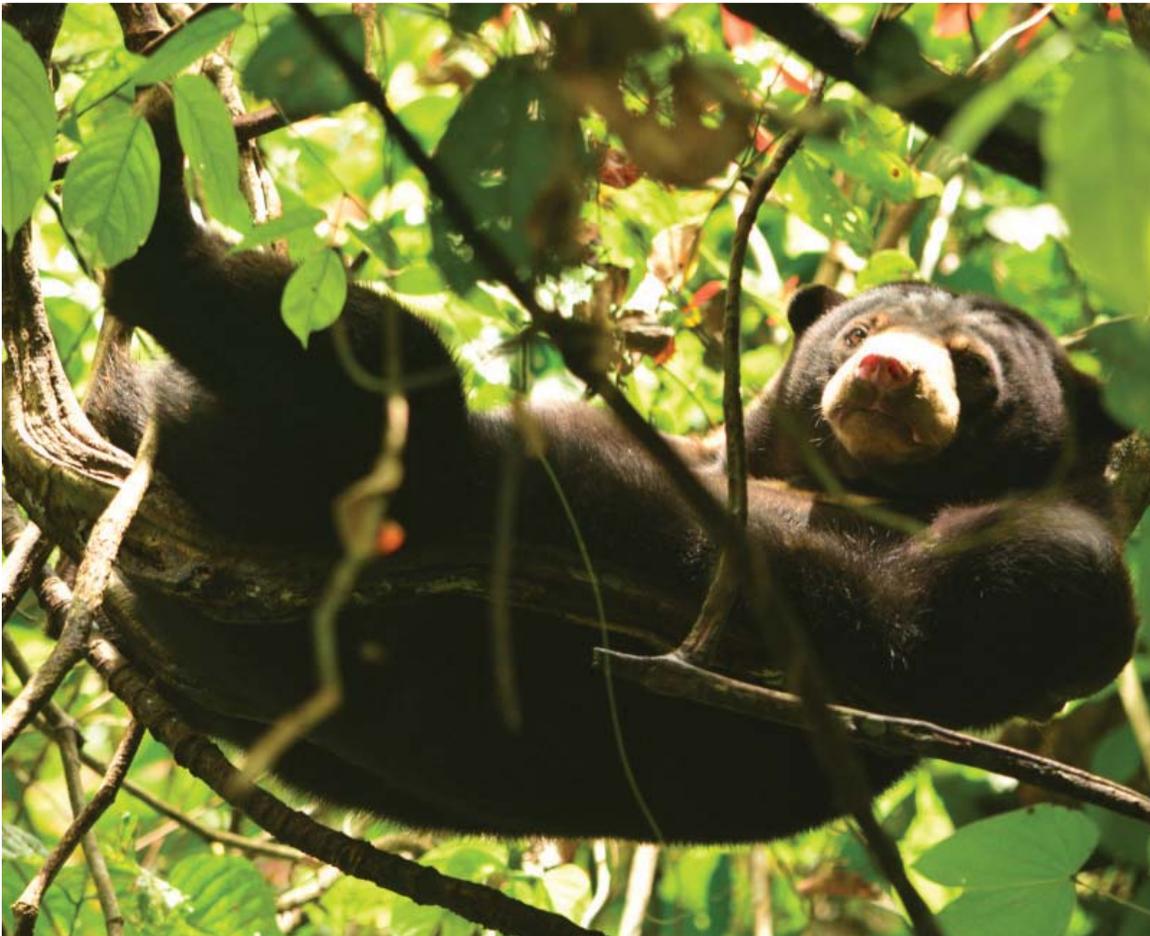


International Bear News



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

Spring 2015 Vol. 24 no.1



Rescued sun bears at Bornean Sun Bear Conservation Centre often display some amazing arboreal behavior. This adult female bear sleeps comfortably on some lianas high above the ground.

Photo Credit Lin May Chiew/BSBCC. Read more on rescued sun bears on page 24.

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Tri-Annual newsletter of the International Association for Bear Research and Management (IBA)

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Editorial Policy

International Bear News welcomes articles about biology, conservation, and management of the world's eight bear species. Submissions of about 750 words are preferred, and photos, drawings, and charts are appreciated. Submissions to regional correspondents by email are preferred; otherwise, mail or fax to the address above. IBA reserves the right to accept, reject, and edit submissions.



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Deadline for the Summer 2015 issue is 12 June 2015.



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The use of the BSG logo at the end of an article indicates articles submitted via the Bear Specialist Group.

IBA President

President's Column

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Paradigms of Change

In January it became official that 9 of the world's 10 warmest years on record occurred since 2000. Change becomes increasingly undeniable, even among those whose ideology or financial interests are served by denying it. Over the 4+ decades that span my professional training and career, our work as ecologists, wildlife managers, and conservation scientists has changed, too. When I entered college in 1971, we talked of ecological balance and regular, predictable succession in plant communities following disturbance. These words recognized change, but also assumed a sort of dynamic stability through time; a predictability in recurring cycles. We advocated for the preservation of untouched wilderness to provide natural laboratories in which to document, in essence, how things are "supposed to be" in the absence of humans.

These days the fallacy of this paradigm is evident. The current speed of environmental change means that it no longer suffices to understand and manage for what is: rather, we must decipher how the entire natural system might be changing under our noses, even as we conduct our surveys, studies, and experiments. This is no easy task. Even human-accelerated change can be just gradual enough to slip past detection until a crisis point. Twenty years ago, few in Minnesota, where I live, could have imagined the catastrophic crash in moose numbers, even in prime habitat, that has occurred in the last 10 years. Even where change is clear, predicting trends and outcomes can be like trying to hit a moving target. Climate change in some places brings drought, in other places floods, and everywhere, it seems, greater variability. As ecologists, we recognize how varied and unexpected some of the ramifications can be, ranging from ocean level change, to insect outbreaks, to change in human disease patterns and social upheaval.

Clearly, the necessary frame of mind for conducting work in the 21st century has shifted from that of a few decades ago. In today's paradigm, geographic space and time are third and fourth dimensions superimposed onto the more 2-dimensional concept of ecological cycles. More than ever it is important to practice the art of framing and evaluating multiple working hypotheses through the simultaneous collection of multiple types of data. Importantly, this paradigm requires constant vigilance regarding what is yet to come, not just in nature, but also in the directional drift of human societies and their interface with the natural world.

Luckily, data technologies now available make this more possible. The availability of long-term data sets that can help us discern underlying trends is growing exponentially. Make use of them. Think adaptively. I've been enjoying the TV documentary series entitled "EARTH, A New Wild" about new ways that people are finding to live amidst thriving wildlife populations. In embracing the reality of ecosystem and social change from the start, we are better equipped to find adaptive solutions to today's conservation challenges.

On a personal note

By way of full disclosure, the issue of change is more on my mind than usual. In December I retired from my position as a wildlife research biologist for the (USA's) state of Minnesota, Department of Natural Resources. I now work in my capacity as IBA President from my home, so please note the new contact information.

Changes on Council

On January 1, IBA entered the New Year with a slightly different Council in place. Andreas Zedrosser was re-elected in December as Eurasian Vice President and Emre Can was elected to his second term as Councilor. Alex Kopatz was newly elected to Council to replace outgoing member, Ximena Velez-Liendo, who completed her second term and thus could not run for a third. Many thanks and much gratitude to Ximena for her 6 years of service in this leadership position. A second change was the addition, through appointment, of Shaenandhoa Garcia-Rangel, Venezuela, to Council. For many years, IBA



bylaws have allowed for the appointment of up to 2 Council members in order to achieve greater representation on Council of species or geographic perspectives. Last year at this time, Council appointed Nishith Dharaiya for greater representation of Asia and sloth bears. Ximena's exit from Council, however, left us with no representation from South America or experts on Andean bears. We welcome Shaena to fill that gap.

New bear-human conflicts board planned for Greece

We just heard from Alexandros Karamanlidis that as the dust settles following Greece's recent elections, natural resources officials have announced their intention to establish an advisory committee on bear/human conflict. Alex believes that this is in part a result of the IBA conference held in Thessaloniki in October. A number of government officials attended parts of the conference and were particularly impressed with the work presented from Slovenia and Scandinavia on dealing with human-brown bear conflict. Alex will keep us apprised of this in the coming months as the ministry moves forward with its plans.

IBA Website

I am very happy to announce that we have started serious talks with a new company regarding plans to build a new IBA website. The company that currently maintains our site will no longer support the software platform for our current site. To migrate to the new platform with that company would not only be prohibitively expensive, but would not solve our serious need for greater responsiveness from the web company and greater accessibility, adaptability and agility in the website itself. The old site has served us well but is outdated, overly expensive, and most importantly, rigid. Thus we are excited to be exploring possibilities with a smaller company that can better serve our needs. There will be more news on this as things develop. I want to thank everyone at the IBA Conference who took the time to talk to me about ideas for the IBA website after our discussion of the issue at the IBA members meeting. If you have further thoughts on potential changes to the website, feel free to contact us.



IUCN BSG Co-Chairs

Brown Bear(s) Do Exist in Syria: Fuzzy Photo Generates Much Interest

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In most of the world, brown bears would be safely tucked away in dens during a mid-January snowstorm. But in 2004, brown bear tracks in the snow were recorded in the Sannir range (more commonly called Anti-Lebanon Range) of south-western Syria. Snow is not uncommon in higher altitudes of this region. The tracks, at 1900 m, provided the first evidence of bears (or at least an individual bear) in this country in ~50 years. That discovery was reported in *International Bear News* in 2011 (20[1]:5–11).

Did this discovery mean anything for conservation? Was it a single stray wandering bear, perhaps coming from Turkey, observed only because it left traces in the snow? The closest Turkish population would likely be >400 km away.

If it was a lone male, then chances are it would die (likely at the hands of a person) without reproducing, and Syria would again be without bears. That situation has occurred elsewhere, as for example the lone bear that wandered into Germany in 2006 (http://en.wikipedia.org/wiki/Bear_JJ1) and Switzerland in 2013 (IBN 22[1]:34) — both of these were eventually killed, even though the Swiss bear had a GPS-GSM collar, so it could be closely monitored, and a substantial attempt was made to protect it.

IUCN BSG Co-Chairs



Issam Hajjar

Line of bear tracks coming up from a valley and traversing a ridge, photographed after a snow in February, 2011 (track line along top of snow bank, near center of photo).

Ironically, the war in Syria may have made it less safe for people to go out and hunt, providing a sort of refuge for wildlife. The same might be true for American black bears in the most dangerous, drug-running areas of Mexico. However, in Syria, a brown bear would be exposed in an open, arid environment, and likely viewed as a threat to people and their property — the main food here for a bear would be people's orchards of apples, apricots, cherries, and figs. Also, a bear in Syria is apt to attract attention, just by being novel, and that in itself could put it at more risk.

Certainly, that lone bear from 2004 could not survive for long, trying to hide out in the caves common throughout the area.

In February 2011, though, 3 more sets of bear tracks were seen in the same general area: again, a bear tramping in

the snow. These tracks were larger. Was it the same bear, now 7 years older? Could there really be a large male brown bear, subsisting on human-grown fruits and possibly wild juniper, roaming the hills on the Syria–Lebanon border? Has it somehow found a way to elude people? Could the multiple tracks have been multiple bears?

On January 14, 2015, a local person in this same hilly region of Syria took a photo of a small bear and posted it on Facebook. This bear, like the others, was wandering about after a fresh snow — and so was the person. The site (elevation 1700 m) was 50 km north of the track sightings. This now became big news. An image of tracks is one thing, but an image of a live bear is something else entirely! Suddenly people were talking about bears and mentioning other possible sightings.

The photo is unfortunately not clear (probably taken with a cellphone). We sent it to BSG members of the South Asian Brown Bear Expert Team, and they tended to think it looked more like a dog (and offered suggestions on specific breeds). We heard unsubstantiated reports that other local people in the area in Syria saw the animal and thought it was a hyena, and therefore killed it. The animal in the photo does not look like a hyena to us, and since hyenas are common in the area, it would seem doubtful that this animal could be confused as one. We cannot confirm whether this animal was killed.

Regrettably, that is the end of this intriguing story, as far as we know it. We have not been able to obtain the original photo, or otherwise confirm that this was really a bear. The coloring, which may seem unusual for brown bears, does match the variegated fulvous (tawny) and white pattern described by Hemprich and Ehrenberg (1828) for bears that used to live in Syria. There is a machine in the foreground of the photo, to the left of the bear, which is used for plowing the orchard (gas-



Issam Hajjar

Issam Hajjar

(left) Although mainly arid, water sources are available in the area near where the bear tracks were photographed in 2011. (right) Region in Syria where tracks were seen and bear photographed is largely agricultural.



Locations where bear was photographed (2015) and tracks were observed (2011) in western Syria, near Lebanese border. Closest bear population is >400 km away in Turkey. Turkish border is shown in the north.

powered rototiller), so it provides some scale to the animal; if it is a bear, it appears to be quite small.

A small bear roaming this area would certainly be welcome news, if it means that it was born here to a wild female. Maybe there is a small, reproducing population?

Alternately, it might be an escaped bear from one of the local private "zoos" that are known to exist in the area. Or, maybe it is not a bear at all.

This is the sort of frustrating, fragmentary evidence of possible bear presence that is so common in areas where bears are thought to be rare or absent. Consider: Bhutan – last known documentation of a brown bear in 1950s, but continued reports of Yetis/possible bears (Sykes et al. 2014); Argentina – recent genetic evidence of Andean bears (Cosse et al. 2014) corroborating reports of bear sign in the region (Del Moral and Bracho 2009) that was previously disputed (Rumiz et al. 2012); Bangladesh – photo obtained of a skin of a sun bear, after extensive sign surveys across the country had found no evidence of this species persisting (Islam et al. 2013).

Does it really matter whether a few brown bears (at best) inhabit Syria



Issam Hajjar

There is no doubt that these tracks, photographed in western Syria in February 2011, were from a large bear (note claw marks in snow).



Issam Hajjar

One of 3 sets of bear tracks found in February 2011 in western Syria, near the ancient village of Bloudan (population ~3,100), 50 km northwest of Damascus.

(and likely Lebanon)? It certainly does not matter for the global status of the species, which numbers over 200,000 and occupies nearly 50 countries. But what about a distinctive subspecies? Even the much-heralded blonde Syrian subspecies (*Ursus arctos syriacus*), reported to range from Turkey to Iran, including the Caucasus Mountains, may not be as genetically distinct as once thought (Calvignac et al. 2009). Could there be a relict population, though, of true Syrian bears?

The presence (or not) of bears in Syria should matter to anyone who values bears still living in places that they occupied historically — especially where they were an integral part of human history, and where humans were largely responsible for their demise. Attractive, light-colored (sometimes described as white) brown bears were once found from Syria and Lebanon south through the region known as the Levant to the

Sinai of Egypt (they existed in Egypt as late as 500 years ago; Manlius 1998). They are the subject of historical, biblical, and sometimes mythical accounts. They were said to have “infested the roads and even the neighborhood of towns” of ancient Palestine (Kitto 1841). They were traded and imported about the region as valued pets for Egyptian pharaohs (Foster 1998).

If there are still bears roaming the hills on the Syrian-Lebanon border, then they are indeed the stuff of legend. We can only hope that the fuzzy photo of the small animal in the fresh snow was a native-born bear, and that the photographer was not the only one in the area to see value in it living there.



Photo taken of brown bear after a snowstorm in Syria, posted on Facebook January 14, 2015. Note hand-plowing machine in snow, giving perspective to the size of the bear. Some have disputed whether this is indeed a bear. Photo credit: Unknown. (original photo brightness and contrast adjusted)

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We Protect What We Fall in Love With

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TED is a nonprofit organization devoted to spreading ideas (originally in the fields of Technology, Entertainment and Design) in the form of short, powerful talks. Independently run TEDx events also occur in communities around the world. One can now find engaging TED and TEDx talks on virtually any subject. They are, as they claim, "Ideas Worth Spreading".

Just before Christmas, I happened upon a particularly inspiring TEDx talk by filmmaker Louie Schwartzberg, titled Nature. Beauty. Gratitude: <https://www.youtube.com/watch?v=gXDMoiEkyuQ>

I passed it on with this message: This is the season for compassion. It is one of the few times of the year when strangers stop to wish each other well. Christmas Eve has been described as the single most compassionate day of the year, where humans connect to each other by the sheer identity of sharing genes and sharing Planet Earth. Imagine if we could extend that same level of compassion to everyday. Consider waking up each morning and instead of thinking of all the work you must do, thinking how wonderful it is to be alive, and how wonderful it is to have the ability to appreciate the wonder of life. Compassion for living things is hard-wired in our brains, but it competes with so many other forces. Unmasking it is the key to lasting conservation, and happiness.

The response by BSG members was overwhelming — 36 people wrote back with messages, moved by the video and by the warm greetings from others. It can be said that within the BSG, the message "went viral."

Here I share some of the comments of BSG members, which are well worth documenting on the pages of this newsletter:

It made me stop and think of something really important we fail to think of in everyday life. I'm greatly impressed.

Thanks to all who fiercely protect the things we love.

I don't usually bother with New Year's resolutions, but am going to resolve to watch this video again and try to see the world through my daughter's eyes more often.

It's so nice to be part of such a wonderful community of people!

If you haven't seen the video, it's well worth 10 minutes of your life.

I now have my New Year's resolution summed up.

I would hazard a guess that nearly everyone on this list struggles with issues like this: finding hope when things seem bleak in conservation, sustaining passion when we are drowning in paperwork, remembering why we are doing what we are doing.

When we get frustrated and cynical and tend to forget about the passion we have for nature, and our appreciation of its beauty, we should see it again through children's eyes.

It's a pleasure working with such a wonderful group of people who are so committed to ensuring that some wilderness remains for the next generation, and the one after that.

