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Russian Conservation News

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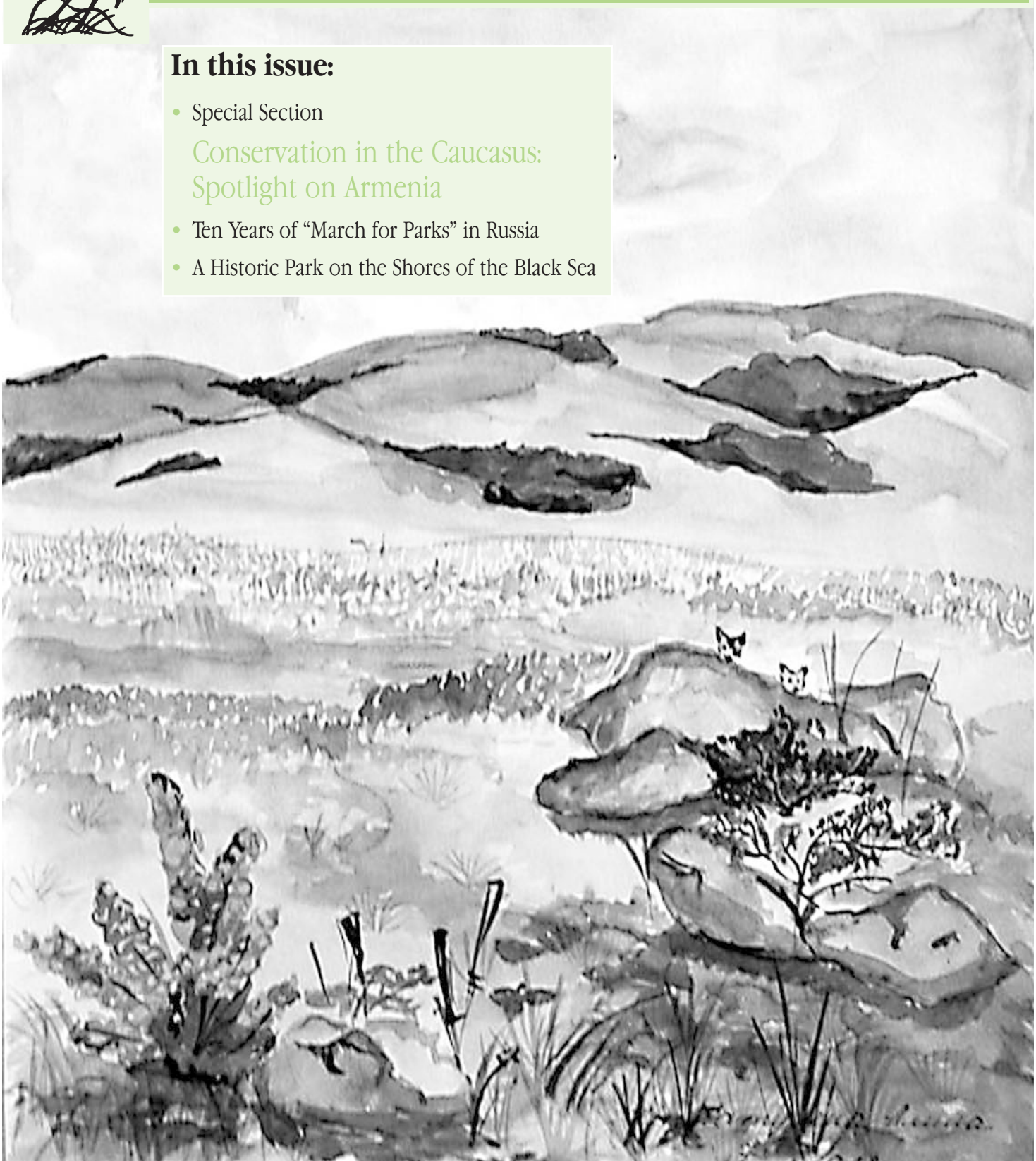

PROMOTING BIODIVERSITY CONSERVATION IN RUSSIA AND THROUGHOUT NORTHERN EURASIA

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The mission of the Center for Russian Nature Conservation (CRNC) is to promote the conservation of nature in Russia and throughout the former Soviet Union, and to assist conservation groups in that region through information exchange, coordination of professional and education exchanges, and provision of technical assistance to protected areas. CRNC is a project of the Tides Center.

Center for Russian Nature Conservation

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RCN *has many partners and friends in Russia, including the Partnership for Zapovedniks, whose mission is to offer organizational, technical, and financial help to zapovedniks and national parks in Russia.*

PARTNERSHIP FOR ZAPOVEDNIKS

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Acknowledgement: *Maps of Russia's protected areas that are featured in this issue were prepared using the Protected Areas GIS database of the Biodiversity Conservation Center/International Socio-Ecological Union. For more information, please consult http://oopt.info/gis/database-eng.html*

ON THE COVER

The Orenburg steppe, in Russia's southern Urals region. Cover drawning by A. Khismatulina, a fourteen-year-old participiant in Orenburgsky Zapovednik's 2005 March for Parks Celebration.

Voice from the Wild (A letter from the editor)

As this issue of *Russian Conservation News* goes to press, the 8th World Wilderness Congress (WWC) has just ended in Anchorage, Alaska. Delegates from around the world gathered there to share experiences, methods, and ideas for conserving the world's remaining tracts of intact wilderness. More than ever, I remain convinced of the importance of the legacy of Russia's zapovednik system. No other country in the world has anything like it. Few people know about it. Fortunately, the WWC agenda included a panel of presenters who spoke about the Russian Far East and its protected areas, but I feel that these presentations only scratched the surface in presenting the values and opportunities for conservation in Russia. Thus, once again, I ask you, our readers, to continue to lend your support to *RCN*; to share the news (good and bad) about conservation in Russia and Northern Eurasia; and to do what you can to support the many dedicated conservationists working in the region.

In this issue of *RCN*, we put a spotlight on one of the great strongholds of biodiversity in Northern Eurasia: the Caucasus region. Straddling Europe and Asia, the Caucasus, which incorporates parts of four former Soviet states, as well as Iran and Turkey, serves as a biogeographic bridge connecting the two continents' dramatic landscapes and remarkably rich biodiversity. In this thirty-ninth issue of *Russian Conservation News*, we offer a profile of a country at this special region's very heart: Armenia. This ancient land, which is widely known for its rich culture and history, is also a hotspot of biodiversity and endemism.

Perhaps one of the most important messages coming out of the World Wilderness Congress is the need to recognize success. Conservationists today are bombarded with tremendous challenges, and we often feel daunted by what sometimes seem to be insurmountable challenges. So, while our extensive special section devoted to Armenia will acquaint you with some of the urgent conservation challenges facing this small nation, such as deforestation and the unsustainable use of Lake Sevan's water resources, we also bring you news of an exciting and inspiring effort underway in the country. This is the Armenia Tree Project, which is preserving Armenia's forest resources by combining reforestation efforts with community development activities, yielding real results and transforming landscapes and lives across Armenia. In other good news, we share with you a triumph of grassroots activism, which helped secure the fate of one of Armenia's strictly protected areas, Shikahogh Reserve.

Rounding out this issue is a pair of encouraging reports on two species that are highly endangered in the Russian Federation: the Aleutian Canada goose and the Siberian tiger. Thanks to the dedication of committed conservationists and a concerned public, the status of these species is increasingly stable and gives us at *RCN* cause for hope.

Finally, history figures prominently in this issue of *RCN*. We share with you unique materials compiled and adapted from an exhibit on the involvement of Russia's protected areas and the Moscow Zoological Park in World War II. We also acquaint you with one of the elder stateswomen of Russia's protected area system, Ksenya Golgofskaya, whose lively reminiscences reflect on fifty years spent working in Kavkazsky Zapovednik. In this issue, we celebrate two other milestones marked. March for Parks, a now ubiquitous movement to draw public attention to Russia's protect nature areas, recently celebrated its tenth annual campaign, while an interesting program of the International Socio-Ecological Union to advocate for the ecological safety of rocket and space activity just completed its fifth year of work.

Protected Areas

Reflections on the Beginning of March for Parks

*By **Margaret Williams***

The early 1990s were a heady time for protected areas in Russia. Although chaos reigned and uncertainty prevailed in the post-Soviet re-organization of government, it was a time when anything seemed possible, new ideas were welcome, and the only limits to action were attitude and time. I had the opportunity to be living in Russia during this period and will never forget the excitement of the times. One of the highlights was the introduction of a new event in Russia, one which was entirely experimental, yet ten years later has become a matter of course for Russia's federal protected areas. This is the March for Parks.

In its ten years, March for Parks has reached such heights as Elbrus, Europe's highest peak. *Photo provided by Alaniya National Park.*

It all started when, having been living in Russia for nearly a year, I returned to the U.S. for the Christmas holidays in December 1994. While poring through mail that awaited me, a small ad in the magazine *National Parks*, a publication of the National Parks Conservation Association (NPCA), caught my eye. "March for Parks!" it called out to readers, inviting American citizens residing near national parks to organize events that would raise money and help build support for their parks. The concept of this sort of "march" is a familiar one in the U.S.: participants find sponsors to commit some amount of money in advance of a walk, hike, or other athletic event. Sponsors may commit ten cents, a dollar, or any amount for each mile traversed, each meter ascended, each lap biked, etc. The end result is a grassroots campaign that yields funds, a higher profile for the cause at hand, and a greater sense of engagement in the issue by those who have been involved.

Back in 1994, just a few years after *perestroika*, Russia's zapovedniks and national parks were facing a fiscal crisis. They were fast realizing that their future, politically and financially, could not depend on the same old Soviet structures and approaches that once kept them going. With neither traditional subsidies nor outside sources of support to replace them, the zapovedniks and parks faced a bleak future. It would now be necessary to cultivate a group of sympathetic local businessmen and regional authorities and to establish a basis of local support — local schools. How to go about doing this was not exactly clear, and zapovednik managers hotly debated the role of their nature reserves — traditionally closed to the public — in outreach to their fellow citizens.

Having not been aware of the March for Parks event (although I had worked as a volunteer and interpretive ranger in two US parks), I was intrigued by the idea, and wondered whether we could try it in Russia. Several calls to NPCA to a most helpful coordinator yielded a better picture of how the March could work. NPCA generously provided pamphlets, stickers, pins, and brochures on results of previous events in the US.

Armed with these materials, I returned to Russia in January 1995, and shared them with my colleagues from the Biodiversity Conservation Center (BCC). Irina Chebakova, one of the group's experts on parks and protected areas, was taken with the idea of a Russian "March" and we decided we would float the concept to our closest colleagues in the Russian parks and zapovedniks. We made our own Russian-language brochure to share the idea with these colleagues, emphasizing the opportunity to raise their protected area's profile and improve its public image. (We didn't think the fundraising element should be stressed in Russia, especially in rural areas, where the economy was in tatters and efforts to solicit funds could work against the parks.) We printed up stickers, and made up

packets of materials, including some "March for Parks" T-shirts and pins, and began to send them out to those zapovednik and park managers who agreed to launch this experimental effort.

In the days before reliable express mail services delivered throughout Russia, we made use of friends, who served as couriers. We also frequently employed the services of friendly train conductors, who, for a nominal sum, would ensure the safe arrival of our materials. Irina made quite a few phone calls to Samara, Nizhny Novgorod, Petrozavodsk, and other cities, to notify a colleague about meeting a particular car of a particular train in order to retrieve a March for Parks package.

One of the most enthusiastic supporters that first year was Losiny Ostrov National Park, just on the outskirts of Moscow. Leaders of that park went wild with the idea, organizing all kinds of events: folk dancing and music; games and contests; kite-flying; and a designated "march" of friends and allies from a nearby metro stop to the park's entrance! Hundreds of people showed up, not only from the conservation community, but also from local neighborhoods. It was the most exciting grassroots event in which I've ever been involved.

Within days following the first Russian March for Parks, held in conjunction with Earth Day on the third Saturday in April, Irina and I began to hear about some of the creative events that park and zapovednik managers had held. In Samarskaya Luka National Park, in the Samara Region, on the middle reaches of the Volga River, Boris Roschevsky had organized a bus trip for journalists to visit his park and they generated so many articles in the local press that an effort by regional leaders to downgrade the federal park to a regional protected area was stopped. In Bolshaya Kokshaga Zapovednik, in Mari El Republic, Svetlana and Alexei Popov held a round table discussion for officials in the region, developed a partnership with a school in Yoshkar-Ola, and held a massive event for young people — one which still continues today. More and more stories filtered in, all of them positive, and all of them examples of local people turning out to enjoy and support their park or zapovednik.

Since its inception, March for Parks has always attracted great interest among children. *Photo provided by N. Troitskaya.*

The following year, Irina and the Biodiversity Conservation Center went into full gear to broaden participation in March for Parks. We found additional sponsors inside and outside of Russia, and printed up hundreds of T-shirts, stickers, and flyers for parks to share with their supporters. That year, more than 50 parks and zapovedniks took part in the event. NGOs launched March for Parks events in other areas, too. For example, in Moscow, BCC held a rally and the Laboratory for Ecological Designs organized a major clean-up at a zakaznik, or special purpose reserve, located within the city's limits.

During the Soviet Era, large-scale public demonstrations were carried out twice a year – in honor of the Great October Revolution and Victory in World War II. Now, thanks to March for Parks, people turn out in great numbers to support Russia's zapovedniks and national parks. *Photo provided by N. Troitskaya.*

By 1997, nearly all of Russia's federal protected areas were participating in March for Parks, and news of the movement traveled by word of mouth to other countries, including Central Asia, where protected areas joined the initiative. I was thrilled and surprised to see an article in a Tajik newspaper about a March for Parks event that took place there. In 1999, I learned that even on the remote Commander Islands off of the coast of Russia's Kamchatka Peninsula, local children were participating in a March for Parks drawing contest held by BCC.

Gradually, word about the initiative traveled to Western Europe, where Russian colleagues shared the idea of March for Parks with counterparts in Germany and elsewhere. I am not certain whether it has taken hold there, but I do know that the well-known Swiss-based Rolex Awards for environmental achievement learned of Irina's outstanding organizational efforts and recognized her with an international prize.

Today, March for Parks continues in Russia and varies according to the individual leaders and managers at each protected area. It is a great pleasure to remember those early events, and to read about the creative activities that continue to take place, some of which are mentioned in this issue of *RCN*.

Margaret Williams *is the Editor of* Russian Conservation News.

March for Parks Celebrates Ten Years in Russia

*By **Irina Chebakova***

One of Russia's most popular nature conservation celebrations ever, March for Parks, celebrated its tenth anniversary this spring. For us, this anniversary makes the year 2005 a special one. It is a year for assessing what the March for Parks phenomenon has become for Russia's conservation movement and what it meant to those of us who gave it life a full decade ago.

In Russia, March for Parks began in 1995 at the Moscow-based environmental organization, the Biodiversity Conservation Center (BCC). At that time, the preliminary phase of the Global Environmental Facility's (GEF) "Biodiversity Conservation" Project was being prepared and the problems facing Russia's protected areas were being examined. These problems included the lack of adequate funding, pressure on natural resources, and a lack of understanding among local communities and the public at large about why zapovedniks and national parks are created and what purpose they serve. It became clear that we would not be able to resolve these problems and prevent new ones until we involved the public in their resolution, until we won society's support for our cause, and until we were able to prove to the government that zapovedniks and national parks should be financed not at 30% of their needs, but at a full 100%. But how would we achieve these ambitious goals?

The March for Parks nature conservation celebration called upon all segments of society — business, the media, state organs, and local communities — to unite around the idea of supporting our specially protected nature areas. The goal of the March is to win public support for the zapovedniks and national parks. Now the campaign has turned into a traditional spring nature conservation festival which constitutes a multitude of various activities in almost all regions of Russia: rallies, conferences, ecological games and quiz-bowls, volunteer work in the protected nature areas, and round table discussions with representatives of the media and local governments.

March for Parks still marching along after ten years. *Photo provided by N. Troitskaya.*

In the first year of the March, zapovedniks, national parks, and several NGOs carried out twenty local marches, in which close to 5,000 people participated. After that the March grew increasingly. By 1999, close to 250 local Marches were conducted in which more than one million people participated. The campaign has retained that scale to this day. Annually, hundreds of regional newspapers and television and radio programs spotlight March activities. Over the ten years that the March has been conducted, sponsors—primarily Russian entrepreneurs, businessmen, and commercial and industrial enterprises—have contributed significantly more than $1,000,000 to the zapovedniks and national parks.

What does March for Parks give people? Above all, it gives each person the opportunity to learn more about Russia's protected areas and its national heritage, and to make a personal contribution to supporting these territories, with money, participation in events, and unpaid voluntary assistance. The March helped zapovedniks and national parks establish regular contacts in their regions with local governments, the press, and business circles. Youth — both school children and university students — became an appreciative audience and teachers and pedagogues, our reliable partners.

Having carried out the March for Parks for ten years, zapovednik and national park staff have developed their own approaches and methodologies for establishing dialog with the public and have steadily built on their successes.

Irina Chebakova *worked for several years at the Biodiversity Conservation Center in Moscow, where she was one of the original coordinators of Russia's March for Parks celebration. She is a member of The World Conservation Union's World Commission on Protected Areas.*

March for Parks 2005: Reports from the Field

The Biodiversity Conservation Center's March for Parks 2005 logo.

Note from the Editors: *This spring* Russian Conservation News *editors contacted many of Russia's zapovedniks and national parks with the request that they send us accounts of their activities during March for Parks 2005. From protected areas nationwide, we received numerous dispatches, photographs, and examples of artwork. We chose several interesting and vivid excerpts from a small selection of reports and share them with you below.*

Kavkazsky Zapovednik
(Sochi, Krasnodar Krai)

This year, for the first time since Kavkazsky Zapovednik has been participating in March for Parks, the reserve involved pre-school aged children its March activities. The zapovednik organized a thematic arts and crafts contest for children at five nursery schools. The competition focused on the mountain bison, which is Kavkazsky Zapovednik's symbol. The contest's goal was both to involve the youngsters in the March and to offer them the opportunity to learn more about Kavkazsky Zapovednik and its animal inhabitants.

The contest's little participants were instructed to depict the bison in various conditions and circumstances. But in order to execute their drawings and appliquè work, the children first had to become more closely acquainted with the animals. With this goal in mind, staff of the reserve's environmental education division arranged and delivered interesting lessons at the pre-schools. During these lessons, reserve staff told their captivated audience about the bison and their behavior. They also shared with them pictures and illustrations of the animals and showed a video called "Bison." One of the zapovednik's educators even donned a plush bison calf costume and posed riddles to the children about some of its "neighbors" living in the reserve. The youngsters took genuine delight in socializing with the "bison calf" and vied for the opportunity to hold him by the "hoof."

This drawning by Irina Zaichenko, Yulia Rusinova, Vera Antonova, and Mikhail Novikov, all children at Kindergarten No. 166 in Sochi, took first place in the March for Parks art contest.

A "bison calf" from Kavkazsky Zapovednik awarded prizes to pre-school-aged winners of an art and crafts contest held in Sochi during March for Parks. *Photo by A. Popov.*

With their parents' help, the children imaginatively depicted bison by using not just crayons and paints, but also colored string, modeling clay, construction paper, and even semolina. There was no limit to the children's creativity! Participants received prizes at a special assembly, where the "bison calf" awarded certificates to the lucky winners. Teachers at the nursery school are confident that this special March for Parks event is one that their wee wards will remember for a long time to come.

Text prepared by the Environmental Education Division of Kavkazsky Zapovednik.

Khakassky Zapovednik

(Abakan, Republic of Khakassia)

March for Parks participants at work distributing information about Khakassky Zapovednik in Abakan, in the Republic of Khakassia. *Photo provided by Khakassky Zapovednik.*

March for Parks has been carried out in the Republic of Khakassia since 1997 and Khakassky Zapovednik has served as the initiator and primary organizer of the celebration in this south-central Siberian republic. With each passing year, the reserve acquires new experience in conducting the March and plans increasingly diverse events and attracts more and more participants.

It would be impossible to report on all of our March for Parks activities in one short dispatch. But as just one example from this year, on April 13, 2005, in order to draw residents' attention to March for Parks 2005, specialists from the zapovednik's Environmental Education Division and teenagers in bright uniforms rode through one of the busiest parts of the city of Abakan in a colorfully decorated bus. The bus stopped in the most peopled areas and its passengers distributed posters, calendars, booklets, and information about the zapovednik and its activities. City residents happily entered into discussions with the zapovednik's educators, displaying great interest in nature protection issues in the Khakassia Republic, in the zapovednik, and in March for Parks. Many of them then participated in subsequent events that the reserve implemented and some became supporters by providing various types of assistance.

The President of the Republic of Khakassia and the National Foundation "Strana Zapovednaya" provided much assistance to March for Parks 2005. The "Russky Aluminium" Company, the closed joint stock company "Tonnelnyi Otryad Number 22," and the "Medved" Advertising Agency came forward as associate partners of the event. It can be said with confidence that March for Parks has become traditional and successful in the Republic of Khakassia.

Text prepared by the Environmental Education Division of Khakassky Zapovednik.

Volzhsko-Kamsky Zapovednik

(Raifa, Republic of Tartarstan)

In 2005, for the first time in the ten years that Volzhsko-Kamsky Zapovednik has been involved in March for Parks, all events revolved around the Raifsky House of Culture in the village of Belo-Bezvodnoye. Spring's late arrival did not allow event organizers to hold events around the zapovednik's headquarters as usual.

On April 23, when the main events were carried out, it was very sunny and participants were in fine spirits. Close to 250 students, all eager participants in March for Parks, gathered in the local House of Culture. Interesting children's drawings, compositions, and poetry, which the children submitted for a special March for Parks contest, adorned the building's interior and created an atmosphere that was all at once celebratory and business-like. Upon entering the building, every child sought out his or her own creation and compared it with others. The children gathered in the main assembly hall for a concert program prepared by school- and pre-school aged children. Then winners of the art contests were awarded valuable prizes for the best drawings, compositions, and poems. All in attendance enjoyed viewing a film about the zapovednik shown on the big screen.

"March" activities organized by Volzhsko-Kamsky Zapovednik captivated enthusiastic children in the village of Belo-Bezvodnoye, in the Republic of Tartarstan. *Photo by Y. Gorshkov.*

Next, the remaining contests began. They were all conducted in an informal and sometimes even rowdy atmosphere. The children competed to be the first to identify different local riparian fish species, which were on display. Many of the children demonstrated excellent knowledge of primrose plants (*Primulaceae spp.*). The children not only identified them by photographs, but were also able to speak about which plants are rare and in need of protection. The children also gave a good showing in the contest "Whose tracks are these?" and particularly enjoyed the computer game "Animal Population Count."

