

# International Bear News



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

Spring 2017 Vol. 26 no. 1



Remote Andean bear nesting site on a secluded rock face in the paramo habitat, northern Ecuador.  
Photo: David Jackson. Read more on this bear and her multi-generational family on pages 24-25.

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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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Consult website for submission guidelines. Deadline for the Summer 2017 issue is 5 June 2017.



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



The use of the IBA-BCF logo at the beginning of an article signifies work that was supported, at least in part, by the Bear Conservation Fund through an IBA grant.

## President's Column: Where is Science Headed?

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It is a pleasure and honor to write my first President's column in the International Bear News. I have some big shoes to fill by following outgoing president Karen Noyce. She sure did an excellent job! The previous Council deserves our thanks for the great job they have done for IBA, moving forward on many important issues and steering IBA in an excellent fashion.

Change in any form often comes with new challenges but also new opportunities. It looks like the new IBA Council is moving forward into interesting and maybe more challenging times. The political situation on a worldwide scale is currently fascinating to observe. Independent of the British vote on "Brexit", who won the latest political elections in the United States, or who will win upcoming elections in France, the Netherlands, or Germany, I personally cannot shake the feeling that it is becoming increasingly difficult to defend the integrity and independence of science and scientific information. The term Post-Factual Era had already been termed in 2007, and it refers to political discussions in which debate is driven and framed mainly by emotions or appeals to emotions and where factual arguments are readily ignored. According to some political commentaries, we are already deep into the Post-Factual Era.

How should IBA navigate through these more challenging times of increasing science distrust and ignorance of facts? It is certainly not IBA's role to take political stands, however, the first point in our mission statement is that IBA should promote and foster well-designed research of the highest professional standards. Our most important answer to science distrust or ignorance can only be to raise our professional standards to even greater heights.

In fact, our mission statement provides excellent guidance on how IBA should approach these new challenges. IBA's mission statement asks us to publish and distribute scientific information not just among our peers, but also to the public. Providing the public with translations of technical results is key to building trust and increasing general knowledge about bears and the ecosystems they so often share with humans. International cooperation may become even more important in the future to show that science and conservation does not stop at borders; also the bears we are working with do not stop at human-defined borders. We must provide professional council and advice on natural resource policy. We may not be the ones making the decisions, and we may not always be happy with the decisions, but we have to maintain the highest standards of professional ethics and scientific integrity whenever we provide our advice.

Maybe by going back to our roots as an organization and by more actively following up on the great thoughts provided by our mission statement will give us the best opportunity to work for the conservation of bears and their habitats on a worldwide scale, and to tackle the challenges of the Post-Factual Era.

### Old and New Faces on Council

Alex Kopatz will fill in as VP Eurasia (for Andreas Zedrosser) until the next IBA elections in fall 2017. After he earned his degree in biology, Alex worked with wolves in Finland and came to study brown bear genetics for his Ph.D. Today, he works for the Norwegian Institute for Bioeconomy Research (NIBIO) and its genetic research lab in Svanhovd, in the far northeast of Norway, at the border to Russia.

Welcome to our new treasurer Jennifer Fortin-Noreus. Jennifer started working with brown and black bears in 2002 when she began graduate school at Washington State University. She then had the amazing opportunity to conduct field research in Alaska and Yellowstone National Park to complete both her master's and Ph.D. degrees, respectively. Currently, Jennifer works as a wildlife biologist for the U.S. Fish and Wildlife Service Grizzly Bear Recovery Office.

Klemen Jerina will fill in the seat vacated by Alex Kopatz. Klemen is a professor of wildlife ecology & management at the University of Ljubljana in Slovenia. His research mainly focuses on ecology, management and conservation of brown bears, other large carnivores and ungulates in Central and Southeastern Europe. The IBA Conference in the fall of 2018 will be held in Ljubljana, Slovenia.



Klemen Jerina.

Santiago Molina will fill in the seat for geographic/species representation until the next IBA elections in fall 2017, which became vacant due to the retirement of Shaena Garcia Rangel from Council. Santiago is working with Andean bears in Ecuador and is also one of the organizers of the coming up IBA conference in Quito.

We welcome back Shyamala Ratnayeke. Shyamala has accepted a seat on Council for regional/species representation. She has already served on Council from 2007-2010, was on the IBA's Research Conservation Grants Committee from 2005-2011, and co-chaired the BSG Sloth Bear Expert Team from 2003-2008. Shyamala is an associate professor in the Department of Biological Sciences at Sunway University, Malaysia, where she leads a research program on sun bears.



Shyamala Ratnayeke.

## Conference news: IBA Quito, Ecuador

In 2017 we will have our very first IBA conference in South America. We will meet from November 12th-17th in Quito, Ecuador. The main topic of the conference will be "New frontiers for bear research and conservation in the tropics". There will be special sessions about bears and climate change, but also on Andean bears in Spanish with simultaneous translation. The deadline for submitting abstracts is on April 15, 2017. Be sure to follow along on the conference website for further information!

## Important council business

IBA Council has unanimously agreed on signing an agreement with Wathall Design in Bozeman, Montana, USA, for the design and the development of a new IBA website. We hope that the new website is up and running in good time before the Quito conference.



# IUCN BSG Co-Chairs

## Bringing Back the Giant Short-faced Bear?

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The Giant short-faced bear (*Arctodus simus*) was among the largest mammalian terrestrial Carnivores and largest bear that ever lived, with some individuals estimated to weigh about 1000 kg. As such, they have captured the imagination of the public and spurred a host of investigations by morphologists and paleontologists, mostly debating whether they were super carnivores, wide-ranging scavengers, or just giant, long-legged omnivores (reviewed by Figueirido et al. 2010).

This behemoth species was once very common and ranged across North America from central Mexico to Alaska, and California to Florida (see range map in Schubert et al. 2010). They were one of a number of bears in the subfamily of short-faced bears (Tremarctinae), which occupied North, South, and Central America — including an equally-large South American giant short-faced bear (*Arctotherium angustidens* - Mitchell et al. 2016). The only remaining extant member of this subfamily is the Andean bear of South America. The cause(s) of the extinctions of all but one member of this subfamily remains unknown. However, *Arctodus simus* persisted until approx. 10,000 years ago, so it lived coincident with humans in North America (Schubert 2010); in fact, this bear was one of the last species to go extinct during the massive megafaunal Pleistocene extinction (followed by the last bear extinction — the Florida cave bear, another Tremarctine - Garshelis 2012).

I posed a theoretical question to Bear Specialist Group members about the possibility of bringing such a bear back from extinction (so called "de-extinction"). I used the giant short-faced bear as the subject of such a hypothetical revival only because it has so-captured human fascination, due to its immense size, and the fact that it lived alongside humans and current North America bears.

# IUCN BSG Co-Chairs

Geneticists are now at the cusp of bringing species back from extinction by using remnant bits of their DNA (for a brief entertaining description of the process, watch this TED talk ([https://www.ted.com/talks/stewart\\_brand\\_the\\_dawn\\_of\\_de\\_extinction\\_are\\_you\\_ready](https://www.ted.com/talks/stewart_brand_the_dawn_of_de_extinction_are_you_ready))). The IUCN recently produced a document on: Guiding Principals on Creating Proxies of Extinct Species for Conservation Benefit (<https://portals.iucn.org/library/sites/library/files/documents/rep-2016-009.pdf>)

It is generally acknowledged that no extinct species can actually be “brought back” in its entirety “due to genetic, epigenetic, behavioral, physiological, and other differences.” But geneticists may create species that look and act a lot like the extinct forms and serve as “functional equivalents” of what was lost. But how might this affect the current ecosystems that have evolved (some say “downgraded” – Estes et al. 2011) in the absence of these species? That’s the main controversy. We have little idea what would happen in an area if we establish a population of giant short-faced bears. Conversely, do we have a moral obligation to bring back species that we caused to go extinct if we have the technical abilities to do so?

Note that the question I asked presumes that humans caused this bear (or other species considered for “de-extinction”) to go extinct, although that is still an open question (see reviews by Barnosky et al. 2004, Stuart 2015). The answers from BSG members overwhelmingly fell into the following categories:

1. If there is no good proof that humans caused the extinction, we should not do anything to bring them back.
2. The priority should be on saving the species we have. De-extinction efforts divert attention (and funds) from that.
3. If a species is brought back from extinction, policy-makers and the public may be led to believe that the consequences for present-day extinctions are not as dire as conservation biologists claim – if extinction is perceived as reversible, it will be more difficult to convince people to make sacrifices to save current species.
4. A species like the giant short-faced bear, brought back from extinction, will disrupt present ecosystems, which have had a long time to settle into the present equilibrium.
5. De-extinct species like the giant short-faced bear may cause other species to go extinct (through competition, predation, spread of disease, etc.).
6. We might be able to produce an extinct species genetically, but we do not have sufficient room to create a viable population of short-faced bears.

Here is a smattering of some other notable comments:

- *“Do we want to create a fenced “Pleistocene Park” or are we really willing to share space and allow dynamics to resume which have been absent for 10,000 years?”* Petra Kaczensky
- *“I have low interest in using expensive, high risk, ethically ambiguous science to put living creatures into zoos or research facilities with little hope of free living populations.”* Emily Puckett
- *“Some scientists warned that such gene reconstruction might result in ‘mistakes’, and nobody can really predict the results if applied on a whole genome. Some just see the potential positive outcomes but never consider the risks.”* Lydia Kolter
- *“I shudder to think of managing habitats for a home range of a giant short-faced bear or dealing with the human-wildlife conflict it will create.”* Brian Scheick
- *“Evolution has occurred...habitats have disappeared...climates have changed...all since these animals went extinct. We cannot and should not try and duplicate what takes eons to develop and perfect.”* Rich Beausoleil
- *“Bringing back the short faced bear would only serve to make bear conservation harder.”* Lana Ciarniello
- *“This de-extinction project will take incredible sums money and most likely will not be successful. It will be extirpated very soon.”* Liya Pokrovskaya
- *“In the interest of science and of creating a Pleistocene version of the Jurassic Park so we can all go and visit, I would say yes!”* Shena Garcia Rangel
- *“It will be a great opportunity to stand with old vanished species.”* Ashish K. Jangid
- *“I do believe there is a moral responsibility that has people of the future correcting wrongs (i.e., loss of species) of people in the past and I think it is important that our generation help pave the way for this to occur by not only devel-*



What would be the repercussions of recreating the giant short-faced bear?

