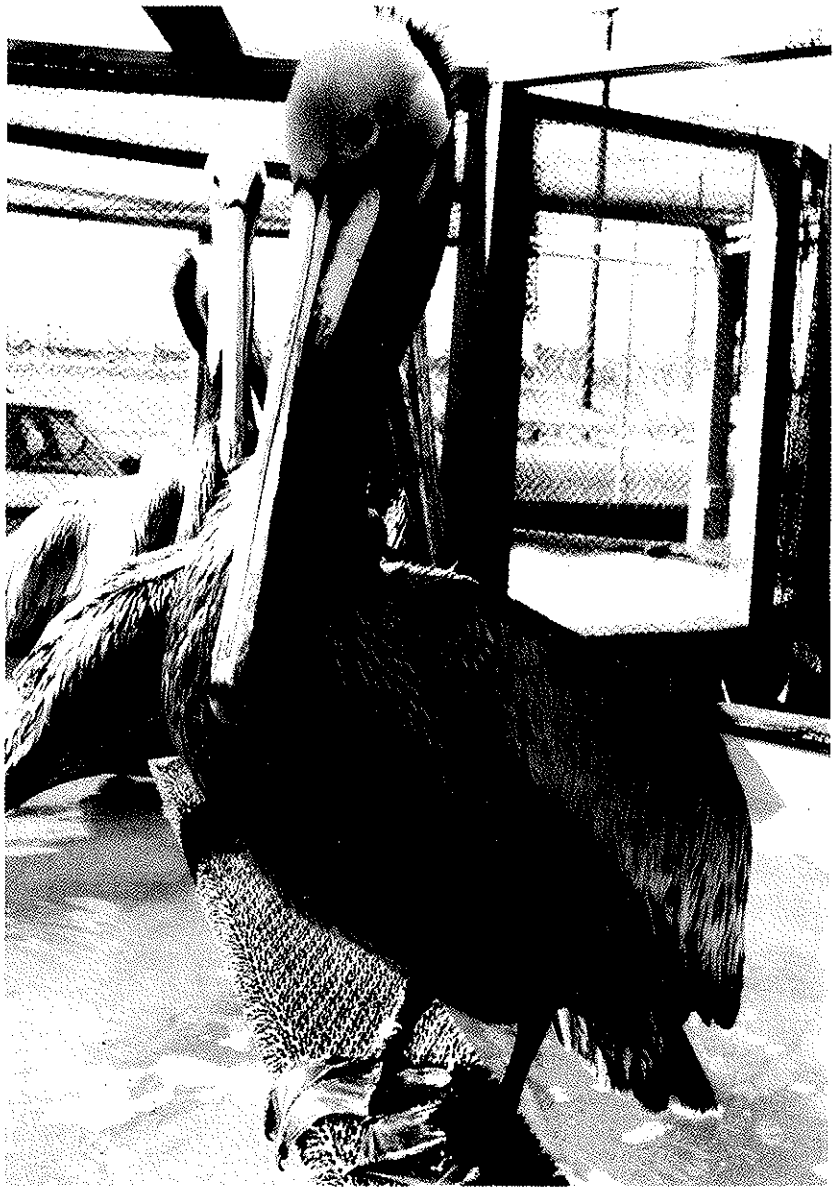
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Winter 1990 Vol. 13, No. 4

WILDLIFE JOURNAL

Journal of the International Wildlife Rehabilitation Council



How Emaciated is that Brown Pelican?

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, 4437 Central Place, Suite B-4, Suisun, California 94585, USA. The manuscript should include references, photo legends, and footnotes, and should be typewritten, double-spaced, if possible. The author's name, address, and phone number should be placed on at least the first page of the article so it can be readily identified and the author contacted.

2. The *Wildlife Journal* is prepared on a Macintosh personal computer with desktop publishing software. If papers are already on a personal computer disc, the submission cover letter should include that information, as well as what type of hardware and software systems were used. Obviously, being able to use the author's disc directly or translate by machine to Macintosh format prevents input errors and speeds up the process.

3. Manuscripts are received with the understanding that they have not been accepted for publication elsewhere. **It is the author's 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 of the author. Where appropriate, please list any academic degrees, special training, or experience 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, FA; Peakall, DB; and Butler, RG. 1983. "Heinz-Body Hemolytic Anemia from the Ingestion of Crude Oil: A Primary Toxic Effect in Marine Birds." *Science* 20:871-873.

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Winter 1990 Vol. 13, No. 4

EDITOR
Jan White, DVM

ASSISTANT EDITOR
Louise Shimmel

ASSOCIATE EDITORS

Deborah Marcum
Laurie Siperstein-Cook, DVM
P.C. Hanes

REGIONAL NEWS INFORMATION

P.C. Hanes
P.O. Box 632
Hamilton, TX 76531

MARKETING AND ADVERTISING

Dianne Pearce
17308 Queen Anne Bridge Road
Bowie, MD 20716

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Editorial . . .

Taking the Next Step . . . .

Several colleagues and myself who serve on the IWRC/NWRA Standards and Accreditation Committee will be embarking on yet another uncharted path this year as we meet to begin to "brainstorm" a 2nd tier standards program. From past experience, I can tell you that this kind of work is a bit like jumping off a tall bridge and praying that the bungee™ cord will cushion what is certainly going to be an exhilarating ride into uncharted space.

I remember the "good old days" (aka. 1982-1989) when the first group spent three years developing the basic standards program—something many nay-sayers predicted would not only be an impossible task, but would be rejected by wildlife rehabilitators. Thankfully, we did not believe the "scuttle butt" and proceeded quietly and patiently to develop a program that would serve rehabilitators working at home or in centers. Then, we worked hard to get approval from both NWRA and IWRC for our first joint program.

I think the hardest part was when we had to sit down and develop the caging standards for the non-raptorial birds. The IWRC board had done the early work on the common mammals and raptors—with a rancorous harmony that allowed us all to complete the project with consensus—but never total agreement. The non-raptors seemed like a tall order to fill. However, a working group of rehabilitators from the East, who cheerfully called themselves the "The Thankless Drudges," addressed the monumentous product of their efforts to me, their chairman, whom they fondly named the "Heartless Taskmaster"! (For those of you who are wondering, it was LYNNE FRINK, BETSY JONES-CROZIER, and MARY FORNESS!) They took off for the Pocano Mountains in Pennsylvania where they locked themselves into a room and vowed not to emerge until they had a planon which they could agree and one which they thought would serve the program. Frankly, I never expected to see a document as complete as what emerged. Oh, by the way, they were such an incredibly driven group, the "Heartless Taskmaster" only had to give them a moderate push and once they were rolling they had plenty of steam, the likes of which could have rolled over me!

Well, I have kept every shred of correspondence from those years from every reviewer and rehabilitator. It is kind of like a time capsule that we should put in a rehabilitation museum someday. The comments came from all points of view and really do reflect the times and the rehabilitation community. Looking back today brings back plenty of memories—of conflict and growth, of change and fear of change, and of the pioneers who worked so hard to make this program possible.

However, lest we not rest on our laurels for very long, much work still needs to be done. For example, this summer we are completing our pilot program in California and will be doing a giant summary for both boards from which we hope will come the first batch of officially accredited wildlife rehabilitators. Once we have them, we have services that we have promised to provide (e.g., workshops to assist them with development of their programs). Additionally, we need to develop funds for the program nationally so it can become affordable to the "little" guys or folks with limited budgets (which is virtually everybody in the field!).

We take one thing at a time, and for now, we are beginning to develop what we call a "second tier" standards program. This is the one to which we will all aspire, but for the most part pay a lot of attention

Continued on Page 18

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Applied Ethics, Decision Making and the Not-For-Profit Organization

Sherman Titens, President
Fromm Institute
9140 Ward Parkway
Kansas City, Missouri 64114

Introduction

One element that has always played a role in the decision process is ethics...the ethics of the organization, the ethics of the decision makers and the ethical impact on both the environment in which the decision is to be implemented, as well as those who will have to implement the decision. Applied ethics, also, has always played a role, but it is only quite recently that the applications issue has become highly visible.

Applied Ethics

Applied ethics, simply defined, is what is good and right and just in the conduct of the affairs of an organization. Put another way, a recent best selling business book suggests, "There is no right way to do a wrong thing." (*The Power of Ethical Management* by Ken Blanchard and Norman Vincent Peale, Wm. Morrow & Co., New York, 1988).

The goal is to achieve a full awareness of what actions are being taken, together with a real sense of the consequences of the actions or non-actions and then to evaluate the consequences against the ethical organizational issues involved.

