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REHABILITATION WILDLIFE COUNCIL

WILDLIFE JOURNAL

Journal of the Wildlife Rehabilitation Council Winter 1984



Keeping Fawns "Wild" . . . page 5

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1. Submissions should be typed and double-spaced, with 1 inch margins.
2. Full length articles run between 1500 and 2500 words.
3. Fillers and short articles run between 500 and 1500 words.
4. The writer's name and address and organization should be typed on the first page, and name and page number should appear on all consecutive pages.
5. It is the writer's obligation to obtain permission or reprint rights if submitted copy has been published elsewhere.
6. Provide a stamped, self-addressed envelope if you wish manuscript and/or photos returned.
7. We accept black and white glossy photos only, preferably 8 × 10.
8. We pay $25 for any feature article accepted; $5 for any fillers and "Handy Hints" under 500 words.

Articles should be mailed to: Editor, WRC Journal, P.O. Box 3007, Walnut Creek, California 94598.

REHABILITATION WILDLIFE COUNCIL

WILDLIFE JOURNAL

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Cover Photo by Susan B. Kelly

*This article is available as a reprint.

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EDITORIAL . . .

Reflecting Back on 1984 Accomplishments

The finish of another year brings to mind my annual review of what we accomplished this year and what our goals were. They are never quite the same because this new and growing field of wildlife rehabilitation has seemingly endless amounts of work that need to be done in order to grow into the profession that we hope it will eventually become.

We have endeavored to make the *Wildlife Journal* a publication full of useful and current information for rehabilitators who are new as well as the more experienced people. It is not always an easy task. We need more input from our members about what information they need to perform their tasks. Many who have much to offer are too modest to contribute what they have learned. We try to actively seek out such people and encourage them to contribute, realizing that there are many of you out there that we are unaware of. Don't be so shy, call or write us with your ideas or articles. We can help you put them into a format and context that can be used in the *Journal.*

We have made many of our articles available as reprints. If you are teaching a class, contact us about the possibility of bulk rates for our Rehabilitation Notes. We would like to see the information used widely in the field.

We have worked hard this year to further develop our growing skills seminar curriculum as a part of our commitment to providing standardized training under supervision for wildlife rehabilitators. In fact, much of the writing energy of WRC has been directed towards the creation of the packets that are the required reading for those classes. This year, for the first time, we offered the Basic Wildlife Rehabilitation 1AB series which included nearly 80 pages of information and two sets of homework. Additionally, we required each participant to demonstrate the skills taught in the laboratory as a prerequisite to sit for the first ever basic competency examination. We put together what we feel is a good exam and gave it during the second laboratory. We received positive feed back from participants and laments from people who could not come to Northern California to participate.

In response, we offered the demonstration skills lab and exam at our February conference to allow people with some experience to be certified in the Basic class. We are also offering the Basic class in other states as interest is generated. It takes about thirty people and one person to act as liaison-coordinator. Contact WRC if your organization is interested.

"Jobline", which is a listing of current opportunities for training or jobs in wildlife rehabilitation, was added to the *Wildlife Journal* this year as a service to members. We wish to encourage internships wherever possible because they allow more opportunities for supervised learning in this field. Be sure to send us your announcement. This service is a free way of widening your recruitment efforts. We get letters consistently asking for such opportunities.

We have continued in our joint efforts with NWRA to establish a national standards and accreditations program. During the year a joint committee has put together a first draft of standards and plans to present a second draft to both the boards of the Wildlife Rehabilitation Council and the National Wildlife Rehabilitator's Association early in 1985 for approval. This program would assist centers, organizations, and individuals in a rigorous self-examination of their program efforts in comparison to the minimum standards established by both organizations. It would be a way of providing technical assistance for new programs as well as comprehensive review for more established ones. It will, like other similar programs in other fields, have a written component as well as an on-site visitation and review. We have hopes that the program will be completed in 1985. When it is complete, it will be ready to go and provide yet more service to the members of both organizations.

Our Hotline service has gained favor with our members and been increasingly used this year. It is a new service that is still under utilized by the membership. The calls are always interesting and usually we are able to give an answer or suggestion to the caller. If you need our help, call the Hotline.

(continued on pg. 13)

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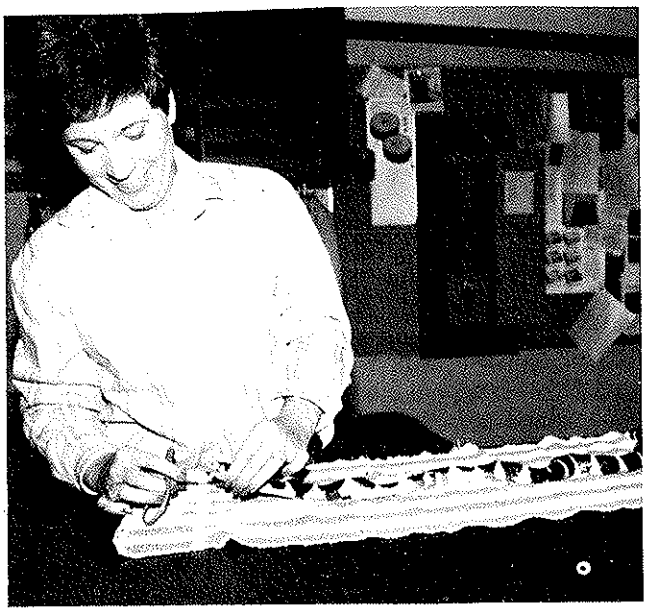
WRC Sets Up First Skills Class Exam and Certification

Photographs by Jan White

In response to a growing need in the field of Wildlife Rehabilitation, WRC has established the first wildlife care skills classes complete with skills testing and certification. Over the years, people around the world have looked to WRC to set the standards in wildlife care and training. While we began offering advanced skills training over three years ago, the basic wildlife care class evolved due to the non-uniformity of skills taught in the many organizational basic classes. Participants enrolling in the advanced classes had varying levels of skills making these classes difficult to gear so that everyone understood them and yet no one found them repetitious or basic in nature.

The scope of the class includes all of the basic skills that WRC feels are important for a wildlife rehabilitator to know. The class gives participants an opportunity to learn these skills under supervision and to demonstrate competency by completing a closed-book examination.

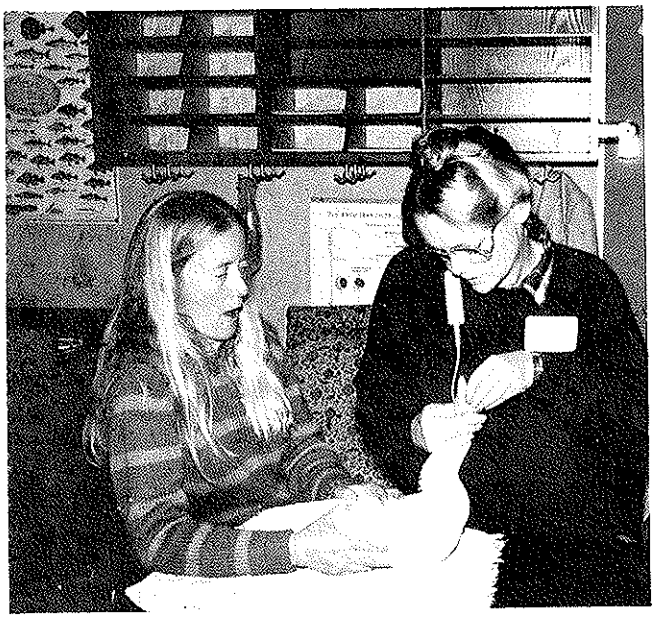
Class materials were sent out for advance study. The packet covered these topics: basic physiology, intake procedures, restraint, thermo-regulation, stress, initial



Participant Ann Mayer inserts a gavage tube into a King Snake in preparation for gavage.



