Protected Areas Programme



Vol 6 No 3 · October 1996 Protected Areas and Post-Communist Reform

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Editorial

PAUL GORIUP

HIS ISSUE OF PARKS focuses on the effects of the post-Communist transition process on protected areas, mainly in the states of the former Soviet Union. The papers were assembled by Natalia Danilina, and Clement Patient ably edited the translated texts. A pithy overview was kindly provided by Margaret Williams.

In reading the material, one could be forgiven for feeling that there is an irreversible decline in progress, with the already meagre protected area network first to go to the wall. But Margaret Williams is right to point to the first glimmers of hope and optimism that the worst may be over. But travelling from Ukraine to Kazakhstan, one gains a sense of immense contrast. The staff of protected areas face deprivation with dedication, determination and innovation. Fieldworkers and institutes have assembled unparalleled environmental data sets over decades but have no tools or techniques for analysis and interpretation. And the vast arable landscapes (occupying virtually the whole former steppe zone) are demarcated abruptly by equally huge areas of natural vegetation.

It is this lack of intermediates between extremes that most strikes the western visitor today: for the most part habitat is either destroyed or intact. The mosaic of semi-natural vegetation so characteristic of western Europe is only beginning to become a feature of eastern Europe and northern Asia as agricultural land is abandoned, military training areas retired and polluted sites vacated.

This situation is reflected in the protected area planning system, no less subject to the centralised orders of narrow hierarchies than Communist society as a whole. In the past, nature reserves were off-limits for ordinary people. They were guarded by wardens who, to serve the wishes of privileged scientists and party officials, sometimes took a zealous approach that has left lingering resentments.

The future challenge, and indeed historic opportunity, will be to re-think the whole approach to biodiversity conservation in the post-Communist era, and especially to add a human face to its implementation. At the very least, the concept of buffer zones, described in this issue by Jerzy Kozlowski and Ann Peterson, will have to be seriously taken on board. Ways of restoring the ecological value of surplus land, hand in hand with sustainable rural development, need to be found. Few areas on earth offer the scope for large-scale experiment that is now available in eastern Europe and northern Eurasia. The lessons will have, indeed are already having, a profound effect on the administration of protected areas everywhere.

Paul Goriup is Editor of PARKS. He is currently leading an IUCN project on Sustainable Agriculture and Steppe Biodiversity in Russia and Ukraine.



Opportunities from chaos: a new era for protected areas of the former Soviet Union

MARGARET WILLIAMS

OR MANY years, the combined barriers of the Cold War, language differences, and an information deficit kept the former Soviet Union's protected areas unknown to the west. Only in recent years was this treasure – a vast and valuable system of nature reserves – discovered by the international conservation community.

As the articles in this issue of PARKS will attest, the changes that erupted with the collapse of the Soviet Union have in many ways incapacitated the state system of protected areas. Today, the drastically reduced federal budgets no longer adequately support the basic operational needs of the reserves and parks; ethnic conflicts between newly independent states have brought wrenching changes to the reserves; and pressure to develop the natural resources protected in these areas has sharply increased. In some regions, such as the remote reaches of Russia and Central Asia, the problems are so overwhelming that many dedicated professionals have been forced to leave their work and homes in protected areas.

Despite these hardships, the current period of social, political and economical instability in the former Soviet Union offers new opportunities to domestic conservationists, their colleagues abroad, and to the general public at large. In the late 1980s the removal of the old barriers signified greater access to information, opportunities for professional exchanges between the former Soviet Union and the west, and new partnerships – all of which had been unthinkable in the former regime.

And, while the crash in the federal budget spells disaster in many places, the stark need to raise funds has forced protected areas to look for new sources of support. No longer able to rely on the state, nature reserves and national parks are now looking to local communities for support. This search for support has led to a new wave in public education initiatives. Managers are developing ingenious methods of attracting support and making partners out of the most unexpected players. In one case in Russia, a nature reserve has enlisted the support of the Orthodox church, the military, the schools and a petrol company! People who were once shut out from protected areas are now being invited to learn about and enjoy the nature set aside for preservation. Although the results will not be instant, these important efforts will undoubtedly be critical in raising a new generation of citizens who value their environment and natural heritage.

In recognising the 'positive' aspect of the chaos in the former Soviet Union, we should not ignore the difficulties facing protected areas and the suffering of the people who work in them. Rather, we should realise that we conservationists beyond the borders of the former Soviet Union are faced with a rare opportunity to take part in the tumult of change and shape a future which is better for nature and humans. In the west we can contribute to this future by facilitating information exchange with our colleagues in that region, supporting joint projects and joint

publications, and working with our governments to ensure that foreign assistance continues to flow to the Commonwealth of Independent States (CIS) for nature conservation during this unstable period.

This new period of openness offers the west a tremendous opportunity to learn from the Soviet experience in conservation (which, contrary to popular belief, is extensive) and from the scientific resources that accumulated for years in the nature reserves of the CIS. Similarly, the world has much to benefit from the natural and cultural sites being protected as national parks throughout northern Eurasia. Like the famous Hermitage Museum in St Petersburg which preserves thousands of valuable and unique objects, the forests, wetlands, wilderness and cultural monuments form a unique historical record which must be preserved for future generations.

The international community can and should play an important role in assisting protected areas of the CIS. These places are crucial to preserving irreplaceable natural resources and global biological diversity. Assistance from international organisations is essential now, but is unlikely to be needed in the long-term. The level of domestic expertise is extremely high, and in most countries of the CIS a cadre of skilled and energetic managers, scientist and environmentalists continue to work in the system of reserves and parks. The new efforts to develop public outreach programmes suggest that the next generation of citizens and governments of these countries will wish to sustain their protected areas. In a short period of time, they have found and will continue to find resourceful solutions to problems in the post-Soviet era.

Margaret Williams has been working closely with Zapovedniks (State Nature Reserves) in Russia for several years, and more recently in Central Asia, to develop public support and education programmes. Currently she is editor of Russian Conservation News, and Co-Director of the Centre for Russian Nature Conservation.

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IUCN - The World Conservation Union

Founded in 1948, The World Conservation Union brings together States, government agencies and a diverse range of non-governmental organisations in a unique world partnership. IUCN seeks to influence, encourage and assist societies throughout the world to conserve the integrity and diversity of nature and to ensure that any use of natural resources is equitable and ecologically sustainable.

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World Commission on Protected Areas (WCPA)

WCPA is the largest worldwide network of protected area managers and specialists. It is one of the six voluntary Commissions of IUCN – The World Conservation Union, and is serviced by the Protected Areas Programme at the IUCN Headquarters in Switzerland. WCPA can be contacted at the IUCN address above.

The WCPA mission is to promote the establishment and effective management of a worldwide network of terrestrial and marine protected areas.

Zapovedniks of Russia and the modern state

V.B. STEPANITSKY

This paper gives a general outline of some major problems confronting zapovedniks in Russia. At the level of macro-economic policy in the Russian State, the policies being promoted in favour of a market economy may adversely impact on the gains which have been achieved by zapovedniks. At the level of sectoral policy, the State has approved new regulations, such as the ban on privatising zapovednik property, with a view to giving zapovednik authorities more control over protected areas. The effective enforcement of these new regulations however depends to a large extent on the availability of human and financial resources. Many zapovedniks are in debt and cannot even buy necessary materials such as fuel wood or heating oil. Their poor powers of enforcement do not facilitate their role of preventing the encroachment of nature reserves. It is also argued that the natural resources of zapovedniks are being unscrupulously exploited by high state officials who are hunting and fishing illegally. The confrontation between zapovednik authorities and members of regional or state bodies can be said to reflect the opposing forces of a liberalised economy and those of strict conservation. The author is of the opinion that zapovedniks in Russia face a bleak future.

APOVEDNIKS ARE nature sites which are owned by the state and have been traditionally used for biodiversity protection in Russia. Most zapovedniks are under the authority of the Ministry of Environment Protection and Natural Resources of Russia, while others are controlled by the State Committee for High Education or the Federal Forestry Service. There are 93 zapovedniks in Russia, covering a total area of 30,057,434 ha. They represent 1.48% of Russian territory under legal protection.

The Presidential Decree of October 1992 on "Protected Areas of the Russian Federation" states that "conservation and the development of protected areas are priority goals in Russian environmental policy". The Federal Law of 1995 also declares that protected areas are part of the national property of Russia. A programme to establish 62 new zapovedniks in Russia by the year 2000 has been approved by the president. To that effect, 18 new zapovedniks have been established since 1992 and the territory of 11 zapovedniks has been increased. The total area of zapovedniks has in fact increased by more than one third. The programme also calls for significant levels of funding to maintain the daily operations of zapovedniks and for carrying out scientific research.

At the administrative level, some restructuring of the overall management of zapovedniks has been implemented. It is expected that the administrative changes will help in effective enforcement of the new legislative framework. For example, the warden's department, formerly under the jurisdiction of the Forestry Department, is now overseen by the Russian Inspectorate which has authority for nature conservation.

Functions of zapovedniks

Scientific research

Zapovedniks have played a central role in scientific research: 75 zapovedniks have a scientific department, and there are 429 scientists engaged in the study and

monitoring of zapovednik ecosystems. The agenda for scientific research is set out in the "special purpose scientific research programme" of the MinPriroda of Russia. Moreover, they also conduct scientific research in compliance with collaborative agreements between Russia and foreign conservation research organisations. The results of such research are increasingly being considered as an essential element for policy making in the field of nature conservation and sustainable use of natural resources in Russia.

Environmental education

The role of zapovedniks as institutions for environmental education is recognised in the Federal legislation. Many zapovedniks have started to inform the public about the importance of protected areas. They are now well recognised for their innovative work with schools and musuems as well as with the media. Such activities are geared towards creating popular support for zapovedniks.

Impacts of privatisation on zapovedniks

Zapovedniks are also increasingly being recognised for their importance in the conservation of the earth's natural resources. Hence, 18 zapovedniks have Biosphere Reserve status; one is on the list of World Heritage sites; and eight of them are considered as wetland sites of international importance under the Ramsar Convention. However, there is a fear that the process of land reform and privatisation in modern Russia will have negative implications for the whole network of zapovedniks. Those involved in nature protection are concerned that the trend towards private ownership does not affect the traditional role of zapovedniks, that of nature protection. It has therefore seemed essential to expand the network of zapovedniks in the face of development pressures. At the same time, new legal measures have been passed by the Department of Reserves Management. The legislation in place is intended to solve some of the problems confronting the authorities which are in charge of zapovedniks. The legislative framework includes the following:

Prohibition of the confiscation of territories which have been formally passed under zapovednik control.

Prohibition of renting the territories owned by zapovedniks.

Prohibition of privatising zapovednik property, such as houses and research facilities.

• New legal measures consolidating the legal status of zapovedniks as places for scientific research and education.

• A taxation regime which would increase the financial resources of zapovedniks, such as dispensation from taxes on profits, and return of the money which has been levied as fines.

Availability of financial and human resources.

Financial problems

These new measures have been welcomed, but in spite of the high-level declarations of intent to increase the financial resources of zapovedniks, the reality is very different. Some zapovedniks do not have enough resources to pay their electricity and heating bills. There is an acute shortage of equipment and materials. Hence, the guard and inspection service has no means to acquire modern methods of communication and field monitoring equipment. Also, the lack of funding threatens the ongoing captive breeding projects which have been successful in many zapovedniks. These projects involve rare animal species such as European bison *Bison bonasus* and crane *Grus grus*.

Some examples of funding problems

The lack of funds particularly affects zapovedniks which are situated in remote areas, such as the Siberian regions and the European Far North. It is extremely difficult to provide them with building materials, petrol supplies or firewood. Another example of the critical situation of remote zapovedniks relates to the marine and coastal areas in the Far East Arctic region. Protection is inadequate as there is no boat for patrolling the area.

The following are some concrete examples of financial problems that illustrate the critical situation of some zapovedniks.

■ The main office of Barguzinsky zapovednik is situated 180 km away from the nearest village. Supplies can only reach personnel by water transport through Lake Baikal. However, the boat which is used for delivering supplies needs urgent repairs and is grounded. The boat will not be repaired in the foreseeable future since there is no budget for maintenance and repair. To date, the zapovednik has debts of USD\$30,000 for deliveries of energy supplies.

• Ostrov Vrangelya zapovednik in the Far North has debts exceeding USD\$100,000 for fuel and lubricants. The air connection to the mainland, which is crucial throughout the year, has been stopped.

Bashkirsky zapovednik, a data gathering centre, has ceased its operations. Vehicles, machines and houses have fallen into disrepair.

