

BP Oil Spill Deepwater Horizon Response: NIOSH Health Hazard Evaluation of Wildlife Cleaning and Rehabilitation Workers

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Abstract: In June and July 2010, the National Institute for Occupational Safety and Health (NIOSH) evaluated potential exposures and health effects of workers involved in Deepwater Horizon response activities due to the BP oil spill. The evaluation included on-shore wildlife cleaning and rehabilitation workers in AL, FL, LA, and MS. NIOSH investigators assessed site factors and surveyed workers to collect information on demographics, job duties, occupational exposure to oil or other agents, and health symptoms experienced. Birds were the most common type of wildlife being treated and rehabilitated at the centers. For nearly all health outcomes, more injuries and symptoms were reported among wildlife cleaning workers than among a comparison group. Among the most commonly reported health conditions, scrapes and cuts were reported by 67 percent of workers, and itchy or red skin or rash were reported by 46 percent. Occupational factors unique to oiled wildlife cleaning and rehabilitation likely contributed to the health conditions reported. These factors included: skin contact with oil on the wildlife and in cleaning water; skin exposure to detergents and cleaners; persistent wet skin; and, frequent handling and awkward lifting and moving of wildlife and cages. An occupational health concern common among all Deepwater Horizon response workers was heat stress from work in a hot and humid environment. NIOSH recommended continuing heat stress management plans and use of protective equipment to minimize skin and mucus membrane contact with oil and oil-contaminated water, measures to reduce ergonomic hazards, housekeeping to prevent slippery surfaces, and encouraging workers to report and seek care for health concerns and injuries.

Key words: wildlife, oil spill, NIOSH, NIOSH-HHE, health hazard, safety

INTRODUCTION

On 28 May 2010, the National Institute for Occupational Safety and Health (NIOSH) received a request from BP for a health hazard evaluation (HHE) to evaluate potential exposures and health effects among workers involved in Deepwater Horizon Oil Spill Response activities. In June and July 2010, investigators made multiple site visits to on-shore worksites

in Alabama (AL), Florida (FL), Louisiana (LA), and Mississippi (MS). The work sites evaluated included shore clean-up, wildlife cleaning and rehabilitation, equipment decontamination, and waste management areas. This article presents the findings of NIOSH's evaluations of wildlife cleaning and rehabilitation workers and includes the NIOSH interim recommendations.

METHODS

NIOSH's teams of investigators were based out of the command centers in Mobile, AL, and Houma, LA. Investigators visited each of the known wildlife treatment centers, including two in LA (Fort Jackson and Grand Isle) and one each in AL (Theodore), FL (Pensacola), and MS (Gulfport). One investigator from each team focused on exposure assessment and site characterization, and the other individual focused on assessing health symptoms among the workers at the site. Site factors also were assessed related to potential exposures and occupational hazards, and a structured exposure assessment checklist was used at four of the five sites to aid in investigator assessment.

NIOSH asked many of the workers at the sites visited to complete a health symptom survey. However, access to the workers and the workers' activity level on the days of visits varied considerably between sites. The one-page surveys were self-administered and included questions related to demographic information, job duties, exposure to oil or other substances, symptoms experienced during the response efforts, and other health-related topics. NIOSH investigators also provided the health symptom survey to 103 workers at the Venice, LA, Field Operations Branch and the Venice Commanders' Camp, where workers reported they had not worked on boats and had not been exposed to oil, dispersant, cleaner, or other chemicals (the comparison group).

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NIOSH

The National Institute for Occupational Safety and Health (NIOSH), in the Centers for Disease Control and Prevention (CDC), conducts research and makes recommendations for the prevention of work-related injury and illness. The NIOSH health hazard evaluation (HHE) program is available for employees, employers, or union representatives to ask NIOSH experts for an investigation of health and safety concerns. NIOSH's team contacts the requestor and discusses the problems and how to solve them. This may result in sending the requestor information, referring them to a more appropriate agency, or making a site visit (which may include environmental sampling and medical testing). If NIOSH makes a site visit, they provide a report that includes specific recommendations and general guidance for following good occupational health practices. NIOSH HHE reports are available online (see Resources).