A decision that you view as ethical, typically, is one where the consequences of the organization's actions have been analyzed, harmonized in light of the impact of applying your personal ethical values, as well as organizational ethical standards. A judgement is made that the consequences will generate an appropriate balance of the stated factors. The objective is to violate no law or compromise any ethical value while achieving the intended objective.

Recent inquiries into applied ethics and decision making tend to indicate that organizational ethics is becoming more and more situational; that is, the same decision to the same problem might not be made if environmental circumstances changed. (*Applied Research*, second edition, by Dr. Robert Gray and Dr. Sherman Titens, Parkway Press, Kansas City, Missouri, 1990).

In example, an arbitrary decision to eliminate a member program unwanted by an influential volunteer leader might be implemented with no consequences where no members were participating in the program, but obviously real consequences would result when members were participating in and benefiting from the program.

Ethical behavior among the not-for-profit community is critical to the continuation of organizations as we know them. Everyone has a sense of ethics. It is the expression of our value-based experiences tempered by the culture of our organization's environment. The applied ethics you employ reflect the blend of your experience, your personal values and your environment.

We have been able to identify the sequential activities involved in the process of reaching an ethical decision. They are:

1. Define the situation and the ethical issues to be resolved.
2. Identify the organizational considerations and human factors involved.
3. Determine the sources of ethical dilemmas: personal, role-defined and/or organizationally generated.
4. Generate alternative solutions.

5. Evaluate probable outcomes, estimating the probability of success for each alternative solution.

6. Weigh outcomes against desired result, if known.

7. Assess legal and ethical validity of alternative solutions ranked in relation to desired outcome.

8. Select from among alternatives the most desirable outcome consistent with the ethical values involved.

9. Ascertain whether resources are available to support the proposed solution.

10. Make the decision. Then, apply the decision to the situation.

To fully comprehend the interactions of an applied ethics decision, the applicable human factors and the decision making process, it is helpful to have a familiarity with, at least, the fundamental notions of ethics.

At different poles on the spectrum of ethics are ego-related and utilitarian behavior.

Ego-related behavior adopts the rationale that says if it is good for me, then it is good for everyone. Current organizational thinking treats members and constituents as "markets" and adopts the view that ascertaining and fulfilling their wants and needs successfully should be the principal focus of the organization.

This market centered approach is inconsistent with the ego-related concept. Rather, it is in harmony with the utilitarian theory which suggests that if it is good for everyone, then it is good for me. Utilitarianism rests on the other pole of the ethics spectrum.

Rarely is anyone ego-related all of the time, nor do we generally encounter utilitarian behavior in all matters. And often we find ourselves not rigidly at either end of the ethical spectrum, but rather moving from one end to the other and then back. The pressures of everyday living, combined with our need to live in many worlds simultaneously - personal, business, community, religious and family - require a flexible approach to survive and grow in the years ahead. We are now beginning to accept the situational nature of applied ethics.

When you and your organization have developed and communicated your ethical values, there will be a dramatic, positive reward to the entire organization and yourself. The resulting clarity and cooperation will enhance the likelihood of improved productivity and success.

On the other hand, organizations with continuing ethical conflicts suffer the consequences. The ethical values of any organization can be found in the organization's culture...the way things are done. Do meetings start on time or are attendees kept waiting with a resultant loss of time and productivity? Are decisions countermanded or not made? Are people treated differently for no reason? Is there little or no regard for the well-being of the staff and members? When such conditions exist, productivity, trust and loyalty are diminished.

You can gain insight into the ethical values of an organization by becoming aware of the people interactions in handling these issues:

Is there:

1. Unauthorized involvement and favors given to friends or relatives.

2. Personal use of organization resources.

3. Consistent misuse of time, such as using time for personal projects.

4. Exaggeration of program and service quality, or overlooking of service or program deficiencies.

5. Severe knocking of members and constituents by the staff.

6. Awareness of stealing by staff or volunteer leaders with no reporting of the theft.

7. Giving less than full loyalty to the organization.

8. Repeated failure to make timely decisions.

9. Refusal of top staff and volunteer leadership to take responsibility for their actions.

10. Disregard of government regulations.

Organizations which permit or encourage any of the conditions presented above are likely candidates for ethical conflict among the staff and between the staff and the volunteer leadership. Ethical conflict tends to breed an environment which is inconsistent with success.

Some may argue that if it is not illegal, then the behavior is acceptable. Economist Milton Friedman is credited with the philosophy which embraces the principle that the sole purpose of a business is to make an acceptable profit for the shareholders. There is support for this position. Often, it appears inconsistent to function in any other fashion. Now that not-for-profit organizations are driven to generate surpluses (profits) for their survival, there could well be those who would embrace Friedman's position.

And yet, if surpluses (profits) are the central focus, then it would seem appropriate to consider the various operating philosophies available to maximize the opportunities for profits. Ample evidence exists to support the view that the ethical environment encourages cooperation among employees, as well as loyalty and commit-

ment to the enterprise. As a result increased productivity and profitability is achieved. This should apply to the not-for-profit organization as well.

American notions of short-term performance can be a contributor to unethical behavior in an organization, particularly where clear goals and expectations, as well as standards of conduct, are not communicated or available, and the pressure to perform exists. Newspapers are filled with the stories daily. The results theory of management, "I don't care how you do it, just get it done," fosters ethical dilemmas constantly.

When we are very young, making ethical decisions is fairly simple. The facts are usually clear and they appear readily apparent. After being told not to, you either ate the cookie or you didn't. As adults, the situation is often shadowed by vagueness, lack of complete information, opposing points of view and politics, in addition to the pressures of the work environment and your personal needs and dilemmas. Ethical conduct calls for a full awareness of the importance of complying with standards such as laws, regulations, and organization policies together with the abstract concept of fairness...fairness to staff, volunteer leaders, competitors, suppliers, members, and the community.

Conclusion

There must be an understanding of the contribution that organizations make to the improvement and well-being of society. More and more organizations are recognizing that ethics begin in the marketplace with the discovery of the wants and needs of the member/constituent. This is a utilitarian view and is usually tempered by the ego-related concept of measured success. The results reflect the implementation of decisions which, as we have seen, should be the outcome of a structured process that takes into account current data-gathering technology, the organizational environment and the application of ethical decisions.

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Antibiotic Use in the Raptor Patient: Selecting an Appropriate Antibacterial

Julie A. Nettifee, LVT, BS*
Douglas G. Aspros, DVM**
Hudson Valley Raptor Center
RR 2, Box 338, Stonehouse Rd.
Rhinebeck, New York 12572

Introduction

One of the most common problems encountered in avian medicine are bacterial infections. Optimizing the use of antibiotics in an affected raptor patient can make a crucial difference in the outcome of many cases.

It is important to state at the outset that the present knowledge of the pharmacokinetics of antibiotics in the raptor (hawks, owls, eagles, falcons and osprey) patient is limited. Many avian dosages are empirically derived—extrapolated from other species or adapted using dose scaling. The purpose of this paper is to provide an overview of some of the factors influencing the selection of antibiotics in the raptor patient, and to outline some of the commonly used antimicrobials in this group.

Antimicrobial Therapy

The goal of antimicrobial therapy is elimination of the infecting bacteria from the host. Antibiotics play only a partial role in this process, and it is important to realize that host defenses are usually required to rid a bird of infection. Supportive care, in the form of re-hydration, forced alimentation, and provision of warmth, oxygen and a stress-free environment are *as* important as correct antimicrobial therapy.

When selecting an antibiotic, a variety of factors influence the selection, including:

Antimicrobial spectrum. Under most circumstances, organisms causing disease can be cultured and identified and the susceptibility to various antibiotics measured in a laboratory, often using a Kirby-Bauer disc susceptibility method.

Pharmacodynamics. An antibiotic must achieve therapeutic concentrations at the site of infection. Wound management and daily assessment of infected sites are necessary to evaluate the therapeutic regimen.

Route of administration. The route of administration may include any of the following: oral, intramuscular, subcutaneous, intravenous or topical. In situations where multiple choices of antibiotics and routes of administration exist, a primary concern should be to administer a suitable drug in the least stressful manner.

Unlike many psittacine patients, most raptors are *not* accustomed to humans. If the raptor is eating on its own, "pilling" is the easiest route of administration. Placing the medication in a mouse or other food source is often an effective method of administering an antibiotic.

Toxicity. Many of the therapeutic agents involved for use in veterinary and human medicine can be used on raptors, but few products are in common usage in these species, and fewer still for which the pharmacokinetics and toxicity in raptors or other birds have been determined. One group of drugs that should be avoided if possible in raptors are the aminoglycosides, such as gentamicin and amikacin, because of their potential to cause kidney damage, especially in dehydrated individuals. Despite the fact that aminoglycosides are commonly used in caged birds without deleterious effects, care must

be taken when deriving antibiotic protocols from other avian species.

