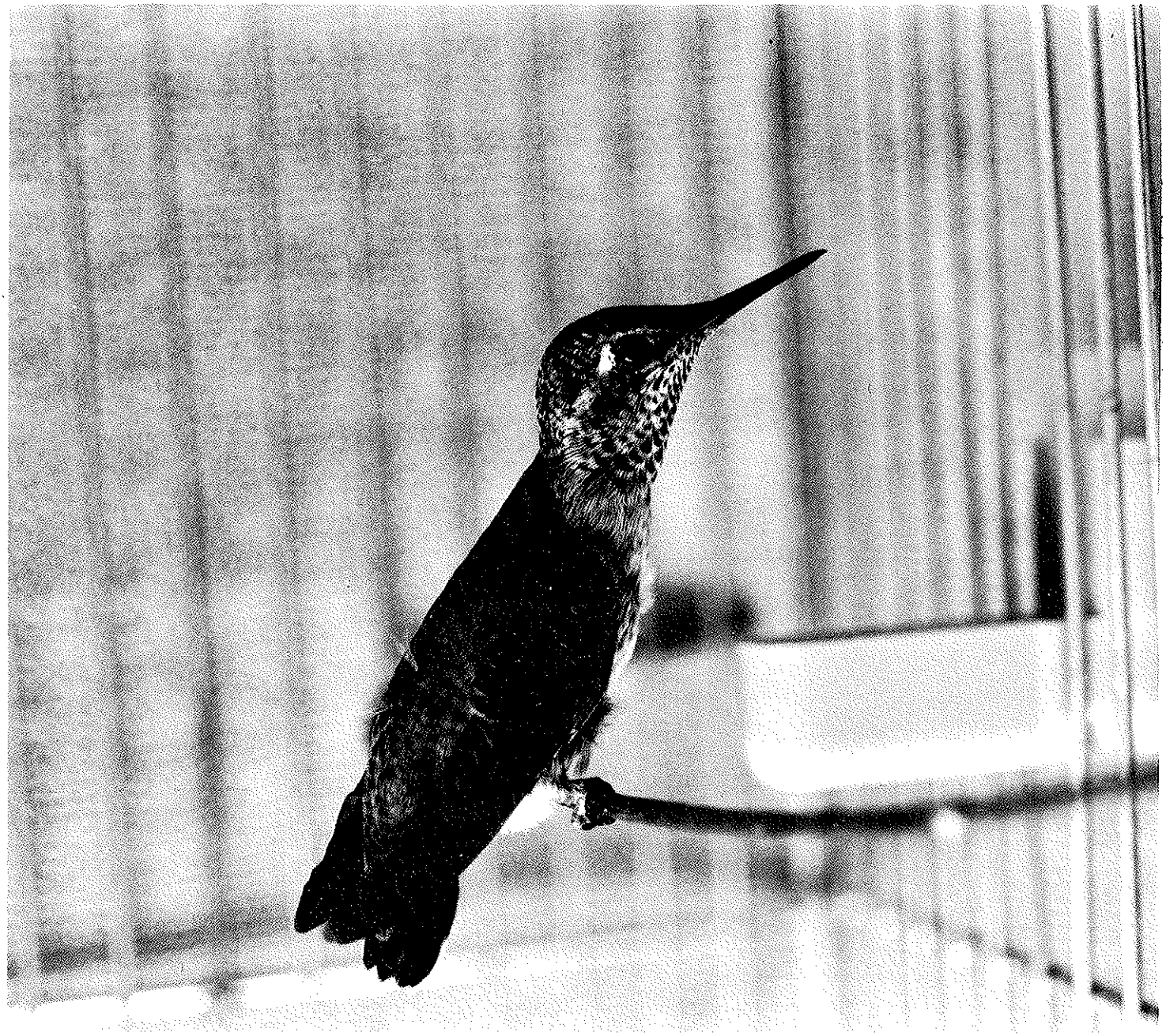
REHABILITATION WILDLIFE COUNCIL

WILDLIFE JOURNAL

Journal of the Wildlife Rehabilitation Council Spring 1985



Hummingbird Rehabilitation . . . page 5

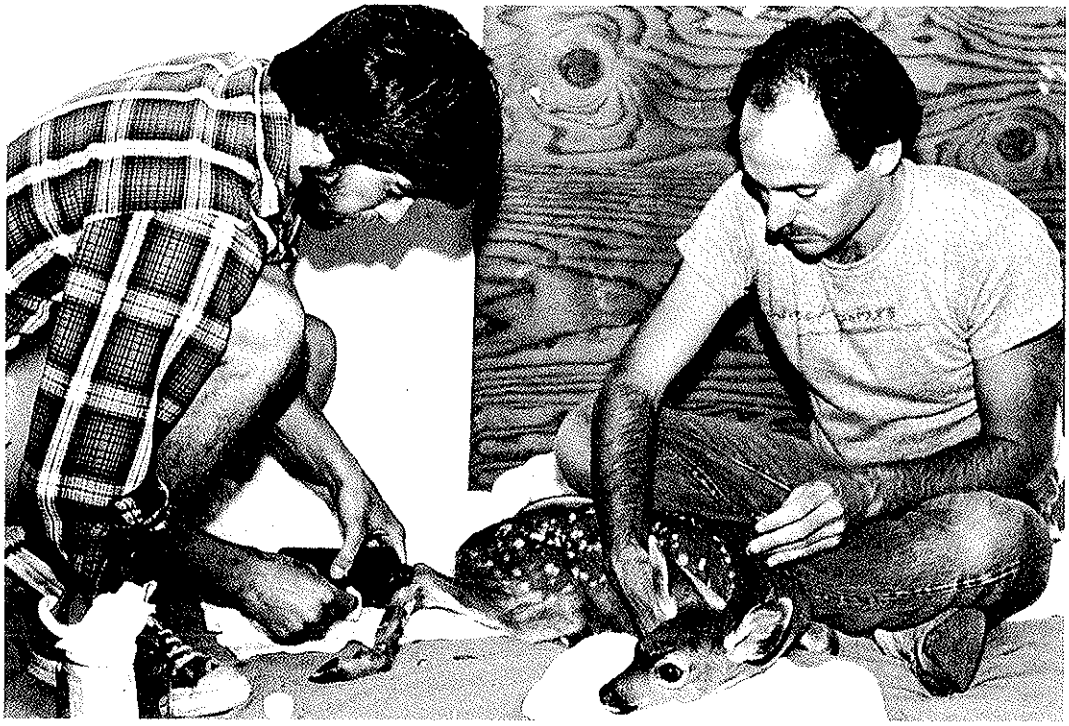
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1. Submissions should be typed and double-spaced, with 1 inch margins.
2. Full length articles run between 1500 and 2500 words.
3. Fillers and short articles run between 500 and 1500 words.
4. The writer's name and address and organization should be 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

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*This article available as a reprint.

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EDITORIAL . . . .

Networking in Wildlife Rehabilitation

Wildlife rehabilitators need each other. As this profession has emerged over the last two decades, it has been observed that groups that communicate with others seem to grow steadily with knowledge they have learned by experience *and* knowledge that they have gleaned from their peers. There are many benefits to networking besides the knowledge, but it ranks righ on the list of reasons to do it.

What else do we get from establishing friendships within our field? There are so many things, I will not mention them all. Let us consider some local history. In 1974, there were already numerous wildlife care organizations located around San Francisco Bay. They were fairly territorial and communication was limited. Many volunteers were told that their organization was the best and that people from other places were jealous of their work. While it was all right to play out the enlightener role, i.e., give out information that was known to result in successful rehabilitation, one was *never* to indicate that any problems either organizational or rehabilitation oriented existed within the group.

