International Bear News

Spring 2021 Vol. 30 no. 1

Andean bears in a patch of upper montane forest east of Quito, Ecuador. See article on page 17.

Photo credit: Carnivore Lab-USFQ/ Fundación Condor Andino/Fundación Jocotoco

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

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Tri-Annual Newsletter of the International Association for Bear Research and Management
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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 2021 issue is Monday, June 14, 2021.

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The use of the IBA logo at the end of an article indicates articles submitted via the IBA regional correspondents and the IBN editorial staff.

Bear Specialist Group

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

BCF Bear Conservation Fund

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

It's hard to believe it's already been over a year since I became IBA President, a crazy year that so dramatically changed the world as the COVID-19 virus spread. I don't think anyone understood how dramatically the pandemic would affect the world. What still seems so strange is how such major adjustments to our lives become the new normal. Uncertainty persists, but I hope science, vaccines and rapid testing will help us get back on track. I wonder, though, what sorts of things will change permanently?

In spite of the pandemic, and the unfortunate postponement of our conference, IBA is doing well. We've had to modify plans and adjust expectations a bit, but all in all we're still making good progress. Our invaluable volunteers continue to support IBA, even now with added stress and issues such as home-schooling. We are also aware of the challenges so many members are facing and have tried to be as supportive as possible.

Officers and Council

I want to mention the results of our recent election and welcome our new members. Agnieszka Sergiel is our new Vice-President Eurasia. Marta de Barba was re-elected and joined by newly elected Council members Colleen Olfenbuttel and Mark Edwards. And using the Bylaw option to appoint one additional member per election cycle, Council added Vivianna Albarracin Davalos to Council. Thanks to everyone who ran in the last election. We had a strong slate of candidates. I also want to thank Mei-Hsiu Hwang who served as Vice-President Eurasia for the last 3 years and Gordon Stenhouse who served on Council for 7 years. Their dedication and expertise enriched IBA Council these last few years.

Dr. Art Pearson

Dr. Art Pearson, one of the early Canadian bear researchers died last December at age 82. He worked for the Canadian Wildlife Service from 1962-1975 in the Yukon doing research on grizzly bears in Kluane Park and the Barn Mountains. He chaired the first bear meeting in Whitehorse Yukon in 1968 that was the first of what would become IBA conferences. He left biology and moved on to politics and business but left his mark on bear conservation with his pioneering studies.

Positions and Policy Statements

As a professional organization grounded in science, IBA holds a recognized position in the world of conservation, and we regularly receive requests to address policy issues relevant to bears. Balancing science and advocacy can be a challenging, even controversial task. IBA must be a strong advocate for conservation but must support our positions with the best available science, or IBA's credibility will suffer.

We sometimes have enough facts to argue for or against certain policies or actions that could have serious consequences, and advocate for the best option. But there will also be situations where science alone cannot dictate the best course of action and even within our membership there will be legitimate differences of opinion and values regarding outcomes. When we are asked to comment on the relevant science related to decisions that are ultimately political (and have to consider social and economic concerns as well as environmental factors), we must try to provide impartial and evidence-based background on the likely impacts on bears. That hopefully will be considered when evaluating alternatives. Our reputation as a reliable source of expert opinions and impartial factual information to inform policy is crucial to safeguard.

We are currently using the Policy Guidance for the International Association of Bear Research and Management adopted by Council in 2016, which I urge everyone to read.

I also want to mention the basic criteria set forth: "…policy guidance for IBA should be based on bringing relevant and timely information to the policy process while maintaining credibility and scientific integrity beyond question. Therefore, IBA Council involvement in policy issues should be limited to those that meet the following criteria:"

1. Compatible with IBA Mission
2. Need for Science to Resolve Issue
3. Conservation or Management Significance
4. Catalytic Effect/Value Added
5. Clear Objectives
6. Supported by at least Two-Thirds of Council

IBA leadership recognizes our responsibility to help inform policy and the increasing importance of providing factual guidance. We are looking at ways to refine and improve our process. Recent work on IBA's Program Development Plan included suggestions on how IBA can provide more effective policy guidance. Some recommendations from that group include:

Establish the Scientific Advisory Board (as per IBA's Structural Development Plan) and clarify its role in IBA actions to inform and influence policy.

- Establish a pro-active process to engage members in identifying and selecting issues for IBA involvement. Explore ways to use conferences or online engagement in this process.
- Prioritize issues where there is best access to influencers and decision-makers.
- Partner with environmental news organizations to get emerging issues for bears into the public eye.

Adequate time to recruit knowledgeable members, review and prepare the fact-based input and get Council approval is crucial to efforts. Which is why some agencies in the U.S. release documents over holidays with comment periods as short as possible. We encourage members who become aware of issues to bring them to our attention sooner rather than later. We want to avoid rushing to weigh in and not doing an adequate job. But we also don't want to miss appropriate opportunities to provide expertise that could help decision-makers.

Not everyone is happy with our process or pleased with every official IBA policy document, but that's to be expected with as diverse a membership as we have. There are good and bad aspects to having a bureaucracy involved in preparing such documents. Our members have more latitude to comment including championing their personal values (and I encourage everyone knowledgeable regarding conservation issues to comment whenever possible). Whereas IBA's remarks must be limited to evidence.

We can expect the need for sound science to help inform conservation debates to grow. We intend to keep working to ensure IBA maintains its reputation as a trustworthy source for bear science and try to find ways to increase and improve our ability to contribute to policy discussions.

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The Truth is Generally Not "Somewhere in the Middle"

Imagine a Conservation Officer looking through binoculars, watching a grizzly bear feeding on berries in an opening well up the mountain. Suddenly he hears a shot and the bear runs, then drops. Scanning to the right 200 meters he sees a man with a red shirt and a rifle. As the Conservation Officer heads to the scene, he hears on his radio that the man has called in and admitted killing the bear, claiming it was self-defense, which is legal. At the court hearing, the judge hears two very different stories, and must decide what really happened.

Now imagine a U.S. presidential election in which the incumbent loses, but immediately claims that the vote count was rigged; he offers no substantive proof, yet persuades a large following that it is true, and motivates them to riot and try to interfere with the final vote certification by storming the capitol building[a].

The first scenario is not hard to imagine, as it occurs in some form routinely across the world. The second would seem far-fetched had it not just occurred, prompting this essay.

The point in each case is that there were radically different stories about what actually occurred. In many situations there is just one truth, but people with different motives, perspectives, or beliefs may conclude differently about what that truth is. More disconcerting, the goal may not be to portray the real truth, but rather a manipulated or manufactured account to support a certain outcome.

Often when disputes occur, it is common to hear the assertion, from non-involved parties trying not to take a side, that "the truth lies somewhere in the middle" (an expression attributed to Paul Alessi). At its heart it means that both sides' versions are somewhat untruthful, but we can't tell which is closer to the truth. This is a big win for perpetual liars and exaggerators, and a big loss for honesty.

We now live in an age where assertions of "fake news" and alternative realities are commonplace, and many people are swayed by non-factual information. Sadly, a large number of people now distrust science.

This toxic trend is seeping into conservation, even sometimes by conservationists themselves who may be tempted to combat disinformation with exaggeration. Peh (2018), in a thoughtful paper about why "truth matters" insisted that conservation is weakened if not based on "mutually-agreed and established facts." He used an example of a high-profile report which asserted, wrongly, that massive proceeds from the illegal elephant ivory trade were supporting terrorism—clearly trying to bolster efforts against ivory trading by linking it with an even more alarming issue. Another example of a false, alarmist claim cited by Peh was that the pollution caused by illegal forest clearing in Indonesia in just 1 year caused 100,000 human deaths—again, an attempt to strengthen the public's reaction to the environmental issue.

Long-term damage is done to the credibility of all conservationists when "crying wolf" becomes a common approach to try to shift public opinion. The low science literacy of the public can result in their confusion between real scientists, exaggerators, and those who provide intentional disinformation.

The subject of climate change is particularly rife with misinformation. The press, in an attempt to provide "balanced reporting," underpinned by the assumption that the truth lies in the middle, caused widespread misunderstanding and mistrust, dangerously setting back the global response to climate change for decades (Boykoff and Boykoff 2004, Wetts 2020).

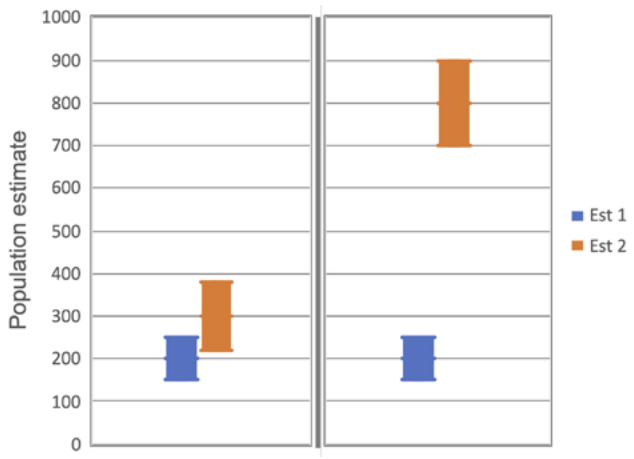
The field of conservation is inherently full of disputes and turmoil. Maybe one of the biggest and most important this year is whether the COVID-19 pandemic was linked to the illegal trade in endangered pangolins, some of which carry viruses genetically similar to SARS-CoV-2. If so, what could be a stronger deterrent in halting this trade? But the evidence remains sketchy, even insofar as the genetic match. Also, whereas many of the people who initially contracted COVID-19 in Wuhan, China, visited a wet market where pangolins were held, the earliest known patient had not (see further details by Quammen 2020). This is not to say that pangolins were not the original source, only that conservationists should be careful about being caught in the "truth lies somewhere in the middle" trap in situations where it is either true or not, and we need to know which. A good deal of effort is being invested in trying to find out whether and which species may have transmitted COVID-19 to humans, and obviously knowing that truth is important (see do Vale et al. 2020 for a review). Further to this point, some have raised concerns that Chinese medical practitioners were experimenting with bear bile as a treatment for COVID-19, raising the specter that (if it worked), it could start a worldwide scramble for bear bile (Environmental Investigation Agency 2020, Fobar 2020). This was another unfortunate case where some conservationists either overreacted, or used

the circumstances that were in the public eye to draw more attention to other issues (bear poaching and bear farming).

To be clear, we are not referring here to stated preferences, world views, or even recommended courses of action for conservation, all of which are not definable truths or single best options. Also, in some but not all cases, multiple estimates of numerical values (e.g., population estimates) may yield a closer approximation to the truth. But two assessments of population trend, one increasing and one decreasing, is not evidence that the population is likely stable.

Each of us can probably think of cases where certain aspects of bear management or conservation have led to disputes, sometimes between bear biologists and others, and sometimes among ourselves. These disputes can be healthy in forcing us to examine the data fully, and lay out all possibilities of interpretation. We recognize that science is often hampered with imperfect data or confounding factors that make interpretations unclear.

But even if there are two or more viewpoints on what the science says, there is often just one underlying truth, which typically is not "somewhere in the middle."



Imagine two independent population estimates for a certain bear population at roughly the same time. In the panel at the left, the 95%CIs are overlapping, which provides some credence to the real value being somewhere in the middle between the two estimates (blue and orange). In the panel at the right, the two estimates are highly divergent, suggesting that at least one of them is biased (untrusted), providing no support for the real value being in the middle. The highly divergent case demonstrates the fallacy of the common assertion that the truth is likely to be in the middle as a way of softening highly polarized arguments.

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Footnote:

[a] The example here is not intended as any political statement, but simply to make the point that very high-profile and meaningful events in today's world are being shaped by an attempt to distort the truth, and this tendency is affecting how we communicate.

Bear Specialist Group

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A Message from the Executive Director—Our Lasting Legacy

In this age of COVID-19, the changes and unknowns that continue into 2021, I have joined what I suspect are a growing number of people thinking about what impact I want to leave on the things I hold most dear—family, community and the natural world. As it concerns the latter, involvement in wildlife conservation is how I hope to do my part, and I think most of us agree that IBA past, present and future is leaving a tremendous legacy in support of our planet.

Through the dedication and hard work of IBA volunteers, members and staff, we have successfully completed a number of important steps in our structural evolution these past months, which will set the foundation for even greater achievements in the future, while continuing to build a sound financial base that has allowed for robust 2021 funding of projects through the Bear Conservation Fund and other activities.

Among the most important was the development and approval of the IBA Structural Development Plan which will be the primary tool that we will use for program prioritization and development over the next several years. In addition, new financial reporting systems, our first IBA budget and soon to be completed 2020 Audit Report will help to keep us transparent and on track financially. We also moved to new investment managers—Jacobson and Schmitt based in Madison, WI, USA—which has motivated a review of our investment strategy and policies with the goal of growing our reserve fund. And, to allow the IBA Council members to provide needed oversight and input to better manage these efforts, we have begun implementation of 4 standing committees as part of the new structure. And we will report on a good deal more in the coming months that we expect will strengthen IBA, making it more efficient, transparent, visible and a resource to our members and communities of people.

But there are other ways that IBA is working to help people—those who have a desire to make a lasting difference regardless of one's financial capacity—leave a legacy that allows bears to thrive and be enjoyed by future generations. Several members have made the decision to make IBA a beneficiary of their wills and estates, supporting IBA through a future investment and leaving a legacy in their name or the names of their loved ones. There is perhaps no greater way to show one's commitment to IBA's mission than to consider this opportunity to make a lasting commitment to IBA. Another way people are beginning to support IBA funded conservation projects is by making a minimum 3-year financial commitment by offering an IBA Fellowship, often in honor of an individual or institution that can then be remembered well into the future. To date, 4 fellowships and a special IBA Travel Grant have been developed to recognize and remember:

- fRI Research Fellowship
- Glen Contreras Memorial Fellowship
- Elizabeth Grace Bivins Fuller Fellowship
- Mike Hooker Memorial Travel Grant

If you would like more information about these legacy gifts, fellowships and grants, please contact me at christopher.kelley@bearbiology.org, 1-415-902-8115.

