



International Bear News

Quarterly Newsletter of the International Association for Bear Research and Management (IBA)
and the IUCN/SSC Bear Specialist Group

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Council News

- 2 From the President: 14th IBA, Dues, \$\$ MATCH*
- 4 IBA Member Survey Results
- 5 IBA Grants: Changes and a CHALLENGE*
- 6 Ursus 13 Contents

14th IBA Conference, Steinkjer, Norway

- 8 Living with Bears, 14th Conference
- 10 Field Techniques in Bear Research
- 11 Reintroduction and Augmentation
- 12 Bear Biology
- 13 DNA Techniques in Bear Population Research
- 14 Poster Session
- 15 Bear Management Issues
- 16 Landscape & Habitat Approach in Res. & Mgmt.
- 17 Bear Human Conflicts
- 18 Limitations for Releasing Rehabilitated Bears

Eurasia

- 19 Italy Brown Bear Genetics Monitoring
- 20 Limiting Bear Expansion in Croatia
- 20 Brown Bear in Iran

Americas

- 21 Spectacled Bear Genetics, Ecuador
- 22 Chaparri Progress
- 22 MacNeil River Science/Educ. Permits
- 22 Need: Bear Skeleton Atlas
- 23 Grizzlies & Army Cutworm Moths
- 24 Black Bear Regulations, USA
- 26 Gatlinburg Bear Officer
- 26 Florida Hiring Three Bear Biologists
- 26 New Jersey Black Bears & West Nile Virus
- 26 Virginia Black Bear Mgmt. Plan

Student Forum

- 27 Student Breakfast, List Serve, Ursus
- 27 Finishing the Process

Zoo News

- 29 Training for Trust

Bears in Culture

- 31 Animals & the Law

Book Review

- 33 Lewis & Clark Among the Grizzlies

Events

- 34 DNA-based Wildlife Studies
- 34 Border Bears Workshop
- 35 17th Eastern Black Bear Workshop
- 35 8th Western Black Bear Workshop Final Call for Papers
- 35 15th IBA Conference
- 35 IBA Conferences

IBA

- 36 IBA Contact Information
- 37 IBA Membership Application
- 37 CHALLENGE GRANT DONATION FORM*
- 39 IBA Publications Order Form
- Back Cover About IBA & Mission Statement



Diana Doan-Crider

Andreas Zedrosser, IBA member & graduate student, takes measurements on a sedated brown bear in Sweden for the Scandinavian Brown Bear Research Project during a trip hosted by Jon Swenson before the 14th IBA conference in Norway.

***Help Meet the Challenge & Double Your Gift to IBA!**
IBA website: www.bearbiology.org/www.bearbiology.com

From the President

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IBA is making a difference in conservation of bear populations throughout the world. It is through the enthusiasm and expertise of individuals, joined together as members of our association that this difference is coming about. Ongoing research and conservation projects that IBA supports show that the potential for real conservation is possible. What we lack in financial support, we have made up in commitment. But our potential for being an even more effective force for bear conservation is clear. Through our close relationship with the Bear Specialist Group of the World Conservation Union, our members are developing strategic plans to address the most crucial problems faced by bear populations wherever they exist. Efforts are ongoing to secure the funding necessary to accomplish our goals not only in North America and Europe, but also in those areas of Asia and South America where conservation projects can show substantial benefit for the modest financial support.

14th IBA Conference

As anyone who attended can attest, all future conferences will be measured by the outstanding program at the 14th IBA conference in Steinkjer, Norway. The theme, "Living With Bears," was of special concern in this region of Norway because bears are returning to their former ranges, and people are searching for ways to reduce conflict with livestock. This concern is certainly not confined to Norway. Although the conference may not have provided a universal solution to this problem, open discussion among scientists and local people are important steps to solving some aspects. Read about the conference on pages 8-18.

The conference sponsors and the organizing committee drew in over 200 participants from 32 countries. The efforts of Ole Jakob Sørensen and Tor Kvam were vital to the success of the meeting — they seemed to be everywhere at once, solving problems, organizing last minute changes, and doing the many unnoticed jobs that resulted in this achievement. The goals of our conferences

are not only to serve as a place to hear scientific papers but to provide the opportunity for discussion of potential solutions to common problems that bear populations face. It is especially important to international bear conservation efforts that those individuals on the front lines of conservation are able to attend. Support for travel and attendance at conferences was a priority for the organizers and the success of the conference was in large part due to their efforts, along with help from Glen Contreras of the IBA Travel Grant Committee and donations from the Bevins Foundation and individuals.

Among the most enthusiastic IBA members are students; this is especially encouraging because their involvement in our association will determine the future for bears. Students organized a student breakfast at the conference to discuss common concerns, but mostly to offer their services to IBA. This is a very bright group of individuals and we should applaud their initiative and positive approaches.



Election Results

At the 14th conference in Norway, IBA members elected to council: Jon Swenson, Norway, Vice President Eurasia; and Djuro Huber, Croatia, and Mike Vaughan, USA, council members. Also, council appointed Isaac Goldstein of Venezuela to council, as provided in the bylaws, to achieve broader regional representation. All of the candidates for these positions received substantial numbers of votes; a reflection of the high regard in which they are held by their fellow IBA members. See page 36 for contact information.

India Conference Delayed

Despite the best efforts of the organizers, plans for a 2003 IBA conference in India will be indefinitely delayed. The staff of the Wildlife Institute of India had secured necessary support for the conference, but unforeseen problems occurred through no fault of theirs. We hope to hold a conference in this very important region as soon as practical.

San Diego Conference

The 15th IBA conference will be in San Diego, California, USA, February 8-13, 2004. It will be held in a beautiful and warm setting, and promises to be a productive meeting. Minimizing bear-human conflict will be a featured topic. In addition, the American Zoo and Aquarium Association Bear Taxon Advisory Group (Bear TAG) is exploring the possibility of holding their meeting in conjunction with that of IBA. The Bear TAG is the organization of zoo professionals who specialize in bears — most Bear TAG members are also members of IBA. A closer relationship and more free exchange of information between our disciplines would prove useful for both, and bear conservation will benefit. See page 35 for conference details.

New Dues Structure and Membership Benefits

At the IBA general membership meeting at the 14th conference in Norway, members approved two changes that affect subscriptions to *Ursus*, our professional journal, and the amount of dues. The standard membership now includes *Ursus*. The previous total for annual membership and purchase of *Ursus* was US\$70 (US\$25 dues including the newsletter *International Bear News*, US\$45 for *Ursus*). The new dues structure is US\$50 per year, or US\$45 for three or more years, for a standard membership which includes the newsletter and *Ursus*. We've also added institutional memberships at US\$100 per year or US\$250 for three years. Since some members may find it difficult to afford a standard membership, a low-cost option is available. Likewise, an option is available for members to donate their copies of *Ursus* to libraries or individuals who cannot afford standard memberships. Use the form on page 37 to order or renew your membership and receive the current *Ursus*.

We're also discounting back issues of *Ursus* and IBA proceedings. Buy at least three volumes and take a 40% discount. See page 39 to order.

These changes will allow our publications to be more widely available to all concerned with bear conservation. Although a dues increase is required, dues will not only cover publications but will also allow us to concentrate on other IBA functions listed in our mission statement (on back cover). More importantly, it will also help provide the necessary resources to meet the responsibility that IBA members feel to be proactive leaders in scientific management and conservation of the world's bears.

Challenge Grant — Double Your Money!

This year, an anonymous donor gave \$7,500 to supplement the shortfall of funds available through the Bevins Foundation to IBA programs. The same donor believes strongly enough in our mission that he offered to match all donations to funds used for IBA conservation programs up to a total of \$10,000 by December 31, 2002. That means the value of any donation IBA receives by December 31 will be doubled. Thank you to those who have contributed to date — we've received donations ranging from \$10 to \$1,000. Every donation is important and helps us reach our goal. Donations currently total only \$2,000, so there is still time to make a difference for bears. Use the form on page 37 to make your donation — double your money for bears!

IBA Member Survey Results

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For the past year, the IBA membership application that appears in *International Bear News* has included a questionnaire for members. This questionnaire was designed to provide IBA with two things: first, information on the makeup of our membership, including a survey of the skills and expertise represented and the willingness of members to lend those skills for specific IBA tasks; second, input from members regarding how IBA can continue to improve its service to members and its effectiveness promoting scientific understanding and conservation of bears. In July, IBA secretary Joe Clark tallied members' responses to the survey, with the following results.

Of 794 IBA members, 126 responded to the survey. Of those, 72% hold graduate degrees (MA, MS, or above); 27% have Ph.D. or DVM degrees. Among respondents, 55% have experience studying American black bears, 44% brown bears, 11% polar bears, 9% Asiatic black bears, 7% Andean bears, 6% sun bears, 2% sloth bears and 2% giant pandas. Years of work experience were highest among those studying American black bears and brown bears (11 years) and lowest for those studying pandas (4). Respondents have worked in 31 different countries and speak 16 different languages.

Between a third and a half of respondents offered comments regarding how IBA could better serve them as members or how they would like to see IBA expand its efforts.

Several recurrent themes emerged in these comments. The five general suggestions summarized below capture the intent of most comments submitted by members.

1. IBA should engage in more public education and outreach. This includes more public outreach at conferences and an expanded and improved website.

2. IBA should continue to expand its efforts to facilitate more communication among professionals, and to steer members and the public to available resources, information and publications. Suggestions include providing IBA membership lists to members, publishing the newsletter on the website, providing conference abstracts, papers, and bibliographies of recent bear publications on the web and/or in the newsletter, posting job inquiries and position advertisements, publicizing specialized workshops, publishing technical bulletins, and providing more research updates in the newsletter.

3. IBA should do more to encourage more active interchange among members, regarding science, conservation, and IBA organizational matters. Several members felt that panel discussions and problem-solving sessions should receive more time and attention at conferences. Others suggested providing a letters forum in the newsletter, publishing field evaluations of bear-related products, encouraging anecdotal reports in the newsletter, and providing more opportunity for members to have input into IBA business.

4. IBA should expand its role in worldwide bear conservation, including pursuing sources of funding for the IBA grants program,

providing the newsletter and other materials in languages other than English, and increasing the focus on international reports in the newsletter, encouraging research on less-studied bear species, and actively recruiting more international members.

5. Finally, many members expressed support for current IBA programs and directions. The newsletter received praise.

IBA's philosophy has always been that a crucial element in implementing effective conservation is the acquisition and exchange of accurate information. Clearly, IBA members continue to believe this philosophy. *Ursus* is now an annual journal. In recent months, IBA has taken steps to increase the circulation of *Ursus* and make it more available to libraries and individuals around the world. Our newsletter has become a well-established quarterly source of up-to-date information for members, and back issues are posted on the web site. Through this survey, IBA members have provided more ideas of how IBA can continue to improve. Many have offered to share their time and talents to the organization. Thanks go to all the members who took the time to return this survey and to those who indicated their willingness to volunteer. In the coming months, IBA Council will look at ways to follow-up on member suggestions and put our various talents to work. And if you have not yet filled out a survey, please do. It will continue to appear on the back of the membership form.

New IBA Grant Deadline and Important Changes!

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Anyone considering requesting a grant from the IBA should note the following changes.

1. *All proposals should be submitted electronically unless this is really impossible.*

2. Submitters should send all documents in *MS Word format or in plain ASCII text* (a format that can be converted to MS Word easily). Please do not use WordPerfect format.

3. *Proposals may be submitted at any time*; they will be held for the next review. Normally there will be *only one review each year*. The review will begin shortly after the start of the calendar year.

4. The deadline is different from previous years! All proposals must be *received before midnight on 31 December*. Any received after that will be held over for the next year's review.

The IBA Grant Review Committee will make awards to persons proposing projects which it determines most likely to benefit biologically sound bear conservation and management efforts. Among other things, the committee will consider priorities established by the Bear Specialist Group, the likelihood of alternate funding, the feasibility of the proposed work, and the qualifications of the investigators to do the proposed study. Proposals will be considered for funding of portions of studies, for support of graduate students working on bear projects, for publication of significant findings on bear biology or management, for preparation or publication of public information and education projects about bears, and other projects.

Applications will be considered from, but are not limited to, individual students including post-doctoral students, researchers, educational institutions, conservation organizations, and government agencies. Applications for projects in developing countries with threatened bear species or populations are strongly encouraged.

Applications for grants must be in English and be received by the committee chair no later than 31 December for projects to be conducted during the next calendar year. Applications should be less than four pages in length, but additional pages containing budgets, endorsements, and other supporting documents may be attached. Three letters of reference from individuals familiar with the proposer and the project are strongly encouraged. The application must include a description of all items listed on the grant application form. Grant proposals will be strengthened if commitments for partial funding from other sources can be shown in the proposal. Print application forms directly from the IBA website www.bearbiology.com or contact Frederick C. Dean at the address above.

Typically grants will be less than US\$5,000/year. The minimum grant is US\$500. The maximum grant is US\$10,000/year. No more than US\$15,000 may be granted to any project over a three year period.

All grant recipients agree to provide a written report of accomplishments to the grant review committee by June 1 of the year following that in which the grant was received. In the case of multi-year grants, a progress report will typically be required by the end of December before funds are disbursed for the next year. Annual progress reports and final reports sent to the committee must include an account-

ing of how funds were expended. Unused funds must be returned to the IBA, and no significant change in the proposed use of monies received may be made without authorization of the chair of the grant review committee. Awards made by the IBA Grant Review Committee may be modified or canceled if funds are not available.

Grant recipients agree to acknowledge the support of the IBA and, when appropriate, the John Sheldon Bevins Memorial Foundation in any publications or educational materials that result from the supported project.

We also encourage submission of progress summaries to IBA's newsletter, *International Bear News*. Such summaries may be submitted at any time and should be sent directly to the editor (ibanews@bearbiology.com), with a copy to the grant committee.

Project Summaries

In this issue of the newsletter, four projects are highlighted that received support from the IBA: Marta De Barba's genetics work with brown bears in the Italian Alps, page 19; Bernhard Gutleb, Ramazanali Ghaemi and Josip Kusak's work on brown bears in Iran, page 20; Bernard Peyton's work on the Chaparri Reserve in Peru, page 22; and Hillary Robison's work on army cutworm moths and grizzly bears, page 23.

Challenge Reminder — Double Your Money for IBA!

An anonymous donor has offered a challenge. This donor will match contributions, up to a total of US\$10,000 made in 2002 for the 2003 IBA Grant Program from private sources other than the Bevins fund. Use the form on page 37 to make donations to the research fund.

Many thanks to the individuals who have their contributed honoraria from speaking engagements.

Ursus 13 Contents

A copy of the current *Ursus*, a US\$45 value, along with the newsletter is now included with new and renewing US\$50 IBA standard memberships. Use the membership form on page 37, or order *Ursus* using the publications order form on page 39. Purchase three or more back issues of *Ursus*/IBA proceedings and take a 40% discount.

Behavior and Ecology

- A Multi-Scale Assessment of Habitat Use by Asiatic Black Bears in Central Japan by Meghan, M. Carr, Jun Yoshizaki, Frank T. van Manen, Michael R. Pelton, Oscar C. Huygens and Hidetake Hayashi.
- Denning Ecology of Female American Black Bears in South Central Louisiana by Dwayne A. Hightower, Robert O. Wagner and Richard M. Pace, III.
- Grizzly Bear Denning and Potential Conflict Areas in the Greater Yellowstone Ecosystem by Shannon R. Podrutzny, Steve Cherry, Charles C. Schwartz and Lisa A. Landenburger.
- Grizzly Bear Denning Chronology and Movements in the Greater Yellowstone Ecosystem by Mark A. Haroldson, Mark A. Terment, Kerry A. Gunther and Charles C. Schwartz.
- Den-Type Use and Fidelity of American Black Bears in Western Virginia by Sybille A. Klenzendorf, Michael R. Vaughan and Dennis D. Martin.
- Modeling Grizzly Bear Habitats in the Yellowhead Ecosystem of Alberta: Taking Autocorrelation Seriously by Scott E. Nielsen, Mark S. Boyce, Gordon B. Stenhouse and Robin H.M. Munro.
- Energetic Production by Soft and Hard Mast Foods of American Black Bears in the Smoky Mountains by Robert M. Inman and Michael R. Pelton.
- Black Bear Monitoring in Eastern Interior Alaska by Mark R. Bertram and Michael T. Vivion.
- Predation and Multiple Kills of Muskoxen by Grizzly Bears by Patricia E. Reynolds, Harry V. Reynolds and Richard T. Shideler.
- Interspecific and Intraspecific Social Interactions among Brown Bears and Wolves in an Enclosure by Paul Koene, Jentina Ardesch, Annette Ludriks, Egbert Urff, Ludger Wenzelide and Verena Wittenberg.

