



11th - 14th MARCH 2025
 ALCÁZAR DE JEREZ
 ANDALUSIA

INTERNATIONAL NORTHERN BALD IBIS SYMPOSIUM



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Jerez de la Frontera, 2025



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Programme

Tuesday

17:00	Registration
18:30	Welcome & Icebreaker

Wednesday

09:00	Official welcome	
09:20-10:00	Miguel Angel Quevedo Jose Cabral	<i>Proyecto Eremita</i>
10:00-10:20	Luis Santiago Cano Alonzo	<i>Tracking Northern Bald Ibis in “Proyecto Eremita”: A Quick Overview</i>
10:20-10:40	Chuss Fernandez Christian Ceballos Relinque Indhira Domínguez Márquez Claudia Pineda Peña Celia Tirado Oliva Érika Tirado Oliva	<i>Waldrappteam’s Northern Bald Ibis Field Data Collection in Andalusia: Towards a Connection Between Science and Education.</i>
10:40 - 10:50	Discussion of the previous presentations	
10:50 - 11:20	Coffee break	
11:20 - 11:40	Johannes Fritz	<i>Northern Bald Ibis in Europe: 20 Years of Conservation, Research, and Reintroduction Success</i>
11:40 - 12:00	Anne-Gabriela Schmalstieg	<i>Safeguarding the Northern Bald Ibis: Integrating Management Measures and GPS Tracking</i>
12:00 - 12:20	Laura Stefani	<i>Protecting Northern Bald Ibis from Illegal Hunting in Italy</i>
12:20 - 12:40	Bernhard Gönner	<i>Electrocution on Medium Voltage Power Poles: Threat to the Reintroduced Northern Bald Ibis Population and Measures Against It</i>



12:40 - 13:00	Barbara Steininger	<i>The Method of Human-Led Migration: A Unique Approach to Restore the Migratory Tradition of Birds Like the Northern Bald Ibis</i>
13:00 - 13:10	Discussion of the previous presentations	
13:10 - 14:10	Lunch	
14:10 - 14:30	Didone Frigerio	<i>The Northern Bald Ibis as a Model for Behavioural & Conservation Studies at the Konrad Lorenz Research Center</i>
14:30 - 14:50	Sarah Wirtz	<i>Insights into the Northern Bald Ibis Genetics in European Zoo Populations, Recommendations for Captive Breeding and Reintroduction</i>
14:50 - 15:10	Sinah Drenske	<i>On the Road to Self-Sustainability: Population Viability of Reintroduced Northern Bald Ibises</i>
15:10 - 15:30	Alexandra Scope	<i>Veterinary Care of the European Migratory Northern Bald Ibis Population</i>
15:30 - 15:50	Helena Wehner	<i>Remote Sensing for Conservation of the Northern Bald Ibis – Ongoing Studies and Opportunities</i>
15:50 - 16:00	Discussion of the previous presentations	
16:00 - 16:30	Coffee break	
16:30 - 18:00	Poster presentations	
18:00	End of official agenda	

Thursday

09:00 - 09:20	Melissa Lewis	<i>Species Action Planning and Implementation under the African-Eurasian Migratory Waterbird Agreement</i>
09:20 - 09:40	Chris Bowden	<i>Establishing the International Working Group, Its role & Outcomes for Conserving the NBI</i>
09:40 - 10:20	Amina Fellous Djardini Mohammed Nafti	<i>The Bald Ibis in Algeria: Between the Past and the Future</i>



10:20 - 10:40	Latifa Sikli	<i>The National Action Plan for Conservation of the Northern Bald Ibis in Morocco</i>
10:40 - 11:00	Yassine Baladia	<i>The Wild Northern Bald Ibis: Expanding from Souss-Massa National Park to the World.</i>
11:00 - 11:10	Discussion of the previous presentations	
11:10 - 11:40	Coffee break	
11:40 - 12:00	Jorge Orueta	<i>Northern Bald Ibis Conservation from SEO/BirdLife's Perspective and Experience</i>
12:00 - 12:20	Bernat Garrigós	<i>NBI Release Proposal for the Empordà</i>
12:20 - 12:40	Miguel Casares	to be announced
12:40 - 13:00	Juliane Pokorny	<i>The Northern bald ibis EEP - an Overview and Current Data</i>
13:00 - 13:10	Discussion of the previous presentations	
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14:10 - 14:30	Caterina Spiezio	<i>Individual and Social Behaviour of Juveniles and Adults of Northern bald ibis (<i>Geronticus eremita</i>): Ex-Situ Conservation for Reintroduction.</i>
14:30 - 14:50	Tatiana Beuchat	<i>20 Years of Support for Species Conservation</i>
14:50 - 15:10	Willam Costa	<i>An Introduction to the EAZA Conservation Translocation Working Group</i>
15:10 - 15:30	Thomas Grangeat	<i>Management of a Free Flying Group of 14 Bald Ibis</i>
15:30 - 15:40	Discussion of the previous presentations	
15:40 - 16:10	Coffee break	
16:10 - 16:30	Markus Unsöld	<i>Some New Historical Facts about the Northern Bald Ibis in Europe</i>
16:30 - 16:50	Carlos Castillo Gomez	<i>Can the Northern Bald Ibis Become a Rock Star? Should It?</i>
16:50 - 17:00	Discussion of the previous presentations	
19:30	Collective dinner at a local restaurant at the invitation of Förderverein Waldrappteam	



Friday

08:30 - 09:00	Meeting and departure for excursion
10:00 - 13:00	Excursion to local NBI breeding sites
13:00 - 14:00	Lunch at a local restaurant
14:00 - 15:00	Excursion to local NBI breeding sites
16:00	Arrival back in Jerez - official end of Symposium



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1. Oral Presentations

The wild northern bald ibis: Expanding from Souss-Massa National Park to the world.

Baladia, Yassine; El Bekkay, Mohammed

The Northern Bald Ibis (*Geronticus eremita*), one of the world's most endangered bird species, maintains its last wild population in Morocco's Souss-Massa region. Historically on the brink of extinction, the species has experienced significant recovery, leading to its reclassification on the IUCN Red List from "Critically Endangered" to "Endangered." This remarkable turnaround is the result of Morocco's dedicated conservation efforts, spearheaded by the National Agency of Water and Forests, in collaboration with international partners and conservation organizations.

The establishment of Souss-Massa National Park in 1991 was pivotal in securing the survival of this species. At its inception, the park housed less than 300 individuals, including 60 breeding pairs. Over three decades of conservation measures, including habitat protection, monitoring, and community engagement, have fostered a substantial population increase. Current estimates exceed 800 individuals, with more than 180 breeding pairs.