All of these contests were intended to deepen the children's knowledge about local nature and to foster in them nature conservation-oriented thinking. The event's organizers believe it was successful in doing so. Furthermore, none of the children who participated in the contests left without prizes and positive feelings. The culmination of the event was a visit for the younger students to the zapovednik's dendrological garden and museum.

The day's happenings did not take place without media attention. The "Efir" television broadcast company from the city of Kazan aired a report on March for Parks on the Republic's local television station.

Text prepared by the Environmental Education Division of Volzhsko-Kamsky Zapovednik.

Bolonsky Zapovednik

(Amursk, Khabarovsk Krai)

"March for Parks" participants rest at the end of a job well done. *Photo by I. Nikitina, Bolonsky Zapovednik .*

March for Parks has become a traditional celebration in the land of the Amur River. Spring came late to the region this year. Although foul weather thwarted our plans to conduct a proces-sion and mass demonstration in the city of Amursk – both have also become traditional for the reserve during the March – we accomplished no less than in previous years.

Our "Life without Garbage" campaign was a resounding success. As part of this campaign, participants from various schools in the city took part in a thematic discussion, "The Amur Needs Protection." They also viewed a documentary film about ecological problems in the Russian Far East called "What Legacy Are We Leaving?" Armed with new knowledge and emotions, the children really threw themselves into an activity to pick up garbage along the Amur's shore, which ended up being a genuine investigation. The children broke up into groups of two and three and as they gathered trash, they filled out a form that inventoried and tallied the various types and quantities of litter.

Back in their classrooms, the children warmed up with some tea and pies, and engaged in a heated discussion about what they had just seen. The students marked the most littered territories on a map and analyzed what typed of garbage they encountered most often, how it might have ended up there, and what should be done to keep the Amur River's shores cleaner in the future. The children were full of ideas and suggestions, including writing a letter to the city's mayor about the need to take measures to defend the Amur's shores from the disposal of unsanctioned construction waste. The local television company "AMV" filmed the day`s events and broadcast the program on the city's public television channel.

Text prepared by the Environmental Education Division at Bolonsky Zapovednik.

Zyuratkul National Park

(Satka, Chelyabinsk Oblast)

Every year, with the coming of spring, we expectantly await one of the great celebrations for Russia's protected nature areas: March for Parks. This year, the celebration began on April 1 with the traditional "Bird Day." Many outstanding events followed, including: the "Clean Shore" activity, during which school children cleaned up trash on the shore of Lake Zyuratkul; the "Heart to Heart" awareness campaign on the Ufa-Chelyabinsk highway; the "I live on this Earth" celebration, held in the village of Sibirk; various children's competitions; and a journalistic press tour.

The "Heart to Heart" campaign, which took place on April 22-24, was a new one for us and proved very successful. School children prepared for the campaign in advance by attending discussions about forests and the need to protect nature. They also prepared reports and drawings and wrote compositions. Then the most "advanced" students prepared reports about how people should conduct themselves in nature. They also printed flyers, and prepared booklets, postcards, drawings, and photographs depicting Zyuratkul National Park. With these handmade materials, as well as balloons and banners, the children took to the "Ufa-Chelyabinsk" highway, one of the major arteries running through the Ural Region.

At designated tuck stops and rest areas, the children distributed flyers and promotional booklets about the national park, sang songs, and told people about the park's nature and natural landscapes. An inspector from the State Inspectorate for Traffic Safety stopped cars at the Staka

Young participants in the "Heart to Heart" campaign inform drivers along the Ufa-Chelyabinsk Highway about Zyuratkul National Park. *Photo provided by Zyuratkul National Park.*

Obelisk, a local monument. Much to the drivers' surprise, they did not receive fines or citations, but instead listened to children speak about the campaign's goals and also received flyers, postcards, and booklets about Zyuratkul National Park. The children's lighthearted enthusiasm was transferred literally "heart to heart." Drivers drove off with a small remembrance that every person plays a role in preserving nature, while the children were left believing that a living planet will be saved and that humanity will find harmony in it.

*Text prepared by **Aleksandr Bryukhanov**, Director of Zyuratkul National Park, and **Tatiana Bryukhanova**, Head of the park's Environmental Education Division and Coordinator of March for Parks.*

Yuzhniye Kultury Dendrological Park: A Historical Treasure on Russia's Black Sea Coast

By ***Lyudmila Boichenko****,* ***Svetlana Popova*** *and* ***Rita Melkonyan***

Yuzhniye Kultury Dendrological Park is a verdant paradise and an exceptional work of garden art. This federally protected park is located in the city of Adler, in southern Russia's Krasnodar Region, where it is situated along the eastern coast of the Black Sea, at Imertin Bay. Here, natural conditions create an almost greenhouse-like atmosphere, which is exceptionally favorable for the rapid growth of plants, including sub-tropical plants, of which there are both local species and those that have been imported from other countries. Yuzhniye Kultury Dendrological Park is one of the five best known parks on the Black Sea coast. Although its plants are slightly less biologically diverse than those in other parks, Yuzhniye Kultury Dendrological Park surpasses the others in its architectural layout and design.

The park was created almost a full century ago, upon the initiative of Danil Vasilievich Drachevsky, a general in the Imperial Army and the Vice-Governor of St. Petersburg. Drachevsky wanted to decorate the territory around his estate in Adler, which was called "*Sluchainoye*" [Translator's note: the word "*Sluchainoye*" means fortuitous in English]. According to legend, Drachevsky won the plot of land in a card game some time between 1903 and 1905. More likely, though, he had received the property through a land lottery. After the Sochi Region had been established as part of the Chernomorskaya Guberniya (Black Sea Province) in 1896, this naturally rich but remote province of the Russian Empire needed to be settled, and by the early twentieth century, land near Sochi was not only sold, but also issued by lottery.

The main part of the park was established over an area of twelve hectares during the period 1910-1912. Russian park-landscape architect Arnold Eduardovich Regel designed the project, curiously without actually ever having seen the territory or visited this corner of land along the Black Sea. A German horticulturist by the last name of Grabbe led efforts to divide the park into districts and to plant vegetation, while an Austrian horticulturalist by the last name of Skrivanik lovingly tended and cared for all plants brought to the park. Until his final days, Skrivanik coddled the plants and protected them from foul weather. He pruned and fertilized them and observed their growth and development. According to wishes expressed in Skrivnik's will, this self-sacrificing person was buried on the park's territory.

All of nature's finest creations were planted around the estate residence, of course with consideration for the region's climactic particularities. Plants of the most diverse kind were received from specially-set aside plots in the nurseries of one Prince Oldenburgsky.

The park was not open for visitation until after the 1917 revolution, when the Soviet government acquired Drachevsky's estate and opened its splendid dendrological park to the public. Since then, generations of residents of and visitors to Russia's renowned Sochi resort area have enjoyed the park.

Landscape architect Regel successfully used the territory's natural relief and beauty and incorporated vistas of the sea and mountains into the park's composition. The majority of the park's territory is flat, with only its eastern section being located at a small elevation. In the upper part of the park, a palm-lined path was created, as were various types of raised beds. Large green beds with beautifully blossoming shrubs and trees create the impression of an open free expanse. A view on the central part of the garden zone opens up from the panoramic square, from which the nearby beach and mirror-like, blue surface of the sea are also visible. Extensively dispersed paths open up astonishing views for visitors. And no one part of the park resembles any other!

Adler is home to Yuzhniye Kultury Dendrological Park. *Map by M. Dubinin.*

Two ponds, which are closely linked to the territory's main path, play an important role in the park's composition. Both were man-made. The first was created from a widened natural brook; it is situated at the foot of a slope framed by hedges of radiant pine. The second pond is small with greenish water and a thoughtful and lonely appearance. In its still surface, Italian cyprus (*Cupressus sempervirens*), Deodar cedar (*Cedrus deodara*), olive (*Olea europea*), and oleander (*Nerium oleander*) are reflected. Next to the pond, the park's open zone, or parterre, is located. [Editor's note: the term parterre describes a flower garden, the beds of which form a pattern]

The parterre is the main part of Yuzhniye Kultury Dendrological Park. Ancient Egyptians and Babylonians widely used this particular style of garden design. In the seventeenth and eighteenth centuries, the parterre became a sight of interest in French palace ensembles and parks. They soon became fashionable in Russia as well and were also widely adopted in other European countries.

In the parterre, everything is arranged according to strict geometric principles. The space is strongly framed and

a bright green lawn, which is divided by a narrow path into two different parts, occupies most of it. Pruned baskets of box tree (*Buxus sempervirens*) and euonymus (*Euonymus sp.*) and symmetrically arranged flower pots create a realm of harmony and order. Parterres are usually laid out in front of a beautiful building. In this case, the composition was completed by an open pergola arbor, entwined with kudzu (*Pueraria hirsuta*). Tall conifers and magnolia trees create a green setting around the open space. A master of park design attempted to create the impression of a large green massif here. To achieve this, he widely used a technique of the illusory removal of open expanses and perspectives, by planting evergreen and plants with silver and light blue-colored leaves. Unfortunately, the plantation of coniferous species, which was located in several rows along the edge of the territory and which provided for the defense of the interior plantations, was not preserved. Natural cataclysms destroyed this green curtain.

The pride of the old park was the path leading toward the sea. Although it is only 400 meters long, the path seems to stretch on endlessly. This effect was created by the successful combination of two tree species, planted on both sides of the path. High above head level, the crowns of broad-trunked sycamores (*Platanus sp.*), with their whitish bark, close in on dark thin tulip trees (*Tulipa sp.*). The trees lining this path are now significantly thinned out, as gale-force winds blowing in from the sea have uprooted several hundred-year-old sycamore trees.

Although a rare sighting across Russia, such exotic settings are common in Yuzhniye Kultury Dendrological Park. *Photo provided by Yuzhniye Kultury Dendrological Park.*

Numerous paths invite visitors to stroll through the park's grounds. *Photo by A. Troitsky.*

Soviet botanical scientists began taking particular care of the park in 1924. They created new green corners and replenished the collection of rare and beautiful plants. In 1935 the dendrological park was given the name "Yuzhniye Kultury." During 1937-1938, the newest part of the park was created, where unique plants, which had been brought from sub-tropical regions, were gathered. With that addition, the park's territory expanded to its present area of 21.5 hectares.

In the 1950s, work to improve the park was launched. A new rose-garden was planted and framed by a boxtree hedge, which at one time was maintained in the topiary style. This recalled Italian gardens in the Middle Ages, although the rose garden ended with an Italian garden pergola, which is no longer there. Paths were also decorated with borders and flower beds and a pool for warmth-loving aquatic plants was constructed.

This artificial pool, which was designed based on the plans of agronomist G. E. Brenneisen, has attracted tourists' attentions since it was created in 1952. The pool is not very deep. Its sides and bottom are covered in cement, which helps the water retain the warmth of the sun's rays. Plant pots with fertile soil line the bottom of the pool. During warm periods of the year, aquatic plants are planted in them. From June to October, the water surface of the pool transforms into a multi-colored carpet of blossoming water lilies (*Nymphaea sp.*), lotus (*Nelumbo sp.*), water hyacinth (*Eichornia crassipes*), and cyperus (*Cyperus sp.*). In the past, visitors to the park loved to be photographed at the pond, with its rare aquatic plants, including a true botanical wonder, the Giant water lily (*Victoria amazonica*), the leaves of which can grow up to seven feet in diameter. They also enjoyed boating on the neighboring pond, among the white and black swans that gracefully swam alongside them.

In the 1970s, the park's "green treasury" numbered more than 1,000 species, forms, and sorts of plants. Half of them comprised exotics from China, Korea, and Japan. A collection of plants from North America, Asia Minor, the Mediterranean, Himalayas, Australia, New Zealand, and East Africa was also presented here. Alongside the "foreign imports," "local residents" such as Georgian box tree (*Buxus colchica*), cherry laurel (*Laurocerasus officinalis*), and common yew also stand out in their beauty. The majority of plants are evergreens and conifers, and for this reason the park retains its

More then a half century ago, visitors to Yuzhniye Kultury pose by one of the park's many small ponds. *Photo from the archives of the Adler Regional Museum.*

green attire year round. Cheery colors are also a regular sight, as plants blossom in the park throughout the year.

Fruit-bearing trees also grow in the park. On warm May days, the golden fruits of snow banana (*Musa basjoo*) ripen in the park. In December, the Japanese raisintree (*Hovenia dulcis*) offers a treat, its sweet and juicy fruit. Jelly palm (*Butia capitata Bece*) and Canary Island date palm (*Phoenix canariensis*) trees also offer edible fruits, albeit not very good tasting. The sub-tropical Japanese banana liu-kiu plant, which has become acclimatized in our region, also bears fruit, although they are inedible.

Misfortune unexpectedly befalls both man and nature. At five o'clock in the morning, on June 8, 1983, a tornado swept across Yuzhniye Kultury Dendrological Park and uprooted and damaged more than 1,600 trees. The city's residents efficiently worked together to clear the park's territory. Dozens of local organizations also participated and contributed their equipment to the cause. The damage to the park saddened people terribly, but despite such destruction, it continued to bring pleasure to visitors. Like a phoenix, it rose from the ashes. In recent years, tornados have ravaged the park's "green treasury" more than once. In 1990, tornados damaged 720 exotic tree-shrubs, while in 2001, 620 trees and shrubs were destroyed. Gigantic stumps still lying alongside the road recall the destructive activity of that tornado four years ago.

Over the course of its existence, the park has suffered significantly and the appearance of parts of it has lost its esthetic value. This may be attributed not only to the effects of harsh natural phenomena, or the natural aging of trees, but also to a lack of funding. The park urgently needs reconstruction and this requires significant capital investment. Yet despite the fact that Yuzhniye Kultury Dendrological Park has the status of a specially protected nature area of federal significance, the Ministry of Agriculture does not allocate funds for its maintenance.

Around the world, there are notable cases of similar parks generating funds to support themselves. One particularly relevant example may be found on Germany's Mainau Island. The island's "Garden for Everyone" very much resembles our park. Created by Count Lennart Bernadotte, the son of Prince Wilhelm of Sweden, many years ago, the garden now generates income—and not only just to support itself. The German garden has a theater, an exhibit center, and a restaurant with excellent cuisine. It also has its own printing facility and creates attractive promotional materials such as album-style books and booklets. On the shore of the island's Lake Boden, a yacht club was created. Annually, close to two million tourists visit the island and political, scientific, and nature conservation conferences are carried out there. Exhibits of original photography of flowers and plants from the "Garden for All" travel around the world.

Located on the Black Sea coast, Yuzhniye Kultury Dendrological Park has all the conditions to become an outstanding recreational center, which could be completely capable of supporting itself. But for now, we can only wonder what fate awaits Yuzhniye Kultury Dendrological Park, this crumbling cathedral, this monument of nature and history.

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With more than 1,000 species registered, the park boasts an extremely high diversity of vascular plant species.
Photo by A. Troitsky.

Altaisky Zapovednik Finds an Unexpected Ally in Russia's Federal Space Agency

*By **Melissa Mooza**, with assistance from **Vyacheslav Trigubovich***

Altaiskay Zapovednik has forged an interesting new partnership with Russia's federal space agency, *Rosaviacosmos*. This spring the reserve contracted with the "Center for the Exploitation of Terrestrial Space Infrastructure" (Center), a commercial subcontractor to *Rosaviacosmos*. The Center, in its role of managing Russia's terrestrial space infrastructure, monitors the drop zones for the waste stages of booster rockets launched from the Baikonur Cosmodrome. [Editors' note: *Cosmodrome* is a Russian term used to describe a space exploration center and rocket launching facility.]

The Baikonur Cosmodrome is the oldest and largest rocket launching facility in the world. It is located on the barren steppe of south-central Kazakhstan, unlike space launch facilities situated on or near a coast. Consequently, jettisoned lower, suborbital stages of booster rockets launched from the facility fall on land. Because different launch corridors are used for different spacecrafts, there are more than seventy designated drop zones across the territory of the Russian Federation and the Republic of Kazakhstan[1]. One of these areas, Drop Zone No. 326, is located on 5,181 square kilometers in parts of the Altai, Tuva, and Khakassia Republics, in

Map by M. Dubinin.

southeastern Siberia. Over sixty percent of this drop zone, which is used for spent second stages of "Proton" and other rocket boosters, is on the territory of Altaisky Zapovednik. Over one third (3,281 square kilometers) of the zapovednik's territory, including the southern part of Teletskoye Lake (Russia's second largest after Baikal), falls within the drop zone.[2]

There are no precise data on the volume of space debris that has fallen on the reserve's territory since the Soviet Union first began using Proton rockets in 1965. However, during the period 1974-1996 approximately 120 second stage Proton rocket boosters—many with toxic residual propellants still on board—fell into Drop Zone No. 326. Each second stage booster weighs approximately twelve tons, and it is estimated that the total weight of the fallen debris is close to 1,400 tons.[3] Because the nature reserve occupies more than half of the drop zone, it stands to reason that much of this debris has fallen into the zapovednik.

Under the contract concluded earlier this year, Altaisky Zapovednik provided services to ensure safety on the zapovednik's territory related to the March 30, 2005, launch of an "ExpressAM-2" spacecraft from the Baikonur Cosmodrome. On the day before the launch, staff from Altaisky Zapovednik, the Center, and the Institute of Water Ecological Problems (within the Siberian Branch of the Russian Academy of Sciences) flew over the drop zone in an MI-8 helicopter provided by the Siberian Scientific-

With the majority of Drop Zone No. 326 located within Altaisky Zapovednik's borders, it is not uncomon for jettisoned rocket stages to fall into the reserve's tree-covered mountains. *Photo by N. Troitskaya.*

The serene calm preserved in the reserve is sometimes broken by the thunderous roar of falling space debris. *Photo by D. Laurens.*

Research Institute for Aviation. The specialists on board conducted aerial surveillance of the territory and informed zapovednik staff and local residents living in nearby villages—there are about 300 people inhabiting the region—about the impending launch. Once the specialists determined that the drop zone was ready for the launch, they communicated this to the Management Center at the Baikonur Cosmodrome.

Following the rocket launch on March 30, a second flight reconnoitered the territory for fallen debris and forest fires, which are often caused by the impact of scorching hot rocket stages slamming into the Earth. Specialists used special thermal imaging cameras to record the territory and then compared the data with similar recordings taken of the same area the day before. They found neither rocket stage debris nor fires. During this flight, specialists from the Institute of Water-Ecological Problems gathered water, vegetation, and soil samples to be analyzed later for the presence of the highly toxic rocket fuel, heptyl.

In addition to ensuring safety in Drop Zone No. 326, these flights also enabled the reserve to conduct nature conservation activities. Helicopter flights are expensive and, given the zapovednik's financial constraints, a rare luxury. For this reason, reserve staff maximized the utility of each of the two eight-ten hour flights by dropping supplies and fuel at the zapovednik's most remote and difficult to access cordons. They were also able to conduct aerial surveillance of the reserve's territory to locate poachers and other violators of the zapovednik's protection regime. The flights offered scientific value as well, as reserve staff were able to observe animal populations, their location, and density. The infrared recordings used to locate smoldering debris or fires may also provide more detailed information about fauna in the reserve. If regularly gathered, this data could become a part of the reserve's monitoring, included in its *Letopis*, or Chronicles of Nature.

Altaisky Zapovednik's participation in the March 30 activities satisfied *Rosaviacosmos*' expectations, and the reserve hopes a mutually beneficial collaboration with the space agency will continue and lead to additional safety-related activities for subsequent launches. This will be determined on a case-by-case basis. In addition, the reserve is currently negotiating with *Rosaviacosmos* regarding clean up of rocket debris and contamination from its territory. In this work the reserve would serve not as an implementer but as a co-contracting agency. Clean-up of these toxic contaminants is highly specialized work, which would require particular licensure, expertise, and equipment not possessed by the reserve staff.

Of his reserve's new relationship with *Rosaviacosmos*, Altaisky Zapovednik Director Vyacheslav Trigubovich offered the following: "Russia and other countries will continue to utilize the Baikonur Cosmodrome. This is a reality we must live with. This use of Baikonur Cosmodrome will entail the pollution of Altaisky Zapovednik in one way or another. The nature reserve could try to assert its rights vis-á-vis the space agency, by quarreling with them, by bringing them to court to sue for damages and compensation. But a similar result can also be achieved through positive and productive collaboration. This is an excellent example of just that."

Melissa Mooza *is Assistant Editor of* Russian Conservation News.
Vyacheslav Trigubovich *is the Director of Altaisky Zapovednik.*

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NGO News

Working for the Environmental Safety of Rocket and Space Activity

*By **Sergei Krichevsky***

Rocket and space activity[1] has made considerable positive contributions to the progress of mankind. At the same time, however, these activities present an increasing threat to humans and to the natural environment, both in the Russian Federation and in the world as a whole.

Rocket and space activities contaminate the Earth's surface and near-earth atmosphere with spacecraft debris and rocket fuel, both in liquid and solid forms. Such contamination occurs on the territories of cosmodromes, where spacecraft are launched; in "drop zones," where jettisoned rocket boosters fall; and also along rockets' flight trajectories, as toxic aerosols are generated and released. In addition, contamination can occur during the production, transport, storage, and "utilization" of rocket fuel.

On the territory of the former Soviet Union, now the Commonwealth of Independent States, the gravest consequences of rocket and space activity manifest themselves in the areas of its greatest intensity. This includes the areas of the Baikonur, Plesetsk, and Kapustin Yar Cosmodromes (located in south-central Kazakhstan, in Arkhangelsk Oblast in northern Russia, and in Russia's Astrakhan Oblast on the banks of the Volga River, respectively), as well as their corresponding drop zones for waste booster rocket stages. These drop zones are situated in Kazakhstan and in close to twenty regions of Russia, among which are Arkhangelsk Oblast, Altai Krai, and the Republics of Altai, Tuva, Khakasia, and Sakha (Yakutia).

The widespread use of rockets (including conversion rockets), which run on fuel with highly toxic components continues and those using unsymmetrical dimethyl hydrazine, or heptyl, pose the greatest danger. Military doctors are well aware of the clinical effects that even low-dose exposure to the liquid rocket fuel, heptyl, has on humans. They have observed symptoms including liver damage, vegetative-vascular dystonia, myocardiodystrophy, stomach and intestinal disorders, anemia, leukocytopenia, and hypo- and hyperthyroidism. People living near cosmodromes, drop zones for the waste stages of booster rockets, and along rocket flight trajectories, who are chronically exposed to rocket fuel, demonstrate similar symptoms. High-dose exposure is particularly harmful to children and fetuses. Nevertheless, the military continues to deny the evident causal links between exposure to toxic components of rocket fuel and the incidence of disease among people living in areas affected by rocket and space activities.