■ Kronotskjy zapovednik is situated 200 km from the nearest village. There are no roads leading to the protected area and supplies have to be delivered by air. However, the 1995–1996 budget did not make any provision for air transport. There are debts of more than USD\$50,000 due to the air-flight company. Also, the heating has been turned off as bills are still unpaid.

As can be expected, the lack of financial resources imposes constraints on the recruitment of guards and salaries are very low. Even state inspectors are not well paid. It can be said that zapovedniks survive only because of the enthusiasm and commitment of the remaining staff for nature conservation.

Threats to protected areas

In recent years, there have been many attempts by regional and local authorities to reduce the size of protected area territory or to change the status of protected areas in order to exploit their resources without hindrance. As mentioned earlier, Russian legislation prohibits the confiscation of land which is declared as zapovednik territory. However, some officials seem to ignore the current legislation, such as the Council of Ministers of Tuva (an autonomous republic) which has confiscated 50,000 hectares of protected areas to be used for deer hunting. The confiscated land is also rich in valuable species such as cedar wood, and beaver *Castor fiber* of the Bash-Khem river. Protected area land has also been confiscated by the Supreme Council of the Republic Kabardino-Balkaria. The teritory of Kabardino-Balkarsky zapovednik was reduced by 1,142 ha, an area which contains unique highland woods. Such actions clash with the official state commitment to safeguard protected areas, and reflect the tension between effective conservation and the move towards privatisation.

Poaching

Illegal hunting and poaching are common in many zapovedniks. Wild meat, fish, animal furs and ginseng are some of the natural resources which are increasingly being harvested without authorisation. For example, the herd of thoroughbred bisons in Severo-Osetinsky zapovednik has been reduced by poaching. In Kavkazsky biosphere reserve, the number of ungulates has fallen dramatically. Prevention is extremely difficult since the guards of zapovedniks do not have the means to track down and fight poachers. The effective enforcement of laws against poachers is very difficult since it seems that many poachers are in fact high ranking officials who often use their authority and power to challenge the patrol service of zapovedniks. For example, officials of the Regional Department of the Internal Affairs of the Amurskaya district were caught illegally fishing, but have used their power in retaliation. One inspector of the zapovednik was jailed for ten days and the premises of the zapovednik were searched. Very often, helicopters of the Air Defense Army are used to transport poachers from one place to another or are used for above ground shooting of animals.

The zapovednik workers who try to prevent encroachment of protected areas also face serious risks of being killed. For example, the inspectors of Kaluzhskiye zapovednik were met with armed men while trying to prevent poaching. In the Republic of Tuva, four inspectors have disappeared since September 1994. Their disappearance is cause for alarm as to the safety of zapovednik officials in the course of their duties. There are many more examples which demonstrate that zapovednik professionals are not being supported by officials of the State in the enforcement of protected areas legislation. Too often, decrees and regulations approved by state officials are being flouted by the same officials. In such a situation, zapovednik professionals face daunting challenges in maintaining an adequate regime for nature conservation in Russia.

Conclusion

The conflict between conservation and economic development in Russia is reflected in the emerging legislative framework to expand protected areas and in the attempts by high ranking bureaucrats to exploit the existing resources in defiance of existing legislation. Although there seems to be a desire to maintain the international importance of Russia's protected areas, as the various new national state laws show, there are difficulties in enforcing them at local and regional levels. Most importantly, zapovedniks lack resources to implement these rules and regulations. Concrete support from all levels of state administration is also not forthcoming, as has been argued. On the contrary, it appears that the activities of some local and regional officials are seriously undermining zapovednik conservation efforts.

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Protected areas in conditions of democratic change in Russian society

NATALIA DANILINA

Zapovedniks were established as strict nature reserves and therefore have a long history of excluding human activities. However, these protected areas were used as holiday and hunting resorts for the governing elites, thus reinforcing the image of zapovedniks as forbidden territories for local people. The participation of local people in the management of zapovedniks is now recognised as essential for the survival of biodiversity. A series of projects, under the guidance of the "Environmental Education Centre Zapovedniks", have been implemented. The aim is to educate both zapovednik managers and the public about the benefits of protected areas. This is a challenging endeavour in a society in transition from a planned to a market economy. Activities promoting environmental education may not be lost even though social and economic changes point to the contrary. The author also argues that technical and financial support from the international community is an essential ingredient for the successful implementation of environmental education programmes.

THE TERRITORY of Russia encompasses four climatic zones (arctic, subarctic, temperate and subtropical) and practically all biomes are represented, including arctic desert, tundra, forest-tundra, forest (coniferous, mixed and broad-leaved forests), forest-steppe and steppe with the famous Russian "chernozem" (black earth). Forests still occupy vast areas of Russia and remain one of the essential natural resources.

Baikal seals Phoca sibirica in the "Baikalsky" Nature Reserve. Photo: K. Mikhalkin.

The present condition of economic and political instability, together with poor enforcement of protected areas legislation and environmental degradation, make protected areas even more important for the effective conservation of species and



ecosystems. In fact, protected areas may become the last refugia for many animals and plants.

Protected areas in Russia have been established to meet three goals, namely conservation, ecological monitoring and recreation. Russian legislation describes protected areas as sites of ecological, aesthetic, historical and medical importance.

The main types of protected areas are: State zapovedniks, of which 18 have biosphere reserve status.

National parks.

"Zakazniks" or monuments of regional or national importance.

Zapovedniks and national parks have national and global importance and are under the control of federal authorities. Zakazniks and other types of protected area, are managed by district authorities. The role and potential of the latter as protected areas is not well recognised, but they can play an essential role in conservation. It is significant that an inventory of this type of protected area is under way. Moreover, the Action Plan for Protected Areas in North Eurasia, currently being developed, calls for the development of a diverse range of protected areas and it is hoped that zakazniks would be a prime focus of attention in such plans.

What are zapovedniks?

State zapovedniks occupy a special place for biodiversity conservation within the protected area system. Their establishment is based on the principle that they should represent the diversity of all natural landscapes and ecological zones in the former Soviet Union. The first zapovednik was created in 1916 and declared exclusive state property. This implies that the state could make decisions about the use of natural resources without taking into account the opinion of people living in zapovedniks. The strict protection regime has helped in the conservation of biodiversity, especially where zapovedniks are situated in areas of high population density. One of the specific characteristics of zapovedniks is that they all have a scientific staff and are involved in a network of scientific research institutions.

Almost half of Russian zapovedniks (46 of them) are located in the European part of Russia. Their individual size is rather small when compared to the zapovedniks of the less inhabited regions. In contrast to the large areas of nature reserves in the Arctic and Siberian regions, zapovedniks in the European part are smaller than 10,000 ha and their total size does not exceed 100,000 ha. By itself, the Bolshoy Arcticchesky (in the Arctic region) extends to more than 4 million ha. The Komandorsky is the second largest zapovednik, with an area of 3.6 million ha.

Since 1991, 21 new zapovedniks have been established (an increase of 30%) with support and financial assistance from the Federal Ecological Fund and the World Wide Fund for Nature. Further expansion of protected areas is planned to cover 3% of Russian territory, instead of the current 1.6%. This expansion also involves national parks. Since 1985, 31 national

Fresh wolverine tracks in snow at the Kostomukshsky Nature Reserve in Karelia. Photo: Evgeniy Matyushkin.

national parks. Since 1985, 31 national parks have been established and further developments are expected.

The biological diversity of zapovedniks

Of the 620 bird species that are found in Russia, nearly 85% have their habitats in zapovedniks. For some species which are included in the Red Book of Russia, zapovedniks are the only places where they now survive. For example, ten of the 14 species listed as Endangered are confined to zapovedniks. Animals such as Asiatic bear *Ursus thibetanus*, polar bear *Thalarctos maritimus*, tiger *Panthera*



tigris, leopard *P. pardus*, ounce or snow leopard *P. uncia* and European bison *Bison bonasus* are protected in zapovedniks such as Oksky, Prioksko, Teberdinsky and Mordovsky. The bighorn sheep is also protected in Putoransky zapovednik.

Many zapovedniks can also be considered as natural heritage sites. The Kronotsky Biosphere Reserve in Kamchatka has a number of nature sites of international importance. These are the Valley of Geysers; the Uzon volcano; and the Kronotskoye lake (which contains rare fish species).

Zapovedniks and local people

The establishment of new zapovedniks has allowed for the existence of small settlements and villages. In these cases, the villages host the headquarters of the zapovednik. There are 20 such zapovedniks. People in the villages live in conditions of complete isolation and their only means of subsistence come from the surrounding natural resources. They plant garden crops and use wild plants such as berries and mushrooms. They also keep some cattle. Hence, some form of traditional land use has always existed in the protected areas of the zapoveniks. However, the implementation of zapovednik legislation for strict nature reserves has generated serious conflicts with any kind of land use. For example, the "Typical Regulation on State Zapovednik" of 1981 bans all kind of activities on zapovednik territories. Disputes on the use of zapovedniks have emerged because while local people are under pressure to cease their traditional land uses, officials of the state use the protected areas for hunting and as holiday resorts. For example, the Valley of Geysers was once closed to visitors except to those who were in a position of authority. Protests against such practices have gathered momentum and some local people have even demanded the closure of zapovedniks. In Kerzhensky zapovednik, local people have claimed rights for grazing land and have called for a 50% reduction in the size of the protected area. Their protests relate to the fact that zapovedniks have not contributed to their economic development while people in privileged positions were using zapovedniks for their personal welfare. The authorities have been finally convinced that the offer of new concessions to the villagers for exploitation of the zapovednik would reduce popular opposition to conservation. Hence, local people in Kerzhensky can now conduct such activities like hay making,

A playground in the "Losiny Ostrov" National Park.



cattle grazing and collection of wild plants. Non-governmental organisations which were involved in the issue have also played an influential role in the resolution of this conflict between local people and district authorities.

It is clear, from the above example, that the network of zapovedniks can only be protected with the consent and participation of the local people, and that public opinion should be considered in their planning and management. The situation where only scientists in zapovedniks make decisions about the level of protection is no longer appropriate to the new political and social situation in the country. In particular, the management of protected areas by a small group of scientists has allowed a few unscrupulous directors to benefit from their hunting practices.

The involvement of local people in the protection of zapovedniks stems from many other factors. Of importance is the current financial crisis of the Russian economy, which means lower budgets for zapovedniks, and in some cases funding may be completely withdrawn. This lack of financial resources seriously affects the effectiveness of traditional measures of protection. It is thus urgent to gain public support for the zapovedniks so as not to lose the important conservation and scientific values embodied in zapovedniks. Fortunately, work has already started to create public awareness. With the financial support of international non-governmental organisations such as the MacArthur Foundation, publications aimed at the general public have been distributed emphasising the importance of protected areas. Other projects intend to raise awareness of nature conservation among school children. Public participation in protected areas is therefore one of the main challenges for Russian society in the coming years, especially as changing social and economic values may pose a threat to effective conservation.

Development of an appropriate legislation

In 1991, the Reserves Department made the first attempt to reconcile conservation interests with those of people living in and around zapovedniks. A general Regulation on State Zapovedniks of Russia was passed in spite of the opposition of conservative scientists. This regulation was consolidated in 1992–1993, when regulations specific to each zapovednik were legislated. These define particular regimes of sustainable land use in different areas of zapovedniks, taking into account the interests of local people. The new regulations also provide for tourism and recreation opportunities by targeting specific sites for infrastructure development. The argument put forward by some scientists that the new regulations would ultimately damage protected areas is not substantiated, since only 3% of each zapovednik territory is given to some kind of economic activity. Moreover, several laws and enactments provide safeguards against the possible negative effects of human activities in the protected areas. In particular, the law stipulates the necessity

of working with local people in the planning and management of zapovedniks. Finally, it could be argued that by approving the package of legislation by enacting a Federal Law on Protected Areas, the State Duma has further consolidated the establishment of an appropriate legal framework for the management of zapovedniks.

Public support for zapovedniks

Before 1994, public support for protected areas in Russia was virtually non-existent. However, local and international nongovernmental organisations have since Firs and spruce taiga near the northern border of the Sikhote-Alinski Nature Reserve. Photo: Evgeniy Matyushkin.



started to give attention to issues of environmental education. For example, the Socio-Ecological Union of Russia, with the support of the MacArthur Foundation, has established a Biodiversity Conservation Centre. The Centre has been active in the provision of information on zapovedniks and other national parks. In addition, as a result of an initiative from the directors of zapovedniks, an independent publication, "Zapovedny Vestnik", has been published since 1994. The newsletter intends to facilitate communication between the protected area specialists of the states of the former Soviet Union.

Other important activities to increase awareness of protected areas among the public include a seminar funded by the Global Environment Facility on environmental education. As a result, an "International Association of Zapovedniks", which brings together all the local protected areas organisations, has been set up. Many zapovedniks have also started to publish their local newsletter which informs the public on the role of zapovedniks.