Diets and Food Habits

- Consumption of Fungal Sporocarps by Yellowstone Grizzly Bears by David J. Mattson, Shannon R. Podrutzny and Mark A. Haroldson.
- Consumption of Earthworms by Yellowstone Grizzly Bears by David J. Mattson, Marilyn G. French and Steven P. French.
- Diets of Asiatic Black Bears in Taiwan, with Methodological and Geographical Comparisons by Mei-Hsiu Hwang, David L. Garshelis and Ying Wang.
- Food Habits of Malayan Sun Bears in Lowland Tropical Forests of Borneo by Siew Te Wong, Christopher Servheen and Laurentius Ambu.

Population Dynamics and Estimation

- A Meta-Analysis of Grizzly Bear DNA Mark-Recapture Projects in British Columbia, Canada by John Boulanger, Gary C. White, Bruce N. McLellan, John Woods, Mike Proctor and Stefan Himmer.
- Population Fragmentation of Grizzly Bears in Southeastern British Columbia, Canada by Michael F. Proctor, Bruce N. McLellan and Curtis Strobeck.
- Estimating Numbers of Females with Cubs-of-the-Year in the Yellowstone Grizzly Bear Population by Kim A. Keating, Charles C. Schwartz, Mark A. Haroldson and David Moody.
- Estimating Total Human-Caused Mortality from Reported Mortality Using Data from Radio-Instrumented Grizzly Bears by Steve Cherry, Mark A. Haroldson, James Robison-Cox and Charles C. Schwartz.
- Managing the Risk from Hunting for the Viscount Melville Sound Polar Bear Population by Mitchell K. Taylor, Jeff Laake, H. Dean Cluff, Malcolm Ramsay and François Messier.

Bear Management

Distribution of Grizzly Bears in the Greater Yellowstone Ecosystem, 1990-2000 by Charles C. Schwartz, Mark A. Haroldson, Kerry A. Gunther and David Moody.

Grizzly Bear Mortality and Human Access in Banff and Yoho National Parks, 1971-98 by Bryon Benn and Stephen Herrero.

Hunter Effort and Success Rates of Hunting Bears with Hounds in Virginia by Kristine L. Higgins and Michael R. Vaughan.

Effects of Sex and Age on American Black Bear Conifer Damage and Control by Gail H. Collins, Robert B. Wielgus and Gary M. Koehler.

Spatial Analysis of Locations of Brown Bears Killed in Defense of Life or Property on the Kenai Peninsula, Alaska, USA by Lowell H. Suring and Gino Del Frate.

Grizzly Bear-Cattle Interactions on Two Grazing Allotments in Northwest Wyoming by Charles R. Anderson, Jr., Mark A. Terment and David S. Moody.

Effects of Human Activity on Brown Bear Use of the Kulik River, Alaska by Tom S. Smith.

Survival of Orphaned Black Bears Released in the Smoky Mountains by Jay E. Clark, Michael R. Pelton, Brandon J. Wear and Daryl R. Ratajczak.

Methodology

Bone Prominence and Skin-Fold Thickness as Predictors of Body Fat and Reproduction in American Black Bears by Karen V. Noyce, Pamela L. Coy and David L. Garshelis.

Evaluating Nutritional Condition of Grizzly Bears Via ¹⁵N Signatures and Insulin-Like Growth Factor-1 by Robert J. Gau and Ray Case.

Assessing the Risk of Bear-Human Interaction at River Campsites by A. Grant MacHutchon and Debbie W. Wellwood.

Sampling Considerations for American Black and Brown Bear Home Range and Habitat Use by Jerrold L. Belant and Erich H. Follmann.

A Passively Triggered Foot Snare Design for American Black Bears to Reduce Disturbance by Non-Target Animals by Steven R. Reagan, Janet M. Ertel, Pat Stinson, Paul Yakupzack and Don Anderson.

Perspectives, Essays and Reviews

Misconceptions, Ironies, and Uncertainties Regarding Trends in Bear Populations by David L. Garshelis.

Bear Reintroductions: Lessons and Challenges by Joseph D. Clark, Djuro Huber and Christopher Servheen.

Experiences with Trapping, Chemical Immobilization, and Radiotagging of Brown Bears in Slovenia by Petra Kaczensky, Felix Knauer, Marko Jonozovic, Chris Walzer and Thomas Huber.

Reducing Bear-Human Conflict through River Recreation Management by A. Grant MacHutchon and Debbie W. Wellwood.

New Strategies for Bear Conservation: Collaboration between Resource Agencies and Environmental Organizations by John W. Schoen and Sterling D. Miller.

Short Communications

Spectacled Bear-Cattle Interactions and Tree Nest Use in Bolivia and Venezuela by Isaac R. Goldstein.

Probable Grizzly Bear Predation on an American Black Bear in Yellowstone National Park by Kerry A. Gunther, Mark J. Biel, Neil Anderson and Lisette Waits.

Grizzly Bear Predation on a Bull Bison in Yellowstone National Park by Travis Wyman.

Grizzly Bear Predation on a Bison Calf in Yellowstone National Park by Nathan Varley and Kerry A. Gunther.

14th IBA Conference, Steinkjer, Norway

Living with Bears

14th IBA Conference on Bear Research and Management

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The 14th IBA Conference on Bear Research and Management took place July 28-August 3, 2002 in Steinkjer, Norway where 180 participants from 32 countries gathered. Most European countries with bear populations were represented as well as Asia and South American: Argentina (1), Austria (4), Belgium (1), Bolivia (1), Bulgaria (1), Canada (6), Colombia (3), Croatia (2), Ecuador (4), Estonia (1), Finland (7), France (3), Germany (1), Hong Kong (1), India (4), Italy (7), Japan (3), Latvia (2), Mongolia (1), Netherlands (1), Norway (50), Pakistan (1), Peru (2), Russia (6), Slovakia (1), Slovenia (4), Spain (1), Sweden (16), Turkey (1), UK (3), USA (40), Venezuela (1). Thirty-five guests and 11 student volunteers brought the total to 226 participants.

Considerable efforts were made to accommodate all possible desires. Geographic and gender diversity were considered in appointing session chairs; countries represented were USA, Netherlands, Russia, Norway, Ecuador, India and Sweden; and 46% of the session chairs were women. Student involvement was important. Eleven of our students did an excellent job as volunteers, and made contact with the top scientists worldwide. An IBA-sponsored student breakfast allowed new recruits in the bear business to meet established biologists.

We also showed the connection between bears and art: from the bear dance performed at the conference banquet at Stiklestad after the historic play, to a premiere performance of music based on plots of radio-collared bears, and decorative art and crafts sold by local artisans outside the conference hall.

Reports from the session chairs on following pages demonstrate that important themes were covered. The conference theme "Living with Bears" reflected Norway's difficulties as immigrating bears from neighboring Sweden increase our bear population and have caused so much despair, discussion and almost open war among sheep-owners, conservationists and management bodies over the last two decades. To date, the sides in this conflict have been impossible to move from their positions. The media is always on the spot and often makes the situation worse.

This was also the case at the start of this conference: residents in Lierne municipality (where bear problems have been most severe) were interviewed by the press. The headlines told the world that "Scientists do not pay attention to the opinion of locals," and "They know nothing about real life in bear country."

Some residents attended the bear conference at Dampsaga Culture Hall. The attitude shifted from negative to very positive as the conference continued. It was appreciated that bear experts from all over the world came to the local communities to see for themselves. Reporters from the press joined the various Wednesday excursions, and published positive articles in local and national newspapers, and journals.

The organizers are proud and happy for the opportunity to host the bear conference in Steinkjer. We think it has had a positive effect on the attitudes of different interest groups. After the conference, the

county governor offered funding, and asked for help and cooperation. And this autumn a series of meetings with local authorities, teachers and sheep holders have been arranged. We see this as a promising start to a positive process.

Awards for Presentations

It is important to encourage good presentations; a high scientific standard is not enough. The message must be delivered effectively. And it was, as the county governor, who really got the point, is paying for translation into Norwegian of all conference papers and speeches. Most presentations used PowerPoint software, and our information technology students gave us a brilliant demonstration of their skills. Nothing went wrong, and all of the more than 100 papers and files appeared on cue.

A committee selected the best presentations in each session. As almost all presentations were brilliantly given, the committee had a difficult job choosing the winners:

Field Techniques in Bear Research: *Use of Ultrasonography as a Non-invasive Tool to Detect and Monitor [American] Black Bear Fetal Development* by C. Olfenbutt et al. (Presented by M. Vaughan).

Reintroduction and Augmentation: *Testing the Predictions of the Feasibility Study for the Reintroduction of the Brown Bear in the Italian Alps: Preliminary Data of Costs of the Program, Space Use and Damage Patterns of the 7 Released Bears* by A. Mustoni et al. (Presented by P. Genovesi).

Bear Biology: *The Brown Bear's Spatial Expansion in Slovenia: Speed of Expansion and Saturation Dependent Dispersion* by J. Klemen and M. Adamic. (Presented by J. Klemen).

DNA Techniques in Bear Population Research: *Estimating Population Numbers of [American] Black Bears in Eastern Kentucky Using Microsatellite Analysis* by K. Vowels et al.

Posters: Three posters were given awards. Two posters shared first place: *Bear Rubbing Activity: Implications for Population Monitoring* by Katherine C. Kendall, David Roon, Jeff Stetz and Lisette Waits, and *Wildlife Corridors and Their Effects on Brown Bear (Ursus arctos): A Comparison Survey Between Alberta (Canada) and Slovenia on Knowledge and Attitudes* by Maria Wechselberger. Ali Nawaz from Pakistan won a special award for his very informative non-text poster, as an illustration of effective communication to illiterates needing information about bears.

Bear Management Issues: *Status of Brown Bears in Turkey and the Priorities for Research and Conservation* by Oe. Emre Can.

Landscape and Habitat Approach in Bear Research and Management: *Connections that Matter: A Graph Theoretic Analysis of Grizzly Bear Movement in the Yellowhead Ecosystem, Alberta, Canada* by B.L. Schwab et al.

Bears and Humans Today and Through History: *Perception of Brown Bears by the General Public and Hunters in Latvia* by Zanete Andersone.

Bear Human Conflicts: *Density of European Brown Bears and the Extent of Reported Bear Damages in Slovenia: Do They Have Anything in Common?* By M. Jonozovic and M. Adamic (Presented by M. Jonozovic).

Conference Field Trips

Three of the conference field trips went to bear areas and communities where bear predation on sheep has been a controversy for the last 20 years. The fourth field trip went to the western coast. Two groups visited Lierne. One group met the mayor and two sheep-holders who discussed the increasing bear activity and its impact on the local community. Due to bear predation, more than 50 sheep farms 10 years ago have been reduced to 29

today. A community of 1500 will have to make rapid changes to survive. State financial support will help, but cannot eliminate the additional stress to life in the area. Effective solutions must be reached fast, before too many people leave. In the worst case, the situation may destroy the community. Local people's great fear of bears were discussed and broadcast on local radio.

The visit to a local sheep-holder touched the whole group and made it clear that paying for killed sheep, and economic support to prevent damage are only the easy part of the complex human dimension. His history was typical: due to bear problems, his sheep husbandry has been slowly degraded to a fraction of what it was supposed to be. Without accusing the bear for his problems, the farmer expressed dissatisfaction. Thirty years ago the authorities encouraged development of his sheep farm, but the unforeseen changes in bear management have ruined his life.

The other sheep farmer showed us how sheep are now held in an area with electric fencing. He has had to reduce his sheep numbers to about 25% of the original total when sheep were grazing free in the forests. The electric-fenced enclosures cannot support the sheep with enough high quality forage to provide sufficient lamb growth during the short summer of about 100 days of grazing. Even with compensation for bear damage added, the economic factors reach a point where it becomes meaningless to keep sheep farming. He stated that this would most probably be his last year as a sheep farmer. He also welcomed bears to become his forest neighbors when sheep would no longer be his source of income.

The second group visited a sheep farmer using guarding/herding dogs, shepherds and night enclosures. The lamb weights were also lower with

his solution, and profits were dropping. Guarding dogs constitute a new solution in Norway, although it is a well known practice in other countries. The idea of guarding dogs has caused strong opposition from neighboring sheep farmers.

We also organized a shorter trip to Snåsa, west of Lierne. The predation problems have not struck as hard there yet. The situation is almost like Lierne 10 years ago. Residents also presented information here, and a challenging two-hour hike to a bear den was organized.

One bus went to Namsos, where the Coast Guard vessel *Garsøy* took us to Sør-Gjeslingan, an old fishing village that has been restored by the Coast Museum, and to Villa with its 1839 lighthouse. The coast excursion became very popular as word spread that spotting sea eagles (*Haliaeetus albicilla*) was guaranteed.

We depended on the goodwill of local residents to organize and implement these excursions. We are very grateful for all their help. We see the positive attitude we have met as confirmation that local people have appreciated visitors from the scientific world.

After the Conference

The lights are turned off, and all participants have returned home. Important knowledge was presented. All presentations were video-taped, and we hope to be able to present the presentations, the abstracts and the PowerPoint presentations on our internet site <http://www.hint.no/bearconference/> shortly after November 1.

The organizers want to thank the IBA for entrusting us with the responsibility for the 14th conference. And we want to thank our sponsors for all their support.

It was hard work, but it was worth it.

Field Techniques in Bear Research

Session Chair: Karen Noyce

Scientific information is only as good as the methods used to obtain it. In wildlife research, most techniques have their limitations and flaws. Thus, an important part of research is to look for ways to improve techniques, even those considered "tried and true," and to refine techniques for the specific circumstances unique to different studies. New techniques push science forward in waves, as each new methodology makes it possible to answer new sets of questions. Five presentations in this session covered topics ranging from immobilizing drugs to sign surveys. These papers presented new techniques, reevaluated some common techniques, and compared pros and cons of alternative techniques.

Sybille Klenzendorf and Mike Vaughan examined the influence of radio-collars on annual survival of American black bears in a hunted population in Virginia, USA. They reported that radio-collared females experienced less mortality than those without collars (0.98 vs. 0.87 annual survival). The authors suspected that hunters specifically avoided shooting bears with radio collars because hunters knew that the majority of adult bears radio-collared for research in the area were females. Local hunters wished to preserve a large adult female population to boost local reproduction and population density.

Nigel Caulkett reviewed the physiological effects of four combinations of immobilizing drugs in North American ursids, including tiletamine-zolazepam (Telazol or TZ), xylazine-tiletamine-zolaepam (XZT), medetomidine-tiletamine-zolazepam (MZT), and medetomidine-ketamine (MK). TZ caused the least disruption

of normal physiological function, but anesthesia required relatively large drug volumes, could not be reversed, and provided only minimal analgesia. Combinations of xylazine or medetomidine with telazol or ketamine resulted in mild hypertension, bradycardia, and hypoxemia, but these effects were relatively minor and were well-tolerated in healthy bears. Hypoxemia was treated effectively with supplemental inspired oxygen. Because MK sometimes resulted in sudden recovery and XZT tended to produce hyperthermia and was not reliably reversed, the author recommended MZT as the best choice of a reversible anesthetic in healthy bears capable of producing surgical analgesia with small drug volumes.

Andrew Bridges developed a morphometric dichotomous key for identifying yearling American black bears in the field. His research on yearling survival and dispersal required radio-collaring yearlings, but not other bears. It saved time and effort to be able to distinguish yearlings from other juveniles at the time of capture. Captures in this study occurred primarily in traps in summer, because capture of yearlings at maternal winter dens was unreliable as many bears abandoned dens when approached. No single measurement distinguished yearlings from older bears, but by using several measurements, in the form of a dichotomous key, he was able to correctly identify known yearlings most of the time. The author reminded others that a simple key can sometimes help extract useful information from combinations of various parameters that, considered alone, impart little information.