The following is a brief description of therapeutic agents and recommendations for their use in raptors:

1. *Amoxicillin* (Amoxitabs™, Amoxidrops™-Beecham) 50mg/kg BID, oral, intramuscular.

Amoxicillin is safe and efficacious for use both as a therapeutic and prophylactic drug, as in the case of open wounds. The product can be administered orally as a tablet or a suspension or intramuscularly and is readily available from veterinary supply companies. Reported side effects are minimal.

2. *Amoxicillin-Clavulinic Acid* (Clavamox™/ Clavadrops™-Beecham) 62.5 mg/kg BID, oral.

Same indications as Amoxicillin, but has a wider antibacterial effect.

3. *Carbenicillin* (Geopen™-Roergig) 250 mg/kg BID, intramuscular.

Carbenicillin can be a useful drug to use in raptors as well as cage birds. It has excellent activity against *Pseudomonas sp.* and *E. Coli.* It is extensively used for bumblefoot disorders. Oral dosing of carbenicillin is not recommended; parenteral administration is advised.

4. *Ticarcillin* (Ticar™-Beecham) 200 mg/kg BID, intramuscular.

5. *Piperacillin* (Pipcillin™-Lederle) 100mg/kg BID, intramuscular.

Generally, both ticarcillin and piperacillin are safe and effective products against a broad spectrum of gram-negative bacteria. (Note: Gram-negative bacteria are normal inhabitants of the lower GI tract of raptors, unlike caged birds.)

It is important to note that carbenicillin, ticarcillin and piperacillin are all administered by injection, a more stressful method of medicating the raptor patient. All three of the products are relatively unstable after reconstitution (less than 72 hours) and are costly therapeutic choices. Prepared aliquots are usually divided and frozen for future use. No studies have been done to document the efficacy of these drugs following reconstitution, freezing and thawing, however.

6.*Trimethoprim&Sulfacombinations* (Tribrissen™-Roche) 30 mg/kg BID, oral or intramuscular.

This is a broad spectrum antibiotic used for a variety of medical situations such as bite wounds, scratches from talons, or other injuries.

7. *Enrofloxacin* (Baytril™-Haver) 5-10 mg/kg BID, oral/IM.

8. *Ciprofloxacin* (Cipro-™) 10-20 mg/kg BID, oral.

Both Enrofloxacin and Ciprofloxacin are classified as quinolones - the latest class of antibiotics to be used in veterinary practice. Both products are excellent drugs for gram-negative infections in raptors, and are administered orally or by injection. To date, the quinolones have been very successful in the treatment of raptors with distal extremity injuries, such as trap or other puncture wounds.

The quinolone antibiotics are bacteriocidal compounds that interrupt DNA replication. No study data are available to date on these products in the raptor patient, but in clinical evaluations, affected raptors are responding favorably to treatment, with little to no side-effects. Occasional anorexia may be observed in raptors on enrofloxacin treatment.

Antifungal Therapy

The following two products are antifungal medications, but mentioned within this text because of the high incidence of these diseases noted in captive and wild raptors.

1. *Amphotericin B*(Fungizone™-Squibb) 1.5 mg/kg TID, diluted and administered intravenously; 1.0 mg/kg diluted in 1-2 ml saline, administered intratracheally.

Amphotericin B is used primarily for the treatment of aspergillosis. The product should be administered intravenously for three days, in conjunction with or following flucytosine therapy.

2. *Flucytosine* (Ancoban™-Roche) 50-75 mg/kg BID, oral.

Flucytosine, or 5-flourocytosine, is an adjunctive product to be used in conjunction with amphotericin B for the treatment of aspergillosis. Flucytosine is used successfully for the prevention of aspergillosis in susceptible species during the initial period of treatment, or following a stressful situation in a captive raptor (50 mg/kg BID orally

for 10 days). Susceptible species include Osprey, Golden eagles, Rough-legged hawks, Snowy owls, Goshawks, Gyrfalcons, Prairie falcons and Gyr- or Prairie hybrids.

Conclusion

Prior to placing the affected raptor patient on any type of antimicrobial therapy, it is important to evaluate the patient in terms of hydration, nutritional status and overall health. Bacterial cultures of the wound, cloaca, oral cavity and/or trachea may be necessary prior to treatment. In the case of an open gunshot wound or fracture, antibacterial treatment is warranted immediately.

It is important to realize that antibiotic therapy may not necessarily cure a problem. In many cases, persons dealing with injured raptors may be facing a "mixed" infection, caused by more than one microbe. As the wound progresses, a change in the nature of the wound may be apparent, and may warrant a change in the antibiotic regimen.

Also, a long-term antibiotic therapy disrupts the normal gastrointestinal flora and may cause anorexia or secondary yeast (*Candida albicans*) infections. It is also important to note that the Candida organism is an opportunistic one, and the stress of hospitalization is enough to allow the organism to reproduce. Routine (weekly) pharyngeal/cloacal cultures are a good screening method to detect infections during and following antibiotic therapy.

A good therapeutic regimen includes appropriate use of antibiotics, wound management if indicated, and restoration of normal hydration, nutritional and hematological parameters in the patient.

* Julie A. Nettifee, LVT, BS, is a licensed veterinary technician and a veterinary technical writer. She is an assistant at the Hudson Valley Raptor Center located in Rhinebeck, NY.

** Douglas G. Aspros, DVM, is an avian specialist. He is the owner and operator of Bond Animal Hospital located in White Plains, NY.

The authors would like to thank the following individuals for their assistance in the preparation of this article:

Dr. Laurel Degernes, The Raptor Center, University of Minnesota, St. Paul, MN.

Dr. Patrick Redig, The Raptor Center, University of Minnesota, St. Paul, MN.

This article was reprinted with permission from *Gaining Altitude*, the newsletter of the Hudson Valley Raptor Center.

News from the NWRA

The National Wildlife Rehabilitators Association announces its small grants program. This program makes available **two** $1,000 research grants in the field of wildlife rehabilitation. Each may be applied to one large project or several smaller research projects each totaling less than $1,000.00. Applicants must demonstrate financial need and submit a typewritten proposal that includes: name(s) and resume of personnel involved, objectives of the project, a brief description of how the project will be carried out, a brief literature review and an itemized budget.

An annual report on progress is required. It is expected that those receiving NWRA support will present the results of their projects at an NWRA national meeting within two years of receipt of the grant.

The deadline for submitting proposals for research grants is December 15 of each year. Recipients will be announced at the NWRA annual meeting in February and in writing.

Proposals should be submitted to:

Mark Pokras, DVM
Tufts University School of Veterinary Medicine
Wildlife Clinic
200 Westboro Road
North Grafton, MA 01536

The Gadwall *(Anas strepera)*

Jan White
International Bird Rescue Research Center
699 Potter St.
Berkeley, CA 94710

Introduction

The Gadwall is a fairly ordinary-looking dabbling duck whose scientific name, *Anas strepera*, is derived from the latin work streperus which means noisy, an apparent reference to the loud calls of the female (Terres, 1980).

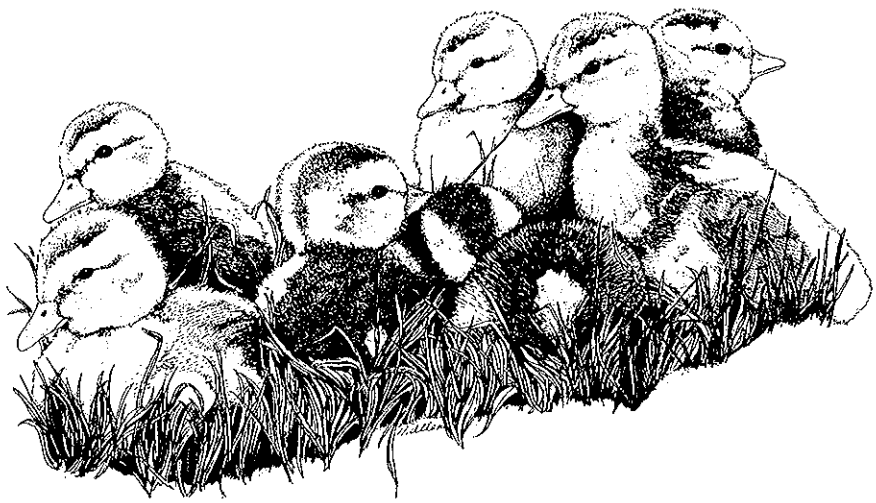
These are freshwater ducks found in the temperate zones of both the old and new worlds. In North America, two separate but distinct populations occur: one in the East and one in the West/Midwest. They are generally an uncommon bird (Terres, 1980).