Additionally, the range of the species has begun to expand. Northern Bald Ibis individuals have been observed beyond Souss-Massa, with sightings reported in other Moroccan regions such as Safi, Boujdour, and Khenifiss. Remarkably, the species has also been spotted in France, marking its first appearance in the wild there after nearly 400 years of local extinction.

The daily conservation efforts at Souss-Massa National Park remain integral to the continued success of this iconic species. These actions not only secure its survival but also contribute to expanding its geographical distribution, underscoring the importance of sustained conservation strategies and international collaboration. The recovery of the Northern Bald Ibis serves as a powerful example of how targeted conservation initiatives can restore species once thought to be on the brink of extinction, offering hope for global biodiversity conservation.

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20 Years of Support for Species Conservation

Beuchat, Tatiana

For 20 years, Bioparc Zoo of Doué-la-Fontaine has been actively involved in the conservation of the bald ibis (*Geronticus eremita*), an iconic species of threatened biodiversity. As part of this support, Bioparc has made a significant contribution to the Proyecto Eremita, a bald ibis reintroduction program led by the Zoobotanico de Jerez and coordinated by the EEP (European Endangered Species Programme) of the EAZA. This large-scale project aims to strengthen bald ibis populations through rigorous management in captivity and the gradual reintroduction of the species into its natural habitats in Spain.

Bioparc Zoo of Doué-la-Fontaine has played a key role throughout this initiative, contributing to the management of captive breeding programs and ensuring rigorous scientific monitoring. Thanks to this long-standing collaboration, notable progress has been made, with growing populations of bald ibises and successes in field reintroductions, particularly in Spain.

Today, Bioparc wishes to share its experience and perspectives for the years to come. Indeed, reintroduction projects are ongoing and diversifying, with new initiatives in Algeria, where the species was once widely present, and in France, where efforts are being made to extend the bald ibis's range. In Algeria, reintroduction projects are being developed in collaboration with local partners to restore habitats and create favorable conditions for the species' reintroduction. In France, similar programs aim to strengthen the bald ibis population in the south of the country, leveraging the experience Bioparc has gained through the Proyecto Eremita.

Bioparc's ongoing role in the conservation of the bald ibis is part of a broader international collaboration, and the Zoo of Doué-la-Fontaine intends to continue its commitment to ensure a future for this endangered species.

We hope to contribute to the symposium on the bald ibis by sharing the results of these 20 years of collaboration, as well as the future perspectives of ongoing projects. This will be an opportunity to highlight the importance of collective commitment and the involvement of zoological institutions in the preservation of biodiversity.

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Establishing the International Working Group, its role & outcomes for conserving the NBI

Bowden, Chris

The status and population trends for the NBI can be summarised over the past hundred years, as a long and widespread story of declines and regional extinctions. The key threats can be summarised as pesticide use (DDT etc), loss of steppe feeding habitats, and human disturbance and at the cliff nesting sites. Other key factors include direct persecution as well as electrocution and collision threats linked to power infrastructure in many parts of the range. The main conservation initiatives and organisations, range-state governments, and individuals involved are summarised, and with growing government engagement in the implementation, there has been significant evolution over more recent years. The establishment of IAGNBI in 1999 was an important step towards the coordination of the diverse set of organisations involved, leading to the production of the International AEWA Single Species Action Plan published in 2006 which drew heavily on IAGNBI expertise. This then led to the need for an inter-governmental International Working Group (IWG), established in 2012, revising the Action Plan in 2016. The welcome growing engagement of governmental responsibility for the species has been coordinated through IWG workshops, updating of the action plan, and with documented and agreed interim implementation planning. The overall scope of the action plan is explained, and how future priorities will be further refined through this process to keep focus on the key actions needed for conserving the species. Meanwhile research and wider engagement for the species, including translocation methodology, and a range of research studies has been successfully progressed by an array of organisations and individuals, and there is an ongoing need to strengthen links and ensure such work targets key questions arising from efforts within the former range.

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Tracking Northern Bald Ibis in “Proyecto Eremita”: a quick overview

Cano Alonzo, Luis Santiago; Cabral, José A.; Quevedo, Miguel A.; Fernández-López, Javier; López-Vázquez, José Manuel;

“Proyecto Eremita” was started in 2004 to establish a sedentary, free-flying colony in southern Spain. There is information of 269 tagged ibises between 2014 and 2023: 145 males, 89 females and 35 with unknown sex. 138 tagged birds were born in captivity, 115 tagged ibises were born in the wild, and 5 birds were breeding by foster parents. According to the tracking data, the reintroduced and sedentary Spanish population does not have contact with the wild population of Morocco after 21 years since the reintroduction began, the reintroduced ibises have not established a flyway to Morocco, do not show regular movements between Spain and Morocco, even do not have dispersal movements to Morocco. The individual distribution size ranged depends on animal sex and born origin. Both males and wild-born individuals showed significantly bigger occurrence distributions than females and captive-born. Regarding the mortality (N = 75), the main cause is electrocution (30 cases); other causes are; predation (14 cases); diseases (12 cases); collision “sensu lato” (12 cases, including 1 case of car collision and 1 case of golf ball impact); shots (4 cases), heavy rain (2 cases) and wind turbine (1 case).

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Can the Northern Bald Ibis Become a Rock Star? Should It?

Castillo Gómez, Carlos

We often see that the greatest challenges in species conservation are more emotional than technical. They revolve around convincing and persuading decision-makers to take action for those species. This can make a vital difference—such as whether or not there is sufficient funding to undertake a complex project that ensures their future. The challenge becomes even greater when the species in question is not seen as “cuddly” by human standards, unlike lynxes, pandas, or lemurs. In these cases of “non-VIP species,” such as the Northern Bald Ibis, we need to take it a step further and craft a creative, high-impact strategy to build “Ibis Pride.” The goal is to raise awareness, foster a connection with the species, and, most importantly, inspire society to stand by it. This is the difference between merely spreading knowledge and truly captivating an audience—between simply knowing a species and genuinely caring about it. In this talk, we will explore the case of the Northern Bald Ibis and its potential to become a rock star—appreciated and recognized beyond scientific or technical circles. A direct connection with society is critical for its survival and future.