Sue Moffat gives an IM injection to a pigeon under the supervision of lab instructor Dara Nance, A.H.T.



Class instructor Jan White observed the gavage feeding of a domestic duck by Carol Blalock.

examination, shock, routes of administration for medications, types of fluids and their uses, nutrition, metabolic bond disease, emaciation and feeding regimen, gavage, caging, zoonoses, and release criteria. Participants were assigned two sets of homework. One set taught them the factor label method used in calculating drug dosages. The other set taught them the basics of breaking down wildlife diets in terms of protein, fats, carbohydrates, and caloric content.

The class includes four hours of lecture and discussion during which many of these topics are illustrated. Two laboratory sessions were held providing six additional hours of experience. One of the labs focused on skills that all rehabilitators should have. All participants were required to demonstrate during the labs competency in the following tasks in order to sit for the basic wildlife care examination. These tasks were: use of the gram scale, restraint and handling, intramuscular injections in birds, reptiles, and mammals, oral medications in birds, application of a Robert-Jones bandage in mammals and a basic wing wrap in birds. Additionally, each group of students performed a basic physical examination on a bird and mammal. The other laboratory session covered anatomy of birds with students dissecting a latex-injected pigeon to identify organs, vasculature, and other major structures.

Participants took a basic examination that covered the topics that were in the assigned reading, homework, and skills covered in the laboratory. Emphasis was placed on concepts of good care, handler safety, and the processes taught that enable students to apply their knowledge to their work.

We were amazed at the response from members when we offered the first class in October 1984. We have subsequently planned to include this class in our national wildlife conference in February. Additionally, the class will be made available in other areas of the United States as interest among wildlife rehabilitators dictates. Contact WRC for more information.□



Participant Donna Burt applies a basic wing wrap to a pigeon under the supervision of Kathy Hobson, one of four lab instructors.



A Robert-Jones bandage in the making on the leg of a domestic rabbit.



Participant Joan King applies a basic figure eight wrap on the wing of a captive pigeon.

Raising White-tailed Fawns "Wild"

Mary C. Forness
Hawk Hideaway Wildlife Rehabilitation Center
Cuba, New York

INTRODUCTION

Hawk Hideaway Wildlife Rehabilitation Center (HHWRC) undertook the challenge of raising White-tailed Deer fawns in a "wild" state after the news media photographed some fawns being "kissed goodbye" by people who raised them, as well as numerous feature stories on fawns being raised inside homes where they were in constant contact with dogs and people. As rehabilitators, we know these fawns were definitely tamed, unafraid of domestic animals, and therefore unreleasable. Such fawns may not recognize natural browse items or predators, and if released, they are at a disadvantage in terms of survival as well as a potential human health hazzard. In New York State's region nine alone, Hawk Hideaway has numerous documented records on file concerning human injuries resulting from deer raised and tamed in captivity.

In order to develop the proper methodology to raise fawns with minimal human contact, a four-year program was undertaken by HHWRC in 1979, with special permission from the New York State Department of Environmental Conservation. This paper will review briefly the progress of the four year program.

FAWN CLASSIFICATIONS

White-tailed Deer fawns encountered at Hawk Hideaway can generally be place into one of three categories: Type A, Type B, and Type C. These categories refer to the manner in which the animals were obtained.

Type A: Injured Fawn

These fawns have been injured by collision with a vehicle, attacked by dogs, or any natural accidents. Such cases require immediate clinical examination, diagnosis and treatment by a veterinarian. Keep in mind that as in all wildlife rehabilitation, there are cases when the most humane treatment is euthanasia.

If the fawn's prognosis is good, isolate it in a heavy gauge cardboard box with straw bedding. The box should measure about 3' x 3' x 3' high. Place it in a quiet, warm, semi-dark environment until stable. When stable and able to compete with other fawns, move to the fawn compound.

Type B: Orphaned or Not?

These are the individuals picked up in the woods or along the road by well-meaning but uninformed people believing the fawn is abandoned or orphaned because no doe is present. If a fawn is brought to our center the same day it is found, it is immediately returned to the same location and observed from afar. Many individuals have subsequently been reunited with the doe. Many calls are received at Hawk Hideaway from the general public describing a fawn near their home or in a field. Some fawns lying quietly while others are calling. The concerned public is advised to keep all dogs inside, be patient and observe the animal until dusk and/or the following morning. In all but a few cases, the fawns have been observed following the doe, or being called by the doe.

Type B fawns are usually very wild and hyperactive, but generally in good health. In most cases, they will not readily nurse. If they are uninjured, they are placed in the fawn compound as soon as they arrive.

Type C: Confiscated

These individuals are being raised illegally and are confiscated by law enforcement agents. Type C fawns usually arrive in a dehydrated condition with diarrhea as a result of undesirable formulae and/or overfeeding. They will ususally nurse readily. Depending on the severity of the diarrhea, they can be switched to any electrolyte solution and then put onto appropriate formula when the condition subsides (24 hours). In less severe cases the deer can be fed the appropriate formula upon arrival in small amounts (no more than two ounces irrespective of fawn size) every four hours. If diarrhea has not abated in 24 hours, a veterinarian is consulted for further veterinary intervention. During this period of time the fawn is kept in an isolation box as described previously under Type A. When recovered and showing normal feces, the fawn is placed into the fawn compound. Note: feces of fawns on formula will be pasty and are often a yellowish brown color. As they begin to eat browse, their droppings turn darker brown and make well formed balls of various sizes. Before individual fawns are placed into the compound, care is taken to see that they are urinating on their own. If not, they are stimulated with a warm, moist towel after feeding.

FEEDING AND WEANING

Formulae

Two formulae have been used successfully at Hawk Hideaway Wildlife Rehabilitation Center. They are:

Modified Bogue Formula: 1 cup calf manna
2 pints heavy whipping cream
1 quart homogenized milk (not low fat)

Foremost Doe Replacer: Commercially prepared

The Modified Bogue Formula has been modified for use in White-tailed Deer and should not be used for other types of deer. The ingredients can be purchased at the grocery store and feed store (calf manna). Place all ingredients in a large kettle and bring to a rolling boil, stirring constantly. Let boil for about 5 seconds, then remove from the burner. Cool by placing the kettle in cold water bath with ice cubes. Stir while cooling. When cooled, run through the blender until mixed well; 3-4 minutes, or longer if necessary. Store in the refrigerator. The formula will keep for three days. Formula should be presented to the fawns at room temperature or warmed. The formula will settle and must be shaken well before use.

Additionally, we use a vitamin-mineral supplement made for mammals during the first feeding of the day. Dosages used are on the label.

Doe Milk Replacer is produced by Foremost-McKesson. It was formulated for Black-tailed Deer and already contains vitamins. Simply mix one cup of the powder to 22 ounces of warm water. Best results are obtained by the use of a blender. The formula will keep for three days when hydrated although lesser amounts can be mixed by reducing the amount of powder and water proportionately. It is best to make up one day's feeding at a time. The powder will keep well in a dry place and can be kept in the freezer until the next season.

Doe Milk Replacer may be ordered from Foremost-McKesson, Inc., Crocker Plaza, One Post St., San Francisco, CA 94104. Experimental Doe Milk Replacer, Project #1878-RI, comes in fifty pound boxes. The price in 1984 was $1.58 per pound ($78.75 per 50# bag) plus shipping. The price may vary. Shipping costs vary depending on how far the destination.

As a comparison, the Modified Bogue Formula was used the first and second years of the program while the Foremost Doe Milk Replacer was used the third and fourth years. The Doe Milk Replacer was not only easier to prepare and saved time, but produced growth rates faster than the Modified Bogue Formula. However, both groups of fawns were approximately the same size at the time of release.

Bottles and Nipples

Best results were obtained by utilizing *used* regular baby nipples and bottles. When new nipples were purchased, they were boiled for ten to fifteen minutes after splitting the top to soften their textures. Bottles and nipples were washed and sterilized daily.

