

RRT IX Regional Contingency Plan – Dispersant Use Plan for California

Job Aid 6

Resources at Risk from Dispersant Use

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6.a Regional species and habitat information

Response Planning Area	Features and species needing additional awareness
<p>Nearshore and shoreline</p>	<p>Refer to the following resources for detailed information related to resources at risk from oil spills and spill response activities, including those related to dispersant use.</p> <ul style="list-style-type: none"> ✓ CDFW-OSPR Resources at Risk (RAR) Technical Specialist(s), within the Environmental Unit ✓ GIS and Situation Status Technical Specialist(s), within the Environmental Unit ✓ Area Contingency Plans, https://www.wildlife.ca.gov/OSPR/Contingency ✓ ERMA (Environmental Response Management Application), https://erma.noaa.gov/southwest ✓ ESI (Environmental Sensitivity Index) maps, within ERMA or at: https://response.restoration.noaa.gov/resources/environmental-sensitivity-index-esi-maps
<p>North Coast offshore</p> <p>Del Norte, Humboldt and Mendocino counties</p>	<p>Sensitive marine mammal and sea bird areas include Castle Rock, the slopes and offshore waters over Mendocino Ridge, the Vizcaino Canyon fan (used seasonally by northern fur seals), the Steller sea lion rookeries at Cape Mendocino and Seal Rock, and the sea lion and harbor seal haul outs on St. George Reef and Trinidad Head. The waters near St. George Reef, the Klamath River mouth, and Big Lagoon near Trinidad Head support seasonal populations of gray whales.</p>
<p>San Francisco offshore</p> <p>Marin, San Francisco and San Mateo counties</p>	<p>Sea birds and mammals congregate in spring and summer months to feed in the highly productive upwelling zones and shelf areas near Bodega Canyon, Cordell Banks, the region between Point Reyes and the Farallon islands, and the shelf break off the most northern of the Farallon Islands.</p> <p>A large larval retention area in the lee of Pt. Reyes is environmentally and economically important to fish and invertebrate population recruitment and stability at Gulf of the Farallons offshore islands.</p> <p>Eleven seabird species have breeding colonies on the Farallon Islands and feed in the Gulf of the Farallons National Marine Sanctuary (GFNMS), including common murre, two species of auklets, storm petrels, Leach's petrel, tufted puffins, pigeon guillemots, and two species of cormorants.</p> <p>Large populations of marine mammals occur in offshore area, including blue, humpback, fin, sei, right, and sperm whales, Southern Resident population of killer whales, harbor porpoise, Pacific white-sided dolphin, Steller sea lion, Guadalupe fur seal, harbor seals. The California sea otter is sporadically present.</p> <p>Farallon Islands and Año Nuevo Island have breeding populations of harbor seals, northern elephant seals, Steller sea lions, and California sea lions. There is also a small colony of breeding northern fur seals.</p> <p>April through November, the GFNMS is a destination feeding ground for one of the largest concentrations of blue and humpback whales in the Northern Hemisphere. The minke whale, harbor porpoise, Dall's porpoise and Pacific white-sided dolphin are considered year-round residents of the sanctuary; the harbor porpoise is the most abundant small cetacean occurring here. Numerous other species of dolphins are common, often in groups of dozens to hundreds.</p>
<p>Central Coast offshore</p> <p>Santa Cruz and Monterey counties</p>	<p>The high species richness of the area is due to the complex topography, convergence of several water masses and changeable environmental conditions. The <u>Monterey submarine canyon</u> is an extremely important topographical feature in the central coast region, to which the area's large faunal species diversity and density is attributed.</p> <p>Cetaceans use the area as year-round habitat and calving grounds, seasonal foraging, or annual migration. Numerous species of dolphins and porpoise are common, often in groups of dozens to hundreds, and commonly associated with the Monterey submarine canyon.</p> <p>Thousands of pinnipeds (elephant seals, California sea lions, harbor seals, Guadalupe fur seals, northern fur seals, Stellar sea lions) feed in and move through the area as either resident or migrating populations. Harbor seals breed on offshore rocks and isolated beaches of the central coast.</p> <p>The threatened southern sea otter, a year-round resident of mainland central coast nearshore waters (generally within 6 miles of shore), is an endemic population of limited range and numbers.</p> <p>This may be a key foraging area for leatherback sea turtles due to the seasonal upwelling relaxation and concentration of prey, primarily brown sea nettles, in the late summer and fall.</p> <p>Sea bird densities are typically highest during the late summer through fall and winter periods (July through January) and lowest in April to June when birds are concentrated on their colonies. Bird abundance drops off dramatically over the continental slope and deep offshore waters, and south of Pt. Sur due to low water column productivity.</p> <p>Common sea bird species occurring seasonally over deep (>200m) offshore waters include sooty shearwater, phalaropes, Leach's storm petrel, northern fulmar, black-legged kittiwake, gulls, Cassin's and rhinoceros auklets, and common murre.</p> <p>At least 554 species of California marine fishes inhabit or visit California waters. Monterey Bay is one of the most important spawning areas in the state.</p>