Thank you for the reminder of the beauty of life on this amazing planet. I have never thought of the meaning of OMG or how the words apply to our viewing of, and connection with, the universe.

I'm so proud to be part of this inspiring group.



D. Garshelis

"Nature's beauty is a gift that cultivates appreciation and gratitude" — Louie Schwartzberg



Conference Reports



Ximena Velez-Liendo

Attendees of the 23rd International Conference on Bear Research and Management.

Session 1: Bears of the World

Chairs: Santiago Molina and Alexander Trajce (mulequi@hotmail.com; alextrajce@gmail.com)

This session began with A. Trajce et al. reporting that in the past, Brown bears in Albania have not been monitored properly, however, recent camera-trapping surveys, track transects and questionnaire surveys have generated good information on the status of the bears and some conservation concerns related to human-bear conflicts, especially those which include illegal capturing of bears for exhibitions in roadside restaurants and bars. Next, J.C. Blanco et al. reported that the population of brown bears in the Cantabrian Mountains have decreased and split in 2 isolated populations. Nevertheless, a successful crossing event between a western male and an eastern female was detected in 2008. The crucial factor for the population recovery has been the reduction of the human-bear conflict that caused the illegal mortality of bears. Different conservation actions have been included and for the next years, researchers suggest that the conservation action must be focused on trying to recover the eastern population and the areas recently re-colonized by mature females. This presentation was followed by K.C. Kendall et al. discussing the grizzly bear populations in the Cabinet-Yaak ecosystem (CYE) that remain threatened since 1975. The use of genetic detection data in traditional and spatial capture-recapture models have been used to generate estimates of abundance and density. The CYE consist of 2 populations that are demographically and reproductively isolated from each other. Through parentage analysis, it was documented the first natural migrants by bears born to parents in neighboring populations. These events suggest that the expansion of neighboring populations may eventually help sustain the CYE populations. K Tirronen and D Pachenko presented next on brown bear populations of the Kola Peninsula that inhabit all forest and use rivers to penetrate into the tundra zones. According to official estimates there are about 500 individuals and average density less than 0.2 bears/ 1000 ha. Studies on the coastal population show densities 10 times higher than all around. This concentration responds mainly to the presence of food sources that includes young grass, different berries and the introduced humpback salmon, together can be the reason for the bear concentrations. The research used field methods as count of animals and their footprints, observations, forest cameras and molecular-biological and parasitological methods. The next speakers, I-M Popo et al. reported that between 2011 and 2013 in the Romanian Northern part of the Eastern Carpathians, 5 brown bears were equipped with GPS collars to provide information about habitats suitability and cross border movements. During the monitoring activity 1 male bear was poached indicating the ex-

istence of this threat. Two other males crossed the border to Ukraine. Poaching and lack of reliable information about the size of the population are the main threats. The results of the project indicate main areas for connectivity between Romania and Ukraine and the need of improving the habitat suitability. The final presentation from this session was by C. Cáceres et al., who discussed their study to evaluate the occupation, habitat availability and other environmental aspects of the Andean bear in the Tama National Park northeast of Colombia. As preliminary results, marks of Andean bears have shown a clearly variation in a spatial and temporal level. Collection and analysis of scats identified plants from 31 families and 28 species that are used by the Andean bear. Traces of plastic in the feces and the presence of herds of wild horses and other anthropogenic pressures are a serious problem for the conservation of the species.



D. Huber

Tsakiris/ARCTUROS

Session 2: Bears and Infrastructure

Chair: Yorgos Mertzanis (mertzanis@callisto.gr)

The session “Bears and Infrastructure”, had international contributions (including an invited speaker – Frank van Manen, US) from Europe and North America dealing both with black and brown bears. F. van Manen (invited speaker) started the session with a very interesting review on transportation networks and bear conservation, a preoccupying issue related to numerous bear populations’ conservation problems across the world in relation to existing or developing transportation infrastructure and especially in North America and Europe. The presentation focused on different case studies in North America and Europe with special emphasis on highways impact and mitigation issues and strategies implemented. Y. Mertzanis et al. presented a case study on highway KA45 (located in NW Greece bisecting core bear habitat) serious impact with a high rate of bear traffic fatalities upon a geographically marginal brown bear sub-population of NW Pindos mountain range. The presentation showed how the combined use of telemetry with risk assessment modelling substantially contributed in effectively mitigating the highway impact by prioritizing the highway sub-sections where the mitigation means (new bear-proof fence, warning signs for drivers and wildlife reflectors) had to be and have been urgently installed by the highway constructor company a fact that has resulted in drastic minimization of bear traffic mortality. Next, S. Findo et al. presented the transportation infrastructure impact resulting in brown bear habitat fragmentation in Slovakia, and namely in the W. Carpathians (Malá Fatra National Park). The trans-boundary importance of this area is high as it functions as a source bear population for the neighboring countries (Poland and the Czech Republic). Among the main objectives was to assess the functionality of the remaining bear migration corridors between the National Park and the surrounding areas by using telemetry techniques. Results showed that traffic intensity around the national park is constantly increasing, so there is a real threat for further isolation of bears in this area. M. Hooker and M. Chamberlain presented next on highway GA96-related movements of black bears from one of the most isolated black bear population of Central Georgia (US), the Central Georgia Bear Population (CGBP). GA96 bisects core CGBP habitat while plans to widen and fence portions of the GA96 led to close monitoring of bears movements using telemetry with GPS/virtual fence collar modes. Out of 48 radiocollared bears only 5 crossed GA96. The resulting utilization distributions were combined to GIS data to characterize habitat types and landscape features associated with crossing locations. This information will aid in the placement of wildlife crossing structures as well as characterize bear movement during the pre-construction phase of the widening works. The last presentation was by A. Cotovala et al. who presented an interesting country scale approach on gene flow in Carpathian brown bear population before infrastructure development in Romania. Landscape genetics was used as a tool to detect fine scale structuring within one large continuous bear population. Mantel Test, Partial Mantel Test and MRM (Multiple regression on distance matrices) were applied in order to determine the significance of landscape features to gene flow. Considering the next 8 years period, of national program on infrastructure development, highways will affect brown bear habitat, causing habitat fragmentation. The core areas with the highest current intensities of gene flow must be prioritized for long-term conservation as contact zones between new-formed populations. Some key messages from this session were: 1) infrastructure development (and mainly transportation infrastructure) has become a major conservation issue across many countries and continents hosting bear populations mainly in terms of mortality, habitat and population fragmentation, and gene flow decrease; 2) there is a growing threat for new (and maybe the last) undisturbed bear habitats to be degraded due to new projects for transportation infrastructure development; and 3) specific tools such as telemetry, GIS, landscape genetics and related statistics, substantially contribute in predicting, visualizing, monitoring and mitigating the problem.

Conference Reports

Session 3: Bear Foraging Ecology

Chair: Jack Hopkins (jbhopkins3@gmail.com)

The bear foraging ecology session had 5 presentations. In the first presentation, T. Oi, the Director of the Department of Wildlife Biology at the National Forest Research Institute in Japan, showed that a group of Japanese macaques (*Macaca fuscata*) had much higher energy requirements but a smaller home range than an Asiatic black bear (*Ursus thibetanus*). A detailed comparison of their diets revealed that these species primarily both forage for plants and fruits; however, macaques digest fiber from plants more efficiently than black bears, making their sympatric coexistence possible. In the second presentation, C. Takahata, a recent Ph.D. graduate from Shinshu University in Japan, described the habitat use of 31 Asiatic black bears in relation to human settlements. Takahata et al. found that bears used unmanaged lowland forests, avoided artificial forests, and frequented human settlements each season. For the third selected presentation, J. Hopkins, a Postdoctoral Fellow at University of Alberta, Canada and Peking University, China, demonstrated the use of stable isotopes ($\delta^{13}C$, $\delta^{15}N$, $\delta^{34}S$) to predict the number of grizzly bears (*Ursus arctos*) that used the railway in Banff National Park and to estimate the contribution of whitebark pine nuts to the diets of bears in Yellowstone National Park. He found that approximately a third of the sampled population in Banff used the railway and that the contribution of whitebark pine nuts may have decreased in bears' diets with the decline in whitebark pine health in Yellowstone. In the fourth presentation, G. Mowat, a Wildlife Research Biologist with the province of British Columbia, assessed the use of $\delta^{34}S$ from grizzly bear hair to estimate the diets of bears on the lower Stikine River in British Columbia. Mowat et al. found that including $\delta^{34}S$ in a 2-isotope mixing model did not increase the precision of estimated dietary contributions for salmon and terrestrial prey. In the last presentation, Diana Lafferty, a Ph.D. student at Mississippi State, used DNA and stable isotopes derived from grizzly bear hair collected in the Stikine watershed in northwest British Columbia to determine if certain genetically distinct segments of the population had different diets. Lafferty et al. found evidence that a coastal segment of the bear population consumed more salmon and less vegetation than an interior segment.

Session 4: Population Ecology Studies

Chair: Frank T. van Manen (fvanmanen@usgs.gov)

This session started with a presentation by S. Molina, who reported on an important natural corridor for Andean bears just northwest of Quito, Ecuador, which connects state and private protected areas. Using facial markings to distinguish different individuals, his field studies have documented 43 bears (21 males, 7 females, 15 undetermined) since 2008 in a relatively small area of approximately 200 km². Being close to the capital city, the existence of a sizeable bear population represents a unique conservation opportunity. The project has received substantial interest from officials with the Metropolitan District of Quito, as well as much media and public attention. The second presentation was from J. Laufenberg et al., who reported on a population viability analysis for the Louisiana black bear, a subspecies of the American black bear that is classified as threatened under the U.S. Endangered Species Act. Taking advantage of recent developments in hierarchical modeling, this work is an excellent example of how various data sources (e.g., genetic sampling, live captures, radio monitoring) can be combined to increase inference. The findings from this work will likely be a key consideration in a potential proposal by the U.S. Fish and Wildlife Service to delist this subspecies, which would transfer management responsibilities to state authorities. A. Kopatz et al. presented the next paper and described a genetic study that tracked the growth and geographic expansion of the Finnish brown bear population from 1996 through 2010. Noteworthy, the analyses showed decreased genetic structure and increased genetic variation and it is encouraging to see how well this fits genetic theory. Remarkably, the results also showed a northward shift of genetic groups by >100 km in this relatively short time period, suggesting that brown bear populations can respond quickly to management that allows populations to expand. The next speaker was T. Graves et al., who presented an insightful retrospective analysis with DNA data from Alberta to investigate accuracy and precision of different sampling scenarios for spatial capture-recapture techniques. She found that substantial cost reductions may be achieved, without major impacts on accuracy and precision of population estimates, by increasing sampling intensity in areas accessible by roads and reducing intensity in areas that are difficult to access and require more costly sampling (e.g., areas that require helicopter use). An important lesson from this study is that these types of sensitivity analyses with real data can be extremely informative. The final presenter in this session was T. Skrbinšek et al., who used recent advances in genetic analyses to determine changes in effective population size, or N_e , over time. With a large database of over 1500 brown bear genotypes from Slovenia and Croatia, combined with sex and age data, the N_e analyses demonstrated divergence of the population between the 2 countries, possibly as a consequence of implementation of increasingly different bear management objectives. This study demonstrates that these emerging techniques are a promising avenue to understand population dynamics and the role of management at the genetic level.

Key messages from this session were: 1) as the Andean bear study demonstrates, there is no substitute for intensive field observations when little is known about a particular bear species or population and to generate conservation interest; 2) with the luxury of more data, emerging techniques based on integrated population models can increase inference about populations by maximizing use of different data sources; 3) advances in genetic analysis techniques are promising developments that should substantially increase our understanding of bear population dynamics and the effects of management; and 4) pilot studies and retrospective analyses can be very useful to identify cost-effective scenarios for DNA-based capture-recapture studies.

Session 5: Bear Behavior

Chair: Andreas Zedrosser (andreas.zedrosser@hit.no)

The session Bear Behavior was very international with high quality contributions from Europe and North America, all of them dealing with brown bears. K. Pigeon et al. started the session with a presentation about the effects of a changing climate on brown bear denning behavior in Alberta, Canada. Hibernation behavior was investigated based on a sample of 15 males and 58 females. The results presented demonstrated that denning behavior varies with sex and age, however that different extrinsic factors trigger den entry and exit. Den entry appeared to be driven by food availability while den exit is linked to weather-related environmental conditions. Next T. Zwiłacz-Kozica et al. presented a video-documented case of an infanticide committed by a female brown bear. A cub-of-the-year fell down from a winter den located on a steep hill side, and was unable to return to its den. After two days of vocalizing this abandoned cub was killed and eaten by another female that had a den nearby. The authors speculated that this intra-specific predation could have also been an act of desperation and caution. The female could have killed this cub to stop it from making calls, which could have attracted adult males; the killing of the abandoned cub would therefore decrease the probability that an adult male might be attracted to the area, which in turn would have endangered also her own cubs. L. Bereczky et al. next presented information on personality differences in orphaned bear cubs raised in a rehabilitation center and then released into the wild in Romania. Ten personality types were differentiated and then evaluated if these behavioral differences were related to habitat selection, and if these behavioral differences predisposed some personality types to get more often involved into bear-human conflicts. The results suggested that certain personality types (e.g., "focused", "confident") preferred habitats further from people than other personality types (e.g., "shy", "absent minded"). This suggests that some individuals may be more prone to take risks than others, which may be related to bear-human conflict situations. This presentation was followed by J. Naves et al. who presented observational data on winter aggregations and social behavior of bears in the Cantabrian Mountains, Spain. The authors presented data of an unusual winter aggregation of adult bears. In an area of ~400 hectares the social interactions of up to 10 different bears per day were observed. These interactions were exclusively of friendly behavior, i.e., frequent playing behavior and physical contact; no fights, chases or aggression were observed. Unfortunately, no genetic data was yet available to test the relatedness of the individuals involved. This unusual observation may lead to new perspectives about the complex and diverse interactions in the social system of bears or other so-called solitary species. Then, J. Kermish-Well et al. reported on a new method based on space-time statistics to predict bear foraging behavior. The approach uses hourly GPS location of brown bears to identify clustered locations of concentrated foraging, and then applied a generalized linear model to estimate probabilities of a cluster being a kill site, a site of other types of foraging, or a resting site. The method was then tested with visits of randomly selected GPS-clusters in the field. This method has the opportunity to successfully predict behaviors beyond predation events, such as bedding and grazing, and could provide substantial insights into behavioral ecology and the resulting management decision of several species. The last presentation in the bear behavior session was by A. Visintin et al. on the energetic values of landscape components as a tool to describe behavior of brown bears in relation to ecological requirements. Their data set was based on 4 GPS-collared bears in the triangle area where the countries Slovenia, Italy, and Austria meet. The potential energetic costs ("output") of different behaviors, such as locomotion, thermoregulation, feeding or resting and the potential energy of food allowance (input) was set in relation to different landscape variables, such as habitat cover or human presence. Based on this information



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thematic maps were developed showing the spatial distribution of input and output, making it possible to evaluate habitat characteristics in relation to ecological requirements and habitat suitability for bears. The audience was able to take home 3 major messages from this session: 1) the development of new statistical tools and methods to better understand the spatial and temporal behavior and landscape/habitat requirements of bears; 2) we obtained a deeper understanding of what triggers den entry and den exit behavior; and 3) although the brown bear is a comparatively well-studied mammal, there are still aspects of its behavior and social life that are poorly understood, despite the fact that these aspects may be important for management and conservation.

Session 6: Bear Physiology and Toxicology

Chair: Agnieszka Sergiel (a.sergiel@biol.uni.wroc.pl)

The session was very Croatian and had an interesting set of 3 talks by the researchers from this beautiful country. M. Lazarus et al. discussed the brown bear as a good bio indicator for environmental pollution. The information gained from such a monitoring of toxic metals, pesticides and biphenyls in bear tissues can be relevant for human inhabitants of the monitored areas, people consuming the meat, as well as for the bear population itself since the pollutants accumulated in tissues reflect the environmental load. This long-term study conducted by Maja and her team is the first of such on Dinara-Pindos bear population. From the talk we could know that in general the measured concentrations of pollutants were low and differed between sexes. Regarding the maximum levels allowed for human consumption, the bear meat in Croatia can be considered safe but liver and kidneys are not recommended. Nest, S. Reljic et al. used two-sex matrix modeling to test the management implications of the earlier gonadal maturity of bears in Croatia. Histological examinations of gonads of 30 traffic-killed bears showed them active at the beginning of the third year of the bear life, what implicates the potential reproductive activity in the closest mating season. When the animals of this age class were included as reproductive in the model, the increase in recruitment to effective/reproductive population size could be 10.9-11.4% for females and 12.8-16% for males. Then, D. Huber et al. reported on their latest efforts to illustrate variability and complexity of winter behavior of bears in Croatia. Seventeen bears were tracked during 24 bear-winters giving in total 1389 denning days. The analysis of wintering data showed some bears (at least 4 cases) returning to the same den after leaving it during the same winter season. Interestingly, none of the bears studied used the same den twice during different denning seasons. In case of 10 dens, sun beds were found nearby and appeared used during daytime in winter. While taking into account the observed decrease in the average days of snow cover over the past 3 decades, as well as an increase in the average winter temperatures, no change in bear winter behavior was observed. To summarize, I see 3 take home messages (1 per paper presented) for the audience: 1) although the bear meat in Croatia is safe to eat, the chair personally (being a long-term vegetarian) does not recommend this ; 2) the approach of including all characteristics and factors influencing reproductive success into the modeling for an effective population size might help answer the question on how much mortality can be compensated, which is important for sound management decisions not only in hunted populations; and 3) bears are an amazing species with remarkable adaptability. As a chair, I very much enjoyed this session and was happy to spend this time with Croatian team although it was a very early Thursday morning.

