Environment and Climate Change Canada
Environnement et Changement climatique Canada
Canada

Guidelines for the Capture, Transport, Cleaning, and Rehabilitation of Oiled Wildlife

Cat. No.: CW66-773/2021E-PDF
ISBN: 978-0-660-40088-4
EC21154

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Environment and Climate Change Canada
Public Inquiries Centre
12th Floor, Fontaine Building
200 Sacré-Coeur Boulevard
Gatineau QC K1A 0H3
Telephone: 819-938-3860
Toll Free: 1-800-668-6767 (in Canada only)
Email: enviroinfo@ec.gc.ca

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Abstract

Environment and Climate Change Canada's Canadian Wildlife Service (ECCC-CWS)'s *Guidelines for the Capture, Transport, Cleaning, and Rehabilitation of Oiled Wildlife* provide guidance concerning the treatment of Wildlife under its jurisdiction that have been affected during a Pollution Incident in Canada. While these guidelines focus on actions that should be undertaken related to oil pollution, the guidance provided herein may be useful in planning a response during other types of Pollution or Non-Pollution Incidents. These guidelines provide direction to organizations and personnel authorized to undertake oiled Wildlife capture, transport, cleaning, and rehabilitation. Recommendations to undertake Wildlife rehabilitation during a Pollution or Non-Pollution Incident will be situation-dependent, based on factors outlined in the *National Policy on Wildlife Emergency Response* (ECCC-CWS 2021). When rehabilitation is undertaken, ECCC-CWS will support the rehabilitation of oiled Wildlife by issuing permits under the *Migratory Birds Regulations* (MBR), the *Migratory Bird Sanctuary Regulations* (MBSR) and the *Species at Risk Act, 2002* (SARA), as appropriate, for qualified organizations to carry out these activities. When rehabilitation is undertaken during Pollution Incidents, ECCC-CWS will engage with the Wildlife Response Organizations (WROs) that have been authorized and contracted to respond in an incident. ECCC-CWS will provide and advise on the location of oiled Wildlife, will advise on priorities for rescue and rehabilitation, supports banding of rehabilitated Migratory Birds prior to their release (authorized under the *Migratory Birds Convention Act* and MBR), and will advise concerning potential release sites and post-release monitoring requirements.

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List of Acronyms

CCAC	Canadian Council on Animal Care
CWA	*Canada Wildlife Act, 1985*
CWS	Canadian Wildlife Service
ECCC	Environment and Climate Change Canada
ECCC-CWS	Environment and Climate Change Canada's Canadian Wildlife Service
LA	Lead Agency
MBCA	*Migratory Birds Convention Act, 1994*
MBR	*Migratory Birds Regulations*
MBSR	*Migratory Bird Sanctuary Regulations*
NABC	North American Banding Council
NIOSH	National Institute for Occupational Safety and Health
OSHA	Occupational Safety and Health Administration
OWRC	Oiled Wildlife Rehabilitation Centre
PPE	Personal Protective Equipment
RP	Responsible Party
SARA	*Species at Risk Act, 2002*
SCBA	Self-contained Breathing Apparatus
WRP	Wildlife Response Plan
WRO	Wildlife Response Organization

Definitions

Chain of Custody: A written record for a legal sample documenting the continuity by tracing the possession of the sample from the point of collection through introduction into evidence.

CWS Co-ordinator: A person who leads and implements regional Wildlife Emergency preparedness and response on behalf of ECCC-CWS and represents ECCC-CWS's policies and interests when liaising and integrating with other federal and provincial/territorial government departments, Indigenous governments and Indigenous organizations, and stakeholders involved in the response during Wildlife Emergencies. CWS Co-ordinators may also fulfill some of the on-site roles of responder.

CWS Responder: Emergency response personnel that provide on-site support on behalf of ECCC-CWS, as directed by the CWS Co-ordinator, during Wildlife Emergencies.

Environmental Emergency: Any uncontrolled or unexpected incident involving the release (or the likelihood thereof) of a polluting substance into the environment that results or may result in an immediate or long-term harmful effect on the environment, or constitutes or may constitute a danger to human life or health. It may be caused by an industrial activity, natural emergency or by a wilful act.

Field Collection Point: Support structure that offers short-term holding of collected Wildlife in carrying crates or boxes prior to transport to a Field Stabilization Site or an Oiled Wildlife Rehabilitation Centre. It is not meant for stabilization or overnight holding.

Field Stabilization Site: Facility that provides initial triage, care and/or euthanasia as well as short-term holding (sometimes overnight) for Wildlife prior to transport to an Oiled Wildlife Rehabilitation Centre. It is not meant for washing oiled Wildlife and not designed for long-term care.

Incident Command: Responsible for overall management of the incident and consists of the Incident Commander, either single or unified command, and any assigned supporting staff.

Incident Commander: The individual responsible for all incident activities, including the development of strategies and tactics and the ordering and release of resources. The Incident Commander has overall authority and responsibility for conducting incident operations and is responsible for the management of all incident operations at the incident site.

Lead Agency: The governmental authority that regulates or has legislative authority over the responsible parties' response and is responsible for overseeing the appropriateness of the response.

Migratory Bird: As defined in the *Migratory Birds Convention Act, 1994*, a migratory bird referred to in the Convention, and includes the sperm, eggs, embryos, tissue cultures and parts of the bird of species listed under Article 1 of the Convention (Government of Canada 2017).

National Wildlife Area: A protected area created under the *Canada Wildlife Act* that contains nationally significant habitats for plants and animals and that is managed for the purposes of wildlife conservation, research and interpretation.

Non-Pollution Incident: An uncontrolled or unexpected Wildlife injury or mortality event other than a Pollution Incident.

Oiled Wildlife Rehabilitation Centre: Facility used for the triage, stabilization, cleaning, pre-release conditioning and/or euthanasia of oiled Wildlife. The centre may be a permanent purpose-built facility, an existing Wildlife rehabilitation centre, a mobile facility, or a temporary facility established during an incident.

Pollution Incident: The release or deposit of a substance that is harmful to Wildlife into an area or waters that are frequented by Wildlife or into a place from which the harmful substance may enter an area or waters frequented by Wildlife.

Responsible Party: Any person or organization who might be responsible for the source or cause of an environmental emergency and/or a Wildlife Emergency.

SARA-listed Species: A wildlife species listed on the List of Wildlife Species at Risk set out in Schedule 1 of the *Species at Risk Act* (SARA).

Species at Risk: As defined in the *Species at Risk Act* (S.C. 2002, c.29), means an Extirpated, Endangered or Threatened species, or a species of Special Concern.

Unified Command: An application of the Incident Command System, used when there is more than one agency with incident jurisdiction or when incidents cross political jurisdictions. Agencies work together through the designated members of the Unified Command to establish a common set of objectives and strategies and a single Incident Action Plan.

Wildlife: In this document, "Wildlife" is used to refer to the terms Migratory Birds as defined under the *Migratory Birds Convention Act,* and listed Species at Risk as those terms are defined under the *Species at Risk Act* for species falling within the jurisdiction of the Minister of Environment and Climate Change (with the exception of individuals of SARA-listed Species that are located on lands administered by Parks Canada). This term also refers to all wild species occurring in the National Wildlife Areas set out on Schedule I of the *Wildlife Area Regulations* (C.R.C., c. 1609).

Wildlife Emergency: A Pollution or Non-Pollution Incident that results or may result in an immediate and/or long-term harmful effect on the life or health of Wildlife and/or their habitat.

Wildlife Response Organization: Organizations that provide expertise, capabilities and trained personnel to undertake one or several aspects of response, including planning, implementation and reporting of activities related to Wildlife Emergencies. Wildlife Response Organizations (or representatives thereof) are authorized under applicable federal, provincial, and/or territorial legislation to capture, transport, clean, rehabilitate, euthanize, and release Wildlife.

Wildlife Response Personnel: Personnel authorized to undertake Wildlife capture, transport, treatment, and rehabilitation and who may be involved in one or several aspects of the field recovery, stabilization, treatment (including rehabilitation and euthanasia), and release of rehabilitated Wildlife. Personnel may include those from a Wildlife Response Organization, a rehabilitation organization, veterinary staff, and/or trained volunteers.

Wildlife Response Plan: A document that outlines the initial and ongoing Wildlife-related strategies that are needed to support any Wildlife response objectives that may occur at the onset of a Pollution or Non-Pollution Incident.

1.0 Overview

Environment and Climate Change Canada's Canadian Wildlife Service (ECCC-CWS) issues permits for the rehabilitation of contaminated Wildlife by qualified organizations, veterinary staff, and/or trained volunteers under the authority of the *Migratory Birds Convention Act, 1994* (MBCA) and its regulations (*Migratory Birds Regulations* (MBR) and *Migratory Bird Sanctuary Regulations* (MBSR)), as well as the *Species at Risk Act, 2002* (SARA) (see Appendix A for ECCC-CWS regional permits offices). These *Guidelines for the Capture, Transport, Cleaning, and Rehabilitation of Oiled Wildlife* provide guidance on the various aspects for the treatment of Wildlife captured during an oil Pollution Incident. While these guidelines focus on actions that should be undertaken related to oil pollution, the guidance provided herein may be useful in planning a response during other types of Pollution or Non-Pollution Incidents.

2.0 Regulatory Requirements in Canada

Environment and Climate Change Canada (ECCC) is responsible for the administration and implementation of the MBCA, the *Canada Wildlife Act* (CWA), and elements of SARA. Through these Acts, ECCC is responsible for the management and conservation of all Migratory Birds and Species at Risk under ECCC's jurisdiction (i.e., Wildlife). The CWA and *Wildlife Area Regulations* broaden the responsibility of ECCC-CWS to include habitats and all wild species within designated National Wildlife Areas. Refer to the *Guidelines for Wildlife Response Plans* (ECCC-CWS 2022a) for further details on species under ECCC jurisdiction.

ECCC regulates the killing or taking of Migratory Birds, nests and/or eggs as outlined in the MBR and MBSR. Only Migratory Birds listed under Article 1 of the MBCA are protected under the regulations, and permits with authorizations may be issued for activities affecting those birds (Government of Canada 2017, 2018). Authorizations under MBSR are required if activities are occurring in Migratory Bird Sanctuaries. In the case of the *Wildlife Area Regulations* and the *Scott Islands Protected Marine Area Regulations* (under the CWA), a permit is not required in the case of an emergency. Oil spills or other Pollution Incidents that would necessitate the immediate rehabilitation of Wildlife in these protected areas would be considered an emergency.

ECCC-CWS issues permits with authorizations under the MBCA and its regulations (MBR and MBSR) to individuals involved in the capture, transport, rehabilitation, banding, release and euthanasia of orphaned, injured, or oiled Wildlife, as well as to those who collect Migratory Bird carcasses. SARA-compliant authorizations for Migratory Bird rehabilitation may be issued under the MBCA, even if these Migratory Birds are listed on Schedule 1 of SARA (although additional requirements must be met). Depending on the level of training and expertise, organizations and/or personnel may be permitted to undertake all or part of these activities under a Scientific Permit. Individuals from Wildlife Response Organizations (WROs) or other qualified organizations may be issued Scientific Permits, and are not specific to any incident, location, or group of Wildlife. Additional permits may be issued to organizations or personnel contracted during an incident to support specific aspects of response (e.g., Wildlife capture). In either case, permits include specific authorizations, terms, and conditions on the types of activities that are permitted, species groups that are covered, rehabilitation and release requirements, as well as federal documentation and reporting. Permitting for banding rehabilitated Migratory Birds is

part of the Scientific Permit process, and permits are issued to skilled personnel by the Bird Banding Office (see contacts in Appendix A). Personnel need to demonstrate training, expertise, and justification specific to the response activities for which they are requesting authorization, in order to acquire ECCC-CWS evaluation and approval.

Other Wildlife listed under SARA will generally require provincial permits, except when they occur on federal land, in which case a SARA permit applies. In all cases, permit applications should consider recommendations and requirements for animal care, as described by the Canadian Council on Animal Care (CCAC 2003, 2006, 2008) and the North American Banding Council (NABC; NABC 2019). Municipal, provincial, territorial, or other federal departments and Indigenous governments may require additional permits. While these guidelines may provide information that would also support response efforts for provincially or territorially regulated species, this is outside the jurisdiction of ECCC-CWS. Where this document refers to birds, it should be assumed that guidance is specific to Migratory Birds under ECCC's jurisdiction, and additional guidance should be sought from other federal, provincial, territorial and Indigenous governments or agencies for non-Migratory Birds, where applicable. It is the responsibility of WROs to ensure that all the necessary permits and technical expertise have been obtained prior to commencement of emergency response.

