

OIL SPILL CONTINGENCY MANUAL

SECTION 5

WILDLIFE RECOVERY

WILDLIFE RECOVERY

5.1

Action

- Consult with Canadian Wildlife Service and/or Fish and Wildlife authorities to obtain approval prior to implementing a bird deterrent or rescue program*

Procedure

- Contact CWS for all migratory bird species.
 - Alberta: John Dunlop, Acting Permits Officer
 - Prairie and Northern Region, Saskatoon
 - 306-975-4090
 - British Columbia:
 - Contact local Fish & Wildlife office (See Appendix A)
 - Saskatchewan: John Dunlop, Acting Permits Officer
 - Prairie and Northern Region, Saskatoon
 - 306-975-4090
- Contact Fish & Wildlife local offices for **all species of animals and birds**. (See appendix A for directory of offices.) If uncertain as to migratory status, contact either provincial or federal authorities.

Action

- Prevent birds and wildlife from entering spill site.*

Procedure

- Dispatch company and/or WCSS wildlife response units to the appropriate staging areas.
- Consider supplementing the wildlife response unit with equipment from the local Area Oil Spill Cooperative and/or regional equipment (ie: OSCAR units, boats).
- Ensure the Canadian Wildlife Service and local Fish & Wildlife office is consulted with prior to any hazing operations.
- See Appendix B for various deterrent methods. Note: options may not be limited to those listed.
- Note wildlife (including birds) will become habituated to most deterrent techniques. Onset of habituation can be very rapid, from several minutes to several days.

Action

- Notify government emergency response in the event of an oil spill affecting wildlife.*

Procedure

- Call Environmental Protection Emergency Response
 - Alberta: 1-800-222-6514
 - British Columbia: 1-800-663-3456
 - Saskatchewan: 1-800-667-7525
 - Northwest Territories & Nunavut: 1-867-920-8130

Action

- Assuming appropriate permission and direction is obtained, prepare for capture and containment of oiled wildlife.*

Procedure

- Ensure safety and preparedness of workers prior to handling wildlife.
 - Provide access to personal protective equipment (PPE) for all workers.
 - Eye goggles.
 - Non-skid boots or shoes.

- Long sleeved shirt or jacket. Best choice is oil resistant rain gear or protective clothing such as Tyvek™.
 - Gloves must protect handler from the contaminant as well as from injury.
 - The following is recommended:
 - Leather and/or neoprene gloves for the handling of raptors, small mammals, or birds with long beaks such as loons, herons, grebes, and pelicans. It may be possible to put neoprene or nitrile gloves over leather gloves in some cases. Care must be taken to avoid being punctured by a talon or tooth.
 - Disposable latex or rubber glove under nitrile or neoprene gloves, for handling ducks, geese, and small shorebirds.
 - Respirators may be necessary when working around some contaminants.
 - Earplugs may be necessary when working around heavy equipment.
 - Personal flotation devices may be necessary when working around water.
 - All personnel must have current tetanus shots.
 - Keep food, drink, and smoking areas separate from wildlife.
 - Immuno-compromised or pregnant personnel must not handle oiled wildlife.
 - Wash hands and face with soap and water immediately after handling oiled wildlife.
- Prepare containers for individual birds and mammals before placing them inside.
- Birds: Cardboard boxes are best for holding and transport of all bird species. (Figure 1)
 - Mammals: Cardboard boxes may be adequate for holding and transport of small mammals, particularly if they are oiled and weak. Place a towel inside the box for warmth and privacy and to reduce likelihood of escape. Vigorous and/or larger mammals may be able to chew or claw their way out of a box. Alternate containers include plastic pet carriers (Figure 2) or plastic storage containers (e.g. Rubbermaid storage bin). If using storage bins, it will be necessary to punch air holes in the sides and/or lids. Lids must close securely or be taped shut.
 - Line the bottom of boxes and kennels with clean rags, towels, or blankets. As a last resort, use multiple layers of paper towels. This lining is essential to provide traction, warmth, and absorption of blood, feces, and contaminants.
 - Punch ventilation holes that are large enough to allow air circulation but will not allow heads or long beaks to stick out.
 - Close tops of boxes with duct tape to prevent escape.



Figure 1: Prepared cardboard box



Figure 2: Pet kennel

Action

- Capture oiled birds and/or mammals. Avoid excessive handling.

