INLAND STRANDED OIL HABITAT FACT SHEET FOR RESPONSE:

Wet Meadow

Indicator Species

Joe-Pye Weed
Eupatoriadelphus spp.

Bluejoint Grass
Calamagrostis spp.

Prairie Cordgrass
Spartina spp.

Invasive Species

Reed Canary Grass
Phalaris spp.

I. Habitat Description

The wet meadows habitat includes lowland areas that are close to 100% vegetated with perennial grasses and forbs. Vegetation is typically darker and/or greener than surrounding areas. Common vegetation types include reed canary grass (*Phalaris*), bluejoint grass (*Calamagrostis*), cordgrass (*Spartina alterniflora*) and goldenrod (*Solidago*). This habitat may have small incursions of woody vegetation, sedges, or emergent vegetation, such as smartweed or the invasive purple loosestrife. It is typically found growing on saturated soils and is often considered the transition zone between aquatic communities and uplands. Wet meadows are common along the shores of shallow lakes, stream margins, and the edges of marshes, and can occur in areas of restricted drainage. Though the soils remain saturated most of the year, there is little standing water present (except after flooding or precipitation events).

Wet meadow dominated by grasses.
Image: USDA NRCS

Goldenrods in a wet meadow.
Image: Bob Arnebeck

II. Sensitivity to Oil Spills

The wet meadows habitat is highly sensitive to oil spills. This transitional habitat is valuable to upland and wetland plants and animals. Many animal species use the wet meadows habitat for reproduction, feeding, and as winter cover. Significant loss of this habitat would greatly affect the populations of these animals and consequently, the local ecology. Light refined oils can spread downslope even through thick vegetation and can penetrate into the organic-rich soils. Light refined oils with high amounts of water-soluble fractions can cause acute mortality to animals and plants in this habitat. Heavier oils get trapped at the edge of thick vegetation and can be more persistent. They also tend to coat vegetation and animals, though the vegetation may survive if oil coats only the stems or if the roots are not affected.

References/Additional Information:

General Classification Handbook for Floodplain Vegetation in Large River Systems (http://pubs.usgs.gov/tm/2005/tm2A1/)

Inland Oil Spills: Options for Minimizing Environmental Impacts for Freshwater Spill Response (http://www.michigan.gov/documents/deq/deq-wb-wws-FreshwaterResponse_NOAA102706_265069_7.pdf)

MN DNR (http://www.dnr.state.mn.us/restoreyourshore/pg/meadow.html)

The U.S. National Vegetation Classification (http://usnvc.org/)

Wetland Plants and Plant Communities of MN & WI, 3rd Edition (http://www.bwsr.state.mn.us/wetlands/delineation/WPPC_MN_WI/index.html)

Oil Spills in Marshes: Planning and Response Considerations (http://response.restoration.noaa.gov/sites/default/files/Oil_Spills_in_Marshes.pdf)

Information compiled by UMRBA staff from NOAA, USFWS, and U.S. EPA sources, March 2016.

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III. Sensitivity to Response Methods

The following text describes potential adverse impacts to this habitat resulting from various oil spill response methods and provides recommendations to reduce impact when these methods are implemented. This is not intended to preclude the use of any particular methods, but rather to aid responders in balancing the need to remove oil with the possible adverse effects of removal. More detail about the response methods themselves can be found in the Inland Response Tactics Manual.

Least Adverse Habitat Impacts

Flooding

- Appropriate for locations with gentle gradient where persistent oil has pooled.
- Should only be used if released oil can be reliably directed towards sorbents or recovery devices and prevented from impacting other areas.
- Effectiveness increases with lighter oils because they are less viscous and less residual oil is left in the environment.
- Some oil may still be left stranded after flooding and will need to be collected through other means.

Collection by Direct Suction

- Adverse impact can be mitigated by limiting vehicles, hoses, and equipment to staging areas with firm substrate and sparse vegetation. If equipment must access other areas, precautions should be taken to avoid driving oil into sediment or softer substrate, and trampling vegetation. For example: limit access routes through the area; walk, drive, and station equipment on mats or boards instead of directly on top of vegetation; use boats in flooded areas; and use a helicopter to bring in equipment to areas that are difficult to access.
- Only useful where oil is thickly pooled (not appropriate for sheens).

Low-Pressure, Ambient-Water Flushing

- Effective for washing oil stranded on banks into the water for recovery.
- Vegetation cover minimizes the potential for sediment erosion from flushing. However, thick vegetation also reduces area of influence of flushing operations.
- Effectiveness increases with lighter oils because they are less viscous and less residual oil is left in the environment.

In-Situ Burning

- May be one of the least physically damaging means of moderate and heavy oil removal.
- "Heavy ends" of petroleum product remain unburned and must be recovered. This residue will sink once it is cool.
- Least adverse impact when used in grassy areas versus areas covered with trees and shrubs. Fires are a naturally occurring part of this habitat's plant lifecycle, so vegetation should be able to recover quickly from a burn as long as the roots are not damaged.
- Authorization of in-situ burning is subject to RRT approval, consultation and concurrence from the state and the Department of the Interior.

Some Adverse Habitat Impact

Natural Attenuation/Phytoremediation

- Least impact for small to moderate spills and lighter oils; avoids damage often associated with cleanup activities.
- Cleanup should be used in addition to attenuation in areas where using only attenuation would put sizable wildlife populations as risk for becoming oiled or re-oiled.

Debris/Vegetation Removal

- Most appropriate for oils that form a thick, sticky coating on the vegetation, such as medium and heavy oils.
- Remove stained or oiled vegetation to protect wildlife users of the habitat. Additionally, grass roots can by damaged by oil and may need to be removed as well.
- Damage by cleanup crews may be reduced by avoiding excessive cutting/removal.
- Response crews entering the marsh can inadvertently trample vegetation during cleanup/removal. To reduce this impact: control and minimize access routes through the marsh; have personnel stand or kneel on boards while working; and conduct operations from boats when possible.

Most Adverse Habitat Impact

Light Equipment Oil Removal

- May be needed where oil has heavily contaminated bottom sediments.
- Most effective where access is good and substrate can support vehicles.
- Avoid forcing oil into the substrate and trampling vegetation by limiting access routes through the area, traversing the area on boards/mats/pontoons, or using a helicopter to bring in equipment.

Hand Tool Oil Removal/Cleaning

- Used where persistent oil occurs in heavy amounts and animals using the wetland are likely to be oiled.
- Avoid forcing oil into substrate and trampling vegetation by limiting access routes through the area and walking on boards or mats.

Sorbents

- Overuse generates excess waste.
- Forcing contact between pads and oiled substrate can drive oil into the soil, making it more difficult to recover.

Sediment Removal

- For watered areas: vacuum/dredge sediments and dewater using geotube/settling tank; or, where feasible, dewater the area and excavate the sediment.
- Significant sediment removal may result in a change in the area's hydrology as well as make it difficult to fully restore the plant community that existed prior to the spill incident.
- Permits will be required for sediment removal and for water discharge.