For information concerning permits and authorizations required under the MBCA, SARA, and the CWA please contact CWSPermit.PermisSCF@ec.gc.ca or 1-800-668-6767, or see Appendix A for regional information.

3.0 Health and Safety

3.1 Health and Safety Plan

Wildlife Emergencies may result in personnel being exposed to environmental conditions and hazardous materials, combined with the hazard of handling live oiled Wildlife and carcasses. To address these potential threats, an incident-specific Health and Safety Plan will be developed by the Incident Safety Officer, as part of the Incident Command Post. WROs may contribute to the development of these plans to address considerations specific to the capture, transport, cleaning, rehabilitation, and release of oiled Wildlife. The following section provides some additional considerations of Wildlife Response Personnel in developing and reviewing incident-specific plans. The Health and Safety Plan should be posted and read by all Wildlife Response Personnel before participating in Wildlife response activities.

The plan should consider the most effective methods for minimizing potential hazards associated with Wildlife response activities using the following criteria:

1. **Elimination or Substitution** of a hazard
2. **Engineering Controls:** physical modifications to facilities, equipment, or processes to reduce exposure to a hazard
3. **Administrative Controls:** changing work practices, tools, and training to improve awareness and limit exposure risk
4. **Personal Protective Equipment (PPE):** the least effective control used when the previous three options cannot reduce the hazard exposure sufficiently

In Canada, the Canada Labour Code Part II Section 124 specifies that "[*e*]*very employer shall ensure that the health and safety at work of every person employed by the employer is protected*" (Canada Labour Code 1985). A best practice approach should be considered that meets the requirements of the Canada Labour Code, applicable provincial legislation, and the expectations of any worker. In many jurisdictions, any Wildlife Response Personnel risking exposure to hazardous materials must have some level of Hazardous Waste Operations and Emergency Response (HAZWOPER) or Hazardous Materials Operations (HAZMAT) training. The level of training required depends on the risk of exposure and nature of tasks completed by Wildlife Response Personnel.

The Health and Safety Plan should address all potentially unsafe environmental and physical conditions (e.g., slippery shorelines, steep slopes, or unsafe water conditions) and potential hazards associated with Wildlife encounters or captures (e.g., venomous snakes, large carnivores or ungulates, and stinging insects). Anticipated environmental, physical, and incident-specific conditions determine minimum required PPE to protect Wildlife Response Personnel against the hazards posed by the environment, pollutant(s), and oiled Wildlife.

PPE is the last line of defense. Safe work practices and safety procedures can eliminate or provide administrative controls over hazards. Safety training applicable to the task of capture or retrieval must be ensured for primary Wildlife Response Personnel in order to eliminate or reduce the potential for injury to both response personnel and Wildlife. The following are key health and safety protocols that all Wildlife Response Personnel should follow when implementing a capture and retrieval plan:

- Review the incident-specific Health and Safety Plan prior to daily activities, paying particular attention to anticipated weather conditions and material hazard information
- Properly wear all designated PPE
- Use species-specific safe handling techniques for captured Wildlife
- Follow implemented check-in/check-out procedures
- Abide by safety procedures for work on and around water

3.2 Personal Protective Equipment

Guidelines and standards are designed to ensure the safety of workers when they are handling hazardous materials and wastes. Wildlife Response Personnel operating within an oiled Wildlife treatment facility must have adequate training to care safely and humanely for Wildlife. Personnel should be trained to the highest level of responsibility they may need to assume, and trained to handle the highest level of potential exposure to hazardous substances they encounter. Those in charge of Wildlife response operations need to ensure that Wildlife Response Personnel use appropriate PPE, based on the standards outlined below.

The Canadian pollution response industry uses the PPE standards defined in the United States Occupational Safety and Health Administration (OSHA) Hazardous Materials standards (United States Department of Labor 1994). OSHA standards provide a comprehensive background on worker and volunteer safety with respect to a Pollution Incident response. OSHA standards outline four levels of protection (US Department of Labor 1994; US OSHA CFR 1920.120 Appendix B), from Level A (highest degree of personal protection in environments that are immediately dangerous to life and health), to Level D (basic level of protection against nuisance contamination). During an incident, the Incident Command Post Safety Officer will work with ECCC-CWS, the WRO(s), and associated personnel to determine the appropriate level of PPE requirements for these activities.

The level of protection outlined in this section represents minimum recommended level to manage exposure to hazardous materials. Additional PPE and first aid equipment may be required to further protect Wildlife Response Personnel from biological or physical hazards of handling individuals (e.g., pathogens, bites). A hazard identification and risk assessment should be completed for each response to ensure that worker health and safety is addressed according to the actual hazards at the site of the incident.

In the event of an incident which generates hazardous materials or wastes, the individuals responsible for their management, handling, or cleanup should be outfitted with appropriate PPE.

Level A
The following Level A equipment may be used as appropriate when the greatest level of skin, respiratory, and eye protection is required:

- Positive-pressure, full face-piece self-contained breathing apparatus (SCBA), approved by the National Institute for Occupational Safety and Health (NIOSH)
- Totally-encapsulating chemical-protective suit
- Coveralls
- Long underwear
- Chemical-resistant gloves (inner and outer)
- Chemical-resistant steel toe and shank boots
- Hard hat (to be worn under protective suit)
- Disposable protective suit, gloves and boots may be worn over the totally encapsulating protective suit for additional protection

Level B
The following Level B equipment may be used as appropriate when a high level of respiratory protection but a lesser level of skin protection is needed:

- Positive-pressure, full face-piece SCBA (NIOSH approved)
- Hooded chemical-resistant clothing (coveralls, chemical-splash suit, etc.)
- Coveralls
- Chemical-resistant gloves (inner and outer)
- Chemical-resistant steel toe and shank boots
- Disposable chemical-resistant inner boot covers
- Hard hat
- Face shield

Level C
A Level C work uniform provides a moderate level of protection against known airborne substances at a concentration that meets or exceeds the criteria for using air-purifying respirators. The work uniform protects against dermal contact with hazardous substances. The following constitutes Level C equipment, which may be used as appropriate:

- Full-face or half-mask air-purifying respirators (NIOSH approved)
- Hooded chemical-resistant clothing (overalls, two-piece chemical-splash suit, disposable chemical-resistant overalls)
- Coveralls
- Chemical-resistant gloves (inner and outer)

- Chemical-resistant steel toe and shank boots
- Disposable chemical-resistant outer boot covers
- Hard hat
- Escape mask
- Face shield

Level D
A Level D work uniform provides minimal protection, used for nuisance contamination only. The following constitutes Level D equipment, which may be used as appropriate:

- Coveralls
- Gloves
- Chemical-resistant steel toe and shank boots
- Disposable chemical-resistant inner boot covers
- Safety glasses or chemical splash goggles
- Hard hat
- Escape mask
- Face shield

3.3 Zoonotic Diseases

Zoonotic diseases (diseases transmitted from Wildlife to humans) are a significant health and safety concern that must be considered by all individuals handling Wildlife or rehabilitation equipment and materials (e.g., bedding, instruments, other husbandry items). Zoonotic diseases may be viral, bacterial, fungal, or parasitic in nature. These diseases can be transmitted to humans by four primary routes:

- Inhalation (e.g., particles (spores, bacteria), aerosols)
- Ingestion (e.g., projectile feces, poor hygiene)
- Injection (e.g., needle sticks, insect bites, scratches, and bites)
- Absorption (e.g., contact with mucous membranes)

To minimize the risk of contracting zoonotic diseases, the prescribed PPE must be worn when working with Wildlife. The following are additional mitigation measures that reduce the risk of transmission:

- Maintain preventative vaccinations (e.g., tetanus, hepatitis, rabies)
- Maintain hygiene after handling Wildlife
- Wash hands before eating or smoking
- Ensure appropriate first aid measures are employed

Direct Wildlife–human interaction (i.e., in the absence of appropriate PPE) should be minimized whenever possible. Pregnant woman or individuals with immunosuppressive conditions are more susceptible to contracting zoonotic diseases (Berg 2003) and should consider not taking part in Wildlife response activities.

A table of zoonotic diseases, modes of transmission, symptoms, and mitigation measures are provided in Appendix B.

3.4 Field Safety Considerations

3.4.1 Exposure Considerations

Many activities associated with a Wildlife Emergency response occur in the field. Wildlife Response Personnel should support the development of a Health and Safety Plan in coordination with the Safety Officer and Incident Command/Unified Command that addresses environmental hazards and extreme conditions, consistent with applicable occupational health and safety regulations and incident-specific health and safety plans. The following sections discuss some of the key environmental considerations for Wildlife Response Personnel.

3.4.1.1 Extreme Heat Environments

When working in extreme heat environments, Wildlife Response Personnel should:

- dress according to projected temperatures
- wear loose-fitting, lightweight, and moisture-wicking clothing
- protect eyes and skin against UV exposure
- use shaded work areas or take frequent breaks to avoid excessive exposure to radiant heat and direct sunlight
- complete strenuous tasks during cooler periods of the day or in shifts with breaks or exchange of Wildlife Response Personnel
- if indoors, use air conditioning, or otherwise ventilate the work space and rest areas to manage air temperatures
- rest often, replenish lost fluids, and avoid consuming diuretics
- communicate with co-workers and be aware of symptoms of heat stress and heat stroke

3.4.1.2 Extreme Cold Environments

When working in extreme cold environments, Wildlife Response Personnel should:

- dress according to projected temperatures
- wear multiple layers of clothing, but consider the range of motion required for the task
- ensure that ideal head, hand, and footwear are selected
- use windbreaks whenever possible - wind magnifies cold temperatures
- complete strenuous tasks during warmer periods of the day or in shifts with breaks or exchange of Wildlife Response Personnel
- identify heated areas where rests can occur
- consume warm liquids and high-energy foods during periods of rest
- communicate with co-workers and be aware of symptoms of hypothermia and frostbite
- avoid excessive movement and immersion in water, which can increase susceptibility to cold-related stress

4.0 Capture of Wildlife

During an oiling incident that has potential or known effects on Wildlife, an incident-specific Wildlife Response Plan (WRP) will be developed by the Responsible Party (RP) or their contracted WRO and Wildlife subject matter experts to outline response approaches, responsibilities, permit requirements, and information management procedures. The WRP will include information on the processes for identifying and implementing Wildlife capture, assessment, relocation, euthanasia, and rehabilitation

and release procedures, including authorized organizations and Wildlife Response Personnel (see Figure 1). ECCC-CWS has developed *Guidelines for Wildlife Response Plans* (ECCC-CWS 2022a) to support the development of these plans. ECCC-CWS works with the RP, WRO(s), and other federal, provincial, territorial and Indigenous governments or agencies on the development of a WRP. The Plan requires approval by Incident Command/Unified Command before being implemented as part of response activities.

4.1 Response Decision-making

ECCC-CWS uses the criteria outlined in its *National Policy on Wildlife Emergency Response* (ECCC-CWS 2021) when determining which approach is best suited to a Pollution Incident response. The Wildlife Response Personnel and facility resources available to mount a response are directly related to the success of rehabilitating oiled Wildlife. Pre-planning in areas that are at risk for significant incidents may increase the efficiency and efficacy of a response, and will help to provide a clear understanding of response limitations. When appropriate during a Pollution Incident, ECCC-CWS will authorize and make recommendations on the capture, euthanasia, or rehabilitation and release of individual Wildlife. Response choices may include:

- leaving animals in place (e.g., due to weather, access, or safety concerns for Wildlife Response Personnel)
- deterrence and dispersal
- capture for relocation
- euthanasia, which is typically reserved to alleviate suffering of oiled individuals, or if appropriate care facilities cannot be made available, or Wildlife cannot be stabilized and held for a period of time until resources are available to transport, treat, and release them with good prospects for long-term survival in the wild
- capture, rehabilitation, and release of Wildlife

ECCC-CWS issues permits for the rehabilitation of Wildlife by WROs authorized under the MBCA and its regulations (MBR and MBSR) and SARA to carry out these activities. ECCC-CWS maintains a functional relationship with these organizations to provide information on the location of Wildlife, advises on species priorities for capture, supports banding of rehabilitated birds prior to their release, and advises on release sites and follow-up monitoring for captured Wildlife. Information concerning Wildlife treatment facility safety can be found in the *Guidelines for Establishing and Operating Treatment Facilities for Oiled Wildlife* (ECCC-CWS 2022b). Under some circumstances, ECCC-CWS supports euthanasia of Wildlife.

