

AVIAN ROUNDS

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THE CARE AND REHABILITATION OF OILED WATERFOWL

Condensed from a report by
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Veterinarians practicing in coastal areas or near major inland waterways may be presented with oil-polluted waterbirds or may be called upon to advise citizen conservation groups in large scale rehabilitation efforts following a major oil spill. Indispensable to this work is a knowledge of the effects of oil on birds and the recommended techniques of cleaning oiled waterbirds.

PART I: THE EFFECTS OF OIL ON BIRDS

Crude oil and manufactured petroleum products are mixtures of aromatic and aliphatic hydrocarbons, metals and various chemical additives specific to the oil's intended industrial use. Refined oils are more toxic than crude oils since they have a higher percentage of aromatic hydrocarbons which are believed to be the major toxic component. In addition, refined oils are more likely to contain toxic additives such as heavy metals or organophosphates.

THE EFFECTS OF EXTERNAL CONTAMINATION

The water repellent property of a sea-bird's plumage is largely dependent on the regular precise arrangement of feather architecture. A tightly-fitting, interlocking arrangement of barbs and barbules traps a layer of air between the feathers and the skin, preventing penetration of water. The bird maintains this orderly arrangement by frequent preening. Natural oils produced by the uropygial gland (preen gland) may be important in lubricating feathers, thereby aiding feather arrangement, but these oils do not, as some believe, act as a waxy coat to repel water. Crude and other oils mat feathers and disrupt the fine structure of the feathers, allowing cold water and air to penetrate to the skin. The loss

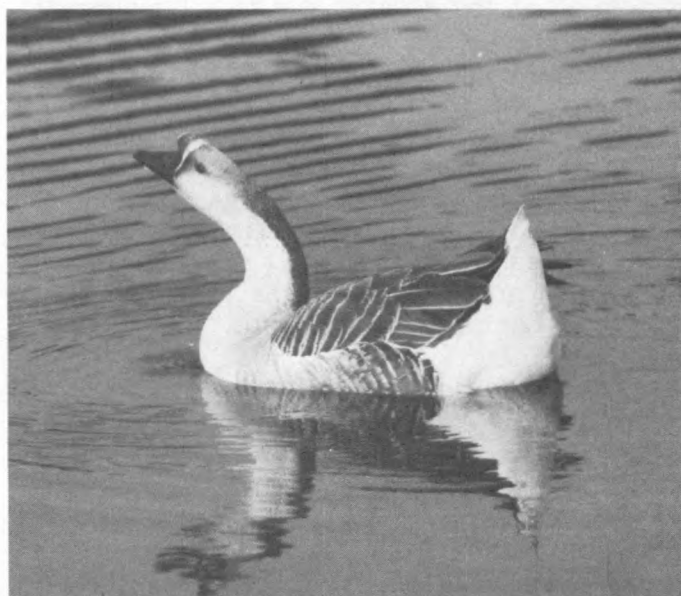
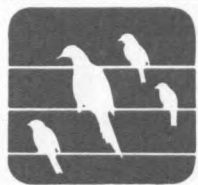


Photo: D. Winters

of waterproofing and insulating properties requires metabolic compensation. Since oiled waterbirds spend most of their time preening and not feeding, their increased energy requirement must be met by mobilization of body fat stores. Not surprisingly, emaciation and hypothermia are the most frequent physical findings in oiled birds brought in for evaluation and treatment.

THE EFFECTS OF INGESTED OILS

When a bird becomes oiled it immediately begins to preen and ingests oil. Significant quantities of oil also may be ingested when birds eat contaminated food material during surface feeding in floating oil or when diving ducks feed off oily sediment on the bottom of a body of water. Despite the large number of reports in the literature, there is no consensus as to the effects of ingested oil on wild avian species. It has been estimated that a bird can remove and ingest 50% of its external oil burden by preening over an eight day period (a range of 10-125 grams oil was found on lightly to heavily oiled ducks). In this time a heavily oiled bird of an average body weight of 700 grams may ingest approximately 1-11g./kg. body weight/day of oil - a toxic level of oil.