Dave Garshelis

oping the technical skills necessary but also digging into the philosophical issues and ethics of such actions.” Stewart Breck

- “I think scientists have a moral obligation for not “bringing back” species such as short-faced bear or woolly mammoth but other species, which went extinct recently can be seriously discussed. Conservation is about preventing the extinction of species, de-extinction is solving the wrong problem.” Emre Can
- “In the future if we can build an ideal world then we may think to re-create this extinct species.” Huseyin Ambarli
- “If one were loose in Montana, Minnesota, or Alaska, the public reaction to bear conservation would likely not be positive once it reverted to its ecological role. The public response and support for conservation just might be a change for the worse. So I'd vote against it.” Harry Reynolds
- “A small population of giant short-faced bears, brought back from extinction, would generate incredible positive interest (awe), as well as scientific inquiry, providing a very large audience for our (carefully thought-out) messages about the conservation of the other bear species.” Dave Garshelis

What do you think?

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## What's New for the BSG in 2017?

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January 2017 marks the beginning of new 4-year terms for members of the Bear Specialist Group. As with all specialist groups in the IUCN, this is a period of transition, which entails an assessment of the group's membership and structure. The BSG has recently completed this process and we report here on changes to our membership and structure for the upcoming term.

There has been healthy turnover in our membership, with some old members reappointed and some not, and some new members invited to join. Membership now stands at 175 people, down slightly from 200 at the end of the previous term. Although overall numbers have been reduced, 52 new members were added. New members represent 27 different countries, and particularly strengthen BSG's representation in Russia, Eastern Europe, and central Asia—regions which hold large populations of brown bears. This is especially important for conservation of brown bears in Asia: our enhanced membership from this region will help rectify major gaps in knowledge about the distribution, threats, and trends of bears there. We also added 6 new members from India, which holds most of the world's sloth bears and suffers high levels of human-bear conflict.

# IUCN BSG Co-Chairs

Another new development is the addition of technical specialists to strengthen the BSG's scientific capacity. A number of bear biologists from the USA and Canada were invited to join the BSG in this capacity. We also added some specialists on species/topics other than bears, from non-bear range countries. Their role will be to assist conservation and research initiatives of the BSG, as well as to help individual BSG members with scientific practice. We envision these members assisting the BSG particularly with questions about population viability, structure, fragmentation, genetics, and illegal wildlife trade — crucial topics for conserving bear populations.

Besides revising the membership, we have slightly reorganized the structure of the BSG as well, including:

- Dissolution of the Trade in Bear Parts team, with reassignment of these members (all from SE Asia) to the Asiatic Black Bear and Sun Bear Expert Teams.
- Dissolution of the Mexican Black Bear Team, with some members retained in the overall BSG.
- Consolidation of the North and South Asian Brown Bear Teams into a single team, with three co-chairs (all other teams have two co-chairs).
- Appointment of some members in positions not within an expert team, including specialists in pertinent subjects like population monitoring, population genetics, and GIS.



The current BSG is thus slightly leaner than before, but has greater breadth as well as enhanced organizational and scientific capacity to move forward in conserving the world's bears.

## IBA Grants Program News

### Don't Forget the Bears in Your Estate Planning

Patti Sowka

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Legacy gifts, also known under the term “planned giving”, are gifts for charity included in a person's will. They are a powerful way to make a significant difference in the future of charitable organizations like the International Association for Bear Research and Management Association (IBA). They are usually straightforward and easy to set up, and can be gifts of cash, other assets such as real estate, stocks, bonds or life insurance proceeds. Legacy gifts can be set at a fixed amount or a percentage of a person's estate.

Many of us are used to receiving a constant flow of donation requests from a wide range of charitable organizations and most people have limited funds to donate to all of these worthy causes. This is where the beauty and the power of planned giving comes into play. By including an organization like the IBA and its charitable arm, the Bear Conservation Fund, in your estate, you can provide that organization with a future income stream without causing yourself a financial hardship today.

Another benefit of legacy gifts is that they help ensure the future financial viability of the recipient organization while providing potential tax benefits to the estate beneficiaries. Legacy gifts assure future revenue and thus act as a bit of an insurance policy. This is very valuable to organizations in crafting strategic plans and setting long term goals.

The IBA is very fortunate to have a top-notch estate-planning attorney we can consult in the event that one of our members wants to include the IBA in their will. We also have an Ameritrade account so we can accept donations of appreciated stock. This is a really great option since donors don't have to pay capital gains taxes on that stock and it is a cost-effective way of making a charitable donation.

To find out more about helping the IBA by including a Legacy Gift to the Bear Conservation Fund in your estate, please contact Julia Bevins at juliabevins@hotmail.com or by phone at 1-907-223-3483.



## The Neglected Brown Bears of Iran

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The brown bear (*Ursus arctos*) is the most widely distributed bear species in the world. It is found in the remote mountains of many Asian countries, where information on population size and ecology is urgently needed to produce meaningful conservation strategies. However, the techniques commonly used to assess population status of bears, such as telemetry, camera trapping, and DNA analysis, are rarely used for Asian brown bears, mainly due to logistical and financial issues.

Iran is a vast country, more than half of which is covered with mountains inhabited by brown bears. The two great mountain ranges in Iran are the Zagros Mountains in the west and the Alborz Mountains in the north. Despite this availability of habitat, brown bears in Iran face serious threats, including: 1) a lack of adequate management and conservation programs by Iran Department of the Environment (DoE), which is the responsible governmental organization; 2) a lack of funding and necessary tools, such as camera traps, GPS or VHF collars, etc. to conduct research; 3) a seeming lack of interest to conduct bear surveys by international scientists, universities, and other organizations; 4) current research by international organizations being concentrated on the Asiatic cheetah and Persian leopard, thus attracting most Iranian researchers to these 2 species; 5) increasing conflict between local people and bears; and 6) poaching. We do not know the number of bears killed in conflicts or by poachers, but a number of such cases have come to light via social media (see accompanying photos).



J. Parchizadeh

Camera trap photo of Iranian brown bear in Lar Wildlife Refuge, northern Iran



(a-c) Poachers posing with brown bears in Iran (and later posting photos on social media). (d) Local people posing with a dead brown bear in Iran, the reason the bear was killed is unknown. Photos: www.iew.ir.

In an effort to obtain some baseline population data, I conducted a camera trap survey of the brown bears of Lar Wildlife Refuge (455 km<sup>2</sup>) in the Alborz Mountains, northern Iran, from June 2013 to August 2014. Unexpectedly, my results suggested that bears were not present permanently in the refuge, as I only obtained photographs in November and December. They likely came from an adjacent refuge to enhance their fat reserves before hibernation, taking advantage of spawning brown trout (*Salmo trutta*). Hence, protecting both the bears and salmon in this reserve could be crucial at this time of year. Hopefully, these results will be incorporated in conservation and management strategies for brown bears in this area. A fuller description of the methods and results of this study can be found in Parchizadeh (2017).

I hope that the Iranian DoE, international and Iranian scientists and organizations, conservationists, and students will increase their interest and conservation efforts on brown bears in Iran, so this species doesn't follow the path of the Asiatic (Persian) lion and the Caspian tiger.

### Acknowledgements

I wish to sincerely thank Dr. Jon E. Swenson for reviewing this article and also for his help and advice during and after my survey in the Lar Wildlife Refuge in northern Iran. I also thank Dr. Andy Derocher for help with the published paper stemming from this work.

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# Conservation

## Panda Milk Analysis Shows that Mother Knows Best

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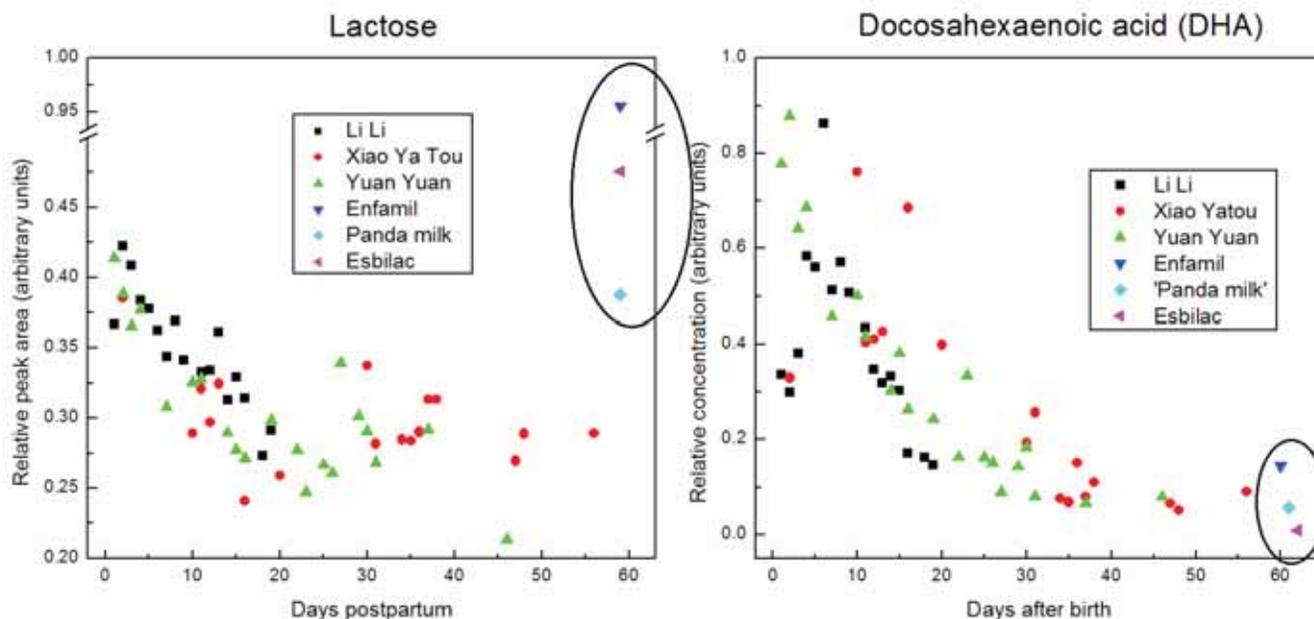
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The milk of giant pandas (*Ailuropoda melanoleuca*) is uniquely suited to meet the immunological and developmental needs of a cub. While this may seem intuitive, a trilogy of research articles on the intricacies of panda milk describes just how unique panda milk is, and calls into question the standard rearing practices for giant pandas that rely heavily on supplementation with artificial milk replacers.

