

NET ENVIRONMENTAL BENEFITS ANALYSIS HABITAT FACT SHEET: UNCONSOLIDATED BOTTOM HABITATS

I. Habitat Description

The unconsolidated bottom habitat includes all wetland and deep-water habitats with at least 25% cover of particles smaller than stones, and a vegetative cover less than 30%. This low energy habitat is characterized by the lack of large stable surfaces for plant and animal attachment and may be very unstable. The substrate type plays a vital role in the determination of species diversity, which often includes a wide variety of plants and animals. The plants and animals that inhabit this environment exhibit a high degree of morphologic and behavioral adaptation to flowing water. Most of the animals live within the substrate, which can be quite diverse. As substrate diversity increases, invertebrate fauna diversity also increases. The unconsolidated bottom habitat has been sub-classified into Cobble-Gravel, Sand, Mud, and Organic.



II. Sensitivity to Oil Spills

Unconsolidated bottom habitats have medium sensitivity to oil spills. The biological communities are sparse due to the instability of the substrate and therefore contain mostly deep burrowing invertebrates as well as organisms that have adapted to low oxygen environments.



Animals commonly found in this environment are snails, scuds, oligochaete worms, mayflies, freshwater mollusks, fingernail clams, caddis flies, and midges. Different parts of the substratum will contain different organisms. At the waters edge, oil will penetrate deeper in gravel/cobble-dominated substrate and not as deep in the mud-dominated substrate, or where mud and sand fill the interstitial spaces around the gravel/cobble. The combination of oil and high concentrations of unconsolidated sediments may also lead to the formation of an asphalt pavement.

III. Sensitivity to Response Methods

Methods Causing Least Adverse Impacts

Debris Removal

- Degree of oiling that warrants debris removal and disposal depends on human and sensitive resource use of the site

Flooding

- Most effective when the oil is fluid and adheres loosely to the sediments
- Use on heavy oils is likely to leave large amounts of residual oil in the environment

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Natural Recovery

- Least impact for small spills, lighter oil types, and remote areas

Sorbents

- Overuse generates excess waste
- Useful for recovering sheens
- Physical removal rates of heavy oils will be slow, so less oil will be mobilized for recovery by sorbents

Methods Causing Some Adverse Impact

Vacuum

- Early use of vacuum on pooled, liquid oil can prevent deeper penetration

Manual Oil Removal/Cleaning

- Minimizes sediment removal and problems of erosion and waste disposal
- Preferable when oil is mostly on the surface, not deeply penetrated or buried

Sediment Reworking

- Use to break up heavy surface oil or expose persistent subsurface oil deposits, particularly where sediment removal will cause erosion
- Use where there is sufficient exposure to waves to rework the sediments into their original profile and distribution

Mechanical Oil Removal

- Tends to remove large amounts of sediment with the oil
- Applicable for heavier oil types, which are difficult to remove otherwise

Shoreline Cleaning Agents

- May be only technique to remove viscous oils without removing sediment
- Individual products vary in their toxicity and ability to recover the treated oil

In-Situ Burning

- Can effectively remove pooled surface oil accumulations
- Concerns about air pollution, physical nature of the residue, and thermal impact on biota
- May have to dig trenches to accumulate oil in pools
- Lighter oils will not remain on the sediment surface

Methods Causing Probable Adverse Impact

High-Pressure, Cold-Water Flushing

- High-pressure water jets will flush oiled sediments in to near shore habitats
- Excessive pressures can cause erosion if large amounts of sand are present

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Low-Pressure, Hot-Water Flushing

- Any organisms present will be affected by hot water

Methods Causing Most Adverse Impact

High-Pressure, Hot-Water Flushing

- Will flush oiled sand into near shore zone and affect any organisms present

Sources:

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