The reported effects of ingested oil are numerous. Oil may enter the trachea during preening, swallowing or regurgitation and the lungs of birds which have aspirated oil show thickening of the airways due to a lymphocytic inflammatory infiltrate and proliferation of connective tissue. Airway occlusion may occur causing respiratory distress. Such damage predisposes the bird to secondary bacterial infections. Hemorrhagic enteritis and diarrhea caused by irritation to the gastrointestinal mucosa has frequently been reported, however other researchers report a "conspicuous absence" of gross lesions in the intestinal tract of experimentally dosed gulls and puffins. Fatty infiltration of the liver and hepatocellular degeneration are reported in experimentally and naturally oiled birds. Recent research on anemia, an early reported effect of oil ingestion, characterizes the anemia as a regenerative, Heinz-body hemolytic anemia arising four to five days after ingestion of crude oil. The presence of Heinz bodies suggests that petroleum oil causes an oxidative reaction leading to red blood cell destruction. The exact biochemical mechanism is unclear but may involve the enzyme glutathione peroxidase. This suggests that therapeutic doses of vitamin E/selenium, if given early, may be beneficial in treating oiled birds by preventing oxidative damage to red blood cells.

The oiled bird's ability to respond to environmental stress may also be impaired. Petroleum hydrocarbons may suppress adrenal gland function as evidenced by reduced blood glucose and reduced plasma corticosterone concentrations. Osmotic balance, a problem faced by marine birds, has been studied and shown to be affected by oil ingestion through the inhibition of a key enzyme. As an added consideration, ducks in poor body condition maintained under crowded conditions at a low (0 - 10° C.) ambient temperature have been shown to be more sensitive to the toxic affects of ingested oils than healthy birds. This presents a strong argument for keeping recouperating waterbirds in warm, dry, quiet, uncrowded housing. Stressful conditions, including malnutrition and close contact with humans, should be minimized.

PART II: CARE, HANDLING AND REHABILITATION

FIELD RETRIEVAL

Successful collection of birds - without injury to volunteers or animals - requires teams of organized and trained volunteers working in cooperation with federal and state wildlife officials. Birds should be approached from the seaward side and slowly driven onto the shore, where they can be caught by hand or with nets. Prolonged chasing should be avoided as oiled birds are already short on energy reserves. Injured and traumatized birds will often move two or three miles inland searching for protection and fresh water, so search teams should investigate nearby inland creeks and ponds. Once caught, birds should be completely wrapped in cloth with only the head and neck protruding to prevent preening and further ingestion of oil, and to help maintain body temperature. Wrapped birds should be placed in ventilated boxes or crates for transportation to the treatment center. The back of an open pickup truck is not a suitable transportation vehicle.

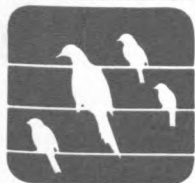
MEDICAL EXAMINATION AND TREATMENT

All birds should be tubed with warm oral fluids containing electrolytes and dextrose to provide energy, promote urinary function, and maintain circulatory volume. Suggested rehydrating solutions and dosages are:

1. 2 1/2% dextrose in 1/2 strength lactated Ringers Solution
2. 100cc Karo^R corn syrup in 1 quart warm water
3. Electro-Plus c^R (Pitman-Moore)
Dosage: 10-25cc/lb.

All birds should receive a quick physical exam paying attention to:

- 1) character of respiration - slow, open-mouthed, labored, gurgling.
- 2) eyes - response to light, nystagmus, conjunctival irritation.



- 3) musculoskeletal system - fractures, lacerations
- 4) cloacal temperature, normal = 102° - 106° F.
- 5) body condition - palpate pectoral muscle mass along keel
- 6) overall attitude

Each bird should be identified with a leg band, weighed, and a record established for that bird. Body weight and cloacal temperature are the best prognostic indicators of survivability and allow triage when large numbers of birds are involved in a spill and personnel resources are limited. High body weight compared to conspecifics and normal cloacal temperature are indicative of birds best able to survive the stress of cleaning and captivity.