Unlike other environmental problems, those associated with rocket and space activities became clearly apparent and a subject of public discussion only in the 1990s. In the Soviet Union, Russia, and other countries, information about the ecological problems of rocket and space activities was not available, and a number of state organs and rocket-space corporations covered up the dangerous impacts and consequences of rocket and space activity.

Yet, knowledge about the unfavorable impacts and consequences of rocket and space activity has been growing since the 1990s, and leaders, professionals, and the public are now aware of the problem. Unfortunately, however, the situation has not yet pro-

Author Sergei Krichevsky pictured here in 1997 in a training simulator for the Soyuz spacecraft at Yuri Gagarin Cosmonaut Training Center. © *S. Krichevsky.*

gressed to the point that policymakers have recognized priorities and implemented actions to ensure the environmental safety of rocket and space activity.

In Russia in 1993, lawmakers approved a federal law "On space activity," which in theory provides for the environmental safety of rocket and space activities. However, Russia's current "Federal Space Program" for 2001-2005 was prepared and adopted without broad discussion and without undergoing a mandatory state environmental impact assessment. This flagrantly violated standing legislation, specifically articles 11, 12, 18, and 30 of the federal law approved in 1995, "On environmental impact assessments." In addition, no money was allocated within the budget of the federal space program to insure against environmental risk, to properly dispose of contaminants, or to resolve socio-ecological and other problems in regions affected by the impacts and consequences of rocket and space activity (in Russia, this amounts to 20 of 89 federal subjects). This same history is now repeating with Russia's "Federal Space Program" for 2006-2015.

Fallen space debris in Altaisky Zapovednik. *Photo by I. Shpilenok (www.shpilenok.com).*

Political will is lacking. Individual activities and decisions, which are not secured by adequate "rules of the game," by an international and state strategy, or by necessary funding, will not be able to resolve this complicated problem. Furthermore, the absence of dedicated and adequate environmental policy is suppressing development in the sphere of rocket and space activity, in the renewal of rocket-space technology, and in the introduction of environmental technology and other innovations. It also preserves inherited problems, including a high level of environmental contamination and the sector's low level of economic efficiency.

In Russia and elsewhere around the world, there is a lack of independent organizations and media outlets that professionally investigate problems related to the negative environmental consequences of rocket and space activities. There is a radical gap in the realization and solution of human rights issues within the framework of the ecological threats of rocket and space activity. Public oversight of this sphere is extremely weak. Projects and programs are being implemented without social and environmental impact assessments. Aerospace agen-

Fast Facts about the Environmental Threat Posed by Rocket and Space Activity:

- Rocket and space debris and rocket fuel components contaminate more than 30 million hectares worldwide.
- The problem affects numerous countries including Russia, Kazakhstan, Ukraine, the United States, countries of the European Union, China, India, and Japan. The territory of the former Soviet Union, primarily Russia and Kazakhstan, are particularly affected.
- Drop zones for the waste stages of booster rockets cover than 10 million square kilometers of terrestrial and marine area.
- Rocket and space activity also pollutes near-Earth space. More than 3,000 tons of "space junk," including spent satellites and other elements of technology hang over us. Large fragments exceeding 10 centimeters in size number close to 10,000, while there may be more than 3 million smaller fragments.
- Every year, approximately 60 spent satellites disintegrate in dense layers of the atmosphere and fall to Earth.

Information provided by ***Sergei Krichevsky****.*

cies and rocket-space transnational corporations are initiating a new phase of the rocket and space race based on commercialization and heavy lobbying in political circles.

With awareness about the growing ecological danger of rocket and space activities increasing, I developed a draft non-governmental public program, "For the Environmental Safety of Rocket and Space Activity" in the summer and fall of 1999, with active participation by Maria Cherkasova, the director of the Center for Independent Ecological Programs in Moscow. After a lengthy agreement and revision process, the Council of the International Socio-Ecological Union (SEU) approved the program on April 24, 2000. [Note from the Editor: Established in 1988, SEU was the only international ecological organization founded in the Soviet Union. Today, SEU serves as an umbrella group for diverse independent non-governmental organizations and groups from seventeen countries. The union brings together more than 10,000 people representing a broad spectrum of environmental-related interests. In addition to the "For the Environmental Safety of Rocket and Space Activity" program, SEU implements a number of other targeted programs around diverse topics such as nuclear ecology and radiation safety, chemical contamination and chemical safety, and ecology and children's health.]

The "For the Environmental Safety of Rocket and Space Activity" Program aims to decrease the danger of rocket and space activities for man, society, and nature. This direction was new not only for SEU, but for other Russian and foreign NGOs as well. One of the program's priority goals is to contribute to the growing awareness among government officials, professionals, and the public at large about the environmental safety problems of rocket and space activity. In recent years, the media has increasingly published material exposing these dangers and the "For the Environmental Safety of Rocket and Space Activity" Program has played an active part in this process. The program has ensured that information and discussions about the issue regularly appear in various mass media, including in listservs, newspapers, websites, and television and radio programs. It has also participated in a number of scientific and public conferences, round table discussions, and other fora. In addition, the program has issued and contributed information to a number of publications on pressing issues related to the environmental safety of rocket and space activity.[2]

Other priorities for the program include: monitoring the health of people and the natural environment in regions where rocket and space activity are carried out; conducting environmental impact assessments of rocket and space activities programs and projects; and developing foundations for national and environmental policy in the sphere of rockets and space activity.

After five years, the Program is alive and well and very active. In April 2005, the Amur branch of the SEU and other environmental NGOs established a new social coalition, "For the Environmental Safety of Svobodny Cosmodrome," in Blagoveshchensk, in the Russian Far East. With the initiative of, and active participation by the Program, similar coalitions can and should be created in other regions, particularly in those regions where drop zones for the Plesetsk and Baikonur Cosmodromes are located. In June 2005, the decision to create a broad public collation "For the Environmental Safety of Rocket-Space Activity" was adopted. Also during June 2005, Russian environmental NGOs prepared and adopted two important documents upon the Program's initiative. Participants in the scientific conference "Human Rights, Ecology, and Civil Society," which was held in Ivanteevka, in the Moscow Region, on June 4, issued an appeal concerning the impacts of heptyl fuel on humans and nature. (The appeal, called "The use of heptyl, a highly toxic rocket fuel, violates citizens' environmental rights and threatens the Earth's environment," is available online in Russian at: *http://seu.ru/conference/ecopravo/geptil.htm*). Shortly

"Hotspots" Identified by the "For the Environmental Safety of Rocket and Space Activity" Program

- Activities of the Plesetsk and Baikonur Cosmodromes have dangerous consequences for the environment, including Altaisky Zapovednik, a large part of which is included in a drop zone for the waste stages of booster rockets (Drop Zone 326).
- The implementation of projects to liquidate disarmed solid fuel rockets through incineration threaten more than one million people in Perm, in the Urals; and in Biisk, in Altai Krai.
- The implementation of the "Strela" project at Svobodnyi Cosmodrome in Amur Oblast in the Russian Far East and the construction of a new cosmodrome in Orenburg Oblast will likely increase the heptyl threat.
- Ukraine is implementing a dangerous project in Brazil using "Cyclone-4" heptyl rockets, which will lead to the contamination of new territories.
- On July 14, 2005, the Russian government adopted the country's new Federal Space Program (for the period 2006-2015) without first conducting a state environmental impact assessment.
- Making rocket-space activities more environmentally sound, above all by limiting and subsequently prohibiting the use of heptyl and other highly-toxic rocket fuel components, as well as by decreasing the number of drop zones and the territory that they encompass.
- "Ecologizing" the disarmament and conversion of rocket-space technology.

Space debris mars this wild landscape in the Arkangelsk Region. *Photo from 2002 provided by Novaya Gazeta.*

thereafter, on June 28, Russia's environmental NGOs issued an open letter "On the necessity of carrying out an environmental impact assessment of Russia's draft Federal Space Program (for 2006-2015)." (This letter is available online in Russian at: *http://seu.ru/news_ru/index.html?x=5717*).

We congratulate all participants and supporters of the Program on the fifth anniversary of its establishment. We extend particular appreciation and gratitude to those who were with us in the beginning and who and continue to actively participate in our work and support us: Lev Fedorov, Maria Cherkasova, Mikhail Shishin, and Aleksei Yablokov. We recall the kind words of people who contributed to our general work, especially those who are no longer with us: Vladimir Lupandin (Moscow) and Viktor Pakhomov (Altaisky Krai). We also thank all colleagues from NGOs in the regions and from Moscow for their collaboration, including representatives of: SEU, the Amur Branch of SEU (Blagoveschensk), "Katun" and the "Altai-21st Century" Fund (Barnaul), the Union "For Chemical Safety," the Center for Independent Ecological Programs, as well as the Center for Russian Environmental Policy (Moscow), "Ecomuzei" (Karaganda, Kazakhstan), and other organizations, for their cooperation, assistance, and criticism.

Rocket and space activities are global in nature and they create global risks and new threats for man, society, and the environment. We have just one path by which to resolve the socio-ecological problems of rocket and space activity: to direct aerospace trans-national corporations, organizations, and specialists toward the "ecologicalization" of the rocket-space sector—in Russia and in other countries—by using the mechanisms of civil society. We invite you to collaborate and participate in the common cause.

***Sergei Krichevsky**, who was born in 1955, is a candidate of technical science, an ecologist, a retired military fighter pilot, and a retired test-cosmonaut. During the period 1989-1998, he was in the cosmonaut squadron at the Yuri Gagarin Cosmonaut Training Center and prepared for flights on the "Soyuz" and "Mir" spacecrafts. He currently serves as the Coordinator of the International Socio-Ecological Union's Program for the Environmental Safety of Rocket and Space Activity. For more information about the Program and its activities, please consult http://wwwseu.ru/programs/eng/cosmos-e.htm. Additional materials are available in Russian at http://wwwseu.ru/programs/cosmos/.*

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[1] Rocket and space activity is defined as activity that is directly related to the exploration and practical use of the Earth's atmosphere and outer space. This activity is implemented using rocket and space technology, which comprises ground segment, space assets and technologies within their complete life cycle, including development, production, exploitation, elimination, and utilization.

[2] For further reading, the author recommends Russian-language texts available online at: *http://wwwseu.ru/programs/cosmos/press/*

Civil Society, Environmental Organizations, and Putin

*By **David Gordon***

A July meeting in Moscow between Russian President Vladimir Putin and NGO leaders has been the source of much hand-wringing among civil society, the media, and environmentalists in Russia. Putin's comments about foreign funding of NGOs and the future of Russia's environmental laws underscored many of the most extreme fears that have been brewing since the beginning of his term. However, many of Putin's widely-reported statements from that exchange have been taken out of context. A more thorough reading of his statements reveals that while the current political climate remains precarious for activism in Russia, opportunities to influence and even cooperate with the government are actually expanding.

Putin on Civil Society Funding

At the meeting, Putin highlighted the government's support of Russian philanthropy. However, as many observers note, the Russian oligarchs who hold most of Russia's wealth are making much of their fortune through the extractive industries. It is unlikely that these sources will support environmental work, which they will likely perceive as being against their interests. In addition, many of Russia's environmental organizations are unwilling to accept money from these sources to avoid any perception of conflict of interest.

This leaves foreign philanthropy as the primary funding source for many leading Russian environmental groups. At the meeting, Putin expressed extreme displeasure with the financing of direct political activities from abroad. While this was widely reported as an attack on foreign support of NGOs, much of it does not support the direct political work, to which Putin referred.

Putin clarified this in an August 2 press conference, saying, "I am against financing of political activity in Russia through any channels. This does not have any relationship whatsoever to ecology and culture." It appears that Putin wishes to draw a line between charitable funding of environmental organizations, which is acceptable, and funding of political campaigns, which is not.

Clearly, there is a "gray area" in terms of funding political activities. Can foreign foundations fund public education efforts that might encourage citizens to vote in a pro-environmental manner? Can foreign foundations fund organizations to meet with government officials and Duma representatives to encourage pro-environmental policy changes?

It is important for foreign funders to be aware of and sensitive to concerns about funding political activities within Russia. At the same time, however, the regulations on funding charitable organizations to conduct political activity are similar to those in the U.S.: direct grants for political campaigns or political parties are not appropriate; however, there is no immediate problem with funding for public education campaigns or other conservation activities.

Perception Clashes with Reality at the Regional Level

Regional groups are concerned that the Russian media's reporting of Putin's comments has added to an already oppressive atmosphere. This could increase regional government officials' harassment of organizations that are funded from foreign sources. Environmental NGOs are increasingly being checked by the Federal Security Service (FSB) and government auditing organizations, although these checks have not led to problems as long as their books and activities are in accordance with the law. In one instance – in Siberia's Altai Region – two government officials were prevented from traveling to the U.S. on an environmental exchange following Putin's comments. Meanwhile, Vladimir Grachev, the head of the Duma Committee on Ecology, used the opportunity to criticize foreign funding of environmental groups that leads to "political pressure."

Environmental Laws under Attack?

During the July meeting, Putin entered into a testy exchange with Svyatoslav Zabelin, who is the chair of the Socio-Ecological Union and who has been a leading environmental activist since the 1980s. Zabelin confronted Putin over his support of the controversial Siberia-Pacific Pipeline, which, if built, will stretch over 4,000 kilometers from Siberia to the Russian Far East. Russian environmentalists have asked that the pipeline be routed around the habitat of the Amur Leopard, and that it avoid a pristine marine ecosystem on Russia's Pacific Coast. Thus far, Putin and the Russian government have not acceded to those demands.

Putin's responded to Zabelin by saying, "These environmental impact reviews should not prevent the development of the country and its economy."

It is clear from this dialogue that Putin and other government bureaucrats share a misunderstanding that environmentalists are "anti-development." This is a bit surprising, given that Russian environmental groups have clearly articulated that they favor a different route for the Siberia-Pacific Pipeline, not a stop to the project altogether.

Analysis from Moscow-based environmental organizations following the meeting primarily focused on the issue of environmental impact reviews. Several groups worried that Putin's comments foretold a potential liquidation of environmental impact review processes within Russia. However, in the same meeting, Putin promised to address environmental concerns that the environmental review functions are working inadequately due to hav-

ing functions dispersed among two agencies.

In Putin's August 2 comments, he added, "as soon as large and competitive projects develop with our partners, ecological problems appear. We are interested in a true, deep environmental impact review of any project, but we are against using ecological problems as an instrument in a competitive fight. That is my position."

Based on these comments, it appears that some version of Russia's environmental impact review process – which is an underpinning of Russia's Law on Protection of the Environment – will remain. However, Vladimir Grachev of the Duma Committee of Ecology is leading a commission that is developing a new proposal of Russia's environmental laws. Some observers believe this new law could weaken the environmental review system or limit public participation in the process.

While it is doubtful that Russia will get rid of its environmental impact review processes, it must be recognized that environmental groups have been particularly successful at using these review processes to gain environmental wins – just as environmental groups have been successful at using the National Environmental Policy Act or the Endangered Species Act in the U.S. It is especially important to develop additional approaches in Russia that will gain government and public support for environmental protection.

For funders, this dynamic highlights that foreign foundations and environmental organizations must be especially sensitive to local groups' recommendations about how to maneuver within the political atmosphere for environmental advocacy within Russia.

Conclusion

Vladimir Putin's comments demonstrate the power of Russia's civil society, and particularly that of environmental organizations. While he did not call for any further restrictions on civil society, his comments have already changed the political climate in which environmental organizations operate, especially among lower-level federal and regional bureaucrats. In this climate, it becomes especially important to maintain or increase independent support for environmental organizations in Russia.

David Gordon *is Executive Director of Pacific Environment, which supports public environmental efforts in Siberia and the Russian Far East. For more information about Pacific Environment, please see http://www.pacificenvironment.org.*

Recent Draft Legislation Threatens Russia's Third Sector

Just over three months after Russian President Vladimir Putin issued comments condemning foreign financing of non-governmental organizations (NGOs) carrying out political activities in the Russian Federation, a group of Duma deputies – elected representatives in Russia's lower house of parliament – introduced a bill, which if passed into law, would significantly restrict NGO activities in Russia.

The bill, which was submitted on November 7, 2005, proposes changes to several federal laws drafted in the 1990s, including those governing the activities of public associations and non-profit organizations. The draft legislation envisions the compulsory registration of all NGOs with a state commission, or its designated plenipotentiary organs on the local level. In addition to making decisions about whether or not a particular organization will be registered, this body would also be invested with extensive monitoring functions. According to the bill's text, the registration body would have rights including those to request an NGO's financial documents without cause or justification, to deploy its representatives to observe activities carried out by that organization, and to conduct check-ups to verify that the organization's activities correspond with the aims set forth in its by-laws.

The Russian Duma, where lawmakers are reviewing a controversial bill on NGOs. *Photo by B. Mooza.*

The draft legislation devotes particular attention to subsidiary offices of foreign NGOs. Its first article plainly states that the establishment and operation of such representative offices, or that of non-profit organizations, the founders of which are foreign non-profit NGOs, is not permitted in "closed administrative territories," which are considered strategic. Also, in order to maintain their Russian presence, all other foreign NGOs would have to register their representative offices as separate organizations, and in accordance with the requirements established by the law.

Although the bill's sponsors claim that the legislative changes they propose are intended to curtail money laundering and control the activities of terrorist groups, many NGOs fear that the proposed law would significantly restrict their activities and limit their effectiveness. Some observers believe that this clear crackdown on civil society may be in response to the recent democratic revolutions in the former Soviet Republics of Georgia, Ukraine, and Kyrgyzstan, which many Russian officials attribute in part to targeted foreign funding and influence in the region.

Lawmakers had not yet begun to review and discuss the bill at the time this text was prepared. However, because the draft law has multi-partisan support within the Duma, it is expected to pass. According to the bill submitted on November 7, the law, if passed in its present form, would come into force on January 1, 2006.

Compiled by ***Melissa Mooza****, RCN Assistant Editor.*

Conservation in the Caucasus: Spotlight on Armenia

By Way of an Introduction

Conservationists around the world widely recognize the Caucasus region as one of the Earth's most biologically diverse. Boasting high species richness and levels of endemism, among other exceptional characteristics, this mountainous region between the Black and Caspian Seas is globally important for biodiversity conservation. In the upcoming section of this thirty-ninth issue of *Russian Conservation News*, we spotlight one of the countries at the heart of this special region: Armenia.

The following pages of the journal offer a rounded conservation profile of the country, including descriptions of its varied landscapes and rich biodiversity. Although the present Armenian state is no larger than Russia's Lake Baikal, its landscapes are remarkably diverse, including semi-desert, juniper sparse forest, broadleaf forest, mountain steppe, and sub-alpine meadow habitats. These habitats harbor many rare species, such as the Persian leopard, which stealthily prowls Armenia's southern regions. In this section, you will read about the research work of two dedicated Armenian scientists to research and protect this extremely rare and elusive cat. We also offer an article on work conducted under the Birds of Armenia Project to investigate the majestic raptors circling the skies above the forests on Armenia's highest peak, Mt. Aragats.

The upcoming pages also present some of the pressing conservation challenges facing the country. You will read about Armenia's beloved and beleaguered Lake Sevan, and the long-lasting mark that unsustainable nature use policies during the Soviet era have left on this vast alpine lake. We also report on the deforestation threat, which emerged most noticeably after the dissolution of the Soviet Union, when acute economic and energy crises plagued the newly independent Republic of Armenia.

A view from Armenia's highest peak, Mt. Aragats. *Photo by C. Santore.*

In our coverage of Armenia, we will also share with you a number of heartening conservation success stories, such as the reforestation and poverty reduction work of the Armenia Tree Project and a victorious campaign by Armenian and international activists to reroute a highway planned to cross one of the country's protected nature areas.

This reporting is part of our continuing commitment to cover conservation-related issues in the Caucasus region. It was made possible by the Critical Ecosystem Partnership Fund. For more information about this funding partnership between Conservation International (CI), the Global Environment Facility (GEF), the Government of Japan, the MacArthur Foundation, and the World Bank, please see: *http://www.cepf.net.*

Landscapes and Biodiversity in Armenia: An Overview

By ***Gohar Oganezova***

Armenia is an ancient land, and although its name appeared on maps belonging to the Egyptian pharaohs, many people in the modern world are unfamiliar with the nation's whereabouts. Armenia's territory has decreased significantly since antiquity and now just ten percent of its historic lands fall within the borders of the contemporary Republic of Armenia. Situated on approximately 30,000 square kilometers in the southwestern Transcaucasus region, Armenia is a small spot on the globe, but one well worth knowing.

Armenia is not only the smallest of the three republics in the southern Caucasus region (the others being Georgia and Azerbaijan), but it is also the most mountainous. It occupies the northern part of the Armenian Plateau and is located almost entirely at elevations of at least 500 meters above sea level. The highest point in the republic is Mt. Aragats (4,095 meters above sea level). The region's largest alpine lake, Lake Sevan, is located in Armenia. Also found here are the sources of numerous rivers in the Kura-Araks watershed, which encompasses 200,000 square kilometers in Armenia, Azerbaijan, Georgia, and parts of Turkey and Iran.

The country harbors a surprising wealth of flora and fauna. In Armenia, 5,455 plant species[1] are registered, of which 3,015 species are flowering plants. Diverse vegetation communities are also characteristic for the republic. Steppe, meadow, mountain forests, different types of open woodlands, alpine and sub-alpine communities, swamps, semi-deserts, and islands of desert are among the many communities that comprise Armenia's surprising mosaic of vegetation cover.

Map by M. Dubinin.

This diversity can be attributed to the country's complex mountain relief. Armenia's mountains have varied origins. Some appeared as a result of tectonic shifts and others from the activity of numerous volcanoes. The country's mountain chains run north-south and east-west and differ from one another in their moisture regimes. Some, such as the Murguz Chain in northeastern Armenia, have abundant springs and streams and receive much precipitation. Others, such as Mt. Arailer, in the central part of the country, are almost completely devoid of springs and receive very little precipitation.

