LIFE with bears

LIFE DINALP BEAR project bulletin 2018

LIFE DINALP BEAR

LIFE13 NAT/SI/000550

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Dear Readers,

We have prepared the fourth issue of LIFE DINALP BEAR project bulletin "LIFE with bears". In the fourth year of the project, we have concluded some of the most important analyses that offer expert and scientific basis in the decision-making process regarding long-term brown bear management and conservation.

Here we summarize the results of bear counting with non-invasive gene tic sampling, population dynamic reconstruction for the last 20 years, habitat suitability estimates for Alps and Dinaric Mountains and habitat connectivity issues, and the outcomes of an experiment about bear use of artificial feeding sites. We are also part of the process for establishing a legal framework for sustainable bear-watching in ecotourism.

We have been also very active in sharing our knowledge and raising public awareness. We are especially proud that an international conference on bear research and management, which was carried out under our organisation and included all eight bear species in the world, was so successful.

We kindly invite you to read.

Nives Pagon

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There is enough suitable habitat for bear, but it is fragmented

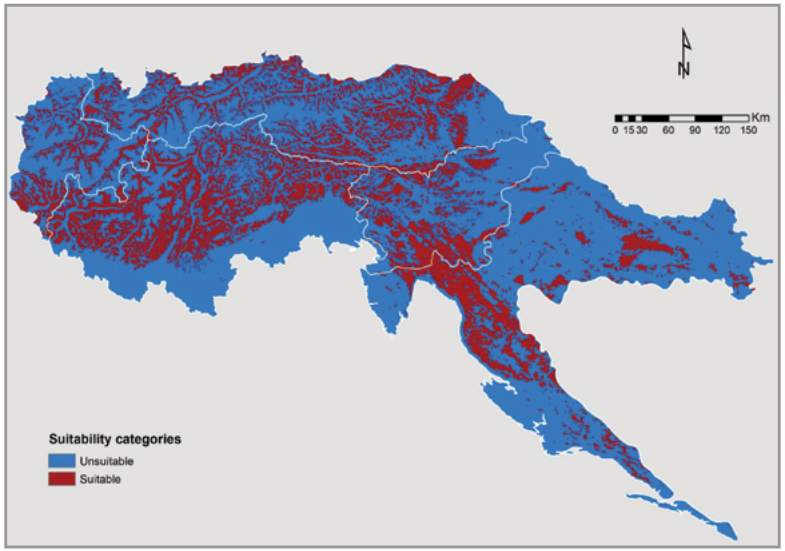
The habitat of any wildlife species consists of patches of suitable habitat and unsuitable areas, through which animals move (pass by), and of obstacles that prevent such movements. The loss of habitat and its fragmentation represent two of the principal threats for bear populations, which holds true also for the brown bear in the Dinaric Mountains and the Alps.

To know better the habitat requirements, we analysed the habitat suitability and connectivity for brown bear in the Alps and the Dinarides. We also prepared guidelines for spatial planning officers to set a baseline to maintain or increase the habitat connectivity in the future. An extensive database with GPS locations from all bears that were monitored by GPS telemetry in the study area has been used for the study.

The bears in all three analysed demographic groups (Dinarides, pre-alpine area, the Alps) primarily chose the forested areas. However, the groups differed strongly in the effects of other environmental variables. The bears in Trentino, Italy, for instance, preferred the areas that are difficult to access, in steep and topographically diverse terrain, which could be a response to a high frequency of human activity in the area.

The spatially explicit model showed that there is enough suitable habitat for bears in the study area, but it is strongly fragmented. The largest and most important patches of the habitat coincide with the current brown bear distribution and are crucial for population connectivity in the Alps and the Dinarides. A common transnational decision-making is required for the preservation of sufficient habitat connectivity within and among populations.

There is a lot of suitable habitat for brown bear in the Alps and Dinaric Mountains, but it is strongly fragmented.



Brown bear habitat suitability map for the Alps and Dinaric Mountains (Croatia, Slovenia, and parts of Austria, Italy and Switzerland).

How many bears are there in Croatia?

