird is already in the box).
- ✓Capture the bird using a scoop net or if possible a thick piece of material (towel, clothing...).
- ✓Hold its wings against its body and its head down.
- ✓Do not care for the rescued bird in any way (food, water, cleaning).
- ✓Isolate the bird and store it in the closed box.
- ✓Seal the container and stick a label on it saying: "Live bird, do not open, handle with care".
- ✓Attach an information sheet to the box (see example below).
- ✓Call the closest rescue centre to transfer the bird to their care.

Illustrations and tools

LIVE BIRD

Date of discovery: ... / ... / ... Time: ... : ... Phone: ...

Place of discovery (place name): ...

Bird sent by (full name or team reference): ...

Address (street - post code - area): ...

SPECIES (if known): ... Number of birds in box: ...

Section reserved for Rescue Centre

Registration number: ...

Initial care and/or feeding: ...

HANDLE WITH CARE

Example of label to identify rescued live birds

© Colón de Cangas

Oiled bird rescued during the *Prestige* spill

© USCG

Collecting an oily bird during the Deepwater Horizon oil spill

DECONTAMINATING EQUIPMENT AND PERSONNEL (1/2)

Aims and principles

For more information on decontamination tasks, please refer to the POSOW Oil Spill Volunteer Management Manual.

During spill response operations, PPE and response equipment become contaminated by the pollutant. Before leaving the worksite, they must be decontaminated so as:

- ✓to avoid spreading the pollutant to unaffected areas;
- ✓to ensure at least a minimum level of comfort for responders after each session (transport, meals);
- ✓to prolong equipment lifetimes;
- ✓to reduce the quantity of hazardous industrial waste (decontaminated equipment is considered as normal waste, which is up to 5 times cheaper to treat).

Operational procedure/protocol

Preparation of the decontamination area before the beginning operations

- ✓ Identify a suitable area near the worksite exit. Cover the ground with a polyethylene tarpaulin and attach it using barriers or stakes. Mark off the area using barricade tape. Set up:
  - a boot bath with a cleaning agent that is harmless to human health, as well as cloths or sponges;
  - two bins to dispose of used oiled or clean equipment;
  - a tub (1 to 2 m^3) containing cleaning agent to soak small items;
  - a layout going from dirtiest (entrance) to cleanest (exit).

Decontaminating personnel

- ✓ Clean boots by going through the boot bath.
- ✓ Clean oil off coveralls or waterproofs with a cloth dipped in cleaning agent.
- ✓ Clean the skin: remove as much pollutant as possible using paper towels, then rub the remaining traces with an oily product (cooking oil, vaseline, butter...); then wash the skin with lukewarm water and soap. Do not use solvents (white spirit, gasoline, diesel...) or abrasive products.

Decontaminating worksite tools

- ✓ soak the tools in the appropriate tub. If necessary, remove the pollutant by rubbing with sorbents.

Storage and inventory

- ✓ The tools and equipment cleaned should be counted and stored near the decontamination area.

Observations

The cleaning products used must not be surface active agents so that the polluted effluents can be recovered at the surface.

Illustrations and tools

Decontamination of recovery tools

Decontamination of a fisherman

DECONTAMINATING VESSELS (1/2)

Aims and principles

To clean vessels after demobilisation to make them fit for their normal use once again.

Resources required

Equipment

- ☐ Appropriate PPE
- ☐ Cleaning agents (recommended and approved by a reference organisation)
- ☐ Sprayer
- ☐ Hot water pressure washer
- ☐ Water hoses
- ☐ Tarpaulins
- ☐ Drydock area
- ☐ Sorbents (packaged and/or loose)
- ☐ Floating and/or sorbent booms
- ☐ Mechanical or oleophilic skimmers

Human resources

- ☐ Fishermen under the responsibility of an experienced manager

Safety and response limitations

- ✓Wear respiratory and skin protection to prevent contact in the case of spray.
- ✓When using a hot water pressure washer, keep the pressure as low as possible to avoid damaging the paint or antifouling paint on the hull.
- ✓Keep the hull/cleaning agent contact time to a minimum, to prevent softening and stripping.
- ✓For operations on water, remember to set up containment and recovery means (pumps or sorbents).
- ✓Recover washing effluents.

Observations

The cleaning products used must not be surface active agents so that the polluted effluents can be recovered at the surface.

DECONTAMINATING VESSELS (2/2)

Operational procedure/protocol

Choosing the cleaning agent and technique according to the hull type

- ✓ Wooden hulls: prioritise hot water moderate pressure washing.
- ✓ Unpainted metal hulls: high pressure/ hot water.
- ✓ Polyester resin hulls: clean manually with care by scrubbing with sorbent pads and cleaning agent. Never apply hot water pressure washing.

Preparing the decontamination area

- ✓ Protect infrastructures and ensure that decontamination areas (platforms covered with tarpaulins) are fully watertight; set up an evacuation gutter and an oil separation system.
- ✓ Set up containment and recovery systems if the effluents are on the water surface

Initial cleanup

- ✓ Rinse the hull with water using a hose to remove the bulk of the oil.

Final cleanup

- ✓ Soften the hardened oil by spraying a cleaning agent, according to the hull type, and leave it for 15 to 30 minutes.
- ✓ Rinse the surface with water.
- ✓ For an adhesive product: use hot water high pressure washing, with a cleaning agent where necessary.
- ✓ For a relatively non-adhesive product: use fire hoses or high pressure hoses with cold water.