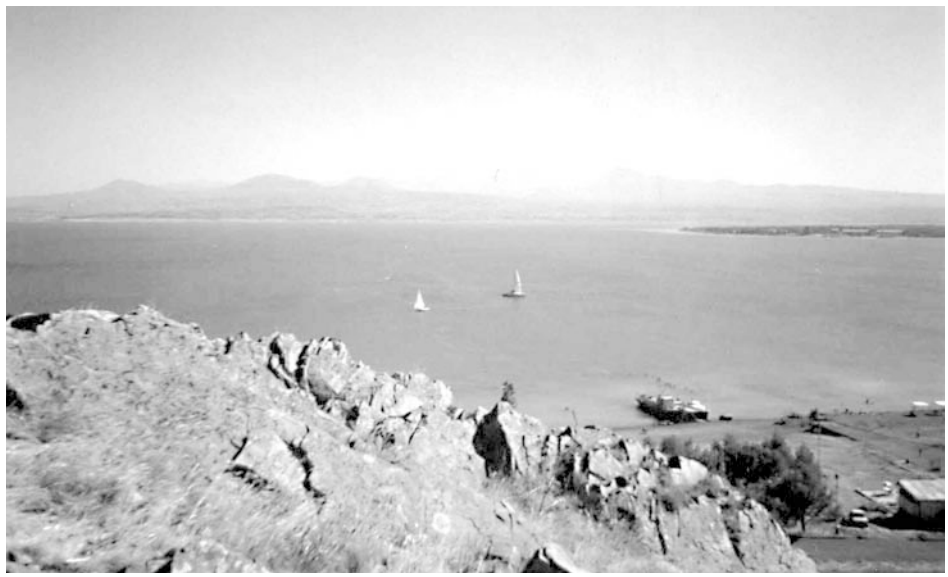
It is also here in Armenia that two different floristic complexes meet: the moisture-loving Caucasian mesophytic floristic complex and the Armenian-Iranian floristic complex, which is adapted to arid climates. The country is also regarded as one of the world's ancient cradles of agrobiodiversity. Numerous local, and for that reason

The Ararat Valley at dusk. Mt. Ararat is a 5,165-meter-tall snow-capped dormant volcanic cone located in northeastern Turkey. The peak, which was part of Armenian territory until 1915 when it fell to the Turks, remains a national symbol of Armenia. *Photo by K. Avanyan.*

especially precious, types of apricots, peaches, apples, pears, walnuts, grains, and other cultivated plants are concentrated here. Diverse populations of these crop plants' wild relatives are also encountered here and they comprise an important part of the republic's ecosystems.

Armenia's mountainous terrain and its various vegetation communities create habitat for a diverse group of animal species. Birds occupy a special place among local fauna and avifauna here is extremely rich. Located along the global flyway, Armenia is an intersection, where Asian and European bird species approach and co-exist with one another. In total, 349 bird species are registered in the republic. The Dalmatian pelican (*Pelecanus crispus*) and marbled teal (*Marmaronetta angustirostris*) are listed in both the Red Data Book of Armenia and on the World Conservation Union (IUCN) Red List of Threatened Species, while other bird species encountered in Armenia such as the ferruginous duck (*Aythya nytoca*), lesser kestrel (*Falco naumanni*), and corn crake (*Crex crex*) are included on the IUCN Red List only. Richer still is the country's insect fauna, which is represented by more than 14,900 species.

Reptiles and mammals are far fewer, 52 and 83 species, respectively. Of the reptiles, many are endemic, including the white-bellied lizard (*Lacerta unisexualis*), the Armenian lizard (*L. armeniaca*), and Darevsky's viper (*Vipera darevskii*). Threatened reptiles include the Caucasian rat snake (*Elaphe hohenackeri*); the lidless skink (*Ablepharus cernovi*); and the Armenian viper (*Vipera raddei*) and racerunner (*Eremias arguta transcaucasica*), both of which are also endemics. Among Armenia's 83 mammals, six endemic species or subspecies are registered: the northern mole vole (*Ellobius lutescens*), Vigradov's jird (*Meriones vinogradovi*), the jeroboa (*Allactaga williamsi*), the Caucasian birch mouse (*Sicista caucasica*), the Armenian mouflon (*Ovis ammon gmelin*), and a sub-species of Natterer's bat (*Myotis nattereri araxenus*). Endangered mammals, listed both in Armenia's Red Data Book and the Red Data Book of the former Soviet Union, include the Mediterranean horseshoe bat (*Rhinolophus euryale*), Mehely's horseshoe bat (*R. mehelyi*), the bezoar goat (*Capra aegagrus aegagrus*), and the Armenian mouflon.



Lake Sevan. *Photo by G. Oganezova.*

Yet, much of Armenia's outstanding biodiversity is under significant threat. The reasons for this are similar to the causes behind biodiversity loss in other parts of the world. Simply, global climate change and human activities are negatively affecting the natural environment. In Armenia, anthropogenic impacts such as intensive agricultural and livestock development and urban and industrial development, are exacerbated by the country's relatively high population density (400-500 people per square kilometer), as well as by the paucity of arable land (just 18% of the total land area), much of which is also threatened by desertification. Nearly 80% of Armenia's land is characterized by some degree of degradation.

For Armenia, the last fifteen years have been very difficult. Socio-economic and political crises have been abundant and this has only increased human pressures on the environment. In Armenia, the use of all natural resources, including biological resources, has been uncontrolled to the point of being catastrophic. The country's forest ecosystems have suffered in particular, as illegal logging has reached disastrous levels. Specialists predict that if the current rate of logging persists, Armenia will be stripped of its forests in a matter of several decades. And with the forests, so too would disappear many of the country's animal species.

Lake Sevan, which is both Armenia's largest lake and the largest supply of freshwater in the region, also faces a very serious threat. Since the 1930s, when the waters of this oligotrophic lake were first used to support the country's industrial, agricultural, and energy sectors, the lake's level has plunged by almost twenty meters. As a result, its temperature regime has changed. As the water mass began to warm, algal blooms occurred, meaning that algae in the lake increased dramatically and became visible to the eye. The Sevan trout (*Salmo ishkan*), an endemic fish species that had previously been represented by four subspecies, diminished drastically, while two sub-species of less valuable whitefish (*Coregonus lavaretus*) that were introduced to the lake in the 1920s, thrived.

In recent years, though, use of the lake's water has been scaled back; now it is used for irrigation only. In addition, a tunnel that diverts water to the lake from the nearby Arpa River was repaired and again put into use. These interventions have not only stopped the decrease in the level of the lake, but also succeeded in increasing it by

A typical mountain forest landscape in northern Armenia. *Photo by G. Oganezova.*

two meters. This positive development has buoyed hopes that the lake's natural balance might be restored and that Sevan, Armenia's great jewel, will be saved.

The Armenian government is making efforts to improve the ecological situation in the country. Most of the state's plans are related to obligations under various international conventions, including the United Nations (UN) Conventions to Combat Desertification, on Climate Change, and on Biological Diversity, and the Council of Europe's European Landscape Convention. At present, a national strategy for the sustainable management of forest resources is being developed. The strategy proposes many new approaches. Among other innovations, it envisions forest certification and the partial transfer of forest ownership, such as by leasing forest resources or transferring ownership of forests to nearby villages.

In addition, the Armenian government approved a national strategy and action plan to develop the country's specially protected areas. According to this program, the number of specially protected areas will increase almost two-fold; that is, the percentage of the country's territory under various protection regimes will grow from ten to nearly twenty percent. The implementation of this program may unify Armenia's specially protected areas within one network, which would be connected by migration corridors. The prospects of uniting Armenia's protected areas network with a regional network of protected areas, which is only just now being planned, are also very real.

Despite these positive steps, most of the ecological problems in Armenia still remain unresolved. Many of the issues are not actively being addressed—plans to resolve them exist only on paper—while some issues are not even being reviewed right now.

Armenia is going through a challenging period in its long history. The country is making a serious effort to build a civilized and democratic state, but for now, real results are still a long way off. Corruption and shortcomings in management on all levels of government are thwarting progress. The republic's non-governmental organizations often collaborate with governmental bodies, participate in various programs, and initiate activities to resolve ecological problems. But, to a large extent, these organizations' activities remain ineffective. The country's NGOs are not always in step with one another and seldom collaborate. In addition, most of the public, which is still largely impoverished, is not involved in the environmental movement.

But hope is not lost. We remain firm in our belief that Armenia will be incorporated into global processes, and that the country will long occupy a place on the map of the world, not just as an intersection of flyways, but also ecotourism routes. Come, visit us in Armenia. Come to our mountains. This ancient land has endured many misfortunes and hardships and should withstand these latest challenges.

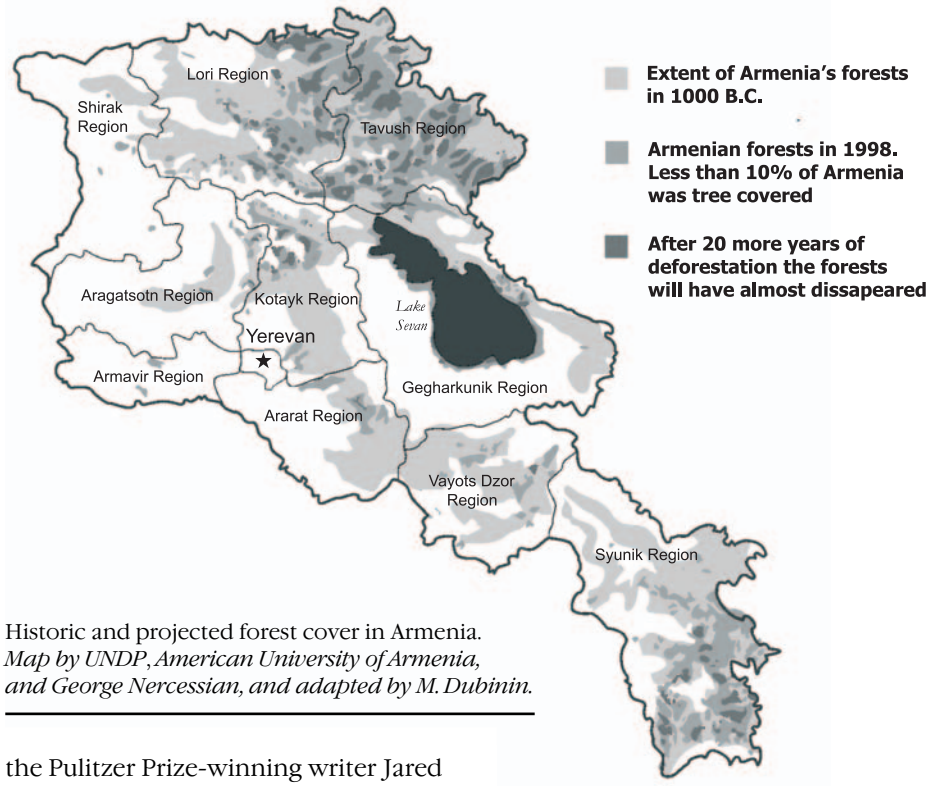
***Gohar Oganezova**, a doctor of biological science, is Vice President of the Armenian Botanical Society and the Head Specialist of the Institute of Botany, within the National Academy of Sciences of the Republic of Armenia.*

[1] All numeric data were taken from "The National Action Plan to Combat Desertification in Armenia" (Armenia 2000) and "Desertification in Armenia and Measures to Combat it" (G.G. Oganezova, "Conference on Desertification," Caucasus Regional Environmental Center, Tbilisi, 2002).

Armenia Tree Project Beginning to Fight Deforestation Threat

*By **Jeff Masarjian** and **Jason Sobigian***

At the turn of the twentieth century, an estimated twenty-five percent of Armenia was covered by trees. According to a Ministry of Nature Protection report on biodiversity, forests now cover approximately just ten percent of the land surface of Armenia, while others have reported forest cover at only eight percent. Because of the low level of forest cover, the World Bank has estimated that eighty percent of Armenia is at risk of becoming desert. At the current rate of deforestation, all of Armenia's forests may be gone in as little as twenty years, leading to irreversible environmental damage and loss of a critical component of Armenia's infrastructure.



Historic and projected forest cover in Armenia. *Map by UNDP, American University of Armenia, and George Nercessian, and adapted by M. Dubinin.*

The loss of forests in Armenia, brought about by a lack of alternate fuel sources, legal and illegal cutting and export of wood, and improper management of this renewable resource, is having a dramatic impact on the environment. A primary cause of deforestation is poverty and unemployment. Without other sources of income, people inevitably turn to unsustainable harvesting of forest resources. In urban centers such as Yerevan, residents desperate for fuel cut between 2–3 million trees during the energy shortages of the early 1990s, often leaving only the stumps remaining. These barren lots were once protective hillsides circling urban areas as a vital barrier to pollution and dust, and once beautiful parks were turned into ecological graveyards devoid of greenery.

Forests perform important environmental and socioeconomic functions, but when they disappear, inevitable and long-term consequences result, such as increased erosion, flooding, and landslides, drying of the local climate and loss of water supply, reduction of topsoil fertility causing lower crop yields, loss of plant and animal biodiversity, and severe air pollution. As the Pulitzer Prize-winning writer Jared Diamond has noted in his recent book, "Collapse: How Societies Choose to Fail or Succeed," deforestation, soil erosion, and water management problems all result in less food for populations. Such problems have also been exacerbated throughout history by droughts, which have been partly caused by humans through deforestation, notes Diamond.

To help address this crisis, Armenian-American philanthropist Carolyn Mugar founded Armenia Tree Project (ATP) in 1994. During the winter of 1992 while visiting Armenia, Ms. Mugar saw that families desperate to heat their homes were burning their own furniture, and massive numbers of trees were being cut for fuel. In order to research and develop a plan for an organization that would work towards preventing further deforestation in Armenia, she hired a local staff in Armenia, and ATP's efforts were officially launched with a tree-planting at the Nork Senior Center in Yerevan in 1994. In the US, a small staff was hired to do fundraising and public relations with the national and international community.

Over the course of eight years, thousands of trees were planted in communities throughout the country as part of the Sponsor-A-Tree program funded by thousands of individual Diasporan donors, two state-of-the-art nurseries were opened in Karin and Khachpar (in the Aragatsotn Region), several forest rejuvenation programs were implemented in the Tsitsernakaberd Genocide Memorial Park (in the Yerevan Region) and elsewhere, and a database of Diasporan donors was created.

ATP has expanded over the past several years, and as a result, the organization has revisited its methodology to ensure that programs and objectives work hand in hand toward accomplishing the interrelated goals of tree planting, poverty reduction, and environmental education and advocacy.

Since 2001, ATP has begun to redirect its goals towards more aggressive, all-encompassing reforestation efforts, aimed at rehabilitating devastated rural and urban areas and providing

Armenian citizens with the resources as well as incentive for redeveloping their immediate environment. Specifically, programs have been launched in Aygut (in the Gegharkounik Region) in the vicinity of Lake Sevan and in Vanadzor, the third largest city in Armenia, located in the Lori region. Since 1994, over 600,000 trees have been planted and restored, and hundreds of jobs have been created for Armenians in seasonal tree-regeneration programs. For the coming year, ATP has been searching for ways to expand its output and begin planting trees at an even larger scale to combat the threat of deforestation in Armenia. In addition to the 50,000-60,000 trees outplanted each year from the organization's traditional nurseries in Aygut, ATP has 200,000 seedlings growing for reforestation purposes, and at its current nursery site in Vanadzor there are more than 300,000 trees growing.

ATP's tree planting strategy has three components. The first is production of trees on an increasingly larger scale at the state-of-the-art nurseries at Karin and Khachpar, at the reforestation nursery in Vanadzor, and in backyard reforestation nurseries in the rural Getik River Valley. Second is planting these trees in partnership with residents of urban and rural communities at public sites, rural backyards, and areas targeted for mountainous reforestation. And third is coppicing, whereby the unproductive shoots that sprout from a stump are trimmed by teams of workers in order to grow a new, vital tree with an intact root system. ATP's targets for 2005 have been to extend community tree planting activities to local villages where backyards and common areas will receive new trees, rejuvenate public areas including the Botanical Gardens and Komitas Park (both in the Yerevan Region), and to reforest a large tract of land in Aygut.

As highlighted by international foresters such as Nobel Peace Prize winner Wangari Maathai of the Green Belt Movement in Kenya, poverty is one of the great enemies of forests. Historically, people with no other viable source of income or energy have destroyed the forests that were their lifelines, due to non-sustainable harvesting. Therefore, successful reforestation must be combined with locally based poverty reduction efforts in order to protect existing resources and investments in the future. In both urban and rural settings, poverty reduction and community development activities reduce the pressure on remaining forests.

After assessing the severity of tree cutting and how it affected the vitality and sustainability of citizens in rural, impoverished areas, ATP laid out a strategy to reforest the Getik River Valley, an area located just north of Lake Sevan. ATP initiated a pilot project that was designed to reforest degraded lands while generating income through micro-enterprise development in villages inhabited by Armenian refugees relocated from Azerbaijan. In 2004, ATP taught 17 families in the village of Aygut techniques for growing tree seedlings in backyard nursery plots.

With ATP's technical support these micro-enterprises produced 20,000 seedlings, and ATP paid participants for each seedling transplanted into the forest. This year, ATP has expanded this project to include 200 families who will be growing 200,000 seedlings. The development of these "micro-enterprise" nurseries not only provides for larger scale reforestation efforts, but also significantly increases each participant's annual income.

While ATP's primary focus is reforestation, it has also encouraged the involvement of other agencies in providing a broad range of services to the Getik River Valley. Organizations including Heifer International, Project Harmony, World Vision, Armenian Eye Care Project, UNDP, USDA-MAP, and Weyerhaeuser Family Foundation are all involved in new projects. The ultimate goal is to revitalize the socioeconomic and ecological conditions of the thirteen villages throughout the Getik River Valley.

ATP is also developing environmental education as a core program area in order to prepare the nation's youth for becoming the next generation of environmental stewards. By actively engaging youth in a process to better under-

The efforts of the Armenia Tree Project helped transform the Khor Virap Monastery in the Ararat Valley. *Photo courtesy of Armenia Tree Project.*

Members of the environmental youth club established by Armenia Tree Project (ATP) working in the school fruit orchard in the village of Aygut. *Photo by G. Lachinian.*

stand and appreciate the value of a healthy and sustainable environment, ATP seeks to protect the trees planted today from future exploitation.

ATP has developed an environmental curriculum called "Plant an Idea, Plant a Tree." ATP staff and Peace Corps volunteers are field-testing the environmental curriculum on students of all levels at the Ohanian Center, at the ATP nursery in Karin nursery, and in villages. They are presenting the various lessons to students and providing ATP feedback on the quality of information provided and its effectiveness. The eventual goal is to present the curriculum to the Ministry of Education for implementation in schools throughout Armenia, but it is still in an early stage and we anticipate it will be some time before that is done. In addition, all of the reforestation work in rural villages has a key educational component focusing on youth. An Environmental Education Center at the Karin nursery is a state-of-the-art facility in which students from secondary schools and colleges, as well as professionals in the field, attend trainings and seminars on trees and the environment.

Advocating for the development of a sustainable forest policy in Armenia and environmental laws that provide for natural resource protection is most effectively accomplished with a coalition of like-minded individuals and groups, and ATP has been a proponent of working in collaboration with partners to promote an environmental ethic at all levels of society.

Just this year, ATP worked with others to advocate for an alternative to a proposed roadway through the middle of the Shikahogh Nature Reserve in the southern part of the country. In May when the construction project became known to the public, ATP founder Carolyn Mugar sent a letter to the President and other high ranking officials urging them to hold public hearings and choose an alternate route. ATP staff traveled to the site on fact-finding missions with scientific experts and journalists, and Ms. Mugar traveled from the U.S. on such a visit in June. The ATP outreach office issued several press releases and action alerts via email to constituents about the endangered reserve, and commissioned a documentary film on the Shikahogh Reserve, funded in partnership with Armenian Forests NGO and World Wildlife Fund. The coalition of individuals and representatives of more than forty local and international NGOs and scientific organizations is cautiously optimistic that a decision to bypass Shikahogh will be implemented. During a June 17 public forum at the American University of Armenia, the Minister of Transportation announced that the government is choosing a new route that bypasses the reserve, and the Prime Minister appointed a commission to study the issue.

In its first 10 years of operation in Armenia, ATP has developed a significant range of knowledge and experiences. As it builds on successes and failures by moving toward large-scale reforestation efforts, ATP has begun the process of appealing to international agencies and organizations for larger sources of funding. In addition, ATP has begun to focus its attention on some of the challenges of reforestation in Armenia. These include the need to work in cooperation with Armenian governmental agencies and local communities for securing access to land for reforestation, finding adequate supplies of local seed sources since most of the healthy trees in the country have already been harvested, and meeting the organization's stringent site selection criteria. Sites are chosen based on a number of factors, including access to adequate water, protection from livestock grazing, and adequate protection measures against fire and especially poaching and cutting.

After operating in Armenia for over a decade now, it has become apparent that the constraints on reforestation are not merely financial. ATP is dedicated to working with communities, organizations, governments, and individuals toward the goal of assisting the Armenian people in using trees to improve their standard of living and protect the environment, guided by the need to promote self-sufficiency, aid those with the fewest resources first, and conserve the indigenous ecosystem.

Jeff Masarjian *is Executive Director and* ***Jason Sobigian*** *is Deputy Director of Armenia Tree Project. For additional information about the program and the problem of deforestation in Armenia, visit the Web site www.armeniatree.org.*

Lake Sevan: Lessons in Nature Use

By ***Rafael Hovhannisyan, Zhanna Mkrtchyan, Robert Hovhannisyan****, and* ***Varduhi Grigoryan***

Among the former Soviet states, the Republic of Armenia is one of the most arid. The vast majority of the hundred or so lakes and reservoirs dotting the countryside are small, generally occupying no more than a few dozen hectares and averaging less than 10 meters in depth. Lake Sevan, in the northeastern part of Armenia, is an exception. This vast alpine lake, located in the Caucasus Mountains at an elevation of 1,916 meters above sea level, holds 58.5 cubic kilometers of water and its surface area spans nearly 1,250 square kilometers. Lake Sevan is not only the largest freshwater body in Armenia, but also in the entire Caucasus Region.

The energy of Lake Sevan's waters have brought power to many cities and villages in Armenia and helped drive industrialization of the country. The lake also brought life to the sultry deserts of the Ararat Valley by enabling the development of agricultural activities. Resorts built along the shores of this picturesque lake have accommodated tourists from around the world. Lake Sevan has always been and will always be exceptionally important for Armenia's economy. For this reason the protection and sustainable use of its waters is a task of utmost national importance.

