

SPILL RESPONSE DECISION-MAKING IN RELATION TO WILDLIFE RESOURCES AND OIL SPILL APPLIED TECHNOLOGIES

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ABSTRACT: *During a response to spilled oil or hazardous material, the protection, retrieval, and rehabilitation of affected wildlife is the jurisdiction of the United States Fish and Wildlife Service (USFWS), the US Department of Interior (DOI), the National Marine Fisheries Service (NMFS), and the affected state resource trustees. Only permitted and trained individuals (Qualified Wildlife Responders - QWR) are allowed to directly handle the affected wildlife. QWRs are familiar with a wide range of actions that can be taken to minimize the adverse effects of spilled oil on fish and wildlife resources and their habitats. However, decision-makers and QWRs are not always familiar with the effects that various oil spill products and technologies may have on different wildlife resources. Applied oil spill products and technologies are listed under the National Contingency Plan (NCP) Product Schedule (40 CFR § 300.317) and are the focus of the Selection Guide for Oil Spill Applied Technologies. These applied oil spill products and technologies are relatively unknown and most decision-makers have limited experience in their use. To facilitate greater understanding of these products and technologies, the Selection Guide assists the decision-maker to evaluate the various spill response products and technologies for potential or suspected impacts to the environment, workers, and natural resources. Of particular interest is the evaluation of the use of various oil spill response*

technologies, taking into account possible effects on the wildlife resources that might be present at sea, nearshore, on land, or in riverine/lake spill locations. The Selection Guide has decision-makers consider wildlife when evaluating potential response options and promotes the involvement of the Planning Section's wildlife personnel in the review of strategies and options for a response.

Discussion

As part of the national preparedness efforts for oil spill response, a decision-making tool, the Selection Guide for Oil Spill Applied Technologies was developed to provide information and guidance on the use of oil spill response technologies and actions that may be unfamiliar to Federal or state on-scene coordinators or local incident commanders. The Selection Guide allows decision-makers to quickly evaluate response options for special circumstances or niches where conventional response technologies may not be the most appropriate option.

As part of the national response priorities, On Scene Coordinators (OSCs) are directed to employ all necessary containment and removal countermeasures in a coordinated

manner to ensure a timely, effective response that minimizes adverse impacts to the environment (40 CFR § 300.317), including the use of products listed on the NCP Product Schedule. To facilitate greater understanding of these products and technologies, the Selection Guide was developed to further evaluate the technologies and identify appropriate uses of these potential response options.

The Selection Guide provides the OSCs/decision-makers with an easy-to-use source of technical information on spill response countermeasures that are regulated by the NCP, including: sorbents, bioremediation agents, dispersants, elasticity modifiers, emulsion treating agents, *in situ* burning on land and on water, shoreline pre-treatment agents, solidifiers, surface collecting agents (herders), surface washing agents, and the use of fire-fighting foams as well as potential response strategies for “unusual” spill response conditions (e.g., fast-water booming strategies, non-floating oil strategies, oil-in-ice situations, water intake monitoring, and pyrolytic oil strategies). The Selection Guide facilitates easy comparison among product categories, as well as aiding the decision-maker in determining the best response strategy or product for a particular issue that “traditional” response tools do not add value and may cause additional harm.

In the past, this evaluation was conducted without directly prompting the decision-maker to evaluate an applied technology or strategy relative to its potential and limitations to shoreline and natural resources. As part of the 2002 update, the Selection Guide Development Committee (whose members draw from various federal, state, and local government, industry, and special interest groups) revised the standard evaluation process to prompt the decision-maker to consider the relative impact of a spill response technology relative to wildlife and other natural resources.

Oil spill response decision-makers need to understand the relative benefits and injuries that could result from the use of a particular product or technology and this evaluation will assist the decision-maker in clarifying the potential benefits and appropriate situations for the use of these products and technologies relative to their potential impacts on wildlife resources. An OSC is held accountable for their decision-making and must take into account federal law and agency jurisdictions for wildlife resources when making spill response decisions (Table 1). To address this accountability aspect of spill response decision-making, a table was developed that facilitates a general evaluation on the relative impacts of a response technology on wildlife and other natural resources (Table 2).

The Selection Guide provides a relative ranking of the effects of applied technologies on 6 general categories of wildlife resources: 1. marine mammals, 2. terrestrial mammals, 3. birds, 4. amphibians and reptiles, 5. fish, and 6. shellfish (Table 2). Each of these categories were further subdivided into individual species or species categories based on the mechanism(s) that these resources are impacted by oil spills (e.g., whether their exposure is typically through ingestion, inhalation, wading thru spilled oil, swimming in or under surface slicks, or just being in the general vicinity).

This evaluation is general enough to address situations when the oil spill occurs at sea, in the nearshore waters, on land, or riverine/lake habitats. The “categorizing” of species within a resource category is very generic and attempts to capture the potential impacts to species that have been impacted by oil spill responses in the past, regardless of life stage. This table provides the OSC with a prompt to conduct further evaluations on the potential impacts to the resource and to coordinate all decision-making following consultation with wildlife resource trustees on

the potential impacts from the use of a particular product or spill response technology.