Session 7: Population Genetics and Genomics in Bear Conservation

Chair: Marta De Barba (marta.debarba@gmail.com)

The technical session on Population Genetics and Genomics in Bear Conservation had 6 contributions including 2 selected presentations outlining exciting prospects for bear genotyping, and 4 case study presentations with conservation implications for brown bears in Europe. In the first selected presentation, A. J. Norman et al. explained how, in Sweden, brown bear fecal samples are efficiently collected through a form of citizen science. She then presented the development of a SNP chip for reliable genotyping of DNA extracted from feces, and provided examples of SNP applications from the south Swedish brown bear population, showing their usefulness for studying genetic processes of conservation relevance. The second selected talk, by M. D. Barba et al., introduced a new microsatellite genotyping approach based on high-throughput sequencing. With this method, alleles are unambiguously identified by their sequences, allowing greater genotyping accuracy and direct comparison of genotypes between labs. Another advantage is reduced time and cost of large genotyping projects. She provided results of application on brown bear non-invasive and tissue samples. The session then continued with P. Anijalg giving insights on brown bear phylogeography in Eurasia and colonization of North America, by analyzing the mitochondrial genome of Eurasian brown bears. He showed that about 35 kya, brown bears from a refuge area (likely in eastern Siberia) divided into 2 large populations, from which colonization of North-America and Kamchatka, and migrations in Eurasia originated. He discussed these events in the context of past climate change. L. Paule used microsatellite mark-

ers to investigate the degree of genetic differentiation between the Western (Slovakia) and Eastern (Romania) Carpathian brown bear populations. Levels of differentiation detected were high, but he also found higher similarity between Romanian and Eastern Slovakia brown bears, and evidence of genetic structure within the Western Carpathian population, probably related to human activities dating to the period between the two world wars. P. Ciucci presented a mark-recapture abundance estimation for the remnant brown bears in the Apennines in central Italy, based on microsatellite genotyping of samples collected through multiple non-invasive genetic techniques. The estimated population size was 51 bears, greater than in a previous survey. While this data definitely confirm that the population has not been recently declining, he argues for cautionary interpretations of a positive trend in the population. In the final presentation, V. Muñoz-Fuentes provided an evaluation of the genetic status and structure of brown bears in the Balkans using microsatellite and SNP genotyping of non-invasive, tissue and blood samples. Major structuring was detected among the Dinaric-Pindos, Carpathian and Eastern Balkan populations, but also between bears in different mountain ranges within these populations. She also showed that the Dinaric-Pindos population appears more distinct, and provided evidence for connectivity where the three populations meet.

Session 8: Bear Immobilization

Chair Fatima Sultana (drfatimaehh2009@gmail.com)

The session on Bear Immobilization was held on 9 October 2014 from 11:20 -12:00 a.m. N. F. Esteruelas a Veterinarian with a Masters in Biodiversity and Conservation Biology from Spain, presently pursuing her Ph.D. on stress of capture and handling in brown bears presented her paper, along with co-authors, on Leukocyte coping capacity (LCC) as a tool to assess capture and handling induced stress in Scandinavian brown bears (*Ursus arctos*). Fandos et al. studied 24 brown bears, including 19 that had abdominal surgery. LCC values demonstrated that solitary animals and females were more stressed at the time of capture than animals in family groups and males. Surgery had no impact on LCC levels. The next speaker was G. M. De Benedictis on Influence of stress on Wild Marsican Brown Bear Chemical Immobilization. The aim of Benedictis et al. study was to evaluate if stress induced using Aldrich snare's restraint influenced anesthetics requirement for chemical immobilization and physiological parameters. According to them this was the first study evaluating the level of stress induced by physical restraint in Marsican brown bears and it showed that stress influenced not only physiological parameters but also anesthetics needs, thus the anesthetic protocol should be tailored to the bear's stress state.

Session 9: Bear Activity

Chair Fatima Sultana (drfatimaehh2009@gmail.com)

The session on Bear Activity was from 12:00 - 13:00 p.m. on 9 October. The first presentation focus was on spatio-temporal interactions in relation to the social behavior of brown bears in NW Greece by A. Giannakopoulos et al. According to their study, the home ranges overlapped extensively, even for home range core areas. Male bear dyads overlapped by 50% in all seasons in core areas, compared to female male bear dyads, which only overlapped by 50% in spring. Temporal interaction analysis showed that adult male pairs were closer in autumn than female-male pairs, which were closer in spring. Social interactions between bears were variable, showing a certain degree of seasonality. Next, A. Soyumert et al. presented on activity patterns and distribution of brown bear in Northwestern Anatolia. Their study revealed the importance of local data to understand the activity patterns of brown bear, and contribute to fill the gaps in ecological information on brown bear populations in Turkey. The final presentation was by H. Ambarli on daily activity and resting patterns of brown bears in Turkey by using camera traps and GPS-GSM collars. His study aimed to determine daily activity and resting patterns of brown bears in Artvin, Turkey by using camera traps and Followit Tellus GPS-GSM collars integrated with activity logger. He used 10 of 22 camera trap stations every year between 2008 and 2011 in 450 km² area located in the northeastern part of Turkey. All the data were pooled into 4 hour intervals to reveal daily activity and resting patterns of individual bears. He analysed both time of bear images and activity in six time periods in a day with descriptive statistics. Activity data loggers indicated that bears were mainly nocturnal and mostly active (mean %= 57.65) rather than inactive (mean %= 42.35) during day. The most active bear was a sub-adult male, followed by male bears.



Fatima Sultana chairing sessions on bear immobilization and bear activity.

Fatima Sultana

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Session 10: Methodological Innovations and Considerations

Chairs: Diana Doan-Crider and Michael Proctor (diana.crider@gmail.com, mproctor@netidea.com)

This session opened with “Modeling urban black bear occurrence in the Mid-Atlantic Region (USA) using Boosted Regression Trees” by A. N. Tri et al., where authors used boosted regression trees to create predictive models of bear occurrence in urban and suburban habitats for New Jersey and Pennsylvania. They were able to estimate bear occurrence in proximity to roads, forest edges, and boundaries of urban areas. In “Making the most out of different sources and qualities of data in species distribution modeling: an example on the distribution of brown bears (*Ursus arctos* L.) in Greece”, A.S. Bonnet-Lebrun et al. combined 2 indices produced from the use of genetic monitoring via barbed-wire fitted power poles and opportunistic presence information collected by non-scientists throughout the country. This produced a species distribution model for each dataset, where they were able to correct for bias in the systematic and opportunistic approaches. In their presentation, “Technologies for monitoring morbidity of free ranging bears” P.J. Karlsson et al. reviewed methods of monitoring morbidity in bears and highlighted technical approaches to improve current methods citing methods also used with humans. In a related topic, “A methodological comparison of body condition in polar bears during the ice-free season in western Hudson Bay” by L. Sciuillo et al., the authors compared indices of body condition in Hudson Bay polar bears with a focus on bioelectrical impedance analysis (BIA). BIA was shown to be an accurate measure of body condition as fat reserves correlated well with adipose tissue across cohort, age, and reproductive status of females, and declined with fasting length and energy expended on offspring. Next, in “Demography of the Pyrenean brown bear: accounting for heterogeneity in the detection process and small population size in a capture-recapture framework”, B. Piédallu et al. focused on demographic rates and population size, and accounted for heterogeneity found in the monitoring methods currently used by the French and Spanish Brown Bear Network. They also performed a mark-recapture analysis in a Bayesian framework and incorporated this information to evaluate the implications for population viability projections. In “Capture heterogeneity in hair-trapping: sources of bias unique to the method”, K.V. Noyce and D.L. Garshelis, discussed heterogeneity found among bear sex, wire placement, timing of collection (due to molt), and number of strands used. Their results suggested that 2-strand designs may better capture population diversity than single-strand designs. In their presentation titled, “Temporal features of tundra ecosystems best predict the distribution of Barren-ground grizzly bears of the Canadian Southern Arctic”, by T. Jessen, et al, a DNA based hair snare program and remote camera surveys were used to determine whether static landscape features such as diamond mines were affecting grizzly bear distributions, but their findings did not support this. However, they did find that bear distributions were affected by temporal variation of resources, and plant phenology will now be included in their occupancy models. In “The use of Normalized Burn Ratio (burn severity) maps to evaluate the recovery of key bear foods after wildfires in large, arid landscapes”, D. Doan-Crider and A.N. Tri proposed a method to estimate losses of primary productivity by quantifying changes in calorie production across patchy landscapes in combination with the use of burn severity maps after large wildfires. This model can then be used to monitor recovery of key bear foods, and help predict bear population responses and movements. In the presentation, “Comparison and integration of different techniques for the estimation of the minimum number of brown bears (*Ursus arctos* L.) in a peripheral and low density population” N. Comand et al. used a combination of DNA sampling, camera traps, and radio telemetry to assess monitoring methods of brown bears in the Dinaric population between the northern Italian and Slovenian populations. The use of computerized algorithms helped them distinguish individuals from photographs; videos helped them reduce the number of DNA samples run in the lab, and to identify individuals not genetically sampled.

Session 11: Bear Conservation and Community Participation

Chair: Tony Knight (ajk34@kent.ac.uk)

By focusing on community participation, this session was convened to explore the human and social implications of bear conservation. The 3 papers explored human coexistence with bears and, in particular, were interested in the local knowledge and perceptions of bears in humanised landscapes. Indeed, the central use of social science methods employed by the 3 panelists was perhaps the most focused of the conference. As an environmental anthropologist, this was particularly important for me personally as it was my first presentation to a predominantly scientific audience; I have to admit, it was also a little intimidating. Interestingly, when I met with Ine Dorresteijn the day before, I was surprised that she, too, was anxious about how our presentations would be accepted, this despite her conservation biology background before consciously choosing to take a more interdisciplinary approach: this did little to ease my anxiety. Our third panelist, Brandon Leforest, a wildlife biologist, showed no such concern: he was very comfortable with presenting research using mixed-methods. As it turns out, the presentations proceeded with no issues and were, it seemed, very well accepted by the audience.

I will look at the 3 papers in reverse order. Brandon was interested in the Traditional Ecological Knowledge of polar bear

biology in the Eeyou Istchee marine region of north-western Québec, Canada, in particular, relative to climate change. Brandon et al. used both quantitative and qualitative methods to analyze data collected via semi-directed interviews with local Cree elders and hunters. Biological science and local knowledge both confirmed that climate change was increasing the ice-free period of the region. The local knowledge added valuable information about the changing distributions of polar bears and their use of the habitat. Equally as important, the study revealed differing views about conflictual coexistence between bears and humans depending on the transgressions of bears as their movements become more irregular due to the changing climate. Their conclusions clearly show the value of conservation science working closely with local knowledge as a means to improve conservation methods while considering the implications to the human actors.

Ina was more interested in the trends of changing human acceptance of brown bears in Transylvania, the mountainous area of Romania where people have coexisted with bears for hundreds of years. This coexistence has been relatively peaceful, but evidence from other parts of Europe suggest that human dominated landscapes are becoming increasingly anthropocentric and, as socio-economic change rapidly impacts such areas, tolerance for the presence of large predators can be negatively impacted. Ina et al. were interested in how to remain aware of specific social drivers which hold the potential to maintain or to decrease this tolerance. The team focused on the use of qualitative questionnaires and personal interviews with local people in order to obtain a broad understanding of the social dynamics and changing perceptions of coexistence with large carnivores. The research revealed that continued peaceful coexistence will depend on general perceptions that depredations and damages due to bears remain at an acceptable level. More importantly, the research demonstrated the need for ongoing social research in order to avoid or at least minimise potential issues.

My own research is based on 14 months of ethnographic participant observation of pastoral families in the central French Pyrenees, where there has been an uneasy coexistence with large predators for millennia. Unlike Ine's Transylvanian example, though, the historical record shows that over many centuries, French pastoralists have become increasingly entrenched against any form of coexistence due to predations being a significant threat to families' livelihoods, and even their identities. A bear conservation program has been operating for over 30 years, based around the reintroduction of Slovenian brown bears into the Pyrenees. Despite the bear being considered by many the symbol of the mountains, today's pastoralists refuse to accept its presence. Most of the conservation science has focused on financial means to encourage pastoralists to adapt and to better accept the presence of bears. As such, it has failed to truly understand the way pastoral people feel about living with predators, resulting in an increasing alienation between conservation and pastoralism. No amount of scientific research, even when complemented by mixed-methods, can properly identify paths to a successful coexistence. My research reveals that without a deeply social research working with the pastoral actors, then there will be no chance that such coexistence will be achieved, and that this will result in imminent failure of the bear conservation program, but also in land and farm abandonment by thoroughly disheartened pastoral farmers.

These 3 cases studies used differing degrees of social science as part of their research methodologies, but they demonstrate the value of social science for effective conservation and managing human-bear conflicts. This value appears to become more significant depending on how effectively natural and social science can work together transdisciplinarily, which is not always easy in the real world. I, for one, certainly plan on continued participation at IBA events for this very reason.

Session 12: Human-Bear Conflicts

Chair: Marty Obbard (martyn.obbard@mnr.gov.on.ca)

In this lively, well-attended, session (standing room only) each of the speakers discussed aspects of the overall conference theme of "Bears and humans in the 21st century: challenges and solutions for a peaceful coexistence". E. Can et al. led off the session and summarised results of a survey of 104 bear experts in 54 countries, a review of 50 management plans and 172 peer-reviewed articles. This review suggested that human-bear conflicts are increasing world-wide often with negative outcomes for bears. He presented a toolbox for conflict management that emphasised that solutions must be holistic and tailored to the needs of people and bears. Next, L. Bautista et al. presented a review of patterns of brown bear damage in Europe. Overall, 45% of brown bear damage was to livestock, 34% to beehives, and 10% to crops. However, the proportions



Tony Knight, Chair of Session 11, speaking with Blaise Piédallu, a doctoral student of ecology in France.

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varied greatly among countries (e.g., in Poland 97% of claims were related to damage to beehives, whereas in the Pyrenees 86% were for loss of sheep). The number of claims was not strongly correlated with bear abundance but landscape variables (proportion of forest cover, human density) had an important effect on occurrence of damages. Next, M. Obbard et al. presented results of a study of the relationships among food availability, harvest and human-bear conflict in Ontario, Canada. Results of that study confirmed the large effect of variation in availability of natural foods on conflict levels, and suggested that at the levels of harvest in Ontario and similar jurisdictions (~6-10% of population) harvest cannot be expected to reduce conflict levels. Next up was L. Wu et al. of Peking University who presented an analysis of a pika eradication policy and whether it affected human-bear conflict levels in the Tibetan plateau. She concluded, despite earlier work suggesting pika eradication did increase conflict levels that the biomass of pikas in the study area exceeded the bears' energetic requirements and conflict levels were better explained by the efforts local people made to secure their houses when they moved to summer range. The authors concluded that measures such as electric fencing to protect houses would be effective in reducing conflict levels. Next, J. Hechtel presented a review of bear attacks in Alaska from 1980-2010. Of 152 attacks, brown bears were responsible for 88%, black bears for 9% and polar bears for 1%. Of 17 fatalities, 82% (14) were from brown bear attacks, 12% (2) from black bear attacks, and 6% (1) involved a polar bear. Most attacks by brown bears were defensive, whereas black bear attacks were predatory. Lastly, R. Marquez and I. Goldstein described a framework and tools for managing human-Andean bear conflicts. The framework and tools arose from a 2009 workshop: "Principles of Andean bear-human conflicts resolution". Tools included a "Manual for the identification of predation of domestic animals by carnivores" and a "Guide for the diagnosis of the conflict landscape". Results of pilot studies to evaluate the manual and guide were presented. Information provided by the speakers covered a wide geographic range and all bear species.



Conference attendees.

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Session 13: Bear Management

Chairs: Sam Steyaert and Klemen Jerina (sam.steyaert@nmbu.no, klemen.jerina@gmail.com)

Eleven studies were presented at the Bear Management session: 4 on direct and indirect impact of artificial feeding of the bears, 3 on bear translocations, 2 on impact of hunting, 1 on multi-species habitat management and 1 on policy/funding. Most of the presented studies were from Europe and North America; they were focused on brown bear or grizzly (9), black bear (1) and polar bear (1).

The study in Slovenia and Scandinavia presented by S. Steyaert et al. indicates that supplementary feeding does not affect frequency of occurrence of bears close to human settlements at population level. K. Jerina et al. showed that intensive diversionary feeding with carrion from domestic animals in Slovenia did not affect frequency of livestock depredation. Carrion was an important food source during spring. However, on an annual basis, the share of carrion relative to other protein rich sources (e.g. non-vertebrates) was low. Similarly, A. Moorehouse et al. showed that intercept feeding grizzly bears with carrion did not reduce feeding on frequency of livestock depredation in Northeast Alberta. N. Selva et al. showed that intensive supplemental feeding of ungulates has a range of side effects on brown bear ecology and behavior in Poland, and can have a key impact on bear winter ecology.

One of the measures to mitigate nuisance bear behavior is translocation and relocation of problematic individuals. L. Brown et al. showed that such measure were only successful in about a third of cases, with translocations being more effective (approx. 30-times) than relocations. Translocations were more likely successful when the conflict did not involve anthropogenic resource use. R. Jurj et al. presented similar results from Romania. Brown bears that fed on urban waste were trans- and relocated to areas of several dozen to several hundred kilometres away from cities. The measure was successful in 20-30% of all cases. F. van Manen showed that offspring that were separated from their mothers during translocations in the Greater Yellowstone Ecosystem could still make significant contributions the population.

Two studies investigated direct and indirect effects of hunting. B. McLellan et al. investigated if hunting can lead to the extirpation of grizzly bears in British Columbia (BC). There have been numerous suggestions that the bear hunt is unsustainable and will lead to the extirpation of several populations in BC. The harvest levels in BC were well below or within the sustainability range for almost all populations, and population densities were often higher than in un hunted populations in North America. Their results indicate that bear hunting will most likely not lead to local extinctions of Grizzly

bears in BC. Hunting can directly and indirectly impact other biological traits such as circadian activity, habitat choice, migration, etc. M. Leclercq et al. indicated that behavioral patterns are often heritable and that hunting may act as a selective pressure on behavior in a Scandinavian population.