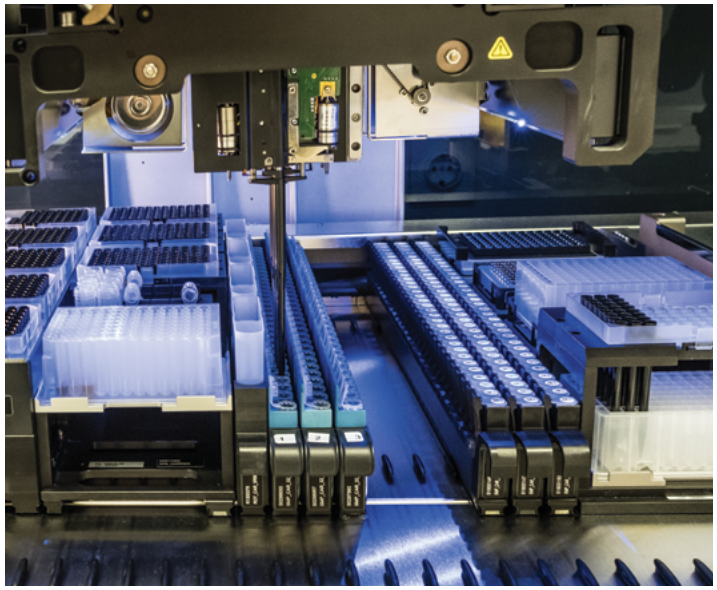
The size of the brown bear population has been scientifically estimated in Croatia for the first time.

From September to December 2015, the LIFE DINALP BEAR project team conducted a collection of bear faeces for genetic research purposes on the territory of Croatia and Slovenia. With the help of thousands of volunteers (mostly hunters and foresters, and also the interested general public), 4687 non-invasive genetic samples have been collected in both countries within an area of more than 20.000 km^2. For Croatia this was the first time that the size of the brown bear population has been estimated using scientific analyses.

The samples were processed at the Biotechnical Faculty of the University of Ljubljana using laboratory robotics and next generation sequencing, which significantly reduced the manual work in the process of DNA extracting and genotyping.

Among other parameters, we estimated the minimal and maximal annual number of bears in Croatia for 2015. Minimum yearly estimate was 793 (95% CI: 702-928) bears and maximum 937 (846-1072) bears. The minimum yearly estimate refers to the period during the winter 2015 - after the annual mortality, but before the new offspring cohort was born. The maximum yearly estimate refers to spring 2015 with the new-born offspring included. We also estimated the sex-ratio, which was 58.2% of females and 41.8% of males in the Croatian population of the brown bear.

Owing to the results of this research, we can now contribute the highest quality scientific data to the decision-making process about brown bear conservation and management in Croatia.



Inside of the liquid-handling robot in our laboratory in Ljubljana during DNA extraction.

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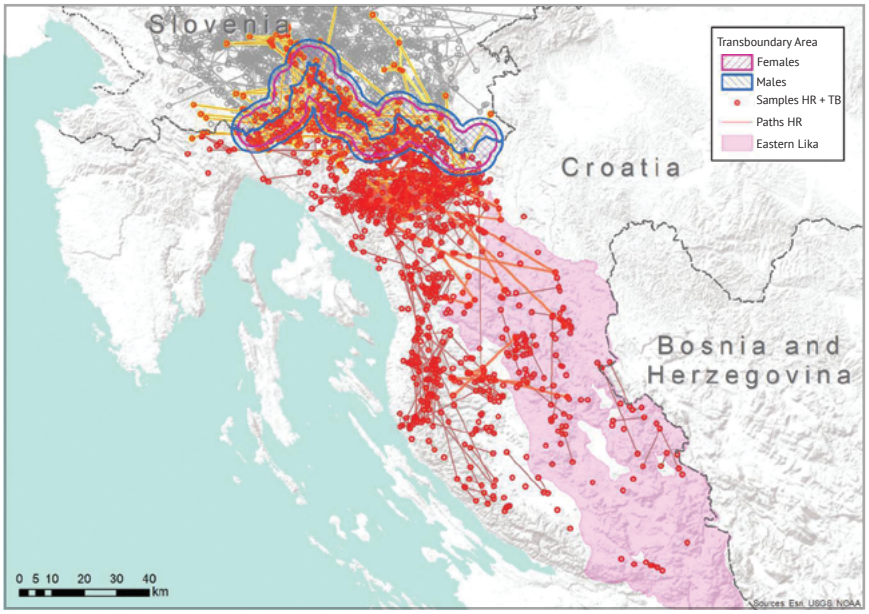
POPULATION MONITORING



Spatial distribution of genetic samples in Croatia. Lines (paths) connect the samples of the same animal, the paths of the detected transboundary animals are highlighted yellow.

