

SAIGA NEWS



A group of saigas in the Stepnoy reserve, Astrakhan region, Russia. Photo by Mark Pestov

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“Conservation triumph”: Saiga antelope reclassified from Critically Endangered to Near Threatened on IUCN Red List

This positive status change reflects the species’ remarkable recovery in Kazakhstan and huge conservation efforts across the species’ range, but action is still needed to ensure populations continue to improve.

On 11th December 2023, the IUCN Red List status of saiga antelope (*Saiga tatarica*) was changed from Critically Endangered to Near Threatened, thanks to national and international conservation efforts. This substantial positive change in global Red List status – a rarity in conservation – reflects the remarkable recovery of saiga populations in Kazakhstan, which have risen from a perilous low of just 48,000 in 2005 to now over 1.9 million. The IUCN Red List of Threatened Species is the authoritative global list of the conservation status of the world’s species, which is used worldwide to support conservation efforts, including as a headline indicator of progress in conservation action for the Convention on Biological Diversity. It includes an assessment of the threat of extinction faced by a species, sub-species and at the national level, and also a Green Status score for the impact of conservation action and prospects for recovery.

This triumph is thanks to Herculean conservation efforts over nearly 2 decades by range state governments, national and international NGOs and research organisations,

including the Saiga Conservation Alliance, the Altyn Dala Conservation Initiative (comprising the Association for the Conservation of Biodiversity of Kazakhstan (ACBK), Fauna & Flora, Frankfurt Zoological Society, the RSPB and the Government of Kazakhstan), Wildlife Conservation Society, WWF-Mongolia, and NABU. Long term support from donors has been critical.

The Convention on Migratory Species has also played a crucial role in bringing governments and civil society organisations across the saiga range together, to agree and then implement an Action Plan on the Conservation and Sustainable Use of the Saiga Antelope, in coordination with the Convention on International Trade in Endangered Species (CITES). Under this Action Plan, the partners have together implemented anti-poaching measures, improved available habitat and monitored existing populations, as well as worked with local communities to raise their awareness of the issues facing saigas and to form community-led ranger teams.

Such an improvement in status shows that conservation and management measures are working and must continue. Yet despite this good news, conservation action is still urgently needed to ensure that saiga antelope has a long-term sustainable future in Kazakhstan, and to ensure that populations recover in Mongolia, the Russian Federation and Uzbekistan, against the many threats the species still faces.

The species will only be fully recovered if it regains its role in the ecosystem across its entire range, which will require the ongoing threats which it faces to be addressed in each of its populations. Their new Near Threatened category reflects the potential for the species’ status to deteriorate rapidly in the absence of ongoing conservation action. This nuanced picture is reflected in the saiga’s Green Status of Species score, which is “Largely Depleted”. This highlights that saigas are not yet playing their full role in the ecosystem across their whole range, despite impressive conservation efforts. However the species’ Green Status also demonstrates that there is excellent potential for further recovery if conservation efforts are continued and intensified, range-wide.

The published saiga assessment on the Red List website can be found here: iucnredlist.org/species/19832/233712210

The details on the saiga’s Red List and Green Status can be found here: iucnredlist.org/species/19832/50194357

Join us at the CMS Conference of the Parties in Samarkand

The saiga antelope will be a prominent species at the 14th Conference of the Parties to the Convention on Migratory Species, which is taking place on 12th-17th February 2024 in Samarkand, Uzbekistan. This is only right, as the saiga is a flagship species in CMS's activities within Central Asia. Highlights will include an official side event led by the Government of Kazakhstan, celebrating the success of the CMS/CITES Memorandum of Understanding on the Conservation and Sustainable Use of the saiga antelope, which has seen a spectacular recovery of this species since the MoU was signed in 2006.

The Saiga Conservation Alliance will be holding an Annual General Meeting and Strategic Planning workshop on 11th February, the day before the official Conference of the Parties. This will be a chance to meet colleagues from across the saiga range and hear about their work, as well as considering how best the SCA can support the saiga community over the next five years. Everyone with an interest in saigas is welcome to join us.

There will be other official saiga side events, and several USFWS-funded saiga projects will take the opportunity to meet and exchange ideas and updates.

You can register for the Conference of the Parties here: meetings.cms.int/meetings/COP14/registration

Please email saigaalliance@gmail.com if you would like to attend the Strategy Day on 11th February, or if you would like to be kept up to date on the calendar of saiga-related events.



Saigas at a watering hole. Photo by Babette Fourie

PETER DAMERELL¹

Launching 5 years of collaborative work on the saiga horn trade

In 2023 five exciting new projects addressing the illegal trade in saiga Horn started (see article by Tatiana Hendrix in SN-28), as well as an overarching project led by the SCA, entitled “Building a collaborative foundation for evidence-based saiga antelope conservation”. This is designed as an enabling project for the whole portfolio of U.S. Fish and Wildlife Service (USFWS) funded saiga antelope projects. Through it we will be actively supporting the other 5 projects to identify opportunities for collaborative activities, foster ongoing learning and evidence generation, and invest in capacity building for the long-term sustainability of saiga conservation. This way we can collectively accomplish more than if each project operated in isolation from the others.

The first significant activity for building collaboration within the portfolio of projects was to bring together representatives from all of the projects at an inception meeting. Held in Oxford, UK between the 20th and 22nd of March 2023, project representatives were joined by staff from two additional saiga conservation programmes; the Altyn Dala Conservation Initiative and the project “Resurrection

Island: enterprise, conservation and development around the Aral Sea”. We were also pleased to welcome representatives from the Convention on the Conservation of Migratory Species of Wild Animals (CMS) and our Programme Officer from USFWS, Tatiana Hendrix.

The inception meeting provided an opportunity for those working across

the trade in saiga horn – from poaching within range states to the purchase of products derived from saiga horn in consumption states – to come together and collectively explore the activities, aims, methods and approaches of their work. It was decided early on that the inception meeting should be held face to face rather than virtually to provide the best possible networking opportunities for the community of saiga conservation practitioners. The portfolio of USFWS-funded projects introduces new participants and geographic areas, such as Japan, to the field of saiga conservation. It was therefore important that new professional relationships could be made as well as reestablishing old friendships. Twenty-five participants were able to join the meeting; whilst our colleagues from China were not able to attend in person, their participation via video call was appreciated by all and enabled them to make valuable contributions to our discussions. The SCA is grateful to the Wildlife Conservation Network for their financial support for participants from Mongolia and Uzbekistan.

Across two and a half days of intense activities we addressed three major themes:

1. The first theme was about understanding the objectives and approaches of the different projects and how they fit within the broader picture of saiga conservation. Each project was introduced to the meeting, allowing participants to identify similarities or differences with their own work. Participants were encouraged to look for opportunities for collaborative activities with



Inception meeting participants. Photo by Peter Damerell

other projects and to consider where opportunities for knowledge exchange existed. Each project also mapped its activities onto the medium-term work plan of the CMS Memorandum of Understanding concerning Conservation, Restoration and Sustainable Use of the Saiga Antelope. This activity gives us a clear picture of which aspects of saiga conservation are being addressed by the work in the portfolio. It also allowed us to look for saiga conservation measures, not currently being addressed within the portfolio of projects, that might prove to be suitable targets for collaborative side projects.

2. The second major theme of the meeting was reflecting on the assumptions and evidence that underpin our work. Participants began carrying out an evidence gap analysis regarding the trade in saiga horn. We spent time considering what evidence is required for our projects' activities. We also shared our knowledge about

existing data sources relevant to the trade in saiga horn. Finally, participants considered the evidence that their work will generate and how to make that data available for the benefit of others. Participants also created a 'theory of change' for their projects. They were asked to think critically about how the activities they propose to undertake will lead to the outcomes they are hoping to achieve. By planning out the causal pathways within our projects and challenging our own assumptions we were able to ensure that our projects were internally consistent and achievable. This initial work will allow a portfolio-scale theory of change to be developed in the second half of this year.

3. The third theme of the event was about collaborative work. Participants explored promising opportunities for knowledge exchange and shared training activities. Training in horn stockpile management was just one of a number of promising

opportunities for shared learning that were identified. Informed by activities undertaken earlier on in the inception meeting, participants also developed concepts for collaborative side projects. These smaller projects, which fall outside of the core activities of the 6 projects, might address a significant evidence gap or support part of the Medium-Term Work Plan that is not currently being addressed. Developing and supporting these side projects and creating opportunities for shared learning will be core to the SCA-led project's work over the next few years.

Across the two and a half days of the inception meeting I was delighted to see all the participants come together and work with enthusiasm on activities designed to connect them to each other and build on the amazing foundations which their projects provide. The community of researchers and practitioners working to conserve saiga antelope has grown considerably since I last worked in this field almost a decade ago. I hope that, through the inception meeting, we have created the foundations for friendships that will last for decades more and span across Asia, Europe and North America.

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Development 'theory of change' for better planning of USFWS projects. Photo by David Hill

PRIYANKA SURI¹

Building networks and sharing expertise across six projects addressing the trade in saiga horn

Illegal wildlife trade supply chains are complex and know no borders, with wildlife being moved from source to destination countries across the world. Take the example of saiga antelopes; they naturally occur in the steppes of Central Asian countries of Kazakhstan, Mongolia, Russia and Uzbekistan but are coveted for their horns which are used in Traditional Chinese Medicine (TCM) across Asia.

Illegal wildlife trade supply chains are complex and know no borders, with wildlife being moved from source to destination countries across the world. Take the example of saiga antelopes; they naturally occur in the steppes of Central Asian countries of Kazakhstan, Mongolia, Russia and Uzbekistan but are coveted for their horns which are used in Traditional Chinese Medicine (TCM) across Asia.

The trade and use of saiga horns are quite prevalent in Malaysia, specifically in Peninsular Malaysia, where there is a large Chinese community. For this reason, Malaysia is considered an important saiga consumer and trading country. TRAFFIC has monitored the saiga horn trade in the Malaysian TCM market over the past two decades. Recent observations still show a high percentage of TCM shops selling saiga horn products.

They are sold in a variety of forms that are either raw or processed such as whole horns, horn powder, horn shavings, pills, cooling drinks, soups packs and sometimes as formulations.

As a successful recipient of the U.S. Fish and Wildlife Service's (USFWS) Species Conservation Catalyst Fund (SCCF), TRAFFIC is working closely with PERHILITAN, Peninsular Malaysia's wildlife authority and a CITES Management Authority, to establish and maintain a system to manage saiga horn stocks permitted for trade in the local market. This is to ensure the trade in saiga horns is well-regulated, legal and sustainable.

However, reducing wildlife trafficking and improving conservation outcomes for a species requires targeted and synergistic interventions across a species' entire supply and trade chain. This is one of the primary reasons why the inception meeting organized by the Saiga Conservation Alliance (SCA) between 22–24 March 2023 was so crucial. It brought together twelve organisations, leading and supporting projects under the USFWS SCCF saiga portfolio across the range and consumer states - two projects in the range states of Kazakhstan, Uzbekistan and Mongolia and three in the consumer states of Malaysia, Japan, Singapore and China.

The SCA organized the inception workshop in Oxford, United Kingdom, with the intention to ensure the cross-pollination of expertise and ideas between projects rather than the projects operating in silos. It was clear from the get-go that there's a wealth of knowledge and passion among the participants who are dedicated to improving



Diogo Veríssimo's talk about saiga horns trade in Malaysia.

Photo by Peter Damerell

conservation outcomes for saiga antelopes. Buuveibaatar Bayarbaatar from Wildlife Conservation Society Mongolia phrased it aptly when he said, *“The in-person format was particularly effective, as it enabled us to have in-depth discussions about the similarities between our projects and potential opportunities to collaborate within the USFWS catalyst fund to further reduce or eliminate the saiga horn trade.”*

The workshop started with a presentation on the individual projects under the USFWS portfolio, which painted a big picture of the breadth of work being undertaken. This was helpful as it set the stage by ensuring participants were familiar with each other’s projects and expertise. As Madina Tauyekelova from the Association for the Conservation of Biodiversity of Kazakhstan said, *“The inception meeting allowed me to personally meet all the project representatives and learn about their proposed activities to reduce the illegal trade in saiga horn.”*

Various activities were carried out during the meeting, which involved mapping projects to the Convention on Migratory Species Medium Term International Work Programme (CMS MTIWP) to ensure project activities contribute to conservation goals outlined for the species. In addition, participants collectively identified gaps in evidence, ways in which expertise can be shared across organizations and ideas for potential collaborations, especially on streamlining similar activities across projects and countries. For example, Buuveibaatar echoed the participants’ sentiments when he said, *“I am looking forward to several collaborative events and activities throughout the projects. Specifically, I am excited to find out about a potential collaboration with TRAFFIC in Malaysia to develop a saiga horn stockpile management protocol. It was also a great pleasure to connect with other scientists who have a great deal of experience with social survey methodology, such as the Unmatched Count Technique, which is an approach that we are going to apply in our social surveys in western Mongolia.”*

The strongest outcome of the meeting was that it provided an opportunity to present a unified voice for saiga conservation, which will help ensure that the portfolio is more than the sum of its parts. Media identified include the SCA’s communication channels, the CMS Conference of Parties that will be held in Uzbekistan in February 2024 and other communication platforms that can be used for the participants to collaborate beyond the inception meeting.

The meeting provided an avenue to create a sustainable, inclusive network of experts who can learn from each other in the field of saiga conservation to reduce the threat of trafficking to the species and to ensure lessons learnt are shared throughout the lifetime of the project portfolio.

At the heart of the meeting was the recognition that it is only through collaborative partnerships across Saiga projects, geographies and sectors that we can develop integrated and enhanced wildlife management approaches with improved conservation outcomes.

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During the presentation on the new USFWS projects.
Photo by David Hill

Welcome to Waleri Schmunk

We are happy to introduce Waleri Schmunk, the new Trustee of the Saiga Conservation Alliance. We asked him to tell us a little about himself and his experience in saiga conservation.

It just so happens that my experience combines both a scientific background and practical nature conservation. I started as a virologist, but the last 14 years have been dedicated to the conservation of rare species of animals and plants. Finally, 7 years ago when I was the Director of the WWF-Russia Caucasus Office, I first saw a saiga rushing across the steppe, which made a very strong impression on me. But what impressed me even more was the dedicated work to protect the saiga antelope, which was carried out by a very small team of rangers. It was on

the territory of the Stepnoi Sanctuary in the Astrakhan region, Russia. It was then that my colleagues and I at the WWF-Russia learned about the threat that loomed over the saiga antelope in the Pre-Caspian region, as well as about the basic needs that are needed for its conservation. With the help of scientists, protected areas, and businesses, we were able to create conditions for the growth of the saiga population. Special attention was given to strengthening habitat protection (conducting anti-poaching raids, increasing the technical capabilities of rangers,



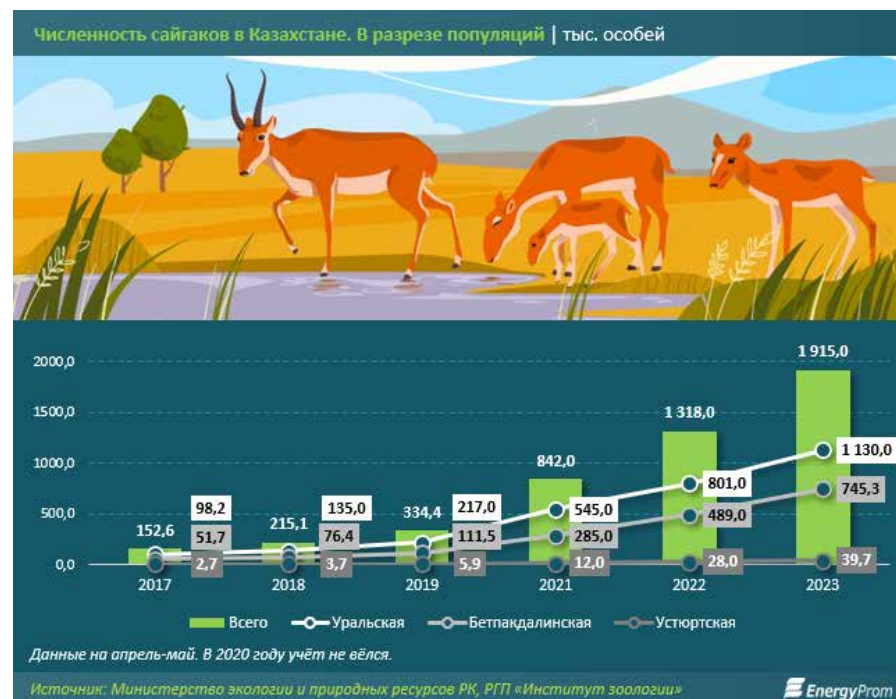
implementing measures against wild-fires), supporting monitoring of saiga using camera traps and surveillance cameras, raising awareness and developing innovative approaches to assessing the number of animals using unmanned aerial vehicles. I am ready to share my experience with all interested parties throughout the saiga range.