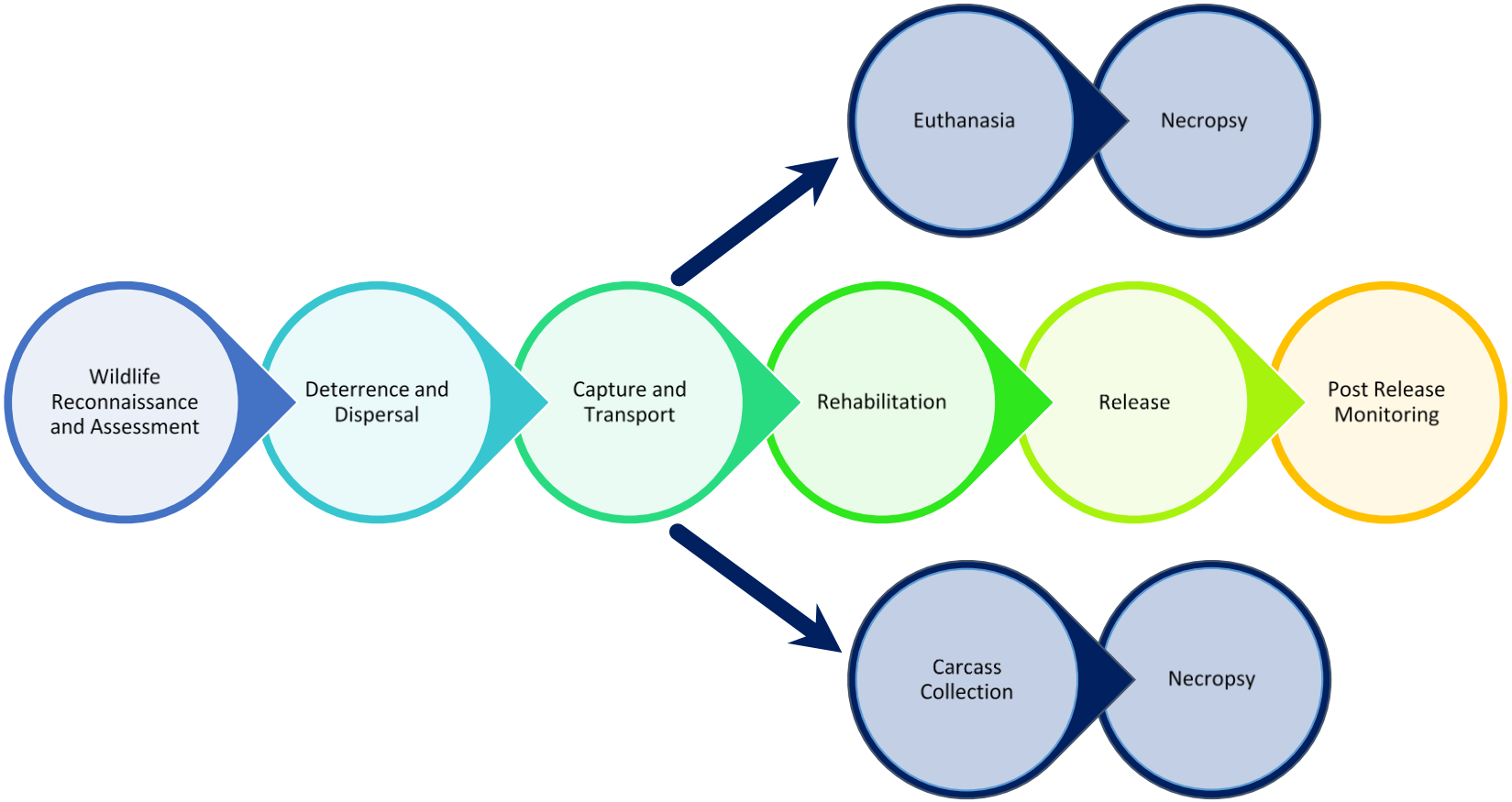

Figure 1: Phases of Wildlife Treatment

4.2 Pre-emptive Capture of Wildlife during a Pollution Incident

Pre-emptive capture refers to the capture of Wildlife before they have the opportunity to become affected during a Pollution Incident. Such an undertaking is complex and pre-planning requirements must include protocols for capture, transportation, holding, and release. If pre-emptively captured individuals are held in captivity, an authorized organization must be identified to provide the species with appropriate housing, husbandry, and medical care (if necessary) for a potentially extended period. The identified organization may or may not be the same organization managing Wildlife rehabilitation efforts. Pre-emptively captured Wildlife should be housed separately from all other Wildlife rehabilitation functions in order to reduce stress and the potential for cross contamination.

Pre-emptive capture is a strategy that may be considered for vulnerable breeding adult birds and their eggs or young, or SARA species, and may be used to relocate nests, where applicable (Shigenaka 2003). Examples of successful pre-emptive capture programs include:

- Treasure Oil Spill Response, African Penguins, the South African Foundation for the Conservation of Coastal Birds, South Africa
- Rena Oil Spill Response, Dotterel, Wildbase Hospital at Massey University, New Zealand
- Ixtox 1 Well Blowout / Deepwater Horizon, Kemp's Ridley Turtles, Mexico / United States

4.3 Capture of Wildlife during a Pollution Incident

A WRP will outline the details of the response activities, including the capture and retrieval phase. This plan must be in place prior to initiating capture and retrieval of oiled Wildlife. Every attempt to capture Wildlife will require permitted, trained, skilled and experienced Wildlife Response Personnel authorized to carry out these activities. A variety of site- and species-specific techniques will be required to capture Wildlife successfully. The capture program uses the information collected from a thorough assessment of environmental and site conditions as well as a knowledge of Wildlife to develop strategies for capture. All capture methods employed during emergency response should adhere to applicable guidelines developed by the CCAC (2003, 2006, 2008) and NABC (2019). Where available, national or regional best practices should be referenced in determining appropriate capture techniques for various species or species groups.

4.3.1 Capture Equipment

The following is a generic list of basic capture equipment. Use of specific equipment is determined on an incident-specific basis:

- Short and long-handled dip nets
- Throw nets
- Traps
- Pneumatic/cannon nets
- Hand-held pneumatic nets
- Catch poles (for some mammals)
- Bed linens or towels
- Wildlife carriers, travel kennels, cardboard boxes
- Buckets
- Bait materials

Additional, specialized equipment may need to be sourced depending on the environment and the species to be captured.

4.3.2 Capturing Wildlife on Land

The following is a sample of techniques that can be used to capture oiled Wildlife, particularly birds, on land and as they come ashore:

- Long-handled dip nets, throw nets, sheets, or towels can be used to capture and retrieve individuals or small groups of Wildlife
    - This type of approach requires at least two Wildlife Response Personnel
- Netting, snow fencing, herding boards, or similar material can be used to establish a trap. To support effective habituation by some species, traps may be built slowly over a period of several days and are most effective when placed in locations already used by Wildlife. Placing food bait into the trap may help attract the target individuals. Once inside, the entrance can be closed.
    - Traps should be established and monitored by experienced Wildlife Response Personnel (with both equipment- and species-specific experience). For large trapping operations, small teams led by experienced Wildlife Response Personnel may be required to manage equipment, assessment, and transport of captured Wildlife.
    - Traps must be closely monitored on a schedule appropriate for the target species. Where available, species or taxa-specific best practices should be referenced for appropriate capture techniques.
    - If left unmonitored or overnight, traps should have two escape routes to allow Wildlife to escape from predators or return to their natural habitat to maintain appropriate thermoregulatory and foraging behaviours.
- Cannon nets can be used strategically over areas of congregating or nesting Wildlife, or in a baited area to capture a large number of Wildlife. Several Wildlife Response Personnel are necessary to conduct a large capture operation and to ensure that Wildlife are retrieved and transported quickly and without injury.
    - An experienced operator is required to deploy the equipment so that injuries to Wildlife do not occur. Cannon net weights must be evaluated for the potential to injure Wildlife during deployment.
    - Equipment used for this technique produces a very loud noise. If deployed in human-populated areas, coordination with local governments and fire and police departments will be necessary.
    - Not all captured Wildlife will be exposed to pollution. Experienced Wildlife response capture personnel should be present to determine which Wildlife should be brought into care.
    - Groups of polluted birds should be monitored and feeding and resting areas recorded. Congregations inhabiting an area where a cannon net may be successfully deployed should be baited for several days to ensure they remain in the area. The use of cannon nets requires specific permits and pre-planning to ensure success.

In all cases, Wildlife capture should only be attempted if there is a reasonable chance of success. Wildlife can become wary of repeated capture attempts and will typically leave protected locations when they are harassed by Wildlife Response Personnel. Repeated capture attempts should be avoided for some species (e.g., birds) as it may lead to excessive stress, overheating, and possibly death. For other species groups (e.g., aquatic amphibians, reptiles, small mammals), repeated trapping efforts may be necessary to remove individuals from an affected area. Regional and species-specific

procedures for capture should be referenced, as applicable, in developing capture strategies. In all cases, Wildlife capture should follow permit conditions, which may allow or restrict repeated capture attempts depending on the targeted species.

4.3.3 Capturing Wildlife from Water

On-water capture of oiled Wildlife during a Pollution Incident poses unique seasonal, weather, logistical and other incident-specific challenges that may influence the overall success of Wildlife capture relative to capture efforts on land. For example, diving birds and other aquatic species will often dive, change location, or remain submerged for an extended period to avoid capture. Excessive pursuit of any individual is likely to result in additional stress for the animal, and may in extreme circumstances lead to injury and death. The following techniques are used to capture Wildlife from the water:

- Most often, a single small vessel is used to approach an individual or small group. Wildlife Response Personnel may bait or lure Wildlife towards the vessel, where they can be captured with hand-held nets.
- In rare circumstances, multiple small vessels may be used to corral and capture individuals with nets strung between the vessels or through the use of hand-held nets.
- The use of spotlights from small vessels during night operations can cause some species of birds to become motionless and may be an effective method for capture. Specific authorization by Incident Command/Unified Command for night operations will be required.

In addition to typical Wildlife response PPE, the use of a life jacket or personal flotation device is required. The *Canada Shipping Act* Marine Personnel Regulations (SOR/2007-115) require that a person crewing or part of the required complement on a small non-pleasure vessel hold a Marine Emergency Duties (MED A3) certificate of training. Wildlife Response Personnel not engaged in crew responsibilities are recommended to have this training. Safety protocols should be reviewed with Wildlife Response Personnel prior to any work performed on a vessel. Duties should be reviewed with Wildlife Response Personnel prior to any on-water response activities.

4.4 Capture Documentation

Chain of custody and documentation of individual capture information is essential and is led by the WRO; these procedures should be incorporated into the incident-specific WRP. Both CWS Co-ordinators and Responders should be trained to ensure that information is collected and appropriately documented at the time of Wildlife capture. Documentation should be attached to each animal's transport container. Placing all documentation in a waterproof bag and attaching it to the outside of the transport container can help maintain the integrity of the record.

The following information should be documented for Wildlife captures:

- Location of capture (i.e., GPS coordinates, address, or physical description)
- Date and time the animal was captured
- Capture/retrieval methodology, particularly if a baiting substance was used
- Duration of capture attempt
- Name and contact information for the capture team
- Extent of contaminant contact, abnormal behavior, or obvious injuries
- Species or type of Wildlife (i.e. common eider, harlequin duck, great blue heron, etc.)
- Age (adult, juvenile, nestling, etc.)

- Any treatment or care (including the provision and/or consumption of food or water) given to the Wildlife prior to arrival at a treatment facility
- Any bands or tags on birds must be reported to the North American Bird Banding Program (1-800-327-BAND)

5.0 Handling Wildlife

5.1 General Handling Considerations

In all situations where personnel must handle oiled Wildlife, human health and safety must be prioritized. Appropriate PPE should always be worn. Basic PPE should consist of nitrile examination gloves and a protective suit made of material such as Tyvek to ensure protection against dermal contamination. Additionally, safety glasses are necessary to protect against injury or contaminant exposure. Footwear requirements can vary considerably and should be appropriate for the activity.

Safe, species-appropriate handling and restraint methods should be used. Large and aggressive birds and mammals may be more easily controlled by two handlers. Personnel should never attempt to handle Wildlife if they are alone or they are unfamiliar with the animal, if there is a danger of harming either the person or the animal.

Unnecessary noise and handling of Wildlife should be eliminated. Loud noises, talking, shouting, equipment operation, peeking into enclosures, or taking photographs are visual and auditory stressors and should be minimized to allow Wildlife the opportunity to rest.