RESULTS

Site Descriptions and Process. The oiled wildlife cleaning and rehabilitation centers were operated by United States (US) and State government organizations in cooperation with non-governmental organizations (NGO). Workers included government employees, employees of NGOs, and university students and faculty.

The type and extent of work on the days of NIOSH's evaluation varied between the sites. For example, the primary function of one site was wildlife stabilization (in Grand Isle, LA) for transfer to another site for cleaning (in Fort Jackson, LA).

Birds were the most common type of wildlife being cleaned and rehabilitated. In most cases, the process was as follows: search and retrieval (sometimes using boats), baseline health assessment at the worksite, stabilization (rehydration and feeding if necessary over a period of 48 to 96 hours), cleaning (usually with vegetable oil-derived compounds as a pre-treatment, followed by detergent baths in several tubs and a water rinse), and post-cleaning placement in a drying area, then in indoor and outdoor pens for rehabilitation while awaiting transport to the release points. Workers were encouraged to handle animals properly, both for wildlife and worker safety. Individuals worked in pairs or in teams of three for larger birds. Some worksites had adjustable-height work tables to aid in handling the various types of wildlife. In addition to cleaning wildlife, workers constructed holding pens and cleaned these frequently using agents such as bleach. Veterinary equipment was disinfected with chlorhexidine or Virkon[®]S (potassium peroxomonosulfate, sodium dodecylbenzenesul-

phonate, and sulfamic acid, Dupont Animal Health Services, Wilmington, DE).

Exposure Characterization. NIOSH investigators observed that wildlife cleaning and rehabilitation involved repeated and prolonged skin contact with water, which varied from 'oily' to 'clean' as the animals went through the cleaning process. Personal protective equipment (PPE), including safety glasses, gloves and sleeve protectors, protective clothing such as Tyvek[®] (DuPont, Richmond, VA) suits, other protective coveralls and plastic aprons, and rubber boots, was worn routinely. Workers wore face shields when handling highly contaminated birds or if water was expected to spray from the cleaning activities. Respirators were not routinely worn. Workers who handled oily animals prior to cleaning had some potential for direct skin exposure to oil, but exposure was minimal when PPE was worn.

All sites were concerned about heat stress and took actions to prevent this in workers. At shore cleaning sites evaluated by NIOSH, the mean temperature was 88 degrees Fahrenheit (°F) (31°C) (range: 82–95 °F) (28–35°C), the mean relative humidity was 69 percent (range: 52–88 percent), and the heat index based on mean values was 101°F (38°C) (range: 87–134 °F) (31–57°C). One site required a 20-minute rest break in an air-conditioned area after every 40 minutes of work. Other sites required frequent rest breaks, encouraged fluid replacement, and observed the workers for signs of heat-related illness. Large fans were present in several work areas to help circulate air.

Ergonomic and safety risks were present at all sites. Handling wildlife, cages (with and without

animals inside), and other equipment required awkward and occasionally forceful lifting. Work areas were usually wet from wildlife cleaning, presenting risks for slips and falls.

Worker Reported Symptoms. Fifty-four persons at the wildlife treatment worksites completed the health symptom survey; the total numbers of workers at those sites at the time of the NIOSH visits is uncertain, but was estimated to be 113 (leading to a 48% participation in the survey). NIOSH's health symptom survey showed wildlife cleaning and rehabilitation workers more often reported most of the health outcomes and symptoms than did the comparison group.