Response Planning Area	Features and species needing additional awareness
<p>Los Angeles-Long Beach offshore</p> <p>San Luis Obispo, Santa Barbara, Los Angeles, Orange counties</p>	<p>Common marine mammals include 27 cetacean species, six species of pinnipeds, and the southern sea otter. Pinnipeds breed on the Channel Islands and on offshore rocks and isolated beaches along the mainland coast; thousands annually migrate through the area. Cetaceans use the area year-round for calving, seasonal foraging (particularly in summer and fall around the northern Channel Islands), or annual migration. Dolphins of several species are common, often in groups of dozens to hundreds.</p> <p>There is a small Guadalupe fur sea rookery on San Miguel Island.</p> <p>The sea otter is appearing in increasing numbers in the western Santa Barbara Channel and around the northern Channel Islands.</p> <p>Green sea turtles are present in the Long Beach area; there is a small population in the San Gabriel River. Olive Ridley turtle occurrence is sporadic and unpredictable, but presence should be assumed. Loggerhead sea turtles can be expected from San Luis Obispo county south, particularly during periods of warm sea surface temperatures in the Southern California Bight.</p> <p>High concentrations of seabirds occur in nearshore waters from Morro Bay to Point Arguello and the Santa Barbara Channel. Seabird colonies occur on the Channel Islands and along the mainland from Pt. Conception north. Abundance drops off dramatically over the continental slope and deep offshore waters. Densities are typically highest during the late summer through fall and winter (July-January) and lowest when birds are concentrated on their colonies (April-June).</p> <p>Seasonally common seabird species in deeper (>200m) offshore waters include sooty shearwater, phalaropes, Leach's storm petrel, northern fulmar, black-legged kittiwake, gulls (herring, Bonaparte's, western and California), auklets (Cassin's and rhinoceros) and common murre.</p> <p>The pelagic realm is the largest habitat in the Southern California Bight (SCB) and the home of 40 percent of the species and 50 percent of the families of fish. The pelagic zone includes the water column covering the shelf and the upper 150 to 200 m of water overlying the slope and deep basins. The northern Channel Islands are important spawning areas.</p> <p>Point Conception is widely recognized as a faunal boundary with mostly cold-water species found to the north and warm-water species found to the south, though extensive migrations do occur as a result of fluctuating environmental conditions. Warm- and cool-water events in the SCB affect fish recruitment and can alter the composition of some fish assemblages for years.</p>
<p>San Diego offshore</p> <p>San Diego county</p>	<p>The offshore species, patterns of occurrence and resources at risk expectations described for the Los Angeles-Long Beach area to the north also apply to the offshore San Diego area, with a couple of exceptions:</p> <ul style="list-style-type: none"> • There are no offshore islands in this area; • Green sea turtles are present in San Diego Bay; they may be present in larger numbers in waters offshore San Diego.

6.b Summary of findings from Net Environmental Benefit Analyses (NEBA)

An extensive Net Environmental Benefit Analysis (NEBA) effort was conducted by all California coastal Area Committees at the request of the Regional Response Team IX. The NEBA meetings occurred over a period of roughly two years (2000-2002) and the findings from those meetings were used to support the dispersant zone recommendations made by each Area Committee to the RRT IX. Each NEBA subcommittee generated the same conclusions at the end of that process.