The development of a genetically self-sustaining captive giant panda population has been a key objective in the struggle to save the species. Progress toward that goal has been hampered by health and behavioral problems among captive-bred individuals, and by prioritization of numbers over quality of cubs. In the annual competition for cub numbers, standard rearing practices in China's panda breeding centers involve the intensive supplementation, if not complete replacement, of maternal milk with artificial milk replacers. At 3–5 months of age, cubs are permanently removed from their mothers so that females reproduce again (every year). In the wild, cubs stay with their mothers for at least 1.5 years.

Bear cubs are the most altricial (developmentally immature at birth) of any mammalian infant other than marsupials, and among the 8 species of bears, giant pandas are the most altricial. Newborn panda cubs weigh only 100–150 g, about 1/1000th of their mother. At birth, cubs have no functioning immune system, they cannot regulate their own body temperature, and they cannot see or hear. They are naked and completely dependent on the mother for every aspect of survival and development.

We are interested in the adaptations of the milk of bears that support the development of unusually altricial neonates. The very first milk that a mammalian mother produces following birth, called colostrum, contains unique types and concentrations of immune factors and specific proteins, lipids, and other molecules. In precocious species – which produce newborns that are relatively mature and can, for example, walk within just a few minutes of birth – the colostrum phase may last only a few hours, while in altricial species, it may last several days. Given the unusually altricial nature of giant pandas, we hypothesized that the transition from colostrum to mature milk would be unusually long.



Examples of two compounds that are high in the early colostrum phase of giant pandas and fall to low levels in mature milks, and comparison with the 3 commonly used milk replacers. Lactose in the milk replacer vastly exceeds levels in natural milk (circled; note broken Y-axis scale). DHA is essential to the development of the brain and eye. High levels are found in panda colostrum, while almost none is found in milk replacers (circled).

Our “panda milk trilogy” (listed below), published in 2015 and 2016, describes the proteomic, metabolomic, and lipidomic analysis of serial milk samples obtained from 6 giant pandas. This was a collaborative project with the laboratories of Richard Burchmore and Dave Watson at the Universities of Glasgow and Strathclyde, respectively, in Scotland, and the panda breeding center in Chengdu, P.R. China, where the pandas are housed. The studies represent the first analyses of bear milk at this biochemical level, and the first insight into the dynamic changes of bear milk over time, specifically during the rapidly-changing colostrum phase.

We found that the panda colostrum phase was indeed very long, lasting 30–40 days. Moreover, the biochemical components of the milk were highly dynamic. Some compounds were high initially and fell away over the following weeks, while others began low and rose dramatically over the same period.

Some of the most remarkable changes during the colostrum phase and in the transition to mature milk were in the dynamics of small molecules that serve as building blocks for development of the brain, neurologic system, and the eye. Others are integral components of biosynthetic pathways, cell membrane structure, and essential developmental processes in the neonate. A third group of molecules that stood out appears to be important in antibacterial defense and in the establishment of an appropriate colony of microorganisms in the neonatal gut (the microbiome). The latter may be particularly relevant to giant pandas in their progression from a milk-based to a predominately vegetarian diet within the first year of life.

We also analyzed the artificial milk formulae that are commonly used to supplement giant panda cubs. Key compounds were found to be at extremely inappropriate levels: some too low, and some too high. Moreover, the levels of these compounds in artificial milk remain static, while those in the mother’s milk change to meet the needs of the developing infant. Among other abnormalities, artificial milk formulae have a gross excess of lactose, which is abundant in cow and other milks, but is essentially absent in panda milk after the first day or two of colostrum. Lactose causes severe gastrointestinal disturbances, and disrupts the fragile microbiome of an infant cub.

Moreover, with the gross deficiencies of other key compounds in milk replacers, the concern arises as to the degree to which brain, eye and other organ development is compromised in artificially-nourished panda cubs. For cubs that are being raised ultimately to support the wild panda population, potential compromises in organ function and cognitive capacity are a grave risk.

Our analysis of panda milk reveals just one aspect of the deficits suffered by cubs whose mothers are not allowed to raise them undisturbed. Wild bear mothers invest extraordinary time and skill in the rearing of their infants. We have a great deal to understand about the intricate role of maternal care in raising cubs whose adaptiveness and resilience are essential for success in the wild. Under current captive husbandry conditions, maternal care is severely compromised. For example, hourly interference with maternal activity and barren enclosures in which panda mothers find no privacy or control of their environment are conditions ill-suited for the well-being of a mother who is raising a vulnerable infant.

Our research emphasizes the evolutionarily proven wisdom that no one is better suited to raise bear cubs than the mothers of those cubs. If we wish to build a captive panda population of physically, cognitively, and behaviorally healthy individuals, particularly to raise individuals who are fit to repopulate the wild, then we must leave the mothers to their work.

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# Illegal Trade

## Status of the Illegal Bear Trade in Viet Nam

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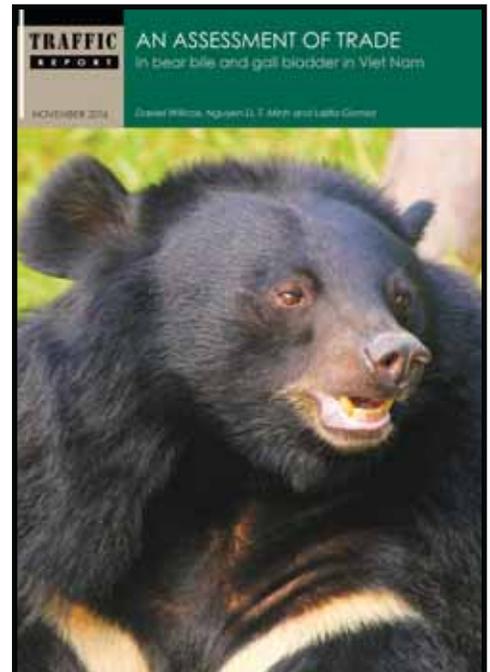
Viet Nam is home to the Asiatic black bear (*Ursus thibetanus*) and sun bear (*Helarctos malayanus*). Both species currently face a daunting future in Asia as they are coveted by the traditional medicine (TM) industry. The trade in live bears, their parts and derivatives is widespread and drives a growing network of illicit trade across their range. Viet Nam plays a key role in this trade dynamic as a source, consumer and transit country. The bear farming industry and high demand for bear bile and bear parts in Viet Nam has not only affected wild bear populations locally but is also driving regional declines in these 2 species. Available trade data support this suspected decline with bears now sourced from neighbouring countries such as Cambodia and Lao PDR to satisfy demand in Viet Nam (Nguyen 2007, Burgess et al. 2014).

TRAFFIC undertook a study to examine the market dynamics of the bear bile trade across 6 major cities in Viet Nam. One survey was undertaken during May – July 2012 and a second follow-up survey in March 2016. This work was recently published in a TRAFFIC Report (Wilcox et al. 2016), which was launched at the Hanoi Conference on Illegal Wildlife Trade in November 2016.

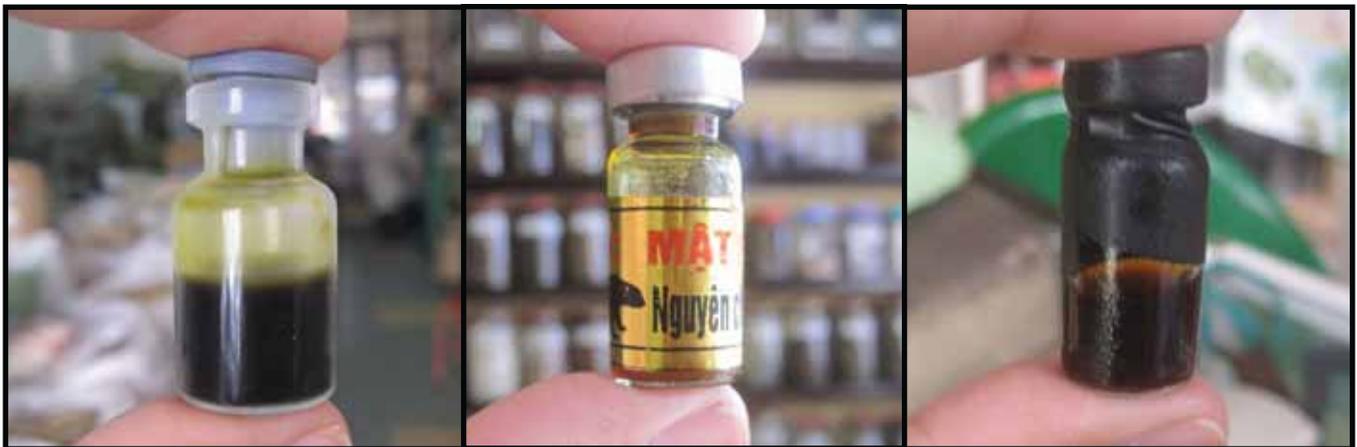
Both bear species are protected by law in Viet Nam. Furthermore, since 2005 it has been illegal to acquire new bears to stock bear farms or extract bile from existing bears in such facilities. Even the sale of bear bile products has been banned. Despite this, the study revealed that the commercial trade in bear bile and gall bladders is still prevalent in all 6 cities.

In 2012, more than half (56%) of TM outlets surveyed were found to be selling or admitted to selling bear bile products in violation of Viet Nam's wildlife protection laws. This was slightly lower than the 65% of TM outlets observed selling bear bile products in 2010 – 2011. By 2016 this dropped to 40%.

Raw bile was the most frequently sold form of bear product in Viet Nam in both 2012 and 2016. Most sellers reported bear farms within the country as the source. But 3 retailers indicated the bile was sourced from bears of wild origin. This was reflected in the price, which was twice as expensive as bile sourced from farmed bears. In general, however, reported sales of raw bear bile were considered low by TM retailers due to a diminishing consumer demand within the country.



