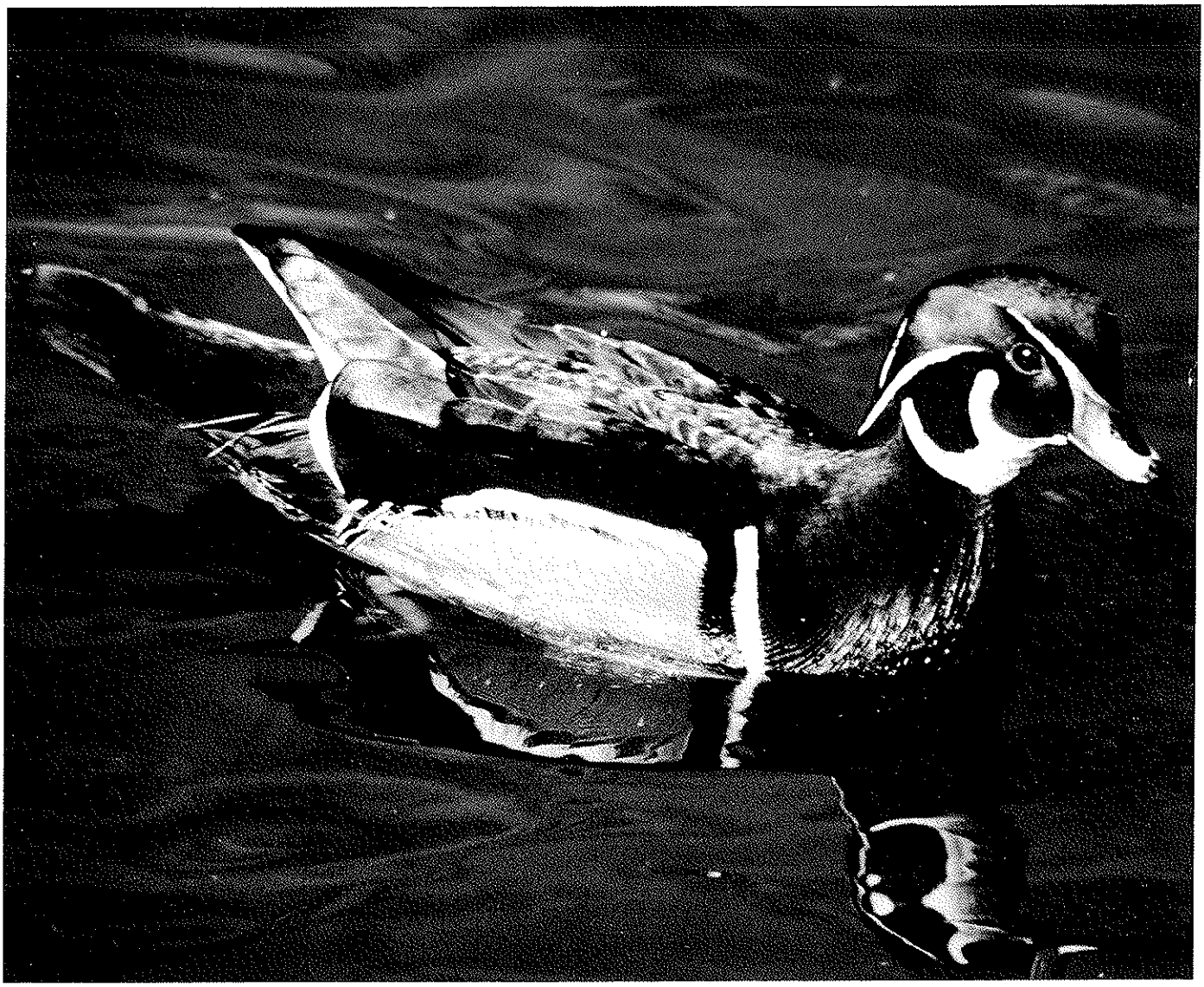
Sample

Summer 1990 Vol. 13, No. 2

WILDLIFE JOURNAL

Journal of the International Wildlife Rehabilitation Council



Raising Orphaned Wood Ducks . . . Page 9

Guidelines for Authors for the *Wildlife Journal*

The *Wildlife Journal* is designed to provide useful information to wildlife rehabilitators and others involved in the care and treatment of native wild species with the purpose of returning them to the wild. All featured articles are subjected to a review process and our staff and reviewers work with authors to produce the most accurate information possible in our ever changing field.

The *Wildlife Journal* has various feature categories. We solicit submissions in the form of feature articles, rehabilitation notes, book reviews, news articles related to major events in the field, and selected case studies. Articles on veterinary medicine as it relates to wildlife rehabilitation are also welcome. We would like to expand the *Wildlife Journal* to include wildlife rehabilitation articles from countries outside the United States and welcome inquiries regarding such articles. We have two short features we use for basic information: "For The New Rehabber" and "Simple Things That Make a Difference". They are intended for basic information or new ideas that are easily demonstrated with a short text and photos. We pay authors a $25 honorarium for each article accepted for publication or provide a one year membership or renewal.

Submission Instructions

1. An original and two copies of the manuscript should be submitted to the Editor, IWRC, 1171 Kellogg St. in Suisun, California. The manuscript should include references, photo legends and footnotes, and should be typewritten and double-spaced if possible. Please put the authors name and address on at least the first page of the article so it can be readily identified.

2. The *Wildlife Journal* is prepared on a Macintosh and if papers are already written and on a disc the author should let us know that at submission what type of hardware and software systems were used.

3. Manuscripts are received with the understanding that they have not been submitted to other publications. It is the authors obligation to obtain permission or reprint rights if the submitted copy has been published elsewhere. All accepted manuscripts are subject to editing. Unused manuscripts will be returned.

4. A separate page should be submitted with a short synopsis of information on the background of the author. Included should be the name, address, rehabilitation organization, and phone number for the author. Where appropriate, please list any academic degrees, or special training that is relevant to the article (i.e., physical therapy—RPT, etc.)

5. Black and white photographs are preferred for use in the *Wildlife Journal*. When no other option is available, color slides and prints can be converted but this is costly and to be avoided when possible. Photo credits should be listed with the photographs.

6. Acknowledgments are limited to people who have contributed to the article in a major way.

7. References should be noted in the text with the last name of the author and the year published (i.e., Leighton, 1983) and listed at the end of the manuscript in alphabetical order in the following style:

LEIGHTON, F.A., Peakall, D.B., and Butler, R.G, 1983. "Heinz-Body Hemolytic Anemia from the Ingestion of Crude Oil: A Primary Toxic Effect in Marine Birds". *Science* 20:871-873.

WILDLIFE JOURNAL

Summer 1990 Vol. 13, No. 2

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Features

Diagnosis and Treatment of "Sick Gull Syndrome"
Ed Shaw, BS
California Center for Wildlife
San Rafael, California 3

"Wet Ball Bandages" Treatment for Overgrown Talons
Paula Lind, BS, Diane Olson, BS, and Patrick Redig, Ph.D
The Raptor Center
St. Paul, Minnesota 5

Simple Things That Make a Difference: Accounting for Gloves
Jan White, DVM
Suisun, California 7

Rehabilitation Notes: Wood Ducks *(Aix sponsa)*
Raine Carson
Highlands Wildlife Rehabilitation Center, Inc.
Milford, New Hampshire 9

Clinician's Corner: Measuring Plasma Total Proteins
Dara Nance
School of Veterinary Medicine, Class of '92
Madison, Wisconsin 13

Departments

Editorial 2
Book Review: Owls 8
Letters to the Editor 17

Cover by Dave Curtis.

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Editorial . . .

Quality Release in Wildlife Rehabilitation Programs

What makes one program better than another? Who is doing good work and who is just getting by? How good is good enough? How do we get everyone to do the "best" job? How do we keep those who don't from hurting the rest of us who keep trying?

I have been consulting for rehabilitation organizations for about 15 years, and have seen a rather cyclic progress when considering the growth of individual programs. When a major player leaves an organization often it slides for a period of time until someone new arrives to carry the program on to new highs. However, when a program disintegrates to new lows, often the animal care suffers, as does the reputation of the organization.

It seems to me that we are a field with little quality control. Some folks think that this is best because it allows for the most individual freedom. As I get older, I question the wisdom of this kind of latitude. Should we be required to maintain a certain level of quality in our programs or close them?

The first step in developing true standards of care is to develop a consensus among wildlife rehabilitators regarding what kinds of behavior, policies, or level of care are acceptable. These ideas must then be considered by all and accepted by most. *If* we policed our own actions, there would be little need for government intervention. Yet, more states are adopting stricter licensing regulations and minimum care standards every year, which tells me they think that more teeth must be put into the field.

It seems to me that one glaring mistake often becomes the stimulus for sweeping policy changes. Last year, when a humane society released non-native red foxes into a national forest—all rehabilitators in California were told they would face new policy on such behavior. The way in which any of us conducts ourself affects all of us. Yet, each group feels free to excel or slide in the quality of such programs. I think we had better start looking at the way in which we operate—when wildlife suffers in our hands, some enforcement staffer will eventually react and then we all pay the price.

A major and often pulic issue is the release of wildlife which is a particular source of frustration in California. It is a state with a huge economy and enough people to be a country. Wildlife is constantly being moved to the edges, much the way the native Americans were in the last century. We have even set aside "wildlife reservations" to try to allow for continued existence of these species. Yet, when wildlife is released in Marin or San Francisco counties, it becomes a political issue with the modern citizens who now inhabit the land.