The World Wide Fund-US has also launched a major project for environmental education, as part of its main programme for biodiversity conservation in Russia. With an initial allocation of US\$20 million, one of its components focuses on "Environmental Education and Public Awareness in Protected Areas". Zapovedniks and other protected areas play an important role in the implementation of this project component. It is expected that the success of this project will significantly contribute to raising awareness of the immense value of protected areas for Russian people.

Environmental education and zapovedniks

Ecological education has always been one of the many activities of zapovedniks but was not always given the priority that it should have been. Zapovedniks are well placed to educate people on the importance of the environment since they have some experience of environmental education. They have in the past, in conjunction with schools and museums of natural history, undertaken many activities related to nature conservation. 'Ecological routes' are currently being developed in 34 zapovedniks, yet much remains to be achieved. The main problem is lack of funding to develop the environmental education activities of zapovedniks. The lack of methodologies for environmental education and communication is also a serious problem, as well as the

Participants in the Seminar on Ecological Education in the "Losiny Ostrov" National Park, within the borders of Moscow. Photo: Natalia Danilina.



near absence of technical training to prepare specialists of environmental education. Overall, the existence of viable protected areas in Russia depends on strong support from all sectors of society. It is more likely that protected areas will be fully integrated in the policy and decision making process if such support comes from the public at large. Zapovedniks will only survive if they can meet this challenge.

Environmental Education Centre Zapovedniks

The World Wide Fund for Nature has established an "Environmental Education

Centre Zapovedniks" to manage the project "Public support for protected areas and environmental education". The Centre works with the Reserves Department of Russia, the Department of Forests and National Parks, the Committee for the Environment of the State Duma, and with many non-governmental organisations. The government of Switzerland has provided financial support for the project which has the following objectives:

To create public awareness of zapovedniks and protected areas.

To highlight the role of zapovedniks and protected areas in the conservation of biodiversity.

To ensure that local, regional and national authorities implement the Federal law which recognises protected areas as national property.

To ensure that authorities give adequate financial support to protected areas.

The lack of expertise, training, financial skills and management techniques prevent zapovedniks from giving full attention to environmental education. The Environmental Education Centre intends to help zapovedniks gain these required skills and has already involved 30 zapovednik specialists in its programme. For example, the Centre has already launched a training course for zapovednik specialists which has an emphasis on public participation and methodological issues in environmental education. The Centre has also launched an information campaign, targeting the public media as well as regional and federal authorities. Recent activities include public exhibitions on protected areas; publication of books and information sheets; conferences; training courses; and competitions. The Centre is also actively looking for project funding for environmental education and has approached several international donors.

The Centre intends to develop links with conservation organisations world-wide in order to raise the profile of zapovedniks. It would welcome information and studies on the experience of protected areas in other regions, since such material could be useful in enhancing protected area management in Russia.

Conclusion

The involvement of local people in the management of protected areas of Russia requires a long sustained effort in environmental education and in changing the perception of zapovedniks as strict nature reserves. District authorities need to engage local people in conservation practices which at the same time offer opportunities for their social and economic well-being. This fact has too often been ignored by zapovednik managements and has generated serious conflicts between people and conservation authorities. Innovative work in the field of environmental education has made progress and is spearheaded by the "Environmental Education Centre Zapovedniks". The national and international support already gained for the implementation of this project suggest that environmental education in a society in transition will become a cornerstone of conservation success.

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Problems of zapovednik development and sustainable land use in Ukraine

T.L. ANDRIENKO AND N.F. STETSENKO

This survey of Ukraine protected areas highlights the importance of the protected area system for the country's natural resources. The article argues that the protected area system, although extensive in comparison with other European countries, is not adequate to provide protection for the vast array of natural landscapes and areas found in Ukraine. In particular, the forest steppes which represent a major biome in Eurasia are not fully protected. The general conclusion is that policy makers need to develop a representative system of protected areas which reflects the varied ecological characteristics of Ukraine. The authors suggest how such a representative system could be achieved. They also draw attention to the fact that land degradation, associated with agricultural activities and economic develop and implement a land rehabilitation programme for Ukraine.

THE DEVELOPMENT of a network of protected areas in Ukraine has been addressed in the document "Development of Reserves (zapovedniks) in the Ukraine: Programme and Perspectives", which was endorsed by the Supreme Council of Ukraine in September 1994. The Programme provides for the definition of a strategy of action and for its implementation. Some of the problems raised in the Programme relate to scientific research and monitoring; legal and financial aspects of protected area management; and the enforcement of rules and regulations to achieve biodiversity conservation. In view of the fact that only a third of the territory of Ukraine remains under plant cover, it has become urgent to consolidate the existing protected areas and to extend such coverage to other parts of the state.

The main elements of a programme for the development of zapovedniks would consist of the following actions:

An increase in the total area under protected area status so that 3%–4% of territory is protected by the year 2000. Some specific regions would need to extend protection to 9%–10% of their land. Such coverage would achieve a representative network of Ukraine ecological and biogeographical units.

Selection of some zapovedniks and national parks which would be strictly protected. This is because the establishment of a network of parks is developing very slowly in Ukraine, and it seems practical to enforce strict protection where possible.

■ The development of other categories of protected areas other than strict nature reserves. In particular, the protection of cultural and architectural sites would require a category which can reinforce the protection of the surrounding environment and its values. International experience shows that combining the protection of natural and cultural values can help to achieve the sustainable use of resources.

Current status of protected areas in Ukraine

As of January 1996, Ukraine has 6,450 protected areas which represent an total of 1,665,000 ha or 2.8% of the country under protection. They can be classified according to IUCN categories of protected areas as follows:

Category IA–Strict nature reserves: 13 zapovedniks correspond to this category, covering an area of 207,600 ha; three Biosphere Reserves are also included.

Category II – National Parks: there are five national parks, with a total area of 184,600 ha. The largest national park, Podolskiye Tovtry, covers 260,000 ha. In addition, 17 Regional Landscape Parks are being established and would average a total of 169,200 ha.

Category III – Nature Monuments: there are 2,929 Nature Monuments, of which 129 are considered as of national significance. Nature monuments cover an average of 18,000 ha.

Category IV – Species and Habitat Protection: there are two kinds of protected areas for the protection of species and habitats, namely the "zakazniks" and the "zapovedny urochishcha". Zakazniks cover an area of 866,000 ha, while zapovedny urochishcha are smaller reserves and occupy a total area of 85,000 ha consisting mainly of forests and areas of natural landscape.

Category V – Protected Landscape and Seascape: this category, which is less developed in Ukraine, includes a few landscape zakazniks. Unlike some European countries, the concept of regional protected landscapes or biological corridors has not yet taken root in Ukraine.

The analytical framework as set out in *Parks for Life: An Action Plan for Protected Areas in Europe* (IUCN 1994) has been used to guide a comparative study of European and Ukrainian protected areas. When compared with other European countries, Ukraine seems to have a significant percentage of land under strict protection. Species and biomes are also well protected. On the other hand, insufficient attention is paid to landscape protection. One particular characteristic of protection in Ukraine is captive breeding for ex-situ conservation as well as insitu conservation. There are 18 botanical gardens, 21 arboretums and six zoological parks. There are also 508 so-called memorial parks or garden-parks which have been established on old farms. All these units form a network specially created to conserve biodiversity.

Although Ukraine can be said to have a good system of protected areas, when compared to its European neighbours, they are not evenly distributed across the country. Zapovedniks have an adequate representation of the main geo-botanical regions, covering 207,000 ha, but this is merely 0.34% of the country. The percentage of protected areas is highest in the northern and north-eastern regions, where the main natural areas are found. Such regions are: Ternopolskaya, with 8.4% of land under protection; Ivano-Frankovskaya (6.8%); Zakarpatskaya (6.6%); Rovenskaya (5.6%); and Volynskaya (5.5%). In other geo-botanical regions, such as Vinnitskaya, Kievskaya and Cherkasskaya, the percentage of protection is unreasonably low. In particular, the forest-steppes and the right bank of the Ukraine are not adequately protected and it is therefore necessary to create more protected areas in such regions.

Sustainable land use

The development of new protected areas as outlined above should consider how the protection of natural and cultural values can be combined with the sustainable use of resources. This is important since Ukraine has a predominantly agricultural economy. Up to 81% of land use is agricultural and agricultural encroachment of the remaining natural habitats represents an increasing threat to protected areas. In addition, more than 4.5 million hectares of agricultural land is considered to be radioactive after the Chernobyl accident and is therefore not immediately amenable to sustainable use. Erosion and land acquisition for hydro-projects have also led to a decrease in available agricultural land. Another threat to protected areas comes from the state policy of land privatisation; protected areas could be sold and converted to cash cropping.

In the face of these changing circumstances affecting land use, some scientists have called for a Land Rehabilitation Programme. One task is to reconcile the policy of privatisation with the role that protected areas can play in a changing society. One possible solution is to establish new categories of protected areas which allow for conservation and development. Another crucial issue relates to the management of existing protected areas which are already threatened by surrounding agricultural activities, such as Askania-Nova zapovednik. Urgent solutions are needed to cope with on-going intensive land degradation as a result of heavy use of chemical fertilisers.

Future prospects for protected areas

Protected area professionals in Ukraine have only recently been exposed to international issues in protected areas. They have started to participate in international programmes related to conservation and have established links with the World Commission for Protected Areas. A regional network of WCPA is presently working on the development of a "Regional Action Plan for Protected Areas in North Eurasia". The aim is to identify common priority actions and the means to implement them. It is expected that the North Eurasia Action Plan would be as effective as "Parks for Life: An Action Plan for Protected Areas in Europe", which is now at various stages of implementation. The prospects for regional networking appears to be good and protected area specialists from Ukraine, Russia, Byelorus and Poland have already defined a common strategy for the development of an inter-state network of protected areas.

Conclusion

The challenge of safeguarding Ukrainian natural areas under new socio-economic conditions requires the combined efforts of protected area specialists, scientists and the general public. One of the key issues is to highlight the importance of biodiversity in Ukraine both for the country and globally.

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Zapovedniks of Turkmenistan and biodiversity conservation

KH.I. ATAMURADOV

The position of Turkmenistan on the border between several different biogeographical zones means that it has a high level of biodiversity, significant for both the region of Eurasia and globally. Turkmenistan zapovedniks provide habitat for many endemic and endangered species. Captive breeding of endangered species such as the wild ass has yielded positive results and many more ex-situ and in-situ conservation projects have been undertaken in zapovedniks. However, the success of these projects hinges on effective management of zapovedniks and financial support for biodiversity conservation. Against the backcloth of the collapse of public spending for protected areas and economic transformation, the breeding programmes to save many species are not getting the required financial support. Suggestions are made for implementing a plan designed to protect the biodiversity of Turkmenistan.

The BIODIVERSITY of Turkmenistan is of global importance due to its unique characteristics as a region lying between different biogeographical areas. Along the southern border, plant and animal diversity is high because of the climatic variability associated with the Mediterranean, Khazakhstan and Afgano-Turkmenian regions. In southern Turkmenistan, two main biogeographical regions meet, namely the Iran-Turanskaya and the Eastern Mediterranean regions. The different ecosystems of Turkmenistan include mountains, sand deserts, sub-tropical forests, river valleys and coastal and marine environments. There are eight zapovedniks which provide protection for this diversity. Table 1 gives an indication of the major protected ecosystems.

zapovednik	total area (ha)	landscape	number o	of protecte	ed species
			animals	birds	plants
Amu-Dariynsky	50.5	Amu-Daria	48	203	183
		river valley			
Badkhyzsky	87.7	Mountains of	42	258	1,015
		Paropamize			
Kaplanguyrsky	570.0	Rubble desert	26	147	245
Kopetdagsky	49.8	Turkmeno-Khorasansky	68	80	1,100
		Mountains			
Kutigansky	27.1	Pamiro-Alaisky	22	75	857
		Mountains			
Repeteksky	34.6	South eastern	20	25	134
		Kara-Kum			
Sunt-Khasardagsk	xy 29.7	Dry sub-tropic of	37	217	799
		South Western Kopet-Dag			
Khazarsky	262.0	Gulfs of the Caspian Sea	18	372	486

Table 1. Summary of major protected ecosystems in Turkmenistan.

Species in danger

Many species in Eurasia are in danger of becoming extinct and their survival very much depends on their protection and reproduction in zapovedniks. A great number of endemic species are present in Turkmenistan. For example, 24 of the 216 species of vertebrate listed in the "Red Book of the former USSR", are found only in Turkmenistan's zapovedniks. There are fears that the populations of these animals will lose their capacity to adapt to changing environments and will eventually lose their natural ability to reproduce and survive, as is the case for the cheetah *Acininyx jubatus* and the tiger *Panthera tigris*.

