

NEWSLETTER

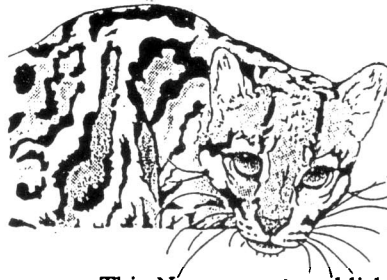
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Duck the Halls with LOTS of Poultry.....fa la la la la la la



Again, our Christmas greeting is provided by the Bellinghams and Zaire, their serval.



LIOC

Endangered Species Conservation Federation, Inc.

This Newsletter is published bi-monthly by the LIOC Endangered Species Conservation Federation, Inc. We are a non-profit (Federal I.D. 59-2048618) non-commercial organization with international membership, devoted to the welfare of exotic felines. The purpose of this newsletter is to present information about exotic feline conservation, management and ownership to our members.

The material printed in this newsletter is contributed by our members and reflects the point of view of the author but does not necessarily represent the point of view of the organization. LIOC ESCF, Inc.'s Statement of Intent is contained in our by-laws, a copy of which can be requested from the Secretary. Reproduction of the material in this newsletter may not be made without the written permission of the original copyright owners and/or copyright owner LIOC.

Persons interested in joining LIOC should contact the Term Director in charge of Member Services.

Since the Newsletter consists primarily of articles, studies, photographs and artwork contributed by our members, we encourage all members to submit material whenever possible. Articles concerning exotic feline are preferred and gladly accepted. Articles involving other related subject will also be considered. Letters and responses to articles may be included in the Readers Write column. Deadline for the next issue is the 1st of even-numbered months. Please submit all material to the Editor.

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LIOC needs YOU!

A Change of Spots



Guess how one keeps a juvenile serval from biting? Stick a bottle in mouth! Here is my new buddy *Sukari*, (Swahili for sugar) because for the first three days he was with me, he was sweet as he could be. That all changed now that he is master of his domain. Declawed on all fours by the breeder, Carol Stiles of C.A.T.S., *Sukari* is a beautiful serval, born May 5th, 1997 in Oregon. From what Carol has told me, he played with their Rottweiler dog. She was teaching him "NO bite" prior to sending him to me.

Well, "no bite" should be his name because because that's all I say to him all the time. When the teeth go into action, the stuffed toy, or ball or toy goes into the mouth. He wears a harness and even tries to bite the leash when I'm training him to walk around the house. Hopefully, he will outgrow the mouthing. If he doesn't get better then I'll be forced to use stronger discipline measures.

Neither my margay of 19 years, nor my 6 year old clouded leopard were biters, but I did not play rough with them, when they were young.

Sukari at this writing, weighs 15 pounds,

eats Zupreem Feline Growth, cottage cheese, raw egg yolk, calcium tabs, Nutrical, and KMR/canned milk in his bottle.

So far he's potty-trained and uses his litter pans - all three of them.

BeeJay Lester
Neptune Beach, Fl.

Now Available

LIOC Caging & Handling Guidelines



34 pages of practical tips and guidelines for proper caging and handling of exotic cats.

Includes diagrams on construction of proper equipment for any size feline, including squeeze cages, collars, leashes and much much more.

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Mobile, Al 36619



Well folks, this is it.....the last time my name will appear at the end of this column. Sherry Blanchette will assume LIOC's editorial duties with the next issue. I know you'll give her the same support and help you've given me. But, know what, I'm going to ask you to do more than that.....I'm asking you to make an extra effort so submit material for the Newsletter. She's taken on a very important job for LIOC as our newsletter is our face to the world and more than that the one thing that reaches all of us.

I'm not going anywhere - my address, email address and phone number will still appear on page 2 (under Life Directors) I hope for many years to come. I'm still available to all of you.

From time to time I too will be submitting columns for the Newsletter. I'm considering the title *This & That*, using the graphic at the bottom of this. The reclining ocelot goes back to the days of our Founder Catherine and her ocelot Tercera. It heralded the annual picnic with the invitation "Let us entertain you". Of course I've seen my ocelot, Tres, strike similarly enticing poses, so it seemed appropriate.

So many thoughts and remembrances suddenly come to mind. So many wonderful folks have assisted these past 23 years. A close look at this columnhead reinforces this.....a typewriter on the desk - and a manual at that! drawn by one of many contributing artists who

brightened the pages of the newsletter over the years.

This is something we really need some help with, and I know there are some artists out there. Please consider offering your talents to illustrate articles.

Yes, there have been some rough spots along the way, but the good times have vastly outnumbered them and I believe will continue to do so.

I know this because of all the new faces and enthusiasm I witnessed at convention! Elections are coming up next year and I'd like to encourage each of you to seriously consider offering your skills by running for an office. You stand to gain ever so much more than you give.....I know, I've been on the receiving end since Catherine took my offer of help up in 1970 and appointed me Membership Secretary.

At time LIOC may appear to move slowly, but remember, separated by distance as we are, with the opportunity to get together only once a year, it is a handicap we operate under. Unfortunately, not all are linked with email capabilities yet. But then, email doesn't convey the nuances, looks, and tonal inflections of face to face or even telephone conversations. It's not quite as personal. This is one more reason to come to convention! To get to know, if only a little, those to whom you communicate your needs and wants.

Again, thanks for the memories, this isn't farewell - I'll be in touch and I hope I'll see you at Convention.



But It Wasn't Really an Escape.....

After all the hoopla following the Zoo Inquiry, (it never rains, it pours so they say), and five years with no escapes from our compound, we awoke to find our electronic front gate standing wide open and the door ripped off the cat yard with the lock still in place.

The two cougars who resided there were three years old, bottle-raised pets. The male came looking for us and was returned to his cage within minutes after we discovered him missing. We had recently banned a volunteer from the compound after he was seen kicking the female cougar who was now at large and fired a housekeeper for theft. We didn't notice that a gate remote opener was missing (those things are like TV remote controls and socks they disappear and reappear at will it seems) The volunteer had been threatening to sue us for the past few months (he said the cat bit him after he kicked her) if we didn't give him and the fired housekeeper several of our animals. To date he hasn't found an attorney to take the case. We

wondered if this was an attempt on his part to make the female cougar look like a menace to society.

We called our neighbors to let them know one of our cats was at large and we called the Animal Control Department and Fish & Game. My brother is a deputy Sheriff, so he was on the lookout there. We expected people would call in Florida panther sightings if she did leave the yard and we wanted everyone to know that she was a tame pet and not to shoot her.

Five local television channels and 2 newspapers descended like vultures. The news stations had a helicopter circling overhead at very low altitude for hours until my sixteen year old daughter called the station and threatened to shoot it out of the air if they didn't stop frightening the animals. Apparently all of the noise and bands of vehicles scared the cat further away from our facility. In all of the "escapes" we've ever had, the animals never left the property and we spent the entire day



Escape - continued

looking under every leaf on the forty acres.

We never considered looking down the road. It was almost midnight when the Sheriff called and said the cat had been seen at the end of our dirt road at the Circle K Convenience store. My husband and I grabbed a snare pole and raced to the scene. The second time Don called to her she ran right up to him and buried her head in his embrace. I thought I was going to cry.