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An Introduction to the EAZA Conservation Translocation Working Group

Costa, William

Conservation translocations are an increasingly popular conservation intervention, and a critical tool for saving species and restoring ecosystems. Zoos and aquaria have a significant contribution to make to the conservation of species, habitats and ecosystems through conservation translocations. Although zoos and aquaria have traditionally provided captive-bred organisms for release, they also make substantial contributions to conservation translocations by developing and coordinating projects and the provision of staff time, funding, equipment, and expertise.

As of 2019 EAZA member institutions had reintroduced >156 animal species in 260 separate projects over a 58-year period. This is an underestimate of conservation translocation effort as it does not include conservation introductions, wild-to-wild translocations, and projects with a plant and or fungi focus. Overall, conservation translocations remain a popular conservation tool, and it is vitally important that EAZA members follow best practice guidelines to maintain high standards. The EAZA Conservation Translocation Working Group (CTWG) was formed in 2007 to support EAZA members in carrying out high quality conservation translocation projects to contribute to species, habitat, and ecosystem conservation.

The EAZA CTWG facilitates EAZA's mission through supporting members to engage in high-quality conservation translocation projects with a discernible conservation impact, sharing information on conservation translocations, providing fora for discussion and best practice, facilitating training in conservation translocation practice for members and forging and maintaining links with relevant external organisations including the IUCN SSC Conservation Translocation Specialist Group.

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On the road to self-sustainability: Population viability of reintroduced northern bald ibises

Drenske, Sinah; Radchuk, Viktoriia; Scherer, Cédric; Esterer, Corinna; Kowarik, Ingo; Fritz, Johannes; Kramer-Schadt, Stephanie

The Northern Bald Ibis *Geronticus eremita* disappeared from Europe in the Middle Ages. Since 2003 a migratory population has been reintroduced in Central Europe. We conducted demographic analyses of the survival and reproduction of 384 northern bald ibises over a period of 12 years (2008–2019). These data also formed the basis for a population viability analysis simulating the possible future development of the northern bald ibis population under different scenarios. We analysed life stage-specific survival rates, rearing protocols and colonies, and the influence of stochastic catastrophic events and reinforcement translocations on population growth. Life stage-specific survival probabilities were 0.64–0.78. Forty-five per cent of the mature females reproduced, with a mean fecundity of 2.15 fledglings per nest. The complementary population viability analysis indicated that the Waldrappteam population is close to self-sustainability, with an estimated population growth rate of 0.95 and a 24% extinction probability within 50 years. Of the 326 future scenarios tested, 94% reached the criteria of extinction probabilities <5% and population growth rates <1. Stochastic catastrophic events had only a limited effect. Despite comparatively high survival and fecundity rates the population viability analysis indicated that to achieve self-sustainability the Waldrappteam population needs further translocations to support population growth and the implementation of effective measures against major mortality threats: illegal hunting in Italy and electrocution on unsecured power poles. The findings of this study are to be implemented as part of a second European LIFE project.

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The bald ibis in Algeria between the past and the future

Fellous Djardini, Amina; Nafti, Mohammed

Following recent investigations launched by the National Agency for Nature Conservation (ANN), looking on the last nesting sites of the bald ibis in Algeria, original data, resulting from bibliographic and museum collections research adding to fresh interviews of local people residents who have lived near bald ibises breeding sites, allowed us to understand more about its distribution area, ecology and the main disappearance causes.

All of those data, we hope, will be a useful tool for the current project on the feasibility study, researching potential sites for the reintroduction of the bald ibis in Algeria, an approach initiated by AEWA organisation, with the collaboration of the forest administration, national and local partners .

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Waldrappteam's Northern Bald Ibis Field Data Collection in Andalusia: towards a connection between science and education

Fernández Vélez, Chuss; Gutiérrez Ruíz, Victoria; Ceballos Relinque, Christian; Domínguez Márquez, Indhira; Pineda Peña, Claudia; Tirado Oliva, Celia; Tirado Oliva, Érika

Waldrappteam's Northern Bald Ibis Field Data Collection in Andalusia: towards a connection between science and education. Since February 2024, and within the framework of the Waldrappteam project, an exhaustive field data collection work is being carried out in the province of Cadiz on the Northern Bald Ibis arriving from northern Europe. This group, initially composed of 35 birds, is part of the first Human Led Migration (HLM) to Andalusia in 2023. The main objective of this project is to record the feeding territories, analyse the characteristics of the soils and study not only the habits of this species in its natural environment, but also its integration in the area with the local population of resident Bald Ibises of the Proyecto Eremita of the ZooBotánico de Jerez.

The person in charge of carrying out this work in situ is Chús Fernández Vélez, who, in addition to being a volunteer for the Bald Ibis Group of volunteers of the Sociedad Gaditana de Historia Natural (SGHN) and living in the area, participated as a member of the ground team in the last stages of the HLM 2023 expedition.

As of December 2024, the project has been enriched with the incorporation of a group of students from IES La Janda, in Vejer de la Frontera. This team, made up of five students (Celia Tirado Oliva, Christian Ceballos Relinque, Claudia Pineda Peña, Indhira Domínguez Márquez and Érika Tirado Oliva) and their tutor teacher María Victoria Gutiérrez Ruiz, actively participates in the field activities as part of their own research project. Their involvement not only reinforces the scientific work, but also promotes learning, awareness and interest in the conservation of this emblematic species that lives so close to them.

Data collection is carried out by working closely with Helena Wehner, one of the foster mothers of the two HLMs in Cadiz, the 2023 and 2024. Every ten days, Helena sends four locations to survey. These locations correspond to the areas with the highest density of Bald Ibis visits during that period.

In addition to this work, the birds are also monitored, both inside and outside the province of Cádiz, thanks to the collaboration with the Waldrappteam Bird Manager Daniela Trobe, who reports all incidents so that the characteristics of each case can be communicated from Cádiz to the relevant authorities, whether it is an injured or a dead bird, or a bird that has travelled long distances far from



the Spanish breeding areas, and to comply with the legal protocols for collecting, sending and determining the causes of death or injury.

All of this will be discussed in this brief nature talk, which will focus on field data collection, environmental education and the proposal to implicate the local population in the responsibilities of protecting and conserving Bald Ibises as an umbrella species and their habitats.