Table 2. Red Data Book animals in Turkmenistan and other CIS countries. The number of species is followed by the percentage this represents of the total number of species for each Class listed in the Red Book of the former USSR.

Class	number of species found only in Turkmenistan zapovedniks		number only in and othe	totals		
Mammals	8	(8.7%)	17	(18.4%)	25	(27.2%)
Reptiles	13	(37.1%)	7	(20%)	20	(57.1%)
Birds	3	(3.7%)	29	(36.3%)	32	(40%)
Fish	-	(0%)	3	(33.3%)	3	(33.3%)
total	24	(11.1%)	56	(25.9%)	80	(37%)

Table 2 lists some of the animal species which are included in the "Red Book of the former USSR" and compares Turkmenistan animal populations with other CIS countries. As can be seen, 24 species listed as endangered are found only in Turkmenistan's zapovedniks while 56 species live both in Turkmenistan and other countries. Endemic species include the Turkmenian wild goat, the wild sheep and the honey badger. The number of endemic reptiles is also significantly high. Such figures underscore the important role of zapovedniks in the conservation of rare species. In addition, there are many species which have important populations in zapovedniks although they survive in low densities in other territories. Some examples of mammals include striped hyaena Hyaena hyaena, Anatolian leopard Pantera pardus tulliana, and goitred gazelle Gazella subgutturosa. Some examples of reptiles are the desert monitor lizard Varanus griseus, cat snake Boiga trigonatum melanocephala, and cobra Naja naja oxiana. Species which have critical populations in Turkmenistan and therefore depend mainly on conservation measures in Turkmenistan for their survival include onager Equus hemionus onager, the bat Tadarida teniotis, tiger, otter Lutra lutra seistanica, and gazelle Gazella gulden. This brief list of threatened species highlights the important role of conservation in Turkmenistan zapovedniks, especially for species which are found only in Eurasia.

The conservation of species which have a special ecological niche, such as the lizard *Eublepharis turkmenicus* (see photo on page 20), must be given priority in protected areas. Lack of protection would surely lead to a loss of genetic diversity (the variation that enables adaptation to new conditions and evolution of species) and may also affect the abundance of other organisms.

The Red Book also lists 23 species of birds of the second category, 19 of which are found in Turkmenistan's zapovedniks. These include the roseate flamingo

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Phoenicopterus ruber, spoonbill *Platalea leucorodia*, short-toed eagle *Circaetus gallicus heptneri* (see photo below), golden eagle *Aquila chrysaetos*, peregrine falcon *Falco peregrinus*, black francolin *Francolinus francolinus*, great bustard *Otis tarda*, black stork *Ciconia nigra*, imperial eagle *Aquila heliaca*, demoiselle crane *Anthropoides virgo*, and purple moorhen *Porphyrio porphyrio*. Two examples illustrate the vital importance of protected areas for bird conservation:

The roseate flamingo nests in Turkmenistan only in winter and their numbers can reach between 15,000 and 16,000 individuals. Winter migration takes them from the Khazarsky region to the Turkmenistan coast of the Caspian sea. The importance of such migration has been recognised and in 1976, the Krasnovodsky and North-Chelekensky Bays zapovednik was included in the list of wetlands of international importance, under the Ramsar Convention.

The erne has declined dramatically. In 1932, the number of ernes averaged 2,680, but data released in 1995 show that there are only 70 ernes on the Turkmenian coast of the Caspian sea. It is therefore clear that conservation of the "Turkmenian" population of ernes in winter is extremely important for their survival in Eurasia.

Current projects on biodiversity conservation

In many cases, protection of species listed as threatened in the Red Book requires a regime of captive breeding. Reproduction in controlled conditions takes time

and species may not be able to adapt to the natural environment after their release in the wild. However, past success stories in Turkmenistan zapovedniks reinforce the author's conviction that such work is valuable. A current captive breeding project in Gyaursky zapovednik relates to the goitred gazelle. Fifteen gazelles are being reared and 50 more from Ogurchinsky island in the Caspian sea will soon be introduced to the station. Similarly, in Sunt-Khasardagsky zapovednik, work is under way to breed black partridge. Another example of captive breeding is that of onager in Badkhyzsky zapovednik, which now has a total population of 600. Their resettlement in the whole of Eurasia should soon begin, provided financial support is forthcoming. The Ministry of Environmental Protection and Natural Resources of Turkmenistan has already given its support to the resettlement initiative. Zapovedniks have also achieved considerable success in preserving the habitats of such animals as flamingo and deer.

Short-toed eagle Circaetus gallicus heptneri, one of 19 Red Listed bird species found in Turkmenistan's zapovedniks. Photo: Henry Levenstein.





What should be done to conserve Turkmenistan biodiversity?

What emerges from this discussion about Turkmenistan biodiversity is that measures should be taken to conserve rare and endemic species of the region. The implementation of urgent measures for conservation is becoming a formidable challenge in a changing political and economic situation where poaching and development pressures on land, among other factors, make it extremely difficult to give adequate attention to nature conservation. This situation therefore begs the question: what measures should be taken to further

The lizard Eublepharis turkmenicus, a priority spcies for protection in Turkmenistan. Photo: Henry Levenstein. ensure the protection of biodiversity? The Turkmenistan State has recently adopted two decrees which deal with conservation issues, namely the Decree on Nature Conservation of 1992, and the Decree on the Protection and Sustainable use of Plants of 1993. However, enforcement of these laws is seriously flawed. It is therefore recommended that the following urgent measures should be taken:

Involve international organisations and donors in the conservation of rare plant and animal species of the region. There should be enhanced support for on-going projects of in-situ and ex-situ conservation. The success which has been achieved in saving some from extinction demonstrate the usefulness of zapovedniks as suitable areas for captive breeding.

Improve the management of zapoveniks and ensure that regulatory regimes are enforced. Zapovedniks also need equipment and modern means of research and monitoring to achieve effective conservation.

Establish a data bank on biodiversity. This involves the gathering of up to date information on threatened species and regular assessment.

Allocate funds to zapovedniks for the long-term implementation of their projects.

Conclusion

The conservation of biodiversity in Turkmenistan calls for the implementation of urgent measures in view of the many endangered species of the country. It is clear that zapovedniks play a central role in biodiversity conservation and that their management should be supported. Although in-situ and ex-situ conservation can yield positive results for the protection of the genepool of many species, attention should also be given to wider measures such as availability of funds, training, monitoring and evaluation of species and support from national and international organisations.

Bibliography

- 1984. The Red Book of the USSR. 382 pp.

- 1978. The Red Book of Kazakhstan. Alma Ata, Kainar. 205 pp.
- 1985. The Red Book of Turkmenistan. Azhabad, Turkmenistan. 414 pp.

Atamuradov, Kh.I. 1996. Some ideas on improving the network of Nature Reserves of Turkmenistan. In: Common Actions of the Zapovedniks and National Parks of the North Eurasia. Moscow. 18–19.

Karavaev, A.I. Nature Chronicle of Khazarsky zapovednik. Turkmenbashi. 19-42.

Maskaev, A. 1996. Protected Areas of Tadjikistan. Newspaper "Zapovedny vestnik" No. 5 (18).
Nadjafarov, A. 1996. Protected Areas of Azerbaijan. Newspaper "Zapovedny vestnik" No. 5 (18).
Psysakova, N. 1996. Protected Areas in Kazachstan. Newspaper "Zapovedny vestnik" No. 5 (18).
Pushkarenko, V., and Filatov, A. 1996. Protected Areas in Uzbekistan. Newspaper "Zapovedny vestnik" No. 5 (18).

Rustamov, A.K. 1987. Urgent tasks concerning the Red Book of Turkmenistan. News of Turkmen. Academy of Science, Series biol. No. 4: 8–14.

Vasiliev, V.I. 1994. Registration of waterfowl at Khazarsky zapovednik. Nature Chronicle of Khazarsky zapovednik. Turkmenbashi. 43–58.

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Ecotourism in Russia

VERA P. CHIZHOVA

The development of an ecotourism industry represents an alternative for financing the management of zapovedniks and national parks. Russia has magnificent natural sites which can be marketed abroad, but has no experience in attracting tourists to these destinations. Some zapovedniks and national parks have taken the first steps towards developing an industry based on ecotourism, and are experimenting with a few projects. There are also many small voluntary organisations with experience in ecotourism activities. These combined factors – natural assets and local experience – could form the basis of a much larger ecotourism industry. Since much of the ecotourism activities are still in their formative stage, Russia needs to learn from the experience of other countries which have implemented successful ecotourism programmes.

The CONCEPT of ecotourism has gained worldwide recognition in recent years and is viewed as an instrument to achieve the sustainable development of protected areas. Management of ecotourism has the potential to be a viable alternative to the spoilation of parks by mass tourism. Ecotourism also brings the prospect of an environmentally educated traveler who is respectful of the environment. The concept also has important implications for the national economy of a country which is seeking to develop its natural resource base in a way that avoids its destruction. Russia, which has huge natural areas which could be used to develop a substantial tourist industry, is however only starting to consider ecotourism as an important industry. This paper attempts to explain the difficulties which face Russia and other CIS states in developing an ecotourism strategy.

MSU student geographers using a pneumatic safe boat (PSB) during work on a project for an eco-route over the Zhupanova river, Kamchatka. Photo: V.P. Chizhova. Ecotourism in Russia revolves around the creation of a feeling of personal responsibility for natural areas, the awareness that nature can provide recreation and spiritual contentment, and that natural areas must be protected from harmful development. In Russia, environmental education is given a central role on the ecotourism agenda because protected areas have historically been invested with the mandate of diffusing environmental knowledge. The paper by N. Danilina (this issue, page 8) explains the historical role of zapovedniks in the field of environmental



education. Suffice it to say that the culture of environmental education through the medium of protected areas is emphasised in the 1995 Russian Federal Law.

Although environmental education was considered one of the main functions of zapovedniks (the key functions being nature conservation and scientific research), their activities were limited to lectures, collaboration with museums of natural history and publication of study texts for students. Tourism in zapovedniks was prohibited. However, Russia's economic difficulties have led zapovednik authorities to open up such

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areas to tourism. Some zapovedniks have already gained substantial income from tourist activities. Another advantage of this new policy is that the scientific and conservation achievements of zapovedniks are now known to a wider public, rather than being restricted to few scientists. This may in itself broaden public support for protected areas as more people have the opportunity to visit these formerly closed territories. The advantages to be gained by stimulating a tourist industry have brought home the idea that Russian protected areas need to raise their profile and prestige both at home and abroad. A seminar on zapovedniks of the Caucasus in 1994 passed a resolution to the effect that national and non-national people must be made acquainted with the CIS natural heritage.

Tourism in zapovedniks

Since zapovedniks are still considered as strict nature reserves, their buffer zones are preferred areas for the development of tourism. Katunnsky zapovednik in Altay

(the South Siberia mountains) attracts an average of 700 tourists in summer. Primorye, Sikhote-Alinsky and Ussuriysky zapovedniks are also regularly visited. Some 2,000 to 6,000 people visit them every year.

Kronotsky Biosphere Reserve in Kamchatka has virgin forests, tundra and mountain landscapes, and volcanic attractions in the famous Geyser Valley, and has been the focus of intensive research for its development as a tourist attraction. The author participated in studies of the zapovednik before it opened to tourism in 1990. The recommendations that were made for the planning of routes and other infrastructure facilities have been implemented. A maximum number of visitors for the reserve per year has been agreed, as well as the duration of tourist trips. In opening the area to tourism, care has been taken to minimise any negative environmental impacts. Since 1990, the monitoring of tourist activities have been carried on a regular basis and it seems that there is no evidence of a deterioration of the reserve ecosytems as a result of tourism.

Another example of recent ecotourism development relates to Bailaalsky zapovednik, located of the shores of Lake Baikal. This initiative started three years ago and allows only A rock outcrop known as "Perya" (Feathers) in the zapovednik "Stolby" – a favourite place for rock climbing, educational excursions and sightseeing tours. Photo: V.P. Chizhova.



3–4 groups of 12 people to visit during summertime. The programme includes nature trails, a visit to a museum of natural history, and environmental education on the effects of pollution on Lake Baikal ecosystems.

Although Russia has wonderful attractions such as the Valley of Geysers, they are not yet famous as the Serengeti or Yellowstone national parks. This is one of the reasons zapovedniks prefer to target foreign visitors rather than nationals. This preference for visitors from abroad also stems from the fact that foreign visitors can bring large amounts of income. There is also an underlying assumption that local people are not respectful of the environment because they have frequently been seen to cook with open fires and to be negligent with their domestic wastes.