L. Finnegan et al. investigated how habitat restoration may affect the spatial distribution of 2 species at risk, caribou and 1 of its main predators, the brown bear, in Alberta. Landscape disturbances (e.g., seismic lines, pipelines, cutblocks) affect the spatial behavior of both bears and caribou. Seismic lines in areas with high caribou use and cover types that facilitate predator movements should be considered as focal areas in restoration projects.

S. Elvin presented a novel approach to the conservation of polar bears; the Large Marine Ecosystem Approach. Brown bears are distributed across Large Marine Ecosystems (LME) and five nations. The LME approach offers a framework to assess, prioritize, and address transboundary issues by evaluating several modules, including marine mammals. She points out that the LME approach may provide means to evaluate and plan transboundary polar bear conservation in arctic LMEs.

The bear management session had several take home messages, including: 1) despite being rather inefficient as a management tool, supplementary feeding bears is common and locally increasing. Supplementary feeding carries several indirect ecological effects, which are poorly understood; 2) managing human-bear conflict is a major challenge for managers throughout the world, and translocation of bears can be an efficient strategy under specific circumstances; 3) direct effects of bear hunting on the population remains heavily debated and hunting likely comes with indirect effects of bear behavior and evolution; 4) habitat studies are crucial for efficient conservation of endangered populations; and 5) think big and out of the box.

Session 14: Reproductive Biology

Chair: Nuria Selva (nuriselva@gmail.com)

On the last day of the conference, the session Reproductive Biology brought 3 exciting presentations on polar and black bears, all from North America. E. Richardson et al. started the session with a description of the mating system of polar bears. He presented results from parentage analysis of the western Hudson Bay population based on an amazing amount of data (2,229 offspring born during a 30-year period). Using 25 microsatellite markers, they documented 14 cases of multiple paternity. During their lifetimes, male polar bears were estimated to have a minimum of 0 to 9 mates and produce a minimum of up to 13 cubs. Male opportunities for sexual selection seemed to be greater than for females.

C. Gray et al. presented results on female denning ecology in an isolated black bear population of about 150 individuals in central Georgia. The authors conducted field inspections of potential female den sites in December-February 2013 from 34 females equipped with GPS-collars. Ten out of 16 dens found were identified as parturition sites and were mostly associated with fallen trees. The micro- and macrohabitat characteristics of these sites were described. Authors highlighted the lower litter size in relation to other black bear populations and the need to take into account denning habitat requirements in bear conservation and management.

The last presentation by J Clark et al., also dealt with an isolated black bear population, this time in Louisiana. This black bear population consists of 4 subpopulations and is classified as threatened. Using step-selection functions from GPS-collared bears and non-invasive genetic sampling, the authors aimed at assessing connectivity among the 4 population segments. They found evidence for male dispersal among some segments and even for breeding with reintroduced bears in 1 of the subpopulations. They propose the establishment of satellite populations in the linkage zone as an effective measure for female interchange and demographic rescue.

Session 15: What Works: Innovative Successes in Bear Conservation, Management, and Science

Chair: Karen Noyce (karen_noyce@bearbiology.com)

It is easy at IBA conferences for stories of successes to be lost or overlooked amidst dozens of presentations regarding the myriad of challenges we face in all aspects of our work. This session, "What Works", was intended to highlight some of our successes, whether in improving research tools, finding answers to long-standing enigmas, applying effective conservation strategies, or changing public attitudes towards bears. The session comprised 8 presentations, including 2 invited and 6 chosen from among submitted abstracts. Abstracts were chosen that indicated new or innovative thinking, measurable success, and potential for broader application.

Invited speaker, S. Wilson, talked about emerging work with co-author M. Krofel to apply Seth's successful approach to bear conflict management in the US to communities in Slovenia. Seth reported on his long-term engagement with com-

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munities in western US to identify goals (with regards to grizzly bear management) that the communities could support, to involve members in data collection and interpretation, and to focus on building trust and changing human behaviors, rather than values. The communities he worked with witnessed a drop of 93% in reported bear-human conflicts between 2003 and 2013, even as the local bear population increased in size and range. Presenter L. Flores Muriel et al. similarly engaged community members of villages in southern Colombian in ecological survey work, data interpretation, and implementation of bear education programs. Communities now have an understanding of resident Andean bear ecology, ongoing monitoring programs, and a strong group of citizens committed to bear conservation.

The second invited speaker, A. Karamanlidis et al., summarized the many ways that electric power lines running through bear range can be used for investigating the status of bear populations. Bears ubiquitously use power poles for marking, leaving both visual and genetic (hair) evidence, thus power lines provide wide-spread, long-term networks of ready-made monitoring stations at no cost to researchers. For over a decade, Alex and colleagues have explored their use in formal studies of presence/absence, occupancy, genetic status, genetic-based mark-recapture, and marking behavior.

Three additional speakers presented work on long-term monitoring. M. Marenče et al. reported that in Slovenia, a country with wide-spread supplemental feeding of bears, bears have been counted simultaneously by observers at 167 permanent feeding stations on 3 full-moon nights each year. These standardized observations have provided a wealth of data on population structure and trend, seasonal behavior, and reproduction. M. LaRue et al. developed and continues to test and refine the use of very high resolution (VHR) satellite imagery to count polar bears with a high degree of accuracy, providing an exciting new tool for cost-effective future monitoring of polar bears on a broad geographic scale in the face of climate change. I. Goldstein and R. Marquez developed a standardized approach to monitoring Andean bear occupancy that can statistically detect 20% change over 4 years and is now being applied in multiple national parks in Colombia.

A common problem when new habitat management plans are implemented is the lack of follow-up monitoring. T. Larsen et al. combined LiDAR mapping and GPS bear location data to demonstrate that forest management that increased the heterogeneity in the size of retained forest patches during logging resulted in greater use of those forests by grizzly bears post-logging. The final speaker, V. Stephan-LaBoeuf, discussed the components of successful rehabilitation of American black bears in Idaho, even near urban areas. Post-release monitoring has shown that <2% of bears released from this program over 25 years have come into conflict with humans within a year of release.

Session 16: Ex situ Conservation

Chair: Marion Schneider (mfschneider@gmx.de)

The Ex situ Conservation session consisted of a variety of interesting presentations, demonstrating how zoos and sanctuaries can contribute to nature conservation by means of captive breeding, education and research.

M. Schneider (Behavioural Biologist from the Cologne Zoo in Germany) et al., presented a study on the effects of spatial unpredictability of food availability on foraging behaviour in captive Malayan sun bears. The data presented showed that implementing unpredictability of food availability significantly increased the time the bears spent foraging and led to a higher diversity of foraging behaviors. The effects lasted throughout the entire day and no habituation occurred. Despite a restrictive diet, intraspecific aggression was reported to be constantly low. The study suggested that functional species-typical behaviour in captive bears can be stimulated in the long term by simulating natural patterns of food availability.

S. Silver (Animal Curator and Director of the Queens Zoo) and D. Thompson, gave an overview of the role and status of managed bear programs within the Association of Zoos and Aquariums (AZA) and provided an insight into how zoos can contribute to bear conservation by managing captive bear populations. The presentation outlined the different categories of management for each of the 8 bear species population in North American zoos, as well as the status and challenges facing each population. The status of collaborative efforts between field programs, non-AZA managed populations, and ex-situ populations within range countries were also illustrated. The different strategies designed to affect conservation of wild bear populations were outlined. Finally, the potential for future actions for sustaining (or in some cases not sustaining) captive populations and increasing the conservation effectiveness of zoo exhibits was discussed.

R. Van Horn (Scientist at the San Diego Zoo Institute for Conservation Research) and M. Owen, presented a retrospective analysis of maternal investment in captive bears by evaluating data from captive-born litters of seven bear species. The proportion of males in litters



Conference attendees.

Tsakiris/ARCTUROS

was not statistically different from 50% among Andean bears, Asiatic black bears, brown bears, giant pandas, and polar bears. However, there were unexpected and contrasting sex ratios among sloth bears and sun bears. In addition, the results presented suggested that female provenance may influence cub sex ratio in some species but not others. These results suggest that in some species the offspring sex ratio may be affected not only by conditions earlier in females' lives, but also by species' evolutionary histories and revealed that skewed sex ratios pose challenges for captive breeding programs faced with genetic management of small populations.

A. Sergiel (Assistant professor at the Institute of Nature Conservation at the Polish Academy of Sciences in Kraków) et al., reported on long-term effects of suckling deprivation in captive bears. In order to investigate the mechanisms and determinants of regular observed and persistent fellatio in 2 captive male brown bears, both orphaned as cubs, 20 video records were employed. The humming vocalizations used by suckling bear cubs suggested that the providing bear retained infantile behavior. The presented data suggested that the fellatio behaviour may have emerged from frustrated suckling reflex in individuals orphaned as cubs.

E. Curry (Reproductive Physiologist at The Center for Conservation and Research of Endangered Wildlife (CREW) at the Cincinnati Zoo & Botanical Garden) et al., evaluated the use of a detection dog and volatile organic compound (VOC) analysis for non-invasive pregnancy diagnosis in polar bears and to characterize the VOCs present in pregnant versus pseudo-pregnant polar bear feces. The presented results indicate that a trained detection dog may be useful for non-invasively diagnosing pregnancy in polar bears. However, since it is likely the dog has identified a scent signature involving numerous compounds instead of a pregnancy-specific VOC, further investigations should provide information necessary to define the window that pregnancy is detectable post-estrus and pre-parturition.

N. Field (Bear and Vet Team Director at Animals Asia, China) and J. Robinson, presented a solution based approach towards ending bear bile farming in China. The described strategy has taken a multi-faceted approach including 5 key components; reducing demand, education and raising public awareness, political negotiation and policy change, monitoring trade and running bear sanctuaries. With the intended outcome that ending bear farming can be achieved where the needs of farmers, bears and the government can be addressed, Animals Asia embarked on collaboration with a bear bile farm in Nanning, Guangxi Province to convert the facility to a sanctuary. This collaboration is assumed to be a realistic and convincing model to show that it is possible to work together with the industry to end bear bile farming in a solution based approach.



Workshop: There is a need for transformation of human-bear conflict resolution in developing countries

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World's bear experts believe that the severity of human-bear conflicts are worsening and their impact on bear conservation is increasing in many areas across the range of bear species (Can et al. 2014). Conflicts might simply be an annoyance and don't pose a threat to the survival of bears in North America but they cause hardship for people and may threaten the small and isolated bear populations in South America and Asia. Conflicts also cause diminished psychological well-being of communities, disruption of livelihoods and food security in poorer parts of the world (Barua et al. 2013).

According to the United Nations, in 36 years time, about 7.8 billion people (87% of the world's population) will be living in developing countries. This implies that many people will find themselves near bears, making conflicts increasingly likely. Failure to mitigate the conflicts may reduce local communities' tolerance and diminish conservation efforts for bears. With the support of World Animal Protection (WAP), we hosted a session on human-bear conflict management in developing countries during the 23rd IBA Conference in Thessaloniki, Greece. The session included presentations (presenters given in parenthesis) from Human-Bear Conflict Expert Team of IUCN BSG (J. Beecham), Bolivia (X. Velez-Liendo); Bulgaria (A. Dutsov), Lao PDR (L. Scotson), Nepal (B. Prasad Yadav), Slovakia (R. Rigg) and Indonesia (G. Fredriksson). We were limited by time and this didn't allow an in depth discussion as much as we would like to have but the distilled wisdom from the presentations and discussions was briefly as follows:

In South America and Asia, the information on human-bear conflicts is generally limited and gathering data on conflicts are labour-intensive and time-consuming. Expansion of people into bear habitats (so the resulting consequences) is a primary source for conflicts and there is a need to integrate poverty alleviation strategies together with conflict management

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to foster reconciliation between bears and people. Economic instruments need to be created to foster tolerance among local communities in areas with high levels of human-bear conflict. Running effective conflict management programmes require establishing partnerships between managers, locals and conservationists to gain public trust and this is critical in areas where institutional capacity is limited. Transferable lessons need to be identified and shared between practitioners tackling human-bear conflict in different countries and given the limitations, there is a need for innovative, cost-effective and thoughtful solutions. Increasing the capacity of local institutions and create awareness among rural communities are essential. However, although education is the most consulted tool in conflict management, there is a need to understand the effectiveness of educational activities (Can et al. 2014) to be able to design and run effective educational initiatives. Assessing and addressing the values of local people and then tailoring education initiatives in order to make the desired behavioural changes in the target population is a key factor for conflict resolution. In brief, as discussed by Peyton (1994) and Can (2014), the reduction in conflicts will hinge on a holistic approach that is as sensitive to the needs of people as it is to those of bears.



Workshop Presenters: from left to right: Ximena, Gabriella, John, Lorraine, Aleksandar, Robin, Emre and Bhupendra (absent: David).

In South America and Asia, rather than the government institutions as is the case in North America and Europe, individual researchers and practitioners lead the efforts on human-bear conflict management and operate in sometimes chaos and without the resources. Research per se does not guarantee success in human-bear conflict management since the link between science and policy is not straightforward. However, this doesn't change the fact that evidence is the bedrock of management and conservation and evidence comes from research. Therefore, the key component of human-bear conflict management and conservation in South America and Asia is actually researchers and practitioners themselves. Researchers working in middle- and low-income countries need data, facilitation and negotiation skills, understanding of policy but they also need perseverance, resilience and luck to get policy makers to listen and to make a positive change for bears. The question, which remains perhaps for another workshop is: What can professional organisations like IBA do to help them?

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Workshop: Strategies for Recovery of Mongolia's Mazaalai (Gobi Bears)

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Presenters: Dr. J. Batbold, State Secretary, Ministry of Environment and Green Development (MEGD), Ulaanbaatar, Mongolia; Bayasgalan Amgalan, Officer, MEGD; Tuya Tserenbataa, Mazaalai Working Group, Ulaanbaatar, Mongolia; Odbayar

Tumendemberel, Institute of Biology, Mongolian Academy of Sciences, Ulaanbaatar, Mongolia; Dr. Lydia Kolter, Zoologischer Garten, Koln, Germany; and Dr. Bruce McLellan, IUCN Bear Specialist Group, Red-listing Coordinator.

The nation of Mongolia is the committed caretaker of the Mazaalai, or Gobi bear. Gobi bears are not only a national treasure for Mongolia, their continued existence is and should be a global responsibility. Parliament passed a bill to establish 2013 as “The Year of Conservation of the Gobi Bear.” Mongolia’s goal is to increase numbers and provide for their recovery in the range they occupied prior to 1970. Almost all of their 17,000-km² present range is included within the 49,000-km² Great Gobi Strictly Protected Area (GGSPA) in the extreme south-western portion of the country, which is administered by the Ministry of Environment, Green Development and Tourism (the Ministry). Regulations for the GGSPA allow access to the area only for administrative purposes, including research and monitoring activities—tourism is not allowed.

Gobi bears are a unique desert-dwelling brown bear; as few as 22-40 may still exist in the extreme environmental conditions present in their range, where annual precipitation may be as low as 30mm and temperatures may range from -37C to 46C. Recent genetic analysis tentatively indicates that Gobi bears comprise a separate subspecies, *Ursus arctos gobiensis*. Although the largest male captured during the research weighed 138 kg, mean weight was 112 kg, and 68 kg for adult females. Gobi bears have been protected in Mongolia since 1953; there is no known mortality from illegal taking. They feed almost exclusively on roots, berries, other vegetation, and insects (beetles and grasshoppers); bears may consume some rodents and very rarely carrion from large mammals, even when readily available—no evidence of predation on other large mammals has been documented.

Because of the bear’s vegetarian food habits, an important limiting factor probably includes overgrazing by livestock, mostly goats and camels, within the buffer zone of the Protected Area where grazing is allowed during October-March, exacerbated by effects of climate change. Concurrently, the water table has declined and small springs are drying up. Disturbance related to illegal small-scale mining in the area may exclude bears from springs.

Positive recovery actions taken by the Ministry have included providing additional scarce funding available to the Ministry for conservation of Gobi bears: it established the National Program on Mazaalai Bear Conservation, with a Working Group to guide and assess utility of conservation activities. Their primary goal is to explore the best means of improving carrying capacity of environment to assure natural reproduction of bears; to maintain a research/baseline database; to use best science/technology to assess efficacy of captive breeding; and to introduce Gobi bear conservation policy on an international level. They recommend establishing an independent Mazaalai Bear Trust Fund as an NGO to help fund conservation and research.

IUCN Guidelines for reintroduction and translocation (including from captive breeding sources) clearly dictate that absolute level of risk to the wild source population and to the success of the reintroduction must be assessed. If a high degree of uncertainty is present or it is not possible to reliably assess that the action presents low risk, alternative solutions must be sought. If a high degree of uncertainty is present, the captive breeding and reintroduction plan should not proceed.

The risk of captive breeding for population recovery is substantial, especially for small source populations and especially for bear species. Zoo studies have shown that the likely loss of genetic diversity is high: with 2 founders (captive breeders), 56% of diversity has been shown to be lost in first generation; with 4 founders, 51% of diversity may be lost by fifth generation. This means that the choice would be to either take ALL of bears out of habitat for captive breeding or leave ALL in them in natural habitat and do everything to protect bears and habitat. For captive breeding to succeed, recommendations are to minimize the number of founders and maximize the carrying capacity of habitat. Of wild-born brown bear females taken into captivity in zoos, only ~ 42% breed in captivity. Also, large and naturalistic enclosures with natural foods readily available must be available so that mothers can teach offspring how and when to forage for rare food items. Individual males and females must be compatible; dens of females have to be far away from dens for males.

