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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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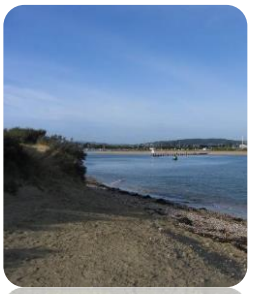
Habitats at Risk – Sandy Shoreline

- 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

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- 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

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- 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

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- 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

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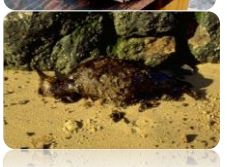
Key Species at Risk: Birds

- 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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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 plants and animals
  - physical removal of plants and animals
  - damage to 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

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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, TCG,
  - 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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Environmental Impact Assessment

- Major spill will likely require EIA
- PREMIAM
- Spill features determine requirement e.g. BRAER vs SEA EMPRESS
- Will involve stat. bodies and academia – overseen by Government appointed committee

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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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