Procedure

Birds.

- Approach from the side or behind if possible. (Note: Some birds will circle so they are always facing the threat. In such cases, capture can proceed regardless of approach as long as the handler remains aware of where the head and feet are.)
- Drop a towel, light sheet, or blanket completely over the bird. (Figure 3a and 3b.)

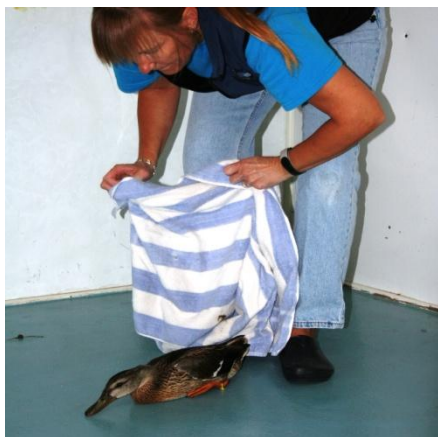


Figure 3a: Drop towel onto bird



Figure 3b: Cover and wrap bird

- For highly mobile birds, a fishing net may be required to immobilize and capture. If this is necessary, once caught in the net, cover the bird with the towel and press down gently

on its body as the net is slowly lifted. (Figure 4) Note: net may become tangled around wings and/or legs; care must be taken to avoid injury!

- Control wings by keeping them tight against the bird's body while encased in the towel and tucked under your arm. (Figure 5.)
- Control feet:
 - Birds of prey: interlock fingers between legs and above feet, taking care to avoid contact with talons. (Figure 6.)
 - Waterfowl: Keep legs tucked under the body wrapped in the towel.
- Keep bird's head under the towel but allow sufficient flow of air for breathing.
- Hold the bird at hip-level and upright, away from the face.
- Do not hold or wrap birds too tightly. Constriction of the chest causes suffocation as it prevents expansion of the keel and lungs.
- Do not put any food or water in the box.
- Lower wrapped bird into box, placing gentle pressure on bird's back for restraint. As the box is closed, lift and remove capture towel and remove completely. (Figure 7) Note: leaving capture towels inside the box can cause injury, overheating, and suffocation.
- If encountering difficulties, or for species-specific tips on capture methods, call the Alberta Institute for Wildlife Conservation at **403-946-2361**.



Figure 4a: Using a fish net to capture active birds



Figure 4b: Removing bird from net



Figure 5: Correct restraint of waterfowl



Figure 6: Correct restraint of raptor feet



Figure 7: Remove capture towel from box, applying light pressure on bird's back to keep it immobilized

Safety note: The handler in these illustrations is not wearing appropriate safety gear for the capture of oiled wildlife. The photos are for illustration purposes. Please ensure proper PPE as needed.

Mammals

(Note: Due to large variation in the handling of different mammal species, it may be necessary to consult with a wildlife center on the phone during capture attempt.)

- Approach from the side or behind if possible. (Note: some mammals will circle so they are always facing a threat. In such cases, rescue can proceed regardless.)
- Drop a towel, light sheet, or blanket completely over the animal and immediately press down gently on its back while wrapping the towel around the body.
- For highly mobile mammals, a fishing net may be required in order to immobilize and capture. If this is necessary, once caught in the net, cover the animal with the towel and press down gently on its body as the net is slowly lifted away.
- Control legs, feet, and teeth by keeping the animal tucked within the towel. Immediately place entire 'bundle' inside container or hold snugly against handler's body while moving to container. Keep the animal's eyes covered at all times but be careful not to rub or irritate them, particularly if there is contaminant around the head and eyes.
- Remove the capture towel as the mammal is lowered into the box. However, if the animal is lethargic or comfortably 'snuggled' in the towel, it can be left inside the box for extra security and warmth. (Note: this is opposite of bird protocol.)
- If encountering difficulties, or for species-specific tips on capture methods, call 403-946-2361.
- Clean and treat cuts, scratches, or bites immediately.

Action

- Consider first aid for affected animals.*

Procedure

- In most cases, first aid is not recommended. Administer first aid to affected animals only if all the following conditions are met.
 - Transfer to qualified facility will not occur within two to four hours of capture, and
 - The animal's condition is deemed to be an 'emergency', and
 - Handler can consult with trauma specialist during administration of first aid. (Call 403-946-2361.)