As always, we appreciate your commitment to IBA and the legacy you are leaving each day to the world's 8 bear species and the health of our natural world.

Wishing you all good health and peace,

Chris Kelley

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Transition News

Dear IBA Members,

We hope you keep doing well and are healthy and safe. With the New Year, we would like to summarize the achievements related to the transition we are undergoing.

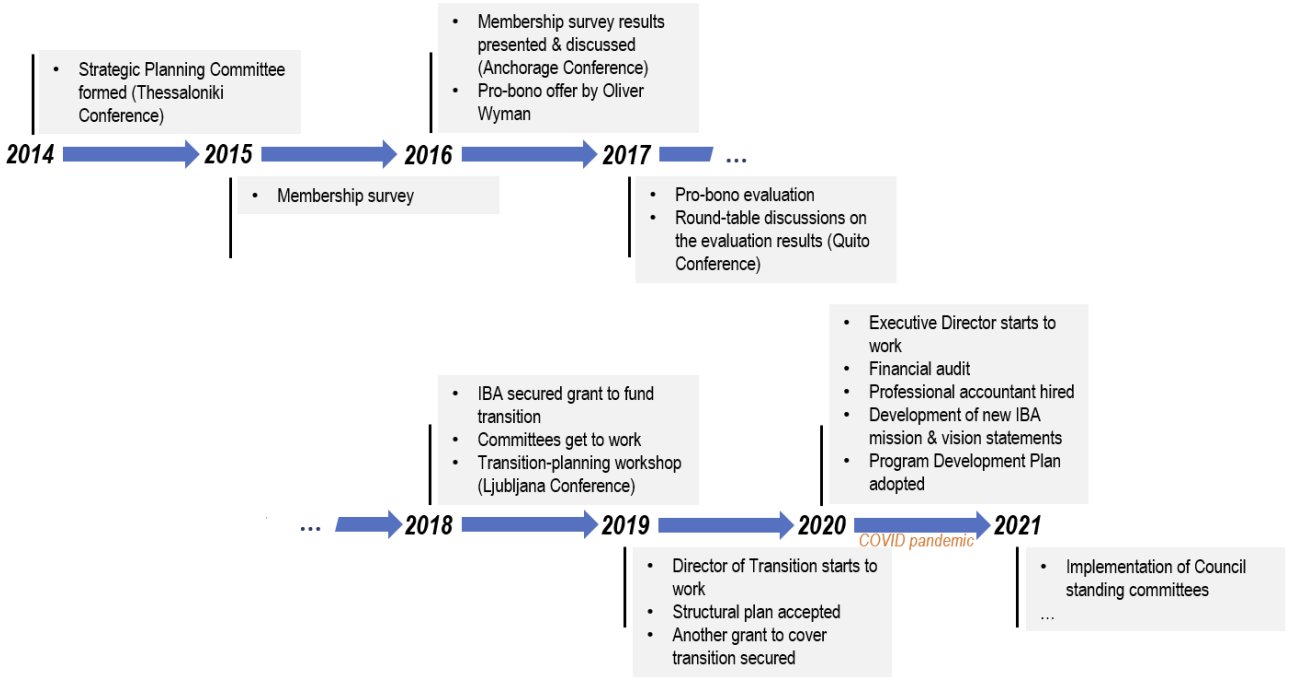
Going forward

In 2020, the Council worked as 2 teams for the development of a mission and vision statement and programs plan as a foundation for IBA's strategic plan for the next 5 years. The program's team brought in IBA members outside of Council (Djuro Huber, Mark Edwards, and Russ van Horn), to complete the monumental task, which was presented to the full Council this past December for review, input, and a vote to adopt. The Council unanimously approved the adoption of this new plan along with the vision and mission statements presented by the 2 committees. Both can be found on the IBA's Structural Development Plan website.

In our last column, we reported on the progress for establishing the 4 standing committees of Council: 1) Programs, 2) Governance and Internal Affairs, 3) External Affairs, and 4) Financial and Legal Oversight. With the expertise of our Executive Director, we finalized the committee members, and each committee is now up and running. Using the guidance from other similar organizations, an Executive Officer and a non-officer Council member serve as co-chairs for each committee and are selected from the current voting Council members. The Executive Officer Co-chair serves as a representative of the committee to the Executive Officers which is led by the IBA President. The President coordinates the Executive Officers and does not serve as a member of any of the standing committees. Both the Executive Director and Director of Transition serve as ex-officio members for all committees to coordinate the work of the different committees. This structure is used as a way to spread out the work among all Council members, allowing Committees to address topic-related needs for IBA throughout the year with quarterly full Council meetings for committees to report and exchange on their work over the previous 3 months.

As part of the Structural Development plan and establishment of the 4 standing committees of Council, the goal was to begin regular virtual Council meetings every quarter. Due to COVID-19 and not having a conference council meeting, these virtual meetings began earlier than planned. The first 2 were held in December 2020 and in January 2021. It will continue as we implement the process for the 4 standing committees reporting on their work to the full Council on a quarterly schedule.

As a reminder, all transition-related member communications, adopted plans, the timeline we regularly include in these columns, and surveys that provide the foundation and information on the transition can be found on the IBA's Structural Development website.



Professional management of IBA finances

Recently our Executive Director and Director of Transition completed their work organizing our finances with a professional accountant. As a result of this work, budgets for 2020 were completed and a budget for 2021 was reviewed and approved by the full Council. Having a budget each year is a critical and essential piece for all nonprofits. This is a big step for IBA with a lot of work going into the process. Now, with finances regularly maintained by a professional accountant, the Treasurer's role shifts to oversight and long-term planning for IBA programs. The Treasurer will no longer be the only person responsible for IBA's finances. The Financial and Legal Oversight Committee, co-chaired by the Secretary and Treasurer with one other Councillor as a member and Executive Director and Director of Transition as ex-officio members, will maintain a system of checks and balances of the finances. This is a natural shift for all-volunteer organizations as they grow financially and hire staff to no longer place the burden on a volunteer Treasurer and allow for professional management of the finances. It also allows IBA leadership to stay informed of finances regularly and provides transparency, which is a fundamental requirement for organizations with U.S. non-profit status.

Conference news

The Conference Planning Committee met in February to assess the situation with COVID-19 and travel restrictions for the planned Fall 2021 IBA conference in Kalispell, Montana, USA. As we all understand, the situation is constantly changing, and this has put difficult stress on the conference organizers. It was decided that a virtual conference will be planned for with certainty and hopes for a hybrid if enough people can attend in person. Updates will be provided as they develop.

As a reminder, you can view video presentations from some of the conference presenters on the work they will present at the conference on our website or YouTube Channel. Recently added is a presentation from Larissa Thelin on her work *Projecting habitat changes for the polar bears of Davis Strait*.

We are also beginning to receive videos highlighting the work of IBA grant recipients from the 2020 grant year. These will be uploaded as we receive reports from the grant recipients. They can also be viewed on our website or our IBA YouTube Channel.

If you would like to share your work with a video on our YouTube channel, please contact Jennapher Teunissen van Manen.

What is next?

Hopefully not a long winter.… A comedian from Iceland we watched on Netflix says when tourists visit their country, they jokingly refer to Game of Thrones and the famous line, "Winter is Coming", to which Icelanders respond "No, winter is not coming, winter is here, it never left!". Nevertheless, we hope that this IBN issue will catch you while feeling the full swing of spring and more hopeful times ahead.

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Second row left to right: Christopher Kelley (Executive Director), Konstantin Tirronen (Councillor), Karine Pigeon (Councillor), Agnieszka Sergiel (Councillor).

Third row left to right: Marta De Barba (Councillor), Jared Laufenberg (Treasurer), Karyn Rode (Vice President Americas), Mei-Hsui Hwang (Vice President Eurasia).

Fourth row left to right: Andreas Zedrosser (Past President), Anne Hertel (Councillor), Gordon Stenhouse (Councillor).

Top row left to right: Jennapher Teunissen van Manen (Director of Transition), Alexander Kopatz (Secretary), John Hechtel (President), Colleen Olfenbuttel (Councillor), Christopher Kelley (Executive Director).

Second row left to right: Agnieszka Sergiel (Vice President Eurasia), Anne Hertel (Councillor), Karine Pigeon (Councillor), Marta De Barba (Councillor), Viviana Albaracín Dávalos (Councillor).

Third row left to right: Andreas Zedrosser (Past President), Jared Laufenberg (Treasurer), Mark Edwards (Councillor), Konstantin Tirronen (Councillor), Karyn Rode (Vice President Americas).

Bear Research and Management in the Time of the Pandemic: One More Tale

I began documenting the experiences of our bear biologists and managers during the pandemic, conducting interviews and creating a column for the last 2 issues of the IBN. Here is the harrowing experience of another colleague; harrowing in the sense of what it took to get the appropriate permits and visas to pull together a fabulous collaboration, made even more complicated by pandemic restrictions and uncertainties. I say "kudos!" to both Frank and Andrea for their perseverance.

Andrea Corradini

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I'm an Italian bear biologist living in Trentino in the Italian Alps. I've been working with wolves in Romania with regard to feeding ecology and space use and now I'm undertaking a PhD on brown bears in the Alps. We've recently developed an index of human disturbance based on human mobility and studied "social-ecological connectivity" which was of interest to Frank van Manen and his Interagency Grizzly Bear Study Team for the Greater Yellowstone Area.

In 2019 I spoke with Frank who encouraged me to apply for a permit to collaborate with his group. That permit was granted and then came the hard work! For the visa, I had to fill out forms online, pay fees, procure a physical document of invitation from the Department of the Interior, purchase health insurance, and schedule an appointment at the U.S. consulate in Florence, over 300 km away from where I live. At the consulate, I was able to get a visa that allowed me to travel to the USA, with some restrictions. Both Frank and I put in a lot of work to make this collaboration happen.

Then came the pandemic lockdown in early March! I couldn't make it to Yellowstone to start up in April with my intended research on human disturbance. That was so disappointing. I was by myself in lockdown and that was really alienating—I didn't know what was going on, I couldn't see anyone and I didn't think I'd ever get to Yellowstone.

Frank came up with plan B—he had a data set on long-term body mass trends in brown bears in Yellowstone with regard to both food resources and bear densities. This data set went back to the 1980s and included data collected before the white bark pine tree

decline, an important food source for brown bears in the area, and the decline of which may be linked to lower body masses in the bears. Would I change my research topic and still collaborate? I said "yes."

Frank and I put in another huge effort to get that second round of permits. I worked a full week coordinating with the U.S. embassy to organize my travel and Frank at his end had to renegotiate with the Department of the Interior. Eventually, we found that there could be a "National Interest Exception" for work that couldn't be postponed, in this case summer trapping of brown bears for this study. That exception was granted, and Frank was able to get me the necessary Department of Interior letter of invitation in the nick of time—a week before the exception expired. I purchased my plane ticket the day before departure—that was August 10 of 2020.

The international travel was surreal. There were only 30 people on the transatlantic flight and when I arrived at JFK; the immense terminal was almost empty. When I arrived in Montana, I quarantined in a trailer in Yellowstone for 2 weeks, and then the field work started—I worked with USGS/NPS technicians and we started trapping bears! I worked with Craig Whitman and he taught me so much. We wore masks and observed COVID-19 protocols all the while.

I worked for 2 1/2 months in Yellowstone conducting fieldwork and then I had 1 1/2 months of analysis and writing before it was time to fly back home. Frank and his wife Jennapher invited me to live with them in Bozeman until I left. They provided wonderful hospitality—we made our meals together, we made ravioli, we hiked together, they treated me as if I were a member of their family.

For me, working with grizzly bears in Yellowstone was an incredible privilege and a career pinnacle. That I was able to do so had to do with a lot of hard work and luck, especially when it came to the timing of events. I have so much gratitude for Frank and Jennapher. One day I hope to be able to help a young bear biologist in training like they helped me.

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Changes for the 2021–2024 Term of the Bear Specialist Group

All IUCN SSC Specialist Group members serve 4-year terms. The terms coincide with the World Conservation Congress (WCC; where the IUCN President, Commission chairs, and other high-level positions are elected). When terms end, Specialist Group memberships can be renewed by Specialist Group chairs. Additionally, this is a good time to bring in new members and change some of the leadership.

Although the WCC has been delayed again (now scheduled for September 2021), the Bear Specialist Group has remained on track for ending the current membership term and starting a new term in January 2021 (as we were instructed).

Our most significant change was in the BSG co-chair position: Rob Steinmetz (Thailand) stepped down after 8 years, and the Steering Committee of the BSG endorsed Michael Proctor, from British Columbia, Canada, to replace Rob. That nomination was then accepted by the Steering Committee and Chair of the Species Survival Commission. Mike has been studying and working on bear conservation as an independent research scientist for 25 years, focused largely on recovering several small threatened brown bear populations in North America, using genetic and GPS radio-telemetry tools. He has also collaborated on field projects in Ecuador and Mongolia, and has served a number of roles in the BSG (presently as co-chair of the Asian Brown Bear Expert Team).

