

The Status of Oiled Wildlife Preparedness in British Columbia: A General Overview and an Analysis of Enbridge's Wildlife Response Plan for the Proposed Northern Gateway Project



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Executive Summary

The Oiled Wildlife Trust (OWT) is made up of the primary non-governmental organizations involved in oiled wildlife contingency planning and response in British Columbia. The cumulative experiences of the OWT organizations, in previous spill responses, have exposed substantial shortcomings in the ability to effectively respond to oiled wildlife incidents. In this report, the issues preventing an efficient and well-orchestrated wildlife response in B.C. are discussed. As Enbridge's proposed Northern Gateway Project would bring with it a significant threat to terrestrial and coastal wildlife species, also discussed are the substantial inadequacies of the proposed oiled wildlife response plan specific to this project.

Challenges and Limitations of Oiled Wildlife Response in British Columbia

The OWT believes all oiled wildlife deserve a response effort in order to prevent wildlife suffering as well as ongoing environmental contamination, however industry and government regulators often do not agree. The result is a delay in the activation of an oiled wildlife response or complete lack thereof.

British Columbia lacks all of the major resources to conduct a swift and efficient wildlife response including localized facilities, equipment and trained personnel. The absence of designated funding for oiled wildlife response is a significant impediment to prompt oiled wildlife response as government and industry struggle to decide who is financially accountable each time there is an oiled wildlife incident.

Divergent management and communication structures among government regulators in B.C. often result in the delayed activation of a wildlife response or inefficiencies in how it is carried out.

Government regulators involved in decision-making and oversight of oiled wildlife response often lack an understanding of the process and complexities of oiled wildlife rehabilitation.

While many nations have adopted legislation to mandate oiled wildlife response, Canada has not; here, oiled wildlife responses are policy-driven and extremely variable in nature.

Wildlife Rehabilitation Challenges Specific to Northern Gateway

The proposed Northern Gateway pipeline terminus locations and tanker routes are adjacent to numerous provincially, federally and globally significant bird populations, including species that are sensitive in a rehabilitation setting. Oiled wildlife casualties in one of these areas could have devastating consequences for these populations.

Rugged shorelines, high winds and currents in areas potentially impacted by a spill may all preclude uncomplicated beach capture of impacted wildlife. Many coastal areas along the

proposed tanker routes are accessible only by air or boat presenting further challenges to rescuing contaminated wildlife.

The lack of local resources for oiled wildlife response in the vicinity of the Northern Gateway pipeline and terminus may hamper successful wildlife response efforts.

As the proposed volume of oil to be transported by tankers along the B.C. coastline is extraordinary, a single mishap could potentially impact enormous numbers of birds.

Oiled wildlife response planning needs to be equally robust for terrestrial and marine environments. Currently, Enbridge has not included plans for sufficient resources to respond to an inland spill, especially in remote regions, which include the majority of the pipeline route.

Significant resources would need to be invested in the development of professionally trained local personnel in all areas potentially impacted by a spill to ensure a swift wildlife response.

It is unclear what factors would determine when a wildlife response effort is initiated.

The Response Organization that is called in to mitigate environmental damage following a spill has little responsibility for (and, in most cases, little capacity for) a wildlife response.

Information regarding the effects that condensate has on contaminated wildlife is absent. Similar highly volatile chemicals cause serious and often fatal physical effects.

Currently there is no clearly defined legal fiscal responsibility for oiled wildlife response in British Columbia. The effects of a delay as government and industry try to determine who will be financially responsible may be particularly troublesome in this ecologically sensitive region.

Conclusion

British Columbia lacks the infrastructure, equipment, and necessary local professional response capacity to respond to most spills. A clear system of communication between government regulators and other stakeholders in oiled wildlife response has not yet been established, and there is no financial plan in place prior to a spill to address oiled wildlife requirements. While provincial and federal policies guide oiled wildlife response, these policies lack the depth that legislation would provide to ensure all oiled wildlife receives equal protection. These substantial inadequacies all contribute to British Columbia's lack of preparedness to respond to oiled wildlife disasters. Until these inadequacies can be addressed, significant oiled wildlife casualties will be expected in the event of a spill.

Introduction

What is the Oiled Wildlife Trust?

The Oiled Wildlife Trust (OWT) represents the primary non-governmental organizations responsible for wildlife response and preparedness planning in British Columbia. Members of the Oiled Wildlife Trust include the:

- Wildlife Rescue Association of British Columbia
- Wildlife Rehabilitators' Network of BC
- Vancouver Aquarium's Marine Mammal Rescue Centre
- British Columbia Society for the Prevention of Cruelty to Animals (BCSPCA)
- Oiled Wildlife Society of British Columbia.

The Oiled Wildlife Trust was born out of the need for a collaborative approach to oiled wildlife response based on historical experiences of B.C. wildlife non-governmental organizations (NGOs). In the late 1990s and early 2000s, B.C. NGOs were frequently called upon to handle wildlife recovery and rehabilitation aspects of oiled wildlife response efforts. However, these NGOs were ill prepared to deal with these incidences without professional and governmental support. As there was no financial backing from the Responsible Party (i.e. the party responsible for the oil spill) or government regulatory agencies, the NGOs primarily bore the entire financial burden. This had devastating consequences on their normal animal welfare service delivery programs.

As a result, in January 2008 the OWT was established to facilitate wildlife response management through a collaborative structure between NGOs, government regulatory agencies and professional wildlife response organizations. By maintaining a dialogue with government and industry, and working towards improved contingency planning, it was hoped that there would be a better outcome for both the organizations involved and the wildlife impacted during a spill event.

Each organization represented in the OWT is permitted and governed by one or more of the four wildlife regulatory agencies: Canadian Wildlife Service, Environment Canada, British Columbia Ministry of Environment, and Department of Fisheries and Oceans. Their areas of expertise involve all components of Wildlife Branch management within the Incident Command System and wildlife response operations including reconnaissance, wildlife capture, data collection, animal medical care and rehabilitation. They also have extensive experience with wildlife contingency planning, training, and capacity building. Through its involvement with the regulatory agencies, the OWT participates in the Joint Wildlife Group initiated by Burrard Clean Operations, Canadian Coast Guard, Transport Canada, and the Chamber of Shipping. Each representative organization is discussed further in the subsequent section.

Though each contributing organization has its own mission, values and goals, together as the OWT, these organizations work to establish uniform, professional response to oiled wildlife incidents and to engage all stakeholders in actively supporting best achievable practices for all oiled wildlife. The OWT values the:

- Intrinsic worth of all oiled wildlife irrespective of species
- Humane treatment of wildlife
- Professional standards of operation in oiled wildlife response
- Strength of cooperation and respect of expertise and diversity

The OWT continues to work with government regulators and industry to identify Incident Command System wildlife branch structure and responsibilities; determine triggers for notification, assessment, and response; build an understanding of qualified wildlife assessment process and personnel; identify wildlife response variables; and determine range of reasonable costs.

OWT Members

Located in the Lower Mainland, the [Wildlife Rescue Association of British Columbia](#) (WRA) is one of the busiest wildlife rehabilitation centres in Canada, taking in approximately 3,100 injured, orphaned and pollution-damaged animals every year. Historically, the WRA led wildlife response efforts (by default) through the provision of staff, volunteers, equipment and facilities during oiled wildlife incidents in the Lower Mainland. Having recognized a need for professional oiled wildlife responders and limited site and equipment availability, the WRA has established on-site capacity for two oiled animals (which varies depending upon caseload at any given time). During present day response operations, the WRA supports professional wildlife responders by providing trained staff and experienced volunteers for a workforce based on need and availability.

The [Wildlife Rehabilitators' Network of BC](#) (WRNBC) is an organization dedicated to advocating for wildlife through appropriate action, legislation and education. Wildlife rehabilitators in the province can voluntarily become members of this professional organization to remain connected with other rehabilitators and to share information. During an oiled wildlife spill response, the WRNBC primarily functions as an information-sharing pathway, but has no real wildlife response capacity of its own. The WRNBC supports professional oiled wildlife response by supporting training workshops for its members.

The [Vancouver Aquarium Marine Mammal Rescue Centre](#) (MMR) works to rehabilitate ill, injured, abandoned and stranded marine mammals for release back to their natural habitat. While MMR has highly qualified staff and volunteers to deal with injured marine mammals, it has limited and seasonally dependent capacity to care for oiled marine mammals on-site and very limited personnel to provide expertise should an incident occur outside of the B.C. Lower Mainland.

The [BC Society for the Prevention of Cruelty to Animals](#) (BC SPCA) works to protect animal welfare through cruelty investigations, sheltering, policy, legislation, and humane education. This organization was created under the auspices of the provincial Prevention of Cruelty to Animals Act. It is the only animal welfare organization in B.C. that has the authority to enforce laws relating to animal cruelty and to prepare cases for Crown Counsel for the prosecution of individuals who inflict suffering on animals. During an oiled wildlife response, the BC SPCA may

assist by providing shelter staff and officers to aid in search, rescue and transportation of impacted wildlife. Its response however, is limited by the availability of staff and proximity of the incident to a local BC SPCA shelter. In the event of a spill occurring in the proximity of southern Vancouver Island, limited skilled rehabilitation staff may be diverted from the BC SPCA Wild ARC (Wild Animal Rehabilitation Centre) in Victoria to respond, depending on seasonal capacity.

The [Oiled Wildlife Society of BC](#) (OWS) strives to maintain preparedness for oiled wildlife response in B.C. This includes maintaining a small, centralized stockpile of equipment, establishing contingency plans and providing training for personnel. The OWS possesses limited oiled wildlife response equipment including personal protective gear, medical supplies, husbandry supplies, feeding supplies, and caging and washing equipment. The OWS does not have sufficient equipment to mount an oiled wildlife response on its own and is entirely volunteer-run with many board members from other OWT organizations. As such, it must function in conjunction with a professional oiled wildlife response organization in the event of an oiled wildlife incident.

For a more in depth summary of OWT representative biographies see Appendix A – OWT Representative Biographies.

Oiled Wildlife Rehabilitation

Oiled wildlife rehabilitation has advanced considerably since its inception in the 1950s. The process is no longer a “best guess” approach by well-meaning people who are “just trying to do a good thing” for oiled wildlife. It has become a scientific process that involves careful monitoring of individual patients and is overseen by professional wildlife responders who have extensive oiled wildlife experience and knowledge. Species-specific protocols exist and international guidelines for best achievable practices are adhered to (see [US Fish & Wildlife Service – Best Practices for Migratory Bird Care During Oil Spill Response](#), [International Petroleum Industry Environmental Conservation Association – A Guide to Oiled Wildlife Response Planning](#), OWCN Protocols for the Care of Oil Affected Birds, OWCN Protocols for the Care of Oil Affected Marine Mammals). Personal Protective Equipment (PPE) is provided and safety training is in place to ensure human protection from the adverse effects of the product. A primary priority is to ensure personnel safety and full compliance with national and regional safety regulations.