- Mechanical cleanup activities would be used, oceanographic conditions permitting, in concert with dispersant application to aid in the cleanup of any significant spill.
- In average or worse than average offshore response settings along the coast, and/or where spill distances from shore significantly increase the response time, mechanical cleanup and in-situ burning, by themselves, provide very little improvement over the no response option. When this is the case, these response techniques will not significantly reduce the risk of spilled oil contacting biological resources at the sea surface or in more inshore regions.
- In most imaginable response settings, it may be better to disperse the oil into the water column (where there may be short-term toxicity to larvae in the upper few meters of the water column) than to leave the undispersed and unrecoverable oil on the water surface (where it could reside long-term, spread, and potentially impact a wider range of sensitive species and habitats in waters closer to shore).
- Due to spatial and temporal distribution of larval species, the dispersed oil from any one oil spill response was expected to impact a very limited portion of the overall community. Many constituent plankton species would quickly replenish their numbers through reproduction or immigration from surrounding waters. It was therefore considered unlikely that there would be population-level affects to the plankton community.
- The concentration of dispersed oil in the open ocean is expected to decrease rapidly through natural dispersion within the three-dimensional space of the water column to undetectable levels within several hours, while the actual oil particles will be biodegraded into carbon dioxide and water within weeks to months. In areas where the dilution potential is the greatest (i.e., open ocean), concentrations of dispersed oil high enough to cause adverse effects are unlikely to persist for more than several hours. Oil concentrations are typically less than 50ppm below dispersed slicks. Field data indicate that concentrations of dispersed oil are usually less than 1ppm at depths below 10 m. Within a matter of weeks to months, dispersion and biodegradation processes can remove much of the plume of oil droplets from the upper water column, and/or reduce concentrations of oil in the water column and at depth, to scientifically non-detectable levels.
- Undispersed and unrecovered oil left on the water surface in the open ocean can drift for weeks to months, where it can continue to impact pelagic birds, mammals and perhaps sea turtles. If the oil moves toward shore, it can strand in sensitive coastal habitats especially intertidal areas and pose a persistent threat, on a time scale of months to years, to those sensitive coastal habitats and their dependent species and communities.
- Emulsification of the oil remaining at the water surface can increase the oil-in-water volume several fold, and hence the contamination risk to marine and coastal plants and animal communities.
- Shoreline cleanup methods may not be available or appropriate for use in some sensitive coastal habitats (e.g., rocky intertidal, marshes, wetlands); their inappropriate use may pose a greater risk to these sensitive habitats and dependent species than unrecovered oil itself. The goal in this case shifts to keeping the oil from reaching sensitive coastal and inland areas.
- Oil spill impacts to sea birds can threaten the existence and persistence of whole colonies and perhaps the state's entire population of some species. This is especially true for colonies and populations of common murre, marbled murrelet, shore birds (including the Western snowy plover), and the southern sea otter.
- Appropriate and timely use of dispersants (on oil spills characterized as dispersible) may greatly reduce the risk of an offshore slick from reaching the more abundant and sensitive habitats and species found in the more inshore, coastal areas. While dispersing oil into the water column can pose a short-term risk to the plankton community inhabiting the upper few meters of the water column, the impacts will be to a much more geographically limited area, and the temporal duration will be relatively short.

6.c Key findings from Endangered Species Act (ESA) Section 7 reviews

- ✓ Concurrence letters can be found at: https://response.epa.gov/site/site_profile.aspx?site_id=8592
- ✓ ESA reviews were limited to the RRT Pre-Authorization Zone but may be informative for emergency consultations on dispersant decisions within the RRT Incident-Specific Authorization Zone as well.
- ✓ ESA reviews were limited to listed species and habitats. These are “driving” species and habitats for risk assessments and may serve as suitable proxies for unlisted species and habitats.

i. National Marine Fisheries Service (NMFS)

