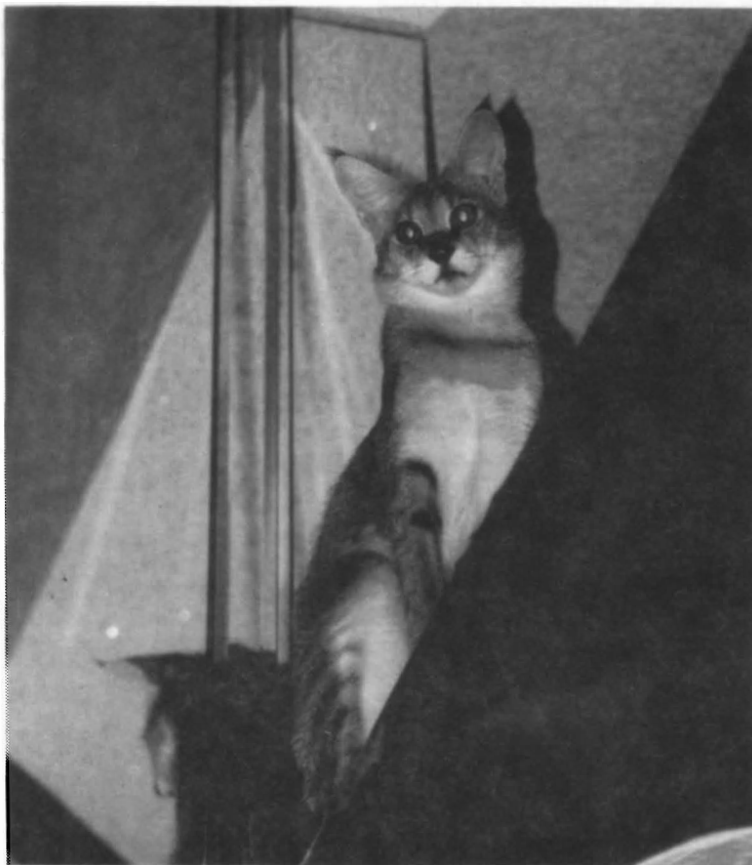
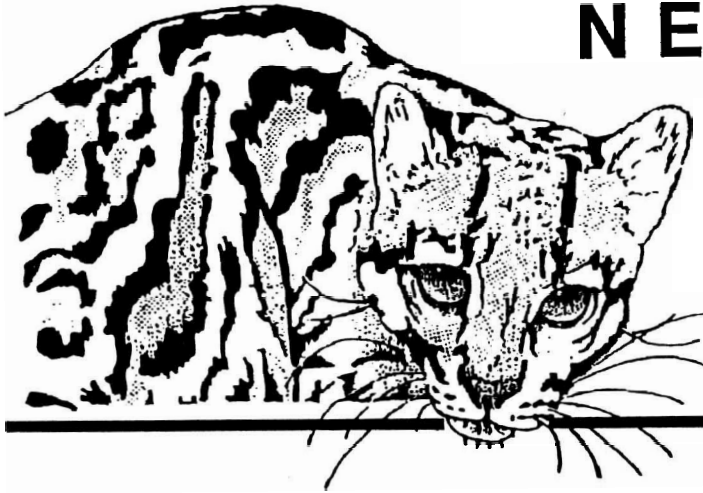


NEWSLETTER

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Nala, Jungle Cat (*Felis chaus*) is a year and a half old. She resides with new LIOC members Craig & Jana Londre'.



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 15th of even-numbered months. Please submit all material to the Editor.

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LIOC needs YOU!

1997 L.I.O.C. Endangered Species Conservation Federation, Inc. 27th annual conference - August 7-10 - Jacksonville, Florida

The Ramada Conference Center, Jacksonville, Florida is your destination for the 1997 LIOC Convention, August 7-10. **Call 1-800-874-3000 to reserve your room for \$72.00 each night double occupancy.** The Ramada Conference Center has 270 spacious guest rooms, is nestled in 19 acres of wooded sanctuary, and is just minutes from downtown, the airport, the fairgrounds, and Jacksonville's beautiful beaches. Amenities include, an Olympic sized swimming pool, lighted tennis courts, volleyball courts, half mile jogging track, cable TV and a family style restaurant.

In addition, the Ramada Conference Center provides **FREE transportation to and from the Jacksonville Airport, from 6:00am to 10:00pm.** Upon arrival to the Jacksonville airport, call 904-724-3410 for a pick up, then retrieve your luggage. **Your transportation will be waiting outside at the Hotel Taxi stand.**

The CATS are welcome! (Less than 30 pounds) The Ramada Conference Center requires notice when you make your reservations, as to which cats you are bringing to the convention, and a \$25.00 non-refundable room deposit.

REGISTER for the 1997 LIOC Convention by June 15. Please send \$85.00 payment to LIOC-ESCF, Inc., PO Box 22085, Phoenix, Arizona 85028 (After June 15 the fee will be \$110.00) **Note: Send your choice of either Chicken Cordon Bleu or Grilled Swordfish, for the Saturday night Banquet Dinner.**

Wednesday, August 6, the Hospitality Room will be open for early travelers.

We are scheduled for a visit to a private conservation center. This tour will be taken in two groups of 30 maximum each day, both Thursday and Friday mornings. **Those who are attending the annual LIOC board meeting and their guests will enjoy this tour on Thursday, August 7. The balance of the convention attendees will enjoy this tour on Friday, August 8.** (The annual LIOC board meeting is scheduled for Friday morning, August 8.) This private conservation center is not open to the public, and it will be our special privilege to tour this facility.

Thursday, the General Membership Meeting will start at 3:00pm. Our evening begins with a **DELICIOUS BUFFET DINNER and SURPRISE ENTERTAINMENT.** Friday afternoon and evening is "free time" to explore Jacksonville and the surrounding area.

Saturday's agenda includes guest speakers and a visit with attending felines. The evenings festivities will begin with the Banquet Dinner and LIOC auction! We will learn about old business and any new projects from the LIOC board and where the 1998 LIOC convention will be held, during the Sunday morning final convention breakfast meeting.

MORE 1997 LIOC CONFERENCE INFORMATION IN THE UPCOMING NEWSLETTERS!

Submitted by Kelly Jean Buckley

States Seek Alternative to Listing Jaguar as "Endangered"

By Steve Yozwiak

Jaguars, the biggest and among the rarest wild cats in the Western Hemisphere, are the subject to a roaring debate over whether they should be protected under the Endangered Species Act.

Federal wildlife officials and environmentalists say yes, and that it should have been done in 1971 when the federal law was first passed. Arizona and New Mexico wildlife officials say no.

Instead, the two states are pursuing a "conservation agreement" that they say would bring government and ranchers into a friendly arrangement that would better protect the spotted beasts.

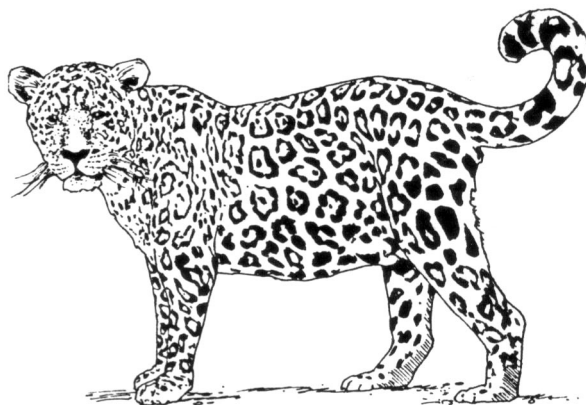
"We're doing the right thing here (with the land), or they wouldn't be coming through here," said Wendy Gleen, a southeastern Arizona rancher. Ranchers fear that putting the big cat on a federal list would close grazing, hiking and hunting activities in the San Bernardino Valley and elsewhere along the border, Gleen said.