Oiled wildlife rehabilitation itself is an extensive process. It involves: search and recovery of impacted wildlife; data collection and documentation; medical intake, stabilization and treatment; continued husbandry and medical care before and after animals are cleaned; removal of contaminants; pre-release conditioning and evaluation; and whenever possible, post-release survival studies. Professional wildlife response organizations are equipped to perform all of these functions, in addition to conducting hazing efforts to keep non-oiled animals away from contaminated habitat in instances where it is deemed appropriate.

Although mammals and reptiles are at risk following an oil release into the marine environment, marine birds have historically been the species affected most numerously. They have been noted

as the “flagship victims of oil pollution” (Burger 1997), and it is not unusual to see victims numbering in the thousands.

Oil acutely impacts birds by damaging the integrity of their feathers, such that they no longer interlock properly. This has serious consequences for the bird, physiologically and behaviourally. With the protective structure of their contour feathers disrupted, water is able to seep into the downy layer of feathers, causing the bird to become waterlogged and cold. Hypothermia, the condition in which the core body temperature drops below a level that permits normal body functioning, may quickly set in. As they are no longer able to remain buoyant, adequately thermoregulate (maintain normal body temperature), and in many cases fly, these birds will typically come to shore. This gives them the opportunity to attempt to preen the oil from their feathers (for most, a fruitless process), but leaves them highly vulnerable to predation in their compromised state.

Ingestion or inhalation of petroleum products may have acute or chronic physiological effects. Contaminants often act as strong irritants to eyes and other mucous membranes, and may result in fatal lesions. Hydrocarbons ingested during preening or ingestion of contaminated prey may cause dehydration, damage to the liver and intestines, anemia, suppressed immune system function and long-term reproductive failure (Leighton 1995).

The energy consumed while birds attempt to remove oil (and are unable to forage) may lead to dehydration and starvation if not promptly rescued. Further, predation of oiled birds occurs at a high rate, as birds are typically unable to protect themselves by flying or diving to safety.

Mammals and reptiles that are contaminated with oil may suffer similar toxic effects. However, certain marine mammals (cetaceans and most pinnipeds) have a lower susceptibility to becoming oiled because they appear to be able to detect and avoid surface slicks (Geraci & St. Aubin 1990). Additionally, as most have fat or blubber stores for warmth, they usually do not suffer the immediate effects of hypothermia as many birds do. Mammals with thick fur, such as sea otters, are most susceptible to the physiological stresses of oiling, as it compromises their ability to thermoregulate the same way it does in birds.

Challenges and Limitations of Oiled Wildlife Response in British Columbia

Over the last 13 years, member organizations of the OWT have been called to assist in nine oiled wildlife incidents in British Columbia. These spills varied greatly in spill volume, contaminant type, in the number of animals impacted, and in their responses by industry, government regulators and NGOs. Involvement in these incidents however, has given the OWT great insight into the strengths and weaknesses that currently exist in our province with respect to oiled wildlife response and expertise.

Members of the OWT have been proactively involved in contingency planning in our province, initiating relationships with regulators and attending planning meetings on a regular basis. OWT members have helped to lead the province in transitioning from an ineffective and under-resourced local wildlife rehabilitator response program to a professional oiled wildlife response plan. However, significant challenges with respect to governmental oiled wildlife preparedness in British Columbia still remain.

Determination of when to intervene

Finding consensus between industry, regulators and wildlife responders as to when to mount an oiled wildlife response effort following an incident remains an ongoing challenge. OWT members strongly believe that an oiled wildlife response should be mounted in any incident where wildlife have become oiled or have the potential to become oiled. This will work to prevent further environmental contamination and secondary oiling of predator species, as well as to mitigate suffering for those affected. An oiled wildlife response may involve active capture and rehabilitation to release but can also include euthanasia for animals that are not medically stable to undergo rehabilitation or have a low survival prognosis.

However, to date the OWT has found that there is often a delay in having qualified personnel assess the area for impacted wildlife or a disagreement among industry, government and/or the OWT regarding whether an oiled wildlife response effort should be mounted. This is particularly true when impacted animals are not considered “Species at Risk” – the priority of the Canadian Wildlife Service. Canada Geese, gulls and Mallard ducks have frequently been the victims of oil spills where no effort was made to either capture and rehabilitate or to recover and euthanize, leaving live and dead contaminated animals in the environment (e.g. the Westwood Annette spill in 2006, the Burrard Inlet Mystery Spill in 2009, and the Southmere Village Park Ponds Incident in 2011). The OWT strongly supports Jessup’s (1998) assessment that *“oiled wildlife should be removed from the environment if for no other reason than to remove them as a continuing source of contamination to other wildlife (conspecifics, predators, or scavengers), humans, and the environment.”* In other words, the OWT believes wildlife response should always be conducted; industry and the government do not.

Lack of facilities, resources and trained personnel

British Columbia requires the development and acquisition of pre-established resources that are necessary to provide an adequate response in the event of a spill. This includes facilities infrastructure, equipment, trained personnel and funding to support oiled wildlife rehabilitation efforts.

With spills impacting wildlife on a nearly annual basis, pre-existing facility identified for use as an oiled wildlife care centre should be mandatory. However, no such facilities have been identified in British Columbia. B.C. has 18 times the amount of coastline as the state of California, where ten oiled wildlife primary care facilities exist and hundreds of veterinarians, animal health technicians, wildlife rehabilitators and volunteers are trained and available to assist in oiled animal rehabilitation. According to the Oiled Wildlife Care Network-UC Davis (Bailey 2000) "*one of the many lessons learned from past oil spills is that the presence of an appropriately designed and equipped veterinary care facility and well-trained staff gives oiled wildlife their best chance at surviving the experience.*" In previous spills in British Columbia, oiled wildlife response facilities have been identified in times of crisis, and are less than ideal, lacking the amenities that are required for an efficient, effective, and safe oiled wildlife rehabilitation program, such as unlimited water supply, ample water pressure, adequate electricity, sufficient ventilation and provision of heat or air-conditioning as necessary.

The need for trained personnel in British Columbia is also of utmost importance. While there are certain individuals (fewer than 15 in B.C.) within the OWT organizations who are trained and experienced, they are not guaranteed to be available during the event of a spill. As on-call workforce in an emergency response, they are generally unavailable to provide full-time oversight of a spill response due to other full-time professional commitments. Ideally, professional on-call wildlife first responders would be stationed throughout the province (along the coast and pipeline route) and a pre-identified oiled wildlife response organization would be ready to mobilize immediately upon notification of a spill.

Wildlife rehabilitation centres across the province take in thousands of injured birds, mammals and reptiles every year, but are unequipped to deal with oiled wildlife, as they require specialized facilities, equipment and expertise. This is not unique to British Columbia, as even on a global scale animal welfare charities and voluntary environmental groups "*... lack the resources (financial and other) to undertake their own detailed pre-spill planning and to invest in the level of dedicated facilities and other resources appropriate for the perceived level of risk*" (White and White 2007). Most rehabilitation centres rely on public donations to care for their usual patient load and function at capacity year round. Staff and volunteers typically have no training or expertise in the care of oiled wildlife.

Treatment and care of oiled wildlife, especially in a response environment, is an extremely specialized discipline with different requirements for success. These requirements often conflict with those necessary for traditional wildlife rehabilitation. The admission of even one or two oiled patients into an existing wildlife rehabilitation facility can have a significant impact on the

ability of a wildlife rehabilitator to provide high quality care for their existing patients, in addition to the expert care required for any oiled patients.

Oiled animals require isolation and separation from non-oiled patients. Separate physical space, caging, air ventilation and exchange, as well as different ambient air temperatures, are required during the stabilization phase. Once animals are stable, cleaning requires specific hoses, nozzles, water quality and pressure, unlimited quantities of hot water, a means of safe and regulated disposal of contaminant and rinse water, as well as drying pens and grooming dryers. Pre-release conditioning requires more water for the overflow of diving/swimming pools. Throughout the entire process, veterinary and rehabilitation staff experienced in oiled wildlife care must also be trained to manage the health risks associated with caring for oiled animals to ensure the safety and well-being of wild patients and those caring for them.

The space requirements alone for oiled wildlife response are unattainable by all current wildlife rehabilitation facilities in our province. See Appendix C – Minimum Space Requirements for Rehabilitation.

Professional oiled wildlife response organizations have the expertise, knowledge of equipment, and experienced personnel to ensure that oiled wildlife response is carried out effectively and humanely. They are able to incorporate a tiered response, integrating more resources as necessary, without the proliferation of expensive and rarely used resources (White and White 2007). Though wildlife rehabilitators will always be an important resource during an oiled wildlife incident, their personnel and facilities should not be considered a feasible alternative to a professional oiled wildlife responder.

Absence of designated funding for oiled wildlife response

Fiscal responsibility is a challenge that contributes to all of the identified shortcomings surrounding oiled wildlife rehabilitation in our province. While the Canadian Wildlife Service, BC Ministry of Environment and Department of Fisheries and Oceans hold responsibility for migratory birds, non-migratory birds and terrestrial mammals, and marine mammals respectively, there is no designated funding within these agencies to fund oiled wildlife response for these animals. In California, where oiled wildlife rehabilitation is legally mandated (Lempert-Keene-Seastrand Oil Spill Prevention and Response Act and U.S. Oil Pollution Act of 1990), legislation has provided the financial and legal infrastructure necessary to conduct quality wildlife care which has unquestionably improved animal husbandry, biomedical care and release rates over the past 50 years (Newman et al. 2003). The [Lempert-Keene-Seastrand Act](#), which became effective in 1990, has become the key state compensatory mechanism for spills since the Exxon Valdez Oil Spill. It establishes a comprehensive liability scheme for damages resulting from marine oil spills with recoverable damages including the cost of wildlife rehabilitation activities. In California, oiled wildlife care facilities are funded by the interest earned on California's \$50 million Oil Spill Response Trust Fund, which also pays for the operation of the Oiled Wildlife Care Network.

Without the financial structure to ensure that wildlife rehabilitation efforts are pursued in the

event of a spill, the animals ultimately suffer, and in many cases die. Even on a small scale, the time delay that it takes to determine where money will come from and who will undertake response efforts, can mean the difference between life and death for hundreds of animals in the field. The condition of animals left in the wild deteriorates quickly, and once their physical condition has declined, rehabilitation success rates are reduced and are more costly to pursue.

