

SAIGA NEWS

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Providing a six-language forum for exchange of ideas and information about saiga conservation and ecology



Saiga male displaying a white winter coat. Photo by Eugeny Polonsky

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Feature article

Thoughts on the proposal to move *Saiga tatarica* from CITES Appendix II to Appendix I

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This article is a personal view, and the aim is to help readers to understand the CITES process and its implications for saiga conservation. It is not the stated position of the Saiga Conservation Alliance.

Background to the CITES process

The Conference of the Parties (CoP) to CITES (the decision-making body of CITES made up of representatives of the CITES Parties) uses a set of biological and trade criteria to help determine whether a species meet the CITES criteria for inclusion in Appendices I or II. Prior to each regular meeting of the CoP, Parties (i.e. national governments) submit proposals based on those criteria to amend these two Appendices. Those amendment proposals are discussed at the CoP and either adopted by consensus, or are put to a vote.

Appendix I includes species threatened with extinction, for which trade is permitted only in exceptional circumstances, and not for primarily commercial purposes. Appendix II includes species not necessarily threatened with extinction, but in which trade must be controlled in order to avoid utilization incompatible with their survival.

Any proposal to amend the Appendices can only be submitted by a national government of a CITES Party, or co-sponsored by several Parties. There is a strong presumption that at least one range state should sponsor a proposal for it to get support from the CITES Parties.

Summary of the proposal

In December 2018, Mongolia and the USA submitted a proposal (https://cites.org/sites/default/files/eng/cop/18/prop/020119_d/E-CoP18-Prop_draft-Saiga-tatarica.pdf) to transfer *Saiga tatarica* from Appendix II to Appendix I at the May 23 – June 3, 2019 CITES Conference of the Parties (CoP18). Although IUCN and the SCA recognise the Mongolian saiga as a subspecies of *S. tatarica* (*S.t. mongolica*), following the best available genetic information, CITES classifies it as a separate species, *Saiga*

borealis. Unfortunately, therefore, at the moment the proposal does not cover the Mongolian saiga. When referring to both subspecies, CITES and CMS use the umbrella term *Saiga spp.*

What is the legal position of saigas at the moment?

Saiga spp have been listed on CITES Appendix II since 1995. Currently all saiga range states have voluntary moratoria on international trade in saiga products and strict laws against hunting and domestic trade in saiga and saiga parts and products. Therefore they do not grant export permits for legal trade under CITES. This has been the case for some years (exact dates vary by country).

There have been seizures (sometimes quite large) of saiga horn at borders and from poachers within range states (see media reports in Saiga News 21 for examples). One particularly large seizure was by Chinese border officials on 30th October 2015, and comprised just over 5 tonnes of saiga horn. Clearly there is still illegal international trade going on.

Stockpiles were reported to the CMS MoU meeting in 2015 by Singapore and China. Singapore reported <20t of pre-convention (pre-1995) horn, owned by TCM traders and retailers. This is registered with the Singaporean CITES Management Authority, checked periodically, and exports are deducted from the records for that dealer. China reported that it has privately owned stockpiles but they are not required to be legally registered and therefore the volume is not known. There is substantial consumption of saiga products in Singapore, as documented recently by Theng et al., and a varied online trade has also been documented (see article by J. Lam in SN-23).

The most recent CITES decisions related to the saiga are from CoP17, which was held in 2016

Feature article (cont.)

(<https://www.cites.org/eng/dec/valid17/81889>). These decisions require countries to collaborate to implement the CMS Saiga MoU. There is also a requirement for better stockpile management, better enforcement of illegal trade and work towards reducing demand for saiga products.

On 1st–5th October 2018, there was a meeting of CITES Standing committee at which progress towards fulfilling the CoP17 saiga-related decisions was discussed, and progress updates given by various range and consumer states (see update by A. Mezhnev in this issue). The main messages were:

- there is very limited legal international trade in saiga products at the moment, which is all between Asian non-range (consumer) states.
- there is a strong need for all parties to continue to support the actions under the CMS MoU.
- the CITES secretariat should continue to support the CMS MoU parties by keeping saiga product trade under review.

Do *Saiga spp* meet the criteria for transfer to Appendix I?

The first criterion for inclusion in Appendix I is that the species is or may be affected by trade. *Saiga tatarica* is clearly in trade. Although there is no legal trade in saiga products reported from the range

states, there is ongoing legal trade between consumer countries. In 2015–16, China, Hong Kong and Japan exported horns and processed medicines to Japan and Singapore. In 2016 (the latest available data), about 330 kg of medicine was exported from China to Japan, and 11 kg of horns and 150 kg of medicines from China to Singapore. There is also clear evidence of illegal trade, through continued reports of poaching and seizures both within range states and by customs on the borders between range and consumer states.

Saiga spp as a whole, and *Saiga tatarica* (as CITES defines the species), can be argued to meet the biological criteria for Appendix I under Annex I, paragraph C, “A marked decline in the population size in the wild, which has been observed as ongoing or as having occurred in the past (but with a potential to resume)”. The global population of *Saiga spp* is currently not in decline; in fact at the most recent red list reassessment (February 2018, <https://www.iucnredlist.org/species/19832/50194357>) its status was considered to have improved to the extent that it qualified for moving from Critically Endangered to Endangered; under the five-year rule it will be moved in 2020, assuming that its status does not deteriorate. However, there is the potential for the decline to resume should threats (from poaching, infrastructure or disease) worsen.

The Mongolian saiga has a worse status than the other populations at the moment; it has suffered substantial mortality from disease and is subject to heavy competition for forage from livestock as well as harsh climatic conditions (see updates in this issue of SN). The population has declined markedly in the last two years. It would therefore also qualify for transfer to Appendix I under criteria A and B (small population/range and: declining, vulnerable to extrinsic factors, restricted to one/few areas/populations).

A key point to note is that there is no necessity to uplist a species just because it meets the criteria for uplisting. In my view, a proposal for uplisting should be put forward only if it would be a positive move for the conservation of the species.



Saiga female is eating. Photo by Eugeny Polonsky

Feature article (cont.)

How would the legal position change if the saiga were transferred to Appendix I?

There would be no international trade for primarily commercial purposes allowed, in products or live animals. Domestic trade would not be impacted. For live animals, commercial trade is only allowed if the facility is registered with the CITES Secretariat under Resolution Conf. 12.10. There is no CITES-registered captive breeding facility for saigas currently. Export and import of sport-hunted trophies would still be allowed with proper permits (but this is not an issue for saigas).

There would be no legal international trade for primarily commercial purposes in saiga parts and products. This would affect the relatively small current trade in medicines and horns between consumer countries. It would still be possible for countries with declared pre-1995 (pre-Convention) stockpiles to trade products from these stockpiles; there are no CITES restrictions on domestic sales. Although there has been no legal commercial international trade from range states in recent years, due to the voluntary moratorium, this would now move from being voluntary to mandatory.

If the saiga no longer met the criteria for Appendix I then a proposal for transfer back to Appendix II would need to be submitted and considered by the CoP, under the process outlined above. That would be the only way for legal commercial international trade from the wild to resume.

What are the other implications of an Appendix I listing?

There is demand for saiga products in consumer countries, which could not be met from captive herds currently, or in the near future. Whether that demand will increase (due to speculation or preferences for rarity) or decrease (due to better understanding of the endangered status of the species) as a result of the Appendix I listing is not known, because we do not have enough information on consumer identities and motivations.

There is currently only one captive breeding facility with a relatively large number of animals, which is

Askania Nova in Ukraine, containing around 600 animals (<http://saiga-conservation.org/wp-content/uploads/2017/09/CBW-meeting-report.pdf>). No other captive breeding centres have the capacity or mission to supply saiga products for sale. There is a plan for China to reintroduce saigas to their historical range. This will be a long-term process, and it is very unlikely that there will be a large enough population in China to supply an internal market in the next decade (if ever). Therefore, in the medium to long term, as legal stockpiles run down, the amount of legal saiga product available in consumer countries will reduce to zero. Therefore this decision would lead to the near-cessation of saiga product consumption over perhaps the next 10 years (depending on the rate of depletion and the size of the stockpiles in China and Singapore, which are currently unknown).

Potential benefits of an Appendix I listing

It might raise the profile of saigas internationally, and might unlock additional funding for the species' conservation. It might raise the profile of the species in the range states (though this is already a high profile species), and potentially prompt more investment in law enforcement both in the range itself and at international borders.

It might encourage consumer countries to better monitor and regulate their stockpiles, which would then enable illegally traded saiga products to be better identified and enforcement actions taken. Consumer States may apply stricter penalties and greater enforcement and prosecutorial emphasis on illegal trade in Appendix I species. It could prompt consumer countries to institute demand reduction; for example prohibiting the domestic sale of saiga products. It may prompt countries to address concerning trends with respect to new (probably illegal) markets, including "blood jewellery" which is being sold online on Chinese sites (see Jack Lam's article in SN-23), and saiga horns being seen on markets in countries which are traditionally not consumers (e.g. Vietnam, Laos).

Movements of live animals are a potential welfare concern, even if they are from captive populations

Feature article (cont.)

and therefore may currently be legal (or at least a grey area). Trade in live animals in Europe has been observed recently (probably from Ukraine). An Appendix I listing should cause importing Parties, such as the EU and others, to more strictly scrutinize the permits they are issuing, and in some cases not issue permits for these imports.

Potential concerns about an Appendix I listing

The main current threats to saigas are infrastructure (fences, railroads, pipelines), disease and poaching (see the CMS saiga MoU overview report from 2015). But the poaching mostly seems to be for meat for internal use rather than for horn trafficking (though there is clearly still some horn being trafficked, as seen from the seizures). An Appendix I listing won't address most of these threats.

The species has a high profile nationally in the range states, and internationally, as a priority species that is well covered by an MOU coordinated jointly by CMS and CITES, to which all range states and NGOs are signed up. This MOU has an agreed prioritised medium term international work programme (MTIWP), which runs until 2020 and will then be updated. The MTIWP seems to be working well as a mechanism for driving conservation actions in the range states and range state government and international investment. Currently an Appendix I listing is not a priority action of the MTIWP.

The CMS MOU has sustainable use as a long-term goal. The Appendix II listing, with voluntary zero exports by the range states, recognises this fact but also reflects the consensus among all signatory countries that now is not the time for exploitation, until it is properly recovered. Jeopardising this consensus, and constructive working relationships between all interested parties (range states, saiga-focussed NGOs, CITES, CMS, IUCN, and China as a major consumer country), may be dangerous when the evidence suggests that international trade is not the major threat to the species (including for the Mongolian saiga, which is currently of particular conservation concern).

Appendix I listings may lead to some short-term attention but then may lead to species getting less

attention, management and government funding, because it puts obstacles in the way of future sustainable use. In some of the saiga range states, game species get more attention, funding and national legislative protection; putting the species on Appendix I could compromise this. Similarly China may disengage if there is no prospect of sustainable use.

Moving forward

Listing *Saiga tatarica* but not *Saiga borealis* on Appendix I (as proposed) would effectively halt international trade in *Saiga spp*, because there is currently no evidence of Mongolian saigas being traded internationally. Given that the Appendix I proposal came from Mongolia, however, and this population is of particularly acute current conservation concern, there have been suggestions that a way forward would be to list *Saiga borealis* on Appendix I while retaining the less threatened *Saiga tatarica* on Appendix II.

However, this creates major issues for enforcement, particularly for species like the saiga where it is not straightforward for non-specialists to tell the products of one sub-species from the other (particularly when processed into medicines, but even as horns), and where we know that Mongolia is used as a transit route for illegal trade in horns from the other range states. Therefore, in this case it seems that transferring just the Mongolian saiga would not address the issues identified here. If the Mongolian saiga were transferred to Appendix I, *Saiga tatarica* would anyway have to be transferred as well, because of the difficulties in telling them apart (under a "look-alike" clause). It would make more sense to take whatever action is decided upon with respect to *Saiga spp* as a whole.

My view is that a transfer from Appendix II to Appendix I is, on balance, not likely to improve the conservation status of the saiga. This is because a) international trade in saiga products appears not to be the main threat to saiga populations nowadays, compared to disease, infrastructure development or (in Mongolia) pasture degradation and climate change, b) I don't think that the transfer to Appen-

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dix I will lead to significantly more fundraising or enforcement given the investment already going into saiga conservation by governments and NGOs, and c) there are risks that the transfer would have unintended consequences such as reducing the focus on the species by governments working towards a sustainable use goal. There are uncertainties around each of these statements, however, which mean that the decision is a difficult one.

An alternative option is to amend the Appendix I proposal to instead become a proposal to set a zero quota for *Saiga spp* trade, while remaining on Appendix II. This would not affect the range states, as they already have a voluntary moratorium on trade in saiga products, but it would make the moratorium legally binding. Like Appendix I, it would prohibit the live export of wild saigas for primarily commercial purposes, but not exports for non-commercial purposes (breeding for reintroduction, for example) or the export of captive-bred animals from registered facilities. It would prohibit the (relatively small-scale) commercial trade in saiga products between consumer countries, which would make enforcement more straightforward, help incentivise the rigorous management of stockpiles, and send a message to consumers about the threatened status of the species. It would enable the quota to be changed if and when the species returns to a status

where sustainable use can again be contemplated.