NOTE

Without proper training, providing first aid or treatment can cause death to the animal.

- Do not attempt to wash oiled wildlife.

Procedure

- Collect documentation for each animal.*

- Attach information sheet directly to each box. (If paper is not available, write directly on the box with permanent marker.) Information should include the following.
 - Date and time of capture.
 - Date of spill, if known.
 - Name of handler(s).
 - Contact info of handler(s).
 - Location animal was found. Name of location as well as details of site. (Example: Ghost Lake, grounded on-shore, gravel beach at campsite.)
 - MSDS for contaminant, if available. If MSDS is not available, write known contaminants directly on the document or on the box.
 - Name of species, if known. Description of species, if name not known. (Example: duck, hawk, fawn, etc.)
 - Description of any first aid, food, or water given to the animal.

Action

- Hold animals for transportation.*

Procedure

- Keep oiled wildlife contained in a warm, dark, well-ventilated, and quiet place until transportation commences.
- Do not stack boxes on top of one another.
- Allow at least 4 cm. of space between boxes.
- Avoid keeping predator and prey species near each other.
- Contact wildlife trauma facility to arrange transfer of animals.

Action

- Transport oiled wildlife to treatment facility.*

Procedure

- Arrange boxes and/or containers in vehicle as follows.
 - Keep box tops clear; do not stack on top of one another.
 - Allow at least 4 cm. of space between them and/or adjacent walls to ensure adequate air flow.
 - Prevent boxes from shifting during transport.
 - Keep out of direct sunlight.
 - Transport in an enclosed vehicle, free of drafts, with adequate ventilation, and temperature control. Do not transport in an open truck-bed.
 - Provide a room temperature of 21 - 24 degrees Celsius for dry birds.
 - Provide a room temperature of 26 - 27 degrees Celsius for wet birds.
 - Provide a room temperature of 21 - 23 degrees Celsius for dry mammals.
 - Provide a room temperature of 25 - 27 degrees Celsius for wet mammals.
 - Do not play stereo or radio during transport. Keep conversation to a minimum.

NOTE

Ideal transport conditions for oiled wildlife can cause discomfort to the driver(s) of the vehicle. Drivers should dress in layers to avoid overheating and must be aware of the potential effects of fumes on their own safety.

Action

- Contact wildlife treatment facilities for transport arrangements, assistance, or advice.*

Procedure

- For spills affecting more than ten animals consider:
 - Focus Wildlife: serving western Canada **778-294-1501**
 - Tri-State Bird Rescue & Research **302-737-7241**

- For spills affecting less than ten animals; we recommend calling:
 - Calgary Area: Alberta Institute for Wildlife Conservation **403-946-2361**
 - Edmonton Area: Wildlife Rehabilitation Society of Edmonton **780-914-4118**
 - Red Deer Area: Medicine River Wildlife Center **403-728-3467**
 - British Columbia: Wildlife Rehabilitation Network of B.C. www.wrn.bc.ca
 - Omineca & Peace:
 - Prince George **250-963-3373**
 - Dawson Creek **250-843-7681**

Action

- Consult with Fish and Wildlife and obtain prior approval prior to disposing of any wildlife mortalities.*

Procedure

- Bag and label each carcass individually.
 - Date and time animal was found.
 - Name of finder.
 - Contact info of finder.
 - Location animal was found. Name of location as well as details of site. (Example: Copper Creek, pulled from water at outflow pipe.)
 - MSDS for contaminant, if available. If MSDS is not available, write known contaminants directly on the document or on the bag.

- Name of species, if known. Description of species, if name not known. (Example: duck, hawk, fawn, etc.)
- Transfer body to Fish and Wildlife officer, OR
- If permission is given, dispose of carcasses in Hazardous Materials waste disposal area.

Record all actions taken in the capture, handling, possession, transport, and disposal of wildlife.

- It is illegal to harm, possess, or interfere with migratory birds without a permit. For all other wildlife, regulations vary depending on classification and status. Therefore, it is recommended that records are made and stored for later reference. All of the following documents could prove useful (in exonerating or prosecuting), at a later date.
 - Photos of the following
 - Spill site
 - Finders, handlers, and witnesses
 - Animals rescued
 - Animals found dead
 - Spill control measures
 - Hazing operation
 - Hand drawn maps of site, showing location of identifiable structures and geography in relation to location of animals.
 - Procedures utilized to prevent wildlife from entering the contaminated area.
 - List of individuals who assisted in rescue.
 - Number and list of affected animals, both live and dead.
 - List of agencies contacted and who contacted them at what time.
 - Chain of custody record for each animal. (Table 1) This document tracks possession of wildlife from point of rescue to final disposition. The layout of the document is not important. The information can be hand-written or prepared on a company form.