Within Canada, in an incident where there is no identified Responsible Party or the Responsible Party chooses not to take complete financial responsibility for wildlife rehabilitation efforts (e.g. the MV Andre incident in 2006, the Burrard Inlet Mystery Spill in 2009), it is left to government regulators to determine where finances will come from. If this is not promptly determined, the result is oiled animals left in the field to suffer lingering and painful deaths where they will remain as ongoing sources of environmental contamination (e.g. the MV Andre incident in 2006).

Divergent management and communication structures among responders

Regulator support and effective communication within and among governmental agencies, industry and NGOs involved in oiled wildlife incidents is critical to a timely and effective response. The Incident Command System is an organizational structure employed by many organizations, corporations and government agencies for the management of major emergencies, including oil spills. By providing a unified, centrally authorized chain of command, incidents of any size or complexity can be effectively dealt with. By providing the necessary structure, Incident Command allows personnel from varying agencies to efficiently and effectively work together, even if they do not normally do so. It provides a common management structure, clear lines of communication, and clarity surrounding the roles of individuals and organizations in the emergency response. The system is adaptable, scaling up or down as needed. While most Canadian government agencies and corporate industry have embraced this model in responding to oil spills, not all key players (most notably, the Canadian Coast Guard) in oil spill response in British Columbia are engaged, resulting in communication breakdown, duplication of some efforts and the absence of others. Further, while Incident Command may be used by the Responsible Party or other government agencies to manage an oil spill incident in Canada, the Wildlife Branch (see Appendix D) is often not incorporated, resulting in an oiled wildlife response effort that is disorganized and inefficient.

In the Leroy Barge Incident (2007) the absence of the Canadian Coast Guard from the Incident Command System provided a clear example of the disjointedness that may evolve during a response. In this incident, two separate command posts were established, one by the Responsible Party (involving Incident Command) and the other by Canadian Coast Guard (without the Incident Command System). Without clear lines of communication between the Canadian Coast Guard and the Responsible Party, and an established pathway for commencing a wildlife response effort, the wildlife response was chaotic and slow to mount. Fortunately, in this incident the BC Ministry of Environment took a proactive role in supporting reconnaissance efforts and no impacted wildlife were found. If large numbers of wildlife had been contaminated, this spill may have been disastrous.

Misunderstood wildlife rehabilitation procedures among regulators

Due to mounting public pressure in recent years regarding the humane treatment of oiled wildlife, government entities have increasingly rewritten policy to support wildlife rehabilitation following an oil spill event. However, a lack of understanding from high-level regulators regarding procedures necessary to adequately and humanely rehabilitate oiled wildlife has meant that legislation has been slow to follow. There is a lingering train of thought amongst many that “an oiled duck is a dead duck”. Though most certainly factual at one point in time, this idea no longer holds true, as oiled wildlife rehabilitation has become a well-documented scientific process adhering to strict internationally accepted protocols (e.g. [US Fish & Wildlife Service – Best Practices for Migratory Bird Care During Oil Spill Response](#), [International Petroleum Industry Environmental Conservation Association – A Guide to Oiled Wildlife Response Planning](#), OWCN Protocols for the Care of Oil Affected Birds, OWCN Protocols for the Care of Oil Affected Marine Mammals).

There are many factors that affect an animal’s ability to be successfully rehabilitated following an oil spill incident, including (but not limited to): the animal’s condition prior to the spill, species impacted, type of contaminant, and length of time from oiling to rescue and rehabilitation. However, there tends to be a belief that degree of oiling is a major predictor for successful rehabilitation, which is highly inaccurate. Even heavily oiled birds that are *quickly* recovered, stabilized and rehabilitated can have a high rate of success in their rehabilitation.

Cited in Canadian Wildlife Service’s National Policy on Oiled Birds and Oiled Species at Risk (Environment Canada 2000):

“There are areas in Canada and types of incidents where cleaning and rehabilitation may successfully allow many oiled birds to re-enter the breeding population. These are areas where the water is warmer and with oiled species which respond more readily to cleaning and rehabilitation. However there are vast expanses of Canada’s coastlines where the waters are generally cold or frigid and the species generally affected do not respond well to cleaning and rehabilitation. In these cases the most humane treatment is often to euthanise affected birds.”

This incorrect statement helps to guide CWS’s response to oiled wildlife incidents and also represents a core misunderstanding of the basics of the oiled wildlife rehabilitation process. While unfavourable environmental conditions and colder ambient temperatures will lead to hypothermia more quickly in oiled birds, it does not automatically render them poor candidates for rehabilitation. A swift recovery effort can make rehabilitation efforts for birds, even in colder areas very effective (e.g. [Pribilof Island Spill](#), Alaska, 1996). A more accurate predictor for the successful rehabilitation of birds is their body condition when rescued, which normally coincides directly with how quickly they were captured following oiling. Current oiled wildlife rehabilitation protocols use standardized clinical predictors to assess candidacy for rehabilitation, such as:

- degree of wasting (as a percentage of body weight which is compared to normal values for that species, sex and season)
- degree of dehydration
- body temperature
- heart rate
- respiration rate and quality
- blood values (packed cell volume and total solids)
- condition of eyes and other mucous membranes
- condition of skin and scaly areas (e.g. presence of burning)
- temperament and response rate of animal (e.g. depressed, lethargic)

In instances where animals are found to be poor rehabilitation candidates based on the aforementioned professional protocols, oiled wildlife medical personnel (and the OWT) support and regularly administer humane euthanasia.

Deficient response capacity of government entities

In British Columbia, the government entities responsible for wildlife typically hold no capacity themselves to respond to oiled wildlife in distress. Therefore they depend on other organizations for operational provision of equipment and expertise. Depending on the species impacted, different government agencies will be called into action to help provide varying levels of oversight or guidance.

Canadian Wildlife Service

As waterfowl and seabirds are the species most often affected by oil spills it is the Canadian Wildlife Service (CWS) that is most commonly engaged following an oil spill impacting wildlife. In the [National Policy on Oiled Birds and Oiled Species at Risk](#) (2000) the CWS has identified its responsibilities during a spill to be: the licensing of bird responders and rehabilitators under the Migratory Bird Regulations, ensuring their compliance with permits issued, monitoring their effectiveness, and ensuring that oiled migratory birds are treated humanely. However, it has been the experience of the OWT that designated CWS personnel are often untrained and inexperienced in recognizing oiled wildlife and are generally unfamiliar with the oiled wildlife rescue and rehabilitation process. This renders them unable to provide critical oversight. Additionally, as the OWT has frequently experienced, designated personnel may be absent from critical oiled wildlife planning meetings, they may be difficult to contact during an actual emergency, or they may find themselves without the financial backing needed to support the National Policy during an oiled wildlife incident.

In creating the National Policy, the CWS identified the effective conservation of migratory bird populations and the assurance of humane treatment of oiled birds and Species at Risk as imperatives. Further it is declared that: *“as necessary, CWS will ensure humane treatment (either through cleaning and rehabilitation or euthanization) of oiled wildlife.”* In most historical spill

scenarios this has not been undertaken, with potentially containable oiled birds often remaining in the field (see Appendix B – Oiled Wildlife Trust Case Studies).

The CWS's National Policy also outlines that cleaning and rehabilitation will normally be required when impacted birds are listed as endangered or threatened, as defined by federal, provincial or territorial regulations. This policy frequently results in oiled birds (such as Canada Geese, Mallard ducks and gulls) being left in the field because of their species status (see Appendix B – Oiled Wildlife Trust Case Studies). This section of the National Policy comes into direct contradiction with the other sections outlining that oiled birds need to be removed from their environment to prevent them from acting as an ongoing source of environmental contamination. Further, it fails to acknowledge the advantages of oiled wildlife rehabilitation other than conservation benefits such as: the prevention of unnecessary suffering to wildlife, the opportunity to assess wildlife damage by means of evidence collection, the public value of wildlife and their support for oiled wildlife rehabilitation activities, and the critical preparedness opportunity to maintain oiled wildlife response skills for use when threatened or endangered species are impacted. This section of the National Policy came directly under fire in the international wildlife community (C. Doucette personal experience, Effects of Oil on Wildlife conference, 2008), where government regulators in the United States explicitly criticized the decision to rehabilitate individuals based solely on species conservation status.

Environment Canada

[Environment Canada](#) is the federal government entity responsible for environmental protection, and is mandated to “*preserve and enhance the quality of the natural environment, including the air, soil, flora and fauna*” (Environment Canada 2011). The Canadian Wildlife Service belongs to the Environmental Stewardship branch of Environment Canada.

While the Canadian Wildlife Service is responsible for the National Policy on Oiled Birds and Species at Risk, the roles of the Canadian Wildlife Service and Environment Canada with respect to oiled wildlife are not always clearly defined. In the 2009 Burrard Inlet Mystery Spill (see Appendix B – Oiled Wildlife Case Studies) Canadian Wildlife Service personnel were unreachable. Seriously distressed migratory birds were being sighted and reported by members of the public, so oiled wildlife responders called the provincial regulators to ask for guidance. Environment Canada (after being contacted by the provincial government regulators) agreed to fund the activities of a professional oiled wildlife response organization over the B.C. Day long weekend. At the end of the weekend, responsibility for oiled wildlife was to be transferred back to the Canadian Wildlife Service. The Canadian Wildlife Service ultimately decided that oiled wildlife response efforts would not be conducted. As a result, the oiled, but otherwise healthy, wildlife that had been captured were euthanized and 30-40 live oiled animals were left in the field.

As is evidenced by this example, even though Canadian Wildlife Service is under Environment Canada's jurisdiction the two government entities may have very divergent decision-making pathways. Though it may be expected that they would support and follow the same policies, this does not necessarily happen in actual oiled wildlife incidents.

BC Ministry of Environment

The BC Ministry of Environment has typically taken a supportive role in oiled wildlife rehabilitation activities but may be limited by resources and jurisdiction. The Province of British Columbia “*acknowledges the strong public concern for the fate of wildlife affected by an oil spill and give(s) a high priority to wildlife protection and rehabilitation*” (BC Ministry of Environment 2002). As stated in its [response strategy](#) “*provision will be made to contract veterinary services to ensure that professional decisions are made in the management of wildlife rehabilitation.*” This was the case in the MV Andre, Westwood Annette, and Westridge Pipeline spills, where the provincial veterinarian provided oversight of oiled wildlife rehabilitation efforts.

As the government entity primarily responsible for terrestrial mammals and non-migratory birds, the BC Ministry of Environment is typically called upon less often than the Canadian Wildlife Service, which oversees migratory birds. So, though its role is crucial, the BC Ministry of Environment’s involvement is limited by jurisdiction and by the cooperative relationship with federal government entities.

