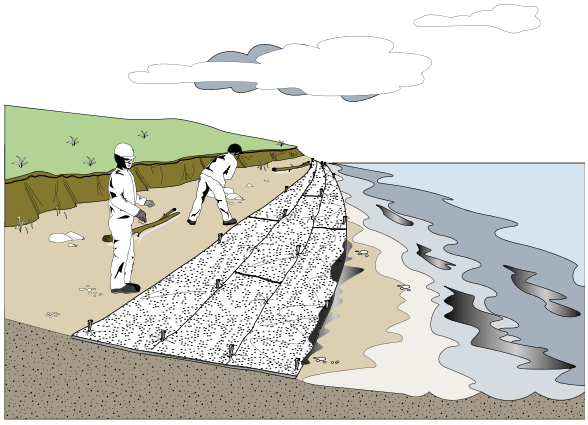
PASSIVE RECOVERY

OBJECTIVE & STRATEGY

PR

The objective of the Passive Recovery tactic is to remove spilled oil by collecting it in a sorbent material. The sorbent material and associated oil are then removed from the environment and disposed of according to an approved Waste Management Plan.

TACTIC DESCRIPTION



Passive Recovery is performed through the process of adsorption on sorbent materials, such as sorbent pads, rolls, and boom; pom-poms (oil snare); and natural products. Sorbent boom and pom-poms are made from substances like polypropylene, a synthetic material that is oleophilic (oil-attracting) and hydrophobic (water-repelling). When left in an oily water mixture, they can collect many times their weight in oil while collecting very little water. Their effectiveness depends on the type of oil, how they are placed, and the environmental conditions at the recovery site. The tactic is usually deployed by anchoring rows of sorbent boom or oil snare along the shoreline. A variation for marine mammal haul-outs is accomplished by broadcasting natural sorbent material, such as peat moss or sphagnum moss, on the haulout (Figure PR-4).

The general strategy is to:

1. Identify the trajectory of the spilled oil and select areas to be protected. Identify natural collection sites where floating debris is usually found.
2. Evaluate access restrictions and select appropriate deployment vehicles.
3. Mobilize and deploy personnel with tools and materials.
4. Secure sorbents with anchors or stakes.
5. Monitor the sorbent on a regular basis for oil content and security of the anchor systems.
6. Replace saturated sorbents as necessary.
7. Store and dispose of all recovered sorbents according to the waste management plan.

Passive Recovery

Passive Recovery can be deployed along shorelines prior to impact to reduce the quantity of oil that might otherwise impact sensitive habitats. The tactic can also be applied to shorelines that have already been oiled to help keep the re-mobilizing oil from refloating and migrating to other non-impacted shorelines. Passive recovery can also be used to line the inside of containment or exclusion boom as an effective collection technique. Likewise, passive recovery can be used with diversion boom in cases where small amounts of oil are anticipated. Sorbents can be used with tidal-seal boom or fences to create an adsorption barrier. In all cases, the sorbent material must be monitored after each tide and replaced as necessary.

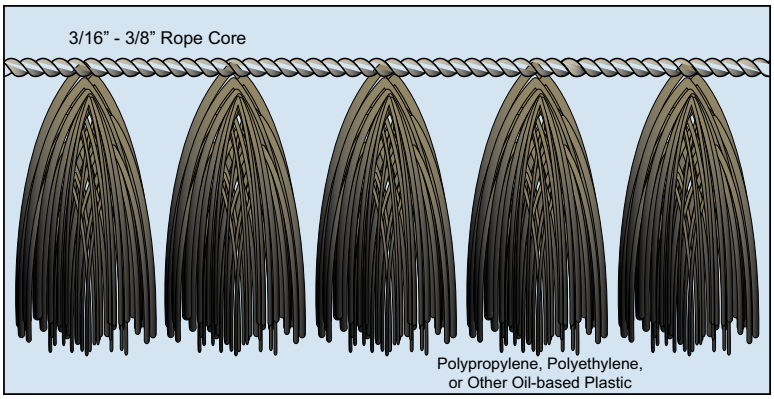


Figure PR-1. Snare line.