Juvenile and adult male saigas in Stepnoy reserve, Russia. Photo by Mark Pestov

ALYONA KRIVOSHEYEVA¹

Saiga numbers in Kazakhstan approaching 2 million



Trend in saiga numbers. Infographic by energyprom.kz

Okhotzooptom – a country-wide enterprise supported by the State budget under the Forestry and Wildlife Committee, Ministry of Ecology, Geology and Natural Resources of the Republic of Kazakhstan – organises an annual aerial survey of saigas in all the three populations on the country's territory.

The 2023 survey, which lasted from 15th April to 5th May, was carried out using an EC-145 helicopter. The total flight duration was 200 hours, with 100 hours spent on the Betpakdala population, 60 on the Ural and 40 on the Ustyurt population.



Survey team. Photo by ACBK

The aerial survey recorded a total of 1,915,000 individuals in Kazakhstan in 2023, which is 45.3% higher than 2022. The Ural population (the most numerous at the moment in Kazakhstan and the world) comprised 1,130,000 individuals (41.1% increase), the Betpakdala population – 745,300 individuals (a 34.4% increase, including 25,300 forming the "eastern group" in Pavlodar, Karaganda and Abai regions, which was counted in a ground survey), and the Ustyurt population consisted of 39,700 individuals (41.8% increase).

The aerial survey was carried out by ACBK specialists in cooperation with representatives of the Okhotzooptom, Forestry and Wildlife Committee's regional territorial inspections and protected areas within the saiga range, including Bokeyorda, Altyn Dala, Irgiz-Turgai and Korgalzhyn Reserves.

As in previous years, the 2023 aerial survey was fulfilled in accordance with the "Methodological recommendations on saiga air survey in Kazakhstan" approved by the scientific and technical council of the Forestry and Wildlife Committee on 17th March, 2014, which ensures comparability of the results with previous years.

However, the increase in saiga numbers (and, accordingly, density) has caused a problem of accuracy in the counting of the animals in large groups. Therefore, there is now a need to refine counting methods and extrapolate them to accommodate these higher numbers.

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STEPHANIE WARD¹

Altyn Dala – a model of restoration

In December 2022, the UN Environment Programme recognized the Altyn Dala Conservation Initiative as one of ten “World Restoration Flagships, [unep.org/news-and-stories/press-release/un-recognizes-10-pioneering-initiatives-are-restoring-natural-world](https://www.unep.org/news-and-stories/press-release/un-recognizes-10-pioneering-initiatives-are-restoring-natural-world).” Altyn Dala’s goal is to re-establish full functional steppe ecosystems in a vast area of central Kazakhstan, thereby safeguarding the habitat range of the saiga antelope populations found there.

Kazakhstan’s temperate grassland ecosystems are home to a rich diversity of wildlife, but most notably the largest population of saiga antelope globally, which was nearly wiped out in the early 2000s. Since the founding of the Altyn Dala Conservation Initiative in 2006, we have made it our mission to bring back the species and restore its habitat.

Since its inception, the Altyn Dala Conservation Initiative has so far contributed directly to several outcomes for conservation and restoration.

Firstly, in helping to conserve areas of great significance for biodiversity. The Altyn Dala Partners have provided

the scientific evidence enabling establishment of >4 million hectares of new state protected areas; extensions to existing state protected areas; and new ecological corridors. As well as surveying biodiversity across multiple taxa, it is the saiga telemetry data that contributed the most powerful justification for these new protected areas.

Our telemetry programme began in 2008. To protect the critically endangered antelope and its vast steppe habitat, we need reliable information at our fingertips – for this, tracking data is a crucial tool. Since 2009, 204 saiga antelope have been successfully fitted with satellite transmitters. The tracking data collected has

enabled a detailed understanding of the home ranges of the three saiga populations in Kazakhstan and a better understanding of their migration routes and patterns.

In terms of ecosystem restoration, the integration of activities from both the NGOs and Government has worked very effectively on shared anti-poaching patrolling and intelligence gathering. The saiga location data helps protected area staff to closely monitor the herds and combat poaching. Building on this, we have contributed greatly to staff development work, for both NGO and Government staff, and important research such as identifying the location of calving and rutting sites in order to collect data on sex ratios and calving success. This in turn helps us to better understand saiga population dynamics. All this feeds in to the improved capability and capacity of everyone involved in protecting these steppe ecosystems. Indeed, there has been a significant recovery of saiga antelope populations from <50,000 in 2006 to ~1.9 million in 2023, making this by far the largest population globally of this iconic key-stone steppe species.

Understanding saiga movement and migration behaviour throughout the different seasons helps us to pinpoint possible threats to their seasonal movements beyond combatting poaching. Particularly, we have worked on the mitigation of threats to the migrations with regards to different barriers e.g. railways, roads and border fences. Saigas avoid crossing existing paved roads, yet freely cross dirt roads, and we have seen from local on the ground reports, regular monitoring and from saigas wearing our transmitters, that



Male and female saigas. Photo by Eric Romanenko

they will not cross the Shalkar-Beineu railway. This data helps us to maintain connectivity for the saiga antelope in the landscape by supporting the Government of Kazakhstan to take remedial and preventative action. For example, in amending border fences to allow the saiga to pass; in assisting with the investigation into potential crossing points over the railway and by engaging in productive dialogue with the Government with regards to preventing road construction that threaten saiga migration.

The growth in state protected areas, saiga antelope anti-poaching teams and biodiversity science that underpins all these activities has created new jobs, especially in rural areas and within ACBK. These jobs are also benefiting from capacity development that is integral to each type of activity of our partnership.

“However, we are aware that our work is not yet done,” says Vera Voronova CEO of Association for the Conservation of Biodiversity of Kazakhstan. “We will continue to invest in the sustainability of the vast Kazakh steppe and its contribution to climate change mitigation for the region and the planet as a whole. Our success and ambition are results of the immense support we receive from international partners and our close collaboration with the Kazakhstan government.”

The United Nations Environment Programme, together with the Food and Agriculture Organization (FAO), in 2021 declared the UN Decade on Ecosystem Restoration that lasts until 2030.

The Altyn Dala Conservation Initiative is spearheaded in Kazakhstan by the Association for the Conservation of Biodiversity of Kazakhstan, with financial and technical support from Fauna & Flora International, Frankfurt Zoological Society, and the Royal Society for Protection of Birds, and in partnership with the Kazakh Government’s Committee for Forestry and Wildlife, part of the Ministry of Ecology and Natural Resources.

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CHIMEDDORJ BUYANAA¹

Wildlife rescue and rehabilitation is a priority for Mongolia

WWF-Mongolia, in collaboration with Ministry of Environment and Tourism (MET), successfully organized a discussion-meeting on wildlife rescue and rehabilitation, including the current legal framework and a set of standards and best practices from other countries, on March 17, 2023. The discussion-meeting was attended by over 60 individuals represented central and local government officials, officers, and specialists (the MET and Departments for Environment and Tourism in 21 provinces) and research institutions and universities. The meeting agenda included presentations on the current legal and policy environment and a set of national standards on wildlife rescue and rehabilitation. Moreover, some local specialists made presentations on the practices on how to promptly deliver first veterinary and

rehabilitation services to injured or sick wildlife, when reported.

The discussion-meeting was attended by B. Bat-Erdene, the Minister of Environment and Tourism, who provided a briefing on the policy, legal, and regulatory framework on wildlife rescue and rehabilitation and answered to questions of the participants.

WWF-Mongolia's Conservation Director, B. Chimeddorj has given particular attention to WWF-Mongolia's collaboration with the MET regarding the prompt delivery of veterinary and rehabilitation services to sick and injured wild animals, which is one of key conservation efforts that was inserted in the Law on Fauna. Four sets of national standards on wildlife rescue and rehabilitation services were adopted in 2022,

an achievement of this collaboration between WWF-Mongolia and the MET. Besides, WWF-Mongolia have been developed a manual "Wildlife Rescue and Rehabilitation" including case studies and best practices. It has become a useful reference for specialists and professionals who deliver first-hand services on the ground.

During the discussion-meeting, the MET Department in Uvs province presented some cases of successful delivery of wildlife rescue and rehabilitation. These included a red deer injured by the metal protection fence around a local airport in 2020 and a baby Mongolian saiga rescued in 2022. After successful rehabilitation, the red deer and saiga individuals were released into their herds. One of best practices of Uvs province is that the Department has funding set aside for wildlife rescue and rehabilitation in its annual budgets, according to the presenters.

The meeting was productive and inspiring, as it shared useful information on the wildlife rescues and rehabilitations that are being carried out under the current legal and regulatory framework and national standards, and shared good practice.

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WWF-Mongolia's Conservation Director, B. Chimeddorj giving a speech at the discussion meeting. Photo by WWF Mongolia

CHIMEDDORJ BUYANAA¹

WWF-Mongolia's initiative is being supported and recognized by local governments

Protecting headwaters of natural springs and streams is one of WWF-Mongolia's most active programmes. It has contributed to protecting the headwaters of 34 natural springs including 26 within the range of the Mongolian saiga and 8 within snow leopard range, with the direct participation of local people. Protection of these headwaters contributes to

maintaining and increasing water discharges and flow, and increases water supply for both domesticated and wild animals. To date, this initiative is being well supported by local governments and communities in Gobi-Altai aimag (province).

The government of Gobi-Altai province has a standard procedure for

protection of the headwaters of natural springs and streams. The headwaters are protected by different types of materials depending on the funding available. Sometimes, however, these areas are mis-designated. WWF-Mongolia's recommended guidelines and examples of how to protect of headwaters, along with a certificate and monitoring logbook is a key reference. Having agreed with these documents, the Environment and Tourism Department of Gobi province issued a standard procedure which has been approved by the Provincial Governor. Local communities and authorities are happy with this decision, which will make their efforts more efficient and standardized.

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Protection of springs in cooperation with local herders.
Photo by WWF Mongolia

CHIMEDDORJ BUYANAA¹

Motorbikes and hardhats for the “Community conservationists for saiga” network

The Mongolian saiga has been protected by the dedicated efforts of the “Community conservationists for Saiga” network since it was established in 2008. WWF-Mongolia supports the network's efforts with technical and material resources. Recently, rangers from this network received motorbikes along with helmets from the Programme Office to use when patrolling in difficult field conditions.

The team has 12 members and plays an important role in saiga conservation. In particular, in harsh winters when it has snowed heavily, they carry out conservation measures (*see update below*).

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Saiga conservationist network members with motorbikes.
Photo by WWF Mongolia

CHIMEDDORJ BUYANAA¹

Hay for saiga; or From the rangers with love

Winters in Mongolia, can often be extreme, particularly if there was little summer rainfall for pastures to grow so that animals could gain enough fat to survive the winter. Severe icy winters are called “dzud”; these truly test the strength of both people and animals. Extreme winter weather can rapidly take the lives of millions of livestock and wild animals.

This winter (2022/2023) was a record year for its the severity, with temperatures dropping to –45 degrees Celsius. As usual, to prevent unwanted casualties, saiga conservationists placed hay for saiga in the most affected spot/s; areas with a thick snowpack and the lowest temperatures. It is common for local communities willing to help the saiga overcome such cold weather to

place blocks of hay and fodder out for them so they can safely overcome the winter. The video images from 2017 of saigas coming to eat this hay and even lying on it to get warm, clearly demonstrate the absolute relevance of such biotechnical interventions.

Batsaikhan, Leader of the “community conservationists for saiga” network, explained: “This winter is particularly freezing. All along the fields there are no signs of livestock or other animals, except saigas wandering in the snow in search of food. The only plants saigas eat are Anabasis and saltbush. But as these plants grow close to the ground they are often covered with snow, which makes it difficult for saiga to spot them and dig for them.”

This winter, the network placed over 400 blocks of hay in dozens of spots where they observed saigas. To document images of saiga coming for help, and to inform further study, they installed camera traps in each location. Baldan, a saiga conservationist, said: “We feel confident that these actions save saiga lives and help them to survive and overcome harsh winters. We see these measures as very much favorable for this animal”.

Since 2003 WWF-Mongolia has dedicated years of effort and resources to saiga population recovery and have managed to bring numbers up to almost 14,000 from only 750 in 2003. Willing to keep up the pace, WWF-Mongolia's community conservationists for saiga network members work hard to safeguard saigas during “dzud”, through taking these relevant and timely measures.

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Putting hay out for Mongolian saigas during the harsh winter.
Photo by WWF Mongolia

CHIMEDDORJ BUYANAA¹

A baby saiga has been saved and released back home

A little saiga, chased by a dog, was saved by herder Namsrai in late January 2023. Right away he informed local saiga conservationist Badamjav, who in turn, called local veterinarians and wildlife biologists. Initial checkups showed that this juvenile (born in 2022) was in good condition except for its hooves which has small cracks, probably because, in fear, it had to run over

sharp stones to save its life. The vets applied healing ointment and carefully looked after the saiga, feeding it with fresh hay and fodder until the wounds had healed.

Luckily, our little saiga showed a quick recovery and a group of experts from the provincial Environmental agency and WWF-Mongolia's western region

office decided to release this little one to its natural habitat in Tataal Khev, in Zavkhan region of Uvs province.

Over 70 years ago Tataal Khev, used to be a home to Mongolian saigas. Unfortunately, until 2013 not a single saiga was observed there. However, by November 2022, thanks to favorable climatic conditions in previous years and conservation interventions undertaken by WWF-Mongolia and its partners, there were 212 Mongolian saigas in Tataal Khev, out of a total of 13,925 for Mongolia as a whole.

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Rescued saiga calf.
Photo by WWF Mongolia

CHIMEDDORJ BUYANAA¹

“The Sprinter of the Desert Steppe” documentary

The WWF-Mongolia Programme Office pays particular attention to increasing public awareness about saigas, and the species' value and role in ecosystem conservation, as well as stopping poaching. Public awareness is important for effective conservation, so WWF-Mongolia aims to produce scientifically based, well documented, and quality public awareness materials (e.g. films)

in order to give detailed insights on species' behavioural characteristics and conservation needs. One recent product is a 16-minute documentary called “The Sprinter of the Desert Steppe” that covers the behaviours, diet, and seasonal patterns of saigas. The filming was done by researchers, specialists, and officers of Western Regional Branch of WWF-Mongolia.

To raise awareness of the Mongolian saiga, which is only found in Mongolia, among international audiences, the documentary has English subtitles and narration.