Birds with body temperatures below 101° F need immediate care and should be tube fed warm rehydrating solution every hour and placed in a warm (80° - 90°F), isolated area until stabilized. Some rehabilitators report good results from tube feeding birds with Pepto-Bismol R (3 - 5 ml/kg body weight) to flush out any ingested oil and to protect the intestinal mucosa. A recent study of ruddy ducks contaminated with fuel oil showed no significant differences in survival rate of birds given dexamethasone (5 mg./kg. IM), pentobarbital (5 mg/kg IM) or no IM injections. It's more likely that survival rates will be enhanced by rapid and efficient field retrieval, rehydration, cleaning, and release than by specific medical therapeutics.

CLEANING

Cleaning is a stressful procedure and should be done when the oiled bird is in the best possible condition. Ideally, candidates for cleaning should have temperatures of at least 103°F and should be alert and eating. Even debilitated birds should be immediately cleaned, however, when the oily substance is particularly toxic or when birds are severely oiled.

Two major groups of cleaning agents have been used in cleaning oiled birds - solvents and detergents. Although solvents quickly remove

oil and do not require rinsing, they are infrequently used since they are expensive, flammable, dangerous to store and toxic when inhaled or absorbed through the skin. Two specific detergent products are recommended for washing oiled birds - Lux Liquid Amber^R (Lever Brothers) and Dawn^R dishwashing detergent (Proctor and Gamble). Concentrations of 5% - 15% Lux Liquid Amber^R have been used successfully but generally the type of oil will determine both the type and concentration of detergent.

All detergent must be thoroughly rinsed from the feathers. Detergents can act as a wetting agent by decreasing the surface tension of water and residue detergent will interfere with waterproofing and thermal insulation.

REHABILITATION AND RELEASE

Cleaned birds should not be released until they are fully waterproof. The length of time required for re-waterproofing may vary from one day to two weeks. Good sanitation of pens during rehabilitation is important since feces and dirt contaminate plumage in the same way as oil and detergent residue.

Restoration of the fine structure of the feathers and hence waterproofing is accomplished by the bird itself when it preens. Swimming stimulates preening so all birds should have access to a pool of clean water with a ramp or pile of rocks to facilitate access. Short, intermittent swim periods are recommended at first when birds are incompletely waterproof. Contact with others of the same species may encourage swimming and preening in social species such as gulls and terns. Swimming birds must be observed for signs of chilling or wetness. Shivering birds or birds appearing uncomfortable or listless, or who seem to lose their buoyancy should be removed from the pool and dried with a heat lamp or pet dryer.



"IT'S TIME FOR YOUR MEDICINE" : HOW TO RESTRAIN & MEDICATE YOUR PET BIRD.

By Angela DeVito '86
With thanks to Dr. D. Graham.

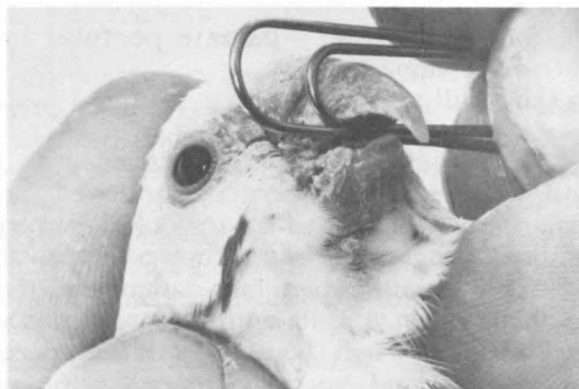
Illness in a pet bird, as with any other household pet may mean that an owner will need to medicate the patient at home. This article will explain a few of the more common methods of medicating birds and how to safely restrain a bird for treatment.

I. RESTRAINT

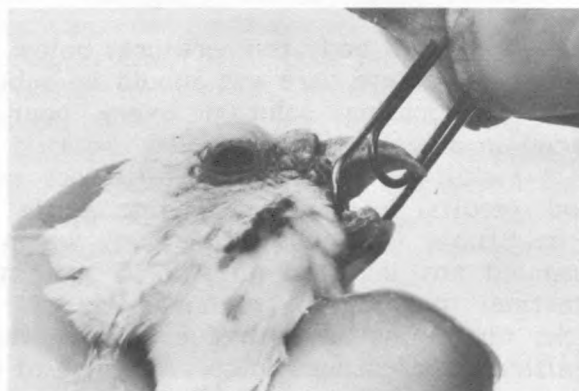
In general, birds must be restrained gently but firmly in such a way as to minimize movement and feather damage while allowing free keel (breastbone) motion. If a bird is accustomed to being handled, capture it in the accustomed way. If, on the other hand, the bird is not used to being captured, get the bird firmly in hand by throwing or draping an appropriately-sized towel over the bird and then securing the head, wings and body through the towel. This is an important concept; it is presumed the bird will associate the unpleasant experience of capture not with its owner's hand, but with the towel and will not learn to fear its human handlers. For small birds such as budgerigars, a handkerchief or other light cloth may be sufficient. Large birds, such as macaws, may need one handler to properly restrain the wings, feet and the head while another person examines or medicates the bird.

