A LARGE CARNIVORE INITIATIVE FOR EUROPE

Carnivore Damage Prevention News

No 3 / July 2001

Notes from the Editors

Again, the number of subscribers to the CDP News has more than doubled since the last issue, now summing up to over 400 subscribers. We think this demonstrates that many people desire such a forum and understand this as an order to continue in this direction.

The CDP News does not only want to publish results from prevention experiments, but it is above all meant to be a discussion forum for all aspects of damage prevention. Keep this in mind when you respond to articles in the CDP News. Not only the authors want to learn about your own experiences and views on a certain topic. Do not hesitate to send a huge number of e-mails with questions, ideas, suggestions, and protests – but please always send a copy to the editors of the CDP News so we can publish a selection in the next newsletter.

We were pleased about the interest in the CDP News from outside Europe. As you can see in the article by S. P. Goyal on man-eating leopards in India (page 9), there is not only livestock affected by large carnivores. Stories about man-eating predators will not be a main focus of the CDP News; but when they are related to protective measures, we are of course pleased to print them.

We still would like to make the CDP News a more hands-on periodical. This newsletter should at the first place help to make out work more efficient. Starting with the issue in fall 2001, we would therefore like to open a column called “Where to find” with very simple hints on technical or educational material, information, etc. Just all these little nothings which take hours and days to get organised, and yet you know somebody is out there who has done (and solved) all this before. Remember that the CDP News depends on your contributions, suggestions and ideas to become and to remain a lively forum.

The Editors:
Christof Angst, ch.angst@kora.ch
Jean-Marc Landry, landry@vtx.ch
John Linnell, john.linnell@ninatrd.ninaniku.no
Urs Breitenmoser, Breitenmoser@ivv.unibe.ch

Contents

1. Notes from the Editors................................. 1
2. Managing wolf conflict with livestock in the Northwestern United States
Ed Bangs & John Shivik.............................. 2
3. Compensation for livestock kills by tigers and leopards in Russia
Michiel Hötte & Sergei Benuk...................... 6
4. Electric fencing of fallow deers enclosures in Switzerland – a predator proof method
Christof Angst.. 8
5. Man-eating leopards - status and ecology of leopard in Pauri Garhwal, India
S.P. Goyal 9
7. Abstracts of the 19th Vertebrate Pest Conference, San Diego 6-9 March 2000............. 11
8. Meetings of interest..................................... 15
9. Damage prevention on the Web................... 15
10. Subscription for CDP News 16
11. Impressum.. 16

Managing wolf conflict with livestock in the Northwestern United States

by
Ed Bangs; John Shivik
Ed_Bangs@fws.gov; john.shivik@aphis.usda.gov

Wolf Recovery in the Western United States

Wolves (*Canis lupus*) were once common throughout North America but were deliberately exterminated in the lower 48 United States, except in northeastern Minnesota, primarily because of depredations on livestock. Wolves remained abundant in areas with few livestock such as most of Canada and Alaska. Sixty years after being nearly exterminated, the gray wolf was listed under the United States Endangered Species Act (Act) in 1974. The combination of natural recovery in NW Montana, and reintroduction in central Idaho and the Greater Yellowstone area (NW Wyoming, eastern Idaho, and SW Montana) has resulted in an expanding wolf population (Bangs et al. 1998). In this paper we discuss our attempts to minimize conflicts between wolves and livestock and to build human tolerance for restoring wolf populations.

Wolf Predation and Conflicts

Since 1987 total confirmed minimum livestock losses in NW Montana totaled 82 cattle, 68 sheep, 7 dogs, and 2 llamas. Depredations averaged 6 cattle, 5 sheep, and less than 1 dog annually. Agency control killed about 3 wolves a year. On average, less than 6% of the wolf population is annually affected by agency wolf control actions (Bangs et al. 1995). Minimum confirmed livestock losses have annually averaged about 4 cattle, 28 sheep, and 4 dogs in the Yellowstone area and 10 cattle, 30 sheep, and 2 dogs in central Idaho. In addition, 1 newborn horse and probably 3 adult horses were killed in the Yellowstone area. In total there have been 148 cattle, 356 sheep and 37 dogs confirmed killed by wolves from 1987 until January 2001. Since 1987, the Service and USDA Wildlife Services have relocated or killed, respectively, 32 and 41 wolves in NW Montana, 33 and 18 in central Idaho, 34 and 26 in the Yellowstone area, because of conflicts with livestock. Wolves are removed by leg-hold trapping, neck snaring, and darting or shooting from the ground or air.

A detailed analysis of the potential impact of wolf reintroduction [USFWS, Environmental Impact Statement (EIS) 1994] predicted that 100 adult-sized wolves would kill about 10-20 cattle and 50-70 sheep in each recovery area, worth $2,000 to $30,000, annually. The EIS predicted that wolf control to resolve livestock conflicts would kill about 10% of the wolf population annually. Annual livestock losses in each of the Idaho and the Yellowstone areas prior to wolf reintroduction from all causes, a small fraction of which were predator-caused, were reportedly 8,000 to 12,000 cattle and 9,000 to 13,000 sheep annually. Between 300,000 and 400,000 sheep and cattle graze summer pasture on public lands in each recovery area. The rate of confirmed wolf-caused livestock losses and the number of wolves that have been removed in agency control actions is one third to one half of the levels predicted. Despite lower than expected losses and less wolf control than predicted, wolf depredations and control remain inordinately controversial. Even the most routine wolf depredations and control action still result in major local news coverage. To the general public this probably greatly exaggerates both the role of wolves as livestock predators and the level of agency control. Since 1987, livestock producers who experienced confirmed or highly probable wolf-caused losses in Montana, Idaho, and Wyoming have been compensated a total of $150,000 by a private compensation fund administered by the Defenders of Wildlife, who support wolf recovery and management efforts. In the United States, the federal government does not directly compensate for property damage caused by wildlife including wolves, but some states have compensation programs.

A recent study funded and initiated by the Nez Perce Tribe, a host of federal agencies, and local livestock producers found that confirmed livestock losses may be a faction of actual losses under some circumstances (John Oakleaf, Univ. of Idaho, personal communication). That study determined the cause of death and detection rate of 231 radio-tagged livestock calves of about 700 that grazed on large very remote and heavily forested USDA Forest Service public grazing allotments near an active wolf den. After 2 years, natural mortality (pneumonia, etc.) killed the most calves (64%), but wolf predation was the second leading cause of death (29%). Sample sizes were very small (1999 n=9 and 2000 n=5) but 2.3 to 5.7 calves may have died from wolf predation for every one found and confirmed killed by normal livestock herding practices. Calf survival was 95% and 98%. Wolves killed calves that were the lowest weight, less guarded by people, nearest to an active wolf den, and in the heaviest forest cover, suggesting that wolves tested and hunted cattle like wild prey and attacked the most vulnerable animals.