A few leaders from the larger facilities decided that the prevailing attitudes were more feudal than modern and came up with the idea of a group of groups which they called the Wildlife Rehabilitation Council. In the first few years, although strides were made to share information, there was a significant amount of in-fighting. (Over what, no one was sure!) What we saw was a few people trying to tell others that their rehabilitation methods were the best. We noticed, however, that the people who were doing the telling, never seemed to have any real problems, just the answers.

At that time, so little was known about rehabilitation that if we only addressed what was known, the topics were limited. So we began to have problem sharing sessions and encouraged brainstorming. This meant one actually had to come right out in the open and admit their was a problem that had gone unsolved within the organization. It was hard at first, since nearly all believed they had come from the best organization and surely if any group would crack the problem, theirs would have. It was so amazing to us to find that working together and sharing experiences we eliminated the process of repeated trial and error. That put us all onto the right tract that much faster.

Jackrabbits are a good example. One summer, when we had a session, I brought up jackrabbits and the chronic problem of bloat, diarrhea, and death. It had been an overload year and centers were impacted heavily. Two of the larger centers, Marin Wildlife Center and Alexander Lindsay Jr. Museum, had simply been too populated to feed the little hares three times daily as was the regimen of the day. As we discussed the problem, they admitted that they had been unable to feed as often as they liked and that surprisingly, their mortality rates had dropped. Looking back today, we know that it is important to look at the natural history of the species, and had we done so, we would have realized that three times a day is not normal in this species. We walked out of that session armed with an idea and simultaneously all around the bay the feeding practice was changed and the jackrabbits benefited. Had the "inadequate" feeding practice not been brought up who knows how long it would have taken to figure it out.

Many other examples can be cited, but the bottom line is that even if you don't know the answer, you must keep asking the questions and the people to ask are others in our field. There can be no shame for not knowing the answer, especially if one is new to the field. Consulting is the lifeline in good wildlife rehabilitation today. In the eighties, this network extends across the nation because as the west was developing its techniques, so was the rest of the nation. Wildlife care facilities have existed for some thirty years in many parts of the country. Rather than spend anymore time trying to figure out who is the oldest,

(continued on pg. 15)

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"Wildlife Rehabilitation Today" 1985 Wildlife Rehabilitation Council Conference

In February of 1985, WRC held its eighth annual three day conference in San Mateo, California to address current topics in wildlife care. The event was divided up into sessions on song and garden birds, raptors, mammals, waterbirds, education and philosophy, and veterinary care. Additionally, for the first time, WRC offered certification of basic wildlife care skills to members while at the conference with two wet labs and testing sessions.

With nearly three hundred participants, the conference came off smoothly as planned thanks in no small way to the conference coordinator, Sally Lewis. The welcome address was given by WRC President, Jan White, who updated the membership on the current efforts of the organization and some of the goals set for 1985. As a special treat, Jan prepared a slide show programmed to music on the Pt. Reyes oil spill and clean up that involved volunteers from centers all over Northern California. Sessions then began with the papers scheduled for the day.

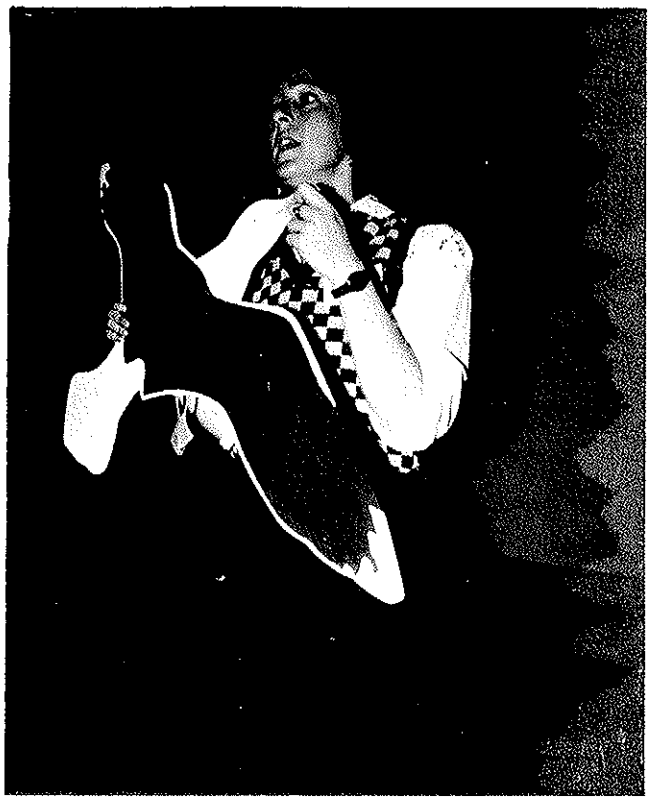
While most papers were presented by rehabilitators on the subject of rehabilitation, this year we had a few exceptions. One morning was livened up by a illustrative demonstration on gull identification by Wendy Lieber, a California State Parks Interpreter, who had prepared some very changeable gull models. As an interpreter, Wendy's speaking skills were top notch which only added to here effectiveness in the demonstration. Not just focusing on the western birds, she proceeded to take us around the world with gull types.



Katherine McKeever, Ontario, Canada, giving a workshop on owl rehabilitation.

Another presentation that was enjoyed by all was one by our esteemed colleague, Luis Baptiste, Ph.D., who has spent many years studying communication between birds, i.e. their songs. Dr. Baptiste took his research and related to us some of the aspects that we as rehabilitators need to be aware of when it comes to juvenile song birds learning their species songs as well as local dialects. It was once believed that song birds who were deprived of adult sounds during critical learning periods could not learn their normal songs and hence might well encounter difficulties finding mates and reproducing. Well, we were all relieved to find out that they could, indeed, at a later time learn their proper songs and that they could even teach each other local dialects if transplanted. We were all very relieved to know this since in rehabilitation it is not always possible to raise songbirds with adults of the same species. We were captivated by this researcher when he proceeded to sing the bird songograms illustrating species and regional differences.

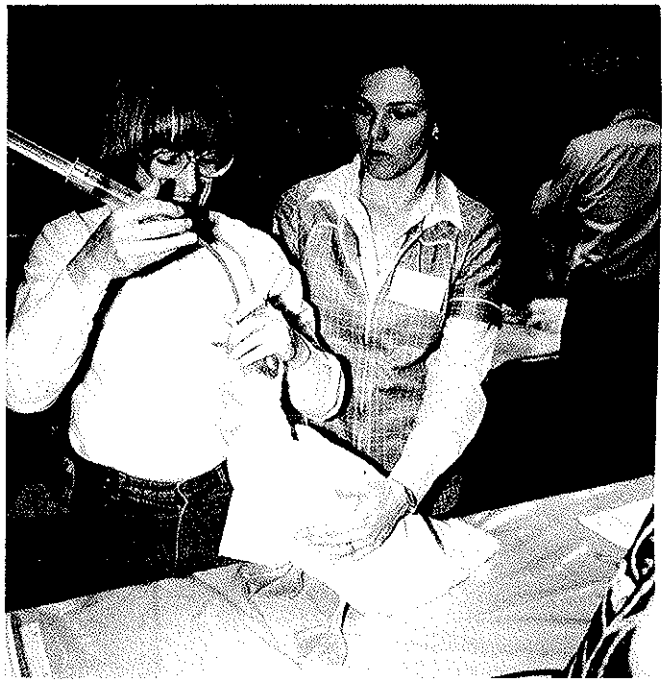
This year we scheduled a variety of concurrent workshops on administration in wildlife rehabilitation, necropsy procedures, shore bird identification, animal awareness education and captive care of owls, loons, hummingbirds, and reptiles. Many of these workshops



Wendy Lieber, interpreter, illustrating gull identification techniques with the use of interchangeable models.