Feeding Methods

A life-sized doe shape was cut out of exterior plywood and painted with acrylic artist paints to simulate the colors of a doe (Figure 1). Although it was by no means a work of art, everyone viewing it had no problem identifying it as a female White-tailed Deer. A twelve inch square of exterior plywood was cut and four holes three inches in diameter were drilled in the bottom. A two inch edge was placed around the square. This square ledge was then attached to the wooden doe in the area where the teats would be. The entire structure was then supported and attached to an inside wall of the compound. A small opening was cut out of the stockade fence directly behind the square ledge. This was hinged and made into a door, complete with latch and padlock.

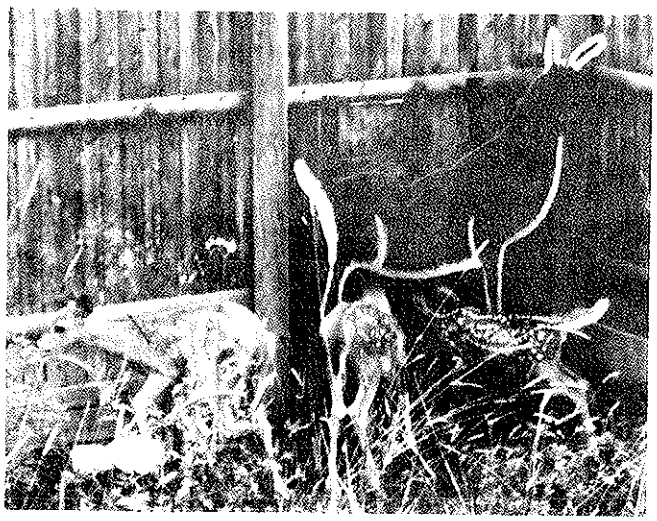
At feeding time the small door was opened and four bottles of formula were placed upside-down, one in each of the holes. Then the door was closed and latched. As the bottles were emptied they were replaced with full ones until the feeding session ended. The more aggressive fawns would nurse first, followed by the remaining individuals. Care was taken to make sure all fawns had the opportunity to nurse a full measure.



Feeding Schedule

During the first two weeks fawns were fed four ounces of formula four times daily. Increases in the amounts fed were made in accordance with the fawn's growth and demand, until a full measure of 16 ounces is given each feeding. At about four weeks the fawns should receive only three feeding per day. At about the fifth or sixth week the fawns may refuse a feeding by showing little or no interest in the bottles. This behavior may occur at the last feeding of the day. One week later, another feeding (usually at noon) is deleted.

(continued on page 11)



Rehabilitation Notes: North American Barn Owl *(Tyto alba pratincola)*

Jan White, Editor

INTRODUCTION

The North American Barn Owl is the only member of the family Tytonidae found in the United States. The Latin name alba describes their white colored ventral side while *pratincola* is derived from *pratum* meaning meadow and *incola* meaning inhabitant. Their distinctive features make them easy to differentiate from other owls. They have a heart-shaped face disc, elongated bills, small uniformly dark eyes, and lack ear tuffs. The inner edge of their middle toe is pectinated or has a serrated edge.

These birds have been described as cosmopolitan because they are likely to roost or nest in human structures and can be found in cities. They may roost in groups, sometimes up to 50 birds in the same general area. Sites utilized by these birds include: old buildings, mines, caves, burrows, tree hollows, and barn lofts.

The range of the North American Barn Owl is between latitudes 40° N and 40° S of the equator. They are rarely found outside of tropical regions and are susceptible to cold snaps, which can result in fatalities.

These beautiful birds are often presented to wildlife rehabilitators after being hit by an automobile. While it is known that their prey species do occur along roads, it is not altogether clear why they are so frequently the victims of the automobile.

Characteristic behavior of this species includes "toe-dusting". They move their heads back and forth over their toes, hissing and sometimes clacking. This behavior is seen in Barn Owls as young as 22 days old. This is used as a warning to approaching intruders.

Favored habitat for this species is open country where rodents abound. They are not prone to woodlands. Cities are utilized where ample food sources are available.

DESCRIPTION:

- *Adult:* Total length 14-20" (35.5-50.8 cm) with a wing span of 43-47" (109-119.3 cm). These birds tend to be whitish below, rusty buff above with black speckles. There is considerable variation between birds, some are much darker than others. Their facial disc is white and heart-shaped. They are rather slim owls with long pointed wings, feathered legs, and long claws. While the sexes are generally alike, females tend to have darker feathering on their upper parts and are slightly heavier. Weights: Averaged 442 g for 16 males with a range of 299 to 580 g. The average for 21 females was 490 g with a range of 382 to 500 g.
- *Juveniles:* Newly hatched Barn Owls are covered with a short white down. This is gradually replaced with a second longer creamy-buff down beginning on day six. This thick wooly covering is the most conspicuous feature of the young owlet until about the age of 50 days. Although at about the age of three weeks the first winter plummage begins to appear and is fully in place at the age of 60 days. Down is worn off during this period by abrasion.
- Moulting is once yearly in the adult bird (July to November).
- The potential life span in the wild ranges from 2-11 years. In Holland, one wild caught bird had been banded over 17 years previously.

NATURAL DIET

- The main prey items are mice, moles, shrews, rats, gophers, cottontails, and jackrabbits. They will occasionally eat bats, skunks, and muskrats. Other birds constitute a minor part of the diet. They range from small sparrows to pigeons to green herons.

BIRTH AND YOUNG

- Nesting season depends on the part of the country. In the Northeast it is between March and July; in the Southeast, March through December, and in California, January through June. They may have one to three broods per season. The clutch size ranges between 3 and 11 with 5 to 7 being more normal. The eggs are laid in 48 hour intervals. Incubation, usually handled by the female, begins with the first egg. Hatching occurs in 30-32 days. During incubation, the female is fed by the male. Later, both parents hunt to feed their young. The young can fly at 52-56 days. They fledge at about 11 weeks of age.



CAPTIVE CARE AND FEEDING

Infant: (Up to 3 weeks)

- Housing: The main emphasis is to provide a safe, warm, clean environment. A variety of systems are in use today. Use common sense and let the age of the chick be the guideline. If eggs or freshly hatched young (14-22 g) are presented, the ambient air temperatures should be higher than for older young. Chicks will pant if they are too hot. Overheating will result in dehydration and/or death. Monitor carefully. Assuming the ambient room temperature is near 70°F, start with 92°F (range can be 92°-95°) and observe the chicks. Older chicks will require decreasing temperatures to about 80°F. They can be housed in incubators, or other systems that employ heat for warmth. Keep the environment clean. A moist sponge may be added for humidity. Do not mix chicks that are substantially larger with small ones, they may kill them.
- Diet: These raptors will grow nicely on rodents. Very young chicks should be fed rodents minus fur and major bones. *Fresh* visceral organs are okay to feed. Adult quail may also be used. After the first week, bones can become a more integral part of their diet. Fur in the diet is best delayed until the age two weeks. If other food items are used i.e., chicks, muscle meats, etc., they must be balanced so that they contain the absolute amounts of Calcium and Phosphorus required and they are in a ratio of 2:1. Liver, heart, etc., are not recommended food items. It is not adequate to roll these food items in bone meal and assume that they are "balanced". The birds are fed upon demand or every few hours when very young. This will be about 6-8 times per day. Weights should be monitored carefully. They should show steady gains. Avian vitamins are a good practice.

Adolescent: (3-8 weeks)

- Housing: By the age of three weeks, the birds can be housed without external heat in a facility or home that is warm enough for comfortable human habitation, i.e., 65°-75°F. Similarly sized birds can be housed 2-3 in a veterinary cage or equivalent that is 24" L x 18" W x 24" H upon arrival until it is clear they have adapted to their new surroundings, are healthy, and will eat on their own. They can be moved outdoors into an aviary providing the weather is warm enough. They will be able to fly at about seven weeks and should be in an enclosure that will allow development of flight skills. WRC has recommended as a *minimum* size that the pen be 15' L x 8' W x 8' H.