Most wildlife centers have no urban biologists to guide their release programs. Policies about where animals are released are virtually non-existent —other than don't do it here and don't do it there. Often the first sign of a problem arrives with the game warden at your door—giving you yet a new " don't" to add to the list. They, after all, are the ones who interface with the citizenry on wildlife issues. In California, the Department of Fish & Game has made several aborted forays into the release issue. Usually it is in a crisis mode with media and public emotions at their heels that they arrive. Still, for all of the noise—little constructive work has been done by either side to find sensible and workable solutions. "Don't do it here"—is not a workable solution given the ever expanding habitat of modern man (by the way, the Indians didn't get much in the way of forethought or planning in the policies that roughly translated to "don't do it here" either).

So, what is the answer? Well, we have resources to bring to bear on

Continued on Page 5

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Diagnosis and Treatment of "Sick Gull Syndrome"

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Introduction

In recent years a number of gulls have been presented to various wildlife centers in northern California, including the California Center for Wildlife, exhibiting signs of flaccid paralysis, projectile diarrhea, and dehydration. This illness has been diagnosed as having several causes with nearly identical signs and was therefore labeled "sick gull syndrome." In many instances it is fatal if immediate treatment is not initiated.

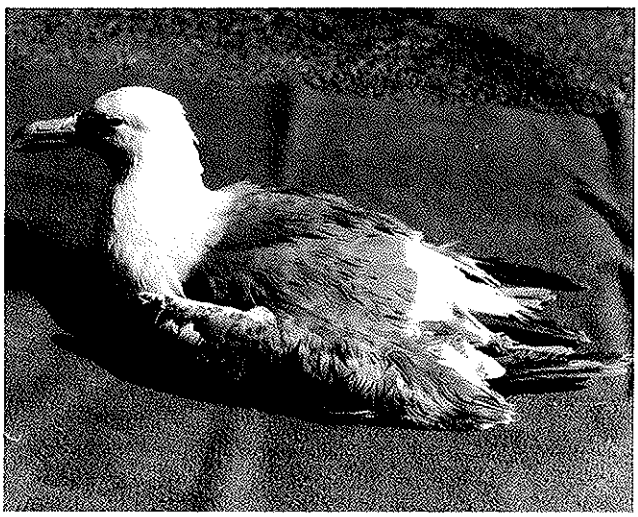
The Causes

It has been discovered that there are several causes—the two most common of which are salmonellosis and avian botulism—which are contracted after the bird has eaten contaminated foods. Other causes may include toxicities (e.g. mercury), trauma (e.g. fractures) and viruses. Historically, the majority of the "sick gull syndrome" patients we have seen have been found in populated beach areas on hot summer days. This may lead one to speculate that garbage left by humans is a major culprit. The problem also seems to be more prevalent during drought years.

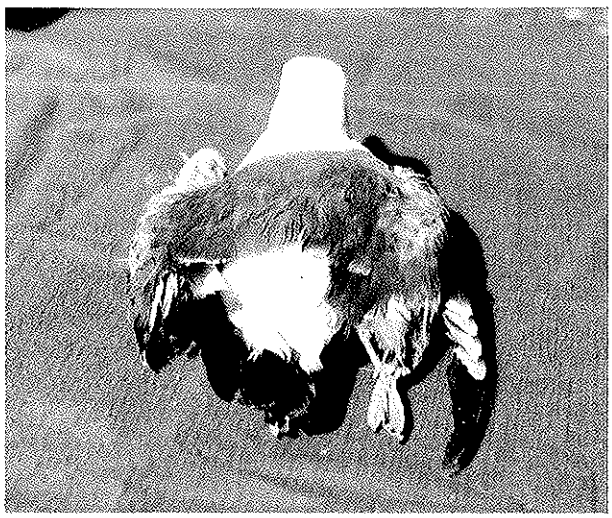
Salmonella

The first of the two causes to be discussed here is the gram negative bacterium, *Salmonella*. It is non-spore forming, and is closely related in morphology and physiology to the family *Enterobacteriaceae*. It is parasitic upon man and animals and usually produces inflammatory reactions in the gastrointestinal tract.

The signs observed in gulls are emaciation, general weakness resembling flaccid paralysis,



Lateral View: Typical presenting signs include wing droop, eyes half open, and inability to bear weight.



View from the rear: Wing droop and legs positioned downward in a paretic gull.

and yellowish-brown diarrhea which is very odorous and projectile in nature. Packed cell volumes (PCV) run from 50-65%, with total solids of 5.0 to 7.0 g/dl — all of which are considered elevated in these birds. The buffy coat as measured as a percentage of PCV is 1-3% (normal is less than 1%). Cloacal temperatures were normal at 104° F.

Isolation of *Salmonella* can usually be done by cloacal swabs, and streaking SS agar or Brilliant green agar plates. Growth will occur in 24 to 48 hours. The colonies are black, round and somewhat shiny. A gram stain of the cloacal swab should reveal many gram negative rods, all with the same morphology. A few gram positive rods will be seen, as these comprise the normal flora for these birds.

Individual tests using Entero Tubes II™ (multimedia tubes) (Roche Diagnostics, Nutly, NJ) to isolate species have been performed, but serotyping has not. The most common species generally identified have been *S. gallinarum* or *S. typhimurium.* The physiological characteristics of these species are as follows:

They produce gas from glucose, fructose, galactose, arabinose, maltose, xylose, mannitol, sorbital, trehalose, and inositol. They do not ferment lactose, sucrose, rabbinose, inulin, salicin, or adonitol, and they do not produce hydrogen sulfide (H_2S) as a by-product, but this has not been the case in older broth cultures. They do not form indol, and do reduce nitrates. *S. typhimurium* is motile, produces an increasingly alkaline reaction in litmus milk, and does not liquefy gelatin. *S. gallinarum* is non-motile, and does not acidify or coagulate litmus milk.

Clostridium botulinium

The other major cause of sick gull syndrome are the toxins produced by botulism. The causative agent is *Clostridium botulinium*, with C and E types being the two most common afflicting the birds. Botulism is the main cause of food poisoning among humans and animals. In wildlife, it is usually seasonal and is most prevalent in late summer, or in drought years when water sources become stagnant. Waterfowl and deer are also affected by botulism, and it has been responsible for large die-offs in the past. (Friend, 1987)

Clostridium botulinium is a gram-positive rod that is a large bacillus, 0.9 to 1.2 µ by 4 µ to 6µ, with rounded ends. It occurs singly or in short chains. Oval spores are usually greater than the cell diameter and are situated terminally. The organism is sluggishly motile by means of 4 to 8 peritrichous flagella.

Clostridium botulinium is a strict anaerobe and will grow on most media. Probably the best medium to use is one that is slightly alkaline. Blood agar enhanced with 0.5% glucose and 0.5% Dibasic Potassium Phosphate (K_2HPO_4) works well. Colonies form on the surface and are small, translucent, grayish white, and irregular. Types C, D, and E have woolly edges and, on blood agar, produce a beta hemolysis.

This organism is found naturally in the soil and can be a natural flora in birds. Therefore, isolation from the intestinal tract can be inconclusive, and diagnosis is made through history and signs of the bird, taking into account general environmental conditions (drought status). The mouse protection test provides a more definitive diagnosis and can be performed by a reference laboratory.

Transmission of this pathogen is by ingestion of contaminated food products and water. The hot temperatures of July and August, coupled with drought conditions, cause stagnation of mud flats. Toxins are produced in the mud, often resulting in affected gulls or other birds.

Signs of botulism toxicity resemble lead poisoning, but in this case large numbers of gulls will present simultaneously. True flaccid paralysis is displayed. The use of leg muscles is lost and there may be no deep pain felt in the lower toes. There is projectile diarrhea that is often green in color, but is non-odorous as compared to that of patients with salmonellosis. Muscular control of the nictitating membrane is lost and the pupils will pulsate spasmodically. Fluid may build up in the neck and lower eyelids. Breathing is depressed and a shallow, irregular heartbeat may be noted. Temperature may be as low as 98° to 100° F. Packed cell volumes run 50-65%, with total solids of 4.5 to 6.0 g/dl, and a minimal buffy coat of less than 1%.

Treatment and Care

Gulls exhibiting signs of salmonellosis and botulism can be treated in almost the same manner. Initially, the bird should be incubated at 85° F until it is responding to treatment. In treating salmonellosis or botulism, IV fluids are beneficial. Take the weight of the bird in grams and multiply by 5%. Then give that number in milliliters (mls) of Lactated Ringers (i.e., a 500 gram bird will receive 25 mls) intravenously and an equal amount subcutaneously. If birds are in shock, dexamethasone can be given at a rate of 1-4 mg/lb of body weight. Oral fluids should be tubed four to five times in the first 24 hours, three times daily for the next three days, and as needed thereafter.

Supplementary tube feedings of a high carbohydrate, high calorie liquid diet can be started on the first day and used until the bird is eating on its own.

In treating cases of salmonellosis, oral trimethoprim/sulfadiazine has been given at a rate of 10 mg/Kg of body weight twice daily for three days. It is *not* generally recommended that antibiotics be used in cases of salmonella poisoning. This is because the strains tend to become resistant and can then present a more difficult challenge to treat whether the disease manifests itself in man or in animals. However, antibiotic treatment of *S. gallinarum* cases appear to have a better recovery rate.

Treatment for botulism is as mentioned above with IV fluids being essential. Do not begin supplemental tube feedings, or introduce solid foods for the first 24 hours. Activated charcoal (Toxiban™) at a rate of 52 mg/Kg body weight has been given to gulls with severe cases of botulism, and was successful four times out of eight.