Tadej Burazer,
Hunter in hunting ground ˝Loka Črnomelj˝

“I participated in this study with non-invasive genetic sampling in the field. Nowadays, when there is a need to study nature for the purpose of future management and at the same time to consider past knowledge, the best choice is undoubtedly a well-established cooperation of hunters and wildlife experts. As a hunter, I always support an expert approach to dealing with wildlife species and I hope I will be – upon a new opportunity – invited to participate again!”

How has the bear abundance in Slovenia and Croatia changed during the past 20 years?

Population dynamics – i.e. change in population size over time – is one of the key parameters in management and research of wildlife species. Molecular genetics has been the primary method for estimating bear abundance in the past 10 years. However, due to the financial and logistic limitations, these estimates are impossible to obtain on a yearly basis. To know the brown bear population estimates in Slovenia and Croatia on a yearly basis, we have developed some modelling methods for population reconstruction, which allow us to obtain data on population size, as well as on sex and age structure.

The results showed that the abundance of bear population in the Dinarides has been increasing rapidly and for most of the time during the past 20 years. The average annual nett bear population growth has been 4.5% in Slovenia and 5.0% in Croatia. In Slovenia, for example, the estimated bear population size in spring 1998 and 2018 was 405 (CI: 330-460) and 975 (875-1130) bears respectively, which indicates a 2.5-fold increase of bear population size in a 20-year period. It is important to note that usually, the estimates for bear population size were reported for the late autumn period, when the bear abundance is at the lowest, i.e. after the annual cull. Here we provide the estimates for spring, when the bear abundance is the highest due to reproduction.

In Slovenia, the relative anthropogenic mortality during the study period was slowly decreasing and in Croatia rapidly increasing, which is a consequence of divergent changes in hunting intensity in both countries. In the recent years, the relative hunting mortality of bears in Croatia exceeded the mortality in Slovenia. On average, the hunting removed 12% of the population in Slovenia annually, and 11% in Croatia. In Slovenia, the hunting

The abundance of bear population in the Dinarides has been increasing rapidly and for most of the time during the past 20 years.

Report:

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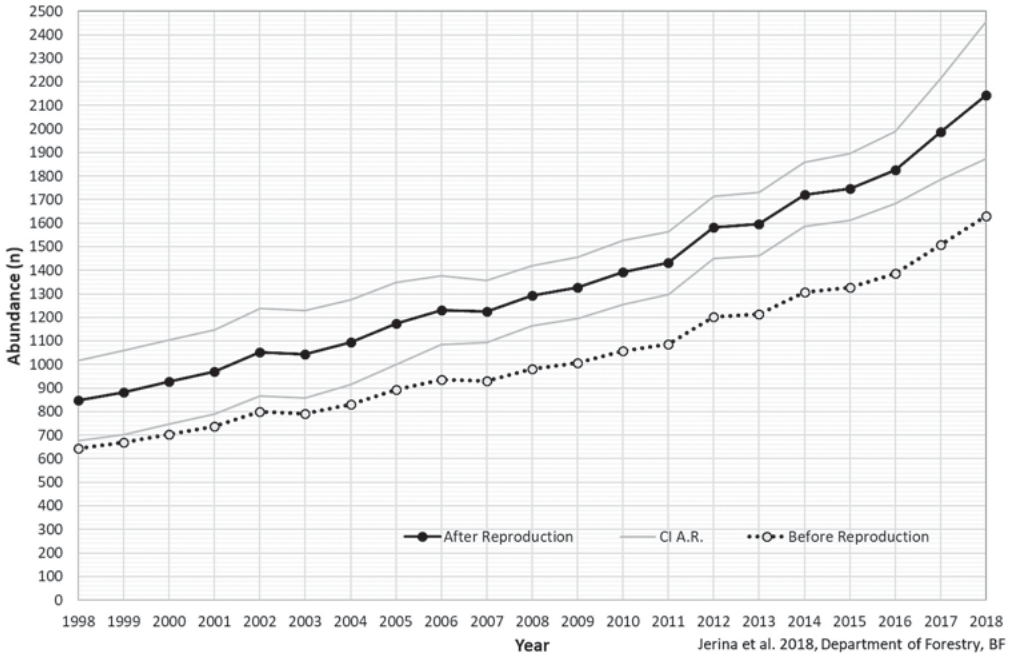
mostly targets the lighter (younger) bears of both sexes, aiming to mimic the natural mortality patterns, whereas in Croatia the hunting is trophy-oriented and targets adult males. The reconstructed population structure indicates that the proportion of mature males in population was very low compared to the proportion of reproductive females. Assuming that the rate of the recorded mortality does not change, the demographically sustainable anthropogenic relative mortality of the Dinaric population would be around 18-20%, and the sustainable hunting mortality around 14-17%, which is considerably higher than the relative past and present hunting mortality.



