

Life and Death: How Should We Respond to Oiled Wildlife?

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Abstract

There is ongoing public debate about the best course of action to take when wildlife are affected by oil spills. Critics of wildlife rehabilitation suggest that the cleaning and release of oiled animals is a waste of resources focused on individual animals (not populations); thus, the most responsible course of action is to immediately euthanize affected animals. These critics claim that survival of rehabilitated animals is poor, and that the funds spent on rehabilitation would benefit wildlife more if spent on other conservation efforts. In this opinion piece, with a focus on birds, we review reasons for engaging in a coordinated response to oiled wildlife that includes cleaning and rehabilitation. The reasons for responding to oiled wildlife in any capacity include ethical, human safety, and legal aspects. Our rationale for proposing that responders attempt to rehabilitate wildlife, rather than planning on immediate euthanasia, includes financial, scientific, and additional ethical reasons. Financially, costs for wildlife rehabilitation are typically a very small portion of overall oil-spill response costs, and are typically independent of postspill enforcement and funds used to restore injured natural resources. Scientifically, we review recent studies that have shown that animals cleaned and rehabilitated after oil spills can often survive as well as nonoiled control animals. Ethically, some people would consider individual animals to have intrinsic value and that we, as consumers of petroleum products, have an obligation to reduce suffering and mitigate injuries associated with such accidents. For these reasons, we suggest that, although humane euthanasia should always be considered as an option for animals unlikely to return to normal function after rehabilitation, response to oil spills should include a coordinated effort to attempt wildlife rehabilitation.

Keywords: oil Spills; seabirds; wildlife rehabilitation

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Introduction

The negative effects of oil spills on wildlife are widely recognized. In particular, aquatic birds and heavily furred mammals (e.g., sea otters *Enhydra lutris*) are highly susceptible to physiological effects of oiling, and it is generally assumed that most of these animals, if oiled

significantly, would die in the absence of human intervention (Helm et al. 2015).

The question of whether or not oiled wildlife should be rescued and rehabilitated has been raised regularly for many years, both in academic settings (Randall et al. 1980; Kerley and Erasmus 1986; Estes 1998) and in the popular media (Gauss 2010; Baker and Isabella 2016;



Nikiforuk 2016), particularly after significant or high profile oil spills such as the *Deepwater Horizon/Macondo* incident of 2010. The issue is most often presented as questioning whether effort and financial resources should be expended on individual animal rehabilitation if there is uncertainty related to how likely animals are to survive both during rehabilitation as well as after release, whether caring for commonly occurring species is “worth” the resources expended, and whether those released animals positively impact the greater population. Twenty years ago, considerable excitement was generated in the media by a published review (Sharp 1996) of survival data of oiled birds in North America. This study, based on band recoveries, found that survival of oiled and rehabilitated seabirds was very low, and the study continues to be cited as evidence that rehabilitation is not effective. However, as we discuss below, more recent studies indicate that postrelease survival of oiled wildlife is considerably better than values reported by Sharp (1996).

Despite the occasional resurgence in the media of the viewpoint that rehabilitation of oiled wildlife is a waste of time and resources, there is a clear line of reasoning to support the positive outcomes of collection and medical treatment of oiled wildlife. Here, we present this argument with a focus on oil spills in the United States; however, similar reasoning should be applicable to any location with similar laws and similar ethics. Similarly, although our discussion here is focused on seabirds (the taxa most commonly affected by oil spills), there is growing evidence, albeit primarily anecdotal at this stage, that this argument applies to many other taxa as well. However published studies on the success of rehabilitation of oiled wildlife are currently limited to birds (discussed below) and turtles (Saba and Spotila 2003).

Why Respond?

The most basic question regarding treatment of oiled wildlife is, why do we respond at all (rather than just leaving oiled wildlife to fend for themselves)? The reasons that we respond may seem self-evident, but it is worth reviewing them briefly here.

Ethical issues

While a great deal of petroleum enters the ocean from natural seeps throughout the world, most acute oil spills are caused by human-induced accidents—namely, extraction, transportation, or consumption-based activities (NRC 2003). We believe it is the ethical responsibility of humans to minimize suffering to wildlife when that suffering is caused by humans and human-related activities. Acts to minimize suffering can include prevention of anthropogenic impacts; however, if an impact does occur, intervention and appropriate veterinary care for the animal (including humane euthanasia when warranted) are necessary. In the case of anthropogenic oil spills, we propose that humans have an ethical responsibility to minimize the suffering of

affected animals, including both caring for live affected animals, if possible, and removing oiled animals from the environment to decrease the potential of other animals becoming contaminated through scavenging or predation.