Despite some positive examples of ecotourism development in zapovedniks, there are still large differences in the facilities and services they provide. Most of them need to develop the necessary infrastructure to attract tourists. There is also a need to train staff who will be able to educate tourists on the importance of protected areas.

Tourism in national parks

Although zapovedniks have enormous potential for ecotourism, a cautious approach in relation to "openness" seems to prevail. This is understandable in view of the strong tradition of zapovedniks as closed territories to the large public. In such a situation, national parks could be considered to have immediate potential for



developing an ecotourism strategy since they are more visited than zapovedniks. There are 30 national parks in Russia which are at various stages of development. The system of parks is relatively new as the first one was established in 1983 and is only beginning to emerge as an economic asset. National parks which already offer some important attractions for tourism include Vodlozersky and Kenozersky Parks in the Russian north; Valdaisky and Mary Chodra Parks in Central Russia; Yugydva and Taganay Parks in the Urals; and Pribaikalsky and Zabaikalsky Parks in Siberia.

When compared with the number of visitors in well-known national parks of the world, Russian national parks do not attract a large number of tourists. Mary Chodra Park in the Middle Volga has between 50,000 and 70,000 visitors annually. Valdaisky Park in the ancient city of Novgorod is visited by some 60,000 people. Vodlozersky Park, one of the largest in Europe, is visited by only 4,000 people. These figures include

MSU student geographers on a project expedition at Oka river bank in Meshchersky National Park (Ryazan district). Photo: N. Bunina. national and foreign tourists as well as members of national parks' ecological groups who regularly spend time in the parks.

Prospects for ecotourism

In addition to the high natural potential of Russian protected areas for tourism and ecotourism, there exists a number of clubs, unions and groups which have experience in organising expeditions to remote regions. Their activities include mountaineering, sailing, horse-riding, skiing and trekking. These small organisations could play a major role in further developing ecotourism activities. One outstanding example of this kind of educational tourism relates to the work done for more than 20 years by volunteer students of the Department of Geography of Moscow State University. They have been influential in the design of ecotourism programmes for protected areas in Karelia, Siberia, Ukraine, Armenia, Turkmenia, Kirghysia and Tajikistan. In some cases, their expertise and knowledge of the environment have been drawn upon for the establishment of new zapovedniks and national parks. Many schools and colleges also have a "nature protection brigade". This organisation has been in existence for 35 years and continues to focus on environmental education for young people. Although such small groups may influence the direction of some ecotourism programme, they do not have the capacity or the authority to have a greater impact on policies.

Protected area professionals in Russia still lack the theoretical and practical knowledge for implementing an effective ecotourism strategy. For example, there are no "ecotourism information centres". Long-term planning and management of ecotourism has not been developed. However, it should be said that ecotourism is still in its early formative stages in Russia.

Russia's first steps toward ecotourism would greatly benefit from regional and international cooperation and networking on tourism and protected areas. Zapovednik and national park managers are keen to exchange ideas and experience with their counterparts in countries which have established successful ecotourism activities. This is necessary to avoid pitfalls and mistakes resulting from poor planning and management. The task of learning from the experience of the international community in matters of ecotourism has already started under the guidance of IUCN's World Commission on Protected Areas. This involvement would certainly boost our commitment to preserve our natural, historical and cultural values and traditions as we face the critical choices of a society in transition.

Conclusion

The development of a fully-fledged ecotourism strategy in Russia is not immediately possible since the country lacks the required experience in ecotourism planning and management. Russia, however, is extremely rich in natural areas and potential tourist attractions for an ecotourism industry. A few programmes have started in zapovedniks and there seems to be a gradual but slow attempt to open these areas to visitors. Russia could also draw on its long tradition of environmental education in planning ecotourism programmes. Such local knowledge should be complemented with the lessons learned from regional and international experience in ecotourism.

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Clean air and drinking water: protected areas contributing to human health in Kazakhstan

MANUEL CESARIO, ANDREY VERKHOVOD AND VLADIMIR UVAROV

The 'cause and effect' links between the environment and human health are rarely explored. Protected areas conserve watersheds and stabilise climate and can thus provide for clean air and water. This paper considers a case study from the Ele-Alatau National Park of Kazakhstan and explains how the surrounding Tuyuksu glacier may have an influence on the quality of air and water.

INKING HUMAN health with biodiversity is a sound way of promoting the necessary commitment of local communities to their neighbouring protected areas. This commitment is vital if we are to reverse the present threat which humankind has created for its own survival, but it will be achieved only if we provide the local communities with a practical clue to understanding the importance of conserving the world's biological diversity.

McNeely and Mackinnon (1989) state that the World Conservation Strategy, prepared by IUCN in 1980, recognises that under current conditions, nature is likely to prosper best when it serves the human interest. Conservation was defined as "the management of human use of the biosphere so that it may yield the greatest sustainable benefit to present generations while maintaining its potential to meet the needs and aspirations of future generations". The principles of the World Conservation Strategy have been widely accepted by governments, development agencies and conservation organisations. The question is no longer whether conservation is a necessary part of social and economic development, but rather how conservation can be achieved. The better that protected natural areas serve basic human needs, the better are the chances of survival for natural areas. Linking protected areas with human needs can support ecologically-sound development which takes on practical meaning for governments and local people.

Every ten years IUCN hosts a World Congress on National Parks and Protected Areas, during which a course of action for the following decade is charted. The IV World Congress on National Parks and Protected Areas (Caracas, Venezuela, 1992) emphasised the challenge which the conservation community is facing: the need for protected areas to attract public and political support. It is necessary to show that the contribution of protected areas to society is relevant and important (Martinet and McNeely 1992).

The challenge facing professionals working in protected areas is to find ways of demonstrating that the conservation of nature and the sustainable use of natural resources has a fundamental relevance to the daily lives of people, including those who may never visit a protected area. There is a need to emphasise the contribution that protected areas make to the quality of life. If the aim is for all people to be in favour of parks, then it must be demonstrated far more clearly that parks are for people (IUCN 1994).

The holistic and official definition of health, coined in 1948 by the World Health Organisation and stated in the preamble of its charter, is that "health is a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity". Although officially accepted by the health professionals of some 185 countries, it has been criticised by some for being "unrealistic, picturing health as a static state of perfect well-being" (Capra 1983). Others, such as Howe (1973) have agreed with the definition and understood it to imply a balanced relationship of the body and mind and a complete adjustment to the total environment. Graham and Honari (1990), adapting the official definition, understand health "as a sustainable state of total well-being, within sustainable ecosystems, within a sustainable biosphere" and reaffirm that "to individuals, good health means improved quality of life, less sickness and disability, a happier personal, family and social existence, and the opportunity to make choices in work and recreation".

Health, according to Hippocratic writings, requires a state of balance among environmental influences, ways of life, and the various components of human nature. "Understanding the effects of environmental forces on man is thus the fundamental basis of the physician's art; health is the expression of harmony among the environment, the ways of life, and the various components of man's nature" (Dubos 1970).

The authors agree with Reid (1995) when he suggests that human health concerns, more than any other biodiversity-related issue, can help restore the need for conservation of the world's natural and cultural heritage as an important goal for society. Health concerns have important attributes. First, they embrace the entire

scope of biodiversity values and threats. Second, health concerns often help to promote behaviour changes; they have been used for increasing awareness related with environmental pollution, and for the development of environmental-related concepts, such as Primary Environmental Care (PEC, which evolved from Primary Health Care) and Ecosystem Health. And last but not least, all people care deeply about health. Caring for health is a universally shared goal, whereas the notion of conserving and wisely managing the natural and cultural heritage is a salient issue for only a small minority of people.

¹ WHO's definition of Health was re-affirmed at the Alma-Ata Declaration. See "Report of the International Conference on Primary Health Care, Alma-Ata, Kazakhstan, 6–12 September 1978", WHO/UNICEF 1978. Figure 1. Benefits for human health provided by protected areas. After Cesario 1996.



Health benefits of protected areas

It is accepted that protected areas "provide major direct and indirect benefits to the local and national economies and models for sustainable conservation" (IUCN 1994). A national park was defined as "a legal and organisational form for protecting the highest natural values which a country possesses and which are esteemed by its citizens, serving the preservation of the timeless values of nature and culture as well, and serving culture by serving science and education, by protecting traditional forms of coexistence of local communities with nature and by creating conditions conductive to making inspired artistic works" (Olaczek 1994). This suggests that protected areas could provide valuable opportunities for promotion of human physical, mental and social well-being. McNeely and Mackinnon (1989) identified 16 different kinds of benefits of protected areas for regional development. Surprisingly, the capacity for improving human health has not yet been listed as one of the benefits.

Cesario (1995, 1996a, 1996b, 1996c, 1996d) has worked on the health benefits of protected areas, summarised in Figure 1. They include the importance of protected areas in purifying the air, absorbing pollutants, and providing and maintaining sources of clean water.

Figure 2. General map of Kazakhstan, indicating the position of the Ele-Alatau State National Nature Park, near Almaty. Air and water are closely related to human health. They act favourably to the maintenance of human health (when pure from pollutants), being considered 'biogenic complexes'. On the other hand, when contaminated, air and water can be considered 'pathogenic complexes', helping the spread of diseases or infirmities. (Sounis 1985).



Kazakhstan

Kazakhstan is the second largest country of the CIS (Commonwealth of Independent States: the Russia Federation is the largest). Its area of about 2.7 million km² extends from the Volga to the Altai mountains and from the plains in western Siberia to oasis and desert in central Asia. Its boundaries include the Russian Federation, the Caspian Sea, Turkmenistan, Uzbekistan, the Aral Sea, Kyrgystan and China. While Kazakh is the official language, two-thirds of its 17.4 million inhabitants speak Russian. Up to last year, Kazakhstan had only one national park: the Bayanaul'sky National Park, created in 1985 (IUCN 1994). In 1996, three other national parks were created: the Altyn Emel State National Nature Park (in the south-east region), the Kokshetau State National Nature Park (in the northern region) and the Ele-Alatau State National Nature Park (near Almaty, the capital in the south-eastern corner of the country) (Figure 2).



Ele-Alatau State National Nature Park

The government of the Republic of Kazakhstan established the creation of the Ele-Alatau State National Nature Park in the Almaty region (Decree 228 of 22 February 1996), with its 164,450 ha classified as "forests of a national nature park", corresponding to IUCN Category II. The main goals for the creation of the park were "the conservation and rehabilitation of the unique natural complexes of the Ele-Alatau region that have distinctive ecological, historical, scientific, aesthetic and cultural values". Within the concept of "unique natural complexes of the Ele-Alatau region" are included the glaciers on the Ele-Alatau mountain ridge (Figure 3). They amount to more than 400 with a total area of about 510 km² and a moisture content of approximately 30 km³ (Makarevich 1985).

Among them, the most studied is the Tuyuksu glacier, which is presently 3.5 km long and has an area of about 2.5 km² (Figure 4). It is situated on the upper part of the Malaya Almaatinka valley. On-site annual measurements and reconstructions showed that prior to the 1930s the mass balances of the Tuyuksu glacier were positive every year and from the 1930s to the 1970s the balances alternated positive and negative, with the total balance being slightly negative. But from 1972 and on, the annual mass balances of the glacier were always negative (Makarevich 1985). According to Vilesov *et al.* (in press), from 1979 to 1990 the area of the glacier had diminished by 220,000 m², while its volume decreased by 16 million m³.

Almaty, health and protected areas

The capital of Kazakhstan (population 1.3 million) is located on the bottom of the valley in which the Tuyuksu glacier is found (Malaya Almaatinka), and has a desert region on its northern side. This fact places Almaty in a unique position in relation to two important complexes that influence human health: water and air.

It is known that the Ele-Alatau mountain ridge is the main supplier of water for Almaty, for drinking purposes, hydroelectric power plans, irrigation for agriculture and for industrial needs. Boldyrev (1996) states that up to 80% of Almaty's water originates in the mountains. Makarevich *et al.* (1984) affirm that during dry seasons the glaciers are, in fact, the only significant source of water for the mountain rivers.

According to Makarevich (1985), the Malaya Almaatinka river (which crosses Almaty and is one of the city's three main suppliers of surface water) is formed by the Figure 3. The Ele-Alatau State National Nature Park and the glaciers of the Ele-Alatau mountain ridge. Inset: detail of Tuyuksu glacier.



normal melting of the Tuyuksu glacier. Melted ice water is up to 70% of annual river runoff at its source, and 10%–33% at its runoff down the mountains. The role of glaciers as suppliers of water for other rivers of the ridge is even more important. In the warm season melt water makes 60% or more of the rivers' runoff and averages during the year are up to 40%.