Population dynamics of brown bear in Slovenia and Croatia in the period 1998-2018.

Dr. Maja Lazarus,
Institute of Medical Research and Occupational Health, Zagreb, Croatia

"Additional value of LIFE DINALP BEAR project for our own research team was giving us the opportunity to study if toxic metals from food in bears' environment accumulate in amounts that could harm the health of bears. I analysed the level of toxic metals in soft and hard tissues of culled bears. I found that age, sex, sexual maturity, season, and growth period do influence the amount of toxic metals that enter and accumulate in bears' organism."

Test on efficiency of using carrion for artificial feeding of bears

Artificial feeding of bears has a long tradition in Slovenia as well as in several other countries. Following the ban on feeding livestock carrion in 2004, strong concerns arose among the general public. There was a widespread opinion that carrion feeding is effective in reducing bear conflicts, even though no scientific study supported such concern.

Thus, we carried out an experimental study to test for the first time whether bears prefer wildlife carrion over plant-based food. Alternately, we supplied either plant-based food (mostly maize) or either both, maize and carrion (mostly deer road kill), to 19 feeding sites for two years. The presence of animals was monitored using camera-traps.

We found that the bears somewhat preferred the feeding sites with added carrion, with a one third higher number of bear pictures. Still, bear presence on carrion feeding sites was higher only in the year 2017, when natural food availability was extremely low. On the other hand, there were no differences in using feeding sites with or without carrion in 2016, when beech mast was abundant.

Based on these outcomes, we suggest that carrion from wild animals may be supplied to feeding sites when accessible and technically feasible to transport. We believe that artificial feeding should be based on rational justification and used only when desirable effects, such as diverting bears away from settlements, simplifying monitoring and hunting, exceed the unwanted.

Use of artificial feeding sites by brown bear has been recorded for two years with the help of photo-cameras.

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Communication for large carnivore conservation

Planning the communication activities, implementing and evaluating them are some of the crucial points for a successful large carnivore conservation. Many activities in our project include a dialogue and collaboration with stakeholders, and general awareness raising campaigns.

We, the project team members, are well aware of the fact that learning from experience of others and sharing our own experience are crucial for maximizing the effectiveness of planned actions as well as for ensuring the transferability of best practices.

Therefore, we organised an international three-day workshop entitled "Communication in large carnivore conservation and management" in cooperation with LIFE Lynx project. The purpose of this networking and experience exchange event was to discuss the key challenges and opportunities for communicating with the main target groups in large carnivore conservation and to present best practice examples. Experts and practitioners of communication activities exchanged their knowledge and experience, and discussed solutions to the challenges in large carnivore conservation and communication.

The first two days of the event were dedicated to 16 presentations by experts in communication with interest groups. A discussion among all participants took place after each presentation.

In smaller working groups the workshop participants formed scenarios for communicating with various interest groups on the topic of bear or lynx conservation.