Department of Fisheries and Oceans

Finally, while marine mammals tend to be affected in far fewer numbers than their avian counterparts, preparedness for oiled marine mammals needs to be an integral part of contingency planning. Thus far, oiled marine mammal planning has been largely ignored. The Department of Fisheries and Oceans (DFO), along with CWS and BC Ministry of Environment need to be integrated into the Wildlife Branch of the ICS during an incident that affects all species. While wildlife NGOs in our province have pushed the government to adopt a professional model for oiled wildlife response for birds, this has not yet happened for marine mammals; the Vancouver Aquarium Marine Mammal Rescue Centre is still largely relied upon and responsible for the care for oiled marine mammals. This is in addition to their regular patient caseload and may be overwhelming. As is the case for any wildlife rehabilitator, this may impact their capacity to care for newly admitted oiled animals and/or limit their ability to accept regularly admitted patients due to strain on personnel, space, equipment and consumable supplies, particularly during the busy summer season when the facility may be caring for over 100 animals at one time. Additionally, this means that MMR bears the financial burden of responding to oiled marine mammals, which may detract from their regular rehabilitation activities.

Absence of federal legislation

The absence of legislation to ensure the protection of wildlife is at the heart of the ineffective involvement of government agencies in response to oiled wildlife incidents in British Columbia. While each entity has its own policy to guide oiled wildlife response, the absence of federal and provincial legislation means that each incident varies greatly in its response as there is no clear pathway for decision-making. This allows for major inconsistencies that, ultimately, result in

wildlife casualties. Until substantive federal legislation is in place that ensures that oiled wildlife rehabilitation activities are undertaken, we anticipate that in many instances, the wildlife response will be less than adequate.

Wildlife Rehabilitation Challenges Specific to Northern Gateway

As outlined previously, major challenges have occurred during oiled wildlife response in British Columbia's Lower Mainland, despite oiled wildlife NGOs being present and centralized government offices nearby. The proposed Northern Gateway Project would bring with it unique difficulties because of its remote location, proximity to large numbers of sensitive bird species and the potential (based on the historical frequency of terrestrial and marine oil spills) for exposure to highly volatile contaminants.

Proximity of project to important bird areas and sensitive species

Certain species are considered hardier and are more apt to survive the rehabilitation process regardless of body condition. These include geese, swans and dabbling ducks which typically spend at least a portion of their life on land. Seabirds, however, which spend most of their time afloat (swimming), and cannot survive onshore for any length of time (e.g. auks, loons, grebes), are the most sensitive to oiling. Even a few droplets of oil in their plumage cause these birds to give up diving, which means they can no longer feed. Many succumb to starvation (Camphuysen *in press*). Their high metabolic rate, high degree of stress in captivity, and high rate of secondary complications means that even with a diligent response, some casualties can be expected.

Physiological adaptations that make these birds extremely proficient divers, swimmers and flyers also make them very ineffective on land. The position of their legs (further back on their body than most birds) means they are unable to walk. Birds that have come to shore post-oiling are typically stranded on their breast and are able only to drag themselves should they need to move. Lying in this position puts enormous pressure on their keel bones, respiratory organs, and feet and hock joints. As a result, respiratory distress and lesions to the keel, feet and hocks may all occur within as little as 24 hours from onset of oiling. Dealing with these secondary complications in an oiled wildlife rehabilitation setting is time consuming and extremely stressful for the animal. These complications may be largely avoided and are most effectively treated when animals are collected from the field in a timely manner.

The potential for any of these species to be impacted by a spill is a very real possibility given their proximity to the proposed pipeline terminus as well as the proposed tanker routes (see Table 8-4, Volume 8C of Enbridge's Application). Even with considerable infrastructure, planning, trained personnel, and equipment ready to mobilize on very short notice there is the possibility that enormous numbers of these birds could become casualties, including many that are part of a globally important population. The species below are all considered globally important in the Open Water Area and Confined Channel Assessment Area; they are very sensitive to rehabilitation settings, requiring swift rescue and special attention in captivity to ensure that potentially lethal secondary complications do not arise. These include:

- Ancient Murrelets (74% of global breeding population)
- Leach's Storm Petrel
- Fork-Tailed Storm Petrel
- Pigeon Guillemot

- Cassin's Auklet
- Tufted Puffins
- Pacific Loon
- Rhinoceros Auklet
- Marbled Murrelet (endangered)
- Western Grebe
- Surf Scoter

The potential number of birds that may be impacted, even by a low volume oil spill, is also of importance because many birds congregate in large numbers or have significant colonies in the area. It has been noted that the impacts of oil spills on wildlife are not necessarily determined by the volume of oil spilled, but more importantly, by the density of wildlife in the spill zone which is seasonally determined (Newman et al. 2003). Surf Scoters have been known to congregate in groups as large as 50,000 in the Confined Channel Assessment Area (Enbridge Application 2010), and approximately 90% of the global population of B.C.'s blue-listed Tufted Puffin inhabit the Scott Islands and surrounding waters. In order to be adequately prepared to handle a spill affecting such a significant number of birds, enormous resources would have to be in place to respond including (but not limited to):

- a facility (or facilities) large enough to hold 50,000+ birds and equipped with all amenities for proper oiled wildlife response including: adequate ventilation, water supply, electrical supply, oily water capture and disposal ability
- large numbers of trained personnel and designated boats to perform proactive hazing/deterrence and safe capture and containment of oiled birds and who are able to mobilize on extremely short notice (i.e. located in the immediate area)
- safety and capture gear for all personnel (e.g. life jackets, nets, Tyvek suits, nitrile gloves, etc.)
- facilities to house and feed all response personnel
- access to consumable supplies for housing, feeding and rehabilitating 50,000+ birds

Evidently, considerable investment and prior planning would be required to ensure that these resources are in place to mount a response.

Inaccessibility of project area

Safe capture and containment is the first step in the rehabilitation of oil-affected species. As British Columbia's coastline can be rocky and rugged, with high winds and strong currents in many locations, safe capture and containment for oil-impacted animals is inherently risky. As such, it may be unattainable because the risk for personnel is too high.

In instances where there is no beach access for oiled animals and/or animals are inaccessible by boat or land due to geography or environmental conditions, this first critical step in the rehabilitation process cannot be undertaken. As such, it may be expected that birds, and some mammals that have experienced even partial oiling, will die. More information is needed to assess how and where oiled birds are likely to become beached or to be rescued from the water. Additionally, in areas where small watercraft would be necessary to rescue oiled birds, further

analysis of the likelihood of permission to use such craft (for safety reasons) is necessary. If it is anticipated that strong currents and winds would make them unsafe during times of the year when birds are present, then there is a real probability that all birds affected by an oil spill would die.

Distance from response centers

The physical location of the pipeline and terminus present further challenges due to their geographical distance from any major centre. Currently, wildlife response personnel and equipment would need to be sourced from the Lower Mainland region of British Columbia. Even if personnel were sourced from other regions in Canada or the U.S. they would need to arrive in Vancouver prior to travelling to a spill site. The drive from Vancouver to Kitimat is more than 19 hours under favourable conditions. During the winter months, when driving conditions are unfavourable, it will take even longer for equipment and accompanying personnel to access this distant location. The remoteness of the location presents major difficulties not only for the swift delivery of mobile equipment but also for the ongoing demand of consumable supplies throughout the duration of the response, something that may take months or years in the event of a significant spill. As such, local preparedness is essential. Without locally trained personnel (oiled wildlife first responders) and equipment depots located at regular intervals in remote locations, the time delay in organizing a wildlife response may be critical for impacted wildlife.

Potential spill volumes due to substantial quantity of oil proposed for shipment

The volume of oil that tankers will be moving along the proposed routes is remarkable. With each one carrying more than eight times that of the infamous Exxon Valdez, even one mishap involving a tanker along the proposed route may contaminate an enormous area. By comparison the Exxon Valdez Oil Spill caused contamination of more than 2,000 kilometres of shoreline and the estimated deaths of: 250,000 seabirds, 2,800 sea otters, 300 harbor seals, 250 bald eagles, and up to 22 killer whales (Exxon Valdez Oil Spill Trustee Council n.d). Logistically, trying to address the personnel and equipment needs for search, collection and rehabilitation of oiled wildlife over the potentially great distance that could be damaged by the contents of large tankers would be astounding and would most certainly require significant pre-planning, particularly as a large portion of the coastline is accessible only by water or air.

Inadequate terrestrial response planning

Thus far, the focus has been on the potential for a marine oil spill. While the potentially catastrophic results for a marine spill are most evident, the preparedness for oiled wildlife in the terrestrial environment is also essential. The proposed pipelines would travel 1170 km in length before reaching the marine terminus. A leak or breach of the pipelines may occur at any point along the way. As such, oiled wildlife preparedness plans need to be in place to address impacted wildlife even in inland areas.

As recently as July 2010, one of Enbridge's pipelines burst releasing more than 800,000 gallons of oil into a creek eventually reaching the Kalamazoo River. As of July 13, 2011 nearly 4,000 oiled animals had been recovered from [this spill](#) including mammals (muskrat, beaver and opossum), amphibians, birds (including Canada Geese, Mallards, Great Blue Herons, Wood Ducks, Belted Kingfishers), crustaceans and reptiles (mostly turtles). Wildlife rehabilitation activities in response to this spill are anticipated to continue at least until September 2011, more than a year following the original leak. This provides a useful example of the wildlife damage that can result from an inland spill and reinforces the need to be prepared for such a scenario.

In order to be adequately equipped, mobile oiled wildlife response gear would need to be available at regular intervals along the pipeline for relatively quick and easy access. In addition, personnel trained in oiled wildlife response would need to be on-call and available to mobilize at any time. However, the response limitations discussed previously in the marine realm also apply to terrestrial ecosystems. As such, significant limitations are present. Adequate terrestrial response is also currently inadequate.

Insufficient availability of professional wildlife response organizations

Enbridge's Application (Table 5-2, Volume 8C) identifies one of their response strategies as "initiating citizen volunteer effort for oiled bird rehabilitation." This is an inadequate and inhumane approach to oiled wildlife response and would be dangerous for citizens involved, as well as falling far short of internationally accepted protocols for oiled wildlife response. As previously outlined, oiled wildlife rehabilitation duties must be undertaken by individuals with specialized training and experience who are able to medically assess and support wildlife patient care throughout the intense process of oiled wildlife rehabilitation.

There are three professional oiled wildlife response organizations ([International Bird Rescue](#), [Tri-State Bird Rescue](#), [Focus Wildlife](#)) in North America. However, none of the organizations have personnel located primarily in Canada. This presents a significant challenge in assuring a timely response for any spill north of the United States/Canadian border. Further, even with a professional wildlife response organization pre-identified and on retainer, there is no guarantee that they will be available to respond should a spill occur if their resources are previously engaged in another response effort. With no significant investment in equipment, or ongoing training of local personnel and developing infrastructure in place ahead of time, any of these organizations will be challenged to adequately perform their functions if called to duty.

