

PART A: SCREEN INCIDENT

Introduction Part A of the Selection Guide provides the means for evaluating, during an actual spill or in a scenario, all potential applied technologies for responding to spilled oil.

Purpose In *Part A: Screen Incident*, you will examine the Oil Spill Applied Technologies Overview matrix (Table 1) to determine what technologies might be used for the response. You will then complete Worksheet 1, using the information contained in the Environmental Matrix (Tables 2a, b, or c) that fits the current response conditions being considered.

Note The first step in the use of this Selection Guide is to screen the incident and determine whether a product or technology category is a viable option for the current response conditions. Part A is a critical step in this progression and **SHOULD NOT** be skipped during the evaluation process. A copy of Worksheet 1 is also located in Appendix H. It has been provided as a blank for photocopying purposes.

Tools Needed to Complete Part A

- Table 1 – Oil Spill Applied Technologies Overview
- Worksheet 1 –Decision-Tracking/Evaluation
- Table 2a, 2b, **or** 2c – Environment-specific matrix
- Table 3 – Relative Impacts of Applied Technologies on Shorelines Matrix
- Table 4 – Relative Impacts of Applied Technologies on Natural Resources Matrix

Worksheet Help At the end of this section, we have provided an example scenario that will walk you through the evaluation processes and demonstrate the information needs to complete Worksheet 1 and the initial evaluation (Part A - Screen the Incident).

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PART A: SCREEN INCIDENT (CONTINUED)

Step Action Table

Follow the step by step table below for *Part A: Screen Incident*.
NOTE: If you are unsure of any of these steps, please refer to the example scenario in Appendix M.

STEP	ACTION
1.	Locate the Oil Spill Applied Technologies Overview (Table 1), located immediately after this section.
2.	Review all applied technologies for possible use and applicability for the current response conditions of concern. This is done to familiarize you with the different technology categories.
3.	Locate Worksheet 1, which is immediately after the overview.
4.	Following your review of the technology overview (Table 1), mark an “X” under each technology or strategy that you want to consider further on Line A of Worksheet 1.
5.	Refer to the “If/Then” chart on the next page to determine the appropriate Environmental Matrix to use and then continue on to step 6. <i>Warning: The Environmental Matrices reflect environmental conditions and is NOT based on zones of jurisdiction.</i> Note: Matrices (Tables 2a, 2b, and 2c) are located immediately after Worksheet 1.

Disclaimer:

The objective of the Oil Spill Applied Technology Overview matrix (Table 1) is to give decision-makers an initial sense of what oil spill applied technologies can be used in different oil spill situations.

Please note that this matrix is not intended to be 100 percent accurate for all situations. Its purpose is to assist decision makers in their initial assessment of the applicability of these technologies (products and strategies) to the situation under consideration.

Many other factors also need to be considered prior to using applied technologies. Incident-specific conditions, such as potential environmental impacts, product availability, and advantages and disadvantages should be assessed before making a final decision about whether to use applied technologies and, if so, which ones.

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PART A: SCREEN INCIDENT (CONTINUED)

If / Then Chart

The “If / Then” Chart below will assist you in selecting the appropriate Environmental Matrix to use.

IF the oil is on:	THEN use this matrix:
Water in a: <ul style="list-style-type: none"> • Bay • Harbor • Inlet • Estuary • Slough • River or Creek • Lake or Pond 	Inland Waters Matrix (Marine and Fresh) (Table 2a)
Water in the open ocean	Coastal Waters Matrix (Table 2b)
Land that can or does affect surface waters: <ul style="list-style-type: none"> • Marsh or wetland • Beach • Man-made structure • Storm drain • Shorelines • Ditch • Other land types 	Adjacent Lands Matrix (Table 2c)

Example Matrix

Below is a partial example of an Environment Specific Matrix.

Example of - TABLE 2A: Environment Specific Matrix for Inland Waters

INLAND WATERS
 Includes: Bay, Harbor, Inlet, Estuary, Slough, River, Creek, Lake, or Pond -Refer to chart on pg 10 for more information
X = consider further

	Alternative Sorbents	Bioremediation Agents**	Dispersants	Chemical Modifiers**	Emulsion Treating Agents	Fresh Water Booming	Fire Fighting Strategies	In-situ Burn (ISB)	Non-floating Oil Strategies	Oil Tracking	Shoreline Pre-Treatment Agents**	Solidifiers	Surface Collection Agents**	Surface Washing Agents**	Natural Attenuation	Future Products
Response Phase																
Emergency (Days 1 to 3)	X	?	X	X	X	X	X	X	X	X	X	X	X	X	X	
Project (product still mobile)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	
Clean up (discharged product stable)							X							X		
Disposal (transportation and storage)				X			X									
Oil Type																
Very Light Oil / Light Oil (gasoline, diesel fuel, condensate, jet fuel)	X	X	X		X	X	X		X	X	X			X		
Medium Oil (LA crude, AK North Slope)	X	X	X	X	X	X	X		X	X				X		
Heavy Oil (bunker, No. 6 fuel oil)		X		X	X	X	X		X					X		

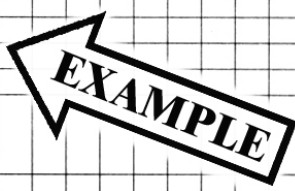
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PART A: SCREEN INCIDENT (CONTINUED)

**Step Action Table
(Cont'd)**

STEP	ACTION
6.	Fill in the title of the appropriate Environmental Matrix on Line B of Worksheet 1 (<i>refer to example worksheet below</i>)
7.	Examine the Environmental Matrix chosen (Table 2a, 2b, or 2c) and look at the incident-specific information classifications under each grouping on the left side of the matrix (start with "Response Phase").
8.	Using the Environmental Matrix, fill in the Incident-specific Information under Line C on Worksheet 1. <i>See example below.</i>

Incident: JACKS BAY SPILL		Worksheet 1 Sample												
<i>Mark Choices with an X</i>														
		<small>Sorbents Bioremediation Agents Dispersants Elasticity Modifiers Emulsion Treating Agents Fast-Water Booming Foams Fire Fighting Burn (USB) In-situ Burn Non-floating Oil Strategies Oil Tracking Shoreline Pre-Treatment Agents Solidifiers Surface Collection Agents Surface Washing Agents Natural Attenuation</small>												
A.	Technology Choices of Interest: (check)	X				X	X	X					X	Future Products
B.	Environmental Matrix Used:	INLAND WATERS												
C.	Incident-specific Information:													
	Response Phase:	PROJECT												
	Oil Type:	MEDIUM												
	Treatment Volume:	1000-10000G.												
	Weather Conditions:	LOW SEAS												
	Decision Authority:	<small>NR - No Spec. Reg Req's PS - Must be on Prod. Schd PA - Pre-Authorization in Place CR - RRT Concurrence Req'd SP - Special permit Req'd</small>												
	Monitoring:	<small>SM - SMART Monitoring OM - Effectiveness or Other Monitoring</small>												



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PART A: SCREEN INCIDENT (CONTINUED)

Step Action Table (Cont'd)

STEP	ACTION
9.	<p>Now, copy all the “X”s from your chosen environmental matrix (Table 2a, 2b, or 2c) on the Incident-specific Information for the technologies being evaluated. (Refer to the example below.)</p> <p>Note: When filling in the box for Decision Authority, copy the letters denoting the types of authority required. Do the same for Monitoring.</p>