These birds nest in North America from Alaska through the prairie provinces in Canada, south through California and east to southwest Kansas and into northwest Pennsylvania. There are local breeding colonies on the East Coast in New York, New Jersey, Delaware, Maryland, and North Carolina. They winter from Alaska to western Mexico, with the main population in the Pacific Flyway. Eastern populations winter from Chesapeake Bay south to northern Florida, along the Gulf coast, and into Mexico (Terres, 1980).

During the Exxon-Valdez accident in 1989, a number of hatchlings were presented for rehabilitation when they became separated from their natural families during the massive rescue program that was launched to salvage oil-affected birds. Three young Gadwall hatchlings were brought in with no evidence of oiling and were reared and released in Alaska during that summer. Physiologic data presented in this paper comes from these ducklings and represents the kind of research information that wildlife rehabilitators can collect to improve the care offered by others who follow in our footsteps in this field.

Adult Description

•The adult Gadwall is 19-23 inches long and has a wing span of 31-36 inches. Females



weigh 1 lb. 5 oz. to 2 lbs. 4 oz. (Terres, 1980). Males, usually heavier than females, weigh from 1 lb. 9 oz. to 2 lbs. 8 oz. (Terres, 1980). However, when comparing averages instead of ranges, the weight differences become more apparent with males averaging 2.18 lbs. (.990 Kg.) (n=16) and females averaging 1.87 lbs. (.849 Kg.) (n=14) (Dunning, 1984).

•The male Gadwall is a gray-brown bird with a black rump. It has a pale brown head and neck with a dark bill. The female is mottled brown with a pale brown head. Both sexes show reddish brown on their forewings and white bellies when in flight. This is the only dabbling duck to show a white patch of speculum in the wings near their body (Terres, 1980).

•Post-breeding molts leave the adults flightless for about 25 days sometime during the summer. Early breeders molt first, followed by late breeders. They completely renew their feathers in about 35 to 40 days (Belrose, 1976).

Natural Diet

•These birds consume a diet that is almost entirely made upof plant foods. A dabbling bird, these birds draw stems, tubers, and leaves from vegetation found in ponds, along sloughs, or slow-moving streams. They eat Bulrush, Naiad, Spikerush, Widgeongrass, Sawgrass, Panicgrass, Wildbarley, arrowhead, pondweed, duckweed, algae, and other similar plants (Martin, 1951). Gadwalls are one of the few dabling ducks that are known to dive for food when necessary (Terres, 1980). They are known to leave water to find food such as waste grains following harvests, or acorns.

•Gadwalls will go after and eat small animals such as fish, snails, tadpoles, crustaceans, worms, water beetles. Additionally they prey on insects such as Caddisfly adults, their larvae, bugs, dragonflies and their nymphs (Martin, 1951).

Nesting, Egg laying and Incubation

•Pair formation begins in late summer and continues into the fall/winter. The pair bond is highly variable, with a few staying together through the incubation period while most end during the first two weeks of nesting (Bellrose, 1976). Breeding season varies by latitude (i.e., later in the north, earlier in the south) but is usually from May to July (Madge, 1988).

•Birds may or may not breed as yearlings, depending on their maturity. (Bellrose, 1976).

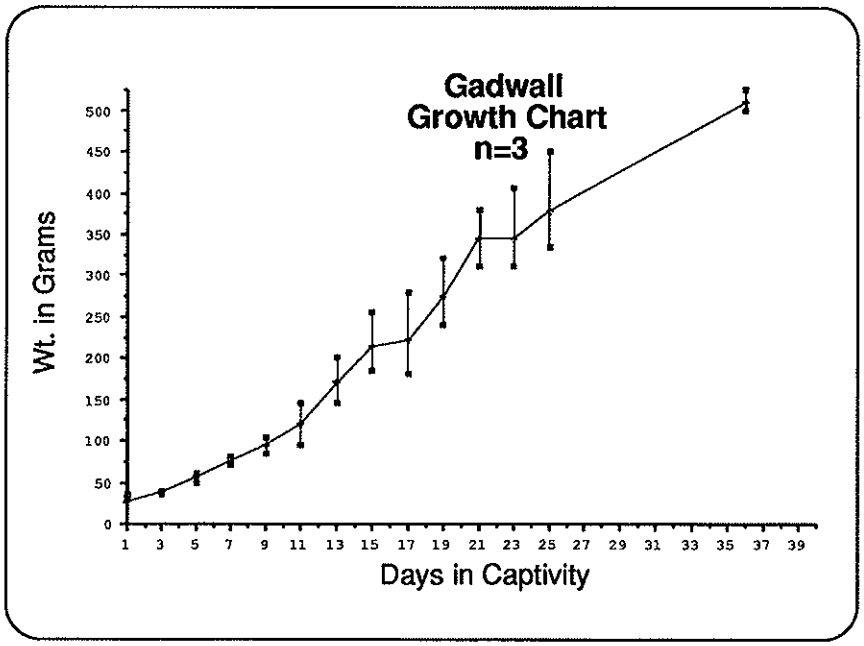
•Gadwalls prefer lakes, ponds, or slow-moving streams as nesting sites, usually in thick vegetation such as nettles. They often use island nesting sites. (Harrison, 1978). The ground nest is a hollow that they line with down or feathers.

•The female incubates the 8-12 eggs alone. The incubation period is 25-27 days and begins upon the completion of the egg lay. Predation may occur from mammalian predators such as striped skunks, coyotes, foxes, badgers, ground squirrels, and raccoons. Avian predators include California and Ring-billed Gulls, Crows, Magpies, and Ravens (Bellrose, 1976). Those escaping predation are hatched downy and precocial. They are taken to the water soon after they hatch.

•The young stay with their mother for about seven weeks. They can fly at 49 to 63 days after hatching.

Nestling Care

•Young ducklings can be successfully raised in a variety of housing types, provided some basic requirements are met. Solid-sided walls provide them with security and privacy and help hold in ambient heat. A net bottom allows feces and spilled water or food to fall away from the duckling to help keep it clean and warm. The top of the pen can be netted or cloth but should allow for ample air exchanges. A heat lamp is positioned over the enclosure to heat it to 100-104° F. It should be heated in such a way that one



Juvenile Gadwall Serum Chemistries n=3

Test	Glucose	Uric Acid	Cholesterol	Triglycerides	Alk. Phos.
Units		g/dl			
Min	230	4.4	171	137	827
Max	276	15.0	280	300	1131
Average	**253**	**8.3**	**224**	**225**	**932**

Test	ALT	ALP	LDH	GGTP	Ca+	CPK	T. Protein
Units							
Min	27	51	292	5.2	10.4	657	3.6
Max	40	68	435	5.3	11.6	711	4.8
Average	**33**	**57**	**367**	**5.2**	**11.0**	**684**	**4.1**

*These were 5-6 week old growing Gadwalls which where not fasted prior to their blood tests. Tests were run in-house on a Abbott Vistions™ Blood Analyzer.

corner is somewhat cooler and the birds can move to that area if they desire. The temperature of the enclosure is reduced as the ducklings grow larger and no longer need it.

•Generally they will huddle together and keep each other company. However, if raised singly, another duck of similar size but a different species may be co-raised as a sibling. If that is not an option, a feathered duster can be inserted into the caging to allow the bird to huddle with a feathered object.

•Generally, a clutch (8-12) of ducklings are initially housed in an enclosure that is 24" long by 30" wide by 16-20" tall. As the birds grow, larger and larger enclosures are substituted to allow for more room to roam and develop muscle tone. Judging the size of the enclosure for the size and number of birds can be done by a rule of thumb. If it is impossible to keep the enclosure free of feces or urea smell and it is being cleaned twice daily already, it is too small. One can split the clutch into two groups and keep the same sized caging or increase the pen size accordingly.

•Since Gadwalls are taken to the water soon after hatching, shallow water should be provided at all times. IT IS VITAL to set up the water in such a way that the ducklings CANNOT drown. If they become soiled by food or feces, they can temporarily loose their waterproofing and become wet and cold in water. If they cannot get out of even shallow water and are unattended, they can drown. The most common accident reported regarding ducks is forgetting to provide a ramp and having a bird drown. Often, inexperienced rehabilitators don't realize that the bird cannot get out of even three inches of water when it is very small.