Irena Furlan, M.Sc., biologist and pedagogic coordinator at the Ljubljana ZOO, Slovenia

"Within the frame of the LIFE DINALP BEAR project, we set up an interactive terminal as an info-point about bears at the Ljubljana ZOO. Helping to decrease the human-bear conflicts is one of the most important goals of the project and we would like to contribute by raising the awareness among our visitors. The visitors of our ZOO frequently visit the info-point. The most visited interactive pages on the terminal are those that teach via playing a game, and those that explain the human-bear coexistence."

Minimizing the negative and maximizing the positive effects of bear tourism

Bear-related tourism must be carefully planned to prevent the possibility of increase in the number of conflicts between bears and people. On the initiative of the Ministry of the Environment and Spatial Planning, Slovenia, we have prepared a proposal for the regulation of the legal framework for commercial bear watching.

In order to prepare the starting points, we have organized a consultation entitled "Bear as a Value in Tourism". Decision makers, large carnivore experts, representatives of special purpose hunting grounds, local tourism organizations and travel agencies marketing bear-related tourism products were invited. We discussed positive and negative impacts the tourism might have on bears and opportunities for the local communities in the bear area.

Following, we have prepared recommendations for the legal regulation of bear watching activities. We proposed the establishment of formal education for bear-watching guides, which would include the basics of ecology, biology and behaviour of the species and appropriate human behaviour in case of bear encounter. We emphasized the importance of the constant presence of a qualified guide alongside guests and made recommendations about bear watching hides and use of artificial feeding for attracting bears. The aim of the proposed regulation is to prevent potential negative effects of tourism on bears, while providing a quality product for guests and economic benefits for the local community.

Together with the representatives of the Ministry of the Environment and Spatial Planning we have visited one of the best practice examples of bear watching tour on the field.

The aim of the proposed regulation of the legal framework for commercial bear watching is to prevent the potential negative effects of tourism on bears, while providing a quality product for guests and economic benefits for the local community.

Dr. Anja Moric, Researcher at the Department of Ethnology and Cultural Anthropology, Faculty of Arts (Ljubljana), and Director of The Putscherle Institute, Slovenia

"Kočevska region, where I come from, is an inexhaustible source of inspiration for my research work as well as creativity. The Bearies' collection of ceramic products has been spontaneously inspired by a permanent resident of the forests of Kočevska – the brown bear. With the Bearies' collection, I wanted to draw people's attention to the importance of the bear for the local environment and to remind them of the importance of coexisting with bears in their everyday life. The clay products are environmentally friendly, thus contributing to the preservation of nature and the bear's habitat."

26th IBA conference hosted by LIFE DINALP BEAR in Ljubljana

In September 2018 more than 250 bear researchers and bear managers from 42 countries gathered in Ljubljana on the 26th IBA conference. The main theme of the "Life with bears – 26th International Conference on Bear Research and Management" was human-bear coexistence in human dominated and politically fragmented landscapes. Specific conference topics were designed in a way to welcome the recent research results, technical advances, and case studies on a wide spectrum of issues relevant to ensuring a long-term coexistence of bears and humans.

The conference's 88 oral presentations were organized in seven sessions and the poster session included more than 90 posters displayed. Additionally, the participants could attend two out of four thematic workshops that were offered during the conference.

The conference provided also events open to wider public, such as the Bear-friendly market - an opportunity for the conference participants and the interested visitors to meet bear-friendly ambassadors and support their contribution to bear conservation by purchasing local bear-friendly products. An evening public presentation »Polar bears and the changing Arctic« offered by Andrew E. Derocher, one of the leading researchers on polar bears, attracted a lot of attention also from the local media.

The project team has proudly presented the results and experiences from the LIFE DINALP BEAR project. We prepared 14 presentations and organized one of the four thematic workshops.

The International Association for Bear Research and Management (IBA) is a non-profit organization open to professional biologists, wildlife managers and others dedicated to the conservation of all bear species in the world. The organization has over 550 members from over 50 countries.

The rich and diverse conference program included, among others, also 88 oral presentations and more than 90 posters displayed.