Colleen Olfenbuttel demonstrated the use of ultrasonography to monitor fetal development in captive

American black bears. Since the 1980s, female black bears trapped as nuisance animals in late summer or fall have been brought into captivity and held over winter. Researchers have focused on monitoring the pre- and post-natal growth of cubs in these bears and the effects of pre-denning maternal diet on fetal development. Using ultra-sound, cubs were first detected in-utero about 32 days prior to parturition. Of 123 cubs detected, 18 did not reach full term: 2 were aborted, 7 were reabsorbed, and 9 died in utero of unknown causes. Of 105 cubs born, 35% died, 6 days, on average, post-partum. Cubs of mothers on low-calorie prehibernation diets experienced greater in-utero and post-partum mortality than those of mothers fed normal diets.

Accurate information on distribution and population status is lacking for many of the world's bears, and resources have been lacking to conduct extensive surveys. K. Yoganand investigated the usefulness of sign surveys as a low-cost means of evaluating population status of sloth bears. He monitored the occurrence of scats and bear diggings along 100 km of trail in Panna National Park, central India, on a biweekly basis for two years. Both types of sign showed seasonal and annual variation, but occurrence of diggings was far more variable than scats. The author was unable to test these indices against known bear densities, but because scat occurrence was less variable and scats occurred more frequently, he concluded that scats should provide a more reliable index of bear abundance than diggings.

Reintroduction and Augmentation

Session Chair: Jiska van Dijk

Piero Genovesi from the National Wildlife Institute of Italy reported, on behalf of Andrea Mustoni, on the brown bear reintroduction program in the Italian Central Alps. In 1997 a feasibility study was conducted. The study analyzed biological, economic and social aspects of the reintroduction. In particular it focused on possible habitat use and suitability, possible livestock predation, predicted compensation and total costs of the project. The first bears were translocated from Slovenia to the Italian Alps in 1999. Between 1999 and 2002, 10 bears (3 males and 7 females) were fitted with radio transmitters and released. This year the first two cubs were born. Results of the monitoring program show that the bears in the first period after release didn't move farther than the predicted 50 kilometer minimum. The total damage compensation costs were at the lowest expected level (10,845 Euro per year). Remarkable is the high variability of the behavior and movements of the individual bears. Due to the intensive monitoring program, the cooperation with hunters and the involvement of the public, opposition by the local residents was minimized. Only in recent months, after an attack on a piglet, was stronger opposition recorded.

Sophy Vickery (previously Sophy Sharpe), Ph.D. student at Oxford University in England, studied abnormal behavior in captive Asiatic black bears and sun bears housed in a government confiscation facility in Thailand. She reported on the outcome of several experiments related to stereotypic behavior and possible relationships between stereotypy and abnormal behavioral persistence. Behavior of 18 Asiatic

black bears and 11 sun bears, all individually housed, was observed. To assess abnormal behavioral persistence, experiments were performed in which bears were trained to discriminate between two spatial stimuli, and rewarded for correct responses. Once a performance criterion had been met, further responses were un-rewarded, and the bears' ability to cease responding was recorded. The results of the experiments show that stereotypy frequency increased with age but was unaffected by species or sex. However, there was a significant positive correlation between the number of trials for which bears continued responding without reward and stereotypy frequency. The results show that bears have difficulty in ceasing non-functional behavior in proportion to their level of stereotypic behavior and that captivity may influence behavior control. In the wild where behavior must be adaptive and flexible to meet the different situations, this kind of behavioral deficiency could account for reduced survivorship of released captive bears.

Mikhail Vaisfeld from the Institute of Geography at the Russian Academy of Science was invited to present an overview of the historical and current situation of polar bears, Asiatic black bears and brown bears in Russia. Russia is the only country in the world where polar bears, distributed over the Russian Arctic, are not harvested. Since 1956 polar bear hunting was prohibited. Enforcement and current economic conditions however, make it difficult to determine the extent of illegal hunting. About 3,000 Asiatic black bears inhabit the south of the Russian Far East. Since the Asiatic

black bear was listed on the Russian Red Data Book in 1983, the number of bears shot each year decreased significantly. In Russia the number of brown bears, a traditional game species, is about 120,000. The registration of damage (on crops, beehives, livestock) is not consistent over the country and is therefore difficult to assess. Of the total number killed each year, 10% can be assigned to traditional den hunting and 51% are killed at oat fields. The remaining 39% are killed either near baits or with the help of hunting dogs.

A.J.T. Johnsingh from Wildlife Institute of India was invited to give an overview of the four bear species found in India. Since 1972 all four species — sun bear, sloth bear, Asiatic black bear and brown bear — are included in Schedule I of the Indian Wildlife Protection Act, which offers the highest legal protection status in India. Poaching and habitat disturbance, however, are major threats for all species. Only with the formation of a border reserve between India and Pakistan can the brown bear in the Himalaya be protected; together with a total ban on the capture of young bears; and with ensuring that protected areas are not disturbed between May and October, crucial months to gain fat after and before hibernation. Protection against poaching and capturing of cubs is a must for the conservation of the Asiatic black bear and sloth bear. Diminishing the extent and significantly increasing the time interval between shifting cultivation, and protection from poaching may help sun bear populations to recover.

Bear Biology

Session Chair: Leonid Baskin

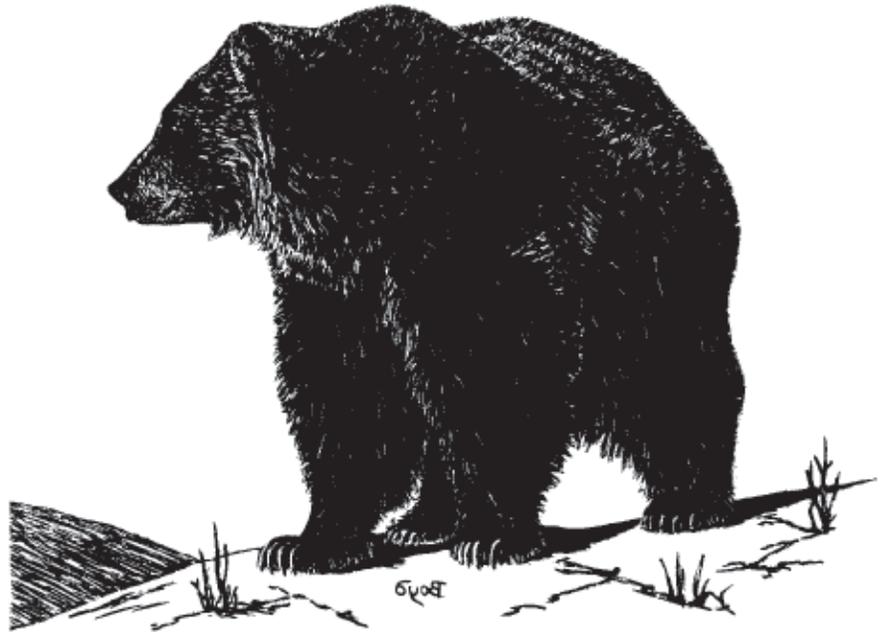
Biological issues were the focus of the nine presentations in this session

Harry Reynolds with co-authors discussed population characteristics of grizzly bears in Alaska, which are potentially important if their habitats would be impacted by oil development. This study was conducted over a long period, and determined rate of natural and human-related mortality.

Thomas Eason with co-author M. Pelton presented data on population ecology of American black bears in the Great Smoky Mountains National Park, USA. They found that habitat quality, not poaching, explained most differences in population density and other parameters of population ecology (sex and age structure, litter size, survival rate). Also, details of sex and age structure, reproductive indicators, and survival and population growth rates were estimated.

K. Yoganand with co-authors C. Rice and A. Johnsingh presented data on range, food and activity (mostly nocturnal and crepuscular) of sloth bears in India. Veronica Troya's project on Andean bear food habits was also concerned with a rare species of bear, and both researchers considered measures to protect these species and to conserve their habitats. For the Andean bear who prefers the leaves and hearts of *Puya* and *Greigia*, conservation of the montane forests is vital.

B. Dahle, J. Swenson and F. Sandegren explored brown bear depredation of moose calves in Scandinavia. Bears annually kill 26% of moose calves which are important bear food in spring and early summer. In spite of acceleration of the moose cows' breeding



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rate in the year after loss of calves, the bears reduced the moose population by 4.2%.

Torgeir Nygård presented results for a team of eight Norwegians which estimated home range of 13 brown bears in Central Norway and Sweden. Besides scientific interest they decided a practical aim was to predict bear/sheep conflicts. They found 1550 sq. km home ranges for males, and 440 sq. km for females. It is interesting that variations in the size of home ranges were not more than 66% (24% for females and 39% for males).

J. Adamic from Slovenia and D. Lee and M. Vaughan from the USA studied problems of bear spatial expansion. Since 1945 in Slovenia a bear population has enlarged its range an average of two kilometers per year. The males first colonized the new areas.

Daniel Lee summarized ongoing research by West Virginia, USA scientists studying dispersal of American black bears that is not well enough understood.

Chuck Schwartz, USA, presented the work of 16 zoologists and

mathematicians that estimated reproductive senescence of brown/grizzly bears. They studied data on 4,275 radio-collared females for which age and reproductive success was estimated precisely. None of the 276 3-year-old females produced a litter. The first visible change of female productivity occurred between 4 and 5 years of age when the rate of cub production accelerated. The peak of reproduction was observed for females 8-17 years old. Females 26-27 years old bear produced fewer cubs (it was the second shift in reproductive performance). No female older than 28 had a litter. However in the literature, the authors found evidence of breeding in 3-year-old females, as well as those older than 27 years.

It is useful to mention that there were practically no behavioral studies presented in the session (and very few during the conference). Radio- and satellite-collaring could also be used for behavioral studies.

DNA Techniques in Bear Population Research

Session Chair: Kate Kendall

Summary prepared by Marci Johnson and Kate Kendall.

As the techniques of DNA analysis are carefully refined, its applications have broadened. The presenters of this session offered varied perspectives from a wide array of backgrounds and research initiatives, yet provided a steadfast fervor for the advancement and sound use of this new technology.

Marju Metsalu presented research investigating the phylogenetic relationships of Eurasian brown bears since the last ice age. While the brown bears of Russia and Finland exhibit extensive gene flow, analysis of mitochondrial DNA indicate the isolated population of Estonia suffered a recent demographic bottleneck which the investigators attribute to the effects of prevailing refugia isolation after glaciation.

Elisabeth Iregren, an osteologist from Sweden, has explored the prevalence of inbreeding throughout the Scandinavian brown bear population. Evidence of decreased body size recorded in Northern Sweden since the 18th century, a decrease in tooth measurements, and smaller litter sizes documented over time in newspaper articles will now be scaled against the abilities of genetic analyses to assess genetic diversity.

In Kentucky, USA, American black bears, absent for more than a century, are beginning to recolonize the mountains and hardwood forests bordering Virginia. Kelly Vowels, a graduate student from Western Kentucky University, introduced a cooperative pilot study with the Kentucky Department of Fish and Wildlife Resources to quantify the reoccupation. Using 46 hair and nine scat samples collected at 200 hair traps and employing eight microsatellite loci and the SRY marker, they have estimated 35 bears currently reside in this area of Kentucky. This estimate will be integral to management of this resurging population. Next, Bonnie J. Furman, an

Assistant Professor of Genetics at Western Kentucky University, discussed the subsequent challenges of managing a dynamic population: promoting expansion, reducing human conflicts, incorporating public involvement, and monitoring genetic diversity. Bear research in Kentucky is only a year old and the population is not much older. Non-invasive genetic techniques will be used to monitor the degree of genetic variation in the population.

From 1985-1987, grizzly bear track measurements were recorded along cutthroat trout spawning streams flowing into Yellowstone Lake of northwestern Wyoming, USA. Bears visited 61% of the streams for this important food resource. In 1994, non-native, rapacious lake trout were discovered, and cutthroat numbers now are believed to be declining. Mark Haroldson repeated the previous track measurement study to quantify the use of these areas by grizzlies, and applied recent genetic capabilities to improve the accuracy of identification. Barbed wire snares were constructed along 26 streams around the lake during spawning season 1997-2000. Of the 981 hair samples collected, DNA analysis identified 75 individual grizzly bears. From these data, it was estimated that 10-20% of the Yellowstone grizzly bear population frequents the spawning streams to fish. The study documented a decrease in bear fishing activity in the West Thumb area. Because West Thumb is apparently the site where lake trout were first introduced to the lake, the decline in bear use may indicate a decline in the cutthroat population.

Elizabeth Peacock used microsatellite analysis as an indicator of movement between islands in the Alexander Archipelago of southeast Alaska to investigate island biogeography theories. *Ursus americanus pugnax* inhabit all but four of the thousand islands character-

ized by montane temperate rainforest. The islands vary in distance to the mainland and have strong ocean currents. Using 10-loci genotypes, her preliminary data suggests divergent populations and surprising isolation throughout the island chain. With the exception of Kupreanof Island, she found that bears from each island harbor unique allele profiles.

Facing threats from unsustainable hunting pressure and habitat fragmentation, *Tremarctos ornatus* is certain to benefit from non-invasive studies of population genetics. Paulina Viteri reported on the methods she used to assess the population of bears in the 16,500 ha Oyacachi River basin. First she explored Andean bear genotypes using tissue taken from captive bears. Armed with that laboratory experience, she collected 47 scat and hair samples in the field, and using 13 microsatellite markers, she identified 25 individuals. Genetic diversity in the wild bear samples ($H_e=0.4835$) was higher than that of captive bears ($H_e=0.3853$). Manuel Ruiz-Garcia of Pontificia Universidad Javeriana, Bogota, Colombia, presented the population genetic structure of the Andean bear found in Venezuela, Colombia, and Ecuador. Genetic diversity not only was found to be lower than the global population ($H_e=0.24$ and 0.38 , respectively) and neotropical carnivores in South America, but was the lowest value of heterogeneity found in mammals thus far. Responsible factors appear to be low gene flow, gross habitat fragmentation, an inability to achieve a Hardy-Weinberg equilibrium, and an isolation-by-distance paired with a possible ancient bottleneck during colonization 16,000-30,000 years ago and a total population estimate of 19,000-24,000 animals.

Poster Session

Session Chair: Tor Kristian Spidsø

A total of 30 posters were shown. In addition to the poster session, posters were exhibited from Tuesday through Friday. The posters covered a wide range of topics and were of a high standard.

A comparison of reproduction of brown bear was made between captive and wild Hokkaido brown bear and bears in North America.

In India human casualties and agricultural crop damage by sloth bear were shown to be serious problems. Attacks on human beings and agricultural crop damage by sloth bears are on the sharp increase.

Management of brown bear in Northwest Russia was presented. Hunting was an important part of the management.

In Scandinavia in an area with a relatively high density of brown bear and a moderate density of moose, the bear took approximately 26% of the moose calves born during the study period.

In the USA a method of monitoring the bear population by use of short pieces of barbed wire attached to rub trees were presented. DNA analysis was used to determine the species, gender and individual identity.

In the USA the effects of vegetative habitat characteristics and antenna orientation on proportion of successful relocations for GPS collars was assessed.

One study focused on the attitudes and knowledge of Alberta, Canada citizens towards brown bears, and these results were then compared to the results of a Slovenian bear study.

Genetic analysis was carried out using microsatellites and sex specific PCR markers to characterize the

brown bear population in central Austria. The aim was to determine a more accurate estimate of the population size and sex ratio.

In the Greater Yellowstone Ecosystem the importance of army cutworm moths (ACM) to grizzly bear conservation has been studied. Understanding ACM population structure and migration to the Rocky Mountains is important to grizzly bear conservation. In addition to being a rich and heavily used food source, ACMs lure grizzly bears up to precipitous high elevation terrain where the bears separate themselves from areas of human activity.

In Norway brown bear predation on domestic sheep was studied. Bears accounted for 96% of the losses of radio collared ewes, and 42% of the collared lambs. Ewes with bells had a higher risk of being killed than ewes without bells.

The effect of seismic cutlines on landscape use of grizzly bears was studied in Canada. Their distribution and effects as a major fragmentation feature on landscape structure have been assessed.

In Finland seasonal movements of male brown bears at the edge of a core area was studied.

In another study distance between cattle farms and apiaries to brown bear observations was presented.

Denning habitats of brown bears and Asiatic black bears was studied in the Russian Far East. Female brown bears entered dens earlier than did males.

Status and management of the brown bear in the Russian European north was presented.