Incident: JACKS BAY SPILL		Worksheet 1 Sample										
Mark Choices with an X												
A.	Technology Choices of Interest: (check)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Future Products
B.	Environmental Matrix Used:	INLAND WATERS										
C. Incident-specific Information:												
	Response Phase:	PROJECT	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Oil Type:	MEDIUM	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Treatment Volume:	1000-10000 G.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Weather Conditions:	LOW SEAS	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Decision Authority:	NR - No Spec. Reg. Req's PS - Must be on Prod. Sched. PA - Pre-Authorization in Place CR - RRT Concurrence Req'd. SP - Special permit Req'd.	NR	NR	CR	NR	NR	NR	NR	NR	NR	NR
	Monitoring:	SM - SMART Monitoring OM - Effectiveness or Other Monitoring	OM	OM	SM	OM	OM	OM	OM	OM	OM	OM

Step Action Table (Cont'd)

STEP	ACTION
10.	<p>Can you already rule out any of your initial technology choices of interest (Line A of Worksheet 1) just based on the information you have so far? If you can, you may want to do so now. Document your decisions at the bottom/back of Worksheet 1.</p>
11.	<p>Review the Considerations listed under Line D on Worksheet 1 and check off the ones that are applicable for the current response.</p> <p>Check boxes are provided on the left side of Worksheet 1.</p>

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PART A: SCREEN INCIDENT (CONTINUED)

Step Action Table (Cont'd)	STEP	ACTION
	12.	Next, copy all the + and - symbols from the <i>Considerations</i> section of the matrix onto Worksheet 1. You only need to copy the symbols that apply to the considerations you have just checked off. See example below.

D. (Check)	<i>Considerations</i>	Worksheet 1 - Sample of <i>Considerations</i> area									
<input type="checkbox"/>	Cultural or Historic Resources										
<input type="checkbox"/>	Limited Oil Handling and Storage Capacity										
<input type="checkbox"/>	Oil On Fire or Potential for Fire										
<input checked="" type="checkbox"/>	No Oil Containment and Recovery Options	-						+	+		+
<input type="checkbox"/>	Oil Contaminated Substrate										
<input type="checkbox"/>	Light Oil Type - Difficult to Recover/Skim										
<input type="checkbox"/>	Oil Will Form an Emulsion										
<input type="checkbox"/>	Oil Has Formed an Emulsion										
<input type="checkbox"/>	Oil Has/Is Likely to Sink										
<input type="checkbox"/>	Buried Oil										
<input type="checkbox"/>	Oil Likely to be Remobilized										
<input type="checkbox"/>	Fast Currents Prevent Effective Booming										
<input type="checkbox"/>	Need to Protect Against Significant Surface and Shoreline Impacts, Including Marshland										
<input checked="" type="checkbox"/>	Need to Protect Against Significant Water Column and Benthic Impacts	+									
<input type="checkbox"/>	Oiled Site is Access Limited										
<input checked="" type="checkbox"/>	Oiled Shoreline/Substrate Needs Cleaning Without Significant Impacts	-									
<input type="checkbox"/>	Significant Problem of Waste Generation										
<input type="checkbox"/>	Vapor Suppression										
<input type="checkbox"/>	Oil on Roadways										
<input checked="" type="checkbox"/>	Water Intakes at Risk	+						+		+	
<input checked="" type="checkbox"/>	Oil Trapped in Vegetation	+							+		+

13.	<p>Discuss which of these criteria and other effects are, or are not, most important for the current response.</p> <p>Note: Take into account only those criteria that apply to the current and potential response conditions.</p> <p>Use the chart on the following page to assist in the discussions and decisions.</p> <p>Note: If you are unsure of any of these steps, please refer to the example scenario at the end of this section.</p>
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PART A: SCREEN INCIDENT (CONTINUED)

Decision

Use the "If-And-Then" chart below to assist in the decision making process:

IF a technology:	AND there are:	THEN
Appears to be well suited for the situation and response capabilities	No overwhelming negatives	Consider using the technology and proceed to step 14.
Does not seem suited for the situation and response capabilities	No overwhelming reasons to use the technology	Consider other technologies

Step Action Table (Cont'd)

STEP	ACTION
14.	Locate Table 3 – Habitat matrix, which is immediately after the environmental matrices.
15.	Using the Habitat matrix (Table 3), review the recommendations given for each product or technology category for the potential application areas being evaluated for applied technology use. After considering the information provided in the Habitat matrix (Table 3), indicate whether you think the technology being considered is useful/appropriate for the current response situation (“+”), not useful/inappropriate (“-”), or may be useful/appropriate (“?”) and insert the correct item in the appropriate box in Line E on Worksheet 1. Do this for each technology being considered.
16.	Locate Table 4 – Natural Resources matrix, which follows the Habitat matrix (Table 3).
17.	Using the Natural Resources matrix (Table 4), review the recommendations given for each product or technology category of interest for the natural resources of concern that may be exposed to the applied technology(s) under consideration.

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PART A: SCREEN INCIDENT (CONTINUED)

**Step Action Table
(Cont'd)**

STEP	ACTION
18	Consult with natural resource trustees (state and federal) to evaluate the expected effects/influences (+, -, ?, and I) from each product or technology category for the resources listed in the matrix. This natural resource trustee consultation needs to weigh the potential impacts to these natural resources versus the benefits for the overall response operation if an applied technology is used.
19	<p>After considering the information provided in the Natural Resources matrix (Table 4), indicate whether you think the technology being considered is useful/appropriate for the current response situation (“+”), not useful/inappropriate (“-”), or may be useful/appropriate (“?”) and insert the correct item in the appropriate box in Line E on Worksheet 1.</p> <p>Document your decisions and special concerns at the bottom/back of Worksheet 1. You may want to have the natural resource trustees initial these decisions.</p>
20.	<p>Record the top (up to three) product or technology choices from this evaluation under Line F on Worksheet 1. Record major advantages and disadvantages for each of the top three choices.</p> <p>Additionally, there is also space available to record any other information that may be useful in the decision-making.</p> <p>Note: This worksheet can be circulated among the Unified Command in order to document any consensus reached thus far on the applied technologies of interest.</p>
21.	Continue and Proceed to Part B: Review/Select Options (evaluating individual products or strategies from the categories you identified on Worksheet 1).

**Still Confused
About Part A?**

Located in Appendix M, an example scenario and worksheet are provided that will guide you through the initial screening of the incident (Part A) and will take you through the completion of Worksheet 1 for this scenario.

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Table 1. Oil Spill Applied Technologies Overview.