Because of all the flashing lights, news crews, flashlights and people screaming that she was caught, we put the snare on her and held her tail to keep her from flipping around. We loaded her into the car and drove the half mile home with a police escort of some six squad cars. She ate as if she'd been gone a week. The attention this whole episode brought was on the scale of a papal visit but all bad. The media was now misquoting the phony report of the WSPA (see last issue) and saying that the cats had escaped because of the abuse they had been forced to endure here. Every time something was said it was exaggerated more. People were stopping me on the street and asking if we had caught the 800 pound tiger yet. We were issued a citation and given a court date and told that we could receive a \$500 fine or six months in jail for the escape.

When something like this happens it hurts us all. The vast majority of people will not know what the facts were. All they will remember is that some fancy sounding group said people shouldn't own exotics and that one escaped. When bills are presented to ban exotic ownership the general public is not going to realize the devastating consequences for the species involved. Hindsight is always 20/20. We have since thought of countless ways this could have been prevented (including having quietly fed the offending parties to the cats), but it won't change things now.

The purpose of this is to share with you how easily something like this can happen and urge all of you to go to extreme measures to prevent such mishaps - you really can't do too much. The lives of countless animals depend on

us.

It is ironic however that the public, wanting to witness all this "abuse" poured in the gates by the truckload. Our volunteers and staff were hard pressed to keep up with the requests for tours - the appointment book was overflowing. After seeing for themselves what our refuge is all about, donation were four times higher than ever and some even took time to write the papers and take them to task for their inaccurate reporting. Of course, it wasn't so much inaccurate as one-sided their having regurgitated the WSPA story without checking the facts for themselves. I guess that was the silver lining if there was such a thing.

You can meet most of our "residents" and visit WildLife on Easy Street on the web, our address is: <http://www.wildlifeeasyst.com>

Carole Lewis.



Studies of Potassium Depletion in Cats

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Introduction

Potassium, the body's most abundant intracellular cation, is responsible for normal functioning of a number of vital cellular processes, especially maintenance of normal transmembrane potential. Depletion of potassium stores may induce a wide variety of abnormalities in cats, including muscle weakness, renal dysfunction, cardiac dysfunction, weight loss, and anemia. Recent studies of potassium-depleted cats have underscored the importance of potassium depletion in clinical disease and apparent prevalence, particularly in certain portions of the feline population. Experimental studies are currently in progress to evaluate the effect of experimental potassium depletion on renal and endocrinologic function in cats. This article summarizes much of what is currently known about naturally occurring potassium depletion in cats and presents preliminary data obtained from experimental studies.

Hypokalemia: Redistribution versus Depletion

The clinical assessment of body potassium balance by determination of serum potassium concentration is at best a crude estimate, owing to the fact that potassium is distributed primarily as an intracellular cation. Unless the factors that govern potassium distribution are taken into account when interpreting serum potassium concentration, it is not always possible to determine whether hypokalemia is the result of intracellular redistribution of potassium (with normal total body potassium concentration) or of total body potassium depletion. Under controlled conditions, however, serum potassium concentration has been found to roughly parallel

total body potassium concentration.

Intracellular redistribution of potassium is generally a relatively short-lived phenomenon that is unlikely in most instances to account for persistent hypokalemia. Clinically, the most important mediators of potassium redistribution are acute metabolic alkalosis, hyperinsulinemia, and stimulation of adrenergic receptors. If any of these conditions persists for more than several days, potassium depletion via increased urinary losses may result. Acute metabolic alkalosis is the factor most likely to induce significant intracellular redistribution of potassium and hypokalemia. Consequently, if hypokalemia is detected in a cat, evaluation of the acid-base status (or at least the total bicarbonate concentration) is recommended as one means of distinguishing redistribution hypokalemia from total body potassium depletion.

Total body potassium depletion often develops gradually and, until potassium concentrations reach critical levels, usually does not result in clinically apparent disease. Excessive urinary losses of potassium are often the most important cause of potassium depletion. Common causes of urinary potassium wasting in humans include administration of diuretics, mineralocorticoid excess, glucocorticoid excess, and renal tubular acidosis; however, few of these factors have been recognized as important causes of potassium depletion in cats. Excessive gastrointestinal potassium losses may also induce potassium depletion, although in these cases, clinical signs (persistent vomiting and/or diarrhea) are often obvious. Until lately, the effect of diet on potassium balance in cats has been largely overlooked. Interpretation of recent data, however, suggests that diet may be an important contribution to potassium homeostasis, particularly in cats with renal dysfunction.

Clinical Features of Potassium Depletion in Cats: Hypokalemia-Induced Myopathy

One of the earliest clinical signs of

Potassium Depletion ...continued

severe, chronic potassium depletion in cats is muscle dysfunction, manifested primarily as muscle weakness. Persistent cervical ventroflexion; easy exercise intolerance; an awkward, stiff gait; and apparent muscle pain on palpation are often observed (Figure 1). In most instances, the onset of muscle weakness appears to be acute, though many owners relate that their cats were lethargic and tired easily for weeks to months preceding the final crisis. Subclinical myopathy may exist before more obvious weakness develops.



Typical signs of severe potassium depletion including cervical ventroflexion.

A physiologic explanation for the apparent sudden onset of muscle weakness, despite the gradual nature of the potassium depletion, can be found in experimental studies of potassium depletion in dogs, assuming that cats respond in a similar manner. As potassium is depleted, a progressive increase in muscle cell resting transmembrane potential (hyperpolarization) results, so that the myocyte becomes increasingly refractory to electrical stimulation. Eventually, however, the muscle cell membrane suddenly becomes very permeable to sodium ions. The resultant sudden membrane hypopolarization induces rapid, severe muscle weakness. If the potassium deficit is not corrected at this time, muscle dysfunction may progress to paralysis and rhabdomyolysis.

Creatine kinase activity is often elevated in cats with severe hypokalemia, typically 5000 to 10,000 IU/L range. On light microscopic examination, however, muscle biopsy specimens

from cats with myopathy induced by hypokalemia have either been normal or been characterized by infiltration of small numbers of macrophages thought to be a response to muscle cell necrosis.

Renal Dysfunction

In clinical studies, severe potassium depletion was found typically in old cats with evidence of renal dysfunction. Serum creatinine concentration in most cats ranges from 2.5 to 6.0 mg/dl and azotemia was present. Early studies suggested a possible link between renal dysfunction and potassium depletion and also indicated that development of depletion was a prolonged process. Urinary fractional excretion of potassium and other electrolytes was measured as a means of assessing renal potassium handling in affected cats. Paradoxically, it was found that severely hypokalemic cats had significantly *increased* urinary potassium excretion relative to that of normal cats.

Other Clinical Abnormalities Observed in Hypokalemic Cats

The typical cat with advanced potassium depletion generally has poor body condition with evidence of weight loss, poor haircoat, and anemia. These effects are thought to occur as a result of prolonged adverse effect of potassium depletion on body protein synthesis. With correction of the potassium deficit, many of these abnormalities are reversible over a period of several months. In some hypokalemic cats, signs of unknown pathogenesis, which may initially resemble toxicosis (excessive salivation, vocalization, altered behavior) develop acutely.

Biochemical Abnormalities in Hypokalemic Cats

In addition to severe hypokalemia, several biochemical abnormalities, including

Potassium Depletion - continued

azotemia, hypercholesterolemia and hyperchloremia, have been observed in hypokalemic cats. Except in the case of renal dysfunction, the relationship between these abnormalities and hypokalemia is currently unknown.