Jay Holcomb demonstrates the use of a gram scale in the Basic Wildlife Rehabilitation 1AB lab class.



Instructor Doris Van Winkle supervises Meryl Faulkner as she gavage feeds a duck as a part of WRC Certification.

were repeated so that people were not forced to choose only one topic. Some of the sessions were wet-lab style with participants learning first hand how to perform gross necropsies and remove tissues for lab analysis, while others were more presentation oriented with question and answer sessions.

We offered for the first time a dinner banquet and scattered the WRC Board Members around the ballroom so that our members could meet and get to know them. Nearly 200 showed up for dinner and we will surely do it again because a good time was had by all.

Our Basic Wildlife Care Skills Seminar and certification was a big hit with the members. Fifty people signed up for the lab and written exam. This course is normally offered every fall in Northern California as a forerunner to the Advanced Skills Seminar series. For our travelers, we offered the lab section of the class and the opportunity to sit for the exam. During the lab, participants learned to handle and weigh animals, give oral and intramuscular injections, gavage or tube feed birds, do a basic physical examination, and apply immobilization wraps to birds and mammals.

Participants read the study materials prior to attending the class and many of them even held study groups in their hometowns to go over homework problems and discuss the material. It showed on their test results and made those of us at WRC proud to have such a group of determined bright people to work with.

We look forward to our 1986 conference with great anticipation. Our conference coordinator, Marguerite Comstock, has been working with a whole crew of professional rehabilitators to bring together our best event ever. Anyone who is interested in giving a paper should contact her at WRC immediately as our schedule is nearly complete. Persons willing to work at the conference should contact her also as extra hands are always needed.

The proceedings for the 1985 event are in press and should be ready by summer. Look for the order form with this journal.□

CONFERENCE ANNOUNCEMENT

"Wildlife Rehabilitation Today: Basics to State of the Art"

Start making plans to attend the WRC 1986 Wildlife Conference January 31 through February 2, at the Amfac Hotel, Burlingame , California. This three day event will be filled with new information for the new and seasoned rehabilitator. Friday and Saturday morning will be general session followed by an afternoon of exciting workshops. Sunday will be split into two sections, veterinary medicine for the advanced rehaber and basics for the beginner. We also have plans to offer the Basic Wildlife Care 1AB class for those who wish certification. Watch your next Journal for more information.

Rehabilitation Notes: Anna's Hummingbird *(Calypte anna)*

Karen Prill
Alexander Lindsay Junior Museum, Walnut Creek, California

INTRODUCTION

More than 300 species of hummingbirds (family Trochilidae) are found in the Western Hemisphere where they are the second largest bird family. Their aerial capabilities are unique. They can fly forward, backward, sideways, vertically, and even upside down. They are the only birds capable of prolonged hovering and hovering with their bodies motionless. Their pointed wings move freely only at the shoulder joint where they rotate almost 180 degrees. The humerus, ulna and radius are very short making the wing nearly all hand. The pectoral muscles, which control movement of the wings, account for 25-30% of their body weight.

Their long, translucent tongues are extensible and comprised of two troughlike tubes which fork near the tip. It was once thought that their tongues worked as a soda straw — that the birds sucked nectar from flowers. This theory has been disproved by microscopic examination of serial cross-sections of the tongue. Nectar is probably taken up by capillary action in the troughlike tubes, taken to the back of the mouth when the tongue is retracted, and then swallowed in the usual manner.

Hummingbirds are not able to capture insects with their tongues nor do insects adhere to their tongues. They are unable to swallow an insect if it is picked up with the bill. Insects caught while hummingbirds are in flight are forced to the back of the mouth cavity by the forward movement of the bird. If not back far enough in the mouth, the insect is discarded since it cannot be swallowed. [17, 22]

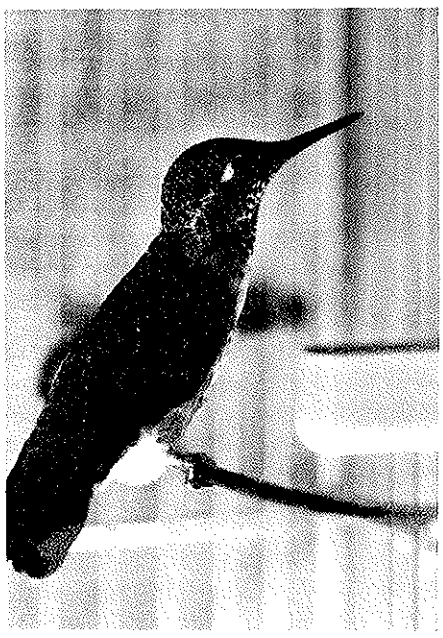
Hummingbird bills vary greatly in length and shape among species, and they can be useful in age determination. Under 10X magnification, the bills of birds less than one year old appear corrugated, the bills of older birds appear smooth. As the birds mature, their bills become longer, harder, smoother and more slender.

Although rarely seen on the ground, hummingbirds can walk. They use their wings, however, to move even a few inches on a perch.

Hummingbirds have the ability to become torpid and do so if their energy reserves are low and/or possibly if their water balance is precarious. They have relatively large evaporative water losses when non-torpid. During torpor, body temperature is lowered, rates of oxygen consumption and respiration are greatly decreased, and the rate of evaporative water loss is lowered. It has been proven that some species are able to control their body temperature while torpid by increasing oxygen consumption as the ambient temperature drops. This capability is probably widespread among hummingbird species. Hummingbirds may spend only a few hours before dawn in the torpid state, or they may be torpid most of the night. Any one or more of the following factors are believed to influence frequency of, length of time in, and arousal from torpor: ambient temperature, availability of food during daylight hours, inadequte diet, good or poor health, emotional state. While torpid, the bird is fluffed and appears not to be breathing; long periods of apnea occur at lower body temperatures. If disturbed, the bird utters a high-pitched squeak. A healthy Anna's Hummingbird can usually come out of torpor within fifteen minutes and is fully awake before dawn. Nestlings should not become torpid.

Hummingbirds bathe while hovering, only partly immersing themselves in water for a few seconds. They also bathe by pressing against or gliding over wet leaves or by hovering in a spray of water. In captivity, an occasional bird "insists" upon bathing

Karen Prill



Young hummingbird perched at feeder.

alone, but most often if one bird flies down to the water dish most of the others quickly follow suit. When a very shallow bathing dish is used, the birds will stand in the water and bathe much the same as songbirds. They also perch on the rim of the dish and dip their heads into the water, using their bills to flip water onto their backs. Anna fledglings usually don't bathe until they have been out of the nest for a week or so.

Hummingbirds appear to be curious; they "check out" everything usually with tongues. Nothing goes unnoticed. They are fearless; they have been seen pursuing hawks flying over nest sites. However, they are often kept from feeding by yellowjackets. They are pugnacious; although they have rarely been known to injure each other. In encounters with other hummers, they sometimes use their delicate bills but most often contact is made using the feet. They are territorial; males maintain and defend breeding or feeding territories depending on the time of year. In some species, females also defend feeding territories.

DESCRIPTION

Note: The following specific information on description, timing of molt, etc. pertains only to Anna's. General information regarding captive care and feeding would apply to other North American species as well.

Adult male: Total length is 3¾-4" (9.5-10 cm). Males are iridescent green above, gray and bronze-green below. The crown and gorget are metallic rose-red. The tail is emarginate. Average weight is 4.3 grams.