Once the bird is in hand, the wings may be held to the body by hand or with the towel. The back of the bird rests diagonally on the palm of the hand with the head and neck gently restrained and slightly extended between the index and middle fingers. The other fingers partially enclose the wings and body but must put **no pressure on the breast**. Some procedures, such as administration of oral medication and feeding by crop tube, require more secure restraint of the bird's head. The head and neck are extended by the thumb and middle fingers (on each side of the neck just below the jaw) while the index finger steadies

The use of the "paper-clip speculum in budgerigars or small psitticines.

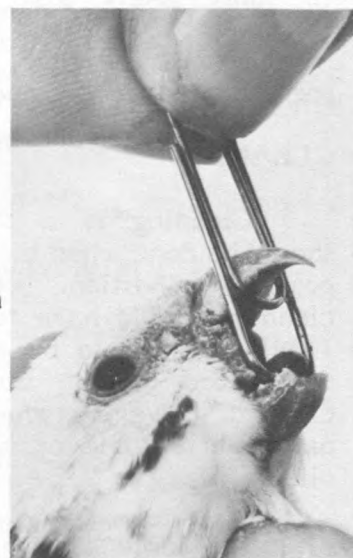


Allow the bird to bite at adjacent wires.



Slide and rotate the paper-clip until the bird's mouth is held open by the separated loops.

Administer medication or gavage.



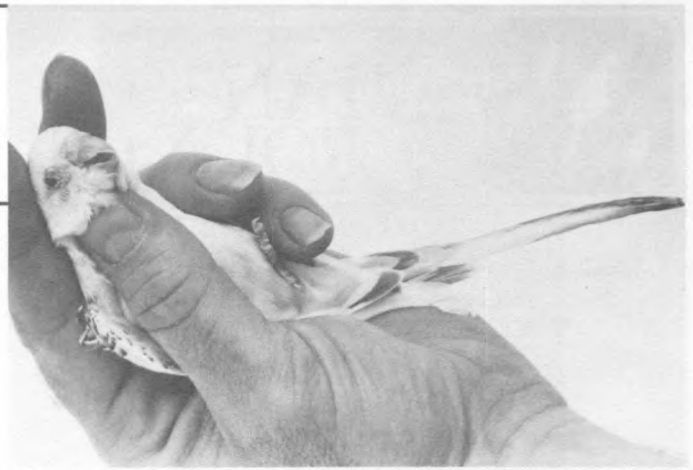
Restraint of small bird.

the head from above. In restraint, it is very important not to close the hand entirely around the body as this prevents outward movement of the bird's sternum. Birds lack a diaphragm and must move their sternum to breathe. Improper body holds may asphyxiate the patient.

II. MEDICATIONS

1. ORAL: Oral medications such as vitamins and antibiotics are most often prescribed in liquid form. These may be added to the drinking water in a proper dilution. Be aware that some pet bird species may not drink water regularly and thus will not receive the benefits of the medication. Alternatively, the liquid may be instilled directly into the lower bill via a plastic medicine dropper or plastic (not glass!) syringe. The latter works especially well for bigger, heavy-beaked birds which may need a larger volume of medication and also may clamp down rather tightly on the delivery vehicle. In small, seed-eating birds and birds the size of a budgerigar, the bill may be held open with a paperclip speculum. With larger psitticines, an appropriately larger and stronger speculum can be fashioned from heavy gauge wire. At all times, avoid being bitten, especially when handling the more powerful psitticines. Remember, a large macaw is strong enough to crack your thumb! Oral liquid medications should be given in small amounts - one or two small drops at a time- to reduce the hazard of accidental inhalation of the medicine. Finally, never place oral medication in the seed cup. When a bird cracks seed, it eats the seed kernel and discards the seed hull along with the medication.