National Marine Fisheries Service (NMFS)		
Species & habitats reviewed	Exposure routes and risk threats	Determination
<p>Whales</p> <p>Fin whale</p> <p>Blue whale</p> <p>Humpback whale (Cen. America DPS)</p> <p>Humpback whale (Mexico DPS)</p> <p>Sperm whale</p> <p>Sei whale</p> <p>North Pacific right whale</p> <p>Western North Pacific gray whale</p> <p>Southern Resident killer whale</p>	<p>Inhalation and aspiration</p> <ul style="list-style-type: none"> • Surface oil, oil volatiles, or microtized oil droplets can be inhaled or aspirated directly into the lungs. These threats are present with both treated and untreated oil. • The high rate of lung volume exchange and extended breath holds during subsequent dives allows for elevated absorption of hydrocarbons into lung tissue and blood, which may result in increased lung disease, bacterial pneumonia and reproductive failures. <p><u>Mitigating factors:</u></p> <ul style="list-style-type: none"> ✓ Cetaceans may avoid spill areas ✓ Low likelihood of direct dispersant contact if spray buffer in place <hr/> <p>Dermal exposure</p> <ul style="list-style-type: none"> • Sensitive membranes (eyes, mouth) could be affected if direct contact with dispersants, microtized oil droplets, or the volatiles (BTEXs) in treated or untreated oil. <p><u>Mitigating factors:</u></p> <ul style="list-style-type: none"> • Thick epidermis unlikely to be affected. Dispersants make oil less sticky, and oil sprayed with dispersant likely to wash off skin. • Low likelihood of contact to sensitive membranes and epidermis if spray buffer in place. <hr/> <p>Ingestion</p> <ul style="list-style-type: none"> • Whales can ingest oil and dispersed oil, especially if foraging in shallow water column under an oil slick. <p><u>Mitigating factors:</u></p> <ul style="list-style-type: none"> ✓ Cetaceans may avoid spill areas. ✓ Cetaceans unlikely to consume enough oil, directly or via prey, to cause deleterious effects. ✓ Baleen whales: Oil sprayed with dispersant likely to wash off baleen as part of water ejection during feeding. <hr/> <p>Prey base</p> <ul style="list-style-type: none"> ✓ Dispersants increase mass of PAHs and other hydrocarbons in the water column up to 10-20m deep for a few hours and could be a concern for prey fish such as Pacific herring, northern anchovy or mackerel. ✓ Zooplankton and some fish larvae expected to be impacted by chemically dispersed oil (more than with physically dispersed oil); need to also consider environmentally realistic exposure times. ✓ Some invertebrates may bioaccumulate PAHs or hydrocarbons, but trophic transfer of dispersed oil not seen experimentally. <p><u>Mitigating factors:</u></p> <ul style="list-style-type: none"> ✓ The toxicity of dispersed oil to exposed adult fish is unlikely to be worse than that of naturally dispersed oil in the upper water column. ✓ Dispersing oil results in lower concentrations of exposure with increased water depth and time. ✓ Adult fish (prey of toothed whales) metabolize and depurate oil. ✓ Many of the cetacean prey species are in portions of the water column much deeper than will be impacted by dispersant applications and therefore are not expected to be significantly affected. ✓ Zooplankton will rapidly recolonize impacted area. <hr/> <p>Vessel and aircraft operations</p> <ul style="list-style-type: none"> • Noise from vessels or aircraft in the response area is a concern but is also hard to quantify; hazing of animals from haulout areas and into surrounding oiled water is also a concern. <p><u>Mitigating factors:</u></p> <ul style="list-style-type: none"> ✓ Dispersant application from vessels unlikely, but if used, vessels will observe BMP of 10 kt speed limit. ✓ Aircraft and vessels will observe BMPs that limit operations and overflights near and over haulout sites. 	<p>Potential direct toxicological impacts from oil dispersant and dispersed oil are considered insignificant and the indirect effects to prey bases were insignificant or discountable.</p> <p>Potential genotoxic and cytotoxic effects unlikely to occur in a field scenario.</p> <p>Potential impacts to critical habitat for the S. Resident killer whale are insignificant.</p> <p>Dispersant use in Pre-Authorization Zone may affect, but not likely to adversely affect (NLAA), whales if stipulated Best Management Practices (BMPs) are followed.</p>