See more: youtube.com/watch?v=wHG00IDho-I

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Mongolian saigas. Photo by B.Munkhzorig/WWF Mongolia

CHIMEDDORJ BUYANAA¹

Saiga Day in Mongolia

In May 22, 2023, Mongolian Saiga Day was successfully celebrated by WWF-Mongolia together with local stakeholders including representatives of local government institutions. Over 500 local people, including more than 300 schoolchildren, participated in this year's event.

On Saiga day, young people aged 18-30 in Gobi-Altai province started tree planting to make a grove for saigas. They will be responsible for looking after and watering the saplings and will share the results next year.

A field trip took place to get acquainted with the saiga's habitat, involving 100 children. Rangers came along to give children detailed and insightful information; they were the main heroes of the day in their efforts to make children experience what it is truly like to be a ranger. They gave a great presentation on how to monitor the animals, how to observe their habitat changing depending on livestock movements, and how to use GPS. During the trip, the children counted about 1200 saiga individuals. The trip was highly appreciated by the children.

Moreover, a children's drawing competition was organized, entitled "Saiga and spring". Almost 100 children's drawings were received by WWF-Mongolia. Eight children won prizes in different age categories and the best drawings were shared via WWF-Mongolia's Facebook page.

School eco-club members gave press interviews on natural spring protection and its value, and their work on this topic. The press actively publicised the event, releasing 11 newspaper articles and broadcasting 4 videos on mass media channels.

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Children's drawings.
Photo by WWF Mongolia



Eco-club members during a field trip. Photo by WWF Mongolia

ELENA BYKOVA¹, ROBERT WILLARD²

Schoolchildren from remote villages of Uzbekistan in search of an environmental paradise

On 11th and 12th May 2023, children from secondary schools No. 31 and 54 in the villages of Jaslyk and Kyrk-kyz presented a wonderful performance, "Susambil: Let's Create It Together", to the residents of Jaslyk and Muynak. Susambil is a fabulous land of happiness, peace and quiet, with pastures covered with thick grass and streams filled with crystal clear water. It knows no suffering and pain, and everyone strives to get there. Our Susambil is a beautiful steppe in the middle of the Aralkum sands, where animals live in harmony with each other and the environment. *'Migrating animals, such as gazelle, saiga, flamingo, golden eagle and bustard, are travelling in search of*

this place. There is no grass in their homeland, and there is little clean water. Poachers live in their homes, killing animals for meat and selling their horns. Many of their parents, brothers and sisters have died. Those that have survived are looking for Susambil...'

The children were not just telling a story. By personifying their heroes, studying their behaviour, and analysing their problems, they attempted to look at the story through the prism of their own short life experiences and consciences. During the performance, the children living in ecological disaster zones – in the Aral Sea region and on the Ustyurt Plateau – shared their

concerns, showed how environmental changes affect their daily lives, the lives of their families, and the fate of their villages. They interacted with the audience, emotionally involving everyone present.

The idea of the play was that the children's feelings would coincide with those of critically endangered animals, like the saiga, goitred gazelle, golden eagle and bustard. These species are affected by issues including poaching and water scarcity. The involvement of children in writing the script was an important part of the creation of the play; the participants collected documentary material from elderly residents of their villages and told their stories from memory, as well as sharing their own worries and dreams.

By portraying animals, the performers thought about the possibilities of building Susambil – an environmental paradise inhabited only by animals and closed for people. By the end of the performance, they came to the conclusion that they could join efforts to create Susambil on their own land, in their own village, for both people and animals to feel comfortable, by eradicating poaching and finding access to clean water.

The performance appealed to people of different ages, making them empathize with other people and animals and think about how to make life better for everyone. This was the first instance of cooperation between the Saiga Conservation Alliance and the World Aral Region Charity (WARC), aralregioncharity.org.

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Young artists complete an eco-performance in Muynak.
Photo by Elena Bykova

KRISTINA KUZMICHEVA, RUSTAM OLIMOV, ZEBO ISAKOVA¹

SOS – Save Our Saiga, Save Our Steppe

The theme of Saiga Day 2023 in Uzbekistan was "SOS – Save Our Saiga, Save Our Steppe", highlighting the inextricable link between the stability of the steppe ecosystem and the saiga as its key representative. An online competition was organised among teachers from 8 schools within the saiga habitat (in Jaslyk, Karakalpakstan, Kyrk-kyz and Elabad villages, and Muynak and Nukus cities), on who could give the best and most interesting lesson entitled "Saiga, steppe, man". This was followed by various competitions between 10th and 12th May and a series of gala concerts on the closing day. In total, more than 900 students, teachers and guests took part in the festival.

The Progress Centre for Education and Development hosted the festival in Nukus. It was opened with an eco-marathon followed by a puppet show on how important it is to take care to protect wildlife. Puppets were used to portray various characters, except for saigas, which were shown in pictures to demonstrate how the species would remain a rare Red Data Book species unless it is protected.

In school No. 54, Jaslyk village, an eco-relay race with stages titled "Sportive", "Scrabble" and "Folk Traditions" was organised on Saiga Day. At every stage the participants tried as hard as they could to win, demonstrating good athletic and intellectual training. At the Folk Traditions stage, contestants dressed in national costumes perfectly conveyed each tradition. After awarding the teams with

diplomas and prizes, representatives of the Saigachy Complex (Landscape) Reserve prepared a surprise – a ceremonial pilaf (National dish, made of rice and meat) for all the participants and guests to enjoy. The festival was closed in the evening on an open-air stage, where all the villagers gathered. To the accompaniment of songs, students performed beautiful traditional dances. The interactive eco-play *Susambil: Let's Create It Together*, directed by Robert Willard and 9th-grade students, was also premiered (*see update above*).

Saiga Day in the village of Karakalpakstan was celebrated with a running and bicycle marathon for the students of school No. 26. The villagers actively supported them and even took part in the event themselves. The Eco-Carousel competition was performed between teams called Jeyran (Goitred gazelle) and Akbuken (saiga). Competitors performed various tasks: they prepared a story about the saiga's features, answering biological questions, and guessed the name of an animal from hints. In the best eco-scene competition, both teams showed the audience how hunting saigas is punishable by law. This activity was followed by an athletic stage with various tasks, won by the stronger and more united team.

Saiga Day in the city of Muynak was hosted by the children's camp Ak Keme. The festival was co-organised by the Saiga Conservation Alliance, UzKorGaz Chemical and the authorities of Muynak District. It was a joint event for schoolchildren from 4 secondary schools in Kungrad and Muynak Districts. The festival was attended by rangers from the regional branch of the Ministry of Ecology, representatives



Children from Muynak with their creative works at the Saiga Day.
Photo by Elena Bykova

of the international foundation People's Trust for Endangered Species (PTES), which is a long-term supporter of saiga conservation in Uzbekistan, and by The World Aral Region Charity.

The students competed in various creative and athletic contests. They drew posters on the theme "SOS – Save Our Saiga, Save Our Steppe". This was followed by sports events on three themes: "Save saigas from poachers", "The Aral Sea water for saiga" and the Saiga 2023 bike marathon. A concert featuring a performance from each team closed the programme, leaving the audience and participants in a joyful mood. At the end of the festival, a team from the village of Kyrk-kyz led by Robert Willard performed the eco-theatre "Susambil: Let's Create It Together" (*see update above*).

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Saiga Day winners from Jaslyk village. Photo by Kristina Kuzmicheva



Join PTES & SCA team with biology teacher Gauhar Tanabergenova and her students, Muynak. Photo by Nodira Shaabasova



Students from school No. 54, Jaslyk village during the competition at the "Scrabble" stage. Photo by Kristina Kuzmicheva

AIBAT MUZBAY¹, TIL DIETERICH^{2*}, NURLYKHAN ISMAILOV³
STEFAN MICHEL²

An increase in the Ural saiga population and its impact on agriculture – observations during the calving period 2023

The increasing saiga population in Kazakhstan, particularly within the Ural population, is a great success of the decades-long efforts of the Kazakh Government and several national and international organizations to save the species from the brink of extinction. Nevertheless, it has brought about both positive and negative feedback from different stakeholders. In the Kaztalov and Zhanibek districts, farmers have filed an increasing number of complaints. They report saigas trampling their crops and depleting haymaking areas and pastures, leaving allegedly insufficient fodder for livestock. Farmers claim that the most substantial pressure on their lands occurs during the calving season when saigas congregate in the area. In response, a team of local and international specialists conducted a survey in May 2023, specifically targeting calving sites in these two districts to assess the impact of saiga calving on rangelands, hay fields and wheat fields.

The survey involved three specialists equipped with binoculars, spotting scopes, high-resolution cameras, GPS devices, and mechanical counters. We recorded the size of herds in the calving aggregations. Counting large saiga herds individually proved challenging, so decimal and hundredth system counts were utilized. The newborn calves were not counted as only some were visible (most were still lying on the ground). Livestock were also counted and used as additional means of verification of the counting approach, as the animals allowed observers to approach closely. All data on the observed animals were meticulously recorded in a specially prepared field journal to create distribution maps of the saiga population within the range.

The survey recorded more than 180,000 saigas, predominantly comprising calving or pregnant females. The recorded proportion of subadult and adult males was small, at approximately 12,000 individuals, constituting slightly over 6% of the total observed population. It is necessary to consider that juvenile males (12 months old) are often hard to distinguish from females. The survey identified five main saiga calving areas. Additionally, large herds were observed consisting of around 50% males and the remaining pregnant females that had not yet separated for calving by the 8th of May (see Fig. 1).

Three main calving areas were identified by the survey team (Fig. 1): the southern, central, and northern areas. The southern calving area is composed

of two sites with a combined area of just over 7,000 ha. These are situated within the Bokeyorda State Reserve (Russian: prirodnyy rezervat), and as a result, there are no farms present. Nonetheless, we observed livestock in the vicinity of both sites. The central calving area consists of two sites totalling 15,350 ha, with approximately 11,000 ha leased as farmland. This area falls within the Ashiozek reserve (Russian: zakaznik). The two sites were estimated to have 14,000 saiga females, and various domestic animals such as horses, cows, and sheep were also encountered there. The northern part of this central calving area, covering a total of 8,356 ha, was the primary calving ground for the Ural population in 2022.

The primary calving area identified in 2023 (the northern area) is situated further to the north than in 2022. This vast area spans over 25,000 ha, where we recorded more than 73,000 saiga females. Located in the Zhanibek district along the border with the Russian Federation, this calving site is not part of the protected area and serves as crucial grazing land for the local population's livestock. Within this area, there are 24 farms covering approximately 18,000 ha. In 2022, the southern part of the area served as a smaller saiga calving ground, measuring only 2,270 ha.

Apart from saigas, the survey also counted domestic livestock (cattle, small ruminants, and horses) and stray dogs. We observed cattle and small ruminants up to 10 km from farmsteads, and horses up to 30 to 40 km away. We counted 6,574 cattle, 5,358 small ruminants, and 2,852 horses, as well as four dogs, two of which were approximately 13 km from

the nearest village. On multiple occasions, saigas were observed grazing in proximity to livestock, with the closest distance being around 100–200 m (Fig. 2). Nevertheless, they were moving in separate herds and did not mix entirely.

The number of saigas observed during the field trip was only approximately 15% of the official population estimate from the aerial survey undertaken the week prior to the expedition. The expedition took place in the most densely populated area based on maps of the aerial surveys from the years 2021 and 2022. Thus, the expectation was to witness around 25–30% of the estimate from the aerial survey, which should

have been around 270,000–350,000 individuals. It should be acknowledged that aerial surveys and ground surveys offer different perspectives, resulting in discrepancies. It is possible that during our ground survey we observed only the leading edge of the saiga population. However, aerial surveys also have their limitations, including the potential for repeat counting of the same group when saiga disturbed by the aircraft move into the next survey transect. This may have occurred during the 2022 Ustyurt population count, which estimated a population size of 28,000 individuals, equivalent to 133% of the count from the previous year. Furthermore, estimates of heavily aggregated animals based on

samples are prone to large errors as a few large aggregations inside or outside of the survey transect could cause a substantial over- or under-estimate.

Regarding the alleged wildlife-land user conflicts reported from the region, about 70–80% of the Kaztalov and Zhanibek districts are leased to local farmers as pasture and hay grounds. The pastures around the villages make up 5–10% of the total range area used by saigas during the calving season. Thus, about 80% of the land area within the saiga's Ural range, outside reserves, is used for livestock farming. We calculated that 61% of the calving occurred on lands leased for livestock farming. Two of the calving grounds are situated

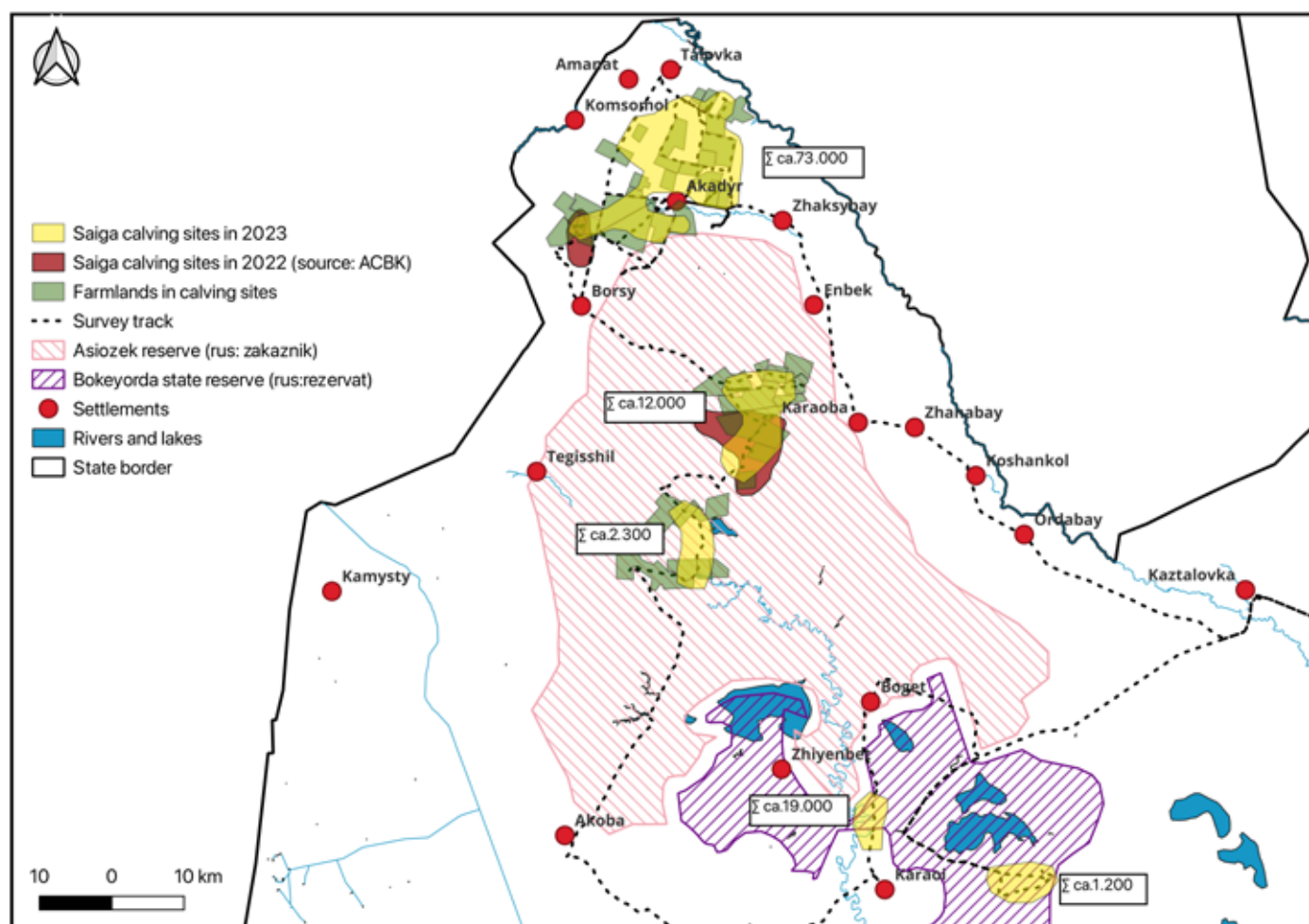


Fig. 1. The calving grounds in the Kaztalov and Zhanibek districts in the West Kazakhstan oblast. Leased farmland is only shown for the calving sites, beyond these sites about 70–80% of the area is leased except for the area of the reserve. Map by Aibat Muzbay

in the reserve, where there is no leasing and thus no livestock farming (Fig. 1). As livestock and saigas are predominately using the same pastures it is a challenge to understand the relative impact of these two sets of grazers. Semi-structured interviews revealed that, despite the alleged problems they see (fodder competition, transmission of diseases, etc.), most farmers are ready to co-exist with the saiga if they can profit from the sustainable use of the species in one or other form. We therefore suggest a very simple mechanism to stimulate the local farmers to welcome saiga on their pastures. The approach suggested is to have only three simple categories reflecting the impact of the saiga on the pasture and hay land and resulting benefit

sharing i.e. pastures/hay grounds used by saiga for calving in spring, pastures/hay grounds used by large herds of saiga (> 5000), and pastures/hay grounds used by small saiga herds only (< 5000).