- Diet: Birds that are 3 weeks old should be capable of self-feeding on dead prey. In fact, they may do so at an earlier age. Feed 3 times daily until 4 weeks old and then cut back frequency to 2 times. Do not decrease amount fed. As they begin to practice flying, small live prey species i.e., half-grown mice should be introduced. They may not eat live food unless fasted for 24-36 hours. This will not adversely impact birds who are at good weights and have nearly complete first winter plummage. Birds should be given multiple opportunities to catch live prey. Be sure to observe which bird is hunting as one bird may kill all the mice and others may simply take it. Release at 10-11 weeks.

Adults:

- Housing: Injured adults can be housed in the same sized veterinary cage or equivalent as described for adolescents while recovering. They should be provided with a perch that is tall enough so that their tail feathers do not touch the cage flooring. All four sides should be solid or towel covered to reduce stress. Although water can be offered, Barn Owls get the water they require from their food. If it is hot enough, they may bathe.
- Birds that are ready to fly upon recovery should be placed in an outside enclosure as described in the adolescent section. Various materials are used for these cages including wood, fiberglass, and coated 1" x 1" welded wire. If this wire is used, it should be angled out from the top of the cage to the bottom much like a tent. Various forms of netting have been used as well. Flooring materials vary including pea gravel which is changed bi-annually, grass (in very large enclosures), and concrete. The latter tends to stay wet but is reasonable to disinfect in pens where the turnover of birds is rapid. It is best used as a base and then covered with several inches of gravel or wood chips.

RELEASE

- Habitat considerations should be made allowing for release in areas where rodents are in plentiful supply. These birds are fond of meadows. They get into trouble along highways. Make sure that Barn Owls are in the area during the time of year that you plan to release. In colder climates, they move southward in the fall as they cannot tolerate intense cold.
- Nocturnal: release at the end of the day or in the evening.
- Weights of birds should be above 400 g. Occasional birds may weigh less but should be well fleshed.
- Packed cell volumes should be above 40% and preferably around 45%. Plasma proteins should be above 2.5 and preferably about 3.0-4.0.

DISEASES

- Barn Owls are susceptible to ectoparasites (i.e., feather lice, flys) and should be treated with a carbamate or pyrethins based product when afflicted. Follow product directions and do not enclose bird in closed box or cage immediately following treatment.
- Endoparasites may occur. Fecal check should be a part of the rehabilitation program.
- While this species can acquire a range of diseases known to occur in avian species, it is commonly found infected with trichomoniasis. This protozoan causes a build up in the

mouth, throat, and crop of a cheezy white lesion. Birds displaying oral lesions should be presented for veterinary work-up as differential diagnosis must be made between these and other similar diseases prior to treatment. When fed improperly, young Barn Owls can develop metabolic bone disease.

- Birds displaying signs of illness should be isolated until evaluated to minimize the possibility of the spread of disease. □

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Avian Trichomoniasis

Sandra Emanuelson, D.V.M.
Walnut Creek, California

Trichomoniasis is an infectious disease whose primary host is the domestic pigeon (*Columba livia).* It is caused by the protozoa *Trichomonas gallinae* (also known as T. columbae). Trichomonoiasis is called "canker" in pigeons, chickens, and turkeys and "frounce" in raptors.

T. gallinae is present in an asymptomatic form in approximately 80 to 100 per cent of domestic pigeons. It causes disease in nestlings two to five weeks of age and in weak or debilitated adult birds. The disease occurs in raptors that feed on pigeons either in the wild or in capativity. *T. gallinarum* causes lower digestive tract disease in turkeys and domestic fowl. Infections of *T. gallinae* and/or *T. gallinarum* in chickens and turkeys can occur naturally or from the ingestion of contaminated feed or water. Many strains of *T. gallinae* vary in virulance from non-disease-producing strains to severely virulent strains. There are many nonpathogenic *Trichomonas* organisms.

SYMPTOMS

Affected birds often lose weight through reluctance to feed. Other symptoms that may be seen are diarrhea, a sour crop (atonic crop distended with fluid), gasping while flying, and drooling of a green-yellow fluid. Sick birds may merely have fluffed feathers. Diseased birds are the very young (two to five weeks of age) and those that are stressed by other disease, poor nutrition, unsanitary conditions, racing, or breeding.

Healthy individual birds are frequently carriers and do not exhibit any signs of disease. The incubation time for *T. gallinae* is 4 to 14 days. Young birds may die within one to a few days after developing the disease. Older birds may die after two to three weeks of illness.

TRANSMISSION

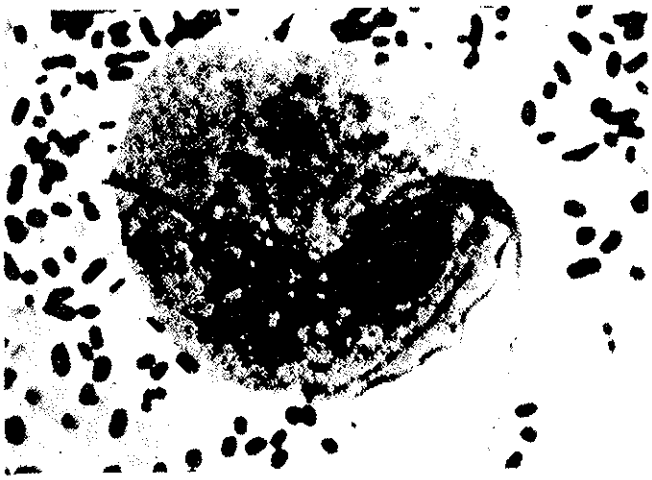
The organism does not encyst and can remain alive in tap or distilled water for two to five days at 5 to 10°C. At 21°C it survives for one day. The organism dies immediately in a dry environment.

Adult-to-adult transmission occurs primarily from affected or carrier birds picking up seeds and then dropping them. Susceptible birds feeding in the same area may then ingest the infected seeds. Adult-to-offspring transmission occurs when the organism is transferred in the crop milk given to the young by adult pigeons or doves. One case involving a cockatiel was the result of an owner hand feeding a fledgling dove and cockatiel at the same time. Contaminated feeding apparatus has transmitted the disease among songbirds raised by rehabilitators. Sinusitis symptoms were produced without visible lesions. Yellow caseous lesions described hereafter were found on opening the sinuses.

GROSS LESIONS

Lesions are most frequently found in the oral and pharyngeal areas. They range in size from 1 mm to approximately 1 cm, are yellowish in color, elevated, and can be peeled off the mucosa with little or no bleeding. They are thought to originate from tiny excoriations in the mucous membrane and, therefore, can occur in aberrant sites such as the tip of the tongue.

Diseases that can be confused with trichomoniasis are avian pox, hypovitaminosis A, avian tuberculosis, bacterial diseases such as salmonellosis, and fungal diseases such as candidiasis. Secondary bacterial infection may be present as well as the primary trichomoniasis. The systemic form exhibits well-defined yellow nodules in the liver. More unusual forms involve the navel or cloaca of nestlings, in whom there are yellow crusty or nodular lesions.



DIAGNOSIS

The organism can be demonstrated microscopically by swabbing the lesion and placing the smear on a warm slide with a small amount of saline. The organism is a flagellated protozoan that is pear shaped to rounded. It measures approximately 6.2 to 18.9 μm × 2.3 to 8.5μm. It has four free anterior flagella and a fifth that trails posteriorly. There is an undulating membrane along approximately two-thirds of its length and an axostyle that extends along and beyond the long axis of the body. In some media, various cytoplasmic bodies can be seen. Its characteristic spiral movements differentiate *T. gallinae* from other flagellates that may be commensal organisms unrelated to the lesions.