Birds begin to show some signs of improvement in approximately 48 hours, with marked return of muscular function within four days. In most cases, the birds can be released after a two week recovery period.

Conclusion

For many years birds have been presented in facilities with these signs. While some diagnostic work has been done previously, during the last two years concerted efforts were made at the California Center for Wildlife to characterize the syndrome, identify the source, and treat the affected birds.

While treatment of gulls with sick gull syndrome can be time consuming, it certainly is possible with only a small financial investment. Since these treatments are very similar, birds can be treated based on signs when diagnostics are unavailable.

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Editorial continued . . .

this problem and both sides should begin doing so. We need to bring biological planning into this. Years ago, in my county, we had this issue arise and we gathered a species inventory for the natural areas in our county that we wished to use for releases. We submitted that information along with our request to release species native in that area to the Department, who then reviewed it. It was a primitive attempt to look at what kinds of animals went where and could be expanded to include how many go where. It is information that could be utilized in retrospect to review what it is that your organization is doing to the wild and how the animals are faring.

The California Department of Fish & Game (CDFG) began working on a voluntary basis with San Francisco Bay Area organizations to tag and attempt to gather post-release information on released animals. This could give CDFG and the participating organizations valuable feed-back on the quality of their rehabilitation programs. Telemetry tracking would even be better—if we could afford it. Researchers are still telemetry tracking oil-rehabilitated Brown Pelicans from the Huntington Beach spill to follow their long term survivability, which at this time appears good.

But, having worked with so many organizations and seeing these large quality cycles their programs go through, I also worry about what the results of such efforts could lead regulatory agencies to do. We know that some groups have release programs that more resemble illegal toxic dump

Continued on page 8

"Wet Ball Bandages" Treatment for Overgrown Talons in Raptors

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The Raptor Center
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Introduction

Chronic overgrown talons in raptors can lead to serious foot problems if left untreated. A review of raptor foot problems and their care was recently published (Degernes et al, 1990). Educational birds housed inside or long-term convalescing rehabilitation birds are obviously more prone to this condition. They are often observed to grow a longer and thicker talon over time that, if left untended, can lead to more serious foot problems. This article describes a current method for managing foot cases involving overgrown talons in raptors.

Application of "Wet Ball Bandages"

Applying wet ball bandages is exactly the same as applying regular ball bandages except that all the gauze bandaging material is applied wet. The area beneath the foot pad is filled with 2" x 2" wetted gauze pads. To retain the moisture, the wet material is covered with dry 2" Vetrap™ (3M Animal Care Products, St. Paul, MN) followed by a layer of 2" nonporous white tape.

Depending upon the degree of the problem, the bandages are left on for 24-48 hours. During this time, the bird should be housed in a cage with a padded floor. The perch and water pan should be removed from the cage and any food offered to the bird should be cut into bite-sized pieces.

After removing the bandages, the cutting edge of a pair of scissors can be used for the trimming process. Minimal effort is needed to trim the talons, the overgrown and thickened area of the talon will easily slough off exposing the appropriately thinner shaped talon underneath. Since this procedure leaves the talons dagger sharp, it is highly recommended as a part of the pre-release protocol for long term convalescent raptors. However, in educational birds, it is advisable to blunt the ends of the talons.

Conclusion

This procedure has been used successfully by the author in about twenty raptor cases. It should be considered for routine use as a part of the pre-release procedure for birds that have been in captive care for four months or longer or for captive birds. In either case, this procedure can assist the wildlife rehabilitator in preventing foot problems.

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Simple Things That Make a Difference:

Accounting for Gloves

Jan White, DVM
IWRC
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Introduction

Anyone who has worked in a centralized wildlife care facility knows just how hard it is to keep track of restraint equipment. It seems that this type of safety equipment always is noticed as missing just as it is really needed. The results are not always pretty! In the case of gloves, it has been my experience as a right-handed person that the right glove is often missing and two left gloves simply don't work!

Traditionally, gloves are stored in drawers in a pile. Using this system, right-handed gloves are often discovered missing only when it is most inopportune to have to search for them.

A Simple Solution for an Old Nagging Problem

While visiting the Nature Conservancy in Naples, Florida in 1989, I noticed they had a system that made it obvious what gloves were available for use. It was so simple, I probably would *never* have thought of it myself!

They use hanging clothespins to pin together a right and left glove and then hang them in full view so that missing items become obvious—unlike the pile in the drawer. (See photograph.) Additionally, other restraint items, such as the goggles shown, can also be stored in the same manner.

Conclusion

From a supervisory point of view, this system has numerous advantages. The staff/volunteers can readily see where the restraint equipment is located and what is currently available. When an item comes up missing, it is likely to be noticed immediately and a search for it has a better chance of being successful—unlike a search launched weeks later.

Using this system, an item is more likely to be noticed as missing between uses—rather than at that critical moment when it is needed. Finally, while theft is not always a problem, I have found that putting things in obvious places where they will be easily missed has reduced the number of times a replacement item has had to be purchased.



A hanging system used in accounting for gloves.

Book Review

A Place for Owls
Katherine McKeever
Key Porter Books Ltd.
2775 Matheson Blvd. E.
Missauga, Ontario
Canada L4W4P7
Price $6.95, 95 pgs.

A Place for Owls is an entertaining and educational book about owls for "kids" from six to sixty. Canadian author Kay McKeever is a pioneer in wildlife rehabilitation. Kay has devoted the past twenty five years of her life to owls and helping them have a place, which is rightfully theirs. The goal that is always paramount is returning them to freedom and to their place in the wilderness.

This timely book, in it's second printing, gives the reader insight into the perils of wildlife survival imposed upon them by humans as well as nature. It also impresses upon the lay person the difficulty of proper, responsible, and successful rehabilitation of wild creatures. It further stresses the effects of human imprinting.

What makes this book so wonderful is Kay's wit and charming storytelling ability. With the dignity they deserve, Kay gives uniqueness, character and "personality" to each owl, whose story she shares. *A Place for Owls* is not only entertaining and educational, it is heartwarming. Hopefully, it will touch enough little hearts so as to inspire them to try to better understand our wildlife planetary partners, so that they may become the best stewards our planet has every known.

Also from the McKeever household is" *A Dowry of Owls*, a book written by Kay's husband Larry McKeever. This is a splendid book for the friends, family, and spouses of wildlife rehabilitators. They will surely relate to the humorous tales Larry tells about the adventures and misadventures of living with a wildlife rehabilitator.

The McKeevers are the founders of ORRF - The Owl Rehabilitation Research Foundation. *A Dowry of Owls* is available from ORRF directly for about $12.00. The address is: R.R. 1, Vineland Station, Ontario, Canada L0R2E0.

-P.A.S. Drum
Camarillo, CA

Editorial continued . . .

runs than true wildlife rehabilitation programs. I call it the "dump and run" brand of releases—where little or no planning or evaluation is done, and animals, no matter the species, age, or wildness, are simply plucked from inside cages, placed in cars, and put out along roads willy nilly. Occasionally, these animals show up in the newspapers after having gotten into trouble. This has the potential for a great disaster.

This problem is "out of the closet" and we have a choice to make at this point. We either get working with department staff as a team to openly explore the problem and try to find workable answers or we continue to be part of the problem. The choice is ours to make. We know from experience that what we do in California often ultimately seeps out to other states—so we had better make it good.

We are past the day when release statistics alone will not define quality in a given program. Just as airlines are now rated on the percentage of "on-time arrivals", we may someday be judged on the quality of the released animals that we rehabilitate. We'd better plan now to move to the next level of quality care—or we may find the "don't list" expanded to include species of native animals instead of areas for no release.

--Jan White, DVM

Rehabilitation Notes:

Wood Ducks *(Aix sponsa)*

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Introduction

The species name of the Wood Duck, *sponsa*, is the Latin for "bride" or "the promised one," and stems from the exquisite beauty of the male in adult plumage. This medium-sized freshwater dabbling duck is considered by many to be the most gorgeous of all North American ducks, if you are lucky enough to see one in the wild, that is! Extremely secretive in its habits, it is highly nervous and quick to flush. These facts play a vital role in handling this species in captivity.

Wood ducks summer from southern Canada to Texas, from the Atlantic to the Pacific Oceans. It is migratory in the northern limits of its breeding range. Its flight is swift and direct, and it is capable of weaving its way through tree tops with remarkable ease. In the water, it is agile and an excellent diver. A pert and dapper creature, it sits high on the water, tail angled upwards. On land it runs and walks easily, head held high, and frequently perches in trees.

Wood ducks are difficult to raise in captivity because of their extremely nervous disposition, but by following a few simple rules which respect this facet of their nature, they can be raised without problems.

Adult Description

The adult Wood Duck is about 17-20 inches long with a wing span of 28-30 inches, and a body weight of about 1 1/2 lbs. The male has a dark iridescent head with a backward-facing crest, lined in white. A white necklace encircles the neck with a white stripe leading towards the orange-red eye. The breast and neck are a rich tawny brown, easing into creamy underparts. The back is dark and iridescent; the wings are dark, and the tail is square. The bill has a variegated pattern of black, white, red, and yellow. In eclipse plumage, the male resembles the female but has a bright bill and no white eye ring.