Response Technology	Mechanism Of Action	When To Use	Target Areas	Characteristics Of Effective Products	Limiting Factors	Waste Generation	Oil Types	Impacts to Sensitive Resources
Traditional Mechanical/Manual Countermeasures, e.g., boom, skimmers, shovels	<ul style="list-style-type: none"> Mechanical containment and removal of oil from the water surface (i.e., booms, skimmers) Manual removal of oil from shorelines and land (i.e., loaders, shovels) 	<ul style="list-style-type: none"> Typically first line of defense during a response Spills on water, on land or hard surface 	<ul style="list-style-type: none"> Varies 	<ul style="list-style-type: none"> Contains, removes spilled product 	<ul style="list-style-type: none"> Weather conditions Site accessibility 	<ul style="list-style-type: none"> Varies by method 	<ul style="list-style-type: none"> Varies 	<ul style="list-style-type: none"> May cause stress/ impacts on sensitive resources due to presence of response personnel; May be invasive/ destructive to land habitats;
Sorbents	<ul style="list-style-type: none"> Absorption (uptake into the sorbent material) and adsorption (coating of the sorbent surface) 	<ul style="list-style-type: none"> Spill on land or hard surface; To create a physical barrier around the leading edge; To immobilize small amounts of free oil that cannot be removed from inaccessible sites 	<ul style="list-style-type: none"> Shorelines at the water/land interface Hard surfaces with recoverable oil 	<ul style="list-style-type: none"> Low application rate; Applied with available equipment; Easy to recover; oil does not drip out 	<ul style="list-style-type: none"> Access to deploy and retrieve products 	<ul style="list-style-type: none"> Concern if only lightly oiled; May be burned or recycled; 	<ul style="list-style-type: none"> Light to heavy oils; Not effective on viscous oils 	<ul style="list-style-type: none"> May cause smothering of benthic/attached wildlife if not recovered; May be ingested by wildlife if not recovered
Bioremediation Agents	<ul style="list-style-type: none"> Accelerate rate of oil degradation by adding nutrients, microbes, and/or surfactants; Surfactants break oil into droplets to increase the surface area 	<ul style="list-style-type: none"> After removal of gross contamination; When further oil removal will be destructive, or ineffective; When nutrients are limiting natural degradation rates 	<ul style="list-style-type: none"> Any size spill in areas where other cleanup methods would be destructive or ineffective. As a polishing tool for any size spill. 	<ul style="list-style-type: none"> Treated samples show oil degradation greater than control samples in lab tests; Key factors are site-specific 	<ul style="list-style-type: none"> Nutrient availability; temperature (>60°F); pH 7-8.5; Moisture; Surface area of oil; Rate of nutrient wash-out, especially for intertidal use 	<ul style="list-style-type: none"> Can significantly reduce volume of oily wastes, if effective 	<ul style="list-style-type: none"> Less effective on heavy refined products; Not for gasoline, which will evaporate 	<ul style="list-style-type: none"> None expected; Unionized ammonia can be toxic to aquatic life in low concentrations; Dissolved O₂ levels may be affected
Dispersants	<ul style="list-style-type: none"> Break oil into small droplets that mix into the water and do not re-float 	<ul style="list-style-type: none"> When dispersing the oil will cause less impact than slicks that strand onshore or affect surface water resources 	<ul style="list-style-type: none"> Open water 	<ul style="list-style-type: none"> Products have to pass a dispersant effectiveness test to be listed 	<ul style="list-style-type: none"> Low effectiveness with heavy, weathered, or emulsified oils; 	<ul style="list-style-type: none"> Can significantly reduce volume of oil wastes, if effective 	<ul style="list-style-type: none"> Any oil with a viscosity less than 20,000-40,000 cP 	<ul style="list-style-type: none"> Consult with Resource Trustees on environmental issues.
Elasticity Modifiers*	<ul style="list-style-type: none"> Increase the cohesiveness of the oil, improving skimmer efficiency 	<ul style="list-style-type: none"> On contained slicks of light oils which are difficult to recover 		<ul style="list-style-type: none"> Low application rate; readily mixes with oil; treated oil is not sticky 	<ul style="list-style-type: none"> Low water/air temperatures which make oil viscous and mixing more difficult 	<ul style="list-style-type: none"> Will reduce water pickup by skimmers; Treated oil can be re-cycled 	<ul style="list-style-type: none"> Light oils 	<ul style="list-style-type: none"> Consult with Resource Trustees on environmental issues.

Response Technology	Mechanism Of Action	When To Use	Target Areas	Characteristics Of Effective Products	Limiting Factors	Waste Generation	Oil Types	Impacts to Sensitive Resources
Emulsion Treating Agents	<ul style="list-style-type: none"> Composed of surfactants that prevent the formation of or break, water-in-oil emulsions 	<ul style="list-style-type: none"> To separate water from oil, increasing oil storage capacity; To increase effectiveness of dispersants and <i>in situ</i> burning 		<ul style="list-style-type: none"> Low application rate; rapid oil/ water separation (within 1-2 hours) 	<ul style="list-style-type: none"> Not possible to predict effectiveness for an oil, but there is a standard test; will wash out, so emulsion can re-form over time 	<ul style="list-style-type: none"> Will reduce the amount of oily material for handling and disposal 	<ul style="list-style-type: none"> Light to heavy oils 	<ul style="list-style-type: none"> Consult with Resource Trustees on environmental issues.
Fast-water Booming Strategy	<ul style="list-style-type: none"> High-angle booming strategies which 	<ul style="list-style-type: none"> When high current waters are oiled; To prevent oil from spreading downstream 	<ul style="list-style-type: none"> High current environments when traditional booming methods are ineffective 	<ul style="list-style-type: none"> No oil entrainment 	<ul style="list-style-type: none"> Boom and specialized equipment availability 	<ul style="list-style-type: none"> Not applicable 	<ul style="list-style-type: none"> Oil that floats 	<ul style="list-style-type: none"> None expected
Fire-Fighting Foams	<ul style="list-style-type: none"> Act as a barrier between the fuel and fire; suppress vapors; cool the liquid 	<ul style="list-style-type: none"> To prevent ignition or re-ignition of spilled oil 		<ul style="list-style-type: none"> Forms stable heat-resistant foam blanket; applied with standard equipment 	<ul style="list-style-type: none"> Polar solvents can destroy foam; water currents can break foam blanket 	<ul style="list-style-type: none"> Not applicable 	<ul style="list-style-type: none"> Any type of oil that can burn 	<ul style="list-style-type: none"> Consult with Resource Trustees on environmental issues.
In-situ Burning	<ul style="list-style-type: none"> Removes free oil or oily debris from water surface or land surface by burning oil in place 	<ul style="list-style-type: none"> To quickly remove oil to prevent its spread to sensitive areas or over large areas; To reduce generation of oily waste When access is limited When oil recovery is limited 	<ul style="list-style-type: none"> Remote areas on land or water where oil is thick enough for an effective burn 	<ul style="list-style-type: none"> Removal of free oil from the water surface or land surface Need oil thickness that will sustain burn 	<ul style="list-style-type: none"> Heavy, weathered or emulsified oils may not ignite, even with accelerants Wind speed and direction could affect smoke plume Air Quality monitoring needs to be done 	<ul style="list-style-type: none"> Burn residue can be formed; residue may sink; a semi-solid, tar-like layer may need to be recovered Erosion in burned on-land areas may occur if burn kills plants in area 	<ul style="list-style-type: none"> Fresh volatile crudes burn best; most oil types will burn Oil thickness required for minimum ignitable slicks increases with oil weathering, and heavy- component content 	<ul style="list-style-type: none"> Consult with Resource Trustees on environmental issues.
Natural Attenuation	<ul style="list-style-type: none"> Leave oil in situ and do not treat or recover 	<ul style="list-style-type: none"> Access to spill site is limited or other methods will not provide value 	<ul style="list-style-type: none"> In areas where other response strategies result in more harm than value 	<ul style="list-style-type: none"> Must have monitoring plan in place to assess effectiveness 	<ul style="list-style-type: none"> Resources present in the affected area 	<ul style="list-style-type: none"> Not applicable 	<ul style="list-style-type: none"> Varies 	<ul style="list-style-type: none"> No additional impacts other than the effect of the oil alone
Non-floating Oil Strategy	<ul style="list-style-type: none"> Various 	<ul style="list-style-type: none"> When oil sinks or travels mid-water 	<ul style="list-style-type: none"> In water 		<ul style="list-style-type: none"> Human health during diving operations Existing methods are often ineffective, slow and logistics-intensive 	<ul style="list-style-type: none"> Large volumes of collected water will have to be addressed 	<ul style="list-style-type: none"> Heavy oils or heavily weathered oils 	<ul style="list-style-type: none"> Recovery of sunken oil could affect bottom habitats and resources