TRAFFIC report, An assessment of trade in bear bile and gall bladder in Viet Nam, which was launched at the Hanoi Conference on Illegal Wildlife Trade in November 2016



Various forms of raw bear bile for sale in TM outlets across Viet Nam. Photos: Daniel Wilcox and Nguyen Do Thu Minh/TRAFFIC



Gall bladders openly for sale in Ho Chi Minh City, Viet Nam in 2012, some allegedly from bears.

Gall bladders were also found for sale, although the detected availability of this product decreased between 2012 (12 outlets) and 2016 (2 outlets, neither of which stored bear gall bladders in their shop). This was also the most expensive bear product in the market, reportedly sourced from the wild within the country and from Lao PDR, Russia and Thailand. Other bear products available in the market included bear paws and teeth, though in small quantities. Bear paws were also reportedly sourced either from farmed bears or wild bears in Viet Nam or other countries, with higher prices being charged for wild bear paws.

The study revealed that the bear bile farming industry is in decline in the country. However, the trade in wild-sourced parts and products is lucrative and presents an ongoing threat to bear populations across Asia. More concerning, however, is the potential consumer preference for wild-caught versus farmed bear products (as reflected by difference in price), not just in Viet Nam but elsewhere in Asia, like China and Lao PDR (Davis et al. 2016, Shairp et

al. 2016). If consumers are willing to pay more for wild-origin products, then incentives to acquire and trade in wild bears will persist, regardless of availability of farmed products, or of the advertised quality of farmed bear parts and products. Bear farms around the country may exacerbate the threats to wild bear populations in Southeast Asia, as they create a network of captive facilities through which it is relatively easy to launder wild-caught bears.

Viet Nam has a crucial role to play in limiting the illegal cross-border trade from countries in the region that still have relatively healthy wild bear populations. A genuine commitment to law enforcement along its borders as well as better monitoring and enforcement of existing bear farms and TM outlets is vital if Viet Nam is to halt the negative impacts of the country's role in the illegal bear trade.

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# Human-Bear Conflicts

## The Sloth Bear of Mysore: A Really Rogue Bear, a Typical Sloth Bear, or Several Different Bears?

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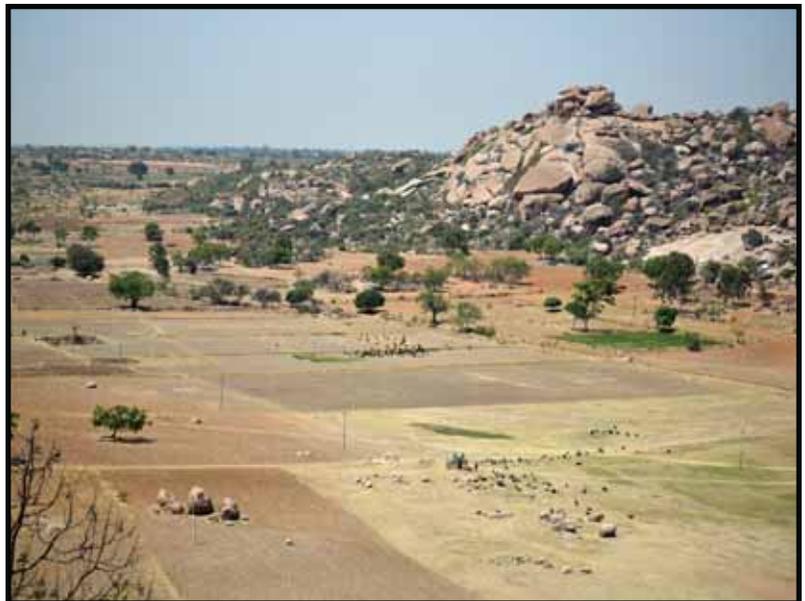
Sixty years ago, Kenneth Anderson (1957) published the story “Alam Bux and the Big Black Bear” in his book *Man-Eaters and Jungle Killers*. The bear at the story’s center has become infamous as the Sloth Bear of Mysore, and appears on Internet top 10 lists of the “greatest animal serial killers.” This bear supposedly killed at least 12 people and mauled more than 24 others near Mysore in the state of Karnataka, southern India. Rereading the story more than a half century later, what can we now ascertain? What insights does the story offer about sloth bear (*Melursus ursinus*) attacks? And do the last 60 years of sloth bear research shed any more light on these events?

Anderson wrote that sloth bears “are excitable, unreliable and bad tempered animals,” a view still widely held today by both local people as well as sloth bear biologists. Yet he also appeared to have a true affection for this species: “As I have mentioned somewhere else, Bruin is an old friend of mine, against whom I have no antipathy. I was therefore most disinclined to go after him.” Anderson’s writing makes clear that he was both fond of and knowledgeable about sloth bears and their ecology. His writing is filled with the details of a sloth bear’s life, including their diet, daily lifecycle, activities like crop raiding (though he does not use this term) ground nuts (peanuts), and, of course, attacks.

Anderson set the stage for the story by stating that sloth bears “have a reputation for attacking people without apparent reason, provided that person happens to pass too close, either while the bear is asleep or feeding, or just ambling along.” He later described how a sloth bear attacks a victim. Recounting one specific event (but saying it was emblematic of all sloth bear attacks), he wrote that the bear “invariably attacked the face of the victim, which he commenced to tear apart with his tremendously long and powerful claws, in addition to biting viciously.” However, Anderson also made it clear that for the most part, sloth bears are generally “vegetarian”, meaning not carnivorous, eating almost exclusively fruits, vegetables, and insects or insect products such as honey. Anderson also mentioned that these bears eat carrion, and he thought that reports of the Sloth Bear of Mysore partially eating its victims were at least plausible — in fact, sloth bears partially eating their victims has been documented as recently as 2005 (Bargali et. al. 2005).

The bear encounters that Anderson described were apparently brought about by a food source that lured the bear into the human domain. Anderson wrote specifically about figs, which lined the road to the shrine where his friend’s son was killed. He also mentioned ground-nut that was planted behind the same shrine. However, Anderson also commented that this particular bear “would go out of his way to attack people even when he saw them a long distance away,” though he offered no evidence of this claim.

The habitat in which this bear lived — rocky hillocks surrounded by farmlands, which the bears raided on a nightly basis, as Anderson described it — is very similar to the habitat of our Wildlife SOS (WSOS) sloth bear study area in eastern Karnataka. Additionally, Anderson’s description of the bears’ nightly habits seems to describe the vast majority of bears that we observe: “Hungry by sunset he could be seen coming forth from his cave, and, as twilight deepened into nightfall, he would amble down the knoll and come out on the ground-nut fields. Here he would spend a busy night, eating, uprooting and generally shuffling about over a wide area throughout the hours of darkness.... Leisurely he would climb back to his abode, there



Typical open farmland with dwellings surrounded by rocky hillocks occupied by sloth bears in Karnataka, India.

# Human-Bear Conflicts

to spend the hot hours of the day in deep and barely slumber.”

Given the similarities of the famous “Sloth Bear of Mysore” and the many bears that we have seen in eastern Karnataka, it seems fair to ask if all the attacks and deaths were likely from this single bear. And what’s more, could they be ascribed to the bear that Anderson eventually shot and killed? Sloth bear attacks in this hilly habitat were not uncommon then, as Anderson clearly indicated, and they are not uncommon now, as indicated by our study of sloth bear attacks during the last 5 years.

Anderson first hunted the bear where his friend Alam Bux’s son was killed. Having no luck, he returned to Bangalore for a month. Upon hearing of 2 more bear attacks roughly 30 km from the first location, Anderson “concluded that it was the same bear.” However, several things suggest otherwise. First, the 30 km between these 2 attacks is a large distance for a sloth bear: this species may have the smallest home range of any bear species, with study

area-specific averages for males spanning just 4–14 km<sup>2</sup> (Joshi et. al. 1995, Ratnayeke et. al. 2007; although Yoganand et al. 2012 suggested ranges could be much larger). Therefore, the distance between attacks would be unlikely to fall within the home range of a single male bear. Also, since sloth bear home ranges can overlap extensively (Joshi et al. 1999), the area in which these 2 attacks occurred was likely inhabited by multiple bears. Supposedly both attacks were by a large male, not a young dispersing animal that could be traveling extensively. Anderson describes the area where the bear was killed, as “wanting for nothing.” If true, then the bear would likely not be searching widely for food or water.

It is impossible to know with certainty whether this was indeed 1 marauding bear. Perhaps there were reasons not explained in the literature that led to the single-bear theory. However, it seems more plausible that several different bears were responsible for the many attacks. It is clear that Mr. Anderson understood sloth bears, but perhaps his determination to rid the area of a problem bear clouded his judgment in this case. Or perhaps he realized that his narrative would not be quite as compelling if the tale was not about a single aberrant bear that was dispatched at the end of the story. Whatever the case, this would not have been the first time, nor obviously the last, that a bear would have been killed to make the public feel safer after an attack or a series of attacks. This happens not just in India, but anywhere where bears or other potentially dangerous wildlife still occur.

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In Karnataka, India, sloth bears typically emerge from rock crevices in the evening and come down from the hillocks to feed at night. They are widely regarded as being prone to attack people



# Human-Bear Conflicts

## Consecutive Fatal Attacks by Asiatic Black Bear on Humans in Northern Japan

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In early summer 2016, consecutive fatal attacks by Asiatic black bear(s) (*Ursus thibetanus japonicus*) on humans occurred in Kazuno City, Akita Prefecture, in the northern part of Honshu Island. Six bear attacks occurred, 4 of which were fatal and ended in the bear(s) eating the victim's body; these victims were elderly. In 2 other incidents the people managed to escape; these people were relatively younger.