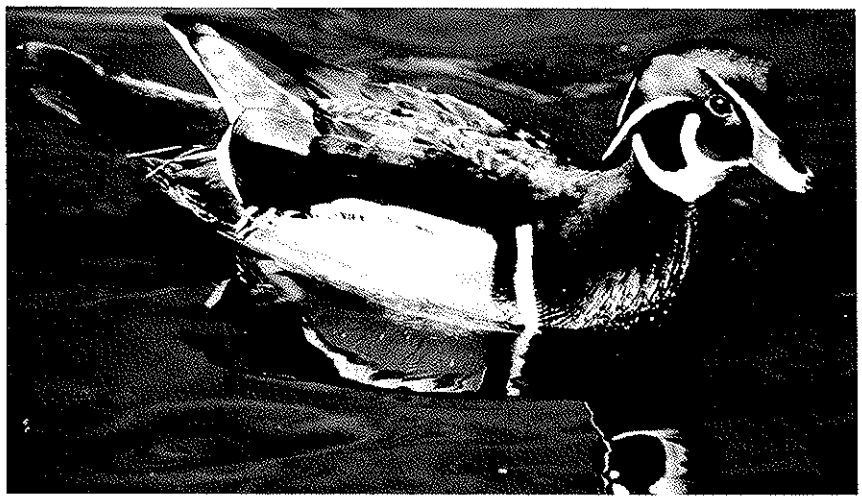
The female has a grayish head and crest, brown eyes surrounded by a white ring, and a black bill. Her throat is white; the back, breast and flanks are brownish, and the underparts are streaked cream and tawny brown. She is slightly smaller that the male.

Natural Diet

The Wood Duck's natural diet is 90% plant life. This includes aquatic plants, pondweeds, grasses, seeds and tubers of sedges, as well as waterlily seeds. The birds have a particular affinity for duckweed. They will wander far into wooded areas in search of acorns, beechnuts, and hickory nuts. Fruits eaten include wild berries and grapes and they will sometimes eat corn. The balance of the diet is made up of aquatic insects, small minnows, frogs, earthworms, dragonflies, crickets, grasshoppers, moths, spiders, bees and wasps.

Nesting, Egg Laying, and Incubation

Wood Ducks are cavity nesters, though they do not build the cavity themselves. Use is made of holes and cavities in trees, abandoned nests of Pileated Woodpeckers, Common Flickers, and even squirrels. To their det-



riment, uncapped chimneys are sometimes investigated as possible nesting sites. Man made nest boxes are very acceptable. Nest sites range from 5-50 feet above the ground and up to a mile from water. The cavity is never modified and if nesting materials are present, the female simply adds her own down to them.

The average clutch has 9-12 eggs, the eggs being 51.1 mm x 38.8 mm. Incubation, by the female only, runs 27-33 days. The male protects the nest site and assists in raising the young once they leave the nest. The cavity can be quite deep, and the hatchlings are equipped with sharp claws used to climb out of the nest when about 24 hours old. The female encourages the hatchlings to leave the cavity by calling to them from the ground below. The young launch themselves into the air and using highly inadequate, tiny wings, flutter to the ground, from where they are led to the nearest water. There a accounts of the female carrying the young from the nest to the ground on her back. The female then flies to the water where she hoists herself into a vertical position leaving the hatchlings to drop off into the water. The ducklings fly when about 63 days old.

Territory and Courtship

In a habitat of open woodlands around forested lakes, swamps, marshes, ponds, and streams, many birds court and pair in fall and winter. Courtship is simple ritual, with the male swimming before the female, head held high. He then bows to her, displaying his crest. She responds by swimming up to him and caressing his feathers with her bill. The pair separate from the small flock and, with the "conjugal compact" sealed, fly off in search of a nesting cavity. Courtship takes place completely in the water.

At the end of the nesting season, Wood Ducks form family groups, and are seldom in the company of other ducks. At sunset these small groups gather in ponds in numbers of up to 200 or more where they spend the night. Sunrise finds the small groups again breaking away from the flock for the daylight hours.

Duckling Development

The ducklings are small, about half the size of Mallards and Black Ducks. The down is also darker above and paler below. The head is dark on top. The sides of the head are creamy with a dark stripe extending from the eye to the dark down at the back of the neck. The bill is dark with a pinkish tip to the upper mandible. There is a creamy patch of down on either side of the dark back close to the tail.

The feet are dark with a thin, whitish mottled line along the phalanges. The underparts are creamy colored. Dark plumage appears first on the scapulars and flanks, progressing to the tail, breast, and belly, the latter two areas being a mottled tawny brown. Down will still be visible on the back of the neck and rump when the duckling is almost fully grown. Once fully feathered, the wings exhibit iridescent coloring in the secondaries. A fully feathered young duckling has the white throat markings of the male adult, but shows a white eye ring around dark eyes.

Captive Diet

A diet of non-medicated Game Starter™ crumbles forms the staple diet in captivity. This is offered in dry form as well as in a soupy mix, though the dry crumbles are preferred. The method of offering the food is as follows: the cage floor is covered in white paper towels and crumbles are scattered on this. Additional items provided and scattered are pieces of peeled grapes, blueberries, raspberries, strawberries, soybeans and honeysuckle berries. The pieces must be small for very young ducklings. Crumbled hard-boiled egg yolk, broken-up softened currants or raisins, andfinely grated lettuce and carrots are offered. A shallow pan of crumbles and vegetables as a soupy mix is provided. A second shallow pan of clean water is made available. (Placing pea gravel in the water bowl keeps the ducklings dry when they fall into it yet allows them to drink). Drowned small mealworms are placed on the cage floor. Live food such as tubiflex worms can be offered as well.

Once the ducklings begin to develop feathers, finely grated walnuts, horse chestnuts and acorns are offered. As the ducklings develop in size, larger pieces of the above foods are provided. The mealworms are then offered live. Any of the "bugs" forming the natural diet are given when possible. The game crumbles have a scattering of Vionate™, calcium, and Vitamin B_1 added until the ducklings are feathered.

When the ducklings are moved outdoors, the crumbles are provided in a pan. Earthworms are also given at this time.

Housing

There are two keys to successfully raising highly strung Wood Ducks - one for raising a group of ducklings and one for raising a single duckling.

Whether you are raising a group of Wood Ducklings or a single, they are jumpers. Most likely as soon as they are placed in a cage, and they will spend up to an entire day jumping up the wiring of the cage walls. The author has not had this problem with a group; perhaps it is because they have company and the activities of siblings to watch. The singly raised duckling is more prone to these jumping activities, however it has been my experience that if the single duckling is "cuddled" as described below, the jumping decreases, and at worst

does not last more than a day. No detrimental effects upon the duckling(s) have been found from these activities.

Raising a Group

Leave them alone. They do not need frequent attention. They need quiet, quiet, quiet.

In advance, prepare caging thus: for up to 10 ducklings, a 4 foot x 6 foot indoor cage is used, covered in 1/2 inch hardware cloth. The hardware cloth floor is slightly raised to allow spilled water to sink below. The floor is lined with newspapers and areas are covered in paper towels on which foods are scattered. A water pan suitable in size for the number of ducklings is placed on the floor. Broad wooden planks are provided as dry areas for resting. These will be well used. An essential ingredient of caging is a nest box complete with a feather duster to simulate the mother duck. (See drawing.) Use only undyed natural feather dusters, and wash in soap and warm water and dry before use. A heating pad on low is placed on the nest box floor, covered with soft flannel cloth.

The caging must be located in a room which requires no other use and is quiet. In order to reduce stress, the side of the cage facing the door to the room is covered with a material shield. A peep hole, one-eye-size, is cut in this shield. The final essential ingredient of the caging is evergreen branches, attached to the cage walls in such a manner as to provide hiding places for the tiny ducklings. Only when everything needed is in place, and the heating pad is warm, are the ducklings put into the cage, at which point each duckling is placed into the nest box. Immediately after they are all in the cage, lower the material shield, and depart quietly. Resist the temptation to check on them for at least two hours, then enter quietly and look through the peep hole. If all is well, leave immediately in silence. Gradually lengthen the time between checks throughout the first day. After that, the cage is visited only twice daily, and only to clean it out and replace food stuffs.

To clean out the cage, proceed as follows. Assemble everything needed and place silently within reach. Speaking in a soft reassuring voice, remove the material shield and open the cage door, being prepared to meet with wild panic and attempts to escape. With luck, the ducklings will dive into the nest box, but if not, you will have to hussle them into it as best and as quickly as you can, using the door of the nest box to prevent escape of those already in the box. As soon as all the ducklings are in the nest box, secure the door shut and remove the entire box. Cover with a dark cloth. Quickly clean out the cage, putting in all food, water, etc., and a complete new nest box. Place the nest box containing the ducklings into the cage, open the door and allow them to exit on their own. Depart immediately and quietly.

By three weeks of age, ducklings raised in a group are moved to an outdoor cage where they remain from then on. Choose a spell of warm weather because it will be too traumatic for the ducklings to catch them and bring them back indoors should bad weather occur.

The outdoor aviary, like the indoor cage, must be prepared in advance. Again provide copious amounts of evergreen branches and shrubbery to create lots of hiding places. A kiddie wading pool is now provided for swimming. Create a set of steps using logs beside the pool to allow easy access. Make sure the pool is filled to the rim and place a rock in it, close to the log steps to further aid in exiting. Place the pool in the aviary in such a location that the pool can be changed when needed, and in as short a time span as possible. Provide a clean nest box with a feather duster but no heating pad. This nest box can be removed when no longer used. With the ducklings secure in the indoor nest box, transport them to the aviary. Open the nest box door, and leave the aviary immediately, allowing the ducklings to settle down. The location of this aviary should be as far from other activities as possible. Food stuffs are replaced twice daily, allowing the ducklings time to hide before entering the aviary. The pool is changed when needed in the same manner - quickly and quietly.