Brown bear predation on semi-domestic reindeer was studied in Finland.

A presentation on human-bear relationships among forest living reindeer herders in eastern Siberia was given.

In Slovakia use of livestock guarding dogs to protect sheep from bears and wolves was studied.

Black bear predation on cattle in Mexico and the influence of canopy cover on kill frequency was studied.

From Norway a poster on a program of information and dialogue focused on conflict in rural areas.

A conservation program for the Andean bear was presented.

Studies on Asiatic black bear from Japan indicate that the seasonal feeding history of a bear is recorded along the length of its hairs.

In a study on management of brown bears in an area in Alaska, evidence indicates that the high levels of harvest have not significantly reduced grizzly bear abundance over this large area so far.

An awards committee consisting of Rolf Brittas, Sweden; John Schoen, USA; Martin Smith, USA; and Tor Kristian Spidsø, Norway (chair), evaluated the posters. The committee decided to give the first prize to two posters, Katherine C. Kendall, David Roon, Jeff Stetz and Lisette Waits for *Bear Rubbing Activity: Implications for Population Monitoring*, and Maria Wechselberger for *Wildlife Corridors and Their Effects on Brown Bear (Ursus arctos): A Comparison Survey Between Alberta (Canada) and Slovenia on Knowledge and Attitudes*. It was decided not to give out a third prize because with so many excellent posters, it would have been unfair.

Bear Management Issues

Session Chair: Francisco Cuesta

The management of wildlife is focused on the development of strategies and actions that allows the co-existence between humans and wildlife, taking into account the fact that they compete for the same resources. These actions are implemented at different levels and scales depending on the country. The management session dealt with an array of topics focusing on conservation of bear habitat or interactions of humans and bears.

In Scandinavia these actions are strongly oriented to recover the few brown bear populations that still remain. Their actions try to accomplish the national policy goals defined by the Swedish and Norwegian governments. Their management actions must be based on a political and socio-economic framework that allows the accomplishment of their goals through the reduction of human-bear conflicts due to livestock predation and to positively influence the local attitudes and practices towards bears. It is important to note that there are differences in cultural perceptions between Norway and Sweden which result in important differences in the management actions developed.

In countries like Turkey and Croatia the main strategies adopted have been to link small remnant populations by an integrated system of protected areas and to reduce the negative impact of development infrastructure, such as roads. Lack of ecological information regarding the brown bear limits the effectiveness of the management action.

On the other hand, the work in South America is oriented to gather biological and ecological information about the Andean bear in order to design conservation strategies at a regional and local level. These strategies include management actions that can help increase the amount of Andean bear habitat under protection and can reduce the mortality of individuals due to human-bear conflicts. The Andean bear has been identified as a flagship species that allows development of management actions for natural resources associated with mountain ecosystems.

In the case of the Malaysian bear and the sloth bear, conservation actions have been focused on the generation of basic information on the ecology of the species to help understand the effects of the loss and fragmentation of tropical forests, and the different impacts that human activity can have on the animals. Lack of information on these important topics prevents the development of sound management actions on habitat or wild populations.

In North America, management of bears has mainly been directed to maintain productivity of populations in order to sustain hunting activities. There is also a strong focus on understanding the impacts of human activities in the carrying capacity of

the habitats used by the species. For the grizzly bear, there is only one solid investigation available on its ecology that allows the development of management actions on its habitat, and conservation actions that will help improve the viability of remnant populations and reduce conflicts with human populations.

The different levels of wildlife management among countries that have bears species are influenced by three main factors: socio-economic situation, cultural perceptions about the species, and the institutional and political framework of the countries. Poverty in Asian and Latin American countries together with a weak institutional framework has limited the knowledge on the ecology of their bear species, which impedes the development of adequate bear management actions. On the other hand, the socio-economic situation and the level of knowledge of bears in Scandinavian and North American countries has allowed the development of management actions focused on the long-term maintenance of viable populations.

Landscape & Habitat Approach in Bear Research & Management

Session Chair: A.J.T. Johnsingh

India has not done any specific landscape level planning for bear conservation, but several priority landscapes have been identified for the protection of tiger and Asian elephant. Planning conservation areas requires information about the size of the area, species population size and its habitat needs, threats to the habitat, need for corridors to connect fragmented habitats, and how local people can be involved in the conservation programs. While planning conservation measures it was realized that India was 30-to-50 years late, as unplanned developments have already fragmented the habitats for which corridors are now being identified and established. Landscape level planning is much easier in countries like Sweden where human population density is low, but will be difficult in regions like Southeast Asia and South America. Real challenges of conservation lie in such areas.

Dave Augeri from the United Kingdom investigated sun bears across four study areas on the islands of Sumatra and Borneo. Two phases of field work were being conducted and phase one was near completion, which included bear sign counts, forage productivity and diversity surveys, habitat assessments, and genetic analysis from scat and hair samples. Phase two involves density estimates using camera traps.

Naim Akhtar from India spoke about habitat utilization by problematic sloth bear in disturbed and undisturbed habitats. He quantified habitat types, other habitat parameters and food habits. He concluded that there was no avoidance or preference for any habitat type.

Leonid Baskin from Russia identified forest fragmentation as the main

factor of brown bear range decline in Eastern Europe. The history of brown bear in Eastern Europe proved that the species survived in areas where the land had more than 40% forest cover. Patch size and shelter characteristics were also found to be important for bear survival. Bear density was enhanced by the habitat having a mosaic of mature and young forests.

D.P. Onorato from the USA presented details on home range, habitat use, den modeling, and management implications of American black bears in Big Bend National Park of southwestern Texas. Males and adult bears had larger home ranges than female and sub-adult bears. Home ranges in the xeric habitats were larger and vegetation associations were used in a non-random fashion. Suitable den habitat was in close proximity to park hiking trails. Emigrations of bears to Mexico showed the instability of the population.

Francisco Cuesta gave a presentation on habitat use of the Andean Bear in the Oyacachi River basin, Ecuador. The study included sign surveys, habitat use analysis and habitat modeling. He concluded that sign surveys provide useful ecological information. GIS and multivariate statistical analysis have great use in evaluating habitat.

Manuel Peralvo from Ecuador spoke about defining priority areas for Andean bear habitat conservation. The study used sign surveys and evaluated biophysical and ecological variables for every site where signs were recorded. Conservation areas were modeled using the Digital

Terrain Model. The study concluded that ecological parameters, biophysical and socio-economic criteria are vital for a successful conservation process.

Barbara Schwab studied brown bears in the Yellowhead Ecosystem, Canada, and outlined that the Graph Theory Approach with information from remote sensing GIS and GPS telemetry techniques, provided an opportunity to study habitat connectivity in the context of habitat use and human influence.

Djuro Huber from Croatia made a presentation on the use of infrared sensors for recording crossing by brown bears and other large- and medium-sized mammals across a specially constructed green bridge at Dedin in Gorski Kotar. A total of 6,364 crossings were recorded during 360 different days of monitor operation. Animals taller than 40 cm which used the bridge were roe deer, red deer, wild pig, brown bear, wolf and humans.

All the presentations were well received by the audience and the presentation by Barbara L. Schwab won the first prize for this session.

The eight presentations included five bear species from all four continents where they occur. The studies emphasized the importance of amalgamation of simple methods such as sign surveys with the use of modern techniques such as GIS, remote sensing, radio-telemetry, and the use of sophisticated statistical software for data analysis.

Bear Human Conflicts

Session Chair: Diana Doan-Crider

This session nicely summarized the conference theme "Living with Bears."

Hal Morrison presented his paper *Grizzly bears and visitors in the Moraine Lake area of Banff National Park (Canada) – How effective is restricted access at allowing controlled visitation while maintaining grizzly bears in the area?* While park visitors and managers are not particularly keen about backcountry closures, managers are still confronted with the reality of having to ensure both visitor and bear safety. Overall, the program seemed to be successful, and will likely improve with some modification to ensure regulation compliance.

Isaac Goldstein presented his paper *Spectacled bear-cattle conflicts: a regional perspective*. As the human population in South America increases and encroaches upon Andean bear habitat, bears are brought into close proximity to humans and their livestock. This research team is currently developing protocols to identify predation problems through local managers, and implementing programs that will help people to better understand Andean bears and their ecological needs in a challenging environment.

After lunch, we watched two videos. The first was *Working in Bear Country – For industrial managers, supervisors, and workers*. This video has received the endorsement of the IBA, and is an excellent tool for educating people who work in bear country, but may not have the necessary familiarity with bears to ensure safety. Pierre Yves Quenette presented the second video as part of an international brown bear restora-

tion program in the Pyrenees Mountains. The film recorded a young male brown bear that was released into the mountains of France. We were entertained as we watched the bear play in the snow, climb the rocky cliffs, and just simply be a bear that didn't know he was being watched.

Dick Shideler presented *Evaluation of hazing to reduce conflicts between grizzly bears and oil production activities in the Prudhoe Bay oilfields, Alaska*. Conflict reduction is focused on improving structures to keep bears from breaking into facilities, providing a cultural understanding to workers so they understand the ramifications of bear habituation, and the actual removal of problem bears.

Juan Carlos Blanco presented *Brown bear interactions with large mammals; implications for its conservation in the Cantabrian mountains*. This team studied the frequency of interactions of female bears and their cubs between other mammals such as dogs, wild boar, deer, people and other bears. Their overall conclusions were that in order to protect the bear population, free-ranging dogs, forest roads and tourism should be limited. They also felt that infanticide might be a significant influence in survival rates.

Marko Jonozovic presented *Density of European brown bears and the extent of reported bear damages in Slovenia: do they have anything in common?* The

brown bear population of Slovenia is expanding into areas that are occupied by humans or are being used for human economic development. Most conflicts arise between sheep and bears, which seems to be increasing, and Marko is challenged with preventing any problems before they arise in order to ensure the continued expansion of this population.

Finally, Frank Christiansen presented his work on *Preventative measures toward predator damages on sheep; herding and the use of livestock guarding dogs in Lierne Community*. Frank's knowledge about dog behavior, and his familiarity with the sheep industry provided us with good insight for the potential of coexisting with bears. It appears that sheep farmers using these techniques experienced a dramatic reduction in predation problems, although the overall sheep farming community seems a bit skeptical in adjusting their management strategies. It is possible that the future of brown bears in Norway depends upon the community's ability to re-adapt to an old way of life.

Limitations for Releasing Rehabilitated Bears Workshop

Workshop Chairs:

Jiska van Dijk

&

Djuro Huber

The workshop started with an overview of the current situation at different rehabilitation centers around the world. The only similarity among the different rehabilitation programs is that bears are kept in captivity over a period of time. The age of bears (traffic victims, orphaned cubs) and the treatment or care (foster parents, minimized human contact) is different in each rehabilitation program. These differences have their impact on the released bears and therefore on the wild population. The conservation value of rehabilitation is debatable and the aim of the workshop was to define the limitations for releases of rehabilitated bears to minimize the possible negative impact on bear conservation.

After the introduction Joe Clark was asked to give a presentation of his experiences with reintroduction programs. According to Joe, one should create a broadly-based acceptance by involving the public. This is a necessity for the success of both reintroduction programs and release programs. He also asked two questions that he thought needed attention:

- Should IBA, as an organization, rule out possibilities for rehabilitators and dictate policies for agencies?
- Do we have sufficient knowledge about the development of the different bear behaviors and about how to "reprogram" the behavior of habituated bears?

Djuro Huber outlined his experiences with releasing rehabilitated bears that later became nuisances. Those bears formed a severe threat to the conservation of the wild bear

population. Djuro argued in favor of preventing bears coming into human hands and emphasized habitat preservation. Djuro gave an example in which captive bears can be used for conservation education by permanent placement in a large sanctuary that is open to the public.

Several statements for discussion were offered by Jiska. The statement, "releases of captive bears without any kind of rehabilitation should not be done at all," was rejected because the form of captivity should be defined. Human interactions should be limited, but again this depends on how long the bear will be in captivity and what kind of treatment or care the bear will get.

The statement, "from a conservation point of view it is advisable to recommend against releases of rehabilitated bears," was accepted. Also from a population perspective it is not reasonable to release rehabilitated bears. Still, rehabilitators might not be interested in wildlife conservation, so that rehabilitation and release is an issue related to animal welfare rather than to animal conservation. However, rehabilitation and releases may be contradictory to conservation attempts. The creation of problem bears threatens public acceptance and rouses anti-conservation opposition.

Linked to this discussion is the question about how to define the success of a rehabilitation and release program. The degree of biological success (survival rate, behavioral aspects) may differ for the different bear species. Success in terms of gaining public awareness also differs by region. However, people all over the world like to believe that a particular bear has survived because of their action. It makes people feel good and it is easy to forget about the consequences.

If enough funds are available to rehabilitate and release bears, to monitor them adequately and to monitor the wild bear population, then releases can be carried out as experiments. This may result in gaining insight in how to increase the biological success and its possible contribution to bear conservation. In all cases the IUCN reintroduction guidelines should be followed.

It is a must that more knowledge on different behavior on the ontogeny of bear cubs is obtained. The problem at the moment is that rehabilitators have a lot of knowledge on these issues but there is no exchange of information with them; nor is it easy to share this knowledge because it is not standardized. Rehabilitators are not often consulted in the exchange of scientific data and different protocols make data difficult to compare.

After the discussion five concluding statements were formulated and agreed upon:

- If a bear is found, it should be released back into the wild before it is habituated.
- If bears are to be released, it should be done for the benefit of the conservation of the wild population only. Such action should not be based solely on human emotions.
- Attempts to rehabilitate bears for reintroduction purposes are only justified in cases when there is no other source of wild bears to be taken.
- If releases of rehabilitated bears take place, careful monitoring of the released bears is highly recommended.
- There should be an emphasis on information exchange between rehabilitators and bear biologists.

Monitoring the Brown Bear in the Italian Alps Through Non-invasive Genetic Sampling

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The brown bear became extinct in the Alps in the last century, due to habitat loss and conflicts with humans. In 1998 only three individuals remained in a geographically restricted range in Western Trentino, in the Italian Central Alps. In 1999 a translocation plan was initiated by the Adamello-Brenta Natural Park in collaboration with the Trento province and the INFS (National Wildlife Institute). The program was co-funded by the European Union through a LIFE program. Between 1999 and 2002, 10 bears were captured in Slovenia, fitted with radiocollars and released into the park. One female died in 2000 under an avalanche. Last spring two newborn cubs were seen with one of the introduced females: the first reproduction event since 1989! Two bears are still radio-tracked by the park.

In order to ensure the persistence of the alpine brown bear population, a monitoring program, which will provide demographic and reproductive information on the relict and reintroduced bears, is critical. Recapturing animals to install new radiocollars is expensive and puts the population at further risk and stress. The primary objective of my research is to verify if non-invasive genetic sampling is an effective way to gather the necessary information, without handling animals, since DNA is obtained from hair and feces collected in the field. In addition these techniques will allow assessment of potential gene flow with the bear population of the Eastern Alps, by identifying bears naturally

arriving from Slovenia. The study is part of my Ph.D. project being conducted in cooperation with the University of Idaho, the INFS, the Trento Province and the Adamello Brenta Natural Park. Lisette Waits is my advisor at the University of Idaho and co-investigators are Ettore Randi and Piero Genovesi at the INFS. The project is supported by a grant from the IBA.

This case study presents a challenge not found anywhere else in Europe. Bears live in an area of about 6000 km² intensively exploited by humans. Human density is high, mostly concentrated in the valleys, where the economy is dominated by tourism and agriculture. Medium altitude areas are characterized by typical rural economy, with farming and livestock breeding. In the higher areas density of residents is very low, and concentrated in the winter sport centers. Bears have historically lived in this region and in fact the goal of the LIFE *Ursus* program is "the reestablishment of a viable population of bears in the central Alps in coexistence with people." In addition, a monitoring system must also support the implementation of an effective policy for mitigation of human-bear conflicts.