In addition, the BSG recently added two new Expert Teams (ET). The North American Bears ET was announced in the previous issue of *International Bear News* (29[3]: 6-7). The new Asian Bears Monitoring ET was developed a year ago at a workshop in Taiwan, but with the new term, we formalized this team with its first co-chairs, Dana Morin (Assistant Professor of Wildlife Ecology, Mississippi State University, USA) and Sandeep Sharma (Research Scientist at the Conservation Biology Department, Göttingen University, Germany).

We also switched co-chairs for 3 Expert Teams: Mei-hsiu Hwang (National Pingtung University of Science & Technology Institute of Wildlife Conservation, Taiwan) replaces Dave Garshelis as co-chair of the Asiatic Black Bear ET (serving with Matt Hunt as the other co-chair), Brian Crudge (Free the Bears, Cambodia and Laos) replaces Rob Steinmetz as co-chair of the Sun Bear ET (with Gabriella Fredriksson), and Thomas Sharp (Wildlife SOS, India) replaces Harendra Bargali as co-chair of the Sloth Bear ET (with Nishith Dharaiya).

Most but not all BSG members have been renewed for the 2021–2024 term. So, far, as of this writing, nearly 40 new members have been added to the BSG (which now totals ~220 members). We are still seeking members from a few range countries where we have no current representatives.

Photo credit: Grant MacHutchon

Michael Proctor has been appointed as new co-chair of the Bear Specialist Group (with Dave Garshelis). Michael has done extensive work on grizzly bears in small threatened populations in North America.

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In Memoriam: Markus Guido Dyck

On Sunday, April 25 2021, a helicopter operated by Great Slave Helicopters inbound to Resolute Bay, NU crashed on Griffith Island about 22 km from the community. On board were pilot Steven Page, helicopter engineer Benton Davie, and Nunavut's Senior Polar Bear Biologist Markus Dyck. There were no survivors. The crew were conducting a much-needed survey of the Lancaster Sound polar bear subpopulation, data for which are outdated.

Born March 25 1966 in Riedlingen, Germany, Markus first saw a polar bear during a trip to Churchill while serving in the German military and stationed at Canadian Forces Base Shilo near Brandon, MB explained long-time friend Harvey Lemelin of Lakehead University. "When Markus saw a polar bear for the first time, it was love at first sight," said Lemelin. Markus enlisted in the German army in the late 1980s and was posted to CFB Shilo in 1990. In about 1991, Markus and his wife made a train trip to Churchill where Markus saw his first polar bear. An early mentor was Malcolm Ramsay who studied polar bears near Churchill. Influenced by Ramsay, Markus decided he wanted to conduct his own polar bear research. In 1993 he started a B.Sc. program at Brandon University, and later obtained a Master's degree at the University of Manitoba studying whether tundra vehicles carrying tourists affected vigilance behaviour of polar bears.

Lily Peacock was Nunavut's Senior Polar Bear Biologist from 2005–2009. She remembers Markus this way: "I met Markus catching polar bears by helicopter; he worked with me as a field technician in Nunavut. He would expertly orchestrate a year's worth of logistics including caching hundreds of drums of helicopter fuel across the Arctic. We spent many hours flying and ski-dooing across the landscape doing the work of polar bear research and management. As all friendships that develop in the field, we spent days in cabins waiting for the weather to clear talking about science and life. Drinking tea, playing cards, watching the fog and wondering if the spot on the side of the far hill would develop into a bear that would later visit the cabin. Markus will be missed. Nunavut and the globe have lost a fierce advocate for polar bears and the North, and a true and talented field biologist. He was gruff, but funny and worked hard. I will remember him fondly."

Angela Coxon worked in Nunavut's polar bear program from 2008–2014. Angela recalls "At first he wasn't the easiest person to work with, but the more time you spent with him you learned to watch for that mischievous glint in his eye and you eventually understood his dry sense of humour. If you didn't, you thought he was a jerk. One of my responsibilities was to manage the research lab and the polar bear sample inventory. Everything had to be just-so, and to my dismay Markus took delight in hiding things on me when I went away on vacation, and then watching me try to figure out where they were upon my return."

Photo of Markus in the field. Photo credit: Lily Peacock

Meghan Marriott first met Markus in Igloolik in 2012 and remained a close friend. Meghan commented "Markus was a character. He was proud of the fact that when he came to Canada with the German military he was the youngest drill sergeant at the time". Many have commented that Markus fancied himself as a maker of awesome pizzas, especially awesome tuna pizzas, though most didn't share his enthusiasm. It was Meghan who showed Markus how to make pizza crust and she "actually liked his tuna pizza".

Jasmin Ware started working with Markus in 2017 on a study of the Davis Strait subpopulation. "I feel we may never meet another Markus in this life. His knowledge and

experience of the Arctic, the relationships he built through years of consistent representation and honesty, and the high caliber of work he carried out are irreplaceable", said Ware. She continued "Markus was a devoted friend to his dogs and the people allowed a glimpse of his intensely private life. His depth of caring and thoughtfulness were beyond measure for those he loved."

Incorporating Traditional Knowledge and scientific information into polar bear management is a challenge—one that Markus embraced. David Lee of Nunavut Tunngavik Inc. said "Markus was a friend and colleague. In no small sense, Markus was genuinely focused on improving our knowledge of the species which included conducting aerial surveys that required hundreds of hours of planning and logistics. Markus was committed to Nunavut and working with Inuit organizations. This included meeting regularly with Inuit representatives not only to communicate research plans and results but also to listen to any concerns and to receive any advice." Angela Coxon agreed: "He understood how important the polar bear was to Inuit culture and he incorporated as much traditional knowledge as scientific knowledge into his research."

David Lee remembers Markus, the person: "Although Markus could appear intimidating by his physical appearance and demeanor, once you worked with him, it became apparent that he was a kind spirit who was keenly passionate about polar bears and their conservation." Harvey Lemelin shared the following story which illustrates Markus's nature. Markus wrote to Harvey in 2000 as he prepared to drive to Saskatoon for the memorial service for Malcolm Ramsay who died in a helicopter crash that May. In the letter he said "Sometimes people don't say things to others they should because they think there will be better or other and more appropriate times. Those individuals are wrong…sorry to get all sentimental on you at this time, but it is this tragic event that woke me up in that respect."

One of Markus's outstanding accomplishments was his collaboration with other researchers to leverage the maximum information from samples collected and bears handled. Canadian collaborators included colleagues at York University, University of Alberta, Queen's University, Environment and Climate Change Canada, World Wildlife Fund, Ontario Ministry of Natural Resources, and Québec's Ministère des Forêts, de la Faune et des Parcs. International collaborators were from Norway, Greenland/Denmark, and the U.S. Topics ranged from polar bear diets, to contaminant levels, to climate change impacts.

Kristin Laidre (Greenland Institute of Natural Resources and University of Washington) worked with Markus on the shared Canada-Greenland subpopulations and commented "Markus was a great person to work with, always helpful, generous, and straightforward. He spent hundreds of hours in a helicopter for the new Baffin Bay estimate flying all over Baffin Island while we did the same in West Greenland. We coordinated for many years and I will miss him." Eric Regehr (Polar Science Center – University of Washington) worked with Markus since 2012 on population analyses for polar bears. "Markus had one of the hardest jobs in the Arctic, coordinating research and management for multiple polar bear subpopulations," said Regehr. "He loved what he did and was tireless. He just loved the bears and was committed to the communities that rely on them as a subsistence resource."

Friends and colleagues often mentioned Markus was direct and rough around the edges but had a big heart, and he never had a bad word for anyone. Markus was a member of the Canadian Polar Bear Technical Committee and the IUCN's Polar Bear Specialist Group since 2012.The close-knit international polar bear research community grieves his loss.

Andean bear conservation on private lands in the highlands east of Quito

In March 2020 we received the great news that our project had been awarded an IBA Research & Conservation grant. Unfortunately at the same time, Ecuador was starting to impose strict and what would be prolonged COVID-19-related restrictions. In the following weeks both our local funding and in-kind support were severely reduced, further hampering our efforts to launch the project in April as was planned. However, IBA again stepped in to support us, allowing us to pivot the project in response to the new global situation and connected us to other members who could provide much needed equipment. By October, our team was in the field and we have since been able to complete our baseline data collection on a previously unstudied population of Andean bears. We are incredibly grateful to IBA for their support and encouragement during these difficult times, particularly to Jennapher Teunissen van Manen, Paolo Ciucci, and Gordon Stenhouse. Gordon and fRI Research generously donated 20 used camera traps to our project, ensuring we could get started. During these difficult times IBA reminded us that nothing is impossible with the support of our colleagues and friends. We are deeply grateful for this support.

In Ecuador, Andean bears (*Tremarctos ornatus*) are listed as endangered, threatened by habitat loss and fragmentation, illegal hunting, and livestock-bear conflict. Due to the advancing agricultural frontier and development of roads and urban areas, Andean bear habitat has been reduced by up to 85%, fragmenting the landscape and isolating bear populations (Zapata Ríos 2019). In order to connect bear habitat in Ecuador, conservation on private lands must be a priority. In collaboration with local partners, we

Two Andean bears pause to sniff a rub-tree and the rub-post in a patch of upper montane forest in the study area east of Quito, Ecuador. October 24, 2020. Credit: Carnivore Lab-USFQ/ Fundación Condor Andino/Fundación Jocotoco

A mother Andean bear, standing on a 200-year-old lava flow, watches while her cubs investigate the rub-post in the páramo landscape of the study area east of Quito, Ecuador. October 29, 2020. Credit: Carnivore Lab-USFQ/Fundación Condor Andino/ Fundación Jocotoco

have developed a long-term, multi-phase project with objectives that align with the Andean Bear Action Plan for Ecuador (Ministerio del Ambiente de Ecuador 2019). This first phase of the project was to collect baseline data on the bear population in our study area, determine the areas of high bear activity, explore and establish access points into and across this difficult landscape, and to strengthen local relationships. Our key partners on this project were 3 local NGOs: Fundación Jocotoco, the water protection fund FONAG, and Fundación Condor Andino (FCA). These organizations own and/or oversee the management of large areas of land in the study area. Both Fundación Jocotoco and FCA provided on-the-ground support to access the study area, have park guards assist in data collection, provide logistical support, and to use their camera trap equipment.

The study area (3,300-4,800 masl) is in the eastern highlands of the Metropolitan District of Quito (MDQ), 50 km outside of the city's urban area. It is bordered to the north and south by roads, to the northeast and east by Cayambe-Coca and Antisana Ecological Reserves, and to the west by rural communities in the MDQ. Our research site is on 2 large, privately owned lands and is approximately 250 km^2 of páramo (high altitude grasslands) scattered with patches of montane, or elfin, forests. This region provides fresh drinking water to more than 2.6 million people in the MDQ. Part of this zone has been recognized as a water protection area, protected and managed by our partner, FONAG. This area is also an important corridor for the Andean condor (*Vultur gryphus*), listed as Endangered in Ecuador (Tirira 2011). There is also a lot of human activity in this area, most significantly cattle ranching. Ranching can negatively impact this ecosystem and has been responsible for an increase in cattle-bear conflicts.

From mid-October to early November 2020, our field team set-up 30 camera trap sites across the study area. Site selection was based on the following criteria: information about bear presence provided by local people, presence of bear sign, presence of food resources (e.g. *Puya* spp.), degrees of site accessibility, and authorization to enter private areas. Each site had 1 camera trap and a rub-post with a vanilla scent attractant to increase the probability of bear identification through the recognition of unique facial markings (Molina et al. 2017). Cameras stayed in the field for a period of 4 months and were checked every 4 weeks by a team of trained field technicians.

Preliminary results indicate a significant population of bears in this area. Bears were detected at 9 (30%) of the camera trap sites and 10 adult bears and 5 cubs have been individually identified. Several bears, including 1 female with 2 cubs, have been seen on more than 1 occasion and at more than 1 camera trap site. Camera traps also photo-captured an abundance of biodiversity in this landscape, including the first records of an endangered mountain tapir (*Tapirus pinchaque*) in the MDQ in 50 years. We also photo-captured a lot of cattle and many free-ranging and/ or feral dogs.

This first phase of the project has confirmed that these private lands will play a significant role in the protection of Andean bears in this landscape. Most bears were photo-captured along the western border of Antisana Ecological Reserve. Private lands just outside of the reserve, where bears encounter people, cattle, and dogs, could isolate or act as a sink for this population. During our next phase of

camera trapping we hope that the recapture of individuals will help to illuminate the impact of human activities on bear movement in this area. GPS-collared bears will allow us to monitor bears as they move between private lands and the protected area.

In addition to baseline data on the bear population and local biodiversity, we were also able to determine target points for the next phases of camera trapping and research, and to refine our camera trapping methods in this difficult landscape where false triggers from grass and shadows can cause significant data clutter.

Our next steps in 2021 include analysis of the genetic variability of this population and the launch of our community outreach and education components. These components will help us to understand local perceptions of bears, the history of conflict in the area, and raise bear awareness through our education program in local schools.