Improving carrying capacity of Mazaalai presents the best option for its recovery. This would require working closely with local herders to restrict use the buffer zone of the GGSPA for livestock grazing. In addition, establishing a means of enhancing connectivity with the national park to the east of GGSPA, along with continued enhancement of water sources and continuing improvements of nutritional makeup of the supplemental food. Continuation of Ministry support for the GGSPA ranger patrols, and conservation activities is crucial as well.



Conservation

Bornean Sun Bear Conservation Centre Opens To The Public

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After 6 years of establishment and preparation, the Bornean Sun Bear Conservation Centre (BSBCC) opened to the public on 16 January 2014. The grand opening was on 9 October this year. The center is located at the edge of the Sepilok-Kabili Forest Reserve in Sabah, Malaysia Borneo. It is adjacent to the world famous Sepilok Orangutan Rehabilitation Centre. BSBCC was founded in 2008 with collaboration from the Sabah Forestry Department, Sabah Wildlife Department, and a non-government organization, Land Empowerment Animal People (LEAP). The center aims to conserve sun bears through improved animal welfare, public education and outreach, research, and rehabilitation.

Sun bears are a totally protected species in Sabah. Keeping, killing, and trading of sun bears are prohibited under the Sabah state Wildlife Conservation Enactment. However, due to lack of awareness of their conservation status, sun bears are poached, and cubs are often kept as pets. BSBCC currently is home to 35 rescued ex-pet sun bears. These bears were all rescued or confiscated by Sabah Wildlife Department from all over Sabah after receiving information about these illegal activities. These captive bears represent all age classes, from a few months old to 18 years of age. Some of these bears suffer from health problems such as malnutrition, injuries, and severe stereotypic behaviors. The sick and problem animals are being taken care of properly before they are trained to adjust to their new life in the forest enclosures of the sun bear center. BSBCC shares veterinary facility with the neighboring Orangutan rehabilitation center. There are resident veterinarians and vet nurses who can give veterinary care and medical attention when needed.

The facilities at BSBCC include a Visitor Centre with a reception area, video room and souvenir corner, an access boardwalk and observation platform, two bear houses and a one-hectare forest enclosure. An additional one-hectare forest enclosure will soon be built around Bear House No.2. The rescued sun bears are released into the forest enclosure during the day and kept in the bear house for the night. There are 19 full time staff working at the center. The center has also been helped by more than 1200 local and foreign volunteers since 2008.

The center is open to the public each day from 9 am to 3:30 pm. To date, more than 36,000 visitors from about 100 countries have visited since the center opened to the public in January 2014. About 50% of these visitors are Malaysians. These included 1360 students and teachers from 31 local kindergartens, primary and secondary schools who visited the center this year. Beside the visiting school groups, BSBCC also conducted education outreach programs to 17 remote schools this year across Sabah that could not visit the center in person due to logistical constraints. Sun bears remain the least known bear in the world; even many local people are ignorant about the presence of sun bears in the forest. Therefore the experience and the knowledge that the visitors gain when visiting the center is important for providing general knowledge about sun bears and building public support for their conservation.

BSBCC is committed to helping these rescued bears adjust to life back in the forest. Unfortunately, the majority of the rescued bears are not releasable as they associate humans with food and do not fear people. These bears will be permanently housed at the center for education. For potential release candidates, BSBCC will prepare



BSBCC education officer giving a talk on sun bear conservation to a school group.

BSBCC



Visitors of BSBCC viewing a sun bear in a natural forest enclosure.

Cede Prudente



(left) Sun bears are usually solitary animals in the wild. But at BSBCC we observe interesting social behavior especially among the younger individuals. (right) Rescued sun bears at BSBCC display their natural climbing behavior in the natural forest enclosure of BSBCC.
Photos: Lin May Chiew/BSBCC

them through a rehabilitation process designed to achieve their eventual reintroduction back into the wild.

Sun bears are listed as Vulnerable on the IUCN Red List of Threatened Species. Their populations in the wild are declining due to habitat loss, poaching for body parts and keeping bear cubs as pets. BSBCC is determined to become an important force for conservation of sun bears through a holistic approach in this region.



Illegal Trade

Coordinated Enforcement Efforts Needed to Combat Illegal Trafficking in Bears

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INTERPOL

Submitted at request of Trade in Bear Parts Expert Team, Bear Specialist Group

INTERPOL is the world's largest international police organization, linking law enforcement authorities across its 190 member countries and providing unique tools and services to police worldwide. INTERPOL's Environmental Security unit supports member countries in their efforts to prevent, investigate and combat all forms of crimes affecting the environment, from illegal logging to elephant and rhino poaching to the illicit trade in hazardous waste. This support includes training, criminal intelligence analysis, coordinated operational support and intelligence exchange.

INTERPOL has a number of projects focused on wildlife crimes. Project Wisdom deals with the illegal trade in ivory and rhino horn, Project Scale targets fisheries crimes and Project Predator assists countries in tackling the illegal trade in wildlife products. Though the main focus of Project Predator is on tigers and other Asian big cat species, INTERPOL has been engaging further resources into the illegal trade in bear products.

After multiple incidents related to bear trafficking were reported by authorities to the Environmental Security unit, INTERPOL undertook an assessment to analyse the illicit trafficking in bears, their parts and derivatives.

A questionnaire designed by INTERPOL was sent to our member countries affected by bear trafficking, to determine poaching threats to bear species globally. The answers, provided by the relevant government agencies that investigate bear crimes, allowed INTERPOL to develop some insights about bear trafficking and identify information gaps. Finally, in order to tackle bear trafficking, INTERPOL assessed law enforcement capacities and provided recommendations to member countries affected by bear trafficking.

Illegal Trade

Main Findings

We found that global illegal trafficking of bears is evident on a large scale (INTERPOL 2014). Adult animals can be killed by poachers who wish to capture the cubs for the pet trade or to place them into farms for bile extraction. Our member countries reported that the most common parts and derivatives seized were paws, gallbladders and bile. Other items reported in illegal trade included furs, skin, claws, teeth, skulls and genitalia bones. When bears were seized alive, seizures were most often made within source countries and these bears were usually destined to stock bile farms. A variety of methods of bear poaching were reported, including baiting, trapping, electrocution and shooting.

Wild caught bears are sometimes transported as if they were captive bred, with falsified documentation, to circumvent CITES regulations. Smuggling techniques included concealment within car tires, and packing in containers of food to hide the smell. Our survey highlighted different roles that countries play in the trade as either source, transit or consumer destinations.

Offenders involved in bear trafficking can be hunters, middlemen, traders, wholesalers, consumers and users (Broad et al. 2003). The hunters provide the middlemen and traders with the product. Middlemen can sell to traders and wholesalers who smuggle the products out of the country. Traders and wholesalers can be individuals, retailers, dealers, or organized criminal networks.

Prices of bear products vary between countries and are generally the highest in Japan and South Korea. Prices can be up to 80 times higher in international markets than domestically. Prices of wild bear bile significantly outweigh that of farmed bear bile (extracted from captive-reared bears), with traders demanding many times the price for bile extracted from a bear caught in the wild. Currently, bear-bile flakes or powder in Japan are worth more than the per kilogram price of cocaine and gold in Asia (INTERPOL 2014). Based on these high prices, there is a clear incentive for criminals and criminal syndicates to exploit the illegal bear trade.

Recommendations

The value of the annual worldwide market in illegal bear parts is estimated at US\$ 2 billion, though the clandestine nature of illicit trade makes it difficult to provide a definitive figure. As bear populations decline, their parts and derivatives have become more valuable and the prices continue to rise.

To respond effectively to bear trafficking, dedicated units composed of analysts and investigators should be established, promoting the sharing of information between countries involved in a case. The sharing of information related to bear trafficking among regional and global law enforcement agencies would assist in connecting seemingly isolated incidents, and in determining effective methods for law enforcement intervention. In some cases, wildlife trafficking may be linked to other serious crimes such as fraud and money laundering, which can lead to stronger penalties at the prosecution phase. Close cooperation between different authorities is crucial. Greater enforcement coordination, bringing together police, customs and wildlife law enforcement units can have



Caged bear cubs were seized during INTERPOL's Operation Paws in Malaysia.

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A variety of different methods of bear poaching have been identified, including baiting, trapping, electrocution and shooting.

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an important impact on the individual criminals and syndicates involved in trafficking.

Forensic evidence and information collected during investigations into incidents of poaching and seizures, combined with network analyses of the criminals involved, can aid in the identification and dismantling of the criminal enterprises involved in bear trafficking. Interviews of suspects, as well as inspection of communications equipment such as seized mobile phones and laptops, can help identify poachers, their facilitators and higher ranking individuals involved in criminal syndicates.

We recommend capacity development to standardize operating procedures and encourage joint investigations and operations. Training in interviewing suspects and forensic evidence collection methods would enhance the value of investigations as they pertain to mid-level operators and facilitators. The utilization of the ICCWC Wildlife and Forest Crime Analytical Toolkit (http://www.unodc.org/documents/Wildlife/Toolkit_e.pdf) by countries could provide a framework and comprehensive guidance through which governments can analyse and assess their effectiveness in addressing wildlife trafficking.

Improved enforcement coordination, from legislation to investigation, can have a significant impact on crimes of this nature, which rely on a complex network of individuals. The use of INTERPOL tools is strongly encouraged, as it can enhance multinational law enforcement cooperation.



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Improved international law enforcement cooperation is key to combating the illegal bear trade.

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Feeding caged bear cub.

Human Bear Conflicts

Human-bear conflict in the Kennicott Valley, Alaska

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I recently completed my MSc research on human-bear conflict in the remote and populated Kennicott Valley of Wrangell-St. Elias National Park & Preserve in southcentral Alaska. The focus was on understanding the interplay between local peoples' attitudes towards bears, and the use of lethal or non-lethal safety methods.

Research Questions included the following

1. How does the local population perceive bear conflict and its causes?
2. What attitudes exist towards killing bears in the Kennicott Valley?
3. What underlying factors determine these attitudes?
4. How do these attitudes affect the use of bear-safety methods?

Methods

I used rigorous, interdisciplinary methods to answer these questions and to develop locally based conflict prevention ma-

Human Bear Conflicts

materials. Data collection included: 1) formal video or audio recorded interviews; and 2) closed and open response anonymous questionnaires. Data analysis included: 1) coding of qualitative information in NVivo; and 2) cross-sectional analysis of quantitative variables in RStudio.

Results

Part I. I defined and expanded upon bear-human conflict in terms of the community, finding 6 primary causes: 1) anthropogenic attractants; 2) letting your guard down; 3) development and ecology; 4) natural attractants; 5) human habituation; and 6) bad bears.

Part II. I found that community members tended to exhibit non-persecutory to indifferent attitudes towards killing bears (about 17% admitted to having killed a bear), and that attitudes were generally non-polarized. I then analyzed the underlying beliefs that formed these attitudes, and found that beliefs about the efficacy of reading bear behavior were indicative of the use of lethal control. This means that if a person in the valley reads bear behavior and/or believes in its efficacy, they are significantly less likely to take lethal actions against bears.

Part III. I identified existent bear-safety methods and the relative use/non-use for each. I also identified 4 main bear-safety topics in the valley (i.e., food and trash, firearms, bear behavior, and dogs) and summarized bear-safety solutions as defined by community members. I used the data to write my dissertation and to create bear conflict prevention materials. An example can be seen in the four-part video series on life in bear country, or the bear-safety poster below.

Part I - Life in Bear Country: <https://www.youtube.com/watch?v=uQu-2p95Ej8>

Part II - Bear-safety Methods: <https://www.youtube.com/watch?v=ggrc-xpErkY>

Part III - Bear Conflicts: <https://www.youtube.com/watch?v=C-f4m2SFL9Y>

Part IV - Problem Encounters: <https://www.youtube.com/watch?v=QiUloJ4RSAk>



Grizzly teeth marks on a gasoline container.

Leanne Phelps



Wider Implications

The workings of human-bear conflict are multifaceted, so they require effective and interdisciplinary

research methods and solutions. Alike other large carnivore conservation, bear conservation depends upon human-bear interaction, which makes bear survival very context specific. I addressed these complex issues by designing the research to serve investigative purposes, and to contribute to community-based conflict solutions. When it comes to human-wildlife conflicts, there are plenty of solutions and untapped knowledge nestled in local peoples' stories and perspectives; they just need to be represented in accessible and relevant ways.



Community-based bear safety poster about reading bear behavior.



Grizzly tracks heading to den at the onset of winter.

Leanne Phelps

Leanne Phelps

The Impact of Climate Change on Andean-bear Habitat Suitability across the Venezuelan Andes

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Climate change is accelerating due to significant increases in atmospheric concentrations of greenhouse gases and aerosols, with human activities being the main cause of this increment (IPCC 2007). Worldwide, the Andes is one of the most vulnerable regions to climate change (Malcolm et al. 2006, Vergara et al. 2007, Vuille et al. 2008, Lawler 2009) due to the large environmental heterogeneity restricted to a relatively small area, long-standing human presence and high levels of species endemism (Myers et al. 2000, Fjeldsa 2006). The Andean bear (*Tremarctos ornatus*) is endemic to this region and depends on various ecosystems currently threatened by this global process (Rodríguez et al. 2003, Goldstein et al. 2008). In Venezuela, Andean bears are considered "Endangered" (Rodríguez & Rojas-Suárez 2008) and the loss and fragmentation of Andean ecosystems is the main threat for their long-term survival (Peyton 1999, Kattan et al. 2004, Goldstein et al. 2008). Thus, a possible impact of climate change could bring additional risks to the species. In light of this situation, we decided to evaluate the potential impact of climate change on Andean-bear habitat suitability across the Venezuelan Andes by generating species distribution models based on climate data using MaxEnt.

The distribution of Andean bears in Venezuela is divided into 2 separate sections: 1) Cordillera de Mérida and the Macizo El Tamá to the East; and 2) Sierra de Perijá to the West (Yerena et al. 2007, Sánchez-Mercado 2008) (Figure 1). However, to avoid excluding any areas that could be suitable in future projections, we used the length of every state overlapping the species' distribution as the study area. At present, there are 12 national parks and 1 natural monument along the distribution of the Andean bear in Venezuela (blue line on Figure 1), which means that about 40% of its range is protected (Peyton 1999, Yerena et al. 2007).

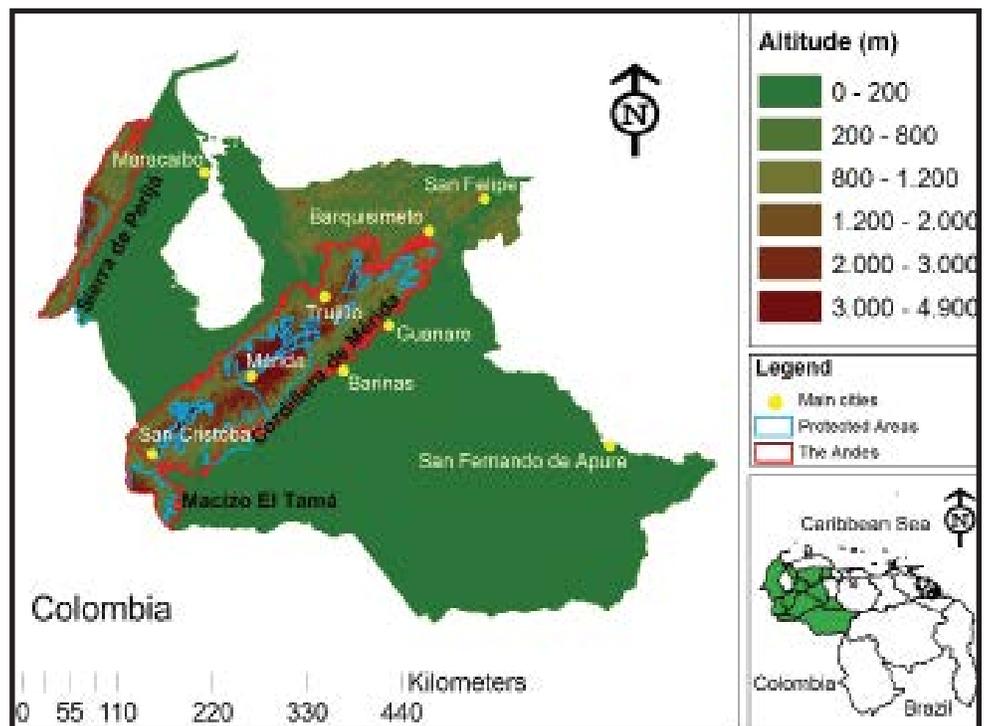


Figure 1. Study area: the red lines show the Venezuelan Andes and the blue lines show the protected areas within the Andean bear (*Tremarctos ornatus*) distribution.

Biological Research

We compiled presence data from different sources to generate the database of Andean-bear presence records to feed into the models (Table 1). We then georeferenced those points lacking such information, but for which we had gathered details about their location.

Table 1. Presence data compiled from different sources to generate the database of Andean-bear presence records

Sources of Information	Description	Number of records
Global Biodiversity Information Facility (GBIF)	Online database that compiles information from museums and private collections of the distribution of species (http://www.gbif.org/)	8
DataOSO	Database of Andean-bear presence records based on published and unpublished data compiled for Venezuela by Sánchez-Mercado (2008)	831
Researchers, government institutions and NGOs	Data shared by researchers and government institutions on Andean-bear presence across the Venezuelan Andes.	233
Bibliographic information	We followed the Evidence-Based Conservation Protocol to systematically search bibliographic databases for publications related to Andean bears in Venezuela.	183

Based on a correlation analysis of the Worldclim database (Hijmans et al. 2005, <http://www.worldclim.org>), we selected 4 climatic variables (i.e. seasonal temperature, average temperature of the coldest quarter, annual precipitation and precipitation of driest month) to model historic (i.e. 1950-2000) and future (i.e. 2050) Andean-bear habitat suitability (Cuesta et al. 2003, 2009). To dictate the future projection, we chose MIROC5 as the global circulation model and RCP8.5 (high emissions) as the climatic scenario (IPCC 2013). Finally, we ran the models on MaxEnt using the selected bioclimatic variables and the presence records at a resolution of 1 km.