The goal of this year's summer field season was to gather information in order to plan and better define strategies to apply the next year. Field activities were concentrated from the beginning of September through mid-October. We set up a limited number of hair traps in two main areas which are known to be historically important for the indigenous bears and extensively

used by the introduced bears. Traps were of the same kind used in the United States and in Canada for bear research. Our efforts were to assess efficacy of different trap sites, trap design and bait. In regard to the density of inhabitants, it was necessary to carefully select sites. In order to test which sampling method will be more effective to detect individuals, we considered sign survey and rub trees as alternative or complementary methods to the hair traps. Kits for scat and hair collection and storage were delivered to the forest service, hunting association and the park personnel, so that during regular daily field patrol activities they will collect samples. I collected samples from indigenous and released bears to build a reference collection of known genotypes. These samples were previously collected at the capture and release of the reintroduced bears and from sign survey in the field. A significant amount of time was spent involving the local forest service and hunting association in the project through meetings focused on the research purposes and ways in which it will be carried out. The involvement of these parties, as well as of the park, at each level of the study, is critical to achieve the goals of the project, because the future of bears in the Central Alps primarily depends upon the acceptance of the local people.

Limiting Bear Expansion in Croatia

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As in most countries with a stable or increasing bear population, bears more or less frequently appear where they are not expected. The reactions of local residents typically range from enthusiasm to panic — the latter prevailing. Some people would like to feed such a bear and keep it in the area, while others fear the bear and keep their children indoors. Residents always speculate about why the bear arrived. Either they believe it is hungry or disturbed (unhappy) in its normal range, or bears are overcrowded elsewhere, or somebody (e.g. researchers) introduced the bear. The media follow all the stories and keep the situation hot. Unless the bear disappears (returns to its normal range) there is no happy ending. The bear is killed by traffic or has to be destroyed, with bitter comments reported in the same media that a day earlier reported how dangerous the situation was.

In Croatia we see all of this. We have brown bears that swim to the island Krk, less than 0.5 km from the mainland. Three bears were shot there in the last few years, and at least three more are claimed to live there now. The island is big, forested, and has plenty of unguarded sheep. Along with sheep owners, the tourist workers are afraid for their industry. In the Plitvice Lakes National Park, with over half a million visitors per year, nobody fears wild bears. However, this summer when one bear started to dig in garbage containers there was a quick decision to destroy it — even faster than the decision to remove the garbage containers.

In one part of the bear range in Croatia (Primorsko-Goranska county) the officials appointed me, together with Alojzije Frkovic and Josip Kusak, to prepare the local bear management plan. The plan was expected to draw the line for bear expansion toward the Adriatic Sea coastline. Below the line the bears would be discouraged, and above it they would be managed as a game species. According to our studies bears do travel outside of their range following attractions such as maize feeders for wild boars, or even farther towards the coastline to garbage dumps, or along the roads and around houses to other food sources. The demand to stop feeding wild boar has been refused, and it is difficult to assign responsibility to improve garbage management in a timely manner. The hunting organizations above the line are not happy to include bear on the list of their game species. They know that the interest in bear trophies is decreasing with the increasing limitations for international transport of bear parts (CITES), and the number of bears available to be hunted is exceeding demand.

Hence, the reactions to the first draft plan demonstrated the full range of emotions, beliefs and conflicting interests when a large carnivore is the concern. However, through discussion and negotiations around each issue and with each interest group, we approached a general agreement. It remains to be solved how to incorporate the plan into the framework of national and international laws. The conclusion is that the management of a large carnivore like the bear requires continuous care with no final solutions. Many compromises are unavoidable, but the species may be saved on the traditional range, while expansion has to be carefully managed and eventually limited.

Brown Bear in Iran

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&
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Iran is famous for its ancient culture and dry climate. But 10% of the 1.65 mil km² area is considered to be forested. On the steep northern slopes of the Elburz mountain ridge an 800 km long and 20-30 km wide forest belt, the Caspian forest can be found (19,000 km²). It is the remaining primary deciduous forest in the temperate zone of the whole northern hemisphere and the main brown bear habitat in Iran. Three distinct brown bear (*Ursus arctos*) populations can be found in Iran: the Elburz population (1300 ± 300 individuals), the Caucasus population (approximately 100 bears) and the central Zagros population (approximately 100 bears). The brown bear in Iran is protected by law and forbidden to be eaten by Muslims (Haram). We believe the Caucasus and Zagros populations are vulnerable because of their small sizes and isolated habitats. The Elburz population seems to be stable and safe at least in the near future.

A John Sheldon Bevins Memorial Foundation grant from the IBA helped fund our research efforts in 2001, and a paper for the IBA journal *Ursus* is in preparation.

Preliminary Results: Using Non-invasive Sampling to Study Spectacled Bear Population Genetics in Ecuador.

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The spectacled bear (*Tremarctos ornatus*) was classified as threatened by the World Conservation Union in 1974 and is in appendix 1 of the Convention on International Trade in Endangered Species of Wild Fauna and Flora. In Ecuador, the spectacled bear occurs from the tropical rain forest to the snow line on the eastern and western slopes of the Andes, which produces most of the water used for energy, irrigation and consumption. Rapidly increasing human population has caused a decline in the number of spectacled bears. New road construction, expansion of towns, and the over use of natural resources have fragmented core habitat areas and destroyed dispersal corridors (Ferro 1994). Bears also are killed when they damage agricultural crops and for their body parts that are used in traditional medicine (Suarez 1989).

The spectacled bear in Ecuador has a strong cultural connection with Andean communities (Cuesta et al 2000), and it has been important in conservation planning of tropical and subtropical ecosystems (Yerena 1993). Also, its presence has been used in other Latin American countries to index good quality Andean habitats. Therefore a management plan to preserve the spectacled bear and its habitat will be an important step to maintain the biodiversity of this fragile environment (White 1991).

In recent years, some non-governmental organizations have focused their

efforts on the preservation of the spectacled bear with programs including: education of communities living inside national parks or biological reserves; research on the ecological factors that influence the population; and human impact on bear habitat. A reintroduction program is also being considered to maintain bear populations where they are declining or are locally extinct. However, an important step for the conservation of the spectacled bear is to obtain information to assess population density, distribution, and to understand its population genetic structure. Ideally, this information should be obtained prior to any reintroduction program.

The project's objectives are: to identify informative mtDNA loci and microsatellite DNA (STR) markers within the spectacled bear genome; and to estimate rates of gene flow and compare genetic distance with geographic distance between the two populations in Ecuador. We will also examine genetic relatedness of individuals within each population to make recommendations for managing the spectacled bear in Ecuador, including strategies for translocation and recommended size of habitat preserves.

In 1999 and 2000, with funds from Ecociencia (Fundacion Ecuatoriana para Estudios Ecologicos) and the help of trained community members we collected scats and hair samples from two populations: in Sangay National Park (SNP) and in Cayamber-Coca Ecological Reserve (CCER).

We extracted DNA from 67 samples (37 scats and 30 hair samples) from CCER and 13 (hair samples) from SNP for a total of 80 samples. A 480 base pair region of the mitochondrial DNA (mtDNA) Control Region I (CRI) and five microsatellite loci have been amplified for 25 samples (19 from CCER and 6 from SNP).

Preliminary results show higher success rate for hair samples versus scat samples (97% vs. 18% for CRI and 63%

vs. 17% for STRs). The proportion of nucleotide sites variable in the mtDNA is $P_s=0.17$ and the mean heterozygosity for 5 microsatellites (G10A, G10B, G10C, G10M, G10J) is 0.29 (0-0.45) and the range of number of alleles is 1-7. These numbers are lower than shown for American black bears (*Ursus americanus*), which for microsatellites range from 0.36 – 0.80 and 2.3 – 8.8 average alleles for mtDNA (Paetkau and Strobeck 1994). However these are preliminary results and we plan to increase the number of samples and the number of STR loci.

We want to thank the communities in CCER and SNP. This project would not be possible without the help of Francisco Cuesta, Manuel Peralvo, Didier Sanchez, Jaime Camacho and Saskia Flores. Thanks to the IBA for the support to do part of the data analysis.

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Chaparri Progress

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A project to radio-mark spectacled bears in the Ecological Reserve of Chaparri (ERC) in northern Peru was one of the recipients of an IBA grant. As mentioned in previous issues of the newsletter, ERC is the first privately created reserve in Peru. The purpose of the project is to get detailed information on the habitat needs and movements of spectacled bears that live in deserts and dry forests. This grant, with additional funds from the Brookfield Zoo in Chicago, covers the costs of building eight barrel traps and employing them in the field. The combined funds will provide training and five months of employment for people from Santa Catalina de Chongoyape where ERC is located, and from two neighboring communities whose members are in the process of creating their own private reserves. The research is part of a program to monitor the status of bears in northern Peru and to connect parks with protected corridors, many of which will be community-based initiatives such as Chaparri. The local participants are expected to become park guards of their respective reserves.

Apart from the focus on local residents, this project is a volunteer collaborative effort of more than a dozen IBA members who donated funds for travel and equipment, or will donate their vacation time and salary. The field season will begin in late October. This is the height of the dry season, a time when bears have few natural foods to sustain them. Heinz Plenge is gathering materials to make barrel traps based on a

design Harry Reynolds provided with help from Karen Noyce. Karen, Harry, Bruce McLellan and Gordon Warburton, will take slightly overlapping shifts of 10-14 days to train local residents, students and government employees in capture and handling techniques, and telemetry. We will be joined by biologists Isaac Goldstein of Venezuela, and Francisco Cuesta and Armando Castellanos of Ecuador, and Marcelo Stucchi and Judith Figueroa from Peru. The discussions between these leaders should help prioritize plans for bear conservation in their respective countries. We are grateful to the IBA and its grant review committee for their support of this project. We also thank the organizing committee of the 14th IBA conference in Norway for providing a forum to allow South Americans to meet and discuss their issues.

Need: Bear Skeleton Atlas

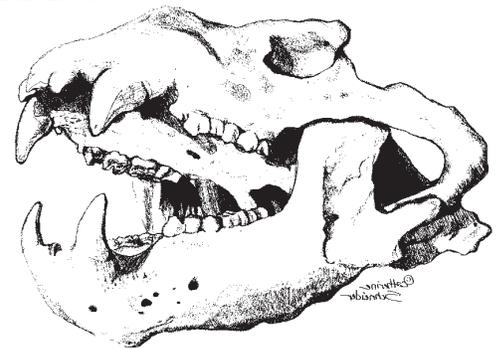
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I am teaching an archaeology laboratory class using data recovered from a Late Woodland Indian hamlet site that I am excavating. I have recovered a number of bear phalanges from the site but few other bear bones. Can you direct me to a

MacNeil River Scientific/Education Permits

Joe Meehan
Alaska Department of Fish and Game
Division of Wildlife Conservation
Southcentral/Southwest Region
333 Raspberry Road
Anchorage, Alaska 99518, USA
Phone (907) 267-2281
Fax (907) 267-2433
Email: joe_meehan@fishgame.state.ak.us

Applications for Scientific and Educational Permits to visit the McNeil River State Game Sanctuary in Alaska during summer 2003 are now being accepted. These limited permits are issued outside the regular lottery permit system and are available to those who have a demonstrated need to visit McNeil River for scientific or educational purposes. Application packets must be received by December 1, 2002 and can be obtained from the Alaska Department of Fish and Game, 333 Raspberry Road, Anchorage, Alaska 99518, USA; (907) 267-2182; or joe_meehan@fishgame.state.ak.us.



resource for a bear skeleton atlas? I have several bones that I am trying to identify as being either bear or not and such an atlas would be very helpful.

Thank you for your time.

Grizzlies and Army Cutworm Moths

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I have received three grants from the IBA in support of my dissertation research (see May 2002 newsletter). My research focuses on the migratory ecology and population genetics of the army cutworm moth (ACM), *Euxoa auxiliaris*, as they relate to grizzly bear (*Ursus arctos horribilis*) conservation. I am particularly interested in where the ACMs that the bears feed on are migrating from in the Great Plains. This information is important to grizzly bear conservation because weather patterns, habitat conversion and pesticide use in ACM origins will influence their abundance and availability to grizzlies.

The ACM is a noctuid moth native to North America. ACM larvae feed on emergent plants in the Great Plains and pupate in underground cells. The adult moths emerge in June and migrate from the Great Plains to the Rocky Mountains. ACMs are one of the several moth species often referred to as "miller moths" by many people who live on the Rocky Mountain front.

Upon reaching the Rockies, ACMs feed on the nectar of alpine flowers at night and hide in talus slopes and metabolize sugars into fat stores during the day. Grizzly bears excavate the lipid-rich moths from the talus and consume them in the thousands. Previous research has shown that a grizzly bear can

consume enough ACMs in 30 days to meet half of its yearly energy needs.

My goal is to determine ACM origins by analyzing variation at microsatellite loci with population genetic methods. From 1999-2001, I collected ACMs from 11 high elevation sites and from 42 surrounding low elevation sites. To date, I have developed six polymorphic loci for the ACM, and I am currently generating and analyzing the genetic data from my ACMs samples. I presented these loci at the IBA's 14th International Conference on Bear Research and Management in Steinkjer, Norway, August 2002.

Understanding the population genetics and origins of ACMs will help scientists and managers understand the scale at which weather patterns, habitat conversion and pesticides influence ACM numbers and, ultimately help them foresee potential booms or crashes in this important food source.

The financial support I have received from the IBA has helped me fund field and laboratory work. My project has also received support from the following contributors: Yellowstone Park Foundation, Camp Fire Conservation Fund, the International Bear Association, the Rob and Bessie Welder Wildlife Foundation, the American Museum of Natural

History, the Wyoming Chapter of the Wildlife Society, and Sigma Xi for this research. Donations from the Turner Foundation, the Bernice Barbour Foundation, Earth Friends, and the National Park Foundation were also contributed through the Yellowstone Park Foundation. This project is coordinated through the Interagency Grizzly Bear Study Team and the Yellowstone National Park Bear Management Office. Montana State University Bozeman Agricultural extension agents and their collaborators have provided ACMs from low elevation sites from throughout Montana.

A Survey of Regulations on Black Bears in the United States

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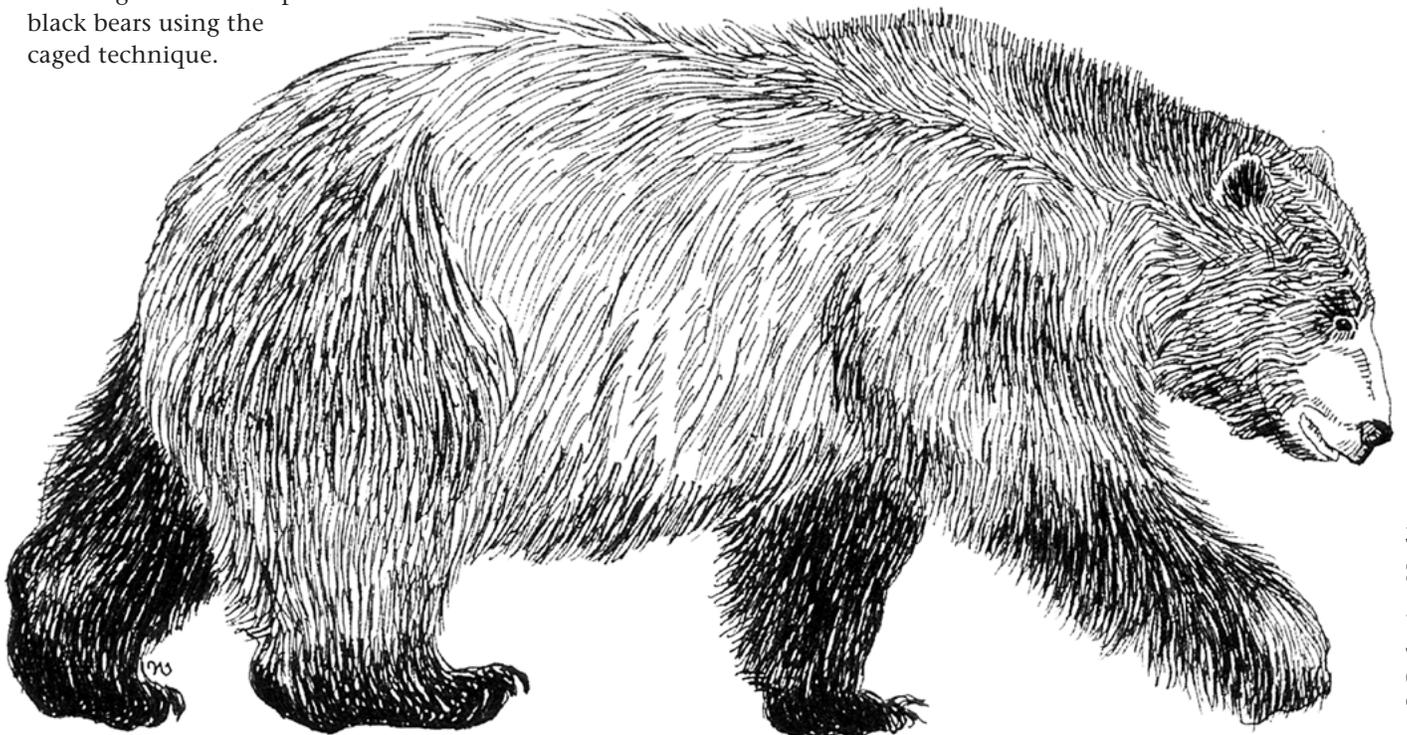
This survey was initiated after the IBA was contacted by citizens of Wisconsin who were concerned about the use and breeding of captive American black bears for dog trials and training hounds for bear hunting. This practice apparently began with raccoons, which is common in several states. With raccoons, the animal is usually in a cage hoisted into a tree. Dogs are set on the trail with the caged animal as the goal, and the dogs are judged on their performance. The raccoon may also be placed in a round metal cage in a larger enclosure, from which it can run from the dogs. In Wisconsin, a private facility began conducting such dog trials with captive black bears using the caged technique.