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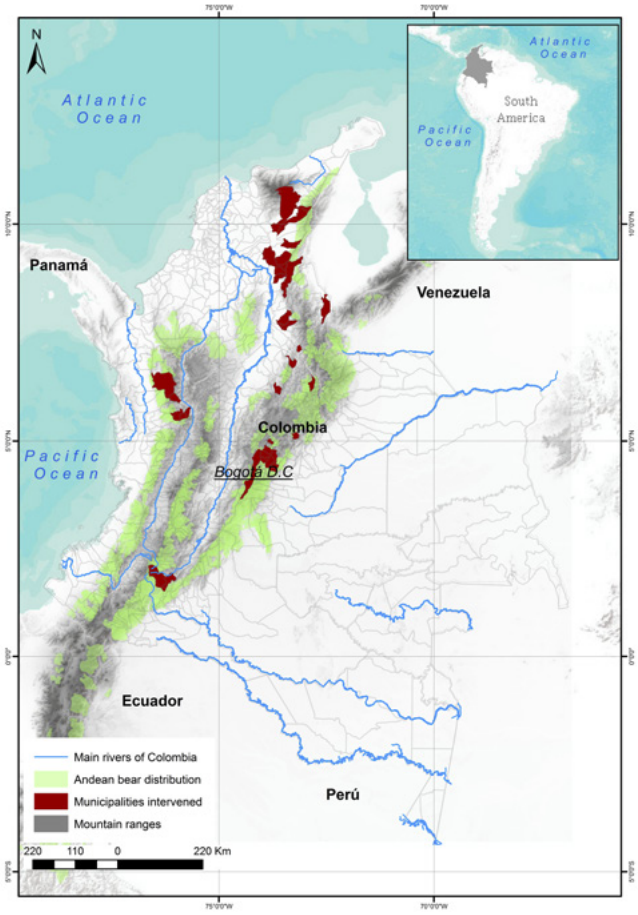
An Itinerant Interactive Tool for Environmental Education: A Strategy for the Conservation of Andean Bears in 31 Colombian Municipalities

Andean bears (*Tremarctos ornatus*) are distributed across the backbone of Colombia in 3 chains of the Andes mountains, occupying approx. 30% of Colombia above 400 m asl; these mountains shape the topography and create Colombia's major river drainages (Rodríguez 2015). The mobility and omnivory of these bears enable them to take advantage of a variety of habitats across a large range of altitudes (Rodríguez et al. 2003). Their broad distribution brings them into interactions with humans and can interplay with social and historical contexts that shape local people's attitudes, tolerance, response to conflicts, and ultimately their relationship with these bears.

These particular contexts highlight the importance of integrating a social component in actions aimed at conserving bears and other wildlife at regional and local levels. Various NGOs have considered these components as a bridge of communication within communities where the bears live.

In our example, the Wii Foundation, with the support and collaboration of the Corporación Autónoma Regional del Cesar, CORPOCESAR, designed and produced an interactive traveling educational exhibit developed from work with students, teachers, rural communities, and indigenous Yukpa peoples from the municipalities in the Colombian Serranía de Perijá. This exhibit, called "Oso pasó por aquí" ("A bear passed by"), included a series of large-format, full-color posters on biology, evolution, biogeography, habitat, ecology, ethology, conservation, legal status, and challenges related to living together with the Andean bear. We presented this exhibit in municipalities within the Colombian Andean bear distribution, with the support of local authorities (mayors), Parques Nacionales Naturales (National Natural Parks), the student group "Oso Andino" of the Universidad Nacional de Colombia (Medellín), the Aqueduct Company of Bogotá, and the local community wildlife monitoring group of the Huila province.

Visitors to the traveling exhibition in Miraflores (Boyacá). Photo credit: Fundación Wii.



Municipalities where the traveling exhibit "Bear passed by" was presented (red) overlaid on Andean bear distribution (green) in Colombia (from Rodríguez 2015).

To date, the exhibit has been visited by more than 4,300 people in 31 municipalities in 7 provinces. People were drawn to the exhibit by local media (radio, newspaper), educational institutions, and environmental authorities. The exhibit remained 2–3 days in each of the municipalities. Experts provided guided tours, clarified questions, and moderated the activities in each of the panels, lasting 10–15 minutes.

Visitors to the traveling exhibition in Andes (Antioquia)
Photo credit: Fundación Wii.

In order to quantify the impact of the exhibit on visitors' perceptions of Andean bears, we administered a survey, before and after the tour, to a small group of randomly-chosen participants (approx. 25 people) in each community. The survey consisted of questions that were intended to measure what they learned from the visit. We wanted to identify methods and indicators of "Communication for Behavioral Change" (CBC), and to quantify changes in knowledge, attitude, intentions, and behavior of participants (Kellert 1984, 1994) towards the Andean bear. We surveyed a total of 874 people, 10–60 years of age. Survey results indicated that the species was widely misunderstood. Before the guided tour, local people were generally unaware of the presence of the Andean bear in Colombia, as well as its biology and ecology. For example, few people knew the role of this species as a seed disperser because they did not know about its diet; also, few knew the threats to its survival. We believe that this ignorance is one of the root causes of loss of biodiversity of the country.

People attending these exhibits were significantly better informed on various topics about the Andean bear. Visitors remembered relevant aspects about this bear and its conservation, at least in the short term. Our hope is that this new knowledge will last long-term and achieve real changes in people's perceptions of and attitudes towards Andean bears.

The learning process points to the need for greater attendance at these exhibitions and for more activities to increase awareness of Andean bears. It is important to link conservation actions with measures of perception among the communities to which the actions are directed.

Analyses such as ours help optimize these efforts and adapt them to the contexts of local communities. Our next task will be to assess if the improved knowledge and understanding of the attendants translates into behavioral change when it comes to coexisting sustainably with these bears as conservation actions are implemented regionally.

	Answered correctly, by percentage	
	Before	After
How many species of bears are in the world?	28%	91%
How many species of bears are in South America?	6%	95%
Are Andean bears frugivorous?	22%	44%
What are threats to Andean bears?		
Hunting	24%	44%
Habitat loss	13%	44%
Deforestation	12%	44%

Change in knowledge of a sample of people who viewed the itinerant exhibition (n = 874).

Visitors to the traveling exhibition in San Juanito Municipality (Meta) Photo credit: Fundación Wii.

Acknowledgments

We thank the communities who welcomed us and we especially thank biologist Wilson Pérez Ascanio for his support during the development of the exhibition. We also thank CORPOCESAR, the mayors of the municipalities, the National Natural Park Las Orquídeas, and the "Oso Andino" group of the Universidad Nacional, Medellín. Nicolas Reyes-Amaya and Russ Van Horn provided helpful revisions to this manuscript.

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The Heterogeneity of Using Bear Bile in Vietnam

Asiatic black bears (*Ursus thibetanus*) and sun bears (*Helarctos malayanus*) are declining across Southeast Asia (Scotson et al. 2017, Garshelis and Steinmetz 2020). In Vietnam, an apparent key factor in the decline of bear populations has been the popularity of bear farming, where bears are taken from the wild and kept for the purposes of live extraction of their bile, with no captive breeding (Crudge et al. 2018). It has largely been reported that Vietnamese users desired bear bile, whether farmed or wild, for primarily medicinal reasons (Drury 2009, Vu 2010). However, the Zoological Society of San Diego (ZSSD), with our partners the Center for the Environment and Rural Development (CERD) and Free the Bears (FTB), have recently found that the reasons people use bile in Vietnam may be more complex than previously reported. Using conservation social science methods of qualitative, semi-structured interviews, ZSSD, CERD, and FTB conducted a countrywide study across five provinces (Nghe An, Tay Ninh, Lao Cai, Quang Nam, Dong Nai) and 2 cities in Vietnam (Hai Phong and Da Nang). The sites were chosen to represent a wide geographic distribution (north, south, east, west), as well as attributes such as how close they were to international borders, whether bear farming was known to occur in past or present (from Crudge et al. 2018), proximity to other cities and other protected areas, and whether bear populations were known to exist nearby (based on previous studies by CERD and FTB). This was designed to accommodate the known diversity of demographic makeup within Vietnam (Thu et al. 2018, Henein et al. 2019), the suspected diversity in wildlife trade and consumption within Vietnam (Davis et al. 2019), and the influence of porous international borders and bear source sites.

The team interviewed 173 self-admitted bear bile consumers about topics ranging from how they used bear bile, the context in which they used it, and their thoughts on bear farming in Vietnam. The sample was diverse in that users represented the dominant Kinh ethnic group, as well as highlands ethnic groups including the Thai, the Hmong, and the Co Tu. Bear bile consumers ranged in age, and although male users tended to be predominant, there were female users represented in every study area.

Initial insights from the data showed that bear bile is used for 3 main purposes. Bear bile alcohol is often used for social drinking between business colleagues. Other

Map of Vietnam, with the surveyed provinces shaded in green, and cities denoted by a red pin (Map created by Jenna Stacy-Dawes).

respondents described instances of bear bile acting as a facilitator of social bonds, through processes of gifting between family members, neighbors, and friends. The third use of bear bile is as a medicine for addressing relatively minor ailments such as bruises, where it is either ingested or applied topically; this corresponds with how bear bile is used in neighboring Cambodia and how it was previously found to be used medicinally in Vietnam (Davis et al. 2019, 2020), but differs from the main ailments (liver and eye) for which bear bile is prescribed as a treatment in Traditional Chinese Medicine (Feng et al. 2009). Although these varying forms of use were found across sites, we did notice contextually-distinct patterns across the country in whether respondents were likely to drink bear bile socially, or use it medically. In general, respondents from urban sites were more likely to use bear bile in alcohol, whereas in more suburban and rural sites, individuals were more likely to use bear bile for medical purposes. Across the study sites respondents implied that farmed bear bile was easily acquired within Vietnam, although nearly every consumer believed that wild bear bile was "better."

We also collected data in Lao Cai, a rural province near the China-Laos-Vietnam border where highlands groups such

as the Hmong and Thai are prevalent. We suspected that use of bear bile would be different in this mountainous area, which theoretically has greater access to intact bear populations. Additionally, the practice of farming bears has anecdotally seemed to be a primarily lowlands, Kinh-dominated practice. Our evidence supported these expectations, with respondents in these sites reporting a longer history of bear bile use than the Kinh, who were more likely to cite their use as having begun in the mid-2000s, when bear bile farming became more prevalent.

An interesting pattern was that bear bile was more likely to be used medicinally in areas where there was a high density of bear farms. We suspect that although bear bile may be an accepted part of the Traditional Vietnamese Medicine (TVM) pharmacopeia, bear farms may have promoted such "traditional" precepts, both actively and passively, by making bear bile more accessible. This process may be analogous to the ubiquity of pubs in England: although drinking alcohol is a historic and traditional practice in England, if pubs weren't on every corner it is doubtful that the rate of alcohol consumption would be as high as it is (Churchill and Farrell 2017). Likewise, although bear bile may be traditionally used as a medicine in Vietnam, it is not the tradition alone that spurs the ubiquity of consumption. Instead, it is a complex array of environmental and social factors ranging from colleagues to access to farms and the forest that dictate whether and how bear bile is consumed.

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Promoting Coexistence Between People and Sloth Bears in Gujarat, India Through a Community Outreach Programme *AatmavatSarvabhuteshu*

The noisily grunting, shaggy and reclusive sloth bear (*Melursus ursinus*) is native to the Indian subcontinent, subsisting in many habitat types, including wet and dry tropical forests, savannah, scrubland and grassland, generally below 1500 m elevation (Dharaiya et al. 2020). It is the only bear species found in the state of Gujarat, which marks the westernmost edge of its range. It is patchily distributed in the eastern part of the state in both protected and unprotected forests. Sloth bear habitat in Gujarat is undergoing degradation and fragmentation due to a high and increasing level of anthropogenic pressure from the burgeoning human population. Additionally, overgrazing, tree-felling, fire, change in land use, and over-extraction of resources all threaten the remaining sloth bear habitat. Dry forests in Gujarat and throughout the sloth bear range appear to be particularly susceptible to degradation (Yoganand et al. 1999).

The degraded habitat in the form of reduced forest cover and food resources, especially outside protected areas (Akhtar et al. 2004), has prompted sloth bears to venture into villages, agricultural lands, and other human-dominated areas in search of food and water. This brings bears into close proximity to humans and increases the chances of bear attacks (Singh et al 2018). Increased sloth bear attacks on humans in Gujarat has increased hostility towards bears, making bear conservation more difficult (Garcia et al. 2016). There is a need to develop a holistic understanding of the cause of such conflicts, which can help to formulate conflict mitigation strategies (Messmer 2000). Research from various parts of the sloth bear's range has revealed that many, if not most of the attacks are avoidable if the local people follow sloth bear safety etiquette.

We initiated the project *AatmavatSarvabhuteshu* in Gujarat as a joint venture between Vadodara Wildlife Division of Gujarat forest department and Wildlife and Conservation Biology (WCB) Research Lab of Hemchandracharya North

Children of 5th grade watching film *Sloth bear: The bear of Indian subcontinent* documentary during outreach program in school.

Photo credit: Sachin Daraji

Gujarat University, Patan. *AatmavatSarvabhuteshu* is a Sanskrit phrase meaning "one should feel the happiness and distress of others as his own". The project is an attempt to increase community understanding of sloth bears to improve opportunities for coexistence. We started this project by interviewing locals and interacting with forest staff in the hope of understanding their perceptions about the sloth bear. As an outcome of these interviews, we developed a model of cross-sector collaboration among the university, local community, and the forest department to promote sloth bear conservation.

Our main aim is to connect our ideas and practices with the local community, and to create and spread science-based, culturally sensitive education to school children and adults through outreach programs meant to sensitize tribal people to the plight of the sloth bear. The hope is that this message will instill more positivity and ideas of how to live with sloth bears. Working with local communities to build relationships and partnerships in conservation through community involvement is also an opportunity for researchers to support community issues. This can be achieved by providing accurate scientific information about the species and involving the locals in the conservation-oriented work. In an effort to accomplish our aim, we published a pocket booklet *Living in the Sloth Bear Landscape* in Gujarati and English languages, and we distributed these among villagers.