5.2 Handling Techniques for Birds

Only permitted individuals, including nominees listed on the permit, should handle birds. The CCAC's (2003, 2008) and NABC's (2019) prescribed guidelines on the care and use of wildlife include recommendations for handling various types of birds and are often included as permit terms and conditions. Birds should always be held in such a manner that the wings, legs, and head are controlled and the body is supported. Handling efforts should ensure that restraint of the bird does not impede respiration. A towel or bed sheet can be wrapped around the bird's body when treatment does not require access to the bird’s wings or body. The towel is an effective method to constrain a bird’s movement without applying too much pressure on the animal. Birds should be held at waist level and will be more comfortable if they are maintained in a normal resting position for the species. A sheet or towel should also cover the bird’s head at all times to reduce stress. Most birds can be held against the handler's side, at waist level, to control one wing. The handler can then hold the legs from underneath with one hand, using their arm to gently control the other wing, and use their other hand to control the bird’s head by gently holding it behind the base of the skull to prevent forward movement. This technique supports the bird without causing further stress.

Bills, feet, and wings can cause serious injuries to personnel. Control of the head of herons, egrets, loons, grebes, cormorants, and other birds with long, pointed bills is essential to prevent stabbing injuries. Large birds (e.g., herons, eagles), often require both hands to control the legs to keep the bills, wings, talons, or beaks away from the handler's face and body. Covering the bird’s head with a sheet, towel or an appropriately sized hood will help to control the head. Personnel handling birds (including

all life stages) should avoid the use of insect repellants, perfumes, lotions, or other hazardous substances that may be absorbed through the skin or eggs. Small passerines are restrained by using one hand to hold the wings against the bird's body, placing the index and middle finger on either side of the bird's neck over the shoulder.

Never hold or tape a bill shut as the following conditions could occur:

- Some pelagic birds (e.g., pelicans) have small or no external nares; closing the bill may suffocate the bird
- Birds often regurgitate when stressed; closing the bill may lead to aspiration of fluids or food into the lungs
- Nares may be blocked with either contaminants or debris; closing the bill may suffocate the bird
- Many birds use open-mouth breathing to thermoregulate; closing the bills may limit their ability to control body temperature
- Birds that may escape during transport may starve

5.3 Handling Techniques for Mammals, Reptiles, and Amphibians

The CCAC's (2003) prescribed guidelines on the care and use of wildlife include recommendations for handling mammals, reptiles, and amphibians. Appropriate PPE must be worn when handling species from each group. Some mammals and reptiles may require the use of additional control equipment such as nets, squeeze cages, herding boards, or chemical immobilization (i.e., tranquilizers) where appropriate. Wildlife Response Personnel should take all necessary precautions to ensure that handling efforts eliminate the potential for them to be bitten, scratched, or to absorb harmful excretions from Wildlife. Personnel handling mammals, including rabies-vector species, must ensure that vaccinations (tetanus, hepatitis, and rabies) are current.

For amphibians and reptiles, extra controls may be required to prevent injury or the absorption of hazardous substances through their skin. Materials used for capture should not injure or interfere with the protective mucus layer covering their skin. As with birds, personnel handling amphibians and reptiles (including all life stages) should avoid the use of insect repellants, perfumes, lotions, or other hazardous substances that may be absorbed through the skin. The CCAC has developed additional species-specific recommendations for amphibians and reptiles (CCAC 2006).

6.0 Transporting Wildlife

6.1 General Transportation Considerations

Transporting Wildlife is a necessary part of a Wildlife response. Transporting activities should follow CCAC guidelines for different groups of Wildlife (CCAC 2003, 2006, 2008). Special consideration must be given to ensure the safety of Wildlife and to reduce stress. Possible transportation demands that may be encountered include transport from the capture site to a Field Collection Point, Field Stabilization Site, or Oiled Wildlife Rehabilitation Centre (OWRC); transport from a Field Collection Point or Field Stabilization Site to an OWRC; transport from an OWRC to a long-term care facility; or transport from an OWRC to a release site.

Consistent communication must be maintained among Field Collection Points, Field Stabilization Sites, and OWRCs. Information must be provided to receiving facilities to aid in preparation for incoming Wildlife for treatment and may include:

- numbers and species of incoming Wildlife (separating carcass and live Wildlife information)
- priority cases (i.e., injured individual priority)
- estimated arrival time
- phone number of the transportation team

Once Wildlife are placed in transport containers, they should be transported to the selected treatment facility immediately to ensure safe transport and minimize additional stress. The following should be considered for transportation:

- All appropriate intake documentation should be recorded prior to transport, including individual health assessments, chain of custody, sampling, photographs, etc.
- Wildlife should be separated from the transport team (i.e., in a box truck or pick-up truck with a cap over the bed); this allows for separate ventilation and temperature controls for the two compartments
- The cargo area of the vehicle used for Wildlife transport should be protected from the weather, but well ventilated to minimize the accumulation of petroleum vapours
- Temperature of the cargo area should be managed to prevent hypo- or hyperthermia
- Transport containers should never be stacked; keep at a low, stable height wherever possible
- To minimize stress on Wildlife during transportation, all unnecessary noise (talking, radio, etc.) should be kept to a minimum
- No domestic animals should be transported with oiled Wildlife

6.2 Transporting Birds

The transportation of birds, including Species at Risk, is authorized under a federal permit for Migratory Bird species, or provincial/territorial permit for other bird species. Transportation requirements should adhere to CCAC (2003, 2008) and International Air Transport Association (2019) guidelines for transporting birds. All Wildlife should be transported as soon as possible after capture, unless the animal is not stable enough for capture. Wildlife should be isolated from humans and predators, including housing predatory bird species away from common avian prey species. During transportation, Wildlife should be transported in a way that limits exposure to environmental conditions that might increase thermoregulatory stress (e.g., direct sunlight, precipitation) and monitored on a regular basis. Birds should be transported in separate containers whenever possible. Individuals of gregarious or communal species may be transported together to help reduce stress, but care should be taken to ensure heavily oiled individuals are not housed or transported with less contaminated individuals.

General considerations for transportation containers are summarized in Table 1. Table 2 outlines the advantages and disadvantages of various types of transportation containers. Additional information for transportation containers can be found in *Key principles for the protection, care, and rehabilitation of oiled wildlife* (International Petroleum Industry Environmental Conservation Association 2017).

Table 1: General Requirements for Transportation Containers

Feature	Considerations
General Transport Container Guidelines	• Containers should be smooth sided (i.e., cardboard, coroplast, plastic) and strong enough to hold the individual. Wire cages (i.e., bird cages or kennels) and burlap sacks are not recommended as they have the potential to cause injuries (i.e., feathers, eyes, limbs). • Large or aggressive species must always be transported in separate containers. • Only one bird should be placed in each container. Exceptions may occur as long as adequate space is still available for movement and ventilation, individuals are healthy, and have the same degree of oiling. Additional monitoring will be required for containers with multiple animals and the container should be clearly labeled with the number of animals inside. ○ Gregarious or communal species can be housed together if the potential for injury is low ○ Young birds can be housed together (although they should not generally be housed with an adult); when known, adults and offspring may be transported together to reduce stress ○ If there are young birds, and the parents are known, containers should be marked appropriately to allow for re-unification upon admission, if appropriate
Container Size	• Birds should be transported in containers that provide enough room to stand and turn around but not to fully extend wings or attempt flight ○ Individual animals should have sufficient space to assume normal postures ○ Ideally several inches of clearance around the head so that each individual can extend its head and neck forward ○ Floor area roughly twice the size of the individual is recommended ○ Containers should be large enough to allow long-legged species to stretch their legs, but not large enough to encourage excessive movement; additional recommendations may exist for long-legged species (e.g., herons, egrets) to avoid excessive bending of the legs ○ Containers that are too small are stressful and can damage feathers whereas containers that are too large can allow excessive movement, which can cause feather damage, aggravation to an existing injury, or can cause a new injury • Containers should be sized to the individual to ensure that it is large enough to prevent breaking of feathers, but not large enough to encourage excessive movement

Feature	Considerations
Ventilation	• Containers should be adequately ventilated by cutting a number of holes in the container to allow air to circulate through • Holes should be made in the container prior to occupancy • Holes should be located at the anticipated height of the bird's head on at least two opposite sides allowing for cross ventilation • Ventilation holes should be sized correctly, ensuring that the bird's head, leg, or wing cannot pass through the container
Padding	• Whenever possible, padding such as towels, sheets, or another absorbent material should be placed in the bottom of the transport container. This will help to absorb excrement, water, and contaminants. For long transports, straw, hay, woodchips, or similar materials should be avoided, where possible, as organic material can promote fungal or bacterial growth that may be detrimental to the health of many species. • When transporting pelagic birds that have limited capacity to stand (i.e., loons, grebes) or others birds that cannot stand because of injury, additional padding or the use of net-bottom boxes should be considered to reduce the risk of Wildlife developing keel lesions that can be life threatening • While it is recommended to use padding during transportation, use of padding for birds should be considered alongside concerns for overheating, stress, respiratory problems, feather damage, or additional contaminant absorption through the skin • Floors and inside tops of transport containers should, depending upon the species, also be padded. Perches should be provided for longer duration (i.e., several hours to several days) transport for birds, particularly raptors. Perches should have non-slip surfaces or be wrapped in towels and be appropriately sized for the bird.

Table 2: Advantages and Disadvantages of Different Types of Transportation Containers

Type of Container	Advantages	Disadvantages
Hard-sided Kennels (Plastic or Metal)	• Wide variety of sizes • Pre-established air holes • Easy to clean (for non-contaminated Wildlife) • Kennels will not weaken from feces, contaminants, or water • Work well for on-water retrieval, but are slightly bulkier than other transportation options	• Metal grates must be covered with cloth to protect feathers and block the visual field of the animal • Air holes may be at eye level and can cause additional visual stress • It may be possible for some species of mammals to chew through plastic siding if held for a long transport • Removing Wildlife from the container can be dangerous for the handler due to the horizontal design • If not stockpiled prior to a Pollution Incident, they may take a while to acquire • Large and bulky, which can pose issues when storing and transporting • Components may rust or break over time
Cardboard Boxes	• Wide variety of sizes • Attainable from a wide variety of sources • Individualized placement of air holes to minimize visual stressors • Simple and efficient disposal • Stores flat for efficient storage and transportation	• Feces, contaminants, and water can weaken of soften the cardboard, causing the bottom to give away • Securing the top may be difficult and will require additional supplies (e.g., tape) • It may be possible for some mammals to chew through the container if held for a long transport • May be easily pierced by bird beaks • Wildlife may burst from the container upon opening, which may be dangerous for handlers and allow for escape

Type of Container	Advantages	Disadvantages
Soft-sided Kennels (Mesh)	• Variety of sizes • Pre-established mesh air holes • Soft sides and mesh openings may prevent injury	• May be difficult to safely remove Wildlife due to horizontal design • Difficult to clean
Wax-lined or Cardboard Disposable Pet Carriers	• Wax lining can provide some short-term protection against saturation with fecal matter, water, or contaminants • Pre-established air holes • Appropriately sized for smaller bodied birds • Simple and efficient disposal • Stores flat for efficient storage and transportation • Easily attainable (often carried at pet stores or with Wildlife care professionals)	• Too small for larger birds • It may be possible for some mammals to chew through the container if held for a long transport • The cardboard box may weaken and soften because of feces, water, or contaminants • The wax-lined boxes may weaken due to saturation over extended transports • Pre-established air holes may be at eye level and can cause additional visual stress • May not be feasible for use for long periods of time because the bottom may deteriorate
Corrugated Plastic Carriers	• Easily cleaned • Will not weaken from feces, water, or contaminants • Work well for on-water retrieval • Pre-established air holes • Stores flat for efficient storage and transportation	• Too small for some larger birds • Pre-established air holes may be at eye level and can cause additional visual stress • If not stockpiled, these containers will need to be ordered from specific sources, which may take excessive time and resources • Slightly more difficult disposal procedure

6.3 Transporting Mammals, Reptiles, and Amphibians

Generally, most non-avian Wildlife listed under SARA that may be impacted during a Pollution Incident can be transported similarly to avian species. As with birds, transporting mammals, reptiles, or amphibian Species at Risk will require a federal permit. Transporting individuals of these species groups may involve additional requirements outlined by CCAC (2003, 2006).

Generally, cooler temperatures are recommended for fur-bearing species, except in cases where symptoms of hypothermia are observed or suspected or where injury or body condition incurs additional stress. Small mammals may have higher energetic demands to meet thermoregulatory requirements and may need to be transported with bedding material to help maintain body temperature. Aquatic mammal species (e.g., beaver) can chew through most wood or plastic transport containers. For longer transport, metal transport carriers or plastic airline kennels covered inside with untreated wood can assist with secure containment. Wire box traps may be used for shorter transport periods, but folding (clam-type) traps should be avoided when possible.

For amphibians and reptiles, individuals should be placed in closed containers that are adequately ventilated, prevent against injury or unnecessary movement (i.e., cushioning substrates), provide the appropriate moisture regime for the species and life stage, have controls in place to prevent changes in temperature during transport, and maintain proper water aeration (e.g., for larval amphibians).