But environmentalists say that both the state and federal governments have stalled for decades, and that the states are acting only after the federal government was prodded by a federal lawsuit to put the jaguar on the endangered species list.

The activists say the fines proposed by the states for killing a jaguar are less than what jaguar pelts fetch on the black market and predicted that the states would fail to prevent developers from destroying potential jaguar habitat.

But Terry Johnson, chief of endangered wildlife programs for the Arizona Game and Fish Department, said a conservation agreement is a better way of protecting jaguars than the more rigid guidelines of the Endangered Species Act. It also is favored by ranchers in southern Arizona where jaguars have been seen in recent months for the first time in years.

The U.S. Fish and Wildlife Service admitted in a 1979 report that its failure to list the jaguar as endangered in the U.S. was "an oversight".



In 1994, environmentalists filed a federal lawsuit charging the government with failing to protect the cat, and a judge ordered the Fish and Wildlife Service to list the cat as endangered.

In the meantime, however, Congress passed a moratorium on new endangered species listings that lasted until October. It was only then, Johnson said, that the state officials became aware that listing the jaguar was imminent.

In January, Arizona Game and Fish officials petitioned the federal government to allow consideration of its conservation agreement instead of listing the jaguar. Hearings on the state plan were held and a public comment period ended February 10th.

Interior Secretary Bruce Babbitt has until April 1st to make a decision.

Arizona and New Mexico officials plan to meet with federal agencies again to attempt to persuade them to accept the conservation agreement.

From the *Arizona Republic*
Contributed by Kelly Jean Buckley

Touch the Jungle

Part II - Adventures in Belize & Guatemala

A year or two after our experience in Guyana with the cougar cubs, Rosa and I decided to head down to Belize and Guatemala to see what the situation there was with jungle cats. Both of these countries are within bus rides of Yucatan where Rosa rescued our margay "Hopi" in 1975. We were curious if the little cats were still being hunted there now that they are on the Endangered Species List (and since it is no longer politically correct to wear pelts in polite circles).

In Belize we meet a big game hunter who had collected some live cats along the way as pets....including a gorgeous and sweet-tempered cougar and a margay that used to live in the house with him. He told a sad tale of having gone away for two weeks and upon his return, the margay that he had raised by hand and been practically a family member now refused to have anything to do with him. His theory was that the cat never forgave him for leaving, and reverted to "wildcat" behavior. All attempts to re-tame the cat failed miserably and she was now penned up in an outdoor cage for everyone's safety. He offered to give her to us if we could take her somewhere she would be safe, but unfortunately, we were not prepared to deal with her at that time and were forced to admit that if she were turned loose she would likely just end up on some farmer's wall (she had also developed a distinct taste for chicken). At least she was well cared for by someone who knew the animal's habits well enough to provide a balanced diet for her. Reluctantly we left her there, but as we left I started making a list of the sorts of sedatives and other supplies we would need to bring next time we came down - just in case. The big question remained, of course, where could we take her (or others like her) where they would be safe?

Our sojourn into Guatemala was to take quite an unexpected turn. It started when we decided to visit a small island zoo near Flores on

the lake of Peten. The lake was beautiful and we arrived by hired boat and walked around a cool, shady island with well kept pathways and birds twittering in the trees. It seemed a miniature paradise until we found the margay cage. Two pitiful, mangy, infested margays were locked in a cage about the size and shape of a large water heater. One lonely piece of driftwood stood in the center of the cage. There was no bedding. No place to hide. No room to run. They barely had room to sit on the small floor next to the driftwood base. Their eyes were the most pathetic eyes I have ever seen in a cat. Rosa started to cry. I ground my teeth and went looking for the curator of the zoo. We walked over the whole island and found no one. Finally, as the sun started to go down and our boatman became more insistent, we returned to Flores. I tried to make Rosa feel better by telling her "We can't save them all." The cage had been padlocked after all and even if it hadn't been, where could they have run to? The whole island was probably less than 2 acres. It would have been extremely unlikely that we could have smuggled them off the island even if we had our own boat and bolt cutters and tranquilizers and gloves and gunny-sack and....and all the other things we would have needed to free those cats.

"And suppose we did free them, and by some miracle they got away - you know they would just trap two more from the jungle to replace them." Grimly, Rosa turned her face towards the sunset, and we traveled the rest of the way in silence. I had to agree, all the logic in the world didn't make me feel any better either.

Back in Flores the next morning, we stopped at a local store to pick up supplies. The shopkeeper, a talkative and cheerful fellow, did his best to engage us in conversation in spite of my weak Spanish and Rosa's quietness. Finding out I was a veterinarian, the topic of the zoo

Touch the Jungle - continued

came up (which he was very proud of as a local "tourist must see"). I tried to diplomatically say we had been disappointed in the condition of the margays and their quarters. In my professional opinion, the cats were going to die soon due to malnutrition, parasitism and general neglect. (The cage was, I admitted, spotlessly clean, but that was not enough to keep these cats healthy.)

"Oh! You want to see a healthy little wildcat?" he asked. "Come to my house - I will close the shop - come, come! You will see!" Surprised, and not sure whether I had adequately communicated that we were only interested in *live* cats (finding a stuffed animal decorating his mantle would have been just too much at that point), we followed him a few blocks to his home. His wife and children greeted us with delight, and wasted no time dragging us towards a small back room where the "jungle cat" lived. The owner explained that he had bought the cat a month ago from a traveling salesman who told him that it was a leopard cub which could be tamed as a family pet or sold for "much money" to the local university.

Meanwhile his wife, in the background, was wailing to Rosa about the amount of meat the cat eats. "This little tigre eats more meat than my whole family put together - he is eating us out of house and home and we can't even get into the room to clean it he is so loco! Be careful, be careful señorita, don't go in there!"

The cat, which had obvious adult canine teeth was *not* a leopard cub, but was instead a full grown male margay who was furious about being chained to a table leg in this back room. I agreed to do a physical exam if we could locate some heavy gloves. He was emaciated but definitely still able to do serious damage to the unwary. He would certainly never be tame. We commiserated with the wife and the husband about how they had been duped, and offered to take the cat off their hands and set him free where he belonged. On the one hand, they really had more than enough of this wild thing in their home, on the other they still believed that it might be worth something - if only to recoup what they had spent on him in the last month. We patiently explained that we could not buy him, much as we might want to, because we



Touch the Jungle - continued

could not take him with us, and also because we did not wish to encourage people to trap these cats for sale. They understood, and yet could not just give him away for nothing - he had cost too much. We finally agreed that we would give them \$50, but they would have to make arrangements for us to transport him to Tikal, a Mayan ruin about a day's drive away where hunting is forbidden. Riding the standing-room-only Guatemalan buses with a sack of hissing, spitting wildcat was obviously out of the question. The deal was struck, and a jeep was found to transport us, although the driver muttered under his breath the entire way, and jumped every time the cat struck at him through the burlap sack on my lap (I sat very still!).