Lake Sevan has long attracted the interest and attention of researchers and planners hoping find an effective means to utilize the lake's water and fish resources. Theoretical work toward this end dates as far back as the mid-1800s, when the prospects of using the lake's water to irrigate land on the left bank of the Radzan River were first explored. The drive to develop Lake Sevan's water resources intensified during the first three decades of the twentieth century, after researchers had determined that under natural conditions, twenty times more water evaporated from the lake than flowed into the Radzan River, the lake's only outlet. They further concluded that lowering the level of Lake Sevan and decreasing its surface area would reduce the loss of water through evaporation, thus making more water available for release and use.

Map by M. Dubinin.

This conclusion served as the foundation of a project, developed in 1931, to decrease the lake's water level by fifty meters over fifty years, or by 1,025 million cubic meters annually—650 million cubic meters for hydropower and 375 million cubic meters for irrigation. According to the plan, the natural outflow of water from the lake through the Radzan River would increase by fourteen times. These water releases were initiated both to irrigate the Ararat Plain and outlying suburban regions (totaling 130,000 hectares in area), as well as to produce hydropower at the Sevan-Razdan "power cascade," a group of hydropower stations constructed on the Razdan River. At the same time, it was expected that the land exposed as the lake's level decreased could be used to sow crops.

Work to lower the water level of the lake according to this plan began in 1933. Within twenty-five years, the water level of the lake had already fallen by almost fourteen meters and it became clear that the plan to decrease the lake's water level by fifty meters needed to be re-examined. Reasons for this were manifold. Calculations suggested that freshwater sources in Armenia that could be used to expand the country's supply of drinking, agricultural, and industrial water would be exhausted by the end of the twentieth century. Given this, Lake Sevan would remain Armenia's only guaranteed source of water. Also, the decrease in water up to that point has exposed close to 200 square kilometers of silty and sandy-silty soil on the lake's shore; however, these areas proved unsuitable for agricultural use and are now affected by intensive erosion processes. In addition, it was determined that Lake Sevan did not produce adequate energy to support the long-term development of the Armenian economy. New hydro-electric and atomic energy stations were built in Armenia and this created alternative opportunities to generate energy without causing such significant damage to nature.

Lake Sevan. *Photo by C. Santore.*

Considering the aforementioned developments, the initial project to use the lake's waters was re-examined and planners decided to take steps to preserve the water in Lake Sevan closer to its natural level. In order to stabilize and subsequently increase the lake's water level, planners decided in 1961 to divert part of the flow (250

Changes in Lake Sevan during the Course of its Drainage

Parameter	Unit of Measure	1930-1935	1978-1982	1985-1990	1995-1999	2001-2003
Deviation from the natural level of the lake	Meters	0.0	-18.8	-17.6	-19.8	-20.2
Height above sea level	Meters	1,915.6	1,896.8	1,898.0	1,895.8	1,895.4
Surface area	Kilometers	1,416	1,249	1,259	1,246	1,242
Maximum depth	Meters	98.6	79.8	81.0	78.8	78.4
Volume of water	Kilometers	58.5	35.3	37.4	34.0	33.4
Water transparency	Meters	14.3	3.0	5.6	2.1	3.0
Bacteria-plankton	10^6 cells/milliliter	0.4	1.80	0.78	2.1	3.6
Phytoplankton Biomass	Grams/meter^3	0.32	3.5	2.1	5.2	6.4
Primary Production	kilojoules/ meter^2/year	4,180	28,600	14,630	29,260	N/A
Macrophytes	Tons 10^3/year	900.0	8.05	37.3	12.0	42.0
Zooplankton	Grams/meter^3	0.45	1.80	0.64	0.70	0.73
Fish	tons/year	1000	3070	2200	800	560

million cubic meters per year) of the Arpa River, which flows from the Vadrenis Mountain Massif, into Lake Sevan through 48-kilometer-long tunnel. Construction on the Arpa-Sevan tunnel began in 1962 and continued for almost twenty years. All this time, the level of the lake continued to fall, and by 1980, the decrease had reached 18.5 meters, the lake's surface area had decreased by 12.2%, and its volume by 42.2%.

The Arpa-Sevan tunnel was put into use in 1982. The lake's water level began to stabilize shortly thereafter and subsequently increased by ninety centimeters. To further increase the rise in the lake's level, planners devised another tunnel project, the 21.6 kilometer-long Vorotan-Arpa tunnel. This second tunnel was planned to transfer 165 million cubic meters of water a year from the Vorotan River to the Kechut Reservoir and from there through the Arpa-Sevan tunnel to Lake Sevan. Construction and repair work of the Vorotan-Arpa tunnel continues to this day.

Although the net inflow of water into Lake Sevan was positive throughout much of the 1980s, high releases again took place during the years 1990-1995, when the country experienced an energy crisis, and the water level of the lake decreased again, this time by two meters. Although the net inflow of water reversed again after 1995, Lake Sevan remains extremely unstable to this day.

And what effects have seventy years of human tinkering had on the lake and its ecosystem? The lake lost more than 10% of its surface area and more than 40% of its volume. The lake's cold, benthic layer of water also disappeared. This zone, located immediately above the bottom of the lake, had the lake's highest concentration and content of oxygen. The cold water also isolated a diffusion of organic material that had accumulated on the upper layers of the bottom of the lake over centuries; it further regulated the biogeochemical cycling of matter. Due to these changes, the average annual temperature of the lake's water increased by almost two degrees Celsius, while its thermal capacity (the accumulation of the sun's energy) decreased nearly 1.5 times, thus leading to frequent freezing. In addition, the lake's horizontal and vertical water current intensified and this increased by several times the quantity of suspended and dissolved organic matter in the lake, which had previously been isolated in the benthic cold water zone.

These phenomena, in turn, negatively impacted the lake's ecosystem in four general aspects. The increase by more than five times of suspended and dissolved organic matter decreased the transparency of the lake's water, which affected photochemical and biological processes in the lake. The oxidation of benthic organic matter, which entered into the lake's biochemical cycle, caused the oxygen concentration in the lake to decrease by more than 50%, while it neared zero in the benthic layers. In addition, the concentration of nutrients derived from human activities, particularly nitrogen, increased by thirty times, and this stimulated massive growth and reproduction of algae. Finally, the diffusion, sedimentation, and sediment burial processes of various organic materials were destroyed, as was the redox process in the benthic zone. All of these changes caused significant biological reorganization in the trophic chains of the lake's ecosystem.

For instance, due to the increase in the quantity of nitrogen in the lake, as well as the significant loss in the biomass of higher aquatic vegetation (from 900,000 tons to 8,000 tons), the biomass of single-celled algae increased almost twenty-fold. This, in turn, affected species and communities of aquatic bacteria, multi-celled invertebrates, and fish.

Many of Lake Sevan's fish communities were also profoundly affected by

A peninsula extends out into Lake Sevan. Once just a chain of small islands, the peninsula formed after the lake's water level decreased. *Photo courtesy of WWF.*

the loss of spawning habitat—many littoral zone breeding grounds dried up as the lake's level fell—as well as by unregulated fishing. Two lake-spawning sub-species of the Sevan trout (*Salmo ischchan*), an endemic, and the only salmonid in Lake Sevan, died out. The trout's two river-spawning subspecies hover on the verge of extinction, as does the Gokcha barbel (*Barbus goktschaicus*). In addition, the population of the Sevan khramulya (*Varicorhinus capoeta sevangi*) continues to decrease.

Numerous other species of flora and fauna have declined or altogether disappeared due to the decreased water level of the lake and its associated consequences. For waterfowl, Lake Sevan serves as an important inland breeding area, as well as a resting and wintering site during migration. However, because of the artificial water-level decrease and the drainage of close to 10,000 hectares of swamp land, the number of bird species inhabiting the lakeshore area has sharply fallen.

It is important to note that Lake Sevan's current ecological situation was caused not only by anthropogenic restructuring of the lake's hydrological processes, but also by the intensification of industrial, agricultural, and other economic activities in the lake's catchment area. Biogenic elements, pollutants, and nutrients (primarily nitrogen and phosphorous) from fertilizers have entered into the lake's ecosystem. In addition, intensive logging and the construction of numerous roads and recreational areas increased erosion in the lake's catchment area.

Delicate flowers adorn the shores of Armenia's largest lake. *Photo courtesy of WWF.*

Armenia's nature conservation and scientific communities, as well as its governmental structures, have been working to save the lake. Work is being carried out to increase the water level of Lake Sevan and to stop eutrophication. Agricultural activity in the catchment basin of Lake Sevan is being regulated and work to decrease anthropogenic nitrogen and phosphorous loading into the lake from its catchment basin is being carried out. In addition, work to improve the sanitary-toxicological status of Lake Sevan and its shore area is being implemented. Hydrological scientific research work also continues.

In 2001, the National Meeting of the Republic of Armenia adopted the "Law on Sevan;" this piece of legislation aims to help improve the ecosystem of Lake Sevan, the natural landscapes of its catchment area, and the watersheds of nearby rivers. The law established criteria for using Lake Sevan's natural resources and allowable limits of change in its water quality. Nevertheless, there are still many unresolved problems and the situation in the Sevan Basin remains very alarming.

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Sevan National Park

Sevan National Park, the only national park in Armenia, was established in 1978 to protect Lake Sevan and surrounding areas. Including its buffer zones, the park protects 150,100 hectares, 24,800 hectares of which are on dry land. The park falls within the jurisdiction of Armenia's Ministry of Nature Protection and is managed as a research center that monitors the lake's ecosystems and undertakes various conservation measures, including the regulation of use and tourism, the protection of historical and cultural monuments, and licensed fishing. The park has a system of zoning which includes a core (reserve) zone, a recreation zone, and a zone for economic use. Protection efforts are focused mainly on rare and endemic species of the lake and surrounding habitats.

Compiled with materials from the Ministry of Nature Protection of Armenia, available online at *http://enrin.grida.no/biodiv/biodiv/national/armenia/proarea/snpv.htm*.

A Victory for Shikahogh Reserve

By ***Inga Zarafian***

"Scorching land:" this how the name of the unique strict nature reserve in southern Armenia, Shikahogh Reserve, translates from Armenian. The reserve's geographic location has given rise to the uncommon diversity of its flora and fauna. Mountain ridges shield three sides of the reserve from the penetration of cold, harsh winds, while one side is open to the caress of warm, moist air masses from the Caspian Sea. In Shikahogh, landscapes change abruptly, with near-virgin oak forests suddenly giving way to peaceful alpine meadows. More than 1,100 plant species grow in the reserve, among which there is a multitude of endemics and rare species. Animals listed in the International Red Data Book, such as the Armenian mufflon (*Ovis ammon gmelin*) and the bezoar goat (*Capra aegagrus aegagrus*), are encountered here. The Persian leopard (*Panthera pardus saxicolor*), which has begun to resettle in the region, has also been observed here in recent years.

The pristine nature, which the reserve has protected since 1958, remains largely untouched by man. Not even the widespread logging of Armenian forests, which was precipitated by the country's energy crisis in 1992-1996, affected Shikahogh. Loggers were unable to access the Mtnadzor Forest Massif, which covers over one third of the reserve, due to the absence of roads leading to it. In the last year, however, plans to construct a highway between Armenia and Iran brought road construction perilously close to the reserve's borders, threatening Shikahogh's intact forests and the rich flora and fauna communities that inhabit them.

Shikahogh Reserve. *Map by M. Dubinin.*

In late November 2004, the Ministry of Transportation and Communication of the Republic of Armenia approved a project to construct the Kapan-Meghri highway connecting Armenia with its neighbor to the south, Iran. According to this initial project, a seventeen-kilometer-long stretch of road was planned to run through Shikahogh Reserve. A tender among construction companies was hastily carried out. Although many necessary documents, including results from an environmental impact assessment, which may have detailed anticipated impacts and damages, were not submitted, a winner of the tender was named: the "Transproject" Company.

The efforts of Armenian and international activists saved the near virgin forests blanketing Shikahogh Reserve from a destructive plan to route a highway through the protected area. *Photo courtesy of WWF.*

The "Transproject" Company quickly set to work. The firm transported construction equipment and workers to the middle of the proposed road, just ten meters from the nature reserve's border. Here, they were met by ecologists who arrived on the scene to inform them that their actions were illegal, and in violation of several international conventions as well as Armenian legislation, including the law "On Specially Protected Nature Areas." The surprised construction workers defensively assured representatives of the regional State Nature Conservation Inspectorate that they were properly licensed and had official permission. The groups reached an impasse and the situation became more acute by the hour. Bulldozers and tractors were stopped just short of the nature reserve's territory. The situation required immediate and decisive action.

Non-governmental organizations in Armenia took up the cause and launched a campaign to save Shikahogh. Dr. Karen Manvelyan, the Director of the Worldwide Fund for Nature (WWF) Caucasus Programme Office in Armenia, appealed to the Union of Armenian Ecological NGOs with the suggestion that a working group to protect the reserve be established. Thus, on May 3, 2005, "SOS Shikahogh," a coalition of concerned individuals and representatives from more than forty local and international NGOs and scientific organizations, was formed.

Working jointly, the members of this grassroots coalition played a critical role in raising awareness about the threat to Shikahogh. In early May, the Armenian representative of the Caucasus office of WWF appealed to international organizations including the United Nations Development Programme (UNDP), United Nations Environment Programme (UNEP), and the Organization on Security and Cooperation in Europe (OSCE) with the request to come forward in support of the reserve. At the same time, the Union of Armenian Ecological NGOs appealed to high-ranking Armenian officials, including the country's President, Prime Minister, Speaker of Parliament, and General Prosecutor, with the demand that the illegal construction be stopped.

Members of the coalition also organized events designed to attract broad public attention to the matter. On May 27, for instance, environmental NGOs organized a protest at the Ministry of Transport and Communication, while on June 17, the "SOS" Group staged a public hearing about the highway construction, which was held at the American University of Armenia.

Another important facet of the work of the "SOS Shikahogh" group was in gathering and disseminating information from the front line. Independent experts from the coalition traveled to the site of road construction near the reserve on June 1 to evaluate the situation and assess presumed future damages, in the event that construction were to continue into the reserve's territory. The independent experts estimated that the cost of the damage to the reserve could reach as high as twelve million dollars. About a week and a half later, another delegation of independent experts and representatives of NGOs and the media traveled to the Syuink region, where the reserve is located, to further investigate the situation on the ground. The NGO "Armenian Forests" subsequently organized a press conference on the results of the trip to Shikahogh.

The endangered Armenian mufflon (*Ovis ammon gmelin*)inhabits rough, rocky, mountainous terrain in Skikahogh Reserve. *Photo by H. Ghazaryan.*

Advocacy for the Shikahogh Reserve came not just from within Armenia. The Armenian Diaspora joined the effort as well. On May 25, the Armenian Assembly of America addressed an open letter about the necessity of protecting Shikahogh to the President of the Armenian Republic, Robert Kocharian. On June 14, the organization Armenia Tree Project issued an action alert asking Diaspora Armenians to communicate their concerns to President Kocharian via an electronic letter forwarded to Armenian Ambassador to the U.S. Tatoul Markarian. More than 700 people participated in this campaign.

The international conservation community also expressed its concern about the threat to Shikahogh. For instance, the acting director of the Critical Ecosystem Partnership Fund (CEPF) Dan Martin and the CEPF Grant Manager for the Caucasus Hotspot Christopher Holtz traveled to Armenia and discussed the issue during a meeting with the Minister of Nature Protection of the Republic of Armenia, Vardan Aivazyan, as well as at a press conference.

Shikahogh Reserve protects important habitat for another endangered species, the bezoar goat *(Capra aegargrus aegargrus). Photo by H. Ghazaryan.*

Finally, after almost two months of intensive campaigning by Armenian and international NGOs and other concerned activists, the government of the Armenian Republic adopted the decision on June 29, 2005, to construct the road around, rather than through, the nature reserve. All those who fought to save Shikahogh wonder if this decision is indeed a victory, or merely a temporary respite. True, the construction workers relocated their equipment to another part of the road. True, they have not yet violated the nature reserve. But Armenian NGOs are already familiar with the workings of those who are motivated more by short-term profit than by concern for the future of the environment. For this reason, the members of "SOS Shikahogh" continue to closely monitor the situation.

Inga Zarafian *is the President of the Armenian NGO, Ecolur. Ecolur is widely known in Armenia for its environmental activities. The organization is establishing a journalists' network for distributing information about conservation-related issues in the country.*

Researching Forest Raptors on Armenia's Highest Peak

By ***Haik Harutunyan, Maro Kochinyan,*** *and* ***Karen Agababyan***

At 4,090 meters above sea level, Mt. Aragats is Armenia's tallest mountain massif. It is located in the central part of the republic, in Aragatsotn Region, where it is isolated from the rest of the country's mountain ranges. For this reason, the small forest massif that covers the mountain's southern macro-slope is isolated from the rest of Armenia's forests; the nearest forest on Mt. Ara is located ten kilometers away. The forest on Mt. Aragats, like other forests in central Armenia, is residual. It is located at an elevation of 2,000-2,200 meters above sea level and occupies an area of about five square kilometers. Although the forest is predominantly comprised of small Caucasian oak trees *(Quercus macranthera)*, other deciduous trees such as wild plum, wild pear, maple, ash, and artificially planted pine trees are occasionally encountered. Sub-alpine steppe with elements of alpine meadows are situated above the forest, while agricultural areas – primarily grain fields – occupy the land below it.

Despite the relatively small size and isolation of the Aragats forest, as well as the diminutive height of its trees, all diurnal raptor species inhabiting Armenia's forests can be found here. During the spring and summer of 2005, a group of staff from the American University of Armenia's Birds of Armenia Project, which included the authors of this article, conducted a series of six expeditions to research the population and species structure of raptors inhabiting the forests of Mt. Aragats.

Mt. Aragats. *Map by M. Dubinin.*

In their work, the researchers employed two methods. They conducted observations from fixed points to identify raptors' nesting territories and then also searched for the nests. As a result of their work, the researchers fixed the inhabitation of the following species: honey buzzard *(Pernis apivorus)*; black kite *(Milvus migrans)*; short-toed eagle *(Circaetus gallicus)*, which is listed in the Red Book of the Armenian Soviet Socialist Republic of 1987; buzzard *(Buteo buteo);* lesser spotted eagle *(Aquila pomarina);* booted eagle *(Hieraaetus pennatus);* sparrow hawk *(Accipiter nisus);* and northern goshawk *(Accipiter gentiles)*.

The researchers found nests belonging to the short-toed eagle, lesser spotted eagle, and buzzard. Based on observations of the birds' behavior during the nesting period, the researchers also surmise that nesting and general ranges for the remaining raptor species occur here. Various types of mating flights, food displays, directed flights with food during the nestling period, and territorial defense reactions suggested nest presence. Researchers did not observe the Eurasian hobby *(Falco subbuteo)* and it is possible that the species is absent from nesting-sites in this forest.

The researchers conducted their observations from three points along the road, from where they could survey the Aragats forest massif in its entirety. From these observation points, the agricultural areas below

Spotlight on the Birds of Armenia Project

The Birds of Armenia Project works to research and protect birds and their biotopes in Armenia. The project was established under the auspices of the American University of Armenia in 1993, upon the initiative of Sarkis Akopian, an American industrialist. The project's first major products were: "A Field Guide to Birds of Armenia," available in both English (M. S. Adamian and D. Klem, Jr., 1997.) and Armenian (M. S. Adamian and D. Klem, Jr., 2000) languages; and the "Handbook of the Birds of Armenia (M. S. Adamian and D. Klem, Jr., 1999). Beginning in 2001, the Birds of Armenia Project expanded its environmental education activities. Starting in 2004, the project began a two-year-long trial course to identify birds in nature. Fifteen students with various specialties and backgrounds participated in the course the first year and in 2005, the course expanded by 70 people. In addition, project specialists are beginning research on the influence of pesticides and heavy metals on indicator species of wetland birds and birds of prey. Working together with nature conservation NGOs and state institutions, the project hopes to preserve Armenia's unique avifauna.

Buzzard *(Buteo buteo)* nestling. *Photo by H. Harutunyan.*

could also be surveyed. Hunting of most of the raptor species – with the exception of sparrow hawk, northern goshawk, and honey buzzard – was observed in these areas numerous times.

Researchers noted several factors of disturbance affecting the raptors inhabiting Mt. Aragats. Their habitat's close proximity to Yerevan, as well as its proximity to road systems, makes this territory an attractive destination for Sunday picnickers. As many as seven to ten groups, each with five to twenty people, may come here on any given Sunday. They leave their litter behind. No one cleans up the territory, so the garbage—plastic bags, bottles, tin cans, foil—just accumulates. The resultant contamination of soil and water is particularly detrimental to birds of prey. They are end links in the food chain and harmful substances accumulate in their bodies and adversely affect their reproductive potential.

In addition, some of the people who visit Mt. Aragats bring with them firearms. Although these people primarily shoot at empty bottles (which is also unpleasant, given the amount of broken glass that remains afterwards) who can guarantee that they are able to resist the temptation of shooting a raptor flying overhead?

Based on their investigation, the researchers see the primary importance of the Mt. Aragats forest to be the high concentration of raptors it supports on a relatively small territory. The raptors here are also often and easily observed. Finally, the forest is regularly visited by people from outlying villages and cities, who are the primary factors of disturbance affecting the raptors. These conditions make the area an ideal point for observing nesting raptors and for carrying out ecological education among the local population. Using raptors as a focal point of ecological education, it would be possible to educate people visiting the Mt. Aragats forest about principles of conduct in nature. In the future, it might also be possible to implement joint activities with the public to clean the territory and protect the birds.

In conclusion, the authors would like to express their gratitude to the Birds of Armenia Project for providing financial support for research work; to A. Asatryan, from the Institute of Botany, National Academy of Sciences of the Republic of Armenia, for consultation; as well as a group of dedicated project volunteers, who actively participated in the investigations. Among them, the authors would like to note: Anna and Arpine Yeghiyan, Siranush Tumanyan, Vilena Bejanyana, Gor Rustamyan, Grigor Janoyan, Levona Rukhkyan, and Ruben Maliyan.