Adult female: Average size is slightly larger than the male. Upperparts are iridescent green, underparts gray with some bronze-green streaking on the sides. They may have a patch of red feathers on the throat or just a few. The tail is rounded; usually the three outer pairs of rectrices have white tips. Average weight is 4.1 grams.

Juveniles: Resemble adult female in coloration and shape of tail. Sexes can be distinguished by the rectrices. The shaft in the white-tipped portion of the outer tail feathers is white in females; in males, the shaft is black almost to the very tip of the feather. Also, generally, females have more white on these feathers than males and their throats are less streaked with bronze-green. Red feathers come in gradually and can appear on the throats of males as young as five weeks. Almost all males have at least one red feather on the throat by seven weeks of age. Females don't usually acquire red feathers on the throat until completion of the post-juvenal molt. Red feathers do not begin appearing on the crowns of males until after the onset of the post-juvenal molt at 2-2½ months of age. (Prill 1983)

Molt: Adult birds molt annually, beginning in late May or early June at the end of the breeding season. There is geographic variation in the timing of molt and breeding season. Birds in the southern portion of the range being 4-6 weeks ahead of these dates. The annual molt takes approximately 2½ to 3 months to complete. The post juvenal molt, which takes at least four months, is a complete molt. The crown and gorget of immature males usually is not completely covered with metallic feathers until prior to the breeding season when molt takes place in this area.

Hybrids: Hybridization has been documented with the Allen, Black-chinned, Calliope, and Costa Hummingbirds.

RANGE

Most of California west of the Sierra Nevada and south into Baja, California. The Anna's is a permanent resident throughout most of its range. However, there are local shifts between habitats and some southward movement in winter of birds from the northern part of the range. Post-breeding wanderings occur to the Southwest — even as far as Texas, south to Sonora, Mexico, and north to British Columbia. Most of the population returns to California by January. In recent years, however, some birds have remained in southern Arizona in spring where they have reportedly nested.

TIME, ENERGY AND TERRITORIALITY

Time: Most people think of hummingbirds as being constantly "on the go". However, observation studies of wild adult male Anna's, occupying both breeding and feeding territories, have shown that about 80% of their dawn to dusk day is is spend perching. A number of Anna's and Rufous Hummingbirds maintained in captivity for a study of daily use, spent 75-85% of the light hours perching. All major activities of hummingbirds involve flight. Therefore, a recent study concluded that a flight to perching ratio of 1:5 or 1:6 may be the most efficient long term operating condition for a non-migrating hummingbird. [20, 26]

Energy: For a 24 hour day in the wild, energy requirements for a territorial adult male Anna's have been calculated to be 7.55 Kcal if the bird becomes torpid at night, or 10.32 Kcal if the bird does not enter into torpor at night.

Territoriality: Adult male Anna's Hummingbirds maintain breeding territories from about late December to late May or early June. They use conspicuous perches and spend much time singing and performing their spectacular display dives. Feeding territories, which are much smaller in size, are defended for a few days up to several months between breeding seasons. A few days after leaving the nest, juvenile male Anna's start practicing singing, producing only soft gurgling sounds at first. They begin exhibiting territorial behavior within a few weeks after fledging when they start giving the characteristic chase call. In the months preceding the breeding season, immature males practice performing display dives and perfecting their song.

NATURAL DIETS

Their diet consists of nectar from flowers primarily and also small insects. Flowers are visited almost exclusively for nectar; insects are captured elsewhere. Assimilation of nectar is nearly 100%.

NESTING, BIRTH, AND YOUNG

The nesting season begins and ends about a month after the breeding season. The female builds the nest, incubates and cares for the young unaided by the male. The clutch is almost always two eggs, infrequently only one but never more than two. Though the eggs are normally laid on alternate days, they usually hatch on successive days after an incubation period of 14-18 days. Nesting females do not become torpid at night because their normal body temperature is necessary for incubation and brooding. The nestlings are fed by regurgitation. Normally, two broods are raised in a season. There are numerous reports of females incubating eggs in a second nest while still feeding young in the first nest.

The altricial young hatch with just a few strands of down on their backs. Skin color is purple to black. Their tiny bills are yellow, turning black within

seven days. The inside of the mouth is yellow or orange. By the time the chicks are seven days old, pins are beginning to emerge and their eyes have a slit opening. At ten days, they start flapping their wings. By twelve days, they are no longer brooded day or night and they have attained their full body weight. The primaries are beginning to open and green feathers are visible on the back. Eyes are completely open at fourteen days; feathers cover all areas of the body by eighteen days. Average age at fledge is 21-22 days, with a range of 18-25 days. After leaving the nest, fledglings do not follow their parent to food sources. They wait in a definite spot, usually near the nest, for the female to feed them. They utter a high-pitched peep note when hungry. They continue to be fed for a few days (up to two weeks) after leaving the nest.

CAPTIVE CARE AND FEEDING

Diet: The hummingbird formula used by the Alexander Lindsay Junior Museum was developed by Ronald Dalzell, DVM of Somis, California. It is used for both infant and adult hummingbirds.

3 oz. honey
2 tsp. Thoro-vita 27 vitamins **or**
¼ tsp. Super Preen Vitamins
5 tsp. Gevral Protein Supplement
2 tsp. nonfat dry milk
2 tsp. lowfat soy powder
¼ tsp. bee pollen or one 500 mg. tablet
1 tsp. Avitron vitamins for birds
1 tsp. Lederplex Liquid B Complex
4 tsp. Gerber's strained liver
2 tsp. Gerber's strained carrots.
12 mealworms

Start with about 4 oz. warm water in blender. Add all ingredients; blend on high speed for ten minutes. Let foam subside. Add cool water to make 32 oz. total liquid. Turn blender on and off quickly a few times to mix well. Pour through strainer to remove mealworm shells. Freeze in ice cube trays; thaw fresh supply daily. Allow about one cube per bird per day. Cubes should be stored in sealed plastic bags.

* Available from:
Palos Verdes Bird Farm
P.O. Box 1305
Walteria, CA 90505
(213) 375-4111

Laboratory tests to determine taste preferences concluded Anna's prefer sucrose over glucose over fructose; Exhaustive research was done by Walter Scheithauer in an effort to develop an artificial food. Results yielded the following daily requirements for adult hummingbirds in relation to their body weight: 400% water, 70% honey, 3% protein, 2% fat, 6% trace elements, minerals, vitamins and roughage.

Nutritional Data

Hummingbird Diet

% Protein (wet)	1.23
Ca/P ratio	1.49:1.00
Kcal/gram	.498

Nestling Care (up to 25 days of age)[22]