The expedition also investigated the situation in the north of West Kazakhstan oblast, where crop fields stocked with wheat overlap with saiga range. This area is mainly used by saigas from the second half of May onwards throughout the summer. Our team did not observe any calving places there. The crop farmers are scaring the saiga off their fields on a regular basis. But livestock also often intrude into the crop fields and, similar to the situation on pasture/hay

grounds, it is very difficult to clearly distinguish which animals caused the damage. We therefore see only the option of partly subsidizing the purchase of electric fences so long as it does not encourage farmers to use fields further south than they do at the moment. Even though only a couple of hundred saiga were observed in this area during our visit, it can be expected that conflict will increase in the future as saiga likely extend their range towards the east, given that the habitat south of the crop fields is suitable for them.

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Fig. 2. Livestock and cattle did not occur in mixed herds but kept a distance of 100–200 metres in separate herds, May 2023. Photo by Aibat Muzbay

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Remote and artificial intelligence methods to estimate the saiga population in north-western Caspian Sea area and how animals use the area

The saiga population of the North-West Pre-Caspian region is currently isolated from other saiga populations. It inhabits the south-western parts of Astrakhan province (Limansky District) and territories in the east of the Republic of Kalmykia (Yashkul'sky and Chernozemelsky Districts). According to experts, despite a wide range of protective measures and the population's tendency to increase in size, it has remained stably small for many years, which is the reason the species has been included in the Red Data Book of the Russian Federation (2021). To date, no statistically reliable data on the size of this population have been obtained. This is, nevertheless, one of the most informative aspects of monitoring, which also requires study of saiga migrations and how long they stay in a particular area within their range.

Among the objectives of our project was to develop and test methods to identify and count saigas on ultra-high resolution optical satellite images using a combination of deep convolutional neural networks with different types of architecture and study how they use their range.

To identify and count saigas on satellite images, it is necessary to use ultra-high resolution optical data (no coarser than 0.5 m/pixels). In this case, each animal occupies more than one pixel, and the image is suitable for analysis. The optimal survey period is when animals stay most stably in the same place, which in case of saiga corresponds to the rut – usually from late November to early January.

To develop automatic counting techniques using artificial intelligence, we used images obtained on 22nd November 2012 from the Eros-B satellite (ImageSat International, Israel). The basic satellite image (3,498,786,500 pixels) used as a model for the development of the method (*Fig. 1a*) covered an area of 8×32 km on the border between Astrakhan province and the Republic of Kalmykia. We used images with a resolution of 0.45–0.7 m/pixels obtained on 2nd December 2022 from another satellite – KA Beijing (Twenty First Century Aerospace Technology, China) – to test the method's practicability and specify the actual number of animals in a case study site of 1,600 km² covering the territories of

two adjacent protected areas – the Chernye Zemli Reserve (Republic of Kalmykia) and the Steпnoy Zakaznik (Astrakhan province) (*Fig. 1b*).

The first stage in the analysis of satellite images consisted of identifying saigas "manually," according to principles proposed by V. Rozhnov et al (2014). The main challenges in rapid automatic identification and counting of animals on a satellite image is that each individual occupies just a few pixels of the image. Therefore, it is extremely difficult to reliably identify all saigas and completely exclude errors on whole satellite images. For that reason, the automated counting of animals was divided into two stages, both completed using artificial intelligence technology designed for efficient image processing – deep convolutional neural networks (DCNN), each with a different architecture. At the first stage (Classification/DCNN-C), the algorithm was trained to segment an image and analyse each segment, one by one, for accumulation of small bright objects with shadows. In this way, the algorithm decides whether there is at least one relevant object (a saiga) in a given fragment of the image. At the second stage (Identification/DCNN-I), we analyse only those fragments of the satellite image that have been classified by DCNN-C as "containing at least one saiga", which minimizes the number of false identifications. These fragments are processed using a neural network with a different architecture (DCNN-I), identifying each individual, determining its coordinates and dimensions and specifying a certainty indicator for each object (*Fig. 2*).

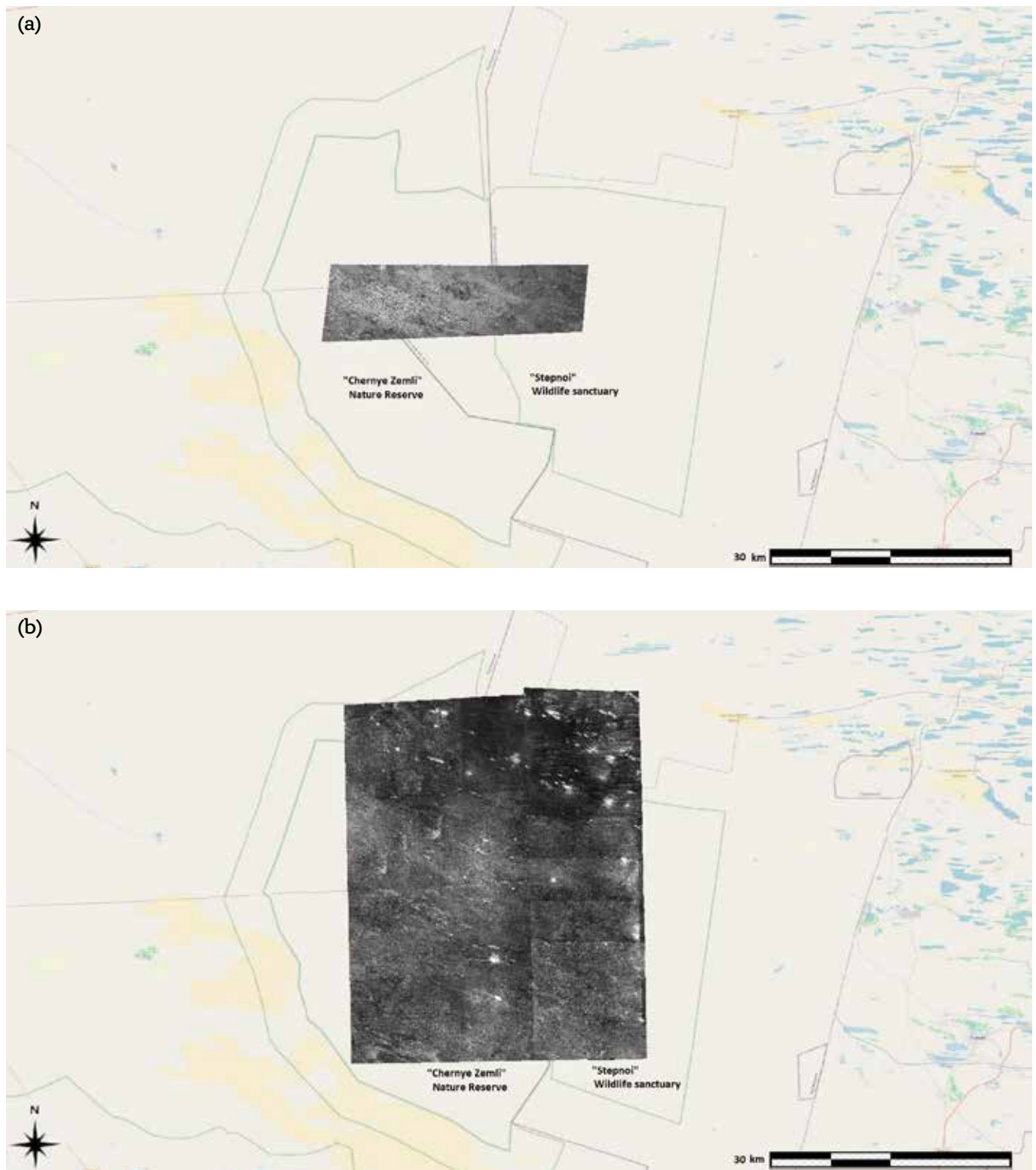


Fig. 1. (a) Coverage of an area with satellite images to develop an automatic saiga counting method using artificial intelligence and (b) to test the method on actual data.

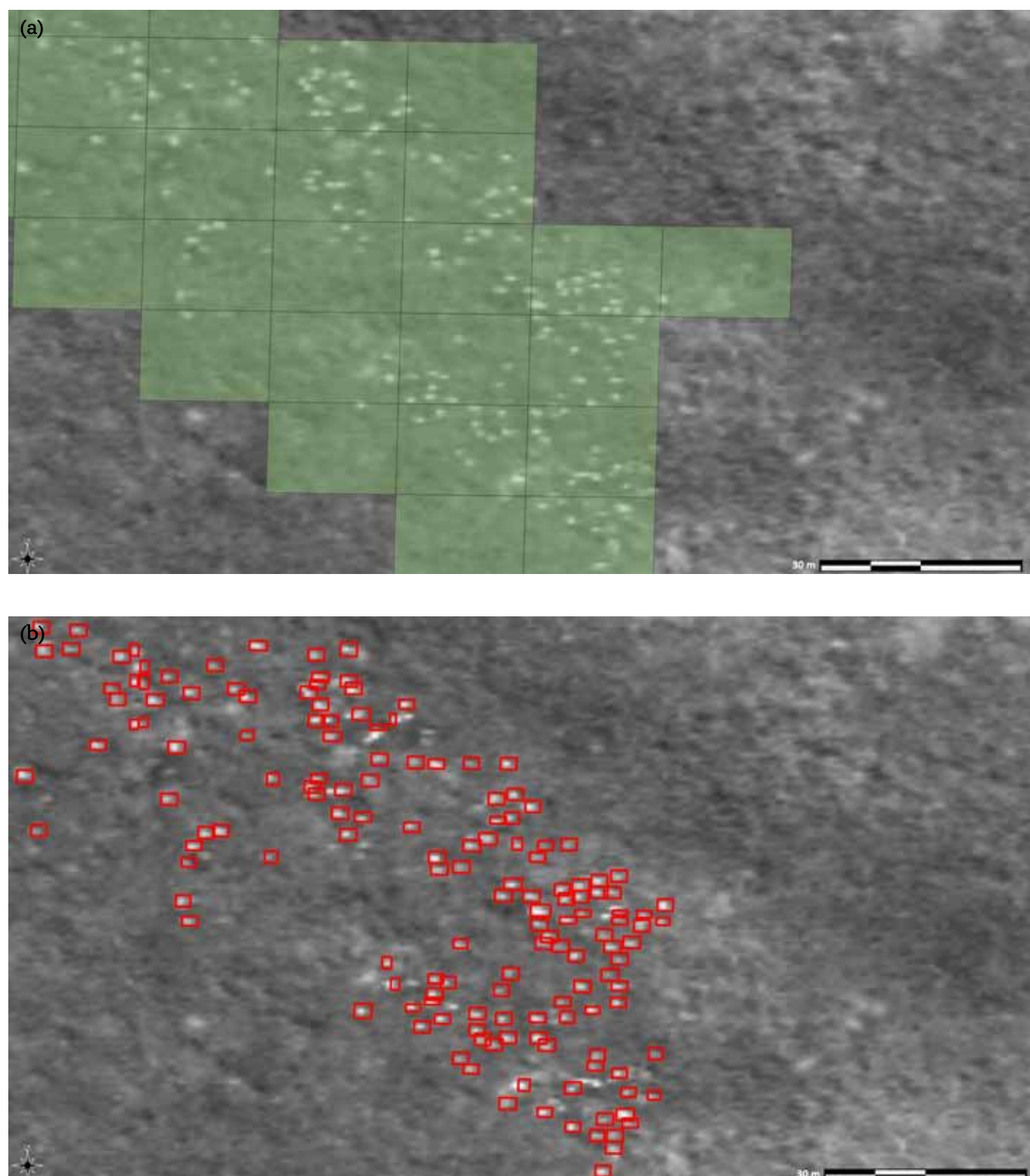


Fig. 2. The results of automated saiga counting on a satellite image using artificial intelligence: (a) – segmentation of the image and successive analysis of each segment for concentration of bright small-sized objects with shadows (stage 1 – DCNN-C), (b) – analysis of the image's fragments that have been classified by DCNN-C as "containing at least one saiga" (stage 2 – DCNN-I).

Our work shows that it is possible to carry out automated processing of ultra-high-resolution optical satellite images. This creates the potential for a complex artificial intelligence-based universal automatic system, effective and modern, to identify and count saigas in steppe ecosystems.

We also evaluated false negative and false positive identifications. Fragments of false positive identifications cover a herd incompletely, without forming a single polygon. This indicator can be used to filter herds of wild animals from freely grazing livestock (Rozhnov *et al.*, 2014): the distances between each individual grazing animal differs in that herds of grazing livestock are denser.

An AI-supported analysis of satellite images shows that at least 26,584 individual saigas were in the case study area in December 2022, with a 50–100% probability. Each identified object has a confidence indicator ranging from 0–100%. The validation sample is based on a manual analysis of the satellite image. Combining this and metrics of completeness, we estimated the best confidence threshold for our network as 50% probability

that the identified object is a saiga. But this indicator may be perceived as rather crude. Thus we also provide here the results for other threshold values: 0.6 – 21,912 individuals, 0.7 – 16,809 individuals, 0.8 – 11,215 individuals, and 0.9 – 4,548 individuals. Verification of the results revealed cases of both under- and over-counting of saigas by the AI-based approach. Additional "training" and improvement of neural networks requires manual verification by a zoologist, which is currently in progress.

The creation of a high-quality system such as this in future would allow processing images with different parameters obtained from different satellite models. This would contribute to the development of a fully automated monitoring system able to count saigas based on the analysis of incoming satellite images within a few minutes.

Only transmitters of specific types can monitor saiga movement, as we already showed in SN-27. To study saiga movements, we used a collar with a GPS/GLONASS-GSM transmitter (Moosefarmer, Russia), developed at the Severtsov Institute of Ecology

and Evolution, Russian Academy of Sciences ([moose-farm/tracking](#)). The transmitter was attached to a seven-month-old male saiga bred in the Saigak nursery of the Astrakhan State Hunting Farm, which was released into the well-protected Stepnoy Zakaznik on 26th November 2022. For six months, the device transmitted 4,388 locations from three protected areas – the Stepnoy Zakaznik, Chernye Zemli Reserve and Mekletinsky Zakaznik (part of Chernye Zemli Reserve), during which time the saiga covered at least 2,800 km (Fig. 3). The data will reveal some important, previously unstudied aspects of the species' spatial ecology.