Diagnosis of Hypokalemia-induced Myopathy

A tentative diagnosis is made by observing typical clinical signs of generalized muscle weakness, especially in an old cat in poor condition. Diagnosis is confirmed by documenting concurrent hypokalemia (usually 3.0 mEq/L and increased creatine kinase activity; clinical signs may occasionally develop in cats with higher serum potassium concentrations). The differential diagnosis includes polyneuropathy, neuromuscular junction diseases (myasthenia gravis, botulism), other electrolyte abnormalities, and primary myopathies (e.g., inflammatory myositis). Muscle biopsy may be necessary to exclude the latter diagnosis.

Renal function should be evaluated in all cats with severe hypokalemia. At a minimum, serum biochemical analysis and urinalysis should be done. Urine specific gravity must be interpreted cautiously, however, as hypokalemia may interfere with urine concentrating mechanisms in the distal nephron. Calculation of the urinary fractional electrolyte excretion is a useful measure of the kidney's ability to handle potassium, and also serves as a rough guide to requirements for supplemental potassium. The fractional excretion index can be calculated by measuring serum and urine electrolyte and creatinine concentrations of specimens taken before administration of treatments that may affect renal potassium handling (e.g., administration of fluids). The fractional excretion of potassium in hypokalemic cats should be able to be reduced to at least 4% normally. Values above 4% in hypokalemic animals are considered abnormal and suggest excessive urinary potassium losses.

Treatment - Acute Crisis

Hypokalemia, if severe enough (especially below 2.0 mEq/L), may precipitate complete muscle paralysis and lead to death by respiratory arrest. Respiratory arrest may be the most common cause of mortality in cats with severe potassium depletion, especially in those treated with fluids containing amounts of potassium insufficient to correct severe potassium depletion rapidly. Treatment with oral potassium gluconate should be started immediately in cats with suspected hypokalemic crisis. Oral therapy may be life-saving and is unlikely to be harmful to cats with other diseases except acute renal failure. Serum potassium concentration should be determined as soon as possible. The initial potassium dosage is 5.0 to 8.0 mEq/cat/day in two to three divided doses. The drug may be diluted 1:2 in water as it may cause gastric irritation and vomiting if given undiluted. Hypersalivation is common as the elixir is apparently not palatable to most cats.

Many cats with severe hypokalemia also have concurrent renal disease and there is a tendency to begin fluid diuresis. Unfortunately, the administration of even potassium-supplemented fluids has a tendency to lower serum potassium concentration initially through dilutional effects and by the acceleration of distal nephron urine flow. If fluids are given, they should be judiciously combined with concurrent oral administration of potassium. For treatment of cats in imminent danger of complete respiratory paralysis, potassium (as potassium chloride diluted in lactated Ringer's solution) should be given intravenously at a rate of 0.5 to 1.0 mEq/kg/hr. Serum potassium concentration and electrocardiograms should be monitored closely. Serum potassium concentration will usually increase into normal range within two to three hours after beginning the infusion. After the first 24 hours of treatment, oral potassium supplementation can be decreased to 4 to 6 mEq/day.

A positive response to potassium supplementation usually occurs within one to two days, manifested by increase in muscle strength. Complete recovery of normal muscle

Potassium Depletion - continued

strength may take up to several weeks.

Maintenance Therapy

Long-term supplementation of dietary potassium (often for life) is likely to be necessary for most older cats with excessive urinary potassium losses. Although it appears that renal potassium wasting may abate somewhat as renal function improves after several months of dietary potassium supplementation, long-term follow-up shows that urinary fractional excretion of potassium remains high in most cats. Periodic determination of serum potassium concentration (weekly at first, then less frequently) is required to determine the dose of supplemental potassium necessary to maintain normokalemia. Most cats can be maintained on 2 to 4 mEq potassium/day. A palatable potassium gluconate powder (Tumil-K -Daniels Pharmaceuticals) has been developed for use as a dietary potassium supplement in dogs and cats.

Neuromuscular abnormalities induced by potassium depletion appear to be completely reversible with potassium supplementation. Perhaps even more encouraging has been the apparent improvement in renal function (decline in serum creatinine concentration and urinary fractional excretion of potassium) observed in nearly all cats treated. In a few cats where a decline in serum creatinine concentration did not occur, creatinine concentration nevertheless remained stable over several months. These findings suggest that potassium supplementation may play an important role in the management of chronic renal function in cats, a disease second only to feline leukemia virus infection as a leading cause of mortality in cats. Dietary potassium requirements for cats with renal disease may need to be reevaluated in light of what is now known regarding altered renal potassium handling in cats with renal dysfunction.

In addition to improvement in neuromuscular and renal function, dramatic weight gain and improvement in hematocrit and haircoat quality have been observed in cats supplemented with potassium over long periods.

Owners often report improvement in attitude, level in activity, and appetite. In general, it appears that a number of vague abnormalities common in old cats, especially those with renal function impairment, may be attributed to the effects of chronic potassium depletion in some instances. Careful attention to potassium balance should be an important part of the clinical management of geriatric cats.

Epidemiologic Survey of Hypokalemic Cats

A cross-sectional epidemiologic study of hospitalized cats treated at Colorado State University Veterinary Teaching Hospital characterized both the prevalence of hypokalemia and examined factors that might be associated with its occurrence in cats. Among 500 cats hospitalized for a variety of reasons, 186 (37%) were found to be hypokalemic.

Odds ratios (ORs) were calculated as a means of determining possible disease and diet associations with hypokalemia. A significantly increased occurrence of hypokalemia was observed in cats with chronic renal failure (OR = 14.4) Liver disease (OR=5.7), diabetes mellitus (OR=4.1), feline urologic syndrome (FUS) or lower urinary tract disease (OR=2.9) and systemic infectious disease (OR=2.7) These results support the association between renal insufficiency and hypokalemia observed previously by our group and by Di Bartola et al and also illustrate the importance of monitoring potassium balance in cats with certain other common diseases. Several biochemical abnormalities occurred frequently, including hypercholesterolemia (48%), hyperglycemia (47%), and hyperchloridemia (39%). At present, it is unclear whether there is any direct relationship between these abnormalities and the occurrence of hypokalemia or whether they could have been induced by a common factor.

Experimental Potassium Depletion in Cats: Preliminary Results

In a series of ongoing studies, we have begun to examine the effects of potassium depletion on biochemical responses, renal functional changes, and endocrinologic responses