Chain of Custody	
Date Time Location found Case number/Animal number/Identifying marks	
Transfer 1 From: (print name, agency, location, date, time) Signature To: (print name, agency)	Signature
Transfer 2 From: (print name, agency, location, date, time) Signature To: (print name, agency)	Signature
Transfer 3 etc. Additional comments:	

Table 1: Sample of a Chain of Custody document

Appendix A: Field Offices, Fish and Wildlife

Fish and Wildlife Offices in Alberta

Athabasca **District Office: 780-675-2419**
Barrhead **District Office: 780-674-8236**
Blairmore **District Office: 403-562-3289**
Bonnyville **District Office: 780-826-3142**
Brooks **District Office: 403-362-1232**
Calgary (Prairies) District Office: 403-297-6423
Calgary (Southern Rockies) District Office: **403-297-8800**
Camrose **District Office: 780-679-1225**
Canmore **District Office: 403-678-2373**
Cardston **District Office: 403-653-5158**
Claresholm **District Office: 403-625-1450**
Cochrane **District Office: 403-932-2388**
Cold Lake **District Office: 780-594-7876**
Coronation **District Office: 403-578-3223**
Drayton Valley **District Office: 780-542-6616**
Drumheller Office: **403-823-1670**
Edmonton Office: **780-427-3574**
Edson Office: **780-723-8244**
Evansburg Office: **780-727-3635**
Fairview Office: **780-835-2737**
Foremost Office: **403-867-3826**
Fort Chipewyan Office: **780-697-3511**
Fort McMurray Office: **780-743-7200**
Fort Vermilion Office: **780-927-4488**
Fox Creek Office: **780-622-3421**
Grande Cache Office: **780-827-3356**
Grande Prairie Office: **780-538-5265**
Hanna Office: **403-854-5540**
High Level Office: **780-926-2238**
High Prairie Office: **780-523-6521**
High River Office: **403-652-8330**
Hinton Office: **780-865-8264**
Lac La Biche Office: **780-623-5247**
Lethbridge Office: **403-381-5266**
Lloydminster Office: **780-871-6495**
Manning Office: **780-836-3065**
Medicine Hat Office: **403-529-3680**
Nordegg Office: **403-721-3965**
Olds Office: **403-556-4215**
Oyen Office: **403-664-3614**
Peace River District Office: **780-624-6405**
Peace River Area Office: **780-624-6405**

Pincher Creek Office: **403-627-1116**
Ponoka Office: **403-783-7093**
Provost Office: **780-753-2433**
Red Deer Office: **403-340-5142**
Red Earth Creek Office: **780-649-3853**
Rocky Mountain House Office: **403-845-8230**
Slave Lake Office: **780-849-7123**
Smoky Lake Office: **780-656-3556**
Spirit River Office: **780-864-4101**
Spruce Grove Office: **780-960-8190**
St. Paul Office: **780-645-6313**
Stettler Office: **403-742-7510**
Strathmore Office: **403-934-3422**
Sundre Office: **403-638-3805**
Swan Hills Office: **780-333-2229**
Valleyview Office: **780-524-3605**
Vegreville Office: **780-632-5410**
Vermilion Office: **780-853-8137**
Vulcan Office: **403-485-6971**
Wetaskiwin Office: **780-361-1250**
Whitecourt Office: **780-778-7112**

Fish & Wildlife Offices in Saskatchewan: Note all area codes are 306

Assiniboia: **642-7242**
Battlefords: **386-2212**
Beauval: **288-4710**
Big River: **469-2520**
Blackstrap: **492-5675**
Buffalo Narrows: **235-1740**
Candle Lake: **929-8400**
Chitek Lake: **984-2343**
Christopher Lake: **982-6250**
Creighton: **688-8812**
Cumberland House: **888-5810**
Cypress Hills: **662-5435**
Dorintosh: **236-7680**
Duck Mountain: **542-5500**
Estevan: **637-4600**
Fort Qu'Appelle: **332-3215**
Greenwater Lake: **278-3515**
Hudson Bay: **865-4400**
Humboldt: **682-6726**
Kindersley: **463-5458**
LaRonge: **425-4234**
Leader: **628-3100**
Lloydminster: **825-6430**