The nest of a lesser spotted eagle *(Aquila pomarina)*, found by researchers in the Mt. Aragats forest. *Photo by K. Agababyan.*

Haik Harutunyan *and* ***Maro Kochinyan*** *are students at Yerevan State University.* ***Karen Agababyan*** *is a Senior Scientist at the American University of Armenia.*

The small forest massif covering the southern macro-slope of Mt. Aragats provides habitat to representatives of all diurnal raptor species found in Armenia. *Photo by H. Harutunyan.*

Changes in the Diversity of Waterbird Species in Select Important Bird Areas in Armenia

By ***Nshan Margarian, Mamikon Ghasabyan,*** *and* ***Luba Balyan***

Under the patronage of BirdLife International, the Armenian Society for the Protection of Birds (ASPB), a local NGO that is working with BirdLife on Armenia's Important Bird Area Program, has worked to designate 18 Important Bird Areas (IBAs) in Armenia for basic monitoring. This monitoring is intended to provide information on the state of the sites and the pressures affecting them. Overall, Armenia's Important Bird Area Program aims to identify and protect a network of sites critical for the long term viability of globally threatened bird species across the range of those species for which the site-based approach is appropriate.

Breeding colonies of the Armenian gull *(Larus armenicus)* are threatened by unsustainable tourism activity in the region of Lake Sevan. © *V. Ananian.*

Of the IBAs designated in Armenia, five encompass wetland sites. Among Armenia's wetland IBAs, three are located in the Ararat Valley and the Sevan Basin: Lake Sevan, the Metsamor River System, and the Armash Fish Farming Ponds.

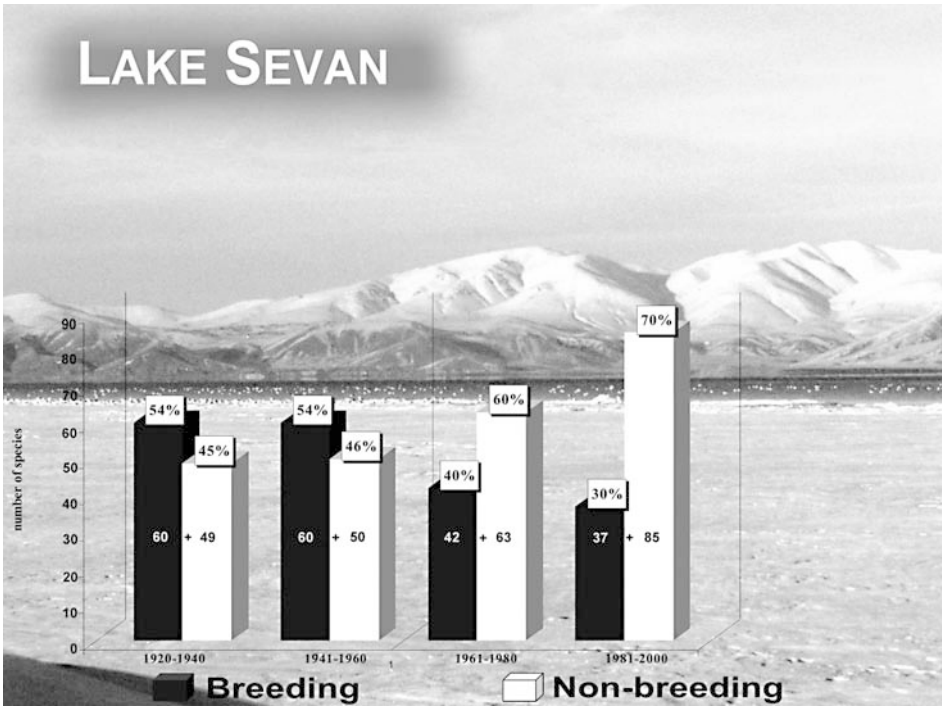
Historically, Lake Sevan, the largest inland freshwater body in the Transcaucasian region, and adjacent Lake Gilli at the southeastern corner of Lake Sevan comprised the primary aquatic habitats for a vast number of breeding and non-breeding waterbird populations. Extensive studies conducted by the researcher Dal in the 1940s suggested that the associated wetlands offered ample food resources and aquatic plants that provided excellent forage sites for both breeders and migrant birds. They determined the overall distribution of waterfowl in the lake basin and established that the overwhelming majority of waterfowl at Sevan concentrated around the former Lake Gilli.

For most of the twentieth century, the Masrik River fed Lake Gilli and associated bogs and marshes. In 1960, however, the government decided to divert the Masrik River and drain Lake Gilli to enhance agriculture in the region. As a result, Lake Gilli disappeared completely and no longer exists as such. Currently, the area is primarily used for low-productive agriculture that brings little profit to local farmers.

Despite its protected status, Lake Sevan has also historically been exposed to various types of human disturbance. Foremost among them is the dramatic twenty-meter decline in its water level. Unauthorized activities including illegal fishing, logging, uncontrolled grazing, and rapid residential expansion are also affecting the lake's ecosystem. Poaching is rampant. The illegal fish catch has even been estimated to surpass the official one. Yet, what most endangers the remaining waterfowl resources is motorized boating, which is a real scourge on the lake. One fishing lodge alone harbors up to fifteen motorized boats that cruise the lake twice daily. This factor of disturbance is present year round and is extremely detrimental to birds such as the white-headed duck *(Oxyura leucocephala)*, ruddy shelduck *(Tadorna ferruginea)*, common goldeneye *(Bucephala clangula)*, and tundra swan *(Cygnus columbianus)* during their wintering and migration periods. Tourism is primarily unsustainable and is practiced in the most environmentally sensitive areas, which poses a great risk to a large breeding colony of the Armenian gull *(Larus armenicus)* during the breeding season.

Armenia: A Hotspot for Avian Diversity

Positioned at the junction of the Western and Eastern Palearctic biogeographic zones, Armenia allows for the exchange of species from the Far North and those from the Far South. Hence, the country's geographical position makes it globally important for establishing links in habitat chains, as well as for the preservation of avian diversity. Thanks to the high diversity of habitats at varying elevations, 352 bird species classified into 18 orders have been observed within this relatively small geographic region, which totals just 29,793 square kilometers in area.



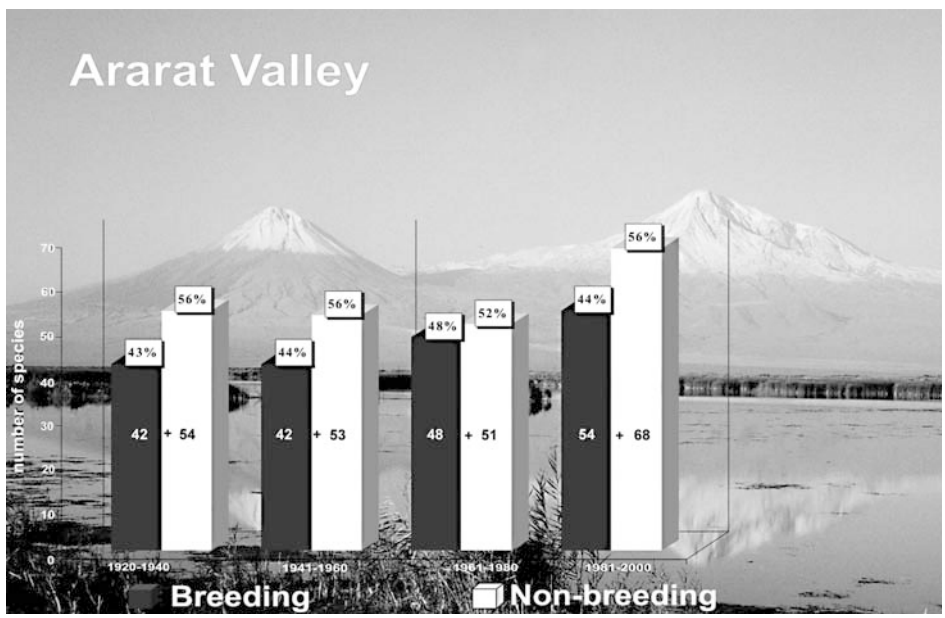
Change in the diversity of waterbird species in the region of Lake Sevan over time. *Graphic provided by the Armenian Society for the Protection of Birds.*

The unsustainable use of Lake Sevan and the drainage of adjacent Lake Gilli and its surrounding wetlands destroyed habitat required for breeding and non-breeding populations of waterbirds such as the great cormorant *(Phalacrocorax carbo)*, red-necked grebe *(Podiceps grisegena)* and caused the contraction of waterfowl resources in the lake basin. Between the periods 1941-1960 and 1981-2000, breeders in Lake Sevan declined from 60 to 37 species, while non-breeders increased from 49 to 85 species.

At the time that Lake Gilli, a life-giving nursery area for breeding waterfowl, was drained in the 1960s, a series of commercial fish farming ponds were constructed in the arid lands of the Ararat Valley in southwestern Armenia. These ponds attracted and now accommodate most of the breeding and non-breeding waterbirds that once occupied Lake Gilli. In other words, they brought about a redistribution of Armenia's waterfowl populations and completely altered the overall pattern of waterfowl distribution in the country. Between the periods 1941-1960 and 1981-2000, breeders in the Ararat Valley increased from 42 to 54 species, while non-breeders rose from 54 to 68 species.

In addition to the large fisheries in the Ararat Valley, an especially important area is the extensive Metsamor River and its adjacent wetlands, which is a natural riverine system that has existed since time immemorial. Winding through the Ararat Valley, the river extends for approximately 20 kilometers and originates with standing and slow-flowing waters. But even this unique matrix of natural wetland patches has begun to lose its avian value due to rapid urban expansion, which has gained momentum over the past decade. Lands adjacent to the Metsamor River are used for agriculture and commercial fish production. They are being converted to small private fish ponds ranging, on average, between 100 and 500 square meters and larger, while wetland drainage and channel excavation is irreversibly altering riparian ecosystems and leading to habitat loss. The Metsamor River System also plays a key role as a waterfowl habitat, wintering, and stopover site for wetland and water-dependent birds such as the common pochard *(Aythya ferina)*, red-crested pochard *(Netta rufina)*, common snipe *(Gallinago gallinago)*, pygmy cormorant *(Phalacrocorax pygmaeus)*, whiskered tern *(Chlidonias hybridus)*, cattle egret *(Bubulcus ibis)* and little crake *(Porzana parva)*, especially now that Lake Sevan and the area of the former Lake Gilli area offer little refuge to birds.

The creation in the 1970s of artificial water impoundments in the Ararat Valley helped to restore waterfowl and other bird species that had disappeared from the Lake Sevan Basin. The sole refuge for breeding avifauna



Change in the diversity of waterbird species in the Ararat Valley over time. *Graphic provided by the Armenian Society for the Protection of Birds.*

Staff members of the Armenian Society for the Protection of Birds conduct an extensive waterbird census of the Lake Sevan Important Bird Area. © *V. Ananian.*

appears to be the Armash fish farm, which was created in 1975 in the arid lands of the Ararat Valley in southwestern Armenia. The farm used to be the largest supplier of commercial fish during the Soviet Era and is still the largest active fishery in the entire Transcaucasus Region. The fishery's 29 ponds, each of which ranges from between 11 and 95 hectares in size, occupy a total of 1,514 hectares. They offer unique habitat for breeding and migratory birds, especially now that the surrounding wetland ecosystem of Lake Gilli no longer exists.

Ornithologist V. Ananian maintains that Armash is currently known to harbor up to 220 species of birds, which comprises over 62% of the total number of bird species in Armenia. Included among these are the breeding white-tailed lapwing *(Chettusia leucura)*, Eurasian spoonbill *(Platalea leucorodia)*, gull-billed tern *(Sterna nilotica)*, slender-billed gull *(Larus genei)*, and blue-cheeked bee-eater *(Merops persicus)*, as well as two species, the marbled teal *(Marmaronetta angustirostris)* and white-headed duck *(Oxyura leucocephala)*, which are listed on the IUCN Red List as threatened species.

Positioned on one of the valley's major flyways, these man-made ponds and wetland patches act as a large transit and stopover point for migratory waterfowl. They also serve as one of their key wintering habitats in Armenia. However, these man-made water impoundments were established with the sole purpose of supplying commercial fish and did not envisage the conservation of birds and their habitat. Although the fish ponds contributed to the strengthened formation of avian fauna in the country, birds are not protected on them by law.

Today, the Armash Fish Farm is a private joint-stock company with intensive commercial fish production, which impedes any effective activities to support the conservation of waterbirds and associated habitats. Breeding waterfowl populations are exposed to the increased degradation of their habitat and to illegal bird kills by poachers and fishery owners who shoot fish-eating birds such as pelicans, cormorants, egrets and herons, which they see as "potential enemies" to their business.

ASPB has committed to a program to develop the IBA Caretaker Network in the Caucasus; this program is an integral part of the IBA conservation program. It aims to establish an effective network of local people who are able to promote, carry out and/or contribute to the conservation and monitoring of bird species, and to promote the direct involvement of civil society in the conservation of sites important for birds. An established site-based approach in the Lake Sevan Basin ensured the full year-round monitoring of birds, as well as monitoring of the state of these sites and the pressures affecting them. This helps provide early warning about changes and signals the need to take conservation actions to remove common threats.

In view of the rapid urban expansion and intensive agriculture development in the Metsamor River System, public advocacy actions will be taken to interpret the importance of habitat changes and land-use impacts affecting different species of birds. As important and comprehensive is the educational component of this conservation program, which aims to promote knowledge of the birds, encourage their protection, and establish a long overdue conservation ethic using traditional educational tools, personal encounters and communication, and the mass media. For the Armash Fish Farm, where birds and the threats affecting them are fully and comprehensively monitored, our approach will be to develop a long-term conservation strategy through the involvement of the private sector and associated hunters who utilize the farm's natural resources. We aim to develop a long-term management plan for the fishery, which will include sustainable farming practices tailored to bird conservation needs and to provide for future tourism development opportunities as an alternative source of income.

Nshan Margarian *and* ***Mamikon Ghasabyan*** *are both Senior Scientists at the Institute of Zoology, within the Armenian National Academy of Sciences.* ***Nshan Margarian*** *is also the Head of the Department of Ecology at the Educational University in Yerevan, while* ***Mamikon Ghasabyan*** *also serves as the Director of the Armenian Society for the Protection of Birds.* ***Luba Balyan*** *is an International Officer and IBA National Coordinator within the Armenian Society for the Protection of Birds.*

Research and Conservation of the Persian Leopard in Armenia

By ***Igor Khorozyan*** *and* ***Alexander Malkhasyan***

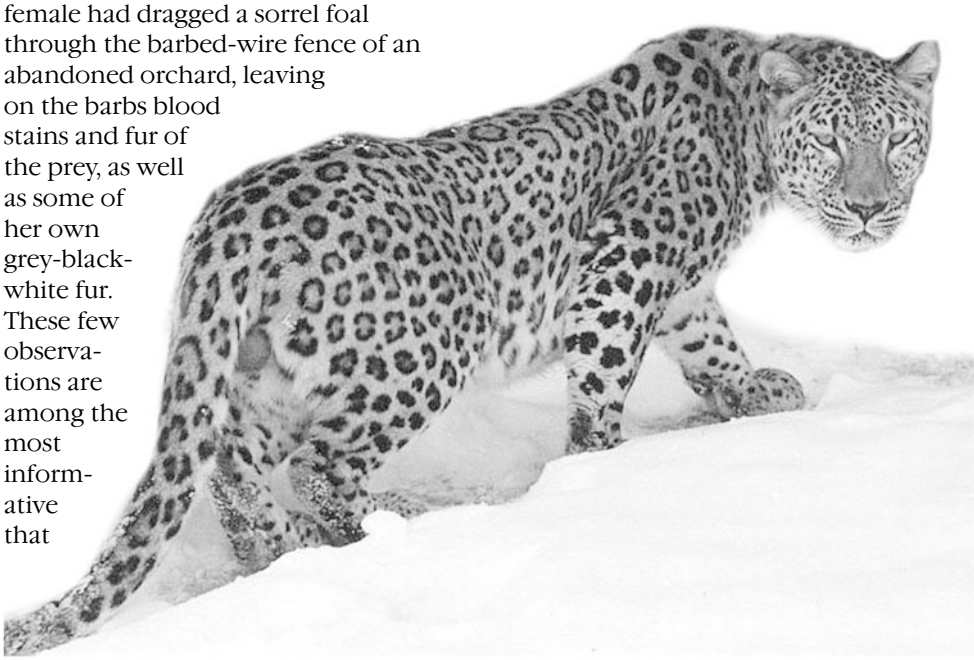
It was a dreary and misty day in late January, like all other days during this month in the rocky mountains of southern Armenia. We hiked over the wind-swept trails along the southern slopes, where the snow melts quickly and wild animals move around more easily. Suddenly, we came across a set of large, round clawless footprints and other similar, but smaller ones, which comprised clear tracks stretching along the trail in both directions. Scrapes, which were dug into the ground to attract a mate, were numerous. We made similar finds over the course of the next several days, and later again in early February and early March. From these signs, we deduced that a large male and slender female of the species were moving around to meet each other. From their fresh scats, it appeared that they had been feeding on wild boar *(Sus scrofa)* and Indian crested porcupine *(Hystrix indica)*. Following the tracks and scrapes, we reconstructed a fuller picture: in one place, the male had scratched the bark of a Christ's thorn *(Paliurus spina-christi)* and left some of its fur on the barbs. In another, a female had dragged a sorrel foal through the barbed-wire fence of an abandoned orchard, leaving on the barbs blood stains and fur of the prey, as well as some of her own grey-black-white fur. These few observations are among the most informative that we might hope to glean about the notoriously elusive and rare Persian leopard *(Panthera pardus saxicolor)*.

The current range of the leopard in southwestern and southern Armenia. *Map provided by I. Khorozyan and S. Asmaryan and adapted by M. Dubinin.*

Since prehistoric times, the leopard's beauty, strength, and grace have evoked a mixture of admiration for and fear of its stealthy, nocturnal, and cryptic life. African tribes gave this big cat such vivid epithets as: "Gentle hunter, whose tail plays on the ground while he crushes a skull;" "Beautiful death, who dons a spotted robe when he goes to his victim;" and "Playful killer, whose loving embrace splits the antelope's heart." Scientists claim that the hypnotizing effect that leopard spots have on humans is genetically programmed, similar in this way to the panic and stupor that snakes excite in monkeys. It is not surprising that leopard skin mantles, amulets made of the beast's teeth and claws, and medicines made from its bones are so very popular among indigenous peoples that live side by side with this predator.

The Persian leopard is the only large felid species still surviving in southwestern and southern Armenia, albeit in meager numbers. Here, the large cat inhabits sparse juniper forests, arid and mountain grasslands, sub-alpine, and alpine meadows, while it avoids semi-desert, nival (abounding with snow), and harsh nival environments. Its current range extends from the Khosrov Reserve southwards to the Arax River on the state border with Iran. As late as the mid-1970s, the leopard also inhabited northern Armenia. The northern boundary of its current range stretches along the Azat River and along the Geghama and Vardenis Mountain Ridges.

According to rough estimates, no more than ten to fifteen leopards, of which five to eight are adults, currently live in Armenia. The most stable group of the population is located in the southern part of the country, on the Zangezour, Bargushat and Meghri Ridges, from where they are able to move to and from Azerbaijan's Naxcivan Republic and northwestern Iran. The Zangezour Ridge and its branches serve as linkages between this group and the other group in



A male Persian leopard *(Panthera pardus saxicolor)* in theYerevan Zoo. *Photo by A. Malkhasyan.*

Khosrov Reserve and the Vayots Dzor Province.

The primary threats that have brought the leopard to the brink of extinction in Armenia are disturbance, poaching, and habitat destruction. More specifically, this entails livestock grazing, edible plant and mushroom gathering, destruction of wildlife by firearms and traps, and dry grasses and conifer fires during the hot summer. All these factors pose a great risk to the leopard and the species upon which it preys, the bezoar goat *(Capra aegagrus)*, wild boar, roe deer *(Capreolus capreolus)*, Indian crested porcupine, and European hare *(Lepus europaeus)*.

Concerned over the fate of the leopard in Armenia, we began researching the species in 1999-2000 by studying its diet, feeding competition, and distribution. We have since incorporated new research methods, including GIS mapping, camera photo-trapping, scat counts and use of lures. We initially began our work in Khosrov Reseve, and subsequently expanded our study areas to include other important "hotspots" of the cat's range such as Mt. Gbndasar/Noravank Canyon, Meghri Region, Vayots Dzor Province, and the Sisian Region. We published a number of scientific papers, monographs, and conference proceedings, which are mainly in English. Three years ago, we established a website, *www.persianleopard.com*, which we regularly update.

Fresh leopard tracks found on Meghri Ridge. *Photo by A. Malkhasyan.*

Thanks to financial support provided by international foundations and zoos, our efforts continue and ensure the quite stable status of the leopard in Armenia. However, this situation is very fragile and can worsen at anytime if even just one leopard is lost to poaching or another human factor.

Leopard habitat in Khosrov Reserve. *Photo by A. Malkhasyan.*

For example, recently in 2005, we faced a real threat of losing the leopard and other biodiversity in southern Armenia because of the national Ministry of Transportation's plans to build a road, the Kapan-Meghri Highway, right through the Shikahogh Reserve, which protects habitat important to the leopard and its prey. To avert the danger, all available resources were mobilized to promote cooperation between the Ministry of Nature Protection, environmental NGOs, and mass media. As this road is essential for Armenia, the coalition did not press for the complete cancellation of the project, but instead insisted that planners implement a second, less damaging option, which would affect the reserve to a lesser extent. This option would lengthen the road by seven kilometers (from thirty-five to forty-two kilometers) and increase costs, but would significantly shorten the segment of road passing through the reserve (from 16.6 to 0.5 kilometers) and reduce the numbers of trees and saplings to be cut (from 19,085 to 681 and from 117,000 to 4,178, respectively). In June 2005, policymakers officially adopted the more reserve-friendly option.

Our ongoing research project aims to identify and describe Priority Leopard Conservation Areas (PLECAs), which leopards currently and constantly inhabit, and which, therefore, require priority conservation actions. This project is necessary because we must know where the leopard presently inhabits in order to direct financial, human, and technical resources specifically there. The first candidates for PLECA status are the central and eastern parts of Khosrov Reserve in southwestern Armenia and the Shvanidzor-Nuvadi area in the extreme southern part of the country. The search for other PLECAs is underway. In this work, we combine field research, lab techniques and GIS mapping. Once we have identified PLECAs, we will divide them into priority regions, where focused protection measures will be implemented. It is still premature to specify which measures, such as the creation of protected areas or strengthened infrastructure, may be realized and when; this will be determined on a case-by-case basis.

Leopard conservation activities have been underway in Armenia since 2002 and include technical support, raising awareness among local people and the border guards, and the operation of anti-poaching squads and population monitoring. These efforts must be intensified and expanded in their scale.

