

# Health Hazard Evaluation of Deepwater Horizon Response Workers

Doug Trout and Christine West



Health Hazard Evaluation Interim Report 5  
August 26, 2010



Interim report reissued December 2012: front and back covers, lead and contributing authors, and acknowledgments were added to the original interim report.

The cover photo shows pelicans housed in a temporary holding area during the wildlife cleaning and rehabilitation efforts taking place as part of the Deepwater Horizon response in the Gulf of Mexico: June 2010.



National Institute for Occupational  
Safety and Health  
Robert A. Taft Laboratories  
4676 Columbia Parkway  
Cincinnati OH 45226-1998

26 August 2010

HETA 2010-0129

Fred Tremmel  
Deepwater Horizon ICP  
1597 Highway 311  
Houma, LA 70395

Dear Mr. Tremmel:

On May 28, 2010, the National Institute for Occupational Safety and Health (NIOSH) received a request from BP for a health hazard evaluation (HHE). The request asked NIOSH to evaluate potential exposures and health effects among workers involved in Deepwater Horizon Response activities. NIOSH sent an initial team of HHE investigators on June 2, 2010, to begin the assessment of off-shore activities. To date, more than three dozen HHE investigators have been on-scene.

This letter is the fifth in a series of interim reports. As this information is cleared for posting, we will make it available on the NIOSH website ([www.cdc.gov/niosh/hhe](http://www.cdc.gov/niosh/hhe)). When all field activity and data analyses are complete we will compile the interim reports into a final report.

This report (Interim Report #5) provides background, describes methods, reports findings, and provide conclusions and, where appropriate, interim recommendations for our evaluation of wildlife cleaning and rehabilitation workers. This evaluation took place in Alabama, Florida, Louisiana, and Mississippi in June and July 2010.

Thank you for your cooperation with this evaluation. If you have any questions, please do not hesitate to contact me at 513.841.4382 or [atepper@cdc.gov](mailto:atepper@cdc.gov).

Sincerely yours,



Allison Tepper, PhD

Chief

Hazard Evaluations and Technical

Assistance Branch

Division of Surveillance, Hazard

Evaluations and Field Studies

1 Enclosures

cc:

Mr. David Dutton, BP

Dr. Richard Heron, BP

Dr. Kevin O'Shea, BP

Ms. Cindy Coe, OSHA

Dr. Raoul Ratard, LA DHHS

Dr. Charles Woernle, AL DPH

Dr. Richard Hopkins, FL DOH

Dr. Mary Currier, MS SDOH

Mr. Brock Lamont, CDC

## **Interim Report #5**

### **Evaluation of Wildlife Cleaning and Rehabilitation Workers; Alabama, Florida, Louisiana, and Mississippi, June and July 2010**

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**Lead Authors: Doug Trout and Christine West**

**Contributing Authors: Walter Alarcon, Randy Boylstein, Geoff Calvert, Brian Curwin, Rick Driscoll, Alberto Garcia, John Gibbins, Barbara Grejewski, Ron Hall, Greg Kinnes, Jennifer Lincoln, Ken Martinez, Mark Methner, Charles Mueller, Eileen Storey, and Hope Tiesman**

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#### **Introduction**

In June and July 2010, NIOSH investigators made multiple site visits to on-shore worksites where Deepwater Horizon response activities were occurring. The broad categories of worksites evaluated included (1) shore clean-up; (2) wildlife cleaning and rehabilitation; and (3) equipment decontamination and waste management. This report presents the findings of the evaluations of wildlife cleaning and rehabilitation centers.

#### **Methods**

NIOSH investigators were organized in teams, with one investigator typically focused on exposure assessment and site characterization and the other focused on assessing health symptoms among the workers at the site. The NIOSH teams were based out of the command centers in Mobile, Alabama, and Houma, Louisiana. Each of the known wildlife cleaning centers were visited during this health hazard evaluation and included two in Louisiana (Fort Jackson and Grand Isle) and one each in Alabama (Theodore), Florida (Pensacola), and Mississippi (Gulfport). NIOSH investigators assessed site factors related to potential exposures and occupational hazards; at four of the five sites a structured exposure assessment checklist was used to aid in that assessment.