One of the most rewarding sights of my life was seeing him creep suspiciously out of the sack (photo below), take a cautious drink at the edge of, and then after a last look at us over his shoulder, in one spectacular, 15-foot leap, he disappeared into the jungle. (See photo on back cover)

The guards at the sanctuary were moved, pounding us on the back and congratulating us on a successful release, even the driver looked at us with new respect. (Though that might have been because my hand was bleeding all over the place and I was still smiling). So, in all we counted that trip as a success, but left with the question: Where do you release these cat's when you don't happen to have a Mayan Ruin Sanctuary handy? Perhaps more than anything else, what these cats really need is a safe haven...

Jona Jordan, DMV & Rosa Jordan

Touch The Jungle

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Contributed by Dawn Simas



LIOC Spotlight:

New Member Curt LoGiudice of Catty Shack Ranch.



Janx & Curt

I first met Curt in 1982 in Ponte Verde Beach, Florida when he and his puma, Max were riding down the highway with Max's head sticking out the window. Curt had a very good facility on his land in the rural area we call Palm Valley. He was licensed by the Florida Game Commission, but his neighbors were afraid of the cat and the city fathers zoned him out. Curt moved to a 5-acre ranch in Northeast Jacksonville, where he now lives.

Max died recently at the age of seventeen years. He had been an older puma when Curt first got him. Curt's original experience with the exotic felidae came from Rod McKinney of Feline Extravaganza in High Springs, Florida. Curt also had obtained a female serval which later died of leukemia.

Curt's collection today includes 2.1 pumas and 1.1 bobcats. His female puma named

Barta, is very old; he has an older male, Chevier that was placed with him by the Game Commission; and his 4-year old male, Janx, is his educational cat. Curt has Class, I, II and II permits from the state and is also an exhibitor/educator.

He tours with the Florida Panther Project with Janx who is whole, but declawed. Janx is a tractible feline that purrs, whistles and talks to Curt.

Curt takes Janx to Duval and Clay county schools, Boys & Girls Clubs, the Museum of Science & History for Earth Week and various other venues where he speaks about habitat protection, the environment, the dangers of big cats and pet responsibility.

The pair of bobcats belong to me, but are on breeding loan to Curt. Bobby is the older, a male given to me by Robert Baudy and Freckles is a female, from south Florida. They seem compatible, but we've seen no signs of mating yet.

Curt hopes to add tiger cubs to his menagerie and is looking for a young, female puma to keep Janx company as Barta is getting very old and is past breeding age.

Curt's phone # is (904) 757-3603 if anyone needs a home for such a cat.

By BeeJay Lester

Mineral Balance - continued

problem had occurred before. However, copper was not suspect and therefore not a part of the work-up. Some studies suggest that animals maintained on a diet that consists primarily of poultry may be particularly vulnerable to this type of copper related deficiency. It appears that large amounts of chicken without vitamin/mineral supplements in the diet may play a causal role.

Maintaining Mineral Balance

By Ron Eldridge, BVSc

Minerals should be administered as a group rather than individually.

A large number of microminerals are components of metalloenzymes, enzymes that contain tightly bound metal atoms. They are involved in the control of many different biochemical reactions. Dietarily speaking, mineral, especially all the micromineral or so-called trace minerals, should be applied as groups. The intake of one trace mineral in an animal's diet above the requirement, also increases the amount absorbed and/or excreted in the urine or feces.

This excess amount could be harmful and the unabsorbed trace minerals may bind with other mineral to prevent absorption from occurring at all. In addition, these trace minerals could also cause a deficiency or imbalance of other trace minerals.

Sometimes the intake of the additional minerals causes binding to compensate for elevated levels of microminerals, thus causing even more deficiencies in the animal. Excess intake of some micro/macrominerals may actually promote the deficiency of other minerals.

It is difficult to determine what specific mineral is in imbalance when examining an animal's symptoms.

There are two reasons for this difficulty: First, when a mineral imbalance is present, the clinical signs for one mineral imbalance can be exactly the same as for several other minerals. Secondly, deficiencies of minerals and excess intake of minerals may present the same symptoms. Too much calcium in an animal's diet can yield the same symptoms as not enough.

Furthermore, definitive diagnosis in many cases cannot be determined. One way to correct the problem is to simply discontinue all feed presently being used. Then provide a diet that is known to contain all the proper *balanced* amounts of micro/macrominerals needed for the

species in question. This method is much easier than trying to correct the amount of any one or more suspect minerals.

The only way to be safe without doing serum blood level studies is to know the mineral requirements for your animals and insure you the feed you are providing is adequate for their continued good health.

Macrominerals (trace) assist in an animal's body functions in several ways:

a) they help maintain the acid-base balance. Sometimes called the electrolyte balance, sodium is exchanged or conserved for hydrogen, depending on the acid or base conditions. This helps in the regulation of the pH.

b) Osmotic pressure - this is needed to maintain the animal's body fluid balance. Blood and body fluids contain about .9% salt. Secretions of the digestive HCL of the stomach, pancreatic and intestinal juices all contain the element of salt. The salt mineral in these secretions are reabsorbed and used over again so loss via digestion is negligible.

c) Structural integrity - potassium and magnesium are necessary for muscle contraction and functioning of many enzymes. Minerals join with an inactive enzyme to activate it. This is called coenzyme.

d) Transmembrane potentials - are needed for a variety of cellular functions including nerve conduction and muscular contractions.

Macrominerals are the major minerals in the animal's nutritional requirements. They are minerals for which the dietary requirements are best expressed as a percentage and are usually required in amounts larger than the microminerals.

Calcium is the mineral which is required in the largest amount in an animal's diet. It must be in the proper proportion to phosphorus and is expressed as the calcium to phosphorus' ratio

Mineral Balance -- continued

(Ca:P).

Most calcium deficiencies are primarily associated with phosphorus excesses, an example would be when an animal which is fed large quantities of red or organ meat.

Phosphorus is a very important mineral both in the total amount and in its ratio to calcium. The structural substance of bone and teeth, phosphorus combines with oxygen and hydrogen and is found in 80% of all bones and teeth. The soft tissues contain 20% of this mineral. The ratio is 1:2 with calcium in bones. It has other metabolic functions such as buffers in the blood, energy utilization and components of many enzymes. Too much phosphorus leads to an imbalance of calcium.

Sodium is the main cation of extracellular body fluids. If deficient in the diet it will cause the animal to exhibit deficiency symptoms the fastest. Not many feeds contain enough salt to provide necessary levels. Symptoms include a craving for salt - animals will lick metal, wood and dirt. Anorexia, decline in milk production, shivering, lack of coordination and death result in severe cases.

Chlorine is found inside and outside of the body of cell tissue. It's major role is that of acid/base regulator and maintaining osmotic balance. Symptoms of deficiency are the same as for sodium.

Potassium also helps maintain the acid/base and water balance in the animal's body. All body cells, especially muscle tissue require a high content of potassium. A proper balance of sodium, calcium and potassium in blood plasma is necessary for proper cardiac function. Alfalfa meal is a good source of potassium. Deficiencies include irregular heartbeat, heart lesions, muscle and nerve malfunction and osmotic imbalance.

Magnesium is required for the activities of many vital enzymes. It is needed for bone development and maintenance. Some deficiency symptoms include muscle spasms, skin lesions, anorexia, arteriosclerosis.

All of the above minerals and their lack of or excess of in the diet can cause problems.

They cannot be studied individually. Each mineral is dependent on other minerals and or/vitamins to function correctly in the body. When you study one, you must analyze it's relationship the other minerals, enzymes, vitamins and hormones they may have an effect on or act as a catalyst for the mineral in question.

In another issue we'll discuss metabolic bone disease as an example of the interdependency of minerals and vitamins.

