

Book of abstracts

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“Biodiversity positive by 2030”

17-21 June 2024 – Bologna, Italy



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With the partnership of



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The Natural History Museum of the University of Pisa is one of the most visited museums in the province of Pisa and hosts the biggest freshwater Aquarium of Italy. The Museum and the Aquarium actively contribute to the University third mission for scientific dissemination and to enhance the awareness of its visitors about the issues of nature preservation. Indeed, it has been widely demonstrated that the possibility of having direct experience with living animals or habitats greatly improves the public engagement in the topics of biodiversity conservation and, consequently, their motivation to corresponding actions.

The Aquarium allows visitors to view several species of conservation interest from different continents, such as the critically endangered *Paretroplus menarambo* and *Ambystoma mexicanum*. Moreover, since 2021 it includes one special room dedicated to torrential and riverine Italian species, menaced by IAS, genetic hybridization and habitat loss. These threatened species and the issues of biodiversity conservation are the focus of dedicated guided visits for schools, and of temporary exhibitions associated to the Aquarium.

As such, we believe that the Aquarium significantly contributes to conservation education by allowing the public to get directly in touch with endangered species, increasing their involvement in biodiversity loss issues and conservation science.

ID: 1165

Who is using Tree-related Microhabitats?

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Tree-related microhabitats (TreMs) are well-delineated structures occurring on living or standing dead trees that provide important resources and refuge for many species. TreMs have been recommended as indirect biodiversity indicators to promote integrative forest management. However, it is unclear as to which taxonomic groups are most frequently associated with which kind of TreM. Through a review of literature of TREM-species interactions, we found that cavities were the most frequently studied TreM. Cavities, crown deadwood and fruiting fungal bodies, and tree injuries are most frequently associated with bats and saproxylic beetles. Since cavities were well-represented in our review, we closely evaluated the TreM-taxa association of different types of cavities. We recommend future studies to evaluate poorly studied TreMs and the evaluation of multiple taxonomic groups when possible.

ID: 1167

Designated juvenile surveys identify cobble beds as important nursery habitats of coral reef fishes

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Juvenile fish often use different habitats than their adult-phase habitats, i.e., nursery habitats. For coral reef fish, several habitats have been established as nurseries, mainly seagrass meadows and mangrove forests. Since nursery research is currently largely focused on these habitats, other, less charismatic habitats, such as cobble beds are overlooked, limiting our understanding of the mosaic of habitats necessary throughout ontogeny. Here, we use paired underwater visual census of designated juvenile surveys and across-life-stage surveys conducted along the Israeli coast of the Gulf of Aqaba, to unveil potential nursery habitats. We find that cobble beds consist of high juvenile densities and species richness compared to seagrass meadows. Moreover, several species

are obligatory to cobble beds as juveniles. Finally, designated juvenile surveys in cobble beds reveal higher juvenile densities, smaller sizes, and distinct species compared to across-life-stage surveys, emphasizing that surveys which are not juvenile-designated may be non-inclusive. Taken together, our results demonstrate that cobble beds may serve as important nursery habitats for coral reef fish, and that designated juvenile surveys may be required to identify nursery habitats. At times when coastal development is increasing, protecting cobble beds habitats may be crucial to conserve coral reef fish communities.

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ID: 1176

To safeguard pollinators' food resources you need to calculate them

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Protection/enhancement of habitats that are rich in nectariferous and polleniferous flora is one of the strategies to mitigate spatial and seasonal gaps in pollinator food resources. However, to recognize the habitats that can safeguard nectar and pollen availability to pollinators a well-established method is required. Here we propose a step by step method that, in brief, includes assessment of flora composition, recording nectariferous and polleniferous species' flowering phenology and abundance, quantification of nectar and/or pollen production and calculations necessary to scale the results up. This approach enables to calculate the mass of available pollinator food resources at species, habitat and landscape scale and their seasonal distribution. To illustrate the method, a case study from south-eastern Poland was used.

The study was a part of the project no. PPN/IWA/2018/1/00103/U/0001 funded by the Polish National Agency for Academic Exchange.

ID: 1188

More than meets the eye: unraveling anthropic land use impacts on skin microbiota of an opportunistic amphibian species

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As amphibians continue to register population declines worldwide due to human-driven habitat modifications and emerging diseases, their skin microbiota has attracted major interest as both a possible means of adaptation to the changing environment and a barrier against pathogens.

Here we focussed on *Bombina variegata*, a small anuran colonizing both natural and artificial water bodies, to investigate differences in skin microbiota composition between individuals living in different habitats across the Province of Trento, Italy. Fourteen populations were sampled, including those of natural ponds, seasonal ponds on agricultural land, water tanks, and farm ponds. Skin and water microbiota were investigated using metataxonomics by targeting the bacterial V3-V4 16S rRNA gene and fungal ITS1 loci.

Our results highlight a significant association between skin and water microbiota across all investigated habitats. Composition and diversity of skin microbiota changed between habitats, with the skin microbiota of animals collected from natural ponds being characterized by lower alpha diversity and distinct bacterial and fungal composition. Furthermore, observed variation in skin microbial diversity could be partially explained by the water parameters: pH, dissolved oxygen, and temperature. Implication of human-driven habitat modifications and water composition on *B. variegata* skin microbiota for the conservation of this species are discussed.

ID: 1191

Successful reintroduction of the Northern Bald Ibis (*Geronticus eremita*) to Central Europe challenged by climate change and human made mortality

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The project to reintroduce a migratory Northern Bald Ibis (*Geronticus eremita*) population to Europe is ongoing since over 20 years now. The population has grown to over 250 individuals. A European LIFE-project (LIFE20 NAT/AT/000049 – LIFE NBI) is aiming for 350 individuals by the end of 2028. The migratory population is breeding in four breeding colonies north and south of the Alps and migrate to a wintering area in Tuscany (Italy).

Probably due to climate change, the ibises are starting their autumn migration later every year. The lack of thermals later in the year prevents them from successfully crossing the Alps. Therefore, last year the project team led a group of young ibises to Andalusia (Spain) for the first time. This new migration route bypasses the Alps and the new wintering area can be reached also late in the year.

The LIFE project also includes measures against human made mortality. Measures against illegal hunting are focused on Italy and include information campaigns, support of criminal prosecution and cooperation with local and international stakeholders. In cooperation with local electric grid operators more than 150 high risk power poles in Austria will be secured against electrocution of all large birds.

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ID: 1194

An experience of twenty years of ex-situ and in situ collective conservation efforts to save species from the extinction: The European bison project

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At the end of the last ice age, more than 11 thousand years ago, the European Bison appeared in Europe, gaining territories from France to Ukraine with some evidence even in Siberia. However, the European's largest herbivore started to disappear from its territories in France at the end of the XVIII century and its extinction continued throughout the centuries since 1927 when the last wild population was exterminated in the Caucasus.

Parco Natura Viva received its first European bison in 1982, one male and two females. Throughout the years, the bison bred several times and joining the ex-situ Conservation Programme for the reproduction and breeding of this species, to keep a high genetic variability of the population across European EAZA Institutions.

Since 2004, 11 animals have been reintroduced. The project has been carried out first in Slovakia and later in Romania. The park built important collaborations with institutions that deal with the protection of wildlife: the Large Herbivore Foundation, Rewilding Europe, WWF Romania, Romanian Wilderness Society and recently Carpathia Foundation.

This is an effective example of how zoological gardens in collaboration with NGOs can be successful in saving species from the extinction with the EU-cofounded projects.

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PhD in Psychobiology

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ID: 1206

Impact of climate and land use change on the distribution of orchids in Estonia

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