NIOSH investigators asked workers at the sites to complete a health symptom survey. The surveys were offered to all workers at the visited sites. However, NIOSH investigator access to the workers and activity level on the days of the site visits varied considerably between sites. The one-page health symptom surveys included questions related to demographic information, job duties, exposure to oil or other substances, symptoms experienced over the course of the response efforts, and other health-related topics. The health symptom surveys were self-administered and collected by NIOSH investigators. The results from the five wildlife cleaning and rehabilitation centers are presented in this report and compared to the findings of the same survey administered to workers at the Venice, Louisiana, Field Operations Branch and the Venice Commanders' Camp. The workers at the Venice site all reported that they had not worked on boats and had no exposures to oil, dispersant, cleaner, or other chemicals.

## Results

### *Process and Site Descriptions*

The wildlife cleaning and rehabilitation centers were operated and coordinated by a combination of U.S. and State government organizations along with non-governmental organizations. The types and extent of wildlife cleaning and rehabilitation and the level of work on the days of the evaluation varied between the sites. For example, one site (Grand Isle, Louisiana) was a wildlife stabilization center; the primary function at that site was to stabilize wildlife for transfer to the Ft. Jackson, Louisiana, wildlife cleaning center. Workers at the centers included government employees, employees of non-governmental organizations, university students and faculty, and volunteers. Veterinarians were among the professionals working at all the centers.

Birds were the most common type of wildlife being cleaned and rehabilitated at the centers. A summary of the cleaning and rehabilitation process for most birds is as follows:

- search and retrieval, sometimes using boats;
- baseline health assessment of the birds when brought to the worksites;
- stabilization, including rehydration and feeding if needed;
- a series of cleaning steps that usually included the use of compounds derived from vegetable oils as pretreatment, followed by cleaning with repeated detergent and water rinses; and
- post-cleaning placement in a drying area, followed by placement in holding pens for rehabilitation while awaiting transport.

During wildlife rehabilitation activities, emphasis was placed on proper animal handling, both for wildlife and worker safety. Workers commonly worked in pairs (or teams of three for larger birds). Some of the worksites had adjustable-height work tables to aid the workers' handling of various types of wildlife. A number of other work tasks were performed at these sites to support the primary task of wildlife cleaning. For example, holding pens and other equipment were constructed and after use required frequent cleaning; cleaning agents included sodium hypochlorite (bleach). Veterinary equipment used at the sites was sterilized with agents including chlorhexidine.

### *Exposure Characterization*

The task of wildlife cleaning and rehabilitation was observed to present considerable opportunity for repeated and prolonged skin contact with water used in washing and rinsing the animals. This water varied from "oily" to "clean" as the animals went through the cleaning process. Routine use of personal protective equipment (PPE) included safety glasses, gloves and sleeve protectors, protective clothing such as Tyvek<sup>®</sup> suits, other protective coveralls and plastic aprons, and rubber boots. Face shields were available and used when handling highly contaminated birds or in circumstances when increased water spray (from the cleaning activities) was expected. Workers handling the wildlife prior to cleaning had some potential for direct skin exposure to the oil on the animal; with PPE use this exposure was observed to be minimal in most cases. Respiratory protection was not routinely used.

All sites were aware of concerns about and taking actions to prevent heat stress in workers. One of the facilities had a formal work-rest schedule in place (40 minutes work followed by 20 minutes off with access to an air-conditioned area). Other facilities managed potential heat stress in workers by requiring frequent rest breaks, encouraging fluid replacement, and observing workers for signs of heat-related illness. Large fans were present in several work areas to help circulate air.

All sites had ergonomic and safety risks. Handling of the wildlife, cages (with and without animals inside), and other equipment required awkward and occasionally forceful lifting tasks. Work areas usually were wet from water splashed or sprayed during the wildlife cleaning activities, presenting risks for slips and falls.

### *Reported Symptoms*

Fifty-four persons at the wildlife cleaning 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). The participating workers included those at the centers at the time of our evaluation. Workers in the field, who might have been actively conducting wildlife search and retrieval, were not necessarily included among our participants. A summary of demographic information is presented in Table 1.