Case Study of Copper Deficiency in a Captive Born Cheetah Population

In the late 1980's, a serious medical problem developed in the cheetah population at a large "state of the art" zoological institution in the Southwestern United States. Over seven cheetah cubs (*Acinonyx jubatus*) were presented with various levels of ataxia which deteriorated from an initial hind limb proprioceptive deficit to complete hind limb paralysis in one cub.

After ruling out infection, inflammatory, traumatic, toxic and parasitic causes, nutritional problems became a consideration. Copper (Cu) deficiency, a nutritional problem not usually considered in carnivores, was known to cause signs compatible with what was seen in these cubs.

Serum blood samples were taken from all the affected and some of the unaffected cubs to determine the copper levels. The results were extremely low levels of copper in all the affected cats. The unaffected cubs had copper levels that were in the low to normal range.

All the affected cubs were treated with both injectable and oral copper supplements. The unaffected cubs were treated with oral copper supplements only. Within four weeks, improvements were seen in all affected animals and after three months on an improved diet, the serum copper levels of all affected cheetah cubs were normal.

It was noted after contacting other zoological institutions around the world, that this

Continued on page 8

Readers Write



Dear Shirley,

We've been members for 10 years and have always enjoyed the pictures and articles in the Newsletter.

Charlie, our cougar, was used as a kitten in the movie, *Benji the Hunted*. We got him at three and a half months old, long past the bottle stage, but he has always been quiet and just loves people - in fact he thinks he is people. We also have three bobcats, one of which slept on our bed every night for two years until we adopted our infant daughter.

We feel that education and responsible ownership are the keys to future exotic ownership. We love our cats like our children and they return that love. But, as you know, it isn't everyone that should own a bobcat or cougar. In fact, one irresponsible owner could make life difficult for the rest of us that

recognize our cats are not the same as a household tabby.

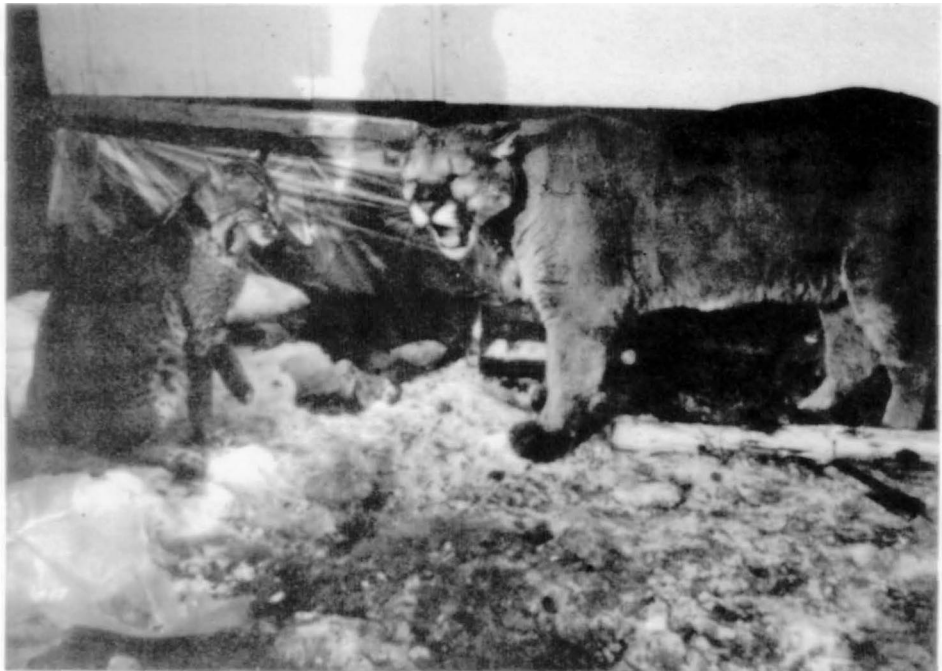
The bobcats in particular seem to be very sensitive to our emotions and feelings. We lost an 8-day old kitten and while my wife sat on the barn floor crying, the father (our largest, 50 lb. male) came over and sat by her side and licked the tears from her face.

Unfortunately, some people don't realize that in the process of bonding with these animals and understanding their personalities and idiosyncracies, teeth will probably puncture skin. This is just part of the process. Our bobcat, Flash, was sound asleep on the couch one afternoon. I reached down to give him a kiss on the forehead, startled him, and ended up with a split lip. After he realized what he had done, he ran circles around me making all kinds of "I'm sorry" noises.

Some time ago, we had a semi-wild bobcat. She bit my thumb. I took my bloody thumb over to Flash and he got angry, jumped off his shelf and spent a little time cuffing this other cat for biting me. How can you help but love them?

Continued next page

Flash (bobcat) &
Charlie (cougar)



Readers Write - continued

We helped the Amadons to get their state permit. We had to go through a very thorough homestudy process in order to adopt our two children (ages 2 & 4). This was to insure that we understood the responsibility that we were taking on and that we were qualified to handle those responsibilities, and so it should be with the cats. I believe LIOC recognizes this fact.

The Amadons are educated people and they put a tremendous amount of preparation into their endeavor. In sharp contrast, another gentleman in our area got a cougar kitten some time ago, it was a macho symbol to him. He recently placed it at a zoo when it jumped his wife. Well, what do cougars like to do more than anything else? You have to have eyes in the back of your head, be vigilant and train them otherwise. To a cougar this isn't being mean or ugly, it's just wanting to have a good romp.

We've learned a lot over the last 10 years and hope to share more in the future.

Bob Erwin.



Bubby, our Maine bobcat - can't get much more relaxed than this!

A Note of Thanks To the LIOC Membership:

I want to thank all the people who have contacted me concerning my handicapped Geoffroy kitten. It reassures me that there are a lot of people who are concerned about the welfare of the cats. The kitten has found a home with a veterinary technologist and is doing well.

Thank you again!
John Perry



Convention Trivia

What cat is featured prominently in LIOC's Convention logo and why?

The jaguar, in honor of Dr. Roger Harmon (our first Vice President, and then President of The SouthWestern Branch) who hosted our 1st national convention in Dallas, Texas in 1972. Prior to that date, there was an annual potluck picnic in our founder, Catherine Cisin's back yard in Amagansett, N.Y. Although Roger's first exotic was an ocelot, true to the Texas theme that bigger can't help but be better, his next, and subsequent cats, were jaguars. His first, Safari, was obtained from Robert Bandy and carried the melanistic gene. Safari was distinctive as she had a bob-tail. This was compliments of a dog that bit her tail as a kitten, necessitating it's removal.



Influence of Seasonality on Reproductive Traits of Male Pallas' Cats (*Felis Manul*) and Implications for Captive Management

INTRODUCTION

The Pallas' cat (*Felis manul*) is a small felid endemic to the rocky steppes of Siberia and Mongolia and adapted to surviving the frequently harsh winter conditions typical of its native range. Wild Pallas' cat populations are threatened due to habitat loss, hunting pressures, and an uncertain political environment in many host countries. Accordingly, this species has been listed in Appendix I of the Convention on the International Trade of Endangered Species of Flora and Fauna (CITES) and designated as a priority small cat species for conservation efforts by the Felid Taxon Advisory Group (TAG) of the American Zoo and Aquarium Association (AZA). The known captive population of Pallas cats is extremely low (20 individuals) and geographically dispersed, with a history of low fecundity and a high degree of suspected inbreeding. Because our knowledge of reproductive processes in this species is extremely limited, improvements in husbandry and captive breeding management have been hindered. Therefore, the objectives of this study were to 1) characterize basic reproductive traits, especially semen quality, sperm production, and hormonal concentrations, in the male Pallas' cat and 2) assess the impact of seasonality on these characteristics.

