NET ENVIRONMENTAL BENEFITS ANALYIS HABITAT FACT SHEET:

ROCK BOTTOM HABITATS

I. Habitat Description

The rock bottom habitat includes all wetlands and deep-water habitats with substrate compositions being 75% stones, boulders, or bedrock and 30% or less vegetative cover. The substrate type and the current (in riverine systems) are partly responsible for this habitat's well-aerated, high-energy characteristic.

The existence and types of biological communities is highly dependant on the substrate composition. Organisms that commonly occur in this habitat type are the pond snail, the mayfly, various midges, the caddisfly, the leech, the riffle beetle, and the black fly. Plants firmly attach themselves to the rocky substrates, often by holdfasts, while animals are generally firmly attached by hooking or sucking devices. Some animals hide in the rocky crevices and under rocks while others burrow into the finer substrates between boulders.

II. Sensitivity to Oil Spills

Rock bottom habitats generally have low sensitivity to oil spills. Sensitivity may vary depending on the presence of biological communities.

The water regime within this habitat type ranges from permanently flooded to semi permanently flooded. Most oil products float and therefore oil seldom reaches toxic levels within the water column. This habitats high-energy, well-aerated characteristic provides ample resistance to the deposition of oil into the water column and therefore constitutes a concern for non-floating oil product spills as well as a concern for oil accumulation at the waters edge. The many sizes of rocky substrate at the shoreline vary widely in terms of their permeability and will highly influence oil activity. Oil will adhere to the rough rocky surfaces and will penetrate and persist in surface sediments. Oil pooling and persistence will occur between cracks and crevasses. Medium to heavy oils can be very sticky and form thick black bands, while lighter oils are more readily removed by evaporation and response efforts.

III. Sensitivity to Response Methods

Methods Causing Least Adverse Habitat Impacts

Natural Recovery

- Sheltered bedrock may need cleanup because of slow natural removal rates

- Cleanup of larger spills may be needed because of the amount of oil present
- Heavy oils may persist on all but the most exposed surfaces

Debris Removal

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

Sorbents

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

Methods Causing Some Adverse Habitat Impact

Flooding and Low-Pressure, Cold-Water Flushing

- Most effective on fresh, fluid oils
- Use on heavy oils is likely to leave large amounts of residual oil in the environment
- Use on gasoline spills may transport the oil to more sensitive habitats

High-Pressure, Cold-Water Flushing

- Primarily applicable to medium-crude oils while still fresh and liquid
- Can be effective in removing oil from crevices and pockets of sediment on bedrock

Manual Oil Removal/Cleaning

- Expect significant residues of diesel and medium oils with only manual removal because of their fluidity and difficulty of manual pickup
- Useful for heavy oils in patches or crevices

Vacuum

- Not applicable to gasoline spills because of safety concerns

In-Situ Burning

- Can effectively remove heavy oil accumulations
- Concerns about air pollution, thermal impact on biota, and physical nature of the residue

Shoreline Cleaning Agents

- May be only technique to remove sticky oils without hot-water, high pressure washing
- Individual products vary in their toxicity and recoverability of the treated oil

Low Pressure, Hot Water Flushing

- Any organisms in the application area would be adversely affected by hot water
- Most effective on heavy crudes where heat would make oil more fluid

Methods Causing Probable Adverse Habitat Impact

High-Pressure, Hot-Water Flushing

- Will likely kill any attached organisms; use is appropriate in limited areas only when oil removal is needed for aesthetic reasons

NET ENVIRONMENTAL BENEFITS ANALYIS HABITAT FACT SHEET:

ROCK BOTTOM HABITATS

Sources:

http://www.great-lakes.net/partners/epa/acp-rcp/app_VI.html#3.0

http://www.npwrc.usgs.gov/resource/1998/classwet/classwet.htm

http://response.restoration.noaa.gov/book_shelf/911_coastal.pdf