Table 1. Consecutive attacks by black bear(s) in Kazuno City, Akita Prefecture in May-June 2016.

|   | Incident date | Person              | Note   |
|---|---------------|---------------------|--|
| 1 | 20 May, 2016  | 79 yr. old male *   | The body was found on 21 May, and was partly eaten.  |
| 2 | 22 May, 2016  | 78 yr. old male *   | He was attacked with his wife, but she escaped. His body was found on the same day in the afternoon, and was partly eaten.   |
| 3 | 25 May, 2016  | 65 yr. old male *   | A small part of the body that was covered by soil was found on 30 May.   |
| 4 | 26 May, 2016  | 58 yr. old male     | He was attacked by a bear, but escaped using a bamboo stick.   |
| 5 | 29 May, 2016  | 78 yr. old female   | She was attacked by a bear, and was injured. However, her son (in his 50s) managed to keep some distance between them and the bear using a wooden stick, and they escaped. |
| 6 | 8 June, 2016  | 74 yr. old female * | The body was found on 10 June, and was partly eaten.   |

\* Killed by bear(s), and predation was confirmed.

All the incidents occurred in a small area within 2.5 km of each other (40.394853 N, 140.956425 E). This area had some cultivation and an old ranch. All of the victims were local residents, and were visiting the area to harvest bamboo (*Sasa kuri-lensis*) shoots for food and for cash. Bears also feed on the bamboo shoots. Bamboo thickets are patchily distributed around the cultivated areas and the old ranch. The area has only recently been inhabited by bears. Before 1978, no bears were reported to occur in this area by the Ministry of Environment.

On the same day when the body of the 6th victim was found by a rescue team, a special hunting team near the scene shot an adult female bear. The bear demonstrated guarding behavior of the victim, denying the rescue team access to the body. According to the post mortem, 33% of the bear's stomach content was human flesh, and the rest was full of bamboo shoots. Unfortunately, the bear was buried without further examination (on order of the Kazuno city council), as a result of insufficient discussion among relevant authorities (e.g., prefectural government, city council, police office, fire station, local hunting association, and National forestry office). Hence, important biological information was not obtained. A member of the special hunting team stated that the female bear had well-developed teats, and was presumed to have been a



Location of Kazuno city, Akita Prefecture, Japan. The orange dots indicate the recent range of black bear as of 2014. Data compiled by Japan Bear Network.

Table 2. Recent human-black bear conflicts during high bear appearance years in Japan.

| Fiscal year | People injured (death) | Bears killed |
|-------------|------------------------|--------------|
| 2004        | 109 (2)                | 2021         |
| 2006        | 145 (3)                | 4340         |
| 2010        | 147 (2)                | 3074         |
| 2012        | 75 (1)                 | 2528         |
| 2014        | 116 (1)                | 3406         |
| 2016        | 95 (4)                 | 2973         |

# Human-Bear Conflicts



Environment of the 2nd incident (left) and the 3rd incident (right) in Kazuno city, Akita Prefecture, Japan. Photos: Koji Yamazaki

mother previously. She had some abdominal visceral fat but did not have subcutaneous fat. Through viewing a photo of her tooth wear, which was taken by the city council, she did not seem to be very old.

It is not known if the same or different bears attacked all the victims. Unfortunately, no samples such as hair or scat were collected at the scenes, so we could not apply DNA analysis to answer this question. It is possible that the bear had a sudden encounter with the first victim in the dense bamboo thicket, killed him in a defensive attack, and later considered the dead body as food. This could have been a trigger for her to become a man-eater. Or perhaps multiple bears were involved, which is more worrying. We will have to carefully monitor the situation in the next bamboo shoot season.

The reason that the authorities could not prevent these consecutive bear attacks was because people were not alerted to the situation, and subsequent people kept entering the dangerous area. Only the police are authorized to handle dead bodies by law, and they did not publicize the fact that the victims had been fed on by bear(s), out of consideration for the victims' families. The police also do not have much experience in wildlife management. Other relevant administrative bodies such as the city council and the National forestry office were thus unaware of the need to warn people away from the area, and people did not realize such grim incidents were happening there. People thus continued to enter the area for the bamboo shoot gathering.

Fortunately, a special committee for future bear management was established in Akita Prefecture after the fatal attacks. This committee includes representatives from the prefectural government, city council, police office, fire station, local hunting association, National forestry office and bear biologists. A system was also established to investigate such bear incidents, including a prepared data form.

In the future, management of the greater bear population in this area is also needed. As this area is relatively new bear range, the administrative bodies will have to decide to either push back the front line of the bear range or accept their range expansion. This must be considered together with local residents.

As previously reported, the bear range has been expanding in Honshu Island, and the mass appearance of black bears into nearby residential areas has repeatedly occurred in the last decade (Yamazaki 2004, Yamazaki and Sato 2014). Many people have been injured and some even fed on by bears. We now have to urgently consider range management of the black bears.

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# Human-Bear Conflicts

## Asiatic Black Bear Killings in Response to Livestock and Crop Losses in Jalkot, Dassu Valley, Kohistan District, Pakistan: Conservation Challenges

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The Kohistan District of Pakistan (in the northern province of Khyber Pakhtunkhwa), lies at the confluence of the Hindu-kush, Karakoram and Himalayan mountain systems. On the east, it borders Kashmir and Gilgit-Baltistan. This unique region supports a high diversity of fauna and flora, including globally Red-listed species such as the western tragopan pheasant (*Tragopan melanocephalus*), snow leopard (*Panthera uncia*), and Asiatic black bear (*Ursus thibetanus*).



Map of district Kohistan (34° 54' – 35° 52' N ; 72° 43' – 73° 57' E), Khyber Pakhtunkhwa, Pakistan.  
The district comprises ~7,500 km<sup>2</sup>, and has a growing human population. We surveyed 1 valley containing 7 villages.

We conducted a study of Asiatic black bears in Jalkot, Dassu valley, a dry temperate and alpine region with temperate forests composed of fir (*Abies pindrow*), blue pine (*Pinus wallichiana*), chilgoza pine (*P. gerardiana*), spruce (*Picea smithiana*), cedar (*Cedrus deodara*), birch (*Betula utilis*), and oak (*Quercus spp.*).

Our aim was to investigate the killing of Asiatic black bears in response to conflicts with people in villages of the valley (i.e., Sasak, Pashoot, Gaheen, Ajlgat, Dadar, Shilo, and Mahershhyen). We conducted informal discussions with the local community to record their knowledge of and attitudes toward such killing, and tried to corroborate such information by asking to see skins of killed bears. Local residents have adopted a lifestyle that entails seasonal movement to summer pastures and back to their winter settlements during fall. In doing so, they make many observations of wildlife species, and they also frequently come in direct conflicts with wildlife, which kill their livestock and damage crops (especially maize planted in small plots along or within the forest).

# Human-Bear Conflicts

We documented the killing of 15 black bears over a period of 5 years (2012-2016), including 4 males, 9 females, and 2 cubs. Most people had guns, and killing of wildlife was not unusual. Six bears were killed as a result of depredating livestock and 9 killed for damaging crops. Locals reported the killing of 528 livestock (mainly goats [n = 235] and sheep [n = 133], some cattle, horses, and donkeys), valued at approx. \$70,000 USD, and 274 cases of crop damage (approx. 40 per village), mainly maize, valued at nearly \$6,000 USD, during the past 5 years.

Documented cases of killing of Asiatic black bears in retribution for losses of livestock or crops in the Jalkot, Dassu valley of the Kohistan District of Pakistan, 2012–2016.

| Case | Year of killing | Village | Bears killed | Distance from the forest | Reasons for bear killing |
|------|-----------------|---------|--------------|--------------------------|--------------------------|
| 1    | 2012            | Shilo   | 1F           | < 1 km                   | Livestock                |
| 2    | 2012            | Pashoot | 1F           | 2km                      | Livestock                |
| 3    | 2013            | Dadar   | 1M           | 3km                      | Crops                    |
| 4    | 2014            | Ajalgut | 1M, 1F       | < 3 km                   | Crops, Livestock         |
| 5    | 2014            | Dadar   | 1F           | < 1 km                   | Crops                    |
| 6    | 2015            | Sasak   | 1M, 1F, 1Cub | 1km                      | Crops, Livestock         |
| 7    | 2015            | Ajalgut | 1M, 1F       | 3km                      | Crops, Livestock         |
| 8    | 2015            | Dadar   | 1F           | < 1 km                   | Livestock                |
| 9    | 2016            | Sasak   | 1F           | 2km                      | Livestock                |
| 10   | 2016            | Shilo   | 1F           | < 1 km                   | Livestock                |
| 11   | 2016            | Pashoot | 1Cub         | 2km                      | Crops                    |



(left) Principal Investigator (Tahir Shah) with stuffed bear found in Ajalgut village. (center) Bear killed at Sasak village, Dasu valley. (right) Locals carrying a freshly killed bear that was responsible for damaging crops and killing livestock in Sasak village. Photos: Tahir Shah.

We observed twelve bear skins and one stuffed bear kept by the people who killed them. People did not sell other parts or consume the meat, but they did use the fat. Interestingly no cases of bear killing have been registered with the Wildlife Department and no legal action has been taken against anyone who has killed a bear, even though all killing of bears is illegal, except to defend one's life. However, we learned that some cases of bear killings in Dubair valley (another adjacent valley) have been registered with the Wildlife Department.

The majority of the people (71% of n = 140 interviewed) in this valley think that the black bear is a major predator of their livestock, and will take the opportunity to kill a bear whenever they see one nearby. We found that 83% of people would prefer that no bears lived near them; 10% wanted bears to be eliminated completely, and 25% thought the bear population should be reduced - although surprisingly, 17% thought the population should be increased, because bears were disappearing.

## Conservation Challenges

There are clearly many challenges to conserving the bears in Kohistan. People in this area have a low appreciation for wildlife, especially species that negatively affect their livelihood. Awareness campaigns would be difficult, and there is little that can be done to protect the livestock and crops. Compensation for crop and livestock losses might be helpful, but the Wildlife Department, which is gravely under-staffed and under-funded for an area of this size, is not even aware of the issues. There is certainly no database by which to judge trends over time in either damage or number of killed bears. Also, law enforcement is nearly nonexistent. We are hopeful that our results will spur more attention to this region.





Angela Fuller



Angela Fuller

(left) Workshop participants Jefferson Morales (Yunguilla) and Antonio Murcia (Mindó) set-up a camera station north of Yunguilla, Ecuador, during a training field day. (right) Workshop participants including Dario Reina (Pululahua Geobotanical Reserve), Dana Morin (Cornell University), Mauricio Morales (Bellavista), break for lunch while hiking to a camera station north of Yunguilla, Ecuador.