In October 1995, K.Sh. Amiryaev, head of Almaty Committee of Hydro Ecology and Bio Resources, reported the main facts relating to the water supply of Almaty. According to this report, the first water supply system of the city was built in 1901. Until 1934 the water originated mainly from two sources: the Malayaand the Bolshaya Almaatinka rivers. Only in 1956 was the first system for underground storage of water built. The importance of this source of water increased from year to year. Presently, up to 70% of the water supply for the city emanates from underground. The remaining 30% is provided by three surface sources that originate from the glaciers: Malaya Almaatinka River, Bolshaya Almaatinka River and from the rivers which come from the Talgar valley.

Figure 4. The Tuyuksu glacier. Photo: E.N. Vilesov. Apparently, underground water is now the main source of water supply for Almaty. But it is known (Boldyrev 1996) that up to 80% of all water in the Ele-Alatau region originates in the mountains, including underground water. It is also accepted that the main source of underground water originates in the region of the glaciers, at some point going underground. Thus, glacier water is still a very important source of water for Almaty, and the Tuyuksu glacier, being the most important glacier in the region, is definitively one of the main suppliers of water for the city.

The second important complex that has an influence on human health – air – also behaves in a particular way in the Almaty region. It is widely accepted (Scorer 1978) that a mountain/valley air circulation system is usually characterised by fresh air from the mountains flowing down to the valleys. As Almaty is in the lower part of the valley in which the Tuyuksu glacier lies at the top, it would be expected that the fresh wind from the glacier would blow clean air down into the city, removing its pollution towards the desert. Surprisingly, this does not occur. According to experts from the Kazakh Research Institute of Hydrometeorology (Helmholtz 1963), Almaty has its own specificity: when the fresh wind from the glacier blows from the mountain it is mainly prevented from going down low enough to enter the city, bypassing it over the top, and only a small amount of fresh air blows through the city's streets. Apparently, the many high buildings built in the last 30 years offer a physical obstacle. On the other

hand, the other half of the mountain/valley air circulation system unfortunately does happen. It then blows Almaty's pollution up the Malaya Altmaatinka valley to the Tuyuksu glacier, polluting the glacier and, ultimately, the main water supply of the city. The City's Department of Ecology and Bioresources states that the two main sources of pollution – stationary sources (industrial plants, power stations, etc) and mobile sources (motorcars, buses, etc) – have slightly diminished, from 1990 to 1995. In 1990, they amounted to about 198,000 tons, while in 1995 to about 170,200 tons per year.

The aforementioned reduction in area and volume of the Tuyuksu glacier together with the cumulative effect of an almost stable high rate of pollution poses a serious threat to the stability of the glacier. And this would affect the water supply for Almaty. Taking into account that Tuyuksu is one of the key components of the mountain/valley air circulation system, the glaciers' rapid deterioration may also have a disastrous effect on the atmospheric situation of Almaty. These two conditions would, consequently, have a negative impact on the health conditions of its citizens.

It is accepted that glacier monitoring provides the most important evidence of 20thcentury global warming. Observed changes in the glacier mass allow experts to make direct comparisons between changes in glacier mass and anthropogenic enhancement of the greenhouse effect (UNEP 1992). Nevertheless, if the alternated (and slightly negative) balances experienced by the Tuyuksu glacier from the 1930s to the 1970s could be explained by known global changes (including the decrease of precipitations observed from the 1940s, the increase of average annual temperature and the glacier's own longstanding dynamics), the strictly negative annual balances since 1972 need more sophisticated arguments for their explanation. Figure 5 shows that glaciers in category 3 (small valley glaciers, like Tuyuksu) remained steady during this period.

Tuyuksu's deterioration has been attributed to 'anthropogenic enhancement of the greenhouse effect'. But another important reason may be the contamination of the glacier's surface by different pollutants: (1) salty dust from the dried surface of the Aral Sea (located 1,500 km from the glacier); (2) industrial air pollution discharged by the Balkhash Cooper Plant (some 700 km from the glacier); and (3) highly polluted air of the nearby industrial Almaty (located some 30 km away, opposite the Tuyuksu glacier). All the above mentioned pollutants diminish to some extent the reflex capacity (albedo) of the glacier and, accordingly, this leads to the acceleration of ice thawing, evaporation and, finally, to the reduction of the glacier (Kotlyakov 1984). The main question, then, is: what source of contamination is the major reason for albedo decreasing in Tuyuksu glacier?

The hypothesis raised by Verkhovod *et al.* (1996) is that the main contaminant is the polluted air blown up from Almaty. To test this hypothesis they choose the method of comparisons with a 'control' glacier. For this control glacier the Bogdanovich glacier was chosen. It is only 5 km from the Tuyuksu glacier and has the same northern orientation. Both Tuyuksu and Bogdanovich belong to the same type of glaciers – both are 'small valley' type. They also begin and end at almost the same altitudes and have similar areas (see Tables 1 and 2). For this reason they fall into the same category: middle sized glaciers. The main difference between the two glaciers is that they are located in orographically different valleys. Tuyuksu is on the Malaya Almaatinka valley which ends at Almaty city, while the Levyi Talgar valley (Bogdanovich glacier is in the upper part of this valley) ends at the small rural town of Talgar (50,000 inhabitants). In spite of all similarities between the two glaciers, the pollution originating from Almaty is much greater than that from Talgar.

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Figure 5. Cumulative length change in four types of glacier. After Glaciers and the Environment,

UNEP 1992.



Table 1. Changes in the area and volume of the Tuyuksu glacier, from 1979 to 1990 (adaptedfrom Vilesov et al. 1994).

altitude (m)	area (km²)			volum	e (km³)
		1979	1990	1979	1990
3,400-3,500	1	0.16	0.083	a na seguera desta	Long to the second second
3,500-3,600		0.32	0.317		
3,600-3,700		0.30	0.291		
3,700-3,800		0.87	0.841		
3,800-3,900		0.42	0.393		
3,900-4,000		0.28	0.238		
4,000-4,100		0.26	0.243		
4,100-4,200		0.10	0.091		
4,200-4,300		0.01	0.003		
total		2.72	2.500	0.131	0.1150

Table 2. Changes in the area and volume of the Bogdanovich glacier, from 1979 to 1990(adapted from Vilesov et al. 1994).

altitude (m)	area (km²)		volum	e (km³)
	1979	1990	1979	1990
3,300-3,400	0.01			
3,400-3,500	0.08	0.029		
3,500-3,600	0.16	0.154		
3,600-3,700	0.18	0.180		
3,700-3,800	0.20	0.200		
3,800-3,900	0.17	0.170		
3,900-4,000	0.30	0.300		
4,000-4,100	0.13	0.130		
4,100-4,200	0.09	0.090		
total	1.32	1.253	0.048	0.0477

It is clearly seen from Tables 1 and 2 that although being very similar to each other, Tuyuksu and Bogdanovich glaciers diminish at a different pace. Tuyuksu has decreased by 8% during the 11 years and Bogdanovich only by 5%, the difference being 38%. The difference in the glaciers' decrease is even more evident if the changes in the volumes of the two glaciers are taken into account (unfortunately, volume estimations are less accurate, because of technical constraints).

Concluding remarks

UNEP (1992) in *Glaciers and the Environment* states that "Glaciers are important to the environmental health of the planet ..." and affirms that "75% of the world's freshwater is stored in glaciers, and the water they release is used to produce hydropower and for irrigation, which represents a considerable economic importance".

The aim of this paper is to show that protected areas may also provide other benefits, on top of the economic ones. The health benefits which will result from a more efficient protection of the glaciers located within the Ele-Alatau State National Nature Park must be more clearly established, locally. This would increase the awareness of the Almaty population in relation to their environmental problems, and would, in turn, help both local park managers and decision makers to work towards a more sustainable way of life. The local media is already focusing on the problem of water supply to Almaty.

Acknowledgements

The authors recognise the assistance provided by Victor Egorov (Management of Ele-Alatau State National Natural Park) and Alexander Mironyok (Almaty's Department of Ecology and Bioresources) with regards to official information. Sergey Ermolaev (Institute of Geography) was very helpful with technical assistance. Warmest thanks to the prominent glaciologist Dr Konstantin Makarevich for his personal advice.

Dr Cesario's field trip to Kazakhstan (20–28 September 1996) was made possible through the INTAS Project 93-1877 – Pan European Scientific Network.

References

- Capra, F. 1983. The Turning Point: science, society, and the rising culture. London: Flamingo.
- Cesario, M. 1995. Conservation, Sustainability and Health: lessons from the Wysoka Region, Southern Poland. In: Abstracts – International Conference: Integration for Sustainable Development and Primary Prevention, focused on European Perspectives (December 1995). Kraków, Poland.
- Cesario, M. 1996a. The contribution of conservation to sustainable living, through health promotion. *AMBIO 25(1)*: 39-43.
- Cesario, M. 1996b. Proposal for an additional reference section on Human Health and Biodiversity within the ISDE Documentation Centre. *Doctors for the Environment: an International Bulletin 1/96 VI (1)*: 31–34.
- Cesario, M. 1996c. Human Health and Biodiversity. In: Abstracts Plants for Food and Medicine – joint meeting of the Society for Economic Botany and the International Society for Ethnopharmacology, 1–6 July 1996. Imperial College, London, England.
- Cesario, M., 1996d. Human Health and Biodiversity: Interdisciplinary Opportunities for Conservation. In: Abstracts – Ecological Summit '96 Conference. Organised by the International Society of Ecological Modelling, International Ecological Engineering Society, International Society of Ecosystem Health, International Society of Ecological Economics, Elsevier Science BV, SAS-Institute Denmark and International Lake Environmental Committee, 19–23 August 1996. The Royal Danish School of Pharmacy, Copenhagen, Denmark.
- Davis, S.H. 1993. Introduction. In: *The Social Challenge of Biodiversity Conservation*. 1–4. Washington: Global Environmental Facility.
- Dubos, R. 1970. Man, Medicine and Environment. London: Penguin Books Ltd.

Boldyrev, V. M. 1996. Investigation and Calculation of Flowthrough of Mountain Rivers of Kazakhstan. Thesis of Doctor of Sciences. Almaty (mimeo).

Graham, J., and Honari, M. 1990. Human Ecology and Health Advancement: the New Castle Experience and Implications. *Journal of Human Ecology*, *2(1–2)*: 197–215.

Helmholtz, N.F. 1963. The Mountain/Valley Circulation in the Northern Slopes of Tien Shan Range. Kazakh Research Institute of Hydrometeorology. (Mimeo).

Howe, G.M. 1973. The Environment, its Influences and Hazards to Health. In: *Environmental Medicine*. 1–8. London: William Heinemann Medical Books Ltd.

IUCN. 1994. *Parks for Life: Action for Protected Areas in Europe*. IUCN – Commission on National Parks and Protected Areas, Gland, Switzerland, and Cambridge, UK. 154 pp.

IUCN. 1994. 1993 United Nations List of National Parks and Protected Areas. Prepared by WCMC and WCPA. IUCN, Gland, Switzerland, and Cambridge, UK. xlvi + 315 pp.

Kotlyakov, V.M. 1984. The Glossary of Glaciology. Leningrad: Hydrometeo Izdat.

Machado, P.A. 1984. Introduction to Human Ecology. Brasília: CNPq, Editora Cortez/Editora Autores Associados.

Makarevich, K.G. 1984. *Tuyuksu Glaciers (Northern Tien Shan)*. Leningrad: Hydrometeo Izdat. Makarevich, K.G. 1985. *Tuyuksu Glacier*. Alma-Ata: Kainar.

Martinet, C., and McNeely, J. 1992. Managing Parks for the 21st Century: Advice from the Parks Congress. *PARKS 3(2)*: 13–21.

McNeely, J.A. 1992. Protected Areas in a Changing World: The Management Approaches That Will Be Required to Enable Primates to Survive into the 21st Century. In: *Topics in Primatology: Vol.2, Behaviour, Ecology, and Conservation.* 373–383, Tokyo: University of Tokyo Press.

McNeely, J.A., and Mackinnon, J.R. 1989. Protected Areas, Development, and Land Use in the Tropics. *Resource Management and Optimization*, 7 (1–4): 189–206.

Olaczek, R. 1994. Wild Nature in the National Treasury. In: *Polskie Parki Narodowe*. Krakow: Oficyna Wydawniczna Parol Sp. z o.o.

Reid, W.V. 1995. Opportunities for Collaboration: the Biomedical and Conservation Communities. Paper presented at: Conference on Biodiversity and Human Health. April 3–4, 1995. Washington, World Resources Institute (mimeo).

Scorer, R.S. 1978. Environmental Aerodynamics. New York: Halsted Press (a division of John Wiley and Sons).