MATERIAL & METHODS

A male Pallas' cat (estimated age 8-10 years) was maintained for 20 consecutive months (June, 1993 - February, 1995) in an outdoor enclosure at the Conservation and Research

Center, Front Royal, Virginia (39°N). The cat's enclosure consisted of two interconnected corncrib pens (6 m in diameter), each containing a partitioned den box. The cat's diet consisted of Nebraska Canine Diet supplemented with a mouse each day and two chicks per week. The cat had been caught in Mongolia in 1985 and was a proven breeder in captivity, previously siring one kitten in 1991, which was cannibalized by the dam. During the first 6 months of this study, this cat was housed within visual and olfactory range of a female Pallas' cat but was physically paired with the female for a brief period (3 wk) in the winter of 1994. The female died of a respiratory infection shortly after pairing and no offspring were produced.

Reproductive evaluations of the male cat were conducted bimonthly using a standardized protocol consisting of blood sampling, testicular measurements, and semen collection via electroejaculation. Food was withheld for 12-24 hours before each anesthetic episode. Anesthesia was induced with ketamine hydrochloride at 20 mg/kg body mass.

Because this male was wild caught, had no surviving offspring, and represented a potential founder for the captive Pallas cat population, cryopreservation of recovered semen was considered a high priority.

For data analysis, the year was divided into breeding (December-April) and non-breeding (June-October) seasons based on limited parturition information for female Pallas cats. For each season mean values were calculated and differences between seasons

PALLAS CAT.....Continued

were analyzed.

DISCUSSION

These data represent the first objective evidence that the male Pallas cat exhibits pronounced reproductive seasonality, perhaps more distinctive than that reported for males of most other felid species. Because only a single male was available for study from the small global population, reproductive evaluations were conducted for 18 months to confirm repeatability of observed seasonal variations and to permit statistical analysis of data. Anecdotal observations indicate that the Pallas cat births in captivity and the wild are concentrated predominately in the months of April and May but have occurred as late as August in zoos. Based on a gestation length of 74-75 days, this parturition period corresponds to a 2 month female breeding season (January-February). This short breeding period has been confirmed by longitudinal fecal hormone analysis of female Pallas cats, which indicated peak values in fecal estradiol metabolites during these two months, with basal levels observed during the remainder of the year. Based on measured reproductive parameters, the breeding season for the male Pallas cat appears to be more protracted than that of the female, a phenomenon probably related to the lower energy cost of male reproductions.

In both study years, the values for the male reproductive parameters increased in October-December, with an abrupt transition occurring between late November and early December. Reproductive peaks were observed for most traits between December and February, corresponding to the females' reported breeding season, with values returning to baseline between April and June. Similar temporal reproductive patterns were observed during each year, irrespective of the presence or absence of the female Pallas cat. Analysis of serial electroejaculations revealed that spermatogenesis ceased during the nonbreeding season. This reproductive seasonality was more marked than that reported for the domestic cat, tiger, and

clouded leopard, felid species that display slight seasonal variations in testosterone production and/or testicular size but rarely seminal traits. The Pallas cat appears most similar to the snow leopard, a partially sympatric species subjected to comparable climatic extremes within its natural habitat. Male snow leopards and the Pallas cat exhibit nearly identical seasonal patterns for seminal characteristics and reproductive hormones, a finding that suggests evolutionary convergence of seasonality in these two distantly related cat species.

Measures of sperm production and quality in the Pallas cat were highly correlated, but values for body weight and testicular volume generally were not clearly related to other parameters. Despite the constant availability of a palatable diet, the male exhibited temporal changes in body weight, with weight gain and loss typically occurring 1-2 months before the defined breeding and non-breeding seasons, respectively. This seasonal fluctuation in body mass probably represents a physiological adaptation for enhancing reproductive fitness during the breeding season and for withstanding the climatic stress of the winter months. In contrast, testicular volume did not exhibit a consistent seasonal pattern, although maximal volumes usually corresponded to peak values for other reproductive traits. Circulating hormone concentrations also varied considerably throughout the year. Although serum testosterone generally was elevated between October and April, distinct fluctuations occurred between successive sampling periods. Because LH and testosterone secretion probably is pulsatile in felids, a one-time blood sampling protocol may be insufficient to provide accurate baseline values. Fecal steroid concentrations however, are less sensitive to episodic secretory activity, and hormonal metabolite analysis has indicated the occurrence of distinct seasonal changes in fecal testosterone production in male Pallas cats. Serum LH concentrations differed between seasons and were correlated to most other reproductive parameters except serum testosterone. This lack of correlations between LH and testosterone may be the result of

PALLAS CAT.....continued

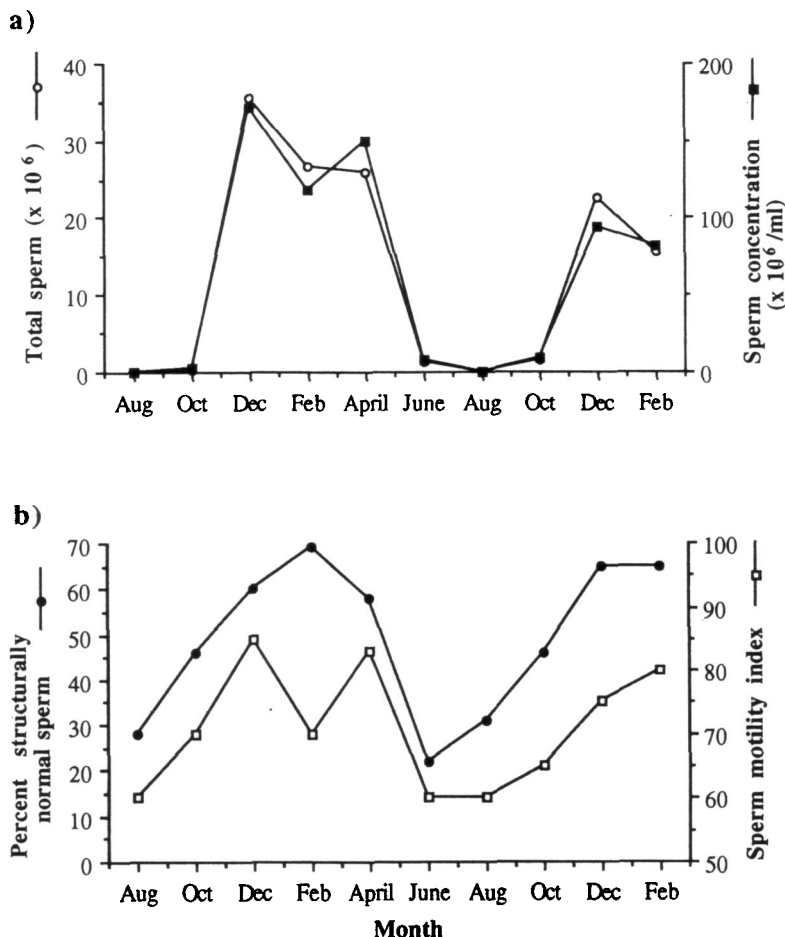


Figure 1. Seasonal variation in semen characteristics in a male Pallas' cat. **a.** Total number of sperm ($\times 10^6$) per ejaculate and sperm concentration ($\times 10^6$) per ml of semen. **b.** Percentage of normal sperm forms and sperm motility index (SMI = [% motility + (20 \times forward progressive movement))/2).

episodic secretory nature of the hormones, the infrequent sampling, and the natural lag time between a LH surge and subsequent increase in circulating testosterone.