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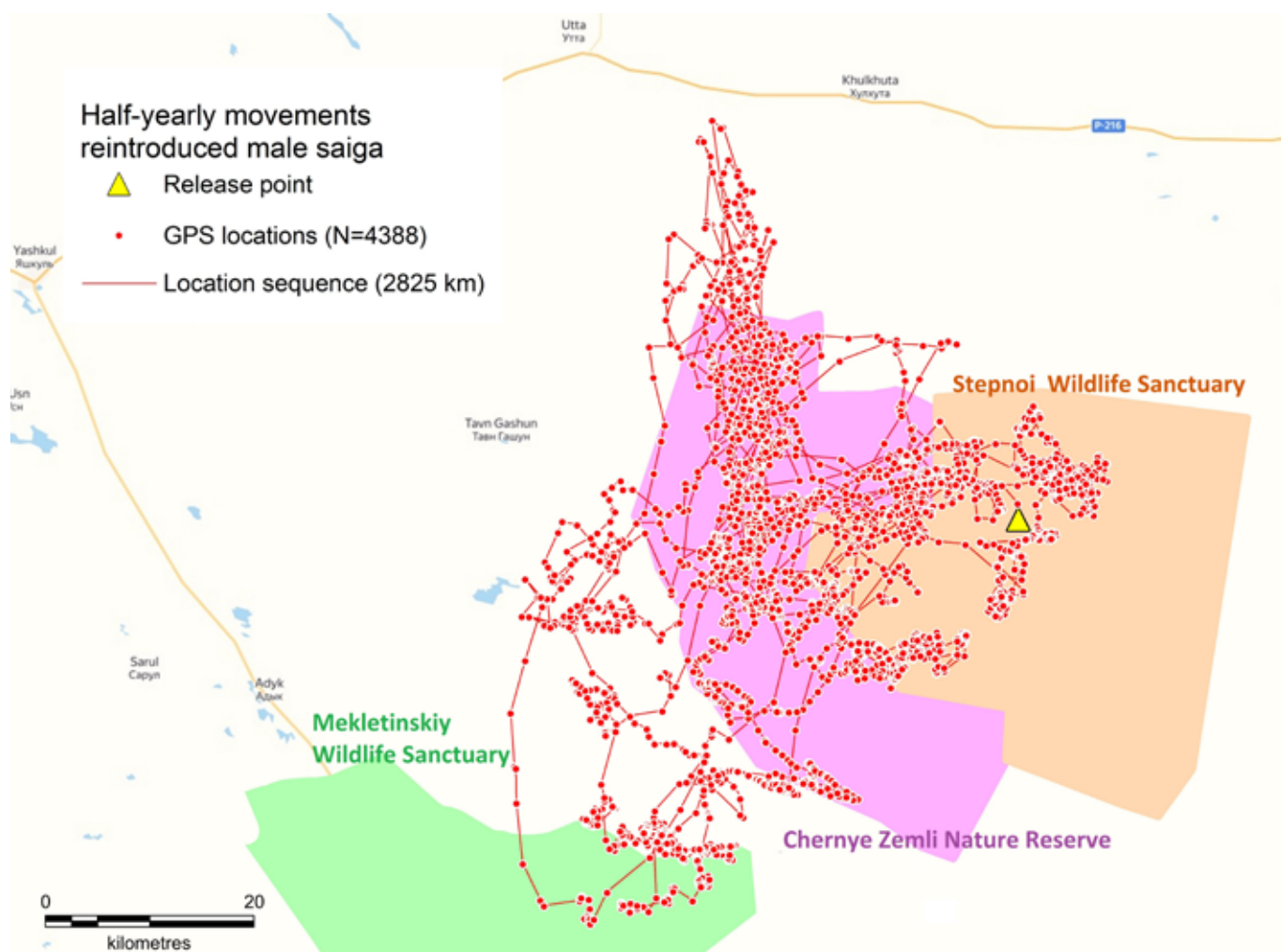


Fig. 3. Movements of a male saiga over six months after release into the Stepnoy Zakaznik (Astrakhan Region) from 26th November 2022 to 26th May 2023. Yellow triangle – release site; red dots – GPS fixes (n=4388); total distance covered – 2,825 km; light brown polygon – Stepnoy Zakaznik; pink polygon – Chernye Zemli Reserve; green polygon – Mekletinsky Zakaznik.

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Genetic diversity of the saiga *Saiga tatarica tatarica* population in the North-Western pre-Caspian region based on polymorphism of neutral and functionally significant markers

There is a common opinion that a sharp decline in abundance of a species may be accompanied by a decrease in genetic diversity. The saiga population in the North-West pre-Caspian region, the only one in Europe, is geographically isolated and has declined by more than 40 times over the past 20 years, which necessitates a study of its genetic diversity.

To assess the genetic diversity in this population, the research team analysed the polymorphism of selectively neutral and functionally significant markers. The selectively neutral markers include mitochondrial DNA (mtDNA) and microsatellite loci of nuclear DNA (nDNA). MtDNA is passed only maternally, and the mtDNA control region (D-loop) has the highest mutation rate in ungulates. The nDNA autosomal microsatellite loci are inherited both paternally and maternally, and their mutagenesis rate is higher than the accumulation rate of mutations in mtDNA. The functionally significant genes primarily include those of the Major Histocompatibility Complex (MHC), which plays a huge role in the formation of the immune response in vertebrates. The MHC gene analysis is particularly important for species such as saiga, whose numbers have been catastrophically declining for a long time.

Material collected within the Chernye Zemli Reserve (Zapovednik) in Kalmykia and the Steпноy Reserve (Zakaznik) in the Astrakhan region from the late 1990s to the present time was used in the research. The samples were divided into two groups based on collection time – one group included samples collected at the initial stage of the last saiga population decrease, 1999-2000 ("Old"), and the other samples were obtained in 2010, 2011 and 2016 ("New"). The samples were collected using both non-invasive methods (faeces, fragments of animal tissues killed by wolves) and in 2010-2011 from the umbilical cords of newborn saigas (Fig. 1).

The following molecular markers were used: the most rapidly mutating mtDNA fragment in ungulates – control region, 8 DNA microsatellite loci (STa14, STa20, STa26, STa30, STa39, STa41,

STa43 and STa47) (Nowak et al. 2003), a fragment of the functionally significant DRB 3, MHC class II gene, associated with the organism's immune response to pathogens – parasites and bacteria. In total, 86 sequences of the mtDNA control region were obtained ("Old"=45, "New"=41). Their length ranged from 918 to 924 bps, depending on the length of insertions/deletions (indels).

51 haplotypes were described, 11 of which included 2–14 samples, and the rest of which were unique (Fig. 2). The nucleotide sequences of the obtained saiga haplotypes were entered into the NCBI genetic database (GenBank No. MT150278-MT150328).

In general, haplotype diversity (H) was 0.92 ± 0.02 , nucleotide diversity (π) was 0.028 ± 0.01 , which is quite high for wild Bovidae. When we compared the results for the two groups of samples ("Old" and "New"), we detected no significant differences in diversity indicators and a genetic distance of zero. There are two possible reasons for the high level of genetic diversity in the mtDNA control region: the first is that 10-16 years is not a sufficiently long period for diversity to decline, and the second is that initially the diversity was even higher in the ancestral population.

The microsatellite analysis was carried out for 95 samples. Structurally, the "Old" and "New" samples were genetically homogeneous, according to the studied microsatellite loci (Fig. 2), and based on the Nei method., so we considered the samples as one group.

41 alleles were described over eight loci. Unlike the control region,



Fig. 1. Collecting faecal samples for genetic analysis

heterozygosity indicators (observed heterozygosity – H_o and expected heterozygosity – H_e) were quite low, while the inbreeding coefficient was high ($H_o = 0.422 \pm 0.08$; $H_e = 0.514 \pm 0.083$, $F_{is} = 0.181$). Analysis of the literature showed that similar values for expected heterozygosity indicators (H_e) were recorded mainly in small populations in various categories of the IUCN Red List. The low level of variability of microsatellite loci in nDNA may be the result of selective poaching of adult males, disruption of the sex and age structure, or loss of paternal lines.

A fragment of the functionally significant MHC gene DRB 3 was analysed for 29 saiga samples. Ten alleles of the DRB 3 gene 249 bps long were described (MF960850-MF960856 and MT150329-MT150331). Only three out of 29 analysed samples turned out to be homozygous for the studied alleles, and the observed heterozygosity of alleles of the DRB 3 gene was higher than expected ($H_o = 0.8$; $H_e = 0.78 \pm 0.05$). Heterozygosity also remained high at the level of amino acid sequences in the DRB3 gene. This level of variability of the MHC DRB 3 gene in the studied saiga population could have been even higher in ancestral forms. It may be the result of exposure to a large number of extracellular parasites, including various helminths.

To summarise, the data suggested a high level of diversity of the mtDNA control region and MHC DRB 3 gene and a low level of diversity of the microsatellite loci in the nuclear DNA. The low heterozygosity of microsatellite loci rates and the high inbreeding coefficient cause the greatest concern. However, so far, we have not detected any critically low levels of genetic diversity in this population. Therefore, presumably, the most important actions to preserve the saiga population would be to control poaching and reduce the level of anthropogenic impact on the habitat.

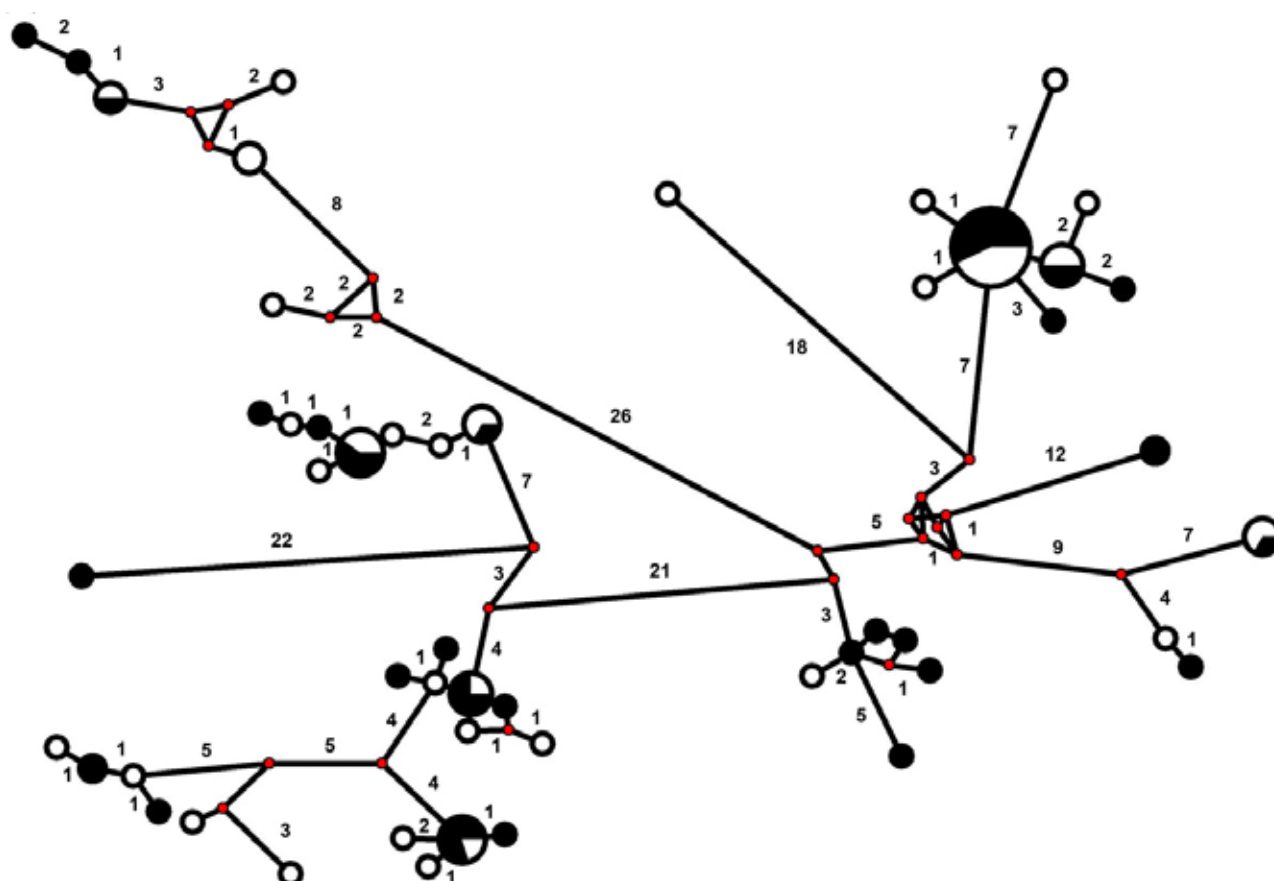


Fig. 2. Median haplotype network of the mtDNA control region (920 bps) in the north-western Caspian saiga population. Black circles – 1999-2000 samples ("Old"); white – 2010, 2011 and 2016 samples ("New"); red circles shown with red arrows – median vectors, hypothetical haplotypes at the base of branching. The number of mutation positions is indicated above the branches; the diameter of the circles is proportional to the number of samples.

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E.J. MILNER-GULLAND¹

An expert mission to Kazakhstan

In May 2023 I was honoured to be part of an expert mission to support the Government of Kazakhstan in developing a new strategy for the conservation and management of saiga antelopes. The strategy was prompted by the continued rapid increase in saiga numbers over the last few years, in all of Kazakhstan's populations (see Update in this issue of Saiga News). We were particularly focussed on West Kazakhstan, where the Ural saiga population has now reached around 1,130,000. Considering that the estimated saiga population in that area averaged around 375,000 in the 1980s, and that it reached a low point of an estimated 6,500 only 20 years ago, this is an extraordinary recovery. However, with this success have come other challenges, and in particular concerns from farmers and livestock owners that large herds of saigas are damaging their crops, hayfields and pastures, and that they are competing with livestock for limited water and potentially spreading disease. These concerns have become particularly acute in the last 2–3 years.

Our expert group included specialists in landscape ecology, spatial planning, community conservation, sustainable hunting, and saiga ecology (Michele Bowe, Norbert Hölzel, Tamas Marghescu, Stefan Michel, me, Navinder Singh, Steffen Zuther), as well as representatives of the Convention on Migratory Species and CITES (Hyeon Jeong Kim, Clara Nobbe, Polina Orlinsky). We were first invited to West Kazakhstan to witness this situation first-hand, and several of us were able to make this trip. After a long journey we reached a petrol station outside the village of Kaztalov. There we were met by rangers from Okhotzooptom, who told us that a large group of saigas was on the communal grazing lands on the outskirts of the village, only a few hundred metres away. The sight was extraordinary and very emotional for me, as someone who has been working for saiga conservation for several decades. In my rare trips to the saiga range I have in the past seen a few

tens or hundreds of saigas, often fleeing over the horizon. This time, a huge group of several thousand females and calves was grazing calmly outside the village, bisected by a road and watched by our convoy of vehicles and other road users. The calves were playing together and every now and again a group of saigas calmly crossed the road close to our vehicles. They were clearly not worried by human presence.

This sight was a clear demonstration that all the hard work to conserve saigas by the government, NGOs and the international community had finally paid off. Talking to farmers and their representatives, however, it was obvious that this huge saiga resurgence was not universally welcomed. Although farmers saw the value and importance of saigas as part of their natural heritage, they felt that in large numbers saigas caused substantial damage by eating crops and grass, drinking water meant for

livestock, trampling crops or hayfields and spreading disease. At the moment they feel powerless to act to protect their lands (it is not allowed to drive saigas away), and angry and frustrated that their concerns have not been acted upon.