This table provides the decision-maker with one of five rankings of potential impacts when evaluating the products and technologies contained in the Selection Guide: “+” = impacts are considered minimal; “?” = potential impacts are possible; “—” = impacts are considered likely and the product or strategy is not recommended for use when the resource is present; “NA” = application not applicable in this resources’ habitat; and “I” = insufficient information – impact or effectiveness of the method could not be evaluated.

The impact ranking for each wildlife resource category was developed from the Development Committee’s previous experiences and handling of wildlife resources during spill responses: how the species react to oil in their environment (curiosity, avoidance behavior, etc.); their feeding behavior; life stages that are typically affected during an oil spill in their environment; preening habits; etc. Using this wildlife behavior knowledge, the Development Committee conducted a review of the individual applied oil spill response product or technology categories to determine the likely impacts and benefits from the use of an applied technology category. The Selection Guide provides the decision-maker with a general summary on the following categories for each applied technology: Mechanism of Action; When to Use; General Application Requirements; and Limiting Factors/Environmental Constraints.

This table is not designed to encompass all situations or life stages for a wildlife resource and should not be considered complete. Rather, the table was designed to trigger further discussions between decision-makers and wildlife resource trustees **PRIOR** to decision-making.

Conclusions

This evaluation is by no means complete; decision-makers need to discuss options with wildlife trustee agencies and keep them involved in the decision-making process. However, in every instance, wildlife experts, preferably from both the state and federal agency (s) involved, should be consulted prior to enacting a response strategy. In order to initiate a well-planned wildlife response during a spill event, wildlife responders need access to the latest information and tools that would allow a timely and efficient response. The Selection Guide helps fill that niche, and allows wildlife responders to make valid decisions and recommendations to the OSC regarding the wildlife impacts associated with response strategies that are suggested by the OSC or Planning Section of the Unified Command during a spill event. The Selection Guide is a relatively easy document to view as the various response strategies and wildlife categories are placed in tabular form and the associated wildlife impacts readily interpreted. At present, presumably due to budget constraints, few states have personnel dedicated to spill planning and response as their primary duties. These duties, particularly spill response, often become the responsibility of individuals that are on hand at the time of the spill and are thrust into the “fire” having little or no oil spill response experience by their superiors. Although these latter responders may have little or no experience with spill response, the Wildlife section of the Selection Guide and its ease of interpretation provides quick access to information that would allow them to at least consider the potential impacts to wildlife associated with suggested response strategies and provide valuable information to the OSC regarding those impacts. The Selection Guide is an ongoing process, as experience is gained

from the application of the various response strategies listed in the Guide, the lessons learned from those response strategies employed will be incorporated into periodic updates of the Guide.

Biography

Debra Scholz is an environmental preparedness specialist for Scientific and Environmental Associates, Inc. She has expertise in spill response, natural resource damage assessment, and contingency planning. Many of her recent projects have involved the study of alternative oil spill countermeasures for spill response, particularly focusing on the potential use of oil spill applied technologies.

References

1. Selection Guide for Oil Spill Applied Technologies. 2002 Edition. Available on the web at: www.responseandrestoration.gov
2. 40 CFR Part 300. The National Oil and Hazardous Substances Contingency Plan (also referred to as the National Contingency Plan or NCP).
3. The Magnuson-Stevens Fishery Conservation and Management Act. Public Law 94-265 as amended through October 11, 1996.
4. 16 USC 703-712; Chapter 128; July 13, 1918; 40 Stat. 755. The Migratory Bird Treaty Act of 1918, as amended in 1936, 1960, 1968, 1969, 1974, 1978, 1986 and 1989.
5. 16 USC 1531-1544. The Endangered Species Act of 1973.
6. 16 U.S.C. §§ 668-668d. Bald Eagle Protection Act. June 8, 1940, as amended in 1959, 1962, 1972, and 1978.
7. 16 U.S.C. § 1361. The Marine Mammal Protection Act of 1972 (MMPA) as reauthorized in 1994. Public Law 103-238.
8. 16 USC 757a-757g; 79 Stat. 1125. The Anadromous Fish Conservation Act of 1965, as amended by Public Law 89-304.

Table 1. Agency authorities and jurisdictions for wildlife resource decision-making.