Potassium Depletion - continued

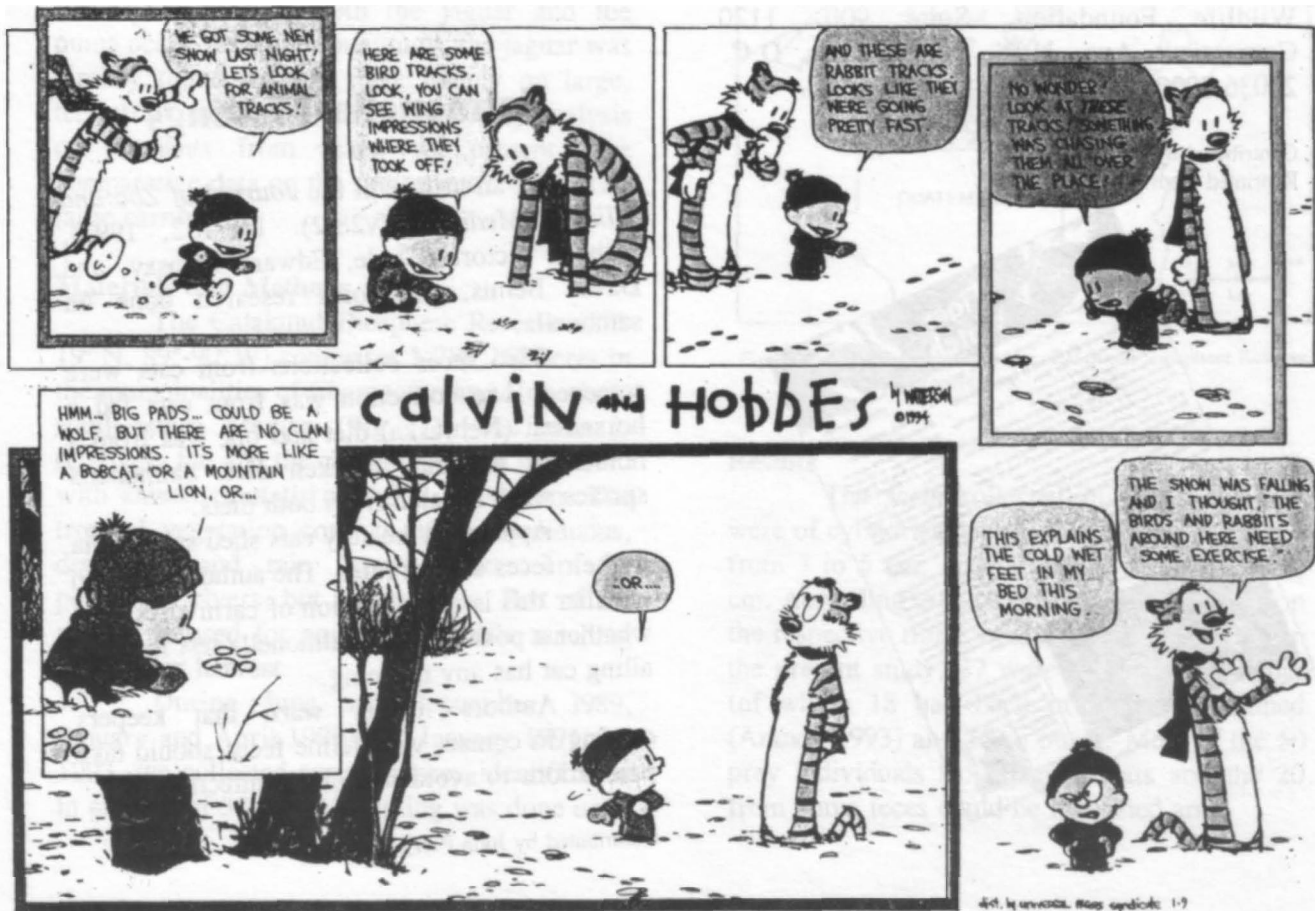
in cats. Based on Ching's work in our laboratory, which showed that long-term dietary acidification induced a significant negative potassium balance, we have also begun to examine for a possible interaction between dietary acidification and development of potassium depletion.

In these studies, with cats fed a potassium-deficient diet (0.2%) on a dry-matter basis, the addition of a dietary acidifier induced a more rapid and sever decline in serum potassium concentration. In addition, systemic acidosis developed in potassium-depleted cats, apparently because of the adverse effect of potassium depletion on urinary acidification mechanisms. A significant decline (20%) in glomerular filtration rate also developed in potassium-depleted cats not given a dietary acidifier. After four weeks of potassium repletion, the glomerular filtration rate is affected cats improved, although it did not return to the normal range.

From studies done in dogs and rats, it is known that potassium depletion may induce systemic acidosis through interference with urinary proton excretion. In addition, renal functional impairment has also been documented in rats depleted of potassium. Our initial results suggest that the same may occur in cats. These preliminary findings may have important implications with regard to the formulation of diets for cats with chronic renal function and for the formulation of acidified diets for the prevention and treatment of feline lower urinary tract disease.

* * * * *

Editor's Note: Potassium depletion has occurred in exotics of all ages. It is noteworthy that these cases were ones in which the owner did not use a vitamin/mineral supplement as part of their cat's daily diet. Please make sure a vitamin/mineral supplement is used daily to ensure the health of your feline.



A Newsletter for Friends of the Tiger

The first edition of *Tiger Watch* has been mailed to friends of the Save the Tiger Fund to keep the abreast of efforts to save tigers.

The newsletter features some of the 41 tiger projects under way throughout the world, including India, Russia and Southeast Asia, as well as educational and research activity.

Sponsored by the National Fish and Wildlife Foundation and Exxon, the Save the Tiger Fund has raised more than \$3.5 million in donations from Exxon shareholders, employees, Exxon and its affiliates and the public. When the fund was created in 1995, Exxon pledged \$1 million a year for at least five years for tiger conservation.

Tiger Watch goes to Save the Tiger Fund supporters, prospective donors and others interested in saving the tiger from extinction.

You may get a free copy of *Tiger Watch* from the Save the Tiger Fund, National Fish & Wildlife Foundation, Suite 900, 1120 Connecticut Ave. N.W., Washington, D.C. 20036-3920.

Contributed by John Perry
Reprinted from *The Lamp*



Did You Know?

*Indiana is second only to
Florida in the number of
cats owned by
LIOC members.
Cats are welcome at
Convention 98!*

*Make Plans to
Join us There*

Salmonella Findings

In an article in the *Journal of Zoo and Wildlife Medicine* (v28(2), 148-152, 1997), authors Victoria Clyde, Edward Ramsay, and David Bemis, put forth research done on salmonella.

Two feces collections from cats were screened: one collection was from cats fed a horsemeat (Nebraska) diet and one was from a horsemeat and raw chicken diet. Salmonella species were isolated from both diets.

Apparently healthy cats shed salmonella in their feces at high rates. The authors question whether this is an adaptation of carnivores, and whether a positive fecal salmonella test in an ailing cat has any meaning.

Authors further warn that keepers coming in contact with feline feces should take precautions to avoid salmonella infections.

Contributed by John Perry

Prey Spectra of Jaguar and Puma in Tropical Forests of Mexico

Marcelo Aranda¹ & Victor Sanchez Cordero²

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Introduction:

The jaguar (*Panther onca*) and the puma (*Puma concolor*) are the largest felids on the American continent, but behavior, reproduction and in particular feeding ecology were studied in more details only recently. Rabinowitz and Nottigham (1986) described the jaguar and Emmons (1987) in addition the puma and ocelot (*Felis pardalis*) as opportunistic predators. This is of particular interest since these big cats are endangered by habitat fragmentation and overhunting in many areas. In the Calakmul Biosphere Reserve in Campeche, Yucatan Peninsula, Mexico, both the jaguar and the puma occur. In a previous study, the jaguar was already found to hunt there mainly on large, terrestrial mammals (Aranda 1993). By analysis of remnants from scats, we present here comparative data on the prey spectra of the two large carnivores.

Materials and Methods

The Calakmul Biosphere Reserve (17°-19° N, 89°-90° W) comprises 1,786,267 acres in the municipalities of Champoton and Hopechen, southeastern Mexico (Fig. 1). The area is relatively flat and the climate is warm subhumid with annual rainfalls of 1,000-1,500 mm. The tropical vegetation consists of semideciduous, deciduous and rain forests. There are no permanent rivers, but many ponds. Part of the reserve is used for agriculture, cattle ranching and timber harvest.

