

Environmental impacts of spilled oil and oil spill response



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Every Spill is Different

- Type of oil and exposure time
- Location
- Time of spill
- Environmental conditions
- Clean up actions



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Habitats at Risk – Rocky Shores

- Generally low sensitivity
 - High wave energy
 - Robust organisms
 - Rapid recovery rates
- Penetration of oil into sediment (eg cobble, shingle)
- Crevices are low energy
 - retention of oil



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Habitats at Risk – Sandy Shoreline

- Generally low sensitivity to oiling
- Relatively easy to clean
- Erosion problems
- Accretion cycle can lead to buried oil
- Sensitive dune vegetation



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Habitats at Risk – Muddy shores

- Sensitive to oiling
- Can be difficult to clean
- Often waterlogged and therefore penetration of oil is rare
- Anaerobic conditions means any oil in the mud takes a long time to breakdown



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Habitats at Risk Saltmarsh

- Act as oil traps
- Heavier oils tend to have less of an impact
- Generally slow rates of recovery
- High protection priority



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Key Species at Risk Plankton

- Sensitive to oiling
- Impact not considered significant in open waters
- Important role in the food chain



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Key Species at Risk: Fish

- Adult populations are not usually significantly impacted
- Larval and juvenile stages may be at greater risk, no evidence of significant impact on future adult populations
- Dispersant use may increase exposure to oil



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Key Species at Risk Fisheries

- Caged fish are not able to 'move on'
- Tainting – petroleum taste or smell
- Can happen even with only a short exposure to oil
- Depuration
- Fishery closure orders
- Potential to move floating cages, suspend feeding or harvest stock early



Key Species at Risk Birds

- Seabirds are highly sensitive to oiling
 - Loss of insulation leading to hypothermia
 - Loss of buoyancy leading to drowning
 - Toxic effects through preening and feeding
- Shorebirds are also sensitive to oiling
- Common short and medium term impact on populations
- Little evidence of long term impact



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Key Species at Risk Birds - Rehabilitation

- Bird cleaning stations are mainly run by NGO's
- Success depends on:
 - Species
 - Extent of oiling
 - Ease of capture
 - Logistics
- Integrated with the Env Group



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Key Species at Risk: Marine Mammals

- Not particularly sensitive to oiling
 - Ability to move on and body mass
- Marine mammals that breed on shore are more likely to be impacted



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Which clean-up actions could cause damage?



Effects of response

- Aggressive clean-up may cause more environmental damage than the oil
- Heavy machinery on shores and hinterland
 - damage to physical structure of shores & fragile habitat e.g. salt-marshes
 - physical damage and dislodgement of animals and plants unaffected by oil
 - oil forced into sediments - sand beaches



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Effects of response

- Hot or freshwater pressure washing or steam cleaning
 - lethal effects on shore plants and animals
 - physical removal of shore plants and animals
 - damage to physical structure of shores
- Scrubbing
 - physical detachment of plants and animals
- Dispersants & releasing agents
 - remobilisation & direct toxic effects
- Removal of beach material
 - geological damage
 - habitat loss
 - coastal defence implications



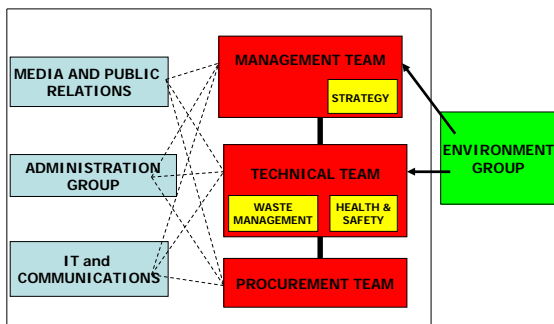
Potential environmental impact of oil spills?

- No single easy answer
 - Time, place & event specific
- Need Environment Group to:
 - Provide advice to all operational response units - SCU, MRC, SRC,
 - Core group made up of :
 - Statutory Nature Conservation Body
 - Environmental Regulator
 - Fisheries Department
 - Core group can invite other orgs to join
- Environment Group is not only for major spills



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Environment Group links to the Shoreline Response Centre



Summary

- Pollution incidents can and do cause a wide range of effects on the environment
- Environmental priorities may not be the same as socio-economic priorities
- The exact effects of a spill cannot be predicted
- Natural recovery processes can provide a positive recovery
- Environmental features may be directly or indirectly affected by oil spill response actions



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