Safety issues

During disasters, the public often demands that damage be repaired as completely as possible. An extremely visible aspect of this effort during oil spills is often wildlife rehabilitation. For example, during the *Cosco Busan* oil spill in 2007 in San Francisco, California, when images of oiled birds began appearing in the media, there was a massive response from the public to volunteer in rescue and rehabilitation efforts (Ziccardi et al. 2011). If members of the public believe that response to oiled animals is not adequate, they may endeavor to respond themselves without proper training. Although this desire is well meaning, self-deployment during such disasters can be dangerous to the animals as well as the people responding, and can lead to serious injuries and damaging exposure to toxic chemicals if done incorrectly. As an example, during the *Refugio* oil spill in Santa Barbara, California, in 2015, members of the public immediately self-deployed to attempt to rescue affected animals, leading to numerous cases of human oil contamination and injury (CDFW-OSPR 2016). In contrast, when authorized agencies (such as state or federal wildlife trustees and/or their approved contractors) respond in a rapid, safe, professional, and collaborative way, the general public may not feel compelled to undertake this effort on their own.

Legal issues

Significant oil spills typically garner substantial media attention, and this attention is often focused on the plight of oiled wildlife. It is difficult to separate out public opinion specific to oiled wildlife from opinions related to other effects of oil spills, but it is likely that images of oiled wildlife and resulting public outrage played a significant role in the creation of major environmental laws in the United States (Morse 2012). The 1969 Santa Barbara Channel (Platform A) oil spill is often cited as a major influence on the American environmental movement, and the U.S. National Environmental Policy Act (NEPA 1970, as amended), U.S. Federal Water Pollution Control Act Amendments of 1972 (FWPCA 1972, also known as Clean Water Act), U.S. Endangered Species Act (ESA 1973, as amended), and U.S. Marine Mammal Protection Act (MMPA 1972, as amended) were all passed soon after the spill, between 1970 and 1973. Similarly, after the *Exxon Valdez* oil spill in 1989 (and major media coverage of oiled wildlife), the U.S. Congress moved swiftly to pass the U.S. Oil Pollution Act of 1990 (OPA 1990, as amended). This act established a mandate that oil spill contingency plans must “...provide for coordinated immediate and effective protection, rescue, and rehabilitation and minimization



of risk of injury to, fish and wildlife resources and habitat...”, thus effectively mandating response to oiled wildlife in the United States.

Also in response to the *Exxon Valdez* spill, as well as the *American Trader* spill in 1990, the California legislature passed the Lempert–Keene–Seastrand Oil Spill Prevention and Response Act in 1990 (OSPRA 1990), establishing a detailed framework for oil spill response, including a mandate for the establishment of wildlife rehabilitation stations for the purpose of oiled wildlife rehabilitation. The development of these capabilities in California has since resulted in the creation of the Oiled Wildlife Care Network, which has worked to improve recovery, documentation, and veterinary protocols for the care of oiled wildlife (Newman et al. 2003). In addition to mandates related to rehabilitation of wildlife, legal documentation of oil spill effects require that impacts to wildlife be quantified, so that responsible parties can be held accountable for the appropriate costs of natural resource restoration. Collection of both live and dead oiled wildlife is an important aspect of this quantification process (Jessup 1998).

Why Not Euthanize?

Once it has been established that humans should act in response to oiled wildlife, the next question is why treatment should be attempted rather than euthanasia of all affected animals. Three arguments have generally been presented for the immediate euthanasia of oiled wildlife either before capture (e.g., gunshot) or immediately after collection (e.g., chemical or other physical means): 1) treatment of live animals is a waste of financial resources that could be better used for other wildlife conservation purposes; 2) even if treated, most animals will die either in care or quickly after release; and 3) if animals are treated, survive, and are released, they will not re-enter the breeding population, thereby displacing ecological resources from other reproductively viable animals. Before addressing these concerns, it must be understood that during any oil spill response, a portion of live animals collected will be euthanized, with the proportion dependent on animal condition, speed of recovery, availability of resources, and dynamics of the spill. Basic veterinary care dictates that humane euthanasia be carried out if an animal is unlikely to return to normal function after rehabilitation (Kirkwood and Sainsbury 1996; AVMA 2013). In addition, depending on the nature of the spill, triage may be necessary based on available resources and animals less likely to survive, or more likely to continue suffering, may be euthanized. However, the arguments related to immediate euthanasia versus attempts at rehabilitation are addressed below.