Injuries and symptoms reported in the health symptom survey are presented in Table 2. This table includes injuries and symptoms for workers at the wildlife cleaning sites and those from the comparison group of workers recruited at the Venice, Louisiana, site.

Most of the health outcomes and symptoms included in the survey were more prevalent in the wildlife cleaning workers than the comparison group. Among the wildlife cleaning workers, scrapes and cuts were reported by two-thirds, itchy or red skin or rash were reported by nearly one-half, and symptoms of headache or feeling faint, dizzy, or fatigued were both reported in more than one-third. Hand, shoulder, or back pain was reported by 39% of the wildlife cleaning workers.

Questions potentially related to heat stress symptoms were included in the questionnaire. One or more of nine non-specific symptoms (see Table 2) that could be related to heat stress was reported by 76% of the participants. NIOSH investigators considered the presence of four or more of the following symptoms as a more specific indicator of heat stress: headache, dizziness, feeling faint, fatigue or exhaustion, weakness, fast heart beat, nausea, red skin, or hot and dry skin. Only 11% of participants reported having four or more of these symptoms.

## **Discussion**

Wildlife cleaning and rehabilitation workers were selected for evaluation due to the unique nature of their work. These workers, however, also have occupational health concerns in this response common to other on-shore response workers. The five work sites visited for this evaluation all had effective programs to reduce potential occupational hazards in wildlife cleaning work. Nevertheless, for nearly all health outcomes, more injuries and symptoms were reported among workers performing wildlife cleaning than among the comparison group. This is not surprising given the strenuous work being performed in hot outdoor conditions. A specific etiology for the various injuries and symptoms is not possible to determine from this evaluation. The health outcomes included in the survey are likely multifactorial in origin, including both occupational and non-occupational factors.

Several occupational factors unique to wildlife cleaning and rehabilitating centers likely contribute to the symptoms reported by the surveyed workers. The NIOSH investigators observed the potential for skin contact with oil both directly from the contaminated wildlife and from oil-contaminated water generated during the cleaning process; other skin exposures contributing to the reported skin symptoms could include exposure to the detergents and other compounds used when cleaning and caring for the

wildlife, and persistent wetness of the skin over periods of hours during the cleaning procedures. Scrapes and cuts reported among workers performing wildlife cleaning were likely in part related to the close and repeated handling of the wildlife (birds most commonly), as well as handling and caring for equipment (such as cages or pens). Work tasks such as handling and moving cages with birds or other wildlife inside are likely to lead to awkward and heavy lifting tasks, potentially contributing to the reported musculoskeletal symptoms.

Wildlife cleaning and rehabilitation workers are also exposed to potential occupational hazards that are similar to those experienced by other Deepwater Horizon response workers. High temperatures at the worksites and physically demanding work often requiring use of PPE will contribute to the potential for heat-related symptoms among these workers.

This evaluation found that 20% of participants reported one or more of five psychosocial symptoms (see Table 2). All Deepwater Horizon response workers may experience psychosocial stressors in the course of their response work. Deepwater Horizon response workers performing wildlife decontamination activities are at risk of psychosocial stressors from specific aspects of their work (such as untimely death or injury of oil-covered wildlife) or from other circumstances more generally related to the oil spill (such as the impact on the fishing communities and the environment).

## **Recommendations**

Recommendations provided for this evaluation of wildlife cleaning and rehabilitation centers are noted below:

1. Wildlife cleaning sites should continue to follow heat stress management plans to minimize the risk of heat-related disorders in response workers. As a part of this plan, close supervisory observation of workers with potential for heat-related illness should be continued, with formal work/rest cycles used as needed and determined on a case-by-case basis.
2. Because of the potential for skin contact with oil and oil-contaminated water, the protective steps observed during this evaluation to minimize skin and mucus membrane exposures should be continued as the wildlife cleaning work continues. This includes using eye and face protection (safety glasses, safety goggles, or face shields depending on the splash potential), coveralls, non-slip footwear, and appropriate gloves.
3. Wildlife cleaning centers should continue efforts to minimize the potential for musculoskeletal disorders from work activities involving awkward lifting positions and heavy lifting tasks. Such steps generally would include providing adequate staffing for work tasks (allowing, for example, adequate staffing for heavy objects to be handled or lifted with two or more persons), using work rotation schedules, and providing appropriate equipment or tools such as kneeling supports/pads and use of adjustable-height work tables. Many of these protective measures were being used at the sites at the times of our site visits. Additional information on methods to reduce ergonomic hazards can be found on the NIOSH website at <http://www.cdc.gov/niosh/topics/ergonomics/>.
4. Wildlife cleaning and rehabilitation centers should be diligent in maintaining housekeeping practices such that the presence of slippery walking or standing surfaces is minimized.