During June and September, 1989, January and April 1990, and January 1991 and 1993, we collected scats for prey identification in an area of 380 km. Sampling was done on

trails showing jaguar or puma footprints, and by these signs the scats were attributed to either species. Prey remnants such as fur, bones, hooves, claws and teeth served for identification. White-tailed deer and red brocket deer were pooled into the same prey group because we could not discriminate their hairs. Based on prey frequencies in the feces the diet overlap index could be calculated.

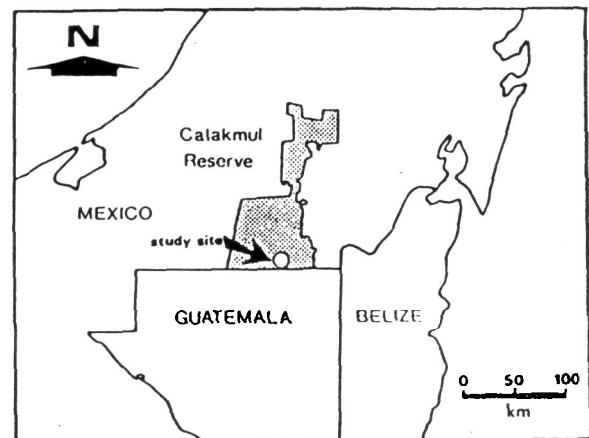


Fig. 1. Location of the study site, Calakmul Biosphere Reserve, in southeastern Mexico.

Results

The scats collected in the study area were of cylindrical shape, their diameter ranged from 3 to 5 cm, and the length from 10 to 30 cm. According to the footprints found nearby on the respective trails, of the 52 scats analyzed in the present study, 37 were attributed to jaguar (of which 18 had been previously examined (Aranda 1993) and 15 to puma. Most of the 50 prey individuals from jaguar scats and the 20 from puma feces could be identified and

Prey Species - continued

Table 1. Number of prey identified from large felid scats collected at the Calakmul Biosphere Reserve.

Taxon	Jaguar	Puma
Collared Peccary	21	2
Deer	4	10
Coatimundi	9	4
Armadillo	6	1
Paca	2	1
Opossum	-	1
Anteater	1	-
Great curassow	3	-
Ocellated turkey	-	1
Unidentified bird	-	1
Unidentified snake	1	-
Unidentified turtle	1	-

represent terrestrial animals, besides a few birds and some reptiles but only from jaguars (Table 1). Within the jaguar diet, peccaries occurred frequently, while the puma fed mainly deer. The resulting diet overlap was calculated at 0.45.

Discussion

If data for prey numbers are used to discuss the feeding ecology of sympatric predator species, abundance has to be considered. For the Calakmul reserve such data were previously recorded from 307 tracks of medium to large sized terrestrial mammal; the result was a total of 11 species of which collared peccaries, coatimundis, pacas, and armadillos were most abundant. These data support the interpretation that the jaguars are opportunistic hunters at Calakmul, as known from other study sites. Jaguars were often reported to make use of habitats along rivers and lakes, and to hunt also on aquatic reptiles which are protected by massive scale exoskeleton. In a number of studies, deer were declared to be preferentially

prey by pumas relying more on their speed than jaguars. For instance, in the Corcovado tropical rain forest, Costa Rica, jaguars hunted more on white-lipped peccaries and pumas on brocket deer, similar to the Calakmul data presented in this study. Diet overlap between jaguars and pumas were slightly lower (0.34) in the Corcovado National Park in Costa Rica compared with Calakmul (0.45) in Mexico. Many more prey species including farm animals have been listed from other places such as Belize and Peru according to local abundance.

The geographic range of the puma reaching from Canada to Patagonia covers quite more animal communities than the occurrence of the jaguar which is distributed from Texas to the north of Argentina. Despite the big overlap, the big cats exhibit usually a pronounce mutual avoidance by hunting, at least at the same time, in distinct territories. In fact, we also never found jaguar and puma tracks located side by side on the same trail at Calakmul. In addition, prey distribution within a given area is not the only reason for the locally observed food habits, because of the massive head and stout constitution, the jaguar is capable of killing larger and more armored animals than the puma. Therefore, sympatric jaguars and pumas may avoid direct competition by observing several strategies: hunting in a specific manner and in often differing biotopes, avoiding predation at the same time in a particular habitat, and preferring slightly different prey spectra. These peculiarities in ecology and behavior evidently allow the large felids to co-exist at least in undisturbed neotropical ecosystems.

Condensed from *Stud Neotrop Fauna & Environment*
Contributed by John Perry

Moving?



Don't miss any issues
Notify Member Services Promptly
(See Page 2 for address)

The Missing Lynx

By Mark Jerome Walters

When federal court Judge Gladys Kessler ruled on the U.S. Fish & Wildlife Service's (USFWS) failure to designate the lynx as endangered, there was no mistaking her opinion: "The decision not to list the lynx and grant it the protections of the Endangered Species Act is arbitrary and capricious, applied an incorrect legal standard, relied on glaringly faulty factual premises, and ignored the view of its own experts."

Small, secretive and low on notoriety compared to larger carnivores such as the grizzly bear and gray wolf, the lynx and other so-called furbearers have played a major, albeit largely forgotten role in the forests of Alaska, the northern United States, and eastern Canada.

The lynx has been more or less extirpated from a once familiar domain, New England, although a few holdouts remain in Maine - at home in the deep snows, pursuing snowshoe hares, their primary prey.

Logging and trapping were probably responsible for driving the lynx from New England and the Great Lakes by the turn of the century. The lynx was also once common in the West, but now only fragmented populations remain in Montana, Washington and Idaho. Nevertheless, Montana and Idaho still have trapping seasons for lynx.

The battle lines over the species began to be drawn in 1991, when conservationists petitioned the USFWS to list certain populations as endangered. After the agency denied that request, a coalition of conservationists filed a petition in 1994 to have the lynx listed as endangered or threatened throughout its entire range in the lower 48 states. The petition presented overwhelming evidence that four of the five listing criteria had been met - habitat destruction, overutilization, inadequate regulation and other human factors. Trapping and hunting had devastated the lynx, while intensive road building, logging and fire suppression had

fragmented its habitat.

Faced with this evidence, the USFWS agreed to reevaluate all available data on the lynx in August, 1994 - an effort led by the agency's Region 6, which includes Montana. After an extensive review, Region 6 concluded that there was, indeed, enough evidence to list the



Northeast, Great Lakes, and Southern Rockies populations as endangered, and another population in the Northwest and Northern Rockies as threatened. The USFWS Midwest and New England regions, along with its Washington State field office, endorsed the proposal. Several months later, however, the USFWS, Washington, D.C., office reviewed this finding and decided that listing the lynx was unwarranted.

Michael Ameral, an endangered species biologist with the USFWS New England field office, says the decision "was political, and it was wrong. At the time of the lawsuit, the Endangered Species Act was under tremendous fire in Congress, and the service was scared to list a species that could cause a strong reaction among timber companies and large landowners."

In March, 1995, Defenders of Wildlife, the Biodiversity Legal Foundation, the Greater Ecosystem Alliance and others prepared to sue the USFWS, noting that the USFWS ruling was

Lynx - continued

inconsistent with findings of the agency's own field biologists.

"When the evidence was so explicit, what could this decision have been but political? asks Bill Snape, legal director at Defenders of Wildlife. "It was not just deceitful, it was stupid. The role of USFWS is to protect species, not sacrifice them in the name of conflict avoidance."