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The Northern Bald Ibis as a model for behavioural & conservation studies at the Konrad Lorenz Research Center

Frigerio, Didone

We share insights in more than 25 years of behavioural research on the Northern Bald Ibis (*Geronticus eremita*) and span the bow from classical ethology to modern approaches for data collection focusing on the relevance of long-term dataset. Several different approaches have been implemented over the years, including behavioural, physiological and ecological ones. In recent times participative and interdisciplinary approaches were implemented too. Our studies contributed, e.g., to a better understanding of the factors associated with breeding success and mortality risk in an endangered bird species as well as of how NBI move through their environment and how they use foraging areas, roosting sites, and space in general. Additionally, evidence from participative approaches with this avian species generated positive attitudes toward, and lasting interest in, science in primary school children involved in NBI research. The colony of northern bald ibis established by Kurt Kotrschal in Upper Austria in 1997 represents one of the few animal populations worldwide with complete life-history data spanning several decades. The birds are individually marked with a unique combination of coloured leg ring, which allows the long-term monitoring of life-history parameters. We discuss the relevance of integrative approaches involving volunteers for the future of conservation biology and the management of the species.

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Northern Bald Ibis in Europe: 20 Years of Conservation, Research, and Reintroduction Success

Fritz, Johannes; Unsöld, Markus; Gönner, Bernhard; Kramer, Regina; Steininger, Barbara; Wehner, Helena

Over the past 20 years, the conservation and reintroduction of the Northern Bald Ibis (*Geronticus eremita*) in Europe have achieved groundbreaking success. A key milestone has been the world's first successful reintroduction of a migratory bird species, overcoming significant challenges along the way.

This talk will explore the main methodological approaches, focus on major threats to the species, and highlight the most recent challenge—climate change—which has led to the establishment of a second migration route to Andalusia. This development, based on a close collaboration with Proyecto Eremita, has fostered a fusion of the European migratory and sedentary NBI populations, with significant implications for the future development of both populations.

Additionally, the role of fundamental research within the project will be discussed, shedding light on how scientific insights have supported the reintroduction and long-term survival of this iconic species.

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NBI release proposal for the Empordà

Garrigós, Bernat

We propose to initiate an NBI (Northern Bald Ibis) release program in Empordà County, located in northeastern Catalonia, Spain. Over the past three years, we have observed both naturally migrating NBI and human-assisted migrating birds arriving in this area. Empordà, situated between the breeding colonies in the Northern Alps and the wintering grounds in Cádiz, is deemed optimal for establishing a new NBI population. The region is at the same latitude as the NBI wintering area in Orbetello, exhibiting a very similar climate that is only slightly cooler in winter and hotter in summer, with comparable rainfall and wind patterns. Empordà could support a sedentary population with occasional exchanges of individuals during migration. Studies indicate a wide area of suitable habitat within 30 km of the release site. The winter crops in the region include grazing pastures and short alfalfa fields. Empordà contains a very significant proportion of natural protected areas. We plan to release young birds using the methods demonstrated in Jerez, constructing a predator-safe enclosure surrounded by herds of aquatic buPalo and cattle. Our plan includes releasing fifty birds, with half being hand-raised and the other half raised by ibis, to create a manageable and tame flock at the time of release. We will receive the birds after the 2025 breeding season and house them in the enclosure until their release in late March 2026. Throughout 2025, we will continue to study the natural populations of prey invertebrates in the target area. Additionally, we plan future releases and the construction of a breeding tower located away from breeding Eagle Owls to ensure the establishment of a viable population within a few years.

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Electrocution on Medium Voltage Power Poles: Threat to the Reintroduced Northern Bald Ibis Population and Measures Against It

Gönner, Bernhard

Electrocution on medium voltage power poles is the main cause of death in the reintroduced Northern Bald Ibis (*Geronticus eremita*) population in Central Europe. In 31 % of all known cases birds died due to electrocution. A recent paper by Serratos et al (2024) shows that this is a major problem for many bird species, as they found electrocution to cause 40.5 % of human-induced mortality events (637 events in 45 species). In Germany a law places all electric grid operators under the obligation to secure medium voltage power poles against electrocution of birds. Therefore, we observe nearly no cases of electrocution in Germany. Unfortunately, there are no such laws in place in Austria, Italy and Switzerland.

As part of the current LIFE project “LIFE Northern Bald Ibis” (LIFE20 NAT/AT/000049 – LIFE NBI) lead by Tiergarten Schönbrunn, we are securing 160 high-risk power poles around the breeding areas of the Northern Bald Ibis population in cooperation with local network providers. Nevertheless, in the project we can only secure a small area, so we are also lobbying for a legal obligation for electric grid operators to secure all power poles against electrocution.

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Management of a free flying group of 14 bald ibis

Grangeat, Thomas

At a time when the presentation of animals for show purposes is a matter of debate, even within our professional associations, particularly around questions of risks and benefits, we will see how and why, in Amnéville Zoo, to manage a group of 14 free flying bald ibis in an education presentation, through different aspect as the rearing, the training protocols, the installation, the diet, and how to maximize the bird safety against the escape during the free flight session.

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Species Action Planning and Implementation under the African-Eurasian Migratory Waterbird Agreement

Lewis, Melissa

The African-Eurasian Migratory Waterbird Agreement (AEWA) is an environmental treaty that was negotiated under the auspices of the Convention on Migratory Species. Since its entry into force in 1999, AEWA has provided the principal intergovernmental framework for coordinating the conservation of migratory waterbirds and their habitats along flyways in Africa and western Eurasia. One of the key ways in which AEWA does this is by bringing range states together to develop International Species Action Plans for priority species and to coordinate their implementation through dedicated International Species Working Groups. This presentation will provide an overview of AEWA's role and functioning, focusing especially on the development and implementation of International Species Action Plans. It is intended to provide context for a more directed discussion of the AEWA Northern Bald Ibis International Working Group in a subsequent presentation.

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Northern Bald Ibis conservation from SEO/ BirdLife's perspective and experience

Orueta, Jorge

In the 1990s RSPB started a research project on NBI in SMNP focusing on the development of intelligence leading to improving its conservation status. The need to establish a conservation approach based on the cooperation with local human population. SEO/BirdLife started implementing projects through different cooperation agencies in Spain (AECID, Cooperación Canaria) regarding improving the economy of local inhabitants (beekeeping, fisheries, seafood, guiding) as well as their capacities and organization (literacy for women, supporting local cooperatives, training). The close cooperation with the National Park was essential to support dialog and governance. At the same time, while a monitoring system was in place and several research actions took place, the findings were applied directly to conservation, improving reproductive parameters and total population. Wardens were an essential part of this process, as they approached local inhabitants and played a crucial role in the rise of awareness in favour of the conservation of NBI in the region. They received an annual training when their knowledge was updated and feedback received.

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The Northern bald ibis EEP - an overview and current data

Pokorny, Juliane

The Northern bald ibis EEP (EAZA Ex situ Programme) is a coordinated and international effort to conserve the Northern Bald Ibis population and its genetic diversity. Through effective studbook management, collection of up-to-date data and close cooperation between different partners, the long-term survival of the species and its reintroduction and conservation will be promoted.