5. Workers should continue to be encouraged to report health concerns or injuries to their supervisor or on-site safety representatives, and seek care through established on-site medical facilities or other healthcare providers as appropriate.

NIOSH and the Occupational Safety and Health Administration have released an interim document (“Interim Guidance for Protecting Deepwater Horizon Response Workers and Volunteers”) that provides guidance on protecting response workers, including more detailed information on the recommendations noted above. Those responsible for wildlife cleaning and rehabilitation centers should consult this document for recommendations to help minimize occupational health problems at their facilities. The document is available on the NIOSH website at <http://www.cdc.gov/niosh/topics/oilspillresponse/protecting/>.

### **Acknowledgments**

Logistical support was provided by Donald Booher and Karl Feldmann. Other project support was provided by Patty Laber.

<b>Table 1. Health symptom survey—demographics by group</b>		
	<b>Wildlife Cleaning</b>	<b>Unexposed*</b>
Number of participants	54	103
Age range	19–64	18–70
Race		
White	87%	40%
Hispanic	2%	29%
Asian	0%	9%
Black	9%	19%
Other	2%	3%
Male	44%	96%
Days worked oil spill	1–84	0–45
*Participants were recruited from the Venice Field Operations Branch and the Venice Commanders' Camp. Those who reported that they had not worked on boats and had no exposures to oil, dispersant, cleaner, or other chemicals were included in this group.		

**Table 2. Health symptom survey—reported injuries and symptoms by group**

	<b>Wildlife Cleaning</b>	<b>Unexposed*</b>
Number (%) of participants	54	103
<b>Injuries</b>		
Scrapes or cuts	36 (67%)	11 (11%)
Burns by fire	0	1 (1%)
Chemical burns	1 (2%)	0
Bad Sunburn	0	8 (8%)
<b>Constitutional &amp; respiratory symptoms</b>		
Headaches	19 (35%)	5 (14%)
Feeling faint, dizziness, fatigue or exhaustion, or weakness	19 (35%)	13 (13%)
Itchy eyes	7 (13%)	5 (5%)
Nose irritation, sinus problems, or sore throat	15 (28%)	16 (16%)
Metallic taste	0	0
Coughing	5 (9%)	8 (8%)
Trouble breathing, short of breath, chest tightness, wheezing	2 (4%)	4 (4%)
<b>Cardiovascular &amp; gastrointestinal symptoms</b>		
Fast heart beat	1 (2%)	1 (1%)
Chest pressure	0	0
Nausea or vomiting	5 (9%)	3 (3%)
Stomach cramps or diarrhea	3 (6%)	7 (7%)
<b>Skin &amp; musculoskeletal symptoms</b>		
Itchy skin, red skin, or rash	25 (46%)	8 (8%)
Hand, shoulder, or back pain	21 (39%)	6 (6%)
<b>Psychosocial symptoms</b>		
Feeling worried or stressed, pressured, depressed or hopeless, short tempered, or frequent changes in mood	13 (24%)	7 (7%)
<b>Heat stress symptoms†</b>		
Any	41 (76%)	21 (20%)
4 or more symptoms	6 (11%)	3 (3%)

\*Participants were recruited from the Venice Field Operations Branch and the Venice Commanders' Camp. Those who reported that they had not worked on boats and had no exposures to oil, dispersant, cleaner, or other chemicals were included in this group.

†Headache, dizziness, feeling faint, fatigue or exhaustion, weakness, fast heartbeat, nausea, red skin, or hot and dry skin.

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