Summer 1988 Vol. 11, No. 2

WILDLIFE JOURNAL

Journal of the International Wildlife Rehabilitation Council



Rehabilitating Cottontails . . . Page 7

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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.
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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.

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WILDLIFE JOURNAL

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Editorial. . .

Responsibility and Leadership

"If I were to try to read, much less answer, all the attacks made on me, this shop might as well be closed for any other business. I do the very best I know how—the very best I can, and I mean to keep doing so until the end. If the end brings me out right, what is said against me won't amount to anything. If the end brings me out wrong, 10 angels swearing I was right would make no difference." Abraham Lincoln

Along about this time of the year, wildlife center directors or organization leaders having had a busy summer with more animals to assist than they care to remember, weary from the stresses of work, frayed from the interpersonal friction so common to working places where stress is sometimes at a level higher that the mercury in our thermometers, ponder whether they have made the best decisions. Operating a wildlife care organization is much like running any business. There is the business of wildlife care—a new art/science combination with plenty of questions and only some answers. There is the business of people management, both volunteers and staff. There is resource management and fund raising, not to mention planning and facilities or program development and management.

When you are up to your elbows in animal care, the last thing you need is to have your judgement questioned by people on your team or people from the outside. Yet it happens, and how we respond to those challenges reveals much about the stuff of which we are made . Inside a voice cries, "not now, I am to busy for this kind of non-productive attack". While we know that it may or may not be a personal attack we have to sort through it, find the real issue, and resolve it in such a way that the wildlife care organization grows. Remaining calm, asking neutral questions, probing to find the issue and then wracking your brain to come up with the best answer is the stuff that wildlife care directors are all about.

Where the organization is big enough to have been split into various teams or sections with specialities, we seek the advice of the team leaders and team members depending on the problem. While democracy is the system our country is based on, leadership is not a democracy. It is a responsibility. The person at the helm is responsible for the decisions and the actions of those working under his/her supervision. The director is responsible ultimately for the decisions that they make for the organization. As the saying goes, history will judge whether the leadership provided was beneficial or stifling.

What those working under directors or wanting to eventually assume that responsibility need to visualize is the amount of energy and sheer guts it takes to do it. It may seem easy to bask in the limelight when things are going well, but it is tough to face the music when you have made the wrong decision whether by your own instincts or by the recommendation of others. Keep in mind that the consequences range from the injury or death of a single animal, to total shutdown of your program. When considering the recommendations of others, you have to be accountable to yourself as well. The decision, whatever it may be, becomes yours and you have to live with it.

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Animal Health Technicians in Wildlife Management and Rehabilitation

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Introduction

In the last ten years an increasing number of veterinarians have found careers in wildlife management or an increasing portion of their practice devoted to wildlife rehabilitation. As a result more veterinary technicians, which I will refer to as Animal Health Technicians (AHT's) have had greater opportunities to work with wildlife. AHT's have also, often independently, become part of wildlife care networks. Other Animal Health Technicians have helped found non-profit wildlife care centers where they can administer to the needs of injured and orphaned wildlife. Currently a few AHT training programs afford their graduates the opportunity to study wildlife rehabilitation techniques.

Most state wildlife or natural resource agencies employ a number of biologists and a few, eight at the time of this paper, employ veterinarians. There are approximately 15 veterinarians working for federal wildlife agenicies. Animal Health Technicians may qualify for jobs with veterinarians in state and federal wildlife agenicies or working for biologists in some states. Although few jobs for AHT's exist in the wildlife field, those few are often quite satisfying.

Employment Survey

During the winter of 1987-1988 a questionnaire on the use of Animal Health Technicians in the field of wildlife rehabilitation (Figure 1) was published in the International Wildlife Rehabilitation Council's (IWRC) *Wildlife Journal*.

One hundred and eight people or organizations from 28 states as listed in Table 1 responded.

Table 1 No. of Respondents by State

State	#	State	#	State	#
CA	40	KS	2	AK	1
OR	10	MA	2	ID	1
NJ	6	WI	2	NC	1
FL	4	NM	2	NV	1
MI	4	PA	2	Unk	5
VA	3	AZ	2		
TN	3	IL	2		
TX	3	ME	1		
OH	3	SC	1		
WA	3	NH	1		
MN	3	VT	1		
NY	3	LA	1		

Seventy eight (73%) did not employ an Animal Health Technician, of those that did, 15 (13%) employed one AHT, 6 employed two AHT's, one employed three AHT's and two employed four AHT's. Some wildlife groups employed AHT's part-time. Six organizations employed one AHT, two employed two AHT's, and three employed three AHT's. Eight people said they had no experience with Animal Health Technicians. Three respondents said their state did not license AHT's or they only used unlicensed AHT's.

Animal Health Technicians volunteered their time to many wildlife care groups. Fifteen responded that they had a single volunteer AHT, ten said they had two volunteer AHT's, three wildlife groups had three AHT volunteers and three had four AHT volunteers. Four wildlife care centers or groups had more than five volunteer AHT's but two of these were affiliated with an Animal Health Technician college training program.

The distance between the wildlife care group and the AHT training program did not appear to make a difference whether or not they employed AHT's. Of the eight wildlife groups within ten miles of an AHT program, only two employed an AHT. Of the 22 wildlife care organizations reporting that were greater than 100 miles from an AHT program, seven employed and/or had volunteer AHT's. There was no apparent pattern of employment at the ten wildlife groups that were 10-20 miles, the sixteen that were 20-50 miles, or the twenty one that were 50-100 miles from an Animal Health Technician training program. Twelve respondents said there was no AHT program in their area and two did not know what an Animal Health Technician was.

Adequacy of AHT Training

Only about half the respondents had an opinion as to the adequacy of AHT training as it relates to the needs of wildlife rehabilitators. Forty said they are adequately trained, nine said they were not. Eleven people wrote that AHT's have a good general background but need special training in some areas such as avian anatomy, feeding infants, etc. Six respondents said AHT's make a most valuable contribution to wildlife care and one said each center should have an Animal Health Technician.

AHT Salaries

Salaries paid to Animal Health Technicians were reported as follows:

Less than $	4.00 per hour	2
$4-5.00	per hour	4
$5-6.00	per hour	8
$6-7.00	per hour	5
Greater than $	7.00 per hour	7

One wildlife care group employed four AHT's at hourly salaries ranging from $6.80 to $8.65.

Duties of the AHT

The responses were quite variable for the duties listed but generally fell into two categories. Either the AHT's did all of the duties listed and then some, or that they did only cleaning and feeding. Twenty-one responded in the former, four in the later, and one said their AHT did everything but cleaning and feeding.

Other Comments by Respondents

There were many interesting comments contributed by respondents to this survey. Twenty said they were very small volunteer networks with no real center, one said they were a loose group of volunteers and AHT's from local veterinary practices. Three people said they were self-trained and did all the technical and animal care work themselves. One respondent stated that the local AHT program required their graduates to attend wildlife care classes but no students had ever volunteered for further experience or been hired. Three wildlife care groups said they were looking for Animal Health Technicians. Four respondents were AHT's looking for wildlife work.