Our trip prompted many questions. This area has seen huge changes in land use over the last decades; much of the land was ploughed up for wheat in the 1950s as part of Khrushchev's Virgin Lands campaign. In the 1980s the saiga was quite heavily exploited for meat and other products and kept at levels well below carrying capacity. Then the break-up of the Soviet Union in the early 1990s caused the collapse of both livestock and saiga numbers, drastically reducing grazing pressure



A farmer shows his pasture to the expert group.

Photo by E.J. Milner-Gulland

and causing vegetation to grow higher and denser. Now numbers of both are increasing, and water is becoming an increasingly scarce resource for various reasons, including extraction for growing towns and cities. The Kazakh government is already meeting shortages by paying the Russian government for water diverted from the Volga river. These dynamics are playing out in a complex way over a large area. Disentangling the relative roles of precipitation and grazing in vegetation growth in the context of the use history of an area is quite a challenge, and our experts spent some time "reading" the species composition of the vegetation and wildlife and linking this to remotely sensed images, so as to guess at how a particular area might have evolved.

Looking into the future, a sustainable balance needs to be reached in a way that is equitable, supports productive farming and livestock keeping, while also conserving and enhancing this unique landscape and its nature. This requires both short- and long-term actions over small to large scales, and the involvement of local communities in determining the way forward. Our role was to provide advice and support to realise this vision; spending even just a few days actually observing the situation and talking to local people was invaluable.

It was also a great treat for me and several other experts who have not had the opportunity to get out into the steppe for some years; to smell

the wormwood, see birds, plants and other wildlife, as well as healthy livestock with their babies, and walk in the open air brought back so many good memories and made us very happy. The whole steppe was bursting with new life and the experience underlined again why this landscape is so special. We also enjoyed the hospitality of our hosts in the villages and appreciated the open way in which they talked with us about the issues they were facing. We came at a time when the livestock were producing new milk and so we enjoyed eating thick cream and home-made butter along with the region's traditional dishes.

After our fieldtrip we participated in a three-day meeting in Astana which was organized by the Secretariat of the Convention on the Conservation of Migratory Species upon the request of the Government of Kazakhstan and with funding received from the Government of Germany. It involved all the relevant stakeholders, including the Committee on Forestry and Wildlife, Okhotzooptom, farmers' representatives, research institutes, UNDP and hunting associations. They were gathered to agree on a detailed strategic action plan covering all aspects of saiga conservation, management and sustainable use for the whole country. Debates were sometimes heated but were underpinned by a shared understanding of what the issues are, and agreement on the overarching goal of coexistence between people and saigas in a way that supports both prosperity for local communities and a long-term future for recovered saiga populations.

At the beginning it felt like an almost impossible task to get through a long and detailed document and agree every



Experts meeting with the Deputy Minister for the Environment in Astana



A meeting of farmers and experts in West Kazakhstan to discuss the issues around saiga numbers. Photo by E.J. Milner-Gulland

one of 24 action points, each of which had several sub-actions, as well as listing the stakeholders involved in implementing each one and its time-frame. People had come with their own priorities and solutions and felt the need to be heard. However, over the course of the meeting our views became more aligned and we moved more quickly, producing in the end a strategy that everyone felt proud to be associated with. This includes the sustainable use of saigas to generate revenues from meat and horns, generating conservation incentives for local communities to coexist with saiga, supported by long term land-use planning at the landscape level.

We should also not forget the potential for tourism. The huge herds of saigas we witnessed could be a great draw for people, alongside the culture and other wildlife of the Uralsk region. We had the privilege also to spend a day in the Korgalzhyn Reserve in the Akmola region between our field trip and the main meeting, where the birdlife is outstanding but which also hosts saigas from the Betpak-dala population, including for mass calving. We saw a few herds including one of several

hundred animals, albeit further away than in West Kazakhstan, as well as impressive waterbodies including Lake Tengiz. This is an area which already has some tourism which can be built upon. In this region the saiga population has also dramatically increased and there are complaints from farmers that they trample their crops, particularly just before harvest. However, the area where they roam is less constrained and so the issues are currently less acute.

The next stage is to find the resources to enable the conservation and sustainable use strategy to be implemented, starting with a few "quick wins" and pilot projects to build trust and help farmers cope with large saiga numbers on their land in the short term, while the longer-term structures are put in place. It's important that local people don't end up feeling that this was just another talking-shop, but that it is the start of a new partnership for genuine change. There are a number of other hurdles, including the Parties to CITES agreeing to allow sustainable horn trade once again, which will require sustained effort and international consultation to achieve. Legislative

change at the national level is also needed to support implementation of the strategy.

The international experts emphasised throughout that Kazakhstan should feel huge pride in their achievement of saiga recovery – right down from the national-level Committee on Forests and Wildlife to every community living in the saiga range. There is an opportunity here to lead the world in sustainable and participatory management of a species and its habitats at a grand scale; my impressions of our trip suggest that Kazakhstan is ready to take this opportunity. I'm sure I speak for every one of the international experts who were part of the trip, in saying that I stand ready to help and support however I can.

Editor's note: While this issue was being prepared, in Kazakhstan saigas were included in the list of species whose numbers are subject to regulation in order to "protect public health, protect farm and other domestic animals from diseases, prevent damage to the environment, and prevent the danger of causing significant damage to agricultural activities," kt.kz/rus/ecology/v_perechen_zhivotnyh_podlezhashchih_regulirovaniyu_vklyuchili_1377955791.html. Soon after this, the Government of Kazakhstan announced the intention to issue hunting permits to cull up to 200,000 saigas to regulate their numbers, and this culling began. It is being carried out by Okhotzooptom, repost.uz/govory-at-mnogo-rasplodilos. We expect to publish some articles on this topic in the next issue of Saiga News.



Experts and farmers assessing pastures in West Kazakhstan.
Photo by E.J. Milner-Gulland

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Take them or leave them in the steppe? Potential uses of saiga horn from natural mortality

Kazakhstan's saiga populations are in the process of recovery. Estimates of saiga numbers suggest that in April 2023 the size of the Ural population already exceeds by several times the highest numbers recorded during Soviet times, the Betpakdala population may soon reach a similar size and even the Ustyurt population, which a few years ago was acutely threatened, is on the path to recovery. This amazing conservation success is accompanied by increasing conflict due to actual or perceived adverse impact on croplands, haymaking areas and even on pasture. Other concerns of farmers are related to the fear that saiga may act as reservoir and carriers for transmissible diseases of livestock. Further negative perceptions are related to the use of watering points by saiga, allegedly newborn livestock following saiga herds and getting lost and carcasses of saiga causing sanitary risks on pastures and technical problems on haymaking areas. Farmers in several districts of the Ural population demand that saiga numbers should be massively reduced and confined to protected areas.

On the other hand, there are huge expectations at various levels – from central government to local people – about the economic benefits of sustainable use of saiga antelopes. During the consultative meeting “Identifying solutions to human-wildlife conflict involving Saiga Antelopes in Kazakhstan” in May 2023, organized by the CMS Secretariat with financial support by the Government of Germany, experts from Kazakhstan and abroad, together with stakeholders from the national and local levels, discussed the potential benefits of sustainable use (see more in article by E.J. Milner-Gulland in this issue). While some stakeholders saw sustainable use of saiga rather as a byproduct of culling to reduce population size, it became obvious that tangible material benefits at the local level have a high potential

to substantially improve acceptance of saigas by farmers, allowing coexistence of saiga and livestock and thus ensuring the conservation of saigas and the ecosystem.

In order to achieve such tangible benefits, which should be large enough to act as incentives for local land users, it will be necessary to use all the economic potential of saigas. Non-extractive use, i.e. eco-tourism, has the potential to provide some income for a rather small number of people. The use of meat for local consumption and trade beyond the immediate region will provide opportunities for more people. Given the necessary investments, costs of the actual harvest operations and initial processing, and also the not yet fully predictable market demand from local and external consumers

and thus the achievable prices, the economic potential of meat use is still difficult to assess. However, it can be predicted that, without a legal, strictly controlled and sustainable international trade in saiga horns, it is unlikely that sufficient revenues can be generated from sustainable use of saigas to deliver sufficient local benefits to regain land users' tolerance towards large, growing saiga herds in an expanding range area.

In the context of sustainable use and legal trade in saiga horns, so far, the horns from natural mortality have received rather limited attention. However, they provide substantial economic potential in the context of a legal trade system, and at the same time they are a potential source of risk and conflict as they attract unregulated and illegal pickup leading to criminalization. Local representatives complained especially about the latter during the above-mentioned consultative meeting.

A rough calculation, based on rather conservative assumptions, may illustrate the scale of the potential. If the Ural population prior to the birth season in 2023 was about one million saiga with 10 percent adult males, there would have been 100,000 adult males. Mortality of adult males peaks after the rutting season and may be as high as 30 percent. Conservatively assuming only two thirds are detected, this represents 20,000 pairs of horns. With four pairs per kg, five tons of horns might be recovered. Depending on the actual market value in a future legal trade system this may represent about 500,000 USD or more!



Take it or leave it? The person who found this saiga skull obviously decided to do both.
Photo by S. Michel

As long as the annotation on saiga antelope in CITES Appendix II prohibits any international trade in saiga horns from the wild, horns from natural mortality cannot be traded. However, they can become an important element of building up a sufficient stockpile – together with already stockpiled horns from confiscations – to buffer fluctuations in supply from harvest. In a legal trade system, continuous supply is important to avoid actual or perceived shortages triggering peaks in market prices which would incentivize poaching and illegal trade. Saiga populations are susceptible to mass die-offs and in such situations the harvest of the affected population would have to cease until its recovery. Accordingly supply of horns from harvest would be reduced for several years – and in the

first years after a die-off, fewer horns would also be available from natural mortality. To avoid related fluctuations in market supply, during the years before the lifting of the CITES annotation a well-managed and large stockpile needs to be built up. Also, when supply exceeds demand, some of the horns might be used for maintaining this reserve so that prices do not fluctuate too much.

Any pickup of horns from natural mortality is currently banned and taking and carrying such horns is legally equal to poaching. The reason is that such horns often cannot be distinguished from horns of killed saigas and poachers may pretend that they just collected horns from natural mortality. There may also be a risk that poached saiga

horn may be laundered at a later stage of the trade chain. Allowing such collection, therefore, may again facilitate poaching if no proper preventive measures are taken.

It is not possible to distinguish horns stemming from saigas which have recently died naturally or from actively killed saiga. For this reason, saiga horn from natural mortality would need to be integrated into the tracing system of legally sourced and managed horn from the moment of pickup. This will be possible by putting individual tags on each horn before removing them from the carcass and taking a photograph on a smartphone with time stamp and GPS location. Ideally this would be integrated within a smartphone application, registering the tags

and linking them to the photographs. These data would then be submitted to the agency in charge of stockpile management as soon as the smartphone is in a zone with mobile data coverage. Using this system, it would be impossible to declare horns from poached saigas as pickup from natural mortality.

The entire tracking system of horns needs to be secure and cost efficient at the same time. Tags should be designed in a way that they can be used only once and cannot be removed from the horn without destroying them. An option might be bracelet-like tags as e.g. such as are used as entrance tickets for festivals. On the tags a numerical and barcode would allow for scanning and tracking in a central database including to whom tags have been handed out, when they were used, when the horns have been handed in to local collection points and so on. These tags would have to stay fixed on the horns until their final destination at a consumer or processing facility.

Alternatively, the central managing entity may replace these initial simple tags with slightly more sophisticated ones – thin wires with tags fixed through a small borehole applied at the horn tips. This would allow the tag on the horn to be kept until it is consumed to the last piece. Used tags would ideally be handed in so that they can be marked in the data base as no longer in use. However, as the monetary value of individual horns is far lower than e.g. rhino horn or ivory, this rather sophisticated retagging system might not be necessary.

Further important aspects are the question of who will be entitled to collect horns, the handing in of horns and the sharing of benefits between the finder of the horns and other stakeholders.

Collection of horns should be allowed only for holders of land use or hunting rights in the area concerned, protected area managers or Okhotzooptom (the government-owned company in charge of saiga management). On communally used lands members of the local communities may apply for permission. Issuing permits to interested local individuals to collect horns on unallocated lands might be considered. By limiting the number of eligible collectors, the process remains controllable. Each collector would have to take a number of tags in accordance with the expected number of horns to be collected, which would be recorded in the database, and would not be transferable to other collectors. Local handing in of collected horns needs to be made as easy and rapid as possible, including recording in the database using the barcode, and the collector receiving a receipt.

The financial value of the horns needs to be shared in a way which rewards the actual work of collecting them while also honoring hosting of saiga on the lands which they use in other seasons, when mortality is low. In addition, the rewards for individual collectors should not be too high to incentivise passing off of poaching as natural mortality. More important would be to provide a substantial share of the financial benefits to the collector's entire

community. For instance, 20 percent might go to the individual collector, 40 percent to their community and 40 percent to communities in the wider range of the saiga population.

While no legal international trade is possible, it might nevertheless be reasonable to implement this reward system using other funds, e.g. from the national budget or with donor support. Having a functioning marking system for saiga horns in place will also be a requirement to lift the CITES trade ban. The system can then also be used for legally harvested horns at a later stage. Once legal international trade is reopened, these initial expenses will pay off through the sustainability of the entire system. Thus, the use of saiga horn from natural mortality could be an important conservation incentive for local people and ensure coexistence of saiga with other land uses in large areas of Kazakhstan.

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Seasonal patterns of waterhole and salt lick use by saiga antelopes in the north-west pre-Caspian

A large permanent watering place fed by an artesian well in Stepnoi State Nature Reserve in Astrakhan Oblast, Russia (*Fig. 1*) is an important site for behavioural studies on saiga antelopes, providing unique opportunities for detailed and prolonged observations from a permanent hide. It has been suggested that this waterhole has a number of functions that are important for the conservation of saigas in the area. In addition to being a source of drinking water, a mineral lick (saigas consume wet salt soils along the banks), a resting place, and a place for cooling off during the summer heat, it has been suggested that it is an epicentre of social contacts for a local saiga population (*Gilev & Karenina, 2015*).

A number of factors explain the significance of this waterhole. It is a long-lasting and year-round waterhole

used by many generations of saigas and attracting many different individuals searching for water and minerals. There are many permanent saiga trails leading to the waterhole from different directions. The relatively large area of water favours evaporation. Moisture, in combination with the specific smell of the mineral-rich water could, potentially, be detected by saigas at long distances, which also may help them to find the place. Moreover, the length of the shoreline allows large aggregations of individuals without competition for access to the water (*Fig. 2*). Another important factor could be that there is an extensive flat open area surrounding the watering place. This provides a) perfect visibility of the surroundings, making it easier to detect potential threats, and b) optimal conditions for active interactions between individuals, such as male fights and play for calves. Finally, an important

characteristic of this site is a very low level of anthropogenic disturbance.

The visiting patterns and behaviour of saigas at the waterhole in different seasons were investigated during our study supported by the Saiga Conservation Alliance. Data collection was based on prolonged daytime observations from the hide. In addition, some camera trap data were analysed. The details of methods applied are described elsewhere (*e.g., Gilev & Karenina, 2019*). Below we provide a summary of our results for each season.

Winter. In winter, the waterhole was visited predominantly by males. Females and juveniles constituted less than 3% of saiga records. During the rut in December, and especially near its end, large aggregations of adult males visited the waterhole in dispersed groups of 100 to 800 individuals. The groups stayed in the area for prolonged periods, approaching the waterhole for mineral licking and drinking, then moving away for a while to graze and rest, before approaching again. Their social interactions included intense face-to-face fighting and chasing, often accompanied by vocalizations. These agonistic interactions happened irrespective of the



Fig. 1. The study site in Stepnoi State Nature Reserve. The hide is to the left of the waterhole. Photo by Andrey Gilev & Karina Karenina



Fig. 2. Saigas standing and walking in the water in August. Photo by Andrey Gilev & Karina Karenina

presence of any females, i.e. they were not directly associated with mating competition. At the same time, small groups of males (2–10 individuals) often formed resting aggregations lying close to each other with inter-individual distances of 2–30 m.