In general, research indicated that wolves often lived near livestock (primarily cattle) and other domestic animals but conflicts were uncommon considering the potential for depredations. Given the common and widespread exposure of domestic animals to wolves, it is somewhat surprising that more are not killed. Dogs, almost exclusively mountain lion (*Felis concolor*) hunting hounds and livestock guard and herding dogs, were apparently killed as "trespassing" competitors rather than as prey, because few were eaten. Wolves commonly fed on carrion of both livestock (carcass dumps) and wild ungulates (road and train kills, lost hunter-killed deer and discarded deer parts) so exposed carrion can attract wolves to areas with livestock and increase the encounter rate between wolves and livestock. In a few instances, abundance of natural prey and relative vulnerability of livestock appeared to affect how often wolves attempted to attack livestock. Sick or wounded livestock or small livestock, such as calves or sheep, appeared particularly vulnerable to wolf predation. But often, wolves appeared to attack livestock without any predisposing factors and nearly all wolf packs with regular exposure to livestock sporadically caused depredations. Wolf depredations on livestock are an insignificant impact to the livestock industry in Montana, Idaho, and Wyoming and the vast majority of ranches never have problems, but a few individual small livestock producers can be greatly impacted.

Minimizing Livestock Conflicts–Developing Techniques

The experimental population rules allow for harassment and killing of problem wolves by the public and government agencies. The Service has permitted livestock producers to shoot wolves actually seen attacking livestock, and in a few chronic cases of depredation on private property, to shoot wolves on-sight, but lethal control techniques used to minimize conflicts of wolves with humans, pets, and livestock directly interfere with western wolf recovery efforts by removing potential breeding individuals from wolf populations. Therefore, extensive investigations into non-lethal predation management techniques are essential and useful for building wolf populations, but also for building a relationship of trust and action (through assistance) with livestock producers and the general public. The Service is evaluating a wide variety of methods to prevent or reduce conflicts with livestock in addition to relocating or killing problem wolves. Wolf relocation, for example, has been used extensively in an attempt to minimize conflicts. However, relocation has generally been unsuccessful at preventing future attacks by depredating wolves or at keeping relocated wolves alive long enough to reproduce (Bangs et al. 1998). Unfortunately, there have been no unqualified successes using any other non-lethal tools of predation management (Clark et al. 1996).

The most important aspect to realize regarding the development of alternative methods of predator control is that there is no one method that will always work in all situations, but some are appropriate and useful in specific situations. Aversive conditioning through conditioned flavor avoidance (CFA) using lithium chloride, for example, is effective for some species in some situations, especially when consumptive behavior, and not predatory behavior is to be altered (Conover and Kessler 1994), and electric fencing can be cost-effective for some species in some situations (Balharry and Macdonald 1999). Because some non-lethal tools are very effective in certain situations, some managers and especially members of the general public are easily mislead into believing that one method, such as CFA, electric fencing, guard animals (Meadows and Knowlton 2999), or scare devices (Koehler et al. 1990). are the solution to all livestock depredation problems, and this is not the case. In the case of guard animals, for instance, wolves have killed a series of guard dogs even when multiple dogs were used to protect sheep and wolves have recently killed llamas which under other circumstances can be successfully employed to protect sheep from coyotes.

Because of the lack of effective non-lethal predation management techniques for most management situations, a concerted effort has been undertaken by the National Wildlife Research Center (NWRC) to hasten the process of non-lethal technique development. Historically, most of the alternative methods and information used to reduce conflicts between humans and wildlife were developed and/or tested by researchers at the National Wildlife Research Center (United States Department of Agriculture 1994). The Service has actively pursued a collaborative relationship with the NWRC and this partnership has become more fruitful due to generous assistance from other agencies and non-governmental organizations

(Turner Endangered Species Fund, Defenders of Wildlife, University of Montana, the Wyoming Animal Damage Management Board, and the Twin Spruce Foundation). The development of future nonlethal techniques is concentrating in two conceptual areas designed to prevent or limit wolf predation on livestock using aversive or disruptive stimuli.

Non Lethal Approach Using Aversive Stimuli

As defined, aversive stimuli are stimuli that cause discomfort, pain, or an otherwise negative experience and are paired with specific behaviors to achieve conditioning against these behaviors (Shivik and Martin 2001). Gustavson (1976) suggested that aversive conditioning using lithium chloride may be an effective management tool, although it is more useful for reducing consumptive behaviors of particular foods rather than for limiting killing behavior by predators (Conover and Kessler 1994). Similarly, the concept and theory of using electric shock as aversive stimuli to alter animal behavior has been thoroughly studied even in field situations (Krane and Wagner 1975, Linhart et al. 1976, Quigley et al. 1997, Tiedeman et al. 1997). Andelt et al. (1999) recently demonstrated the effectiveness of electronic domestic dog training collars for conditioning coyotes, and this work has been expanded to wolves (Shivik and Martin 2001). Currently, the Service is supporting an ongoing research project investigating the use of electronic dog training collars for reducing livestock predation behavior by wolves.

Non Lethal Approach Using Disruptive Stimuli

We continue to investigate the concept of disruptive stimuli for usefulness in solving conflicts between humans, their livestock, and predators. We define disruptive stimuli as undesirable stimuli that prevent or alter particular behaviors of animals (Shivik and Martin 2001). These stimuli include lights and sounds produced by strobes, sirens, or pyrotechnics that may startle or frighten an animal and cause it to retreat or otherwise not elicit a particular behavior. Frightening stimuli have been studied in the past (Bomford and O'Brien 1990, Koehler et al. 1990), with the conclusion that they are very limited in usefulness because of the effects of habituation. Limiting habituation through randomization of timing and stimuli can make electronic repellents effective (Linhart et al. 1984, Linhart et al. 1992), but behavior contingent activation (i.e., stimuli activated only by presence of the animal) appears to be very important for developing long-lasting disruptive stimuli applications (Shivik and Martin 2001).

In cooperation with USDA Wildlife Services and private conservation organizations the Service has incorporated disruptive stimuli approaches into its management program by using: light and siren devices, including models triggered by the signals from individual radio-collared wolves (i.e., behavior contingent activation), guard animals, and flagging. In addition, landowners are now allowed to non-injuriously harass wolves at any time, especially after being trained and issued cracker shells (exploding noise-makers) and less-than-lethal munitions (riot control ammunition such as 12 ga. bean bag shells). We hope that allowing property owners to harass wolves near livestock will help to ensure that wolves are wary of people and areas containing livestock (i.e., we hope to instill aversions in wolves through the use of disruptive and aversive stimuli).