Raising a Single Wood Duckling

The method used in this case is going to raise eyebrows and generate cries of imprinting! This method has been used by the author many times and post-release data (e.g. sightings from the following springtime,) attest to the fact that these single ducklings have not imprinted, have "gone wild" almost immediately, and will not tolerate even the handlers presence on the day following release.

To house the single duckling, a cage is set up in exactly the same manner as for a group, only a smaller cage can be used. The material shield is omitted. After an initial examination, the duckling is cupped in warm hands, spoken to softly and literally cuddled for a few minutes. They are escape artists, so this process is conducted sitting on the floor to avoid injury from a possible fall. The duckling is then placed in the nest box (one without a door can now be used, and a small cardboard box is fine). Leave the duckling alone for an hour to explore the new surroundings and start eating. After one hour, the duckling is again cuddled as above, even though it will initially resist the attempts to catch it. Once in hand it will enjoy the attention. If the duckling has not yet eaten (the author has never

had this problem), upon returning it to the cage, pick up some of the scattered foods and dribble them from your fingers. They will bounce, attract attention, and the duckling will respond by pecking at the foods. For added comfort for a single duckling, a small stuffed toy is provided in the nest box.

The cuddling process continues hourly throughout the first full day. Thereafter it is performed less frequently but should continue for several days. With less cuddling, it is essential to give attention often by simply stopping by and talking to the duckling for a few moments on a regular basis. Periods of attention are maintained throughout the time the duckling is in captivity. Because the cage is relatively small, it is placed outdoors for sunlight as much as possible. To clean the cage, simply put the duckling in a holding cage.

By the time the duckling is about 10 to 14 days old, it can be put into a large outdoor aviary with swimming facilities commensurate with its size. A child's rubber duck is provided for companionship in the pool. Even though the aviary has an enclosed weatherproof corner, for the first week in the aviary, bring the duckling indoors at night. After that, if it is to be a warm summer night, leave it outdoors. Do not forget to provide the nest box when outdoors. Until the single duckling develops a reasonable amount of waterproofing, it should be brought indoors during inclement weather. It will be very accepting of this added attention.

With continual attention, the duckling will remain "friendly," but with increasing age it will establish a longer and longer distance between the handler and itself. Respect this development. A single duckling is released in the same manner as a group.

If other species of ducklings are in-house when a single wood duckling is being raised, it is possible to raise them together. Introduction is done by taking one of another species as close as possible in size and putting it with the wood duckling. If all goes well, more can be gradually introduced, but a careful watch must be maintained to prevent the wood duckling from being harassed by the other inevitably larger ducklings. Separate if there is any sign of incompatibility, and try again later. When all else fails, raise the wood duckling alone. Its housing, however, can be close to that of other ducklings as this provides a measure of companionship. Raising within sight and ear-shot of Canada goslings seems to serve the same purpose.

Release

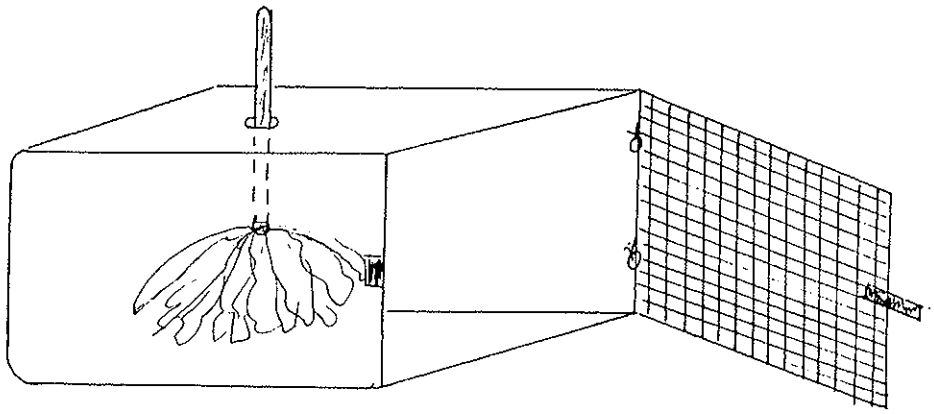
When the ducklings are about 70 to 75 days old, they are released. You may not have seen them fly while in captivity. The transport caging to the release site is a cardboard box for a group and a small cage for a single. Use a box large enough to contain all the ducklings from a group, rather than separate them into two or more boxes. Familiarity with the release site is essential because the entire release process, particularly with a group of ducklings, must be done as quickly as can be. A pond with a marshy area and adequate low vegetation around its banks is ideal. It should be far from human habitation and have a good wooded area surrounding it.

Place the box at the ponds edge, open it from behind , propping the box flap to keep it open. Step far back, sit silently, and wait. If it is a single duckling, a few words of encouragement are in order. When they are ready, the ducklings will leave the box and literally melt into the surroundings. You are likely never to see them again. A single duckling may swim before you for a short while before disappearing, and return visits to the release site may well provide a glimpse of this exquisite animal, but take your binoculars. Tolerance of human proximity fades the moment it finds itself in its natural environment.

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Nest Box For Group Raising

A rectangular plastic wastebasket is used on its side. Part of the original base is removed and 1/2" hardware cloth is attached with tape to fill the gap and provide an airflow. A hole is punched in the top of the basket through which the feather duster handle is pushed. A piece of hardware cloth serves as a door and is attached with string to the basket by punching holes in the plastic. Velcro™ is glued to the side of the basket with the opposing Velcro™ attached as a handle to the door to create a secure closure for removing the ducklings from the cage.

Clinician's Corner: Measuring Plasma Total Proteins

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Introduction

Measuring plasma total proteins for wild animals in wildlife rehabilitation centers has proven to yield valuable status information. It is a simple test to perform and is helpful in assessing animals when they arrive, monitoring their progress as they recover, and evaluating them for release back into the wild. It has also been used by researchers and rehabilitators to unravel the effects of certain crude oils on seabirds contaminated in oil spills (Fry, 1987).

Performing and Interpreting Normal Tests

Blood can be taken from various veins of wild birds including the metatarsal (or caudal tibial), cutaneous ulnar vein (or brachial vein), or jugular vein, using a 25 gauge needle. Using the jugular or metatarsal vein for collection will save the wing veins for emergency therapy such as fluid administration and antibiotic therapy. In a small bird, an alcohol cleaned toe nail may be clipped short enough to cause bleeding and the blood may be collected directly into a hematocrit tube. This is slightly painful for the bird, however, and should be used only when another vein cannot be accessed. Hematocrit tubes used generally contain an anticoagulant such as heparin or EDTA.

In mammals, blood can be obtained from the cephalic vein in the foreleg, the saphenous vein in the hind limb, or the jugular vein. Although other sites can be used when necessary, these are the more common sites utilized.

Fresh blood is placed into a capillary tube and one end is sealed with clay. When sealing the tube, place one finger over the other end to help prevent the blood from going into the clay instead of the clay into the tube. Seal the end opposite to where the blood entered the tube (where no blood has passed). This will allow a seal that will generally be very secure with no loss of sample. Place the tube into a hematocrit centrifuge with the clayed end to the outer edge and spin for 5 minutes at 10,000 RPM or 2 minutes at 16,000 RPM. Times will vary with equipment. This will separate the blood into the components of packed red cells, white cells, and plasma, as demonstrated below. In animals recuperating from blood loss, or other anemias, an additional layer of reticulocytes, or slightly immature red cells may be differentiated. The change in this layer is barely discernible, whereas the bands shown below are very distinct and dramatic.

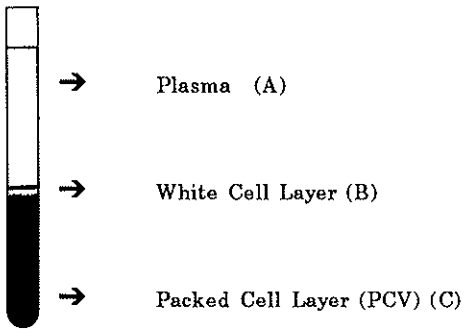


Illustration of PCV fractions (Figure 1)

The separated fractions will appear as shown in Figure 1. The packed cell volume (PCV) or hematocrit is the measurement of the red blood cell layer divided by the total volume (this will be to the top of the plasma layer, labeled A) multiplied by 100% to yield the PCV. For most species of birds this should be about 40-50% (generally the lower range is found in large birds over 450 g and the higher range for birds under 150 g). A PCV lower

than 35% indicates anemia and over 55% may indicate dehydration or excess globulins (see below). Remember, if the values are elevated due to dehydration, a low PCV will likely fall even lower once the bird is rehydrated and a second sample should be taken in 24-36 hours.

Note the color of the plasma once spun down. It may be clear, white, red, or various shades of yellow. Animals who have just eaten fatty meals may have white-appearing plasma which is termed lipemic (named for the lipids or fats in it). Lipemia is seen in some disease states as well, and should be noted. Birds that eat pigment (grain eaters or those eating day-old chicks) will normally have a yellow shade to their plasma. Some species of mammals, such as horses, also demonstrate yellowish plasma because of the high levels of plant pigments, as caretenoids, in their diets. In most mammals, yellow plasma is abnormal and should be reported. This can be indicative of liver problems.

If the red cells lyse when taking or processing the sample, the plasma will have a reddish tint to it from the red blood cells breaking apart (hemolysis). Hemolysis or lipemic samples will give false high values for the protein reading due to the higher refractive index of the lipids and the added protein (hemoglobin) content of the lysed red blood cells.