•Initially, the author provides a shallow pie tin with rocks in it that will allow the bird to get in and out and wade about. When the babies are used to their environment and outgrow the pie tin, a large rectangular cake pan can be used as long as there is a ramp that will not fail to allow them to depart. As the ducklings age, the pool sizes enlarge through various dish pan-sized ponds to a kiddy wading pool up do a free standing metal swimming pool. The same rule of thumb will assist in determining the pool size (how fast it becomes contaminated with feces).

•Clean surface water is very important in assisting birds to maintain their waterproofing. If left to swim in dirty water, the birds will often emerge wet and will try to preen out the debris. Additionally, stagnant water allows for bacterial growth. One way to approach the surface water requirement is to run a hose into the pool and leave it on low to allow the top to overflow.

•Birds should be given at least 30 minutes per day of exposure to sunlight (not through a window) to allow them to manufacturer vitamin D_3 unless it is present in their foods. Check the label of the feed products used.

Captive Feeding

•Food dishes should be non-tippable, so that when they walk through it, it will not spill and drop through the netting. The amounts of food they contain should not exceed what the group would be expected to consume in about four hours. This is because of the fact that they will walk through it, may defecate in it, get water in it, and thus it will need to be changed 2-4 times daily.

•Ducklings can be raised on mixed grains 50:50 with some Purina Duck Chow Starter™ or Game Bird Starter™. Commerial starter feeds have high protein levels (about 28%) while grower rations are about 18-20%. Commercial rations are important to use because they contain biotin; however, they stimulate growth so quickly that if these high protein rations are used as a sole ration, wild ducks in general are at riskof developing "slipped wing" (Kreeger, 1984). Thus, to keep protein percentages at a level that more closely approximates their natural diet, we cut the commercial game or duck chow with mixed grains. Biotin is a B vitamin which, if deficient in the diet, may cause an occasional bird to develop "slipped tendon" perosis, a condition which leaves the bird permenantly unable to lower the leg to walk. A lack of this vitamin may also result in poor hatching success (Snyder, 1986). While biotin is present in various feed stuffs, (i.e., alfalfa meal, green grasses, and grains), it is usually not found in chicken feeds and they should not be used as a main food source for rearing waterfowl.

•Once the birds reach four weeks of age, the starter feeds should be switched to grower rations. The rations should still contain at least 25% mixed grains. Birds that are received for rehabilitation post-fledging can be fed adult type rations. While mixed grains need not be fed, these birds may recognize this type of feed and thus begin self-feeding.

•Getting birds to self-feed can be tricky. Often, mixing a small amount of feed with water (described as "duck soup") works well with duck species who "sift" water and the food it contains through their bill. Eventually, they will feed from the dry feed bowl and mix food with water ad lib, which is a more cost-efficient system with less food waste.

Additionally, tempting new birds with live food such as tubeflex (sewer worms) will often stimulate them into eating. Other insects such as live meal worms can be tried as well.

•It is important to offer a variety of food types that either are found in the wild or are similar to those birds may find following release. These foods will help reinforce feeding habits that will allow the birds to adapt to food conditions in the wild.

Release

•Gadwalls are releasable when they are able to fly (7 to 9 weeks of age).

•They should recognize and eat foods that are native to the area.

•Birds should be checked for waterproofing prior to release.

•They should have a healthy fear of domestic animals (having been reared separately from dogs and cats).

•They should have a normal hemogram. The packed cell volumes for fledglings are between 43-45% (White, 1989). Normal total proteins for fledgling gadwalls are 3.8 to 4.8 g/dl (White, 1989).

•Gadwalls should have reached at least 2/3 adult body weight at release.

•Diurnal birds should be released during the daylight. However, they migrate mostly at night and obviously are capable of flight and navigation (Bellrose, 1976).

•These birds can be predated and should be allowed to visualize the area of release for a minute or so before being released. Throwing birds up into the air from a closed box leaves them disoriented and easy prey for large raptors (i.e., eagles). The author prefers to open one side of a box and allow the bird to leave on its own.

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Squirrel Fibromatosis: A Review

Linda A. Wolf, DVM
Director/Co-Staff Veterinarian
Wildlife Rehabilitation Clinic
University of Minnesota
St. Paul, Minnesota

Summary

Data suggesting squirrel fibromatosis (squirrel poxvirus) has been noted as early as 1934 at the New York State Conservation Department in Albany, New York (Hirth *et al*, 1969). Primarily a disease entity of eastern gray squirrels (*Sciurus carolinensis*), it also has been observed in western gray squirrels (*S. griseus griseus*) (Regnery, 1975) and woodchucks (*Marmoto monax*) (Kilham, *et al*, 1953). The poxvirus agent occurs most frequently in the juvenile population, and primarily results in multiple skin tumors. The virus is presumed to be transmitted by insect vectors and has a high transmittance capability. No treatment for the virus is available. It is important to identify this disease in order to avoid prolonged suffering of the individual and to reduce contamination of the general population.

Agent

The causative agent is squirrel fibroma virus and is morphologically similar by electron microscopy to other poxviruses.

Transmission

Two species of mosquitoes, *Aedes aegypti* and *Anopheles quadriaculatus*, have transmitted the virus from squirrel to squirrel under laboratory conditions, with the occurrence of cutaneous tumors (Kilham, 1955). The virus is also presumed to be insect-transmitted in nature. Secondary spread of tumors is primarily hematogenous.

Pathology

In studies done by Kilham (1955), adult squirrels proved more resistant to infection with the squirrel fibroma virus than young squirrels. Similarly, young woodchucks developed fibromas more readily than adults following intracutaneous inoculation with the virus. Age, therefore, appears to play a role in the pathogenesis of fibromatosis.

In laboratory studies done by Kilham (1955), fibromas first appeared 7-13 days after inoculation. Metastasis occurred at 14-33 days after inoculation, and the number of skin metastases ranged from 3-60. Metastasis to the lungs has also been reported.

Clinical Signs

Squirrel fibromatosis is a viral disease characterized grossly by multiple cutaneous nodules primarily, but not exclusively, of the extremities, head, and abdomen. Considerable variation in the gross lesions may be present ranging from thickened, reddened areas around the face and genitals to multiple hyperkeratotic papular thickenings that are elevated, flattened and firm or a single tumorous mass (Herman and Reilly, 1955; Hirth *et al*, 1969; Kilham, 1955; Wolf, 1987-1990) (Figures 1 and 2). Fibromas resembling Shope's rabbit fibroma also occur. Cross neutralization of the squirrel fibroma virus and Shope rabbit fibroma virus provides further immunological evidence that these two viruses are antigenically related or similar (Banfield and Kasnic, 1971; Kilham *et al*, 1953). Generalized disease can occur and often presents with anorexia, lethargy,



Figure 1: An Eastern Gray Squirrel with typical facial lesions; raised crusty areas are evident with marked thickening of the epidermis around the eyes and pinna.

and respiratory difficulty (Kilham, 1955; Wolf, 1987-90).

In the early stages of the disease, differential diagnoses include ectoparasitic infection (primarily notoedric mange) (Kreeger and Schlotthauer, 1983), ringworm, other skin neoplasias (Herman and Reilly, 1955), and local or generalized bacterial infections (Hirth *et al*, 1969; Wolf, 1987-90).

Diagnosis

Histopathological examination of the skin nodules will generally confirm a diagnosis of squirrel fibromatosis. The nodules are characterized by hyperkeratosis, acanthosis, and proliferation of the epidermis. Eosinophilic intracytoplasmic inclusion bodies characteristic of poxvirus are typically observed (Figure 3). Inclusion bodies are also observed in the epithelium of hair follicles. The dermis can be heavily infiltrated by lymphocytes, plasma cells, neutrophils, and macrophages. Fibroma cells may also be seen around the blood vessels (Hirth *et al*, 1969; Kilham, 1953; Wolf, 1987-90).

Acute pulmonary edema may be present (Wolf, 1987-90). Pulmonary adenomatosis-like lesions thought to be causally related to squirrel fibromatosis virus may also be present. These lesions are characterized by cells lining the pulmonary alveoli with large eosinophilic intracytoplasmic inclusion bodies (Kirschstein *et al*, 1958). Squirrel fibroma virus has been recovered from these lesions (Kirschstein *ibid.*)

To prepare tissues for microscopic examination, the tissue should be fixed in a buffered 10% formalin solution, with a ratio of 10 parts formalin to one part submitted tissue.

Electron microscopy can identify pox virus particles (Figure 4). Portions of epidermal exudate from the lesions can reveal orthopox-like particles upon examination by electron microscopy utilizing negative staining techniques (Wolf, 1987-90).