Armenian citizens should be proud that such a wonderful and rare animal as the leopard still lives in their country. Hopefully, people are gradually coming to understand that a leopard seen for a few seconds in the shadows of the wilderness looks far better than any leopard skin rug or moth-eaten stuffed specimen in a museum.

Igor Khorozyan *is a Yerevan-based freelance researcher of the Persian leopard.* ***Alexander Malkhasyan*** *works for the Ministry of Nature Protection of the Republic of Armenia and the WWF Caucasus Programme Office in Yerevan.*

Endangered Species

Results of Latest Survey Show Tiger Numbers in Russia Stable

Text provided by the Press Service of WWF Russia.

Results of the latest full range survey indicate that tiger numbers in Russia appear to be stable, say the coordinators of a 2005 winter effort to count the animals. After a massive winter endeavor to determine distribution and abundance of tigers in the Russian Far East, the last stronghold of the Amur, or Siberian tigers, researchers report that approximately 334-417 adult tigers remain in the region, along with 97-112 cubs. While stressing that results are preliminary, the news is welcome relief to tiger conservationists around the world, who have seen spiraling decreases in tiger numbers in other parts of Asia.

To determine numbers of tigers in this remote, densely forested land, researchers sent out nearly one thousand field workers to canvass the entire region where it is believed tigers could occur. Though wary of people, and seldom seen, tigers nonetheless leave evidence of their presence with their massive footprints in the snow. With some workers spending months in the field and covering over 21,000 kilometers of transects by foot, ski, snowmobile, and car, a total of 4,100 tracks were recorded, most representing multiple tracks of a single individual. Researchers mapped out the location of all these tracks, and then estimated a minimum number of tigers, based on their size and distribution.

Tools of a tiger tracker. *Photo by D. Kuchma © WWF Russia.*

Dale Miquelle, Director of the Wildlife Conservation Society's (WCS) Russia Program, and overall coordinator for the project, remarked, "This tiger survey represents a milestone in cooperative, international conservation efforts, with full political support from both regional and national governmental bodies of the Russian Federation, as well as financial and technical support from the international conservation community." The project was funded not only by Russia's Ministry of Natural Resources, but by a host of international organizations, led by the Save-the-Tiger Fund, the U.S. Fish and Wildlife Service's Rhinoceros and Tiger Conservation Fund (both from the U.S.), Britain's 21st Century Tiger, and the World Wide Fund for Nature (WWF).

Tiger tracks line a path through the snow. *Photo by D. Kuchma © WWF-Russia.*

The last winter survey, conducted in 1996, reported 330-371 adult tigers, with 85-105 cubs. "The difference in results between 1996 and this survey," said Dimitri Pikunov, coordinator of the survey in Primorye, and a well-known specialist on this big cat, "is not due to a change in numbers, but simply reflects the additional effort we made to survey the entirety of tiger range." Coordinators agree that this survey represents the most extensive effort to date to count tigers in Russia.

Sponsors of the 2005 Winter Survey of Amur Tigers

- Ministry of Natural Resources of the Russian Federation
- The National Fish and Wildlife Foundation's Save-the-Tiger Fund, sponsored by Exxon-Mobil
- World Wide Fund for Nature (WWF)
- 21st Century Tiger
- U.S. Fish and Wildlife Service's Rhinoceros Tiger Conservation Fund
- Wildlife Conservation Society (WCS)
- AMUR

A track such as this can say much to an experienced researcher. *Photo by D. Kuchma © WWF-Russia.*

Tiger conservationists around the world were buoyed by these results, especially since India, once considered the greatest stronghold for tigers, is now under pressure after recent reports of tigers completely disappearing from some of their core tiger reserves. Yuri Darman, Director of the WWF Russian Far East Office, declared, "these results are a tribute to the hard work and dedication of conservation organizations and government officials here in Russia. Despite massive poaching pressures in the 1990s, we have been able to turn back the tide, and retain our tiger population." John Seidensticker, of the Save-the-Tiger Fund, a partnership between Exxon Mobil, U.S. National Fish and Wildlife Foundation, and the Critical Ecosystem Partnership Fund, added, "Russia is a bright spot in the conservation of tigers in Asia, and is proof of our belief that a few dedicated individuals, with sufficient motivation and adequate support, can make a difference in the world."

Coordinators of the survey effort gathered in Vladivostok to present their results, but emphasize that numbers are still preliminary. Still to come will be an assessment of tiger prey species, and a more rigorous analysis of tiger distribution and abundance. According to Miquelle, "Over the next few months, we will be completing the geographic database to ensure these data are preserved, and then we will begin a more intensive analysis of the data. Results may change slightly, but we think it's safe to say that the population appears stable."

For additional information please contact Elena Starostina, WWF-Russia Far Eastern Branch Press Officer Tel/Fax +7 (4232) 41-48-68, Email: EStarostina@wwfrfe.ru

By night, in the cozy atmosphere of a winter hut, a participant in the winter tiger survey logs his daytime observations on a special form. *Photo by D. Kuchma © WWF-Russia.*

Co-operators of the Winter Survey of Amur Tigers

- Ministry of Natural Resources, Russian Federation
- Main Directorate of Natural Resources Supervision *(Rosprirodnadzor)*
- Directorate of Natural Resources Supervision *(Rosprirodnadzor)* in Primorsky Krai
- Directorate of Natural Resources Supervision *(Rosprirodnadzor)* in Khabarovsky Krai
- Inspection Tiger
- Khabarovsky Krai Government
- Primorsky Krai Government
- Directorate for the Protection, Control, and Regulation of the Use of Game *(OkhotNadzor)* in Khabarovsky Krai
- All-Russia Institute for Wildlife Management
- Directorate for the Protection, Control, and Regulation of the Use of Game *(OkhotNadzor)* in Primorsky Krai
- Institute of Geography, Far Eastern Branch of the Russian Academy of Sciences
- Institute of Biology and Soils, Far Eastern Branch of the Russian Academy of Sciences
- Kedrovya Pad Zapovednik
- Ussurisky Zapovednik
- Lazovsky Zapovednik
- Sikhote-Alinsky Zapovednik
- Bolshe-Khekhtsirsky Zapovednik
- Botchinsky Zapovednik
- World Wide Fund for Nature (WWF)
- Wildlife Conservation Society (WCS)

Dedicated Conservationist Pioneers Effort to Save Russia's Aleutian Canada Geese

*By **Denise Woods,** with assistance from **Konstantine Zgurovsky** and **Margaret Williams***

In the remote and wild region of Kamchatka, a quiet and modest project is underway to restore a species that had vanished from the Russian Far East: the Aleutian Canada Goose *(Branta canadensis leucopareia)*. For the last fourteen years, Dr. Nikolai Gerasimov, a senior scientist at the Pacific Institute of Geography, has been running a captive breeding and release project to bring this bird back to its former range in Russia. Since 1991, Gerasimov has raised over 300 Aleutian Canada geese at a modest facility he built for this purpose near Petropavlovsk-Kamchatsky on the Kamchatka Peninsula, and released them onto a fox-free island in the Kuril Island chain in the northwest Pacific.

Constantly mustering his creativity and skillful diplomacy, Gerasimov has built the program with the help and involvement of some unusual allies. Early on in the project, he charmed federal border guards with his good humor and convinced a local businessman, Anatoly Kovalenkov, to provide financial assistance and physical space for the facility. Specialists from the Yagiyama Zoo in Japan also provided help along the way. After initial support from the Russian government, operating funds dried up. So committed was Gerasimov to keeping this operation going, he began to sell his personal stamp collection to generate funds to buy food for the geese. Hearing of this remarkable effort, World Wildlife Fund lent support to Gerasimov in 2004, enthusiastically supporting Gerasimov's plans to return this species to its full range in the Bering Sea ecoregion.

Historically, the Aleutian Canada goose, one of five subspecies of the familiar white-cheeked Canada goose, nested on maritime islands from the Alaska Peninsula, westward along the Aleutian Chain, to the Commander and Kuril Islands of Russia. Its troubles began when early twentieth century fur farmers and trappers began releasing Arctic and red foxes onto many of the formerly predator-free islands within the goose's nesting range. The introduced foxes preyed on the naive birds, which had no natural defenses, having evolved on mammal-free islands.

By 1938, the Aleutian Canada goose was thought to be extinct, but in 1962, a small population of 200 to 300 individuals was discovered on remote Buldir Island in the western Aleutians of Alaska. In 1973, the species was listed as endangered under the United States' newly established Endangered Species Act. Subsequent work by the U.S. Fish and Wildlife Service (USFWS) to restore the species has involved mainly relocating geese captured on Buldir Island to other former nesting sites in the Aleutians. The Aleutian Canada goose has responded resoundingly well to international conservation efforts: in March of 2001, it was removed from the U.S. federal list of threatened and endangered wildlife, and the geese now number in the tens of thousands- a striking conservation success story for the USFWS and its partners. Now, Gerasimov hopes to contribute to a similar story for Russia.

A pair of Aleutian Canada geese *(Branta canadensis leucopareia)* tend their chicks at Nikolai Gerasimov's breeding facility.
Photo by N. Gerasimov.

The USFWS, in particular, the Alaska Maritime National Wildlife Refuge – the primary agency managing the lands to which the goose is being returned – has been a key partner for Gerasimov. In fact, it was a batch of geese flown by plane from Alaska to Petropavlovsk that helped to start the project in Russia. Just last spring, Dr. Vernon Byrd, chief biologist at the Refuge, had the chance to visit Kamchatka and see, for the first time, the Russian captive breeding facility he and his colleagues had helped to establish.

Gerasimov's release of additional captive-reared birds in Russia adds greatly to the effort to recover this species. In the summer of 2004, he was able to release fifty captive-reared Aleutian Canada geese on the island of Ikarma, in the northwest Pacific. At least one sighting of Gerasimov's geese (all of them are marked) was made on the Commander Islands, one of the strongholds of biodiversity in the Bering Sea. During the 2005 season, Dr. Gerasimov and his colleagues released more than 70 juveniles of this nearly extinct goose species into the wild. This is the best result posted over the course of the entire project. Thanks to the large number of birds reared this year, Dr. Gerasimov hopes to fulfill his long-standing plan: to conduct a spring release of birds into the wild, so that they might rear young in their natural habitat and not in the nursery's enclosures.

***Denise Woods** is a Research Assistant for the World Wildlife Fund's Bering Sea Ecoregion Program, based in the Anchorage Alaska field office.*
***Konstantine Zgurovsky** is the Coordinator of the Marine Program for the Far Eastern Branch of WWF.*
***Margaret Williams** is the Director of the WWF Bering Sea Ecoregion Program.*

Conservation History

Kseniya Golgofskaya Celebrates Fifty Years in Kavkazsky Zapovednik

By ***Tatiana Akatova, Lyudmila Grabenko,*** *and* ***Lyudmila Boichenko***

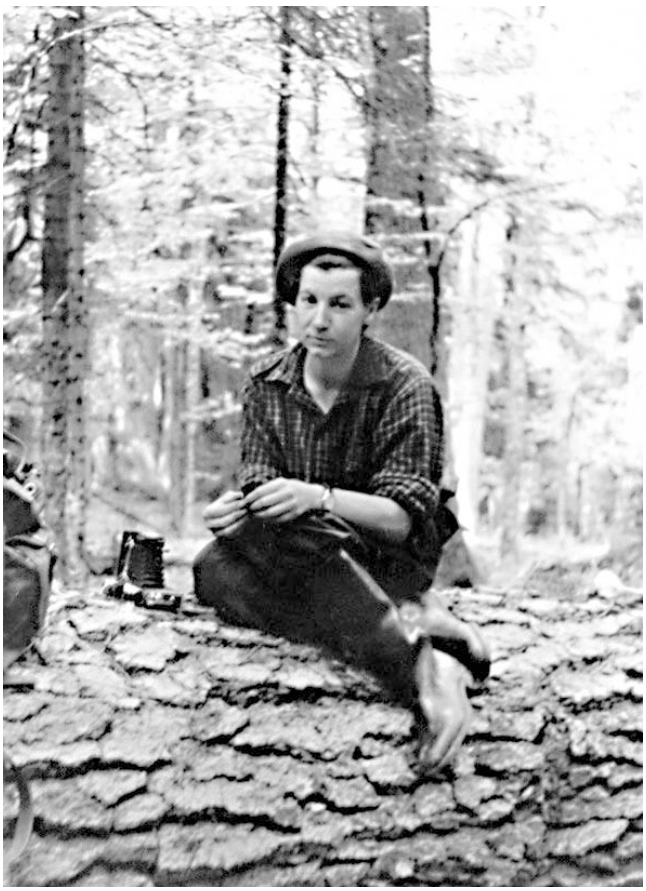
Kseniya Golgofskaya, a scientist at Kavkazsky Zapovednik, spends many late nights working in her office. The office is very simple: an old table, at which her husband, Vladislav Kotov, once worked; a lamp; and a well-lit pile of papers. Along the wall stands a bookshelf with specialized literature and, in the corner, a table with maps. Fifty years after her arrival in Kavkazsky Zapovednik, Kseniya Golgofskaya is still busy working for the reserve and carrying out important work: the creation of a detailed geobotantic map of the zapovednik's forest belt.

Kseniya Golgofskaya was born on February 9, 1924, in Yaroslavl, not far from Moscow. Her father, a doctor, died when she was young, and her mother moved with Kseniya and her other child to her sister's home in Moscow. From early childhood Kseniya was distinguished by her active, inquisitive, and independent nature. She finished high school in 1941, on the eve of the Great Patriotic War. During the war, Golgofskaya dug trenches, kept watch from rooftops, and deactivated firebombs and shells. When the Germans came close to Moscow, her family lost their home during a bombing raid. They were then evacuated from the capital to the Orenburg Region, in the Ural Mountains, where Ksenyia worked on a collective farm. There she learned to manage horses, a skill that would serve her well years later in Kavkazsky Zapovednik. The war continued, but Kseniya decided to return to school. She left for Gorky (now Nizhniy Novgorod) in 1943, where she enrolled in the Institute of Agriculture. As soon as she could move to Moscow, Golgofskaya transferred to the Moscow Agricultural Academy, named after K.A. Timiryazev, where she studied in the Department of Decorative Horticulture.

Kseniya first traveled to the Caucasus region for her undergraduate field work. In Adler, by Sochi on the Black Sea, Kseniya saw a true wonder of landscape architecture, the park "Yuzhniye Kultury" [Editor's note: Yuzhniye Kultury Dendrological Park is a 21.5 hectare landscape-style park, which was established in Adler during the period 1910-1912. In this issue of *RCN*, we feature an article on the park, which is federally protected.] . She wrote and defended her thesis on the topic "Research and a Project to Reconstruct Yuzhniye Kultury Park."

A young Kseniya Golgofskaya surveys the territory of Kavkazsky Zapovednik, where she has lived and worked for a half-century. *Photo provided by Kavkazsky Zapovendik.*

Having received her diploma on December 1, 1949, she enrolled in a graduate program at the Institute of Forestry of the USSR Academy of Sciences, in the Laboratory of Forest Typology headed by V.N. Sukachev. In 1954, she defended her dissertation on "Types of Gully Fringe Forests in the Northern Part of Voroshilovgrad Region" and left for the taiga [Editor's note: Voroshilovgrad Region, in eastern Ukraine, was renamed Luhansk Region in 1990.] She worked as a



Kseniya Golgofskaya at home in the dense forests of Kavkavsky Zapovednik. *Photo provided by Kavkazsky Zapovendik.*

junior scientist on the staff of a detachment of the Tuva Comprehensive Expedition, which was organized by the USSR Academy of Sciences' Council for the Study of Productive Strength. The detachment leader wrote of her: "Young Kseniya Golgofskaya possesses deep knowledge of forest geobotanics, silviculture, and adjoining sciences. While heading the forest station, she demonstrated herself to be an energetic, enterprising, and tireless researcher. Kseniya is an excellent, tactful *tovarisch*, who has won the affection of all detachment members."

One day, while attending an exhibit in Moscow, Kseniya saw a display with information about Kavkazsky Zapovednik. She recalled the rich and incompletely studied nature of southern Russia where she, a geobotanist, might find work. "I decided that I needed to go there; and I saw my future there and only there," said Golgofskaya. In 1955, her dream came true as she began working at the reserve as a Senior Scientist specializing in geobotany.

"The years have washed many of life's moments from my memory, but there are some events that live on clearly and vividly in my heart, as if they happened only yesterday," recalls eighty-one year old Kseniya Golgofskaya. "My first arrival in Maikop [Editor's note: one of Kavkazsky Zapovednik's two units is headquartered in Maikop.] in 1955 is firmly lodged in my memory. I made my way from the train station to the reserve by hopping a ride on a passing truck. It was early February, the peak of winter, but the region was experiencing a rare spell of warm weather. People were out walking the streets in light jackets and sweaters. Wearing my warm, fur-collared winter coat, and carrying a pair of skis, I was a curiosity that attracted stares from surprised passersby. Those skis, a small bundle of things, and a few books bound together by a ligature were all the belongings I had to my name. I had left Moscow behind me. Also behind me were my graduate studies, the defense of my dissertation, and a year of expedition work in Tuva, in the western Sayan Mountains. Ahead of me lay the sheer romanticism of the unknown: an unfamiliar place, new people, interesting work....

I made my way to the reserve's headquarters for an appointment with the director. Two other members of the staff were already waiting outside his office to meet with him. Knowing that I was going to be working at the zapovednik, the men began to playfully tease me. 'What are you here for? We don't need women. We have mountains, and the work is rough. You had better get back to Moscow, and right away!' But then, the Deputy Director for Science, in complete seriousness, sternly warned me, 'The work here is difficult. There will be no pampering and no indulgences. Expectations for everyone are the same: not to snivel.'"

In Kavkazsky Zapovednik, Kseniya Golgofskaya threw herself into her work with characteristic enthusiasm. Together with V. N. Aleksandrov, a zoologist and senior scientist at the reserve, she studied the status of the forage base for bison and other ungulates in the reserve.

Golgofskaya fondly recalls her first guide and assistant, Boris Artamonovich Zaslavsky, an extraordinary and surprising person. When they first met, he took a good, long look at her and announced, quite gallantly, "Well, then, madam, I shall deliver you with kid gloves." "And then we were on our way," recalls Golgofskaya. "We were headed for the glades of Mt.

Kseniya Golgofskaya has spent almost her entire life working in the harsh field conditions in the Caucasus Mountains. *Photo provided by Kavkazsky Zapovendik.*

Kseniya Golgofskaya, a geobotanic, and her colleague at Kavkazsky Zapovednik, a soil scientist, conduct complex field research. *Photo provided by Kavkazsky Zapovendik.*

Alous. In our movement along our route, we observed strict protocol: Boris Artamonovich went on up ahead with his small, quick-footed horse Malchik, while I brought up the rear. We went primarily on foot, leading our pack horses on lead ropes. When we stopped, we stopped out of concern for the horses and not to rest ourselves. Boris Artamonovich wasn't very talkative and it seemed that he was completely indefatigable, despite his considerable age. He would seldom sit, but instead stood leaning on a gnarled stick. 'Boris Artamonovich, sit,' I would say. He would answer, 'Thank you, I have already sat my share,' and not a word more. When night began to fall, my legs were already buckling from hunger and exhaustion. I slowly began to chew on clover and other grasses, embarrassed to admit to Boris Artamonovich that I was tired and wanted so badly to eat. He just kept striding on ahead.

He and I went on many trips together and shared many memorable and humorous moments. We had no special equipment, and because field work was long—sometimes we were in the mountains for months at a time—we were a sight to behold. Once geologists working on the zapovednik's territory nearly took Zaslavsky and me for vagabonds or foreign saboteurs. Only by showing our identification cards were we able to convince them that we were actually scientists. Back then we didn't have sleeping bags. We slept in our quilted jackets by a campfire. One night, when we were sleeping in a shelter we had made using a wind-fallen tree, the tree roots beneath us ignited from the heat of our campfire. We were barely able to throw our things to safety and slip out ourselves before the whole structure went up in flames. There was one occasion when, thanks to Boris Artamonovich's resourcefulness, we escaped what could have become an unpleasant encounter with poachers. We had stumbled upon them in the Urushtena River Valley, where we had been inventorying sample areas and Boris Artamonovich had been measuring the heights of trees. We were unarmed. [Editor's note: According to technical safety procedures, zapovednik staff were required to carry rifles for self-defense purposes.] I lost my head from the unexpectedness of their presence, but Boris Artamonovich quickly threw up his hand with his clinometer, the tool he had been using to make his measurements. This gave the appearance that he was taking aim at our unexpected 'guests' with some sort of firearm. And like the wind, they blew off, and we just burst out laughing with relief."

Kseniya Golgofskaya, a delicate looking woman, spent long periods in the mountains and made many difficult treks while studying and classifying the zapovednik's forest types, performing geobotanical cartography, districting the reserve's territory, and studying the dynamics of forest vegetation and its determining factors. "What were my first impressions of the zapovednik's natural world? I was amazed by its forests. These weren't the familiar birches outside of Moscow; they weren't the rare gully fringe forests of the steppe; and they weren't the larch forests of the Sayan Mountains. That was all I had seen prior to these breathtakingly majestic primeval wilds. It may be for this reason that I chose to devote my life's

work to the comprehensive study of forest communities, one of the more complex biological systems."

As a result of her field investigations, Golgofskaya compiled a list of the zapovednik's dendroflora, and later the flora of its forest belt. In the 1970s, when field station work began at Kavkazsky Zapovednik, Golgofskaya was involved in organizing the biogeocenolgical field station. Upon her initiative, and with participation by a phytopathologist at the reserve, the zapovednik created a microbiological laboratory and began studying bacterial epiphytology in the zapovednik's forests. Golgofskaya with other staff studied the subject: "Predators-ungulates-pasture."

While working in the zapovednik, Golgofskaya has published more than 100 scientific and popular-scientific articles, compiled a monograph of flora in the forest belt, and, with V. Kotov and A. Bannikov, authored a brochure, "Kavkazsky Zapovednik" (Moscow: *Znaniye*, 1967). A gifted writer, smitten with the wild nature of the western Caucasus region, she published a number of sketches about the region's protected areas in the journal "*Literaturnaya Adygea*." They presented reliable information and were a tribute of her love for the zapovednik and the memory of her husband, an outstanding zoologist who was killed by an avalanche while performing official zapovednik duties.