Once the PCV is read, take a triangular metal file, scribe the capillary tube between the white blood cell layer and the plasma layer, very close to the white cell layer (labeled B). Break at the scribe mark. Place the portion of the tube with plasma onto the refractometer reading surface and gently blow the liquid on to the surface and close the lid. Some refractometers have temperature adjustments to control for ambient conditions which will affect the reading. In that case, read the temperature gauge on the side and dial the top to match the ambient room temperature. Point the refractometer towards a light and look into it. Inside there is a scale labeled in the units g/dl (usually on the left side). Look for a sharp line of demarcation between the two intensities observed (usually clear and blue) and read the scale at that line.

Perhaps the most noted difference between animals in plasma protein levels is the range of avian species compared to mammalian species. Normal bird plasma total proteins (total solids), as read on a refractometer, are between 3-6 g/dl depending on size, species, and season of the year. Large birds such as swans or White pelicans will have plasma total solids between 6-8 g/dl. Brown pelicans have been observed to vary in their normal readings by season, age, and captive status (Wolf, 1984). Birds undergoing complete moults may have reduced PCV's and plasma proteins due to the stress of producing a large number of feathers at one time. When laying eggs, some species such as the Brown pelican may have elevated plasma proteins. This is from estrogen-induced increases in the globulin fraction. Egg yolk proteins such as vitellogenin and lipoproteins are produced in the liver and transported to the ovary and the egg via the blood stream. Most mammalian species' total proteins range between 5 and 8 g/dl, depending upon variables such as age of the animal, health status, species, and diet.

If a laboratory is doing your readings, be sure to check with them to see which method of determining plasma proteins is used. If they are using the biuret method, rather than the refractometric method, the values will be a little lower. This is because substances present in the plasma, such as glucose, contribute to the refractive index of the plasma, slightly elevating the values. In species of active birds who normally maintain a high plasma glucose, this can mean a difference of one or two g/dl. It has been suggested by some investigators that only the biuret method should be used for total protein determination in these species. This is a titration method, however, requiring more sophisticated equipment than wildlife centers have. If one remembers that high glucose levels are observed in birds who fly for a living, one may note this with the reported values. Thus, diabetic animals will also demonstrate elevated values. The blood glucose values should be considered when evaluating the total plasma protein values.

Plasma proteins tend to increase with age as well, being low at birth and increasing until the growth rate has leveled off. Since different species and ages of animals have different diets, nutritional status will have a direct bearing on plasma proteins. In general, animals on a low protein diet will show reduced proteins in their plasma protein concentrations. The ability to breakdown and utilize nutrients is of utmost importance.

Types of Plasma Proteins

There are three major types of proteins in the plasma; albumin, globulins and fibrinogen. Figure 2 illustrates typical amounts of these proteins in a waterfowl specimen on an optical density tracing of an electrophoretogram (electrophoresis is used to separate the protein components for analysis).

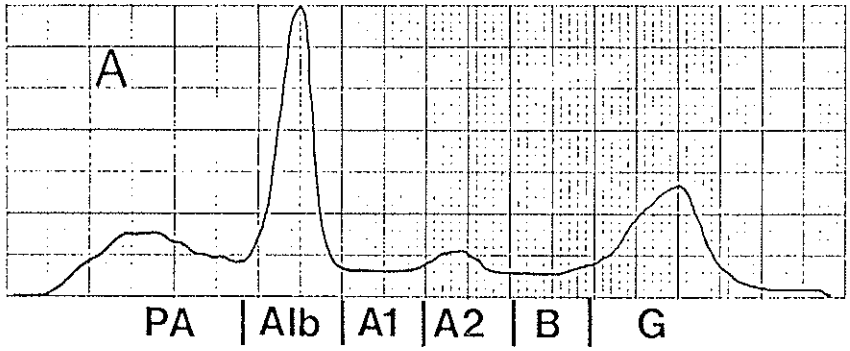


Illustration of Electrophoretogram

Prealbumin (PA): Synthesized in the liver, prealbumin belongs to the albumin type, and functions as a transport protein for thyroid hormones (both T3 and T4) and for retinal (Vitamin A), transporting it from the liver.

Albumin (Alb): Of all the plasma proteins, albumin is present in the highest concentrations. It functions as a transport protein, binding to and carrying free fatty acids, histamine, bile acids, cations, anions, hematin, ketosteroids, prophyrins, and many types of drugs such as penicillin, aspirin, and barbiturates. The liver is responsible for albumin synthesis, nearly all the fibrinogen, and about 75% of the globulins produced. (About 25% of the globulins are formed by the reticuloendothelial cells and lymphoid tissues. These are mainly the gamma globulins or immunoglobulin portion.) So, most of our plasma proteins are made in the liver.

One of the most important roles of albumin is the maintenance of colloidial osmotic pressure (COP). For example, in the healthy animal, the rates of diffusion of substances between the interstitial spaces and the capillaries should be equal. The flow in should equal the flow out. If a condition causes the fluid to leak out of the circulation and into the interstitial spaces, osmotic pressure created by the presence of proteins in the plasma is the force which causes the fluid to leave the interstitial spaces and seep back into the capillaries. As capillary pressure forces fluid out, COP pulls it back in. In most animals, albumin exerts about 75% of the COP while fibrinogen and the globulins comprise the remaining 25%.

Alpha Globulin 1 (A1): This region contains several transport proteins such as lipoprotein for the transport of lipids, fats, fat soluble vitamins, and hormones, transcortin for the transport of cortisol, thyroxin binding protein which also transports thyroxin, and cholinesterase for the breakdown of acetylcholine. Ceruloplasmin, an acute phase protein, is seen in acute inflammatory reactions, parasitic infections, and bacterial or viral infections in elevated concentrations in the plasma. Under normal conditions, small amounts transport 90% of the copper in the plasma to the liver and other tissues. Haptoglobin is a glycoprotein which binds free hemoglobin in the plasma.

Alpha Globulin 2 (A2): In this section are more lipoproteins, a macroglobulin which binds insulin and erythropoietin, a factor which promotes the production of red blood cells.

Beta Globulin (B): Another lipoprotein is found in this region as well as transferrin, an iron transport protein. Fibrinogen, which functions in clotting, in wound repair, and in localizing lesions by the formation of a fibrin wall around them, is found in this electrophoretic region as well. This is another "VIP" or very important protein. Hemopexin, a glycoprotein that binds hematin, is also found in this region.

Gamma Globulins (G): Last, are the immunoglobulins. In this area of the strip are found IgG, IgA, IgM, IgD, and IgE antibodies. These comprise a major portion of humoral immunity in animals, necessary for defense against disease.

In the healthy animal, there is a balance between anabolism (synthesis) and catabolism (breaking down) of proteins. The plasma proteins reflect this balance. Cellular proteins can be synthesized from plasma amino acids at a rapid rate and can be broken down and returned to the plasma. In fact, when plasma proteins are low, the body begins degrading intracellular proteins and returning the amino acids to the plasma. Hormones help regulate this balance. Adrenocortical glucocorticoids will cause an increase in circulating plasma amino acids, while somatotropin (growth hormone) causes a decrease in plasma proteins but an increase in tissue proteins.

Interpretation in Disease or Illness

One of the major reasons wildlife rehabilitators check plasma proteins is to assess the hydration status of the animal. In a condition of dehydration, often one will see increased plasma proteins. Here, the value of the packed cell volume

must be considered as well. Hyperproteinemia with an elevated PCV is suggestive of dehydration. Optimally, the albumin/globulin ratio would be run, but most centers do not have the facilities to do this. So caution, common sense, and clinical signs must be used to assist in the interpretation.

Hyperproteinemia (elevated proteins in the plasma) can be caused by hypergammaglobulinemia (increased immunoglobulins). Here checking the differential white count may assist in the interpretation. An increased number of plasma cells may be observed when the animal is producing large amounts of antibodies. This is sometimes accompanied by an increased proportion of lymphocytes in the white cell count.

Hypoproteinemia (decreased proteins in the plasma) can be seen in animals that are in a state of starvation or malnutrition. Enzyme deficiencies and/or malabsorption syndromes will severely affect protein levels. In any avian, values less than 2 g/dl are a clear indication of very low proteins. In avians, survivability and low plasma protein readings have been noticed to correlate clinically. Thus, it has been suggested by some researchers that birds displaying 2 g/dl or less have a poor prognosis (however, recent data from oil spill birds show that often these birds will recover and be releasable). Birds that look fairly normal at a glance can have values that will tell the rehabilitator to look closer and handle the case with more care. That is, the lower the reading, the lower the bird's chances of survival. As more work is done on birds with low values, more will become known both about what the problems are and what can be done to increase their chances of survival.

However, we do know that birds with low values that are emaciated should not be fed food requiring much energy to break down. Human products such as Isocal™ or Ensure ™ can be used as initial energy sources and when the values climb to between 2-3 g/dl, other food sources may be considered depending on the clinical condition of the bird.

The body will sometimes compensate for an increase in one portion of the total plasma proteins with a concomitant decrease in another portion, in order to maintain proper colloidal osmotic pressure. In this instance a normal protein reading is seen though plasma proteins are abnormal. This is called a dysproteinemia. Ratios of types of constituent proteins are the proven way of assessing this condition.

Let us say a mountain lion tangled with a hunter and a pack of dogs, lost a lot of blood from a gunshot lesion, and managed to be found by a backpacker who calls a rehabilitator. Upon processing a blood sample, the hematocrit is 45%; plasma proteins are 8.6 g/dl. After checking the references, this seems normal, however, the cat does not seem normal. It is depressed, shocky, and has pale mucous membranes, and sunken eyes. Despite the fact that the values lie within a "normal" range, this animal is anemic from blood loss and dehydration. Stress from contact with both humans and by the dog attack has likely caused a splenic contraction which increased the PCV. While we would expect a higher than normal plasma protein level due to the dehydration and concomitant loss of water in the plasma (thus making the proportion of red blood cells higher), in this case the animal was utilizing plasma proteins as fibrinogen to control trauma from the gunshot and lacerations or bites it had received.