Response Technology	Mechanism Of Action	When To Use	Target Areas	Characteristics Of Effective Products	Limiting Factors	Waste Generation	Oil Types	Impacts to Sensitive Resources
Shoreline Pre-treatment Agents*	<ul style="list-style-type: none"> Film-forming or Wetting agents that prevent oil from adhering to or penetrating the substrate 	<ul style="list-style-type: none"> When the oil is heading towards a sensitive shoreline resource or a resource of historical/ archaeological importance 		<ul style="list-style-type: none"> Products need to be sprayed as a <u>thick</u>, even coating Dissolve or degrade in seawater Rapid drying time Low permeability to oil penetration Readily adhere to substrates Not be wetted by oil 	<ul style="list-style-type: none"> Biodegradability of the product (no toxic byproducts) Product should have low contact toxicity Low application rates Film-forming products could smother intertidal biota Oil trajectory monitoring closely monitored 	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> Information not available 	<ul style="list-style-type: none"> Consult with Resource Trustees on environmental issues.
Solidifiers	<ul style="list-style-type: none"> Most products are polymers that physically or chemically bond with the oil, turning it into a coherent mass 	<ul style="list-style-type: none"> To immobilize oil, preventing further spread or penetration; apply to edge to form a temporary barrier; to reduce vapors 		<ul style="list-style-type: none"> Low application rate (10-25% by weight); cure time of a few hours; forms a cohesive mass; easily applied using available equipment 	<ul style="list-style-type: none"> Not effective with viscous oils where mixing is difficult; waves will form clumps not a mass; must be able to recover the solidified oil; 	<ul style="list-style-type: none"> Most products have minimal increase in volume; most are not reversible, so oil must be disposed of or burned 	<ul style="list-style-type: none"> Light to heavy oils; not effective on viscous oils 	<ul style="list-style-type: none"> Consult with Resource Trustees on environmental issues.
Surface Collecting Agents*	<ul style="list-style-type: none"> Have a higher spreading pressure than oil, so they push or compress oil on the water surface 	<ul style="list-style-type: none"> To push oil out from inaccessible areas to recovery devices; to make the slick thicker to increase recovery rates 	<ul style="list-style-type: none"> To push oil from under docks, piers etc to recovery devices' 	<ul style="list-style-type: none"> High spreading pressure; low evaporation rates; low oil and water solubility; remains liquid at ambient temperature 	<ul style="list-style-type: none"> Rain, winds greater than 5 mph, and moderate currents, all which break the surface film; high oil viscosity 	<ul style="list-style-type: none"> Product does not change the physical condition or volume of oil. 	<ul style="list-style-type: none"> Light oils 	<ul style="list-style-type: none"> Consult with Resource Trustees on environmental issues.
Surface Washing Agents	<ul style="list-style-type: none"> Contain solvents, surfactants, and additives to clean oiled surfaces; can "lift and disperse" like detergents or "lift and float" to allow oil recovery 	<ul style="list-style-type: none"> To increase oil removal, often at lower temperature and pressure; to flush oil trapped in inaccessible areas; for vapor suppression in sewers 	<ul style="list-style-type: none"> Oiled, hard-surface shorelines Where oil has weathered and is difficult to remove; When flushing with containment is possible; Volatile fuel spills in enclosed environments; 	<ul style="list-style-type: none"> Soak time less than 1 hr; single application; minimum scrubbing, esp. for sensitive substrate; 	<ul style="list-style-type: none"> Apply on land only where washwaters can be collected for treatment; use "lift and float" products on shorelines to allow oil recovery rather than allowing dispersion into water body 	<ul style="list-style-type: none"> Can produce large volumes of washwater which needs collection and treatment 	<ul style="list-style-type: none"> All oil types 	<ul style="list-style-type: none"> Consult with Resource Trustees on environmental issues.

* As of this revision date, there are no products for this category listed on the NCP Product Schedule.

WORKSHEET 1: SELECTION GUIDE DECISION TRACKING/ EVALUATION WORKSHEET

This worksheet is intended to be photocopied for use during drills and incidents

Name(s):

Date:

Incident:

Mark Choices with an X																	
		Sorbents	Bioremediation Agents	Dispersants	Elasticity Modifiers	Emulsion Treating Agents	Fast-Water Booming Agents	Fire Fighting Foams	In-situ Burn (ISB)	Non-floating Oil Strategies	Oil Tracking	Shoreline Pre-Treatment Agents	Solidifiers	Surface Collection Agents	Surface Washing Agents	Natural Attenuation	
A.	Technology Choices of Interest:																
B.	Environmental matrix used:																
C.	Incident-specific Information:																
	Response Phase																
	Oil Type																
	Treatment Volume																
	Weather Conditions																
	Decision Authority																
	<small>NR - No Spec. Reg. Req's PS - Must be on Prod. Sched. PA - Pre-Authorization in Place CR - RRT Concurrence Req'd. SP - Special permit Req'd.</small>																
	Monitoring																
	<small>SM - SMART Monitoring OM - Effectiveness or Other</small>																
D.	Considerations																
(check)	Limited Oil Handling and Storage Capacity																
<input type="checkbox"/>	Oil On Fire or Potential for Fire																
<input type="checkbox"/>	No Oil Containment and Recovery Options																
<input type="checkbox"/>	Oil Contaminated Substrate																
<input type="checkbox"/>	Light Oil Type - Difficult to Recover/Skim																
<input type="checkbox"/>	Oil Will Form an Emulsion																
<input type="checkbox"/>	Oil Has Formed an Emulsion																
<input type="checkbox"/>	Oil Has/Is Likely to Sink																
<input type="checkbox"/>	Buried Oil																
<input type="checkbox"/>	Oil Likely to be Remobilized																
<input type="checkbox"/>	Fast Currents Prevent Effective Booming																
<input type="checkbox"/>	Need to Protect Against Significant Surface and Shoreline Impacts, Including Marshland																
<input type="checkbox"/>	Need to Protect Against Significant Water Column and Benthic Impacts																
<input type="checkbox"/>	Oiled Site is Access Limited																
<input type="checkbox"/>	Oiled Shoreline/Substrate Needs Cleaning Without Significant Impacts																
<input type="checkbox"/>	Significant Problem of Waste Generation																
<input type="checkbox"/>	Vapor Suppression																
<input type="checkbox"/>	Oil on Roadways																
<input type="checkbox"/>	Water Intakes at Risk																
<input type="checkbox"/>	Oil Trapped in Vegetation																
<input type="checkbox"/>	Oil Trapped in Snow and Ice																
<input type="checkbox"/>	Confined Spaces with Water/Vapors? (sewers, culverts, etc.)																
E.	Habitat and Sensitive Resource Evaluation																
	Habitats (refer to Table 3, pg. 29)																
	Natural Resources (refer to Table 4, pg. 33)																
F.	Evaluation Results																
	Top Three Choices:																
	Any Major Advantages:																
	Any Major Disadvantages:																

Additional Comments/Decisions:

Signatures/Date of Review Team:

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TABLE 2A: ENVIRONMENT-SPECIFIC MATRIX FOR INLAND WATERS

INLAND WATERS

Includes: Bay, Harbor, Inlet, Estuary, Slough, River, Creek, Lake, or Pond -Refer to chart on pg 10 for more information