Angela Fuller



Workshop participants pose at an overlook view of the northern half of the study area. Front row from left to right: Dario Reina (Pululahua Geobotanical Reserve), Raul Torres (Yunguilla), Mauricio Morales (Bellavista), Rene Lima (Pahuma). Back row from left to right: Angela Fuller (USGS, Cornell University), Patricio Ono (Pululahua Geobotanical Reserve), Javier Lima (Pahuma), Dana Morin (Cornell University), Antonio Murcia (Mindó), Edison Tapia (Santa Lucia), Santiago Molina (CONDESAN), Diana Sulca (Cambugan), and Erich Gomez (Tulipe).

In total, we trained 16 participants from Yunguilla, Pahuma, Mindó, Bellavista, Cambugan, Santa Lucia, and also 6 biologists from Pululahua Geobotanical Reserve, the Office of the Secretary of the Environment, District of Quito, CONDESAN, and the Ministry of the Environment. Among local participants were 4 students from Yunguilla, as well as a father son team and 3 ecotourism guides from the region, demonstrating the education and engagement of local communities and partners. Our engagement with these partners has continued as the trained technicians have conducted the study and brought the educational information back to their own communities, empowering them to speak out for conservation of Andean bears and preservation of their native forests, currently threatened by land use change including slash-and-burn agriculture and mining interests. By engaging with the local communities we have already succeeded in promoting the project and the forest diversity as a boon to the residents, adding social and economic value to the Andean bear in a region where habitat loss and human-wildlife conflict is a primary threat.

An IBA Research & Conservation Grant was awarded to the project in 2016, including contributions from the Homer's Bear Conservation Fund and an anonymous donor. Funds from that grant were used to pay daily salaries for trained field technicians as they conducted the camera-trap study, installing and checking cameras, and collecting data. The first 3-month season, coordinated by Santiago Molina and Manuel Peralvo (CONDESAN), and Dana Morin and Angela Fuller (New York Cooperative Fish and Wildlife Research Unit, Cornell University, and USGS), concluded in November 2016 resulting in over 100,000 photos from 101 cameras. In addition to Andean bears we have documented an extensive suite of mammals including puma, ocelot, margay, oncilla, northern pudu, red brocket deer, white-tailed deer, tayra, striped hog-nosed skunk, long-tailed weasel, South American coati, culpeo fox, collared peccary, common opossum, red-tailed squirrel, Central American agouti, paca, giant anteater, and nine-banded armadillo. The enormous amount of mammal diversity at the camera stations is due partly to the expansive extent of the study area and the wide elevational gradient, only possible due to the local community site approach.



# Biological Research

## Genetic Monitoring of the Brown Bear in the Northern Tien-Shan of Kazakhstan

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The Tien-Shan brown bear is a recognized subspecies (*Ursus arctos isabellinus* Horsfield, 1826) that ranges from Afghanistan-Pakistan-India, across the Tien Shan Mountains of central Asia into the southeastern edge of Kazakhstan and eastward to the disjunct population in the Gobi desert of Mongolia (Galbreath et al. 2007). It is listed as a rare and endangered species in the Red Book of Kazakhstan, and in Appendix I of CITES.

Some information on the geographic distribution and abundance of the Tien Shan brown bear in Kazakhstan are available, but are very outdated (Grachev 1973, 1981). No previous information is available on genetics, although it has been assumed (but never verified genetically) that Kazakhstan has the Tien-Shan subspecies in the south, bordering China, and nominal Eurasian subspecies (*U. a. arctos*) in the far east, bordering Russia (Loginov 2012). Here, we aimed to:

1. Map habitats and estimate densities of the Tien Shan brown bear;
2. Collect material (hair and bones) for genetic analysis, and create a DNA database; and
3. Work out methods to study genetic variability.

We collected hair from natural marking trees that were visited by the bears. In our region this is generally Shrenk spruce (*Picea shrenkiana*). To improve the efficiency of the collection we used turpentine as a scent lure. We collected hairs with gloves and put them in sealed bags, which were transported to the laboratory of Molecular Genetics of the Institute of General Genetics and Cytology MES SC for further study.



M. Beshpalov

(left) Hair samples from Tien-Shan brown bears were sometimes found on marking trees, such as this Shrenk spruce, Ayusay gorge, Kazakhstan. (right) Camera traps were used to obtain photos of bears at marking trees (here, still photo extracted from video).



Bone samples were collected from dead bears found in gorges, such as this skull (left). Samples were removed for DNA analysis (right).



S. Kantarbayev

Flash floods in gorges like this caused mortalities of bears and other wildlife.

We collected bones in gorges where bears died naturally (apparently from flash-flooding). To obtain a DNA sample from bone material we sawed the bone fragment from the least degraded areas.

DNA from bear hair and bone samples was extracted and purified using a kit for the rapid isolation of DNA (DNA-SORB-B, Ampli-Sens, Russia). The qualitative and quantitative characteristics of the DNA were determined spectrophotometrically.

During expeditions to the Trans-Ili Alatau gorge (northern Tien Shan) we found 2 marking trees with bear hair. Additionally, 1 hair sample was collected in the Middle Talgar last year, and another was collected from Prohodnoe gorge recently. We found the bones of brown bears in 2 different gorges of Trans-Ili Alatau: 2 skulls and a tibia. The skulls were badly damaged and were not suitable for measurements, but judging by the cranial ridges and seams, we estimated that 1 of the skulls was an adult bear (approx. 7 years old),

and the other a younger individual (2–3 years).

DNA extraction procedures were carried out for all of the collected material. One hair sample was too degraded (root broken off), so no DNA was obtained. The other samples are being used to start a database to study the genetic structure of the various (possibly disconnected) populations in this region. We also aim to study mitochondrial DNA for the phylogenetic reconstruction of the Tien Shan brown bear.

Thus, the collected material will be the start of the first large-scale environmental and genetic monitoring of brown bears in Kazakhstan. This is not simply a scientific study of genetic diversity and phylogeography, but also may point to the need to direct efforts to preserve a unique gene pool within this bear species.

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# Biological Research

## Kinship Relations in a Multi-Generational Andean Bear (*Tremarctos ornatus*) Family in Northern Ecuador

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Sigsipamba Community



Josefa and Majo first sighted in December 2010

Ursids are widely considered to be predominantly solitary, non-territorial animals with polygynous mating systems (Servheen et al 1999, Garshelis, 2004). Despite the lack of territoriality, and widespread evidence of extensive home range overlap, intraspecific avoidance has been documented to be common in many ursid species, and as such they are believed to be the least social family within the order Carnivora (Gittleman 1989, Garshelis 2009). Driving forces that may have selectively led to heightened ursid asociality have been accredited to their large body size in comparison to their non-nutritive and scattered food sources (Dierenfeld et al 1982, Garshelis 2004), and low levels of interspecific predation coupled with high levels of intraspecific competition (Garshelis 2004). However, when foodstuffs are spatio-temporarily abundant, bears have extensively been reported to congregate acceptingly with conspecifics (Walker 1993, Noyce and Garshelis 1997, Huygens and Hayashi 2001). Current knowledge supports the theory that Andean bears (*Tremarctos ornatus*), like other bear species, are solitary animals that only interact to mate and during periods of parental care (Peyton 1999, Velez-Liendo 1999). However, home range studies have shown significant inter- and intra-sexual home range overlap, indicating the presence of intraspecific territorial tolerance and an absence of significant territorial behaviour similar to other ursids (Castellanos 2011).

The current study took place in the Sigsipamba region, situated on the eastern periphery of the central Andean belt of northern Ecuador. Land is apportioned into small farmsteads predominantly dedicated to rearing livestock and cultivating crops. Due to extensive agricultural activity in the area, bear distribution appears to be discontinuous, and few isolated forest patches remain. The study area was concentrated around a 2 hectare avocado plantation that lies in a protected ravine beside the glacial river 'Rio Pisque'.

Within the study area, a remarkable multi-generational Andean bear family relationship has enabled us to shed some light on the species' social behavior patterns. The bear family in question consists of a matriarchal female named Josefa who has been observed to rear 3 litters of cubs during a period spanning over 6 years. Josefa and her cubs were extensively monitored during the study. Individuals were identified using their facial markings, and multiple behavioral observations were made during the 6-year study period.

In December 2010, Josefa was initially observed by co-author Danilo Vasquez with a female cub of approximately 6 months, named Majo. Mother and cub were monitored extensively for approximately 8 months until they disappeared from the area. Josefa emerged again in mid-2012 with a mixed-sex 2-cub litter, named Martin (male) and Silvestra (female). Despite having separated from her mother many months previous, Majo (now a sub-adult bear) returned to her natal area and was observed to spend long periods of time with her mother and younger siblings. Multiple video recordings were taken of Majo's interactions with the new family group, and despite her mother's occasional intolerance when she became over-energetic with the cubs, Josefa generally accepted her presence and often interacted and played with her. During the maternal period, Josefa would often leave her pre-weaned cubs for periods exceeding 24 hrs, presumably whilst in search of food. In her absence, it was common for Majo to appear on the scene and accompany her younger siblings. From the video footage, kin recognition is beyond doubt and the multi-generational bear family remained close and spent substantial time together until Josefa separated with the cubs in 2014. Multi-generational family groups in Andean bears have also been recently reported in other areas of the species' range including in the Oyacachi region of northern Ecuador (Melchor Ascanta, pers comm) and in the Chingaza region of Colombia (Daniel Rodriguez, pers comm). Since separating with Martin and Silvestra, Josefa has reared another litter of cubs within the study area. Majo, now an adult bear of approx. 6 years old has remained within her maternal range, and in May 2016 she was observed with a 2-cub litter of her own, suggesting strong female-biased philopatry exists in Andean bears.

Multi-generational family groups are previously unreported in ursids. Why did Majo return to spend time with her mother and younger siblings? High food abundance (avocados) in a fragmented area may explain overlap and philopatry, but cannot explain the complex social behaviors shown within this family group, suggesting Andean bears display different, and possibly more complex, social behavior patterns than other bear species. With Andean bears being phylogenetically older than all extant bear species except possibly pandas, could the social traits that stemmed from their Carnivora ancestors be more pronounced



(left) Majo staying close to her mother and younger siblings. (center) Majo playing with her younger sibling, Martin, in their mother's absence. (right) Majo and Martin playing as their mother (right) watches on. Photos: Danilo Vasquez.

than those of the more evolutionarily recent species in the subfamily Ursinae? Due to the greater extent of conscious mother-cub interaction of non-hibernators during the maternal care period, could it be that all tropical bear species show a higher degree of kin recognition and are more likely to reconnect after mother-cub separation? Could female Andean bears revisit their mothers to gain experience in maternal care before becoming mothers themselves?