TREATMENT AND CONTROL IN THE FLOCK

Pigeon breeders can greatly minimize the risk of disease by maintaining a well-fed, minimally stressed flock. Equally important is maintenance of proper sanitary conditions in the loft. This should include a clean, nonporous, dry floor; feeders and waterers that provide ample, good quality food; and provisions for avoiding cross contamination. Routine treatment three to four times a year, especially prior to breeding season and following the racing season, will keep the number of organisms low.

The safest, most commonly used drug in the flock is Emtryl[1] (1,2-dimethyl-5-nitro-1H-imidazole). The dosage rate is 50 mg of active ingredient/kg body weight or 1 pouch (36.4 gm)/200 liters water (0.02 per cent) for five days. The drug is available in livestock stores that sell feed to pigeon breeders. Treatment may be inhibited by the lack of patient acceptance of the treated water. Individual treatment is preferred whenever possible. Other drugs used for treatment and control of trichomoniasis are Enheptin[2] and copper sulfate. Enheptin is given at the rate of one 5-mg capsule per pigeon weighing 350 to 550 gm daily for seven days; or 1 gm/liter of water for six days; or up to 40 mg/kg/day for six days. Medicated water is somewhat unpalatable. Enheptin will kill the organisms in an infected or carrier bird. Copper sulfate has been used in the past at the rate of 100mg/100 cc water for 20 days. Copper sulfate can, however, cause liver damage. Enheptin is not considered as safe as Emtryl.

TREATMENT AND CONTROL IN THE INDIVIDUAL

There are several facets of the treatment of individual birds. The safest drug currently used is Emtryl[3], at the rate of 50 mg active ingredient/kg body weight daily for five days. An easy formula to use in dosing Emtryl is 1 cc of Emtryl powder per 10 cc water. Give 0.5 cc of the solution per 100 gm body weight PO daily for five days. A 250 to 300 gm pigeon would receive 1.5 cc of the solution once daily for five days. A 100 to 200 mg dove would receive approximately 0.50 cc once daily for five days. If a bird has difficulty swallowing, divide the dose into two to three smaller doses or give by gavage.

As with any sick bird, warmth should be provided to a level at which the bird is no longer fluffed. If the bird is not eating, it should be force fed. If it has not eaten for two to three day, it should be treated very gently and given 20 to 25 per cent glucose solution at the rate of 0.5 to 1.0 cc/30 gm body weight in small birds and 0.25 to 0.50 cc/30 gm body weight in larger birds (i.e., about 4 to 6 cc per adult pigeon, 2 to 4 cc adult dove). The glucose feeding should be repeated two to four times a day (when the crop emties) for the first one-half to one and one-half days. Then a mixture of force-feeding formula can be added to the glucose solution over the next day or so until the bird is receiving straight force-feeding formula two times a day by gavage with either a red rubber catheter[4] or rodent feeding needle[5]. Force feeding formulae may vary. One that works well for a variety of species of bird and reptiles consists of the following:

4 oz of baby food eggs yolks
1½ tsp. cooking oil
¼ cup Sustagen[6] vanilla
20 grains (1200 mg) calcium gluconate or calcium lactate
1 tsp. Superpreen[7] or other avian vitamin

Grind the calcium to a *very fine* powder and add egg yolk and Sustagen. Mix well. Add enough water so that the misture will *very* easily pass through a feeding tube. Freeze in 3 to 60cc syringes to be thawed and used as needed. Mixture will thicken upon freezing.

Even birds that are severely affected with trichomoniasis can survive if handled carefully. Those with organ involvement can survive too, if the disease has not progressed to involve large areas of the liver.□

Dr. Emanuelson wrote this article in 1983 prior to her death. It is reprinted with permission from *Current Veterinary Therapy* Vol 8, W.B. Sanders Company and her family.

SUPPLEMENTAL READING

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[1] Emtryl (Salsbury Laboratories, Charles City, IA: is difficult to obtain through veterinary suppliers. It is usually available from poultry supply outlets.

Dimetridazole is also known as RP 8595, Emtrymix, and Histostat 50. It is available in 182-gm pouches (36.4 gm active ingredient).

[2] American Cyanamid, Princeton, NJ.

[3] Salsbury Laboratories, Charles City, IA.

[4] Sovereign red rubber feeding tubes, Sherwood Medical Industries, Inc., St. Louis, MO.

[5] Rodent feeding tubes, Corners Ltd., Kalamazoo, MI.

[6] Sustagen, Meade Johnson Nutritional Division, Evansville, IN.

[7] Superpreen, RHB Laboratories, Santa Ana, CA.

(continued from page 4)

Weaning

Whenever the point of a single feeding per day is reached, plans to wean them from the bottle are made. This is generally about the seventh week. It is possible to wean fawns from the bottle earlier but they may display continued sucking behavior.

A large heavy gauge pan (one not easily tipped over) holding the equivalent of their intake was placed in the compound in the early morning. Formula was provided in this manner for the next three to four weeks, with a gradual decrease in volume. During the last week, formula feeding was skipped every other day. The fawns were completely weaned from the formula no less than two weeks before release, with three weeks recommended.

Browse

Small amounts of freshly picked browse were placed in the browse dispenser at each formula feeding. At one to two weeks of age, the fawns began to eat the fresh browse. As this occurred, small pieces of chopped apples (skin and core included) were placed in low-sided, heavy gauge pans and slid into the compound through the small bottom hatch doors next to the watering door. As the fawns grew they required more and more browse, fruit, and berries.

An average of fifteen to twenty pounds of fresh browse a day was eaten per fawn by the time the fawns were consuming 16 ounces of formula per feeding. Three and one-half pounds of seasonal wild fruit and berries were also eaten daily. These averages were maintained until the time of release.

Because fawns learn to recognize food by what they are given, commercial products (mixed grains, corn, pellets, bread, etc.) are not recommended as major constituents of the diet. A great effort was made to feed all natural wild foods in order to enhance recognition when foraging in the wild. Natural foods help develop the appropriate gut flora (stomach bacteria) for digestion. A fawn raised on commercial feeds and then released might well develop problems due to such a shift in foods and stomach flora.

Natural Browse Items Fed

Smartweed
Sumac - new tender shoots
Strawberry - leaves and roots of wild species
Pink, red, and white clover (roots included, if pulled)
Pickleweed - seeds were preferred
Beans - leaves or entire plants (local crop)
Apple - fruit and foliage
Elderberry - fruit and foliage
Plum - fruit and foliage
Other wild fruits and berries local to the area were used.

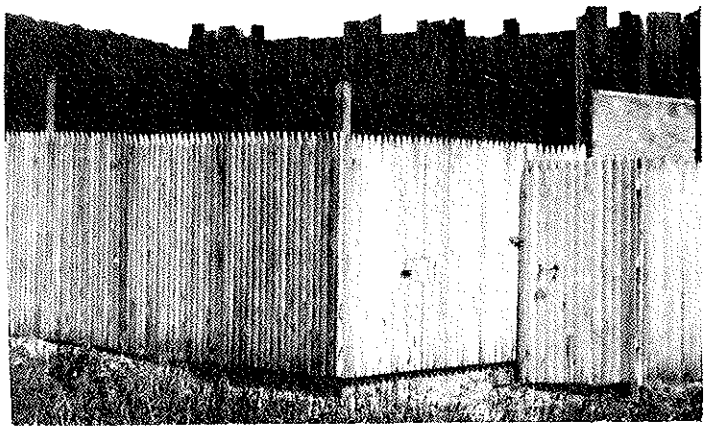
A major browse food was red and pink clover found along the rural roads which was picked at 6:00 a.m. and 6:00 p.m. daily. A four acre field of clover was donated during the third and fourth years of the program. Without this donation, it would have been necessary to drive over 80 miles a day in search of browse.