X = consider further

	Sorbents	Bioremediation Agents*	Dispersants	Elasticity Modifiers**	Emulsion Treating Agents	Fast-Water Booming Agents	Fire Fighting Strategies	In-situ Burn (ISB)	Non-floating Oil Strategies	Oil Tracking	Shoreline Pre-Treatment Agents**	Solidifiers	Surface Collection Agents**	Surface Washing Agents***	Natural Attenuation	Future Products
Response Phase																
Emergency (Days 1 to 3)	X	?	X	X	X	X	X	X	X	X	X	X	X	X	X	
Project (product still mobile)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	
Clean up (discharged product stable)								X							X	
Disposal (transportation and storage)				X				X								
Oil Type																
Very Light Oil / Light Oil (gasoline, diesel fuel, condensate, jet fuel)	X	X	X		X	X	X		X		X	X			X	
Medium Oil (LA crude, AK North Slope)	X	X	X	X	X	X	X		X		X				X	
Heavy Oil (bunker, No. 6 fuel oil)		X		X	X	X	X		X						X	
Non-Floating Oils								X	X						X	
Treatment Volume																
less than 10 gallons	X	?	X								X	X			X	
10 to 100 gallons	X	?	X	X		X	X	X	X		X	X			X	
100 to 1,000 gallons	X	?	X	X	X	X	X	X	X		X	X			X	
1,000 to 10,000 gallons	X	?	X	X	X	X	X	X	X						X	
10,000 to 100,000 gallons		?		X	X	X	X	X	X						X	
greater than 100,000 gallons				X	X	X	X	X	X						X	
Weather Conditions																
Hot (air > 90° F; water > 80° F)	X	X	X	X	X	X	X	X	X		X	X			X	
Warm (air > 75-89° F; water > 65-79° F)	X	X	X	X	X	X	X	X	X		X	X			X	
Mild / cool (air> 41-74° F; water > 55-64° F)	X	X	X	X	X	X	X	X	X		X	X			X	
Cold (air < 40° F; water < 54° F)	X	X	X	X	X	X	X	X	X		X	X			X	
High winds / Seas															X	
Moderate Winds / Seas	X	X		X	X			X	X						X	
Low Winds / Seas	X		X		X	X	X	X	X		X	X			X	
Decision Authority (For regional specific policies refer to Vol. II of the Selection Guide)																
No Special Regulatory Requirements (NR)	NR					NR	NR		NR	NR					NR	
Must be on the NCP Product Schedule (PS) (RRT Concurrence is required)			PS	PS	PS							PS	PS			
RRT Concurrence Required (CR) (but may NOT have to be on the Product Schedule)			CR	CR	CR			CR				CR	CR			
Special Permit(s) Required (SP)								SP								
Considerations																
Oil On Fire or Potential for Fire			+				+									
No Oil Containment and Recovery Options	-	?	-				+		+		-	-			+	
Light Oil Type - Difficult to Recover/Skim	+	?	+		+		+		+	?	+	+			+	
Oil Will Form an Emulsion		?		+					+	+	?				+	
Oil Has Formed an Emulsion			-		+					+	?	-			+	
Oil Has/Is Likely to Sink									+	+					+	
Buried Oil									+						+	
Oil Likely to be Remobilized	NOT APPLICABLE															
Oil is Trapped In/On Ice																
Fast Currents Prevent Effective Booming		?			+				+						+	
Need to Protect Against Significant Surface and Shoreline Impacts, Including Marshland	NOT APPLICABLE															
Need to Protect Against Significant Water Column and Benthic Impacts	+		-		?		-	+	+	+		+			+	
Site is Access Limited	?		?					+			?				+	
Oiled Shoreline Needs Cleaning Without Significant Impacts	NOT APPLICABLE															
Significant Problem of Waste Generation	-		+		+			+			-				+	
Water Intakes at Risk	+		-		-	+	-			+		+	-		+	
Oil Trapped in Vegetation	+							+							+	
Confined Spaces with Water? (sewers, culverts, etc.)			+				+									
Monitoring																
Implement SMART Monitoring (SM)			SM					SM								
Implement Effectiveness or Other Monitoring (OM)	OM			OM	OM	OM	OM		OM	OM		OM	OM		OM	

(+) = Consider for Use

(?) = Case-by-case

(-) = Do not consider for use

d = Fire departments may use without approval. There are special exceptions for fire department emergency response use.

**As of this revision date, there are no products for this category listed on the NCP Product Schedule.

***Refer to Section on Surface Washing Agents for special exceptions for Fire Departments.

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TABLE 2B: ENVIRONMENT-SPECIFIC MATRIX FOR ADJACENT LAND

ADJACENT LAND

Includes: Land that affects surface waters such as marsh, wetlands, beaches, man made structures, storm drains, shoreline ditch or other land types -Refer to chart on page 10 for more information

X = consider further

	Sorbents	Bioremediation Agents	Dispersants***	Elasticity Modifiers**	Emulsion Treating Agents	Fast-Water Booming Agents	Fire Fighting Foams	In-situ Burn (ISB)	Non-floating Oil Strategies	Oil Tracking Shore-line Pre-treatment Agents**	Solidifiers	Surface Collection Agents**	Surface Washing Agents****	Natural Attenuation	Future Products
Response Phase															
Emergency (Days 1 to 3)	X					X	X	?	X		X	X			
Project (product still mobile)	X					X	X	?	X		X	X			
Clean up (discharged product stable)		X							X			X	X		
Disposal (transportation and storage)		X													
Oil Type															
Very Light Oil / Light Oil (gasoline, diesel fuel, condensate, jet fuel)		X			X	X								X	
Medium Oil (LA crude, AK North Slope)	X	X			X	X			X		X	X			
Heavy Oil (bunker, No. 6 fuel oil)	X	X			X	X					X	X			
Non-Floating Oil		*not advs			*not advs										
Treatment Volume															
less than 10 gallons	X	X			X	X			X		X	X			
10 to 100 gallons	X	X			X	X			?	X	X	X			
100 to 1,000 gallons	X	X			X	X			?	X	X	X			
1,000 to 10,000 gallons					X	X			?			?	X		
10,000 to 100,000 gallons					X	X							X		
greater than 100,000 gallons					X	X							X		
Weather Conditions															
Hot (air > 90O F; water > 80O F)	X	X			X				X		X	X			
Warm (air > 75-89O F; water > 65-79O F)	X	X			X				X		X	X			
Mild / cool (air> 41-74O F; water > 55-64O F)	X	X			X				X		X	X			
Cold (air < 40O F; water < 54O F)	X				X				X		X	X			
High winds / Seas	X	X									X	X			
Moderate Winds / Seas	X	X							X		X	X			
Low Winds / Seas	X	X			X				X		X	X			
Decision Authority (For regional specific policies refer to Vol. II of the Selection Guide)															
No Special Regulatory Requirements (NR)	NR				NR	NR			NR	NR					NR
Must be on the NCP Product Schedule (PS) (RRT Concurrence is required)		PS		PS	PS			PS			PS	PS		PS ^{c,d}	
Incident Specific RRT Concurrence Required (CR) (but may NOT have to be on the Product Schedule)		CR		CR	CR			CR			CR	CR		CR ^c	
OSC Pre-Authorization in Place (PA)															
Special Permit(s) Required (SP)								SP							
Considerations															
Oil On Fire or Potential for Fire						+	+								
Oil Contaminated Substrate	+	+					+					+	+		
Buried Oil		+												+	
Oil Likely to be Remobilized	+									+		+	+		
Site is Access Limited		+					+					+	+		
Oiled Substrate Needs Cleaning Without Significant Habitat Impacts	+	+					?			?		+	+		
Significant Problem of Waste Generation	-	+					+				-		+		
Vapor Suppression															
Oil on Roadways	+									+		+			
Vapors Trapped in Confined Areas						+						+			
Oil Trapped in Snow and Ice		-					+						+		
Confined Spaces with Water? (sewers, culverts, etc.)															
Monitoring															
Implement SMART Monitoring (SM)								SM							
Implement Effectiveness or Other Monitoring (OM)	OM	OM		OM	OM	OM	OM	OM	OM	OM	OM	OM	OM	OM	OM

(+) = Consider for Use (?) = Case-by-case

(-) = Do not consider for use

c = RRT concurrence not required if NOT released to surface waters, refer to Vol. II of the Selection Guide

d = Fire departments may use without approval. There are special exceptions for fire department emergency response use.

*Not advs = not advised **As of this revision date, there are no products for this category listed on the NCP Product Schedule.