Final thoughts

CITES Parties are already obliged to implement the Medium-term International Work Programme (MTIWP) 2015-2020 of the Saiga MOU, which addresses illegal trade of saiga products. The new MTIWP, which will cover the period 2021–2025, should include high priority actions related to illegal trade and stockpile management. Efforts should be made to involve consumer states beyond China (particularly Singapore and Japan) in the conservation of the saiga through support for the Saiga MOU. There are already CITES decisions in force, asking consumer countries with stockpiles to document and manage them better; it would be helpful to reiterate and underscore this requirement through strengthening the wording of the draft decisions from the October 2018 Standing Committee meeting.

There is also a need for better understanding of the saiga trade chain, all the way through the chain from poaching rates, through to consumption rates, including the role of online trade and new markets and product types. Some research has been done on this and more is ongoing, but a better understanding would enable us to estimate, for example, how long stockpiles are predicted to last, and what proportion of the illegal poaching is potentially being traded into consumer countries, in comparison to seizure rates. It would also help range states to be proactive in allocation of enforcement effort.

It is important that decisions about the conservation of the saiga antelope are, as far as possible, reached through consensus of the affected countries (particularly the range states), using an agreed process. There is a technical meeting of the CMS saiga MoU being planned which would take place in April 2019. There will be a full meeting of the parties to the MoU in 2020. These are opportunities for further discussion and revision of the saiga Action Plan and Work Programme, based on the current threats that saigas are facing. As CITES is a collaborator on this MoU, any recommendations can feed back to the CITES secretariat and thence to the Parties.



Young saiga male settled down to rest. Photo by Eugeny Polonsky

Updates

Saigas in the CITES arena

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For the first time in its 70-year existence, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) held a session of its Standing Committee in Russia; in Rosa Khutor, a world-famous resort near Sochi. Between 1st and 5th October 2018 over 700 participants from 150 countries and a range of organisations had a chance to exchange their experiences of controlling trade in rare animal and plant species and discuss steps to ensure the sustainable growth of their populations, at seminars, conferences and round tables.

It is quite natural that the saiga was also discussed at the forum. On 4th October the Russian Ministry of Natural Resources and Environment and Roszapovedtsentr (Russian Centre for Nature Reserves; a recently established organisation under the Ministry) organised a round table on 'Saigas and Argali in Russia: the Conservation and Restoration of Populations'. I moderated the round table, in my capacity as a researcher from the Ministry of Natural Resources and Environment, a Russian representative on the CITES Standing Committee and the coordinator in Russia of the implementation of the Memorandum of Understanding Concerning Conservation, Restoration and Sustainable Use of the Saiga Antelope (saiga MoU). The meeting was attended by 73 experts from a range of countries representing CITES Authorities, protected areas, NGOs, scientists and the mass media. The participants discussed measures to conserve CITES-listed species and particularly saigas. The meeting was opened with a report entitled 'The International Aspects of Restoration of the Saiga Antelope in Russia', which put particular stress on the country's implementation of bilateral and international agreements, saiga population dynamics, including transboundary issues, and steps taken to conserve the species, as well as challenges preventing the improvement of the situation and methods to deal with them. The report noted that the ecosystem approach would play a crucial part in the conservation and restora-

tion of saiga populations.

In his report on the role of the Chernye Zemli Reserve in conserving the north-west pre-Caspian saiga population, Batar Ubushayev, director of the reserve, described the reserve's conservation measures and discussed a number of contentious steps, such as the re-introduction of populations of large herbivores, including the Asiatic wild ass. He also suggested that large areas within the reserve should be turned into pastures for horses and camels, which he felt would enhance the stability of the reserve's arid ecosystems and make the area more attractive for tourists.

Valery Neronov, Principal researcher at the Severtsov Institute of Ecology and Evolution, Russian Academy of Sciences, and Deputy Chair of the Russian Committee of MAB UNESCO (The Man and the Biosphere), gave an overview of CITES's role in conserving endangered ungulates in Russia and noted that according to Resolution X/20 made at the Conference of the Parties to the Convention on Biological Diversity (India, 2012), it is very important to strengthen cooperation between the biodiversity conventions, their research arms and national coordination bodies, including CITES, CMS and the Ramsar Convention on Wetlands of International Importance. He suggested a special forum would be a good way to do this.

At the close of the discussion the round table par-



Valery Neronov speaking at the round table. Photo by Anna Yachmennikova

Updates (cont.)

ticipants unanimously approved the Recommendations, many of which (in particular, to develop rapid methods to analyse saiga samples; to develop approaches to compensate for crop damage by saiga; to develop and introduce a sustainable pasture rotation system) were discussed at a CITES meeting for the first time. These resolutions were forwarded to the CITES Secretariat for implementation. The Recommendations can be found at www.vniiecolology.ru [t.b.c.].

A very detailed questionnaire had been distributed among range and consumer countries by the CITES Secretariat to inform the Plenary agenda item on saigas. Based on answers from a number of consumer countries, including Vietnam, Hong Kong, Indonesia, China, Malaysia, Singapore, Japan, and some range states (Russia and Uzbekistan), the Secretariat issued Document 58 (<https://cites.org/sites/default/files/eng/com/sc/70/E-SC70-58.pdf>), prepared by UNEP-WCMC and providing an overview of the legal international trade in saiga derivatives.

In Document 58 the Secretariat acknowledges the the positive cooperation between CITES and the Convention on the Conservation of Migratory Species of Wild Animals. It also calls on range and consumer countries to strictly follow the recommendations of the 2016–2020 Medium Term International Work Programme (MTIWP) for the Saiga Antelope, which forms an integral part of the saiga MoU. In addition, it stresses the necessity to keep in mind CITES's approaches and principles in the next MTIWP (2021–2025). These propositions are also reflected in a draft resolution approved at the Sochi meeting for the 18th meeting of the Conference of the Parties to CITES, which is to be held in Sri Lanka in May-June 2019 (Appendix 1 to Document 58).

The Russian Federation's suggestion that consumer countries should monitor their stocks of saiga horns deserves a special mention. This is not the first time that Russia has put forward this idea at a CITES event. Experts from this country maintain that, because of the total ban on saiga hunting in the range states over the last few decades, the stock of pre-Convention saiga horns, as well as

their curative power, must long ago have run out in the consumer countries, although they report the invention of some new technologies used in processing horns. The Russian Federation's position on this issue was approved by delegations from a number of other countries and organisations.

Saiga News-23 published an article by J. Y. K. Lam (2018), where the author confirms the availability of 'fresh' (that is, illegally obtained) saiga horns in the Chinese medicinal and souvenir market. Interestingly, the Chinese representative opposed the idea of monitoring their horn stockpiles, noting that stockpiles of products from species listed on CITES appendices are an internal matter to be settled by CITES Parties. Nevertheless, the Standing Committee made a proposition to the CITES Secretariat to develop one more draft resolution on the stockpiles of saiga horns in consumer countries, so that the problem could be discussed at the upcoming 18th meeting of the Parties.

Both events were held on the same day and featured key experts, which gives us hope that at the upcoming 18th meeting of the Parties to CITES appropriate steps to conserve saigas in the range states will be considered and opportunities for optimal interaction with countries consuming the products of this valuable species will be found.



Fresh saiga horns for sale at a pharmacy in Shenzhen, South-East China. Photo by Elena Bykova

Updates (cont.)

Results of the 2018 aerial survey of saigas in Kazakhstan

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An aerial survey of all three populations in Kazakhstan was conducted between 14th and 30th April 2018 under the governmental order "Counting and monitoring the Betpak-Dala, Ural and Ustyurt population of saiga in the Republic of Kazakhstan". The results suggest that the total number of animals in Kazakhstan in spring 2018 was 215,100, of which 135,000 are in the Ural population, 3,700 in the Ustyurt population, and 76,400 in the Betpak-Dala population. These figures indicate a significant growth in all three populations compared to the previous year. The Ural population increased by 37.5%, the Ustyurt population by 37%, and the Betpak-Dala population by 47.8%.

This aerial survey was conducted over 200 flight hours using an Antonov-2 aeroplane. The work was carried out by the Association for the Conservation of Biodiversity of Kazakhstan (ACBK) together with State enterprise "Okhotzooptom" and commis-

sioned by the Committee of Forestry and Wildlife of the Ministry of Agriculture of Kazakhstan (CFW). Furthermore, representatives of the regional branches of the CFW as well as from protected areas within the saiga range (Altyn Dala, Irgiz-Turgaiskiy and Korgalzhynskiy state nature reserves) participated in the survey.



Participants in the aerial survey. Photo by Albert Sa-lemgareyev

A new approach to the conservation of the Ustyurt saiga population

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Despite all efforts taken by the government of Kazakhstan and nature protection organisations, including international NGOs, illegal hunting continues to pose a big threat to all three populations in Kazakhstan. Year after year an enormous number of these animals is being killed by poachers. One of the biggest motivators for the poachers is the high demand for saiga horn products used in traditional Chinese medicine.

In April 2017 the Association for the Conservation of Biodiversity of Kazakhstan (ACBK), supported by Fauna & Flora International, formed a group of field researchers as part of the Altyn-dala Conservation Initiative, to assist Okhotzooptom rangers in conserving the saiga population on the Ustyurt Plateau. The project covers the most important sites where

saigas are found, such as the northern escarpments of the Ustyurt Plateau, parts of the Shoshkakol area



Weighing a newly born saiga during monitoring of a calving site on the Ustyurt Plateau. Photo by ACBK

Updates (cont.)



The Ustyurt group and official rangers on joint patrol.
Photo by ACBK



Participants in a training course on launching and controlling a drone. Photo by ACBK

and the Zheltau and Donyztau escarpments, with a total area of 99,395 sq km in Aktyubinsk and Atyrau provinces.

The main objective of this group is regular monitoring of the Ustyurt population, assisting official rangers in protecting the population and controlling the use of saiga products, raising the awareness of local people and popularising the idea of biodiversity conservation in local communities. The group is well equipped to do their work and in 2018 a drone was purchased for aerial monitoring. Through regular monitoring, in spring 2018, the team discovered the calving sites of the Ustyurt population for the first time in a long time.

At least ten days a month a group patrols saiga areas. In the last 11 months they have inspected over 20,000 km, during which they discovered 10 poaching incidents, and found beheaded saiga carcasses in 8 of the cases. Two years of research shows that poaching saigas for illegal trade is a common practice for the people of Aktyubinsk, Atyrau and Kyzylorda Regions. Low wages and unemployment in the Ustyurt Plateau area make saiga hunting quite a profitable and attractive business. Usually, those trading in saiga products know that it is illegal and about its potential consequences, including imprisonment, but since it constitutes a major part of the income of many of these people, this cannot stop them.



Identifying saiga horns. Photo by ACBK

Alongside their monitoring, the group succeeds in carrying out social activities aimed at making the problem more widely known. In 2018, group members organised over 100 meetings with representatives of rural communities, farm owners and workers and about 30 meetings with school children in Aktyubinsk Region. Over 800 students and teachers took part in these events.

Updates (cont.)

Trends in saiga poaching in Mongolia

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The saiga antelope has been listed as Critically Endangered in the IUCN Red List since 2002, based on an observed decline of over 80% between 1998 and 2008. Two recent high-profile mortality events in 2015 and 2017 resulted in the deaths of more than 200,000 saiga in Kazakhstan and around 8,000 saiga (>50% of the total population) in Mongolia. Together these die-off events represented two-thirds of the global population of both subspecies and we cannot predict when this type of event might happen again, causing a huge pressure on the saiga population.

The Mongolian saiga, whose total number dropped down as low as 800 individuals in 2002, has been recovering over the past few decades thanks to local initiatives and generous support from the WWF Network and the MAVA Foundation. However, the population is still in an alarming condition and, regrettably, is once again showing a declining trend.

The Mongolian saiga currently occupies only 27% of its historic range. The last population estimate in March 2019 suggests just over 3,000 animals remaining after the Peste des Petits Ruminants (PPR) virus or “goat plague” outbreak during 2016/2017 (see articles in SN22) and the harsh winter of 2017/2018.

Studies show that the market demand for saiga horn – the main driver of poaching – continue to be strong and that “consumers of traditional Chinese medicine are willing to pay high prices for wild-sourced animal products because they believe that these products are more potent” (Theng et al., 2018). It is expected that the market pressure will increase because Kazakhstan, the major exporter of saiga horn, has banned the use of saiga, their parts and derivatives until 2020, except for scientific purposes.