Sounis, E. 1985. *Epidemiology*. Rio de Janeiro and São Paulo: Livraria Atheneu, Editora da Universidade Federal do Paraná.

UNDP. 1996. Human Development Report 1996. New York and Oxford: Oxford University Press.

UNEP. 1992. *Glaciers and the Environment*. UNEP/GEMS Environment Library No 9. Nairobi, Kenya: UNEP.

Verkhovod, A.B., Kaltaev, A., and Uvarov, V.N. 1996. Abstracts – International Symposium of the Technological Impact on Civilization. Karlsruhe, 21–26 April 1996. Karlsruhe Vorschungszentrum.

Vilesov, E.N., Uvarov, V.N., and Khonin, R.B. 1994. Aerophototopographycal Monitoring of Modern Glaciation of the Northern Slops of the Zailyisky Alatau Mountain Range. Report issued by the Institute of Geography. Almaty: Institute of Geography (mimeo).

Vilesov, E.N., Uvarov, V.N., and Khonin, R.B. (in press). *Degradation of Glaciation of the Northern* Slope of the Zailyisky Alatau Mountain in the Latter Part of the 20th Century. Almaty: Kasgu Vestnik.

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Protecting the protected: buffer zone planning in Poland and Australia

JERZY KOZLOWSKI AND ANN PETERSON

It has long been recognised that the ecosystems and landscape values of protected areas can be damaged by events outside the protected area boundary. The use of buffer zones has often been suggested as a means of combating external threats, but there is little agreement as to how buffer zones should be planned and implemented. This paper puts forward a model "Buffer Zone Planning" method, outlining the principles involved, describing the practical steps necessary to undertake such a method, and giving examples from case studies in Poland and Australia. The legal and institutional requirements necessary for the success of buffer zone planning are discussed. The authors suggest that a rigorous yet flexible approach to buffer zone planning will produce the greatest benefits for protected areas.

ROTECTED AREAS are linked in many ways with their surrounding regions and have been experiencing increasing levels of ecosystem stress due to impacts from incompatible and often unsustainable land use practices occurring outside their legal boundaries. The Third Congress on National Parks and Protected Areas called on governments to initiate measures of sustainable social and economic development to relieve the pressures of local populations on protected areas, and to reinforce measures to reduce the external threats to protected areas (McNeely and Miller 1984). There was a clear concern that unwise land use in the surroundings of protected areas might seriously endanger the security of those areas, if not their very existence. It was also rightly stressed that "... effective resource management cannot occur when conservation planning and development planning proceed in isolation ..." (McNeely and Miller 1984). These views were reinforced at the Fourth Congress on National Parks and Protected Areas, the Caracas Declaration (IUCN 1992) calling on governments "... to take urgent action to consolidate and enlarge national systems of well-managed protected areas with buffer zones and corridors ...". The World Resources Institute (1992: 129-133) has similarly stressed the importance of the management of resources surrounding protected areas and stated that "... the concept of 'buffer zones' or 'transition zones' is an essential complement to protected area design ...".

Although there is world wide interest and support for buffer zones to minimise threats to protected areas, there is as yet little agreement as to how their design and implementation should be achieved. Roughan (1986) and Peterson (1991) examined buffer zone planning around the world, although with particular emphasis on Australia, and concluded that buffer zones were produced largely on an intuitive basis. Wells and Brandon's (1993: 25) examination of Integrated Conservation and Development Programmes (ICDPs), which incorporated buffer zones, in Africa, Asia and Latin America concluded as well that "… Despite their intuitive appeal … buffer zones have not been adequately defined, and there are few working examples …".

Recently, Peterson (in prep) examined more thoroughly a variety of management approaches which incorporated buffer zone strategies. These included biosphere reserves, the multiple use module concept developed by Noss and Harris (Harris 1984, Noss and Harris 1986), core-buffer-multiple use zones as applied to protected areas in India, ICDPs, various wildlife specific buffer zones, and others, and concluded that an effective methodology was lacking to aid in the delimitation of buffer zones and the incorporation of effective buffer strategies. Peterson also attempted to ascertain the practical experiences of buffer zone planning in Australia by contacting approximately 90 agencies involved in the planning and management of land in and around protected areas. Approximately 70% of respondents saw a definite need for buffer zones, particularly where protected areas were surrounded by land intensively developed for tourism and residential uses, and 44% had attempted to produce what the respondents called 'buffer zones'. Where buffer zones had been formally established the majority were single purpose zones designed specifically to deal with only one external threat, for example, fire hazard or watercourse protection, and usually these zones were simple in structure, being defined by a prescriptive distance rule.

Peterson's examination of buffer design in Australia highlighted the lack of an ecological base to buffer planning, with buffers being designed largely on an *ad boc* basis with criteria such as land suitability, logical boundaries, shape, location and prescriptive distances being the dominant concerns. Buffers, in general, were without legal definition, being implemented on an informal basis, and lacked a planning methodology to assist in their design.

The Buffer Zone Planning (BZP) method which originated in the late 1970s (Kozlowski and Ptaszycka-Jackowska 1987, Ptaszycka-Jackowska 1990, Kozlowski *et al.* 1992) was successfully tested in Poland and further refined in various Australian case studies, in an attempt to close this important gap in environmental planning. Although the BZP method seems to offer a quite effective and workable approach to determining comprehensive buffers, it remains largely an 'unknown' in mainstream planning for buffer zones. This paper will therefore try to introduce the BZP method to a wider audience and outline the more important principles underlying the methodology, describe the steps in the planning strategy and briefly discuss two case studies, one from Tatry National Park, Poland, and the other from Cooloola National Park, Australia.

What is the Buffer Zone Planning (BZP) method?

The BZP method is based on the following principles:

■ Legal boundaries to protected areas and reliance on internal management strategies will not afford long-term protection to environmentally sensitive areas. There is a need to eliminate or reduce externally occurring negative impacts which threaten protected areas, and to devise a set of guidelines for management within the delineated buffer.

■ The nature of the environment is heterogenous both within protected areas and in their surrounds and this must be reflected in the process of defining buffer zones with their specific land use measures and management policies devised to eliminate or reduce external environmental threats. This can be achieved through examining a whole range of noxious external impacts on elements (such as flora or fauna) and features (such as silence) of the protected area concerned.

■ The needs and desires of local communities should be considered in the process of determining buffer zones and thus from an early planning stage the approach would incorporate an input from the surrounding community.

The planning procedure must take into consideration the constantly changing nature of the environment and hence anticipated as well as existing threats to the protected area are incorporated to produce a more proactive form of planning.

As the spatial distribution of both existing and potential threats to different elements of protected areas is varied, the areal extent of one negative impact (e.g. feral animals) may be quite dissimilar to that of another (e.g. fire) and hence there should be different specific zones designated to eliminate or curtail these individual impacts. Two such zones delineated in the BZP method are:

(a) 'Analytical' Protection Zones (APZs) which indicate how to protect specific elements and features (e.g. hydrology, fauna or silence) of the protected area from external threats (e.g. water pollution or noise); and

(b) 'Elementary' Protection Zones (EPZs) which indicate how to protect the whole area from particular threats. EPZs can be derived through the definition of APZs but they can also be derived directly.

Guidelines developed for both APZs and EPZs are not applied uniformly in the buffer, but reflect the areas of influence of each identified threat.

■ The final, heterogenous buffer zone should be a synthesis of the EPZs thus permitting the definition of varying protective land use measures and management policies within the buffer. These policies should, wherever possible, be incorporated into statutory development plans which are the subject of formal approval. This would establish their legal status and ensure that their effective implementation is safeguarded. However, non-statutory and more informal, voluntary approaches

should also be utilised, where appropriate. Accordingly, the buffer zone can fulfil its role in relation to the protected area in the most efficient way.

Steps in the BZP approach

Based on these principles, the BZP 'model' planning process (Figure 1) for demarcating Buffer Protection Zones and for laying down guidelines within these zones was developed (Kozlowski and Ptaszycka-Jackowska 1987; Ptaszycka-Jackowska 1990) and tested in the field both in Poland and Australia (Roughan 1986; Peterson 1991; Hruza 1993). Seven main steps can be distinguished in the process.

Step 1: Identification of particular natural elements and features of the protected area (i.e. its essential environmental values) and the main characteristics of its surrounding territory.

Step 2: Identification of the interrelationships between these elements and features of the protected area and its Figure 1. A 'Model' planning process for buffer protection zones.



surrounding territory, as well as the determination of the negative impacts this territory generates at present, or may generate in the future.

Decision Point: are EPZs to be defined directly (variant A), or through APZs (variant B)?

EITHER

Variant A

(used in the Polish application for Gorce National Park)

Step 3A: Synthesis of the negative impacts.

Step 4A: Establishment of criteria for determination of EPZs in relation to these negative impacts.

Variant B (used in the other applications) *Step 3B:* Preliminary formulation of the criteria for demarcating APZs and for defining their land use measures and management policies in relation to these negative impacts.

OR

Step 4B: Demarcation of APZs (with respective measures and policies).

Step 5: Demarcation of EPZs for the protected area and definition of the land use measures and management policies within their boundaries.

Step 6: Delineation of the Buffer Protection Zone surrounding the protected area by overlapping particular EPZs.

Step 7: Formulation of principles guiding different land uses and activities within the boundaries of the Buffer Protection Zone and introduction of these principles into an appropriate development plan.

Figure 2. Location of Tatry National Park.



To illustrate the process and to provide a basis for assessing its practical viability two applications are discussed in some detail, one from Poland and one from Australia.

BZP applications

Tatry National Park (Poland)

Tatry National Park (TNP), located in the northern part of the Tatry Range, is the second largest park in Poland, with an area of 21,000 ha (Figure 2). The Tatry Range is a unique Polish alpine landscape, and is very popular among tourists and skiers (annual frequency of 3 million people).

The Tatry Range, built from Palaeozoic granite and Mesozoic limestone and dolomites, was glaciated three times and has, in consequence, unusually diverse relief and many caves. The Tatry vegetation has developed in layers:

■ Lower subalpine forest (700–1,250 m a.s.l.) of Karpatean beechwood and firbeech forest with spruce and sycamore.

■ Upper subalpine forest (up to 1,500 m a.s.l.) of spruce wood with stone pine stands (*Pinus cembra*) at its upper boundary.

Dwarf mountain pine layer (up to 1,800 m a.s.l.).

Mountain meadows and pastures.

Peak layer (with the highest Polish peak, Rysy 2,499m a.s.l.).

In the lower and upper subalpine forests there are many clearings and also several endemic mountain plant and animal species.

The southern part of TNP is bordered by Slovakia National Park. The Polish foreland to TNP includes vast valleys (500 m a.s.l.) and elevations (up to 900 m a.s.l.), framed in the north by the forest slopes of Babia Gora (1,725 m a.s.l.) and the Gorce mountains (1,300 m a.s.l.). On the border of TNP is the resort Zakopane (30,000 population), the main centre of tourism in Poland.

During the mid 1970s the Research



Institute on Environmental Development in Krakow commissioned the preparation of a physical plan for the TNP (Kozlowski *et al.* 1979). Completed in 1979 and later formally approved, it is even now the main, official tool for management of the Park. The question as to whether a physical plan alone, even if legally binding, would be a sufficient tool to assist in protecting the park from further damage, had to be addressed in the early stages of the planning process. An assessment of the suitability of existing statutory plans in the surroundings of TNP, for the protection of the natural environment of the Park, was undertaken by the Research Institute's team (led by Ptaszycka-Jackowska). Their report clearly indicated the need to define a specific protection area, or 'buffer zone', which included concrete measures to mitigate or eliminate both the existing and anticipated future threats to TNP. As no planning methods, indicating how to determine such a buffer in practice, were available on the 'planning market' a BZP approach was originated, and its application to the surrounds of TNP was its first, successful test (Kozlowski and Ptaszycka-Jackowska 1987, Ptaszycka-Jackowska 1990, Kozlowski *et al.* 1992).

The natural environment of the Park was assessed by specialists who identified the main elements as relief, soils, climate, hydrology, vegetation cover, fauna, natural silence and landscape. Several existing and anticipated negative impacts on the Park were identified as originating in the Park's surrounds, in spite of the fact that the very elevation of the Park substantially limited the scale of influence of its surroundings.

The synthesis of these present and potential negative impacts indicated the need to check and control local hydrological changes, the construction of water intakes in the Park (to meet the demands of its surrounding settlements), local air pollution, Figure 3. Elementary Protection Zones (EPZ) in Tatry National Park.



and macro/micro-climatic changes in the Park caused by the inversions in its foreland. Several negative impacts on animals periodically migrating out of TNP were also identified. Another problem was the protection of the landscape values of the Park's surroundings, which were becoming degraded due to urbanisation processes which additionally upset the natural silence of the mountains.