The Northern bald ibis EEP was founded in 1988 and is one of the longest running EEP's. In my presentation I would like to give an overview of the population trends in the last few years and the current data in the studbook. I will discuss the EEP members, population size, age structure, sex ratio, hatching and mortality rates, inbreeding rates, research topics, etc.

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Proyecto Eremita

Quevedo, Miguel A.; Cabral, Jose

Proyecto Eremita, started in 2004 as a joint project between Zoobotánico Jerez Zoo and regional environment ministry of the Andalusian Government. At present the Andalusian population is considered sedentary and composed of around 300 birds with 37 breeding pairs distributed in three breeding sites in the region of la Janda, Cádiz, Southern Spain. For the last 20 years, 695 EEP birds from the EAZA zoos have been released. During the first seven years, the primary release method used was the hand-rearing by characterized foster parents dressed with an ibis-shaped helmet and black t-shirts to slightly distort the human figure. Once the initial hand-rearing group was settled down in the selected area, an average of 30 birds from EAZA zoos were released annually until 2024. These birds were kept in the aviary for an acclimatization period of 2 months before release. All birds are marked with a white or yellow metal and plastic ring. Some of them fitted with GPS/GSM transmitters for geolocation tracking. Currently this population seems to be stable and sedentary. The main mortality causes are electrocution (19,7%), traumatismos (19%) and predation (17,4%). At present the population is under surveillance and monitoring to assess if it can be considered self-sustainable. In the last 20 years, another ongoing reintroduction program is developed in Europe, the LIFE-Northern Bald Ibis. In both projects, the final objective is to establish a viable and self-sustainable sedentary and migratory population respectively, in their distribution area. Proyecto Eremita collaborates since 2023 with the LIFE-NBI to consolidate a migrating route connecting both populations. This is a good example as to how the international conservation organizations, governments, the EEP and EAZA zoos are working together to ensure the long-term survival of this endangered species in Europe.

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Veterinary Care of the European Migratory Northern Bald Ibis Population

Scope, Alexandra; Trobe, Daniela; Esterer, Corinna; Meyer, Jean; Fritz, Johannes

The collaboration with the “Waldrappteam” began in 2008 with scientific projects on the physiology of migration (Bairlein et al. 2015; Stanclova et al. 2017). This soon developed into veterinary care for the population, with control of the chicks for the HLM when they were picked up from their parents, during hand rearing, and before migration. In the early years, the population in the wintering area in Orbetello was also examined yearly before the spring migration. The population became now too large and too scattered for such systematic screenings.

The large amounts of data obtained from various health screenings have been (Spargser et al. 2018) and are being published and are intended to provide a physiological basis for the care of the Northern Bald Ibis.

The "on call" veterinary care reflects the same problems as the known causes of death. The main causes are trauma, unfortunately particularly frequently caused by electrocution and illegal hunting (poaching). Fractures of the extremities and beak are also very common in this species due to their length.

Infectious diseases, including parasitosis, are rare and usually only affect a few weakened individuals.

In the presentation some specific approaches to treatment and a case report will be discussed shortly (Fritz et al. 2020).

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Safeguarding the Northern Bald Ibis: Integrating Management Measures and GPS Tracking

Schmalstieg, Anne-Gabriela; Esterer, Corinna; Trobe, Daniela; Fritz, Johannes

The Northern Bald Ibis (*Geronticus eremita*), an endangered bird, is making a comeback through reintroduction. Those kind of projects for migratory birds presents unique challenges due to the risks associated with long-distance movements across diverse habitats.

Post-release monitoring is critical for evaluating reintroduction success and informing adaptive management strategies. GPS tracking technology has revolutionized our ability to monitor individual birds, providing detailed information on movement patterns, habitat use, and stopover sites. This real-time data allows the project to identify critical habitats, assess potential threats, and intervene promptly if necessary. Tracking the movement also extends to the breeding grounds, providing valuable insights into nesting success and potential challenges. This information guides conservation efforts, ensuring the ibises have the best chance to thrive.

By integrating GPS tracking data with comprehensive management measures, conservationists can proactively address challenges faced by reintroduced birds. This approach enables the identification of mortality risks, such as collisions with power lines or illegal hunting.

The successful reintroduction of migratory birds hinges on the integration of robust management measures and advanced GPS tracking technology. This presentation will delve into the critical role of proactive management in the reintroduction of the Northern Bald Ibis (*Geronticus eremita*) with a focus on the integral role of the Field Management in this project and how the approach ensures the safety and long-term viability of reintroduced populations, contributing to the conservation of this remarkable and iconic species.

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The National Action Plan for Conservation of the Northern Bald Ibis _Morocco_

Sikli, Latifa

The Bald Ibis (*Geronticus eremita*) is a rare and critically endangered bird species, classified as Endangered (EN) on the IUCN Red List. Once widespread across Europe, North Africa this species experienced a dramatic decline, disappearing from most of its range by the 17th century. Currently, the last remaining wild breeding population, is found in Morocco, within Souss-Massa Region, where conservation efforts have shown promising results.

In response to the ongoing threats faced by this species, the National Agency of Waters and Forests launched an action plan for 2012-2022 to enhance conservation efforts in the Souss Massa region. Following its completion, the plan was revised in 2022 to address emerging challenges and focuses on five strategic areas:

- **Habitat Protection:** Key actions include preventing illegal construction, managing agricultural expansion, and safeguarding critical habitats essential for the species' survival.
- **Reduction of Disturbance:** Strengthened monitoring, controlled access to sensitive sites, and public awareness campaigns aim to minimize human interference with the Bald Ibis.
- **Improvement of Breeding Success:** Measures such as enhancing nesting platforms, managing predation, addressing external threats, and closely monitoring breeding activities help improve reproductive outcomes.
- **Mitigation of Population Vulnerability:** Initiatives include establishing a captive population at Ifrane Park to support reintroduction efforts, creating new colonies, and improving health surveillance.
- **Advancement of Scientific Knowledge:** Research focuses on understanding the species' dispersion, habitat use, diet, mortality, and genetic diversity to better inform future conservation actions.

These integrated efforts aim to stabilize and grow the Bald Ibis population, ensuring the survival of this iconic species in Morocco and contributing to global biodiversity conservation.