Cleaning persistent traces

- ✓ Dip a sorbent pad in cleaning agent.
- ✓ Rub the traces of pollutant left on the hull.
- ✓ Rinse with water.

Illustrations and tools

Vessel decontamination area

© Cedre

DAILY DATA COLLECTION

Aims and principles

During operations, daily record forms should be filled in and transmitted to authorities every day by responders, so as to keep a record of information such as:

- ✓the number of people involved;
- ✓the equipment used;
- ✓the quantities of pollutant recovered.

Resources required

Equipment

- ☐ Laminated daily record forms and permanent marker
- ☐ Or digital forms

Human resources

- ☐ A personn in communication with the command centre

Observations

The data recovered help authorities to obtain an overview of the response operations and to adapt the response strategy and means if necessary. They also help to provide statistical information, determine the amount of compensation and contribute to feedback after response.

Illustrations and tools

ONE SHEET PER FISHING BOAT

BOAT REGISTRATION/ BOAT NAME:		WORKING AREA (geographical coordinates):
TYPE OF BOAT:	DATE:	

to be sent each evening to ..... fax n°: ..... email: .....

PERSONNEL		OPERATIONS [2]	EQUIPMENT USED			POLLUTED WASTE			ADDITIONAL COMMENTS	EXPECTED REQUIREMENTS FOR NEXT DAY
NUMBER	ORIGIN [1]		QUANTITY	TYPE [3]	ORIGIN [1]	QUANTITY (m3)	NATURE [4]	PORT OF WASTE DISCHARGING	INCIDENTS, BREAKDOWNS, TEAM CHANGES	PERSONNEL / EQUIPMENT

ORIGIN [1]		OPERATIONS [2]	TYPE OF EQUIPMENT [3]	NATURE OF POLLUTANTS [4]
Personnel*	**Equipment***	Manual collection	Nets*	Oil
Crew	Stockpile	Mechanical collection	Boom	Oiled debris
Other (specify)	Vessel's gear	Containment	Forks	Oiled sorbents
	Private	Protection	Dispersant	Oiled seaweed
	Other (specify)	Wildlife rescue*	Bigbag	
			...	

* Specify the number of rescued birds:

PART 3

FURTHER INFORMATION

Glossary and acronyms

ARCOPOL: the Atlantic Regions' Coastal Pollution Response (European Union project)

Brailer: a net used for transferring the catch of a deep sea seine after it has been brought alongside. It is operated either entirely by hand or partly by hand and partly by power

cSt: unit of kinematic viscosity (cSt=centistoke)

DDTM/DML: in France, Departmental Directorates of the territories and the sea (Directions Départementales des Territoires et de la Mer) / Delegations at sea and coastline (Délégations à la Mer et au Littoral)

EEAA: Egyptian Environmental Affairs Agency

Emulsion: mixture of 2 or more liquids, such as oil and water, which do not naturally mix together

EU: European Union

FAO: Food and Agriculture Organization of the United Nations

Geotextile: synthetic landscape fabric which allows movements of air and water. Used on the soil of cleanup worksites to restrict the flow of particles of pollutant into the sediments or to help effluent recovery

GPS: Global Positioning System

Knot: a knot is a unit of speed equal to one nautical mile, 1.852 km per hour

Gurdy: large hand-operated reel for mackerel fishing

MRCC: Maritime Rescue Coordination Center

ORSEC: the ORSEC plan is the French generic emergency plan in case of disaster, when the local means are not sufficient (Catastrophe à Moyens Dépassés, CMD). «ORSEC» stands for Organisation de la Réponse de SÉcurité Civile, although most people say ORganisation des SECours, i.e. «rescue organization»

POLREP: Pollution report

POLMAR: the Polmar Plan (POLlution MARitime) is a French intervention plan that is triggered in the event of accidental marine pollution

PPE: Personal Protective Equipment

Recovery: the act of manually or mechanically removing the spilled pollutant from the environment

Sorbent: all products designed to absorb and/or adsorb liquid spilled in the environment, in order to facilitate its recovery

VHF: Very High Frequency

Volunteer: an individual who, beyond the confines of paid employment and normal responsabilities, contributes time and service to assist in the accomplishment of a mission

Weir skimmer: floating skimmer for oil and fuel removal from water made up of three connected floats supporting a central shallow dish

Winch: a stationary motor-driven or hand- powered machine used for hoisting or hauling, with a drumtaround which is wound a rope or chain attached to the load being moved

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Useful websites

ARCOPOL PLATFORM. *Resources.* Available at: www.arcopol.eu/?/=/section/resources

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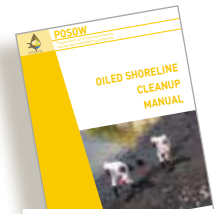
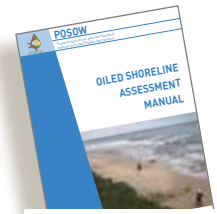
POSOW

Preparedness for Oil-polluted Shoreline cleanup and Oiled Wildlife interventions

Manuals available in this collection



Oiled Shoreline Cleanup Manual



Oiled Shoreline Assessment Manual

Oil Spill Volunteer Management Manual

Oiled Wildlife Response Manual

Oil Spill Waste Management Manual

Fishermen's Support in Oil Spill Response Manual

www.posow.org

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