National Marine Fisheries Service (NMFS), continued

Species & habitats reviewed	Exposure routes and risk threats	Determination
<p>Pinniped Guadalupe fur seal</p>	<p><i>Inhalation and aspiration</i></p> <ul style="list-style-type: none"> • Surface oil, oil volatiles (just above and below water surface) or microtized oil droplets (above surface) can be inhaled or aspirated directly into the lungs. These threats are present with both treated and untreated oil. • The high rate of lung volume exchange and extended breath holds during subsequent dives allows for elevated absorption of hydrocarbons into lung tissue and blood, which may result in increased lung disease, bacterial pneumonia and reproductive failures. <p><u>Mitigating factors:</u></p> <ul style="list-style-type: none"> ✓ Pinnipeds may avoid spill areas. ✓ Low likelihood of direct dispersant contact if spray buffer in place. <hr/> <p><i>Dermal exposure</i></p> <ul style="list-style-type: none"> • Guadalupe fur seals depend on fur (rather than fat) for insulation. Fur could be directly oiled by untreated or treated oil, compromising thermoregulation, especially if fur seals are exposed to oil spills in colder waters. • Sensitive membranes (eyes, mouth) could be affected if in direct contact with dispersants, microtized oil droplets, or the volatiles (BTEXs) in treated or untreated oil. <p><u>Mitigating factors:</u></p> <ul style="list-style-type: none"> ✓ Guadalupe fur seals are rare in CA offshore waters and are generally solitary when at sea. Some sightings of a few individuals on San Miguel Island (Channel Islands). <hr/> <p><i>Ingestion</i></p> <ul style="list-style-type: none"> • Feed mostly on squid and schooling fish (mackerel, anchovies, sardines), which are widely distributed and often found at depths significantly deeper than dispersed oil is expected to penetrate. • Oil on fur of nursing females could be transferred to pups and pose pup ingestion hazard. <p><u>Mitigating factors:</u></p> <ul style="list-style-type: none"> ✓ Impacts to the prey species of Guadalupe fur seals from dispersed oil or dispersant alone will be insignificant. ✓ Limited Guadalupe fur seal breeding in CA. One to three pups seen on San Miguel Island (Channel Islands) annually since 2008, but most pupping in June-August on Guadalupe and San Benito Islands in Mexico. <hr/> <p><i>Prey base</i></p> <ul style="list-style-type: none"> ✓ Dispersants will increase the mass of PAHs and other hydrocarbons in the water column up to 10-20m deep for a few hours and could be a concern for prey fish such as Pacific herring, northern anchovy or mackerel. <p><u>Mitigating factors:</u></p> <ul style="list-style-type: none"> ✓ The toxicity of dispersed oil to exposed adult fish is unlikely to be worse than that of naturally dispersed oil in the upper water column. ✓ Dispersing oil results in lower concentrations of exposure with increased depth and time ✓ Adult fish (pinniped prey) metabolize and depurate oil ✓ Squid prey are in deeper part of the water column and not impacted by dispersant applications. <hr/> <p><i>Vessel and aircraft operations</i></p> <ul style="list-style-type: none"> • Noise from vessels or aircraft in the response area a concern but hard to quantify; hazing of animals from haulout areas and into surrounding oiled water also a concern. <p><u>Mitigating factors:</u></p> <ul style="list-style-type: none"> ✓ Dispersant application from vessels is unlikely, but if used, vessels will observe BMP of 10 kt speed limit ✓ Aircraft and vessels will observe BMPs that limit operations and overflights near and over haulout sites 	<p>Potential direct toxicological impacts from oil dispersant and dispersed oil were insignificant and the indirect effects to prey bases were insignificant or discountable.</p> <p>May affect, but not likely to adversely affect (NLAA), if stipulated Best Management Practices (BMPs) are followed.</p> <p>Dispersant use in Pre-Authorization Zone may affect, but not likely to adversely affect (NLAA), Guadalupe fur seals if stipulated Best Management Practices (BMPs) are followed.</p>