- *Housing:* A small cardboard box (i.e., 6" x 6" x 6") works well. Housing should be small enough to heat uniformly and it should be kept clean. It can be lined with paper toweling as nestlings eject their droppings high onto the sides of the housing. To provide necessary humidity, place a small piece of wet sponge inside the housing. A thermometer is recommended to monitor temperature. As a guideline, nest temperatures average 93 degrees while the female is brooding her nestlings and 78 degrees post brooding. For young babies, a heating pad set on low to medium temperature is needed. Various types of housing, room temperature, and condition of the babies influence amount of heat required. If nestlings are too warm, they stretch their necks onto or over the rim of the nest and they may pant. It a nestling's crop is still full when it is time to feed, it needs more heat. Hatchlings that have been very chilled are an exception. For the first few days, food may stay in the crop hours even though they are warm enough. Whether or not this occurs using other food formulas is not known to the author. Nestlings generally need not be provided heat after ten days of age. However, heat is helpful and should be provided any nestling, regardless of age, if it is received in poor condition (i.e., cold, infested with mites, etc). Use common sense. Hatchlings usually eject their droppings inside or on the rim of the nest. If using a natural hummingbird nest, remove droppings as soon as possible. If using an artificial nest, provide nesting material that can be grasped securely (i.e., soft paper toweling) and replace as soon as it becomes soiled. By the time they are just a few days old, nestlings almost always eject away from the nest. Nests, as well as nestlings, must be kept clean. The author has found that the natural hummingbird nest is easier and cleaner to use then an artificial one. Also, it eliminates the need to handle nestlings and the siblings seem to prefer it.
- *Feeding:* Feed lukewarm formula directly into the crop using a 1cc syringe with a 16 or 18 gauge, 1¼" long, teflon catheter attached. Insert catheter into the crop on the right side of the bird's neck. The crop can be completely filled, but be careful not to overfeed (formula seen in the throat) to prevent gasping or aspiration. Watch crop closely for fullness. This method of feeding makes it easy to keep nestlings clean. However, should formula drip on nestlings, it should *immediately* be removed using a wet cotton swab. Clean feathers are essential for warmth and waterproofing. Hummingbirds have very delicate feathers which can be ruined by formula or frequent cleaning. The following guidelines for feeding nestling Anna's hummingbirds are based on use of the Dalzell formula. Smaller species would require less. The frequency of feeding will vary depending on caloric density of formula used. Naked or featherless birds: up to .15cc every 20 minutes (hatchlings may take only .01 - .02cc per feeding); pin feather stage: up to .55cc every 30 minutes; prefledge age birds: up to .80cc every 45 minutes. It is best not to extend feeding times beyond these guidelines as hummingbirds need constant nourishment. Try to maintain at least a 14 hour feeding day. The mother hummingbird flies directly onto the nest to feed her young. This can be simulated by blowing on the nestlings and they will pop their heads up and gape eagerly. Despite their tiny size, hummingbirds are very hardy and easy to raise.

Fledgling: (18 days to 35 days)

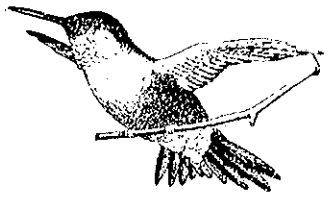
- *Housing:* A cage (i.e., 18" x 18" x 22" H), with vertical bars ⅜" apart or less, is suitable for the first week

or so after fledging. Please note that this type of cage is *not* cat proof. Paper toweling is good to use on the bottom because it is absorbent and hummer's droppings are very wet. Normally, hummingbirds are never on the bottom, however, newly fledged birds sometimes miss landing on the perch and fall to the bottom. Therefore, newspaper is too slippery to be used and disposable diapers tend to fray feathers. Several layers of towels can be put down in the morning and the top layer or two removed a few times a day to prevent soiled feathers. Once the birds are eating on their own, acclimation can begin. Unless it is very cold, this process will take only about a week. Birds need to be protected from hot sunshine, wind and predators.

- *Feeding:* Fledglings quickly learn to eat on their own, usually in less than one day. Feeders can be either syringes or glass water tubes with the small shoe-type plastic bottoms. These bottoms are available in red, orange and yellow which are the colors of hummingbird preferred flowers. Fledglings seem to drink more readily from the glass water tubes; they should be placed so the birds can drink while perched. Attach tubes to the cage from the outside. Fledglings should be fed if they peep. They need to be watched for a day or two to ensure they are eating well on their own, and they'll need a few supplemental feedings throughout the day. Dawn and dusk are two important feeding times for hummingbirds. A feeding is necessary around sunset until newly fledged birds learn to fill their crops prior to dusk. Captive birds usually don't fill their crops during the day, only around sunset. Many newly fledged birds will not self-feed at dawn. They will peep and wait to be fed. Newly fledged Anna's should consume about 15cc/day gradually increasing to approximately 24cc/day by about six weeks of age. Older immatures and adults consume about 20cc/day. Amounts may vary depending on the caloric density of the formula and the activity level of the bird. Monitor daily consumption of all self-feeding birds by putting in a measured number of cc's of formula in feeders or syringes in the morning. Measure the amount not consumed at the end of the day. From the time the birds leave the nest, they should be on a dawn to dusk feeding day. Food *must* be available at all times during these hours. It is best to put out fresh formula at dawn. If necessary, however, enough fresh formula (thaw an extra cube and refrigerate until needed) may be put out in the evening to feed birds until 8:00 a.m. by which time fresh formula should be provided. It is advisable to replace formula at least once during the day when the weather is very warm. Knowing the smell of fresh formula will help determine if formula is turning sour and needs to be replaced more often. Make sure feeders are not in the sun. Syringes and glass water tubes should be washed and rinsed thoroughly. Washing glass water tubes in the dishwasher is recommended to kill bacteria. If disease is suspected, or for routine, thorough disinfecting, feeding equipment can be placed in Clorox diluted 1:32 with water; rinse thoroughly.

Pre-release Juveniles: (four weeks and older)

- *Housing:* Once acclimated, juveniles can be transferred to an outdoor flight cage. Use of a minimum size flight cage (i.e., 30" x 20" x 24") might necessitate caging birds individually. A 4'W x 8'L x 6'H double door cage provides ample exercise space and can be planted with trees which provide natural perching and cover for a chased bird. As many as 15 birds can be housed together in this size cage without one or two individuals dominating feeders or other birds.



- *Feeding:* Feeders should be placed so birds must hover in order to drink. Juveniles need to perfect their insect catching skills. Fruit flies can be provided by putting banana peels in a coffee can inside the cage. Punch a few holes in the lid to let the flies out; this keeps the birds away from the sticky peels. A large, shallow dish can be used for bathing. Drinking water need not be provided with the Dalzell formula.

RELEASE

Juveniles are usually ready for release by seven weeks of age. They can be released from the flight cage if the area has natural food sources as evidenced by the presence of hummingbirds of the same species. Hummingbirds need to have good flight skills and be able to hover effortlessly in order to obtain food in the wild. Juveniles can be shown how to and the location of an artificial feeder before release. Hummingbirds instinctively know their natural food sources. Birds must be waterproof and will be if they preen and have been kept clean. The primaries must be in good condition. The tenth, or outermost, primary is the longest and most important flight feather. When juveniles molt, they drop their first four primaries within a few days, adults drop the first four or five. If one-half or more of the tenth is missing, or as little as one-third if there is breakage of the ninth primary as well, the bird will be grounded until the new inner primaries are almost fully grown. This condition, of course, requires that the bird be retained until the primaries are molted. Any hummingbird that becomes torpid during daylight hours, or within three hours after sunset, or is still torpid at dawn should not be released. This indicated that the bird is in poor condition and is not ready for release.

- Diurnal: release during the day.

INJURED HUMMINGBIRD CARE

(for all age groups)

- *Housing:* Cages for hummingbirds should have vertical bars which are spaced not more than ⅜" apart. If the bird is unable to fly, a small cage (i.e., 8" x 10" x 10") can be used. Perches should be just an inch or so from the bottom so the bird can climb onto them, but high enough to prevent soiling of tail feathers. Any appropriate flight cage, usually the larger the better, is suitable for a bird than can fly and is in stable condition. Initially, a small cage should be used if the bird requires heat. A heating pad may be put on top or under the cage; cover all but one side with white or light-colored

towels to ensure sufficient light so the bird is awake and feeding during the daylight hours.