Although the comparison group also reported the following symptoms, the symptoms were reported more frequently among wildlife cleaning and rehabilitation workers, as follows: scrapes and cuts (67%); itchy or red skin or rash (46%); hand, shoulder, or back pain (39%); headache (35%); and, feeling faint, dizzy, or fatigued (35%). The survey included questions potentially related to heat stress symptoms (headache, dizziness, feeling faint, fatigue or exhaustion, weakness, fast heart beat, nausea, red skin, or hot and dry skin); 76 percent of survey participants reported at least one of these symptoms. However, NIOSH considered reporting four or more of the heat stress symptoms to be a more specific indicator of heat stress; only 11 percent of survey participants reported four or more of these symptoms.

DISCUSSION AND CONCLUSIONS

Wildlife cleaning and rehabilitation workers were selected for evaluation due to the unique nature of their work. Although all five work sites NIOSH visited had effective programs for reducing potential occupational hazards in wildlife cleaning and rehabilitation work, more injuries and symptoms were reported among workers performing this work than in the comparison group. This is not surprising given the strenuous work being performed over long work shifts in hot outdoor conditions. It is not possible to determine the exact cause for all of the health outcomes reported in NIOSH's survey, since there were many possible factors involved (occupational and non-occupational).

Several occupational factors unique to wildlife cleaning and rehabilitation centers likely contributed to the symptoms reported by the surveyed workers. NIOSH investigators observed the potential for skin contact with oil and oil-contaminated water, possible skin exposure to detergents and other cleaning compounds, and persistent wet skin. Bruises, scrapes, and cuts were likely in part related to handling and

cleaning wildlife (birds most commonly) and animal equipment (such as cages or pens). Standing for many hours on cement floors along with handling and moving cages with birds or other wildlife inside also potentially contributed to reporting of musculoskeletal symptoms (such as hand, shoulder, or back pain). Lastly, wildlife cleaning and rehabilitation workers, like other emergency response workers, were at risk for psychosocial stressors from specific aspects of their work and from other circumstances more generally related to the emergency response. Such stressors might include the untimely death or injury of oil-covered wildlife, working long hours on response-related activities, and the impact of the oil release on fishing communities and the environment.

Recommendations. The recommendations NIOSH provided to the centers evaluated were safety guidelines that were already in place prior to the NIOSH visits. These recommendations also are applicable to many other oiled wildlife cleaning and rehabilitation situations. The following recommendations may minimize potential health hazards when cleaning and rehabilitating wildlife:

In situations in which heat stress may be a factor, wildlife cleaning sites should follow appropriate heat stress management plans.

Use PPE to minimize skin and mucous membrane exposure to oil and oil-contaminated water (or other hazardous substances): eye and face protection (safety glasses, safety goggles, or face shields depending on the splash potential), coveralls, non-slip footwear, and appropriate gloves.

Reduce ergonomic hazards to minimize potential for musculoskeletal disorders (injuries). Use more people for awkward heavy lifting tasks, establish work rotation schedules, and provide appropriate equipment or tools, such as kneeling supports/pads and adjustable-height work tables.

Follow good housekeeping practices to minimize slippery walking or standing surfaces.

Encourage reporting of health concerns or injuries to supervisors or on-site safety representatives, and seek medical care if needed.

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RESOURCES

NIOSH Interim Report Concerning Wildlife Cleaning and Rehabilitation Workers: <http://www.cdc.gov/niosh/hhe/pdfs/interim_report_5.pdf>.

NIOSH Interim Report Concerning Shore-cleaning Workers: <http://www.cdc.gov/niosh/hhe/pdfs/interim_report_7.pdf>.

NIOSH Recommendations for Protecting Response Workers at Wildlife Cleaning and Rehabilitation Centers Responding to the Oil Spill: <<http://www.cdc.gov/niosh/topics/oilspillresponse/protecting/>>.

NIOSH Ergonomics and Musculoskeletal Disorders: <<http://www.cdc.gov/niosh/topics/ergonomics/>>.

NIOSH HHE Reports: <<http://www.cdc.gov/niosh/hhe/default.html>>. (WR)

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