National Marine Fisheries Service (NMFS), continued

Species & habitats reviewed	Exposure routes and risk threats	Determination
<p>Sea Turtles Leatherback Loggerhead Green Olive Ridley Leatherback sea turtles have Designated Critical Habitat</p>	<p>Inhalation and aspiration</p> <ul style="list-style-type: none"> • Surface oil, oil volatiles (just above and below water surface) or microtized oil droplets (above surface) can be inhaled or aspirated directly into the lungs. These threats are present with both treated and untreated oil. • Average turtle dive lasts 5-30 minutes, up to an hour for leatherback. Oil compounds trapped in lungs may be absorbed into blood stream, which may result in increased lung disease, bacterial pneumonia and reproductive failures. <p><u>Mitigating factors:</u></p> <ul style="list-style-type: none"> ✓ Sparse and scattered occurrence. ✓ May swim from spill areas. ✓ Low likelihood of direct dispersant contact if spray buffer in place. <hr/> <p>Dermal exposure</p> <ul style="list-style-type: none"> • Sensitive membranes (eyes, mouth) could be affected if in direct contact with surface oil, dispersants, microtized oil droplets, or the volatiles (BTEXs) in treated or untreated oil. Lesser dermal effects expected if oil dispersed into water column. <p><u>Mitigating factors:</u></p> <ul style="list-style-type: none"> ✓ Not all turtle species are common in CA waters. Leatherback more common off central California, other three species more frequent in southern CA. All four species may be found in federal waters, green sea turtles tend to stay closer to shore in state waters. <hr/> <p>Ingestion</p> <ul style="list-style-type: none"> • Sea turtles are known to ingest petroleum. • Oil and dispersed oil may be depurated and not bioaccumulated. • Impacts to the forage resources of loggerhead, green and olive ridley turtles is discountable due to depth and type of foraged species. • Jellyfish and sea nettle prey of leatherback generally very abundant and tolerant of compromised water quality, but sea nettles are also basis of Designated Critical Habitat for leatherback so additional practices will apply. <p><u>Mitigating factors:</u></p> <ul style="list-style-type: none"> ✓ Additional level of protection with minimal horizontal no-spray dispersant buffer of 100m from aggregated sea nettles, even if leatherback turtles not also spotted in area (sea nettles will not be visible under the slick, so spray planes should shut off spray 100m from slick edge if sea nettles seen in unoled water adjacent to slick). <hr/> <p>Prey base</p> <ul style="list-style-type: none"> • Dispersants will increase the mass of PAHs and other hydrocarbons in the water column up to 10-20m deep for a few hours and could be a concern for prey species (plants, benthic invertebrates, fish, red crabs, jellyfish) occurring in shallow waters and subtidal areas. This will not be a concern for the deeper waters and benthic areas of the Pre-Authorization Zone. <p><u>Mitigating factors:</u></p> <ul style="list-style-type: none"> ✓ Dispersing oil results in lower concentrations of exposure to turtle prey species with increased depth and time. Adult fish (turtle prey) in upper 30m of water column will metabolize and depurate oil. ✓ Fish, jellyfish, red crab and benthic invertebrates in deeper part of the water column will not be impacted by dispersed oil. <hr/> <p>Vessel and aircraft operations</p> <ul style="list-style-type: none"> • No information found that indicates turtles are affected by aircraft or vessel operations. <p><u>Mitigating factors:</u></p> <ul style="list-style-type: none"> ✓ Dispersant application from vessels unlikely, but if used, vessels will observe BMP of 10 kt speed limit. ✓ Maintain 100m buffer between vessel operations and sea turtles, have wildlife spotter on board vessel. ✓ No aerial spraying within 100m of aggregated sea turtles. 	<p>Potential direct toxicological impacts from the oil dispersant and dispersed oil were insignificant.</p> <p>Potential impacts to critical habitat for leatherback sea turtle were also insignificant.</p> <p>May affect, but not likely to adversely affect (NLAA), if stipulated Best Management Practices (BMPs) are followed.</p> <p>Dispersant use in Pre-Authorization Zone may affect, but not likely to adversely affect (NLAA), sea turtles if stipulated Best Management Practices (BMPs) are followed.</p>