HOUSING

Stockade fencing six feet high was purchased, along with 4" x 4" support posts, nails, and cement. A gasoline powered post-hole digger was rented to dig the three foot deep holes required because of the clay base soil in the site. The support posts were then buried three feet down into cement.

An existing south wall of the raptor compound was utilized. The fawn enclosure measures 32' x 32' x 6' high. At one end, a six foot browse dispenser was built. Slats of wood two inches wide, with four inch spacing, were attached on the bottom support of the wall. The resulting appearance was much like a hay trough. A small door was cut behind the browse dispenser. Browse was placed in through this door. The browse dispenser held approximately forty to fifty pounds of loosely packed fresh browse.

A double door, or "fawn lock" was built at the same end as the browse dispenser, using left over stockade fencing and exterior plywood. Ground level hatches were cut in and hinged to facilitate pans of fresh water,



formula, and pans of fresh fruit to be slipped in when necessary.

A bedding of straw was placed at the far south corner. A covered shelter, seven feet long and four feet wide, was positioned three feet high. Black heavy gauge building paper was attached on the two walls under the shelter to provide protection from the rain and wind. The east wall of the compound faced the steep slope of a ridge. The fawns were able to view the ridge, (a heavily wooded area), the skyline, and observe the native wildlife. The fawns were exposed to local wildlife vocalizations, the same as if they were free. Raptors in an adjacent compound also provided vocalizations.

The fawn housing materials cost $300.00 in 1979. It was a small price to pay in order to raise fawns wild, as they were born, and most importantly to raise releasable fawns. The compound was designed keeping in mind the need to eliminate all human contact. No talking or whispering was allowed at the compound. I once inadvertantly sneezed while putting in browse and

started a stampede. This aptly illustrates the fact that the fawns were indeed kept in a "wild" state and maintained their fear of humans and other strange noises.

DURATION OF CAPTIVITY

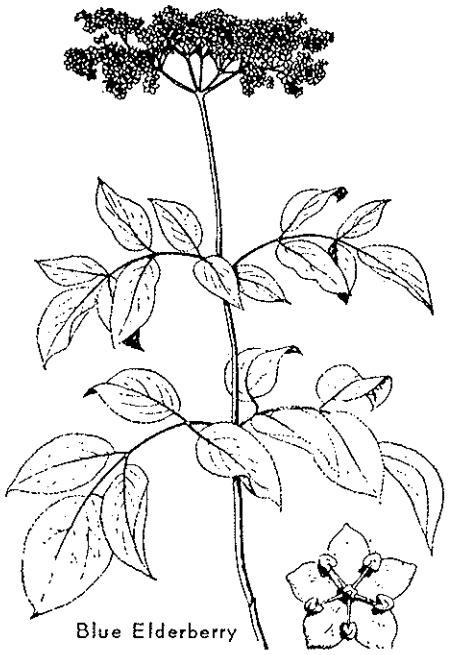
Unlike most rehabilitation projects, the duration of captivity was relatively short, accelerated to fourteen weeks. The philosophy behind this was that the fawns be released at least two or three weeks before hunting season began. This gave the fawns time to acclimate themselves, find food, shelter and perhaps join up with another small herd.

Hawk Hideaway is located in a rural setting, isolated in the middle of thousands of acres of wild country. The nearest town is nine miles away as the hawk flies. During the first year of the program, fawns were released at the facility. In subsequent years, other sites where chosen due to increasing traffic on a road nearby.

RELEASE SITES

The release site was carefully chosen. A dead end road was chosen with only three families in the area. A perfect habitat with thousands of acres of woodland, field and streams. Long hikes revealed wild fruit, berries, acorns, and an abundance of browse material. The families were informed of the program and were instructed to call Hawk Hideaway if any fawns were observed. Fawns were not seen again by any of these families.

Observations by HHWRC personnel and conservation officials revealed that some fawns were separated from each other during release, but had always reunited by dusk. All groups foraged naturally, and exhibited a natural fear of *humans*. A hiker reported that he had observed a herd of fawns (he thought it odd that no adult deer were present) during the fourth year of the program. The fawns were feeding on elderberries. They reacted to the hiker just as wild fawns would. These were almost certainly the animals we had released because the numbers of animals spotted were the same and it was only four days after the release. Although the herd was still in the area, they were not seeking out humans; nor were they acting like tamed animals. The project was a success because the fawns were wild and were successfully returned to the wild to live a natural lifestyle. □



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Mail to: Wildlife Rehabilitation Council, P.O. Box 3007, Walnut Creek, CA USA 94598. Subscriptions outside the United States add $3/year for mailing to Canada, and $5 year for all other foreign countries. Submit all payments in U.S. funds.

This was also our first year of preparation for a conference without the assistance of the San Francisco Zoo. It was the first time that our conference was programmed for wildlife rehabilitation exclusively. While requiring more efforts from our board members and committee members, we are very pleased with the results and look forward to next year's efforts.

All in all, it was a very busy year for WRC. It was not without its tribulations. The fall *Wildlife Journal* was delayed by an oil spill and some of our efforts on our species papers have backed up as well. We hope that with the addition of word processing capabilities, the log jam will clear and we will be announcing the arrival of the hummingbird, deer, and pigeon papers. We will also finish those long awaited revisions of the raccoon and opossum papers.

We now begin the new year with some hold over projects and some new ones. We welcome membership input to guide us in our priorities. We also need your participation in organization development. How can you help? We have many different committees that all need members. There is the conference, species papers, journal, emergency response, statistics, and skills seminars to pick from. Many other projects await us including putting together a packet on starting a wildlife rehabilitation program. Donations of your time will help build WRC. Our fifteen member board can not do it alone. WRC is as good as we make it. Our services are limited only by the manpower and resources of our organization. Help us grow, and we will help you develop your professional skills.

Jan White



environmental T-SHIRTS

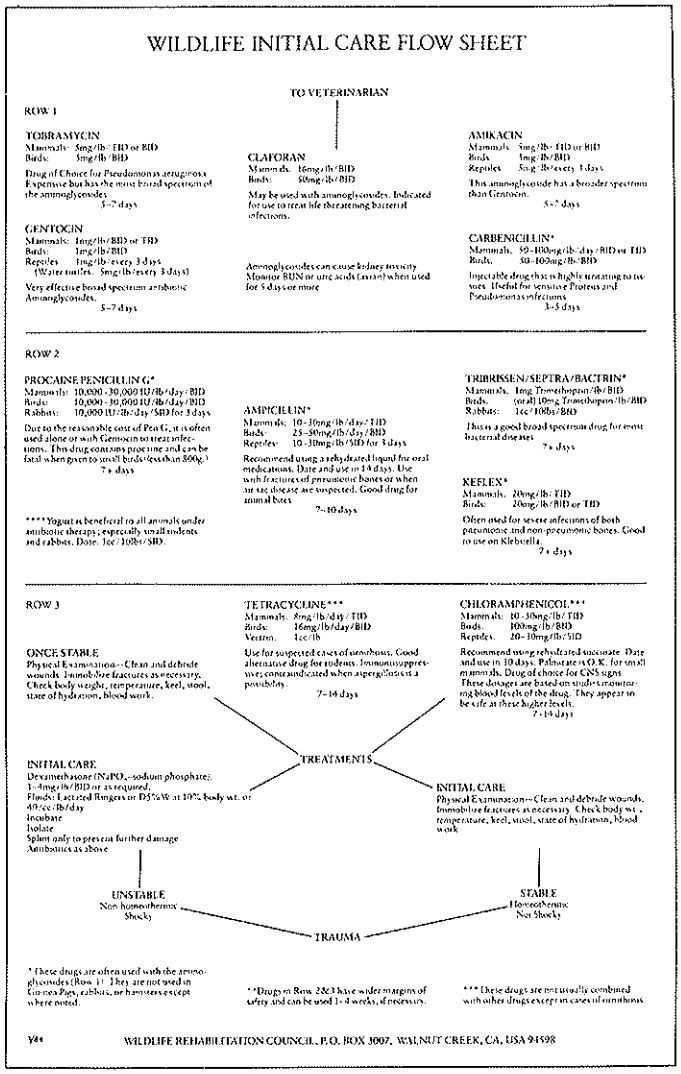
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TO VETERINARIAN