Dispersants may be used on land for "fire and/or explosion" and if dispersant product does not enter "waters of the US", i.e., Holland Decision, 1974. * In Development

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TABLE 2C: ENVIRONMENT-SPECIFIC MATRIX FOR COASTAL WATERS

COASTAL WATERS

Includes water in the open ocean -Refer to chart on page 10
for more information **X** =
consider further

	Sorbents	Bioremediation Agents	Dispersants	Elasticity Modifiers**	Emulsion Treating Agents	Fast-Water Booming Strategies	Fire Fighting	In-situ Burn (ISB)	Non-floating Foams	Oil Tracking	Shoreline Pre-Treatment Strategies	Solidifiers	Surface Collection Agents**	Surface Washing Agents	Natural Attenuation	Future Products
Response Phase																
Emergency (Days 1 to 3)	X		X	X	X	X	X	X	X	X	X	X	X	X		
Project (product still mobile)	X		X	X	X		X	X	X		X	X	X			
Clean up (discharged product stable)							X							X		
Disposal (transportation and storage)				X			X									
Oil Type																
Very Light Oil / Light Oil (gasoline, diesel fuel, condensate, jet fuel)	X	X	X		X	X	X		X		X	X		X		
Medium Oil (LA crude, AK North Slope)	X		X	X	X	X	X		X		X			X		
Heavy Oil (bunker, No. 6 fuel oil)				X	X	X	X		X					X		
Non-Floating Oils								X	X					X		
Treatment Volume																
less than 10 gallons	X										X	X		X		
10 to 100 gallons	X			X		X	X				X	X		X		
100 to 1,000 gallons	X		X	X	X	X	X	X	X		X	X		X		
1,000 to 10,000 gallons	X		X	X	X	X	X	X	X					X		
10,000 to 100,000 gallons				X	X	X	X	X	X					X		
greater than 100,000 gallons				X	X	X	X	X	X					X		
Weather Conditions																
Hot (air > 90°F; water > 80°F)	X		X	X	X	X	X	X	X		X	X		X		
Warm (air > 75-89°F; water > 65-79°F)	X		X	X	X	X	X	X	X		X	X		X		
Mild / cool (air > 41-74°F; water > 55-64°F)	X		X	X	X	X	X	X	X		X	X		X		
Cold (air < 40°F; water < 54°F)	X		X	X	X	X	X	X	X		X	X		X		
High winds / Seas															X	
Moderate Winds / Seas				X	X			X	X						X	
Low Winds / Seas	X		X		X	X	X	X	X		X	X		X		
Decision Authority (For regional specific policies refer to Vol. II of the Selection Guide)																
No Special Regulatory Requirements (NR)	NR					NR	NR		NR	NR						NR
Must be on the NCP Product Schedule (PS) (RRT Concurrence is required)			PS	PS									PS	PS		
RRT Concurrence Required (CR) (but may NOT have to be on the Product Schedule)			CR	CR			CR					CR	CR			
Special Permit(s) Required (SP)							SP	SP								
Considerations																
Limited Oil Handling and Storage Capacity	-		-	+			+				-					+
Oil On Fire or Potential for Fire							+	+								
No Oil Containment and Recovery Options	-		-				+		+		-	-				+
Light Oil Type - Difficult to Recover/Skim	+		+	+			+		+		+	+				+
Oil Will Form an Emulsion					+				+	+						-
Oil Has Formed an Emulsion					+				+		-					+
Oil Has/Is Likely to Sink									+	+						+
Buried Oil									+							+
Oil Likely to be Remobilized	NOT APPLICABLE															
Fast Currents Prevent Effective Booming						?				+						+
Need to Protect Against Significant Surface and Shoreline Impacts, Including Marshland	+					+		+		+			+			+
Need to Protect Against Significant Water Column and Benthic Impacts	+		-			-	+	+	+		+					+
Oiled Site is Access Limited	?						+				?					+
Oiled Shoreline Needs Cleaning Without Significant Impacts	NOT APPLICABLE															
Significant Problem of Waste Generation	-				+			+			-					+
Monitoring																
Implement SMART Monitoring (SM)									SM							
Implement Effectiveness or Other Monitoring (OM)	OM		OM	OM	OM	OM		OM	OM		OM	OM		OM		OM

(+) = Consider for Use (?) = Case-by-case
 (-) = Do not consider for use
 **As of this revision date, there are no products for this category listed on the NCP Product Schedule.

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Table 3 Relative Impacts of Oil Spill Response Applied Technologies on Shorelines. This table was developed from the API (2001) "Environmental Considerations for Marine Oil Spill Response" and the API/NOAA (1995) "Options for Minimizing Environmental Impacts of Freshwater Spill Response" and should be consulted to verify all caveats and restrictions for application based on oil type, weather conditions, etc.

		Sorbents	Bioremediation Agents	Dispersant	Elasticity Modifier
On-Water Habitats	Offshore	?	—	+	?
	Bays and Estuaries	?	—	+	?
	Ponds and Lakes	?	—	—	?
Sub-tidal Habitats	Coral Reef	+	N/A	—	?
	Sea Grass Beds	+	N/A	—	?
	Kelp Forests	+	N/A	—	?
	Soft bottom	+	N/A	?	N/A
	Mixed and hard Bottom	+	N/A	?	N/A
Land Habitats	Exposed Rocky Shores (ESI = 1A)	+	—	N/A	N/A
	Exposed, Solid, Man-made Structures (ESI = 1B)	+	—	N/A	N/A
	Exposed, Wave-cut platforms (ESI = 2)	+	—	N/A	N/A
	Sand Beaches/Tundra Cliffs (ESI = 3 / 4)	+	?	N/A	N/A
	Mixed Sand and Gravel Beaches (ESI = 5)	?	?	N/A	N/A
	Gravel Beaches (ESI = 6A)	+	?	N/A	N/A
	Riprap (ESI = 6B)	+	?	N/A	N/A
	Exposed Tidal Flats (ESI = 7)	+	I	N/A	N/A
	Sheltered Rocky Shores (ESI = 8A)	?	?	N/A	N/A
	Sheltered, Solid, Man-Made Structures (ESI = 8B)	+	?	N/A	N/A
	Peat Shores (ESI = 8C)	?	?	N/A	N/A
	Sheltered Tidal Flats (ESI = 9)	+	I	N/A	N/A
	Marshes (salt to brackish) (ESI = 10A)	+	?	N/A	N/A
	Freshwater Marshes (ESI = 10B)	+	—	N/A	N/A
	Swamps (ESI = 10C)	+	—	N/A	N/A
	Mangroves or Scrub/Shrub Wetlands (ESI = 10D)	+	I	N/A	N/A
Inundated Lowland Tundras (ESI = 10E)	?	I	N/A	N/A	
Ice Environments	Accessible Ice	?	—	?	?
	Inaccessible Ice	?	—	?	?

KEY:

+

Considered to provide value as a response option for this habitat.

—

Not considered a viable response option in this habitat.

?

May provide value as a response option in this habitat.

N/A

Response option not applicable for this habitat.

I Insufficient information- impact or effectiveness of the method could not be evaluated.

Table 3. Continued.