Fibrous polypropylene sorbents, such as pads, rolls, and sorbent boom, work well on non-persistent oil such as diesel. These sorbents can recover approximately 15:1 oil to sorbent by weight. Polypropylene strips, such as pom-poms, work best in persistent oil and may recover up to 20:1 oil to sorbent by weight. Natural material, such as peat, are effective sorbents, but are difficult to recover from the environment once oiled.

Passive recovery operations can produce a significant solid waste stream; all wastes generated must be measured, stored, and disposed of according to an approved Waste Management Plan. Logistical support for this waste stream should be mobilized early in the spill event. One way to reduce solid oily wastes is to wring out oil from the sorbents and reuse them.

Access to selected areas may be accomplished from the water, land, or air. Deployment from the water usually involves using shallow water platforms such as landing craft and skiffs. Access from a land-based response utilizes trucks, ATV's, or other four-wheel drive vehicles, while access from the air may be possible by helicopter.

Passive Recovery is often combined with Debris Removal, where concentrations of driftwood and other debris are relocated or removed from a likely impact area. The impact area is typically the area between the low and high tide lines in marine areas or the present waterline of the inland water body.

Operating Environments

PR-O OPEN WATER

Passive Recovery is not recommended in the open water operating environment due to the likelihood of losing sorbent materials.

PR-P PROTECTED WATER

Consider placing sorbents from the shoreside in the protected water environment. Sorbent materials and anchors for protected water passive recovery systems should be able to deploy and operate in seas up to 3 feet and winds up to 25 knots. Vessels setting and tending the boom should be able to safely transit seas which exceed the boom's operating limitation. Sorbent arrays must be monitored often, due to the forces applied on the anchor systems by wind and waves.

PR-C CALM WATER

Calm water passive recovery systems should be able to deploy and operate in seas of 1 foot and winds up to 15 knots. Vessels setting and tending the boom should be able to safely transit seas which exceed the boom's operating limitation. Calm water passive recovery systems may be based on small fishing vessels, work-boats, or skiffs. Calm water passive recovery systems typically work in depths as shallow as 3 feet.

PR-F FAST WATER

Passive recovery systems are not usually effective in fast water environments, but are often utilized where the currents slow to calm water conditions.

PR-B BROKEN ICE

It is difficult to keep passive recovery systems anchored securely in broken ice conditions. As an alternative to anchoring, sorbent materials may be placed in leads and openings in the ice, closely monitored, and retrieved once free from the ice.

PR-S SOLID ICE

An effective passive recovery method on solid ice is to use snow as a natural sorbent material.

PRm/t MARSH AND TUNDRA

Sorbents can be an effective recovery technique on wetlands, but care must be taken not to damage sensitive habitat when accessing and working on the recovery site. Minimize travel across tundra and marsh and avoid walking on oil-contaminated soils. Place sorbents to remove small pools of oil and to intercept lightly oiled waters that are migrating away from the contaminated site. Take care to ensure that sorbent material is not blown away by high winds.

Passive Recovery

PR-L OTHER LAND-BASED SPILLS

Use of sorbents should be minimized because of solid waste disposal problems. Use sorbents when overland flow is minor and terrain has a low slope.

Deployment Configurations

Typical configurations are shown below, but responders should consider the actual conditions, and modify their deployment accordingly.

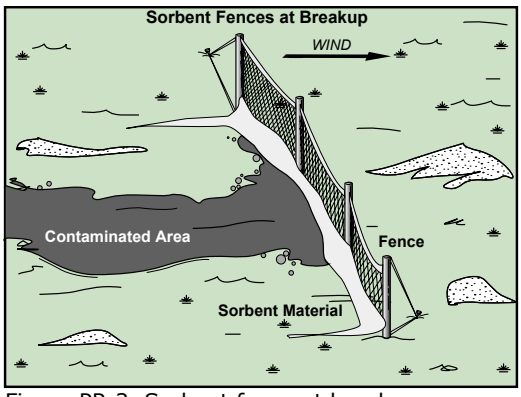


Figure PR-2. Sorbent fence at break-up.