As a part of our outreach programme we also developed a sloth bear conservation outreach center at Ratanmahal Wildlife Sanctuary, which is the first of its kind in India. At this center, we developed state-of-the-art education materials about the ecology and behavior of sloth bears that can be understood by local villagers and outside visitors alike. We created a short documentary film *Sloth bear: The bear of Indian subcontinent* to show in the center

A replica of mother sloth bear carrying cubs after coming out of her den, displayed at the outreach center that we developed for local community and visitors at Ratanmahal Wildlife Sanctuary, Central Gujarat. Photo credit: Shruti Patel

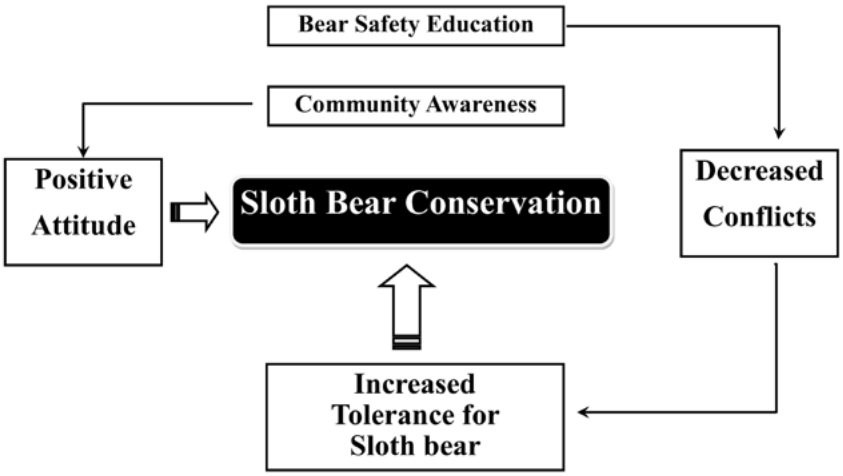
Pratik Desai interacting with local women and children to understand their activity and timing when venturing in the forest area, and explaining behaviours, myths, and facts about sloth bears. Photo credit: Mesaria Shalu

(as well as in schools and other social gatherings). The film is also available on YouTube in three languages (Hindi, Gujarati, and English) for wider circulation. Additionally, we are planning to develop a fun learning activity booklet for children in order to engage them in understanding and appreciating the sloth bear.

We also visited schools and colleges to meet the youth and build capacity so they can help continue this program into the future. Along with community awareness, we also help the forest department and organize field staff training to enhance their capacity in monitoring sloth bear populations. We are also developing a sloth bear monitoring manual as a field guide for the forest staff.

The central Gujarat landscape has been identified as containing important sloth bear corridors (Dharaiya and Singh 2018), but the bears live here in close proximity with people. We are optimistic that this project will help sloth bear conservation in the state by enhancing community tolerance and reducing their retribution against bears. Later, our plan is for this work to be continued by motivated and skilled tribal youth.

We are grateful to Gujarat State Forest Department and Sloth bear TAG of European Association for Zoos and Aquaria for supporting this project. Dr. Zsuzsa Petro of Nyiregyhazi Allatpark, Hungary, and her team helped us in developing the illustrations for the sloth bear book, and Marcel Alaze from Allwetter Zoo, Germany, encouraged us and supported the project in its initial stage. We are still fundraising to continue this project for the year 2021 and we would sincerely appreciate financial and technical support from bear lovers and conservationists. Please contact us to donate or for more details.



Flowchart illustrating how community awareness and outreach can help sloth bear conservation.

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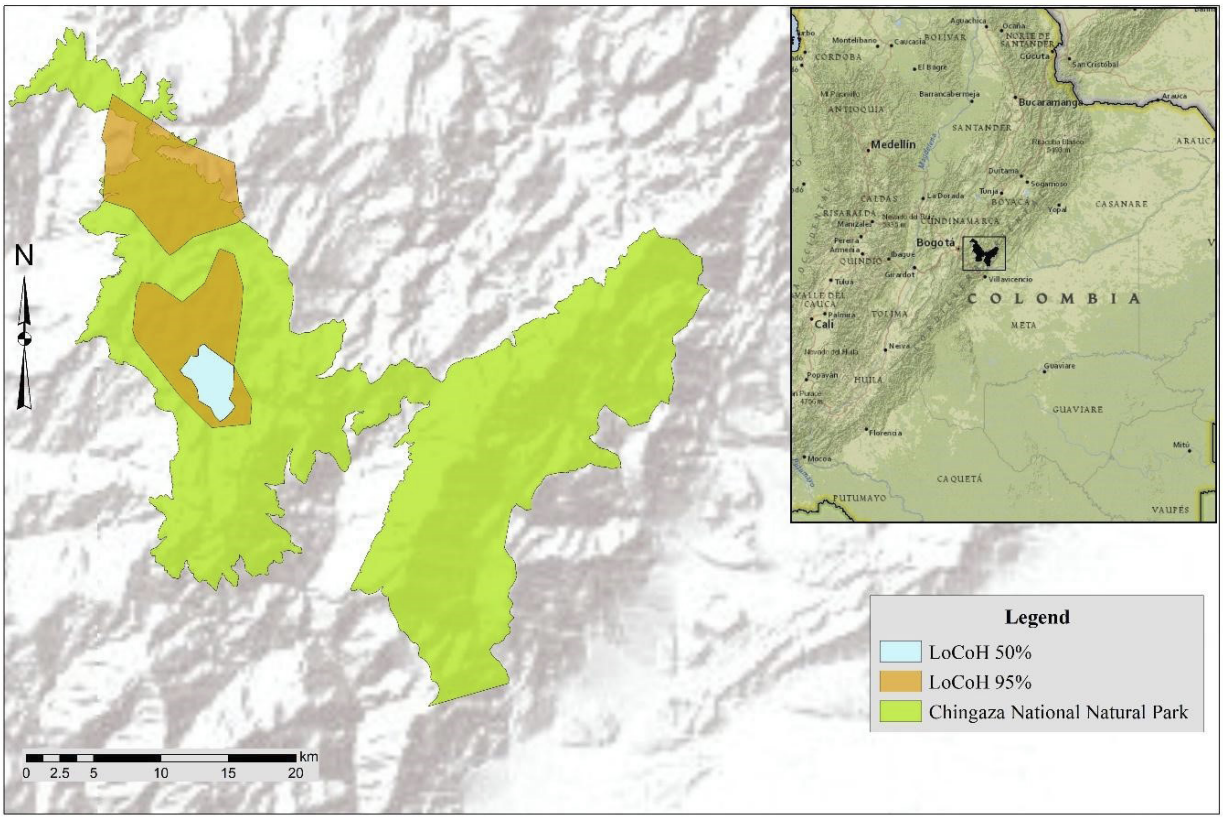
Novel Insights into Andean Bear Home Range in the Chingaza Massif, Colombia.

Studies about spatial ecology and telemetry of Andean bears (*Tremarctos ornatus*) are scarce due to limiting factors such funding, navigating adverse habitats, and the species' elusive behaviors (Castellanos 2011, Garshelis 2011). Knowledge about Andean bear home range have been extrapolated from studies performed in Ecuador and Bolivia (Paisley and Garshelis, 2006; Castellanos 2011), but several authors caution against extrapolating information across systems not in equilibrium or those with heterogeneity (Elith and Leathwick 2009). Andean bear home range sizes in other countries of occurrence are unknown. In Colombia, there have been exercises with VHF and GPS telemetry collars but home ranges have not been published and reports only focus on performance of devices (Rodríguez et al. 2016).

Intensive human development adjacent to protected areas influence the movement of individuals across large landscapes and may displace home range sizes (Castellanos 2011). Chingaza Massif and its protected area has been a stronghold for Andean bear conservation in the east range of Colombia since 2010; monitoring programs in the country have identified more than 30 individuals (Parra-Romero et al. 2017). The protected area covers 78,294 ha with elevations that vary from 800 to 4,020 meters (Parques Nacionales Naturales de Colombia 2016).

In 2018, an Iznachi trap (Castellanos et al.2016) was installed inside of the protected area and supervised for approx. 6 months. The trap was kept "open" to habituate individuals entering the trap baited with fruits, peanut butter, and different scents (Castellanos et al. 2016). In June 2019, we captured 1 adult male (105 kg) and immobilized it using a mixture of Ketamine 4 mg/kg, Medetomidine 0.04 mg/kg and Midazolam 0.1 mg/kg with reversal agent Atipamezole 0.24 mg/kg (Arias-Bernal and Yarto-Jaramillo 2019). We weighed, measured, and released the bear after it was fitted with a GPS collar (Telonics© TGW—4577 GPS/Iridium). The collar operated from June 2019 to February 2020 when the activation of the dropoff system occurred and generated a total of 3,280 GPS fixes during that time.



Home range of an individual of Andean bear (*Tremarctos ornatus*) captured at the Chingaza National Park, Colombia (Local Convex Hull method, LoCoH).

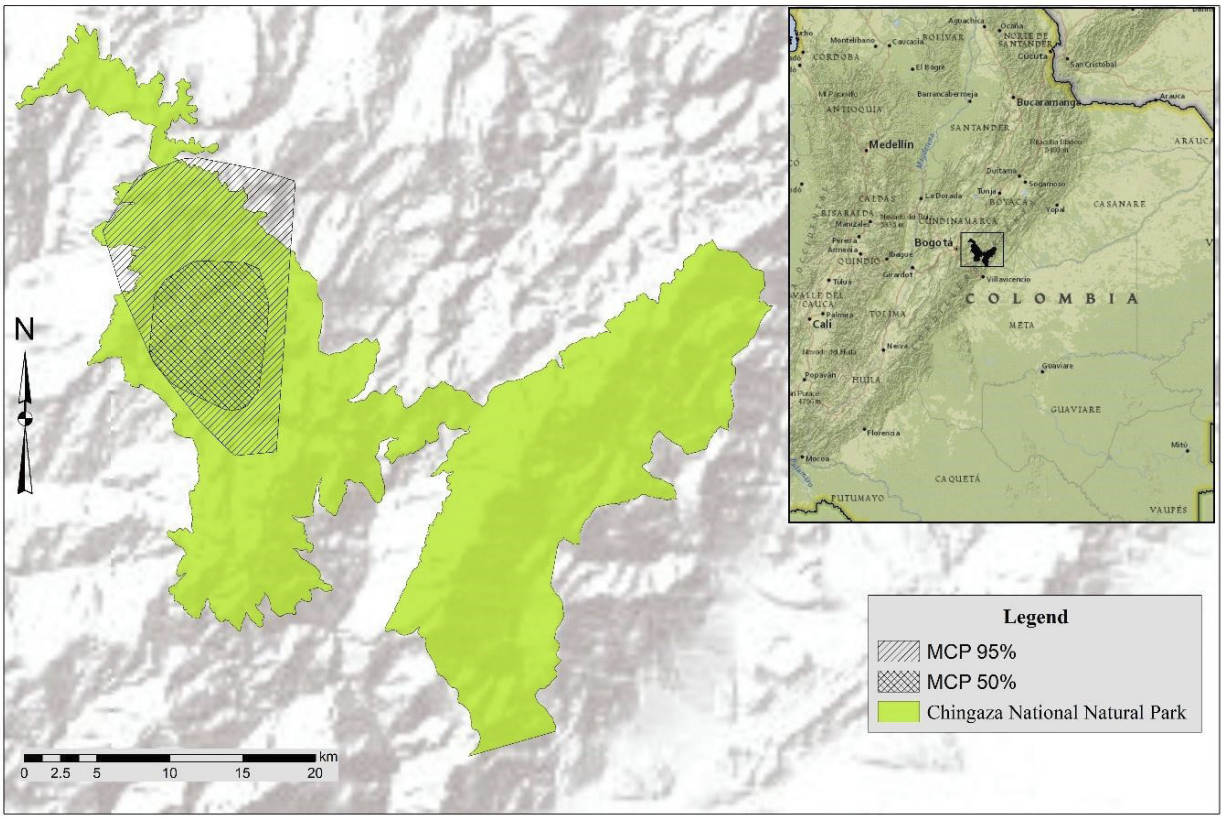
We used the Minimum Convex Polygon (MCP) method to estimate the bear's home range at 189 km^2 for the 95% home range level and 67 km^2 for the 50% core area. We also used Local Convex Hull (LoCoH) method, the 95% home range was 140 km^2 and the 50% core area was 13 km^2. We used adehabitatHR package (Calenge 2006) to perform our calculations in R software (R Core Team, 2013)

We found LoCoH to be more reliable at capturing the heterogeneity of Chingaza protected area's landscape. MCP techniques can overestimate home ranges and include areas individuals avoid or are restricted from, whereas the LoCoH method identifies such spaces and captures physical boundaries of the landscape (Getz and Wilmers 2004; Chirima and Owen-Smith 2017).

Our home range estimates were smaller than for previous reports for Andean bear home ranges using 100% MCP and the total home range for nearest-neighbor convex hull (Castellanos 2011). Castellanos (2011) found the 100% MCP home range of 3 males to be 125.8 km^2, whereas our results showed a large 95% MCP home range with a greater number of GPS fixes (412 locations for males). Using the LoCoH method, Castellanos (2011) reported total home range as 59.08 km^2—less than half the area we found.

The 50% core areas were only 35.4% of the 95% home range suggesting bears use relatively small areas within larger ranges representing opportunities for interindividual overlap as suggested by Castellanos (2011). More individuals and telemetry data are needed to adequately test this hypothesis, and we encourage future researchers to examine Andean bear home range overlap in Colombia. Parra et al. (2019) reported different adult individuals scavenging a dead carcass in the Chingaza protected area without expressing antagonistic behaviors between them, lending some support of range overlap among individuals.