Financial consideration

The cost of cleaning and rehabilitating oiled wildlife, although not insignificant, has often been incorrectly overestimated (see Estes 1998 and response by Jessup

1998). In fact, the cost of wildlife rehabilitation is typically a very small percentage (0.01–5.9%) of the overall oil spill response cost (Massey et al. 2005). Importantly, under the oil spill response framework in the United States, funding for response to oiled wildlife does not come from the same source as funding for postspill restoration (Jessup 1998). Thus, any money saved by curtailing care for oiled wildlife would not be available for other wildlife conservation-related projects to benefit the affected species. In the United States, it is a legal mandate that the cost of the entire spill response, including recovery and treatment of oiled wildlife, is borne by the responsible party (i.e., spiller), or in the absence of an identified or financially solvent responsible party, by federal or state (if present) trust funds for oil spill response. The cost of postspill restoration is similarly borne by the responsible party, but these costs are unrelated to the response costs. The cost of postspill restoration is determined through a collaborative process of natural-resource damage assessment or through litigation, and is based on the estimated cost of restoring each component of natural resource injury to prespill status. For wildlife, this would be the costs associated with management actions required to recover affected wildlife populations to prespill levels. The response costs and restoration costs are independent and not interchangeable; thus, if response costs were reduced by eliminating rehabilitation of oiled wildlife, the only benefit would be to the responsible party in that they would pay less for the response.

It should be noted that the responsible party can benefit from paying the response costs of wildlife rehabilitation in two ways: 1) it is generally good for the spiller’s public image to be concerned about natural resources; and 2) there may be a small “credit” in the natural resource damage assessment process for animals that have been cleaned, rehabilitated, and are presumed to rejoin the breeding population. Although the maintenance of brand reputation may be considered by some as “greenwashing” of an anthropogenic incident, the public will demand that oiled wildlife are cared for, and we believe that a spiller paying for the appropriate care of wildlife is beneficial overall. On the issue of a “credit” for released wildlife, during the process of natural-resource damage assessment for the *Cosco Busan* oil spill in San Francisco Bay in 2007, 64 surf scoters *Melanitta perspicillata* were subtracted from the total injury assessment for this species because this represented the number (25%) of released surf scoters that were considered to have “likely survived” (Ford et al. 2009). This estimate was based on the relative survival of rehabilitated scoters, which survived approximately 25% as well as control scoters (De la Cruz et al. 2013—see below).

Survival of rehabilitated wildlife

There are three sequential circumstances that must be met for an oiled animal to return to normal function in



Table 1. Representative studies published after 1996 related to postrelease survival of rehabilitated oiled wildlife.

Year of oil spill	Study	Taxon	Type of study	Duration of study	Results
Various (after 1968)	Whittington 1999	Penguins (family <i>Spheniscidae</i>)	Band recovery	Various (years)	No difference between OR ^a and control birds
1983	Altwegg et al. 2008	Gannets (family <i>Sulidae</i>)	Band recovery	15 y	Survival of OR birds 97–98% that of control birds
1995	Goldsworthy et al. 2000	Penguins (family <i>Spheniscidae</i>)	Band resight	19 mo	Survival of OR birds 77% to 88% that of control birds
1995	Anderson et al. 2000	Coots (family <i>Rallidae</i>)	Telemetry tracking	4 mo	Survival of OR birds approx. 50% that of control birds
1997	Golightly et al. 2002	Gulls (family <i>Laridae</i>)	Telemetry tracking	9 mo	No difference between OR and control birds
2007	De la Cruz et al. 2013	Scoters (family <i>Anatidae</i>)	Telemetry tracking	16 wk	Survival of OR birds 18% that of rehabbed control birds, 29% that of unrehabbed control birds
2010	Sellman et al. 2012	Pelicans (family <i>Pelecanidae</i>)	Band resight	4 wk	No difference between OR and control birds
2011	Siewwright 2014	Penguins (family <i>Spheniscidae</i>)	Microchip tracking	23 mo	No difference between OR and control birds

^a OR = oiled and subsequently rehabilitated.

the wild following rehabilitation: first, the animal must survive long enough to be released back to the wild, then the animal must survive in the wild after release, and finally the animal must return to normal physiological function (e.g., return to breeding for adults, interact naturally with conspecifics). Although the first condition seems obvious, there are many factors that affect the likelihood of an oiled animal surviving to release. These include the species affected, condition on capture, available resources, and triage priorities at rehabilitation centers (Helm et al. 2015). For an animal to be considered for release back to the wild, it will need to meet veterinary health parameters indicating that its health is similar to that of the wild cohort (Mazet et al. 2002); for those that cannot meet these criteria, euthanasia may be implemented as the most humane strategy.

