

**EFFECTS OF KEEL CUSHIONS ON THE BEHAVIOR OF WESTERN GREBES
ENTERING REHABILITATION**

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Hypothesis and Objectives:

This study will quantify aberrant behaviors exhibited while birds are accoutered in several styles of keel cushions in order to compare the performance of cushion designs. The primary hypotheses are 1) that wearing a pre-fabricated design of keel cushion will alter the behavior of birds, compared to birds not wearing a keel cushion, 2) birds wearing different cushion designs will display different types of detrimental behaviors (agitation, flipping, jumping and/or hyperactivity), 3) the time budget of birds wearing prefabricated U-shaped cushion or the Vetrapp™ and towel cushion designs will differ from that of birds wearing no cushion, and 4) the time budgets of birds with no keel cushion will not differ from that of birds wearing the prefabricated parallel cushion.

Experimental Plan:

Study birds will be housed at the Los Angeles Oiled Bird Care & Education Center in San Pedro, California, in soft-sided, net-bottom pens during the study. The study will be conducted on a minimum of 10 newly admitted individual oiled Western Grebes per treatment group. All birds that have been previously placed in any sort of wrap either at International Bird Rescue or any other organization will be excluded from the study. All birds that arrive at the facility during the study period will be processed with standard intake procedures including physical examination, measuring body weight (BW), cloacal temperature, hematocrit, and total protein by refractometry. A bird will be excluded from the study if it has one or more of the following characteristics: injury with poor prognosis that necessitates immediate euthanasia, keel lesion, hematocrit < 30%, total protein < 3.0g/dL or > 6.0g/dL, or temperature < 101.5°F. Prior to being entered into the study, birds will be stabilized through fluid and nutritional therapy, which will consist of 50 % dilute Emeraid Carnivore with 15 % fish oil, fed at 50 ml/kg every 1.5 hours during operational hours, while being housed overnight in a soft sided net bottom pen with no keel cushion whatsoever. Birds that are included in the study will be placed in the assigned treatment group the following day.

Each bird will be randomly assigned to one of the four treatment groups: 1) No keel cushion, 2) Vetrapp™ and towel cushion, 3) prefabricated U shaped cushion, and 4) prefabricated parallel cushion. The same staff person will apply all keel cushions. Immediately after being fitted with a cushion, the bird will be placed in the pen and videotaped for 30 minutes undisturbed. Specific behaviors will be timed, such as jumping, flipping, labored breathing, preening, walking, and resting.

Time budgets during each study session will be assessed by quantification of minutes spent engaging in each behavior. Behaviors will be classified as detrimental or non-detrimental, and the length of time spent engaging in of each behavior will be compared among birds in different groups. Minutes each bird spends on each behavior will be summed and used to create a ratio of non-detrimental to detrimental behaviors. This ratio will be compared among treatment groups using appropriate statistical tests. The same person will time all the behaviors captured on video. Unfortunately it is not possible to blind this person to the type of keel cushion, since it will be readily apparent on the bird.

The experimental protocol will be approved by International Bird Rescue's Animal Care and Use Committee (IACUC). In the event of a petroleum product spill that requires mobilization of the

facility, the study may be temporarily suspended based on input from the Oiled Wildlife Care Network.

Significance to Oiled Wildlife Health:

Keel lesions are a continual problem when working with oiled diving birds such as Western Grebes (Phillips, et al., 2011, Tseng, 1999). This species has comprised a significant proportion of birds collected during coastal oiling events in California (Hampton, et al., 2003). As an example, during the Ventura Oiled Bird Incident in 2005 over 1000 Western and Clark’s Grebes were admitted into care. Keel cushions are routinely used during the rehabilitation of this species to prevent development or worsening of these injuries during care. During previous OWCN responses these cushions have primarily been constructed of a rolled towel with Vetrap™ used to secure the cushion to the bird (OWCN 2008). The utility of this design is highly dependent on the skill of the person applying the wrap; it is also wasteful of materials, is extremely labor intensive, and has a high failure rate. Consequently, several designs of reusable pre-manufactured wraps are currently being field tested on animals entering rehabilitation at International Bird Rescue. Previous observations have shown that each design has pros and cons, and may elicit different behavioral responses. Calm behaviors such as resting and preening are likely to improve the bird’s final outcome, whereas, behaviors such as flipping, jumping, and hyperactivity are likely to be detrimental. They may contribute to worsening of lesions or delay the progress of the animal due to wasted energetic expenditures or failure to engage in beneficial behaviors (e.g. eating). This study aims to objectively compare the behavior of birds wearing two of these reusable designs, and the older Vetrap™ and towel style cushion, with birds wearing no cushion whatsoever. The ultimate goal of the study is to identify a design that can be mass-produced and used during oil spills.

Project Duration:

October 2011: Order supplies

November 2011-April 2012: Data collection

May-September 2012: Data analysis

Presentation of data is anticipated through the National Wildlife Rehabilitation Association, Effects of Oil on Wildlife Conferences and OWCN’s Annual Rehabilitation Conference

Estimated Budget:

Staff Time for filming	\$2000
Staff Time for Video Analysis	\$1500
Staff Time for data entry/organization/analysis	\$500
Statistician consultation	\$500
Expedited transport (includes mileage and staff time to SBW and CWC, not to exceed 10 trips to each location)	\$3480
12 prefabricated donuts (\$20/each)	\$240
2 Motorola Wireless Baby Monitor Systems (video)	\$190
Miscellaneous supplies	\$300
TOTAL:	\$8,710

References Cited

Hampton S, Ford R, Carter H, Abraham C, Humple D. 2003. Chronic oiling and seabird mortality from the sunken vessel S.S. Jacob Luckenbach in central California. *Marine Ornithology* 31: 35-41.

Oiled Wildlife Care Network. Keel cushion application. Available at: <http://www.vetmed.ucdavis.edu/whc/owcnpdfs/keelcushion.swf>. Accessed July 20, 2011.

Phillips EM, Zamon JE, Nevins HM, Gobble CM, Duerr RS, Kerr LH. 2011. Summary of birds killed by a harmful algal bloom along the south Washington and north Oregon coasts during October 2009. *Northwestern Naturalist* 92: 120-126.

Tseng FS. 1999. Considerations in care for birds affected by oil spills. *Sem Avian Exotic Pet Med.* 8:21- 31.