This was the first successful capture of an Andean bear in a protected area in Colombia. Here, we report the first known estimate of Andean bear home range in Colombia as well as the region. The results presented here serve to highlight the potential for future study with more individuals fitted with GPS collars. Future investigations of Andean bear spatial ecology can advance the knowledge of this charismatic species, inform best management actions, and serve to educate local communities that coexist with Andean bears.



Home range of an individual of Andean bear (*Tremarctos ornatus*) captured at the Chingaza National Park, Colombia (Minimum Convex Polygon method, MCP)

Acknowledgements

We acknowledge the Chingaza protected area rangers for their invaluable help in the process. We are grateful to the Arizona Center for Nature Conservation/Phoenix Zoo, Reid Zoo Park, Wakata Biopark, and University of Arizona for their support, and the Fulbright—COLCIENCIAS Program in Colombia. Trapping and monitoring was performed under National Natural Parks of Colombia research permit #20182000007563.

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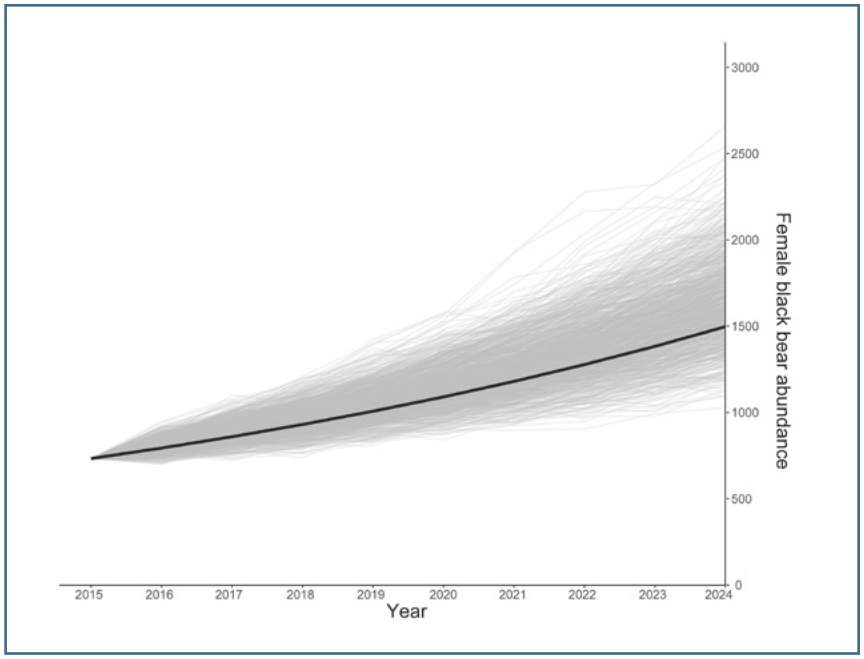
American Black Bear Subpopulation in Florida's Eastern Panhandle is Projected to Grow

There are about 4,000 American black bears (Ursus americanus floridanus) in Florida according to recent estimates (Humm et al. 2017, Murphy et al. 2017) and their geographic range appears to be expanding (Scheick et al. unpublished data). Except for 2015, bears in Florida have not been legally hunted since 1994. For these reasons, the Fish and Wildlife Conservation Commission (FWC) planned to estimate growth rates for the 3 subpopulations with abundance estimates over 1,000 bears (Apalachicola in the eastern panhandle, Big Cypress in south Florida, and Ocala in Central Florida); of these, the estimated growth has been completed only for Ocala (Hostetler et al. 2009).

To estimate survival rates for adult female bears, bears were trapped during the summers (June-August) of 2016, 2017, and 2018. Females over 40.8 kg were fitted with iridium satellite GPS telemetry collars (Lotek Wireless Inc., New Market, Ontario) programmed to collect a location every 2 hours and send email alerts when a sensor indicated no movement over 24 hours. These collars also emitted a unique VHF signal. We monitored 47 females, aged 2-11 years, and, using weekly intervals in program MARK, estimated the overall annual survival probability to be 91.5% (SE 2.9%). The baseline adult female survival model was the most supported model, indicating that there was no significant difference across study years. The sources of mortality for adult female bears in this study area, equally spread among causes, included vehicle strikes, agency kills in response to human-bear conflicts, illegal kills, and unknown causes.

To estimate cub survival and fecundity, we located dens of collared females by their VHF signal in late February when their GPS locations showed a steady cluster for over a month. In late March in 2017, 2018, and 2019, we entered dens to handle cubs. We handled 89 cubs (40M:49F) from 40 dens. Litter size was 2.23 cubs per litter. We fitted 76 cubs (35M:41F) with self-adjusting VHF radiocollars (Mod-105, Telonics, Inc., Mesa, Arizona) that we tracked every 1-5 days until the collar slipped off, the battery failed, or the cub died. From these data, we used weekly intervals in program MARK to estimate the first-year annual survival probability to be 66.4% (SE 7.8%). The baseline cub survival model was the most supported model, indicating that there were no significant differences across study years or between sexes. Interlitter interval was calculated to be 2.31 (SE 0.13) years and fecundity was 0.52 (SE 0.06) female cubs produced per female adult per year.

We developed a stage-structured matrix population model to estimate subpopulation growth using cub survival, adult female survival, and adult female fecundity from this study. We also used subadult survival and fecundity parameters pulled from published literature from the nearby Ocala/St. John's subpopulation (Hostetler et al. 2009). We estimated an annual subpopulation growth rate of +8.3% (lambda 1.083; SE 0.052); the 95% CI of lambda ranged from 0.97 to 1.18. We then used this growth rate to project female bear abundance from the 2015 abundance estimate (Humm et al. 2017). The projected abundance showed a doubling of the subpopulation over 10 years, from 733 female bears in 2015 to 1,497 in 2024. One thousand



Increase of female black bear abundance, including female cubs, in the Apalachicola subpopulation of the East Panhandle BMU projected at an annual growth rate of 8.3% (black line). This subpopulation is projected to double in 10 years, from the 733 female bears estimated in 2015 to 1497 female bears in 2024. Grey lines show possible variations in abundance each year from 1000 simulations.

simulations of subpopulation growth provided a range of possible outcomes, which skewed positive. This is evidence that the subpopulation is likely to grow over time even if growth in some years is negative (lambda < 1). The 95% CI of simulations showed that abundance of female bears would likely grow to between 1,190–2,190 bears by 2024.

Our current growth rate estimate for Apalachicola is faster than the rate estimated in the mid-2000s for the Ocala subpopulation in central Florida (lambda between 0.985 and 1.037, depending on the value of yearling survival used, Hostetler et al. 2009) but slower than the rate estimated in the early 2000s for the Osceola subpopulation in north Florida (lambda 1.184 ±0.002, Dobey et al. 2005). The subpopulation can be expected to withstand environmental and demographic stochasticity. The completion of the study provides us with baseline information to improve our understanding and management of bears in the Apalachicola subpopulation. It has also improved our knowledge of black bear movement, habitat use, home ranges, denning chronology, and reaction to disturbance, which we do not report on here. We intend to begin a similar study in south Florida this summer to investigate the growth rate of the Big Cypress subpopulation.

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In their 25th Year of Operation, the Wind River Bear Institute Expands Wildlife K-9 Program, Publishes Research, and Initiates Applied Management Strategies to Reduce Human-Caused Mortality of North American Bears.

The Wind River Bear Institute (WRBI) and Wind River Karelian Bear Dogs (WRKBD) are on a mission to reduce human-caused bear mortality and human-wildlife conflict worldwide. To commemorate our 25th year, we want to revisit our 2020 accomplishments and outline what comes next. WRBI's contributions to bear conservation include the development of bear spray, the establishment and use of non-lethal projectiles for operant conditioning of bear species, the establishment and use of Karelian Bear Dogs (KBD) as "Wildlife K-9s" (WK9), and our innovative approach to mitigating complex human-bear conflicts by working together with government agencies, industry, and communities in North America and Japan. We advanced our mission during 2020 with the inception of the first National Park Service WK9 Program, the publication of research on Forward Looking Infrared (FLIR) bear den detection, and the initiation of several novel applied bear management programs aimed at reducing bear access to attractants, mitigating human-bear conflicts, and public bear awareness education. Here is a brief overview of accomplishments in our 25th year of operation and what's next for WRBI and WRKBD!

We initiated our WK9 Program in Denali National Park (DNP) by placing WK9 in-training "Hayduke" with Lead Bear Technician, Greg Colligan. Hayduke and Colligan are the first of what will hopefully become a standard for Parks: WK9/Handler Teams working to mitigate human-wildlife conflicts and educate park visitors. In their first field season together, Hayduke and Colligan began WK9 Handler Training with WRBI by responding to human-grizzly bear (*Ursus arctos*) conflicts, practicing scent detection techniques, and educating park visitors. "*I have been extremely happy with Hayduke's progress. His ability to reliably detect bears by scent has been a 'game changer' and we were able to incorporate him into aversive conditioning and hard release scenarios. Using KBDs to move or haze wildlife seems less impactful to visitor experience in the park than using other tools and I find that while working with Hayduke, park visitors are more open and interested in engaging with me. The support that I have received and continue to receive from WRBI staff during this endeavor has also proved invaluable.*" Greg Colligan, Lead Wildlife Technician, DNP.

WRBI Director, Nils J. Pedersen, published a 5-year M.Sc. at the University of Alaska Fairbanks on drone-based FLIR detection of grizzly and polar bear (*U. maritimus*) dens in the Arctic. Building on research by Richard T. Shideler, Alaska Department of Fish and Game (ADF&G), and Craig J. Perham, U.S. Fish and Wildlife Service, we used artificial grizzly and polar bear dens to collect FLIR imagery of den "hotspots"and evaluated how environmental conditions affect odds of detection. Results indicate that lower air

Wildlife K-9s "Rio II" (left) and "Soledad" (right) prepare to board a helicopter to respond to a human-bear conflict incident on the fire line while working for the Alaska Fire Service on the Isom Creek Fire, Alaska. Photo Credit: Wind River Bear Institute.

temperature and wind speed, thinner den snow wall ceilings, and the absence of precipitation and sunlight increase the odds of polar bear den detection. Lead WK9 "Soledad"assisted by scent detecting 2 occupied grizzly bear dens allowing us to "ground truth" our FLIR technique. FLIR-equipped drones can be used to locate and monitor bear dens in the Arctic but putative dens and den habitat should be surveyed using a secondary method (i.e. WK9; Pedersen et al. 2020).

We worked with the Alaska Fire Service (AFS) for 4 weeks to reduce human-caused bear mortality at remote firefighter camps. This was a novel use of WK9/Handler Teams and we believe that our success has broad implications for bear conservation in wildland firefighting. *"[We] have been having problems with bears coming into camps. In previous years [we] have had to shoot the bears. Wherever the dogs are, [we] haven't had bears. [We] plan to continue using the dogs. It just seems to warm everyone's heart to have a dog in camp."* Mike Bradley, Safety Coordinator, AFS.

We conducted an Introductory Bear Conflict Reduction Plan for Girdwood Bear Aware (GBA) and ADF&G. Over 11 days, we took action in 20 cases of human-black bear (*U. americanus*) conflict including: assisting Alaska State Troopers respond to a human-caused bear mortality and helping push a bear out of the 3rd floor of a hotel. WK9/Handler Teams enabled responders to locate the bears quickly with an increased safety margin for people and bears. "*WRBI's time here was exceptional. Beyond the tangible outcomes, WRBI was able to change the discourse and de-escalate community concern over the level of conflict we were experiencing. Working with WRBI shifted the narrative to one of solutions and helped show the community that non-lethal options do exist.*" Alayna DuPont, Chair, GBA.

We assisted Montana Fish Wildlife and Parks (MFWP) in the Bitterroot Valley (BV) and Missoula by conducting site investigations on private and public lands where human-black bear conflicts are frequent. In preparation for grizzly bear population expansion in the area, we assisted land-users and businesses to secure attractants and participated in outreach education events. We identified and mapped conflict "hotspots" and public/private infrastructure needs, and helped develop future management action plans. *"Whether it be assisting MFWP… or conducting door-to-door bear conflict prevention and outreach work across western Montana, WRBI's contribution to Montana's grizzly bear conservation program and black bear management has proven invaluable… This [is]… the 7th year that… the*

Nils J. Pedersen poses with Lead Wildlife K-9 "Soledad '' in front of an occupied grizzly bear den that Soledad found using scent detection techniques in the North Slope oil fields of Alaska. Richard T. Shideler, Alaska Department of Fish and Game, marks the location for a drone-based infrared bear den detection research study. Photo Credit: Wind River Bear Institute.

WRBI [Teams]… have assisted MFWP… in the BV… we have had an upsurge of recent grizzly activity in the [BV], and there is a great deal of work that needs to… be done to prepare the community for grizzly bear population expansion in the ecosystem." Jamie Jonkel, Bear Management Specialist, MFWP.

In 2021 we are producing, testing, and placing WRKBDs for WK9 Training and Handler Certification. We're accepting applications from wildlife professionals interested in becoming WK9 Handlers! We anticipate publishing research on human-bear conflict in Alaska and Alberta, and Hunt's Bear Shepherding Guidelines and Bear Conflict Indexes. We will continue working with agencies, industry, and communities to advance our mission. We're accepting applications for our Internship Program. For more information visit our website at www.beardogs.org or contact us at nils@beardogs.org. To all that have been part of this journey, we say "Good Job on the Bear!" Here's to the next 25 years of meaningful work.