7.0 Wildlife Stabilization

7.1 Field Stabilization for Birds

Field Stabilization Sites may be necessary during a Wildlife response for a variety of reasons (i.e., weather, distance to OWRC, geographic area, road access, etc.). Field Stabilization Sites typically serve two main purposes:

1. They offer the ability to provide basic care, reduce stress, and temporarily hold captured Wildlife prior to being transported to an established OWRC
2. They may offer a temporary holding area when the OWRC is at capacity or is still in the process of being established

In either case, field stabilization is provided to Wildlife that are likely to remain in the field longer than 2–3 hours (Berg 2003; Johnson and Ziccardi 2006). Stabilization treatments are administered as an initial treatment to begin reversing the secondary effects of pollutants (e.g., hypothermia, dehydration, starvation) and to ensure Wildlife are stable prior to transport. Washing and collection of biomedical samples should never occur at Field Stabilization Sites; Wildlife must be transported to the OWRC before qualified and authorized Wildlife Response Personnel can safely undertake such activities.

If Field Stabilization Sites are established, Wildlife Response Personnel should immediately establish and implement care protocols. Wildlife Response Personnel at the Field Stabilization Sites must be skilled, competent and trained in response protocols. In many jurisdictions, Wildlife response requires consultation or supervision by a Wildlife veterinarian to evaluate the appropriateness of euthanasia for individuals. The procedures for field stabilization may change for each incident, or as the incident

progresses, depending on circumstances in the field. The following are options that may become part of the determined protocol; this is not an exhaustive list, nor do all suggestions need to occur at a Field Stabilization Site:

- Perform a quick but thorough physical examination that may include recording
    - species, age, and sex
    - body weight and body temperature
    - degree of oiling (area(s) of body and the degree of oiling on those areas)
    - any obvious injuries, concerns, or signs of disease
    - any bands or other markers to distinguish the individual
- Remove gross contaminants in nares, mouth and eyes. Excess oil or other pollutants may be wiped from feet and hocks using gauze pads. Under no circumstances should Wildlife Response Personnel attempt to wash or clean Wildlife at the Field Stabilization Site, as it may increase vulnerability of Wildlife prior to assessment at the OWRC.
    - Flush oil or other pollutant from the eyes with a warm (i.e., between 16-38 °C) solution of a sterile saline
    - Clear mouth and nares. Heavy viscous pollutants may have promoted the accumulation of debris and pollutants in the nares and mouth, which can impact the animal's ability to breathe
    - Examine the vent/anal region; remove droppings or foreign materials
    - Examine the head and the body. Using a soft cloth, wipe fur or feathers in the direction of their growth. If polluted Wildlife have dramatically decreased movement, using suitable absorbent material may help the individual regain range of motion, to a degree.
        - Wildlife that cannot move because of the pollutant may exhibit symptoms of capture myopathy. Symptoms include weakness, cramping and stiffness in the muscles and involuntary muscle contractions (known as tetany seizures) that can lead to degeneration or necrosis of skeletal and cardiac muscle and fatality.
- Provide temperature control
    - Oiled Wildlife, particularly species that are dependent on feathers/fur for thermoregulation, lose their ability to maintain normal body temperature when contaminated
- Trained Wildlife Response Personnel may treat for dehydration
    - Provide oral or intravenous fluids
    - Fluids must be warmed to an appropriate temperature for the species
    - Oral fluids are generally provided by stomach tubing
    - Oral fluids should only be provided if Wildlife are alert and responsive; birds in shock or those that are unresponsive should be given warm intravenous fluids
- Promote excretion of pollutants
    - If Wildlife are alert and responsive, flush the gastrointestinal tract using stomach tubing
    - If instructed by a veterinarian, provide medications that provide a protective lining for the gastrointestinal tract
- Provide nutritional support
    - If Wildlife will be held in a Field Stabilization Site for an extended period, additional caloric needs should be addressed
- Document all field stabilization treatments on the individual’s case documentation and complete the chain of custody

Additional guidance for stabilization care:

- If fluids have been administered, avoid handling or transporting Wildlife for a minimum of 20–30 minutes to prevent regurgitation
- Wildlife that are neurologically impaired or too weak to maintain an upright head carriage should not be given oral tube-fed fluids because of the risk of regurgitation and subsequent aspiration. In this condition, Wildlife can be provided fluids via intravenous bolus by trained Wildlife Response Personnel.
- Hypothermic or hyperthermic Wildlife should have supplemental warming or cooling, respectively, as needed
- Following treatment, place Wildlife in a quiet environment prior to reassessing against established triage criteria

7.2 Field Stabilization for Mammals, Reptiles, and Amphibians

Generally, the above procedures can be modified to stabilize and treat non-avian Wildlife. The impact of pollutants, particularly petroleum, on the skin, eyes, gastrointestinal tract, respiratory tract, liver, kidneys, and central nervous system are similar in all Wildlife species, with the notable exception that amphibians of all life stages are more sensitive to dermal absorption of contaminants. Basic stabilization care will be similar to that given to birds.

7.3 Intake and Evaluation at an Oiled Wildlife Rehabilitation Centre

The medical examination process conducted during intake at the OWRC involves the collection of biomedical data and information concerning the physical condition of Wildlife. The information gathered will be used to establish a treatment plan.

The intake area of the rehabilitation facility is often the first contact the Wildlife Response Personnel have with Wildlife since their capture. At this point there may be limited information about the condition of the animals, the degree of impact of pollutants, and potentially the species, age, and sex of the individual. All Wildlife Response Personnel conducting examinations and evaluating the status, condition, and health of Wildlife must be:

- skilled and experienced in the tasks involved (it may be appropriate for a veterinarian that is experienced in polluted Wildlife care to consult on or oversee the process)
- wearing appropriate PPE to guard against personal exposure to the hazards posed by the pollutant or the animal, including potential injury during examination

If Wildlife came from a Field Stabilization Site, the intake procedures at the OWRC do not change, but the information collected from field stabilization will be included in the overall understanding of the condition of Wildlife.

7.3.1 Physical Examination

The initial physical examination at the OWRC will provide necessary information to determine the course of treatment for individual and group care. A supervising veterinarian should be experienced in Wildlife response or rehabilitation, as the medical needs for Wildlife are different from those of domestic animals. While it is not necessary for the veterinarian to be present throughout all aspects of a

response, intake procedures and other, similar protocols should be developed in consultation with the response veterinarian. Veterinarians should also supervise the Wildlife Response Personnel assigned to this aspect of the response.

Prior to admitting animals to the OWRC, triage criteria should be established and communicated. Criteria will typically be specific to each response, which takes into account species impacted and the environmental conditions. The response-specific criteria should be reviewed periodically as conditions (the number and species of oiled Wildlife recovered, recovery conditions, etc.) may change and criteria may need to be altered. When establishing triage criteria, clear communication must occur between ECCC-CWS, the Wildlife veterinarian, Wildlife Response Personnel, Wildlife agencies and governments with jurisdiction, and the RP.

The following tasks should be completed during a physical examination, many of which are similar to those completed during Field Stabilization. Depending on the response, these tasks may change:

- Create a document for each individual that tracks all pertinent information (e.g., capture date, stabilization records, chain-of-custody information, permanent band/tag data, intake examination, ongoing care, cleaning, and final outcome)
- Assign a unique case number and place a temporary band, tag, or other identification mark on each individual
- Obtain general information (e.g., species, age class, sex (if possible), weight, and temperature, etc.)
- Observe overall impression of the animal's clinical status (e.g., depressed, hyperactive, alert, etc.)
- Perform physical examination
- Remove excess contaminants from the individual
- Collect a polluted feather sample, swab of pollutant, and photograph the individual (required for laboratory analyses or evidentiary purposes)

7.3.2 Biomedical Sampling and Assessment

Biomedical sampling and assessment is conducted concurrently with physical examination or during other periods when Wildlife are handled in order to reduce handling and stress. Biomedical sampling provides information that can guide Wildlife Response Personnel in two main ways:

1. Sampling may assist in an immediate understanding of the immediate and long-term effects of the contaminants on Wildlife; the results may lead to procedural changes in the care given during a specific response
2. Sampling may provide data for post-response research that will improve the care of Wildlife and will provide a better understanding for the outcomes of responses

Biomedical sampling often requires specific supplies and equipment, as well as Wildlife Response Personnel who can interpret and understand the results. Wildlife Response Personnel should have experience with basic sampling techniques and interpretations, or ability to consult with appropriate experts.

7.4 Dehydration, Additional Medical Considerations, and Treatment

Additional medical issues are common in oiled Wildlife. Pollutants can have both immediate (acute) and long-term (chronic) impacts on an animal's health (Table 3).

Table 3: Acute Complications in Wildlife affected by Pollution Incidents

Complications	Causes	Treatments
Dehydration	• Wildlife do not ingest sufficient water (water intake is impeded by contact with contaminants) • Water sources are contaminated • Wildlife ingest petroleum during preening	Wildlife Response Personnel will provide fluid therapy to correct dehydration. Mitigation can often begin during Field Stabilization or upon admission to the OWRC.
Poor Thermoregulation	• Hypothermia and, less often, hyperthermia occurs when petroleum, food grade oils, and other pollutants physically disrupt an animal's ability to thermoregulate • Particularly likely if the animal relies upon fur or feathers for insulation	Wildlife Response Personnel can adjust ambient temperatures to help Wildlife regain appropriate body temperatures. Mitigation can often begin during Field Stabilization or upon admission to the OWRC.
Nutritional deficiencies	Occur when normal feeding behaviors are disrupted due to: • excessive preening to remove contaminants • inability to dive, swim, float, or effectively hunt due to contamination • severe dehydration, which causes the animal to have trouble processing food	Nutritional support is offered by tube-feeding and self-feeding opportunities and is coordinated with fluid therapy treatments.
Stress	Occurs when animals experience a combination of increased environmental pressures (trying to stay warm, etc.), capture efforts, and/or being confined in captivity	Wildlife Response Personnel can reduce an animal's stress by reducing visual and auditory stressors, limiting handling, and providing housing that allows Wildlife to perform natural behaviours.

7.4.1 Other Preventative Therapies

Alleviate inflammation and protect the gastrointestinal tract from ingested pollutants:

- Flush the gastrointestinal tract using oral fluids
- Gastrointestinal protectant medications may be prescribed by a veterinarian in addition to fluids

Thermoregulatory Support:

- Wildlife should be hydrated to assist with circulation and warming. Rapid temperature changes can result in hypovolemic shock, particularly in severely hypothermic and dehydrated patients. Increased ambient temperature (30 °C) will provide the most effective and stable source of warmth. Heat lamps can be provided to individuals that typically require a source of heat as part of normal thermoregulation (e.g., reptiles) or requiring additional support. Care should be taken to ensure the animal can move away from the heat lamp and that it does not pose a safety or fire risk. Ceramic heat bulbs are preferred over glass (infrared) bulbs, which can shatter.
- Hyperthermic animals can be cooled by decreasing the ambient temperature, providing ventilation, and slowly tube-feeding cool fluids. Alcohol can be used on feet to assist with evaporative cooling. In extreme cases, ice packs wrapped in towels can be placed under wingpits. Ice packs should be removed after a few minutes to ensure that birds are not cooled too rapidly, resulting in temperature swings. Handling should be limited to reduce stress (which can result in an increased temperature).

Stress Reduction:

- Minimize handling
- Use species-specific housing and, when possible, house individuals of gregarious species with one another; protocols for preventing disease transmission and pollutant transmission must be adhered to
- Reduce visual stressors (i.e., use visual barriers between species, visual barriers from humans) and noise
- Vitamin E may also help reduce medical effects of stress (Note: this is a fat soluble vitamin and can be overdosed, leading to additional medical problems); a veterinarian must approve use of vitamin E

Prevention of Aspergillosis:

- Prophylactic use of antifungal treatments may be started once an animal is rehydrated and can continue throughout rehabilitation care or until the animal is outside full time. Prophylactic treatment should only be provided to species that are susceptible to fungal infections.

Promotion of Wildlife Health:

- Specialized nutrition and nutritional support will be required for Wildlife
- Emaciated Wildlife and individuals that are unable to self-feed will require nutritional tube-feeding 2-4 times per day, in addition to fluid support
- Fish-eating species, some wading birds, and raptors will require whole frozen foods (fish, mice, rats). These food sources can be difficult to source. Vendors should be rapidly identified and food items ordered within the first 24 hours of an incident.