Book of Abstracts:

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"Life with bears – 26th International Conference on Bear Research and Management" was hosted by the University of Ljubljana and Slovenia Forest Service within the frame of LIFE DINALP BEAR project.

Bear-friendly market was an opportunity for the visitors to support a contribution of bear-friendly ambassadors to bear conservation by purchasing local bear-friendly products.

Dr. Andreas Zedrosser, president of the IBA and professor at the University of South-Eastern Norway

"The "LIFE DINALP BEAR" team generously and very successfully organized a superb IBA conference. Experts from all over the world gave thought-provoking presentations covering all 8 bear species. IBA conferences help to highlight bear-related management and conservation topics of the country and region they are held in. The impact of these conferences goes even beyond bears, since bears function as excellent umbrella species for conservation efforts. The LIFE DINALP BEAR team has made Ljubljana the world's capital of bear management, research and conservation in 2018. I hope that the positive impacts last a long time!"

Our project supports the new Code of Conduct in Nature

At the initiative of the Scouts Association of Slovenia, a Code of Conduct "Visiting Nature in Slovenia" was created, which represents the guidelines of respectful behaviour in nature and encourages the protection of the environment. It includes five key principles: respect for nature, one-self, others, property and local community. The goal of the code is to better inform visitors of nature on how we behave in nature in Slovenia. Twenty-seven organizations participated in the development of the code, including the LIFE DINALP BEAR project.

The guidelines of the code are general, so that they can be used by everyone. Some guidelines are particularly important in terms of proper behaviour in the areas with brown bear presence, e.g.; we do not dispose of waste (including biological) in nature; we do not enter dens and feeding stations; we alert animals of our presence by talking so that they can withdraw; we never use hunting hides, etc. Within the project, we are promoting the development of responsible bear related touristic programs; these guidelines will therefore help us raise awareness among guests visiting the bear areas.

VISITING NATURE IN SLOVENIA

Code of Conduct:

SCAN ME!

The Code of Conduct "Visiting Nature in Slovenia" was signed by 27 organisations.

Trainings of Bear Intervention Groups in Croatia

Bear Intervention Groups (BIGs) held their training at Bear Sanctuary Kuterevo in Croatia also this year. By caring for bears that were orphaned and raised by humans, and that - as such - would, if released in nature, cause too strong conflicts with humans, the Kuterevo Sanctuary has a direct role in solving issues, related to BIGs. In addition, the management of these bears provides a great opportunity to train BIGs members. Almost every year it is necessary to examine, cure or castrate a specimen, or move it to another enclosure. Handling requires chemical immobilization by an injection gun, measuring the bear, taking its samples, and moving it. If traffic mortality is at our disposition at that time, we train the members also on how to examine interior organs of the carcass.

The Kuterevo village has always hosted us very kindly. The head of the sanctuary, Mr. Ivan Crnković Pavenka, along with his volunteers from all over the world, as well as the residents of Kuterevo provide us with adequate conditions for meetings, trainings and experience exchange. It is hard to imagine a more ideal location for BIGs training.

Bear Sanctuary Kuterevo in Croatia provides an excellent opportunity to train Bear Intervention Group members from Croatia, Slovenia and Italy.

Bear Intervention Group members learn how to carry an immobilised bear; this is the case of moving a bear into a required enclosure.

Update on activities in eastern Italian Alps

In 2017, three bears died in the bottleneck area of the migration corridor between the Dinaric Mountains and the Alps (south-eastern Alps, in the border area of Italy, Austria and Slovenia). One was legally culled in Slovenia near the Italian border, one was found dead near the border with Austria and one was killed in a car accident.

On average, 5 to 6 individual bears are recorded in the Julian and Carnic Alps of Friuli in Italy each year. Loss of the three individuals means that in one year only, half of the local presences were lost in a strategic territory for the recolonization of the Alps. The monitoring activities, such as collecting samples or capture trials, were affected accordingly.

Besides, efforts were taken to open public discussions about conservation of bears and risks in long-term survival. The project partner "Progetto Lince Italia" (PLI) carried out activities to raise awareness and to inform the public about the bears and our project. The researchers also presented the project activities in Belluno, Veneto, where they met with hunters. On the initiative of PLI, the Municipality of Tarvisio dedicated the year 2018 to the brown bear, while also organizing several information events for the residents and tourists. A seminar for hikers and mountaineers of the Italian Alpine Club from Bologna was also carried out.