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Wind River Bear Institute conducting Wildlife K-9 Handler Training with Karelian Bear Dog, "Hayduke," and Greg Colligan, Denali National Park, using a taxidermy grizzly bear mount and odiferous bear parts. Photo Credit: Wind River Bear Institute.

Nils J. Pedersen handling Wildlife K-9 "Soledad" with Alayna DuPont, Girdwood Bear Aware, handling Wildlife K-9 "Mardy" while responding to an incident of black bear chicken depredation in Girdwood, Alaska. Photo Credit: Alayna DuPont.

Jessica W. Reyes, Program Biologist Intern (left), and Carrie Hunt, Founder of Wind River Bear Institute and Director of Wind River Karelian Bear Dogs (right), pose with Wildlife K-9s "Salla" and "Mowgli" in front of their outreach display at the Montana Fish Wildlife and Parks, Grizzly Bear Education & Outreach Summit in Helena, Montana. Photo Credit: Wind River Bear Institute.

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Best Practices for Less-lethal Management of Bears

Originally prepared August 2019 for the British Columbia Conservation Officer Service to inform ongoing development of less-lethal management techniques for training and use during human-bear conflict response.

Executive Summary

Scientific articles regarding the effectiveness of various less-lethal management tools on bears are few and many are quite dated. The tools that have been studied were those available and/or popular at the time and focused on noise deterrents (shotgun, bangers, screamers) and pain deterrents (bean bag rounds, rubber bullets). As jurisdictions applied and reviewed these techniques over time, and new tools became available, most have shifted toward tools that have not yet been tested or published in the scientific literature but have shown promise in the field. Most jurisdictions no longer utilize rubber bullets due to the injury they can cause to the bear, or bangers and screamers due to their ineffectiveness and risk of fire during dry conditions. The use of chalk balls and Tasers has become more prevalent and several jurisdictions prefer them due to effectiveness, safety, and acceptance by the public. All studies and feedback from jurisdictions were consistent in the conclusion that less-lethal management is only effective in the long-term when applied to animals that are not already food conditioned.

Literature Review

Hopkins et al. (2010) defined Aversive Conditioning (AC) as "a learning process in which deterrents are continually and consistently administered to a bear to reduce the frequency of an undesirable behavior." The bear manager's version of AC is therefore a form of operant conditioning causing temporary pain or irritation around humans in an animal displaying objectionable behavior (Lackey et al. 2018). In theory, the goal of most bear managers using AC is that the bear will associate humans and human foods with the negative stimulus, thereby avoiding the area, the anthropogenic foods, or both. Another potential outcome of AC is that a bear learns to avoid humans in general by becoming more nocturnal while still engaging in the undesirable behaviors.

Hazing has been defined as a technique where deterrents are administered to a bear to immediately modify the bear's undesirable behavior (Schirokauer and Boyd 1998, Hopkins et al. 2010). By definition, what bear managers do in most instances is a form of hazing, although it can be repetitive if the bear is recaptured on multiple occurrences.

There are several forms of deterrents used for AC in American black bears (*Ursus americanus*), including on-site releases, trained dogs, less-lethal ammunition, bear spray, pepper balls, emetic compounds, pyrotechnics, noise makers, and conducted electrical weapons like Tasers. Of these, on-site release, less-lethal ammunition (rubber bullets) and noise makers were the most common techniques used (Clark et al. 2002, Beckman et al. 2004, Spencer et al. 2007). Today, agencies who have made focussed efforts to improve best practices have identified the risks of injury to the animal when using rubber bullets and therefore do not recommend. The use of Conducted Electrical Weapons (CEWs) has potential as an effective alternative to chemical restraint or other means of short-term physical capture (Lieske et al. 2018).The use of trained dogs is not widespread but are popular amongst staff handlers and the public where they are used (Washington Department of Fish and Wildlife; Montana Department of Fish, Wildlife and Parks; Nevada Department of Wildlife; Alaska Department of Fish and Game; Wind River Bear Institute).

The effectiveness of AC at altering a bear's problem behavior may be affected by a bear's previous experiences associated with that behavior. It is unlikely that sufficient negative reinforcement could be directed at bears that have learned behaviors that lead to conflicts with humans (McCullough 1982, McCarthy and Seavoy 1994). Even infrequent rewards serve to perpetuate such behavior. Thus, AC is likely to be most successful for young bears and first-time offenders (Mazur 2010). Additionally, the effectiveness of AC is likely impacted by the timing and proximity of treatment to the nuisance activity, intensity of the treatment and repeated application of treatment. While AC is unlikely to provide long-term relief from human-bear conflicts, application of AC techniques may provide immediate relief for agricultural damage and provide public satisfaction that a problem is being addressed (Hurst et al. 2012, Proctor et al. 2018). Mazur (2010) found the main utility of AC was to 1) modify unacceptable behaviors to those deemed acceptable for human safety, 2) keep bears out of developed areas long enough to install bear-proof facilities, and 3) keep females with cubs out of developed areas so the cubs do not learn nuisance behaviors from their mother.

Effective AC may be expensive and impractical because trapping is often required before conditioning can occur. It also requires specialized equipment, professional training and time to implement (Hurst et al. 2012).

Benefits:

Support for the agency message from the public is generally greater because they witness a less-lethal resolution, but the bear remains in the neighborhood.

Aversive conditioning may temporarily alter some specific black bear behaviors and yield a short-term reduction in human–bear conflicts. Some bears may become more wary of people or may simply decrease their diurnal activity.

Ideally, AC should be accompanied or preceded by efforts to address the attractant that instigated the conflict (Leigh and Chamberlin 2008).

Aversive conditioning likely has longer-term benefits on bears that are first-time captures and have not ascended the behavioral ladder of conflict.

Removing a bear, even if only temporarily, may alleviate immediate concerns over conflict or damage.

Post-release bear mortalities associated with translocation are avoided.

Challenges:

Aversive conditioning is not a permanent solution for human–bear conflicts.

Bears can easily learn strategies for evading efforts by managers to apply AC.

Highly habituated or food-conditioned bears often will not leave or change their behavior, thereby offering no reduction of conflicts.

Neighborhood bears often become recognizable to the community and this may lead to greater public concerns.

Effective AC may be expensive and impractical because specialized equipment is often necessary.

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Florida's transition from Culvert to Cambrian traps

In the summer of 2007, the Florida Fish and Wildlife Conservation Commission (FWC) needed to add new bear traps to our aging fleet. At the time we had 15 culvert traps strategically placed throughout the state in high human-bear conflict areas. We investigated whether there might be alternatives to the traditional enclosed tube-style culvert traps that would address some challenges we had experienced. After talking with other state counterparts, we discovered the Cambrian trap. The Cambrian trap is a box trap with a counterbalanced trap door and expanded steel mesh walls mounted on a trailer. Below are a few issues that we have remedied by switching from culverts to Cambrian bear traps.

Heat

Due to high temperatures in Florida we were considering how we could modify the culvert design to mitigate the heat inside the traps. We noticed other states were using expanded steel mesh on the front and back of their culvert traps to help with air flow. Unfortunately, the heat radiating inward from the enclosed metal tube of the culvert was still too hot to keep bears trapped for any duration.

We were immediately impressed that the temperature inside the Cambrian trap was the same as ambient temperature, while the inside of the culvert trap was almost 20 degrees hotter. With the risk of captured bears overheating minimized, we can now keep our traps open during the day for daytime active bears. We are also able to hold wild bears in the field for extended periods of time, which is helpful while attempting to catch family groups. We have loaned out the Cambrian traps to zoos to help move or temporarily house their captive bears during hurricanes, and even loaned our traps to residents for a day or 2 to hold their remaining small livestock (e.g., chickens, goats) after a bear depredation to give the owners time to create a more secure holding pen.

Visibility

Another advantage of the Cambrian trap are the expanded steel mesh walls that provide full visibility of the bear in the trap. The lack of visibility in the enclosed style culvert trap made it difficult to chemically immobilize bears. Even with flashlights and multiple access ports, it was difficult to dart the bear. We added hinged doors along the sides of some of the culvert traps to address this issue, but the bears would inevitably stick their heads or legs out, creating a hazard for the bear and staff. Having a trap with more visibility is also helpful when we ask residents whether the captured bear is the same one that they have observed involved in conflict. This identification process in the culvert traps was very difficult.

We discovered when trying to capture an adult female and cubs, the ability of the bears to see each other through the trap usually results in their willingness to enter a second trap when it is placed nearby. In these situations, we often will manually pull the trigger with a long line attached to the trigger mechanism once the bear(s) are all inside the trap together. We did not have as much success catching multiple bears and family groups with culvert traps because it was hard to see where the bear was in the trap when using this method. Staff are also able to use the visibility of a captured bear as an opportunity to teach people about bears and how to avoid conflicts with them.

Biologist ready to haze a bear with paintballs on release.
Photo credit: Florida Fish and Wildlife Conservation Commission

Safety

Another benefit to the Cambrian trap is the counterbalanced door. The door swings down in an arc with a smooth motion and locks in place by two hooks. In our experience even when the doors hit bears, they are not always frightened, much less harmed as compared to culvert traps. We have had bears come back minutes after tripping the door on a Cambrian trap to try and sneak back to consume the remaining bait.

Incidents of injuries are much lower in Cambrian traps than in our culvert traps. While some bears will fray the tips of their claws in Cambrian traps, more serious injuries are extremely rare.

We find that it is easier and safer to release bears from Cambrian traps. Multiple people can sit or stand on top of the flat roof of the trap safely and the counterbalanced door is easy to hold open with one hand. The rounded top of culvert traps were difficult to stand on, especially while lifting up the relatively heavy guillotine door.

It's easy to see the captured bear for identification and workup. It also reduces or eliminates overheating issues. Photo credit: Florida Fish and Wildlife Conservation Commission

Accessibility

The curvature of the inside of the culvert trap made it difficult to be inside the trap while collecting data on the bear. The Cambrian traps size, rectangular shape, and the ability to open the full-sized front and back doors makes baiting, as well as data collection, easy. Additionally, we can perform all data collection on large (>500 lbs. [227 kgs.]) bears without taking the bear out of the trap.

Versatility

The design of the Cambrian trap has allowed us to make several modifications to its original specifications. We added crossbars and reinforced dart holes to the sides of the trap to make it stronger and less likely to cause injury. We also added the option of switching from a hanging bait trigger-pull to a pressure treadle trigger on all our new Cambrian traps. Since we attempt to collect data on all of the bears hit and killed by cars each year (>200), we added a removable winch to the tongue of the trap trailer and a ramp that stows below the trap that makes removing bears on the side of the road safer and more efficient. We also added a removable internal wall on a couple of our traps that allow us to separate multiple bears for safer transport.

We have found the Cambrian trap to be a safe and effective tool for managing bears in Florida. We now have a fleet of over 30 Cambrian traps statewide and have retired all but a few of our culvert traps. For more information contact Mike Orlando.

The expanded metal makes it easy to see the bear and makes the trap look less enclosed. Photo credit: Florida Fish and Wildlife Conservation Commission

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Speaking of Bears: The Bear Crisis and a Tale of Rewilding from Yosemite, Sequoia, and Other National Parks

by Rachel Mazur 2015.

Falcon Guides, 1st edition

299 pages
print ISBN 978-1-4930-0822-3, $18.95

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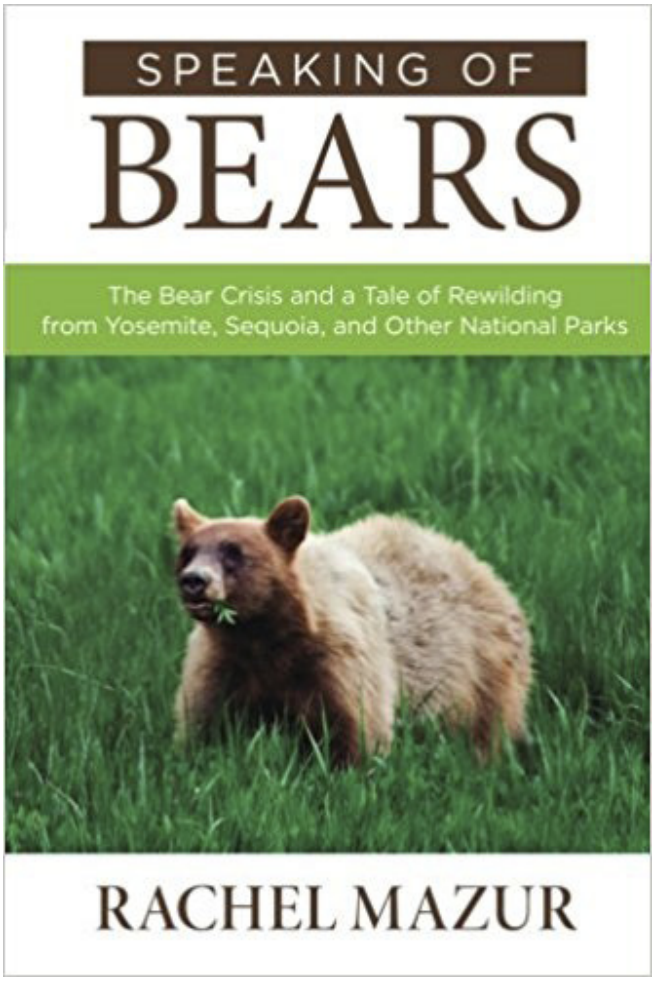

Rachel Mazur, the Branch Chief of Wildlife, Visitor Use and Social Science for Yosemite National Park (hereafter referred to as Yosemite), authored a book entitled "Speaking of Bears" in 2015. When I was asked to review this book, I had flashbacks to 1999, when I spent a few days with the Yosemite Bear Team while visiting a former colleague, Joe Madison. My visit was a chance to catch up with him, see the natural wonders of the park for the first time, and take part in what I viewed as a "black bear rodeo," in which the dedicated Yosemite Bear Team spent long evenings spotlighting for bears, then chasing them on foot out of the valley. After a day of checking culvert traps targeting individual problem bears, Joe and I set out in the evening to survey visitor compliance with food storage requirements. It was there that I got to experience the excitement, or craziness, of chasing black bears (*Ursus americanus*) on foot; sprinting after them with flashlight in hand to encourage them to leave the campground and valley. That experience showed me that despite portrayals of black bears as aggressive and dangerous, in reality, most are easily scared by a 5'4", 130 lb. woman with a loud voice. It also showed me the limitations of this method, as reflected in Ryan Leahy's quote, captured by Rachel, as he described renewed efforts in the late 1990s to create a more holistic approach in Yosemite: "It was finally clear to everyone that bear management needed to be more than just two wildlife technicians running around chasing bears."