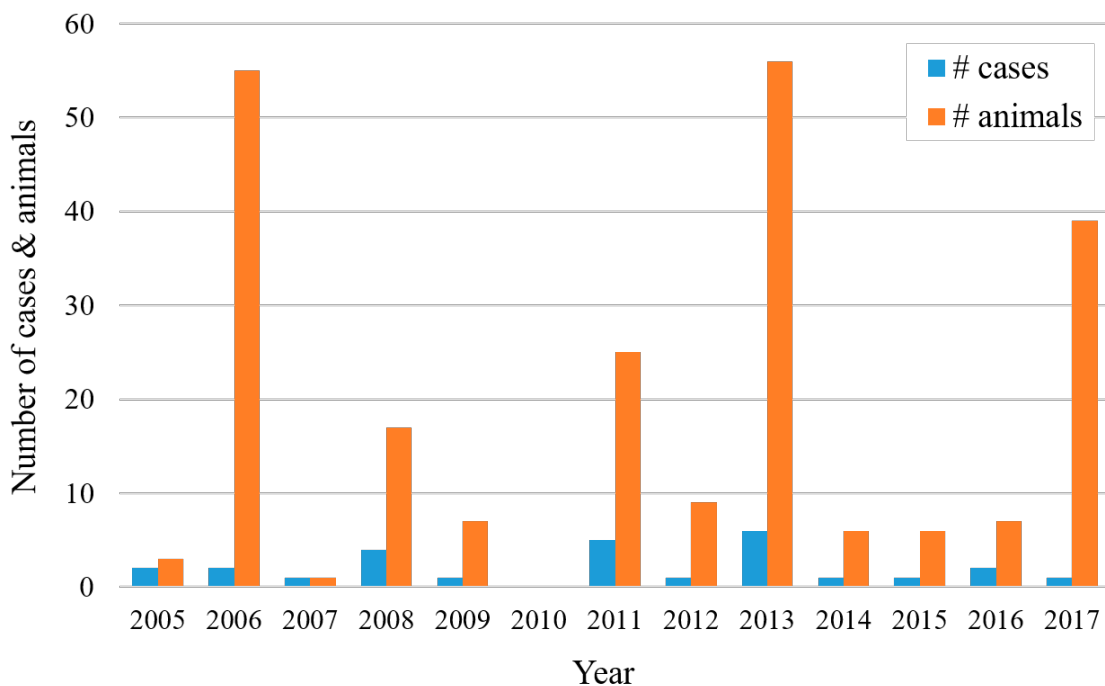


Figure. The number of poaching cases in Mongolia with the associated number of poached individuals in 2005-2017

Updates (cont.)

According to national police and ranger patrol data in Mongolia, there have been a total of 27 cases involving the poaching of 231 saigas recorded during 2005-2017 (Figure). In 56% of the cases, involving the poaching of 123 individuals, the offenders have not been identified. The number of poached saigas peaked in 2013, while no cases occurred in 2010. In addition, the number of poached saigas (or confiscated horns) per case was highest in 2017, which coincides with the mass die-off caused by the PPR virus outbreak. During the fieldwork for the PPR investigation, it was observed that the horns were cut off most male saiga carcasses at the carcass disposal sites. Unfortunately, the investigation team (consisting of FAO consultants, WCS, WWF and other partners) missed the opportunity to collect accurate data on dead animals because

the local authorities had already destroyed most of carcasses prior to their arrival. In recent years, poaching and illegal trade in saiga horn in Mongolia have become more organized and increasingly difficult to deter, suggesting more sophisticated monitoring and inspection approaches are required. It's also critical to strengthen law enforcement, including the control of illegal cross-border trade, by providing training and improving collaboration and information exchange among the relevant law enforcement authorities. WWF and WCS are working to improve poaching detection and illegal wildlife trade enforcement within their focal regions and capacity. However this is a national-level effort which requires multi-sectoral partnerships and international support.

The Extraterrestrial

Galina Kalmykova Stepnoy Reserve, Astrakhan Region limstepnoi@mail.ru

Quite recently, a photographer managed to take a picture of an 'extraterrestrial guest' in the Stepnoy Reserve, Astrakhan Region – an albino saiga baby born from a mother indistinguishable from other saigas. According to the reserve's inspectors who have worked there since its foundation in 2000, this is the first 'white' individual ever recorded in this protected area.

According to specialists, most albino saigas are newborns, making up around one in 5–10 thousand individuals. Their rarity is confirmed by the fact that only two saiga calves of this kind have been recorded in the Chernye Zemli Reserve, both in 2007 (see Saiga News 7), and well-known animal photographer Valery Maleyev photographed a newborn albino in 2010 in the Chernye Zemli reserve.

Albino individuals very seldom reach maturity, because, deprived of their protective colouration and easily distinguishable from their peers, they are easier prey for predators. Whether or not our 'white' friend will survive to maturity and can attract females in the rut is a question we cannot answer so

far. The only thing we can do is to hope for the best.

There was a documentary about these 'extraterrestrials' shown on Channel 1 of Russian television on 20 July 2018 – <https://www.1tv.ru/shows/dobro-utro/mezhdu-tem/belosnezhnye-i-redkie-dobro-utro-fragment-vypuska-ot-20-07-2018>.



The 'white' baby with its mother. Photo from the archive of the Stepnoy Reserve

Updates (cont.)

A meeting of young ecologists in Crimea

Yevgenia Samtanova All-Russia steppe club 'Zhivoye Naslediye', Khaglysheva Diversified School, Yashkul village samtanova1957@yandex.ru

Between 25th and 29th June 2018, the town of Saki in the Republic of Crimea was the venue for the Inter-regional Meeting of Young Ecologists 'We Are the Young Defenders of Wildlife', organised by the Ministry of Ecology and Natural Resources of the Republic of Crimea. The meeting's goal was to attract a new generation to conservation, and exchange experiences in organising conservation activities and developing an ecological culture.

The participants included students and winners of Russian national, republican and regional competitions, Olympiads and tournaments from across the Russian Federation. The Republic of Kalmykia was represented by the leader and members of the 'Zhivoye Naslediye' steppe club.

During the meeting the children took part in various ecological competitions and 'brain rings' and exchanged knowledge and experience. The teams were well-prepared for the event and able to defend the honour of their homelands. The children demonstrated diverse creative approaches to understanding ecological problems and finding good solutions. Among the most remarkable parts of the event were musical performances, a video entitled 'My Homeland' and a photo exhibition on 'The Unique Natural Corners of My Motherland.' Each team staged an eco-version of a traditional Russian fairytale, where the main idea was to protect wildlife and conserve natural resources. During the 'Eco-fashion' fashion show, the children displayed clothes made from recyclable materials, including old newspapers, plastic containers, packing and wrapping paper, tarpaulin and other waste materials. In addition, the boys and girls gave presentations on the unique protected areas in their home regions. The schoolchildren from Kalmykia gave a masterclass on designing a saiga using origami, played the dombra, danced and sang Kalmykian songs. The Kalmykian performers and traditional costumes impressed the other participants so much that the organisers of the event asked the

children to perform at the closing ceremony.

The 'Eco-era' team from the Republic of Tartarstan won the Inter-regional Meeting of Young Ecologists, second place went to 'Zhivoye Naslediye' from Kalmykia and bronze went to the 'Moya rodina – Ural' ('Ural is my motherland') team from Nizhny Tagil, Sverdlovsk Region. The prize winners were awarded cups and certificates by the Ministry of Nature of the Republic of Crimea. At the closing ceremony Natalya Sologub, Deputy Minister of Ecology and Natural Resources of the Republic of Crimea, noted that during the meetings its participants had become one big eco-family in solidarity. She thanked everyone on behalf of the ministry for their participation and suggested that next year the meeting should be extended so that the children could better use their potential and show their talents.

On the closing day the participants had a cultural and educational trip to Yevpatoria city. There they visited a dolphinarium, where they saw a show featuring marine mammals, and acquainted themselves with the historical part of the town, where they walked the 'Little Jerusalem' tourist trail.



The 'Zhivoye Naslediye' team from Kalmykia winning second prize. Photo by N. Galkina

Updates (cont.)

Together with their excitement, the young ecologists brought home lots of ecological information. The meeting gave them an opportunity not only to demonstrate their ecological knowledge, but also to communicate with their peers from other regions and share their conservation experiences, which is very important.

It should also be noted that in the last few years the 'Zhivoye Naslediye' steppe club has invariably been a prize winner in the All-Russia Projects Competition 'Protected Islands in Russia' (www.wildnet.ru and заповедныйурок.рф).

We are deeply and sincerely thankful to V. N. Sangadzhiyev, Chief of Yashkul Road Administration No. 2, for his support of the Kalmykian delegation to participate in this ecological forum.



'The Unique Natural Corners of My Motherland' photo exhibition. Photo by Ye. Samtanova

Onwards to a new dawn!

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'We, the new generation of Russians, the young masters of the Liman lands, will revive and conserve our native steppe!'

This was the motto of the opening ceremony at the Vozrozhdeniye ('revival') steppe club organised within Liman Secondary School No. 1 in Astrakhan Region. The ceremony was attended by the school's teachers and students and members of Liman village.

The idea to create the club was kindled by the Summer Educational Academy for teachers and steppe club leaders organised by the Saiga Conservation Alliance and San Diego Zoo in the village of Liman and Stepnoy Reserve in late August 2018 (see article in this issue of SN). The conference programme was interesting and diverse and featured the managers of steppe clubs from Uzbekistan, Kazakhstan and Kalmykia. The reports from these clubs of their conservation work inspired us to launch a steppe club in Liman District. In our school we organised a competition for children from different age groups to design the best logo and name for the club.

The long-expected day finally came! V. G. Kalmykov, director of the Stepnoy Reserve, told the children 'You are beginning a difficult but very important job! It is essential to conserve the unique ecosystems of our region – rare and endangered species of



Young competitors during the sporting events for Migratory Species' Day. Photo by Darya Aukina

Updates (cont.)

plants and animals, in particular the saiga, a truly inimitable being inhabiting our steppes. Stepnoy will support your club however it can. I hope for a long and fruitful collaboration'. I. V. Ryabina, the school's director, and T. A. Inchikova, chair of the public council of the Board of Education in Liman District, gave their good wishes and words of encouragement.

After the welcoming speeches, poems and songs about nature came from the school's stage, accompanied by videos. One of the highlights of the event was a clear and most beautiful speech delivered by a team of nature conservationists. The pupils were ceremonially enrolled in the steppe club and given certificates, after which ties – indispensable symbols of young environmentalists – were put around their necks.

The next stage of the meeting was the educational tournament 'Migratory Species' Day', which began with a play about the migration of people aimed to facilitate understanding of migrations in the animal world. The club's members told stories about migrating species, their reasons for moving large distances, the principles on which the animals created their routes and the animals' ability to orient themselves in an unfamiliar landscape. The 'Learn Who I Am' competition helped the children acquaint themselves with migratory species in Astrakhan Region through jigsaw puzzles. The programme included a number of interesting games, such as 'Identify the Footprints,' 'Riddles,' 'Crossword' and 'The Spring Wind,' for the participants to broaden



New members of the 'Vozrozhdeniye' steppe club. Photo by Darya Aukina



Members of the 'Vozrozhdeniye' steppe club. Photo by Darya Aukina

their knowledge of various migratory animals, including birds. The 'Wondrous Animals' musical flash mob managed to create a positive emotional atmosphere and raise the participants' enthusiasm. Each dancer had a chance to assume the role of a beautiful crane, swift saiga, gracious antelope, solemn ostrich and royal lion.

Our event was attended by epic Russian strongmen who put on a play about how animals overcome anthropogenic barriers. The club's members also noted that the goal of the Convention on the Migratory Species of Wild Animals is to conserve these species and protect their migration routes.

The event was not only very informative, but also important from an educational point of view. One of the participants said that until then he had no idea that a dense network of roads, bridges and power lines might prevent the migration of wild animals. He was particularly happy to take part in competitions because his class was a very well-matched team. One of the girls admitted, with a gleam of admiration in her eyes, that she had not known before that the saiga had survived since the pre-glacial period and expressed a wish to join the club.

On the next day a series of sporting events was organised for pupils from four classes. The sports competitions were preceded by a discussion of the difficulties of overcoming barriers which animals face during migrations. Very soon, during the 'Sur-

Updates (cont.)

vival of the Saiga' game, the children felt for themselves how hard it is to get over obstructions.

At the end of the festival, the competition winners were awarded their prizes and everyone listened to the ecological anthem of the 'Vozrozhdeniye'

steppe club, during which many of the participants wanted to go on the stage to demonstrate their unity in achieving their common goal, which is to conserve the wildlife of their native land.

An educational seminar on saiga conservation in Astrakhan Region

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On 12 December 2018, a seminar entitled 'Education as part of a programme for saiga conservation' was held at Astrakhan State University to discuss the urgent issues of saiga conservation in Russia and present a new interactive course called 'The Relict Saiga Antelope'.