Many of Golgofskaya's experiences are preserved in her journals. "Journals are a scientist's memory," says Golgofskaya. "They preserve fresh, bright impressions of the past, not overshadowed by subsequent events and occurrences. I thumb through the pages of my journals and in my imagination the past comes alive: acquaintances; landscapes dear to my heart; magnificent sunrises and sunsets; slumbering clouds and river valleys; encounters with animals; treks along forested and meadow slopes; the murmur of streams and rivers; the roar of waterfalls; forest thickets, alive with a chorus of birds and fragrant with pine resin; the bugle of elk and the clatter of their antlers during a rut sparring match; rain and blizzards; a warm fire at a campsite somewhere under a starry sky or a crown of silver fir, by a carefully crafted lath shelter; the ringing of a bell around the neck of a horse grazing in dewy grass. And encounters with glacier caps crowning rocky mountain peaks and glistening in the morning sun."

Golgofskaya has traversed the zapovednik's territory many times, and not just along beaten paths. There is practically no corner of this deep wilderness that she has not laid eyes on. "My very favorite places in the zapovednik," she writes, "are the Malaya Laba River Valley and the Umpyr cordon and its surroundings. It was precisely here, in these places, that I felt most comfortable. These are sublime and peaceful landscapes that evoke from me now a sense of great nostalgia. My entire life has been spent here, in the zapovednik," she says. "Everything is linked to it. It is impossible for me to separate my work from my personal life. Here in the reserve I enjoyed my first successes in science and met many interesting people, including my husband, Vladislav Andreevich Kotov. Our daughter Tanya, now a senior scientist at the zapovednik, was born in Maikop. I am watching my grandchildren grow up. They, too, are interested in science."

In addition to her scientific research, Golgofskaya also actively participated in the life of the zapovednik. She took part in creating an exhibit in the reserve's museum, participated in nature conservation educational activities, and prepared materials about the history of the zapovednik and its staff. She is conscientious in her approach to her work and always willing to help people. Among the zapovednik's staff, Golgofskaya has always been a leader, involving herself in the organization of various celebrations and *subbotniks*. [A *subbotnik* is a day of voluntary, unpaid labor. Trans.] and, in hard times, rallying the staff. People like Kseniya Golgofskaya are the foundation of the reserve.

Kseniya Golgofskaya has made an enormous personal contribution to Kavkazsky State Biosphere Zapovednik and to Russia's protected area system as a whole. In 2002, on the occasion of the eighty-fifth anniversary of Russia's protected area system, she was awarded a certificate of recognition by the Ministry of Natural Resources for her great contribution to the development of protected area affairs in the Russian Federation. In 2004, on the occasion of her eightieth birthday, the Ministry conferred her with the Merited Sign of the Ministry of Natural Resources of the Russian Federation "for service to protected area affairs."

A recent photograph of Kseniya Golgofskaya. *Photo by V. Gorchakov.*

When asked what the zapovednik means to her, Kseniya Golgofskaya answers, "It is a small piece of our vast native land, Russia. For me, it is also a cathedral, a large cathedral of the soul and heart, free from human vanity and fuss, baseness, greed, envy, malice, and betrayal. For me, it isn't work, but life itself, my home, my family."

***Tatiana Akatova**, Kseniya Golgofskaya's daughter, is a Senior Scientist at Kavkazky Zapovednik.* ***Lyudmila Grabenko** previously worked as an Environmental Education Specialist at Kavkazsky Zapovednik and now is a teacher at a school in Maikop.* ***Lyudmila Boichenko** works as an Environmental Education Specialist at the reserve.*

"Protection of Nature is Protection of the Fatherland"

Visitors on opening day of the "Protection of Nature is Protection of the Fatherland" exhibit. *Photo by A. Troitsky.*

Just days after heads of state from around the world gathered on Red Square this past May 9 to celebrate the sixtieth anniversary of Allied victory in World War II, a unique exhibit dedicated to Russian nature conservation organizations' contributions to the war effort opened in Moscow. The exhibit, called "Protection of Nature is Protection of the Fatherland," was held in the Nature Conservation Pavilion of Moscow's All-Russia Exhibit Center. The exhibit ran from May 15 - May 30, 2005. It was jointly organized by Moscow's Department of Nature Use and Environmental Protection; the Moscow Center for Environmental Education, Awareness, and Propaganda; the Federal Service for Oversight in the Sphere of Nature Use; and the International Association for Cultural and Humanitarian Linkages.

Large thematic posters about the military and labor achievements of Russia's zapovedniks and the Moscow Zoo during the war comprised the centerpiece of the exhibit. The posters featured unique photographs and factual and cartographic material about the war era.

Russian Conservation News *is please to present our readers with select photographic materials from these posters, as well as adapted versions of the poster texts. These materials were graciously provided to us by Yulia Goreleva, the Director of the Nature Conservation Pavilion at the All-Russia Exhibit Center.*

Zapovedniks and the War Effort

Even during the war years, scientific research continued in Russia's zapovedniks. *Photo provided courtesy of the Nature Conservation Pavilion of Moscow's All-Russia Exhibit Center.*

During the war, thousands of zapovednik staff members, both scientists and rangers, left for the front. In reserves located further from battle and occupation zones, those who remained behind played an important role both in continuing their reserve's activities—during the war not a single zapovednik was closed—and in contributing to the war effort.

Throughout the war, staff of these zapovedniks remained vigilant in their efforts to combat poaching on their reserve's territory. Even when food and other resources were in short supply, poaching was considered an intolerable violation of a reserve's protection regime.

Science also continued in the reserves. Despite the unthinkable hardships gripping the country, the government continued to finance research activities in the zapovedniks, although it did curtail some scientific programs and adapt others to support more directly the needs of the national economy. In late 1943, for instance, the Main Directorate for Zapovedniks approved a scientific program for 1944 that included strategic research topics such as: geological and geographic surveying; prospecting for rare and defense-related minerals; determining the quantity and distribution of plants with medicinal, industrial, and commercial value; researching methods of reforestation in felled and burnt areas; and studying the ecology of commercially valuable animal species.

In addition to performing their traditional scientific and protection tasks, zapovednik staff also assisted the front line. They gathered and prepared medicinal plants, mushrooms, and berries; and baked bread that was delivered to Soviet troops. They also contributed money to support a squadron of planes appropriately called "Sovietskiye Zapovedniki," or "Soviet Zapovedniks."

Although the government's prevailing position during the war was that the reserves' main goal should be to preserve nature, it did approve limited utilization of natural resources in a number of zapovedniks to address urgent needs. The government allowed timber harvest in Kavkazsky, Buzuluksky Bor, Ilmensky, and Mordovsky Zapovedniks, among other reserves. During the war period, the zapovedniks contributed approximately 700,000 cubic meters of timber to the war efforts, with about half the logging taking place in Ilmensky Zapovednik, in the southern Ural Mountains.

Along Partisan Trails

The fighters of the Russian Resistance movement, who were known as partisans, had a major impact on the course of the war. They operated over an immense territory stretching from the Estonian-Russian border in northwestern Russia to the Crimea in the south. Partisans engaged in classic guerilla activity. They stealthily attacked the German Army in the rear, destroyed military property, damaged communication and supply lines, and provided valuable reconnaissance. Well knowing the local territory, they had a significant advantage over the enemy, despite the fact that the Germans were generally better equipped.

Men, women, and children joined Russia's Resistance movement. These "partisans" has an important impact on the course of the war. *Photo provided courtesy of the Nature Conservation Pavilion of Moscow's All-Russia Exhibit Center.*

Among Russian zapovedniks existing during the war, the following were located in battle and occupation zones: Tsentralno-Lesnoi (Tver Oblast), Tsentralno-Chernozemny (Kursk Oblast), Krymsky (on the Crimean Penninsula, now part of Ukraine), Tulskiye Zaseki (Tula Oblast), Voronezhsky (Voronezh), Kavkazsky (Krasnodar Krai), and Teberdinsky (Republic of Karachaevo-Cherkessia). Staff of these reserves frequently participated in partisan activity.

The partisan involvement of Krymsky Zapovednik's staff is particularly notable. The reserve's former director, A. V. Mokrousov led a partisan detachment in which most of the reserve's staff participated. Hearty and used to living and working in severe conditions, they spent long periods at a time in the mountains and were able to inflict appreciable damage to German troops in the region. The zapovednik's partisan brigade did not escape without losses. In one skirmish with German soldiers, the life of ecologist Vladislav Bukovsky came to a tragic but heroic end. He bravely fought, but realizing circumstances were not in his favor, he used his last grenade to kill himself and his enemies.

Battle for the Caucasus

German military strategists placed particular importance on capturing the Caucasus Region, which offered access to rich agricultural lands and to Soviet oil fields in Maikop, Grozny, and Baku. The Germans launched their drive for the Caucasus on July 25, 1942, and by mid-August of that same year, much of the northwestern Caucasus had fallen into enemy hands. Ultimately hoping to penetrate the Trans-Caucasian front and reach the Black Sea, German troops began their advance over high mountain passes in the Main Caucasus Range, an operation termed "Edelweiss." This brought the war home to Kavkazsky Zapovednik.

Soviet soldiers advance toward victory in the Caucasus. *Photo provided courtesy of the Nature Conservation Pavilion of Moscow's All-Russia Exhibit Center.*

Reserve staff, who were excellent trailblazers and mountaineers, and who knew the region well, actively participated in the opposition movement. Kavkazsky Zapovednik observers (the equivalent of present-day inspectors) came to the aid of the Soviet Army. They led Soviet soldiers along mountain paths to firing positions and often participated in battles themselves. Having guided a platoon of mortar men to the village of Khamyshki, two observers thus participated in the liberation of the small mountain community. For their selfless contributions, zapovednik staff members earned the highest appraisal both from Soviet Army Command and from partisan brigades.

Reserve staff also performed remarkable feats of bravery to preserve the zapovednik's unique population of mountain bison. During the war years, the reserve's bison herd numbered just nine individuals and was kept in an enclosure called the "bison park." During the summer of 1942, the Germans bombed the bison park four times. When the enemy neared, seven zapovednik staff – including four women and two children – who were caring for and protecting the animals, drove the bison to safety in the reserve's most remote units. Often risking their own lives, they never left the bison unsupervised, camouflaged them when necessary, and fed them, sometimes delving into their own meager food stores. [Note from the editor: The text of the preceding paragraph did not appear on any of the original exhibit posters, but was included in a speech that protected areas expert Vsevolod Stepanitsky delivered at the exhibit's opening ceremony.] By early January 1943, the battle for the Caucasus took a decisive turn. The Soviet Army went on the offensive and succeeded in turning back the German advance. Although the Germans had fallen just a kilometer and half short of reaching the zapovednik's headquarters, which were then located in Guzeripol, Kavkazsky Zapovednik staff succeeded in completely restoring the reserve's protection regime by February 3, 1943.

The Moscow Zoo during the War Years

On July 21, 1941, the German Lutwaffe launched its first bombing raid on Moscow, with 73 subsequent raids on Russia's capital to follow throughout that year. The Moscow Zoo was bombed for the first time during the late evening hours of July 22-23, 1941, when more than 500 fire bombs and 10 demolition bombs fell on the zoo's territory.

The zoo's animals reacted in various ways to the bombing raids. Although some carnivorous mammals paid little attention to the explosions, other species were extremely frightened by the bombing and died from stress or wounds. During one of the initial raids, a parrot lost a leg on glass shards. After that, zoo officials decided to evacuate the most valuable parrots to a city, which at the time, they considered to be less imperiled, Stalingrad. [Editor's note: In 1942, Stalingrad, or Volgograd, as the city is now known, would become the site of one of the war's bloodiest battles.]

During the war years, a military unit and anti-aircraft gun were installed at the Moscow Zoological Park. *Photo from the archives of the Moscow Zoological Park and provided courtesy of the Nature Conservation Pavilion of Moscow's All-Russia Exhibit Center.*

For the Moscow Zoo, the birth of a baby hippopotamus, August, was a bright spot in 1943. *Photo from the archives of the Moscow Zoological Park and provided courtesy of the Nature Conservation Pavilion of Moscow's All-Russia Exhibit Center.*

The animals that remained in the zoo throughout the war lived in far from ideal conditions. Shortages and decreased funding forced zoo staff to cut animals' daily rations and decrease enclosure temperatures. Animals inhabiting the zoo's "Island of Beasts," a new territory opened shortly before the war, were transferred back to the old territory to make way for a military unit and anti-aircraft gun that were installed there. The only animal to remain on the "Island of Beasts" was a black bear named Zoyka. Zoyka had already retreated to her den for the winter when zoo staff began evacuating the island's other animals, and when she emerged from hibernation that spring, she so charmed the soldiers stationed there with her tricks and efforts to beg for food, that she remained on the island until the end of the war. Other zoo animals made their own contributions to the war effort. Some animals, such as camels, were enlisted as beasts of burden. The Moscow City Council (Mossovet) also issued a resolution approving the slaughter of some animals whose flesh they considered edible.

Although the zoo's staff decreased significantly during the war— from 750 people before the war, to 225 just following the initial bombing raids, and even fewer as the war wore on—the zoo remained open practically throughout the entire course of the war, with soldiers receiving free admission. Although the war years were a very difficult period for the zoo, there were moments of joy and cause for celebration. In August 1943, for instance, the zoo welcomed the birth of a baby hippopotamus, appropriately named August.

Before the war, camel-drawn carriage rides were a popular at attraction at the Moscow Zoo. The military, it seems, borrowed from this experience: the camel train pictured to the right made it almost all the way to Berlin! *Photos provided courtesy of the Nature Conservation Pavilion of Moscow's All-Russia Exhibit Center.*

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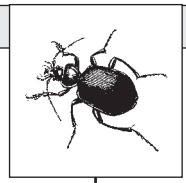

Раздел I. Особо охраняемые природные территории
Воспоминания о начале «Марша парков» в России. ***Маргарет Вильямс.*** Нынешний 2005 - год подведения итогов одной из самых популярных российских природоохранных акций - «Марш парков». Один из авторов идеи и начинателей Марша – Маргарет Вильямс - делится воспоминаниями и размышлениями об истории, развитии событий и результатах Акции.
«Марш парков» - 10 лет в России. ***Ирина Чебакова.*** Почти 10 лет всеми организационными мероприятиями и информационным обеспечением Акции занималась Ирина Чебакова, работавшая в Центре охраны дикой природы и являвшаяся координатором этого успешного проекта. Мнение Ирины о проделанной работе и взгляд на Акцию «изнури» в нашей статье.
Марш парков – 2005. Вести из заповедников и национальных парков. В репортажах из Кавказского, Хакасского, Волжко-Камского, Тигирекского, Болоньского заповедников и национального парка «Зюраткуль» рассказывается о некоторых событиях Марша парков этого года.
Дендрологический парк «Южные культуры»: историческая и природная жемчужина Черноморского побережья. ***Людмила Бойченко, Светлана Попова и Рита Мелконян.*** Генерал, вице-губернатор Петербурга Даниил Васильевич Драчевский захотел украсить территорию вокруг своего, выигранного в карты, адлерского имения «Случайное», и сделал это, оставив в наследство многим поколениям города Сочи прекрасный дендрологический парк. В 70-е годы в парке насчитывалось более 1000 видов, форм и сортов растений. Но, начиная с 1983 года, здесь пронеслись несколько смерчей, от которых пострадало около 3000 деревьев. Авторы статьи рассуждают о необходимости реконструкции и возрождения парка, о вариантах решения проблем.
Алтайский заповедник неожиданно нашел партнера в Росавиакосмосе. ***Мелисса Муза с помощью директора Алтайского заповедника Вячеслава Трегубовича.*** Космические ракеты оставляют на Земле вполне реальный след в виде химического загрязнения и падающих ступеней в несколько тонн весом. Территория Алтайского заповедника с его девственной природой – один из наиболее загрязняемых остатками ракет участков. Об этой проблеме и принимаемых мерах по ее решению в публикуемом интервью.

Раздел II. Новости неправительственных организаций
За экологическую безопасность ракетно-космической деятельности. ***Сергей Кричевский.*** Ракетно-космическая деятельность, помимо всем известной пользы, и вклада в развитие человечества, сопровождается нарастанием экологической опасности и ущерба для человека и природы, массовыми нарушениями прав граждан. Об этой проблеме информируют специалисты-экологи неправительственной организации МСоЭС, разработавшие и реализующие специальную программу «За экологическую безопасность РКД».
Гражданское общество, экологические организации и президент Путин. ***Давид Гордон.*** В июле президент Российской Федерации В.В. Путин встретился с руководителями российских общественных организаций. Комментарии президента о международном финансировании и будущем российском экологическом законодательстве усилил многие из самых острых опасений, которые возникли ещё в начале его правления.

Раздел III. Специальный раздел: Охрана природы на Кавказе: взгляд на Армению.
Ландшафтное и биологическое разнообразие Армении. ***Гоар Оганезова.*** Несмотря на незначительные размеры, территория Армении располагает уникальным ландшафтным и биологическим разнообразием. Здесь можно найти и леса, и пустынные участки, и горы, и уникальное по красоте и запасам пресной воды горное озеро... Статья знакомит нас с наиболее интересными особенностями природы Армении и проблемах ее сохранения.
«Armenia Tree Project» начинает борьбу с обезлесиванием Армении. ***Джефф Мазарян и Джейсон Сохигян.*** Отсутствие альтернативных источников топлива, легальная и нелегальная рубка и вывоз леса, ошибки в управлении, привели к значительным потерям лесов Армении. Для их спасения в 1994 году армянка из Америки Каролина Мугар создала проект по возрождению лесов, благодаря которому были открыты питомники по лесоразведению и высажены тысячи деревьев. Одновременно с посадкой лесов финансировались и социальные вопросы – борьба с бедностью, экологическое просвещение населения и другие.
Озеро Севан. Уроки природопользования. ***Рафаел Оганесян, Жанна Мкртчян, Роберт Оганесян, Вардуи Григорян.*** Озеро Севан, расположенное в северо-восточной Армении, характеризуется своеобразным гидрохимическим режимом, уникальным составом гидробионтов и является единственным крупным резервуаром пресной воды на Южном Кавказе. Во второй половине 20-го века осуществлялись проекты по использованию вод озера для нужд человека, что привело к ряду необратимых и непредсказуемых процессов. Задачу по спасению озера сейчас пытаются решать как природоохранная и научная общественность, так и правительственные структуры Армении.
Победа в заповеднике «Шикахох». ***Инга Зарафян.*** Раскаленная земля – так переводится название уникального заповедника на юге Армении – Шикахоха. В ноябре 2004 г. Правительство Армении приняло решение о строительстве автомагистрали Капан – Мегри, часть которой предполагалось провести через Шикахохский заповедник. Несмотря на отсутствие необходимых документов и экологической экспертизы, строительные работы по прокладке дороги были начаты. Вся природоохранная общественность встала на защиту заповедника, и Правительство было вынуждено отменить ошибочное решение.
Исследования лесных хищных птиц самой высокой горы Армении. ***Айк Арутюнян, Маро Кочинян, Карен Агабабян.*** Самый высокий горный массив Армении – Арагац (4090м н.у.м.), находится в центральной части Республики достаточно изолирован от остальных хребтов. Также изолирован и небольшой лесной массив, покрывающий южный макросклон горы, где участниками проекта "Птицы Армении" Американского Университета в Армении были обнаружены все виды дневных хищных птиц, населяющих леса Республики. О своих наблюдениях рассказывают участники 6 орнитологических экспедиций.
Изменение видового разнообразия околоводных и водоплавающих птиц на отдельных ключевых орнитологических территориях Армении. ***Ншан Маргарян, Мамикон Касабян и Люба Балян.*** Армянская природоохранная общественность совместно с международной организацией BirdLife International осуществляет Программу «Ключевые орнитологические территории Армении» Из 18 выделенных ключевых территорий 5 являются водно-болотными угодьями. В статье рассказывается о 3 из них. Особое внимание уделяется влиянию человеческой деятельности на разнообразие водоплавающих и околоводных птиц этих ключевых территорий.
Изучение и сохранение переднеазиатского леопарда в Армении. ***Игорь Хорозян и Александр Малхасян.*** По оценкам экспертов на территории Армении сейчас живут не более 10-15 особей леопарда. Причины, приведшие вид на грань вымирания – уничтожение мест обитания, подрыв кормовой базы, браконьерство и беспокойство. Озабоченные судьбой леопарда, авторы начали изучение вида, выявление наиболее важных районов обитания животных, мониторинг их численности, разработка мер охраны, просветительская работа с местным населением и пограничниками.

Раздел IV. Виды животных и растений, находящиеся под угрозой исчезновения
Результаты учетов показали – амурский тигр удерживает позиции. ***Материал предоставлен пресс-службой WWF.*** Результаты последнего учета амурского тигра, проведенного зимой 2005 года на всем ареале, показали, что его численность в России стабильна. Ученые заявляют, что на Дальнем Востоке сейчас обитают 334-417 взрослых особей и 97-112 тигрят. Это говорит о стабильности популяции вида на этой территории, в отличие от других частей Азии, где численность тигра попрежнему сокращается. Такая стабильность - результат усилий многих любителей природы, спонсоров со всего мира.
Заслуженный эколог инициирует и много лет осуществляет работы по сохранению алеутской канадской казарки (Branta Canadensis leucopareia Brandt). ***Денис Вудс с помощью Константина Згуровского и Маргарет Вильямс.*** Любовь к природе и преданность делу отличает авторов и исполнителей проекта по сохранению канадской казарки. Повсеместное сокращение численности вида привело к тому, что он был внесен в Красную книгу многих государств. Принятые меры позволили исключить казарку из Красной книги Аляски, однако на территории России его численность так и не восстановилась. О конкретных работах по спасению вида в России рассказывается в статье.

Раздел V. История природоохранной деятельности
Ксения Голгофская - 50 лет в Кавказском заповеднике. ***Татьяна Акатова, Людмила Грабенко, Людмила Бойченко.*** Ровесница Кавказского заповедника, научный сотрудник Кавказского заповедника Ксения Юрьевна Голгофская в нынешнем году отмечает второй юбилей – 50 лет ее рабочего стажа в заповеднике. Для Голгофской заповедник - «Это маленький кусочек большой Родины – России. Большой храм души и сердца, свободный от человеческой суеты, подлости, алчности, зависти, злобы и предательства. Это не работа, а сама жизнь, родной дом, моя семья».
«Защитники природы – защитники отечества». В павильоне «Охрана природы» Всероссийского выставочного центра в Москве прошла выставка, посвященная 60-летию Победы в Великой Отечественной войне, боевому и трудовому подвигу природоохранных организаций и их сотрудников в военные годы. В основе экспозиции - материалы о российских заповедниках и Московском зоопарке в годы войны и вкладу этих организаций в Победу.