Lack of definition for a 'major spill' which constitutes response

In the General Oil Spill Response Plan (Section 12.4), Enbridge has identified that "Treatment facilities, both temporary and fixed, would be required for response to a major spill." However, what constitutes a major spill is extremely subject to opinion. A clear and specific definition of the term "major spill" is required in order to be adequately prepared to mount an oiled wildlife response. As previously outlined, government entities in British Columbia are often at odds about what constitutes enough wildlife damage to warrant a wildlife response effort. While public

opinion demands that all oiled wildlife be responded to, this is often not the case, especially without sufficient government oversight, and significant government direction.

Response Organization's limited role

Enbridge may be operating under the assumption that their Response Organization (RO) (a Transport Canada certified organization called upon to mitigate environmental damage following a spill) will provide oversight of the wildlife response and be actively involved in the rehabilitation process, much the same way that they are for shoreline clean-up. However, according to the [RO regulations](#), they need only to have "a list of the equipment for scaring off birds from an oil spill location and of the measures available in support of the wildlife rehabilitation activities of other parties." Having a list of potential wildlife rehabilitators does not provide or contribute to adequate preparedness for a wildlife response effort. Listed wildlife rehabilitators are unlikely to be trained in oiled wildlife response or have adequate facilities to deal with oiled animals.

While hazing equipment may be of benefit in certain situations, its direct advantage is not always clearly defined. Inappropriate deployment of this equipment may make oiled animal capture and containment more difficult by making wildlife more apprehensive and difficult to approach. Indiscriminate use of hazing equipment may result in clean animals moving into oily areas, thus requiring the use of experienced personnel essential in this role. The ambiguity over responsibility for wildlife operations may, evidently, be very detrimental. By involving professional oiled wildlife responders, and by having wildlife regulatory roles clearly defined in the Incident Command System prior to a spill scenario, potentially impacted wildlife and those already affected will have the best opportunity for success.

Condensate spill danger to wildlife and response personnel

While we can predict the rehabilitative outcome for birds and mammals affected by crude oil to a certain degree, the outcome for condensate, the other product to be carried by the Northern Gateway pipelines and tankers, cannot be as easily estimated. Because condensate is not defined as "oil" under the [Canada Shipping Act](#) (2001) the RO is not required to respond to a spill. Similarly, it is uncertain if a wildlife response would be mounted due to the potential danger to response personnel.

Major distillates such as diesel fuel and kerosene are highly volatile and often result in inhalant pneumonia, emphysema, and skin and ocular burns (OWCN Protocols for Oil Affected Birds, 2000). While it is not entirely certain how contaminated animals would respond to condensate, its highly volatile properties may result in similar physiological ailments. Severe respiratory ailments and burns are often fatal or grounds for euthanasia for an afflicted wild animal. If condensate affects animals similarly to other highly volatile chemicals, a spill of this nature may be disastrous for local wildlife populations. It would be prudent to conduct more research on the effects of condensate in order to better predict the outcome for condensate-contaminated wildlife.

Section 8.8.4 of the Application (Volume 8C), outlines the mitigation measures to be undertaken in the event of a condensate spill. Included in the measures is the plan to boom sensitive bird areas. Historically, booming has been an ineffective means of protecting wildlife due to their ability to swim, dive and fly around it. Though it may be useful for short-term protection of wildlife habitat, there is no guarantee that booming will keep birds or mammals out of contaminated areas. Likewise the application states that a hazing plan will be established to keep birds out of the area. However, the flammability of condensate may make many effective types of hazing tools (e.g. flares, cannons) unsafe because of the potential for fumes to ignite. A detailed plan that addresses these significant product concerns is important to have in place prior to commencement of the Northern Gateway project.

No legal fiscal responsibility for oiled wildlife response

Finally, with even the most carefully drafted wildlife response plan and trained personnel ready to respond, there will be extensive complications if financial resources are not specifically identified to fund a wildlife response effort or if there is ambiguity around who should be fiscally responsible. In a case where the Responsible Party is not clearly defined, the delay in commencement (or absence) of an appropriate wildlife response may result in substantial wildlife casualties, especially in this ecologically sensitive region. Likewise, if the Responsible Party is not Enbridge, as may be the case during a tanker spill along the proposed route, the Responsible Party may abrogate their moral obligations to provide financing for a wildlife response, as they are not legally obligated to do so by the Canadian government. Ensuring that legislation is in place to protect all the wildlife along our coast and enforcement to support that legislation would be a prudent protective action. Even though Enbridge has included their own proposed plan in their project application, oil spill incidents that are not their responsibility will likely end in the delayed activation of any type of wildlife response.

Conclusion

As a wildlife-rich coastal province, British Columbia lags embarrassingly far behind other parts of North America and the world when it comes to oiled wildlife response preparedness. British Columbia lacks the infrastructure, equipment, and local professional response capacity to respond to most spills. A clear system of communication between government regulators and other stakeholders in oiled wildlife response has not yet been established, and there is no financial plan in place prior to a spill to address oiled wildlife requirements. While provincial and federal policies guide oiled wildlife response, these policies lack the depth that legislation would provide to ensure all oiled wildlife receives equal protection.

Many unprepared nations have experienced oil spills resulting in catastrophic damage to wildlife and wildlife habitat. It took the reality of these devastating disasters to provide the incentive to move forward with national legislation that protects wildlife and wildlife habitat. Such was the

case in the Exxon Valdez (United States, 1989), the MV Erika (France, 1999), the Treasure Oil Spill (South Africa, 2000) and the Prestige Oil Spill (Spain, 2003).

If Canada wishes to take steps to avoid damage mirroring or exceeding these global disasters, it would be prudent to ensure that the major gaps outlined in this paper are addressed prior to allowing any further tanker or pipeline activity within British Columbia. For a wildlife response to be efficient and effective in preventing catastrophic damage to wildlife, it is imperative that the country, the province, and industry do everything possible to be prepared in advance. Only when advanced planning has been fulfilled, can we consider ourselves adequately prepared for the oiled wildlife component of a spill. At this time, federal and provincial regulators, industry, and wildlife rehabilitation centers and responders in Canada are ill prepared to adequately respond to an oil spill in terms of oiled wildlife response. Significant wildlife casualties would most certainly be the case in the event of a spill.

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Appendices

Appendix A - Oiled Wildlife Trust Representative Biographies

Glenn J. Boyle, B.Sc., M.Sc., Ph.D. is the Executive Director of WRA Wildlife Rescue Association of B.C., which is the largest rehabilitator of wildlife in B.C. and one of the largest facilities of its kind in Canada. He has been working with wildlife for over 20 years. Glenn has degrees in Marine & Freshwater Biology (Queen Mary College, London), Environmental Technology (Imperial College, London) and Zoology (University of Guelph, Ontario), with a demonstrated interest and expertise in marine mammals, wild animal rehabilitation and wildlife management.

Since 1989, Glenn has worked in wildlife research and rehabilitation internationally in the UK, Norway, the Netherlands and Canada. In that time, he has been involved in the care and husbandry of a variety of marine life (invertebrates, fish, penguins, sea birds, seals, fur seals and sea lions), and has developed expertise in the management of wildlife rehabilitation centres and the coordination of marine mammal stranding response networks.

Since 2001, Glenn has held positions as Curator of the National Seal Sanctuary in Cornwall, UK, and Curator for the SEA·LIFE Marine Mammal Network in Europe, and he has served on the Board of Directors of the Oiled Wildlife Society of BC and the WRA Wildlife Association of British Columbia.

Lani Sheldon, B.Sc. serves on the Wildlife Rehabilitators' Network of BC Board of Directors as the Secretary. She has a Bachelor of Science degree in Animal Biology from the University of British Columbia and received numerous research awards for her work. Lani has completed research in avian physiology and nestling development with the UBC Department of Zoology and the UBC Animal Welfare Program and has her work published in the Journal of Avian Biology, Hormones and Behavior, and the Wildlife Rehabilitation Bulletin. Lani brings considerable experience working with oiled wildlife and facilities management through her work as the Team Leader of Wildlife Rehabilitation with the Wildlife Rescue Association of BC.

Lindsaye Akhurst, RAHT is the Manager of the Vancouver Aquarium's Marine Mammal Rescue Centre, the largest marine mammal rehabilitation centre in Canada. She started at the Centre as a Rehabilitation Specialist in 2006 and moved into the role of Coordinator in 2008 and Manager in 2010. Lindsaye is a registered Animal Health Technologist with the Animal Health Technicians of British Columbia, Board member of the Oiled Wildlife Society of BC and a member of the Wildlife Rehabilitators' Network of British Columbia and the National Wildlife Rehabilitators Association. Her previous work has included working in private practice, employment at the BC Wildlife Centre and working at The University of British Columbia's Animal Care Department. Lindsaye also works part time at the BC SPCA Hospital and Vancouver Animal Emergency Clinic.

Sara Dubois, B.Sc., M.Sc., RPBio. is the Manager of Wildlife Services for the BC SPCA. She began her career with the BC SPCA in 2004 as the Manager of Wild ARC, B.C.'s second largest wildlife

rehabilitation centre located near Victoria. Prior to working for the BC SPCA, Sara completed contracts for the BC Ministry of Environment, Parks Canada and Wild Bird Trust of BC. Sara has a Bachelor of Science in Biology from the University of Victoria and a Masters degree from the internationally renowned Animal Welfare Program at the University of British Columbia. Her Masters research was the first of its kind in Canada, surveying wildlife rehabilitation centers across B.C. to identify best practices for animal care, wildlife education, and facility management. Sara returned to the UBC Animal Welfare Program as a PhD student in 2010, undertaking public participation and policy research to improve the humaneness of wildlife management, while continuing to work for the BC SPCA on a part-time basis.

Sara is a Registered Professional Biologist, past Board member of the Wildlife Rehabilitators' Network of BC, and current President of the Oiled Wildlife Society of BC. She has written articles for the Journal of Wildlife Rehabilitation, Wildlife Rehabilitation, and the BC Veterinarian.

Coleen Doucette, AHT is an emergency response consultant and member of the Board of Directors for the Oiled Wildlife Society of BC. She has extensive experience in executive management, emergency response management and wildlife/exotic animal care and rehabilitation. Coleen is a trained veterinary technician with over six years experience in private practice and founder of Acadia Wildlife Foundation in Bar Harbor, Maine in 1992. She has more than 30 years experience in business management including 17 years as director of wildlife rehabilitation operations.

Additionally, Coleen's areas of expertise include staff management and team building, programs coordination and supervision, financial tracking and reporting, media-relations management and image consulting.