- *Feeding:* Generally, injured birds benefit from a longer feeding day the first day or two after they are received. Ample light will keep the birds awake and feeding later in the evening. Occasionally, an older bird refuses to eat initially. To minimize stress, allow the bird a short period to become accustomed to its new surroundings and to warm up, if necessary. They will not eat if they are cold. Place a syringe over the end of the bill while holding the bird and stroke the neck to initiate the swallowing reflex. Birds that cannot fly appear to prefer drinking from syringes rather than glass water tubes. Food should be placed within easy reach so that injured birds, initially even ones that are able to fly can drink while perched. Release considerations are the same as for juveniles.

EXTERNAL PARASITES

- *Mites:* Most late season (hot weather) nestlings have mites. They debilitate the birds and should be removed as soon as possible. The bird can be held under gently running, warm water to rinse mites out of the feathers. Care must be taken not to get the head wet as water can easily get into the nares and cause the bird to gasp. Rinse feathers from the neck down to the tail, both dorsal and ventral sides. A cotton swab dipped in water or lightly sprayed with a mite spray (pyrethins or carbaryl based) can be used to remove mites from the head. Put the bird on paper toweling in a pre-warmed box on a heating pad which is set on low until the bird is dry and free of mites. It's easier to see and remove any remaining mites if the bird is not put in a nest for a few hours. A natural hummingbird nest with or *without* mites should be sprayed with mite spray and allowed to dry before using.
- *Feather lice:* Hummingbirds sometimes have feather lice. They appear as a buff-colored line running along both sides of the shaft of the rectrices and sometimes the remiges as well. Remove by using a cotton swab sprayed with a mite spray - these can't be removed with water.

DISEASES

Hummingbirds are susceptible to a range of avian diseases as reported by Fowler (1978). Although information regarding diseases is scarce, Candidiasis (a fungal infection) might possibly be the most common. It is characterized by a buildup of the mandibles. Off-white plaque may be seen in the mouth cavity. It can also affect the tongue and rot the tip of the bill. Isolate suspect birds until a throat culture can confirm diagnosis. Treating with Nystatin (Mycostatin) or Ketaconzole (Nizoral) has proved effective if diagnosed in early stages. All treatment should be initiated under veterinary guidance.□

Glossary

capillary action: the elevation of the surface of liquids in fine tubes due to surface tension and forces of cohesion.

crown: the top of the head of a bird; the area between the forehead and the occiput (back of the head).

emarginate: a tail notched at the end or one that is slightly forked with graduations.

gorget: a throat patch in hummingbirds composed of iridescent feather colors.

rectrices: the main tail feathers.

torpidity: a state of inactivity that is brought about by certain physiological changes — greatly lowered heart rate, breathing rate, and metabolism.

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1985 BASIC WILDLIFE REHABILITATION 1AB GRADUATES

All individuals listed below have received a passing score of 70% or better of the WRC Basic Wildlife Rehabilitation Exam and have completed two sets of homework on nutrition and calculating drug dosages. Additionally, all participants have successfully demonstrated adequate skills in wildlife care and handling in a supervised lab session. These individuals are WRC certified in Basic Wildlife Rehabilitation.

Pam Smith
Pinellas Park, FL

Sue Moffat
San Jose, CA

Kim & Judy Edwards
San Jose, CA

Candice Tahara
Monterey, CA

Kristen Nielsen
El Granada, CA

Andrea Sawyer
Salinas, CA

Susan Corley
San Jose, CA

Bill Sosa
Richmond, CA

Diana Whiteaker
Salinis, CA

Meryl Faulkner
La Jolla, CA

Barbara Dullea
San Francisco, CA

Martha Jo Hall
San Diego, CA

Kristie Hammer
Wofford Heights, CA

Michelle Green
La Honda, CA

Carol Blalock
Chowchilla, CA

Ed Ashworth
Monterey, CA

Joan King
Watsonville, CA

Priscilla Estes
S. Lake Tahoe, CA

Rosemary Dyke
Mill Valley, CA

Pat Jewett-Webb
St. Helens, OR

Judith Livingston
Portola Valley, CA

Karen Palmer
Pomona, CA

Maureen Pskowski
Glenwood Springs, CO

Denise Blackman
Castro Valley, CA

Susan Brain
Palo Alto, CA

Mary Lyons
Vallejo, CA

Susan Kaiser
Seaside, CA

Donna Burt
Turlock, CA

Nan Pipestem
Hollister, CA

Ann Mayer
Vacaville, CA

Arlene Gillio
Suisun, CA

Lynn Neibaur
San Jose, CA

Janna Wynne
Sun Valley, CA

Adele Trowbridge
San Diego, CA

Phil McKay
Turlock, CA

Russell & Marilyn Fowler
San Jose, CA

Joe & Susan Blakemore
Palo Cedro, CA

Dorothy Johnson
Palo Alto, CA

Tracy Schriber-Hill
Pebble Beach, CA

Peggy Smith
Lake Isabella, CA

Sheila Ferguson
Bella Vista, CA

Brian & Marsha Feyler
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Debbie Darr
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Karen Gail Mosher
Claremont, CA

Janet Prochazka
San Francisco, CA

Kris Thorne
San Rafael, CA

Jeff Gardner
Hollister, CA

Linda York
Indio, CA

Elaine Thrune
St. Cloud, MN

Jan Moughler
Pacifica, CA

Maryellen Spradlin
Lake Isabella, CA

James Miller
Bella Vista, CA

Phyllis McFall
San Mateo, CA

Sandi Stadler
San Mateo, CA

Wanda Painter
Marysville, CA

Megan Starbeck
Norco, CA

Juana Lewis
Lakehead, CA

Susan Adams
Montrose, CO

Marty Johnson
Menlo Park, CA

Dena Enloe
Anderson, CA

Jeremy Obers
Hughson, CA

Karen Jachens
Cupertino, CA

David Harkess
Fremont, CA

Joyce Long
Los Altos, CA

Liz Beard
Los Altos, CA

Mary Rock
Suisun, CA

Robin George
Alpine, CA

Diana Duncan
Turlock, CA

Dara Nance
Davis, CA

1985 ADVANCED SKILLS SEMINARS

Graduates of the WRC Advanced Skills Seminars attended all six classes and completed the homework set on each class. Classes held in 1985 covered these topics: Clinical Pathology for Wildlife Technicians; Physical Examination and Initial Care; Fluid Therapy in Wildlife Rehabilitation; Wound Management in Wildlife Rehabilitation; Physical Therapy in Raptor Rehabilitation; and Pathology & Gross Necropsy.

Ann Mayer
Vacaville, CA

Jeremy Obers
Hughson, CA

Sue Moffat
San Jose, CA

Candice Tahara
Monterey, CA

Pam Smith
Pinellas Park, FL

Kim & Judy Edwards
San Jose, CA

Nan Pipestem
Hollister, CA

BASIC WILDLIFE REHABILITATION 1AB
SCHEDULES FOR PORTLAND, OREGON ON SEPTEMBER 14-15, 1985

Hosted by the Portland Audubon Society and the Washington Park Zoo, WRC will hold our entire two day course in Portland to certify rehabilitators in the Northwest. WRC members in the area will be notified. For further information contact Jonolyn McCusker at the Portland Audubon Wildlife Care Center, 5151 Northwest Cornell Rd., Portland, Oregon 97210.

Book Review

WILDLIFE REHABILITATION: A GUIDE TO THE LITERATURE
Robert Lobou, Tri-State Bird Rescue & Research, Inc., Publisher
P.O. Box 1713, Wilmington, Delaware 19899
110 pp., 1984, $6.95

Did you ever wonder when someone was going to sit down and write a bibliography which included wildlife rehabilitation literature? Robert Lobou, a librarian, has taken his time to compile a list of books, magazines, and papers that relate to wildlife rehabilitation, general wildlife topics, wildlife reading for children and adults. The spiral bound paper back has been divided into primary and secondary literature as an aid to the rehaber in weeding through which books and pamphlets focus on wildlife rehabilitation or have a substantial part devoted to the subject.