Powdered medications and gruel for anorexic birds may need to be given by gavage (crop, or stomach tube feeding). In this procedure, the delivery vehicle is a syringe outfitted with a flexible rubber or polyethylene tubing. Metal feeding tubes are often sources of injury to the lining of the upper digestive tract when used by inexperienced bird-owners and should be avoided. The appropriate amount of gruel mixture is placed in the syringe and the tube end is introduced into the bird's mouth and into its crop, the distensible portion of esophagus, which serves as a storage place and is present in most pet birds. It is important to



fill the tube with gruel, eliminating dead space or pockets of air. Gavage is a good method for maintenance of debilitated anorexic birds, but extreme care must be taken not to rupture the delicate crop with the end of the tube. It is also important not to overfill the crop. This often leads to regurgitation and inhalation of the gruel, which may result in sudden suffocation or fatal pneumonia. Giving more frequent, small amounts is safer than administering fewer, larger meals. Except under exceptional circumstances, it is best not to attempt this at home, but to leave such care to an experienced bird handler or veterinarian.

2. INJECTABLES: Intramuscular injections are most often given in the breast muscles (pectorals). It is best to stay in the more massive, thicker portion (anterior third) of the pectorals, fairly close to the sternum, to minimize the chances of puncturing major blood vessels. A small gauge needle is used to make a shallow injection at a slight angle to the surface of the muscle. Care should be taken not to hit the bone and cause inflammation. If the needle is too long for the muscle mass (a particular problem in small songbirds) there is also the possibility of penetrating the thin sternum and entering the body cavity. Repeated injections may also cause multiple hematomas. Again, this method of medication is best left in professional hands.

3. OINTMENTS: Ointments are occasionally used in pet bird medicine for treatment of scaly mite infestations and as topical treatment for wounds. The key to successful application is to use as little as possible. If excessive ointment is applied, the bird will spread it throughout the plumage while preening. The result is matted feathers with little or no insulating ability; birds so affected are severely stressed by chilling.

Special handling or treatment problems may crop up with any species, so it is always advisable to consult your veterinarian or a professional aviculturist.



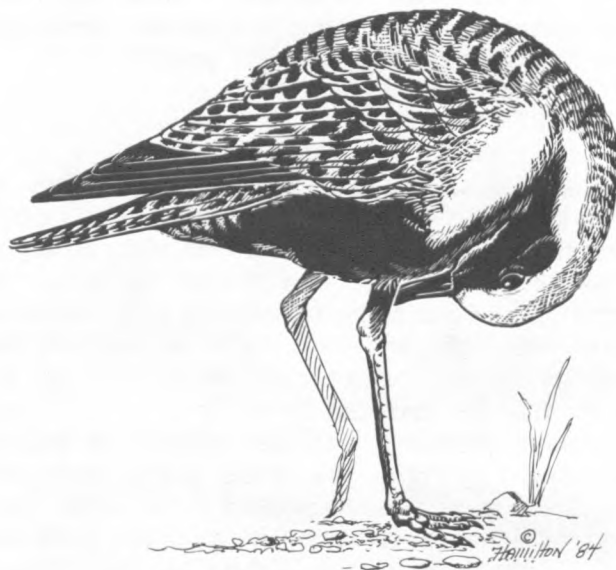
The Case of the Stumbling Plover

By Shelby Riddle '86

Recently a young adult female Blacksmith Plover was presented to the New York State College of Veterinary Medicine with the chief complaint of abnormal head carriage, with the head in pronounced flexion, to the extent that the beak projected caudally below the breast and between the legs. Although this is a recognized behavior posture in this species of the bird, this bird maintained the posture 80% to nearly 100% of the time. She was able to hold her head up normally for infrequent and short periods of time and was able to feed.

This bird had been affected with this condition on and off for over a year and was the parent of 2 juvenile plovers (6 months old) that died with progressive signs, including head tilt and incoordination, in 1983. The brains of the two juveniles were submitted to Cornell and no lesions were found. The diet of the affected plovers consisted of smelt, crickets, mealworms, bird of prey diet and recently had been supplemented with thiamine and other B vitamins and minerals.