In summary, the Service continues to promote healthy and growing wolf populations in the western United States. We realize that fostering human tolerance and minimizing wolf/human conflicts are the most important factors ultimately affecting wolf distribution and population viability (Fritts and Carbyn 1995). We remain committed to efforts to modify and improve wolf management techniques by supporting development of effective non-lethal techniques. Although lethal control currently remains a necessary management option, we are applying as many applicable alternative techniques as possible, such as fencing, extra surveillance of livestock with herders or agency personnel; harassing and moving and/or providing supplemental food to wolves that established dens/rendezvous sites in livestock grazing pastures, and providing alternative pasture away from active wolf dens to reduce livestock and wolf encounters. These efforts have reduced conflicts in some situations but there are so many variables involved in each situation that at this time none of the many techniques we have tried have been proven widely effective. Cumulatively however, our efforts have prevented or stopped enough livestock depredations, without removing wolves, so that the wolf population has continued to expand. Lastly, by working directly with other agencies, organizations, and livestock producers (e.g. loaning radio telemetry receivers so they can closely monitor wolves near their livestock) we are building the relationships that will facilitate flexible and successful long-term management of wolves in the United States.

Further and updated information about the Service-led interagency wolf recovery program can be obtained at:
http://mountain-prairie.fws.gov/wolf/annualrpt00/

Information on NWRC-led development of non-lethal methods for managing predation can be found at:
http://www.aphis.usda.gov/ws/nwrc/preddep2.htm

Literature Cited

Andelt, W. F., R. L. Phillips, K. S. Gruver, and J. W. Guthrie. 1999. Coyote predation on domestic sheep deterred with electronic dog training collar. Wildlife Society Bulletin 27:12-18.

Balharry, E. A. and D. W. Macdonald. 1999. Cost-effective electric fencing for protecting game birds against Pine Marten *Martes martes* predation. Mammal Review 29:67-72.

Bangs E. E., S. H. Fritts, J. A. Fontaine, D. W. Smith, K. M. Murphy, C. M. Mack, and C. C. Niemeyer. 1998. Status of gray wolf restoration in Montana, Idaho, and Wyoming. Wildl. Soc. Bull. 26:785-798.

Bangs, E. E., S. H. Fritts, D. A. Harms, J. A. Fontaine, M. D. Jimenez, W. G. Brewster, and C. C. Niemeyer. 1995. Control of endangered gray wolves in Montana. Pages 127-134 in L. N. Carbyn, S. H. Fritts, and D. R. Seip, editors. Ecology and conservation of wolves in a changing world. Canadian Circumpolar Institute, Edmonton, Alberta.

Bomford, M. and P. H. O'Brien. 1990. Sonic deterrents in animal damage control: a review of device tests and effectiveness. Wildlife Society Bulletin 12:44-50.

Clark, R. G., K. L. Guyn, R. C. N. Benner, and B. Semel. 1996. Altering predator foraging behavior to reduce predation of ground-nesting birds. Transactions of the 61st North American Wildlife and Natural Resources Conference: 118-126.

Conover, M. R. and K. K. Kessler. 1994. Diminished producer participation in an aversive conditioning program to reduce coyote predation on sheep. Wildlife Society Bulletin 22:229-233.

Fritts, S. H. and L. N. Carbyn. 1995. Population viability, nature reserves, and the outlook for gray wolf conservation in North America. Restoration Ecology 5:7-27.

Gustavson, C. R. 1976. Prey-lithium aversion. Coyotes and wolves. Behavioral Biology 17:61-72.

Koehler, A. E. R. E. Marsh, and T. P. Salmon. 1990. Frightening methods and devices/stimuli to prevent mammal damage–a review. *In* L. R. Davis and R. E. Marsh, editors. Proceedings of the 14th Vertebrate Pest Conference. University of California, Davis.

Krane, R. V., and A. R. Wagner. 1975. Taste aversion learning with a delayed shock US: implications for the "generality of the laws of learning." Journal of Comparative Physiological Psychology 88:882-889.

Linhart, S. B., J. D. Roberts, S. A. Shumake, and R. Johnson. 1976. Avoidance of prey by captive coyotes punished with electric shock. Proceedings of the Vertebrate Pest Conference 7:302-306.

Linhart, S. B., R. T. Sterner, G. J. Dasch, and J. W. Theade. 1984. Efficacy of light and sound stimuli for reducing coyote predation upon pastured sheep. Protection Ecology. 6:75-84.

Linhart, S. B. G. J. Dasch, R. R. Johnson, and J. D. Roberts. 1992. Electronic frightening devices for reducing coyote predation on domestic sheep: efficacy under range conditions and operational use. Proceedings Vertebrate Pest Conference 15:386-392.

Meadows, L. E., and F. F. Knowlton. 2000. Efficacy of guard llamas to reduce canine predation on domestic sheep. Wildlife Society Bulletin 28:614-622.

Quigley, T. M., H. R. Sanderson, A. R. Tiedemann, and M. L. McInnis. 1990. Livestock control with electrical and audio stimulation. Rangelands 12:152-155.

Reynolds, J. C. and S. C. Tapper. 1996. Control of mammalian predators in game management and conservation. Mammal Review. 26:127-156.

Shivik, J. A., and D. J. Martin. 2001. Aversive and disruptive stimulus applications for managing predation. Proceedings of the Ninth Eastern Pest Conference, In press.

Tiedemann, A. R., T. M. Quigley, L. D. White, W. S. Lauritzen, J. W. Thomas, and M. L. McInnis. 1997. Electronic (fenceless) control of livestock. U. S. Department of Agriculture Forest Service Research Paper PHW-XXX. Pacific Northwest Research Station, Portland, Oregon. In Press.

United States Department of Agriculture. 1994. Animal damage control program final environmental impact statement. Washington, D.C.

U.S. Fish and Wildlife Service. 1994. The reintroduction of gray wolves to Yellowstone National Park and Central Idaho. Final Environmental Impact Statement. USFWS, Helena, MT.

Compensation for livestock kills by tigers and leopards in Russia

by
Michiel Hötte; Sergei Bereznuk;
mhotte@inter.nl.net; phoenix@mail.proimorye.ru

In the Summer of 1999 a compensation project was started in Khasanski Rayon in the Russian Far East. The compensation project is part of a comprehensive conservation program for the Amur leopard that includes anti-poaching, education, land use planning, forest fire-fighting and monitoring. Approximately 40 of the remaining wild population of less than 70 leopards live in Khasan. The present distribution of the Amur leopard in the Russian Far East is several times smaller than its distribution 30 years ago. Khasan also holds a small population of approximately 20 Siberian tigers (also named Amur tiger). The Siberian tiger numbers in Russia have increased since the Second World War from an estimated 50 individuals to 400 at present. The population has stabilized in the Russian Far East as a whole, but there are indications that numbers in Khasan have continued to increase.

Some experts believe that the main reason why Amur leopards disappeared elsewhere, but remained in Khasan, is the availability of several thousand deer at the deer farms in Khasan (raised for their antlers which are used in Traditional Asian Medicines). We are convinced that compensation helps to prevent retaliations by the farm staff when tigers or leopards kill livestock. The compensation project also increases the support from the local population for nature conservation in Khasan. Therefore, we have implemented this project mainly to prevent retaliation from farmers when tigers and leopards kill livestock and to secure a sufficient food supply for the critically endangered Amur leopard.