Loon Lake: **837-2410**
Maple Creek: **662-5434**
Meadow Lake: **236-7557**
Melfort: **752-6214**
Melville: **728-7480**
Moose Jaw: **694-3659**
Moose Mountain: **577-2600**
Moosomin: **435-4545**
Nipawin: **862-1790**
North Battleford: **446-7416**
Outlook: **867-5560**
Pelican Narrows: **632-5510**
Pierceland: **839-6250**
Pike Lake: **933-6966**
Pinehouse: **884-2060**
Porcupine Plain: **278-3540**
Preeceville: **547-5660**
Prince Albert: **953-2322**
Regina: **787-2080**
Rowan's Ravine: **725-5200**
Saskatoon: **933-6240**
Shaunavon: **297-5433**
Southend: **758-6255**
Spiritwood: **883-8501**
Stony Rapids: **439-2062**
Swift Current: **778-8205**
Wadena: **338-6254**
Weyburn: **848-2344**
Yorkton: **786-1463**

Fish & Wildlife Offices in Northern BC

Prince George, Regional Headquarters and Field Office: **(250) 565-6140**
Atlin: **(250) 651-7501**
Burns Lake: **(250) 692-7777**
Chetwynd: **(250) 788-3611**
Dawson Creek: **(250) 784-2304**
Dease Lake: **(250) 771-3566**
Fort Nelson: **(250) 787-3225**
Ft. St. John: **(250) 787-3225**
Mackenzie: **(250) 997-6555**
Queen Charlotte City: **(250) 559-8431**
Smithers: **(250) 847-7266**
Terrace: **(250) 638-6530**
Vanderhoof: **(250) 567-6304**

Appendix B: Sample Deterrent Techniques

Gas-Operated Exploders (Propane Combustion Cannon)

Detonators consist of a bottled gas supply, separate pressure and combustion chambers, an igniting mechanism and a barrel to aim and magnify the blast. Gas-operated exploders produce a loud directional shotgun-like noise by slowly filling a bellows with propane gas from a tank, then rapidly transferring this gas to a firing chamber and igniting it with a spark. Blasts are emitted at adjustable time intervals. The interval between detonations can be varied from less than one minute to 30 minutes. Some gas operated exploders can be set to fire at random intervals and rotate after each explosion so that subsequent shots are aimed in different directions. The sound level is approximately 120 dB. Tripods can be used to elevate the Zon Gun or the unit can be directed into a drum to enhance the blast sound.

Note: Gas-operated exploders can be extremely dangerous and should be used only by trained personnel.

Advantages

- Deployable in onshore and offshore situations (when placed on anchored rafts) especially when the oil is well confined and where birds are particularly susceptible;
- Protective of relatively large areas (200 - 1000 m or 30 - 50 ha);
- Rapidly remobilized;
- Automatically operated and require only minimal staffing;
- Effective during both day and night;
- Especially effective in deterring dabblers and geese;
- Inexpensive to operate and require little maintenance;
- Inexpensive to purchase; and
- Widely available.

Disadvantages

- Birds rapidly habituate to the sound of the blasts (no more than two or three days and sometimes less than a few hours for some bird species);
- Not effective in deterring most shorebird species as well as gulls, coots, grebes and loons;
- Significantly reduced effective range and sound intensity when used in fog and wind;
- Difficult to install and operate on an anchored raft in open water and in bad weather; and
- Disturbing to local residents and responders.

Pyrotechnics (bangers, screamers and whistlers)

These devices frighten birds by producing a whistling noise, explosion and/or flash of light. Types include shotgun-launched projectiles (shell crackers) and a variety of pistol-launched projectiles; typically starter pistols with 6mm (22 cal.) crimped blank cartridges. When using pyrotechnics, the danger of igniting spilled oil and vegetation should always be avoided. Both

shotgun- and pistol-launched devices should be fired with the wind, and away from personnel. Safety goggles and ear protectors (muff or ear plug type) are worn, and personnel using pyrotechnics are expected to be trained in firearms safety. Shotgun-

launched projectiles include shell crackers and scare cartridges. They are fired from a 12-gauge shotgun with the shell shot being replaced by a bulldog or M-80 firecracker that explodes at 100-150 yards (91-136 m).