Employment Opportunities with State Wildlife Agencies

During January of 1988, the author phoned the wildlife management branch of the wildlife agencies of ten western states (WA, OR, ID, MT, AZ, NM, CO, WY, NV, UT) to find out if Animal Health Technicians were used in any capacity. Only the Arizona Department of Game and Fish runs its own wildlife care center, in all other states wildlife rehabilitation is done at the expense of private citizens or organizations. The California Department of Fish & Game where the author works, usually has AHT's in training and some have been temporarily employed as seasonal aids. Duties include caring for injured, orphaned and confiscated wildlife, laboratory work, assisting in research necropsy and tissue preparation, and some field work. We also employ a laboratory technician, some of whose duties include supervision of animal care and hematology. In the future an AHT may be considered for that position.

The Wyoming Game & Fish Department has several technicians, one of whole works for Dr. Tom Thorne. That job has general technical responsibilities and has been occupied by an AHT.

Colorado employs people with a two year college education as technician assistants to their enforcement officers. This is not really the type of work for which AHT's are trained, however, they may qualify.

Washington, Nevada, Montana, and Oregon do not employ two year graduates. A few states still have game farms run by biologists where birds are raised for release but these programs are in decline. All the western states employ wildlife biologists but a four year college education is a prerequisite.

In Montana, the entry level biologist position requires a master's degree and the trend appears to be in this direction. One AHT stated that she felt that each state wildlife agency should be required to employ a technician. Most biologists, however, believe they are capable of doing most

things a technician might have to do and have a wider training with many more needed skills as well. Thus, a two year AHT degree by itself is not adequate to gain professional level employment with most state wildlife agencies. For those seeking employment with state agencies, an AHT may be a useful adjunct to a degree in biology or wildlife management.

Conclusions

As noted, one of the most common comments in the wildlife rehabilitation survey was that Animal Health Technicians lack specific training in avian anatomy, and techniques in rearing wild orphans. Additionally, they lack specific training in wildlife management techniques. Where can an AHT obtain this type of training? The International Wildlife Rehabilitation Council offers training programs in most aspects of wildlife care at a technician's level. If demand and job opportunities dictate, these and other useful wildlife management procedures may become options in some AHT programs. By volunteering in wildlife care facilities, AHT's have an opportunity to show just how useful their training can be given the opportunity to adapt their skills to wild animal care.

Wildlife rehabilitation in particular seems to hold some real promise for Animal Health Technicians. There is a proven track record and an existing demand in some states. Wildlife centers are often in appealing locations and veterinarians, by necessity, often encourage a fair degree of independence. Because of the latter, the job can be very challenging and allow for more personal growth than in some other rigid job settings. Centers who have worked with AHTs can see the benefits to having them on staff. Once trained in wildlife rehabilitation, they can add new dimensions to daily animal nursing and care. They are especially helpful in health screening and disease surveillance. While getting salary funds is always hard, funding these kinds of positions may in the long run save money by virtue of the work that they can do.

Figure 1

Rehabilitation Questionnaire

Dear Wildlife Rehabilitator:

I am trying to gather information on the use of Animal Health Technicians (AHT'S) in wildlife management and wildlife rehabilitation.

How many licensed AHT's are employed at your wildlife center? Circle One 0 1 2 3 4 5 or more

How many are employed part-time? 0 1 2 3 4

How close is the nearest AHT school? 0-10 10-20 20-50 50-100 more than 100 miles

Approximate salary per hour? less than $4 $4-5 $5-6 $6-7 greater than $7

How many AHT's volunteer time at your center? 0 1 2 3 4 5 or more

What duties do AHT's perform? (circle one)
1) Cleaning & feeding
2) Giving medications
3) Diagnostic & lab work
4) Minor medical/ surgical
5)Other (specify)

In your experience, are AHTs adequately trained to be valuable to your wildlife rehabilitation program?

1) Yes 2) No 3) Comment

Book Review

Last of the Curlews

Fred Bodworth
The Edwin Way Teale Library of Nature Classics;
Dodd, Mead & Company
New York, New York
1987, 160 pp., $17.95 (hard cover), $8.95 (paperback)

The recently reissued *Last of the Curlews* is a novel that follows the last male Eskimo Curlew for one year, beginning with his arrival at the breeding grounds in the Artic tundra one June. The following pages introduce the readers to the behavior of the lone bird and interpretations of these behaviors. Never does Canadian author, Fred Bodworth, slip into over simplistic, sentimental anthropomorphism. He does, however, utilize anthropomorphic thoughts to heighten the reader's concern and interest for the curlew.

The illustrations by T.M. Shortt compliment the text. They help the reader "see" the curlew probe the mud seeking prey, chase an intruder from his territory, lead his adopted flock over the tumultuous sea, and meet, then lose, his mate.

Throughout the book there are excerpts from actual historical accounts of the Eskimo Curlew that were written from the late 1700's to early 1900's. The reader reads description of the new species, Eskimaux (sic) Curlew; of their incredible numbers; of their slaughter and of the concern over their disappearance. The quotes help blur the line between a fictional account of the last curlew and an actual account.

In 1955, when this book was first published, the Eskimo Curlew was thought to be extinct. There had not been a reliable sighting of one since the 1940's. Eskimo Curlews had been pushed to the brink of extinction by full-scale slaughter along their migration route in North America and in their wintering grounds in South America. However, in the 1970's well documented sightings were reported. There have continued to be sightings along the north American migration route, specifically on the Texas Atlantic coasts. In no way does this knowledge dampen the effect of the novel. Extinction is dramatic. It is also a very real possibility for this species.

Last of the Curlews can be enjoyed by people of all ages and interests. It is well-written and straight forward. In addition to being very entertaining, perhaps it may spark an interest in ecology and conservation. For the future of all species, one can certainly hope so.