Goals of the project

1. Prevent killing of tigers and leopards by farm staff
2. Secure an important food base for the Amur leopard
3. Increase support for conservation
4. Collect data on ecology of tigers and leopards
5. Create fairness

Carnivore depredation prevention is not an aim of this project! In other words: we do not promote measures at the deer farms to limit the number of livestock kills by leopards and tigers. An exception is the case of deer fawns. We support measures to protect fawns, but not mature deer. The reason for this policy is that the Amur leopards is critically endangered and that the availability of deer is important for its conservation. Therefore, we do not want to deprive the leopards from this important additional food supply, because it would increase the risk of extinction. However, it is possible that in the future selective measures will be taken to limit the number of deer killed by tigers.

All farmers in Khasan can receive compensation when livestock are killed by leopards or tigers. However, the project focuses on a few large deer farms in Khasan where most of the livestock kills occur. The compensation project creates an element of fairness by ensuring that the burden of conservation is not carried entirely by the local people that live in the vicinity of tigers and leopards.

Data collections

The compensation project provides also useful data about leopards and tigers, such as:
1. places where leopards and tigers occur
2. hunting methods used by leopards and tigers on deer farms
3. prey preferences of leopards and tigers at farms (age, sex of deer killed)
4. the importance of livestock as a food supply in comparison to wild prey

The presence of leopards and tigers is established during counts in winter when there is a snow cover. The presence of these leopards was established during a leopard and tiger count that was held in Khasan in February 2000.

Type of compensations

We provide different types of compensations:
1. farms receive financial compensation for livestock kills;
2. deer farms receive additional financial compensation for the presence of tigers and leopards on or near the farm;
3. deer farms receive practical assistance, such as:
   deer fodder in case deer cannot eat grass due to a thick or hard snow cover;
   petrol and repairs for a truck that transports deer fodder;

payment for building a shed to protect deer fawns.

Paying for the presence of tigers and leopards creates a further incentive for local farmers to tolerate these large predators. We also think it is fair to pay for the presence of leopards and tigers, because many deer killed by leopards and tigers are not detected. Deer fawns (including their skeleton) can be eaten without leaving a trace. In winter black vultures, white tailed sea eagles and Steller's sea eagles eat the carcass of a dead deer within an hour, leaving only bones. In many cases this makes it impossible to establish the cause of death.

Organizational aspects

The project operates as follows. Farm staff contact the local Inspection Tiger anti-poaching team when they discover the remains of livestock that have been killed by a leopard or tiger. The team can be reached for this purpose 24 hours a day by telephone. The reported kill is checked by an inspector from the team within 24 hours. In most cases it is possible to establish if livestock have indeed been killed by a tiger or leopard by examining signs such as tracks, hair and wounds on the body of the killed animal. When it is established that the animal was killed by a tiger or leopard, the inspector and farm staff agree on the value of the animal that has been killed. They then draw up and sign a statement that describes details of the livestock kill such as the date, place and circumstances and the compensation that was agreed. Copies of the statement are sent to Inspection Tiger and to Phoenix Fund. Occasionally, Inspection Tiger inspectors who work outside Khasan will travel to Khasan to check the information that is provided in a statement. When Phoenix receives a statement, they pay the compensation with funds that are provided by Tigris Foundation.

Deer farms that want to become eligible for compensation have to sign an agreement with Phoenix. This agreement states, among other things, that the farm staff will not take actions that can harm tigers or leopards, that they will report all available information about activities of tigers, leopards and poachers, that inspectors of the anti-poaching team are allowed free access to the farm grounds, and that the staff will leave livestock kills undisturbed after they have found them.

The compensation project is advertised in Khasan with articles in local newspapers and announcements on boards in public buildings. This is done in order to make farmers aware of the possibility to receive compensations and also to increase the positive effect of the project on the popularity of our conservation activities.

Preliminary results

Surveys

In 1998 and 2000 surveys of the leopard and tiger populations have been conduct during winter in fresh snow. Where tiger tracks were found, leopard tracks were absent. This is an indication that leopards avoid areas where tigers are present. Inter-species competition between Siberian tigers and Amur leopards is poorly understood, but we assume that a further increase in tiger numbers would have a negative effect on the leopard population.

Actual kills and compensations

Investigations of the kills at deer farms indicate that tigers kill more deer than leopards. We hope that further investigations of the kills will give more insight in the differences in hunting techniques of tigers and leopards. This may make it possible to take measures that prevent kills by tigers, but not kills made by leopards. Based on the investigations of kills so far, we are under the impression that tigers often chase a deer along the fence and kill it in a corner. Therefore it may be possible to limit the number of kills by tigers by removing corners and replace them with more curved fences.

Between September 1999 and November 2000 a total of 24 deer, 1 horse and 1 cow calf were reported killed by leopards and tigers in Khasan. All kills, except the horse, occurred on deer farms. Compensation payments of US$ 1360,- were made for the livestock kills. A total of US$ 1120,- was paid between May and November 2000 for the presence of 2 leopards near a deer farm (US$ 80,- per month per leopard). The number of deer killed at the deer farms during the first 18 months of the compensation project suggest that domestic deer are indeed an important food supply for both Siberian tigers and Amur leopards.

Please contact Tigris Foundation if you have comments and suggestions concerning our project

More information on the web:
www.inter.nl.net/users/tiger

Electric fencing of fallow deer enclosures in Switzerland – a predator proof method

by
Christof Angst; ch.angst@kora.ch

Almost a century after extinction, lynx was reintroduced in Switzerland 30 years ago. Today some 100 adult lynx are living in two separated regions in Switzerland – in the Jura mountains and in the western Swiss Alps. The lynx face an increasing stock of 450,000 sheep, mainly aestivated unguarded on mountain pastures. Raids on livestock occur in periodically: Years with few lynx kills are followed by periods of increased numbers of kills, depending on lynx and roe deer abundance. When many predators face few wild prey, lynx tend to kill sheep. In winter, there are hardly any lynx kills. The sheep are then in the plain, away from the lynx habitat. Since 1971 a total of 1433 domestic animals have been found to be killed by lynx: 1261 sheep, 132 goats and 40 fallow deer. However, even in peak years, the losses of sheep due to lynx predation never exceeded 0.2-0.4% of the local stock (Angst et al. 2000).

By the end of the seventies, a national project was launched to assess whether breeding fallow deer could be profitable on otherwise unprofitable areas. In 1978, the first test breeds were started, increasing to 479 deer farms with a total of 7,500 deer in 1998. The fallow deer is not an indigenous species in Switzerland. There has to be at least a 2 m high enclosure, to prevent the deer from escaping. The first lynx attacks on deer in farms occurred already in 1981 in the canton of Lucern. Since then, a total of 40 fallow deer have been killed by lynx in Switzerland. Killed deer in farms are compensated by the cantons and the government with US$ 300.- to 600.- per animal. Nevertheless, killing of fallow deer has ever been a marginal problem.