This past March Judge Kessler agreed and gave USFWS 60 days to review its decision. Although the service acknowledged the lynx is in serious trouble in the contiguous U.S., it stubbornly refused to list the species. Still, the USFWS must reassess the situation within a year, so the beleaguered lynx can still hope for protection.

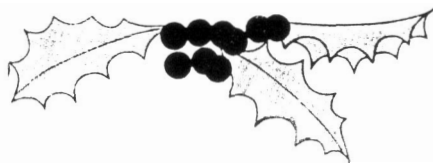
This might seem like a lot of legal expense and consternation over a cat so secretive that it is rarely seen by humans. But this battle, like so many others waged over endangered species, is about more: on the one hand, it's about our will to dominate nature, and, on the other, our begrudging acknowledgement that we are not the only thing that matters.

Reprinted from *Animals*
Contributed by Jean Hamil



***And then they heard the angels tell
"Who were the first to cry Nowell?"
Animals all, as it befell,
In the stable where they did dwell!
Joy shall be theirs in the morning!***

***Kenneth Grahame,
The Wind in the Willows***



President's Perspective

What a great year for LIOC ESCF. I wish I could take credit, but I'm sure that goes to the whole Board. Everyone has given of their time and talents above and beyond the job description. I really appreciate it.

Our greatest achievement in the past year was to approve the Ken Hatfield Memorial Scholarship Fund. It is now in the capable hands of the KHMSF Board of Directors: John Perry, Shirley Wagner, Carin Sousa and J.B. Anderson. I feel especially privileged to have been a part of this project. Ken was a very close personal friend and actively involved in LIOC ESCF as we know it now.

As you know, Shirley Wagner has resigned as newsletter editor. We feel extremely lucky to have Sherry Blanchette volunteer. She has some really big shoes to fill but she is well qualified and was unanimously appointed by the Board. I hope all of you will enjoy the new newsletter. Please help Sherry feel welcome.

Convention in Jacksonville, Florida was great. We had a diversified group of exotic cat enthusiasts present and several cats to enjoy. Robert Baudy's white tiger cubs were a real treat - too bad they have to grow up!

I am pleased to see so many of you becoming involved in the governing of LIOC ESCF. I've often heard the expression "the in crowd". As far as I'm concerned, every member of LIOC is the "in crowd". If you think the "in crowd" is the Board of Directors, then join us there. 1998 is election year and all positions, except Life Directors, are open.

I hope to meet many more of you at Convention in Indianapolis and in closing I want to wish all of you the best Christmas wishes and a happy and prosperous New Year.

Barbara Wilton
President

*From Aristotle to Disney,
Westerners have created literary
tigers of many different stripes.*

Tigers of the West

By William Crain

It's not surprising to find the tiger roaming widely in the ancient lore and literature of Asia, where the regal creature struggles to survive against the greatest of odds.

The surprise is how many have found their way into Western literature. Writers who've perhaps never seen tigers - not even in a zoo - have introduced them in books and poems for more than 2,000 years.

Indeed, one of the most memorable poems in Western literature is about a tiger. Even those of us who otherwise fail to recall a single line of force-fed poetry from high school days can usually reel off "Tiger! Tiger! burning bright..." from "the Tiger."

By whom?

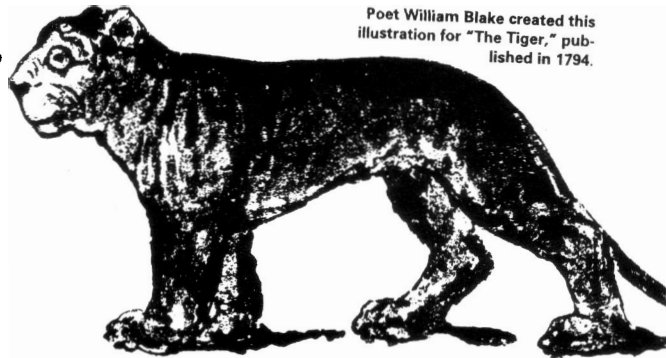
By William Blake. Oh, yes, that one.

Occidental writers who have unleashed tigers in their works range from Aristotle to Marco Polo and Shakespeare, from poet T.S. Eliot and novelist Pat Conroy to screenwriters at Walt Disney.

Never mind that Westerners often wronged the tiger by misrepresenting everything from its tail to its stripes. Aristotle portrayed the tiger with a "sting in its tail" that shoots off pines. Marco Polo described the Great Khan's "lions" as "striped lengthwise with black, red and white" - clearly a description of tigers.

But if tigers entered Western literature with flaws, it mattered little to readers who had never seen one and clearly never expected to encounter a tier in the night burning bright... on a lonely footpath in the jungle.

And therein lies a large difference between the treatment of the tiger in Oriental



Poet William Blake created this illustration for "The Tiger," published in 1794.

and Occidental literature. Asian lore often casts the tiger as a spiritual creature - deity or demon, protector of humanity or fearless predator. Little wonder, given that the tiger reigned supreme for eons across all Asia.

Chinese legend holds that a tiger stands at each of the four main points of the compass to keep demons from entering the earth. In another Eastern myth, the tiger becomes the origin of evil. The mythical tiger of the East tends to personify royalty or mystical power.

In the West, where tigers never roamed, they command more respect than worship. Western writers' distance from tigers gives them the freedom to cast the striped cat in myriad forms, from benign cartoon character to fearsome beast.


The tiger's literary debut in the West may have been in the Greek myth about Bacchus, the wine god. After Bacchus taught the secret of making wine in his travels to India, his grateful hosts rewarded him with tigers to pull his chariot.


Alexander the Great recorded tiger hunts during his conquest of India in 327-325 BC. Legend has it that one of his generals, Seleucus Nicator, presented a tiger to the citizens of Athens.


In the Middle Ages, tiger references became more common. Chaucer wrote in "The Squire's Tale" of *The Canterbury Tales*, "There is no tiger, nor cruel beast." Like Chaucer, Shakespeare probably never saw a tiger, but the great bard wrote them into at least five of his plays.


Tigers of the West - cont


The iger


iger! Tiger! burning bright
In the forests of the night,
What immortal hand or eye
Could frame thy fearful symmetry?



n what distant deeps or skies
Burnt the fire of thine eyes?
On what wings dare he aspire?
What the hand dare seize the fire?

nd what shoulder, and what art,
Could twist the sinews of thy heart?
And when thy heart began to beat,
What dread hand? and what dread feet?

hat the hammer? what the chain?
In what furnace was thy brain?
What the anvil? what dread grasp
Dare its deadly terrors clasp?

hen the stars threw down their spears,
And water'd heaven with their tears,
Did he smile his work to see?
Did he who made the Lamb make thee?

iger! Tiger! burning bright
In the forests of the night,
What immortal hand or eye
Dare frame thy fearful symmetry?

by illiam lake

Perhaps the most famous is the "imitate the action of the tiger" line from Henry's rousing speech before Agincourt in *Henry V*. In *Romeo and Juliet*, Romeo describes his "intents" as "more fierce and more inexorable far/Than empty tigers or a roaring sea."

One of the Bard's would-be rivals, Robert Green, lashed out at Shakespeare for having "a tiger's heart wrapped in a player's hide." Though few remember Shakespeare's tigers, almost everyone knows the most famous tiger poem in Western literature. Some say William Blake's "The Tiger" is the West's best-known poem. Period.

Many people think of it as child's poem, but its simple opening lines introduce a profound meditation on the nature of the divine. One of the 18th century's influential forces of English romanticism, Blake created in "The Tiger" a symbol of elemental energy, a quality he also greatly admired in humans.