National Marine Fisheries Service (NMFS), continued		
Species/habitats reviewed	Exposure routes and risk threats	Determination
Fish Sacramento River winter-run Chinook salmon ESU Central Valley spring-run Chinook salmon ESU CA coastal Chinook salmon ESU S. CA steelhead DPS CA Central Valley steelhead DPS N. CA Coast steelhead DPS Central CA Coast steelhead DPS South-Central CA Coast steelhead DPS S. OR/N. CA Coast coho salmon ESU Central California Coast coho salmon ESU Southern DPS of N. American green sturgeon Pacific eulachon/smelt southern DPS Eastern Pacific scalloped hammerhead shark DPS Giant manta ray Oceanic whitetip shark	<p>Gills, skin and membranes</p> <ul style="list-style-type: none"> • Dissolved hydrocarbons from chemically or naturally dispersed oil may diffuse across gills, skin and other membranes of organisms. • The sensitivity of individual species and life stages is highly variable, but embryonic and larval life stages are usually more sensitive than adults. • Thin sheens of undispersed oil are also extremely toxic to early life stage fish and invertebrates. • Cardiac toxicity to developing fish embryos can result in mortality. • Narcosis of adult fish is a typical impact from exposure to PAHs and nonaromatic or heterocyclic aromatic hydrocarbons. Narcosis can temporarily impair swimming and lead to higher predation on adult fish. <p><u>Mitigating factors:</u></p> <ul style="list-style-type: none"> ✓ ESA listed fish species do not occur in the pre-authorization zone as larval species. ✓ Juveniles and adults of these species are typically in water column depths or locations that are unlikely to have dispersants or dispersed oil at concentrations of concern. ✓ Juveniles and adults are highly mobile. ✓ Adult fish generally metabolize and depurate oil, not take it up into tissues. ✓ Larval species typically abundant and widely distributed, will reoccupy the area post-spill. ✓ Acute lethality of dispersed oil is primarily associated with the dissolved oil constituents, and very little with the dispersant itself. ✓ Dispersants reduce the duration and concentration of oil exposure to water column resources. ✓ No compelling evidence that oil dispersed with Corexit 9500 or Corexit 9527 is more toxic than physically dispersed oil. ✓ Only 9% of the designated critical habitat for green sturgeon falls within the pre-authorization zone, and any application of dispersant will only result in temporary water quality impacts on the scale of minutes to hours. ✓ Salmonids migrating from the ocean to natal streams for reproduction are unlikely to be deterred by dispersant or dispersed oil, or perhaps even undispersed oil, unless it is at higher concentrations than typically found in the ocean post-dispersion. <hr/> <p>Prey base</p> <ul style="list-style-type: none"> • Dispersants will increase the mass of PAHs and other hydrocarbons in the water column up to 10-20m deep for a few hours and could be a concern for fish prey species. <p><u>Mitigating factors:</u></p> <ul style="list-style-type: none"> ✓ None of the prey of the listed species are expected to be exposed or impacted at concentrations of concern. 	<p>The wide ranges and variable water column distribution of these species allows them to avoid exposure.</p> <p>Potential direct toxicological effects are insignificant.</p> <p>Potential indirect effects to prey bases were insignificant and there are no potential interrelated or interdependent effects.</p> <p>Dispersant use in Pre-Authorization Zone may affect, but not likely to adversely affect (NLAA) adults of these fish species.</p>
Invertebrates Black abalone White abalone	<p>Black abalone</p> <ul style="list-style-type: none"> • Live and spawn only in intertidal and shallow subtidal zones. <p><u>Mitigating factors:</u></p> <ul style="list-style-type: none"> ✓ 3+ nautical miles between the pre-authorization zone and black abalone (and their designated critical habitat). <hr/> <p>White abalone</p> <ul style="list-style-type: none"> • Historically found within the pre-authorization zone in depths between 5-60m, but overharvesting has resulted in remnant populations between 30-60m depth. • Larvae within the upper water column in the pre-authorization zone could be impacted. <p><u>Mitigating factors:</u></p> <ul style="list-style-type: none"> ✓ White abalone habitat (open low relief rocky reefs and boulders) is patchy and therefore so is their areal as well as depth distribution. ✓ Temperature and density gradients generally limit dispersed oil distribution to the upper 10-20 m of the water column. White abalone larvae will likely be below this depth during their 3-10 day larval stage and unlikely to be unexposed to high concentrations of dispersed oil. 	<p>Dispersant use in Pre-Authorization Zone not likely to adversely affect (NLAA) black or white abalone populations.</p>