In 1997, in a period of high lynx abundance and a high number of killed livestock in the Northwestern part of the Alps, the first fallow deer have been killed in this region, although the lynx has been present for about 20 years here. A total of 18 deer have fallen prey to lynx in six different enclosures; 15 alone in three enclosures during 10 attacks. As the attacks occurred always in the same farms, protective measures had to be taken to protect the deer farms because incidents as in 1998, where 7 deer have been killed within two nights in the same enclosure, led to an enormous disgruntlement in the local people.

In zoos, lynx are kept in escape-proof electrified enclosures. This inspired us to reverse these enclosures for the deer farms. On the already existing stakes we installed a steel girder of about 50 cm length in an angle of 45° on the **outside**. This steel girder bears two electrified wires (Fig. 1). The voltage in the wires should be at least 5000 V, so it is important to get a unit (aggregate) that has a strong enough capacity (today most device on the market bring this without problems). A good unit is able to provide enough energy for a fence of 10-20 km that covers an area of about 500-2000 ha. The unit should preferably be mains-operated, this is both economically and practically beneficial. If the fences are mounted far from electricity, batteries or solar cells can be used.

Fig. 1. Fallow deer enclosure after electrification on the **outside**

So far, five enclosures have been electrified in the north-western Alps. On average, the adaptation costs about US$ 1600.-. An estimated cost covering both wires, stakes, aggregate, etc. is US$ 2.80 to 4.60 per meter. The costs for the material were payed by the cantons. The labour had to be done by the owners themselves. One owner spent about 75 hours to electrify an enclosure of 0.5 ha with a fence of 330 meters.

Before the five enclosures have been electrified in 1998, there had been lynx kills in three out of them: three, five and seven fallow deer, respectively, had been killed. Since the enclosures have been modified, there have been no more lynx kills so far.

A preventive electrification of all existing deer enclosures in Switzerland does not pay because raids on deer farms are rare. This measure is therefore only applied after repeated attacks on the same enclosure. This system could also be applied to protect enclosures against other big cats.

For more information about the project KORA please contact www.kora.ch.

References:

Angst, Ch., P. Olsson & U. Breitenmoser, 2000: Übergriffe von Luchsen auf Kleinvieh und Gehegetiere in der Schweiz. Teil I: Entwicklung und Verteilung der Schäden. Kora Bericht No 5, Muri, Switzerland: 58 p.

You can find this report on the net on:

www.kora.unibe.ch/main.htm?ge/publics/reports.htm (pdf-file German, executive summary in English and French)

Man-eating leopards - status and ecology of leopard in Pauri Garhwal, India

by

P.S. Goyal; goyalsp@wii.gov.in

The leopard is widely distributed in the world but the least know of all the big cats. Leopards, being solitary, elusive and shy, are difficult to study in the wild. The leopard’s ability to feed on a broad spectrum of prey makes it the most successful predator among all big cats in regard to survival. In Asia, the leopard has also an advantaged over the tiger through its ability live in the vicinity of humans. Due to international demand for skins and bones, and due to conflicts with humans, the leopard is subjected to culling for economic and social reasons. Unexpectedly, the leopard-man conflict has recently increased in the Garhwal hills and resulted in a large number of leopards killed either officially as man-eaters or by irate villagers. However, a study would be needed to understand the ecology and biology of all species concerned in Pauri Garhwal Himalayas in order to minimize the leopard-man conflict and preserve the cat from local extinction. The findings could also be useful in other parts of Himalayas.

Any discussion on the relationship between man and leopard would not be complete without understanding the ecological reasons for the increasing leopard-man conflicts. It must be stressed that man-eaters are abnormal, or attacks are provoked under special circumstances. Man-eaters have given the species a bad name as a whole, although exceptional conditions may be responsible for instances of man-eating in some regions. It is important to know why leopards changed their behaviour, why contacts with humans have increased, and why there are conflicts between them.

A leopard study was planned in two phases. Phase I started in December 1999 to study distribution, status and level of leopard-man conflicts in Pauri Garhwal. Maps of regions of conflicts have been generated in order to find the best suited sites to intensively study the ecological reasons for such conflicts. The entire area was classified into low, medium and high conflict zones and incidents of leopard predation on livestock and attacks on humans have been analysed.

Although leopard attacks on human are not new in Garhwal, the frequency has increased surprisingly during the last decade (Negi 1996). Garhwal and Kumaun in Indian Himalaya are prone to attacks by man-eater leopards. Based on the Forest Department records, leopards have killed 158 humans from 1987 to 2000 just in Pauri district. On the other hand, 93 leopards were killed by irate villagers between 1998 and 2000 as supposed man-eaters. It is important to look at the causes behind these incidents. Leopards were not uncommon in the forest of Garhwal. Their food consist of wild prey species such as goral, barking deer, sambar, musk deer, wild boar, jungle fowl and monkeys (Rhesus macaque and common langur). Due to severe human pressure mainly through hunting, cattle grazing, fire wood cathering, forest fire, deforestation, and habitat alteration, most of these prey species became either locally extinct, or their numbers are too low to sustain the existing number of leopards. All these factors have put leopard under pressure to survive. A change in leopard behaviour has been noticed. They became extremely bold and are reported entering big towns even during daytime. An increasing frequency of leopard-man conflicts during the last decade in the hills of Uttarranchal Pradesh may probably be related to accelerated habitat fragmentation, and, as a result of the scarcity of wild prey, the predominant feeding on domestic animals. Consequently, leopards get into closer contact with human settlements and humans themselves.

Phase II of the project is proposed to provide the necessary information on ecological and biological reasons to design a strategy to solve such conflicts in Garhwal Himalayas. It is important to understand the availability of prey species, land use patterns and human dimension aspects. This would allow explaining the changed behaviour of the leopards in hills. In the present study, we envisage examining these aspects for female leopards. During gestation and lactation periods, females need more energy and are more restricted in their movements than males. Female leopards might explore more often settled areas in the absence of wild prey species in their traditional habitat to assure the raising of their cubs. We presume that females come closer to human settlements, predate more on livestock and even sometimes on humans. The sex ratio of leopards killed as man-eaters was not systematically recorded by the Forest Department. Anecdotal data of seven leopards killed as man-eaters during our survey showed that four of them were females. Phase II of the study aims understanding the ranging patterns and reproductive biology of females. If possible, male leopards will be studied in phase III. The objectives in study-phase II on leopard in Garwhal Himalayas are:
To determine land tenure patterns of female leopards in relation to topography, vegetation, prey (wild & domestic) abundance, land uses patterns, human activities and reproductive status;

1. To study the reproductive biology with reference to frequency of pregnancy/extent of lactation;
2. To suggest mitigation measures to minimize leopard-man conflict.

Reference: Negi, A.S. 1996. Man-eating leopard of Garhwal. Cheetal 35(1-2): 22-24.