Kirstine M. Thorne
Wildlife Biologist

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Rehabilitation Notes:

Cottontails: *(Sylvilagus floridanus)*

Anne Buglass Hiss
Chesapeake Wildlife Sanctuary
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Bowie, Maryland

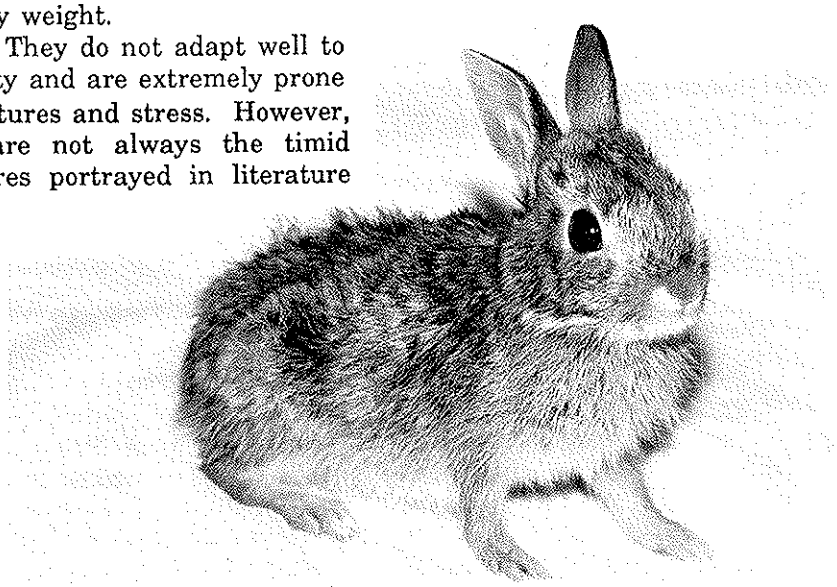
Introduction

The order lagomorpha is divided into two families, Ochotonidae (pikas) and Leporidae (rabbits and hares). *Sylvilagus* (cottontail) is one of eleven genera within the family Leporidae and is classified as a true rabbit. There are eight subspecies of *Sylvilagus* in the United States: The Desert/Audubon's Cottontail which is found in the southwest and into northern Montana; the Mountain/Nuttall's Cottontail which inhabits the northwest intermountain region; the Swamp and Marsh Rabbits both inhabiting the southeastern United States; tthe New England Cottontail found sparsely in the New England states; the Pygmy Rabbit found mainly in the great basin; and the Eastern Cottontail which is the most widely distributed of all cottontails. The range of the Eastern Cottontail extends east of the midwestern United States and south from southern Canada through Mexico and beyond. (Chapman, et al 1982)(Cheeke, et al 1987)

The Eastern Cottontail's preferred habitat is deciduous woodland with light ground vegetation, brushy fields and downtimber. They do not thrive in cold mountainous regions and dense coniferous forests. They are generally nocturnal and do most of their feeding from dusk to dawn. Their average life span in the wild is one half to two years, however, captive cottontails have lived beyond seven years of age.

Adults weigh between 400 to 2300 g. and characteristically have a white-buffy undercoat and tail, hence the term "cottontail". Both sexes have grey brownish black to reddish brown black dorsal fur which varies little from season to season. Scent glands located under the chin are used for marking, especially in the buck. They have four upper and two lower incisors which grow continuously throughout the life of the rabbit. (By contrast the rodent has two upper and two lower incisors). They have a relatively small heart and skeletal frame in proportion to their body weight. A rabbit's skeletal make-up is 8% of its body weight. In comparison, a cat's skeletal make-up is 13% of its body weight.

They do not adapt well to captivity and are extremely prone to fractures and stress. However, they are not always the timid creatures portrayed in literature and can defend themselves with blows from their front feet and from bites. They rely mainly on their sense of hearing and smell, and vocalize with a high pitched scream and growl or grunt when threatened. Their large well vascularized ears also help serve as a thermoregulatory mechanism. Rabbits practice coprophagy, i.e., they eat their own feces directly from the anus beginning during the weaning stage. These so-called "night time feces" appear as soft, small grape-clustered fecal matter and contain vitamins and minerals vital to the health of the rabbit. To observers of coprophagy, it appears that the rabbit chews the feces before ingesting them. Necropsies of rabbits shortly after coprophagy



reveal that the feces are actually swallowed intact.

Birth and Young

In the eastern United States, cottontails mate between February and September. The gestation period is approximately 28 days and the average number of litters per season per female is four.

Reproductive activity generally occurs later at higher elevations and at higher latitudes . Primary factors attributed to the onset of breeding among cottontail species are temperature, favorable weather, availability of succulent vegetation, rainfall and photo-period changes. (Chapman, et al 1974)

Before birth, the female prepares a shallow nest which she lines predominantly with fur plucked from her abdomen. There are typically four to seven bunnies in a litter. The young are born naked, eyes closed, ears flat and are three to four inches long. Within a week of birth they are fully furred. Their eyes open within six to ten days after birth, and within three to four weeks of birth they are weaned and on their own. Suckling rabbits are nursed for three to five minutes once every twenty-four hours.

"In most mammals, the gut flora is established within a few hours of birth and persists with minor changes throughout the animal's life. Suckling domestic rabbits are unique among nursing neonates, because they have a stomach and intestine that are usually devoid of microorganisms. These baby rabbits have a fully distended stomach filled with a firm milk curd. This milk curd and its relatively high pH, which in other species fully supports the growth of a luxuriant gastrointestinal flora within the first day of life, does not support similar growth in the rabbit. In the rabbit, there is a so-called stomach oil, a fatty acid with an antimicrobial action distinct from that of the secreted gastric acids. Separately, rabbit milk and the homogenized stomach of the baby rabbit both support bacterial growth in vitro, but when they are incubated together, an antimicrobial factor is formed. The antimicrobial fatty acid is produced from an enzymatic reaction of the suckling rabbit's stomach with a substrate in the doe's milk. Rabbits fed milk from other species do not develop this antimicrobial factor and are more susceptible to infections. This special physiological adaptation controls the gastrointestinal microorganisms in very young rabbits. That in turn, is a possible explanation for the necessity of the milk antimicrobial factor, since a fully distended stomach with enough milk to last many hours would otherwise provide an excellent growth medium for potential pathogens".(Brooks, 1986)

Captive Care

Initial Care: Upon admission, the orphan should be checked for normal body temperature (101° - 103° F) and hydration state. The rabbit should feel warm to the touch. If not, it should be warmed on a heating pad, with a heat lamp or preferably in an incubator. If a heating pad is used, check the orphan often. Human monitoring of temperature is important with very young or ill orphans.The pad should be placed in such a way that the animal can get off the heated area to cool down when necessary. The area under the pad should feel warm and cozy but not hot to the touch. The pad can be placed under the box habitat to help eliminate the possibility of burns or overheating. Skin turgor is used to measure the hydration state. When the skin around the dorsum of the neck is pulled upward, it should return to its natural position in about one second. If the skin return takes longer than 2 seconds, the animal is dehydrated and fluids should be administered. When dehydration is mild, fluids may be given orally. In more severe cases, they may be given subcutaneously, intraperitoneally, or intravenously, with the latter being the most direct, quick, and requiring increasing skill on the part of the handler.

Rabbits are placed in appropriate housing and kept warm for several hours before attempting to bottle feed. They should be housed in a quiet or low traffic area.

If the orphan's eyes are still closed, stimulate urination before or after each feeding. This can be a serious problem if the handler is unaware of the necessity to do so. To stimulate the orphan to urinate and defecate, gently jiggle or flick the urogenital area with a Q-tip dipped in warm water or a soft damp kleenex. The urine should be clear or tinted slightly yellow. Brown urine indicates the orphan has gone for a long period of time without urinating.