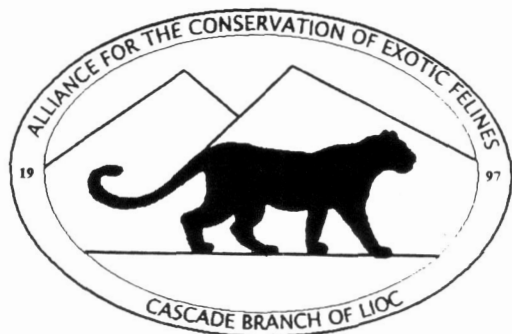
In a later work, he wrote, "The tigers or wrath are wiser than the horses of instruction." Blake raised the tiger to mystical heights in Western literature.

Yet another Englishman, Rudyard Kipling, deflates the supremacy the tiger enjoys in Blake's works. Kipling created Shere Khan, the famous literary tiger in *The Jungle Book*. The conflict between the menacing yet cowardly Shere Khan and Mowgli, the wolf-child, has entertained generations readers.

In the 20th century, the tiger has lived an incredibly rich and varied life in the Western imagination - from the strange and childlike Tigger of A.A. Milne's *The House at Pooh Corner* to the furious agent of revenge in novelist Pat Conroy's *The Prince of Tides*. Other notable writers who employed tigers in their works include Hilaire Belloc, D.H. Lawrence and T.S. Eliot.

Tigers also figure in many movies - from numerous films about the circus to the *Wizard of Oz* ("Lions and tigers and bears, oh my") and the 1973 movie *Save the Tiger*, starring Jack Lemmon. Kipling's Shere Khan

continued next page



Meeting Report

We held our September meeting at Peter & Zuzanna Kukul's house. Before and after the meeting we got to meet and play with their 2 servals, Ozzy and Sierra. They were wonderful! Attendance was pretty good, six people showed up.

We talked about creating membership packets to hand out to people if they were interested, as well as making business cards with the logo and the names and phone numbers of the officers on them. Business cards are now available for anyone that wants to hand them out.

Gary brought a young jungle cat (chaus) and told us about his trip to the hospital after he was bitten by a 5 lb margay on the hand. He also brought the paperwork for USDA licensing to show everyone. USDA licensing is needed if you plan to breed and sell, or otherwise publicly display exotic animals. The USDA application can be requested at (916) 857-6205, if anyone is interested.

We also talked about doing more public outreach to local authorities, zoos, veterinarians as well as to the general public. As a result, the November meeting will be an open public meeting held somewhere in Snohomish County and will be advertised in the Newspaper. If you have any ideas where to hold the meeting, or would like to help organize, please contact me.

We went through the pictures everyone took at the picnic and will be putting several of them on our web page, which is currently under development, thanks to Peter.

Finally, we discussed what we plan to do in the upcoming year, and what trips we might like to take as a group.

Business concluded, we visited and had a good time swapping stories.

Submitted by,
Laurisa Watkins
Secretary/Treasurer



Tigers of the West - continued

made a hit with a new generation in Walt Disney's film of *The Jungle Book*.

The movie that perhaps best underscores the plight of the tiger today is *Dersu Uzala*, winner of the 1975 Academy Award for best foreign film. Coming upon a tiger in the Siberian forest, Dersu, a native hunter, shoots the animal out of fear. As the wounded tiger escapes, the traumatized hunter says in mourning, "It's bad to kill a tiger."

The tragedy is a powerful lament for the tiger. It's up to all of us - Orientals and Occidentals alike - to see that tigers in the wild don't become mere creatures of the imagination.

William Crain, who works in Exxon Corporation's Public Affairs Department, holds a master's degree in comparative literature from Harvard University.

Reprinted from *The Lamp*
Contributed by John Perry



July Meeting Report

Our July meeting was held in Seaside, Oregon at Dwayne's place. A lot of us hadn't been there before. It was quite nice to see Dwayne and all of his guinea pigs and of course his cat. Due to the fact that Dwayne lives on the coast, and for many of our members this constitutes a two hour drive, the turnout was small.

Katie brought her new serval kitten, Sadie. She came from a breeder in Washington. We had a great time visiting with her.

Since the group was so small, we really just spent our time visiting.

Steve did give a report on AAZPA. He felt they were willing to work with private owners. My question: do they want to work with us on breeding programs, or do they just want our cage space to place their unwanted and unhandleable animals? Steve couldn't answer that question.

We again talked about Convention. It was decided we would give \$100 to someone just before the auction.

* * * * *

August Meeting Report

Our August meeting was held at John Van Strys'. There were 20 members and guests in attendance.

Four-legged critters in attendance were, of course John's two cougars and black leopard, Sadie the serval kitten with owner Katie, Steve brought his two bengal kittens.

After introductions were made, Andy asked if anyone had any problems that needed to be discussed. Collette talked about a biting

problem she had with her new Jungle cat male. She did mention that the problem seemed to be solved and that everything was OK now.

Gayle gave a treasury report and also reported that a Dr. Terry Moore and his wife Judith, had won the \$100 our branch had donated to Conention. She also reported that there were 61 persons attending this year, with 5 of them being from our branch. There were lots of cats, including white tiger cubs, snow leopard cub, cougar cubs, serval and caracal crosses, and an adult serval.

Carole Stiles and Debbie Walding reorted on other things that happened at Convention. They both (it being their first time) really enjoyed the trip to the private conservation center and had great fun at the auction. Debbie taped the trip and a lot of the convention doings.

Steve reported on the last meeting of Oregon Dept. of Fish & Wildlife he went to. They are still working on the list of animals that will be allowed in Oregon.

Andy and Gayle met with Larry Cooper of ODFW as they are still working on the new regulations for cougar caging.

Gayle took the floor and explained about the Lottie, what it is, what it means and how it is awarded. She then announced that Robert Baudy was this year's recipient.

She also spoke about the Ken Hatfield Memorial Scholarship Fund that has been set up. It was announced that next year's convention will be in Indianapolis, Ind. So everyone should start making plans now to attend.

After the dollar game which was won by Ed Gates, we had the raffle.

The rest of the day was spent playing with kittens, visiting and watching Debbie's tape of convention.

* * * * *

September Meeting

Our September meeting was held in the home of Bob & Collette Griffiths in Vancouver. We had several members there to enjoy the sunny day, and it was nice to see all of their cats.

PNW Branch Report - continued

Jackie Vanderwall brought one of her bengal kittens, and Steve brought his 2 male bengals that are looking for new homes.

Andy, our President was unable to attend as his company sent him to Europe for a couple of weeks on business. In his absence, Steve got the meeting going.

After introductions, most of the day was spent talking about the problems a person was having in Portland with his neighbors, and the Oregon Dept. of Agriculture over his 10 month old Siberian tiger.

It seems that with all the publicity going on, the City, Counties, and State are temporarily shutting down. The Portland City Council doesn't want the tiger in Portland, Multnomah County has decided not to renew any existing licence or issuing new ones. The Oregon Dept. of Agriculture is no longer issuing permits and are looking into their policy. They feel their system may be a little to lax. They are talking about re-vamping the whole system. Isn't it amazing what one tiger cub can do?

Clarke county in Washington state is also considering a ban on all exotic animals. Hopefully, we can put a stop to this before it goes too far. We will continue to fight for our rights as Americans.