Recently, oil contaminated birds from the West Coast were noted to have high plasma proteins that were initially thought to be from dehydration (Fry, 1987). However, no matter how much the birds were hydrated, those refractometer values stayed very high (between 6-8 g/dl in Common Murres). Upon performing electrophoretograms, it was discovered that the gamma globulins were elevated, either as a response to inflammation or possibly to the No. 3 crude oil the birds had ingested.

Summary

In conclusion, plasma total proteins can be an extremely useful tool in the evaluation of the wildlife patient. However, it must be used in conjunction with clinical signs and correlated with other laboratory data (such as the differential, blood glucose, electrolytes, and packed cell volume) to be correctly interpreted. More data is needed before we can say with surety that an animal displaying low values has little chance of survival. It would be good to be able to establish a cutoff point, below which the prognosis is so poor that the rehabilitator knows to devote his/her energies to other animals. Continued collection of this data and correlation with survival figures will assist in this endeavor. One should always remember to look at the patient as well, not just at the numbers, when deciding to continue with or retreat from therapy.

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Letters to the Editor . . .

Comments on the Care of the Wild Feathered and Furred Book Review

Gentlemen:

A brief summer vacation has given me the opportunity to "catch up" on some long overdue reading—the articles that you put aside until you have a few quiet minutes (and suddenly the stack has gained considerable stature). Among those magazines and pamphlets was a copy of *WILDLIFE JOURNAL* (Vol. 12, No. 4, to be exact). The book review by Diana Granados and Louise Shimmel of *CARE OF THE WILD FEATHERED AND FURRED* caught my eye. At first I thought surely there must be some mistake—were they really reviewing a book originally printed in 1973 and revised in 1978—hardly a review of something "hot off the presses." And after reading the review and a few trips to local book stores I realized that the reason they chose to "review" this book in 1990 is that there isn't anything else out there of this nature to review. You need only to walk through the Nature section of any book store to find that there is a plethora of books with marvelous color photos—wildflowers galore, animals viewed on an African safari, the wonders of the Galapagos Islands, manual after endless manual for the birders to help them identify what they see (or think they see), etc. All of these have a place in our libraries—they give us migration patterns, nesting habitat, eating habits, how to distinguish male from female, etc.—but no basic manuals to help the lay person when your child walks in with a pink, furless, cold little creature you finally decide is a baby squirrel that has managed to survive last night's electrical storm which destroyed its nest.

Now what do you do ???? Your local vet (a warm, caring, wonderful person) is going to charge for a visit and having recently paid $80 for treatment and overnight stay for my own beloved hound it is highly unlikely that I'm going to shell out for an orphaned baby squirrel. With the "now what do I do " firmly planted in my mind, I made a call to my veterinarian's office and talked with his nurse/receptionist/girl Friday. I posed the question of where to go with an injured wild creature. I was told that when they are confronted with this situation they "generally put it down." When they are called on the phone and asked for a referral they give out the number of the New England Wildlife Center located in Hingham, Massachusetts (619-749-1248). Glad to have their number and address for my own future reference, I called and received the following specifics:

Animal admissions — 7 days a week — 9:00 a.m. - 4:00 p.m.

Phones manned — 7 days a week — 9:00 a.m. - 5:00 p.m.

I asked what would happen if I called them at 5:00 p.m. and was told that I could expect a return call "probably by 9:00 p.m." — That, my friends, is 4 hours by my timepiece — 4 very long hours with no help. If I am lucky enough

to get my "injured creature" to their offices by 4:00 p.m. (cut-off time for admissions) I'm fortunate—otherwise I have to wait until 9:00 a.m. the following morning (a 17 hour wait for help).

What animals do they accept? — They take in all wildlife native to Massachusetts but "bear, moose, and whitetail deer are not rehabilitated in the state of Massachusetts." I pursued the question, especially in the case of deer, and was told that "they are usually injured and we put them down" and "besides, deer do not rehabilitate well anyway".

When an animal (be it wild or domestic) is badly injured and beyond your ability to mend, certainly the humane action is to put it to sleep as quickly and gently as possible. But an orphaned fawn can be raised and returned to the wild. I know that Mae Hickman (author of the book reviewed) has taken in dozens of fawns, successfully raised them and returned them to the wild.

Where do they release rehabilitated wildlife? Their headquarters backs up to 100 acres of unspoiled land. The day I called (September 25) they had released 9 squirrels on that particular property but the site for release depends on where the animal came from — they try to return it to its original "home" whenever possible.

Going to the yellow pages of my phone book, I randomly selected other vets to call and was consistently referred to the New England Wildlife Center. One other source was offered — The Blue Hills Trailside Museum (617-333-0690). By phone they identified themselves as a "wildlife center" but "take in only birds and refer everything else to the New England Wildlife Center." The Fire and Police departments in the surrounding towns refer you to your local veterinarian.

Please understand that I am not being critical of any and all assistance that is available to help with injured/orphaned wildlife—on the contrary, if it were within my power I would "multiply their numbers" and give beyond my means to help fund their work. But the facts are that there just simply aren't enough people/monies/centers to do the job. Please note that *Mrs. Hickman's home and phone have been available 24 hours a day, 7 days a week for over 40 years* — and no one has been turned away yet.

Mrs. Hickman has both State and National licenses to conduct her rehabilitation of wildlife and works very closely with local vets, other rehabilitators, game wardens, etc. She solicits advice and assistance from them and they from her. She contributed to the research of the late Rachael Carson — another lady much criticized and maligned in her day. And, haven't we come to regret having doubted that little lady? Her *SILENT SPRING* remains as an outstanding contribution to our society. Were she alive today, perhaps she would "revise" or "update" her work, but I haven't noticed anyone referring to it as dangerous and wanting to remove it from circulation.

A number of years ago baby chicks were dyed pastel colors and sold to the public as an "adorable, fluffy" addition to your child's Easter basket. Unfortunately this fad caught the public's eye—the dye, of course, eventually killed the little chicks and the parents were left with a dead chick and a grieving child. Naturally, it would have been hoped that adults would have thought ahead to wonder what they were going to do with a full grown chicken which does not necessarily come to mind as your basic house pet. But "impulse" buying is the name of the game. So where there was a market there had to be a product to sell. I wonder just how many little chicks were subject to this type of death? Mae Hickman went to bat and was instrumental in getting this inhumane practice stopped—no more pastel chicks!

The original impetus to write the book came from scores of people who urged her to put "her knowledge down on paper." These urgings continued until she finally started writing notes, making sketches, refining, and trying to make the text "readable" for the lay person. This book is not the product of an egotistical desire to see her name in print. Although approached many times to "serve" as this or that, to "join this board", to "spearhead this or that drive," Mae Hickman has stayed, by choice, out of the limelight—she does her job without seeking recognition or applause. *CARE OF THE WILD FEATHERED AND FURRED* has been reprinted numerous times—perhaps 10 or so. Should it have been updated beyond the 1978 revision? No doubt improvements could be made—new technology added—'tis always desirous to "build a better mouse trap." Therefore, ladies, why not take up the challenge and write a better book rather than trying to destroy and discredit something that has given help for over 20 years?

Has Mrs. Hickman had failures—you bet she has—just like the rest of us mortals. But nothing has died in her hands that had not been mangled, mutilated, shot, starved or otherwise mistreated by humans or human devices. She has always given it "her best shot" and recognizing a hopeless case has solicited the assistance of a veterinarian to euthanize the creature as quickly and humanely as possible. And, furthermore, they were all given a proper burial—not thrown in a trash dumpster.

Your reviewers refer to the importance of co-specific groups—naturally it would be

reasonable to raise a creature with "family" but if you are presented with an orphan, you raise an orphan. And their reference to animals not learning appropriate behavior seems very far-fetched. I have yet to see an animal or bird that did not recognize its likeness—and instinct teaches them behavior. Mrs. Hickman has never found it necessary to give vocal lessons to a bird, eat a mealworm, pick at grain or sit on a perch—the birds do quite well without instruction.

Your reviewers criticise the "releasing of animals on personal property." Mrs. Hickman's "personal property" where she releases many rehabilitated creatures is not your all too normal building lot with a backyard fenced in with a cedar stockade fence. It is 50 acres of woods and open fields, underbrush and hosts a large pond. This is contiguous to other parcels (some smaller and some larger) where she has solicited permission to release wildlife along with other rehabilitators who need good "release" areas. She has been known to drive many miles to get a release to the best possible natural habitat. I remember hearing a story some years ago about a large migrating bird that was downed and brought to her for treatment. When in good health and ready to go, the time for natural migration had passed. She contacted a wildlife center in the South (Florida comes to mind) and made arrangements for them to receive her patient, and the fine young feathered fellow "flew" South via commercial airline. She would *never* condone keeping a healthy wild creature in captivity and would go straight for the jugular of anyone who suggested that they "keep a wild bird/animal as a pet."

From what I have read it would appear that the West Coast has considerably more facilities to assist with the rehabilitation of the wild and I heartily commend the people of that area for their forward strides. Unfortunately we on the East Coast find it more difficult to find such facilities—they just simply are not as prevalent here. Mrs. Hickman was instrumental in getting the SPCA animal shelter established in Arlington, Virginia, and was the backbone for the establishment of wildlife rehabilitation in Northern Virginia—and from that let's hope the movement will continue its momentum and will grow in strength and numbers.