7.5 Euthanasia

Euthanasia decisions are made in almost all Pollution Incidents to reduce individual suffering and increase animal welfare. WROs establish euthanasia criteria in consultation with the response veterinarian and ECCC-CWS, and must be approved by the Lead Agency (LA) and the RP. Incident-specific factors related to species population status or caseload, in addition to medical health, should

be incorporated into the criteria and be approved by the LA and the RP. Criteria should be determined within the first days of an incident. The WRO should consult the CCAC, which outlines requirements and permits for euthanasia (CCAC 2003, 2006, 2008).

Euthanasia has several purposes:

- Ending pain and suffering for impacted and injured Wildlife
- Focusing rehabilitation efforts on individuals of priority species or populations when personnel and facility resources are limited
- Providing better quality care for a majority of the caseload

Euthanasia should also be considered an alternative to treatment for complicating injuries or conditions that may impair the ability of Wildlife to be successfully rehabilitated, meet release criteria, or survive long-term, or that may impact the survival of other Wildlife undergoing rehabilitation. Examples include (but are not limited to):

- fractured limbs (particularly compound fractures and those near or involving a joint)
- extensive damage to the bill that limits natural feeding, preening, or drinking behaviours (states of extreme emaciation or dehydration may also affect these natural behaviours)
- significant soft tissue injuries (especially when the body cavity is exposed to significant amounts of the pollutant)
- visual or auditory defects that limit natural behaviours (i.e., feeding, drinking, breeding; states of emaciation or dehydration may also affect these behaviours) (Berg 2003)
- neurological impairment or central nervous system damage that does not resolve within 48 hours

Euthanasia may also be considered if the pollutant is considered extremely hazardous to human or Wildlife health, and may pose risks to Wildlife Response Personnel if treatment is attempted.

There are incidents that may require a selective process for rehabilitation or triage when there are capacity challenges related to facility operations. It is critical that the size of a facility and the skill of Wildlife Response Personnel match the scale of the incident at all times, and that the response capacity is scaled appropriately as an incident progresses. Euthanasia may be required to ensure that the resources are adequately distributed for the best results. This ‘best achievable care’ prioritizes the care or individuals or species that are most likely to be successfully rehabilitated.

The most limited resource determines the capacity of the facility. This could include floor space (housing), electricity, water, Wildlife food, equipment, or consumables, and is not necessarily the number of Wildlife Response Personnel that can be mobilized or the number of Wildlife requiring treatment. If resources cannot be expanded, euthanasia is an appropriate option to reduce animal suffering.

Triage criteria for other species and groups should be evaluated and documented in a Euthanasia Plan or in a segment of the WRP. If more selective criteria are used to determine priority for receiving care, this must be done such that medical attention, treatment, and rehabilitation can be given to Wildlife with the greatest probability of survival, the greatest benefit to the species or population, or an overall net environmental health benefit. In the event that adult birds are the affected group, there are three generally accepted criteria that, in combination, can be used to establish the likelihood of survival:

- Packed cell volume
- Relative weight (for sex, age, and season)
- Body core temperature

Additional conditions such as the presence of an infectious disease should also be considered when determining whether care is appropriate. In an environment such as an OWRC, an infectious disease may spread quickly to healthy rehabilitation candidates if Wildlife Response Personnel do not take the proper precautions.

8.0 Wildlife Collection Program

8.1 Carcass Management

There will typically be animal casualties during a Wildlife Emergency. Casualties may be found in the field during other response operations, or they may be individuals that expire or are euthanized during the rehabilitation processes. Wildlife Response Personnel must collect and manage Wildlife found in the field appropriately to prevent secondary contamination of healthy Wildlife as well as livestock and domestic pets, and to prevent humans from coming into contact with potential hazards. Recovery of Wildlife casualties also helps reduce duplicate survey effort. ECCC-CWS uses the criteria outlined in the *Guidance and Protocols for Wildlife Surveys for Emergency Response* (ECCC-CWS 2022c) for the collection, management, and storage of oiled Wildlife carcasses.

Complete documentation is an important aspect of Wildlife specimen and carcass management. Permits provide some terms and conditions for documenting and reporting on Wildlife mortalities during Pollution Incidents. The collection team must complete documentation and record the chain of custody for any Wildlife specimen or carcass collected in the field. The RP, LA, ECCC-CWS, and Wildlife Response Personnel may require documentation and chain of custody. Depending on who requires this documentation, additional specific procedures and evidence tags may also be required. The documentation remains with the specimen or carcass through the term of its possession until authorized carcass disposal occurs. Depending on the nature of the incident, the LA may decide that specimens or carcasses may also become evidence for legal proceedings. Protocols for carcass management are an important aspect of incident response and should be established in the early stages of any response. The WRO managing Wildlife operations should coordinate with the LA to determine the protocol for the collection and disposal of carcasses.

8.2 Necropsy

Necropsies are post-mortem examinations that can be performed at the OWRC by qualified veterinarians or pathologists, and should only be conducted when the RP and LA issue approval. ECCC-CWS may recommend necropsy to understand indirect exposure pathways and toxicological effects or if information from the examination may improve response strategies. Information obtained from post-mortem examinations can assist in determining treatment protocols of live birds and aid in immediate rehabilitation efforts. To conduct chemical or histological analysis, tissue samples must be collected, prepared, and stored appropriately. Additional analysis requires more time and is conducted at specialized laboratories.

9.0 Cleaning Wildlife

9.1 Pre-Wash Evaluation

Prior to cleaning, a pre-wash evaluation is conducted to ensure that individuals considered for cleaning are in a condition that will allow them to manage the stress incurred by the washing process. Some animals may require 24 to 48 hour stabilization before initiating washing. For most Wildlife, the following criteria are generally used to assess an individual's condition:

- Responsive and stable condition
- Packed cell volume and total solids tests showing results within 90% of normal values

Additional criteria and observations as defined by a veterinarian or experienced Wildlife Response Personnel may be employed on a case-by-case basis.

9.2 Wash and Rinse Water Criteria and Considerations

The water used during the cleaning process must have particular properties to effectively remove the pollutant and surfactant from feathers, fur, or skin. The following properties will help to achieve a successful wash for most Wildlife:

- Water temperature should be 40ºC when used for washing and rinsing
    - Consider the cooling that will occur during tub preparation and the time leading to its use in the wash program
- Water with a hardness of 30-50 mg calcium carbonate per litre is ideal for wash, rinse, and husbandry needs. Surfactants are removed more easily in softer water
    - Water hardness extremes (both too soft and too hard) can be detrimental to the process
        - Extremely soft water impedes efforts to rinse detergents from feathers, fur, skin, etc.
        - Extremely hard water can result in mineral scale deposits in washed feathers/fur reducing the ability for feathers/fur to achieve waterproofing
    - Water pressure should be 40–60 psi during the rinse process, which will help to force the surfactant out of the feather or fur structure
- Water quantity also needs to be considered. The amount of water required will depend on the species, age, and degree of contact with a pollutant for each individual. Water will be needed for the wash, rinse, and conditioning pools.

9.3 Surfactant and Washing Agent Criteria and Considerations

A surfactant is used to break down or lift the pollutant from the Wildlife's skin, fur, and/or feathers. The surfactant used must mirror the type of pollutant in a given incident. Prior to cleaning Wildlife, a pollutant-specific wash process should be established to ensure the removal of pollutant with the first cleaning process. Experience and training will determine the correct surfactant, but testing for effectiveness is often the only way to confirm the wash protocol. As a pollutant weathers, this effectiveness test may need to be repeated and the wash protocol changed. Washing a deceased

animal (or feather/fur samples) can help to determine the percentage of surfactant needed to achieve a successful wash.

Surfactants should be selected based on research performed before a response. Research and experience will help to indicate the maximum concentrations that should be used to prevent additional injuries (Tegtmeier and Dunne 2008).

Dish soap is, at the time this document is written, the most internationally used surfactant. Beyond being effective at removing a wide variety of pollutants, dish soap:

- can be used at various concentrations when diluted in water
- is generally easy to obtain in large quantities at short notice
- is cost effective
- is typically less toxic than other surfactants

In some cases, the pollutant involved may be persistent (e.g., heavy fuel oils, lubricants; vegetable or fish oils) and may be difficult to remove without a pre-treatment solution to assist in lifting the pollutant from the feathers, fur or skin. Pre-treatments should only be used when necessary and should be safe for both Wildlife and response personnel working with the product. Pre-treatment tests are imperative to determine treatment times and ensure that the pre-treatment will be effective, and can be conducted alongside surfactant tests. Currently methyl soyate, ethyl lactate, warmed canola oil, as well as some commercial products are considered appropriate agents for pre-treatment of persistent petroleum compounds (Berg 2003; Tegtmeier and Miller 2007).

9.4 Washing

Generally, the washing procedure consists of using a series of tubs filled with water and diluted dish soap. A typical washing procedure has three tubs set up in succession with decreasing amounts of surfactant solution. Once used, each tub is refilled and the washing cycle will continue until the pollutant and surfactant have been effectively removed. The amount of washing required will depend on the type of pollutant, how weathered the product is, the amount of contact the individual has had, as well as other factors.

Sufficient Wildlife Response Personnel are necessary for a successful cleaning. At least two people are required for most species, although, having a third and sometimes fourth person may expedite the cleaning process or be necessary for animals that are more difficult to handle. Wildlife Response Personnel must develop and communicate a wash plan to all wash team members prior to initiating the wash process. There is no established time within which a wash must be completed; however, an understanding of the animal's stress tolerance should be considered and balanced against conducting a thorough wash. Once started, combined wash and rinse times under an hour are recommended. Wash times that exceed this timeframe may require changes in pre-treatment or surfactant choice to improve efficacy.

9.4.1 Bird Considerations

For large birds (i.e., larger than most waterfowl), use tubs that are a minimum size of 38 litres (10 gallons). Sedation by inhalant anesthesia may be considered for specific high-stress species (e.g., loons) and should be done under a veterinarian’s supervision. At least one member of the wash team must be skilled and experienced. Individuals and species may react differently from one another when

being washed. The person overseeing the wash team(s) must be experienced at washing Wildlife to assist the teams in understanding species-specific needs.

9.4.2 Mammal, Reptile, and Amphibian Considerations

Mammals impacted by a Pollution Incident are typically small- or medium-sized terrestrial species that spend much of their time near the aquatic environment (e.g., beaver, muskrat, river otter, etc.). Mammals can typically be treated in a wash program similar to that of a bird. The following are some additional considerations for cleaning mammals:

- Sedation must be considered and should only be done under a veterinarian's supervision
- Wildlife Response Personnel handling mammals must be experienced, and pre-exposure vaccinations may be required
- Water temperatures must be altered to within range of the species' normal body temperature; this may impact the wash as surfactants are more effective at higher temperatures
- Larger mammals may require additional Wildlife Response Personnel to assist with wash activities
- Some mammals may require additional monitoring and mitigation as they can be susceptible to rapid hypothermia or hyperthermia (Johnson et al. 2003)

Similar to mammals, reptiles can range considerably in size and some may also require sedation to be handled and washed safely (e.g., snapping turtles, large or venomous snakes, etc.). Many reptile species should be washed immediately after intake; washing may need to be completed in stages to reduce overheating or stress. Larger reptiles (e.g., some turtles) may be washed in garden pools using a pressure nozzle to spray surfactant solutions and to rinse them off. Water temperatures should be altered with reptiles and amphibians, as they all have some susceptibility to ambient temperatures for regulation of their body temperature (e.g., poikilothermic). Cooler water temperatures (29.4 to 32.2ºC or lower) should be used when washing all reptiles to avoid core temperature complications. Warmer water (38.9 to 40ºC) may be used with sponges or other tools to clean specific areas, but reptiles should never be submerged in water warmer than 32.2ºC. Amphibians should be rinsed in successive warm water baths immediately after intake. Surfactants and pre-treatments should not be used with amphibians.

9.5 Rinsing

After the pollutant is gone from feathers, fur or skin, the surfactant must be completely removed. This process is called the rinse stage. Water requirements continue to be the most important factor in the rinse process.

A thorough and detailed process must be followed to ensure that all the surfactant is removed during the rinsing process, which may require leadership from experienced Wildlife Response Personnel. Rinsed feathers should appear dry or have water beading on them, including down and body contour feathers. These two observations are common indicators that pollutants and surfactant have been removed from the feathers.

With regard to mammals, reptiles and amphibians, indications of a complete wash should be the observation of clean (non-soapy) rinse water. Some mammals may also exhibit water beading or dry fur as an indicator of a successful wash.

There is no established time limit for the rinsing stage; however, an understanding of the animal's stress tolerance should be balanced with conducting a thorough rinse.