National Marine Fisheries Service (NMFS), continued		
Species/habitats reviewed	Exposure routes and risk threats	Determination
Essential Fish Habitat (EFH)	<ul style="list-style-type: none"> NMFS determined the proposed action could adversely affect EFH by temporarily increasing the concentration of total petroleum hydrocarbons and PAHs in the upper water column, potentially leading to increased toxicity to some zooplankton and larval life stages of fish that are a component of EFH. EFH habitats of particular concern, such as estuaries, submerged aquatic vegetation and shallow rocky reefs are often found in nearshore and intertidal areas. <p><u>Mitigating factors:</u></p> <ul style="list-style-type: none"> Impacts are expected to be brief due to rapid dilution and confined to the upper 10-20 m of the water column, leaving a large portion of the photic zone unaffected. Zooplankton will rapidly recolonize an impacted area. Toxicity may be lessened due to a decrease in bioavailability to some EFH prey resources. Dispersing an offshore oil slick may prevent longer term impacts both from surface water exposures and migration of a surface slick into shallow or intertidal waters and the shoreline. The potential adverse effects to EFH from the application of the four types of dispersants authorized under the Dispersant Use Plan are expected to be temporary in nature and the applications may result in prevention of longer term and more widespread impacts. 	<p>The NMFS is not providing EFH recommendations as part of this concurrence.</p> <p>The USCG 11th District and US EPA Region IX must reinitiate EFH consultation with NMFS if the proposed action is substantially revised in a way that may adversely affect EFH, or if new information becomes available that affects the basis for the NMFS EFH conservation recommendations.</p>

ii. US Fish and Wildlife Service (USFWS)

US Fish and Wildlife Service (USFWS)		
Species/habitats reviewed	Exposure routes and risk threats	Determination
Mammals Southern sea otter Salt marsh harvest mouse	<ul style="list-style-type: none"> Southern sea otters potentially at high risk of thermoregulatory compromise and death if surface oil slicks travel toward shore within the otter range. <p><u>Mitigating factors:</u></p> <ul style="list-style-type: none"> High dispersant concentration not used in actual oil spill applications. Southern sea otter may occasionally occur in low numbers in federal waters, but majority of population not within the Pre-Authorization Zone. Offshore application of dispersant expected to force oil into the water column to facilitate biodegradation versus remaining as a floating product and compromising sensitive species at the water surface and closer to shore. Salt marsh harvest mouse not in Pre-Authorization Zone. 	<p>Dispersant use in Pre-Authorization Zone not likely to adversely affect (NLAA) these listed species.</p> <p>Use stipulated seasonal Best Management Practice (BMP) for marbled murrelet.</p>
Birds Marbled murrelet Western snowy plover Short-tailed albatross Light-footed clapper rail California clapper rail California least tern	<ul style="list-style-type: none"> Contact of free dispersant with bird plumage may affect thermoregulation. Contact of oil with bird plumage will affect thermoregulation. <p><u>Mitigating factors:</u></p> <ul style="list-style-type: none"> Areas without a surface oil slick will not be part of dispersant application. Birds within an oil slick will be affected and compromised, regardless of dispersant use. A 1000' no-spray buffer around flocks of birds outside of the slick being treated will protect birds from contact with "drift" spray from an aerial dispersant application. The area with 3-5 nm of shore off Del Norte, Humboldt, and Mendocino counties, is not part of the Pre-Authorization Zone during the marbled murrelet breeding season. It instead becomes part of the Incident-Specific Authorization Zone. 	
Fish Tidewater goby Unarmored threespine stickleback Delta smelt	<ul style="list-style-type: none"> No occurrence of these species within the Pre-Authorization Zone. 	
Plants Salt marsh bird's beak Gambel's watercress	<ul style="list-style-type: none"> No occurrence of these species within the Pre-Authorization Zone. 	