Submitted by
Gayle Schaecher

Europeans Ban Furfarming

In Austria, five of nine provinces have banned furfarming on the grounds of animal cruelty, and the remainder are expected to follow suit shortly. The number of fur farms in Austria immediately plummeted from fifty to just eight.

Last year the Netherlands began what may be an important trend in Europe by banning fox farming.

Contributed by Jean Hamil

LIOC T-SHIRTS



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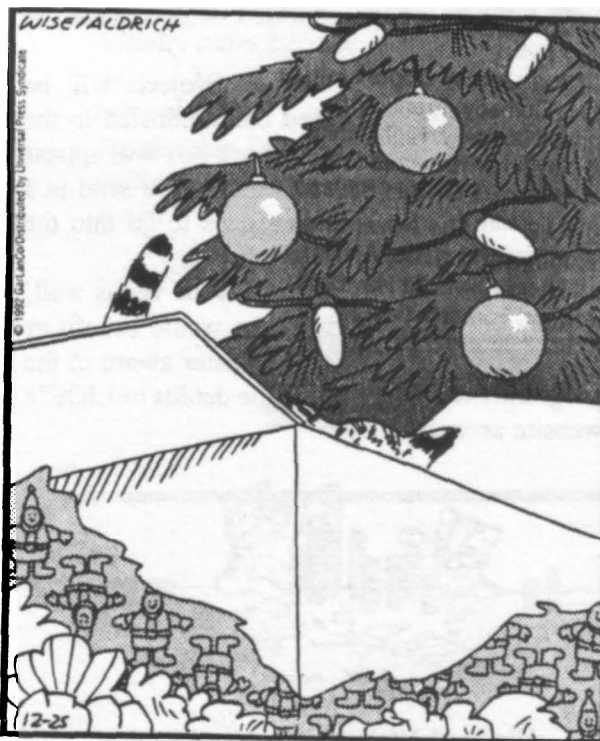
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REAL LIFE ADVENTURES



It's the one day children wait for all year. Cats too.

Ken Hatfield Memorial Scholarship Fund

Two years ago we lost Ken Hatfield. To those of us who knew him it was a great loss. Although unknown to them, even those who didn't know Ken suffered as well. LIOC's first elected President and a life director for 18 years he was a unique individual and one of the most knowledgeable about our cats I've been privileged to know. More importantly he shared. He worked not to promote himself, but LIOC and responsible husbandry. It was to honor Ken and his contributions that the Board voted to establish this scholarship fund.

The scholarships will be given to veterinary students who wish to take courses in exotic animal medicine. Hopefully this will encourage more young veterinarians to take these courses and having been so educated, perhaps they'll be less reluctant to treat our felines. Of course this too means that future vets will be better educated with regards to exotics.

In the future, special projects will be held with the funds raised being donated to the scholarship fund. Also, a check box will appear on your renewal notice, asking you to send in a few dollars more than your dues to go into the trust fund. Please be generous.....

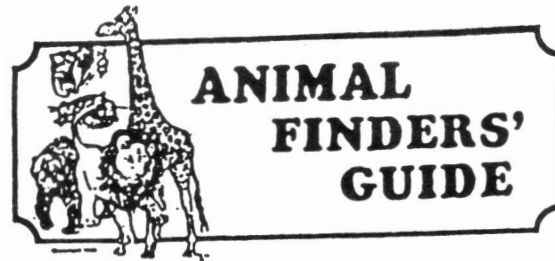
Please mention this to your vet as well, he may know of a student who would benefit or might wish to make his alma mater aware of the program. We'll be posting the details to LIOC's website as well.



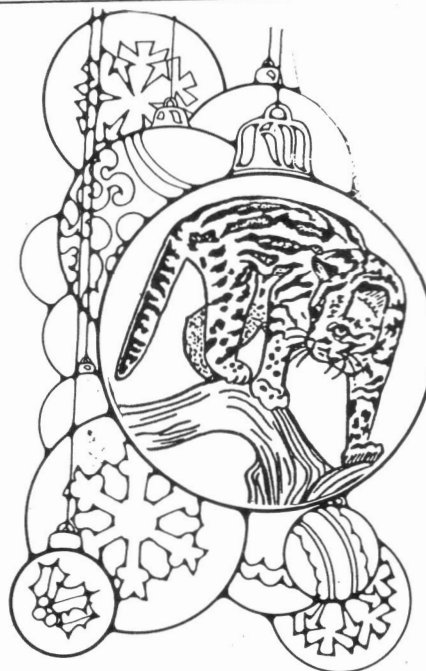
We need YOUR help to make this a
SUCCESS!

The Classifieds

All ads in this publication are void where prohibited by law. All transactions are between buyer and seller. All buyers and sellers must have proper licenses and permits for all animals offered for sale or sold. LIOC ESCF Inc. does not necessarily endorse or guarantee the honesty of any advertiser. LIOC ESCF Inc. reserves the right to edit or reject any subscription or ad. No blind animal ads will be accepted: all ads must a) contain name of business or individual, b) state whether the individual is owner or broker, c) show state and phone number or full address. For further information regarding advertising with LIOC ESCF Inc. contact the Term Director for Advertising & Publicity as listed inside the front cover of this Newsletter.



18 Issues a year. Informative articles on exotic animal husbandry. Exotic animals, auctions, products & services advertised. \$25 a year. P.O. Box 99, Prairie Creek, Indiana 47869





For Children.....

Jaguar in the Rain Forest

**By Joanne Ryder with Illustrations by
Michael Rothman**

Imagine you're a jaguar.....this book brings the reader into the lush, tropical world of one of the most magnificent hunters on earth.

Covering a 24-hour period in the life of a jaguar, this book follows the big cat prowling the forest floor, crossing a flowing river in search of prey and into the darkness of night stalking prey. In this dramatic addition to the *Just for a Day* series, both the author and artist imagine the life of a wild animal in its own natural world.

From Morrow Junior Books, the suggested retail price is \$16.00

Bummer!

"He had her by the throat. She had a horrible death. It totally bummed me out for the whole day and the rest of my vacation, and they never even offered to refund our money"

Dawn Breen, after seeing a male white tiger choke a female white tiger to death at Sigfried & Roy's Secret Garden in Las Vegas. A crowd watched for 30 minutes before employees attempted to separate the two cats.

Exotic Companion Medicine Handbook for Veterinarians

Compiled by Cathy Johnson Delany, DVM is a two-volume work divided into four main sections, with individual chapters covering various small mammals, birds, reptiles and amphibians. The pocket-sized, loose-leaf notebooks serve as a quick reference to behavior, diet, husbandry, physiological and reproductive facts, common clinical syndromes, zoonotic potential, rule-out chart based on clinical signs, and formulary.

Available from Wingers Publishing, \$79.00 plus \$7.50 shipping and handling.

Did you Know?

The little "hillbilly" margay shown below was Ken Hatfield's personal logo as LIOC's President? Ken was one of the Hatfields, and his first exotic, Mittens, margay, garbed in hillbilly attire became his logo.

So, when you see this little guy, remember the Ken Hatfield Memorial Scholarship Fund - and tuck a few extra bucks into the envelope when you renew!



Molly, is a 7 year old Siberian tiger that started life as a "photo-booth" cat living for 3 months in a van. She soon grew too big and wasn't wanted anymore.

Clyde, is a 6 year old lion with an incredible mane that goes over his shoulders down to his back legs.

These are just two of the cats you will visit at the **Exotic Feline Rescue Center** at the 1998 LIOC Convention in Indianapolis, Indiana