As I read through the guide, I found publishing information along with a brief non-critical annotation which describes the scope, contents, and level of information of each work. Most WRC literature is not annotated so readers will have to refer to us for information on the content of our rehabilitation literature.

A great diversity of wildlife rehabilitation literature is covered in this guide: from the areas of oiled birds to wildlife food habits, from parasitic diseases of raptors to the nutritional needs of mammals, from the chemical restraint of bears to the world of the frog and toad. In this diversity, however, there is one drawback. A person new in this field of wildlife rehabilitation would be hard pressed to get a feel for which books contain current information and which have since become outdated by new technology and techniques. However, this point can be mitigated by checking with experienced people. All and all, this little guide can prove to be a handy reference to rehabilitators who want to pursue the literature and are wondering where the information can be found.

—Marguerite Comstock, AHT

Letter to Editor . . .

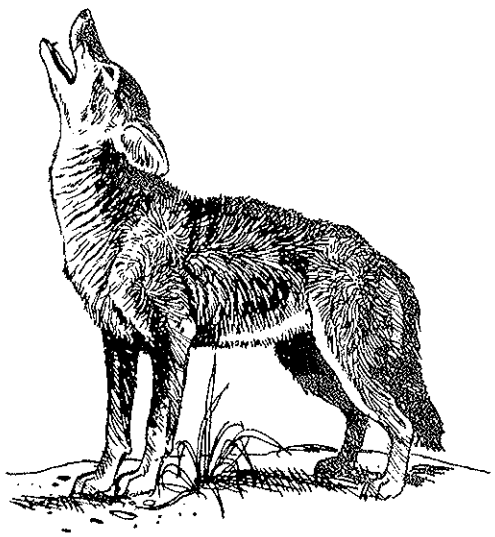
ANNOUNCEMENT OF A WILDLIFE REHABILITATOR'S COMPUTER BULLETIN BOARD SERVICE

Under the auspices of Wildlife Rescue, Inc., Austin, Texas, a new computer bulletin board service is on line as of April 2, 1985. KYFHO WILDLIFE BBS, AT 512/836-6881, is on line 24 hours, 7 days a week. The initial data base consists of papers on care and rehabilitation of orphaned and injured wildlife, especially those native to the Central Texas area, written by members of Wildlife Rescue, Inc., Austin.

As systems operators, we are seeking to reach other rehabilitation organizations nationwide, as well as organizations concerned with wildlife conservation and habitat preservation, and to exchange care information and other news of interest to rehabilitators and conservationists. We would like to solicit care information from groups such as yourselves, which can be added to our data base for distribution. We also maintain a reference materials list as well as a list of recommended reading (peripheral subjects and fiction with a strong preservationist theme) and welcome your additions to this list as well.

Please help us spread the word by telling members of your organization and others you come into contact with, that we are here and ready to help. The Bulletin Board is supported by an IBM PC and a Hayes 1200 Smartmodem capable of sending/receiving in 300/450/1200 baud. Voice line contact can be made by calling 512/836-0915 between 9:00 a.m. and 9:00 p.m. CST. Let us hear from you soon.

P.C. and Bob Hanes
Systems Operators,
KYFHO WILDLIFE BBS
P.O. Box 15223
Austin, TX 78761



INNER EAR INFECTION IN A BADGER: A Case History

Pam Helmke, Humane Society of Santa Clara Valley
Wildlife Rehabilitation Department, San Jose, California

NATURAL HISTORY:

The badger *(Taxidea taxus)* is a large furbearing mammal which is primarily found in open grasslands and low brush in the western and midwestern portions of the United States and Central Canada. The adult badger, whose main food source is rodents, may weigh from 10 to 20 pounds and be 18 to 23 inches in length. The distinctive broad flat body, dark face and white stripe which extends from the nose over the top of the head are easily recognizable features that help in his identification. A fierce animal when cornered, the badger prefers to retreat, digging swiftly with its strong front legs, showering dirt into the face of its attacker.

HISTORY:

An adult male badger was found in the East San Jose foothills by the local Game Warden, who noted him staggering slowly through an open field. When approached the badger was unable to climb a small hill to escape, so the warden placed the animal into a large canvas sack and transported him to the Humane Society Wildlife Coordinator. The warden's major concern was the possibility of the badger being poisoned by ingesting an animal contaminated with the compound 10-80 (sodium monofluroacetate).

EXAMINATION:

The wildlife coordinator had the badger immediately transported to the Crocker Animal Clinic in Santa Clara for examination and treatment by Drs. Faye Umeda and Roark Freeman. They quickly determined that, although the animal was lethargic and severely ataxic, he still would be difficult to handle and the "intractable dog" handling techniques would need to be used. Because of the possibility of a poisoning, it was decided to remove any contaminated material from his stomach by inducing emesis with apomorphine applied to the conjunctiva of the eye. When this treatment was not successful in producing emesis, the badger was tranquilized with Rompun at 3.0 mg per pound intramuscularly. (1)

The tranquilized badger was restrained for the examination with a ketch-all pole and a large blanket. A thorough exam was begun and it was determined that this badger was an adult male in good condition with a weight of 14 lbs. As the exam continued, they found the eyes were clear with no discharge, normal mucous

(1)This dosage is recommended by the California Dept. of Fish and Game at Rancho Cordova.)



Jane Hutchison

membrane color in the mouth with good dentation except for one damaged tooth.

However, the ears were found to be packed with foxtails, and after removing 10 to 15 foxtails from each ear, the right ear drum was diagnosed as being punctured. The rest of the exam was normal with no signs of open wounds, discharges or obvious fractures. Blood was drawn from the jugular vein for a diagnostic study to determine any abnormalities or systemic infections. (2)

TREATMENT:

After the examination, treatment was begun by manually removing all of the foxtails from the ears. As a precautionary measure, the badger's stomach was lavaged and activated charcoal was instilled by a stomach tube to neutralize any possible poison. The badger was placed with a volunteer for nursing care and a prescription of Chloramphenicol 200 mg three times daily (TID) was sent along. Although Panalog ointment is also indicated in the treatment of possible ear infections caused from foxtail penetration, it was decided to eliminate this step due to stress caused from difficulty in capturing the animal for placement of the ear medication.

HUSBANDRY:

The first night the badger was kept indoors, housed in a plastic airline kennel until the effects of the Rompun had begun to subside. After his recovery from tranquilization, he was transferred for observation and treatment to an outdoor enclosure (3' x 3.5' x 2'). The badger recovered slowly from the Rompun and, 48 hours post capture, he was eating well and appearing very alert. He became very aggressive and would charge the enclosure door and then retreat whenever the door was opened.

The badger was medicated by slipping the Chloramphenicol capsules in the belly of a thawed mouse twice daily. In the evening, a guinea pig or rat was used as the main meal with the capsule being slipped in the mouth and pushed down the throat of the carcass. Special attention was given to make sure the capsule was in the belly or chest cavity of the food because any signs of human tampering would cause the badger to remove and discard the capsule and eat the mouse or rat. The rodent meals were supplemented by soaked kibble every other night and because this badger never learned to use the drinker bottle, fresh water was always available by bowl.

Five days into the treatment, the badger was allowed to run in a large concrete-surfaced open area with supervision on a ketch-all pole; he also proved he could dig very well. By the seventh day, he was given large live rats which he killed easily. At this point, a follow-up exam was scheduled to determine the status of his ears and evaluate his releasibility.