Her experience working with governing agencies throughout North America and US Coast Guard 40 hour certification in Incident Command System provides her with the skills and insight to lead wildlife operations in accordance with the overall Incident Command structure of a response. She has participated in every aspect of oiled wildlife response, working in over 40 responses during her tenure as Senior Response Coordinator for Tri-State Bird Rescue and Research, Rehabilitation Director for International Bird Rescue Research Center, and Operations Manager for Focus Wildlife International and Focus Wildlife Canada.

Jacqueline McQuillan, B.Sc. graduated from Simon Fraser University in 2000, where she specialized in animal ecology and environmental toxicology. Following graduation she transitioned from the role of volunteer and part-time staff member to that of full-time staff for the Wildlife Rescue Association of BC, where she worked until 2007, eventually filling the role of Wildlife Rehabilitation Manager. During her time at WRA she was involved in numerous oiled wildlife responses. Jacqueline has worked as a professional oiled wildlife responder for Focus Wildlife Canada on four separate oiled wildlife responses. She is the past President of the Wildlife Rehabilitators' Network of BC and current Vice-President of the Oiled Wildlife Society of BC, as well as an acting advisor for the Oiled Wildlife Trust.

Appendix B – Oiled Wildlife Trust Case Studies

The Oiled Wildlife Trust has documented five case studies involving oiled wildlife occurrences in British Columbia. These cases best illustrate the progress that has been made and the remaining challenges associated with oiled wildlife response management and operations.

All cases are similar in scope but varied considerably in wildlife management strategy. These cases involved the execution of an overarching Incident Command System, but only one case included the implementation of a formal Wildlife Branch management structure throughout the response. In our experience, the cooperative implementation of a Wildlife Branch structure within the Incident Command System has significant consequences for providing a coordinated and efficient wildlife response, ultimately affecting the overall cost and final outcome.

Author's Note: This document was originally assembled by Coleen Doucette for presentation to the Auditor General of Canada December 16, 2009.

July 2006

MV Andre: A foreign-owned vessel spilled oil into Burrard Inlet. As required by law, Burrard Clean Operations was hired to perform clean-up operations.

NOTIFICATION

- Canadian Coast Guard identified the Responsible Party
- Burrard Clean Operations was reporting no wildlife impact but placed Focus Wildlife on alert status
- Wildlife Rescue Association of BC received calls from the public reporting oiled birds
- Wildlife Rescue Association of BC contacted Focus Wildlife
- Focus Wildlife contacted Burrard Clean Operations about public reports
- Wildlife Rescue Association of BC sent out staff to investigate reports of oiled Cormorants, capturing first oiled bird
- Focus Wildlife notified Burrard Clean Operations of oiled bird capture and reports of flocks of oiled birds sighted

ACTIVATION

- Burrard Clean Operations arranged boat transport for Focus Wildlife and Wildlife Rescue Association of BC staff to go out on water for preliminary impact assessment
- Impact assessment - observations of wildlife carcasses, oiled Canada geese (> 50), gulls and cormorants. Several oiled birds captured and several carcasses were retrieved.
- Burrard Clean Operations contracted with Focus Wildlife to commence wildlife branch operations (management, search and collection, rehabilitation)
- Focus Wildlife communicated with federal and provincial regulatory agencies obtaining permit authorization
- Focus Wildlife mobilized response services
- Regulatory agencies had no involvement during activation

CAPTURE

- Focus Wildlife began search and collections operation for live animals and carcass retrieval
- Four days later Burrard Clean Operations halted search and collection operations even though Focus Wildlife personnel had confirmed sightings of oiled wildlife in the field
- Several hours after search and collection had been cancelled by Burrard Clean Operations, Canadian Wildlife Service re-activated the field teams for continued wildlife collection
- Again, the following day, Burrard Clean Operations cancelled search and collection operations, leaving recoverable oil contaminated animals to die in the field

REHABILITATION

- With animals in hand, field stabilization was temporarily set up by Focus Wildlife and the Wildlife Rescue Association of BC team members inside trailers in the Burrard Clean Operations parking lot to begin medical treatment
- Focus Wildlife investigated sites at the Chevron refinery and Pacific National Exhibition (PNE) to establish a primary care facility
- The continuance of the rehabilitation process for the birds in care was stalled for seven days with birds being held at the field stabilization site as the Responsible Party and

- Canadian Wildlife Service were in disagreement as to how to proceed i.e. continuing to provide animal care or euthanizing the birds in care
- Incident Command System's Wildlife Branch was shut down, leaving Focus Wildlife and Wildlife Rescue Association of BC on their own to provide resources for the care of 56 animals
- Two days later, oiled wildlife began to attract considerable media attention, Focus Wildlife was given approval from the Responsible Party to move forward with wildlife rehabilitation of the animals in hand
- Focus Wildlife mobilized a primary care facility, management and administration office on the Shell property in Burnaby, B.C.
- BC Ministry of Environment's provincial veterinarian oversaw medical program
- Animal care activities took place over a 4 week period

ANIMAL CASE STATISTICS

Live Bird Intakes:	56
Died:	01
Euthanized:	06
Released:	49
Release Rate:	88%

RESULTS

- An increased cost of wildlife response was approximately doubled due to stalling tactics and removal of the Wildlife Branch from ICS
- Prolonged time in captivity for oiled birds resulted in increased incidence of health complications
- Dangerous and cramped working quarters for personnel during first seven days while required to provide animal care inside the trailers
- Responsible Party refused to pay for one half of the associated expenses causing severe financial hardship to Focus Wildlife
- Canadian Wildlife Service permitted and requested a wildlife response, but refused to require Responsible Party to pay expenses
- Responsible Party's refusal to cover expenses directly impacted morale of the animal care personnel and community volunteers

OBSERVATIONS

- Canadian Wildlife Service's refusal to take responsibility for decision-making was the major contributor to the problems arising during this event
- Federal regulatory staff assigned to this case were unknowledgeable as to applicable wildlife policies and how to enforce them

August 2006

Westwood Annette: A Canadian-based company spilled oil into the Squamish Harbour. As required by law, Burrard Clean Operations was hired to perform clean-up operations.

NOTIFICATION

- Canadian Coast Guard identified the Responsible Party
- Focus Wildlife was contacted by the media about public reports of oiled wildlife
- Focus Wildlife contacted Canadian Wildlife Service for direction

ACTIVATION

- Focus Wildlife was put on alert by Burrard Clean Operations
- Responsible Party informed Focus Wildlife that Canadian Wildlife Service and Burrard Clean Operations had advised against mounting a wildlife response
- Public pressure forced the Responsible Party to reconsider
- Prior to hiring Focus Wildlife, Responsible Party (via Burrard Clean Operations) contacted unqualified wildlife rehabilitation centres to ask them to take in low numbers of oiled wildlife
- Focus Wildlife contacted members of the Wildlife Rehabilitators' Network of BC to request that individual rehabilitation centres decline taking in oiled wildlife (in an attempt to force professional oiled wildlife response to take place)
- A contract was established between Focus Wildlife and the Responsible Party to provide professional oiled wildlife response services

CAPTURE

- Focus Wildlife collaborated with a local environmental consulting company to provide search and collection personnel coverage
- The species and molting status of the impacted wildlife (flighted flocks of Canada geese) made search and collection efforts difficult using standard operational techniques
- It was assessed and communicated to the Responsible Party that successful capture of oiled wildlife would require specialized operational techniques (cannon nets). Note: Focus Wildlife has successfully deployed cannon nets in other wildlife responses to capture contaminated wildlife
- Focus Wildlife requested permission from the Canadian Wildlife Service to utilize cannon nets to capture the impacted geese; Canadian Wildlife Service refused because there was no equipment to do so
- Focus Wildlife located equipment (within Canadian Wildlife Service); Canadian Wildlife Service refused to permit a non-government entity to deploy the equipment
- Focus Wildlife (via BC Ministry of Environment) found a trained and permitted Parks Canada employee to deploy the equipment. Canadian Wildlife Service refused to permit the Parks Canada employee, claiming it was too dangerous for the wildlife and personnel
- Focus Wildlife attempted captures of the remaining oiled wildlife utilizing conventional methods, but as predicted, had limited success
- The remaining 20-30 oiled wildlife remained in the environment

REHABILITATION

- With the aid of the community of Squamish, a field stabilization facility was identified and established near the spill site
- Focus Wildlife mobilized a primary care facility, management and administration office on the Shell property in Burnaby, B.C.
- BC Ministry of Environment's provincial veterinarian oversaw medical program
- Animal care activities took place over a 4 week period

ANIMAL CASE STATISTICS

Live Bird Intakes:	07
Died:	00
Euthanized:	01
Released:	06
Release Rate:	86%

RESULTS

- Canadian Responsible Party was very willing to mount an oiled wildlife response
- Canadian Wildlife Service was still concerned after media frenzy that left them under scrutiny from the previous spill, one month before. Therefore, they were reluctant for wildlife to be rescued and rehabilitated
- Canadian Wildlife Service adamantly refused to facilitate or approve the use of appropriate capture equipment and methods to be used, leaving the Responsible Party and their hired wildlife contractor without proper means to capture impacted animals
- Oiled birds that remained in the field would have eventually perished and had a high likelihood of being scavenged by the local population of eagles, potentially contaminating them
- Oiled animals that had a high likelihood of successful rehabilitation were left out in the field

OBSERVATIONS

- Canadian Wildlife Service's refusal to cooperate resulted in many oiled birds being left in the field
- Oiled wildlife not only dies a slow death when left in the environment, the carcasses also pollute the environment causing secondary oiling to any animals that come in contact with them from scavenging. This can elevate the level of impact and mortality substantially.
- It was evident that much attention needed to be directed towards education and relationship building with Canadian Wildlife Service

July-August 2007

Westridge Pipeline: During construction activities, a pipeline ruptured in the Westridge neighborhood of Burnaby, B.C.. The Responsible Party was not initially identified, but the pipeline owner took immediate action in mounting a complete response, including wildlife.