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Individual and social behaviour of juveniles and adults of Northern bald ibis (*Geronticus eremita*): ex-situ conservation for reintroduction

Spiezio, Caterina; Valsecchi, Valentina; Sandri, Camillo; Regaiolli, Barbara

The Northern bald ibis (*Geronticus eremita*) (NBI) is one of the most threatened birds in the world. Intense conservation efforts have been undertaken and several research projects on the species are being done in Morocco and in Europe. Observing animal behaviour has been proved to be an efficient and non-invasive technique to assess the animal welfare, with the performance of a wide array of natural behaviours being one of the mostly used indicators of good mental and physical well-being. The aim of this study was to investigate the behaviour of a flock of 14 zoo-living NBI of different ages. The study focused on the variety of species-specific individual and social behaviours, in the light of reintroduction of the study juveniles in the wild. Per subject, 20 10-min. sessions were done. A continuous focal animal sampling method was used to collect individual and social behaviours. Behavioural data have been compared between adults and juveniles as these last ones had to be reintroduced in the wild. Moreover, a Behavioural Variety Index (BVI) has been proposed and calculated based on previous literature describing natural ibis behaviours. The BVI might help in the evaluation of the variety of behaviours performed by each individual and the monitoring of the diversity of the behavioural repertoire of zoo animals. Our results showed that the birds performed species-specific behaviours, and no abnormal behaviour was reported. Moreover, the BVI highlighted a good behavioural variety as each bird performed approximately 78% of the natural behaviours described in the Northern bald ibis and in close relative species. Our findings seem to suggest the presence of qualitative and quantitative similarities between the behavioural repertoires of the study ibises and those described in wild conspecifics, suggesting a good welfare of the colony.

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Protecting Northern Bald Ibis from Illegal Hunting in Italy

Stefani, Laura; Peroni, Roberta; Fritz, Johannes

The illegal hunting of Northern Bald Ibis represents one of the most significant challenges to the species' reintroduction efforts in central Europe. Our data reveals that this environmental crime accounts for 17.6% of documented mortalities in our monitored population, reaching an alarming peak of 26% of confirmed deaths in Italy during 2023. These statistics likely underestimate the true impact, as approximately half of all deaths remain unverifiable due to missing remains.

The recent establishment of a new migratory route through Spain has unfortunately exposed our birds to similar threats. Within just two years of implementing this Spanish corridor, we have already documented three cases of illegal hunting, suggesting a concerning pattern that mirrors our long-standing challenges in Italy.

In the first project years, we concentrated our strategy on preventative measures, i.e. raising awareness among citizens and key stakeholders. However, in this second LIFE project, we intend to shift our focus towards more direct political advocacy. This shift in approach recognizes that long-term protection for the Northern Bald Ibis requires influencing policy decisions at the governmental level. By directly engaging with political leaders and policymakers, we aim to reshape legislation and enforcement mechanisms to better safeguard this endangered species against the persistent threat of illegal hunting.

Through targeted lobbying, conferences, and collaborative partnerships with authorities, including the Carabinieri, we will work to ensure that biodiversity protection becomes a higher priority on the political agenda. Our initiatives have successfully integrated us into a broader network of conservation organizations dedicated to fighting wildlife crime.

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The Method of Human-Led Migration: A Unique Approach to Restoring the Migratory Tradition of Birds Like the Northern Bald Ibis

Steininger, Barbara; Wehner, Helena; Fritz, Johannes

Since 2004, the Waldrappteam has been guiding hand-raised juvenile Northern Bald Ibises from their breeding sites to a suitable wintering area using the unique method of human-led migration.

In this approach hand-raised juvenile ibises imprint on human foster parents, who then guide them along migratory routes using ultralight aircraft. This technique teaches the birds the necessary pathways between breeding and wintering grounds— knowledge that is traditionally passed from parent to offspring.

This method, currently carried out exclusively by the Waldrappteam, has been refined over the past 20 years.

The chicks selected for hand-raising are collected from zoo colonies when they are only a few days old. They are taken into the care of two human foster parents, who are their sole caregivers and maintain exclusive contact with them.

At around seven weeks, the Northern Bald Ibises fledge and begin flight training at a specially adapted campsite near a breeding colony. Using the strong bond between the birds and their foster parents, the juveniles are slowly habituated to the aircraft and trained to follow it.

Since 2023, the Waldrappteam has been working to establish a new migration route. Instead of leading the birds to the original wintering site in Orbetello, Tuscany, they are now guided to southern Spain, where the sedentary colony of Proyecto Eremita is located. This decision was made due to a shift in autumn migration patterns and the resultant need to find a route that avoids the Alps as a migration barrier.

The journey to Spain covers more than 2,600 kilometers, completed in up to 21 flight stages. Along the way, the team and birds must overcome challenges such as shifting weather conditions and technical challenges.

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Some new historical facts about the Northern Bald Ibis in Europe

Unsöld, Markus; Fritz, Johannes

In the 17th century, the Northern Bald Ibis (NBI) was extinct in Europe, and shortly afterwards, disappeared completely into oblivion. Today, it's not only back in Europe, but more and more of the knowledge about its history has also been rediscovered. A lot of previously unknown sources could be found, but well-known writings also contain previously unnoticed content, like Conrad Gessner's Book of Birds. Other frequently cited historical sources turn out, on closer inspection, not to be about the NBI at all, like a collection of recipes entitled "Five different dishes can be made from the Drappen", which is decorated with a NBI figure based on Gessner – but in the end, are also references to the NBI as a Central European species.

A new historical colony for Bavaria was found with the help of a historian: In the period between 1461 and 1482, more than 30 "Steinrappen" were listed in the entry books of the Baumburg monastery close to lake Chiemsee. Gessner gives this as a local name for Bavaria, which could even come from the place of origin of most of the individuals listed here: Castle Stein in Stein an der Traun in Chiemgau.

The special thing about these data is that the entry dates contain the number of NBI, often the exact date, the amount of the tip, the giver and the deliverer. This is unique on this scale and allows hypotheses.

The data suggest that, as described by Gessner (1557), NBI were removed as juveniles that had not yet fledged, and were not shot. Compared with the data of the reintroduced migrating NBI of Waldrappteam, the spring migration and the nesting period didn't change since more than 560 years. The rocks at Stein Castle and the surrounding area still seem suitable for a colony even today.