We obtained a map showing the historical probability of Andean-bear presence across the analysed region and another for 2050. We then used a threshold to convert these outputs into binary habitat-suitability maps and calculated losses and gains for the period analysed. As preliminary results, we found a loss of 43% of Andean-bear habitat suitability with a gain of <1% when the historic and future maps were compared (Figure 2). The smallest National Parks (i.e. Terepaima and El Guache) within Cordillera de Mérida appeared to be most vulnerable to climate change given that habitat suitability was completely lost, as was

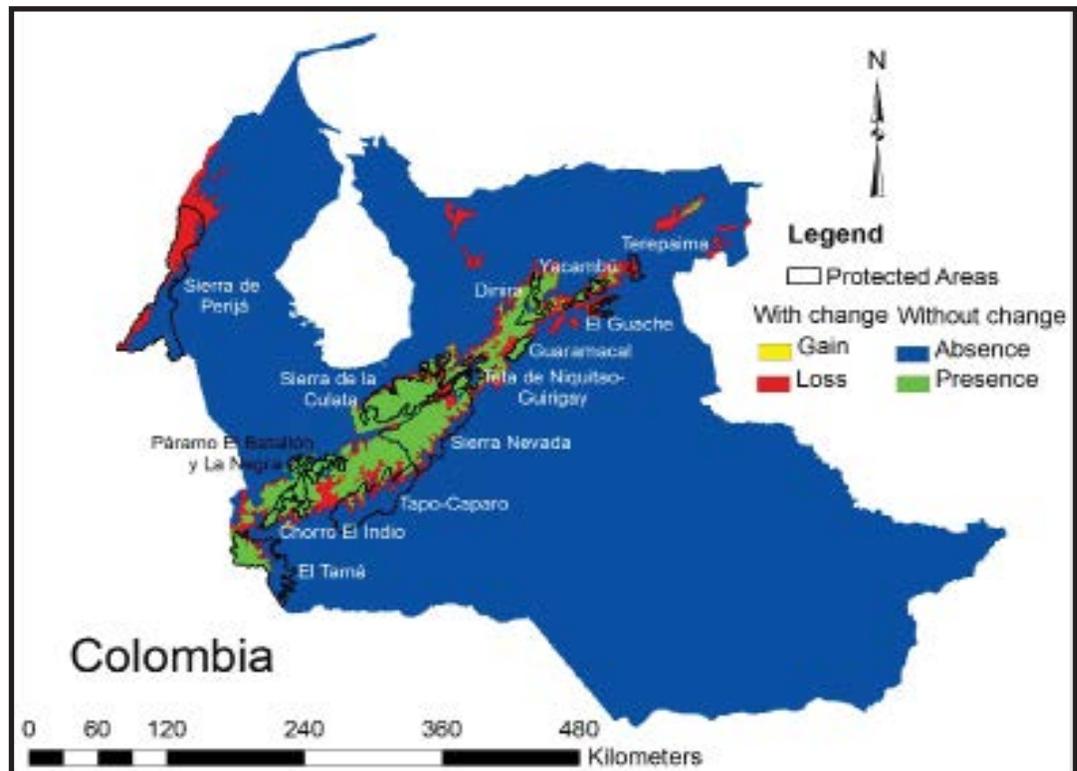


Figure 2. Map of change on Andean-bear (*Tremarctos ornatus*) habitat suitability comparing the historical period (1950-2000) to 2050, under the high emissions scenario (RCP8.5) and using MIROC5 as the global circulation model.

also the case for Sierra de Perijá National Park found in the other section of the Venezuelan Andes.

The next steps in our research will be to generate habitat-suitability models under the RCP6.0 medium-high emission scenario and project climate change impacts for 2070 using both scenarios. We will then apply landscape metrics to calculate changes in suitability using Fragstats 4.2 (McGarigal & Marks 1995). Finally, we will undertake a more detailed evaluation of the effects of climate change within protected areas.

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Biological Research

Maternal Behavior of a Female Andean Bear in the Paramo of Cayambe Coca National Park, Ecuador

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On February 15, 2014, while conducting an expedition to monitor the interactions between Andean bears and Mountain tapirs in the Cayambe Coca National Park, Ecuador, my assistant, Felipe Fernández, observed 4 male bears following a female bear named Delia, who was equipped with a GPS-Iridium satellite collar (Castellanos 2014). The next day she was accompanied by a single large bear, who we suspected bred with her.

Afterwards, data from Delia's collar indicated movements of up to 5 km per day. However, on June 11, 2014, collar data showed that she travelled an atypical distance of 9 km, and then suddenly settled into a place where she moved only a few meters. This behavioral change led me to suspect Delia had denned, maybe at a site that she was familiar with.

After 16 days, during which Delia remained in a relatively static location, my assistants, Melchor Ascanta and Felipe Fernández, and I decided to attempt to find Delia to determine if she was, indeed, in a maternity den. After 2 days of walking, we reached the vicinity of her GPS position, keeping a 300-m distance. That she did not move suggested that she may have had newborn cubs, so we decided not to risk disturbing her and opted instead to return at a later date.

We monitored Delia's status from data downloaded from the satellite. After 21 days of relative inactivity she began moving again, venturing farther from the focal position each day. On day 60 she left the area overnight, so we decided it was an appropriate time to return and investigate further. We arrived on day 62, when the VHF signal indicated she was away. We climbed through a patch of high Andean forest on a small hill in the paramo (at 3,800 masl) that ended at a rock wall next to a rocky platform. The platform had two apparent entry points, one of which was readily visible and the other almost imperceptible. We noted that, although it was the wet season, the location was dry. We searched for something similar to a bear nest that I had previously identified in the cloud forest of the Intag region (Castellanos 2010). Instead, we discovered a large entanglement of vines, branches, and orchids from which sounds were emanating.

Being careful not to disturb anything, we observed a seemingly lone cub, weighing approximately 1.5 kg, inside the den. The cub issued a series of screams and blows, but it was clearly uncoordinated (barely able to climb the small pit that formed the nest). Based on the date the mother denned, and on the size of the cub (compared to captive-born cubs), we estimated that the cub was 55–60 days old. We quickly obtained photographs and recorded a short video (https://www.youtube.com/watch?v=8CMB9I_aoUA&list=UUA9IgdBJTuEWb4hbl_16TXQ), but opted not to take measurements or to attempt to assess the cub's gender so as to avoid disturbing the cub or the nest, and so as not to risk the mother returning while we were there.

The nest was constructed much like the nest of an Andean bird known as the Northern mountain cacique (*Cacicus*



(left) Structure of Andean bear maternity nest found in the paramo of Ecuador (Aug 13, 2014). (right) Andean bear cub inside natal nest after mother had left on an extended feeding excursion. Photos: Armando Castellanos

leucoramphus), a design which effectively blocks wind while retaining heat. The primary component of the nest was *Fuchsia* (*Fuchsia spp*) which, along with some other vegetation, appeared to have been raked from within an area of several square meters surrounding the nest. The slope of the hillside was ~60-70°.

The nights before and after our encounter with the cub, Delia slept away from the nest, having “temporarily abandoned” it for 48 hours. After 81 days of denning, she again stayed away from the nest; that, in combination with her GPS coordinates, led us to suspect that she built a second nest 3 km away, a suspicion we hope to confirm on our next monitoring expedition.

The nest is the first reported den in the paramo habitat of Ecuador. Previously we did not know that bears would den in this habitat. The complex structure of the nest suggests that it would have taken a few days to construct. A similar behavior was observed 3 times by a captive female bear, Palmira, at a rescue facility in the south of Ecuador (Teresa Clare, personal communication), and has been reported in other captive Andean bears by Thieme and Kolter (1995). In the case of Palmira, the bear collected straw and twigs for 15 days prior to each birth.

The discovery of Delia’s cub confirms a gestation (breeding to birth) period of 120–125 days (estimated birth date ~June 13, 2014), which is the shortest reported gestation period for the species. Previous studies indicated a typical gestation period of 160–257 days (Garcia-Rangel 2012), although according to Lydia Kolter (Co-chair of the Captive Bear Expert Team), the full range of observed gestation is 133–272 days. Shorter gestation periods (<110 days) have been reported for the sun bear (*Helarctos malayanus*) (Frederick 2012). Differences in timing of estrus, mating, and parturition within a species can be considered an adaptation to wide geographic distribution across latitudes, altitudes, and habitats, and accompanying variation in food availability and other environmental factors (Spady et al. 2007).

Vacating the primary nest to feed and the possible use of multiple dens to avoid detection are behaviors similar to those of the giant panda (*Ailuropoda melanoleuca*) (Zhu et al. 2001). Long trips made by the nursing Andean bear mother can be explained by the variability of food resources such as bromeliads (*Puya spp*, *Greigia spp*), the main dietary source, which are concentrated in very scattered patches in the paramo, as Troya et al. (2004) found in the study area.

Delia’s temporary abandonment of her cub for several days, a behavior also observed in some Andean bears in the dry forest of Peru (José Vallejos, Spectacled Bear Conservation Society Peru, personal communication), suggests that this is more widespread amongst the species than heretofore known, and may be unique to this species of bear.

Our documenting of this “temporarily abandonment” has prompted the authorities of the Ministry of Environment of Colombia to pledge to require rescuers of presumed abandoned bear cubs to observe a waiting period of up to 3 days to ensure that the cubs are truly abandoned before taking them to rescue centers. We intend to ask the Ministry of Environment of Ecuador to emulate the actions of their Colombian colleagues and hope that the practice will become the commonly-accepted procedure throughout the range countries of the Andean bear.

Intensive studies of more female bears, with the help of GPS-Iridium satellite technology, are apt to bring further understanding of the fascinating maternal behavior of this species.

Acknowledgments

I would like to thank the Zoo Conservation Outreach for its unconditional support and for providing field supplies for this investigation, the Dirección Provincial de Pichincha del MAE for their expeditious approval of my research permit, and the park rangers and Cayambe Coca National Park authorities. Thank you Dr. Lydia Kolter and Dave Garshelis for their insightful and valuable comments.

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Biological Research

Could Historically Advantageous Maternal Investment by Female Bears Create Challenges for Conservation Breeding Efforts?

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As more bear species are threatened with regional extirpation or global extinction we should consider whether their evolutionary history may create opportunities, or challenges, for conservation programs. Evolutionary theory predicts that individuals alter their investment in offspring to maximize their own fitness. In species with larger variation in reproductive success among males than females, and in which that variation among males is driven by male-male competition, females likely to produce good quality offspring may produce more sons and invest more in them. Because adjustments in maternal investment are more pronounced in long-lived, iteroparous species evolving in variable environments, we'd expect to see adjustment in maternal investment among bears. Females may do this by shifting the ratio of their offspring and/or by adjusting the care they provide to offspring, in ways that would differentially affect offspring survival. Adjustment to sex ratio and offspring care might typically produce the maximum fitness benefit under the conditions in which the species evolved. However, the conditions in which captive female bears live are novel, so we are collecting and analyzing data on whether maternal investment by captive bears varies in ways that creates challenges for conservation breeding efforts.

Our preliminary analyses suggest that although the birth sex ratio in several bear species (Andean bears, Asiatic black bears, brown bears, and giant pandas) does not differ from 1 male: 1 female, the birth sex ratio of sloth bears is skewed towards males and the birth sex ratio of sun bears is skewed towards females (Van Horn and Owen 2014). We've been fortunate to work with data from the international and regional studbooks maintained by zoological associations, but as we complete our analyses we would be grateful for any additional information we could obtain, especially from brown bears, sloth bears, and sun bears. So, if anyone knows of a reproductive population of captive bears that might not be represented in the studbooks maintained by zoological associations, we would be glad to hear of it!

Acknowledgements

This work would not be possible without the efforts of husbandry staff at zoos around the world, and without the efforts of the following studbook keepers and conservation scientists: Jessica Amanzo, Andrés Bracho, Carlos Andrés Galvis, Tandra Grant, Amy Hall, Suzanne Hall, Chris Hibbard, Maria Krakowiak, Don Lindburg, Karin Linke, Gail Karr, Lydia Kolter, Randi Myerson, Mark Rosenthal, Helen Shewman, Rebecca Snyder, Tom Spady, Travis Vineyard, and Xie Zhong.

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A Manager's Dilemma and a Call for Discussion

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The Manager's Corner has been a valuable addition to the IBN and I am looking forward to watching it evolve in the future. I believe the section will make us all better bear managers and biologists through the contributed articles because they encourage communication; we can learn from each other because we all struggle with similar challenges. To date, submissions have been outstanding, comprised of insightful research, management, and education updates. But I also hope that IBA members will use the Manager's Corner to talk about their struggles and challenges, to ask questions or advice, and to encourage discussion and feedback from IBN readers. To that end, I am starting that process by writing this article.

In 2012 & 2013, I was lucky enough to attend both of the most recent Eastern and Western Black Bear Workshops (EBBW & WBBW). I observed a general trend across agencies in North America that ongoing black bear research was decreasing and harvest and human-bear conflict was on the rise. In our breakout sessions and evening watering-hole discussions, and this is purely speculation on my part, it seemed that agency folks associated increased harvest and conflict with growing black bear populations. It also seemed like there was decreasing emphasis on research and more focus on modeling, extrapolation, and inference. Additionally, complaint data and hunter harvest statistics were commonly linked to assumptions about population trends. I also have to operate under many of these assumptions, but it has always made me uncomfortable because the data driving these assumptions in my agency aren't the best. Do you have to manage bears similarly?

For example, in Washington (WA), the black bear population is estimated between 25,000 and 30,000. This abundance estimate was calculated in 1997 by extrapolating home range and overlap data from scientific literature and applying standardized densities to eastern and western WA. Recent population assessments using GPS radiocollars indicates home ranges may be larger than originally expected, resulting in potentially lower densities, and thus conceivably higher harvest rates which may be of management concern. In another example, there is no mandatory sealing requirement in WA but hunters are required to report their hunt activity online; failure to report results in a \$10 fine the next time a license is purchased; the result is a 65% reporting rate. We also request hunters submit a tooth from their kill for age estimation via cementum analysis, but the average annual submission rate is 20%. Finally, our management guidelines call for female harvest to be <35% at the black bear management unit level (a regional grouping of game management units or GMU's). From 2000-2010 in 1 study area, female harvest averaged 31% and the limit of the 35% threshold was observed only once. However, at the game management unit level, we found female harvest also averaged 31% but the 35% threshold was exceeded 45% of the time (range=39-67%).

So with the data I have, extrapolation and statistical modeling is a necessity and the questions I ask in my state include: What happened with the other 35% of statewide hunters that didn't report? What are the ages of the harvested bears I am missing? Is my female harvest where it should be and are we analyzing it at the right scale? Were complaints confirmed by agency staff? How were complaints affected by the natural food supply? Was it 100 or 500 bears that generated 500 complaints? Do you ask similar questions?

Extrapolation and statistical modeling are useful and certainly have purpose in our profession, but how accurate are modeled outcomes that drive bear management across variable landscapes? I struggle with these questions. Black bear populations are undoubtedly secure and in no way am I saying there is cause for alarm. It's also important to note that agencies have limited funding as budgets have been squeezed since the 2008 recession. The result is that we do the best job we can for the resource with what we have; we have to. In my state, ongoing research and increased reporting requirements within study areas are helping answer many of these questions.

In closing, with both the EBBW and WBBW's being held in 2015, I am hoping discussions such as these take place because that's what these workshop were developed for. If they do, and something within those discussions stands out to you, please consider sharing it with the Manager's Corner so we can all benefit.

Thanks.



Management Corner

New Law and Drought Conditions Result in Increasing Bear-Human Conflicts in California

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In 2012, state law was passed that made the use of dogs unlawful for hunting bear. The law took effect on January 1, 2013. Without the use of this hunting technique, the 2013 bear hunter success rate decreased. The 2013 California black bear hunting season resulted in 1,078 bears taken, representing a 41% decrease from the previous five year (2008-2012) harvest average of 1,830 bears. Although the loss of this hunting method was controversial, bear tag sales have increased to 26,576, the most in the last five years and 2014 harvest increased to 1,393 as of February 5, 2015. This increase could be a function of a combination of factors including more bear hunters hunting, drought conditions forcing bears to forage longer, or an increasing bear population currently estimated more than 34,000.

California Department of Fish and Wildlife (CDFW) law enforcement personnel are responding to an increasing number of human-bear conflicts. Black bears are now being seen in the Central Valley and desert locations outside of historical bear range. Hot spots for black bear-human conflict and damage include Bakersfield, Fresno, Los Angeles, and San Luis Obispo areas. Bear-human conflicts have increased in recent years and have continued since the new law change (hunting season w/out use of dogs on bears), which most likely are exacerbated by the extreme drought conditions California is experiencing. Conflicts have raised to a level that now local police departments and sheriff's offices are training their personnel to respond to bear incidents to assist CDFW personnel which at times cannot respond to all bear depredation calls. In addition to CDFW, the workload has increased for California Highway Patrol, local police departments and sheriff's offices, CalTrans, and other agencies responding to bear incidents or bear-vehicle collisions which tie up personnel time and equipment.

Kern County in particular saw a dramatic spike in bear activity this past year. CDFW staff responded to 108 black bear sightings within the Bakersfield city limits. In just a two-month period, (September-November), biologists and wildlife officers relocated eight Bakersfield bears to more appropriate habitat in nearby wilderness. Typically bear sightings in the city of Bakersfield are only reported once or twice a year. In addition, more than 1,300 bear calls were made to CDFW in other parts of Kern County, and another 7 bears were captured. While the causes of the increase in black bear activity are myriad, the drought likely had an impact on food resources, and the lack of water forced them to roam further in search of food sources.