The seminar was attended by specialists from four federal and regional protected areas, officials from the Ministry of Nature of the Russian Federation, researchers from the Severtsov Institute of Ecology and Evolution, Russian Academy of Sciences, and school teachers and steppe club leaders from across Astrakhan Region and the Republic of Kalmykia; about 60 people in total. The organisers were the International Fund for Animal Welfare (IFAW) and Zapovedniki Ecocentre.

In the first part of the seminar we discussed topics including the current state of the saiga population in the north-west pre-Caspian region, the impact of wolf predation on the population, its genetic diversity, illegal trade in saiga derivatives and the necessity for joint efforts to estimate saiga numbers in the Chernye Zemli and Stepnoy Reserves.

In the second part of the seminar members of the Zapovedniki Ecocentre presented the 'Relict Saiga Antelope' course, which included interactive tasks and educational games for 5th-8th form secondary school pupils. The course is recommended as a supplement to the curriculum. Its objective is to develop support for saiga conservation, explain the role of protected areas in conserving the species

and its habitats, and demonstrate what each of us can do to protect the saigas. Examples of the tasks and games are:

Task '1:1 Saiga Model': Children find out the size of a saiga by constructing a model of the animal using three ropes equal to the antelope's body length, height at the shoulders and horn length.

Game 'Trophic links in the steppe': Each participant is given a card with an animal and a description of its diet or a plant. Within a time limit, anyone with an animal must find the the person with the type of food it feeds on and put their hand on their shoulder. A web forms, illustrating the complexity of links within the steppe ecosystem.

'The Relict Saiga Antelope' is part of the 'All-Russia Reserve Lesson' project. The materials for the



Photo IFAW

Updates (cont.)

course can be downloaded from заповедныйурок.рф. The website also contains some interesting facts about saigas, videos and photographs, a quiz about saigas and a 'Friend of the saiga' certificate to download. The Zapovedniki Ecocentre and IFAW hope that the course will inspire teachers and students to develop and implement projects to support saiga.

Among the seminar's other interesting activities were a photo exhibition by famous photographer Yevgeny Polonsky and a screening of a film by IFAW, enabling the viewers to feel with all their hearts the life of this steppe antelope. All the photographs from the exhibition were donated to Astrakhan State University. IFAW is grateful to Boguth-Jonak-Stiftung for financial support of this project.

The 'Tropoy Saygachonka' ecological model in operation

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The 'Tropoy Saygachonka' ("On the path of a baby saiga") educational ecological model was designed as part of a project supported by the Saiga Conservation Alliance's Small Grants Programme in 2017 (see SN-23). Through play, the model acquaints pre-school and primary school children with the saiga, a unique inhabitant of the arid regions of southern Russia, and allows them to learn more about their habitats and the main threats they face in the wild.

All parts of the ecomodel are handmade. These consist of animal figures (saiga, wolves, foxes and jackals) and include a poacher on a motorcycle and even the White Old Man, the Buddhist protector of saigas, all made of felt. Some of the components were created with the active participation of children, who were deeply engrossed in this fiddly but very interesting work.

The ecological model was shown in a number of kindergartens and primary schools in villages across the Republic of Kalmykia near saiga areas, and proved deeply moving for the children. They watched the 'steppe' and its inhabitants with great curiosity. The most inspiring thing was that they could touch the figures, pull their ears, tails and noses, make them run, eat 'grass,' drink 'water,' face a poacher and escape wolves. The most touching figurines were definitely the saiga calves.

A handbook called "Our Antelope" was prepared for the children, providing short descriptions of episodes in saiga life and containing practical exercises. The pupils of a primary school listened with the liveliest interest to a legend about the White Old Man, the protector of saigas. They asked many questions and were deeply concerned about the current situation.

The ecomodel helped provide young children with knowledge about saigas without boring them and showed them how much they could influence the future of these wondrous animals. We hope that, despite their young age, they will remember forever what they learnt about the steppe and the saiga's hard life.



A lecture in a kindergarten in Chilgir village, Yashkul District. Photo by T. Goryayeva

Media reports

A harsh winter is expected for the Mongolian saiga

Experts from WWF-Mongolia, together with saiga rangers, had a field trip to the Mongolian saiga range in December 2018 to investigate its condition. The rangeland was found to be totally degraded and inadequate in the core saiga habitat of the Shar-giin Gobi and Khuisiin Gobi, and saigas were rather sparsely distributed. Previously, these areas were occupied by relatively large numbers of saiga, with at least 200-300 individuals present all year around. This time, only 10 individuals were seen in a single herd. This demonstrates the dramatic decrease in the population according to the field team.

B. Batsaikhan, the leader of the saiga ranger team, said: "Last summer was very dry and arid. So the pasture is in a very bad condition and there is no grass for livestock and wild animals, so local herders are moving to remote areas where conditions are better for livestock. Currently, the remaining few

saigas have become too scattered due to a lack of forage because the pasture is severely overgrazed. The upcoming winter will definitely put the remaining individuals' survival at great risk".

Therefore, the best options to reduce the expected consequences of drought and harsh winters include: firstly, to make the species' migration routes free from human and livestock occupation; secondly, to establish a breeding centre in Mongolia in order to restore the saiga in its historical range; thirdly, to remove livestock from the pasture in the reserve to free it up for saigas; and finally, to make hay from areas in the saiga habitat for supplementary use when necessary. As of April 2018, a WWF survey shows that there are only 3000 Mongolian saigas left. See more at: <https://www.webwire.com/ViewPressRel.asp?ald=233698>

Plastic waste is a threat to Mongolian saigas

Plastic waste is a threat to rare species of the Gobi Desert, not just to marine animals. A ranger from Bayan-Uul region in the Gobi-Altai province of Mongolia found a saiga carcass in the Khuisiin Gobi. According to him, the Mongolian saiga had eaten a plastic bag. In recent years, rural people have been

using plastic bags a lot and it's common to see plastic waste in the Gobi desert. Unfortunately, it is clear that rare animals such as Mongolian saigas are eating plastic waste due to the lack of food. See more at: <https://www.webwire.com/ViewPressRel.asp?ald=232385>

A new saiga breeding centre has been set up in Ukraine

Shenzhen Tan pharmaceutical company from China has taken a 7-year lease on a 97 hectare plot not far from the village of Kamysh in Kherson Region, Ukraine, and created a saiga breeding enclosure. This cost the company over 10 million hryvni (editor: more than USD 350,000). An 'electric shepherd' device was installed on the high fence to frighten off predators; the structure is equipped with security cameras and surrounded by a firebreak. The entire system is powered by solar panels. The centre's owners purchased 23 saiga from the Askania Nova Reserve and placed them in the enclosure.

Saigas inhabited the steppes of southern Ukraine up until the middle of the 19th century. 'In the 1970s 72 saiga antelopes were brought to Askania-Nova from Kalmykia, and now the reserve has 700 individuals' reported Viktor Gavrilenko, director of the reserve. 'However, most of our herd is semi-wild, and the animals do not let people get close to them. We fed the animals for this breeding centre from birth, so they were accustomed to people and sometimes they even allowed us to approach and stroke them. These individuals were then moved to the new breeding centre'.

Media reports (cont.)

To increase the saiga population in Ukraine and globally was not the Chinese company's only goal. The project looks quite promising commercially. Among the company's plans are to export saiga skin and horns to China, and in future, perhaps, it can send live antelopes to China. For the Chinese, saiga horns are essential components of a range of traditional medicines. The Askania Nova Reserve has already sent a batch of 30 skulls and a dozen skins to China from animals that had died naturally over the years. The money that the reserve earned through this sale has been used to buy food for their animals, and now a second batch of 130 skulls is ready for shipping to China. The money the reserve is planning to gain from this sale would enable them to purchase a tractor, press and loader. Their Chinese partners, meanwhile, have presented

Askania Nova with a new Ford Ranger pickup for excursions and patrolling their grounds. However, much more important for the Ukrainian partners than the pickup is the project itself; to breed saigas using the resources of a private investor. The staff of Askania Nova regard it as a pilot project to develop methods to breed this rare species and protect it from diseases, which could be adopted in other regions of Ukraine. In particular, suitable areas of uncultivated land can be found in Henichesk and Novotroitsky Districts, as well as in some parts of Zaporozhe and Cherkassy Regions.

For details see: <http://khersonline.net/novosti/obschestvo/122584-na-hersonschine-kitayskie-biznesmeny-i-ukrainskie-uchenye-obedinili-usiliya-dlya-razvedeniya-saygakov.html>



A saiga eating. Photo by Vladimir Dorofeyev

Articles

An individual-based model of the dynamics of the North-West pre-Caspian saiga population

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To analyse the factors determining the dynamics of the north-west pre-Caspian saiga population, we developed an individual-based model, with input parameters based on empirical data obtained between 1948 and 1998, before the current population depression (*Table 1*).

We model a life cycle for each individual, taking into account its specific characteristics such as sex and age. Each year, every individual takes part in reproduction and faces risks with a probability depending on its sex and life-stage. The change in the size and sex-and-age composition of the population are estimated annually. This approach is intuitively easy from a biological perspective, and as knowledge

about the species accumulates, new submodels can be added. The model was written in Python 3.7 and can be experimented with by changing the parameters using the programme JupyterNotebook.

The modelled population consists of animals of different ages and sexes and during the year it goes through a calving stage (May), aggregation stage (August) and rutting stage (November-December), with associated parameter values (*Table 1*). The model also takes weather into account by changing birth and mortality rates in bad years.

During tests the model showed that, with the parameters used for normal years, the average annual population growth rate was $36\pm 4\%$ (*fig. 1*), which

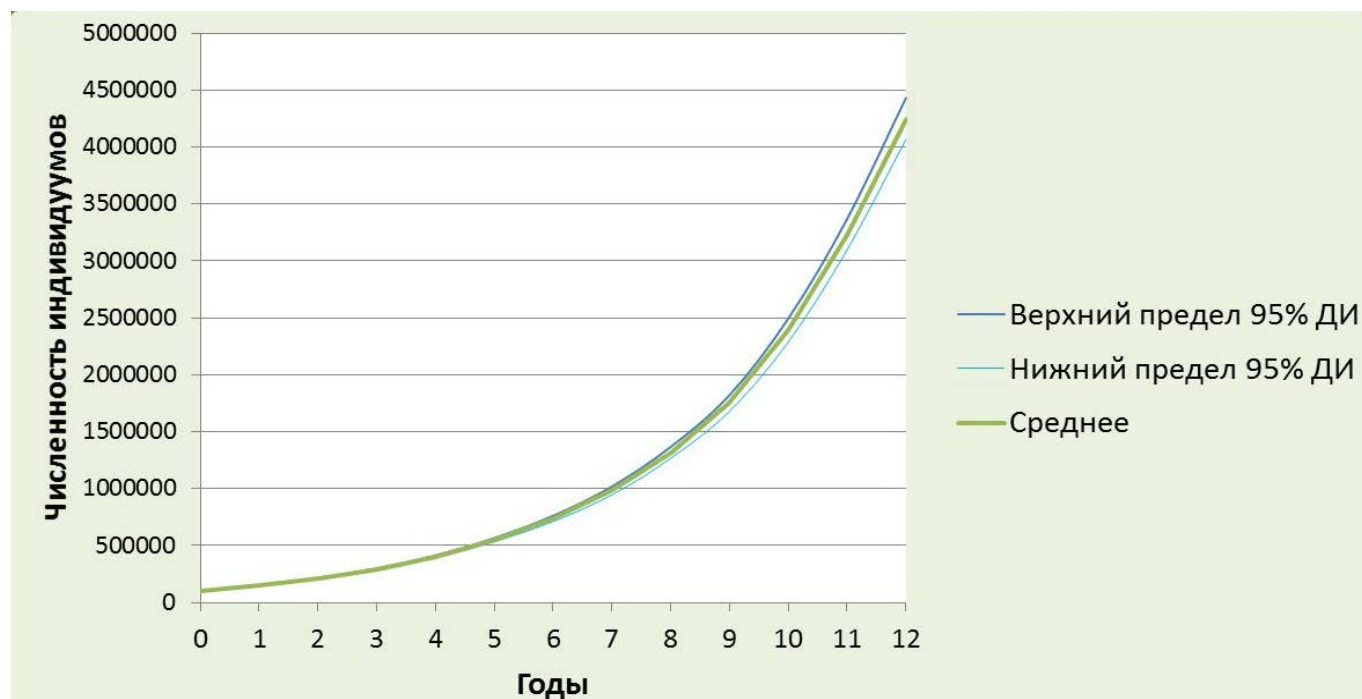


Fig. 1. Population growth with basic parameters (survival rate in normal years, sex-and-age structure without deviations, hunting, poaching and bad weather not affecting the population). (The graph shows average values for 100 programme runs and limits for a 95% confidence interval). Saiga numbers on the y-axis, years on the x-axis.

Articles (cont.)

Table 1. Parameters used in the model (based on data from A. G. Bannikov et al. (1961), A. I. Bliznyuk (2009), O. M. Bukreyeva. (2002), L. V. Zhirnov (1985) and others).