On examination of the bird, it was difficult to determine whether her head posture was causing her unbalanced gait, or whether she had a primary bilateral peripheral vestibular lesion. The vestibular nerve, which is involved in maintenance of balance is associated with the middle ear and an ear infection could affect it. There was no discharge from the ears and physical exam showed no apparent abnormalities elsewhere. While her gait was awkward and she walked backward most of the time, she had normal leg strength. She had a good appetite and was bright and alert. An ophthalmologic examination revealed normal pupillary and palpebral reflexes and normal fundi oculi. Radiographs of the skull were normal. Cervical structures were palpably normal, but palpation could not rule out a primary cervical muscle problem or a neuromuscular lesion. After a short period of anorexia, the plover died, and a necropsy was performed.



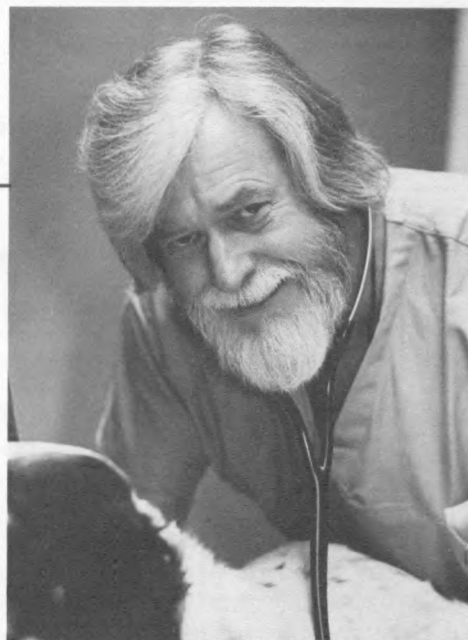
Necropsy revealed pronounced pale tan streaking of most of the major skeletal muscle masses including the cervical epaxial muscles. Histopathologic examination of these lesions revealed degenerative myopathy characterized by hyalin and granular degeneration and necrosis of muscle cells and occasional foci of dystrophic mineralization. These changes are compatible with those in other species caused by hypovitaminosis E.

After these findings, additional inquiries were made concerning the diet of the affected plover in an attempt to support a diagnosis of nutritional myopathy. Due to intermittent episodes of incoordination apparently correlated with smelt in the diet, the bird had been taken off smelt entirely a year previous to presentation. After several months of clinically normal health the plover had another relapse and was sent to Cornell. The bizarre history and presentation of this case, as well as the lack of evidence suggesting either improper handling or storage of the fish or other nutritional inadequacies, tends to remove support for the diagnosis of hypovitaminosis E. The case of the stumbling plover remains unsolved.



HUMMINGBIRD "IN-TRAINING" AT AVIAN CLINIC

It wouldn't be surprising if our youngster went unidentified as a hummingbird. For one thing, our black & white photo doesn't do him justice, giving no indication of his feathers' iridescent colors. It's also fairly unusual to catch a glimpse of a hummingbird at rest, but unfortunately this patient can't fly. Very possibly he's a late summer baby that needs support until he's ready to fly. Certainly, he's in training for the big event. Students caring for him say he spends nearly all of his waking hours flapping his wings and eating. Right now, he's being fed a hummingbird "soup" composed of sugar solution, Gevral (a protein supplement), vitamins and grape juice for color and flavor. Avian clinic personnel are also searching for additional sources of protein to round out his diet.



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"Oiled Waterfowl" continued.

A bird may be judged fully waterproof when water forms discrete beads on its plumage and it can withstand prolonged periods of swimming without getting wet or becoming hypothermic. The downy feathers around the cloaca and inguinal area are often the last to become waterproof and should remain completely dry when swimming before the bird is ready for release.

Other criteria for release include weight gain since captivity, full use of limbs and eyes, preening, feeding, and evidence of alertness and readiness for self defence against threats (including handlers).

Cleaned and waterproofed birds should be released on a relatively undisturbed (and un-

oiled) stretch of coast (or on freshwater depending on the species involved.) Individuals who have been released prematurely will tend to come ashore fairly quickly and can be retrieved for further rehabilitation.

ADDITIONAL READING

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