Editor’s remark. Although this article does not propose any preventive measures, it emphasise an important aspect: The underlying reasons for conflicts between predators and people are often ecological changes in the carnivore’s environment. If, for instance, a predator is forced to switch to livestock prey because the natural prey became rare, effective damage prevention might cut off the carnivore from a crucial food source and hence contribute to the decline of the population (see article by Michiel Hötte & Sergei Benuk on page 6). If carnivore damage prevention should be a integral part of carnivore conservation and lead to co-existence between man and predator, it is indeed fundamental to understand the whole ecological, ethological, and human dimension aspects of the attacks on livestock. Otherwise, prevention is not more than fighting the symptoms.

If somebody has experience in protecting villages against leopards, please let us know.

Abstracts of the 19th Vertebrate Pest Conference
March 6-9 2000, San Diego

Fleming, P. J.S. 2000. Wild dogs and their manipulation to prevent livestock predation in Australia. Pages 277-283 *in* T.P Salmon & A.C. Crabb editors. 19th Proceedings of the Vertebrate Pest Conference. University of California, Davis, USA .

ABSTRACT: Dingoes and other wild dogs cause substantial damage and control expense in many Australian environments. The main methods of control are exclusion fencing, poisoning with compound 1080 (fluoroacetate), and trapping. Strategies to mitigate livestock predation by wild dogs include; enterprise substitution, the reduction of wild dogs populations, and baited buffer zones between wild dog country and sheep country. Damage functions show significant positive relationship between density indices and the losses causes by predation for both sheep and cattle enterprises. However, descriptive and explanatory models fitted data poorly. A strategic approach to the management of wild dogs that aims to reduce predation on livestock while allowing the conservation of wild living dingoes is also outlined.

Allen, L. 2000. Measuring predator control effectiveness: reducing numbers may not reduce predator impact. Pages 284-289 *in* T.P Salmon & A.C. Crabb editors. 19th Proceedings of the Vertebrate Pest Conference. University of California, Davis, USA

ABSTRACT: The fundamental assumption in the management of predators is that reducing predator numbers will reduce their predation on livestock. Research on dingoes (*Canis lupus dingo*) has shown this assumption to be incorrect in beef production areas in northern and western Queensland. Aerial and ground baiting with compound 1080 (fluoroacetate) is the principal dingo-control method used in extensive pastoral areas of Australia. This paper compares four approaches to measure the effectiveness of these control program. Dingo abundance was reduced in 11 of 13 baiting campaigns monitored with almost two-third of these producing > 50% reduction. The time taken for dingoes to recolonize baited areas is also an important measure of effectiveness. In two-third of the control programs, conducted in the first nine month of the year, dingoes recolonized prior to the period of peak calving (November/December) when the biggest threat to calves existed. The timing and the scale of control programs affect the rate of re-colonization. Calf loss was subsequently higher and occurred more frequently in baited areas compared to non-baited areas. Seasonal conditions, the status of prey population and the impact of control programs on social organization and prey selection, are key factors affecting calf predation. Control programs should be assessed by measuring impact rather than changes in predator numbers. The assumption that a direct relationship exists between predator numbers and impact is not valid for dingoes in beef production areas in northern Australia.

Ernest, H.B. and Boyce, W.M. 2000. DNA identification of mountain lions involved in livestock predation and public safety incident and investigation. Pages 290-294 *in* T.P Salmon & A.C. Crabb editors. 19th Proceedings of the Vertebrate Pest Conference. University of California, Davis, USA

ABSTRACT: Using three case studies, we demonstrated the utility to analyse DNA from trace samples collected at sites of livestock predation and public safety incidents. Genetic analysis was used to determine species, individual identity, and relatedness between individual. We documented the presence and individual identities of a mountain lion (*Puma concolor)* and a bobcat (*Lynx rufus)* from swab samples collected from bite wounds in domestic sheep that had been killed at the University of California Hopland Research and extension Center, Mendocino County, California. Four lions and two bobcats in Redwood National Park were individually identified and tested for relatedness using DNA from scats and captured animals. Another lion was genetically typed and matched at a public safety incident through blood spots left near barn in one location in the San Joaquin Valley, and muscle sample collected from a lion captured ten miles distant one week later. We applied statistical techniques developed for human forensic DNA analysis and a DNA database that was compiled for California mountain lion.

Greentree, C. and Saunders, G. 2000. An experimental evaluation of lamb predation in response to fox (*Vulpes vulpes)* control in south-eastern Australia. Pages 299-303 *in* T.P Salmon & A.C. Crabb editors. 19th Proceedings of the Vertebrate Pest Conference. University of California, Davis, USA.

ABSTRACT: Fox predation has long been suspected as a major cause of lamb death in southern Australia. The response of farmers has been to poison foxes using compound 1080 (fluoroacetate). This has become more widespread in recent years due to number of factors including the reduced returns form sale of skins which has made shooting foxes unprofitable. In a replicated experiment we investigated the effect of fox control on lamb survival. Fox baiting was implemented three times a year. This was carried out on sheep properties with ultra sounded flocks over three years. The experiment was conducted in central New South Wales, Australia, in an area where wild dogs and native dingoes has been eradicated. Foxes, an introduced species, were the major mammalian predators of lambs in the district, as estimated from previous post-mortems lamb carcases. No significant difference was detected in lambing, as measured by the number of lambs per ewe at lamb marking 8 to 10 weeks after birth, however, there was a significant effect of fox control on the number of healthy lamb killed by foxes assessed by lamb post-mortems. The possible reason for this result are discussed including features of the experimental design and the level of replication.

Kimball, B.A., Johnston, J.J., Mason, J.R., Zemlicka, D.E. and Blom, F.S. 2000. Development of chemical coyote attractants for wildlife management applications. Pages 304-309 *in* T.P Salmon & A.C. Crabb editors. 19th Proceedings of the Vertebrate Pest Conference. University of California, Davis, USA.

ABSTRACT: Coyote attractants are inherently variable because they are usually derived by mixing and fermenting complex biologically derived substances. We designed the present study to address this problem. We collected volatiles by purge and trap headspace analyses from 33 commercially available attractants, and analysed the trapped odours by gas chromatography with mass selective detection. We then statistically evaluated chromatographic peak area data to produce recipes for seven new chemical attractants. We presented these attractants to coyote in one-choice tests at the Predation Ecology and Behavioural Applications Field Station of the USDA-APHIS-WS National Wildlife Research Center near Logan, Utah. Our results indicated that there were both seasonal and sexual differences in stimulus attractiveness. We also found that several attractants were more effective than Fatty Acid Scent (FAS), a commonly employed coyote attractant. A field trial to evaluate the effectiveness of new candidate attractants is planned.

Martin, J. and O'Brien, A. 2000. The use of bone oil (Renardine) as coyote repellent on sheep farms in Ontario. Pages 310-314 *in* T.P Salmon & A.C. Crabb editors. 19th Proceedings of the Vertebrate Pest Conference. University of California, Davis, USA.