Parameter	Value
time unit	1 year
summer (after calving)	May-August
autumn (after aggregation)	September-November
winter and spring (after rut)	December-April
upper age limit for juveniles	1 year (exclusive)
upper age limit for adult animals	absent
male age at maturity	1.5 years
female age at maturity	6 months
male/female ratio at birth	0.98
male peri-natal mortality	0.065
female peri-natal mortality	0.062
male first-year summer mortality	0.144
female first-year summer mortality	0.147
male adult summer mortality	0.027
female adult summer mortality	0.089
male first-year autumn mortality	0.048
female first-year autumn mortality	0.047
male adult autumn mortality	0.048
female adult autumn mortality	0.047
male first-year winter-spring mortality	0.028
female first-year winter-spring mortality	0.027
male adult winter-spring mortality	0.098
female adult winter-spring mortality	0.027
average number of females per male in case of male shortage	15.5
pregnancy probability for adult females	0.98
pregnancy probability for first-year females	0.86
number of embryos in first-year females	1
number of embryos in adult females	1.6
hunting mortality in autumn when population size (N) is <200,000	3.3%
hunting mortality in autumn N= 200,000-600,000	14.7%
hunting mortality in autumn N>600,000	20%
reduction in birth rate in dry and cold years	8.2
mortality increase in summer droughts	3
mortality increase in autumn droughts	2
mortality increase in winter droughts/cold	5

Articles (cont.)

would lead to a very rapid increase in the total number of saiga.

In the wild, bad weather conditions impacts negatively on population growth at various stages of the year. So, summer and autumn droughts and cold winters causing the formation of ice crusts on pastures ('dzhuts') dramatically increase the animals' death rate. Harsh weather conditions in winter greatly impact the number of mature males weakened after the rut, droughts lower female fertility, while rain in the calving period leads to deaths among newly born saigas. In the model, adding dzhuts nearly halves the average annual population growth rate (to $19 \pm 1\%$), while the subsequent decrease in female fertility leads gradually to a $1.5 \pm 0.8\%$ annual drop in numbers. The addition of all known types of bad weather once in 4 years leads to a clear four-year cycle, which on average still demonstrates a positive growth rate (fig. 2).

In the period under analysis, the saiga population size was controlled through scheduled autumn hunting, the magnitude of which was determined by the results of the summer population survey. Adding autumn hunting to the model sharply decreases the annual population growth rate to $7 \pm 1\%$ (with saiga numbers at 600,000 and an autumn hunting quota of 20% of the population; fig. 3).

Tests in conditions approximating real life, using long-term annual meteorological observations and autumn hunting data for the period under study, produced quite interesting results (fig. 4). The population dynamics are similar to survey data, with the exception of a considerable drop in numbers in the late 1990s. This means that the changes in the population dynamics in those years were caused by factors we have not yet entered into the model.

Further experiments will assess the population's relative sensitivity to changing different parameters, making it possible to find out which has the most critical effect and predict the population's reaction to these changes.

When we use empirical data from periods of relative stability and active research into a population, the model provides quite realistic estimates of its status and dynamics and makes it possible to make a quantitative assessment of the impact of certain factors on the population's growth and composition. Interestingly, the modelling results may suggest the adaptation of the species to an environment with frequent catastrophic weather fluctuations and rapid population growth in good years. The usefulness and further development of the model depends on the recency and accurateness of saiga lifecycle parameters, which have been changed by the popula-

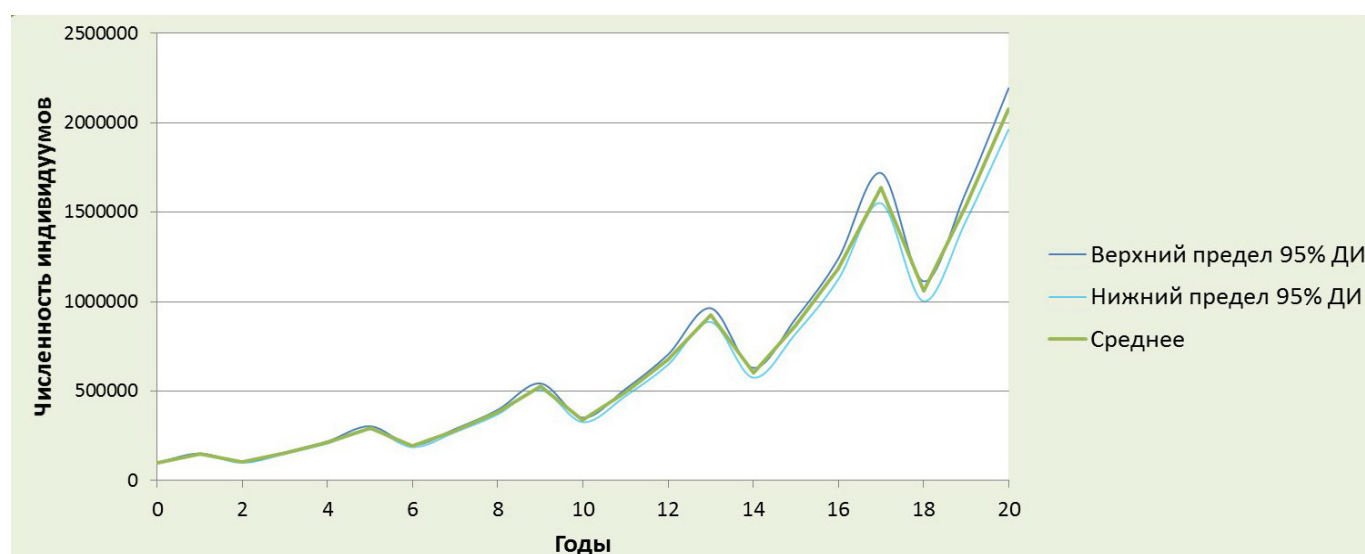


Fig. 2. Saiga population dynamics in the model, with all types of bad weather impacting the population once every 4 years (average for 100 programme runs). Saiga numbers on the y-axis, years on the x-axis, average and 95% confidence intervals shown

Articles (cont.)

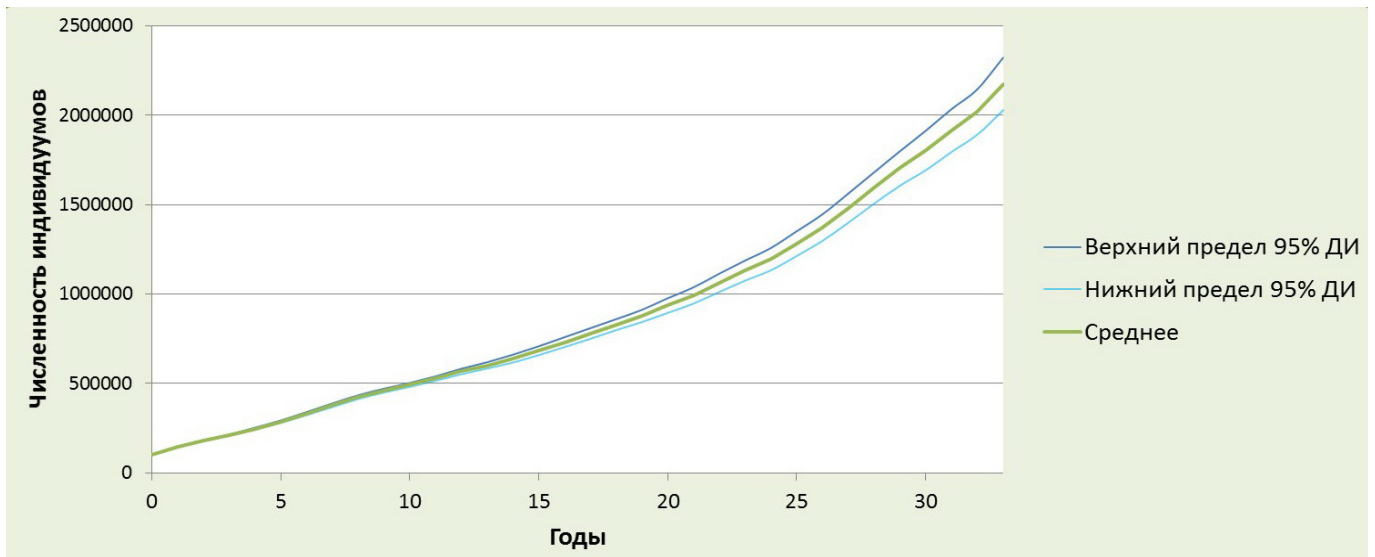


Fig. 3. Saiga population dynamics with the addition of autumn hunting (average for 100 programme runs).

tion depression and the isolation of the small protected area the animals now inhabit, and, certainly, on how deeply we understand the factors underlying the population depression. This is possible only if we manage to organise long-term comprehensive field research into this population. A project like this would enable the individual-based model to become a valuable tool for the analysis of field data.

The authors are grateful to the personnel of the Stepnoy Reserve in Astrakhan Region, whose assistance made it possible to carry out this study, and the Saiga Conservation Alliance for their support in presenting the results of this study at the Asia-2018 conference. The work was carried out with the support of the Russian Foundation for Basic Research (RFBR) (No. 15-29-02459).

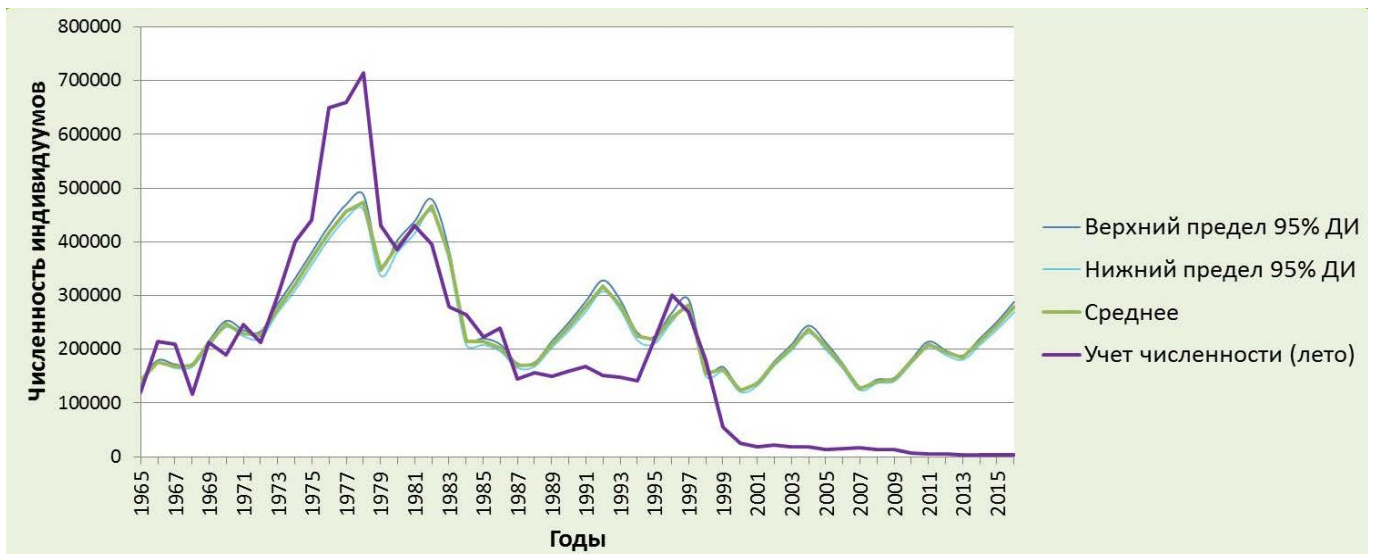


Fig. 4. Saiga population size dynamics with the addition of annual autumn hunting and bad weather conditions calculated using empirical data (average for 100 programme runs). The violet colour shows the population size from actual surveys.

Articles (cont.)

The sex and age composition of saiga groups near the artesian well in the Stepnoy Reserve, Astrakhan Region, in the autumn of 2018

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Currently, the size of most saiga populations is critically low. One of the key reasons for the catastrophic drop in saiga numbers in Russia is the imbalance in the sex ratio (Milner-Gulland, et al., 2003). Selective poaching for horns resulted in a marked decrease in the number of adult males. So, the proportion of males in the North-West pre-Caspian saiga population during the 2014 rut was only 0.1% (Kalmykov, 2015). Probably, the low percentage of adult males affects the social structure of saiga populations and limits reproduction (Milner-Gulland, et al., 2003). All this indicates a necessity for ongoing monitoring of the sex ratio in saiga populations to assess the status of the population and conservation effectiveness.

We analysed the sex-age composition of saiga groups visiting a watering place in the Stepnoy State Nature Reserve, Astrakhan Region, Russia. Active steps to conserve the saiga population taken by the reserve give reason to believe that this will be the first place where the sex ratio will begin to improve. The reserve staff carry out round-the-clock protection and have taken serious steps to prevent disturbance throughout the year, particularly in the calving period. In addition, they created conditions for assessing population size and monitoring the animals' behaviour.