HOUSING:

It became obvious that the badger had an incredible amount of strength, when he escaped for several hours by pulling the cage door into the enclosure, despite its construction with 2 inch x 4 inch redwood and 1 inch x 1.5 inch welded wire. The door was reinforced to prevent any further pulling or pushing motion.

FOLLOW-UP:

Twelve days after admission, the badger was again tranquilized but this time with 37 mg of Acepromazine (2.64 mg/lb) given orally to initially subdue the animal for safe transport back to the animal clinic. Due to the extended time of recovery from the low dose of Rompun the badger was given for the first examination, the veterinarians decided to inject .7 ml of Innovar-Vet (1mg/20 lbs.) intramuscularly. This drug allowed him to stay somewhat awake but still manageable.

The follow-up exam showed no further sign of infection with just a few small fragments of foxtail still in need of removal. After the fragments were removed, it was noted that the punctured eardrum had healed. As is commonplace with Innovar-Vet, a hypersensitivity to sound and touch was observed, so the effects of the tranquilizer were reversed with an equal amount of the drug antagonist Nalline (1 mg/20lbs.) intramuscularly. After a brief and mild seizure, the badger was allowed to sleep it off. Four hours later, he had regained his coordination and bad temper.

RELEASE

Two days after the follow-up examination, the badger was released into a large county park located in the Mt. Hamilton Range, southeast of San Jose. The Park Rangers transported the badger to an area near a large ground squirrel colony in a secluded area of the park that has year round water. The badger was released from his cage and immediately made his way to an existing large hole under a fallen tree where he immediately backed in to defend his position.

CONCLUSION

Although most pet owners are aware of the danger of foxtails to their pets, this common plant pest may be overlooked as a primary cause of illness and ataxia in the ground dwelling animals. Although no preventative measures can be taken to prevent foxtail injuries in wildlife, we should carefully examine all ground dwelling animals for problems and injuries caused from these plants.

PRE-TREATMENT BLOOD VALUES FROM AN ADULT MALE BADGER

Hematology:	Serum Chemistry:
*WBC — 20.6 x 10^3	Albumin — 3.8 Gm
RBC — 1124 x 10^6	Alk. Phos. — 43 IU/L
HGB — 13.1 Gm	Amylase — 349 IU/L
HCT — 37.1%	BUN — 24 mg%
MCV — 33 μ^3	Calcium — 10.4% mg%
MCH — 11.7 $\mu\mu$g	Cholesterol — 144 mg%
MCHC — 35.3%	Serum Glucose — 128 mg%
Neut — 68%	Lipase — 33 IU/L
Lymph — 32%	Phosphorus — 4.1 mg%
Platelet Est. — ADQ.	Potassium — 4.1%
	SGPT (AST) — 60 IU/L
	Sodium — 146 meq/l
	Total Protein — 8.2 Gm%

(2)WBC is felt to be elevated due to the inner ear infection present at the time of the blood test.

NOTE: The author would like to thank Dr. Roark Freeman for his assistance and comments in preparing this history.

(continued from page 3)

or even the best, what we need to do is facilitate transfer of information between the new and the old and at the same time, make it very unpopular to take a feudal attitude about such petty things.

The exception to this may be in crediting others for their influence when writing up a rehabilitation technique. It is fine to credit yourself and others in your group, but if you have learned and refined techniques from talking to others, cite them. Nothing makes people less likely to share than to find their idea in a paper with no reference to them. Let us not let the "publish or perish" fever infect our field. It can cause people to say, "I have been working on that very problem, you can read about it next year when my paper is published." Meanwhile, your animals could benefit from that knowledge this year.

As many of us have found, having close relationships with others who may be thousands of miles away or just in the next county, can be a blessing for personal reasons. We each have problems within our settings. Sometimes, talking to someone who cares, can give us the emotional support we need to carry on in hard times. The flow must go both ways for it to work.

Another benefit, I have found, is that often your phone friend has access to free supplies and will share with you. I have yet to have to buy any fiberglass sheeting because of a consulting relationship that I have with another facility. Yesterday, my friend called with some information on where I can get reject hot tubs donated for my raccoon pen. (We do like our hot tubs in California!) In return for such favors, I have shared with them the free Esbilac and veterinary cages I had gotten donated. Because the two leaders share, the volunteers and animals benefit. However, one not need to be the director to carry on relationships such as these.

In times of trouble with our regulatory agencies, we would have been lost had it not been for our sticking together to attempt to correct an inappropriate policy or detrimental decision. Some organizations have been "leaned" on by regulatory agencies over the years and by WRC taking the position that if you do it to one of us, you must be fair and use the same rule for everyone, we have been able to spare some of the small centers from indeterminable suffering under unfair working conditions.

Networking works for all, but it takes a mature and balanced person to participate in this bartering system of sorts. Compromises must be made when egos find their way into the middle of a problem. While there is no "best" wildlife rehabilitation organization in the world, there are many fine ones and rather than waste time trying to figure out how we are better than others, we would be better off to spend our time looking at each facility we visit to see what we can learn from each other and then give credit where credit is due.

Jan White

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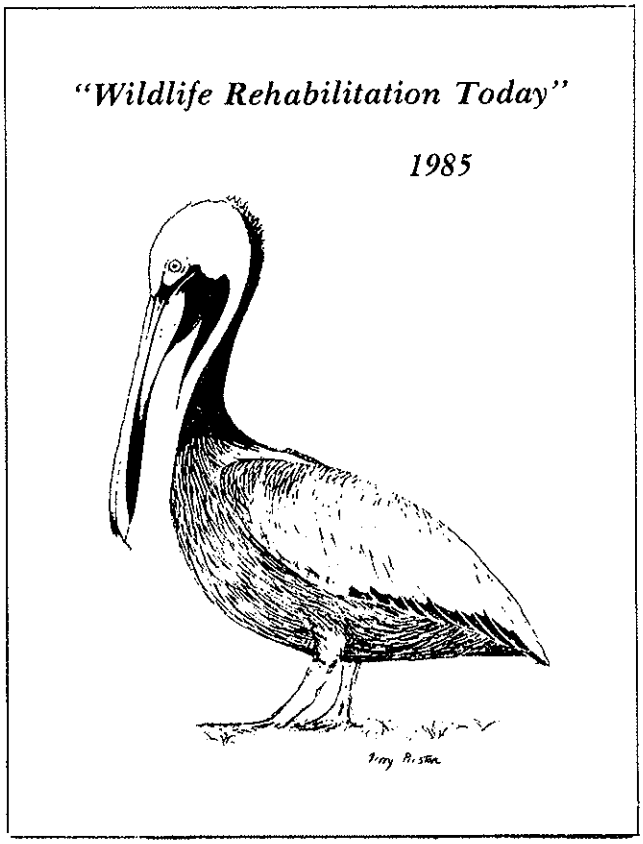
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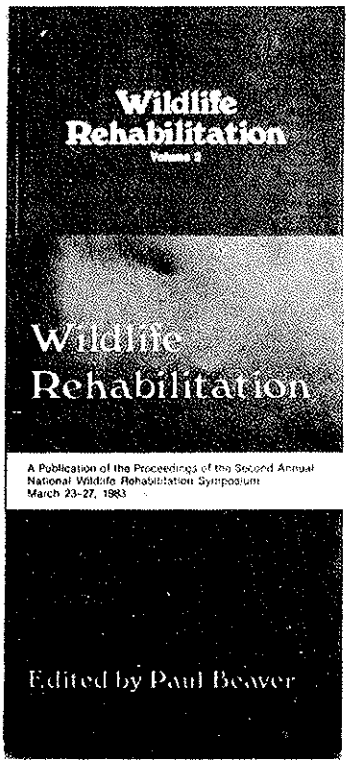
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