There have been many articles written commending Mrs. Hickman for her work—the archives of the Washington, D.C. papers would have copies of these. Also, the newspapers in Fauquier County, Virginia have followed her work closely. You might ask Mr. Ed Clark, president of the Virginia Wildlife Center in Weyers Cave, what he thinks of her work.

I have no argument with the efforts of both Mrs. Granados and Ms. Shimmel to further the programs of rehabilitation of wild animals. Apparently they have a desire to assist or they would not have taken positions at the Alexander Lindsay Museum and Willamette Wildlife Center. And, all of these programs can always use better facilities, more people, more money, etc. It would be a wonderful assistance to all of us if they would direct their energies towards developing a reference list which could be kept on file with veterinarians, police and fire departments throughout the country—a list which would give names, locations and phone numbers of centers where we could solicit assistance for injured/orphaned wild creatures. Perhaps they could organize rehabilitators to put together a knowledgeable manual/book to replace *CARE OF THE WILD FEATHERED AND FURRED* which they are so eager to see "withdrawn from the market." But whatever road they choose, please let it be constructive! I'm sure Mae Hickman would applaud their efforts and wish them good luck and success in whatever strides they could make to carry forward the work of wildlife rehabilitation.

When most of us are thinking about retirement and taking a long-deserved rest, Mrs. Hickman just ignored that fork in the road—she tightened her belt and gave another 20 years to rehabilitation. Yes, she is pushing toward her mid-80's now and "slowing the pace" a bit. This spring she raised 5 little red foxes brought to her so young their eyes were shut tight. In July they were free, absolutely beautiful, very wild but willing to come out guardedly to greet her if she walked into the fields alone. She has had thousands of success stories —and she has done her work alone and unfunded. I hope that when Diana Granados and Louise Shimmel reach their mid-80's they are still active and can look back on many successful years — most of all, I hope no one comes along to denigrate their work.

Regards,

Mrs. Harold Emerson
Duxbury, Mass.

Editors Note:

We received several letters in response to our review of CARE OF THE WILD FEATHERED AND FURRED and are printing one as a representative. It was never our intention to denigrate Mrs. Hickman or her many years of invaluable service to wildlife rehabilitation. Unfortunately, some readers have interpreted our negative review of the book as a personal attack on its authors. Please note: The Wildlife Journal is addressed to those people actively practicing wildlife reha-

Letters Continued . .

bilitation and, as members of IWRC, by definition are those committed to constantly upgrading their knowledge and skills. I have no doubt that Mae Hickman, who has remained active in and committed to this field, would herself agree with much of what we said. There is simply no way that ANY book written nearly 20 years ago could be considered up-to-date and thus adequate in a medical field.

Our review of this book was definitely "ivory tower" in nature and a couple of readers pointed out that competent, licensed wildlife care is not as easily available nationwide as we would like to think. The publisher of CARE OF THE WILD FEATHERED AND FURRED requested that we review the book and, in all conscience, we could not but consider it outdated and, for our audience, a poor resource book. For the lay person finding wildlife in need, it may be the only resource book available. We would love to see (and, yes, perhaps we could write it) a book which assisted the general public finding wildlife in the techniques of first aid necessary to stabilize an animal, so that it might eventually be transported to a licensed caregiver.

We have nothing but respect for Mae Hickman and Maxine Guy and their lifetime of service to wildlife. CARE OF THE WILD FEATHERED AND FURRED was truly a tremendous gift to this field - besides the contribution of knowledge it represented, Mae Hickman has donated all income from the book back to the animal care field. The Wildlife Journal and the authors of the review wish to extend their sincere apologies that the way the review was written allowed it to be construed as conveying a lack of appreciation or respect for Mae Hickman or Maxine Guy.

-Louise Shimmel

Dear IWRC:

Thanks for responding to the Steinhart essay, and for the excellent President's Message in the spring *Wildlife Journal*. As a typical rehabilitator, I am just now getting time to catch up on the reading (10/29/90). Personal ego placed above common goals is worse than bumblefoot.

Here is my check for my membership renewal. Glad you're there.

Sincerely,
Helen Bigelow
Wildlife Rehabilitator
Anthony, New Mexico

Thanks! We appreciate your kind words and endeavor to speak out where ever we can to call for a consensus on ethics in our new and developing field.

Jan White, DVM
Editor

Dear *Wildlife Journal*:

We raise mice for our local rescue center and science museum as well as for the northern California Forest Service for their Spotted Owl studies. We have them both live and frozen and babysit the inventories of ranger and school teachers during their off seasons.

We enjoy doing something worthwhile and would like to provide mice to anyone who is breeding or working with injured raptors.

I taught pet raising with mice as a scoutmaster and merit badge counselor for 15 years. We have memberships with the northern Ohio Association of Herpetologists and American Federation of Herpetoculturists.

We live on Buckhorn Mountain in the Shasta-Trinity Natural Forest. We have a beautiful Red-tailed Hawk that keeps an eye out for escapees from our mouse house.

I am more of a hobbiest than a business man but would like to know of any birds needing mice within 200 miles of Redding, California. We are 25 miles west of Redding.

Thank You,

Paul Jones
Douglas City, CA

Well Paul, I hope you are not overwhelmed with takers on your offer. I think we rehabbers could clean out your inventory faster than you could restock! Good Luck!

Dear IWRC:

Thanks for a well-planned conference! I'm amazed that so few of you accomplish *so* much. That's dedication. My husband and I are both looking forward to next year's conference. You were asking for ideas on the journal.

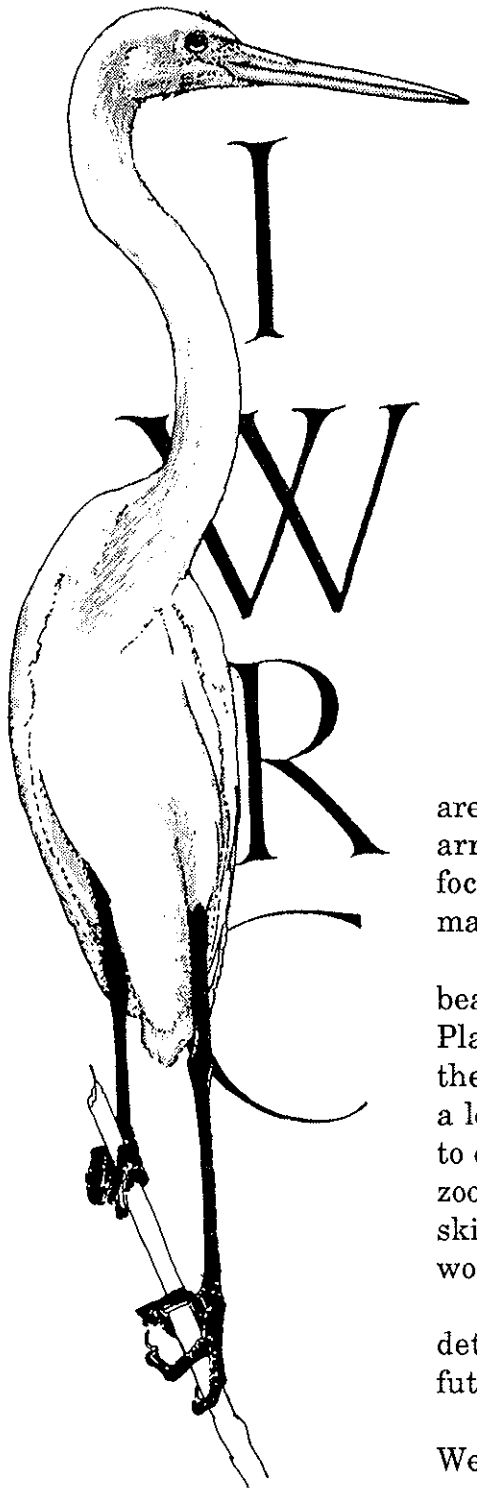
I'd love to see articles on education. I feel it's probably the most important aspect of our program. I'm sure there are some great ideas out there for all age groups. I'm also interested in bat rehabilitation. Any articles on that? How about steps in resolving personality conflicts? That seems to be a challenge in all fields. I've read articles detailing the problems, but none with steps to resolving the challenges. Is there a counselor in the group?

Thanks again for all your hard work.

Sincerely,
Katie Eudy,
Hugo, Oklahoma

Okay, readers--who knows people who can write articles on these topics? Let us know! We appreciate these letters that give us the "pulse of IWRC" via the membership. While we do have full fall & winter issues-- there is room for new articles in the 1991 journals.

International Wildlife Rehabilitation Council



14th Annual Conference

"Handle with Care"

October 17-20, 1991

The Coast Plaza at Stanley Park Vancouver, British Columbia, Canada

Come to Vancouver for the best rehab conference yet! We are pulling together the experts to share with all of us an exciting array of topics on wildlife rehabilitation. This year our special focus for papers will be on keynote species: waterfowl, raptors, marine and large mammals.

We will be having our first international site this year in beautiful Vancouver, British Columbia. Our hotel is the Coast Plaza at Stanley Park located both in downtown Vancouver for the convenience of shopping and sightseeing and on the edge of a lovely park for us to enjoy the wildlife. Conferees will be able to dine in any of thirty nearby restaurants, visit the aquarium or zoo, or go on fieldtrips out of the area. Come early and take a basic skills seminar or see the local sites. This is a lovely site for a working fall vacation.

Call for papers will end on January 5th and program details should be in place by April. More specifics to come in future *Wildlife Journals*!

We look forward to seeing you all in 1991!