Management Corner

Understanding the Ecology and Epidemiology of Mange in Pennsylvania Black Bears

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Mange refers to a group of parasitic diseases of the skin in wild and domestic mammals caused by multiple species of mites (Pence and Ueckermann 2002). Mange in bears is characterized by varying degrees of hair loss and thickened, crusty skin, which can lead to poor body condition, secondary infections and possibly death. In black bears, mange has been associated with infection with *Demodex ursus*, *Ursicoptes americanus*, and *Sarcoptes scabiei*. Historically, mange in black bears has been a sporadic problem involving individuals or low numbers of bears (Costello et al. 2006; Fitzgerald et al. 2008; and Schmitt et al. 1987). In Pennsylvania, however, mange began to be observed more regularly in black bears beginning in the

early 1990s, and has subsequently become a significant source of morbidity and mortality in an expanding area of the state. In 2014, Pennsylvania Game Commission staff documented 56 bears that had either died or were euthanized because of mange similar to the bear pictured.

Currently, detection of mange in bears relies largely on syndromic surveillance, in which infection is identified by grossly visible lesions in the skin. Previous attempts to utilize more sensitive surveillance approaches, focused on the detection of mite infection or host antibody response, have been hindered by a lack of validated diagnostic assays and a poor understanding of the disease ecology and epidemiology among bears. To address these gaps, we have initiated a collaborative study between the Pennsylvania Game Commission and the Southeastern Cooperative Wildlife Disease Study at the University of Georgia. The primary objectives of this study are: 1) to identify the causative mite(s) of mange in Pennsylvania black bears; 2) characterize the epidemiologic trends observed over the last two decades, including the spatiotemporal patterns of outbreaks, whether any “hot spots” exist, and if there are any cyclic patterns to outbreaks; 3) identify sampling and diagnostic approaches for diagnosing mange in black bears, including bears with and without overt disease; and 4) determine the persistence of the causative mite(s) under varying environmental conditions.

Our ability to monitor and manage mange in free-living black bears is significantly hindered by our limited understanding of the disease, including the causative mite(s), transmission and maintenance cycles, disease ecology, and influential factors involved in the expanding epizootic in Pennsylvania and neighboring states. The data generated by this research will provide the basic framework for guiding future management efforts of mange in black bears both within Pennsylvania and beyond. The role of black bear density, relocation activities, recreational feeding, treatment options, and handling practices during capture work are some of the management issues that could benefit from these findings.

We invite any black bear managers experiencing mange activity to contact us, as we would like to further understand the role mange may be playing in other jurisdictions.

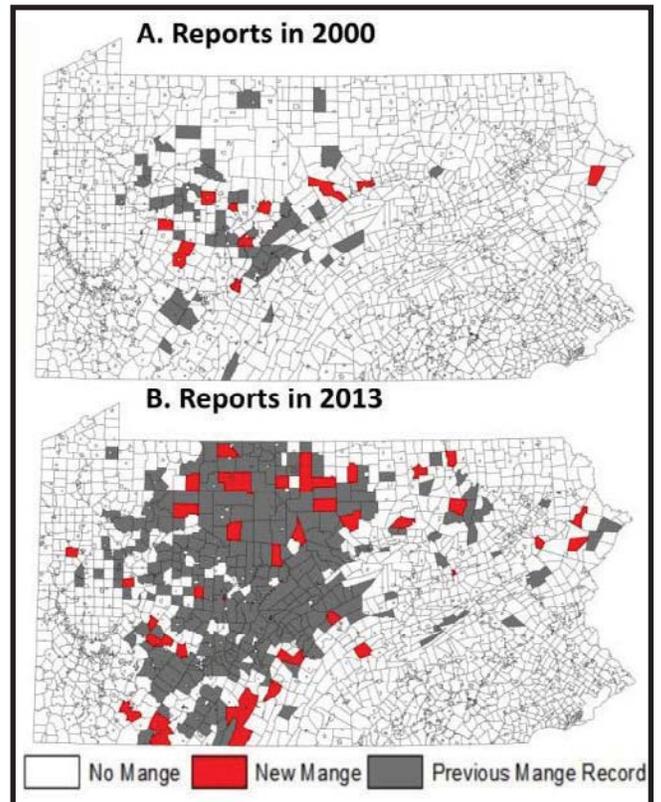
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Black bear with mange from Pennsylvania, USA



Previous and new township reports of mange in Pennsylvania in 2000 (A) and 2013 (B) which illustrates the geographic expansion of cases (Sommerer 2014)



Agency and Private Use of Conducted Electrical Weapons for Human-Bear Conflict Resolution

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Since 2009, agency staff with the Alaska Department of Fish and Game (ADF&G) has utilized conducted electrical weapons (CEWs), commonly known as tasers, for hazing and aversive conditioning of wildlife, primarily targeting brown bear (*Ursus arctos*). Initially the work focused on developing functional improvements for the X3W taser and proficiency of its use to improve field application and effectiveness. Subsequent field work allowed ADF&G to expand the program to the Armstrong-Keta fish hatchery staff at Port Armstrong on southern Baranof Island: the site of much of the CEW research and management actions with brown bears since 2010.

The ADF&G CEW program objectives were to: 1) develop effective hazing techniques for brown bear; 2) use aversive conditioning to reduce overall human-bear encounters resulting in property damage and personal injury to people; and 3) minimize the unnecessary destruction of bears. Since 2010, ADF&G staff has exposed more than 200 brown bears to the CEW device resulting in a 100% flight response.

The Armstrong-Keta hatchery has been in operation since 1983 as a state permitted private nonprofit hatchery, producing and releasing 110.5 million salmon in 2013. The freshwater source feeds from two lakes about 300 feet above the hatchery site. The outlet at saltwater contains a picket weir and steep pass/ladder that direct salmon brood stock to holding tanks adjacent to the egg-take building. During the height of summer spawning, up to 35 brown bears concentrate near the weir to capture salmon.

Prior to the CEW work at the hatchery, efforts to keep bears out of work and residential areas relied on more traditional methods of hazing: noisemakers, lighting, bean bags and rubber slugs. Electric fencing is used to protect buildings housing fish food and temporary garbage holding areas. It also prevents bears from accessing the top of the fish ladder, holding pens, and gates leading to the boardwalk and work area. However, rising tide levels around the piling-supported structures prevent the use of electric fencing to exclude bears from these areas. While firearm, bear pepper and bear safety training is a regular event for staff at the hatchery, the consistency needed to be effective in hazing bears was often deferred until a bear became a persistent problem. Staff was often torn between allowing bears to feed on the salmon in the weir area versus hazing them in adjacent work and residential areas. Non-hatchery personnel visiting the hatchery often brought dogs off-leash, firearms, and little training in bear behavior and safety which complicated the situation.

In October 2012, after 2 years of CEW fieldwork with bears at the hatchery, Armstrong-Keta requested ADF&G consider issuing a CEW permit for hatchery staff. Hatchery staff would receive the department's required CEW user training and have the same reporting requirements for CEW use as ADF&G staff. Hatchery staff was convinced after observing 2 years of work that they could successfully maintain an effective hazing response in a timely manner and prevent a situation from escalating to lethal force under the state's Defense of Life and Property provisions.

During 2013, ADF&G's Division Management Team considered the request and approved a trial permit in October. This first-of-its-kind permit required CEW user training, annual refreshers and reporting requirements which mirrored what agency staff are required to do. During a training refresher session in the summer of 2014, ADF&G staff mentored hatchery staff in actual field deployments of CEWs on brown bears. Through the summer and fall, Armstrong staff successfully deployed the device 7 times, primarily targeting sows with cubs and unaccompanied sub adults that strayed into residential areas.

The ADF&G fieldwork with CEWs typically has been a very intense effort targeting a concentration of bears around-the-clock over a period of 4-5 days. In contrast, the Armstrong CEW response dealt with bears seasonally moving in and out of the hatchery area. The ability of Armstrong staff to prioritize and dissuade unwanted behavior as it occurred appears to be beneficial to both the hazing and aversive conditioning desired results. A notable result: the Armstrong hatchery has not had a bear Defense of Life and Property kill since the CEW program began in 2010 in contrast to 4 killed between 2002 -2009.



Book Review – Dominion of Bears: Living with Wildlife in Alaska

Author: Sherry Simpson

University Press of Kansas, Lawrence KS 66045.

440 pages, 25 photographs, 16 pages in color, 5-3/4 x 9-1/4

Cloth ISBN 978-0-7006-1935-1, \$34.95

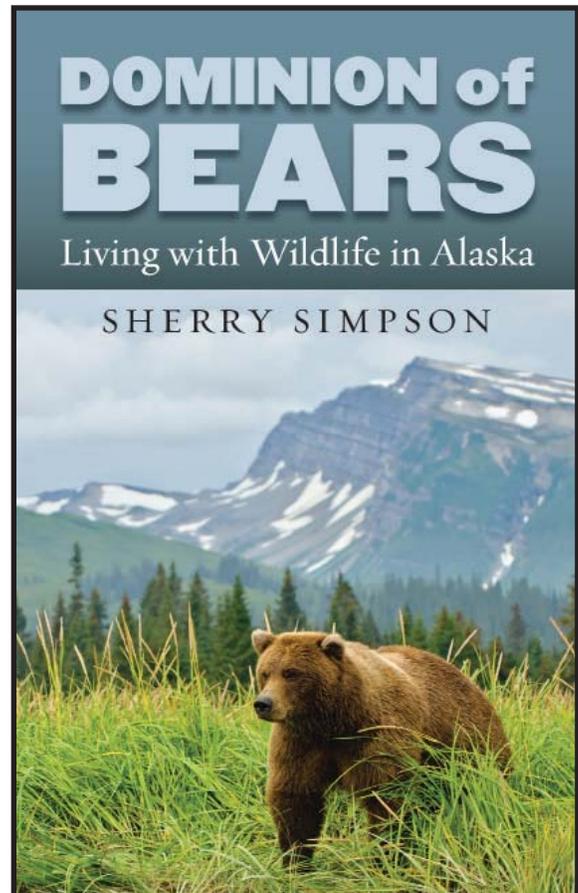
Dominion of Bears is an example of a very authoritatively-written book by someone who is not a professional specialist in the topic. Simpson is a creative writing professor at UAF and a journalist who has a long history in Alaska, a deep interest in bears, a commitment to getting things technically right, and the ability to write in a clear, interesting and occasionally lyrical style. This book is one that all with a professional or personal interest in the bears of North America will benefit from and enjoy reading. Indeed, all with these interests in northern hemisphere bears will find useful information here as Simpson discusses brown and polar bears as well as the North American black bear.

It is difficult to get things right when your source material varies from technical papers in professional journals, interviews with scientists and others with frequently disparate views, newspaper articles, and other sources. Simpson relies on all these sources including many interviews with the key experts and other players in bear management from Alaska as well as outside of Alaska. Her bibliography runs 42 pages and includes about 815 citations (calculated not counted) ranging from newspaper articles to papers in *Nature*, *Proceedings of the Royal Society*, and *Science* with a lot of citations to *International Bear News* and *Ursus* manuscripts. She also cites presentations made at IBA conferences from Trentino and subsequently that didn't make it into print. I was unable to find any significant Alaskan bear expert in the last 25 years who wasn't cited in this bibliography although I'm sure there are some.

Simpson includes 56 pages of endnotes with citations to the origins of the information provided. These endnote citations are very intelligently organized by key phrase and a page number from the text. If you question the authority for any statement, you can easily discover the source. While reading, I flipped back to these endnotes many times. On top of this, Simpson provides an excellent index with references to the page numbers where her many sources and topics are discussed. She frequently mentions the authors of papers or the name of the interviewee in the text as well.

Simpson organizes this material into 11 chapters which are, functionally, stand-alone essays on a topic. These chapters are: The Metaphorical Bear, The Unseen Bear [a grab bag of topics generally around the role bears occupy in the human psyche], The Hungry Bear [nutrition and ecosystem function], The Social Bear [group dynamics and behavior], The Urban Bear [bear management in populated areas], The Fearsome Bear [bear attacks on people which relies heavily on the works of S. Herrero, T. Smith, R. Sinnot, and accounts of attacks], The Hunted Bear [quite a bit about the motives of trophy bear hunters which she finds less than compelling], The Disappearing Ice Bear, The Watched Bear [bear viewing areas], The Predatory Bear [intensive management for predator control of bears in Alaska], and The Story of Bears [includes accounts of re-introductions into Italy, Scandinavia, and Germany]. Because these chapters are stand-alone essays, there is some overlap of material between chapters but this is not a significant problem.

I was especially pleased to see the chapter on "intensive management" of bears as predators in Alaska. This topic has not previously been presented in as a comprehensive overview even though it has been ongoing for over 30 years and Alaska's war on bears continues to escalate every year. This is the case regardless of the lack of information that predator management of bears has done anything to increase the numbers of moose or caribou harvested by hunters and the absence of efforts to document the impacts of this war on black and brown bear populations in Alaska. Simpson interviewed the Board of Game members and others who support this program of bear control and presents their justifications as they expressed them.



Reviews

This book does a good job of reporting on the work by the late Paul Shepard and others on the importance of bears in the mythology of Native Americans/First Nations as well as in western cultures. The chapter on the threats climate change poses to polar bears correctly presented the excellent work by I. Stirling, A. Derocher, S. Amstrup and others on this important topic. Interviews with L. Aumiller, D. Stonerov, J. Hechtel, C. Matt, and others assured that information on bear behavior and bear watching (all 3 species) was accurately presented. Materials from the Bear-Human Conflict Conferences held in Canada and the US was accurately presented and useful to all dealing with these issues anywhere in the world. Although the chapter on the Fearsome Bear accurately puts the probability of these uncommon attacks into perspective, the gruesome nature of the numerous attacks presented resulted in a perception that would cause some readers to look around when in bear country with more trepidation than Simpson probably intended. I also thought that some of the photos in the book were not up to the quality of the text but some were.

This is a book that I will keep on my bookshelf right next to many other books by professional bear biologists.

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Reviews

Video Review – CNN’s Inside Man Zoo Episode with Special Commentary on Bears in Zoological Parks

In early February, I was contacted by CNN to review an episode from the third season of MORGAN SURLOCK INSIDE MAN, which aired on February 5th, 2015. This episode portrays life in captivity for a number of species across the spectrum of facilities licensed to house exotic animals in the United States and ponders the ethics of keeping animals in zoo settings (<http://www.cnn.com/2015/02/03/tv/zookeeping-morgan-spurlock-inside-man/>).

With great accuracy, the segment conveys the sentiment of directors, curators, animal care managers and keepers in accredited zoos throughout the US and Canada. Spurlock’s show, which is filmed on location, examines Detroit Zoo’s particular and unprecedented effort to examine the welfare of all of its residents on a daily basis. Although the program follows the daily activities of penguins, lowland gorillas and elephants, it speaks to the broader treatment of charismatic species confined to the campuses of zoological parks in municipal regions, where expansion of zoo habitats is often limited.

The episode does not address the plight of captive bears per se, but it does include indoor footage of grizzlies and sub-merged polar bears, which are popular residents at most municipal zoos, which house these species. In the segment viewers can also observe Spurlock’s reaction to his closest-ever encounter with a grizzly bear in its night quarters at the zoo as the bear eagerly feeds on some offering from the host himself. There is little attempt to hide anything behind-the-scenes. As for most holding areas in zoos, the night quarters are designed to facilitate husbandry practices and not to “wow” patrons who are rarely given access to off-exhibit areas.

The Detroit Zoo is home to three orphaned cubs from Alaska and an adult female from Montana, which had been deemed a nuisance animal. All are housed in the American Grassland’s exhibit area. According to the facility’s Chief Life Science Director Scott Carter, in a press release,

“The bears’ 8,400-square-foot habitat was one of the first animal exhibits to debut when the Detroit Zoo opened in 1928. The enclosure was groundbreaking at the time because it featured a moat instead of bars to give visitors an unobstructed view of the animals. The habitat includes a 40-foot rock wall, trees, grass, a waterfall and a large pool that is 6 feet deep.”

For bear biologists and managers this may still seem like an awfully modest enclosure for grizzly bears, but it is a dramatic improvement over the original bear grottos at the Detroit Zoo.

A relatively new polar bear exhibit continues to serve as one of the most spacious and enriched of its kind. According to the Zoo’s website,

“The polar bears’ habitat includes grassy tundra, a freshwater pool, a “pack ice” area and a 190,000-gallon salt water pool. The Arctic Ring of Life is North America’s largest polar bear exhibit, which also houses seals and arctic foxes. This state-of-the-art, interactive facility encompasses over 4 acres of outdoor and indoor exhibits and was named the second-best exhibit at any zoo in the U.S. by The Intrepid Traveler’s guide to America’s Best Zoos.”

Zoos continue to make strides mitigating the stereotypic behavior that can be commonly observed in captive bears and predominantly polar bears, but the segment did not discuss this issue. Rather, it focused on the health and welfare of great apes and elephants. But in general, as welfare improves for any species in a zoo, it is improving for others, particularly high profile species like bears.

The Murlock segment provides a very objective view into the conventions of keeping animals in zoological facilities. It speaks to the limitations of captivity and what the standards of care mean for captive wildlife including sentient creatures like gorillas in today's accredited zoological parks.

Once considered radical, by members of the zoo community, Scott Carter and Zoo Director Ron Kagan, who are both interviewed in the episode, have demonstrated that the public really values a zoo that is bold enough to offer an honest assessment of its own animal management practices and the welfare of the animals under human care.

As a former zoo keeper, I would argue that this is one of the best, if not the best behind-the-scenes examinations of husbandry and health practices in a modern zoo. It showcases the realities of day-to-day operations, the interface between the keepers and the animals, the "perspectives" of the animals themselves as they experience a day on exhibit, and some of the experiences of the patrons and public at large.