Treatment

There is no definitive treatment for animals with squirrel fibromatosis. As with any viral etiology, supportive measures (fluids and antibiotic therapy for secondary infections) are the only "treatment" available. It has been shown that adults are more resistant to the virus and that lesions may regress.

Discussion

Squirrels affected with squirrel fibromatosis are often admitted into wildlife rehabilitation centers. The Wildlife Rehabilitation Clinic at the University of Minnesota admitted 18 cases of diagnostically-confirmed squirrel fibromatosis in gray squirrels from May 1987 to September 1990. Even with supportive therapy



Figure 2: An Eastern Gray Squirrel showing typical genital and extremity lesions of hyperkeratotic and papular thickenings of the skin along with distinct fibromatous nodules.

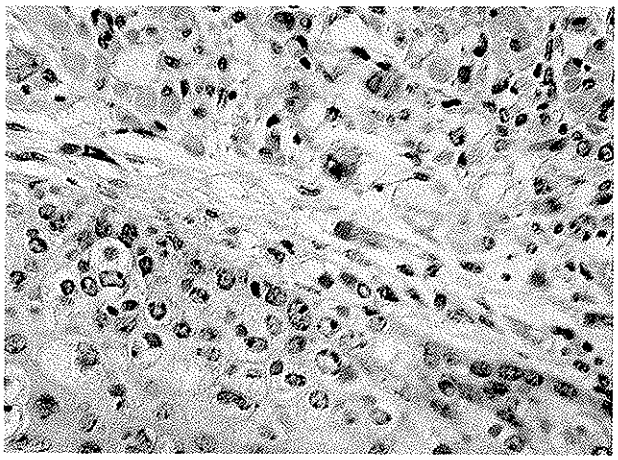


Figure 3: Photomicrograph of cutaneous nodule showing severe hyperkeratosis and acanthosis and numerous eosinophilic intracytoplasmic inclusion bodies typical of pox virus.

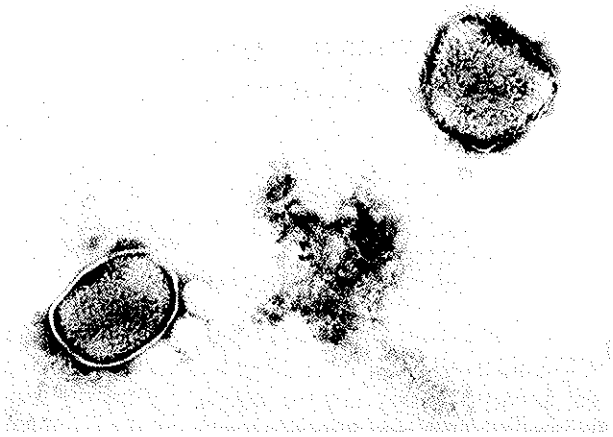


Figure 4: Pox virus particles observed upon examination by electron microscopy. Specimen obtained from epidermal exudate from lesions of adult eastern gray squirrel.

and various antibiotic therapy regimens, 16 of the 18 cases (12 juveniles and 4 adults) developed severe lethargy, anorexia, and severe respiratory complications, most likely due to multiple lung lesions from the fibroma virus. Four of these animals died and 12 were euthanized. The two remaining cases (1 juvenile and 1 adult) were euthanized prior to such complications arising (Wolf, 1987-90).

It is important for rehabilitators to be aware of the clinical signs of the disease and the potential of the disease to be transmitted through a population. The prognosis for recovery/remission is poor. Diagnosis of squirrel fibromatosis and humane euthanasia can avoid prolonged suffering of the individual animal and the transmission of the disease to others.

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All photographs courtesy of L. Wolf, 1987-1990.

How Emaciated is that Brown Pelican?

Laura B. Quinn
Mary Ann Buczek
Florida Keys Wildbird Rehabilitation Center
93600 Overseas Highway
Tavernier, Florida 33070

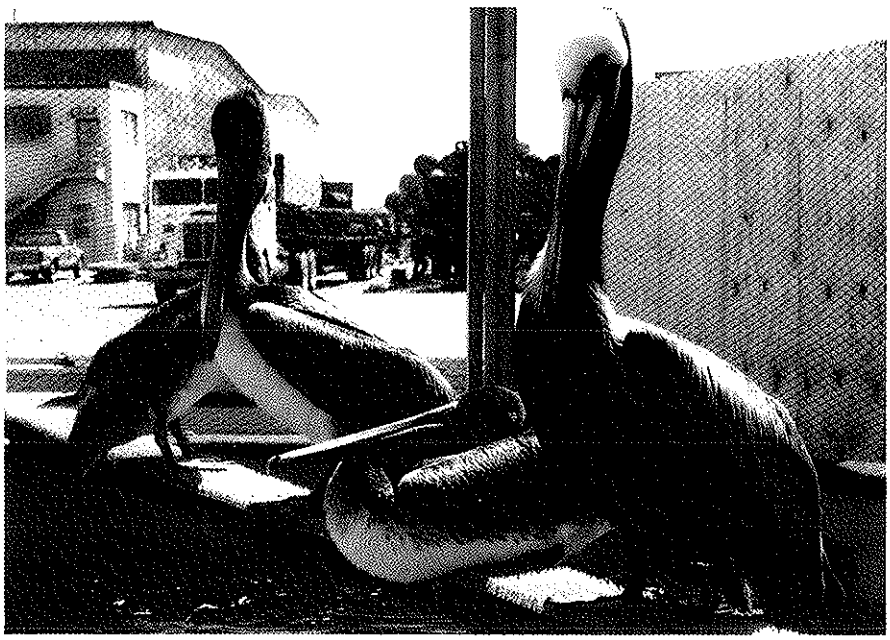
Introduction

In mid-winter, the rush of Florida's "pelican season" is in full force. Daily, one or more Brown Pelicans are received with varying injuries and in various stages of emaciation. After an initial examination, the next question often is "How emaciated is that pelican?" To determine this, several steps must be taken.

Measurements

First, the beak must be measured (see Fig.1). It determines the sex of the bird (males tend to be larger) (Palmer, 1962) and, reportedly, there exists a direct correspondence between the size (and thus normal weight) of the bird and the length of the beak. The bird is weighed and this weight is compared to the "normal" weights listed in Dunning (Dunning, 1984). We also palpate the breast bone; though this is not always an accurate measure of emaciation because of the subcutaneous air sacs or air spaces which, in the pelican, cover the entire breast area, it is good supplemental information. Finally, some quick arithmetic gives us the percentage of weight by which the bird is below normal, if any. All of this is somewhat time-consuming and not always accurate, so an attempt was made to simplify matters.

Utilizing the beak to weight relationship, 56 Florida Brown Pelicans were weighed on intake and release (or death) and their beaks measured. A linear regression and correlation was then computed between intake weight and beak length, and release weight and beak leangth. These regression lines are shown on Figures 2 and 3. The release line establishes normal weights +/- one standard deviation. This line falls within the published Dunning weight ranges. It was then calculated that the weights on the intake line were approximately 80% of release weights. This led to the conclusion that birds whose beak length/weight relationship placed them below the intake line would be more than 20% emaciated. These birds fall into the Class 2 emaciation category (see Fig. 2 and White, 1988). The line representing deceased birds falls into Class 3



Brown Pelicans awaiting release in Long Beach, California. Photo by J. White.

(McSweeney, 1984; White 1988).

McSweeney measured 14 Brown Pelicans (Florida subspecies) and determined sex by necropsy. She found beak lengths of female pelicans to be from 28.7 cm (11.25") to 29.9 cm (11.75") and that of males to be from 31.4 cm (12.25") to 33.7 cm (13.4"). These findings corroborate our graphs. For example, a bird weighing 5.5 pounds on arrival would be "low normal" (and probably female) if its beak was 10.5" long; however, if it had a 13" beak, it would be a severely emaciated male. Alternatively, a bird weighing 6 pounds would be a low normal female if its beak was 11" long, but a moderately emaciated male if its beak was 12" long. California subspecies Brown Pelicans are typically larger (Palmer, 1962).

Conclusion

Of course, determining an immediate treatment plan is not the only use for this chart. As most surgery must be postponed until the bird is stabilized, these charts have also been found useful in determining when a bird might be a safe surgical candidate. It is hoped that these findings will give other rehabilitators a quick and effective way to determine into which class of emaciation a newly-received Pelican might fall, so that recovery of the birds will be facilitated.