ROW 1

YOBRAMYCIN
Mammals: 5mg/lb - BID or BID
Birds: 5mg/lb/BID

Drug of Choice for Pseudomonas aeruginosa. Expensive but has the most broad spectrum of the aminoglycosides.
5–7 days

GENTOCIN
Mammals: 1mg/lb/BID or TID
Birds: 1mg/lb/BID
Reptiles: 1mg/lb/every 3 days (Water turtles: 5mg/lb/every 3 days)

Very effective broad spectrum antibiotic. Aminoglycosides.
5–7 days

CLAFORAN
Mammals: 16mg/lb/BID
Birds: 50mg/lb/BID

May be used with aminoglycosides. Indicated for use to treat life threatening bacterial infections.

Aminoglycosides can cause kidney toxicity. Monitor BUN or uric acids (urea) when used for 5 days or more.

AMIKACIN
Mammals: 5mg/lb - TID or BID
Birds: 1mg/lb/BID
Reptiles: 5mg/lb/every 3 days

This aminoglycoside has a broader spectrum than Gentocin.
5–7 days

CARBENICILLIN*
Mammals: 50–400mg/lb/day/BID or TID
Birds: 50–100mg/lb/BID

Injectable drug that is highly resistant to toxins. Useful for sensitive Proteus and Pseudomonas infections.
3–5 days

ROW 2

PROCAINE PENICILLIN G*
Mammals: 10,000–30,000 IU/lb/day/BID
Birds: 10,000–30,000 IU/lb/day/BID
Rabbits: 10,000 IU/lb/day/SID for 3 days

Due to the reasonable cost of Pen G, it often used alone or with Gentocin to treat infections. This drug contains procaine and can be fatal when given to small birds (less than 300g.)
7+ days

****Yogurt is beneficial to all animals under antibiotic therapy; especially small rodents and rabbits. Dose: 1cc/10lbs/SID.

AMPICILLIN*
Mammals: 10–30mg/lb/day/TID
Birds: 25–50mg/lb/day/BID
Reptiles: 10–30mg/lb/SID for 5 days

Recommend using a rehydrated liquid for oral medications. Date and use in 14 days. Use with fractures of pneumonic bones or when air sac disease are suspected. Good drug for animal bites.
7–10 days

TRIBRISSEN/SEPTRA/BACTRIN*
Mammals: 1mg Trimethoprim/lb/BID
Birds: (oral) 10mg Trimethoprim/lb/BID
Rabbits: 1cc/10lbs/BID

Has a good broad spectrum drug for most bacterial diseases.
7+ days

KEFLEX*
Mammals: 20mg/lb/ TID
Birds: 20mg/lb/BID or TID

Often used for severe infections of both pneumonic and non-pneumonic bones. Good to use on Klebsiella.
7+ days

ROW 3

ONCE STABLE
Physical Examination—Clean and debride wounds. Immobilize fractures as necessary. Check body weight, temperature, heel, stool, state of hydration, blood work.

INITIAL CARE
Dexamethasone (NaPO$_4$–sodium phosphate): 1–4mg/lb/BID or as required.
Fluids: Lactated Ringers or D5%W at 10% body wt. or 40 cc/lb/day
Incubate
Isolate
Splint only to prevent further damage
Antibiotics as above

TETRACYCLINE***
Mammals: 8mg/lb/day/TID
Birds: 16mg/lb/day/BID
Ferrets: 1cc/lb

Use for suspected cases of ornithosis. Good alternative drug for rodents. Immunosuppressives contraindicated when aspergillosis is a possibility.
7–14 days

CHLORAMPHENICOL***
Mammals: 10–30mg/lb/ TID
Birds: 100mg/lb/BID
Reptiles: 20–100mg/lb/SID

Recommend using rehydrated succinate. Date and use in 10 days. Palmitate is O.K. for small mammals. Drug of choice for CNS signs. These dosages are based on studies monitoring blood levels of the drug. They appear to be safe at these higher levels.
7–14 days

TREATMENTS

INITIAL CARE
Physical Examination—Clean and debride wounds. Immobilize fractures as necessary. Check body wt., temperature, heel, stool, state of hydration, blood work.

UNSTABLE
Non-homeothermic
Shocky

STABLE
Homeothermic
Not Shocky

TRAUMA

*These drugs are often used with the aminoglycosides (Row 1). They are not used in Guinea Pigs, rabbits, or hamsters except where noted.

**Drugs in Row 2&3 have wider margins of safety and can be used 1–4 weeks, if necessary.

***These drugs are not usually combined with other drugs except in cases of ornithosis.

V84 WILDLIFE REHABILITATION COUNCIL, P.O. BOX 3007, WALNUT CREEK, CA, USA 94598

WRC Drug Dosage Wall Chart

by

Sandra Emanuelson, D.V.M.

Includes dosages for birds, reptiles, and mammals. Cost is $3.50 per chart. Add 50¢ for mailing. California residents add 6½% sales tax per chart. Send all orders to the WRC Literature Department.

Netting Wild Mammals

Susan B. Kelly
Peninsula Humane Society, San Mateo, California

There are many ways to restrain wild animals for treatment or transport. One of the most effective, easy, and safe methods used at the Peninsula Humane Society is a nylon fishing net as shown being used in the photos below. This kind of net has been used successfully on raccoons, foxes, bobcats, and other medium-sized mammals, while smaller nets have been used with squirrels, rabbits, and hares.

The net is used to move animals into other cages, medicate wounds, give injections, and obtain weights when it is not feasible to pick-up the animal by hand. A ketch (or rabies) pole can also be used, but care must be taken not to choke or cause injury to the animal. In most cases we find the net easier and safer to use than the ketch pole; and during the past ten (10) years of using these nets, we have had no injuries to handlers or animals. Periodically, we net a soccer or basketball to keep our staff and volunteers' skill level high.

One word of caution. Even though you have an animal in the pocket of the net (Fig. 3), raccoons in particular have been known to crawl out. Also, if the net is not deep enough, the animal might be able to work its way free.

You may at some time have to net an animal that is on the run. This can be accomplished by forcing the animal against a fence or some other barrier, and having it run past you. As the animal is just about at your side, push the net in front of it. When the animal enters the net, quickly force the opening against the ground with your foot to prevent escape. Take care not to get bitten. Some animals become quite docile when netted, while others become very agressive, so stay alert. Don't relax, thinking all is well, just because the animal is netted. That could be the break the animal is waiting for.

As with any equipment used on wild animals, it is important to check the net after each use. Sometimes struggling animals or sharp claws can tear the strings. These must be repaired, or the net replaced, before the next use. Some features to consider are the nets replaceability; the handle must be strong enough to withstand the pressure of a struggling animal; net size; and cost. Nets can be purchased in fishing stores and through animal supply catalogues.

Photographs by Marguerite Comstock



Fig. 1 Place the net over the raccoon.