Single barrel shotguns that break and load at the breech are recommended. The shotgun should be fired from the hip at a 45° angle, and shell crackers should explode as close to the birds as possible. Because of the light charge, the shotgun has only a slight recoil.

Note: Pyrotechnics can be extremely dangerous and should be used only by trained personnel.

Advantages

- Effective both day and night;
- Easily directed close to water birds;
- Especially effective in deterring open-water birds;
- Relatively high radius of effectiveness (at least 200 m from the source and up to 1 km for some bird species);
- Effective on land or in offshore situations;
- Highly effective in combination with other deterrents (motorboats, ATV, effigies); and
- Relatively inexpensive (roughly \$50 per hundred).

Disadvantages

- Short duration of effectiveness (one or two hours);
- Less effective in deterring dabbling ducks;
- Ineffective in deterring gulls and shorebirds;
- Significantly reduced effective range and sound intensity when used in windy situations;
- Requires continuous staffing;
- Potentially hazardous to operators and bystanders if not used carefully;
- Potentially hazardous if used in areas containing volatile oil components; and
- Disturbing to local residents and responders.

Aircraft

Aircraft, especially helicopters, are effective deterrents because of the combination of loud noise and rapid approach from above. They are often effective for hazing birds away from large areas. Helicopters may also be used to herd flightless (young and moulting) birds. Aircraft are considered to be especially useful during the early stages of cleanup and hazing operations. They are more effective if used in combination with other devices such as shell crackers and gas-operated exploders. Because of their manoeuvrability and noise, helicopters are probably more effective than fixed wing aircraft. Not all bird species will take flight in response to overhead disturbances. Some water birds (e.g., loons and alcids) dive rather than fly when approached by aircraft, and others who are young or in their moulting or brood-rearing stage may be incapable of flight. Flightless birds can be herded with a helicopter (Alaska Regional Response Team, 1991), or ground patrols after the helicopter has departed. Helicopters have been used

successfully to drive flightless Canada geese over water, exposed tidal flats, and dense sedge in Alaska with the helicopter remaining 10 to 20 m (33-66 ft) behind the geese at an altitude of 1-15 m (3-49 ft). (Timm and Bromley, 1976).

Advantages

- Readily available to remote and roadless areas;
- Disperses birds in different types of habitats (marsh birds, offshore birds);
- Rapidly disperses birds while oil is still offshore;
- Requires minimal staffing; and
- Highly effective at deterring geese.

Disadvantages

- Less effective at deterring species other than geese, especially during moult;
- Less effective for birds gathered in very attractive sites like feeding or nesting grounds;
- Increased potential of bird-aircraft collisions during low flying activities;
- Ineffective at night;
- Reduced or limited feasibility during bad weather (especially fog);
- Time consuming for deterring birds on a large scale basis;
- Limited ability to procure helicopters, in heavy demand during an oil spill; and
- Relatively high cost of charter aircraft.

Motorboats

Motorboats can be used to deter birds located offshore where hazing from the shoreline with other techniques is ineffective in driving birds away. A few studies conducted during the last 20 years have demonstrated the potential of boats as an effective deterrent. Birds are more sensitive to boats propelled by outboard motors. A powerboat causes virtually instantaneous flight as soon as it appears on the water, causing a majority of birds to leave. There is some speculation that the larger the flock, the more sensitive it is to an approach (Batten, 1977). The hazing of diving birds with boats is generally considered slow, labour intensive, and may be ineffective. Boats may be useful for herding flightless waterfowl away from spilled oil to boomed areas of lagoons, or overland to inland lakes (Alaska Regional Response Team, 1991). Note: Remote controlled boats have also been used successfully in waterfowl hazing operations.

Advantages

- Useful in deterring birds located at some distance from the shoreline;
- Rapidly implemented for deterring birds while oil is still offshore;
- Works well with most species except diving birds;
- Covers relatively large areas; and
- Requires limited staffing.

Disadvantages

- Deployment potentially hazardous during bad weather, ice conditions or darkness;
- Limited ability to locate birds, especially in rough seas; and
- Difficult to direct dispersed birds to un-oiled waters.