Agency	Resource	Governing Legislation	Jurisdictional Boundaries	Other Information
USFWS	Birds	Migratory Bird Treaty Act, Bald and Golden Eagle Protection Act	Nationwide	The treaty protects migratory birds in the U.S, Canada, Mexico, Japan, and Russia. Bald and Golden Eagle Act Prohibits the taking or possession of bald or golden eagles or their parts, eggs and or nests.
USFWS	Sea Turtles	Endangered Species Act	Nationwide, on land only	Mostly females who come ashore for nesting
USFWS	Threatened and Endangered species and their habitats	Endangered Species Act	Nationwide	ESA – MOU accountability
USFWS	Anadromous Fish	Anadromous Fish Conservation Act	Interstate or navigable waters, or their tributaries	Authorizes USFWS to conduct studies and make recommendations to USEPA regarding pollutants that may affect fish and wildlife resources.
USFWS	Marine Mammals	Endangered Species Act	Nationwide	Includes: manatee, sea otter, walrus, and polar bear
NMFS	Regulated Fish species	Magnuson Act	All waters within the U.S Economic Exclusive Zone, Great Lakes, and rivers and tributaries used by anadromous fish for spawning	Authorizes protection of coastal fish stocks within the U.S Economic Exclusion Zone
NMFS	Essential Fish Habitats	Magnuson Act	All waters within the U.S Economic Exclusive Zone, Great Lakes, and rivers and tributaries used by anadromous fish for spawning	Requires protection and enhancement of essential fish habitat.
NMFS	Marine Mammals	Marine Mammal Act	All waters of the U.S	The Act makes it illegal to possess marine mammals and or their body parts, harass, injure or kill any marine mammal
NMFS	Sea Turtles	Endangered Species Act	In the water	The Act makes it illegal to possess sea turtles and or their body parts, harass, injure or kill any sea turtle
States	Threatened and Endangered Species	State Laws as required, varies with state, if federal species are involved then the Endangered Species Act applies	Statewide	Most States have their own Threatened and Endangered Species programs in addition to the Federal Endangered Species Act. States act as co-trustees during a spill event
States	Sea Turtles	Specific State laws in addition to the Endangered Species Act	On land and sea (within 3 miles of state coastal boundary)	States act as co-trustees with USFWS and NMFS depending on turtle location
States	Migratory Birds	In addition to the Migratory Bird Treaty Act, States may have their own specific regulations.	Statewide	States act as co-trustees with USFWS
States	Wildlife	Specific State laws apply, vary with state	Statewide	With the exception of federally listed threatened and endangered species, the States usually act as the primary trustee
States	Fish	Specific state laws apply, if federal species are involved, then the Anadromous Fish Conservation Act and or Magnuson Act may apply	Statewide, includes all waters within 3 miles of state coastal boundary	States usually act as the primary trustee except when federal
States	Marine Mammals	In addition to the Endangered Species Act and Marine mammal Act, States may have their own specific regulations	Statewide, to within 3 miles of the state coastal boundary	States act as Co-trustees during spill events

Table 2. Relative impact of oil spill response applied technologies on wildlife 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	+	+
Mid-water 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	?

Table 2, continued.

	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	+	—	?	N/A
Shorebirds	+	—	?	N/A
Wading Birds	+	—	?	N/A
Waterfowl	N/A	—	—	—
Songbirds/other	?	N/A	?	N/A
REPTILES				
Alligators and crocodiles	+	?	?	?
Sea turtles	N/A	?	?	—
Aquatic/ semi-aquatic turtles, terrapins, snakes and lizards	N/A	N/A	?	—
Terrestrial snakes and turtles	+		—	N/A
Frogs, salamanders, toads, etc.	? / I		? / I	? / I
FISH				
Anadromous	N/A	+	+	+
Bottom fish: flounder, rockfish, etc.	N/A	+	+	+
Mid-water fish	N/A	+	+	+
Estuarine fish	N/A	+	+	+
Freshwater fish	N/A	+	+	+
Deepwater Fish	N/A	+	+	+
SHELLFISH				
Bivalves: gastropod, clams, oyster, etc.	N/A	+	+	+
Crabs, Shrimp and lobster	N/A	+	+	+
Crawdads	?	N/A	+	N/A

Table 2, continued.

	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	+	+
Mid-water fish	+	N/A	+	+
Estuarine fish	+	N/A	+	+
Freshwater fish	?	N/A	+	+
Deepwater Fish	+	N/A	+	+
SHELLFISH				
Bivalves: gastropod, clams, oyster, etc.	+	N/A	+	+
Crabs, Shrimp and lobster	+	N/A	+	+
Crawdads	?	N/A	+	+

Table 2, continued.

	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.	+	+	+	+
Mid-water fish	+	+	+	+
Estuarine fish	+	+	+	+
Freshwater fish	+	+	+	+
Deepwater Fish	+	+	+	+
SHELLFISH				
Bivalves: gastropod, clams, oyster, etc.	+	+	+	+
Crabs, Shrimp and lobster	+	+	+	+
Crawdads	+	?	+	N/A

KEY:

+	Impact considered minimal.	?	Potential impact possible.
—	Impact considered likely; not recommended for use when resource is present. Consult natural resource expert for additional consideration.	N/A	Application not applicable in this resource's habitat.
		I	Insufficient information – impact or effectiveness of the method could not be evaluated.

^a **Caveat:** 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.*