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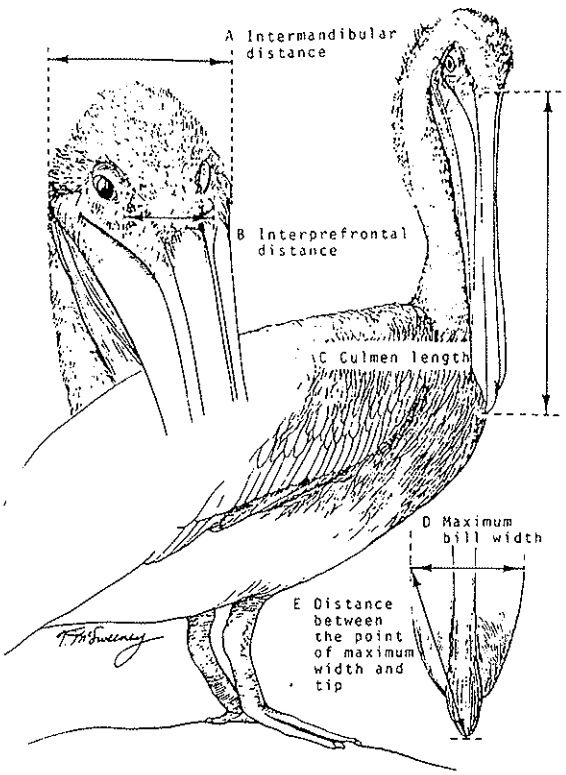
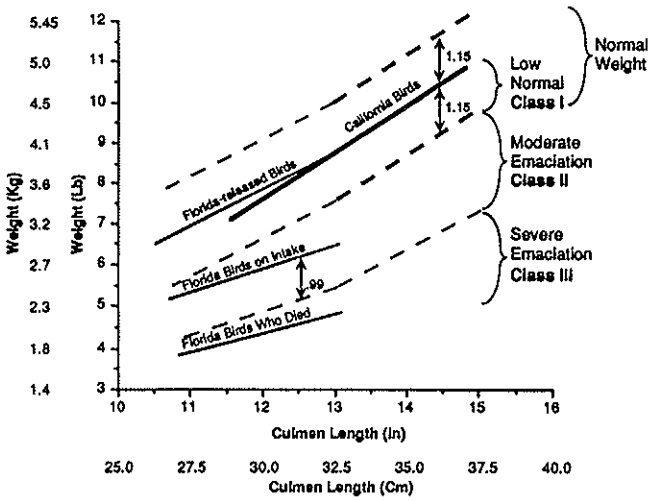


Fig. 1 Drawing of how to measure the Culmen. Artwork by T. McSweeney.



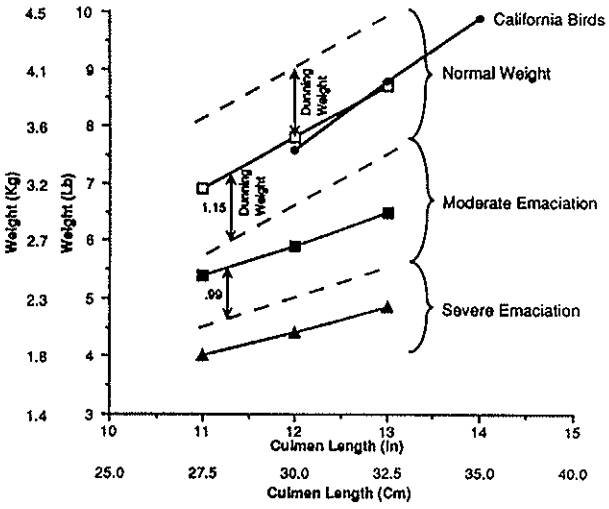


Fig. 2. Metric and English axis graph of weight/culmen points of Brown Pelicans on intake, at death or upon release.

Editorial Continued. . .

to once we have met our basic standards criteria. This is the "state of the art" type program where we measure ourselves against the best there is anywhere. And this summer, the "Heartless Taskmaster" will be again calling on "The Thankless Drudges" (who have grown in number) to repeat their astounding feat and come up with yet another set of standards!

Now some readers may find all of this work mildly fascinating and if you do, boy have I got a job for you. The committee has a good nucleus, but can always put to work additional helping hands—as you can plainly see, we have a rather large task at hand. Further, if anyone has any ideas on how we can get the program funded nationally—I want you to call or write me! We will spend the rest of 1991 quietly putting the nuts and bolts together and in 1992, we hope to have a document available for review and comment by our peers.

-Jan White-

WANTED

Original Art Work

We are in need of original wildlife drawings and photographs to be used in our publications. If you or someone you know would be interested in donating some of your work to us, please submit the drawings or photos to us at:

IWRC
4437 Central Pl. Ste. B-4
Suisun, Ca. 94585

All artists will be given proper credit for any of their contributions that are used.

Letters To the Editor. . .

Dear Editor:

Is there someone in your organization who has had experience with nestling Horned Larks? If so, can you give me some good points on raising them?

Please do not send me general information on "song birds" or "similar species" as I have successfully raised many different species for many years. But, for some reason, have very poor success with these particular babies.

I will appreciate any information you can send on the subject.

Sincerely,
Lois Layton
P.O. Box 2851
Casper ,WY 82602

Dear Lois:

We tried to come up with information but came up short. So as per our correspondence, we decided to publish your letter in the Wildlife Journal in the hope that someone out there can help you. Additionally, if you find someone who has done enough of these Horned Larks, I would like to contact them about writing a "Rehab Notes" article for everyone to learn from. Good luck—let us know what happens!

Dear Editor:

In regard to your editorial in Vol. 12, No. 4," 1990—A year to Examine Wildlife Rehabilitation Ethics," I wanted to say I thought it was a good article. I seem to encounter lots of "Dr. Walkers" throughout the year. Also vets who have never handled birds, some who don't even know anything about their anatomy, and these vets proceed to treat fractures and administer drugs to birds, often with disastrous results. I hope we can work on this issue further.

Bea Orendorff

Dear Bea:

I always like to hear back on my editorials. They are a reflection of the challenges that confront the leaders in our field and I know the issues cut deep amongst wildlife rehabilitators—sometimes in both directions. Thanks for the note!

Dear IWRC:

Thank you for forwarding a copy of the Fall 1990 issue of the Wildlife Journal. A lot of work obviously went into this, and it looks as though it will be an extremely useful tool. Your organization is to be credited for helping "share the knowledge," and we are glad to have been a part of it.

Sincerely,
Otto Harrison
General Manager,Exxon Company, USA

Editors Note: Exxon gave IWRC an unconditional grant to dedicate a special issue of the Wildlife Journal to the lessons learned in recent oil spills. We sent them a copy of the finished product. We are glad they liked it and also hope that wildlife rehabilitators find it useful.

Letters Continued . .

Dear Editor:

I am a volunteer with Project Wildlife, a wildlife rescue group based in San Diego. I have been raising hummingbirds for seven years and am currently the hummingbird team leader. Project Wildlife takes in about 150-200 hummingbirds a year and releases about 60% Part of our failed 40% includes injuries and "newborns."

Previously volunteers have tried diets based on Similac™ (which works well on birds that are 8 days or older); Nectar Plus™ (a commercial product used by zoos); a diet of mainly flies has been tried and a commercial diet produced for hummingbirds by Roudybush. The "newborns" just do not thrive to get normal feather growth when fed these formulas.

After years of frustration trying to raise releasable "newborn" hummingbirds (yellow bills, under 7 days of age) I have finally reached a degree of success with the last 9 out of 10. In an attempt to duplicate an insect diet high in protein, easily digestible, and readily available, I fed black worms (they are thin like pencil lead and 1-1/2 inches in length) to the ten newborns. They were rinsed, drained and drawn up into a 1cc syringe and administered using the plastic cover of an 18 gauge 44 mm IV catheter placement unit (Jelco™). They were given .05cc per feeding which could take up to 3 hours to digest in the 2-3 day old nestlings. "Newborns" are prone to dehydration so they were given .05cc Gatoraide™ when they awoke and before they went to sleep at night.

When their pinfeathers were well established they were gradually put on the Similac™ formula (1 tbs. Similac powder (low iron), 2 tbs. sugar, 1 tsp. high quality fish food flakes with 1/2 cup water).

The 4 and 5 day old nestlings developed perfectly and were released on schedule. The 2 and 3 day olds developed perfectly also, but needed much more time to grow. The timetable broke down like this:

Development	**8 days and older DAYS IN CAPTIVITY**	**3 days and under DAYS IN CAPTIVITY**
Yellow to black bills	7 days	7 days
Pin feathers begin	7 days	12 days
Flapping their wings	10 days	17 days
Primaries begin to open	12 days	21 days
Eyes completely open	12-14 days	21 days
Feathers on all areas	18 days	33 days
Fully fledged	21-22	39 days

They needed more time in the aviary, but when they could compete with the other babies they were released at 10 weeks of age.