Observations were made between 26 September and 5 October 2018 from a stationary hide near a large reservoir around an artesian well. The antelopes use this water body, probably one of the key drinking places for the local saiga population, as a source of water and minerals and as a 'social arena'.

We observed saigas near the water every day, in-



A saiga male approaching the artesian well surrounded by youngsters. Photo by Andrey Gilev and Karina Karenina

cluding single females, females with calves of both sexes, single immature individuals of both sexes, and small (3-10 individuals) and relatively large (30-350 individuals) mixed groups. The average number of individuals visiting per day was 70. Obviously, in autumn the artesian well is not used so much as in spring and summer, when the weather is hotter. So in May 2015, on average 500 animals visited per day, while the maximum recorded number of individuals on one day was 1,500. The sex and age structure of all the saigas that visited the artesian well during the survey is given in *Table 1*.

Most of the saiga individuals visited the artesian well between 10.00 a.m. and 12.00 noon. This contrasts with data obtained in May, when most of the saigas came early in the morning, starting from 4.00 a.m., which is probably associated with seasonal variation in activity. The behaviour of the individuals also varied seasonally. In May almost every individual spent a relatively long time (up to 40 minutes) eating soil (a source of minerals and a natural adsorbent). By contrast, in autumn less than 1% of

Table 1. The sex and age ratio of saiga groups visiting the artesian in autumn 2018.

Adult females (≥16 months of age)	Adult males (≥16 months of age)	Females born this year (≥4 months of age)	Males born this year (≥4 months of age)
35%	18%	21%	26%

Articles (cont.)

the individuals ate the soil. The frequency of social contacts near the well was considerably lower in autumn than in May. In spring the open flat spaces near the shore were used for social activities such as fights between males, hostile and friendly contacts between adult females, harem formation by males and games among youngsters (Gilev, Karenina, 2016). In autumn, contacts like these rarely occurred between adults, while juveniles did not take part in them at all. Vocalisation was also recorded much less often in autumn than in spring. In the autumn, saigas approached the pool just to drink and graze a little, staying at the water for not more than 5–10 minutes.

The low, dry vegetation ensured good visibility, allowing the researchers to monitor not only the saigas that approached the water, but also those within a few kilometres of the well. There were a few large aggregations nearby; on 29 September around 3,500 individuals, on 30 September around 1,500 individuals, on 1 October around 500 individuals. It was hard to estimate the sex ratio in these aggregations precisely, but there was a large proportion of males (about 20%) aged above 16 months (who could be easily identified from a distance by their large horns). Most of the individuals in the aggregations grazed even in the middle of the day, which is uncharacteristic of hotter seasons.

The survey demonstrated that, although in autumn saiga do not use the artesian well very actively and their behaviour is not so diverse, it is possible to monitor the sex and age composition of saiga aggregations near watering places at this time of year. The good visibility in the area, the fact that first-year males possess small horns and adult and first-year females and females differ markedly in body size make it possible confidently to place individuals in specific age and sex categories. It is essential to study the sex and age structure of the pre-Caspian saiga population on a much larger scale. Not counting the sex of individuals born this year (which can't be differentiated at this time of year), the best time to carry out this research would be the hot season, when saigas gather in large numbers near water bodies. Monitoring saigas near water bodies may become an effective alternative to more expensive survey methods using piloted and unmanned aircraft, which often disturb the animals (Mulero-Pázmány et al., 2017).

We thank the researchers of the Steпноy Reserve and particularly its director V. G. Kalmykov for their support of the research and their invaluable contribution to the cause of saiga conservation. The work is supported by the Russian Science Foundation (grant No. 14-14-00284).



A group of saigas near the artesian well (in the foreground: males born this year). Photo by Andrey Gilev and Karina Karenina

Articles (cont.)

The story of the saigas of Vozrozhdenie Island

Elena Bykova and Alexander Esipov Saiga Conservation Alliance ebykova67@mail.ru

The Vozrozhdenie Peninsula ranks among the least studied areas in Uzbekistan. Situated in the former Aral Sea, it is actually an archipelago consisting of a few large islands – Vozrozhdenie, Komsomolsky and Konstantin – and several smaller ones – Lazarev and Bellingsgauzen – projecting from the bottom of what was once a huge saltwater lake (see the figure). The Vozrozhdenie Peninsula is a transboundary region, most of which lies in Muynak District of

the Republic of Karakalpakstan, Uzbekistan, with a smaller portion of it stretching into Aral District of Kyzylorda Region, Kazakhstan. In addition, there are a few other major islands in the Kazakh portion of the former Aral Sea, such as Barsa-Kelmes (which contains Barsa-Kelmes nature reserve) and Kokaral.

According to the limited sources which exist, Vozrozhdenie Island formed in the late 16th-early 17th



Figure. Maps of the Aral Sea in the 1960s (A) and 2010 (B) (from <http://mix.tn.kz/mixnews/sverhsekretnyy-gorod-v-aralskom-more-259007>)

Articles (cont.)

century (Krivonogov, 2009). It was discovered by Alexei Butakov in 1848 and named Tsar Nicolas I Island; later it was given its current name, which means “Rebirth” or “Resurrection”. By the early 1960s the island’s area was 216 km². As a result of the declining water level in the shrinking Aral Sea, it first grew in area, then turned into a peninsula and in 2009 merged with the continent to become accessible by vehicle. Between 1942 and 1992, the island was the site of a military base. Visiting Vozrozhdenie was prohibited up until 2017. That is why no systematic research has been done on its flora and fauna.

In the course of its long history, the water level of the lake has dropped and risen many times as a result of a range of natural and anthropogenic factors associated with climate change and changes in the flow of the two main rivers feeding it – the Amudarya and Syrdarya.

It is not quite clear how animals and plants settled on the island, but, most probably they came there during one of the periods of decline in the water level, the most recent of which took place in the Middle Ages. There is a hypothesis that the water level in the Aral Sea dropped to a minimum for 300 years (from the late 13th century until the late 16th century), and then the lake refilled. Archaeological data suggest the water level remained low for over 100 years, throughout the 14th century (Krivonogov, 2009). The species might have come during this time from either the Ustyurt Plateau and the Amudarya delta or the north-western Kyzylkum, making the formation of the islands’ fauna a complex process. After this, the water in the lake rose to isolate the islands and remained high for at least 400 years up to the current drying-out of the lake, with the ecosystem developing in isolation. Now history to some extent repeats itself, with strong successional processes occurring as more dry land has formed around the island group and exchange with the Aral Sea area and north-western Kyzylkum has restarted. However, succession is quite slow, so at the moment we can observe the insular fauna on the original islands and see the early stages of the repopulation of the Aral Sea’s dry bottom.



Saltpan on the dry bottom of a former saltwater lake in the centre of the Vozrozhdenie Island. Photo by Alexander Esipov

When we talk about the former Vozrozhdenie Island we refer to the entire linked archipelago. The original islands are very much alike and consist of clay semi-desert with elements of sand and stone deserts. The islands are characterised by numerous low escarpments making their surface highly ragged. The saltpans that have formed on the bottom of drying lakes are surrounded by strips of reeds and tamarisk thickets. The islands do not have any sources of fresh water. The former Vozrozhdenie Island has artificial elements, such as the ruins of Kantubek military town, an aerodrome and port. At present, Russian gas companies are developing the islands.

According to the available sources (Zarudny, 1915; Ishunin, 1961; Nuridzhanov A., 2009, 2010; Nuridzhanov D., 2009; Bykova et al., 2017, 2018), the total number of invertebrate species inhabiting the former islands is 127, with 1 amphibian, 12 reptiles, 93 birds and 21 mammals. Some species, such as steppe tortoise *Agrionemys [Testudo] horsfieldi*, greater flamingo *Phoenicopterus roseus*, pallid harrier *Circus macrourus*, steppe eagle *Aquila nipalensis*, imperial eagle *A. heliaca*, golden eagle, lesser kestrel *Falcon aumanni*, pin-tailed sandgrouse *Pterocles alchata*, Brandt’s hedgehog *Hemiechinus [Panaechnus] hypomelas* and saiga *Saiga tatarica* are included in the IUCN Red List and the Red Data Book of Uzbekistan.

The Vozrozhdenie saiga population is the only naturally insular population of this species, which has

Articles (cont.)

remained isolated for at least 400 years. The population currently inhabiting Barsa-Kelmes Island in was introduced in the 1950s. The number of saigas on Vozrozhdeniye was probably very high in the late 19th century. Members of Butakov's expedition mentioned that they saw huge saiga herds pasturing there (<http://st-zajac.livejournal.com/13805.html>). L. S. Berg (1908) reports that in the spring of 1897 an industrialist killed 1,500 saiga to sell their horns to China. According to A. Nuridzhanov (2010), there were at least 100-150 individuals inhabiting the peninsula between 2007 and 2010. The animals could be seen both on the original islands and on vegetation-covered areas on the former Aral Sea bottom. In the winter of 2012-2013, local people saw aggregations of 200-250 individuals on the former Lazarev Island. They also reported saigas found during the rutting period in the north-western part of Vozrozhdenie Island near a group of small lakes. In February 2015 we recorded 150-200 fresh saiga footprints on the dry bottom of the Aral Sea and the territory adjacent to Lazarev Island (Bykova, Esipov, 2016).

For a long time, the isolated saiga population of Vozrozhdenie Island was thought to be the only one which breeds within Uzbekistan (rather than migrating north to Kazakhstan). It was stable due to the low accessibility of the area. However, the shrinkage of the Aral Sea enabled animals and people to move more easily across the lake bottom. In order to study the current status of the saiga population and the impact of people from nearby areas on it, in September 2016 and May 2017 we carried out a survey of the archipelago and interviewed locals (shepherds, fishermen and rural people living in areas adjoining the former Aral Sea, including the village of Muynak, the nearest settlement to Vozrozhdenie), border guards and researchers from the Anti-Plague Service and the Karakalpak department of the Academy of Sciences of the Republic of Uzbekistan, who visit this region for fieldwork.

We inspected every area previously studied by A. Nuridzhanov and mentioned by local people. In 2016 we found nothing, but in 2017 we recorded fresh footprints of four groups of saiga in the south-



Skull of a saiga male that died of natural causes, found in the south-west of Vozrozhdenie. Photo by Alexander Esipov

west of Vozrozhdenie (near Sulama), 18 adults and 2 youngsters in total. The average herd size was 5 individuals. The footprints of a female with calves confirm that saigas do breed in this area. We also found an old skull with horns, which indicates that the male had died naturally. Local people reported a saiga rutting site in the south-west of Vozrozhdenie. A. Nuridzhanov also mentioned this site in his 2010 report. Our attempt to reach the site failed because of the extreme marshiness of the area.

Compared to the observations of A. Nuridzhanov and reports of local people, our observations suggest that saiga numbers have decreased, starting in 2007 when the island turned into a peninsula. According to our interviewees, people from the villages of Muynak, Kubla-Ustyurt and Karausyak visit Vozrozhdenie to poach. A. Nuridzhanov (2010) reports traces of poaching such as motorcycle tracks, hides where the animals ascend the original island from the dry bottom of the lake, and cartridges charged with buckshot. On the former Bellingsgauzen Island we also discovered traces of poaching, which included a saiga skull with sawn off horns and saiga bones. On that island we also found an old weather station with a building and observation tower which poachers stay in to observe the animals.

On the other hand, saigas might be leaving the island and moving onto the former lake bottom. It should be noted that the former islands are rich in valuable food plants. In late spring glasswort (*Salsola orientalis*) pastures yield 1,500-1,700 kg of

Articles (cont.)

plants per hectare, wormwood (*Artemisia terrae-albae*) pastures over 2,000 kg – a capacity recorded nowhere else in Uzbekistan (Shomuradov, 2017). These pastures are a good food resource for saiga, particularly in winter, so it seems unlikely that saigas are abandoning Vozrozhdenie in search of food.

Oil and gas companies might also have had a negative impact on saigas, as until 2014 the Aral Sea Operating Company used the island to prospect for gas deposits and created infrastructure which might act as additional disturbances, along with the construction of the new roads which considerably facilitated access to the former island. In addition, in 2008 one of the two lakes used by saigas and other wild animals as a source of water was almost entirely dried out by industrial geologists. Probably, it was in search of water that saiga moved to the northern portion of the island in Kazakhstan or to the continent in the south. At the time we were surveying the territory all the lakes were already dry.

Thus, there are several factors, including direct and indirect anthropogenic ones and the shrinkage of



Saiga skulls with sawn off horns found on Bellinsgauzen Island. Photo by Elena Bykova

the Aral Sea, that have had a negative impact on the saiga population of Vozrozhdenie Island. Importantly, Vozrozhdenie is a transboundary area between Uzbekistan and Kazakhstan. We do not possess any information on the saiga's status in the adjacent Kazakh territories. We thank the People's Trust for Endangered Species for funding this work.

Look on my works ye mighty and despair: Where to find optimism for the Aral Sea?