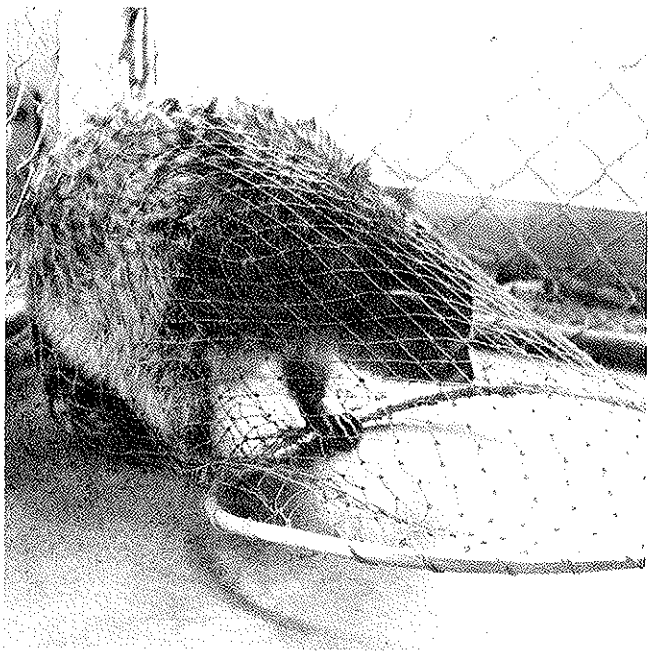


Fig.2 Draw the net toward you, forcing the animal into the end of the net.



Fig. 3 Lift the net, trapping the raccoon in the pocket of the net.

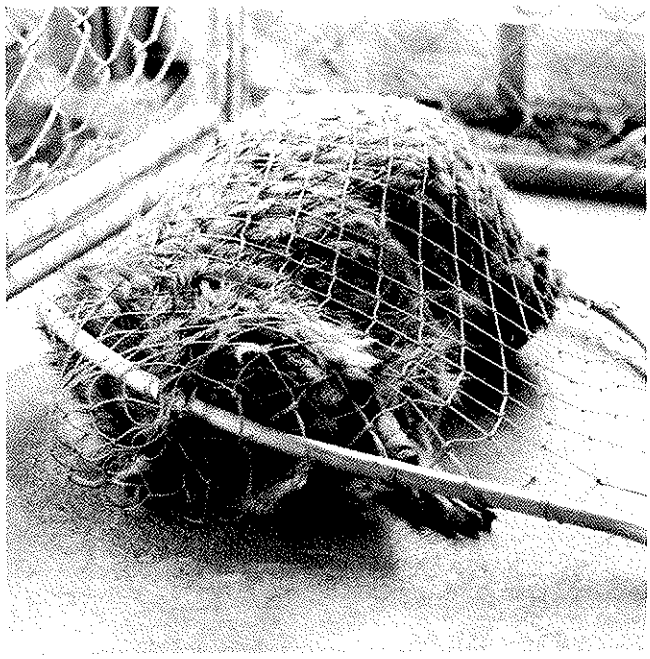


Fig. 4 By folding the net over the animal in the pocket you further restrain the raccoon for treatment. □

ON THE WING?

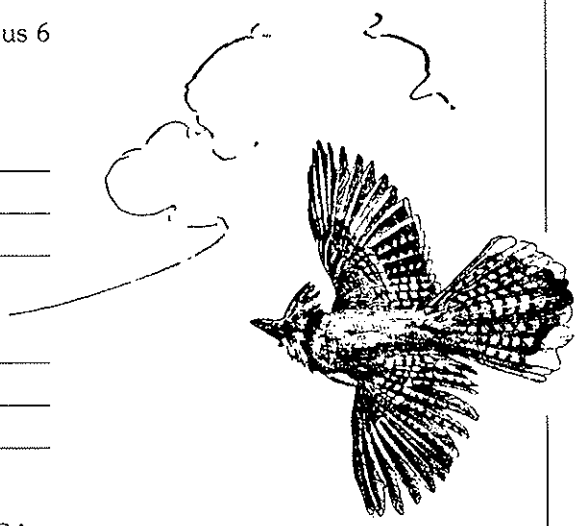
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Book Review

A NATURAL HISTORY OF RACCOONS

Dorcus MacClintock

Charles Scribner's Sons, Publisher, New York, 1981, 144 pp., $11.95.

A Natural History of Raccoons is a thorough publication on the many fascinating aspects of racoon behavior and their way of life in the wild. As is the case with most of wildlife rehabilitation, knowing the natural history of the species involved can be a major asset to any rehabilitator. This book gives one the inside track on many behavioral characteristics that are pertinent to rehabilitation such as their social structure, feeding habits, mating and young-rearing. It gives physiological data that will help determine the age of young raccoons including weights, tooth eruption, and anatomical descriptions. Through her description of the various age groups of cubs, one can get a feel for the kinds of activities and learning tasks that a young raccoon performs as it grows up.

The book gives a brief overview of the kinds of diseased or other limiting factors that keep the population in check. It is not intended as a medical text and does not address treatment but it does give the reader a real sense of the kinds of maladies to which raccoons succumb.

Additionally it has a chapter on the living relative of the raccoon and some information regarding their introduction to Eurasia. While not of vital interest to rehabilitators, it is engaging reading.

One of the most delightful parts of this book is the illustrating which was done by J. Sharkey Thomas. The many drawings depict raccoons in many of their natural activities giving the reader a deeper sense of natural raccoon living. Some people I know have said they recommend buying the book just for the drawings! It is however, much too valuable a work, just to be purchased for the drawings.

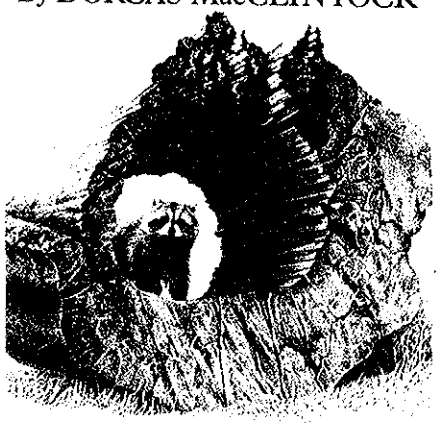
The book also contains a short chapter on caring for orphan raccoons. This section is about 5 pages long and contains basic information of milk formula, feeding instruments, and stimulation for elimination. More current information with much more depth will be available later this year in *Wildlife Rehabilitation* Vol. 3 by the National Wildlife Rehabilitator's Association. However, the information that is given sends the novice in the right direction.

The book is a valuable addition to the personal library of anyone raising or rehabilitating raccoons. The cost is minimal, especially for a hard bound.

Jan White, Editor
Wildlife Rehabilitation Council

A Natural History of Raccoons

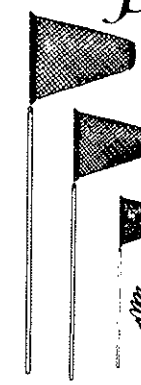
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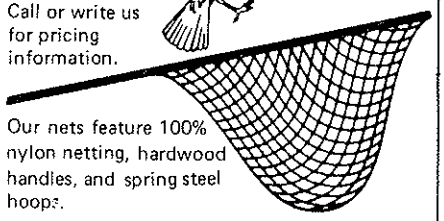
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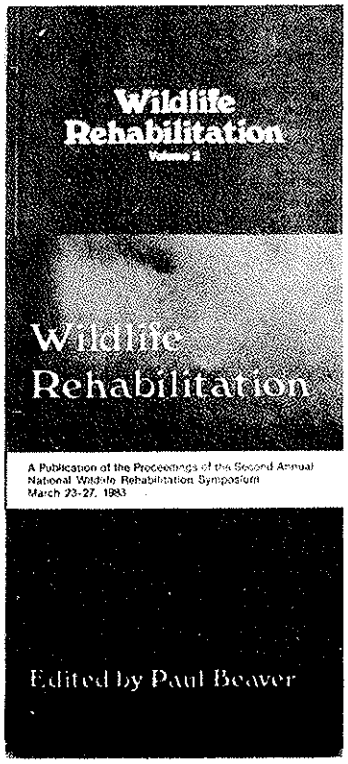
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Wildlife Rehabilitation, Volume 2

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