NOTIFICATION

- OWT organizations first heard about the spill in the media
- Pipeline owner asked Burrard Clean Operations' Logistics Officer for recommendation on how to proceed with oiled wildlife issues; Logistics Officer recommended contacting Focus Wildlife

ACTIVATION

- Focus Wildlife was contacted on the first day by pipeline owner to provide reconnaissance services as soon as possible
- A contract was established between pipeline owner and wildlife contractor
- A reconnaissance team was on site within 12 hours of initial incident occurring

CAPTURE

- As soon as the impact assessment team observed oiled wildlife, Focus Wildlife response services were activated by the pipeline owner, and search and collection teams were mobilized

WILDLIFE BRANCH MANAGEMENT

- At the pipeline owner's request, Focus Wildlife also provided management staffing to the Incident Command Post; a Wildlife Response Manager acted as a Technical Specialist in the Environmental Unit of the Planning Section and as a Deputy to the client's own Wildlife Branch Director
- Focus Wildlife and the wildlife response activities were fully incorporated into the overall ICS structure for the spill
- Federal and provincial regulatory agencies were involved and provided direction and oversight to the wildlife response via the REET and Environmental Unit

REHABILITATION

- Focus Wildlife mobilized a primary care facility, management and administration office on the Shell property in Burnaby, B.C.
- BC Ministry of Environment's provincial veterinarian oversaw medical program
- Animal care activities took place over a 4 week period

ANIMAL CASE STATISTICS

Live Bird Intakes:	20
Died:	00
Euthanized:	01
Released:	19
Release Rate:	95%

RESULTS

- All components of the response were integrated into the emergency management structure providing thorough communication and cooperation
- All stakeholders were involved in the decision-making process at appropriate levels
- Wildlife Action Plans were included in the Daily Incident Action Plan
- Direct communication with Planning, Logistics and Finance allowed for timely acquisitions of needed resources and controlled costs
- Media inquiries were handled in a collaborative manner through the Joint Information Center providing a unilateral, informative message to the public

OBSERVATIONS

- Wildlife staff was able to focus attention on animal care rather than the distraction of communication complications
- Animals received the best possible care without obstacles or time delays
- Costs were minimized

August 2007

Leroy Barge: While transiting Johnstone Strait, the Ted Leroy Trucking Limited's barge listed and drifted into the Robson Bight Ecological Reserve, causing the contents of the barge to spill into the ocean.

NOTIFICATION

- Canadian Coast Guard identified Responsible Party
- Focus Wildlife was contacted by a wildlife rehabilitation organization (a member of Wildlife Rehabilitators' Network of BC) to report possible oiled bird sighting
- At the advice of Burrard Clean Operations, the Responsible Party was reluctant to take financial responsibility for wildlife operations
- Focus Wildlife was contacted by BC Ministry of Environment to provide reconnaissance services
- Two separate command posts were established; one for oil recovery and clean-up and one for the wildlife response

ACTIVATION

- BC Ministry of Environment established a contract with Focus Wildlife
- Focus Wildlife sent a two person impact assessment team to provide services for a three day period
- Canadian Wildlife Service was not actively involved through the incident command because the spill occurred in a site that was the jurisdiction of the Province and Parks Canada

RECONNAISSANCE; IMPACT ASSESSMENT

- Focus Wildlife performed a thorough initial impact assessment, including detailed documentation
- Based on results of assessment, Focus Wildlife recommended recovering carcasses for evidence collection processing
- No additional wildlife response operations needed to be activated due to the limited impact and limited ongoing threat to wildlife
- NOTE: BC Ministry of Environment placed Focus Wildlife on alert during the salvage of the equipment; no significant product release occurred and Focus Wildlife was not activated

ANIMAL CASE STATISTICS

Live Bird Intakes: 00

RESULTS

- Stakeholders were confident that little to no wildlife impact had occurred
- Press inquiries were addressed in an informative manner
- Exercise in proactive wildlife reconnaissance

OBSERVATIONS

- The lack of an integrated Incident Command System caused communication problems between the Responsible Party and Regulatory agencies
- The environment impacted was a highly used Killer Whale habitat causing great public and media concern; a proactive approach to reconnaissance by the BC Ministry calmed the mounting concern

July-August 2009

Burrard Inlet Mystery Spill: On July 30, 2009, a fuel spill was discovered blanketing the waters in Vancouver's Burrard Inlet.

NOTIFICATION

- Canadian Coast Guard suspected but had not yet identified the Responsible Party
- Canadian Wildlife Service and BC SPCA began receiving oiled wildlife reports from the public
- Canadian Wildlife Service gave callers Focus Wildlife's phone number for initial reports
- Focus Wildlife began receiving reports from the public
- Focus Wildlife called Canadian Wildlife Service for direction, attempted to reach three different agents but calls were not returned
- Public calls to BC SPCA increased rapidly over the following six hours
- Focus Wildlife called Canadian Wildlife Service Regional Director's cell phone and left voice mail
- Focus Wildlife called Environment Canada and left voice mail
- The following day public reports continued to pour into BC SPCA
- Focus Wildlife's calls to Canadian Wildlife Service and Environment Canada had not been returned, so Focus Wildlife called BC Ministry of Environment's emergency response staff
- BC Ministry of Environment responded immediately and agreed to contact the federal government
- Several hours later, Canadian Wildlife Service Regional Director returned Focus Wildlife's phone call stating that he would look into it, but that it would take some time

ACTIVATION

- Six hours later, Focus Wildlife received a call from Environment Canada asking to provide a drop-off location for the public to take oiled wildlife
- Focus Wildlife advised Environment Canada to discourage public collection of wildlife for health and safety reasons, and to implement a professional response for collection and rehabilitation of impacted wildlife
- Environment Canada agreed to contract Focus Wildlife to allow professional collection of seriously distressed animals and mobilize a field stabilization unit over British Columbia Day weekend
- Progressive rehabilitation could not be approved for three days due to the unavailability of the Canadian Wildlife Service (Canadian Wildlife Service – not Environment Canada – is ultimately responsible for decisions involving oiled wildlife)
- A cap of \$25,000 was established by Environment Canada for Focus Wildlife to use at its own discretion
- This contract would need to be transferred to Canadian Wildlife Service at the end of three days, with further direction at that time regarding the care of captured oiled wildlife
- Focus Wildlife requested assistance from Environment Canada and Canadian Coast Guard to identify an appropriate location for a primary care facility in preparation for ongoing rehabilitation care

CAPTURE

- Focus Wildlife was directed by Environment Canada to ensure that any and all search and collection activities were conducted with extreme discretion over the weekend to prevent the public from becoming aware of oiled wildlife response activities
- Focus Wildlife conducted only opportunistic capture of highly distressed animals and response to public calls
- Focus Wildlife developed an action plan for the capture of additionally observed oiled wildlife

REHABILITATION

- Focus Wildlife mobilized a field stabilization unit and accompanying animal care staff temporarily staged at Wildlife Rescue Association of BC in Burnaby
- Focus Wildlife identified an appropriate location to be provided free of charge for the mobilization of a primary care facility for a small number of oiled wildlife, but received no assistance from Environment Canada or Canadian Coast Guard
- Canadian Wildlife Service took over the contract three days after the contract commenced and notified Focus Wildlife that no more animals were to be collected and the animals in hand would need to be released or euthanized
- Because captured wildlife could not be released without complete rehabilitation (due to poor prognosis for survival), Focus Wildlife was forced to euthanize otherwise healthy animals with good prognosis for successful rehabilitation and release

ANIMAL CASE STATISTICS

Live Bird Intakes:	04
Euthanized:	04
Release Rate:	00%

RESULTS

- Environment Canada made a grand attempt to establish an oiled wildlife response rather than ignore oiled impacts
- An estimated 30-40 live, oiled animals were left in the environment
- All oiled carcasses were left in the environment
- Due to lack of funding, healthy oiled animals had to be euthanized

OBSERVATIONS

- Ultimately Canadian Wildlife Service is responsible for decision making for affected wildlife
- Federal agencies are ill prepared to handle the decision-making process for wildlife emergencies
- One live oiled juvenile seal was collected by clean-up contractor and delivered to marine mammal rescue. Marine Mammal Rescue currently cares for oiled animals at their own expense, as they have not yet been integrated into the Incident Command System
- Leaving oiled wildlife in the environment to die continues the chain of pollution and causes inhumane suffering

CONCLUSION

KEY SUCCESSES:

- The federal government currently has policies in place to address oiled wildlife. Refer to “Federal Legislative and Policy Framework for Responding to Oil Impacted Migratory Birds” by Dave W. Smith, Canadian Wildlife Service
- Environment Canada is supportive of further developing wildlife contingency planning in British Columbia and problem solving to establish an oiled wildlife program that will meet international standards
- The federal and provincial wildlife agencies have begun to work together to facilitate wildlife planning

KEY CHALLENGES:

- Lack of understanding amongst high-level federal regulators about the procedures necessary to adequately and humanely rehabilitate oiled wildlife; some still believe that “an oiled bird is a dead bird”
- Federal regulatory agencies (i.e. Canadian Coast Guard/Transport Canada and Canadian Wildlife Service/Environment Canada) are not in agreement on the interpretation of federal wildlife policies
- Current wildlife policies are not recognized or enforced by the Canadian Coast Guard
- Marine mammal regulatory agencies and rescue organizations have not been included in the wildlife response planning process or notified when spills occur
- Current legislation does not adequately support federal wildlife policies
- Communication breakdowns amongst federal regulatory agencies, and between federal and provincial regulatory agencies, make contingency planning difficult and cause major time delays in decision-making during actual emergencies. (Some examples: Canadian Coast Guard does not use the Incident Command System, Canadian Wildlife Service has been absent during some responses and critical planning meetings)

RECOMMENDATIONS

- Federal and provincial wildlife regulatory agencies establish a joint wildlife contingency plan
- All federal agencies agree to uphold existing wildlife policies
- Canadian Coast Guard to accept and abide by wildlife regulators’ direction during responses; ideally become integrated into Incident Command System
- Inclusion of Department of Fisheries and Oceans in regulatory wildlife planning
- Existing funding for environmental clean-up of oil spills to include oiled wildlife response
- Development of a federal contingency fund for oiled wildlife response in incidences where a Responsible Party is not identified
- Agency litigators and court system to utilize existing avenues of legislation for prosecutions
- Politicians to enact specific oiled wildlife pollution legislation (policy driven) that meets international standards

LITERATURE CITED

Focus Wildlife. 2006. M/V Andre Status Report.

Focus Wildlife. 2009. Animal Case Records 2006–2009.

Smith, D. W. 2009. Federal Legislative and Policy Framework for Responding to Oil Impacted Migratory Birds. Environment Canada, Canadian Wildlife Service.