All-Terrain Vehicles (ATVs)

All-Terrain Vehicles (ATVs) such as quad-runners are moderately effective for hazing many species of waterfowl and shorebirds. Human presence reinforces the effects of the noise and rapid movement of the vehicle. A quad-runner can also be equipped with air horns or sirens, or used with pyrotechnics.

Advantages

- More efficient for covering larger shore areas (between 3 and 5 km instead of 1-2 km by foot); and
- Most effective when used in combination with other methods (e.g. noisemakers).

Disadvantages

- Limited to birds onshore;
- Limited to daylight use; and
- Potentially destructive to certain habitat types.

Electronic Sound Generators

These devices, broadcast loud, intermittent electronically synthesized sounds that are in the audible range of birds. The units can be adjusted to the most effective range of sound patterns for the target bird species, and sound patterns within this range can be varied over time to decrease habituation. Sound generators can be positioned on land, mounted on boats, or housed within a raft or buoy for effectiveness in open water and marine situations.

Advantages

- Useful in open water environments;
- Rapidly deployed;
- Projects over large areas;
- Readily deployed on leading edge of drifting oil slick;
- Maximizes potential of dispersing birds away from contamination, when deployed directly into oil slick;
- Reduces potential of bird habituation because buoy is moving with the wind and current and regularly encounters new groups of birds;
- Limited habituation of birds, even when anchored, due to the diversity of sounds produced;
- Operable and effective day and night;
- Operable during bad weather (fog and rain);
- Readily retrievable;
- Easy to handle and operate by two persons;
- Constructed to withstand the hazards of fire and explosion sometimes associated with oil slicks;
- Long-lasting effectiveness (>two weeks);
- Low maintenance (requires four marine batteries: two in the unit and two on full charge).

Disadvantages

- May be less efficient in areas where birds are accustomed to loud background noises, where
- hunting pressure is low; or where birds congregate in very secure habitats;
- Batteries must be replaced or recharged after 72 hours of operation;
- Requires a boat or a helicopter to be deployed offshore;
- Regular monitoring (daily) is recommended to ensure effectiveness;
- Range of effectiveness decreases during high winds and rough seas;
- Requires monitoring, when used in oil slick, to ensure that device stays in oil slick;
- Duration of effectiveness unknown when the buoy is used in a stationary mode;
- Disturbing to local residents and responders;
- Expensive, more so if the costs of radio beacon transmitters and receivers are included; and
- May not be immediately available.

Biosonics

These techniques use distress, warning, or alarm calls that are broadcast by tape players to disperse single or closely related species from the immediate area. In general, individuals or small flocks are less responsive than large flocks. The effectiveness of biosonics can be increased by supplementation with pyrotechnics.

Advantages

- Effective at lower sound intensities; and
- Slower habituation.

Disadvantages

- Highly species specific;
- May attract rather than deter birds, depending on life stage; and
- May attract predators and scavengers.

Underwater Acoustics

These include devices that put sound into water, such as sweep frequencies, killer whale vocalizations, and underwater percussion devices. These devices have not been studied enough to allow for guidance or to determine advantages and disadvantages and, therefore, are NOT recommended for use as bird deterrents during oil spill response.

Balloons

All-weather helium balloons are considered effective if properly maintained and frequently refilled and repositioned. They are generally 20-30 inches (50-75 cm) in diameter, and should not be fully inflated in order to reduce stress from wind resistance. Balloons may be suspended from land or from a floating object in the water. They should not be located near trees or other objects that could cause puncturing. Balloons should be tethered on 40-75 feet (12-23 m) of 48 lb

(22 kg) or stronger monofilament line and initially spaced at least every 200 yards (183 m). Some balloons should be set very high to deter birds from flying overhead.

Advantages

- Inexpensive; and
- Readily available.

Disadvantages

- Rapid habituation;
- Ineffective at night;
- Do not function well in winds over 10 mph; and
- Potentially subject to ultraviolet degradation.

Flags

Flags are considered an effective and inexpensive hazing device for waterfowl. They can be constructed by mounting a three-by-two-foot (91-61 cm) sheet of black plastic to a four-foot (1.2 m) stake. The stakes should be driven into the ground at an angle so the flags will move in light wind. They should be erected every 100 to 200 feet (30-61 m) on land, or on buoys over water. Mylar car dealership flags can also be effective for hazing waterfowl. Flags can be used in conjunction with gas-operated exploders.