Gut Flora: Due to the unique gastrointestinal flora situation that occurs in rabbits, their gut environment should remain devoid of microorganisms when they are kept by rehabilitators as infants. To duplicate this condition, the author established a regimen of administering Bactrim® (Roche) twice daily for five to seven days at a dosage rate of .02 ml per 50 grams of body weight. (Bactrim is a combination drug containing 40 mg. trimethoprim and 200 mg sulfamethoxazole per 5 ml. The dose is based on the content of the trimethaprim.) Bactrim will reduce any bacteria counts that the bunny may pick up in captivity during the same general time period that it would have had a sterile gut. It is important to change as few variables as possible when the animal enters captivity. It has

already lost the doe and has had a great change in its environment. To further subject it to the stresses of captivity and the lack of normal antibacterial factor will likely result in diarrhea. The Bactrim regimen has been successful in preventing mucoid enteritis which is a common and fatal non-specific diarrhea in suckling rabbits and weanlings.

The causes of infant mortality in cottontails has been explored by other investigators. Studies from Treehouse Wildlife Center in Brighton, Illinois, using the electron microscope and bacterial toxin testing illuminated some of the causes of death. They showed that affected cottontails had "Rotavirus, *E. coli* and its toxin, *Clostridium spiroforme* and its toxin, as well as Tyzzer's disease. These were the most common agents implicated (in diarrhea) regardless of whether lesions of mucoid enteritis were present . . . Coccidia were found in only 3.5% of these animals." (Evans, 1983) The cause of mucoid enteritis is unknown, and various microorganisms and related toxins, in addition to the ones listed above, have been identified in postmortems on rabbits with diarrhea.

Bactrim® duplicates the environment that the antimicrobial factor produces in the suckling rabbit's stomach by helping to destroy bacteria and producing a near normal intestinal environment partially devoid of gut flora. None of the normal orphans that were treated with Bactrim died of diarrhea while 33% of the normal orphans who were not treated with Bactrim died of diarrhea. Although Bactrim® prevented diarrhea, it did not stop diarrhea if it occurred prior to the administration of the antibiotic. None of the orphans survived if admitted with diarrhea. While the evidence is anecdotal, it is worthwhile to pass on to rehabilitators at this time because so many people have reported problems related to diarrhea in this species.

An alternate regimen reported by White (1988) is to give them two doses of Septra ® (another form of Bactrim) at a rate of 1 mg of trimethoprim per lb., followed by daily feedings of live culture lactobacillus until the rabbit is completely weaned from formula. The general idea is to wipe out any bacteria susceptible to Septra and then to repopulate the gut with harmless *Lactobacillus*. These bacteria will take up sites where harmful bacteria might otherwise attach. Yogurt has not produced the same effect as the live culture *Lactobacillus* tablets, due to the low yield of *Lactobacillus* in it. This regimen has resulted in fewer deaths during the 1988 baby season. The advantage of using this method is that the animals are not fed antibiotics for extended periods of time, decreasing the likelihood that resistant strains of bacteria will develop.

Records: Incoming animals should be assigned an identification number and marked. Methods of marking the animals range from writing the number on surgical tape placed in the ear, using ear tags, painting nails, or patch hair clipping. The author prefers using surgical tape for identification on the ear. The orphans should be weighed daily and the growth should be reviewed regularly.

Food

There are no commercially prepared milk substitutes made for rabbits. Rehabilitators have used KMR® or modified Esbilac ® to successfully rear them. Esbilac (or KMR) is modified to increase the fat content by adding one part heavy whipping cream to one part powdered Esbilac and then the recommended amount of water is added. Evans (1986) also recommends the use of a relatively new product, Multi-milk® for this species. Multi-milk contains higher levels of fat and protein with only trace amounts of carbohydrates. The formula should be warmed and prepared fresh each feeding. This can be accomplished by placing the amount to be fed in a container and then warming it in a larger container of hot water or a thermos to maintain the temperature throughout the feeding because orphans vary in their willingness to nurse and their speed of nursing. The initial two feedings should be one-half strength formula. Feed small bunnies (weight less than 50 grams) with 1 cc or 3 cc syringes either alone or with a teat cannula on the end. Pet nurser nipples inserted on the end of a 10 cc luer lock syringe works well with some orphans. Plastic droppers can be used, however, it is difficult to control the amount of flow and formula, and the droppers also tend to produce air bubbles in the formula.

Orphans are positioned on their stomachs in a normal sitting position to nurse. To stimulate nursing, place a drop of formula on the lips of the rabbit and allow it to lick it off. This may be the only way of getting the rabbit to drink initially. Next, insert the tip of the cannula, nipple or syringe just inside the mouth and squeeze a drop of formula into the mouth. To help reduce the incidence of inhalation pneumonia, do not attempt to force more formula into the mouth until he swallows. Begin with very small amounts (1 cc or less depending on the animal's size) until weight gain dictates an increase. Nursing time varies from two to 30 minutes. If the rabbit takes only a partial feeding, do not attempt to complete the feeding in one or two hours. Rather, wait until the next scheduled feeding time. However, if there is a decrease in weight the following day, either the amount of formula given should be increased slightly or the number of feedings per day increased by one. The au-

thor has had success with increasing the number of daily feedings with bunnies who are poor nursers. There have been, however, problems with bloat associated with an increased number of feedings. To avoid this, White(1988) has administered subcutaneous fluids to maintain normal electrolyte balance and to prevent dehydration in orphans who are slow at learning to nurse from the artificial teat.

As a rule, feed bunnies with closed eyes three to four times daily and gradually decrease the number of daily feedings until weaned. See the feeding chart for more specific information regarding the amount of formula taken daily by weight. It is important to realize that formula intake, nursing preference and number of daily feedings will vary from orphan to orphan.

As shown in the chart, cottontail bunnies vary widely in their formula intake and weight gain. As previously stated, a record of daily weight and formula intake for each orphan is extremely important for assessing amount of formula to feed per day and frequency of feedings. When graphed, weight gain and formula intake produces a jagged up and down line rather than an even sloping curve. Substantial weight gain usually alternates with days of decreased weight gain (not to be confused with an extreme weight loss). It is important to recognize that a five gram weight loss in a 50 gram animal is significant.Steps should be taken to offset weight loss. This can be done by increasing the amount of formula per feeding or increasing the number of daily feedings.