With that personal perspective, I looked forward to reading Rachel's book, which summarizes the history of bear management in Yosemite from just prior to its founding in 1890 through 2014. While other parks, such as Sequoia and Yellowstone, are discussed, the bulk of the book covers the long and anguished history of Yosemite, highlighting many researchers, park staff, and others, who contributed to the management and knowledge of black bears in the park. Bear managers reading Rachel's book will experience déjà vu, as the experiences in Yosemite are still all too common for many agency biologists. For example, the challenges in changing human behavior, as well as the sometimes-heavy influence of agency bureaucracy and politics in affecting management decisions. And bear managers will appreciate many of the details captured in the book, such as bear-resistant garbage containers being identified as a solution in 1933, with the publication of *Fauna of the National Parks of the United States*. Ninety years later, many bear managers are still struggling to successfully implement effective bear-resistant containers on public and private lands to reduce human-bear interactions. Other details describe several techniques developed in response to managing park bear conflicts, such as culvert traps and hazing techniques, that are still used today; I found it fascinating to read their origin stories.

The book also covers the reactions, overreactions, solutions, and fallacies that occurred in response to bear injuries and fatalities. One such example is the long-term

repercussions felt by many female wildlife professionals due to the response after the deaths of 2 female campers in Glacier National Park by 2 different grizzly bears in 1967. Rather than focus on food conditioning coupled with a lean natural food year as the cause of the attacks, antiquated notions at the time, as well as politics, instead blamed the victims' menstruation, thus setting up decades of sexist treatment of women. For example, Rachel reveals that women rangers were switched to office duty while menstruating, which meant they not only had to share very personal information with their supervisor but were restricted from performing their job duties that their male colleagues were not. On a personal note, I remember even into the 1990s, some supervisors in western states would not hire women on grizzly or black bear trapping crews, using the excuse that women would put their trapping crew at risk, especially while back-country camping. Rachel reminds us of this sexist history, while also preserving the progressive voices of those that recognized this myth, including Dave Graber, who was reprimanded for opposing this theory that resulted in decades of biased behavior against women.

I readily admit that at times, the book was a bit choppy and sometimes hard to follow, as Rachel jumps to bear management in other parks, as well as other time periods. And, because she digs so deep in sharing all the details of bear management, both small and large, those details can get a little overwhelming. While the general public may end up skimming over parts, bear managers should not, as those details tell a rich and complete story of people instrumental in bear management, and the decisions that explain many advancements we have made in effectively addressing human-bear interactions in North America. The book reads as a who's who of notable figures, such as the Craighead brothers, early naturalists George Write, Ben Thompson, Joseph Dixon, and A. Starker Leopold. Many pioneering biologists, researchers, and naturalists came before our present day, and reading about their involvement in park bear management was a history that I suspect many of us are not well versed in or perhaps not even aware of. Rachel's book acknowledges and honors those figures for their dedication, passion, and wisdom.

Bear managers will likely recognize Yosemite's history as their history; one that includes learning on the fly, as well as learning from mistakes, dealing with bureaucracy, being inventive, and having an unending devotion to the resource. While Yosemite is now a case study in the success of securing anthropogenic foods, Rachel reminds us of the high cost it took to get there, as decades of ignoring recommendations from subject-matter experts led to the death of 1,000s of black bears. This weighed heavily on many of those that had to carry out the dispatch of these bears, when, as Rachel captures in her epilogue, most would rather have watched a bear being a bear, wild and uninfluenced by human hands.

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One of Us; A Biologist's Walk Among Bears

by Barrie K. Gilbert 2019

Friessen Press, Victoria British Columbia, Canada

249 pages

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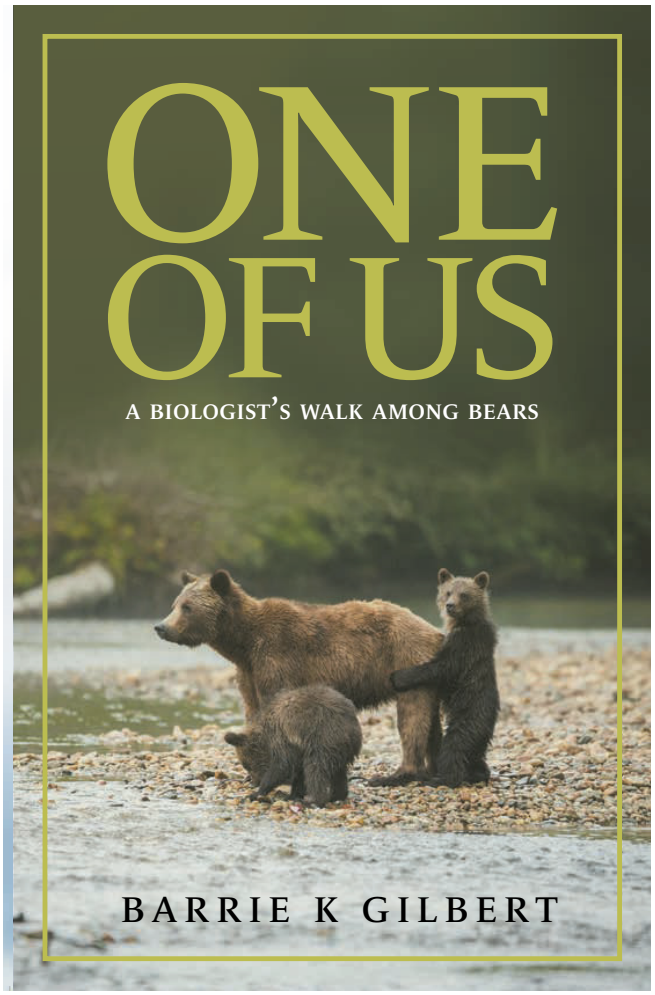
(FriesenPress, Victoria, British Columbia, Canada, 249 pp.).

Barrie Gilbert has written a fascinating book that shares his experiences, knowledge, and convictions from a career-long study of bear behavior (brown [*Ursus arctos*] and American black bears [*U. americanus*]), especially in relation to humans. I first met Barrie at the Sixth IBA Conference in Arizona in 1983. My wife (who is not a biologist and was at her first bear conference) remarked about the respect we all showed Barrie. I had not thought of this, but I think she was right. Views on human-bear- interactions are especially salient coming from one who carries the scars of a grizzly bear encounter. Barrie had been injured in 1977 at the very beginning of his career studying human-bear interactions in Yellowstone National Park's backcountry. The book begins with this experience and he touches upon it throughout the book. This approach is tricky, but Barrie used it masterfully, even joking that one really should not believe advice about safety in bear country from someone who had failed the course! Undaunted, Barrie continued to study bear behavior and human-bear interactions in Yosemite National Park, California; Katmai National Park, Alaska; and coastal British Columbia for the rest of his career.

To obtain a historical perspective, Barrie reviewed the 132 encounters with grizzly bears described by Lewis and Clark during their 1803-06 expedition; 55 of which could be analyzed. Many of these encounters were in my home state of Montana and I have always been fascinated by their journey. Yet, I had not known that none of these encounters were aggressive (towards humans); no people were injured, but 51 grizzlies were killed for their "bear grease" and 18 were wounded. This is a main point of Barrie's book, that grizzly/brown bears are not inherently aggressive, but they can respond to how humans treat them. Barrie also argues that bears with abundant food, such as spawning salmon, are more tolerant of humans and other bears than bears that do not have abundant food. This is an important point to consider in areas where humans meet bears.



Barrie describes how an understanding of how and why bears behave toward each other can help us know how to behave when humans encounter them. He also describes how we often have created the problems that we later have difficulty solving. He gives examples of building infrastructures that concentrated tourists at important sites for bears in Katmai and Yellowstone and food management regulations that increased vehicle break-ins in Yosemite. In these cases, Barrie concludes that we teach bears bad habits and then punish them for those habits. Positive examples are given also, such as the McNeil River State Game Sanctuary and Refuge in Alaska and a private bear-viewing operation in British Columbia. The book covers much more than human-bear- interactions. Barrie also places the brown bear in a greater ecological perspective, describing how it moves the marine-derived nutrients in spawning salmon from the streams into the forest, thus providing the building blocks for the great Pacific Coast rainforests.

As this is not a scientific work, Barrie is free to give his opinions, and he often does. He criticizes how American national park managers often are forced to follow the wishes of national politicians and their supporters, whose plans to profit from park management often conflict with the spirit of the relevant laws. He also criticizes the hunting of brown/grizzly bears, research that is based on the capture and marking of bears, and our general lack of preserving more wilderness and accepting brown/grizzly bears. The text is easy to read and is engaging, although it is sometimes repetitive. I wish that Barrie had included a map or two, especially of the Brooks River area in Katmai, because it would have helped me to visualize his points regarding human-bear conflicts in this area and his recommendations to improve the situation.

I recommend this book for people who are interested in bears generally and those who would be interested in the story of an idealistic biologist who dedicated his career to understanding bears and how people and bears can live together. I enjoyed reading it.

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27th International Conference on Bear Research and Management

Kalispell, Montana, USA

After receiving feedback from IBA members, the IBA conference committee decided to move the conference dates to September 12–18, 2021. The Conference Planning Committee hoped to have a hybrid conference to allow for both in-person attendance and a virtual component. However, with the current situation surrounding COVID-19 and travel, this option is no longer feasible. The Planning Committee met on May 10 and decided to move forward with planning for a full virtual conference. Please watch your email for updates with registration information. Both the IBA and the Kalispell conference conference websites will be updated as information is finalized. Decisions regarding the acceptance of poster or oral presentation made earlier are final and are not affected by the change in format. If you registered for the original in-person conference in 2020, we will contact you regarding processing a refund for your registration costs.

Registration for the virtual 2021 conference is planned to open in early June.

Visit IBA's YouTube Channel to watch some of our members give a preview of the research they will present during the conference.

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CONSERVING BEARS IN A CHANGING WORLD

27th International Conference On Bear Research & Management

KALISPELL | MT

IBA website:
https://www.bearbiology.org/event-list/27th-iba-conference/

Conference website:
https://iba2020mt.com/

YouTube Channel:
https://www.youtube.com/channel/UCWWp97SkhJjRPrN-xNegDjg

Postponement of 3rd International Symposium on Sun Bear Conservation and Management

In light of COVID-19 and the associated impacts to international travel, the symposium organisers have made a regretful decision to postpone the 3rd International Symposium on Sun Bear Conservation and Management 2021 until further notice. The workshop to assess the red-listing of sun bears will also be delayed to coincide with the symposium.

Heidi Quine
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Student Forum

- 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: https://www.bearbiology.org/membership/students

Follow the links to request invitation.

If you are a new member, please submit a paragraph about your project ad include your contact information so we can all get to know you.

Facebook Signup Instructions

Visit: https://facebook.com/groups/IBA.Conference

Recent Bear Literature

Agnieszka Sergiel

Email: agasergiel@gmail.com (or agnieszka.sergiel@bearbiology.org)

If you have an article recently published, please email the citation for inclusion in the Recent Bear Literature. We really appreciate direct contact with you.

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 (or agnieszka.sergiel@bearbiology.org)

For easy access to articles, we are including the DOI citation 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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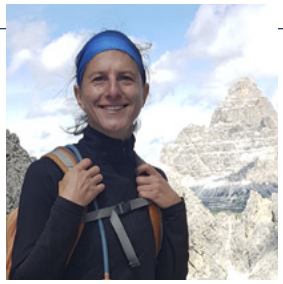

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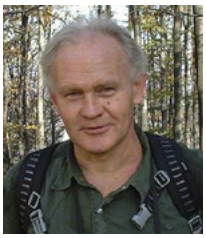

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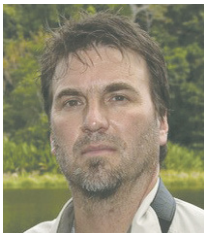

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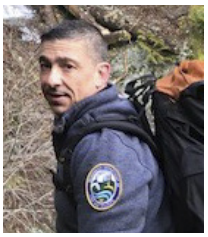

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The International Association for Bear Research and Management (IBA) is a non-profit tax-exempt organization open to professional biologists, wildlife managers and others dedicated to the conservation of all bear species. The organization has 550+ members from over 60 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. Many of the conference papers are published as peer-reviewed scientific papers in the journal *Ursus*.

IBA Mission Statement

Vision: IBA envisions a world where all 8 bear species can thrive and coexist with humans.

Mission: IBA advances scientific understanding and global conservation of the world's 8 bear species

1. Promote and foster well-designed research of the highest professional standards.
2. Support sound stewardship of the 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 setting of conferences, active recruitment of international members and officers, and through financial support for international research, travel to meetings, member ships, 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.