ABSTRACT: As no control methods apart from shooting and leg hold traps, are legal in Southern Ontario, field trials of lithium chloride and bone oil ("Renardine") were carried out between 1991 and 1998. No effect could be demonstrated with lithium chloride. Between 1994 and 1998 bone oil was used as a repellent on seven different flocks, either directly onto sheep or as a perimeter barrier round pastures. As long as the treatment was maintained, the coyotes would return to kill in the trial flocks. A slow release method for perimeter treatment was tried.

Pitt, W.C., Knowlton, F.F., Ogawa, A. and Box, P. W. 2000. Evaluation of depredation management techniques for territorial animals using a computer model: coyotes as a case study. Pages 315-318 *in* T.P Salmon & A.C. Crabb editors. 19th Proceedings of the Vertebrate Pest Conference. University of California, Davis, USA.

ABSTRACT: For centuries coyotes have been controlled to protect livestock and/or enhance game populations. The intensity of control has varied widely and many types of control techniques have been used. The effect of these control techniques need to be evaluated to effectively resolve conflicts, to fulfil legal requirement, and to aid the development of new strategies. However, the influence of these techniques on coyote population size and structure is largely unknown. Furthermore, management decision are often required before experimental tests can be developed, and conducting requisite experimental program on meaningful scale are logistically prohibitive. Therefore, we developed an individual-

based computer model to evaluate the effects of various control techniques on age structure including selective removal, random removal, and denning. This model is part of a larger effort to fully evaluate the effect of current management strategies on coyote populations and to eventually link this population model to a depredation model. Selective and random removal resulted in younger age structures, whereas denning produced population age structures similar to an unexploited population.

Seglund, A.E., Deliberto, T. and Kimball, B. 2000. Evaluation of cabergoline as reproductive inhibitor for coyotes (*Canis latrans*). Pages 319-324 *in* T.P Salmon & A.C. Crabb editors. 19th Proceedings of the Vertebrate Pest Conference. University of California, Davis, USA.

ABSTRACT: Cabergoline, a prolactin inhibitor, was evaluated on its potential use as a reproductive inhibitor for coyotes (*Canis latrans*). Groups consisting of six female coyotes were randomly assigned to three treatments and a control group. At 25 to 35 days after fertilization, coyotes were palpated to verify pregnancy status. If an animal was confirmed pregnant, it was dosed with 50 µg and 100 µg, or 250 µg of cabergoline, or a placebo for seven consecutive days on approximately **day 40 days of gestation**. Five animals dosed with 50 µg of cabergoline, three dosed with 100 µg, and three animals receiving placebo whelped; no animal treated with 250 µg whelped. No drop in serum progesterone or prolactine level were observed for the 50 µg and 100 µg treated groups. However, progesterone levels declined below 2 ng/ml in animals treated with 250 µg. Prolactine and progesterone levels in the control group followed typical patterns observed in pregnant canines. This study suggests that cabergoline in terminating pregnancy in coyotes could be improved with higher doses and at earlier stages of gestation.

Sterner, R.T. and Crane K.A. 2000. Sheep-predation behaviour of wild-caught, confined coyotes: some historical data. Pages 325-330 *in* T. P Salmon & A.C. Crabb editors. 19th Proceedings of the Vertebrate Pest Conference. University of California, Davis, USA.

ABSTRACT: As part of effort to develop The Livestock Protection Collar (U.S. EPA Reg. No 56228-22), we videotape sheep-predation events by 23 (15 X and 8 C) wild-caught, confined coyotes (*Canis latrans*) in a 31 x 41 m enclosure. Coyotes were paired individually with a sheep (*Ovis aries*) during 1 h daily trials. Nineteen (13 X and 6 C) of the coyotes made 75 fatal attacks of 1 to 7 sheep each; 4 coyotes (2 X and 2 C) made no fatal attacks despite 19 to 39 daily pairings. Of coyotes that made fatal attacks, 13 (9 X and 4 C) always attacked at the neck of sheep; 5 (4 X and 1 C) always attacked by nipping at the legs/head/back of sheep; and 1 attacked at the leg/head/back of sheep during two initial events, but subsequently attacked at the neck of the sheep. Greater time in captivity was not correlated with trials preceding a fatal attack (rho = + 0.23). Among coyotes making > fatal attacks, subsequent predation events occurred after fewer intervening pairing with sheep. Initial feeding sites occurred most frequently at the flanks/ribs of sheep. Although collected between 1976 to 1980, these observations represent a never-to-be-acquired-again data set that remains learning. Data showed that not all coyotes display sheep-predation behaviours or kill sheep efficiently. Instrumental learning and stimulus-habituation models of coyote predation behaviour are discussed.

Wenning, K.M. and Deliberto, T.J. 2000. Mechanisms of diet selection in coyotes (*Canis latrans*). Pages 331-335 *in* T.P Salmon & A.C. Crabb editors. 19th Proceedings of the Vertebrate Pest Conference. University of California, Davis, USA.

ABSTARCT: Coyote depredation is estimated to cause in excess of $ 11 million in damage annually to the national livestock industry. Numerous studies suggest coyotes forage optimally. Yet, not all coyotes kill prey with high nutritional benefit to cost ratio (e.g., livestock) when given the opportunity. This suggests that there are other means by which coyotes select prey items. Little research has been conducted to determine the mechanisms driving the selection of particular food items. Previous experience with certain tastes or flavours may play a part in the subsequent selection of prey items. Dietary preferences can be formed in young animals through exposure to chemical cues in utero, in milk, and at weaning. Studies on captive animals are useful in evaluating the importance of exposure to chemical cues on the formation of dietary preferences in adult coyotes. A review of relevant literature is given and management implication are discussed.

Zemlicka, D.E. and Masson, J.R. 2000. Response of captive coyotes to Renardine coyote repellent. Pages 336-338 *in* T.P Salmon & A.C. Crabb editors. 19th Proceedings of the Vertebrate Pest Conference. University of California, Davis, USA.

ABSTRACT: Renardine is a bone tar product available for use as a coyote (*Canis latrans*) repellent in Canada. The substance is applied to pasture borders to prevent coyotes from entering and attacking sheep. Because data regarding the effectiveness of Renardine are lacking, we designed two experiments. In the first, six pairs of coyotes were first presented with 400 g of ground meat in two pans (200 g/pan) with false screen bottoms. Beneath the screens were absorbent tubes wetted with 10 ml of distilled water. Subsequently, during treatment period, the absorbent tube was wetted with 10 ml of Renardine. Pans were presented for 60 minutes, and the amount of time consume the meat was recorded. In the second experiment, six additional pairs of coyotes were first presented with 200 g of ground meat inside a barrier created with baling twine and wooden dowels. The area inside the barrier was 1 m^2, and the twine was tied onto a dowels 0.25 m above the ground. During the treatment period, the twine and dowels were painted with Renardine. In both experiments, all coyote pairs consumed all the ground meat shortly after presentation. We concluded that Renardine probably is not an effective coyote repellent. However, because the active ingredient in Renardine is bone tar oil and bone oil is deer repellent, we speculate that Renardine may have utility as an herbivore repellent.