When they began using a giant version of the round cage, people started to complain to the state that this was animal cruelty. The state of Wisconsin held a hearing in March 2002 to discuss the use of captive American black bears during dog trials and training dogs. Proponents claim that the bears are unharmed in the practice, and actually look forward to contact with the dogs.

Concerned individuals brought this issue to the IBA to request information on methods to measure stress or other indicators of the effects of this action on bears. A new law was drafted in Wisconsin to prohibit the exercise ball but allow dog trials on caged captive bears. Illegal issues such as pitting or fighting bears and dogs, or illegal hounding was not considered. Currently, the only other state that permits hounding captive bears for dog trials or training purposes was Illinois.

During the process of gathering information, IBA decided to gather information on other regulations related to bears from each state (continental USA). This table grew from that effort because laws pertaining to hunting black bears have changed in recent years in many states. We hope that this update is of use to readers and thank the many persons who responded to requests for information by telephone or email. The question of baiting is somewhat complicated by several factors. In this table, the term "baiting" is used only for hunting over the site. For general feeding or baiting for other reasons outside of the harvest season, we used the term "feeding." Additionally, several states allow baiting or feeding other wildlife, especially deer or feral hogs, which feed bears as well.

Sources contacted were state wildlife agency or law enforcement personnel via email or telephone.



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State or Province	Status	Any Bear Season	Dog Hunt Season	Wild Bear Train/ Chase Season	Private Captive Bears	Captive Bear Training Season	Baiting	Comments
Alabama	Game	No	No	No	Yes	No	No	Small population in very southern Alabama only
Alaska	Game	Yes	Yes*	No	No	No	Yes*	Dogs and bait require permits, use of dogs is very rare
Arizona	Game	Yes	Yes	No	No	No	No*	*Baiting season in commission rules, but has not been authorized in over 15 years
Arkansas	Game	Yes	No	No	Yes	No	No*	*No harvest over bait, can bait 30 days prior to start of season
California	Game	Yes	Yes	No	No	No	No	
Colorado	Game	Yes	No	No	No	No	Yes	
Connecticut	Protected	No	No	No	No	No	No	
Delaware	Exotic spp.	No	No	No	No	No	No	No wild bear population since colonial times
Florida	Threatened*	No	No	No	Yes	No	No**	*State listed only, no status in 2 counties, no open season. **Baiting for deer is legal on private lands, which feed bears as well.
Georgia	Game	Yes	Yes	Yes	Yes	No	No*	*No harvest over bait, can bait all year until 2 weeks prior through the season
Idaho	Game	Yes	Yes	Yes	No	No	Yes	
Illinois	Extirpated	No	No	No	Yes	Yes*	No	No wild bear population, may be some transients. *In southern Illinois. Not considered a wildlife issue, exhibit permits through USDA.
Indiana	Extirpated	No	No	No	Yes	No	No	
Iowa	Game	No	No	No	Yes	No	No	No wild bear population, occasional transients from Minnesota or Wisconsin
Kansas	Wildlife	No	No	No	Yes	No	No	No wild bear population, incidental sightings in extreme southeast and far west
Kentucky	Protected	No	No	No	No*	No	No	*Exceptions are educational permits.
Louisiana	Threatened*	No	No	No	No**	No	No	*Federally listed endangered species. **A few were grand-fathered in
Maine	Game	Yes*	Yes	Yes**	Yes	No	Yes	*Includes trapping season. **Training not statewide.
Maryland	Game	No	No	No	No	No	No	
Massachusetts	Game	Yes	No	No	No	No	No	
Michigan	Game	Yes	Yes	Yes	No*	No	Yes	*Older captives bears are grand-fathered in.
Minnesota	Game	Yes	No	No	No	No	Yes	
Mississippi	Endangered*	No	No	No	Yes	No	No**	*State listed, southern half has added federal listing as Threatened for U. a. luteolus. **Feeding wildlife is legal
Missouri	Rare	No	No	No	Yes	No	No	
Montana	Game	Yes	No	No	Yes	No*	No	*May be possible under commercial menagerie permit.
Nebraska	Game	No	No	No	No	No	No	No wild bear population, occasional transients
Nevada	Game	No	No	No*	Yes	No*	No	*No "harassment of wildlife"
New Mexico	Game	Yes	Yes	No	No	No	No	
New Hampshire	Game	Yes	Yes	Yes*	No	No	Yes	*Training 7/15 to season opener
New Jersey	Game	No	No	No	No	No	Yes*	*If season was reopened
New York	Game	Yes	No	Yes*	Yes	No	No**	*Hounding with permit for nuisance/ recreation only. **Feeding bears is illegal.
North Carolina	Game	Yes	Yes	Yes	No	No	Yes	
North Dakota	Protected	No	No	No	Yes	No*	No	No wild bear population, occasional transients from Canada or Minnesota
Ohio	Endangered*	No	No	No	No	No	No	*State designation. Population estimated at 50-75 bears
Oklahoma	Game	No	No	No	Yes	No	No	Population newly colonized from Arkansas, only in 1-2 counties in SE.
Oregon	Game	Yes	No*	No	Yes	No	Yes*	*Only nuisance bears can be baited or hounded.
Pennsylvania	Game	Yes	No	No	Yes	No	No*	*Can feed wildlife, but not hunt over bait
Rhode Island	Unclassified *	No	No	No	No	No	No**	*Protected by closed season. **Feeding bears illegal as well
South Carolina	Game	Yes	Yes	No	Yes*	No	No**	*Under review to prohibit in the future. **Illegal to entice bears for any purpose,
South Dakota	Threatened	No	No	No	Yes	No*	No	No wild bear population, * Animal must remain in cage at all times
Tennessee	Game	Yes	Yes	Yes*	No	No	No	*Hunt 11 Counties, train only in 3 counties
Texas	Threatened*	No	No	No	Yes	No	No**	*State listed, east Texas has added federal listing as Threatened for U. a. luteolus.
Utah	Game	Yes	Yes	Yes	No	No	Yes	
Vermont	Game	Yes	Yes*	Yes	No	No	No**	*6 dogs max, with permit. **Can strike hounds over bait, but not hunt over bait
Virginia	Game	Yes	Yes	Yes	No	No	No*	*Feeding bears allowed on private lands only
Washington	Game	Yes	No*	No*	Yes	No	No	*Hounding and pursuit season removed by voters' initiative, but use of hounds for nuisance bears is allowed.
West Virginia	Game	Yes	Yes	Yes	No	No	No	
Wisconsin	Game	Yes	Yes	Yes	Yes	Yes	Yes*	*Baiting allowed 2 months prior to season
Wyoming	Game	Yes*	Yes	No	Yes	No	Yes	*Spring and fall seasons

New Position Manages Nuisance Bears in Gatlinburg

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The city of Gatlinburg, Tennessee, USA, Great Smoky Mountain National Park, Great Smoky Mountains Natural History Association, and the Tennessee Wildlife Resources Agency have agreed to support a position to manage American black bears in the city of Gatlinburg.

Gatlinburg, Tennessee has a long history of free-ranging black bears that forage on garbage and handouts from people in the city. The new bear officer will develop a pro-active management program designed to reduce human/bear conflicts, provide a safer environment for residents and visitors, and provide more flexibility for area law enforcement personnel to perform their regular duties.

Since 1 April 2002, Gatlinburg's new bear officer has trapped and relocated 18 nuisance bears, enforced city and state laws regarding both the indirect and direct feeding of bears in the city, and provided local residents with technical guidance in dealing with bears. Finally, a website, <http://www.wildlifemanagement.info/gatlinburg.htm>, has been created to help distribute important information on managing bears in Gatlinburg.

Florida Hiring Three Bear Biologists

The Florida Fish and Wildlife Conservation Commission needs three field biologists for an American black bear population monitoring study. Applicants must be available May 1 through September 12, 2003 and have completed a Bachelor's degree prior to May 1, 2003. Field experience is preferred. Duties include field scouting, installation of barbed wire hair snares, sample collection, range delineation, and data entry. The jobs require the ability to work independently in remote field locations and under adverse field conditions. Salary equivalent to \$925/biweekly with housing provided. Dependent upon acquisition of additional funding, positions may become fulltime. Applications will be considered until all positions are filled. Send cover letter, resume, and three references to:

Ms. Stephanie Simek
Bear Management Section
Florida Fish and Wildlife
Conservation Commission
620 South Meridian Street
Tallahassee, FL 32399-1600, USA
Phone (850) 922-9803.

Virginia Black Bear Management Plan

Dennis Martin, the Virginia Department of Game and Inland Fisheries (VDGIF) [American] Black Bear Project Leader announced that after more than two years of work and intensive public input, the final public driven, 104-page statewide *Virginia Black Bear Management Plan* has been approved by the board of directors. A copy of the plan and a

New Jersey Black Bears Test Positive for West Nile Virus

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In a cooperative effort between the New Jersey Division of Fish and Wildlife, and Rutgers University Department of Entomology, blood samples were collected from 51 denning American black bears during the winter of 2001. Three (5.9%) tested positive for West Nile Virus neutralizing antibodies, indicating that they had been exposed to the virus. Two of the three bears that tested positive were denned in Sussex County, New Jersey (Franklin and Sandyston Townships), while the third was in Warren County, New Jersey (Harmony Township); all were adult females with newborn litters of two cubs each. Agency researchers are regularly monitoring the bears using radio-telemetry, and as of October 11, 2002, no signs of sickness or disease have been observed. This is believed to be the first report of West Nile Virus infection in black bears.

PDF file is available on the web site of the VDGIF at http://www.dgif.state.va.us/hunting/va_game_wildlife/management_plans/bear/index.html. Questions can be directed to Denny at martind@dgif.state.va.us or (540) 248-9360.



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Student Happenings: Breakfast, List Serve & *Ursus*



At the recent IBA meeting in Norway, students gathered for our first student breakfast, generously hosted by the IBA Council. We had over 50 guests, and had a great time visiting with council members and students from over 20 different countries! We discussed many ideas, and initiated the membership list for the Truman List Serve. If you are a student or an unemployed bear biologist and are not yet on that list, email me at the above address so I can add you as a member! While the list serve is moving slowly, it is a great tool to communicate with students regarding current issues, project challenges, jobs and research collaboration.

One of our recent endeavors is our Library Project: students are encouraged to ask their libraries to subscribe to our IBA peer-reviewed journal, *Ursus*. Please let me know if you have a library that does not have this essential resource and we will get you the necessary paperwork. Let's show the IBA that we can be a benefit to the organization and carry our share of the workload.

We are already planning student activities for the San Diego meetings, including a special brainstorming session for student projects. Keep your ears open for upcoming announcements!

Finishing the Process

Sometimes, when reading a book that is too slow, I like to cheat a little and skip to the last page to see what happens in the end. So I'm going to skip some intermediate student topics for now and tell you how this one story ends. As I write this, I'm polishing up the final draft of my five-year-old dissertation, which has been like a dysfunctional child at times.

One of the first pieces of paper in my dissertation boldly says, "Diana Doan-Crider has fulfilled all of the requirements for Doctorate of Philosophy..." *Fulfilled all of the requirements? What, exactly, does that mean?* Once I pass my courses and preliminary exams, write my dissertation, and pass my defense, does that mean I can now sit at the same breakfast table with my Literature Cited?

I used to fantasize about being the beautiful, strong-type with coquettish round glasses, pondering philosophy in a lecture room, calculating theories of relativity with a nice, sharp pencil, getting perfect grades, and working out between classes — you know, the kind on the TV commercials. For my fieldwork, I would have everything planned, and would head out into the woods with 12 helpers and a million dollars in funding. I would catch and study wild *National Geographic*-type animals, save small villages from floods in my spare time, and return home in a year looking like something from the movie *Tomb Raider*. Then, I would don a little white coat, put my hair in a bun, and start my data analysis using classified military equipment. I would lock myself in a library cubicle with 40 books and a pencil. In a week, I would emerge with a nice Nobel prize winning dissertation, acquiring the status of Ph.D. in about two years with nary a hair out of place.

Allow me to comfort you — it was a dream. The first year of my Ph.D., I had to borrow money to pay tuition. My first research project was in the wrong mountain range. After a year of wandering in the wilderness and catching only three bears, a drought struck, we ran out of water, and my hair started turning gray. My husband still reminds me that I made him live in a tent for a year. I moved research sites to the original mountain range when I did my Master's degree, and started from scratch. That year, I caught lots of bears, but only had three team members to trap, radio monitor, and conduct a zillion vegetation transects. Then, one of our captured females was killed and eaten in a trap. I thought my life was over, and seriously considered ending the project. The moment passed, and I wised up and started using barrel traps. Then there was a drought and record summer heat, and a big fire that stopped telemetry for about two weeks. At the same time, bears started killing cattle, and we had to monitor cattle herds all through the night, and still do telemetry and vegetation transects during the day. One of the cattle-killing bears mauled a miner down the road, and left him for dead. I had to go catch the bear, and I was scared to death that I wouldn't find him. Once I caught him, I had to destroy him. It upset me and I felt really stupid. I didn't even *look* good! Most of the time, I dressed in old shirts and pants from Goodwill and a piece of a sheet draped over my head that fit under my baseball cap to protect me from the 100°-plus heat. I always had bear scat under my nails, and Blue-Kote on my hands. I was usually covered in mud because I made a habit of dousing myself at the stock tanks and riding on dusty roads. My skin got blotchy, and I

Finishing the Process, cont'd.

gimped around like a 60-year-old rodeo cowboy due to torn muscles from driving 4-wheelers. I spent two years counting thousands of acorns, using a wire frame to count upward into the tree canopy with my head tilted back, and still have bad dreams about big acorns. After three years in the field and many visits to the chiropractor, I headed home. I got sick from some unknown disease when I returned, and was hospitalized for a week. Then I headed into the lab. Guess what? We didn't get the sample sizes we needed, and our data analyses techniques were full of holes. I spent three months digitizing Mexican maps for a Digital Elevation Model, and found out later that I never needed it. We ran three sets of analyses on one data set, and *still* haven't found a way to do it right. The GIS analyses took seven

months instead of a couple of weeks (as we had planned), and now I need reading glasses. All in all, I set out to test three hypotheses, and only had sufficient data to test one. The bright side is that my dissertation will not be very long.