What I appreciate most about this piece, having had a fairly intimate tour of the Detroit Zoo by Scott Carter a few years back, is that this CNN program really speaks to the typical experience for an animal at an AZA-accredited institution, if one can surmise what that is like in any regard. CNN and, perhaps, the zoo elected to feature some very common off-exhibiting holding areas for animals, and not necessarily the Zoo's most state-of-the-art exhibits, as I alluded to earlier in regard to Zoo's polar bear exhibit. Hence, the piece provides a very typical behind-the-scenes experience for the viewer. Again, it is an honest and candid portrayal of accredited zoos today.

The featured roadside zoo in the segment also exposes the potential treatment of captive wildlife under the auspices of anyone with a USDA license. I don't know that the sentiment of the owner of the roadside zoo is shared by the majority of people running USDA licensed, unaccredited zoos, but it speaks to the lack of regulation permitted in operating such a menagerie. Hence, CNN does an exemplary job of juxtaposing the accredited facilities with the unaccredited facilities not only in terms of animal welfare, but in terms of the credentials and competency of animal care providers. Hopefully, this is conveyed to viewership as it was conveyed to me--someone with more of a trained eye.

The featured sanctuary PAWS is perhaps a bit of an outlier, although as far as sanctuaries for elephants, in particular go, it is very representative of the few, but spacious enclosures found in elephant sanctuaries in the US.

The segment speaks to the semblance of freedom offered to these intelligent, sentient creatures (elephants) and I think it will provide the public with an appreciation for what some zoos may neglect to be able to offer their elephants. Although, I should note that many zoos housing elephants have recently upgraded their facilities extensively, putting millions of dollars into new more expansive enclosures under pressure from AZA. With that said the footage taken and narrative recorded from Ed Stewart will certainly motivate viewers to contemplate the benefits of placing zoo elephants in sanctuary settings vs. confining them to smaller spaces in zoos.

Overall it is a very compelling and honest look into the life of a zoo animal. Again, I appreciate that by intention or mere accident it features very typical and standard housing facilities of a modern day zoo both in regard to the environments the animals call home (e.g. night areas and exhibits).

I'm eager to follow the response from the viewership. I think it will be enlightening and provocative at the same time. I also hope in viewing this, that leaders of other major metropolitan zoos will follow Detroit Zoo, endeavoring to be as honest with themselves and the public in sharing a very transparent look at some of our country's most popular and controversial attractions.

I enjoyed Morgan's treatment and approach. He added just enough levity and thoughtfulness to the segment. Well done. Thanks again for sharing this with me.

As far as bears go, zoos are making progress in an effort to provide more adequate housing for ursine carnivores. The gap is narrowing between spacious sanctuaries and zoo exhibits. For example, the Alaska Wildlife Conservation Center, where I served as curator, recently expanded an exhibit for the 3 grizzly bears to over 21 acres. In the lower 48, zoos like the Detroit Zoo are following European enclosure models and replacing artificial and naturalistic enclosures with natural substrates. Although far from perfect, ungulates and large carnivore species in zoos in North America are finding captivity all the more hospitable. For an orphaned grizzly cub, that might otherwise be euthanized, today's accredited zoos and many unaccredited zoos are providing a better quality of life in captivity.

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Communications

Bear Viewing in Alaska and IBA 2016

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Are you planning to attend the 2016 IBA conference in Anchorage, Alaska? Would you like to enjoy some of this state's unique opportunities for viewing bears? If so, you might want to start planning now. Some of Alaska's best bear-viewing opportunities are booked more than a year in advance, so waiting too long to plan a trip will narrow your options in terms of the nature and cost of the experience you could have.

Every bear-viewing site is different. Some sites host black bears, whereas others host brown or grizzly bears. Only three popular sites host both species, which can sometimes be seen interacting, sometimes in surprising ways. Some sites are "leks" where bears gather to breed; others are "nurseries" where females with infant cubs go to avoid breeders, including potentially infanticidal males. Depending on the site, viewing can be done from a boat or other motorized vehicle, from an elevated platform, or on the ground. Viewing distances typically vary from several hundred meters to less than 50 m, depending on the site and circumstances. Bear-watching also changes from month to month, even at the same site, as seasonally changing availability of salmon, clams and other foods concentrate bears at seasonally-specific locations. Predictability in foods and in the behavior of both other bears and human observers can encourage bears to tolerate viewers at photographic distances.

Only some bear-viewing sites will be at their viewing peak during the 2016 IBA conference, so early research can help you to not miss out on an unforgettable experience. A multitude of private businesses offer bear-viewing services ranging from transportation only for day trips to fully-outfitted multi-day experiences. Members of the public can also arrange their own trips to many public viewing sites, but logistics can be difficult and depending on where you go, special permits may be required. Information about safe bear-viewing practices and about bear-viewing guide services are readily available from many sources online. Don't miss out by waiting too long to look into the opportunities available.



Bears sparring.

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Communications

IBA 2016 Anchorage Conference: Session on Bear Viewing and Behavior

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In Alaska, wildlife viewing generates ~\$2 billion each year, twice as much as hunting (ECONorthwest 2014). In the Great Bear Rainforest (GBF) of British Columbia (Center for Responsible Travel 2014), organized bear-viewing activities generate 11 times as much direct revenue for the government as does commercially-guided bear hunting; GDP is \$7.3 million for bear viewing and \$660,500 for non-resident and resident hunting combined.

There is vast opportunity for further growth in recreational bear viewing activities. A challenge facing management agencies is whether and how to allow growth to occur -- how to supervise the industry's growth and regulate practices so as to assure public safety and long term sustainability.

The June 2016 IBA conference in Anchorage, Alaska, provides an ideal opportunity to explore some of these issues. Conference organizers expect to allocate time for up to several sessions on this topic and have accepted my offer to organize one of them. I am seeking presenters for this session to contribute knowledge and varying perspectives on current bear-viewing practices and management and on bear behavior and bear-human interactions at viewing sites. Specifically, I hope to explore in this session some of the following topics. Whereas conventional bear management focuses on avoiding bear-human

encounters and on keeping people distant from bears, the opposite is true in managing viewing activities. Viewers seek encounters within “photographic” distance of bears (close enough to fill a camera frame with a bear), requiring all but those with the most powerful lenses to be within 50-100 m. How can risk to people and/or bears be managed and how can disturbance to bears be kept within tolerable limits? How do we identify thresholds of tolerance?

Similarly, harvest management focuses on large populations, whereas viewing focuses on tiny subpopulations and sometimes on individuals. Each animal can provide a peak experience for only one hunter, whereas it can provide peak experiences for thousands or tens of thousands of viewers. Moreover, the specific challenges of viewing vs. hunting bears have implications for the education and training of agency staff, researchers, and private guides, e.g. more training in animal behavior and body language might be advisable. What training materials are currently available and are they adequate? Finally, how does legal due diligence differ between hunting and viewing activities? What liabilities do agencies and private guides face if someone is injured by a bear?

In preparation for this conference session, I am also seeking others to help compile information on where, when and how bear viewing is occurring and how satisfied are agencies, local residents, and the viewing public with current practices. Feedback from contributors to this survey will undoubtedly lead to modifying the questions asked and to adding new ones to develop a formal questionnaire and to establish a database which can be updated periodically. Everyone contributing substantial information over the next year will be listed as a coauthor of the summary paper to be presented at the 2016 conference. Selection of the lead author will be decided once we determine who is willing to shepherd the project. This might make a great, low-cost MSc thesis project for a student. If you are willing to contribute information on one or more viewing sites, please contact Steve Stringham (gobearviewing@hotmail.com or 907/260-9059).



How close is too close?

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- Center for Responsible Travel. 2014. Economic Impact of Bear Viewing and Bear Hunting in the Great Bear Rainforest of British Columbia [in 2012]. Washington, DC: Center for Responsible Travel, 130 pp.



Symposium Reports

III International Symposium on Andean Bear Conservation and Management: Land of Bears, Land of People, Land of All

A tribute to Bernard Peyton, pioneer in researching the Andean bear

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Symposium Reports

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The III International Symposium on Andean Bear Conservation and Management: “Land of bears, land of people, land of all” was held as part of the IV Colombian Zoological Conference, December 3–5, 2014, at the Centro de Convenciones in Cartagena, Colombia. The symposium was organized by Fundación para la Investigación, Protección y Conservación del Oso Andino and supported by Conservation International, San Diego Zoo Global, and the IUCN/Bear Specialist Group’s Andean Bear Expert Team.



This symposium provided a space for discussing and proposing solutions to issues related to the conservation of Andean bears. Participants reviewed our knowledge of the species, and identified main threats, priority areas to focus conservation interventions, key actors to support decision-making, management measures required and policies and strategies to protect the species at a regional level. This event promoted participation and collaboration, among individuals, organizations and institutions, while strengthening existing relationships between interested parties and promoting the support of local, national, and international authorities for Andean-bear conservation. Learning and networking were encouraged, together with scientific development on the species and coexistence between local communities and bears. Of the 80 abstracts submitted for consideration, 44 were presented as talks and 31 as videos, in 5 sessions across 2.5 days.

Current Status

Shaenandhoa García (Venezuela) and Ximena Vélez (Bolivia), co-chairs of the Andean Bear Expert Team led a session on the current conservation status of the species. Bernard Peyton opened with a touching presentation which emphasized the importance of teamwork and the need to encourage new researchers to provide deeper insights into the social context of Andean-bear conservation.

The status update of the Andean bear for the IUCN Red List emphasized the lack of information about threats to the species, especially on poaching and habitat loss. Evidence presented on the probable existence of the species in Argentina indicates that there are now 6 range countries. This provides an opportunity for the government of Argentina to get more involved in the research and conservation of this species.

Land of Bears

Paulina Viteri (Ecuador) managed a popular session on biology, natural history, ecology, genetics, distribution, and monitoring. Leopoldo Soibelzon’s engaging presentation on the paleontological record of extinctions of South American bears encouraged new perspectives for interpreting climate-change dynamics and their influence on species survival.

Other researchers and students discussed new technological advances such as genetic markers, satellite telemetry collars, camera traps, and GIS software. These tools have enabled a step-change on bear research, providing new and interesting information about denning, birthing, breeding and on the relationship between seasonal food availability and body condition and reproduction.

Land of People

Daniel Rodríguez (Colombia) and Imarú Lamedá (Venezuela) led a session on human-bear conflicts, sustainable land management, environmental education, and ecotourism. One of the most important aspects for Andean bear conservation is how communities perceive the species. Perceptions often range from total ignorance to hatred, due to lack of awareness of the species’ role in the ecosystem and the incidence of human-bear conflicts. Environmental education projects have shown the feasibility of achieving changes in public perception, promoting the preservation of the Andean bear. Compensation for bear-caused damage is seen as an alternative to alleviate human–bear conflict

Land of All

Héctor Restrepo (Colombia) and Robert Márquez (Venezuela) led a session on environmental legislation, protected areas, land use planning, and development. The phrase “land of all” means that preserving the bear and its habitats also ensures



Daniel Rodríguez

Andean bear symposium attendees and organizers on the day of closing.

vital environmental services such as forest water production, benefitting the health of rural people. It is essential that every community feel supported and guided in its land use, from zoning regulation to the establishment of development plans.

A key conclusion was the need to promote good environmental governance in both core bear areas and non-protected areas where the species is present. Likewise, it was deemed essential to foster sustainable-management practices of common forest resources. Big core areas are necessary to support the long-term conservation of bears across their distribution but smaller, isolated fragments are also needed to ensure population connectivity and hence adaptation to climate change. Not only are protected areas important, but people need to understand that other initiatives, such as biological corridors, common lands, land trusts, restoration, land banks, etc., are needed to adequately ensure habitat preservation in the face of continued human development and future climate change scenarios. It is also imperative to direct attention to preservation of high Andean ecosystems based on ecosystem-services schemes.

Ex-situ Preservation

Leonardo Arias (Ecuador) and Andrés Eloy Bracho (Venezuela) led the session on Ex-situ conservation, community participation and participatory monitoring. Participants agreed that, although we possess a fair amount of knowledge about the management of bears in captivity, more experience in capture and chemical immobilization is still needed. Likewise, we need more research in the fields of hematology, parasitology, infectious diseases and metabolic disorders. In addition, more attention needs to be paid to the genetic health of captive populations, primarily in Latin America, but also in Europe and North America.

Environmental Promoters Meeting

During the symposium, we organized a special meeting of environmental promoters, attended by representatives from four countries across the species distribution: Colombia, Ecuador, Venezuela, and Peru. We agreed on the need for strategies involving communities in research and management of wild populations. We should think not only in terms of training field assistants, but also in considering them an integral part of the research.

Linking Art and Conservation

A side course highlighted the role of art in species conservation. Bernard Peyton, pioneer Andean-bear researcher and educator in origami, taught one section for children and another for adult conference participants. A network is being organized with all course participants to exchange initiatives in the use of origami in environmental education and the promotion of ecosystem and wildlife conservation.



Workshop Announcements

22nd Eastern Black Bear Workshop, April 26-29, 2015. Louisville, MS

The purpose of the Eastern Black Bear Workshop is to bring together state/provincial biologists, federal biologists, and university researchers with responsibilities for managing black bear populations in the eastern USA and Canada to discuss issues important to the management, conservation, and perpetuation of those black bear populations. EBBWs are inherently different from general conferences. Whereas conferences have the purpose of sharing information through the presentation of research and management papers, EBBWs are designed not only to share information, but more specifically to discuss and find solutions to problems of managing bear populations at the regional level.



Papers and Posters

There will be a poster session and a limited oral paper session. The poster and limited oral paper session are open to anyone wishing to submit an abstract. Consult the website <http://www.easternblackbearworkshop.org/> for more information.

12th Western Black Bear Workshop, May 12-14, 2015. Canmore, AB.

Alberta Environment and Sustainable Resource Development (ESRD) invite those managing bears in western North America to join us in Canmore, Alberta, Canada on May 12-14, 2015 for the 12th annual Western Black Bear Workshop. The theme of the workshop will be "Living and Working in Bear Country".

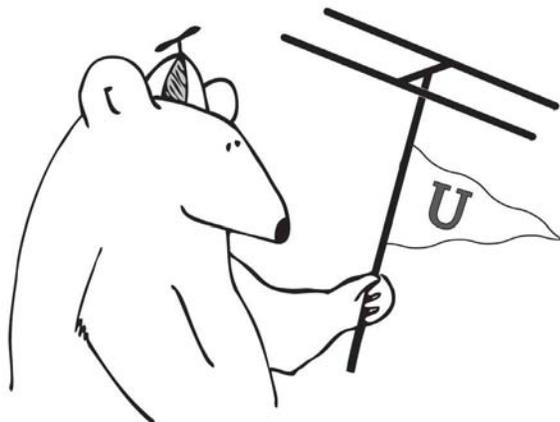


In addition to the main theme, we will have jurisdictional updates, discussions on bear predation of ungulates, fostering and rehabilitating bear cubs, population monitoring/management, and human dimensions of bear management. There may be other topics added as we receive abstracts over the next few months. Please mark your calendars for the workshop and watch for the Call for Papers in the near future. Consult the website <http://deer-elk-bear.com/western-black-bear-workshop/about/> for more information.

Student Forum

Truman's List Serve

- For students only
- Discussions pertaining to bear biology, management, or study design challenges
- Assistance with proposals and study design through IBA professionals
- Job searches, announcements, information regarding the IBA and student membership
- Planning for IBA student activities and meetings
- IBA membership is encouraged, but not required, for initial sign-up



Instructions

- Visit: <http://www.bearbiology.com/iba/stu.html>
- Follow the links to request an invitation
- Do NOT reply to list serve messages using your "reply" button. You must return to Truman to respond within the list serve or else other members will not receive your response.
- If you're a new member, please submit a paragraph about your project and include your contact information so we can all get to know you.



Recent Bear Literature

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With the first issue of 2015, on behalf of the RBL team, I would like to wish you all a lot of happiness, fun and laughter, good luck, joy and success in this New Year.

If you have an article recently published please email the citation for inclusion in the Recent Bear Literature. The deadlines for the next issues are:

- Summer Issue: 12 June: Agnes Pelletier: asg.pelletier@gmail.com
- Fall Issue: 5 October: Marion Schneider: mfschneider@gmx.de

For easy access to articles, we are now including the DOI citation and corresponding author email address, if available. To open articles from their DOI, enter the DOI citation in the text box provided at the following website: <http://dx.doi.org>

- Atwood, T., E. Peacock, K. Burek-Huntington, V. Shearn-Bochsler, B. Bodenstein, K. Beckmen, and G. Durner. 2015. Prevalence and spatio-temporal variation of an alopecia syndrome in polar bears (*Ursus maritimus*) of the southern Beaufort Sea. *Journal of Wildlife Diseases* 51(1): 48-59. Corresponding author email: tatwood@usgs.gov
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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 organization open to professional biologists, wildlife managers, and others dedicated to the conservation of all bear species. The organization has over 550 members from over 50 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 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.
9. Encourage full international participation in the IBA through the siting of conferences, active recruitment of international members and officers, and through financial support for international research, travel to meetings, memberships, and journal subscriptions.
10. Through its integrated relationship with the Bear Specialist Group of the World Conservation Union (IUCN)/Species Survival Commission, identify priorities in bear research and management and recruit project proposals to the IBA Grants Program that address these priorities.
11. Build an endowment and a future funding base to provide ongoing support for IBA core functions and for the IBA Grants Program.
12. Support innovative solutions to bear conservation dilemmas that involve local communities as well as national or regional governments and, to the extent possible, address their needs without compromising bear conservation, recognizing that conservation is most successful where human communities are stable and can see the benefits of conservation efforts.
13. Form partnerships with other institutions to achieve conservation goals, where partnerships could provide additional funding, knowledge of geographical areas, or expertise in scientific or non-scientific sectors.

Deadline for the Summer 2015 issue is 12 June 2015

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