One consequence of the pronounced seasonality in sperm production in the Pallas cat was the limited availability of quality spermatozoa for cryopreservation during some months. Because of low sperm concentrations and poor sperm quality, all semen samples collected between June and October were unsuitable for cryopreservation, demonstrating the potential impact of seasonality on planning and implementing genome resource banking strategies. Similarly, reproductive seasonality

may affect the application of natural breeding and assisted reproduction for captive management. Because males produce high quality semen for about 5 months each year, the breeding period in Pallas cats is apparently regulated by the more restricted seasonality of the female. The control mechanisms of seasonality have not been investigated in this species, but photoperiod and ambient temperature should be considered as contributory factors. For small felids species that can be housed in indoor enclosures, these variables might be easily controlled and manipulated. For example, artificial lighting schedules (i.e., 12 hours light: 12 hours dark) are known to

PALLAS CAT.....continued

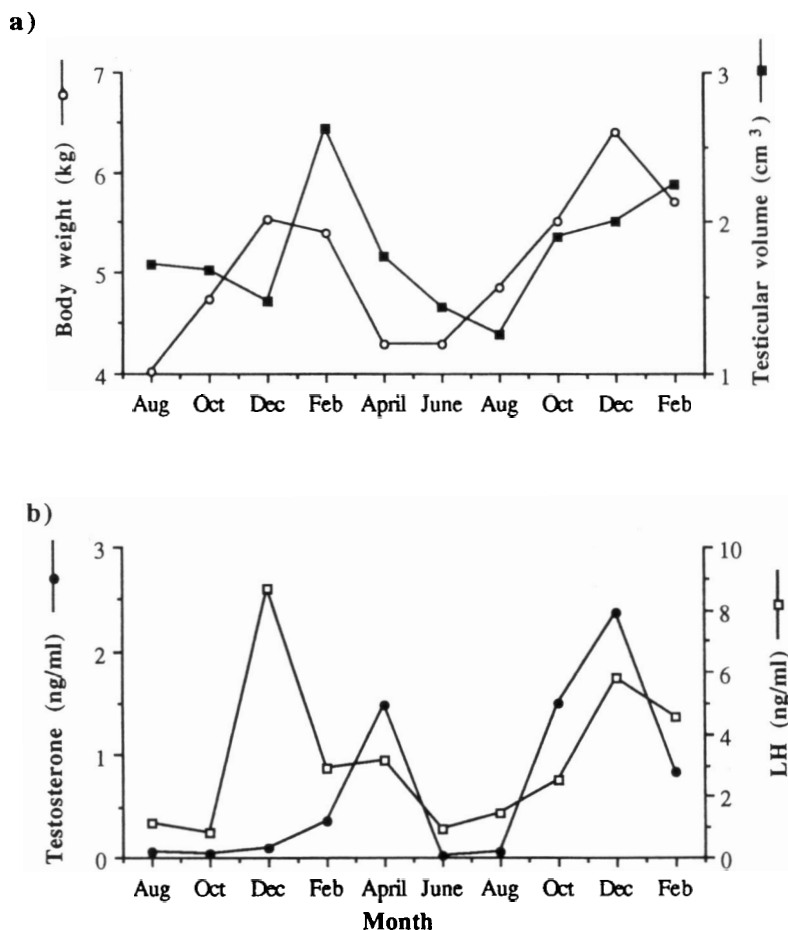


Figure 2. Seasonal variation in morphological and hormonal traits in a male Pallas' cat. **a.** Body weight (kg) and testicular volume (cm³). **b.** Serum testosterone (ng/ml) and luteinizing hormone (LH) (ng/ml) concentration.

Table 1. Mean (\pm SEM) values for semen characteristics, testicular volume, body weight, and reproductive hormones during the breeding and nonbreeding season^a in a male Pallas' cat.

Parameter	Breeding season	Nonbreeding season
Semen volume (μ l)	210 \pm 10	190 \pm 10
Sperm concentration ($\times 10^6$ /ml)	123.0 \pm 16.7 ^c	3.8 \pm 1.8 ^d
Total sperm/ejaculate ($\times 10^6$)	25.2 \pm 3.2 ^c	0.7 \pm 0.3 ^d
Percentage structurally normal sperm forms	63.4 \pm 2.0 ^c	34.6 \pm 4.9 ^d
Sperm motility index ^b	78.5 \pm 2.7 ^c	64.0 \pm 1.9 ^d
Combined testicular volume (cm³)	2.0 \pm 0.2	1.6 \pm 0.1
Body weight (kg)	5.47 \pm 0.34	4.68 \pm 0.25
Serum testosterone (ng/ml)	1.27 \pm 0.41	0.33 \pm 0.29
Serum LH (ng/ml)	5.02 \pm 1.05 ^c	1.37 \pm 0.30 ^d

^a Breeding season = December–April; nonbreeding season = June–October.

^b SMI = [% motility + (20 \times rate of forward progression)]/2.

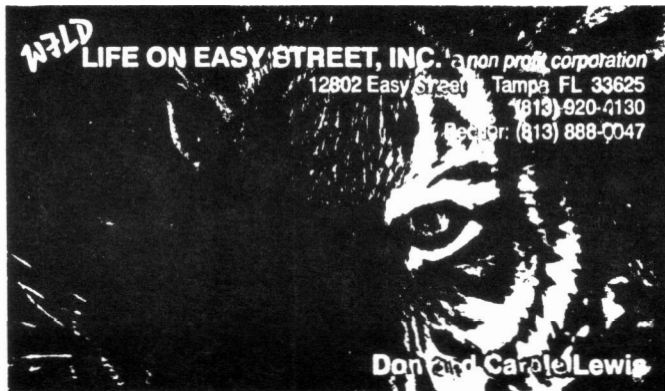
^{c,d} Within traits, values with different superscripts differ ($P < 0.01$).

PALLAS CAT.....continued

stimulate ovarian cyclicity throughout the year in domestic cats. In the Pallas cat, similar lighting regimens might be useful to promote circannual sperm production, ovarian cyclicity, and breeding, thus reducing the dominant influence of seasonality on the captive management of this threatened species.

By William F. Swanson, D.V.M., Ph.D. Janine L. Brown, Ph.D., and David E. Wildt, Ph.D.

Condensed from *Journal of Zoo and Wildlife Medicine* -
contributed by John Perry

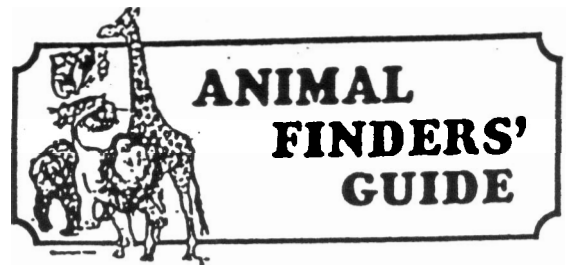


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"With the qualities of cleanliness, affection, patience, dignity and courage that cats have, how many of us, I ask you, would be capable of becoming cats?"

Fernand Mery
French writer

Captive-raised Panthers Released

Two adult male panthers, raised in captivity, were released on January 30th into swampy wilderness of the Big Cypress National Preserve where no males have been found in the last year and a half.

Biologists hoped the two cats, reared in the White Oak Conservation Center in Yulee, Florida, would mate with four female panthers and produce kittens.