A video-camera caught a bear visiting a Culvert trap in the Julian Alps of the Friulian forests (Tarvisio).

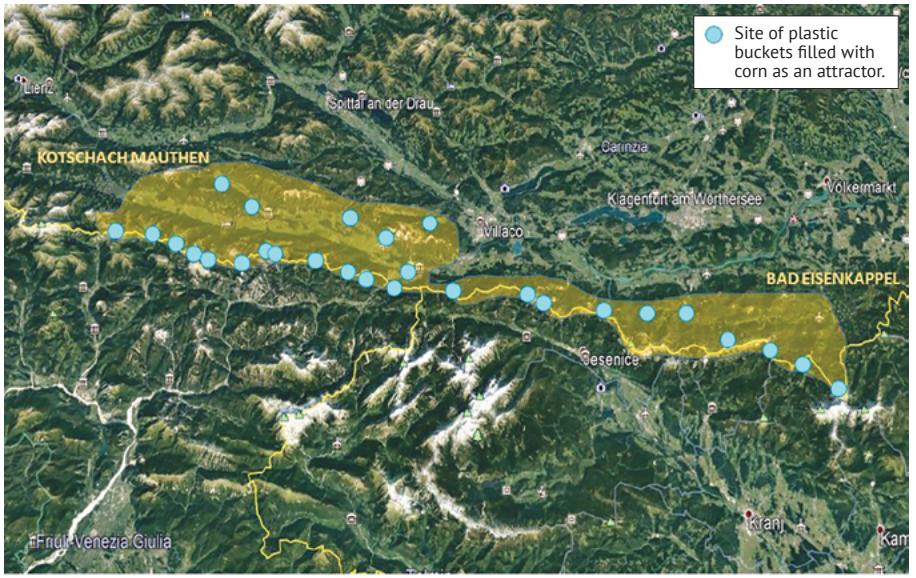
Seminar on coexistence with large carnivores, held in Belluno, Italy, was well accepted by the public.

Monitoring of bears in Carinthia intensified

In Austria, in a study area of 1.200 km² near the border with Slovenia and Italy, we have been testing a method to collect bear hairs for the purpose of monitoring bears with genetic methods. This method, where plastic buckets are filled with corn and fixed on trees, has been successfully used previously in the former range of the Central-Austrian bear population.

Contracted by the Research Institute of Wildlife Ecology of the Vetmeduni Vienna, the Carinthian Hunters Association identified suitable locations for setting such "hair-traps", based on areas known for bear presence and the in-situ terrain characteristics. The hunters set up 28 buckets in 2017 and 15 in 2018. Unfortunately, bears just used two "hair-traps" in 2017 and zero in 2018. Besides, the hunters intensively searched for rubbing trees, so they managed to collect 23 genetic samples in 2017 and 21 in 2018. As very few bears are roaming Carinthia, we are confident they sampled majority of the individuals. The samples were sent to the genetic lab and are waiting to be analysed.

Based on the results of field work, we think that the method with corn buckets does not meet our expectations in this area. Nevertheless, the hunters found many genetic samples on rubbing trees due to the intensive field work. Likely, we will adapt the hair-collection methods accordingly for the year 2019.



Map of the study area (in yellow) for testing the corn buckets as "hair traps" in Southern Carinthia (Austria). Hair trap locations are shown as blue circles.

Ivan Crnković Pavenka,
Kuterevo Bear Sanctuary, Croatia

"At Kuterevo Bear Sanctuary we provide a lifelong care for bears that lost their mothers and were hand-raised by humans, and can therefore no longer live freely in nature. We are always happy to welcome people interested in bear conservation from all over the world. We are particularly pleased to regularly host members of Bear Intervention Groups from Croatia and other countries. This is our contribution in helping reduce the human-bear conflicts and thus improve the coexistence throughout the world."

Coordinating beneficiary

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LIFE DINALP BEAR

Population level management and conservation of brown bears in northern Dinaric Mountains and the Alps