There are no data available on the effects of oil on manatees. Manatees are very similar to whales in that they are nearly hairless and have thick layers of blubber; therefore, no effects on thermoinsulation would be expected. Manatees live in relatively quiet, sheltered areas and feed on submerged and floating aquatic vegetation. Floating, oiled vegetation may be a possible source of exposure by ingestion. Manatees must come to the surface to breathe and may experience the same kind of eye tissue inflammation seen in seals.

RESPONSE ACTIONS

Marine mammals pose very special and complex spill response problems, both in protection and cleanup. Primary response strategies should concentrate on controlling the release and spread of spilled oil at the source, using either mechanical methods or chemical dispersants (where approved). These are intended to prevent or reduce contamination of marine mammal habitats.

Containment of spills in the open ocean is very difficult and frequently impossible. Chemical dispersants may be more useful because they can be applied over large areas in a relatively short period of time and, therefore, may be more effective in preventing or reducing contamination of critical habitats.

Management of marine mammals during oil spills falls under the jurisdiction of the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, and designated state agencies. Any and all response activities in areas populated by marine mammals must be coordinated with these agencies.

For more informational pamphlets concerning various subjects go to the RRT IV Web Site at www.nrt.org

Oil or Chemical Spill Notification

call the National Response Center at
800-424-8802

Oil Spill Response

in the Region IV Coastal Zone, contact the U.S. Coast Guard Marine Safety Office (MSO):

MSO Wilmington, NC
910-792-8408

MSO Charleston, SC
843-724-7616

MSO Savannah, GA
912-652-4353

MSO Jacksonville, FL
904-247-7310

MSO Miami, FL
305-732-0160

MSO Tampa, FL
813-228-2189

MSO Mobile, AL
334-441-5121

In the Region IV Inland Zone, contact the U.S. Environmental Protection Agency:
404-562-8700

Inland Zone U.S. Coast Guard Offices are:

MSO Huntington, WV
800-253-7465

MSO Louisville, KY
800-253-7465

MSO Paducah, KY
502-442-1621

MSO Memphis, TN
901-544-3912

State Pollution Response Contacts are:

North Carolina
919-733-3867

South Carolina
Spill: 888-481-0125
Office: 803-896-4000

Georgia
404-656-4300

Florida
850-413-9911

Alabama
334-242-4378

Mississippi
601-352-9100

Tennessee
800-258-3300

Kentucky
800-928-2380

What are the Effects of Oil on Marine Mammals?

Document prepared by:
Region IV
Regional Response Team

RRT IV Co-Chairs:
U.S. Coast Guard 305-536-5651
U.S. EPA 404-562-8721

INTRODUCTION

Marine mammals are a highly diverse group that includes whales, dolphins, seals, sea lions, walruses, sea otters, manatees, and polar bears. The National Oceanic and Atmospheric Administration (NOAA) is vested with trusteeship responsibilities over these organisms under the Marine Mammal Protection Act, the Endangered Species Act, and the National Contingency Plan. As the sole trustee or co-trustee, NOAA is authorized to manage or protect marine mammals during oil and hazardous materials spills.

OVERVIEW

Marine mammals spend most or all of their lives in the ocean and have a number of behavioral, anatomical, and physiological adaptations that enable them to live in the ocean. One of the most important adaptations in relation to oil spill response is the various mechanisms used to control body temperature. The ability to maintain normal body temperatures while immersed in relatively cool water is possibly the greatest single factor affecting the survival of individual marine mammals (besides, of course, the basic requirements of respiration, feeding, and other factors without which life is impossible). Observations at oil spills and results of various laboratory experiments have indicated that interference with thermoinsulation caused by physical exposure to oil appears to be the primary mechanism of stress and mortality in many warm-blooded aquatic organisms, including certain marine mammal species.

A second important consideration in oil spill impacts is the consequence of ingestion of oil. Crude and refined oils contain a broad range of petroleum hydrocarbons, many of which are highly toxic or carcinogenic. Ingestion of these chemicals during feeding or grooming may have both lethal and sublethal effects on marine mammals.
Oil spills also have been found to have an irritant effect on exposed membranes, especially the eyes. While these effects may not be directly fatal, they may affect the long-term ability of certain species to survive in the marine environment.

WHALES AND DOLPHINS

Whales and dolphins are believed to be relatively insensitive to spilled oil. They rely entirely on thick layers of blubber and skin for thermoinsulation. The insulative properties of blubber and skin are not affected by exposure to oil; therefore, whales and dolphins exposed to oil slicks would not experience any drop in body temperature.

The feeding behavior of whales and dolphins may be divided into two categories. Toothed whales and dolphins capture individual prey using toothed jaws; most of their prey is captured below the water surface, so there is very little likelihood for direct ingestion of floating oil during feeding. Baleen whales, in contrast, must engulf large parcels of water and then filter out the small fish and crustaceans that form the bulk of their diet. The baleen plates in the mouth allow water to pass through while retaining solid particles. Baleen whales frequently feed at or near the surface, so floating oil may coat the baleen or be engulfed during feeding. Laboratory experiments have found that crude and refined oils cause a significant, but temporary, loss in filtering ability of baleen.

The effects of ingestion of oil by whales and dolphins are unknown. There is evidence of accumulation of petroleum hydrocarbons by toothed and baleen whales, but here are no data on any lethal or sublethal effects of either ingestion or accumulation in tissues. There are also few data on the effects of direct contact of oil on sensitive tissues. Direct long-term exposure of gasoline on dolphin skin produces mild, transient damage; effects on eye or nasal membranes are unknown. However, captive dolphins are known to actively avoid floating oil, so it is unlikely that direct exposure to oil would be tolerated for significant lengths of time.

MANATEES

The West Indian manatee is a medium-sized herbivore found primarily in the southeastern United States and in the western Caribbean Sea. In the United States, it is most abundant in south

Florida but has been found in Alabama, Georgia, Louisiana, Mississippi, South Carolina, and Texas. Manatees live in rivers, estuaries, and coastal areas where there are suitable food and fresh water available.