Survival of oiled and rehabilitated wildlife after release is a topic that has generated much interest and debate. Sharp (1996) found that overall survival of oiled western grebes *Aechmophorus occidentalis* was approximately 15% that of a control group of unoiled birds, survival of common murre *Uria aalge* was approximately 8% of control birds, and survival of white-winged scoters *Melanitta fusca* was <1% that of control birds. These values have been used as evidence by opponents of rehabilitating oiled wildlife that rehabilitation is not effective. However, since this summary was compiled in 1996, several studies have been published providing additional information on postrelease survival of oiled and rehabilitated wildlife (Table 1).

There is considerable variability among these more recent postrelease studies. Differences in relative survival of rehabilitated oiled wildlife appear to be strongly dependent on species differences, aspects of the spill (product type, speed of response), or details of rehabilitation methods. Additional research should continue to be conducted to learn more about what factors affect postrelease survival and how postrelease survival

can be improved. However, despite the variability in survival of oiled wildlife, it is clear that survival can far exceed the survival estimates provided by Sharp (1996), and in several cases no difference was detected between survival of rehabilitated birds and control birds. Thus, the a priori argument that rehabilitated oiled animals will not survive in the wild is no longer valid.

Recent studies have also provided more information on breeding success of rehabilitated oiled wildlife that survive long enough to re-enter the breeding population. Two studies (Giese et al. 2000; Barham et al. 2007) found that breeding success of rehabilitated oiled penguins *Spheniscus demersus* and *Eudyptula minor* was lower than that of nonoiled control birds. However, despite the reduction in breeding success, in both studies rehabilitated penguins did re-enter the breeding population and successfully fledged a substantial number of chicks. Additional research on breeding success of oiled and rehabilitated birds would be useful.

Animal value

Many people believe that animals have an intrinsic value, or are valuable not for any monetary reason but just for existing in nature (Heeger and Brom 2001). In addition to other ethical considerations discussed above, it could be argued that an individual animal's life is worth saving for the animal's sake. Cultural values regarding wildlife should also be considered, in particular attitudes of indigenous peoples regarding the value of wild animals' lives. These values will vary with location and species affected, but should be considered at the time of an oil spill response.

Individuals of rare and threatened species may be considered to be of greater importance than other animals for conservation reasons, and each individual of these species may be important at a population level. For this reason, for very rare species it may be justifiable to make every effort to save individual lives, even if the likelihood of survival is relatively low. Conversely, care of

abundant species during oil spills can provide excellent training and research opportunities for threatened species should they be affected in subsequent events.

Summary

Survival of wildlife collected during oil spills is variable, and can be affected by various factors including the nature of the spill (e.g., season, source, product), the logistics of the response (e.g., geographic location, readiness level), and the species affected. However, once rehabilitated animals are deemed healthy enough for release, survival can in some cases equal that of control nonoiled animals. Based on the potential for successful recovery, the ethical and legal reasons to care for oiled wildlife, and the intrinsic value of animals, we suggest that response to oil spills should continue to include collection and rehabilitation of oiled wildlife. To achieve high release rates and best possible postrelease recovery rates, robust planning for oil spill response is critical, including pre-emptively acquiring necessary equipment and supplies; identifying and training appropriate personnel; either constructing, modifying, or identifying available facilities to support operations; and incorporating the latest and best available science in protocols for veterinary care and rehabilitation. Only with this focus on readiness can rapid capture and best achievable care of oil-affected wildlife be realized.

Supplemental Material

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Reference S1. [CDFW–OSPR] California Department of Fish and Wildlife–Office of Spill Prevention and Response. 2016. Refugio Oil Spill response evaluation report: summary and recommendations from the Office of Spill Prevention and Response.

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Reference S2. Ford RG, Casey JL, Williams WA. 2009. Final report: acute seabird and waterfowl mortality resulting from the M/V *Cosco Busan* oil spill, November 7, 2007. Appendix B in *Cosco Busan* Oil Spill Trustees, eds. *Cosco Busan* oil spill final damage assessment and restoration plan/environmental assessment. Prepared by California Department of Fish and Game, California State Lands Commission, National Oceanic and Atmospheric Administration, United States Fish and Wildlife Service, National Park Service, Bureau of Land Management.

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