During the three weeks following the end of the rut, the sizes of male saiga groups and the frequency and intensity of agonistic interactions between them steadily declined. Most males visited the waterhole in small groups of up to ten individuals. The spatial distribution of males indicated social attraction: males approaching the water preferred to start drinking near others.

In general, the behaviour of saigas at the watering hole in winter differed from the pattern observed in warmer periods of the year. The proportion of time spent on active social interactions was 92% lower than in summer. The predominant activities by the water were soil consumption and drinking. In

contrast to summer months, soil consumption took a larger portion of time than drinking and occurred in a specific way. The males submerged the front part of their head in the water up to eye-level and ‘scooped’ the soil from the bottom with repeated movements. In other seasons saigas typically consumed soil on the banks, not in the water. This difference was probably caused by low air temperatures making the soil along the banks hard to bite. Another remarkable behavioural characteristic of males in winter was the duration of soil consumption (up to six minutes continuously), contrasting with short episodes (up to 30 seconds) in warmer seasons. It seems that soil, rich in minerals, is an important factor attracting males exhausted after the rut, and may enhance their survival.

Spring. Much like in winter, the waterhole was predominantly visited by males in early and mid-spring (March–April). Females were recorded only on 12% of days. Females typically

approached the water alone or within male groups (up to 10 females in one group), drinking briefly, and were not involved in social interactions. Males, in contrast, were observed almost daily. Most frequently small groups of up to 20 individuals approached the water. Two age classes were clearly distinguishable; (almost) one-year-old young males, and older males. Only 13% of groups consisted of males of one age class. The main types of behaviours registered were mineral licking, drinking, grazing, standing in the water, lying on the banks, and social interactions. Mineral licking was particularly typical for young males, which often spent up to 20 minutes consuming soil. Social interactions between males included fighting (71% of interactions), chasing, and “climbing” (placing forelimbs and chest on the other male’s back, Fig. 3). In 87% of cases, fights occurred between the males of the same age class. We regularly observed repeated fights between the same pairs of older males.



Fig. 3. A typical social interaction between young males on the banks of the waterhole, April. Photo by Andrey Gilev & Karina Karenina

Summer. From around the middle of May, saiga behaviour started to follow its summer pattern, characterized by large aggregations and profuse social activity. The most typical groups comprised 200-400 individuals of different sex and age classes. The second most frequent type of groups was small groups of up to 20 females with calves. Occasionally, male groups of 30-70 individuals were observed. Single individuals approaching the water were always females without calves.

The main types of behaviour were grazing, drinking, standing in the water, lying on the banks, mineral licking, and social interactions. Mineral licking was rare and brief, much shorter than in winter and spring. Interactions between calves were the most frequent type of social interaction. Calves often formed short-term groups of up to six individuals. Interactions between mothers and their calves were frequent but brief, e.g. sniffing or touching lasting for a few seconds. Calves and their mothers actively vocalized, especially in larger groups. Male-male and male-female interactions were also

frequent. The majority of male fights were brief and gentle but chases of one male by another were not uncommon. Males approaching the watering place within the mix-sexed group often displayed herding behaviours towards females and their calves. Climbing of one female on another female's back was common in large dense aggregations (Fig. 4).

In July and August) the number of saigas visiting the waterhole increased, while social activity decreased. Large aggregations of several thousand individuals were more regularly observed.



Fig. 4. Social interactions between females (rare) on the banks of the waterhole, June. Photo by Andrey Gilev & Karina Karenina



Fig. 5. Saigas resting on the banks of the waterhole in the middle of a hot day in August.

Photo by Andrey Gilev & Karina Karenina

The summer heat is at its peak during these months and saigas spent a significant part of their time standing or slowly walking in the water, which probably helps them to lower their body temperature (Fig. 2). Lying on the banks of the waterhole was also common, with individuals of different sex and age often resting very close to each other (at a distance of less than 1 m; Fig. 5).

Autumn. In September, October and November, the number of saigas visiting the waterhole gradually decreased, and the number of days without any saiga sightings increased. Saigas were regularly observed within a few kilometres of the waterhole, indicating their presence in the area and emphasizing the lack of motivation to approach the watering place. 47% of individuals visiting the site were juveniles born in May. They often formed single- or mixed-sex groups of 20-50 individuals. Until the middle of October, up to 9% of approached the water together with adult females (likely their mothers). Remarkably, 85% of juveniles accompanied by mothers were females, suggesting that females stay longer with their mothers than males. Among adults visiting the waterhole in

autumn, 35% were females, and 18% were males. The majority of saiga visits last for less than five minutes. Mineral licking, grazing, and lying were observed very rarely. The social interactions in autumn were scarce. Despite the very low social activity, juveniles often approached the water with one group and left the area with another group. The waterhole may play an important role in fission-fusion dynamics of juvenile groups.

The project results confirmed the important role of waterholes/salt licks in the social behaviour of saigas, as suggested previously (Gilev & Karenina, 2015). However, our observations demonstrated that the visiting patterns and the social role of the study site varied significantly between seasons. In winter and early spring, the consumption of soil and water rich in minerals appears to be the most significant driver of the waterhole visits, and in late spring and the beginning of summer the social role of the waterhole becomes most prominent. In the middle and the second half of summer, the waterhole is particularly important for thermoregulation and rest during the heat. In autumn, the importance of the waterhole is least pronounced.

In general, the results of the study emphasize the diverse significance of large permanent waterholes and mineral licks for saiga antelopes. We suggest that such places should receive focused protection throughout the saiga range. Moreover, in protected areas lacking large watering places or when it is not possible to minimize disturbance (for example, when watering places are actively used by cattle), saiga populations could greatly benefit from the creation of new watering places with such characteristics. In contrast to smaller ones, large permanent watering places are regularly visited by saigas, and can be used for sustainable ecotourism initiatives such as controlled visits of photographers and wildlife watchers.

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Changing threats for the saiga antelope on Resurrection Island

Regular readers of Saiga News will know of Vozrozhdeniye (Resurrection) Island, the remote island – now connected to the mainland – situated in the Uzbek portion of the former Aral Sea (e.g. *Saiga News Issue 28*). It has a fascinating history both in terms of its unique wildlife, and in terms of its previous human uses: at various points being targeted for hunting, a site of classified Soviet military activities, and now, increasingly, forestry and natural gas extraction. Resurrection Island is also one focal component of the newly designated 'Aralkum' protected area in Uzbekistan, which should in part protect the wildlife that use it as a refuge. So what is the status of threats for the saiga of Resurrection?

The abundant wildlife of Resurrection certainly includes saigas (perhaps numbering 100–150 individuals), along with many other species of conservation interest (e.g. Brandt's hedgehog *Paraechinus hypomelas*, Caracal *Caracal caracal*, reptiles such as Central Asian tortoise *Testudo horsfieldii*, four-lined snake *Elaphe saurornates* and Tartar sand boa *Eryx tataricus*, birds such as greater flamingo *Phoenicopterus roseus* and Pallid harrier *Circaetus pallidus* as well as Steppe *Aquila nipalensis*,

Imperial *Aquila heliaca* and Golden eagles *Aquila chrysaetos*), and some pleasant surprises (e.g. golden jackal *Canis aureus*, recently observed this far north for the first time as result of natural succession). The total list of vertebrates recorded as inhabiting Resurrection Island and the surrounding area includes 130 species (1 amphibian, 11 reptiles, 93 birds, and 25 mammals). We know this from the repeated field surveys and camera trapping being performed regularly on the island, through projects such

as our Darwin Initiative Resurrection Island project ([ref: 28-003](#); see also "Expedition to the Resurrection Island" via the SCA, August 2022). It is also the case that in the past, saigas and other species were hunted extensively on Resurrection, just as elsewhere (*Saiga News Issue 28*).

However, as part of these field surveys over the last year or two, we have increasingly noted almost no signs of saiga poaching on Resurrection Island and across the former Aral seabed; despite saiga poaching having taken place in the recent past based on our own observations and interviews with local people. If true, this could be for various reasons. Firstly, difficulty of access to the harsh and remote former islands – not only are they far away from the nearest settlements, travel there is hugely complicated by the network of deep ridged tracks from forestry operations that criss-cross the seabed, and additionally saigas constantly move to places practically inaccessible to people – this likely makes poaching of saigas too difficult and unprofitable. But also, there has been an increase in border guard and national park staffing, as well as the expanding nearby presence of natural



Many wildlife species have been caught on camera at Resurrection Island: here are examples of Asian steppe cat and Asian badger. Photo by Institute of Zoology / Alexander Esipov

gas exploration and extraction activities (e.g. the Western Aral gas field). We were fairly confident that saiga poaching levels are relatively low, so didn't cover the issue in detail recent social surveys (*see our Darwin Initiative project website for links to outcomes*).

On one hand, this is cause for celebration: a sizeable saiga population living (and, it seems, breeding) on Resurrection Island, somewhat out of reach of potential poachers.

But it is a double-edged sword, as the saigas are still highly disturbed by human activities. As both forestry and natural gas sector activities have intensified, we have noted a correspondingly smaller chance of finding signs of saigas; suggesting that they may be moving away from areas in which they might be disturbed. This is entirely consistent with what we know about the behaviour of saigas. The noise created by heavy transport, drilling, and infrastructure construction; the barrier effect to their movement as linear anthropogenic features appear on the landscape; the reduction in availability of natural resources, including water, as the antelopes have to share them with people; all of these very quickly

push the saigas to move on elsewhere. And despite the size and remoteness of the Aralkum, there are a dwindling number of places that they can go to.

All of this points to the great importance of the new Aralkum protected area: in protecting the wildlife of this area, but also in finding a way to integrate the requirements of both people and wildlife. The protected area must be designed around the needs of the species that occupy the area, taking into account the pressures exerted by the economic activities which are still viable here even while the sea itself has disappeared; particularly natural gas extraction and forestry.

So, we should celebrate reductions in saiga poaching, and the increasingly promising outlook for the survival of the species. But we must not relax our guard too quickly. Given the likely fragility of this remote saiga population on and around Resurrection Island and around, it is crucial that all human activities in the region are designed to minimise disturbance to saigas, and other wildlife.

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Ridges, created as part of efforts to afforest the former Aral seabed with saxaul, make travel across the seabed challenging. Photo by J Bull



Saiga antelope tracks are regularly spotted on and near Resurrection Island, but not near to sites of any intensive human activity, even if there is no poaching. Photo by J Bull



A pregnant saiga crossing the area.

Photo by Institute of Zoology / Alexander Esipov

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Reducing Demand for saiga horn in Singapore and Japan: an ongoing behaviour change intervention project

Despite saiga antelope (*Saiga tatarica*) being listed in Appendix II of CITES, domestic trade of saiga horn products is still allowed in countries like Singapore and Japan (Roberts *et al.*, 2021). In Singapore, saiga horn is part of Traditional Chinese Medicine (TCM) and is known as ling yang or ling yang jiao (羚羊/羚羊角), while in Japan, saiga horn is known as rei yoh kaku (羚羊角) and used as an ingredient in traditional Kampo medicine, which has its roots in TCM. Saiga horns are widely available and accessible in TCM shops and online shops in Singapore, often used as an ingredient in 'cooling water' (Figure 1). In Japan, little is known about the range of products containing saiga horn, but the horn is known to be used as an ingredient in several over-the-counter medicines. In TCM, the human body is composed of Yin and Yang energies, and saiga horn is regarded as a substance that provides Yin energy which could treat fever and heatiness (an illness with symptoms such as cough and sore throat) when Yin energy is insufficient.

Demand for saiga horn remains a threat to saigas. It is thus important to reduce the trade of saiga products from the demand side, requiring a shift in consumer behaviour. To study consumers' behaviour, a country-level survey was conducted in Singapore

to identify core consumers, followed by an evidence-based behavioural change intervention using strategic online advertising campaigns in 2019 which created awareness but was not sufficient to change the behaviour of consumers (Doughty *et al.*, 2021). With over 5 million views of advertisements and articles on local news platforms, the campaign informed those who saw it of the harm of using saiga horns, many of whom expressed conservation-friendly sentiments in response (Doughty *et al.*, 2021). In Japan, no systematic work has yet been done to understand or change saiga horn consumers' behaviour.

As a result of COVID-19, saiga horn use may have seen another surge, as horns are often used within TCM to relieve COVID-related symptoms, such as fever. However, a lack of up-to-date data presents a challenge in understanding any changes in demand and designing consumer interventions to reduce illegal and unsustainable trade.

Therefore, in addition to previous efforts, a new project funded by the U.S. Fish and Wildlife Service is underway to further drive progress. Conducted jointly by the University of Oxford, the National University of Singapore (NUS), and the National Institute for Environmental Studies



Fig. 1. Saiga horn cooling water found in a local TCM family shop in Singapore. Photo by Cai Xiaotong

(NIES) in Japan, the project will gather data and insights on consumer behaviour and consumption drivers to provide solid evidence for more impactful behaviour change efforts in both Singapore and Japan.

This project will be conducted initially in Singapore and subsequently in Japan. Firstly, in Singapore, updated data will be collected using focus groups to qualitatively explore whether consumers' perceptions of the use of saiga horn have been influenced by the pandemic. At the same time, the potential impacts of COVID-19 on saiga horn consumption will be identified. In the second stage, the research will investigate saiga horn consumption in Japan, another important importing country, to fill the research gap on Japanese saiga product usage, core consumer characteristics, and the factors driving

horn consumption. Based on the survey findings, behaviour change intervention will be designed and implemented in both Singapore and Japan. Finally, the effectiveness of these interventions will be evaluated, using follow-up surveys.

The saiga is not the only species that is threatened by the medicine trade. A conference entitled "Faunal Medicalization in an Era of Mass Extinction and Zoonotic Disease," organised by the Asia Research Institute at the National University of Singapore in May 2023, explored the medicinal use of other animals. Scholars shared their valuable research experiences and insights about how personal factors, psychological factors (such as beliefs, personalities etc.), markets, and culture affect consumers' behaviour when purchasing animal-based medicines.

At this conference, Diogo Veríssimo from the University of Oxford, who works on the design and evaluation of behaviour change, delivered a presentation entitled "Conserving Saiga Antelope by Managing Demand for Horn: Singapore as a Case-study". During the presentation, he provided a comprehensive overview of past work on how to define the core consumers of saiga horn and outlined the process of integrating the research and theories from social science disciplines to design an effective intervention campaign, which is imperative for developing impactful behavioural interventions.

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Study: Chinese Singaporeans lack awareness over TCM remedy

Many who use products made from antelope horn do not know animal is critically endangered



Fig. 2. One of the articles in the local news about this campaign. Credit: Choo, 2019

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Ecotourism as a way to form understanding about the environment

Ecotourism is a sustainable form of tourism, which implies travelling to relatively untouched places, preserving the area in its original condition, and supporting the well-being of local residents. The term "ecotourism" was first proposed by the Mexican economist H. Ceballos-Lascurain. According to this scholar, ecotourism means that people can combine positive emotions with the study of fauna and flora, contributing to environmental protection.