Never before have Florida panthers, kept so long behind fences, done successfully in the wild.

Reprinted from The Jacksonville Times-Union
Contributed by BeeJay Lester

USDA Cites Detroit Zoo

The U.S. Department of Agriculture and the City of Detroit, a licensed animal exhibitor doing business as Detroit Zoological Parks, have agreed to a consent decision and order regarding violations of the Animal Welfare Act (AWA).

While City of Detroit officials neither admitted nor denied any violations of the AWA, they agreed to a civil penalty of \$25,000 and a license suspension.

Twenty thousand dollars of the fine is to be used for employee training, facility improvements and/or repairs. The remaining \$5,000 is suspended provided the City of Detroit does not violate the AWA for one year.

The AWA requires that regulated individuals and businesses provide animals with care and treatment according to the standards established by the Animal & Plant Health Inspection Service (APHIS). Animals protected by the law must be provided with adequate housing, handling, sanitation, food, water, transportation, veterinary care and shelter.

The law covers animals that are sold as pets at the wholesale level, transported in commerce, used for biomedical research or used for exhibition purposes.



If you plan to be in Florida (or can change your plans so that you are) either before or after Convention 97, this raffle is for you!

WILD LIFE ON EASY STREET, located in Tampa, Florida has offered two separate nights in their cabin for either August 5th or August 11th. They are only 200 miles from Jacksonville where we're holding our Convention (August 6-10)

Send \$1 for each ticket or for \$5 we'll give you 7 chances to win. The proceeds will go to the Ken Hatfield Scholarship Fund and help a vet student learn more about exotic medicine. First winning ticket gets their choice of dates.

The Drawing will be May 20th - we'll notify the winners and announce the names in the Newsletter.

Make your check payable to LIOC and mail to:

LIOC
P.O.Box 22085
Phoenix, AZ 84028

Your Help is Needed!

Dr. Jennifer Spencer has asked us to help collect samples of blood serum of the various species of exotic felines for her research. "I will be looking at what viruses were in these animals, especially feline leukemia, feline immunodeficiency and feline foamy virus. This would be a help in determining their health status and also if they have been infected with FIV or not, and if so, what effect the FIV has on the different species." she writes.

We are encouraging anyone that has access to drawing blood from a non-domestic feline to participate.

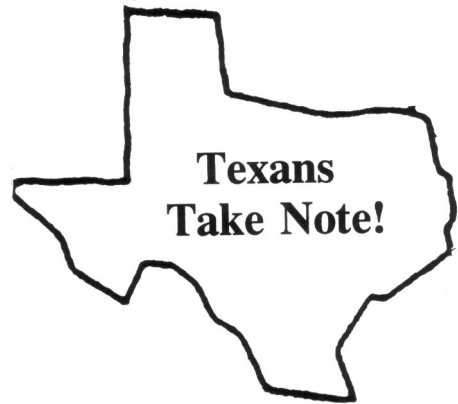
You need to collect enough blood to result in at least 2 cc's of serum (after spinning it in a centrifuge). Freeze it prior to shipping so it will last. It can be shipped in a small box with a watertight icepack. Send it Priority Mail or better yet, Overnight Delivery TO:

Dr. Jenni Spencer
Scott-Ritchey Research Center
College of Veterinary Medicine
Auburn University
Auburn, AL 36849

You may call her at (334) 844-5569 if you have questions. Please include any veterinary records pertaining to vaccinations or previous bloodwork with the sample.

This is a very worthwhile project. If you are going to have your cat at the vet for any reason, please ask him to do this procedure (some vets may be willing to donate the cost if you ask them).

Thanks to Dawn Simas at *Wild About Cats* for bringing this request to our attention.



Anyone interested in forming a LIOC branch in (or around) the Lone Star state should contact:

Amy Rassmussen (210)424-3360

If there is enough interest expressed, a meeting date will be set to explore this exciting possibility.

USDA On the Web

USDA news releases, program announcements and media advisories are available on the Internet. Access the APHIS Home Page by pointing your Web browser to <http://www.aphis.usda.gov> and clicking on "APHIS Press Releases" Also, anyone with an e-mail address can sign up to receive APHIS Press Releases automatically. Send an E-mail to: majordomo@info.aphis.usda.gov and leave the subject blank. in message, type: subscribe press releases.

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Problems of Identification of Camera-trapped Tigers

by S. P. Goyal and A. J. T. Johnsingh

One of the major problems facing tiger conservation today is our inability to accurately estimate the population in a given tract. Population estimation based on pugmarks, the traditional method (Choudhury, 1970; Panwar 1979), has been questioned (Karanth 1995) as most of the parameters used for population estimation have not been statistically validated. Gore *et al.* (1993) concluded that sex can be identified, but the technique for individual identification needs to be refined.

It is believed that individual tigers can be identified based on facial markings and stripe patterns (Champion, 1927, Schaller, 1967, McDougal, 1977). Based on this assumption, Karanth had applied capture-recapture technique for tiger population estimation. He used self-activated cameras to identify individual tigers based on stripe pattern. Data on individuals identified during a time period were used to estimate the population.

Since December, 1994, in Dholkhand, the mini-core area in Rajaji National Park in northwestern India, we have been using self-activated camera units to photograph tigers. Till November 1995, tigers were photographed six times over 85 camera trap nights. Three new facets about the use of camera trap technique arose when we asked our colleagues at the Institute to identify individual tigers based on these photographs. In one case, the face of a tiger was photographed twice with a time difference of nine seconds. In the first picture, one of the face stripes is connected with the eye and in the second, due to a slight change in posture, the stripes looks as if separated from the eye. This had made 100% of our colleagues identify the photograph as belonging to two separate tigers.

Another time, two photographs of the lateral side of a tiger were taken one after the other. All identified them as two different individuals. The track data, however, had shown

that only one tiger had walked in front of the camera. When we examined the face pictures of these two tiger photographs, 10 major stripes were seen in both the pictures. But in the second picture a loop had been formed due to a change in posture, 78% of our colleagues identified these face pictures as belonging to two animals.

When we critically looked at the reason for this confusion, we discovered that 24 stripes above the belly and shoulder were identical in both photographs. There were considerable variations, however, between the two photographs when the stripe pattern on the flank above the elbow joint and hind quarters of the body were compared. We observed similar variations in the stripe pattern of a tiger photographed in Delhi Zoo. The left side of the tiger was photographed three times and the right side four times. When photographs of a particular side were compared to one another, all showed individual variations. These variations are attributed to the loose nature of the skin on the upper parts of the body. As a result, slight changes in body posture bring about variations in the way stripes appear from one photograph to another.

From these preliminary observations we conclude the following:

1. movements are likely to cause least variations in the stripes on the face as the skin is tight. But we have to ascertain, based on photographs of captive animals, whether there are enough variations in face stripes to identify individuals.

2. Shift in posture causes considerable variations in the stripe patterns on hind quarters and flank above the elbow joint and this is attributed to the loose nature of the skin on these parts of the bodies.

3. Stripes above the belly and shoulder show least variation due to movements. This however needs to be ascertained with a large sample from captive tigers.

Vaccination Drive Benefits Lions

Project LifeLion, a vaccination program launched by the World Society for the Protection of Animals (WSPA), aims at saving not only dogs from canine distemper but also lions and other African predators.

The disease has already killed one-third of the lions in Tanzania's Serengeti National Park. "More than 1,000 lions have died," says John Walsh, international Director for WSPA.