Weaning weights vary from 70 to 139 grams (about three to four weeks of age). Once their eyes are open, decrease feedings to once or twice daily depending on weight gain. They will start urinating on their own around this time. Bunnies will pass fecal matter on their own when their eyes are closed. Feces should be well formed and yellow to dark olive green in suckling bunnies

All orphans with their eyes open should be furnished with rolled oats, commercial rabbit pellets, leafy alfalfa, kale, white clover, plantains, dandelion leaves, grass clippings, apple, or corn. It is important that a balance of these food items be offered—not just one or another. Adult cottontails have been observed to eat up

Infant Feeding Chart for Cottontails

Wt. In Grams (A)	Formula Intake in CC's/Day		Number of Feedings/Day		Wt Gain in Grams/Day (B)	
	Ave.	Range	Ave.	Range	Low	High
35-39	8.2	2.5-12.7	5.0	1 - 6	-2.1	7.5
40-44	10.3	3.7-20.0	3.3	3 - 4	-8.5	-.8
45-49	11.2	6.5-26.5	3.1	2 - 4	-1.7	6.4
50-54	13.2	4.5-22.0	3.0	1 - 6	-7.9	10.0
55-59	10.6	5.0-16.0	2.0	2 - 3	-5.6	7.4
60-64	9.9	4.0-15.0	1.2	1 - 3	-7.8	7.3
65-69	13.1	8.0-17.0	1.4	1 - 3	-1.0	9.1
70-74	13.3	8.0 - 26.0	1.3	1 - 2	-10.4	17.5
75-79	17.5	11.0 - 23.0	1.3	1 - 2	2.4	22.2
80-84	12.2	2.0 - 20.0	1.3	1 - 2	.3	17.0
85-89	13.0	4.0 - 27.0	1.4	1 - 2	-1.8	23.2
90-94	9.7	2.0 - 17.0	1.1	1 - 2	.9	22.8
95≥	Maximum 20		Maximum 2		-5.4	37.5

(A) Critical state is a body weight of less than 80 grams.
(B) Average not provided due to wide variation in weight gains. Weights are taken in the evening before evening feeding.
Formula used in these trials was 1 part powdered Esbilac, 1 part whipping cream, and 3 parts water.

to 45% of their body weight in vegetation daily. Greens should be rinsed with a steady stream of tap water to remove insecticides, fertilizers, and other surface contaminants. A balanced commercial rabbit feed should be a staple in the diet. Water is provided in a shallow container. Mineral blocks are also made available.

A shallow bowl of formula may also be placed in the cage to encourage self-feeding. It should be changed as needed, depending on the ambient air temperature. Some rabbits will wean themselves; however, there are always those who still look for the bottle long after "normal" weaning age. For those rabbits that do not wean themselves, feeding amounts should decrease to encourage them to self-feed, followed by a decrease in frequency from twice daily to once daily. Sudden weaning, if not self-initiated, may result in major problems or acute death.

Handling

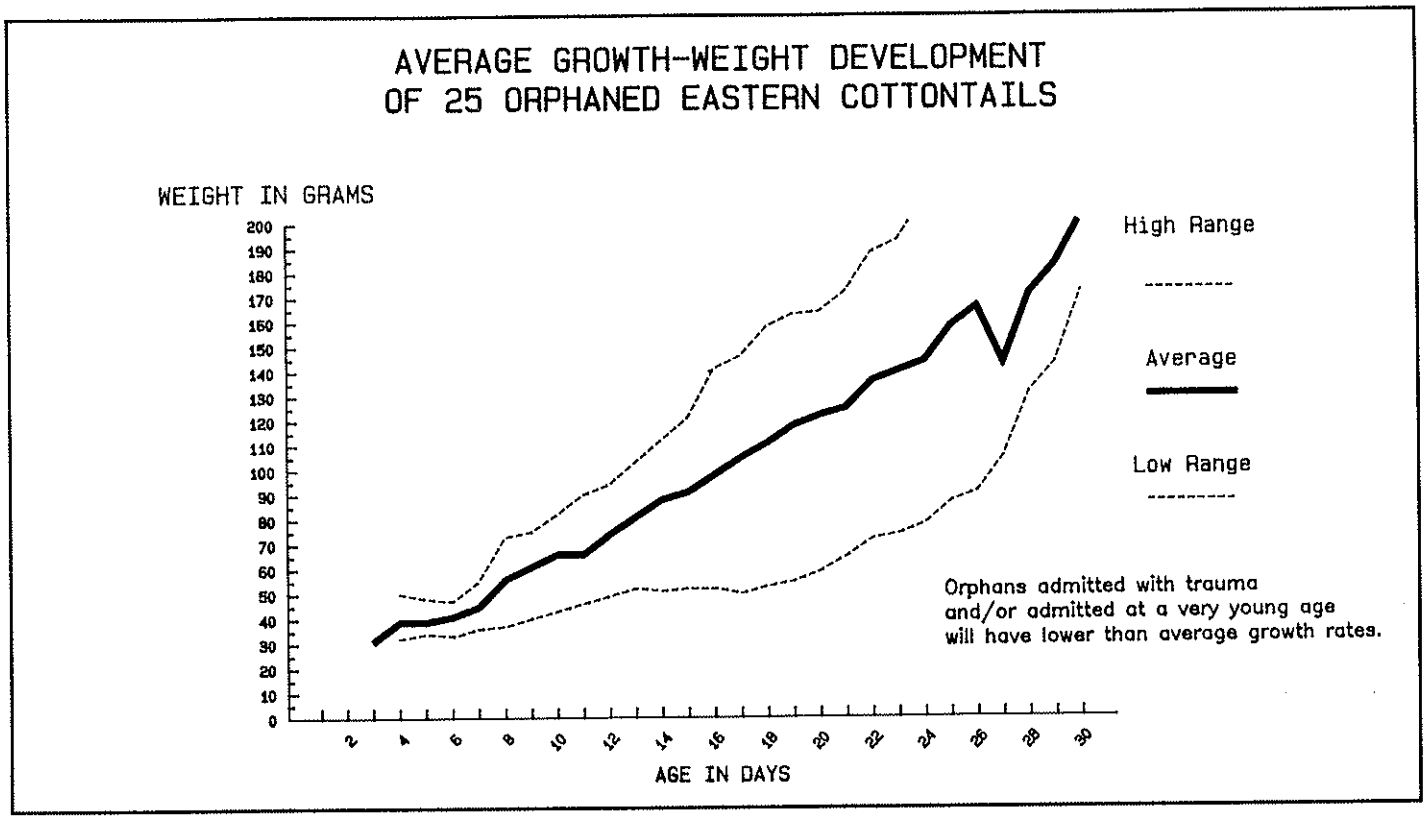
Rabbits should be handled only for feeding, cleaning and weighing and should otherwise be left undisturbed. They thrive in a quiet room where the level of human disturbance is minimal. Note: use caution when handling all rabbits. They can jump unexpectedly (including orphans with eyes closed) and sustain injuries. Use a weighing container with a securely fitting lid.

These animals are known to panic when startled. In their panic, they literally stampede into the sides of their caging or hop up to knock themselves on the top of their caging. The result can be bruises, ocular scratches, fractures of long bones or their back. For that reason, they are carefully housed in environments that provide the best level of safety (see housing section) and are released as early as possible (see release section). In bitter climates, overwintering this species can be difficult and should be avoided if at all possible.