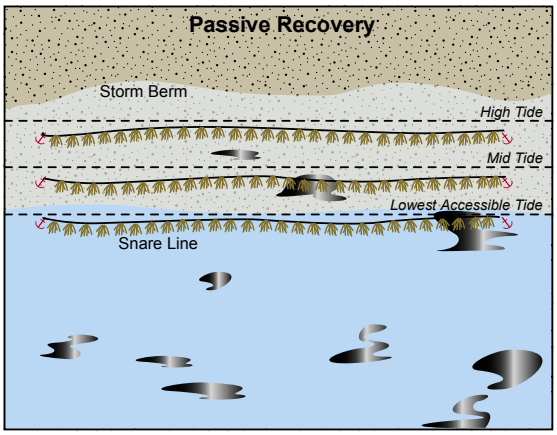


Figure PR-3. Aerial view of a passive recovery general configuration.

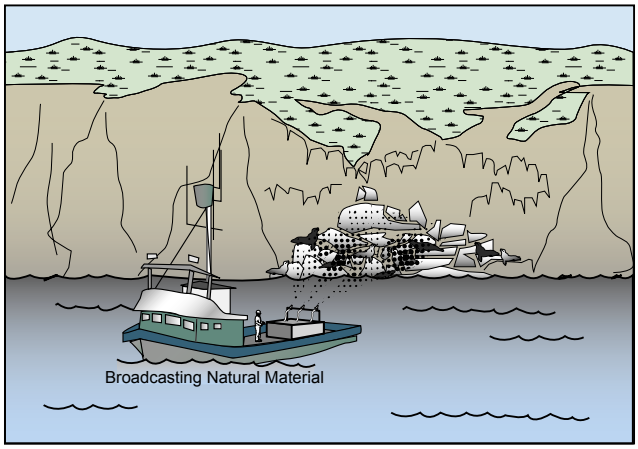


Figure PR-4. Marine mammal broadcast passive recovery.

DEPLOYMENT CONSIDERATIONS AND LIMITATIONS

SAFETY

- Passive recovery teams may require bear guards when working in bear habitat.
- Daily fair and foul weather evaluations are recommended, and should include distance to safe shelter and transit times.
- Vessels setting and tending the boom should be able to safely transit seas which exceed the boom's operating limitation.

DEPLOYMENT

- Shoreline access may influence deployment platform options.
- Passive recovery materials require periodic tending and replacement.
- Logistics for solid waste transport and disposal need to be considered.
- Contact National Marine Fisheries Service (NMFS) before disturbance of marine mammals.

REFERENCES TO OTHER TACTICS

Other tactics associated with Passive Recovery include:

- DV • Diversion Boom
- C • Containment Boom

EQUIPMENT AND PERSONNEL RESOURCES

Commonly used resources for this tactic have been defined as personnel with tools and sorbent materials. Quantity of units required will be determined by site conditions and resource sets may need to be refined as site-specific requirements dictate.

Typical Passive Recovery System PR

Typical Equipment	Function	Quantity	Notes
Sorbent boom, typically 8" diameter by 10' long	Collect non-persistent oil	Site-specific	Best for diesel and non-weathered crude oil
Pom-poms attached to a line, typically in 50' lengths	Collect persistent oil	Site-specific	Best for weathered crude, Bunker C, IFO, and other persistent oils
Anchor systems, small	Secure sorbent in selected configuration	1 system per 200' of boom/line	Use in sub-tidal collection
Anchor stakes	Secure sorbent in selected configuration	1 stake per 100' line	Use on land and in inter-tidal areas
Hand tools: rakes, pitchforks, shovels, sledge hammer	Collect oil	Site-specific	
Oily waste bags and duct tape	Storage of recovered sorbent materials	4 to 8 bags per 100'	
Typical Mobilization Options	**Function**	**Quantity**	**Notes**
Vessel Class 2, 3, 4, 5, or 6	Deploy system to recovery locations accessible from the marine environment	1 or more	Locations with marine access
ATV with trailer	Deploy system to recovery location at an off-road location	1 or more	Locations with ATV access
Helicopter	Deploy system to recovery location at an off-road location	1 or more	Locations with a helicopter landing zone
Trucks and other 4-wheel drive vehicles	Deploy system to recovery location accessible by road	1 or more	Locations with road access
Typical Personnel	**Function**	**Quantity**	**Notes**
Field Team Leader	Supervises operations	1	
Vessel Operators, protected/ calm waters	Operate Response Vessles	1 per vessel, optional	If vessels are required
Skilled Technicians	Lead crews	1 or 2	Depending on crew size
General Technicians	Work under the direction of skilled technicians or field team leader	2 to 15	3 to 5 per crew leader