9.6 Drying

Upon completion of a successful wash and rinse, Wildlife can be temporarily wrapped in a clean, dry towel and gently squeezed to absorb excess moisture from the fur, feathers, or skin. Some mammal species will not require being dried. Reptiles and amphibians should not be dried. Cleaned Wildlife should then be moved to the drying space where it is placed under or on an appropriate heat source. When drying avian species, efforts should be made to maintain a warm, ambient air temperature of 32–35°C (90–95°F) (Berg 2003). The following are appropriate heat sources:

- Pet dryers (most species)
- Heat lamps (passerines and small raptors; some mammals)
- Brooders (juvenile water birds)
- Radiant heaters coupled with an acceptable source of circulation (passerines or small raptors

Prior to cleaning Wildlife, the drying source and space must be identified. The space should be suitable for the animal's size, allowing the individual to move away from the heat source. Net-bottom pens should be used for water birds, which will allow for better circulation of warm air. The space should be pre-warmed before placing the cleaned individual inside.

Drying Wildlife should be monitored routinely:

- Noting the Wildlife's condition
- Providing additional care (i.e., rehydration fluids)
- Cleaning the space of fecal matter, which could re-contaminate a washed individual

Once the animal is dry, it should be placed in appropriate clean housing where it can receive the necessary ongoing rehabilitation, conditioning, and care prior to release. It is ideal for aquatic and pelagic bird species to be moved directly into pools after they are completely dry.

9.7 Waste Disposal

All wastes generated during the washing process should be managed according to the applicable legislation in the region where the response is taking place and adhere to procedures outlined in the incident-specific Waste Management Plan. Generally, it is accepted that wastewater generated during the washing and rinsing stages should be managed as a hazardous liquid waste. Therefore, at the completion of each wash, the waste wash water should be transferred to an appropriate holding tank until final disposition can be determined. In most cases, a sump pump is attached to a leader hose that pumps wastewater directly into a holding barrel which then has a second pump moving water from the barrel to the wastewater containment tank. Additional sampling and analysis may be completed to further clarify the waste class and, therefore, the options for disposal.

Solid wastes generated during the wash process or during rehabilitation are generally considered to be solid non-hazardous waste. It is good practice, however, to segregate these wastes from generic solid wastes in the event that special handling is required.

Additional information on waste management can be found in the *Guidelines for Establishing and Operating Treatment Facilities for Oiled Wildlife* (ECCC-CWS 2022b).

10.0 Care, Housing, and Feeding Needs for Wildlife

10.1 Housing

All Wildlife entering the rehabilitation process will require housing space. Generally, housing enclosures should be constructed of materials that are safe and strong enough to contain Wildlife in both indoor and outdoor settings. Properly constructed housing and appropriate material choices can reduce the potential for injury to Wildlife (e.g., pressure sores, feather contamination, foot lesions), and reduce exposure to pests, predators, and infectious disease transmission (Berg 2003). Housing should ensure a secure, healthy, and safe environment at all times.

The following key aspects should be considered when preparing to house Wildlife for treatment and rehabilitation:

- Indoor housing should maintain an appropriate temperature for the specific species, ages, stage of rehabilitation, and individual medical needs
    - Heating or cooling will be needed to ensure thermoregulation is maintained while individuals eat, regain strength, and rest
- Housing should be designed to ensure that there is adequate room for individuals to prevent overcrowding
- Adequate ventilation should be provided to prevent the buildup of hazardous fumes
- Housing should be designed to minimize human contact with Wildlife
- Visual barriers should be used wherever possible to prevent Wildlife from seeing humans or predatory species also being housed
- Perches, substrate, flooring, and shelters should be incorporated into housing when appropriate
- Conditioning pools should incorporate an appropriate landing, raft, or haul-out area
- Housing should be well lit to the animal's comfort and ease in locating food and perches, but cycled to their normal photoperiod
- Cleaned Wildlife that are injured, ill, or young may be kept in enclosures designed to restrict activity or mobility until their condition allows for unlimited activity

Additional information on housing and enclosures for both oiled and cleaned Wildlife can be found in the *Guidelines for Establishing and Operating Treatment Facilities for Oiled Wildlife* as well as *Minimum Standards for Wildlife Rehabilitation* (ECCC-CWS 2022b; Miller 2012).

10.2 Post-wash Conditioning of Birds

10.2.1 Water Birds

Once water birds (e.g., ducks, murres, loons) are washed, dried, and cleared for the next stage of care, they should be given access to freshwater pools for swimming. Misting the bird will encourage

preening. Water access should be incremental, and the animal's condition should be monitored regularly for adverse behaviour that may indicate the following (Berg 2003):

- Incomplete removal of pollutants during the washing process
- Incomplete removal of surfactant during the rinsing process
- Hard water scale deposits due to poor wash and rinse water quality
- Complicating health condition
- Disease
- Feather loss or damage
- Poor pool-water quality, or re-contamination from feces or fish oils

Regaining waterproofing is a process that can take several days. Birds must preen their feathers, realigning microscopic barbs and barbules. Clean water pools, with a constant overflow to skim the surface of the water, are key to providing the husbandry necessary for birds to regain waterproofing. Birds must be continually monitored for wet areas, hypothermia, sinking or buoyancy problems, and behavior changes during this phase.

10.2.2 Terrestrial and Wading Birds

Once terrestrial or wading and shorebirds (e.g., passerines, herons, egrets, plovers) are washed and have dried, they should be given access to fresh water for drinking and bathing. Additionally, misting terrestrial and wading birds will encourage preening. Terrestrial birds should display waterproofing appropriate for their species.

10.3 Nutrition

Wildlife that have been exposed to pollutants, particularly petroleum products, can suffer from digestive complications brought on by the ingestion of the product during preening or consuming contaminated prey or water. Reduced gastrointestinal tract function can result in Wildlife not receiving an adequate daily caloric intake. Specialized diets and additional fluid therapy should be considered when Wildlife are suffering from such conditions.

Wildlife that are active, alert, and do not demonstrate signs of gastrointestinal tract disturbances (e.g., diarrhea, blood in droppings, discoloured urates) can be provided with appropriate food such as pellet-based foods or thawed frozen fish. The following should be considered when providing food to rehabilitating Wildlife:

- Provide food in dishes or containers in a manner that prevents re-soiling of feathers/fur and is also sized correctly to allow the Wildlife to feed in a manner typical of being in the wild (e.g., dabbling ducks place their bills in the water horizontally and sift through the water to pick out small bits of food)
- Food and fresh water must be available in adequate quantities; it should be checked on a regular basis and replenished or refreshed when necessary
- Food must be fresh and not allowed to become moldy or contaminated with fecal matter
- Augment food with supplements to provide additional nutrients (e.g., Vitamin B1 for fish-eating birds)
- Document daily feeding and care; note the following:
    - Time and date when food and water were provided
    - Dietary supplements provided

    - Food and water consumption
    - Condition and production of droppings
    - Any additional notes, concerns, medications, or treatments
- Clean all utensils and containers after each use and disinfect on a regular basis
- Store all food to prevent contamination and spoilage (e.g., freezers, refrigerators, airtight containers; Berg 2003)

11.0 Releasing Wildlife

The primary objective of Wildlife response is to mitigate the suffering of individual Wildlife. In most successful responses, there will be clean Wildlife to release back into the environment so that they may rejoin and contribute to a healthy wild population. Rehabilitated birds should be banded by permitted personnel prior to release, consistent with conditions set out in a Banding Permit and guidelines established by the North American Banding Program. Banding of released birds can support post-release monitoring.

The release of any Wildlife that have received care must be planned, coordinated, and approved by the LA and RP. ECCC-CWS will maintain a functional relationship with the WRO to advise on release sites for Wildlife and subsequent monitoring needs. The release plan must be communicated to the LA and RP prior to implementation to ensure that plans for release do not conflict with the overall incident response.

11.1 Wildlife Release Plan

In developing a release plan for successfully rehabilitated Wildlife, the following should be considered:

- Release date and alternative date(s)
- Release location appropriate for the species (see Release Site Considerations in ECCC-CWS 2022b)
- Number of individuals that will be released
- Weather conditions
- Release time
    - Diurnal species need sufficient daylight lengths for acclimation and feeding
    - Nocturnal species need sufficient darkness for acclimation and feeding
- Prescribed banding procedure as approved by the agency having jurisdiction over the species to be released, and in coordination with the Bird Banding Office
- Wildlife Response Personnel to ensure quick capture, examination, and placement in transport containers at the rehabilitation facility
- Transport container type and number of clean Wildlife per container
- Appropriate vehicle to transport the clean Wildlife to the release site (e.g., covered truck, on-water transport, in-air transport)
- Number of Wildlife Response Personnel needed at the release site

- Necessary communications for details of Wildlife release. ECCC Information Officers will plan and coordinate any media requirements and communications specific to Wildlife during Wildlife Emergencies, in consultation with the CWS Co-ordinator, Regional Director, and the Communication Unit of the Incident Command Post
- Details of the post-release monitoring strategy

In preparation for the release, consider the following:

- Identification of drugs used in the rehabilitation of any game species that would be unsuitable for human consumption if the animal was harvested. Wildlife may need to be held after it is ready for release due to medications given during rehabilitation and specific drug withdrawal times (Food Animal Residue Avoidance Databank 2019).
- Coordinate appropriate transportation to the selected release site
- Prepare appropriate number and type of containers for transport
- Schedule the Wildlife Response Personnel required for:
    - capture, examination, and placement in transport containers at the facility
    - assisting at the release site
- Everyone involved in the release plan must be briefed concerning the procedures
- An exit photograph may also be taken of the clean Wildlife to document physical condition upon release to support post-release monitoring (Johnson et al. 2003)

The following should also be considered when choosing an appropriate release site:

- Species appropriate, contamination-free site, and an identified alternative site(s); sites should be assessed for suitability and identification of a specific release area prior to transporting animals for release
- When possible, Wildlife should be released back to their point of capture to reduce the possibility of introducing disease; reptiles and amphibians should be released in the vicinity of their point of original capture (e.g., same wetland or watershed complex)
- Arrangements for access to the proposed release site(s)
- Proximity to suitable foraging habitat or conspecifics (depending on territorial behaviours of released animals)
- Distance from any ongoing response operations or human disturbances
- Seasonal migration of each species to be released
- For younger animals, their release should be timed to mirror the period of independence from parental care
- Assessment of environmental impact of the release (e.g., a predatory bird being released in an area where Endangered species live)
- Release should not proceed any later in the fall than the usual migration period so that survival ability is optimized; otherwise, it may be a consideration to hold the bird in captivity over the winter and release it the following spring
- Release sites should be selected to minimize the risk of predation or release into another animal's established territory; this is particularly important with beavers and reptiles
- Avoid release in areas with high populations of domestic cats; ensuring adequate cover from natural predators is strongly recommended
- Release of nocturnal species (particularly storm-petrels and small owls) should be scheduled for late evening at dusk, to reduce the probability of predation and mobbing by other avian species

11.2 Wildlife Release Criteria

Prior to release, clean Wildlife must meet certain and often species-specific criteria. An examination by experienced Wildlife Response Personnel should be completed to ensure that Wildlife meet the set criteria for that species.

The following are criteria often considered prior to release (Berg 2003):

- Clean Wildlife exhibit
    - Normal species-specific behavior
    - Normal waterproofing
    - No symptoms of disease
    - No evidence of significant injuries
- Body weight within 10% of normal range for the age class, sex, species, and season, where known; body condition score may also be used to identify release candidates
- Acclimation to seasonal temperature and light
- Normal blood values (if known)

Options for clean Wildlife that do not meet release criteria must be considered when establishing the release criteria and may include the following:

- Additional rehabilitation in the existing OWRC
- Long-term clean Wildlife rehabilitation at a permanent Wildlife rehabilitation facility
- Permanent placement at an approved zoological, aquarium, or education facility; suitability for placement is highly species-dependent; individual temperament and animal welfare must be considered (Buhl et al. 2018)
- Euthanasia

11.3 Post-release Monitoring of Wildlife

Upon release of any clean Wildlife, personnel must record observations of the individual's fitness, activity level, and general health. Determining the effectiveness of rehabilitation and long-term survivorship of Wildlife impacted during a Wildlife Emergency is accomplished through the development of a long-term monitoring program. A long-term monitoring program will monitor released Wildlife's condition, activities, and contributions to the overall health of a population. Long-term monitoring programs may have varying objectives, and monitoring strategies (e.g., individual tagging, overall population assessments) should be tailored to support the specific objectives of interest. For example, long-term monitoring may provide an understanding of the role that exposure to the pollutant has on both medical and behavioural aspects to Wildlife ecology.