Housing

Bunnies should be housed in a room away from people traffic, noise, domestic pets, etc. Orphans with their eyes closed should be housed in a small cardboard box or aquarium no larger than 10" by 12" with a maximum of three bunnies. The same bunnies, once grouped, should be housed together and not mixed with other groups. If one does not survive, do not replace it with a new incoming bunny. Experience has shown better survival rate is accomplished by using new boxes for incoming groups and not reusing cardboard boxes for new bunnies. When using aquariums, they should be properly sanitized with a disinfectant and sun dried.

The box or aquarium should be placed inside an incubator or on a heating pad with an ambient temperature between 85 and 95 ° F. The temperature must be monitored carefully and lowered slightly if the animals are becoming dehydrated or raised if the bunnies appear or feel cold.



The box or aquarium should be lined with a soft ravel free cloth. Shredded tissue or small pieces of cloth placed in the box provide burrowing materials. A tight fitting ventilated top is necessary as bunnies will jump even if their eyes are closed.

Once the bunnies have opened their eyes, place them in a cage no smaller than 2' by 2' (for three bunnies). As a general rule, allow 1.5 to 3 square feet per juvenile. Up to six juveniles can be housed together if they have been raised together. Severe fighting may occur if established "groups" are mixed. Note: the larger the cage, the more evident the need for cover or hiding places becomes. An upside down box with a small entry portal cut in one side will provide cover and security. They can be disposed of when soiled. Another hiding place that promotes a natural behavior is to provide a pcv pipe to simulate a burrow. (Brooks, 1988)

The bottom of the cage should be lined with newspaper then covered with paper towels or a sheet. This gives the bunnies a surface to scamper on that is not as slick as newspaper and keeps the newspaper dye off of them. Bedding should be changed twice daily. A heating pad set on low should be placed under one-third of the cage and can be removed once the bunnies are completely weaned. Cage siding can be hardware cloth or glass. The author uses a sheet to cover half the cage when these materials are used. Cage walls should be short, about 14" high. Solid siding has been used, however, in some cases, bunnies respond by attempting to jump out continuously, and severe back injuries have occurred due to this behavior.

Release

Orphaned rabbits are ready for release when they are weaned, recognize and eat natural food items, and shun human contact. Depending on the behavior and condition of the orphan, a good release age is anywhere from four to seven weeks of age and between 100-200 grams in weight. The release site should have plenty of natural vegetation for cover and feed, available water, and be an area where cottontails are known to occur or that is potential habitat for this species.

The rabbits should be conditioned to outside temperatures for at least a week before release. Weather should be expected to be clear and warm for several days. Release in the early evening. Supplemental food such as rabbit pellets can be left at the release site.

Diseases

A fecal exam should be routine for all rabbits. Internal parasites are common and should be treated appropriately. Ectoparasites include fleas, earmites (evidenced by crusty material inside the ears and head shaking), and subcutaneous myiasis or warbles (evidenced by localized swelling). Warbles should be removed from under the skin alive and intact. Ask your veterinarian to recommend the proper treatment for mite and flea infestation and instruction for the removal of warbles. Myxomatosis is a pox viral disease, usually fatal, and occurs only in Oregon and California. Pasteurellosis is the most common bacterial infection in rabbits and is manifested in a variety of symptoms including respiratory infections, skin abscesses, conjunctivitis, etc. Seek veterinary assistance when illness occurs.

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Management of Dehydration in Nestling Birds

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During spring and early summer, most rehabilitation facilities see large numbers of nestling passerines. Working in an area where summer temperatures frequently rose above 110 ° F many birds we receive are heat stressed, dehydrated and debilitated.

A critical point in caring for nestling passerines is providing adequate nutrition with frequent feeding. Their nutritional reserves are small, their metabolic rate is high and their ability to survive without frequent feeding is very limited. Small size and limited reserves increases the nestlings' vulnerability to heat and dehydration.

Young birds received in a depressed and dehydrated condition may not have eaten for an extended period of time. They often exhibit anorexia and depression until their hydration status has been corrected. Rapid correction of dehydration may make the difference in whether they survive.

Part of the rapid initial examination (triage) of incoming nestlings should include an assessment of hydration status. Hydration can be evaluated with a little practice by observing the moistness of the mucous membranes inside the mouth, the glossiness of the eyes, and the smoothness and turgor of the skin in the yolk sac area of the ventral caudal abdomen (an unfeathered area in nestling passerines) and over the skull.

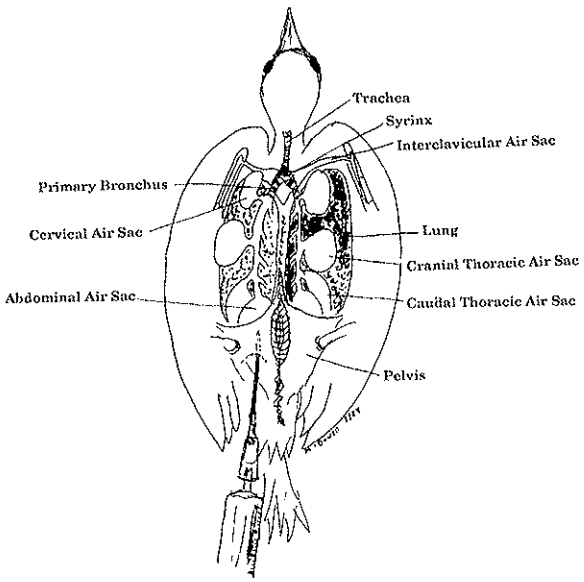
A dehydrated bird has dry, tacky mucous membranes, sunken eyes and a wrinkled abdomen. An additional test which can be used is the pinch test for skin turgor. If the skin of the caudal abdomen or over the skull is gently pinched it will return rapidly to its original position in an adequately hydrated bird. In a dehydrated bird the pinched skin will return to position slowly or not at all.

Dehydration is a common clinical finding with incoming nestlings that are depressed, lack interest or strength to beg for food and refuse to eat. Treatment and support must start by correcting the dehydration.

Methods of rehydration currently in use in nestlings include the use of a toothpick or eyedropper to drip water into the bird's mouth or the use of a very small stomach tube or syringe. The first method is minimally stressful, but very slow and time consuming. The second method is more rapid, but involves quite a bit of stress and can be difficult to do alone. Fluid aspiration can occur easily in weak nestlings secondary to stomach tubing.

The disadvantages of these methods encouraged me to seek an alternative route of fluid administration, such as subcutaneous fluids. The conventional site for fluid administration is the medial thigh area but the dorsal midline area of the back is a more satisfactory site for subcutaneous fluid administration because it allows for rapid administration of adequate quantities and fluids can be given easily and quickly by one person with very little stress to the bird.