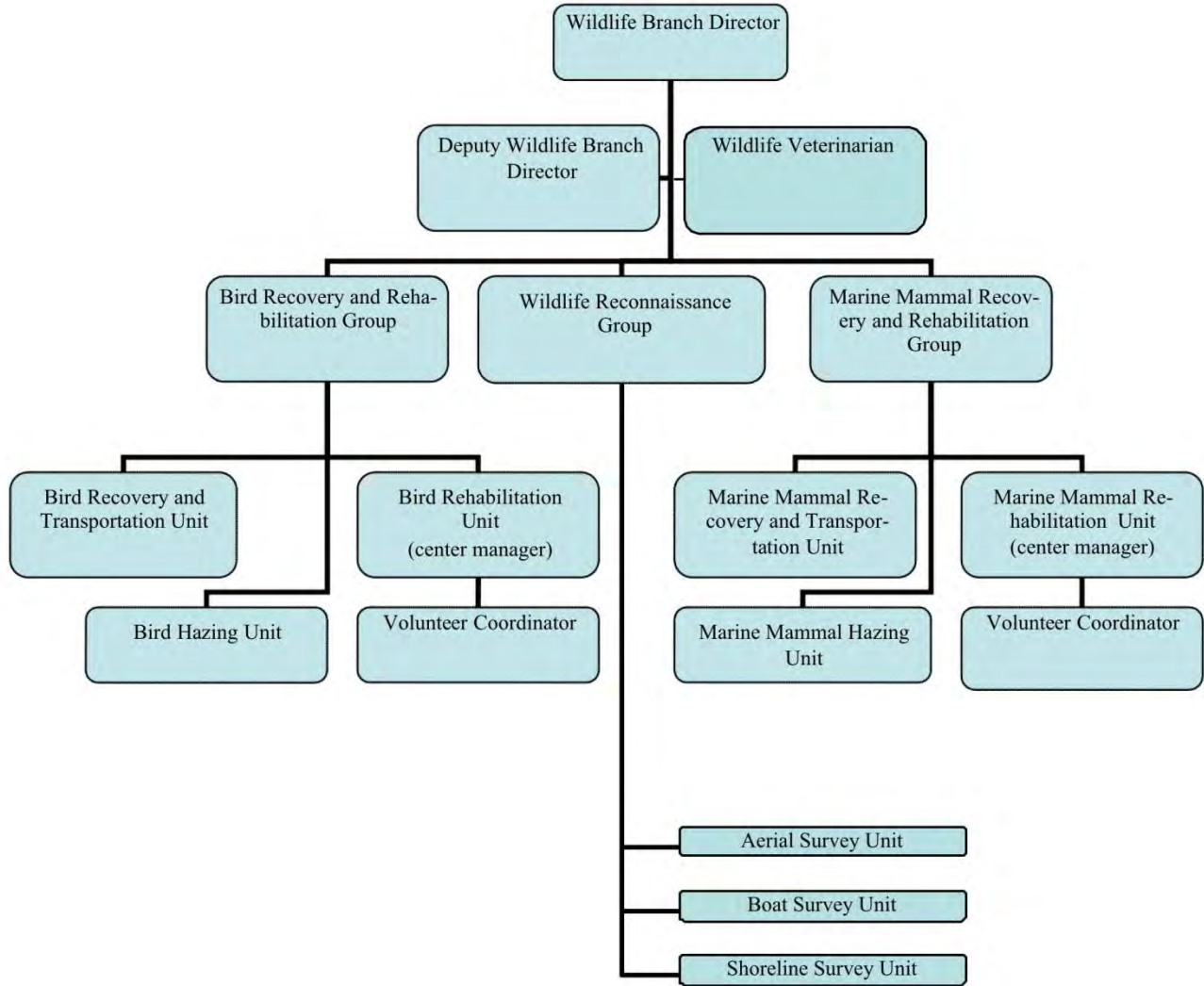
Appendix C – Minimum Space Requirements for Rehabilitation of 100-150 Oiled Animals

Facility	Area (square feet)
Front desk / Admissions	300
Operations Office	300
Kitchen / Food storage	300
Husbandry Area (large central room)	2800
Supplies / Storage	500
Wildlife Cleaning Area I	750
Medical Treatment / Exam	300
Pathology / Lab / Cold Storage	150
Isolation Ward	300
Volunteer / Worker Rest Room	300
Bathrooms / Decontamination / Changing	200
Outside Pool Areas @ one 10' x 15' x 2' pool per 15 birds + access and maintenance space	3300
Nonhazardous and regulated (medical and oiled) trash	
Indoor	100
Outside	400
Outside area for oily waste water	300
Loading Dock / Parking for 50 (opposite side of building from outside cages)	5000
Total interior	6300
Total exterior	9000
Total	15,300

Note: If an existing wildlife rehabilitation center were to be used, it would require the above space in addition to the space allocated for any existing caseload. Animals impacted by an oil spill must be cared for separately from the in-house population.

Source: Canadian Oiled Wildlife Rescue Academy Manual (2008)
Tri-State Bird Rescue & Research Inc. and International Bird Rescue Research Center

Appendix D – Incident Command System: Wildlife Branch Structure



Source: State of Washington – Northwest Wildlife Response Plan (2011)

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Tracy Riddell for use of the photo on the front cover.

JACQUILINE MCQUILLAN (NÉE WARD)

PROFILE

Wildlife rehabilitation specialist and biologist with more than 10 years in the field caring for 140+ different species of birds, mammals, amphibians and reptiles. Extensive experience in oiled wildlife response, maintaining internationally accepted animal welfare standards while performing; search and collection, oiled bird care, oiled bird cleaning, post-cleaning supervision, and release coordination. Skilled at supervising and directing large numbers of staff and volunteers. Strong leadership ability; experienced in board roles as President and Vice-president of two not-for-profit non-governmental organizations.

EMPLOYMENT EXPERIENCE

REHABILITATION MANAGER, WILDLIFE RESCUE ASSOCIATION OF B.C. BURNABY, B.C. 2007

Provided complete oversight of the wildlife rehabilitation activities of one of the busiest wildlife rehabilitation centres in Canada. Interviewed and hired rehabilitation employees. Guided and directed rehabilitation staff. Completed grant applications. Wrote regular articles for publication. Provided insight and direction into strategic growth for the centre. Liaised with government regulators, other rehabilitation centre managers and consulting veterinarians. Prepared media releases. Acted as the primary animal care spokesperson for media interviews.

WILDLIFE CARE TEAM LEADER, WILDLIFE RESCUE ASSOCIATION OF B.C. BURNABY, B.C. 2002-2006

Supervised the medical and rehabilitative care of ill, injured and oiled animals ranging in size from hummingbird to wolverine, from intake through to release. Performed medical procedures on injured wildlife including suturing and dressing wounds, splinting and casting fractures, administering subcutaneous and intravenous fluids, and extracting blood samples. Oversaw wildlife rehabilitation staff. Co-hosted a weekly television segment featuring an ill or injured wildlife patient. Researched nutrition information for wild patients and created a species-specific diet manual based on their metabolic rate and natural diet.

WILDLIFE REHABILITATOR, WILDLIFE RESCUE ASSOCIATION OF B.C. BURNABY, B.C. 1998-2002

Provided medical care to injured, orphaned and oiled wild animals. Created species-specific habitats. Supervised and instructed volunteers. Maintained a database of the 3000+ patients admitted annually. Answered calls from the public regarding urban wildlife issues and wildlife in distress. Meticulously documented patient information.

OILED WILDLIFE RESPONDER, FOCUS WILDLIFE CANADA MULTIPLE LOCATIONS 2005-2009

Provided specialized rehabilitative care for oiled birds in four separate wildlife incidents in Alberta and British Columbia. Supervised and instructed large numbers of workforce/volunteers. Critically assessed the health of oiled birds to determine if they were physically stable to endure cleaning. Coordinated tube feedings for hundreds of oiled animals every few hours throughout the day.

WILDLIFE REHABILITATOR, EARTH RANGERS WOODBRIDGE, ONTARIO 2004

Assisted in the set-up of a new, high technology wildlife rehabilitation centre. Developed species-specific protocols and compiled nutritional information for wildlife patients. Advised on design of animal habitats.

VOLUNTEER EXPERIENCE

WILDLIFE REHABILITATORS' NETWORK OF BRITISH COLUMBIA 2006-2010

President 2008-2010, Co-president 2007-2008, Director 2006-2007

Led the only provincial rehabilitation organization that connects and disseminates information among member rehabilitation organizations in British Columbia. Coordinated responses to challenging and contentious animal welfare issues. Answered wildlife rehabilitation inquiries from member organizations. Developed and presented lectures and chaired Annual General Meetings. Organized annual board member nominations and elections. Oversaw advertising and presentation of an annual student bursary.

OILED WILDLIFE SOCIETY OF BC 2003-PRESENT

Vice-president 2009-2010 and 2011-present, *Secretary* 2007-2008, *Director/Advisor* 2003-2007

Provided insight into the long-term direction and development of the Society, which is dedicated to maintaining oiled wildlife preparedness in B.C.. Organized and chaired meetings. Arranged and carried out oiled wildlife response equipment inventories. Assisted in the development of professional oiled wildlife response in British Columbia.

OILED WILDLIFE TRUST 2008-PRESENT

Wildlife Rehabilitators' Network of B.C. Representative 2008-2010, *Advisor* 2011-present

Assisted in the establishment of the Trust which brings together all of the non-profit organizations involved in oiled wildlife response and preparedness planning in B.C. Contributed to the development of the Trust's guiding principles and mission to establish uniform professional response to all oiled wildlife incidents in British Columbia. Participated in a meeting with the Auditor General of Canada to provide feedback on oiled wildlife response in British Columbia.

INSTRUCTOR, WEST COAST COLLEGE SURREY, B.C. DECEMBER 2010

Provided an introductory class in wildlife rehabilitation to veterinary assistant students.

EDUCATOR, STRONGSTART BC PORT MOODY & LANGLEY, B.C. 2010/2011

Educated pre-school children about urban wildlife issues.

EDUCATION

Simon Fraser University — *Bachelor of Science* 2000

Major: Biology - specializing in animal ecology and environmental toxicology

CONFERENCES

• **National Wildlife Rehabilitators Association Symposia**

- 2010 Bellevue, Washington
 - * **presenter:** *Collaborative Relationships Solving Wildlife Challenges*
- 2007 Chicago, Illinois
- 2006 Costa Mesa, California
- 2005 Minneapolis, Minnesota
- 2004 Orlando, Florida
- 2003 Newport, Rhode Island

• **International Wildlife Rehabilitation Council Symposia**

- 2005 Toronto, Ontario
- 2004 Portland, Oregon
 - * **presenter:** *Care of an Injured Wolverine*

• **Wildlife Rehabilitators' Network of BC Conferences**

- 2011 Abbotsford, British Columbia
- 2010 Gabriola Island, British Columbia
- 2009 North Vancouver, British Columbia
- 2008 Victoria, British Columbia
- 2007 Oliver, British Columbia
- 2006 Abbotsford, British Columbia
- 1999 Delta, British Columbia

• **Alberta Wildlife Rehabilitators' Association Conference**

- 2009 Calgary, Alberta
 - * **presenter:** *Rehabilitating Oiled Wildlife in a Standard Rehabilitation Facility*

SKILLS

Adept at assessing and providing medical and rehabilitative care for most South Coast British Columbia wildlife. Effective communicator. Capable of managing highly stressful situations in a calm and professional manner. Competent and highly specialized oiled wildlife responder. Strong leader. Effective mediator. Adept problem solver. Efficient multi-tasker.