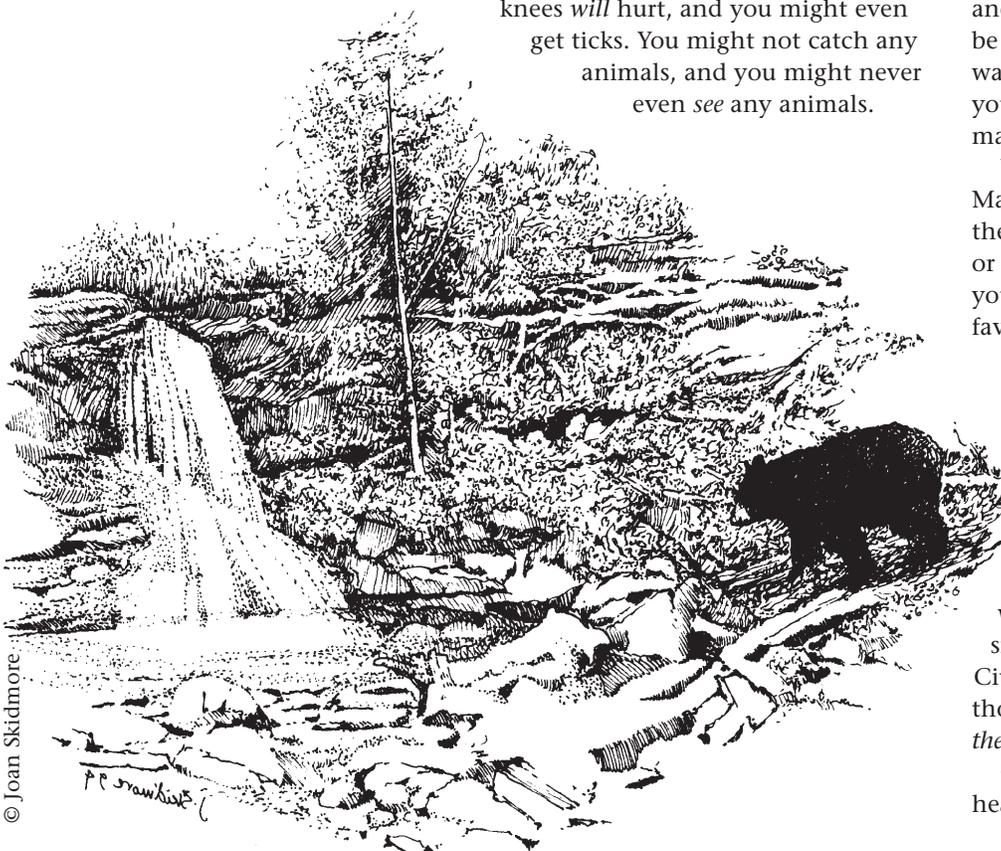
What, exactly, is my point? If I whined like that at an IBA meeting, I'd get knocked on the head and sent out to the car. Welcome to bear biology. Along with your proposal, preliminary exams, coursework and dissertation, there's a little more to *fulfilling all of the requirements* than most people think. For those of you still in boot camp, there is something you *must* know: this is only a test. There *will* be really hard times, and you *WILL* want to quit. Some of your animals may die; you may hate your co-workers; you may be underfunded; and you may get tired of eating beans. You *will* get sick, your knees *will* hurt, and you might even get ticks. You might not catch any animals, and you might never even *see* any animals.

People in town may want to kill you because you're a bear-lover. You might lose your research permit for a year, or some agency monitoring animal handling or drug enforcement might investigate your team. Your data may be worthless because you forgot to include important measurements on your capture sheets. Your computer may crash, and you may lose some of your telemetry locations. Count on it: things just happen.

But just take a deep breath. Take a walk, but whatever you do, don't be fooled into thinking that the grass is greener on the other side. Get over it, and get over it quick. Life's full of bumps, and there are a thousand other students going through the same things, and hundreds of thousands that have made it through the gauntlet before you. Just keep going, one more day, one more week, and you'll get through. You'll even be surprised to find that it really wasn't all that bad, and now that you made it through that, you can make it through just about anything!

Whether you're working on your Master's degree or Ph.D., it is not just the proposal, the preliminary exams, or the dissertation. It's the fact that you finished the process. One of my favorite sayings is: "If you are wearied by the foot soldiers, how will you run with the horsemen?" Things don't get easier when you graduate. As a matter of fact, the load gets heavier, the projects become more complicated, and the politics get *really* difficult. So stick it out, no matter what it takes. That way, when you sit at the table with the Literature Cited, you'll be one of those that *truly fulfilled all the requirements*.

Good luck, and let me hear from you!



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Training for Trust

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Operant conditioning is behavior training utilizing a conditioned stimulus, bridge, and reinforcement, and cooperation between the trainer and subject to achieve a desired response. The subject is given a conditioned stimulus (a verbal or physical command, such as telling a dog to "speak"). The moment the desired response or behavior is emitted by the subject (dog barks), then the trainer bridges and rewards the subject. A bridge, such as a whistle, clicker sound or a verbal "good boy!", is the connection between a desired behavior and the reinforcement (reward).

A reinforcer is anything that strengthens or causes repetition of the desired response. There are two types of reinforcement, positive and negative. Positive reinforcement is something desired by the subject (food treat, pat on the head or friendly talk). The reinforcement is given to the subject as soon as the correct response is emitted. Negative reinforcement is something the subject avoids, such as a net. This avoidance may cause the subject to emit the correct response (move to the left). At this point, the negative item (the net) is removed, the subject is bridged, and given a reward as reinforcement.

Today, many zoos and animal facilities use operant conditioning to encourage and shape behaviors from their animal charges for many reasons, including trust building, behavior modification, medical/research purposes, enrichment, and entertainment. By establishing communication between trainer and animal, operant

conditioning encourages the animal to think and decide to cooperate, which greatly reduces tension, anxiety, and, often, aggressiveness. It also can save time, money and stress.

Operant conditioning has been proven to work well with ursids. From pandas to polar bears, it has been used to build trust between trainer and bear, and to reduce or eliminate negative or harmful behaviors such as pacing or neurotic movements. Without the need for restraint, bears have been trained to accept treatments and procedures from veterinary and research staff for health care, well-being and understanding their life history.

In 1996, the San Diego Zoo entered a loan agreement with China to acquire two giant pandas for scientific study of panda communication, to be conducted by the zoo's Center for the Reproduction of Endangered Species (CRES). The original permit included the study of the olfactory modality including investigation of specialized scent gland deposits with chemical analysis, and determination of how pandas receive and decode these chemical signals. Consistent observation of panda behavior and cooperation between animal care and research staff was critical to this study. However, the introduction of operant conditioning tremendously enhanced the study by giving researchers new ways to collect data, and discover unknown panda biology.

First, some background on the pandas to understand why operant conditioning was introduced to the panda study. The female, Bai Yun, born in 1991 at Wolong Panda Reserve in China, is a healthy, well-adjusted panda who had never been bred prior to her visit to the USA. According to China's researchers and the data collected by the zoo's CRES and veterinary staff, she displays common,

obvious and measurable signs of estrus. The male, Shi Shi, is wild-caught, estimated to be in his mid-to-upper twenties. He was taken into captivity in China due to injuries and poor health. Despite rehabilitation efforts, Shi Shi could not be returned to the wild. He has not bred naturally in captivity, and his wild history is unknown. However, the breeding potential between the two animals seemed promising, and they were paired for the San Diego loan.

Despite many introduction efforts and Bai Yun's willingness and encouragement, Shi Shi would have nothing to do with her. He would either turn his back to her or show aggression. Due to the collaborative efforts of the animal keepers, CRES and veterinary staffs, researchers were able to predict Bai Yun's estrus period. Keepers collected urine, fecal and scent-mark samples daily, and kept accurate records on behavior of both pandas. CRES researchers analyzed the samples and data, and produced regular ethograms of the pandas' behavior. Veterinary staff continued to maintain the animals' optimal health, safety and well-being. All these activities are ongoing.

The next step was to consider artificial insemination (A.I.) using fresh semen from Shi Shi to impregnate the female. It was necessary to identify Bai Yun's greatest receptivity during estrus in which to perform A.I. The best procedure for collecting this information was vaginal cytology. In 1997, panda keepers together with the behavior department and CRES staff began operant conditioning training of Bai Yun to create safe, stress-free conditions for both humans and pandas in order to collect this information. As a result, Bai Yun gave birth to a healthy female cub, Hua Mei, in 1999.

Bai Yun has learned to fully trust and cooperate with her keepers, all of

Training for Trust, cont'd.

her own accord and while fully alert. She has been trained to voluntarily: enter a specially designed squeeze cage for transport, examination, training or vaccinations; accept shaving of her abdomen for ultrasound procedures; allow palpation of abdomen and mammary glands by veterinary and CRES staff; and accept vaginal swabbing for cytology collection. When requested by keepers Bai Yun will also lie down for long periods for vulvar/mammary inspections. This behavior was modified recently to allow x-ray and thermo-imaging procedures. Fortunately, Bai Yun is very food motivated and will "jump through hoops" for us on these last two procedures.

In addition Bai Yun accepts mammary manipulation/milk collection by zoo nutritionist, Dr. Mark Edwards. Dr. Edwards has since chemically analyzed Bai Yun's milk and developed a milk formula for panda cubs in China's Wolong Panda Reserve, thus greatly increasing China's cub survivorship.

Shi Shi proved to be trainable and very willing to learn as long as food was involved. Training turned out to be a medical necessity for him. Our veterinary and keeper staff has kept close watch on the health of these animals, especially the older male. Through regular exams, it was discovered that he has high blood pressure. Shi Shi has been trained to enter a squeeze cage, sit upright with his forepaws grabbing the front bars, and allow blood pressure cuffs to be applied on a regular basis. This has allowed the veterinary staff to compare the blood pressure of a sedated and

unsedated panda. Shi Shi will voluntarily lie down when asked, to permit having his body palpated for a body score or brief exam, and has allowed testicular measurements to compare size changes from pre- and post-breeding season. However, not all training is successful. CRES researchers attempted penile manipulation on Shi Shi in order to collect semen without sedation. Shi Shi would not tolerate this procedure, so it was abandoned.



San Diego Zoo female panda, Bai Yun, participating in an ultrasound.

Both Shi Shi, Bai Yun and their three-year old offspring, Hua Mei, have been trained to move from one area to another or into a squeeze cage; to lie down; and to step onto and quietly sit on a scale for daily weighing.

The zoo's behavior department is largely due the credit for these training successes, as a result of their diligent and patient work training the keepers to train the animals. Besides the pandas, this department has also worked with polar bears, spectacled bears, brown bears, sun bears and their keepers to:

- Reduce the pacing and neurotic stereotypies of mature and young polar bears.

- Crate train two polar bear cubs under four months of age.

- Teach polar bears to voluntarily enter squeeze cages for exams, weighing, and transport; and present open mouths and different body parts for inspection/examination.

- Train a female spectacled bear to accept regular injections for a chronic skin condition; and teach both she and her mate to enter a squeeze cage, sit or stand on a scale, and present open mouths for inspection.

- Train two mature Alaskan brown bears, male and female, to open mouths for inspection; lie down; stand up; and move from one area to another, transport crate or weighing scale (for control and enrichment purposes).

Currently, two female sun bears who were rescued in Borneo are beginning training to accept vaginal cytology swabbing. The goal is

to gain knowledge about their estrus cycles in hopes of predicting the best time to breed or artificially inseminate them.

Training can result in many benefits. The animal subject gets attention, focus and enrichment for itself, as well as positive rewards. The trainers and animal staff get an animal that is easier to work with without the use of chemical or physical restraint, making many tasks easier and safer. Training can facilitate data collection because many procedures can be conducted with a cooperative, fully alert animal who is relaxed and comfortable — all because training builds trust.

Animals and the Law

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In 1499 a bear was tried in Germany. Its defending counsel objected that the court lacked jurisdiction to sentence his client because the bear could only be sentenced by a jury of its peers. The judge forbade the calling of 12 other bears to serve as a jury.

When a bear kills or injures someone today the public often demands that the bear or, at least a bear, be found and killed. Our ancestors did the same.

The criminal prosecution and capital punishment of animals has been documented since the time of Plato and Aristotle. The American scholar, E. P. Evans catalogued more than 200 animal prosecutions from the ninth century (moles in the Aosta Valley, Italy) to the early 20th century. They occurred in Europe, Turkey, Russia (a ram was exiled to Siberia in the 17th century), Libya, Tanzania (a goat was sentenced to two days in jail for stealing fruit from a street vendor), the United States (a dog charged with attempted murder of a child and sentenced to be executed in the electric chair in 1926), Canada, Argentina (a dog sentenced to life imprisonment for killing a child), and Brazil (termites feeding on a church were ordered to leave and inhabit a field prepared for them by the monks of the church).

Today animals are in court under fairly limited circumstances and usually civil cases. Wild animals are plaintiffs in suits brought under the USA's Endangered Species Act (*Palila v. Hawaii Dep't. of Land and Natural Resources*, 852 F.2d 1106 (9th Cir. 1988); *Marbled Murrelet v. Babbitt*, 83

F.3d 1068 (9th Cir. 1996); *Mt. Graham Red Squirrel v. Yeutter*, 930 F.2d 703 (9th Cir. 1991)). Domestic animals have been the subjects of animal welfare or cruelty prosecutions of humans and are encountered in tort (when a dog bites a person), or nuisance cases (barking dogs) but almost always in the context of determining the liability of the owner, not the animal. Seldom is an animal subject to criminal liability.

The *lex talionis* (law of retaliations) is common to most human societies and is probably the oldest of human laws. Its application to animals and humans is found in most societies. In early Greek towns, murder trials were held in the open in the Prytaneum if the accused was an animal. The trials were largely ceremonial but carried out with due process of law. The Malagasy of Madagascar were not to kill crocodiles except in retaliation for killing a human. The Maori would kill a pig that walked over a sacred place. In the Chittagong area of India, if a tiger killed a man, the offending animal or another tiger had to be killed lest the family of the murdered man be socially disgraced. The ancient Persians treated animals as responsible beings and held that a rabid dog could not plead insanity as exculpation if it had wounded a person or a sheep.

According to the Christian bible: "After the flood God commanded to Noah: And surely your blood, the blood of your lives, will I require; at the hand of every beast will I require it; and at the hand of man, even at the hand of every man's brother, will I require the life of man. Whoso sheddeth man's blood, by man shall his blood be shed" (Genesis 9:5). Among ancient Hebrews an ox that gored a person to death was to be stoned to death and its meat consid-

ered unclean (Exodus 21:28). These rules informed law in the Middle Ages under the aegis of the Roman church when a system of punishment was developed that codified the *lex talionis*.

From the early ninth century onward, there were two types of animal trials: secular (usually of domestic animals), and ecclesiastical (usually of wild animals and plagues). Secular trials ended in punishment following the biblical mandates of Exodus 21:28-36 and the punishments meted out by ecclesiastical courts included death, excommunication and banishment by formal decree.

Church scholars were divided as to whether the church could anathematize animals or anything that had not been baptized. Some believed that since animals had been created by God, and he had provided for them in the ark, that animals had legal rights. Opposing scholars argued that since God made the law and gave it to humans, there was a contract between men and God; but that such a contract assumed intelligence, and since animals did not possess intelligence there could be no legal contract between God and animals.

Ecclesiastical trials of animals were usually triggered by a complaint from a town or district. If the accused didn't appear to answer the complaint, guilt was assumed and the court issued an edict telling the animal(s) to leave the area. If they refused, an exorcism was pronounced against them. Slugs, weevils, grasshoppers, mice, sparrows, and various other "vermin" were tried.

In his treatise *Consilia*, Bartholomew Chassenée described the formal requirements of animal trials. His taxonomy turned on

Bears in Culture

Animals and the Law, cont'd.

whether the accused animal had drawn blood. If so, it was to be tried in secular court as a criminal, and if not it was to be charged in ecclesiastical court. He noted that ecclesiastical trials were usually reserved for groups of animals (flocks of sparrows roosting in the sanctuary and soiling the parishioners, packs of rats eating the granary stores, plagues of locusts, or hoards of other insect-eating crops). A senior cleric presided over trials. Defense and prosecuting attorneys were qualified lawyers. Conviction was usually banishment with the threat of excommunication if the convicted did not leave.

Secular courts tried animals that could be physically seized and had drawn blood. When a complaint was made, the animal would be arrested and brought to court where an advocate would be assigned to defend the offender. The animal was tried and sentenced. While awaiting trial the animal was imprisoned with the human prisoners. The animal was assumed to have legal responsibilities and punishment was informed by this belief. In 1457 at Savigny-sur-Étang in Bourgogne, France a pig charged with murdering and feeding on an infant was found guilty and hung. Another pig was convicted of murder and sacrilege for killing and eating a child on a Friday. A pig was dressed in waistcoat, gloves, trousers and a human mask before being hanged for murder. Pigs are the most common animal to appear in secular courts. During the Middle Ages, the owners of felonious pigs were probably not easily located as it was common for pigs to roam, scavenging the garbage of the town — providing a service by cleaning the streets and yards and ultimately providing meat.