Caution and careful attention must be given to



Drawing of injection site for subcutaneous injections in young songbirds.

avian anatomy because the dorsal midline is just behind the area of the cervical air sacs of the neck region, a location where fluid administration would be injurious. The skin of the back overlies the thoracic vertebrae. There is a featherless tract in this area, just off midline, which provides an appropriate site for fluid administration. The location can be double checked by palpating the underlying supporting bone. In the area of the cervical air sacs there are only the neck vertebrae and no other supporting bony structures under the skin.

A tuberculin syringe and needle (25 gauge) can be used to administer 0.5-3.0 mls of lactated Ringers, a balanced electrolyte solution, subcutaneously to each nestling that is judged to be dehydrated. The amount can be quickly determined by using the charts published in the "Clinician's Corner" in Vol. 10, No. 4 of the *Wildlife Journal* or the Basic Wildlife Rehabilitation 1AB Manual. Sites over the back and in the medial thighs can be used to deliver the necessary amounts.

Incoming young birds can be segregated into groups which are hydrated, for whom feeding can start immediately, or dehydrated, for whom rehydration must occur first. The dehydrated birds should be checked hourly. Depending on the original severity of dehydration, they may have improved and show interest in eating or they may require further treatment. If they still appear depressed and dehydrated, run a finger gently over the area of fluid administration to check to see if it has been absorbed. If the area feels flat, the fluid has been absorbed and it is appropriate to repeat the treatment. It may be necessary to repeat subcutaneous fluid administration up to three or four times. When the nestlings brighten and show interest in eating discontinue the subcutaneous fluid administration and start them on moistened food. It may be desirable at this point to use a feeding mixture with an increased proportion of water to help continue rehydration of the bird.

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Editorial Continued from pg. 2

Then there are all of those unhappy campers! When the decision is made, some people agree and inevitably, some do not. They then have to search their minds to see if they can live with the decisions the director has made. If they cannot, all havoc can break loose. Yet, a good leader cannot have a primary goal of satisfying the team leaders, committee chairs, volunteers and staff.

The primary goal is to provide a valuable conservation service, to help return wild animals to the wild and to educate the public about their needs. This does not mean that you work on your primary goal and ignore the needs of the providers. We have seen what happens to directors who do that. Their programs fail to thrive, and become one-man operations.

Well then, good communications must be the answer. It may be in some cases. It is said that failed communication is the biggest reason clients are suing their veterinarians. It also seems to be a major player in the gossip trails known to run behind wildlife centers and organizations. But I think that there is more to it than that. It is an emotional support system. One that gives the beleaguered troups comradeship. This is true especially in the face of tough or controversial decisions. So what do we do? I only wish I knew. My current approach is to acknowledge the problem openly and try to get people back on board or agree to disagree.

What about the person who continues to stir the pot and whom it is evident has their own agenda? In the old days, I used to pretend they weren't there or that their idle gossip was just that and that time would verify what path was correctly chosen. I was wrong and ended up in a protracted court battle that cost me $12,000 of personal income, resulted in revocation of the organizational animal care permit, and caused incalculable pain to me, not to mention the hundreds of animals that died from October 1979 to January 1982 when we were issued a permit to again handle protected wildlife. I swore that I was going to take steps to see that it never happened again in California—and it hasn't. However, it happened two years ago in Bowie, Maryland and the financial losses, pain and suffering inflicted were and are staggering. So in the aftermath, I feel it is necessary to take a harder position.

When your gut instincts tell you that you have a distractor in your midst, find a nice way to 1) isolate them from others in the group so they don't spread their tension and unhappiness, and 2) document any work-related problems you are having and show them the door 3) if it is a volunteer,

Continued on Page 15

Editorial Continued from Page 14

replace them. Do it calmly and with reason. No one can afford the absolute havoc these people can bring. Least of all the animals that are the purpose for the organization. I know this sounds harsh, but if you know someone who has had to suffer through the pain and financial loss of an inspired revolt, you know that the losses far outweigh the gains. Besides, that pain is not part of the job description. It is not our fate in life to have to find a way to incorporate every misfit or sociopath that lands on the doorstop.

My encounters with these distractors have left me with a few opinions regarding their motives. They come to the organization to fill an emotional need. They will often tell you they hate politics and their only concern is the care of the animals. When further pressed, they will tell you that they want to work with animals, not people. They don't like people as much as the animals. They are driven people with strong emotional feelings regarding care issues. They second guess most major decisions of the managers and will not confront the managers, rather they go to others in the organization to voice their "concerns". They will after some time, form alliances within the group and when they divide the team into two camps—the smoking fire turns to flames. If left to their own devices, the entire staff or volunteer team becomes affected in one way or another. It accelerates burn out, wears down good people, animal care suffers and again the primary cause is adversely affected.

So why does anyone in their right mind let them stay five minutes? Because, they are often hard workers and we are often understaffed. After a director has been through one of these uprisings, it becomes clear that no one is indispensable. The key here is to make that known to all entering the organization. Set up rules of conduct and enforce them consistently. Never ever let anyone blackmail you subtly by letting you know that if they don't get their way on an issue that you will suffer the consequences of their leaving. In their mind they already know they are going when they threaten you.

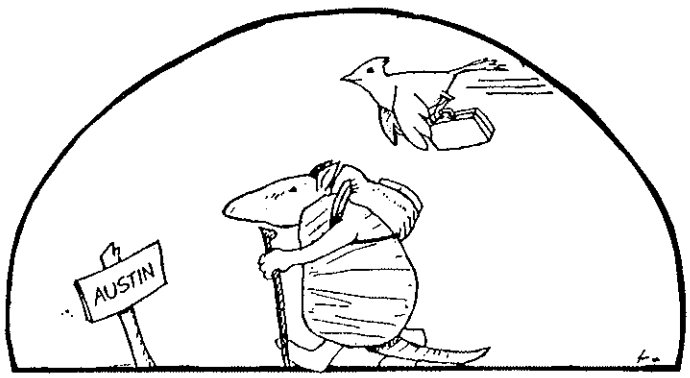
You have to deal with the issues they bring up. Are they real or are they a smoke screen? If they are real, you handle them. If they are not, approach the person with your perspective on the issues at hand.

Leadership is a responsibility. It is always easy to say what you would do if you were the leader when you do not carry around daily the responsibilities of the job. If the director makes a mistake everyone knows it and the failure is both shared and magnified. That is the way it is. But just the same, try to walk a mile in your director's shoes, try to visualize both the agony of defeat and the triumphs before passing judgement. Look at where the organization was when the director took the job and where it is now. Don't get caught in the negativism that is so easy to contract on long hot summer days. Those long dog days are hard enough to get through without the challenges of people who don't have to pay the price if the wrong decision is made.

Try to keep everyone on the same team. This is crucial because we all know that a "house divided against itself cannot stand". More teamwork produces better efforts and more lives saved to be returned to a life in the wild. This is, afterall, why we are in the field of wildlife rehabilitation.