Advantages

- Inexpensive; and
- Readily available.
-

Disadvantages

- Rapid habituation; and
- Ineffective at night.

Human Effigies and Predator Models

Human effigies (e.g., traditional scarecrows) and raptor models may be effective if they appear lifelike, have motion, are frequently repositioned, and are used in combination with loud sounds or recorded distress calls. Human effigies are more effective if you first establish the human form as being potentially detrimental (e.g., have response personnel create disturbance in the area before deploying human effigies), and are dressed similarly to personnel operating in the area.

Advantages

- Readily put in place
- Easily remobilized;
- Does not constitute an auditory disturbance near populated areas or responders;
- Effective in good and bad (winds, rain, etc.) weather; and
- Relatively inexpensive (<\$200).

Disadvantages

- Effectiveness limited to daylight, except if equipped with lights or combined with audio
- deterrents;
- Rapid habituation by birds (a few days); and
- Small range of effectiveness (100m or 4-8 ha).

Reflectors, Mirrors, and Reflecting Tape

Reflector devices can be constructed by attaching aluminum or tinfoil pie plates to a line suspended over land or water. These devices can be used in association with lights to haze waterfowl. Hand-held mirrors that reflect sunlight may also be effective. Mylar reflecting tape is another deterrent for many species of birds. This silver and red-coated tape is generally twisted and strung between support posts. The tape reflects sunlight, and vibrates under windy conditions producing a humming noise.

Advantages

- Inexpensive.

Disadvantages

- May attract, rather than deter, birds; and
- Ineffective at night

Lights

Strobe, barricade, search, and revolving fixed lights have been used to haze birds, and they should be combined with other deterrent techniques such as exploders and pyrotechnics. Although lights may be partially effective for deterring waterfowl during the night, some bird species may be attracted to lights, especially during rain, fog, or heavy cloud cover.

Advantages

- Inexpensive.

Disadvantages

- May attract, rather than deter, birds.

Lure Areas and Bait Stations

Birds may be lured from one area to another with the use of bait food. However, bait stations require that large quantities of bait food be available over a period of days. Because lure areas need to be relatively close to a spill so that the food can be detected, this proximity may increase the oiling risk to birds attracted into the general area. Lure areas are recommended only when, after careful evaluation, alternative techniques would be expected to be ineffective.

Advantages

- Passive form of deterrence.

Disadvantages

- May attract birds not normally present in the area and increase potential for oiling as birds disperse from baited site.

Dyes

The feasibility of using dyes for deterring birds from oil spills is unknown because of data gaps including: species-specific reactions to colors, habituation potential, dye toxicity, dye solubility in various types of oil, concentration required, and rates of dye weathering. Therefore, use of dyes is NOT recommended as a bird deterrent during oil spill response at this time.

Trained Falcons and Hawks

Trained falcons and hawks are sometimes used at airports to chase away birds and disperse birds from runways. If used in a contaminated or oiled area, there is the potential that these trained birds could themselves become oiled or contaminated, or could potentially chase or disperse birds into contaminated areas. Using trained falcons and hawks is NOT recommended as a bird deterrent during oil spill response.

Decoys and Visual Devices

Dead-bird decoys or bird carcasses are sometimes used to discourage birds from using an area. However, placing dead-bird decoys or bird carcasses in a contaminated or oiled area may attract healthy birds of prey or other mammalian predators, potentially causing these predatory species to become contaminated or oiled. Using decoys and carcasses is NOT recommended as a bird deterrent during oil spill response.

CONTACT NUMBERS FOR REPORTING ENVIRONMENTAL EMERGENCIES (24 HOURS)

Alberta.....	1 (800) 222-6514
British Columbia.....	1 (800) 663-3456
British Columbia Federal.....	1 (604) 666-6100
Manitoba.....	1 (204) 944-4888
Northwest Territories.....	1 (867) 920-8130
Saskatchewan.....	1 (800) 667-7525
Yukon Territories.....	1 (867) 667-7244

CONTACT NUMBERS FOR SPECIALISTS

Ducks Unlimited.....	1 (403) 362-4827
Wildlife Help Line (Alberta).....	1 (888) 924-2444
Wildlife Rescue of British Columbia.....	1 (604) 526-7275
Wildlife Help Line (Saskatchewan).....	1 (306) 780-9273