In seventeenth century Russia, a goat butted a child down a flight of

stairs and was sentenced to one year in a Siberian prison camp. Kicking horses and mules were tried, as were goring bulls, biting dogs and a face-scratching cat. During the Reign of Terror in France, in 1792, a parrot was accused of counterrevolutionary activities because it called out in a loud voice, "Vive le Roi! Vive les nobles!" It was tried, convicted, and sentenced to political indoctrination. It was taught to say "Vive le Nation!" and then returned to its owners.

There are a variety of explanations for animal trials. Some attribute it purely to the *lex talionis*. But others, relying on Evans' tabulation of animal trials, point out that there were relatively few trials until the fifteenth and sixteenth centuries, a period in European history of great legal and cultural progress. Further they argue that the secular trials were carried out by and presided over by the intelligentsia while ecclesiastical trials were held before senior clerics. In 1621 the law faculty of the university in Leipzig gave an opinion on the proper mode of execution of a cow. It has also been suggested that during a time when animals were ubiquitous in towns and cities, animal trials were devised to intimidate those who were responsible for an offending animal's dangerous actions. Another explanation is that the prosecuted animals were being anthropomorphized — they were treated as if they were humans. The entire process probably served as a warning and reminder to the public to behave properly as there were both secular and religious sanctions that might be invoked if a person were to offend or harm either an individual or the community.

Why does society call for the death of a bear that has killed or injured a human? Certainly one explanation is to remove an animal thought to be dangerous to humans, but there are very likely other, more subtle reasons for the demand.

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Lewis and Clark Among the Grizzlies: Legend and Legacy in the American West

by Paul Schullery. 2002.
ISBN 0-7627-2524-9. 247pp.
Falcon, Guilford, Connecticut &
Helena, Montana. \$14.95.

Paul Schullery's works are informative and entertaining. He combines the scientific rigor of a professional historian and knowledgeable biologist with the artist's ability to bring his subjects alive. These talents are especially evident when he writes on his favorite subject, the grizzly bear. I recommend his newest book to anyone interested in grizzly bears. If you are also fascinated by explorers Lewis and Clark, this book is required reading.

The book is about more than the Lewis and Clark expedition. It deals with the prehistory and history of American attitudes towards and exploitation of grizzly bears. Schullery uses the Lewis and Clark expedition as the skeleton on which to flesh out how and why grizzly bears south of Canada were reduced to a few scattered remnants in mountainous regions of the northern United States. Throughout their journey, the explorers mentioned grizzlies and bear sign in their diaries. These entries, along with diaries of other early American explorers, modern scientists, literature references, and the author's observations form the basis for the book.

Such analyses are not easy because the explorers needed to sort out bear taxonomy. They were confused by the many colors of the bears including "white," "yellow," "brown," "black," "grizzly" and "varigated." The taxonomist C.H. Merriam was similarly confused by these colors and recognized multiple taxons. In contrast, Lewis correctly assigned the grizzly (or brown) bear to a single species. On

May 15, 1805 in the vicinity of Kamiah, Idaho, Lewis wrote:

...if we were to attempt to distinguish them by their collours and to denominate each colour a distinct species we should soon find at least twenty. some bear nearly white have also been seen by our hunters at this place. the most striking differences between this species of bear and the common black bear are that the former are larger, have longer tallons and tusks, prey more on other animals, do not lie so long nor so closely in winter quarters, and will not climb a tree tho' ever so heardly pressed. the varigated bear I believe to be the same here with those on the missouri but these are not as ferocious as those perhaps from the circumstance of their being compelled from the scarcity of game in this quarter...the bear here are far from being as passive as the common black bear they attacked and faught our hunters already but not so fiercely as those of the Missouri. there are also some of the common black bear in this neighbourhood.

Schullery points out that such passages illustrate that Lewis got the taxonomy right, and debunks claims of opponents to grizzly bear restoration in the Bitterroots that Lewis and Clark found no grizzlies in this ecosystem. The explorers were familiar with the American black bear of the east and correctly recognized the black bear of the west as the same species.

This passage also refers to the great ferocity of the bears encountered "of the missouri." The bad reputation grizzlies gained and hold originated with the many close encounters the expedition had with bears near Great Falls Montana. Schullery notes that the explorers were hauling their canoes on a long and arduous portage around the Great Falls of the Missouri River. They had camps full of meat and other attractive smells

that doubtless attracted bears. They also shot every bear they could, frequently wounding them and inciting aggressive responses. Additionally, the hunters may have experienced frequent bluff charges and sometimes ran from bears inciting chase behaviors. Schullery evaluated 80 encounters between humans and brown bears prior to the Civil War and found only one or two possible cases "in which bears, for reasons of their own and without known human action, attacked people" (page 98).

In the category of minor quibbles, I wish that Schullery had included a better map or more geographic references to help the reader. The explorers shot their first grizzly at the mouth of "The Big Muddy" but I had to consult a highway map to verify that this river was in eastern Montana.

Readers will be left with a sense of sadness at the misunderstandings and intolerance that has left these landscapes bereft of grizzly bears and the humans who coexisted with them for millennia. This natural and human impoverishment of the American West was well-advanced only a century following the Lewis and Clark expedition. As Schullery points out, Lewis and Clark were agents of this change. But it is perhaps unfair to judge them with modern perspectives. Better to admire them for the window they provide on a vanished world. For the grizzly bear, Schullery wipes clean much of the fog from this window.

Reviewed by
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DNA-based Wildlife Studies

November 18-21, 2002 Nelson, B.C., Canada

These three classes are offered by Columbia Mountains Institute of Applied Ecology
Box 2568
Revelstoke, B.C. V0E 2S0, Canada
Phone (250) 837-9311
Fax (250) 837-4223
Email cmi@revelstoke.net

Register separately for each session at www.cmiae.org. Cost: \$175 per session (Canadian funds).

Session One, November 18-19, 2002 Study Design and Field Methods for DNA-based, Mark-recapture Inventories.

Instructor: Garth Mowat, Aurora Wildlife Research.

We will discuss sampling designs for broad-scale inventories of terrestrial mammals including methods for predicting sample size needs. We will begin with a brief introduction to mark-recapture theory and how to use the program CAPTURE to predict estimator precision. Then we will discuss field methods for sampling DNA from carnivores including bears, mustelids and felids. Topics will include the use of baits, comparison of hair removal methods, and the handling of samples including sorting and sub-sampling to minimize laboratory analysis costs. We will close with a brief discussion of how broad-scale data of this type has been used and how we may benefit from these methods in the future.

Session Two, November 19-20, 2002 Genetic Analysis of Individual Identity in DNA-based Inventories

Instructor: David Paetkau, Wildlife Genetics International.

The goal of this session is to provide non-geneticists with targeted information that will enable them to understand, scrutinize, and defend the genetic data that they receive from

laboratories. The workshop begins with a review of basic molecular genetics (what is DNA, the central dogma, terminology, etc.), and an introduction to the common techniques (extraction, PCR, electrophoresis, DNA sequencing) that allow molecular biologists to study the genetic code at its most fundamental level. This will be followed by a description of the specific markers and techniques that are used to establish individual identity. The workshop culminates in a discussion of how and where things can go wrong, and what can be done about it. Participants will be introduced to signatures of error, protocols that can prevent and detect error, and empirical evidence as to how good (or bad) datasets can be.

Session Three, November 20-21, 2002 Advanced Mark-recapture Analysis of Genetic Data

Instructor: John Boulanger, Integrated Ecological Research.

In the past ten years there has been much advancement in mark-recapture estimation including flexible models that allow incorporation of covariates and the testing of research hypotheses directly from mark-recapture data as incorporated in program MARK. This workshop explores the application of newer mark-recapture methods to DNA data from grizzly bear populations. An overview of newer models and general estimation methodology and philosophy will be given. Case studies of DNA projects for the purpose of population estimation and trend will be introduced and discussed with an emphasis on the strengths and weaknesses of newer and older approaches to data analysis. There will not be time to analyze participants' data sets. However, participants are encouraged to bring ideas and questions about how newer methods may be able to aid their research programs.

Border Bears Workshop

Small Populations of Grizzly Bear in the US-Canada Transborder Region: How can we work together to enhance recovery?

December 2-4, 2002 Sandpoint, Idaho, USA

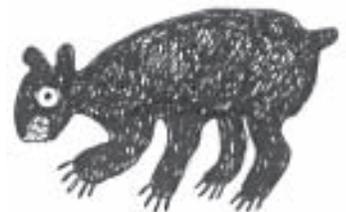
City Forum, 418 North Third Avenue, Sandpoint, Idaho, USA.

Monday, December 2 (1:00 pm) through Wednesday, December 4 (noon), 2002; immediately prior to the winter meeting of the Inter-agency Grizzly Bear Committee at same facility on December 4-6.

Contact Sterling Miller for more information, email millerS@nwf.org, or phone (406) 721-6705.

Agenda, registration forms, and lodging information available at the following websites: IGBC website <http://www.fs.fed.us/r1/wildlife/igbc/> or IBA website www.bearbiology.com.

Wildlife Society Professional Development Credits ($n=18$) available for participants



Seventeenth Eastern Black Bear Workshop

March 2-5, 2003
Mount Olive, New Jersey
USA

The 17th Eastern Black Bear Workshop will be held March 2-5, 2003, in Mount Olive, New Jersey at the Wyndham Gardens and Conference Center. The workshop theme will be "Black Bear in the Backyard."

Two guest speakers have been scheduled. Dr. Val Geist will speak about behavioral changes in hunted populations, and Dr. Mark Fraker will talk about immuno-contraception in wildlife.

For further information and registration forms, contact Kelcey Burgess of the New Jersey Division of Fish and Wildlife at (908) 735-8793 or kburguess@nac.net.



Fifteenth IBA Conference

February 8-13, 2004, San Diego, California, USA

Doug Updike
 Wildlife Programs Branch
 California Dept. of Fish and Game
 1812 9th Street
 Sacramento, CA 95814, USA
 Phone (916) 445-3652
 Fax (916) 445-4048
 Email DUpdike@dfg.ca.gov

Preparations are underway for the 15th International Conference on Bear Research and Management, San Diego, California in 2004. Two hundred rooms (US\$110.00/room)

Eighth Western Black Bear Workshop

April 15-17, 2003
Chico Hot Springs Resort, Pray, Montana, USA

Final Call for Papers

Deadline for summaries is December 15, 2002.

We encourage papers and posters on all aspects of American black bear biology and management, and related topics. Relevant papers or posters on brown bears will be considered as time and space permit. Authors should submit a 1-page summary of the proposed presentation on a 3.5 inch disk or via email (in WORD, WordPerfect, or ASCII format). Please list all authors and affiliations and current address, phone number, fax number and email address of the primary author. Please indicate whether the summary is for a paper or a poster. Send summaries to:

Cecily Costello
 Hornocker Wildlife Institute –
 Wildlife Conservation Society
 2023 Stadium Drive, Suite 1A
 Bozeman, MT 59715, USA
 Phone (406) 522-9333
 Email ccostello@wcs.org or
costello@hwi.org

Workshop Information

Registration materials will be published in the next newsletter. We anticipate two-to-three days of paper and workshop sessions, along with an ice-breaker (on the 14th), a banquet, and optional field trip(s).

Chico Hot Springs Lodge has several types of accommodations including single and double rooms with shared baths, single and double rooms with full baths, suites with kitchenettes, log cabins, chalets, cottages and houses. Although we have reserved the entire facility, space is limited, so we encourage sharing of rooms when possible. Rates range from \$39-149 for rooms, \$149-189 for suites, and \$75-315 for cabins or houses. Visit their website at www.chicohotsprings.com and phone (406) 333-4933 for reservations. Let them know you are attending the WBBW and receive a 10% discount on the prices above.

IBA Conferences

15th International Conference on Bear Research and Management
 February 8-13, 2004
 California, USA

16th International Conference on Bear Research and Management
 2005
 Italy

have been reserved at the Bahia Resort Hotel (www.bahiahotel.com) in San Diego.

Preliminary agenda:
 Bear/Human Conflicts
 Field/Lab/Statistical Techniques
 Habitat Assessment/Relationships
 Genetics/Physiology
 Conservation Biology

Field trips tentatively scheduled for Wednesday (February 11) may include: San Diego Zoo, Balboa Park, Marine World, fishing trip, Disneyland, pelagic birding trip, Mojave Desert.



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International Bear News

The quarterly newsletter of the International Association for Bear Research and Management (IBA).
 Editor: Teresa DeLorenzo, Design Editor: Cynthia Cheney, Conservation Publications, Inc.
International Bear News, ISSN #1064-1564
 10907 NW Copeland St., Portland, Oregon 97229-6145, USA
 Phone (503) 643-4008, Fax (503) 643-4072, Email ibanews@bearbiology.com
 Website www.bearbiology.com/www.bearbiology.org

Editorial Policy

International Bear News welcomes articles about biology, conservation and/or management of the world's eight bear species. Submissions of a maximum 750-1500 words are preferred, and relevant photos, drawings and charts are appreciated. Electronic submissions to ibanews@bearbiology.com are preferred, otherwise mail or fax to the address above. IBA reserves the right to accept, reject, edit or shorten submissions.

Deadline for the February 2003 issue is January 15, 2003.

Thank you to everyone who contributed to this issue. Artwork is copyrighted—do not reproduce without permission.

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Membership

Use the form on the page 37 to order or renew memberships, make donations, and update member information.

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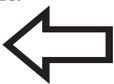
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274 Ellington Hall, Knoxville, Tennessee 37996, USA
Fax (865) 974-3555 or Email jclark1@utk.edu

Please fill out both sides of the form!
Download form at www.bearbiology.com.

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November 2002, Vol. 11, No. 4

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Please check columns in which you have expertise and/or are willing to assist/advise IBA:

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Andean Bear**	years		Management		
Awards*			Member Concerns*		
Bear-Human Conflict			Media Relations		
Bears in Culture			Mentoring/Training*		
Behavior			Newsletter*		
Bylaws*			Nominations*		
Brown Bear**	years		Nuisance/Damage Management		
Conferences*			Nutrition		
Conservation*			Organizational Development		
Disease			Pathology		
Economic Development*			Physiology		
Education/Outreach*			Polar Bear**	years	
Enforcement			Policy*		
Ethics*			Population Dynamics		
Evolution			Quantitative Analysis		
Field Research			Sloth Bear**	years	
Financial Management			Strategic Planning*		
Food Habits			Sun Bear**	years	
Genetics			Toxicology		
Giant Panda**	years		Travel Grants*		
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**Please indicate number of years of experience with each species *Indicates an IBA committee

Please check all academic degrees earned: BA/BS _____ MA/MS _____ PhD/DVM _____ Other (list) _____

Please list major field of study _____

Please list all countries in which you have worked with bears. _____

Please list languages in which you are fluent. _____

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By J. J. Craighead	\$10.00	_____	_____
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About the International Association for Bear Research and Management (IBA)

The International Association for Bear Research and Management (IBA) is a non-profit tax-exempt (USA tax # 94-3102570) organization open to professional biologists, wildlife managers and others dedicated to the conservation of all bear species. The organization has over 750 members from over 45 countries. It supports the scientific management of bears through research and distribution of information. The IBA sponsors international conferences on all aspects of bear biology, ecology and management. The proceedings are published as peer-reviewed scientific papers in the annual journal *Ursus*.

IBA Mission Statement

Goal: The goal of the International Association for Bear Research and Management (IBA) is to promote the conservation and restoration of the world's bears through science-based research, management and education.

Objectives: In support of this goal, IBA's objectives are to:

1. Promote and foster well-designed research of the highest professional standards.
2. Develop and promote sound stewardship of the world's bears through scientifically based population and habitat management.
3. Publish and distribute, through its conferences and publications, peer-reviewed scientific and technical information of high quality addressing broad issues of ecology, conservation and management.
4. Encourage communication and collaboration across scientific disciplines and among bear researchers and managers through conferences, workshops and newsletters.
5. Increase public awareness and understanding of bear ecology, conservation, and management by encouraging the translation of technical information into popular literature and other media, as well as through other educational forums.
6. Encourage the professional growth and development of our members.
7. Provide professional counsel and advice on issues of natural resource policy related to bear management and conservation.
8. Maintain the highest standards of professional ethics and scientific integrity.

Deadline for the February 2003 issue is January 15, 2003