12.0 Demobilization

During a Wildlife Emergency response, the volume of intake and patient care decrease over time. Wildlife Response personnel will need to scale back Wildlife rehabilitation operations and eventually determine when demobilization is required. The following scenarios indicate a decreased need for operations:

- Intake decreases and approaches zero
- Oiled Wildlife are cleaned and cleaning efforts slow because there are few individuals remaining
- Clean Wildlife care decreases as Wildlife Response Personnel prepare for and release Wildlife

Demobilization planning for Wildlife treatment facilities should generally begin as Wildlife intakes begin to decrease. As a Wildlife response changes, the demobilization plan may not be put into immediate action. Ongoing communication with the LA and RP should be maintained. ECCC-CWS will work with the Wildlife Response Personnel to maintain current information on the incident status and the projected outlook of continued operations. Additional information concerning demobilization can be found in the *Guidelines for Establishing and Operating Treatment Facilities for Oiled Wildlife* (ECCC-CWS 2022b).

13.0 Documentation And Record Management

When treatment is implemented during a Wildlife Emergency, documentation and record management must occur throughout the lifecycle of the animal's care (e.g., capture through to release). Communication among the LA, RP, ECCC-CWS, and the WRO is necessary to get a clear understanding of the type of documentation and records that will be required. In cases where a natural resource damage assessment is undertaken, additional documentation may be essential. Documenting a Wildlife response may also become a resource for planning future responses and improving rehabilitation practices and techniques.

Each individual that is collected or captured, treated, rehabilitated, and/or released should have a clear record of care and chain of custody. All documents should be managed appropriately. Therefore, it is essential that a record management system be established and maintained. When establishing a record management system, consideration of the following document formats, data types, and communication will be required:

- Electronic reporting (e.g., e-mails, text messages, Wildlife rehabilitation record management databases)
- Document scans (e.g., records from other facilities or centres)
- Image and video management (e.g., photographic evidence, facility documentation)
- Mapping data management (e.g., GPS coordinates, waypoint data, shapefiles, KMZ files)
- Hard-copy management (e.g., Wildlife care and cleaning records)
- A secure back-up system

Completed documentation will provide evidence of:

- Wildlife Response Personnel, volunteers, and visitors
- Wildlife admitted to a treatment facility
- Carcasses admitted to a treatment facility (if applicable)
- Care provided to the Wildlife
- Record of the costs incurred to ensure appropriate compensation to the involved organizations

Depending on the incident, the following plans may be developed as part of Wildlife capture, transport, cleaning, rehabilitation, and release activities. Templates or incident examples may exist and be

provided by ECCC-CWS as part of the response. Records of these plans (including iterative versions developed over the course of an incident) and their ECCC-CWS, LA, and RP approvals should be documented as appropriate.

1. Wildlife Response Plans
    a. Wildlife Capture and Carcass Collection Plan
    b. Zoonoses and Bio-security Plan
    c. Wildlife treatment facility's Health and Safety Plan
    d. Wildlife treatment facility's Waste Management Plan
    e. Wildlife Release and Post-release Monitoring Plan
    f. Demobilization Plan
2. Wildlife Field Documentation
    a. Wildlife / Oiled Wildlife Survey
    b. Wildlife Retrieval Field Report
    c. Chain of Custody Form
    d. Evidence Tags
3. Wildlife Stabilization and Facility Documentation
    a. Live Animal Log, list of all in-house contaminated Wildlife by species, case number, and final disposition
    b. Morgue (Carcass) Log, deceased oiled Wildlife received, listed by species and case number
    c. Intake Admissions Form
    d. Patient Record
    e. Wash Records
    f. Banding Log and Data Management
    g. End-of-Day Report

14.0 Custodian

The custodian for the Guidelines for the Capture, Transport, Cleaning, and Rehabilitation of Oiled Wildlife and any amendments thereto is the:

Director General, Regional Operations Directorate
ECCC-CWS
ECCC

The approval of future updates is vested to the Director General, Regional Operations Directorate, ECCC-CWS.

15.0 Acknowledgements

This publication represents the collective efforts of many members of the ECCC-CWS National Wildlife Emergency Response Working Group (François Bolduc, Daniel Bordage, Andrew Boyne, Brigitte Collins, Jean-François Dufour, Kevin Fort, Carina Gjerdrum, Jeanette Goulet, Jack Hughes, Nancy Hughes, Lesley Howes, Vicky Johnston, Raphael Lavoie, Jim Leafloor, Erika Lok, Craig Machtans, Kim Mawhinney, Ruth Milkereit, Dave Moore, Patrick O'Hara, Mia Pelletier, Lisa Pirie, Jennifer Provencher, Greg Robertson, Myra Robertson, Rob Ronconi, Pierre Ryan, Saul Schneider, Chris Sharp, Eric Shear,

Marielle Thillet, Graham Thomas, Mike Watmough, Becky Whittam, Sabina Wilhelm, Megan Willie, and Sydney Worthman), the ECCC-CWS Permits Working Group, Tri-State Bird and Rescue Research (Ryan Wheeler, Sarah Tegtmeier), and Focus Wildlife. This document is a product of ECCC.

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Appendix A: Contact Information for Canadian Wildlife Service Regional Permit Offices

Table A-1: Canadian Wildlife Service Permit Office Contacts

Region	Address	Contact
Bird Banding Office National Wildlife Research Centre	Carleton University 1125 Colonel By Drive Ottawa, ON K1A 0H3	• Telephone: (613)998-0524 • Email: bbo_cws@ec.gc.ca
Atlantic (Newfoundland and Labrador, Prince Edward Island, Nova Scotia and New Brunswick)	17 Waterfowl Lane P.O. Box 6277 Sackville, NB E4L 1G6	• Telephone: (506)364-5068 • Fax: (506)364-5062 • Email: Permi.Atl@ec.gc.ca **For SARA permitting enquiries:** go to https://wildlife-species.canada.ca/SPLEP-SARAPS/ for up to date contact information
Quebec	801-1550 avenue d'Estimauville Québec, QC G1J 0C3	• Telephone: (418)649-6129 • Fax: (418)648-4871 • Email: PermisSCFQuebec-CWSQuebecPermit@ec.gc.ca **For SARA permitting enquiries:** go to https://wildlife-species.canada.ca/SPLEP-SARAPS/ for up to date contact information
Ontario	335 River Road Ottawa, ON K1V 1C7	• Telephone: (613)990-8355 • Fax: (613)990-8400 • Email: wildlifeontario@ec.gc.ca **For SARA permitting enquiries:** go to https://wildlife-species.canada.ca/SPLEP-SARAPS/ for up to date contact information

Region	Address	Contact
Prairie (Alberta, Saskatchewan and Manitoba)	115 Perimeter Road Saskatoon, SK S7N 0X4	• Telephone: (306)975-4090 • Fax: (306)975-4089 • Email: prpermisscf-cwspermitpr@ec.gc.ca **For SARA permitting enquiries:** go to https://wildlife-species.canada.ca/SPLEP-SARAPS/ for up to date contact information
British Columbia	5421 Robertson Road Delta, BC V4K 3N2	• Telephone: (604)350-1950 • Fax: (604)946-7022 • Email: scfpacpermitscwspacpermits@ec.gc.ca **For SARA permitting enquiries:** go to https://wildlife-species.canada.ca/SPLEP-SARAPS/ for up to date contact information
Northern (Northwest Territories, Nunavut & Yukon)	P.O. Box 1870 Suite 301-933 Mivvik Street Iqaluit, NU X0A 0H0	• Telephone: (867) 975-4638 • Fax: (867) 975-4645 • Email: CWSPermitNorth@ec.gc.ca For SARA permitting enquiries: go to https://wildlife-species.canada.ca/SPLEP-SARAPS/ for up to date contact information

Appendix B: List of Common Zoonotic Diseases as per Berg (2003)

Table B-1: List of Bacterial Zoonoses

Organism Common Name	Mode of Transmission	Usual Source	Reported Species	Signs and Symptoms	Precautions for Responders
Campylobacter jejuni **Campylobacteriosis**	Ingestion	Contaminated tissue Fecal exposure	Mammals (human), birds	Abdominal pain, fever, vomiting, headache	PPE Hand washing Food hygiene
Chlamydia psittaci **Chlamydiosis**	Inhalation	Aerosol droplets	Mammals (human), birds	Conjunctivitis, depression, respiratory infection	PPE Hand washing
Clostridia sp. **Blackleg/Tetanus - Enterotoxemia/etc.**	Inhalation, injection (puncture wounds), absorption	Fecal contamination Contaminated soil	Mammals (human), birds	Anaerobic wound infections/septicemia , hemorrhagic enteritis/neurotoxin	PPE Vaccination Hand washing Food hygiene
Escherichia coli **Colibacillosis**	Inhalation, Ingestion	Contaminated tissue	Mammals (human), birds	Enteritis, diarrhea	PPE Hand washing Food hygiene
Erysipelothrix sp. **Erysipeloid**, **diamond skin disease**	Ingestion, injection (bites/scratches), absorption	Water/saliva Fish/shellfish	Mammals (human, cetaceans), birds	Cellulitis, septicemia, rhomboid skin plaque	PPE Hand washing
Listeria monocytogenes **Listeriosis**	Ingestion	Water/soil	Mammals (human), birds	Conjunctivitis	PPE Food hygiene

Organism Common Name	Mode of Transmission	Usual Source	Reported Species	Signs and Symptoms	Precautions for Responders
Mycobacterium avium **Mycobacteriosis**	Inhalation, injection (insect vectors, scratches), absorption	Water/soil	Mammals (human, swine), birds	Pulmonary disease, cervical lymphadenopathy	PPE
Mycoplasma sp. **Atypical pneumonia**	Inhalation (aerosols)	Mucous membranes	Mammals (human), birds	Respiratory infection, conjunctivitis	PPE Hand washing
Pasturella multocida **Pasturellosis**	Inhalation, ingestion, injection (bites/scratches), absorption	Respiratory secretions from birds or mammals	Mammals (human, pinnipeds), birds	Cellulitis/respiratory infection, septicemia/enteritis, peracute death	PPE Hand washing
Salmonella, *Shigella*, *Plesiomonas* **Infectious enteritis**	Ingestion	Tissues from infected animal/fecal contamination	Mammals (human), all vertebrates	Enterocolitis/diarrhea, fever/septicemia	PPE Food hygiene Cooking/chilling Hand washing
Yersinia pseudotuberculosis **Pseudotuberculosis** *Yersinia enterocolitica* **Yersiniosis**	Inhalation, ingestion, injection, absorption	Fecal shedding Contaminated food or water	Mammals (human), birds	Enlarged mesenteric lymph nodes Y. enterocolitica enteritis	PPE
Francisella tularensis tularensis / *palaearctica* **Tularemia**	Injection	Insect vector	Mammals (rodents, human)	Fever/septicemia, enlarged lymph nodes	PPE, vector repellent

Table B-2: List of Viral Zoonoses

Organism Common Name	Mode of Transmission	Usual Source	Reported Species	Signs and Symptoms	Precautions for Responders
Paramyxovirus **Newcastle Disease**	Inhalation, ingestion	Secretions and excretions	Mammals (human), birds	Conjunctivitis, fever, chills, headache	PPE Isolation of suspects Sanitation
Influenza Virus **Influenza A**	Inhalation, ingestion	Aerosol droplets	Mammals (harbour seals, pilot whales, human), birds	Upper respiratory tract infection, pneumonia/ conjunctivitis	PPE Isolation Annual vaccination
Rabies	Injection (bite), inhalation, absorption	Secretions and excretions	Mammals (carnivores)	Central nervous system disorders, inflammation (brain/spinal cord), paralysis	PPE Vaccination
West Nile Virus	Injection	Insect vectors	Mammals (human), birds	Fever/flu-like symptoms	PPE, vector repellent

Table B-3: List of Fungal Zoonoses

Organism Common Name	Mode of Transmission	Usual Source	Reported Species	Signs and Symptoms	Precautions for Responders
Aspergillus sp. **Aspergillosis**	Inhalation	Spores from mold growth in damp, poorly ventilated areas	Mammals (human, cetaceans), birds	Respiratory infections, granulomas	PPE Adequate ventilation
Coccidioides immitis **Coccidioidomycosis**	Inhalation	Spores in dust/soil	Mammals (dolphin, human, sea lion, sea otter)	Pyogranulomas in lung/other tissues	PPE Sanitation
Cryptococcus neoformans **Cryptococcosis**	Inhalation	Spores in soil contaminated by bird droppings	Mammals (human), birds	Pulmonary disease but may disseminate to viscera, skin, bones, or central nervous system	PPE Sanitation
Histoplasma capsulatum **Histoplasmosis**	Inhalation	Spores in dust, soil and bird roosts	Mammals (human)	Flu-like signs, fever, respiratory signs	PPE Sanitation