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Remote Sensing for Conservation of the Northern Bald Ibis – Ongoing Studies and Opportunities

Wehner, Helena; Fritz, Johannes

Earth observation and satellited-based remote sensing data is connected to GPS data of Northern Bald Ibises (NBI) across Europe to monitor ongoing reintroduction as well as supporting new conservation strategies. The Northern Bald Ibis has already been study species for interdisciplinary projects and is study species for ongoing projects, both will be presented by short insights into research aims, methods, challenges and opportunities. The basis for this research is set by freely available earth observation satellite images, e.g. the north American Landsat and the European Sentinel fleet and the GPS transmitters used for the monitoring of the NBI colony.

Habitat studies, well known research cases regarding interdisciplinary work between remote sensing and wildlife ecology, have been conducted for the Northern Alpine Foothills. An ongoing analysis widens the model to the Spanish NBI habitats split by breeding seasons. Influences of snow cover for successful or failed Alps crossing were investigated. In which way environmental factors do influence the start of the autumn migration and the crossing of the Alps by the NBI is yet, not fully understood. An automatised set-up wants to systematically show the shift of migration start, observed synchronised migration starts between different breeding sites and in which way air temperature and air pressure might have an influence.

Still not all opportunities of supporting conservation management by integrating earth observation data into wildlife ecology research, e.g. migration behaviour studies, are used in their full potential. A short insight shall be given into a started project that aims to better connect earth observation data to animal migration data to e.g. helps understanding effects of environmental and climate change on animal migration pathways.

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Insights into the Northern Bald Ibis genetics in European zoo populations

Recommendations for captive breeding and reintroduction

Wirtz, Sarah

The vast number of European Endangered Species Programmes (216, EAZA 2019b) shows that the purpose of zoos has noticeably changed over time. Today, zoos have three main tasks:

- (1) keeping and breeding endangered species (Ivy & Lacy 2012, Lees & Wilcken 2009, Williams & Hoffman 2009),
- (2) performing basic scientific research and
- (3) assuming an educational mandate (Barongi et al. 2015, Brichieri-Colombi et al. 2019).

The example of Northern Bald Ibis emphasizes the fact that deliberate conservation management both in situ and ex situ can help to protect a species from extinction. More than 400 years after the species has gone extinct in Europe, scientists have succeeded in reintroducing it to its former habitats in the pre-alpine region of Germany, Austria and Switzerland (Fritz & Unsöld 2015).

Based on 15 microsatellite loci it could be shown that the European zoo population is vital and genetically diverse. Inbreeding, which is a prominent danger in captive breeding or reintroduced populations, was not seen in the selection of 642 individuals. However, research illustrates a strong genetic structure within the European zoo population which represents dominating breeding lines and is in line with exchanges of individuals recorded in the European Endangered Species Programme (EEP). The results should be taken as a basis to optimize the management of the EEP and to align the Long-Term Management Plan (LTMP) for the Northern Bald Ibis. Our study provides the decisive knowledge that based on present data (mitochondrial DNA sequencing and ddRAD sequencing), the eastern and the western populations do not represent two distinct Evolutionary Significant Units. The fact that the microsatellite analysis showed a clear differentiation between individuals from the eastern and the western population suggests that genetic differentiation between the two populations is recent and can be explained by the fact that both populations are separated by a large geographic distance which prevents genetic exchange.

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2. POSTER

Flying Smart: Energy-Saving Strategies in Migrating Northern Bald Ibises

Fritz, Johannes; Perinot, Elisa; Mizrahy-Rewald, Ortal; Ruf, Thomas; Fusani, Leonadi; Gönner, Bernhard; Wehner, Helena; Voelkl, Bernhard

The poster explores the energy-saving strategies of the Northern Bald Ibis (NBI) during migration, using human-led migration projects to gain insights into avian flight mechanics. Key findings reveal how NBIs optimize their position in V-formations through synchronized wing flapping and spatial alignment, enhancing energy efficiency. Studies demonstrate cooperative behaviours where birds alternate between leading and trailing positions to balance flight costs. Additionally, NBI energy savings are confirmed through in-wake flying, with reduced body acceleration and heart rates. NBIs also utilize thermal soaring and intermittent flap-gliding, further minimizing energy expenditure during migration flights. These findings highlight the diverse and complex strategies NBIs use to minimize energy expenditure during migration flights.

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Habitat Suitability Analysis for the Northern Bald Ibis Across Europe

Gaugler, Tabea; Fritz, Johannes; Wehner, Helena;

Spatial modelling is crucial for planning and implementing conservation and translocation projects. In the following study spatial modelling is conducted to support the reintroduction of the Northern Bald Ibis in Europe. In an interdisciplinary approach, we applied a random forest model to assess large-scale feeding habitat availability for the Northern Bald Ibis (NBI) to support its reintroduction in Europe. By the use of GPS tracking data and satellite imagery, Wehner et al. (2022) achieved 84.5% accuracy in predicting foraging suitability along the northern foothills of the Alps for the NBI. A similar approach is now applied to Spain, focusing on habitats used by a sedentary and a migratory NBI population, extending to areas planned for future reintroduction projects.

While the current static model offers a valuable snapshot of habitat suitability, we plan in a next step to extend the analysis to dynamic climate projections. This is important to account for climate change and its potential effects on habitat dynamics.

This spatial modelling approach can also be transferred to regions outside Europe where NBI conservation is ongoing or planned. We consider this approach to be especially important in areas where the impacts of climate change are expected to be most intense, and where adaptive strategies are crucial for the success of reintroduction programs.

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From 3D prints to real life: Northern Bald Ibises at Lake Constance

Winkler, Viola; Gönner, Bernhard; Kramer, Regina; Fritz, Johannes

After initial difficulties in relocating the northern bald ibises in Überlingen on Lake Constance (Baden-Württemberg) from an artificial breeding wall to a natural rock niche at Katharinenfelsen, a new behavioural biology approach was tested: decoys were used to attract the colony-breeding birds. To encourage breeding behaviour, ample nesting material and two Northern Bald Ibis decoys, produced in the 3D laboratory of the Natural History Museum, were placed in a niche over twenty meters high on the rock in February 2024. A previously created 3D scan was adjusted to a sitting position using graphic software and then printed multiple times with a 3D printer. The heads were then painted to resemble the living model more closely. This approach proved successful, as seven northern bald ibises displayed courtship behaviour and roosted in the niche, raising hopes for imminent breeding.

This initiative and long-term management led to a significant success: for the first time in 400 years, northern bald ibises independently bred again in a natural rock niche near Überlingen. This marks an important milestone in the reintroduction of these migratory birds, which were once extinct in Europe. In total, five breeding pairs raised around a dozen fledglings. The young birds are expected to migrate to Tuscany in the fall, contributing to the stability of the colony. At the same time, young birds hatched in zoos continue to be released into the wild and trained on migration routes to establish a stable population.