All bear species have shortened gestation periods and give birth to small cubs, therefore secluded denning sites that provide adequate thermal protection are key territorial prerequisites within female home ranges (Garshelis 2004). Coupled with the enduring effects of human encroachment on bear habitat that restrict the quantity and accessibility of ideal denning sites, the potential competition for such resources is intensifying. Could Josefa be displaying a form of kin-selection behavior by sharing her home range and denning area with her daughter as a strategy to propagate shared genes and increasing her inclusive fitness, hence ensuring the survival of her genetic lineage?

Though current data is not significant enough to define the complex relationships and social patterns of Andean bears, observations made during the study provoke many questions and clearly demonstrate a critical need for more in-depth multi-disciplinary studies on Andean bear maternal behavior. The complex and particular habits in denning site selection linked with the increasing levels of human-induced habitat disruption suggest that identifying and protecting denning sites whilst connecting isolated patches of bear habitat could be a vital first step towards reinforcing the population viability of Andean bears, and ultimately helping safeguard the survival of the species.

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# Manager's Corner

## Washington State Black Bear Research Update

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American black bears (*Ursus americanus*) are among the most researched mammals and thanks to many inventive and generous wildlife biologists, statisticians, and geneticists, there is an abundance of literature describing data collection methods and freely available software for relatively straightforward analysis to accurately estimate population density, abundance, and population trajectories. DNA capture-recapture methods have become ubiquitous among bear researchers because, they allow for more extensive and remote surveys, require fewer people than traditional capture methods, accommodate increased sample sizes, and can be more cost-effective than capture-collar studies (Mowat and Strobeck 2000). Yet, while black bears are a managed game species and hunted throughout the majority of their range, most US and Canadian wildlife management agencies do not have empirically derived abundance estimates, and rely on harvest data for the bulk of their inference on population status (Folta 2011, Beausoleil and Dobey 2015). However, many of these methods are considered unreliable (Garshelis 1991, Clark 1999, Beston and Mace 2012). Certainly, the frequency of DNA capture-recapture projects are on the rise, including with management agencies, but unless these studies are properly randomized and rigorous enough for adequate precision, their utility for management decision-making may be limited (Garshelis and Hristienko 2006).

As part of a collaboration between Washington Department of Fish and Wildlife and Washington State University, we are analyzing data from a 4-year DNA capture-recapture project in Washington state, that was initiated to provide empirical evidence on the status of Washington's black bear population. The project began in 2013 and consisted of 2-500 km<sup>2</sup> study areas in the Cascade Mountains that encompassed much of the variation in habitat and human influence throughout the state. Throughout the study areas, we constructed 579 barbed-wire enclosures, collected nearly 8,000 hair samples, and GPS radio-collared over 240 bears. Preliminary analysis using spatially-explicit capture recapture models suggest that black bear density is highly variable depending on local habitat, harvest pressure, and anthropogenic food sources.

Although our results will be the most rigorous estimates of black bear density and population trajectory ever collected in Washington, we anticipate that extrapolations to other regions of the state, especially the highly variable and more arid habitats in eastern Washington, will be of limited value. Thus, we are also developing an agency monitoring strategy that can be implemented by District biologists to monitor black bear populations at a statewide level. Using data simulations and a range of capture probability, movement, and density parameters, we will identify minimum study area sizes and trap spacing needed to precisely monitor local populations with the least amount of staff effort and cost. Essentially, we hope this product will be incorporated into District staff annual work matrices and used in a similar manner as other big game species monitoring protocols, such as aerial ungulate population monitoring surveys.

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## Book Review

Ice Bear: The Cultural History of an Arctic Icon by Michael Engelhard  
University of Washington Press, Seattle

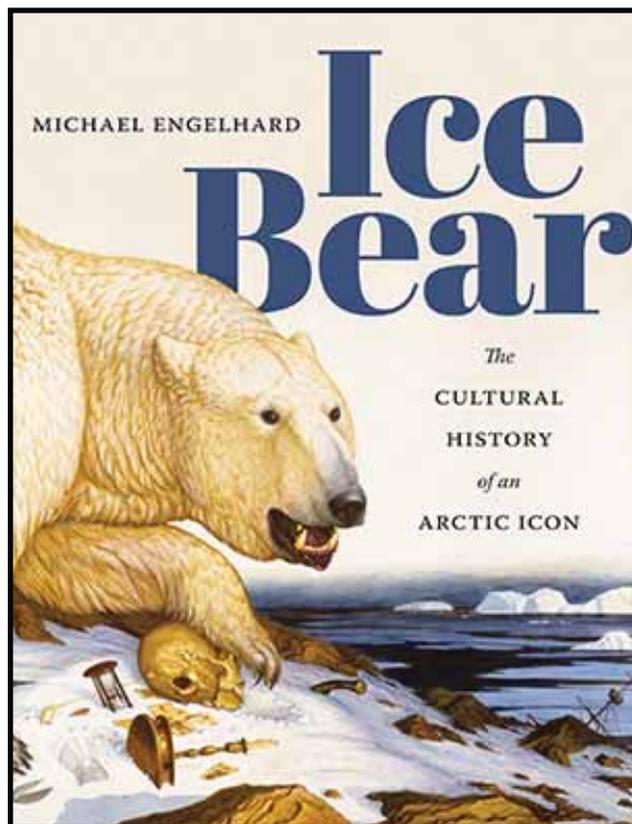
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There are excellent, recently-published books on the biology of polar bears that cover their ecology and behavior in detail. These include Ian Stirling's "Polar Bears: The natural history of a threatened species" (Fitzhenry and Whiteside 2011) and Andy Derocher's "Polar Bears: A complete guide to their biology and behavior" (The Johns Hopkins University Press 2012). Such books provide the interested reader with all they might want to know about the natural history of polar bears. However, given their scope, these books necessarily cover human—polar bear interactions in a cursory manner. What has been missing to date has been a thorough review of the cultural associations between humans and polar bears. That gap has now been filled by Michael Engelhard's detailed treatment of the connection between humans and polar bears in "Ice Bear: The cultural history of an Arctic icon". Engelhard trained as a cultural anthropologist at University of Alaska, Fairbanks and his professional background is evident throughout the book.

In 13 richly illustrated chapters and just over 240 pages, Engelhard takes us on a journey that outlines humankind's long and complicated relationship with polar bears. That journey shows us the pragmatic, spiritual, and supernatural aspects of the relationship between the original inhabitants of the Arctic and polar bears; the impressions of early explorers, naturalists, hunters, and whalers gleaned from their accounts and journals; the position of the polar bear in art, especially of Arctic peoples; the polar bear as star tourist attraction at such places as Churchill, Manitoba and Svalbard; and finally the polar bear's recent status as the "canary in the coal mine" and indicator of the effects of climate warming on Arctic and sub-Arctic ecosystems.

The early accounts of explorers and others were often shown to be incorrect, even fanciful, but by gathering these together Engelhard provides important historical context. Many of these early impressions were subsequently shown to be largely correct and yielded interesting insights to the natural history and behavior of polar bears. In Chapter 5 we see documentation of the extent of harvest of polar bears by fur traders and hunters, the scale of which may be a surprise to many. The many illustrations offer reproductions of original paintings, sketches, and photographs which add to the attractiveness of the book, but also elaborate on the historical context. The entire text is richly sourced with abundant footnotes to satisfy those who wish to check original sources, or seek additional information on a topic. This source information is especially valuable because it provides an entry into a literature that may be largely unfamiliar to most biologists, naturalists, and the general public.

I did find a few minor errors in the text. For example, in Chapter 4 'Object of Scientific Curiosity', p. 59, the text states "Among polar bears, unlike brown bears and black bears, most pregnant females hibernate, preserving energy needed for nursing....". Presumably, what was meant was "Among polar bears, unlike brown bears and black bears, only pregnant females hibernate,..." because in contrast to brown bears and black bears where all bears hibernate in winter, only pregnant polar bears hibernate and all others are out on the sea ice hunting seals. A careful reader will note that this idea is corrected a page or two later. Such minor errors should not detract from the value of the book to those interested in our long and convoluted relationship with polar bears. This book should be in the library of all who share this interest and want to know more about this Arctic icon.



# Workshop Announcements

## 23rd Eastern Black Bear Workshop

The 23rd Eastern Black Bear Workshop (EBBW) will be hosted in April 2017 by the Pennsylvania Game Commission in the Laurel Highlands region of southwestern Pennsylvania. This area, situated atop the Allegheny Plateau, is home to approximately 1,300 black bear with several large public lands, a number of State Parks, and a variety of historic and cultural attractions. The website [www.laurelhighlands.org](http://www.laurelhighlands.org) provides a summary of things to see and do in the region.



Dates: April 24-27, 2017

Location: Antiochian Village Conference Center, 6 miles north of Ligonier, PA [www.antiochianvillage.org](http://www.antiochianvillage.org)

|   |                  |          |
|---|------------------|----------|
| Lodging/meal package: includes 3 nights lodging and 9 meals beginning with dinner on Monday through bag lunch on Thursday | Single occupancy | \$404.49 |
|   | Double occupancy | \$316.20 |
|   | Triple occupancy | \$286.77 |

|                   |                    |       |
|-------------------|--------------------|-------|
| Registration fee: | Student            | \$120 |
|                   | Early              | \$135 |
|                   | Afer April 1, 2017 | \$145 |

To select a lodging and meal package, please visit the Antiochian Conference Center website at <http://registration.antiochianvillage.org/2017EasternBlackBear>. To learn more about the meeting and submit payment for the registration fee, please visit the EBBW website [www.easternblackbearworkshop.org](http://www.easternblackbearworkshop.org)

Nearest airports: Arnold Palmer Regional Airport (LBE, 11 miles) at Latrobe, PA  
Pittsburgh International Airport (PIT, 69 miles) at Pittsburgh, PA

Limited airport transportation will be available for participants arriving on April 24 and departing on April 27. Availability and cost are detailed on the Antiochian Village website.