I also found that newborn babies need to be stimulated to defecate. This is done by GENTLY pushing from the mid-abdomen to the vent on all sides. Needless to say if they are pushed too hard they may die, and often after stimulation they go into shock for 10-15 minutes. This is a necessary evil until approximately day 5, when they do this naturally.

"Newborns" should not be given sugar water; this causes gas and they will die within a day or two. The only other qualification for this diet to work is that the babies must be in perfect condition (cut from the tree, not fallen).

If you would like to try this diet, write me with the results. I will be happy to answer any queries.

Jackie Flesch,Project Wildlife
10548 Avenida Magnifica, San Diego, CA 92131

Dear Jackie:

I hope you get some feedback. I think you realize that 9 out of 10 survival rate is good—but will probably take on a more realistic look when you have a years worth of birds behind you. By the way, if 9 out of 10 did well, why do you qualify against birds that fall from the trees, did the only one to die fall? With only one fatality, can you really draw that conclusion?

I noticed that you categorized the 40% as a "failed" group. Listen, if you save 60% of 200 hummingbirds in your program—believe me it is a success. Injured hummingbirds are the pits to rehabilitate.

I am concerned when you say that the birds go into "shock" when stimulated. Shock is a serious medical problem. Either the birds don't go into shock (physiologically) or there is something there that needs to be further explored.

I think the "black worms" you describe are called "sewer worms or Tubeflex worms" in my area. They are quite attractive to many tiny precocial birds (e.g., killdeer, pheasant, etc.) that we haved raised. However, I have not used them exclusively as a diet. Also, remember that birds not receiving natural sunlight need vitamin D_3 in their diet.

Any diets being used, and especially being recommended to others as you are doing, should be minimally analyzed for protein content, Ca:P ratio, energy, carbohydrate, and fat levels. To be complete, vitamins and other trace minerals should be reviewed. I would recommend that you contact Ann Brice at the University of California, Avian Sciences, who has done research on the nutritional requirements of growing hummingbirds and compare your analyzed diet with what is known about these creatures. Good luck to you!

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"Handle with Care"

October 17-20th, 1991

The Coast Plaza at Stanley Park
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IWRC will be holding its annual conference at its first international site this year in beautiful Vancouver, British Columbia. Our hotel is the Coast Plaza at Stanley Park-located in downtown Vancouver for the convenience of shopping and sightseeing while on the edge of a lovely park where we can enjoy the wildlife. Conferees will be able to dine in any of thirty nearby restaurants, visit the aquarium or zoo, or go on field trips in the area. Come early and take a basic skills seminar or see the local sights. This is a lovely site for a working fall vacation. Come network and share the knowlege with IWRC!

Scheduled Topics and Speakers

General Topics:

Public Speaking for the Rehabber• Alyssa Ottomeier, Corvallis, OR
The Role of Home Care in Wildlife Rehabilitation• Marnie Allbritten, Roseburg, OR
Wildlife Restraint & Handling Techniques•Loretta Simonds, Antrim, NH
Release Criteria for Rehabilitated Wild Animals • Cheryl Stokhaug, Milwaukee, WI
Codependence: An Issue for Wildlife Rehabilitators•Ira Slotkin, MSW, Austin, TX
Grief Issues in Wildlife Rehabilitation•Ira Slotkin, MSW, Austin, TX
Wildlife in Distress: Educational Programs of the 90's•Walter Crawford, Eureka, MO
How to Give Effective Educational Wildlife Programs• Marjorie Gibson, Antigo, WI



Avian Topics:

Care of Rails, Coots, Plovers, and Sandpipers• Meryl Faulkner, La Jolla CA
Intensive Care Techniques (with emphasis on waterfowl)•Anne McDonald, DVM, Vancouver, BC
Aspergillosis in a Rufous Hummingbird Colony• Chris Harvey-Clark, DVM, Vancouver, BC
Artificial Incubation & Handrearing of Raptors•Walter Crawford, Eureka, MO
Rehabilitation of Orphaned Raptors: The Fostering Alternative•Brian Woodridge, Macdoel, CA
Rescuing Trapped Raptors in Large Structures•Anne Miller, Birmingham, AL
Preliminary Investigation into the Diseases of Bald Eagles of British Columbia•Ken Langelier, DVM
Nutrition in Raptors•Kathy Hobson, San Francisco, CA
Handrearing the Orphan Kingfisher•Loretta Simonds, Antrim, NH
Physical Examination of Song Birds• Juanita Heinemann, Belmont, CA
Oiled Bird Rehabilitation Update• Jay Holcomb, Berkeley, CA
Emaciation and How to Deal with it• Louise Shimmel/ Jan White, DVM, Eugene, OR/Berkeley, CA

Mammal Topics:

The Role of Research in Bottle-raising Orphaned Wildlife•Charles Robbins, Pullman, WA
Mammal Rehabilitation: Nutritional Aspects•Beverly Matone-Mathison, Dover, DE
Care & Physical Therapy of Injured Bats•Karen Yaremkowych, Milwaukee, WI
Harbor Seal Pup Rehabilitation Program•Laurence Braun, DVM/Bob Kingston, Vancouver, BC
Emergency Care of Newborn Seals and Sea Lions•Jessica Porter, DVM, Friday Harbor, WA
Rehabilitation of the Coyote•Jeanne Wasserman, Lynnwood, WA
Rehabilitation of Sea Otters• Julie Hymer, Monterey, CA

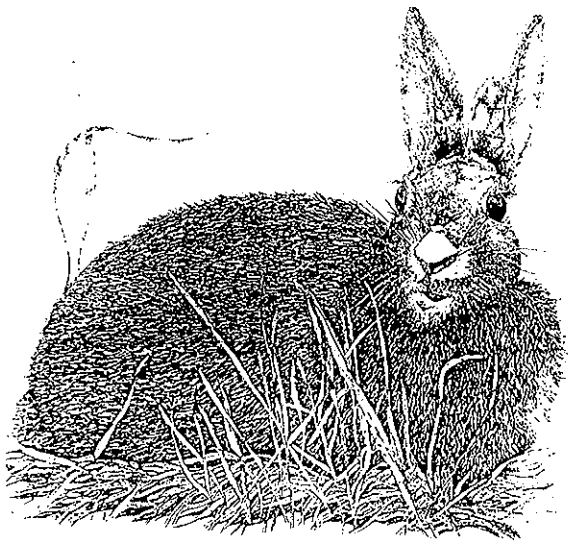
And that's not all! We are planning panel discussions on Lyme Disease, Fund-raising for Small Organizations, Environmental Release Concerns, New Products in Wildlife Care, Caging Alternatives: the good, the bad and the ugly!, Volunteer Burnout, and Conflict Resolution. We also are planning a special hands-on laboratory session on Hematology with Vickie Joesph, DVM of the California Veterinary Diagnostics Laboratory. Final Program details are still being arranged and there is more to come! We hope to see everyone there!

Plan to join us in our first international conference! Conference registration forms will be mailed to IWRC members in July. For more information, call the IWRC office at (707) 864-1761 during business hours (P.S.T.).

IWRC Presents:

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Proceedings of the 1990
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Papers included in this latest IWRC publication include: Conservation - Keeping it in Perspective by Richard Block, A Tenderness Towards All Creatures: Paradoxes and Portents in Wildlife Rehabilitation by John E. Cooper, DTVM, MRCPath, FlBiol, FRCVS Care of Hedgehogs by Les Stocker, Rehabilitation and Release of White-Tailed Deer at the Chesapeake by Wildlife Sanctuary by Michele Paquin, Rehabilitation of the Northern American Raccoon *(Procyon Lotor)* by Jeanne A. Wasserman, Basic Procedures For Raising Baby Opossums by Janice Hughlett, Life Balance and Stress Management For Rehabilitation Professionals by Ellen Kean Rudolph, Electrocution and High Wire Accidents in Birds by Douglas R. Yearout, DVM Evidence Preparation, The Case of Cruelty to Animals vs. Proper Rehab Care by Lisa Gibson, Hand-Rearing Orphaned Eastern Cottontails *(Sylvilagus Floridanus)* by Anne M. Hiss, About Tree Squirrels by Jennifer Simmons, Avian Rehabilitation: Nutritional Aspect by Beverly A. Mathison, Rehabilitation of Tree Squirrelsby P.C. Hanes and Jennifer Simmons, Fox Rehabilitation by P.C. Hanes, Wildlife Telemetry by John Hadidian, Urban Wildlife Solutions by John Hadidian and Guy Hodge.

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