E.J. Milner-Gulland Saiga Conservation Alliance ej.milner-gulland@zoo.ox.ac.uk

Nukus, the little-known capital of Karakalpakstan region, Uzbekistan, has a remarkable and [unexpected collection of modern art](#), created by Igor Savitsky in this remote refuge at a time when such art was discouraged by the Soviet state. Wandering around it, I saw early 20th century paintings of the huge Amu Darya river stretching to the horizon, with fishing vessels, busy ports and markets, and people strolling and working in the shade of trees.

The next day we drove through dusty suburbs and were listening to Oktyabr Dospanpov, tour guide and archaeologist from the Uzbekistan Academy of Sciences, who grew up in Muinak town, the centre of the huge ecological and social catastrophe that was the drying of the Aral sea. We already knew the



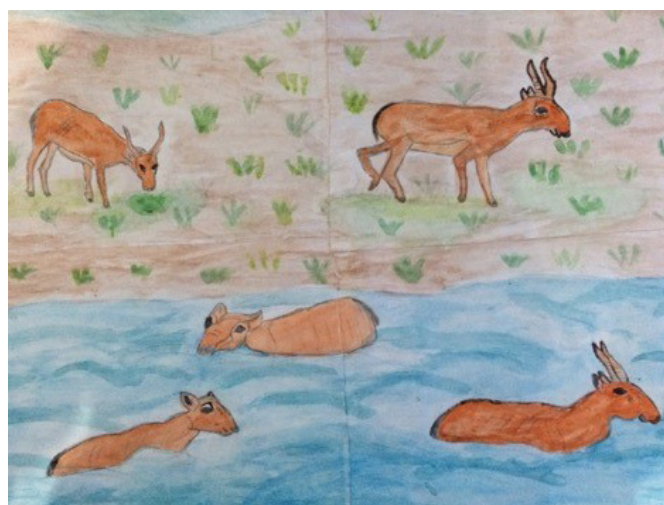
Fishing vessel, Muinak, 1970 (by Vadim Madgazin)

Articles (cont.)

basic story, but it was another thing to hear first-hand about his childhood friend who ran the fish cannery in Muinak, and killed himself when it finally closed a few years ago, with the loss of 2,000 local jobs. Or how both his parents died in their early fifties from cancers caused by the pesticide-laden dust. And how in the old days, it was a huge port and naval base, where all the men from the region embarked to fight in the second world war. People came from all over the USSR to join the commercial fishing fleet, which sent canned fish back to the whole Soviet Union and its allies, while caviar was so commonplace that his mother baked it into bread.

The death of this part of the Aral sea was caused by over-extraction of water from the Amu Darya river for cotton production (with associated heavy chemical usage). This was compounded by large-scale extraction by countries upstream, and more recently by climate change leading to less snow in the Pamir mountains and less rain throughout the region. The river now peters out in Nukus, 200 km south of Muinak.

The Soviets' first reaction to the unfolding crisis was to build a canal from the strategically important port of Muinak to the receding sea, but the water left so quickly that after 25 km they had to give up. For a while, the canneries received fish from other places, but finally they too had to admit de-



A picture of saigas by a child from Muinak school



Abandoned ships at Muinak, May 2018. Photo by E.J. Milner-Gulland

feat. Walking among the boats placed on the sea bottom, below the cliff where Muinak's lighthouse stands, we were reminded of Shelley's poem *Ozymandias*, in particular the lines:

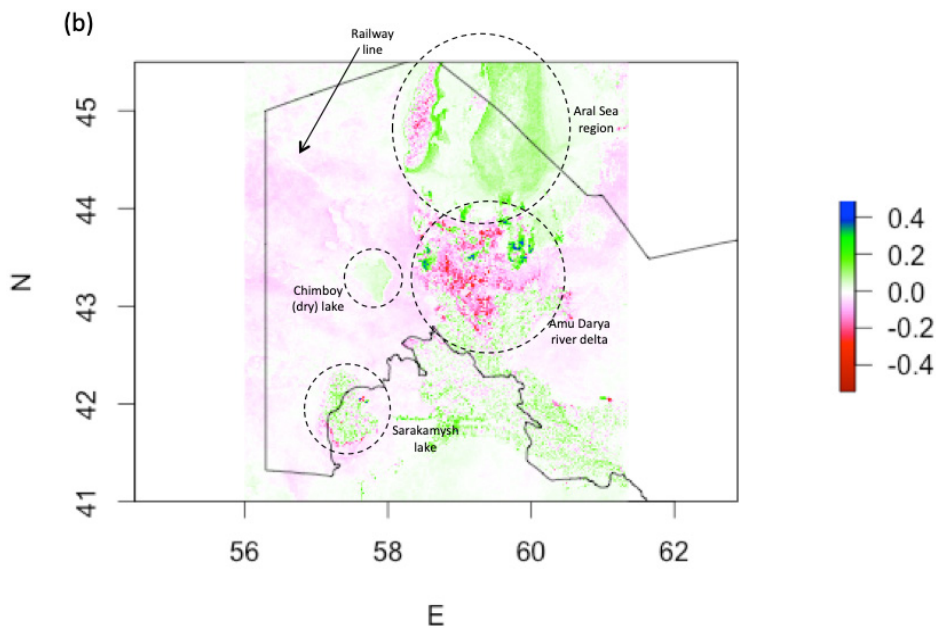
*Look on my Works, ye Mighty, and despair!
Nothing beside remains. Round the decay
Of that colossal Wreck, boundless and bare
The lone and level sands stretch far away.*

We were in Muinak to hold a celebration for school-children promoting saiga antelope conservation, and discuss ways to work together. The school is small and old, with limed walls, and the town has shrunk to a picturesque village, with single-storey white-painted adobe houses. A few tourists come to visit the abandoned ships, but there's nothing to keep them here.

The visit to the school was touching and uplifting, because of the huge excitement that the children and teachers showed for our visit, demonstrated in the pictures they had drawn of a species none of them is likely to have seen. Saigas cling on in Uzbekistan, with most of them now in the new desert which is the bed of the Aral sea, because it is challenging for poachers to access. So my colleagues at the [Saiga Conservation Alliance](#) want to work with these children and their teachers to make poaching socially unacceptable.

As we travelled back to Nukus that evening, I felt perversely optimistic, in the face of one of the most obvious and devastating recent demonstrations of human mis-management in the world. Although vis-

Articles (cont.)



Trends in NDVI from Modis images, 2001-2012, showing greening of the former sea even as the delta dries (from [Bull et al. 2015, Land Use Policy](#)). The circled green area at the top is the Aral sea area (green means increasing vegetation over time). The circled red area in the middle is the delta (red means reduction in vegetation over time). The other circled areas are also areas of vegetation regeneration.

iting the school and seeing the potential for transformative ecological education was lovely, it was more than that. It was not just that we could see that efforts to vegetate the sea bottom were bearing fruit. The artificial waterbodies near Muinak, made to mitigate polluted dust storms, were beautiful and bouncing with birds, which raised my spirits, but that too is not enough.

This area has a long history of large-scale devastation, putting into context the wanton waste of resources and consequent ecological and social damage of the recent past. In the 8th century, Arab conquerors swept away the Zoroastrian culture and its monuments. In the 13th century Ghengis Khan devastated the canal systems that brought life to large areas, as well as the cities and their cultural landmarks, imprinting his own vision. Traces of both previous cultures underlie current land- and cityscapes. We were seeing the results of Soviet megalomania at Muinak, and we were told of the impending demolition of culturally and socially important areas of the country's ancient cities in a push towards mass market tourism. Sweeping

environmental change is also characteristic; until the 15th Century, the Amu Darya drained into the Caspian sea. When it shifted to the Aral sea, leaving cities and silk routes dessicated, the Aral sea grew and the new delta filled with life. So in this desert land, the fertile, productive Amu Darya delta and sea which I saw in the Savitsky paintings were also transient. The landscapes and people of this region are resilient to these endless batterings of large-scale ecological and political forces over which they have no control. Resilience can, however, tip over into fatalism.

So, does the optimistic future for the Aral Sea region lie in sensible environmental management at the large and small scales, allowing more water to flow (international water use agreements, national redirection of agriculture away from cotton and rice to more sustainable crops, local adoption of less wasteful and damaging irrigation techniques)? Probably not, in the short term, as fundamental changes in governance would be needed, of which we see no sign. Is the Aral sea region going to become an ecologically resilient, protected, safe

Articles (cont.)

haven for threatened species like the saiga? The chances are slim. Are the children of Muinak school going to have a healthy and fulfilling future in their home town, with good employment? Unlikely.

The main cause for optimism is that there are a few people in Uzbekistan, like my Saiga Conservation Alliance colleagues, who have a vision for the future, and demonstrate in small ways how it could be realised. They chip away at institutional, personal and social inertia, through events like Saiga Day which tell children, teachers, and indirectly parents, that nature is precious, its casual destruction is wrong, and together we can change the future. They lobby the government for protected status for areas harbouring precious remnants of natural value like the saiga. They instill professional pride into rangers and border guards. They develop enterprises for local women making high quality hand-crafts. They are ready to exploit opportunities such as changes of mood in government, or strong new actors (like the gas companies which are increasingly dominant forces in rural areas). There are also international NGOs like the [Wildlife Conservation Network](#), whose staff came with us to Muinak to see our work first-hand, and who see the value of investing in those with vision in apparently hopeless situations.

Nature and people persist, albeit diminished. There is plenty that can be done to improve things, despite our limited capacity. Although the path to an eco-



New vegetation on the Aral sea bottom resulting from a seed distribution programme, seen from the causeway road to Muinak. Photo by E.J. Milner-Gulland

logically bountiful and socially prosperous future for Karakalpakstan is narrow, twisted, rocky, and is blocked and reblocked, my tough and resilient colleagues keep on picking their way through. That's the cause for optimism.



Children in Muinak school. Photo by E.J. Milner-Gulland

Articles (cont.)

The captive breeding practices of the 'Steppe Wildlife' association

Victor Minoransky Association 'Steppe Wildlife' priroda.rostov@yandex.ru

Important steps to conserve rare and endangered species include captive breeding and release to the wild. Attempts to keep saiga in zoos were made in America, Europe and Asia in the 19th and 20th centuries, but all of them resulted in high death rates among the animals, forcing the zoos to reject the idea of keeping this antelope in captivity. A number of saiga breeding centres in Russia, China, Ukraine and Kazakhstan exist, but they also are facing a range of challenges. Between 1888 and 1958, 19 groups of saiga were brought to the Askania Nova Reserve in Ukraine, but a real herd formed only in 1979, when they were put into 807 and 1550 ha enclosures. A detailed history of saiga captive breeding can be found in Karimova et al. (2017).

The 'Steppe Wildlife' Association (the Association) was founded in Rostov Region in the late 20th – early 21st century by A. M. Uzdenov, a deputy of the Legislative Assembly of Rostov Region. One of its primary goals is to conserve rare steppe animals, including captive breeding. The Association launched a saiga breeding programme in enclosures at the Centre for the Rare Animals of European Steppes (the Centre) in the Manych steppes, where saigas were present in large numbers a few decades ago and were a game species. Having analysed the liter-

ature and studied the practices used in the Askania Nova Reserve and the Centre for Wild Animals in the Republic of Kalmykia, in 2004 Association staff built the first enclosures for 10 young saigas caught in the steppes of Kalmykia. Observations helped establish the required dimensions, structures and forms of enclosures that would suit the antelopes best. Specialists also developed diets for young and adult animals at different times year, as well as the composition of mixtures for the artificial feeding of youngsters and their feeding time. The animals were distributed across enclosures based on their age, sex, physiological condition and number of individuals. By 2013 the Centre had 18 enclosures varying in size and used for different purposes. The Centre received huge support from researchers from the Severtsov Institute of Ecology and Evolution under the Russian Academy of Sciences, the Russian Committee of MAB UNESCO, the Centre for Wild Animals in the Republic of Kalmykia, Centre on Hunting Control and Chernye Zemli Reserve, among others.

By 2008–2011 the death rate among the saiga in the Centre had been considerably reduced to a level lower than in the wild, which resulted in a self-sustaining population of 60–70 individuals. Since 2010 the growth in saiga numbers stopped, and it became necessary to extend the area, construct additional structures, increase staff numbers and make other improvements. Only females above 2 years of age were allowed to take part in breeding, to control recruitment to the population.

Minoransky and Tolcheyeva (2010) gives a detailed description of the practices used by the Association and an overview of saiga captive breeding in other facilities. These practices make it possible to rear saigas in captivity quite successfully. Saigas get 'domesticated' and quite soon become accustomed to people, allowing visitors to approach to them and facilitating research. In 2013 the Association organised an international conference



Release of a saiga into a new enclosure. Photo by 'Steppe Wildlife' Association

Articles (cont.)