		Emulsion Treating Agents	Fast Water Booming	Fire-fighting Foams	In situ Burning On Land
On-Water Habitats	Offshore	?	?	N/A	N/A
	Bays and Estuaries	?	+	?	N/A
	Ponds and Lakes	—	+	?	N/A
Sub-tidal Habitats	Coral Reef	I	?	—	N/A
	Sea Grass Beds	I	?	—	N/A
	Kelp Forests	I	?	—	N/A
	Soft bottom	I	?	?	N/A
	Mixed and hard Bottom	I	?	?	N/A
Land Habitats	Exposed Rocky Shores (ESI = 1A)	N/A	N/A	?	N/A
	Exposed, Solid, Man-made Structures (ESI = 1B)	N/A	N/A	?	N/A
	Exposed, Wave-cut platforms (ESI = 2)	N/A	N/A	?	—
	Sand Beaches/Tundra Cliffs (ESI = 3 / 4)	N/A	N/A	?	—
	Mixed Sand and Gravel Beaches (ESI = 5)	N/A	N/A	—	—
	Gravel Beaches (ESI = 6A)	N/A	N/A	—	—
	Riprap (ESI = 6B)	N/A	N/A	—	—
	Exposed Tidal Flats (ESI = 7)	N/A	N/A	—	N/A
	Sheltered Rocky Shores (ESI = 8A)	N/A	N/A	—	—
	Sheltered, Solid, Man-Made Structures (ESI = 8B)	N/A	N/A	?	N/A
	Peat Shores (ESI = 8C)	N/A	N/A	—	N/A
	Sheltered Tidal Flats (ESI = 9)	N/A	N/A	—	N/A
	Marshes (salt to brackish) (ESI = 10A)	N/A	N/A	—	?
	Freshwater Marshes (ESI = 10B)	N/A	N/A	—	?
	Swamps (ESI = 10C)	N/A	N/A	—	?
	Mangroves or Scrub/Shrub Wetlands (ESI = 10D)	N/A	N/A	—	N/A
Inundated Lowland Tundras (ESI = 10E)	N/A	N/A	?	—	
Ice Environments	Accesible Ice	I	? / N/A	—	?
	Inaccessible Ice	I	? / N/A	—	?

KEY:

- +** Considered to provide value as a response option for this habitat.
- Not considered a viable response option in this habitat.
- I** Insufficient information- impact or effectiveness of the method could not be evaluated.
- ?** May provide value as a response option in this habitat.
- N/A** Response option not applicable for this habitat.

Table 3. Continued.

		In Situ Burning On Water	Non Floating Oil Strategies	Pre-Treatment Agents	Oil and Ice Response Strategies
On-Water Habitats	Offshore	+	N/A	N/A	?
	Bays and Estuaries	+	?	N/A	?
	Ponds and Lakes	+		N/A	?
Sub-tidal Habitats	Coral Reef	?	?	N/A	N/A
	Sea Grass Beds	?	?	N/A	N/A
	Kelp Forests	?	?	N/A	N/A
	Soft bottom	?	?	N/A	+
	Mixed and hard Bottom	?	?	N/A	+
Land Habitats	Exposed Rocky Shores (ESI = 1A)	N/A	N/A	I	I
	Exposed, Solid, Man-made Structures (ESI = 1B)	N/A	N/A	I	I
	Exposed, Wave-cut platforms (ESI = 2)	N/A	N/A	I	I
	Sand Beaches/Tundra Cliffs (ESI = 3 / 4)	N/A	N/A	I	I
	Mixed Sand and Gravel Beaches (ESI = 5)	N/A	N/A	I	I
	Gravel Beaches (ESI = 6A)	N/A	N/A	I	I
	Riprap (ESI = 6B)	N/A	N/A	I	I
	Exposed Tidal Flats (ESI = 7)	N/A	N/A	I	I
	Sheltered Rocky Shores (ESI = 8A)	N/A	N/A	I	I
	Sheltered, Solid, Man-Made Structures (ESI = 8B)	N/A	N/A	I	I
	Peat Shores (ESI = 8C)	N/A	N/A	I	I
	Sheltered Tidal Flats (ESI = 9)	N/A	N/A	I	I
	Marshes (salt to brackish) (ESI = 10A)	N/A	N/A	I	I
	Freshwater Marshes (ESI = 10B)	N/A	N/A	I	I
	Swamps (ESI = 10C)	N/A	N/A	I	I
Mangroves or Scrub/Shrub Wetlands (ESI = 10D)	N/A	N/A	I	I	
Inundated Lowland Tundras (ESI = 10E)	N/A	N/A	I	I	
Ice Environments	Accessible Ice	?	?	I	+
	Inaccessible Ice	?	?	I	+

KEY:

- +** Considered to provide value as a response option for this habitat.
- ?** May provide value as a response option in this habitat.
- Not considered a viable response option in this habitat.
- N/A** Response option not applicable for this habitat.
- I** Insufficient information- impact or effectiveness of the method could not be evaluated.

Table 3. Continued.

		Solidifier	Surface Collecting Agent	Surface Washing Agent	Natural Attenuation
On-Water Habitats	Offshore	?	?	N/A	?
	Bays and Estuaries	?	?	N/A	?
	Ponds and Lakes	?	?	N/A	?
Sub-tidal Habitats	Coral Reef	?	?	N/A	+
	Sea Grass Beds	—	—	N/A	+
	Kelp Forests	—	—	N/A	+
	Soft bottom	?	?	N/A	+
	Mixed and hard Bottom	?	?	N/A	+
Land Habitats	Exposed Rocky Shores (ESI = 1A)	?	N/A	?	+
	Exposed, Solid, Man-made Structures (ESI = 1B)	?	N/A	?	+
	Exposed, Wave-cut platforms (ESI = 2)	?	N/A	?	+
	Sand Beaches/Tundra Cliffs (ESI = 3 / 4)	?	N/A	—	?
	Mixed Sand and Gravel Beaches (ESI = 5)	?	N/A	?	?
	Gravel Beaches (ESI = 6A)	?	N/A	?	+
	Riprap (ESI = 6B)	?	N/A	?	+
	Exposed Tidal Flats (ESI = 7)	?	N/A	N/A	+
	Sheltered Rocky Shores (ESI = 8A)	?	N/A	?	+
	Sheltered, Solid, Man-Made Structures (ESI = 8B)	?	N/A	?	+
	Peat Shores (ESI = 8C)	—	N/A	N/A	+
	Sheltered Tidal Flats (ESI = 9)	?	N/A	N/A	+
	Marshes (salt to brackish) (ESI = 10A)	—	N/A	?	+
	Freshwater Marshes (ESI = 10B)	—	N/A	?	+
	Swamps (ESI = 10C)	—	N/A	?	+
	Mangroves or Scrub/Shrub Wetlands (ESI = 10D)	?	N/A	I	+
	Inundated Lowland Tundras (ESI = 10E)	?	N/A	N/A	+
Ice Environments	Accessible Ice	?	I	N/A	?
	Inaccessible Ice	?	I	N/A	?

KEY:

- +** Considered to provide value as a response option for this habitat.
- ?** May provide value as a response option in this habitat.
- Not considered a viable response option in this habitat.
- N/A** Response option not applicable for this habitat.
- I** Insufficient information- impact or effectiveness of the method could not be evaluated.

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Table 4 Relative Impacts of Oil Spill Response Applied Technologies on Natural Resources.

	Fast Water Booming	Non Floating Oil Strategies	Oil and Ice Response Strategies	Sorbents
MARINE MAMMALS				
Beaked/Toothed Whales: Dolphins, porpoise, whales	+	?	?	N/A
Pinnipeds: seals, sea lions, walrus	+	?	?	+
Furred mammals: sea otter, polar bear	+	?	?	+
Manatees	+	?	N/A	+
TERRESTRIAL MAMMALS				
Swimmers: River otter, muskrat, beaver, mink, etc.	+	?	?	+
Water's edge: deer, fox, raccoon, etc.	N/A	N/A	N/A	+
Domesticated: dog, cat, cattle, etc.	N/A	N/A	N/A	+
BIRDS				
Diving Birds	+	?	N/A	+
Gulls and Terns	+	+	?	?
Raptors	+	+	?	+
Shorebirds	+	+	N/A	+
Wading Birds	+	+	N/A	?
Waterfowl	+	?	N/A	+
Songbirds/other	+	N/A	?	?
AMPHIBIANS AND REPTILES				
Alligators and crocodiles	N/A	?	N/A	+
Sea turtles	N/A	?	?	+
Aquatic/ semi-aquatic turtles, terrapins, snakes and lizards	N/A	?	N/A	+
Terrestrial snakes and turtles	N/A	?	N/A	+
Frogs, salamanders, toads, etc.	N/A	?	+	+ / I
FISH				
Anadromous fish	+	? ^a	?	+
Bottom fish: flounder, rockfish, etc.	+	+ ^a	+	+
Midwater fish	+	+ ^a	+	+
Estuarine fish: mummichugs, silversides, white perch, striped bass, etc.	+	+ ^a	+	+
Freshwater fish	+	? ^a	?	+
Deepwater fish	+	+ ^a	+	+
SHELLFISH				
Bivalves gastropod, clams, oyster, etc.	+	+ ^a	+	+
Crabs, Shrimp, and lobster	+	+ ^a	+	+
Crawdads	N/A	?	N/A	?