Scientists have traced the epizootic to dogs owned by the Masai people living in villages on the western edge of the park. Research indicates that dogs pass the fatal neurological disease to hyenas, which then travel long distances and mix with other animals at kills. Other predators, such as silver-backed jackals, bat-eared foxes, and rare African wild dogs are also affected.

Project LifeLion seeks to stop the disease at its source by vaccinating more than 20,000 dogs. The dogs will also be vaccinated against parvo-virus and rabies. According to Walsh, the vaccination teams will also be equipped to perform general treatment of livestock and companion animals as needed.

WSPA, aided by a \$5,000 contribution from the Massachusetts Society for the Prevention of Cruelty to Animals, will fund the project's first year. Addition funding is expected from the World Bank's International Fund for Agricultural Development and the Welcome Fund in Great Britain. More is needed. To contribute or obtain more information, call (617) 522-7000.

From Animals

Contributed by Jean Hamil



The Flying Tigers To Protect Animals

Friends of Animals (FOA) has announced they have received a grant from the Republic of China on Taiwan for the creation of the "Flying Tigers" project that will enable FOA to create and deploy antipoaching aircraft units over the African bush. After a hiatus of 50 years, the legendary Flying Tigers, will once again take to the skies. Skilled pilots in aircraft we've named the "Bunny Hugger" specially outfitted with sophisticated equipment such as Global Positioning Systems, and night vision goggles will patrol poaching hot spots day and night to catch poachers in the act and then monitor their location until park rangers can arrive to arrest them.

The inaugural flight of the "Bunny Hugger" took place in Israel on October 24th. It will soon begin to patrol Senegal's Niokolo Koba National Park, a sprawling wilderness that's nearly the size of Lebanon, where Africa's most endangered elephants live.

Reprinted from Friends of Animals

Contributed by Jean Hamil

Voters Take Initiative

Election day 1996 saw voters in five states make a choice for wildlife.

Colorado voters outlawed leg-hold traps, snares and other body-gripping traps. In Alaska, voters by a 57.4% majority ended same-day aerial hunting of wolves, foxes, lynx and wolverines. Citizens of Washington and Oregon voted in favor of banning bear-baiting and hound hunting, while Massachusetts voters banned these practices and the use of leghold and other body-gripping traps.

From Friends of Animals

Contributed by Jean Hamil



Swamp Screamer: At Large with the Florida Panther

By Charles Fergus.

209 pages. North Point Press. \$23 hardcover.

On the Endangered Species List since 1967, the Florida panther needs all the friends it can get, and Charles Fergus is one of them.

Fergus spent three years researching and following the approximately 50 panthers still left in southern Florida. In his book he carefully documents the plight of these endangered cats and the individual and collective efforts of biologists, veterinarians, wildlife agencies, and others, all working toward one goal: saving the Florida panther from extinction.

Florida's expanding citrus industry, and increasing number of condominiums and highways, among other things, have all but destroyed the panther's natural habitat. According to Fergus, almost 20 acres of land are cleared in the state every hour, twice the rate of clear-cutting in the Brazilian rainforest. More than 2,400 people arrive daily seeking a new home in the Sunshine State.

For Fergus, the Florida panther represents a last hope. "It lived in a place that was part of my country - yet seemed foreign. If the Panther vanished, it would take a powerful reason for preserving the remaining wild lands of Florida."

The cat's plight has received a lot of attention. But it is the ironies surrounding the

battle for this animal's survival, which are well documented in this book, that set its struggle apart from others.

The Florida panther, a subspecies, lives in a catch 22: it is fatally inbred, and its survival depends in part on crossbreeding with the 30 or so other neighboring subspecies.

Fergus explains that inbreeding has given the remaining Florida panthers much more than a kink at the end of their tails and the distinctive cowlick above their shoulder blades. Most males have heart murmurs, undescended testicles, and deformed sperm. The animals are weak and disease-ridden. More seriously, a virus closely related to the feline immunodeficiency virus has also been detected in the Florida panther.

Crossbreeding would infuse the genetic diversity needed to produce healthier panthers. But it would also dilute the integrity of the subspecies, causing it to lose its listing under the Endangered Species Act and thus the protection it so desperately needs.

Swamp Screamer brings to light a unique group of people dedicated to understanding and preserving the Florida panther. Their combined efforts have helped keep the cat's head above water, but the panther is continually threatened by hunters, speeding cars, mercury poisoning, and chronic ill health, making the future of this native cat bleak.

This book is a wake-up call for anyone who is worried about the vanishing wilderness of Florida and presents a touching portrait of the panthers themselves.

By Carolina De Benedictis

Reprinted from *Animals*



Cheetah Survival Depends On Namibian Ranchers

Sixty percent of Namibian ranchers do not practice any form of livestock management. Consequently, over 10,000 cheetah are believed to have been killed by ranchers between 1980 and 1991. Namibian law allows property owners to trap, relocate, or kill any animal on their land that they feel is a threat to their property.

It is now known that many domestic calf losses formerly attributed to cheetah have been caused by other factors. Cheetah Conservation Fund (CCF) Co-directors Laurie Marker-Kraus and Dan Kraus have been teaching ranchers how to help prevent or lessen their losses. For example, it has been found that raising a heartier breed of cattle, keeping calves in a corral for the first three months of their lives and raising donkeys with the calving herd reduce losses. Livestock guarding dogs have also been helping reduce livestock losses from predators and electric fences have been successful in protecting wildlife on game farms.

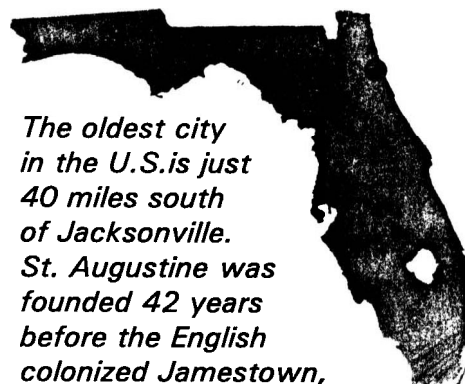
Since 1991, when Laurie and Dan moved to Namibia, they have been encouraging ranchers to call the CCF when a cheetah is trapped. Over 60 out of approximately 160 captured animals have been released back into the wild. Most of these animals would otherwise have been killed.

Johann Coetze is a Namibian rancher who trapped and killed cheetah for years. Living near Etosha National Park, he experienced more problems than most ranchers because of the numerous predatory animals that wander out of the park. Two years ago, he trapped a female cheetah and her three newborn cubs. He killed the mother but took the cubs home. One of the cubs died.

Laurie and Dan performed a necropsy on the dead cub and shared the pathology results with Coetze. Laurie and Dan suggested to Coetze a diet for the other two cubs and discussed with him methods for controlling predator problems on his ranch.

As a former president of the local ranchers' association, Coetze shared his new knowledge of predator control with his neighbors. Today, the two cubs that he kept are part of his family, rolling on the lawn and playing with his young daughter. Coetze now also uses CCF guard dogs to help protect his livestock. When asked on the NBC Dateline interview if he would kill more cheetahs, Coetze replied: "No, I don't think so." The Cheetah Conservation Fund is relying on more local converts like Johan Coetze to help save the wild cheetah from extinction.

Reprinted from Cheetah Conservation Fund Newsletter -
Contributed by Ethel Hauser



*The oldest city
in the U.S. is just
40 miles south
of Jacksonville.
St. Augustine was
founded 42 years
before the English
colonized Jamestown,
and 55 years before
the pilgrims landed
at Plymouth rock.*



"BAD BREATH! You've got BAD BREATH!"