'Breeding and keeping saigas (*Saiga tatarica* L.) in captivity,' with the participation of a wide range of specialists and researchers from breeding centres and zoos, who developed recommendations for the future. Alongside other proposals, these recommendations were used as the basis for Resolution No. 978 by the Government of the Russian Federation of 31 October 2013, to include saigas in the list of "animals of special value". It also inspired colleagues from Kazakhstan and Crimea to create more saiga breeding centres and bring the animals to Almaty zoo (Karimova et al., 2017).

The mass mortalities of saigas in the Astrakhan game ranch in 2009, in the Centre for Wild Animals in the Republic of Kalmykia in 2014 and in the wild in Kazakhstan in 2015 and Mongolia in December 2017 – January 2018 impelled the Association to extend its saiga work. The animals at the Centre were divided into two groups, and in 2015-2016 a new 63 ha enclosure was constructed in the Manych steppes 50 km from the Centre, where the second group of saiga was transferred. That was done to ensure protection of a part of the population in critical situations, such as epidemics. Moreover, animals kept in the semi-wild environment of a large enclosure increase in numbers more rapidly, making it possible to accumulate a stock for release into the wild. An artesian well was bored and



An enclosure with saigas. Photo by 'Steppe Wildlife' Association



Saiga eating hay. Photo by 'Steppe Wildlife' Association

drinking pools were constructed for the animals. The roughness of the area allows the animals to hide in the natural environment. This enclosure is also used to keep Przewalski's horse, camel and, from time to time, other species. The saigas were brought to the new enclosure in spring 2017, when the sustainable tourism festival 'Vospetaya v stepi' ('sung in the steppe') was held across Russia. The ceremony for moving the saiga was attended by S. B. Ivanov, special representative of the President of the Russian Federation for nature protection, ecology and transport, S. Ye. Donskoy, Minister of Nature of the Russian Federation, V. Yu. Golubev, Governor of Rostov Region, and other prominent figures. Currently, the main Centre is home to 14 saigas of a calm disposition, allowing them to adapt more easily to living in the small enclosures of zoos, breeding centres and farms. The second group of 37 individuals resides in the new enclosure. Currently, efforts to improve the enclosure are being made and the animals' adaptation to their new conditions is being studied. One of the principal challenges is that for the last 5 years the saiga populations at the Association have not been supplemented by new individuals, either from the wild or other breeding centres. Some of the females are barren, while others die during calving; those that manage to calve successfully seldom have more than one calf. All this indicates the need to bring in new individuals. The Association is also considering the extension of the captive breeding enclosure to 2,114 ha.

Among other challenges preventing large-scale

Articles (cont.)

captive breeding are lack of interest from state nature protection organisations, a weak legislative basis, inadequate academic support, insufficiency of trained specialists, poor financing. It is surprising, for instance, that, despite many years of consideration, the saiga has not yet been included in the Red Data Book of the Russian Federation, even though it is a Critically Endangered species. Often the saiga's fate is in the hands of officials with insufficient specialist knowledge, incompetent experts and other unauthorised people. They issue recommendations which, if followed, could cause harm to the animals in captivity and even their death. Each animal species possesses a range of highly specific biological characteristics, so even a good livestock specialist or veterinarian may make mistakes working with different species. Some zoo and breeding centre managers are irresponsible enough to state that breeding saigas in enclosures is hardly possible

even with the help of experts. Current practice demonstrates that almost any animal species can be reared in captivity under appropriate conditions.

Between 2013, when the first conference on saiga captive breeding was held, and 2017, we have made progress in keeping this animal in a semi-natural environment and protecting it in the wild. However, these achievements are quite modest so far, and so the question of saiga conservation in Russia remains unresolved. The participants in the international seminar on captive saiga breeding held at the Severtsov Institute of Ecology and Evolution under the Russian Academy of Sciences in 2017 (see Saiga News 23) developed recommendations to improve methods of breeding saiga in captivity and increase captive breeding, and there is hope that they will be actively followed (<http://saiga-conservationorg/wp-content/uploads/2017/09/CBW-meeting-report.pdf>).



Artificial feeding of calves rejected by their mothers. Photo by 'Steppe Wildlife' Association

New publications

Exploring saiga horn consumption in Singapore

Meryl Theng, Jenny Glikman, E.J. Milner-Gulland *Oryx* 52, p. 736-742, 2018

<https://www.cambridge.org/core/journals/oryx/article/exploring-saiga-horn-consumption-in-singapore/7BB3E9739F1422D661DCDF36A9DC770A>

Singapore is a major hub for the global trade in saiga horn and an important consumer country, with saiga horn products widely available in the domestic market. Despite this, little is known about the consumers that drive domestic demand. Before interventions are carried out, it is important to understand who the consumers are, and their motivations. We conducted an investigation into consumption prevalence and consumer demographics, knowledge and motivations. We surveyed 230 Chinese Singaporeans, through a combination of face-to-face interviews and self-administered questionnaires. Recent consumption incidence (in the previous 12 months) was relatively high, at 13%.

Younger respondents (18–35 years) had the highest prevalence of recent consumption (25%), often as a result of influence from an older family member or friend. Bottled saiga horn cooling water was the most popular product among recent users (50%), followed by horn shavings (31%) and tablets (13%). Awareness of conservation issues and regulations was uniformly low. Awareness raising may have an effect in reducing consumer demand in Singapore. However, given the exploratory nature of this study, it is best used to guide and inform future research underlying behavioural change interventions in a relatively understudied but important consumer group, Chinese Singaporeans.

Saiga management at zoos and breeding centres: making effective use of the lessons learnt for the restoration of wild saiga populations

Karimova T.Yu., Lushchekina A.A., Rozhnov V.V. Moscow: KMK Scientific Press. 2018. 117 pp.

This book presents an analysis of almost all available literature body on the history of husbandry and breeding of the saiga antelope (*Saiga tatarica*) under various conditions (zoos, breeding centres with semi-natural environment, and small captive breeding facilities) and the attempts aimed at the release of captive-bred saigas into the wild. It is available both in Russian and English:

Russian: http://saiga-conservation.org/wp-content/uploads/2017/03/saiga-in-captivity_2017.pdf

English: http://www.sev-in.ru/sites/default/files/inline-files/Рожнов_2018%20%282%29.pdf

Rapidly assessing the risks of infectious diseases to wildlife species

Wendy Beauvais, Steffen Zuther, Chantal Villeneuve, Richard Kock, Javier Guitian

<https://royalsocietypublishing.org/doi/full/10.1098/rsos.181043>

Predicting the likelihood of rare events is increasingly demanded by risk managers. A key challenge is dealing with different types of uncertainty, including lack of knowledge, inherent randomness and natural variation. One potentially catastrophic event which is impacted by high levels of uncertainty is

the transmission of livestock pathogens to wildlife, particularly for endangered species. There is often a lack of basic information, e.g. about a given pathogen's presence in local livestock populations or the susceptibility of a given wildlife species to infection by the pathogen. We adapted the OIE (World

New publications (cont.)

Organisation for Animal Health) risk assessment framework to rapidly assess and prioritize the risks of livestock pathogens for wildlife, taking account of uncertainties, seasonal movement of animals and interaction between different species at different spatial and temporal scales. We demonstrate the approach using the endangered saiga antelope

(*Saiga tatarica tatarica*) as a case study. We conclude that, in general, transmission events are likely to be rare and limited to small geographical areas; however, their impact could be high. *Brucella* spp. and foot-and-mouth disease virus are among those most likely to be transmitted from livestock to the Betpak-Dala saiga population.

Saiga heroes

Editor's Notes:

Dear readers, usually in this section we talk about people who have devoted their lives to saiga conservation, interview them to ask questions about their life, work, and views on saiga conservation. But this time we decided to retreat from the rules and talk about someone who we can no longer interview and who actually proved his willingness to give up his life for wildlife conservation and protection of our beloved species. Yerlan Nurgaliyev, wildlife ranger from "Okhotzooptom" (a Kazakh state agency under the Ministry of Agriculture) and his colleague Pyotr Nitsyk, were attacked by saiga poachers and seriously injured. Yerlan died of his severe injuries on 15th January, while Pyotr remains in hospital. The poachers have been arrested.

The editorial team of Saiga News turned to our colleagues from the Association for the Conservation of Biodiversity of Kazakhstan, who knew this saiga hero well, to share their personal stories about him.

We would like also to announce that our annual Excellence in Saiga Protection Award this year will be awarded to Yerlan Nurgaliyev (posthumously) and Pyotr Nitsyk. We wish Pyotr a speedy recovery.

Athletic, brave, educated...

This is how his colleagues, friends and relatives describe Yerlan Nurgaliyev, an Okhotzooptom ranger. Yerlan Nurgaliyev, who had a teaching background, used to work as a military instructor and was a law enforcement veteran and retired major. In 2012 he applied for a job in Okhotzooptom and was appointed as a ranger. He was popular among his fellow villagers, held in esteem by his colleagues and was deeply devoted to his family. His colleagues often refer to Yerlan as a courageous and strong man. Perhaps these traits played a decisive role in his struggle with poachers.

'I believe that for his deed Yerlan Nurgaliyev deserves a state award. We should install a bust in his native village or name a street after him' commented Jannat Tansykbayev, deputy director of

Okhotzooptom, in his interview in the Liter newspaper. 'The Kazakhs should be proud of courageous people like Yerlan'.

Photographer Yakov Fedorov recollected his meeting with the rangers of Okhotzooptom. 'When I was preparing a story in 2017 I had a chance to work with Okhotzooptom rangers, who proved plain and open-hearted people. They told me about their everyday duties, how they sometimes riskily chased offenders across the steppe at night, lights off, at 140 km/h. According to them, the most difficult thing is to identify the advocates and opponents of poaching, as local herdsman may either support those fighting criminals or help poachers escape punishment'.

Saiga heroes (cont.)

On 13 January 2019, Yerlan Nurgaliyev and Pyotr Nitsyk were chasing poachers in Karaganda Region, when the criminals inflicted severe injuries on Yerlan Nurgaliyev, resulting in his death in a hospital a few days later.

Detectives from the Criminal Department of the Ministry of Internal Affairs of Kazakhstan arrested three suspects for his murder. The police are in-

vestigating into the case and collecting evidence. The three suspects are being held in detention. Meanwhile the President of Kazakhstan, Nursultan Nazerbaev, has announced that both rangers will be given an award for their bravery.

*Association for the Conservation
of Biodiversity of Kazakhstan*



Erlan Nurgaliyev with a baby saiga. Photo by Ospan Ali

In memoriam

In memory of Anatoly Vasilyevich Khludnev

3 October 1952 – 10 July 2018

Early in the morning of 10 July 2018, the heart of Anatoly Vasilyevich Khludnev, a person infinitely dear to all of us, stopped beating. It is hard to believe that the big and good heart of this wonderful man, who, it seemed, would live a very long life, stopped suddenly, making everyone acquainted with Anatoly Vasilyevich utterly lonely.

When he finished his military service, to which he dedicated the whole of his adult life, Anatoly Vasilyevich retired but continued to defend his Motherland, this time as the protector of wildlife in his native Astrakhan Region. He was appointed the first director of the Stepnoy State Nature Reserve, which became internationally famous for the efforts its staff made to conserve the pre-Caspian saiga population. It was then that Anatoly Vasilyevich became

an organic part of our 'saiga' family, participating in a number of activities organised by the Saiga Conservation Alliance and receiving colleagues from around the world in the Stepnoy reserve.

Like a true commander, Anatoly Vasilyevich led his small army, sometimes risking his life, to struggle vehemently with the trespassers in the reserve's territory. The outstanding results he achieved were repeatedly mentioned by the international conservation community. Anatoly Vasilyevich made efforts to launch year-round monitoring of the saiga population in the Stepnoy Reserve, to raise awareness and enhance the ecological education of local people. He created an ecological trail, which is becoming increasingly attractive for visitors longing to see saigas protected in the reserve and acquaint



In memoriam (cont.)

themselves with the unique wildlife of Astrakhan Region. One of the strong aspects of Khludnev's personality was his ability to get on well not only with his personnel, but also with local farmers living near Stepnoy reserve, which allowed him to turn many of the farmers into wildlife protectors. Saiga News reported on Anatoly Vasilyevich's work several times, as one of the few people who dedicated many years of their lives to saiga conservation.

In 2013, Khludnev was appointed to a new position as the director of the Volgo-Akhtubinskoye Mezhdurechye Nature Park in Astrakhan Region. He took his experience gained at Stepnoy over the previous 13 years to the new protected area, where he fo-

cused on the development and maintenance of its system of protection, poaching prevention, raising local people's awareness and level of ecological education, and popularising wildlife in the Astrakhan Region.

There is a bitter feeling of injustice, when the best representatives of humankind abandon us forever!

Anatoly Vasilyevich Khludnev will remain in our memory as he often appears in photographs – a kind and happy man and a true expert, who dedicated a fruitful period of his short life to the conservation of saigas and the wildlife of Astrakhan Region.

Saiga Conservation Alliance

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SAIGA CONSERVATION ALLIANCE

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