-Jan White-

IWRC Conference '89



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Esbilac Changes

Editors Note: This letter was written to Associate Editor Debbie Marcum in response to her inquiry regarding problems rehabilitators were reporting using Esbilac milk replacer.

Dear Ms. Marcum:

As per our conversation last week on powdered Esbilac milk replacer, recent changes in the label will indicate a change in mixing directions for making the liquid puppy milk replacer. While the formula has not changed, the density of the powder has decreased. To maintain the 15% solids level in the milk replacer for puppies, a mixing ratio of 1 volume to 2 volumes water is recommended on the label. This is a change from the 1 volume powder to 3 volumes water that has been listed in the mixing directions on the Esbilac label.

If one is using Esbilac powder to make formulas differing from the formula recommended for puppies or is using it along with Multi-Milk for milk replacer formulations, and using the spoon included with the Esbilac, one level spoonful (not packed) weighs approximately 5.2 grams. If a standard household measuring tablespoon is used, the weight is approximately 5.9 grams.

Ms. Marcum, I hope this information is helpful to you. If we can be of further service, please don't hesitate to let us know.

Very Truly Yours,
Jane B. Truitt
Technical Director
Pet Ag Inc.

NAPP Record Loss

The Non-Releaseable Animal Placement Program (NAPP) is a computer based information system for non-releaseable species of mammals, birds, reptiles and amphibians run by the Animal Rehabilitation Center of Midlothian, Texas.

The purpose of the program is to maintain a clearinghouse for wildlife professionals who deal with non-releaseable, permanently injured or imprinted animals. It is designed for the placement of surplus animals into various wildlife programs —zoos, nature centers, science museums throughout North America.

Our NAPP Report files were stolen during December. I am attempting to recreate the file. If anyone is no longer receiving the monthly NAPP Report please contact: Karen Starr Wakeland, Animal Rehabilitation Center, Inc. 449 Edgefield Lane, Midlothian, Texas 76065 (214) 775-6228

Raptor Meeting Scheduled

The Second International Veterinary Symposium on Raptor Medicine and Diseases and the annual meeting of the Raptor Research Foundation including a Rehabilitation Symposiun will be held October 23-29, 1988 at the Holiday Inn Metrodome, Minneapolis, Minnesota.

Schedule of Events

October 23-26 Second International Symposium on Raptor Medicine and Diseases.

October 26 RRF Rehabilitation Symposium

October 27-30 RRF Annual Meeting with sessions on Eagle Management, Impact of Diseases and Toxicities on Wild Populations of Raptors, Raptors of China and the Asian subcontinent, and general paper sessions.

October 30 Tour of the new Raptor Center of the University of Minnesota.

RRF RaptorRehabilitation Symposium Details

Papers scheduled include:

Allometric scaling for nutrition & pharmacological determinations--Mark Pokras DVM.

New Techniques in Bumblefoot Management--David Remple, DVM

Raptor Parasitology--Steve Smith, DVM

Housing & Management--Betsy Hancock

Diagnosis & Treatment of Pesticide Poisoning--Stuart Proter, VMD

Stress in Raptors--Jim Gessaman, PhD

Physical Conditioning of Raptors Prior to Release-Sue Chaplin, PhD.

For Further information contact:

Local Committee Chairperson
RRRP, CVM, Univ. of Minn.
1920 Fitch Ave.
St. Paul, MN 55108

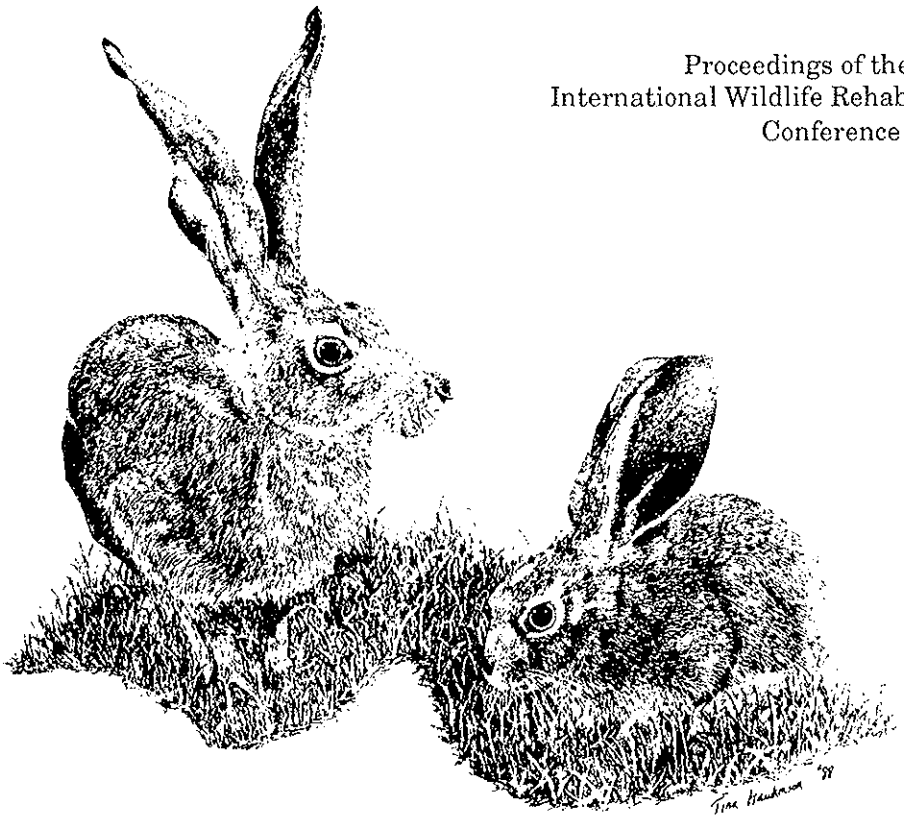
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Lessons of the Past - Pathways to the Future



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Papers cover the following topics: Release of One-eyed, One-footed & Otherwise Physically Impaired Raptors by Pat Redig, D.V.M., Aspergillosis, Diagnosis, Treatment, & Prevention by Douglas Yearout, D.V.M., Avian Orthopedics: Practical Applications for Rehabilitation by Russell Tucker, D.V.M., Hand-rearing Infant Tree Squirrels, Injury & Illness in Tree Squirrels by P.C. Hanes, Raising Orphaned Flying Squirrels by Jeanne Wasserman, Deformities in San Jan Islands' Deer by Jessica Porter, D.V.M. & Athena McEntyre, Raising Orphaned Beavers by Jo Ann & John Hicks, Application of Data from Research on Wild Populations to the Rehabilitation of Harbor Seals by Julie Knight, Natural History & Captive Care of Turkey Vultures by Kirstine Thorne, Tourism & Wildlife Rehabilitation in Peru by Paul Beaver, Ph. D., and New In-vitro Techniques for Testing Oil & Dispersant Toxicity to Seabirds & Sea Mammals.

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