KEY:

- +** Impact considered minimal.

- Impact considered likely; not recommended for use when resource is present. **Consult natural resource expert for additional consideration.**
- ?** Potential impact possible.

N/A Application not applicable in this resource's habitat.

I Insufficient information – impact or effectiveness of the method could not be evaluated.

	Bioremediation Agents	Dispersant	Elasticity Modifier	Emulsion Treating Agents
MARINE MAMMALS				
Beaked/Toothed Whales: Dolphins, porpoise, whales	N/A	—	?	—
Pinnipeds: seals, sea lions, walrus	+ on land	—	—	—
Furred mammals: sea otter, polar bear	+ on land	—	—	—
Manatees	N/A	—	—	—
TERRESTRIAL MAMMALS				
Swimmers: River otter, muskrat, beaver, mink, etc.	+ on land	N/A	—	N/A
Water's edge: deer, fox, raccoon, etc.	+ on land	N/A	—	N/A
Domesticated dog, cat, cattle, etc.	+ on land	N/A	—	N/A
BIRDS				
Diving Birds	N/A	—	—	—
Gulls and Terns	?	—	?	N/A
Raptors	+ on land	—	?	N/A
Shorebirds	+ on land	—	?	N/A
Wading Birds	+ on land	—	?	N/A
Waterfowl	N/A	—	—	—
Songbirds/other	?	N/A	?	N/A
REPTILES				
Alligators and crocodiles	+ on land	?	?	?
Sea turtles	N/A	?	?	—
Aquatic/ semi-aquatic turtles, terrapins, snakes and lizards	N/A	N/A	?	—
Terrestrial snakes and turtles	+ on land		—	N/A
Frogs, salamanders, toads, etc.	? / I		? / I	? / I
FISH				
Anadromous	N/A	+ on land	+ on land	+ on land
Bottom fish: flounder, rockfish, etc.	N/A	+ on land	+ on land	+ on land
Midwater fish	N/A	+ on land	+ on land	+ on land
Estuarine fish	N/A	+ on land	+ on land	+ on land
Freshwater fish	N/A	+ on land	+ on land	+ on land
Deepwater Fish	N/A	+ on land	+ on land	+ on land
SHELLFISH				
Bivalves gastropod, clams, oyster, etc.	N/A	+ on land	+ on land	+ on land
Crabs	N/A	+ on land	+ on land	+ on land
Shrimp and lobster	N/A	+ on land	+ on land	+ on land
Crawdads	?	N/A	+ on land	N/A

KEY:



Impact considered minimal.



Impact considered likely; not recommended for use when resource is present. **Consult natural resource expert for additional consideration.**



Potential impact possible.

N/A

Application not applicable in this resource's habitat.

I

Insufficient information – impact or effectiveness of the method could not be evaluated.

	Fire-fighting Foams	In situ Burning On Land	In Situ Burning On Water	Natural Attenuation
MARINE MAMMALS				
Beaked/Toothed Whales: Dolphins, porpoise, whales	?	N/A	—	+
Pinnipeds: seals, sea lions, walrus	?	N/A	—	—
Furred mammals: sea otter, polar bear	?	?	—	—
Manatees	?		—	—
TERRESTRIAL MAMMALS				
Swimmers: River otter, muskrat, beaver, mink, etc.	—	?	?	?
Water's edge: deer, fox, raccoon, etc.	—	?	+	?
Domesticated dog, cat, cattle, etc.	—	?	+	+
BIRDS				
Diving Birds	—	N/A	—	—
Gulls and Terns	—	?	—	—
Raptors	—	?	+	?
Shorebirds	—	?	+	?
Wading Birds	—	?	+	?
Waterfowl	—	?	—	—
Songbirds/other	—	?	N/A	?
REPTILES				
Alligators and crocodiles	—	?	—	?
Sea turtles	N/A	?	—	?
Aquatic/ semi-aquatic turtles, terrapins, snakes and lizards	?	?	—	?
Terrestrial snakes and turtles	— / I	?	N/A	?
Frogs, salamanders, toads, etc.	—	?	?	—
FISH				
Anadromous	+	N/A	+	+
Bottom fish: flounder, rockfish, etc.	+	N/A	+	+
Midwater fish	+	N/A	+	+
Estuarine fish	+	N/A	+	+
Freshwater fish	?	N/A	+	+
Deepwater Fish	+	N/A	+	+
SHELLFISH				
Bivalves gastropod, clams, oyster, etc.	+	N/A	+	+
Crabs	+	N/A	+	+
Shrimp and lobster	+	N/A	+	+
Crawdads	?	N/A	+	+

KEY:



Impact considered minimal.



Impact considered likely; not recommended for use when resource is present. **Consult natural resource expert for additional consideration.**



Potential impact possible.

N/A

Application not applicable in this resource's habitat.

I

Insufficient information – impact or effectiveness of the method could not be evaluated.

	Pre-Treatment Agents	Solidifier	Surface Collecting Agent	Surface Washing Agent
MARINE MAMMALS				
Beaked/Toothed Whales: Dolphins, porpoise, whales	N/A	+	N/A	N/A
Pinnipeds: seals, sea lions, walrus	?	+	I	+
Furred mammals: sea otter, polar bear	N/A	+	I	?
Manatees	I	+	I	? / I
TERRESTRIAL MAMMALS				
Swimmers: River otter, muskrat, beaver, mink, etc.	?	+	?	—
Water's edge: deer, fox, raccoon, etc.	?	+	?	?
Domesticated dog, cat, cattle, etc.	?	+	?	?
BIRDS				
Diving Birds	N/A	+	N/A	—
Gulls and Terns	?	+	?	—
Raptors	N/A	+	N/A	—
Shorebirds	?	+	?	—
Wading Birds	?	+	?	—
Waterfowl	?	+	?	—
Songbirds/other		+		—
REPTILES				
Alligators and crocodiles	?	+	?	+
Sea turtles	?	+	?	—
Aquatic/ semi-aquatic turtles, terrapins, snakes and lizards	?	+	?	? / I
Terrestrial snakes and turtles	N/A	+	N/A	?
Frogs, salamanders, toads, etc.		+		—
FISH				
Anadromous/ Other	+	+	+	+
Bottom fish: flounder, rockfish, etc.	+	+	+	+
Midwater fish	+	+	+	+
Estuarine fish	+	+	+	+
Freshwater fish	+	+	+	+
Deepwater Fish	+	+	+	+
SHELLFISH				
Bivalves gastropod, clams, oyster, etc.	+	+	+	+
Crabs	+	+	+	+
Shrimp and lobster	+	+	+	+
Crawdads	+	?	+	N/A

Caveats

^a - The use of trawls to determine presence of oil would probably have an impact on all fish and shellfish groups listed depending on where in the water column the oil is present. In addition, most trawling efforts tend to result in a number of dead fish being present (result from net pressure and rapid retrieval from depth) that may be scavenged by birds. This scavenging may lead to oiling in some birds. ***It is recommended that all dead fish be kept on board the trawling vessel and disposed of in a proper manner.***