As part of the project "Vozrozhdeniye Island: nature conservation and development of the Aral Sea region", new tourist itineraries have been developed on the Ustyurt Plateau and in the Aral Sea region. The first pilot tour using these itineraries was organised in May 2023. We visited a number of outstanding historical and architectural monuments such as the Mizdakhan complex, Mazlum Khan Slu underground mausoleum and the Gaur Kala archaeological complex. We were deeply impressed by a stop at Lake Sudochoye and a journey through the variegated slopes and canyons of the Eastern Escarpment

of the Ustyurt Plateau. The plateau offers a breathtaking panorama of the drying Aral Sea and the Aralkum desert, which has recently developed on the former seabed. The next stage in the trip was a visit to the town of Muynak, once inhabited entirely by fishermen, featuring an excursion to the sad "graveyard of ships". We then travelled across the drained bottom of the Aral Sea and further to Cape Sulama and Vozrozhdeniye Island. We had many opportunities to enjoy the unusual nature of this remote region, inaccessible to "ordinary" tourists, see first-hand the results of afforestation

programmes, observe the wildlife and visit unusual geological features. At the end of our tour, we arrived at a local farm, where we learned about the process of growing silk cocoons and took a masterclass on cooking traditional local dishes. The pilot tour helped us draw some conclusions and make recommendations for the future development of this tour.

Main conclusions:

- Small groups of responsible tourists visiting untouched natural sites have a low impact on the environment and improves the economic situation of the local population.
- Visiting the habitats of wild animals and plants and impressive landscapes (such as the Ustyurt Escarpment and the Dinosaur Eggs geological feature) makes eco-tours more attractive.
- Accommodation in places reflecting local culture and traditions (for example, Besh-kala yurt camp, Sulama campsite) in combination with outdoor activities (hiking tours, photographing unusual landscapes, swimming in the sea) increase the attractiveness and informative value of the tour.



SCA team against the backdrop of the Aral Sea, Cape Sulama. Aralkum National Park. Photo by Nodira Shaabasova

- Ecotourism, focused on visiting relatively untouched natural areas, combined with agrotourism and rural tourism, where travellers can acquaint themselves with agricultural production, goes well with nature tourism and can be very attractive.
- During the familiarization tour, we were offered traditional dishes prepared from local products that met quality, safety, hygiene and comfort standards. We would also recommend the inclusion of elements of gastronomic tourism, when guests can acquaint themselves with regional and local cultural traditions through trying local cuisine and being involved in cooking themselves.
- Since local products and labour are mainly used to serve the tours, this provides good support to local communities in terms of jobs and using local resources.
- There are many unique tangible and intangible attractions which can be used to develop a comprehensive tour for those who want to visit remote regions beyond traditional tourist itineraries.

Despite all the advantages and positive aspects of ecotourism, we also need to keep in mind **the following lessons we have learned:**

- It is important to understand that people who are unprepared for life in the wild and visiting remote areas need special training to participate in eco-tours. Acquaintance with wild and remote areas can be informative and enjoyable, but at the same time it is associated with low level of comfort – lack of availability of hot water, unfamiliar food and staying overnight in tents or yurts does not suit everyone. Travellers should be informed in advance about what exactly they can expect from the tour, what kinds of dangers and discomfort they may face, and what they need to take with them for the trip to make it more comfortable and safe.
- It is important to specify places for stops on the route and properly provide them with necessary equipment, and arrange safe overnight stops in advance.
- Viewing photos and videos with images of wild animals from camera traps was very useful. In regions where it is difficult to observe animals due to their lifestyle (such as

in the desert, where animals are active at dusk and night), this type of photo and video excursion can give a more complete picture of the fauna and animal behaviour, allowing the visitors to understand the value of the territory for biodiversity conservation. This type of activity can be especially useful in combination with excursions into the wild led by an experienced guide who knows the territory and species of animals and plants inhabiting it.

Recommendations:

- Developing a flexible package of eco-tours is key to success. The package should be based on a trip plan discussed with the client, including various natural and cultural objects, taking into account the duration and distance of the trip, as well as the frequency and duration of stops on the way.
- It is important to provide reliable information to the tourist. Before the trip, it is recommended that a communication session be held online or in person, a brochure be provided with a detailed description of the history, geography and climate of the area to be visited, as well as the people's traditions and lifestyle.



Participants of the pilot tour at Lake Sudochoye. Photo by Ozodbek Turgunboev



View of the variegated slopes and canyons of the Eastern Escarpment of the Ustyurt Plateau.

Photo by Elena Bykova

- Developing a guidebook and a map with detailed information about wildlife (for example, what kinds of animals and plants inhabit each area) would be very useful.
- A guide should be developed to ensure that tourists do not harm wildlife and treat places they visit responsibly. For example, they should follow clearly marked trails, avoiding places where animals can be disturbed (such as bird nesting sites) or where they may be exposed to danger, know how to dispose of waste and so on.
- It would be useful to inform tourists about local environmental problems, such as limited access to water, and ways to solve them, using environmental projects as examples.
- It is necessary to provide assistance and support to local communities in the development of high-quality souvenir products through training, exchange of experience and competent marketing.
- To develop an effective tourist product, it is key to work systematically with all partners (tour operators, owners of yurt camps, guides, host families and so on).
- It is also recommended that ecotourism should be integrated with agrotourism enterprises. Tourists will then be given the opportunity to acquaint themselves with wildlife, the rural lifestyle, and learn about folk culture, applied arts, traditional songs and dances. They can explore local customs by taking part in agricultural activities and festivals.

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Saiga Hero: Ilya Smelyansky

Our new hero, Ilya Smelyansky, a graduate of the biological faculty of the Samara State University, almost throughout his life has been working in one environmental field, substantiating the value and importance of steppe ecosystems and their practical conservation. He initiated and developed the Steppe Conservation Strategy for Russian non-governmental organisations and contributed to the expansion of the network of steppe protected areas in Russia, with a total of more than 30,000 hectares of steppe ecosystems in different regions of the country protected. He is the founder and ongoing editor of journal "Steppe Bulletin", savesteppe.org/sb, which has been covering steppe ecosystems conservation issues for many years. The problems of saiga conservation and its coexistence with humans are regular topics in the bulletin. In 2020–2022, Ilya and his colleagues studied the recovery of the saiga population in the Volga region in Russia and the associated prospects and challenges; some of the results of these activities were published in our bulletin (see SN-28).

Editor: When did you first become interested in wildlife?

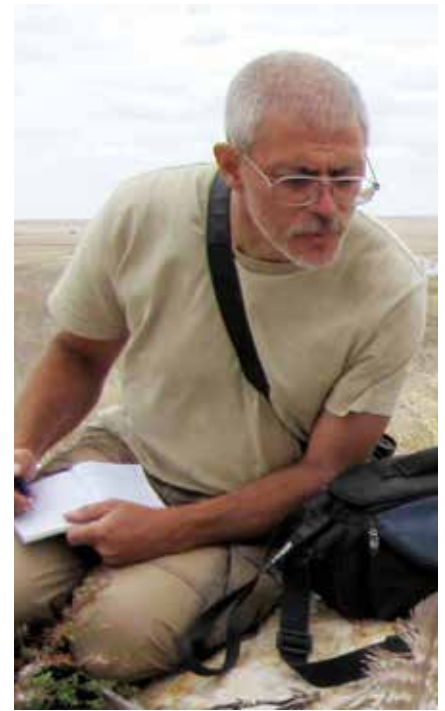
Ilya Smelyansky: Consciously — at about 6 years old. It was (I'm scared to admit) 1974.

Editor: When did you first become interested in saigas?

IS: Hard to say. I didn't take a special interest at first, but as I developed liking for the steppe, I was becoming increasingly more interested in ungulates inhabiting it, including the saiga. The saiga became my special focus only in the early 2000s, which was for purely conservation (not environmental) reasons.



Ilya on an expedition. The low Ulytau mountains, Central Kazakhstan. Photo by Anastasia Antonevich



Editor: When did you start studying and protecting the saiga?

IS: Very recently. I have been following the saiga situation since the late 1990s — but for a long time I dealt with it only as the Steppe Bulletin editor. Throughout my work for the magazine's existence, I tried to gather materials about saiga and do something to conserve it, doing what I could as the editor of a specialist periodical. And nor did I forget about the saiga in my communications with Russia's customs authorities — I gave them advice and gave a few talks at advanced training courses for the Siberian Customs Administration dedicated to the regulation of trade in animal derivatives. Since 2009, first as an author of draft documents, and later as a consultant to the UNDP/GEF/Ministry of Natural Resources of Russia's Russian steppe project, I have attempted to do something more specific for saiga conservation. For example, I was engaged in planning and evaluating the project's results in the North-Western Caspian region, mainly in Kalmykia.



Secondary stipa steppe on fallow land near the border of the Saratov and West Kazakhstan regions, one of the places where saigas enter the Volga region of the Russian Federation. Photo by I. Smelyansky

And I've been working directly just on saiga for the last 3 years. I've been involved in attempts to study and reduce the conflicts between saigas from the transboundary Volga-Ural population and local residents in the Trans-Volga region in Russia (2020–2022) and in the main Kazakh part of the range (2022–23).

Editor: What are the main challenges in your work?

IS: Well, this is a very broad question. If we talk about the problem of reducing the conflict between saigas and farmers, the main challenge is the categorical unwillingness of our states (Russia and Kazakhstan) to compensate people for losses from nature protection. That is, the protection of natural ecosystems and species is usually arranged in such a way that the whole of society benefits from it (particularly the state, since it appropriates much of what is owed to society), while losses are imposed on relatively few local residents and businesses living side by

side with protected objects. It would be fair if society (represented by the state as an expresser of public interests) simply compensated these people for losses. This would stop many potential conflicts. But our states would rather (reluctantly, but still) spend money on repressive measures, strengthening enforcement, broadening rangers' power and increasing their numbers (all this is largely about Kazakhstan, and only partially refers to Russia). But this is a stick without a carrot. And the more they invest in the stick, the easier it is to see there is no carrot. Conflicts continue to grow, and when they break out, the state can only take belated measures, which are usually wrong, because they are aimed at "extinguishing a fire" instead of taking systemic actions to prevent it. This big challenge leads to difficulties in our practical work. Whatever we come up with to reduce conflicts, everything is blocked by this lack of systematic investment in prevention and compensation of damage instead of building up purely repressive security measures.

Editor: What do you like most about the work?

IS: Achieving a result is usually the best part. When we strive to do something and finally complete the task.

Editor: What are the prospects for saiga conservation? What should be done first to help this species survive?

IS: There are actually two questions in one.

A. My understanding is that evolutionarily the saiga is an r-strategist. Its population dynamics are saw-shaped, with periods of rapid increases in numbers until it exceeds the environment's capacity, followed by catastrophic drops to very low values. This happens again and again. Such a model is not the result of human activity, but a natural phenomenon (in general, it is very characteristic of steppe ecosystems, extreme dynamism being one of their most typical features). Nevertheless, currently, it is man that causes the sharp changes in the trend and the context for system dynamics. On a long-term scale, the prospects for saiga conservation depend on the prospects for preserving the steppe biome on the scale of entire regions and landscapes. The main long-term challenge, in my opinion, is not poaching, but loss and fragmentation of habitats. If we protect sufficiently large areas of natural dry steppe and semi-desert ecosystems (in which desertified steppes are mixed with cold winter deserts), the saiga will anyway be saved from extinction. At least, if we regulate mining to a certain extent. But it is difficult to know if they will be preserved at all. The general tendency is increased development of these territories. If not for



Ploughing the steppe near the border of Russia with Kazakhstan — this is how saiga habitats shrink and the potential for conflicts between farmers and the species inevitably increases. Photo by I. Smelyansky

agriculture, they are going to be used for oil and gas production, infrastructure expansion and so on.

B. We should, first and foremost, right now, change our attitude to saiga protection. We should begin to honestly admit that people can really suffer damage from a conserved species, and adequately compensate them for this damage and invest in its prevention, while not reducing the number and distribution of the species. It will incur big costs, but probably they will not be any larger than investing in the protection of the species. At the same time, we should never significantly reduce the level of protection that has been achieved up to now. Even if we allow for some use (hunting in some form, trade in derivatives, also within some limits). It certainly sounds utopian, but there was conditionality in the question.

Editor: How long have you been working in the field of nature conservation? What has changed over the years,

and what are the current trends in this area?

IS: I joined the Nature Conservation Squad of my university when I was a first-year student, in the autumn of 1985. I consider this to be the informal start of my work experience in nature protection. Almost everything has changed since then. Even the country is different (and has managed to turn inside out twice since 1985). The period from 1986 to 1992 was unique for the environmental movement. It was a time when the role of nature conservation grew incredibly in society, and specialists in this field turned from almost unknown cranks (I would say even freaks — but there was no such word in Russian then) into the most influential opposition political force in the USSR (for a very short time) and in Russia (for a little longer). It was the "golden age" of nature conservation. There was probably no such situation in the history of the country, either before or after. Why it

happened this way is a special question, it is inappropriate to talk about it here. But the fact is that environmental ideas and initiatives arose and were passed easily, had very large weight with the public and mass support. It was pleasant to participate in this, but, in fact, it was a strange and unstable situation for society, which could not last long. Why it couldn't is the subject of a separate conversation, but the fact is that after 1992, "environmentalists" began to gradually lose ground, and since the early 2000s, a completely different stage began (which has fully developed by now, 2022–23).

I'm a little afraid to talk about modern trends in nature conservation. In my opinion, Russia has arrived at the end of a period in which the Russian environmental movement has been an inseparable part of the wider world. It lasted from the late 1980s to 2022. This refers to a number of aspects, such as the role of international organisations, development of legislation, environmental practices, the influence of international agreements in the country, and (how to put it) public recognition and understanding of the meanings of this activity. While 1986–1992 was the "golden age" of nature protection, now we are at the beginning of some kind of a directly opposite time. I cannot find an epithet, but there should be an antonym for the word "golden". International nature conservation organisations have been completely ousted from nature protection in the Russian Federation (some banned and crushed, others gently squeezed out), and with them have left (or are about to leave) world standards, approaches and the potential for integration into all kinds of international processes. The role of international environmental agreements



Saiga herd within the Bokey Orda Nature Reserve in the autumn of 2022.

Photo by I. Smelyansky

in the Russian Federation is steadily declining and is likely to reach zero soon, but this is still to come (to say nothing about the situation that over the previous 20-25 years, the Russian Federation was very reluctantly, through great internal resistance, joining such agreements, which were even more difficult to put into practice).

The public environmental movement, as it existed in the previous couple of decades, has essentially been destroyed by the actions of the state, and now something new is taking shape, partly similar to the very old (late Soviet) times. That is to say, the institutions of this movement are largely imitative, but although they are numerous, there is no monopoly (maybe there will never be). Meanwhile, there is the potential for "on the ground" protest, which is constantly being fulfilled in all kinds of local conflicts, but is impossible to institutionalise without it losing meaning. In any case, for the protection of

wildlife, this potential is almost useless – because it represents the reaction of people to the emergence of threats to their living conditions at the local level; these are mainly the problems of cities, waste, pollution and so on (with a few exceptions). The preservation of ecosystems and species that are not directly related to people's lifestyle does not arouse a response at this level. Even worse, effective environmental restrictions can be perceived by local communities as a threat, and they may protest against them, which is happening increasingly often in recent years.

The next characteristic feature is the great potential for erosion of environmental legislation and law enforcement. Although much has already been destroyed and replaced by imitations (the environmental assessment system by EIA, for example), there is still a lot beginning to, or in the process of, collapse. This refers, in particular, to legislation related to protected areas and the very system of

protected areas, the system of keeping Red Books and everything else associated with it. So, in my opinion, the current trends in nature protection in the Russian Federation are characterised by the destruction of all the institutions that emerged in the 1990s and more or less persisted and even somewhat developed in 2000–2015. Personally, I was lucky to observe the entire process from the beginning and, possibly, to the end (depending on when the end will come, if I live that long). Although that system was very far from ideal, and it had many shortcomings and failures, it worked, and it had the potential for very significant improvement. The new one, I'm almost sure, will be much worse. The good thing is that it may not last long. In the future, when this sad period ends, something else will emerge. But this is in the very dim future.

Acknowledgements

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