Copies of the *Proceedings* for the 19th Vertebrate Pest Conference are available for $25.00 plus $5.00 postage and handling. See order form for details on: www.davis.com/~vpc/welcome.html

---

Allen, L.R. and Sparkes, E.C. 2001. The effect of dingo control on sheep and beef cattle in Queensland. Journal of Applied Ecology 38: 76-87.

Predation by dingoes *Canis lupus dingo* is regarded as a widespread problem by Australian livestock producers. This study examined five decades of historical data to evaluate the use and effect of dingo control on distribution of sheep and beef cattle in Queensland.

In Queensland, dingo bounties were significantly more numerous in years with high sheep numbers but significantly less numerous in years with high beef cattle numbers. These relationships probably reflected the social and economic attitudes of the two producer groups to dingoes.

The relatively high impact that dingoes are perceived to have on sheep compared with beef cattle, the control techniques used by the two producer groups, and the intensity at which these techniques are applied, were the underlying causes.

Subsequent to the introduction of baiting using 1080 (sodium fluoroacetate), there was an immediate decline in the use of strychnine, the number of dingo bounties presented for payment, and the number of dingo trappers employed by local governments in Queensland. However, these changes were confounded by a simultaneous decline in sheep numbers and dingo control effort.

Barrier fences and poisoned “buffers” were compared for their ability to protect sheep from dingo predation. With few exceptions, sheep numbers declined or increased marginally within 50 km inside a dingo barrier fence or within a boundary between sheep and beef cattle production outside the dingo barrier fence. This contrasted to areas > 50 km from the dingo barrier fence or sheep/cattle boundary.

Both poisoned buffers and barrier fences could be equally effective at preventing sheep looses. However, buffers are best suited to open arid areas where large-scale coordinated baiting programmes are more feasible and where prey scarcity leads to increased bait consumption. We predict that sheep production outside the dingo barrier fence in Queensland will contract from the north and east. There is a case for re-establishing a barrier fence in this area to prevent such contraction.

Coordinated predator management, such as barrier fencing or aerial baiting, can protect sheep at a regional level. However, unless the financial burden of pest control is shared through a centralized scheme, sheep producers living along the boundary are likely to leave the industry or substitute cattle for sheep and the sheep-production area will contract.

This paper cautions the use of bounties as a measure of relative abundance and illustrates how people’s perception of a pest and the type of livestock they produce can affect their level of control effort and the control methods they use.

Meetings of interest

12-17 August 2001
International Theriological Congress (ITC8), Sun City, South Africa
Symposium: "People and Predators—Conserving Problem Mammals"
For details see:
www.eventdynamics.co.za/itc
or contact:
Dr. Rosie Woodroff, Department of Biological Sciences, University of Warwick. Coventry CV4 7AL, U.K.
Phone: ++24 76 524618
Fax: ++24 76 524619
Email: r.b.woodroffe@warwick.ac.uk
The Congress organisers:
e-mail: sandra@eventdynamics.co.za

9-14 September 2001
3rd European Vertebrate Pest Management Conference,
Kibbutz Ma'ale Hachamisha Guest House, Israel
For details see:
www.ortra.com/vertebrate
or contact:
Conference Secretariat, Ortra Ltd.
P.O. Box 9352, Tel Aviv 61092
Phone: 972-3-6384444
Fax: 972-3-6384445
e-mail: vert@ortra.co.il

17-21 Septembre 2001
Canid Biology and Conservation
University of Oxford
For details see:
http://www.canids.org/conference/index.htm
Contact:
Canid Biology & Conservation Conference
Wildlife Conservation Research Unit
Zoology Department, South Parks Rd, Oxford OX1 3PS, UK
Phone: +44 1865 281264
Fax: +44 1865 271211
E-mail: canid.conference@zoo.ox.ac.uk

4-7 March 2002
20th Vertebrate Pest Conference,
Silver Legacy Hotel, Reno, Nevada USA
For details see:
www.davis.com/~vpc/welcome.html

Damage prevention on the Web

Predator FAQ:
www.members.home.com/18james/rural/predator.html
Reports on several different prevention measurements

Damage Prevention and Control
www.conservation.state.mo.us/manag/coyotes/control.html

Wildlife Solutions Online
www.wildlifesolutionsonline.com/carnivores.htm
A lot of pdf-files about all sorts of wildlife damage

The internet Center for Wildlife Damage Management
www.ianr.unl.edu/wildlife/solutions/handbook/index.htm
A lot of pdf-files available

Predator defence Institute:
http://www.enviroweb.org/pdi/alternat.htm

Flock & Family Guardian Network:
www.flockguard.org
Reports on different breeds of livestock guarding dogs

Working Dog Web:
www.workingdogweb.com/wdbreeds.htm
A lot of information on guarding dogs with links to other webpages

Livestock Guarding Dogs
www.lgd.org

Llamapaedia:
www.llamapaedia.com/uses/guard.html
Provides information about Ilamas as guarding animal

Bear Biology
www.bearbiology.com

National Wildlife Research Center
http://www.aphis.usda.gov/ws/nwrc/

Vertebrate Pest Conference
www.davis.com/~vpc/welcome.html

Please send addresses of Web sites dealing with carnivore damage prevention to: cdpnews@kora.ch

How to get Carnivore Damage Prevention News:

There are three ways to receive CDP News:
1. As a paper copy by mail[1)]
2. By email as a pdf-file
3. Download as pdf-file from the LCIE website (www.large-carnivores-lcie.org/) or the KORA website (www.kora.unibe.ch)

Please order CDP News from the editorial office by e-mail: cdpnews@kora.ch

CDP News on the Web

The CDP News can be downloaded as PDF file on:

- LCIE-homepage: www.large-carnivores-lcie.org

- KORA-homepage: www.kora.unibe.ch

CDP News on *www.kora.unibe.ch* offers the following service:
- Download CDP News as pdf-file
- Database with information about CDP-specialists

Contributions desired

Dear subscribers,
The CDP News will only thrive with your active participation. Articles should be as „down to the earth“ as possible. Please send us any contribution on the following topics:

- Prevention measures
- Prevention measures that did not work
- Statistics on damage
- Compensation systems
- Technical articles
- Problem animal management
- Opinion and forum papers

Impressum:

Editorial: Ch. Angst, J.-M. Landry, J. Linnell, U. Breitenmoser

Editorial office:
KORA
Thunstrasse 31
3074 Muri b. Bern
Switzerland
e-mail: cdpnews@kora.ch
Phone: ++41 31 951 70 40
Fax: ++41 31 951 90 40

Financially supported by LCIE (Large Carnivore Initiative for Europe).

1) The financial support by the LCIE allows us to distribute the CDP News for free. However, to minimise postal taxes, we prefer distribution by e-mail wherever possible.