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The Northern Bald Ibis *Geronticus eremita* in Europe: New Findings on the Historical Occurrence and Migratory Behaviour

Schenker, André

Evidence from the 14th century confirms a breeding population of the Northern Bald Ibis in western France. By analogy with today's situation, a similar migration flyway division can be assumed for the European Northern Bald Ibis population in Central Europe at that time.

A naturalistic drawing of an adult NBI from 1561 indicates a previously unknown occurrence in the French-Swiss Jura Mountains.

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External breeding areas and extraordinary nesting sites of the Northern Bald Ibis

Schmalstieg Anne-Gabriela; Trobe Daniela; Esterer Corinna; Gönner Bernhard; Fritz Johannes

The Northern Bald Ibis (NBI) typically prefers steep rock faces with numerous niches for breeding, providing protection from predators and harsh weather conditions. However, the migratory European NBI population exhibits a remarkable adaptability in nest site selection. In two of four established breeding areas, birds nest on natural rock faces, while in the other two, they utilize artificial breeding walls designed to mimic natural niches. Breeding success remains consistently high across all sites, with no significant differences between natural and artificial structures.

In recent years, an increasing number of individuals have begun to select novel, atypical nesting structures outside established colonies. However, breeding success at these exceptional sites remains low, potentially due to geographic isolation and limited connectivity with established colonies. Nevertheless, this trend suggests an adaptive advantage, enhancing the population's resilience to environmental stressors, habitat loss, climate change, and disease outbreaks. This study highlights the importance of considering behavioural plasticity in conservation efforts and habitat management for this endangered species.

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Conservation education to save the Northern Bald Ibis (*Geronticus eremita*) by involving children and hunting associations

Spiezio, Caterina; Dell’Aira, Katia; Tezza, Marta; Ottolini, Giorgio; Sandri, Camillo; Gönner, Barnhard; Fritz, Johannes; Avesani Zaborra, Cesare

The LIFE+ Biodiversity Project (2014-2019) lead by the Waldrappteam with 50% contribution of the LIFE financial instrument of the European Union (LIFE+12-BIO_AT_000143) is the first scientifically based attempt to reintroduce an extinct migratory bird species, *Geronticus eremita*, in its original European range. Illegal hunting is a major threat for the Northern Bald Ibis and Parco Natura Viva had an important role in the campaign to raise awareness during the autumn migration. Thanks to the educational project “Custodi dell’Arca” run by Parco Natura Viva, 1,500 children of different Italian schools had been involved in experiencing to act for this conservation project: children did drawings and wrote stories about the Northern bald ibis project to be collected in an activity book.

Moreover, in October 2014, an event called “Reason for Hope Festival” was organised by Parco Natura Viva in collaboration with Waldrappteam, within the Annual National Research Conference. During the event, two Italian hunting associations signed an agreement at the presence of Jane Goodall, Johannes Fritz and the Director of Parco Natura Viva, Cesare Avesani Zaborra, to protect this and other endangered migratory bird species from illegal hunting in Italy. The associations also adopted two Northern bald ibis as a clear sign of their awareness. In addition, at the closing session of the event, schoolchildren performed a show, dancing and playing instruments to raise awareness about the importance to preserve this critically endangered species. The result of the educational program was that 10 schools joined the Ibis Adoption Program to help the reintroduction project. These are examples of actions for conservation.

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Minimizing Impacts of Biologging Devices: The Effect of Shape and Position

Steininger, Barbara; Mizrahy-Rewald, Ortal; Voelkl, Bernhard; Grogger, Herwig; Ruf, Thomas; Fritz, Johannes

The European migratory Northern Bald Ibis (NBI) population has been GPS-monitored since 2014, providing critical insights into movement patterns and mortality risks. However, biologging devices can also cause unintended physiological and behavioral impairments. Our research addresses two key issues: Unilateral Corneal Opacity (UCO) and the aerodynamic impact of device shape and placement.

Since 2016, some individuals with solar-powered GPS devices mounted on the upper back have developed UCO, leading to vision impairment. Removing or repositioning the devices eliminated the issue, likely caused by corneal heating from device radiation during roosting. Additionally, wind tunnel experiments and field data demonstrate that poorly designed housings increase energy expenditure and disrupt flight efficiency, particularly when mounted on the upper back. Our findings highlight the importance of aerodynamically optimized designs and lower-back placement to minimize negative effects, improving both bird welfare and tracking reliability.

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Incorporating Climate Change into Conservation Planning: The Case of the Northern Bald Ibis

Unsöld, Markus; Gönner, Bernhard; Kramer, Regina; Wehner, Helena; Fritz, Johannes

Climate change is reshaping conservation strategies, necessitating adaptive approaches to species protection. Over the past 20 years, we have re-established a migratory Northern Bald Ibis (*Geronticus eremita*) population in Central Europe, now numbering around 280 individuals. However, warming temperatures are delaying autumn migration, leaving an increasing number of birds stranded in the northern Alpine foothills, where they face life-threatening conditions (Fritz et al. 2024). Emergency captures have been required but are not a sustainable solution.

To address this challenge, we are establishing an alternative migration route to Andalusia, Spain, connecting the reintroduced population with the sedentary one, established by *Proyecto Eremita*. This route bypasses major mountain barriers, ensuring successful migration despite climate-driven delays. Our project highlights the critical need for climate-adaptive conservation strategies to enhance species resilience in a rapidly changing environment.

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Can Migratory and Sedentary Populations Merge Successfully? A Space Use Perspective

Wehner, Helena; Kölsch, Emma Charlie; Quevedo, Miguel Angel; Fritz, Johannes

Reintroduction efforts have established both migratory and sedentary Northern Bald Ibis (NBI) populations in Europe. As climate change disrupts the traditional migration route to Tuscany, an alternative route to Andalusia is being developed—an unprecedented attempt to integrate migratory and sedentary populations. Key questions include whether migratory birds will return to their breeding sites and how they may influence the sedentary population.

The case of 'Ingrid,' a juvenile NBI who migrated to Andalusia in 2022 and attempted a return in 2024, suggests route fidelity. Migratory juveniles also undertake extensive exploratory flights, covering up to 170,000 km², while sedentary juveniles remain within 50,600 km². Notably, three sedentary juveniles joined migratory birds in flight, highlighting potential interactions.

These findings confirm distinct spatial behaviours between migratory and sedentary juveniles. They also reinforce confidence that, upon maturity, migratory birds will return to their breeding sites, supporting the feasibility of this new migration route.

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