The 23rd EBBW will be a working session designed for biologists involved with black bear research and management. The agenda has been finalized. Sessions include human-bear conflict management, agency response and investigation of bear attacks, advancements in bear handling techniques, and disease in black bears. There will also be a poster session.

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## 5th International Human-Bear Conflict Workshop

Save the date!

The 5th International Human-Bear Conflict Prevention Workshop will be held March 25-28, 2018 at the Park Vista Hotel in Gatlinburg, TN. This workshop is open to anyone working in the field of human-bear conflict prevention. More details to come soon.

# Conference Announcements

## 25th International Conference on Bear Research & Management November 12 - 17, 2017 QUITO, ECUADOR

The 2017 Scientific Committee has chosen the topic "*New Frontiers for Bear Research and Conservation in the Tropics*" as the main focus for the 25th International Conference on Bear Research & Management. The conference is designed to give a special emphasis to presentations about research, management and conservation of bear species in tropical zones. The program will include 9 sessions, and for the first time in an IBA Conference, the program will also include a Spanish session, with simultaneous translation in English about the Andean bear.

We encourage researchers to submit abstracts through our website <http://www.quitolandofbears.com/> until April 15, 2017.

Pre-enrollment forms are already available. By submitting the form participants will have access to an early registration rate.

We are happy to welcome you in Quito in November; it will be a lifetime opportunity for sharing experiences on bear research and conservation and to enjoy the marvelous natural and cultural wonders of the city.

The historic center of Quito has one of the largest, least-altered and best-preserved historic centers in the Americas. Quito and Krakow, Poland, were the first World Cultural Heritage Sites declared by UNESCO, in 1978. The central square of Quito is located about 25 kilometers (16 miles) south of the equator and at an elevation of 2,850 meters (9,350 feet) above sea level. It is the highest official capital city in the world and the one which is closest to the equator. Quito is possibly one of the richest districts in the world regarding bird species biodiversity. There are over 550 bird species registered specially in the Northwest where you can find the best kept Andean forests in the District and where an important population of Andean bears lives. Furthermore, Quito is the home of 400 orchids, 112 mammals, 53 reptiles and 92 amphibians.

Look for more details on lodging, air travel, registration and abstracts submission on our official website <http://www.quitolandofbears.com/>.



## Student Forum

### Truman Listserv and Facebook Page

- 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



### Listserv Signup Instructions

- Visit: <http://www.bearbiology.com/iba/stu.html>
- Follow the links to request an invitation
- 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.

### Facebook Signup Instructions

- Visit: <https://facebook.com/groups/IBA.Conference/>





## Attending a Conference

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Students, the next IBA conference is 8 months away. Do you want to go? Is work being presented that you want to see? Do you have work to present? Can you spare the time from your studies or your job? Can you afford to go? Do you want to volunteer some time to assist the conference organizers during the conference? Are there workshops that will teach you valuable skills and add to your experience? There are lots of decisions to make and deadlines to meet if you are deciding to attend a conference but the benefit can be tremendous, when people gather and exchange information and ideas, innovation occurs and collaborations are created... and for some it is the start of long-term friendships.

Conferences are a marathon and the best way to get the most out of them is to prepare ahead of time as much as possible, know the deadlines and research the location where the conference is occurring (transportation, lodging, culture, etc). Below is a list of things to keep in mind and is not meant to be a comprehensive list, everyone should make their own list as they prepare for a conference.

### 8+ Months Before Conference - Lots of Research

- Location: do you need

- a passport? Passports generally take 6-8 weeks but may take longer for a variety of reasons (note: most countries will not let you enter if your passport expires within 6 months of entry)
- a visa? Some require forms filled out ahead of time and passports sent with applications, others can be obtained at the time of entry to the country, know the rules. Conference organizers can provide letters for participants if you require them for visas or to persuade your employer the conference is valuable to you and your position with them.
- vaccinations? know what vaccinations you have, you need, and are optional for your trip. Some take time before becoming effective or require more than one dose,

- Lodging: usually there is lodging at a discounted rate where the conference is being held or nearby. Sometimes a nearby location is more suitable for your lodging based on price, how many people you share with, type of lodging (university dorm, camping, couch surfing). In my experience it is worth a lot to stay as close as possible to the conference location because you may be there from the early morning til the late evening and it is nice to be able to drop off items, change clothes, or take a quiet break from the hectic schedule of the conference.

- Transportation: from home to the conference city (plane tickets, rent a car, share a ride) and from lodging to the conference location each day (walk, bus, subway, taxi). Take advantage of hotel shuttles from airport or train station if available (sometimes free or a small charge). If your lodging doesn't have a shuttle there are often other shuttle services available for a fee or fellow attendees eager to share a taxi.

- Other Travel: Are you going to vacation before or after the conference in the local area, region, or neighboring country? Sometimes conference organizers arrange optional field trips before or after the conference, these pre-planned group trips are sometimes led by local scientists and can be a great experience. If not, you can always plan something on your own or with fellow conference attendees and friends.

- Create a Budget: you'll be surprised at how much all the expenses of a conference add up to. There are many ways to reduce expenses: share a ride, share a room, book one of the conference block of rooms, use alternate lodging, research travel grants (from the conference organization, local chapters of organization, your college/university, other organizations), most conferences have discounts for early registration. Use online services to watch for deals (e.g. Hipmunk, Skyscanner?)

### 6-7 Months Before Conference

- Abstract Deadline: due 5-7 months prior to the conference, sometimes abstracts for oral presentations have different due dates than poster presentations

### 4-5 Months Before Conference

- Travel Grant Deadline: due 4-5 months prior to the conference, most require proof of registration and sometimes a draft of the poster or oral presentation must be submitted with your application.

### 2-3 Months Before Conference

- Registration Deadline: early registration tends to end 2-3 months prior to the conference, miss it and you'll be paying substantially more for conference registration.

## 1 Month Before Conference

- Deadlines: sometimes your oral presentation powerpoint is due to a conference organizer a week (or two) before the conference, some conferences use this to confirm presenters are still giving a presentation and make sure the presentation will work on their computer system. Usually there is a firm deadline of 24 hours before your presentation to upload the final version so check the conference website for your options and don't stress out if it's still missing a few pieces with a month still to go.
- Preliminary schedule is available and it's time to make some tentative plans for your conference time.
- Inform you're professional network that you'll be attending (and note if you are presenting any work), ask if any of them will be attending – good time to catch up or meet with people in your network if they are attending as well.
- Are you attending a workshop? If so, there may be materials to review or work to be done before the workshop to be prepared for participating in the workshop.
- The work you leave behind: plan for anything that needs taken care of in your absence, remind your supervisor of your upcoming absence, make sure co-workers that rely on you are aware you will be away from the office (and possibly have limited communication ability).
- Travel supplies: any special items of clothing for the climate? personal items or medications you'll need a supply of?
- Emergency contact: someone should know where you will be and how to contact you in case people need to get a hold of you or you need assistance - give a copy of itineraries to your emergency contact.
- Is there a fundraising auction event? As people come from all over for conferences, items unique to your area are often novel and peek interest.

## Day Before Departure

- do have everything? Copy of your presentation on a USB drive and notes as hardcopy (just in case). Documentation (identity, purpose of travel, travel itineraries, copies of reservations, etc), appropriate clothing, medications, currency, credit cards, etc. Double check your lists, get a good night's sleep and dream of the amazing experience ahead.

## Conference time!

- Timing: Meetings starting at 7am, presentations starting at 8am and lasting til 5pm (often with concurrent sessions), a lunch break that never seems long enough and morning/afternoon breaks that may be reduced to a few minutes if sessions run overtime. Even dinner can be a rush if there is an evening event to attend.
- Food: its rare but some conferences provide a breakfast 'snack' usually a small sugary item, enough for those that have missed breakfast to make it to the morning break, morning and afternoon breaks usually have coffee (and often tea) provided but may or may not include snacks. Best to keep at least a bottle of water and back-up snack in your bag, nothing worse than finding out there are no refreshments provided or missing out due to lack of time and being distracted by hunger, or even worse, distracting others with the grumbling of your empty stomach.
- Oral Presentations: you should have these well-rehearsed by the time you leave for the conference. As you've practiced you've likely made tweaks and for conferences these days that is not a problem - thank you digital world - most conferences will allow changes to be uploaded up to 24 hours before, some as few as 6 hours before, your presentation. A room will be set aside at the conference location for this purpose.
- The plan: what have you decided to attend based on the preliminary schedule? Are they still scheduled (unexpected cancellations occur) Is there alternatives, eg. attending a working group meeting instead of a presentation you can watch after the conference (some conferences record presentations and make them available to conference registrants after the conference ends).
- Networking: most conferences have scheduled networking/social events but in reality any time outside of a meeting/session is a networking opportunity – for a short chat or a discussion over a meal. Take advantage of these gatherings of people in your field of study to engage in conversation. Watch for members of your online network that are attending to develop those connections further.

If this will be your first conference, or you've attended a couple and are presenting for the first time, you will be excited and likely nervous. You should begin early to train yourself to be excited about presenting your work, rather than being nervous. Over time this will make you a better presenter. Learn from those that have had last minute preparations cause them to forget a few things or rush a presentation for a conference. Work ahead of the deadlines so if something goes wrong you aren't trying to do too much too quickly. After your first conference you will understand why many of us call them marathons, they take stamina. Keep yourself well rested and well fed or you'll be exhausted by day 3. All of us fail at this to some extent with the hectic schedule, late nights, not enough sleep, too much coffee, and a shortage of healthy food. But if it's a good conference you'll have lots of new ideas and connections, you'll be tired, happy, and a little sad to say goodbye.



## Recent Bear Literature

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

- Summer Issue: 5 June: Agnes Pelletier: asg.pelletier@gmail.com
- Fall Issue: 5 October: Marion Schneider: mfschneider@gmx.de
- Spring Issue: 5 February: Agnieszka Sergiel: agasergiel@gmail.com

For easy access to articles, we are 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>

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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 approximately 500 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 2017 issue is 5 June 2017