In this situation it was necessary to establish a protective buffer zone for the Park. After defining APZs for the main 'elements' of climate, water (surface and underground), soils, vegetation and fauna, and for the main 'features' of natural silence and landscape, eight EPZs were identified. Four EPZs protecting

Figure 4. Tatry National Park buffer protection zone. the silence, migration corridors, clean air and landscape are illustrated in Figure 3. Criteria used for their definition were determined by the measures needed for the control of the external negative impacts. The final 'buffer zone' was derived from overlapping all eight EPZs (see Figure 4).

It should be emphasised that the assessment – and, in consequence, development of the zones – took place only with regard to the Polish (northern) part of the foreland of the Tatry Range. It was not possible at the time to implement the strategy in the Czechoslovakian side (as it then was) of TNP.

Cooloola National Park (Australia)

Cooloola National Park (CNP), a triangular-shaped piece of land 55,000 ha in area, is one of the largest parks in south-east Queensland (Figure 5), containing important physical, sensory and cultural heritage resources. The Park comprises high coloured sand cliffs, a unique surface and underground water system, wildflower heaths, vineforest and a specialised fauna. Having a predominantly coastal orientation, including an extensive interface with spectacular ocean beaches, the land surrounding CNP is under increasing development pressure. Urban development and associated expansion of infrastructure are being planned and traditional rural activities (beef and dairy production) are likely to be of minor importance with a trend to smaller hobby farms, more intensive rural residential living and tourism related development. Such changes will undoubtedly have an impact on the physical, sensory and cultural heritage resources of CNP.

A detailed examination of the Park's resources was undertaken, followed by an analysis of the surrounding area (land tenure, land/water uses and activities, infrastructure and administrative structure). By examining the inter-relationships between each of the Park's resources and its surrounding environment, both existing and potential negative impacts on each of the Park's resources were identified, enabling the delineation of 10 APZs (geomorphology, hydrology, soil, vegetation, fauna, (micro) climate, silence, wilderness, aroma, cultural heritage).

Each APZ was delineated on a map and incorporated control measures and land use policies to help eliminate or reduce the identified negative impacts. For example, the APZ to protect the geomorphic resource of Cooloola (primarily the unique sandmass system consisting of high coloured sand cliffs and ancient beach ridges) (Figure 6), was designed to reduce negative impacts such as removal of vegetation, recreational activities, fire, noxious and exotic plants, excessive visitor numbers and diminished sand supply. Due to the variation in the spatial range of each

variation in the spatial range of each negative impact on the geomorphic system, a complex APZ structure was devised consisting of five sub-zones each with specific policies to control or minimise the identified negative impacts. Although the geomorphology APZ was almost continuous, there was no uniform land use policy throughout the APZ. The fringing beach interface required the greatest level of control (seven identified negative impacts), with the western landward boundary requiring few control measures (one identified negative impact). Detailed policy measures applicable to particular areas are indicated by the sub-scripts in Figure 6.

A total of 16 external negative impacts on the Park's resources were identified and a matrix (see Figure 7), illustrating the inter-relationships and highlighting the extent of the impact on each resource, was developed. The matrix

thus plays an important role in the management of the buffer as any proposed changes in the Park's surrounds can be assessed on the basis of the identified interactions. For example, a new road may be proposed and the matrix would indicate the park resources that could be affected and would provide a platform for a decision on whether to allow the development and if so to indicate where the least threatening route might be.

The matrix also clearly shows that a particular negative impact (e.g. fire) affects a number of different resources of the park (e.g. geomorphology, soil, vegetation, fauna), and so the data were reorganised on the basis of the type of threat. This resulted in the delineation of 16 EPZs, each with specific land use policies. The fire EPZ and noxious and exotic plants EPZ are





Figure 5. Location of Cooloola National Park.

Figure 6.

Geomorphology analytical protection zone at Cooloola National Park. illustrated in Figures 8 and 9 along with a brief summary of some of the more important land use policies.

The EPZs display a highly complex system of inter-relationships among the resources of CNP and its surrounds. Their synthesis (including land use policies) produced an all encompassing Buffer Protection Zone (see Figure 10), comprising

			PHYS	SICAL			SE	NSOR	Y	CULT HERIT	URAL AGE
RESOURCE THREAT	Geomorphology	Hydrology	Soil	Vegetation	Fauna	(Micro) Climate	Silence	Wilderness	Aroma	Aborlginal/European	TOTAL
A Fire	x		×	x	x						4
B Noxious and Exotic Plants	x	x		x							3
C Water Pollution Domestic/Recreational		x	x	x	x						4
Rural		x	x	x	x		ж. — — [—]				4
Industrial		x		x	x						3
D Feral Animals				x	x						2
E Removal of Vegetation	x	x	x	x	x			x			6
F Drainage Pattern Disruption		x		x							2
G Lowering of Water Table		x		x	x						3
H Road Construction		x	x	x	x	x	x	x			7
I Recreational Activities	x	x		x	x		x	x	X		7
J Airport Development							x	x	x		3
K Excessive Visitor Numbers	x						x	x		x	4
L Destruction of Mt. Bilewilam	x							x			2
M Diminished Sand Supply	x										1
N Greenhouse Effect	x	x		x	x			x			5
0 Solid Waste Disposal								x			1
P Air Pollution									x		1
TOTAL	8	8	4	10	8	1	4	8	3	9	

Figure 7. Summary matrix of threats and resources at Cooloola National Park.



Noxious and exotic plants EPZ: the zone to minimise the negative impact of encroachment of noxious and exotic plant species in the Park.

Purpose

To minimise the impact of noxious and exotic plants on the Park resources of geomorphology, hydrology and vegetation.

Scope

The EPZ forms a near continuous zone surrounding the Park. It contains four sub-zones and includes a number of roads within the Park, which are not under the internal control of Park managers.

Land use policies (sample only)

- B1: restricted vehicular access to the fringing beaches bi-annual surveillance and eradication of noxious and exotic species (in particular bitou bush)
- B2: all water bodies to be kept clear of noxious growth and exotic species of plants
- B3: land (approximately 50 m) to be cleared of all trees dual role as a fire break; bi-annual surveillance and eradication of all exotic (especially pine species) and noxious species
- B4: native vegetation to be retained and protected; clearing permitted only with consent of the local authority planting of exotic species discouraged, public awareness campaign to ensure support

discourage construction and upgrading of selected roads (identified in plan) to and through the Park (e.g. the Cooloola Way) closure of selected roads (identified in plan) within the Park



Figure 8. Fire EPZ of Cooloola National Park.

Figure 9. Noxious and exotic plants EPZ of Cooloola National Park.



Figure 10. Buffer protection zone of Cooloola National Park. a complex array of sub-zones, each with land use policies applying to the area of operation of the particular negative impact they are designed to control. In this way, a quite specific set of control measures and land use policies has been devised, responding to the heterogenous environment surrounding the park, and the varied nature of negative impacts that emanate from this environment.

Other approaches to buffer zones

A model process?

Sayer (1991) in his book *Rainforest Buffer Zones* presents case studies to illustrate a range of situations in which buffer zones have been implemented around protected areas in rainforests. He offers no 'blue-print' for buffers, stressing that every situation is unique and that flexibility is fundamental to the success of buffers. However, the use of a model process, such as the BZP methodology, offers flexibility as well as many other advantages.

By establishing a logical progression or sequence of steps those involved in the design and implementation of buffer zones are able to understand the process

of design and in particular the decision points and data input states. A model process also simplifies the planning task. Complex planning problems can be placed into a more manageable framework thus reducing the breadth of analysis and focusing attention to critical aspects. It helps to clarify the types of data that need to be gathered and helps prevent the collection of data as an end in itself. A sequential progression promotes internal coherence within the final buffer plan and the ability to verify results. The use of a rigorous procedural framework also helps to achieve a consistency of plans within an organisation and allows the process of developing the buffer and associated policies to become visible and hence more accountable. This transparency facilitates community involvement such that individuals and groups can focus their attention at various stages of the model process. Thus although each buffer planning situation may be unique (Sayer 1991), the use of a model process, such as BZP, provides a framework for more rational decision making within each local area. The model may, however, be refined if the experience from Sayer's work is also integrated into it, particularly with regard to legal and institutional considerations. It may be worth discussing this proposition in more detail.

Legal considerations

Without legal backing it is difficult, if not impossible, to accomplish any strategy in real life. Therefore, it is necessary to identify the essential legal requirements for effective management and implementation of a given buffer zone in its entirety.

Although external threatening processes and buffer type zones are recognised in most management plans for protected areas, such zones rarely have a legal basis, largely because protected area management in most countries may not legally extend beyond the bounds of the protected area. Many of the buffers described by Sayer (1991) are located within the legal bounds of protected areas and are managed as internal buffer zones where management restrictions are placed on resident activities.

Despite the inability of protected area managers to control lands external to protected areas, protected area legislation, as Sayer (1991) rightly indicates, can make an important contribution to the development and implementation of buffer type zones. IUCN's categories of protected areas have been considerably widened to include areas where sustainable use of resources is permitted. For example, Habitat/Species Monument Areas (Category IV) provide mainly for conservation through management intervention. Protected Landscapes/Seascapes (Category V), are managed primarily for conservation and recreation and are important for safeguarding traditional customs and practices. Category VI, Managed Resources Protected Areas, consists of protected areas managed for sustainable use of their natural ecosystems, while ensuring the long-term protection and maintenance of biological diversity. If 'sustainable resource use' protected areas are encouraged on land identified as a buffer zone, a high level of protection will be afforded land within the buffer and hence the core area.

The first step towards establishing multiple use management areas provisions is an analysis of the existing laws available, for as Sayer (1991) indicates there are laws in many countries that permit types of land management which are consistent with the purposes of buffer zones. He sees that the two principle mechanisms are:

Laws which recognise the traditional rights of local people to harvest forest products in different categories of reserves.

Laws which provide for "Extractive Reserves", that is reserves where traditional inhabitants are allowed to live, and continue to make use of various forest resources in a sustainable way, while maintaining the natural biodiversity of the site.

Although Sayer's interest is focused only on rainforest buffer zones his perception is correct and can be applied to all types of buffers. For instance, the rights of local people to harvest natural products and to make use of not only forest but other natural resources in a sustainable way should be seen as important in the management of buffers. Further, existing legal provisions may be of major assistance in implementing proposed buffer strategies. Many countries have begun to develop, within their national or provincial legislation, a range of 'off-park' protected areas. These are particularly suited to landholders who have a strong commitment to nature conservation and they are an important mechanism for achieving public interest conservation objectives. The declaration of such areas within a defined buffer zone would add greatly to the conservation objectives of the buffer plan. The obvious difficulty with implementing this strategy throughout an entire buffer may be the protected area management authority's inability to attract sufficient voluntary agreements over important habitat. Sayer believes that if national legal tools (that either already exist, or can be created) are combined with this international legislation, it is quite possible to surround totally protected areas with hunting reserves, managed forests or indigenous peoples' reserves. Although this general premise is laudable, such a strategy may be difficult to implement where a protected area is located in a fragmented landscape which is under pressure from a range of development activities. Higher conservation effectiveness, as well as community support, may result from understanding where the greatest needs for protection lie, and implementing 'multiple-use management reserves' in these 'hot spots'. The BZP process through identifying the major threatening processes and their area of operation allows planners to target these critical areas for inclusion as partial reserves or multiple-use protected areas. Merely surrounding protected areas with partial reserves of indeterminate width or size may not produce the desired results.

However, Sayer's view that the minimum requirement for buffer zones is that the protected area authority be consulted before any changes in the use of land are made, must be challenged as inadequate. One can argue that laws derived through planning, as they aim at land use control, can provide effective support for the implementation of buffer zones in real life.

'Guiding principles' for legal provisions in buffer zones may, thereby, include (based on Sayer 1991):

■ Various categories of partial reserves, located in buffer zones, may provide an ideal legal framework. Provisions for such reserves should be included in national (or regional) legislation.

Planning laws (including impact assessment laws) must become an integral part of any buffer zone implementation strategy. They provide an essential mechanism to control development and land use changes.

■ A sound legal framework for the protection and management of the totally protected area and effective enforcement of this legislation are crucial to give credibility to buffer zone programmes.

Institutional considerations

Without a suitable institutional framework for buffer zone management, the proper and effective functioning of these zones will, most likely, remain in the category of 'wishful thinking'. This mechanism has been recognised for a long time, by planners, as essential to ensuring the 'implementability' of planning proposals. For example, Lichfield *et al.* (1975) put the appropriate 'institutional framework' at the very top of his list of factors affecting the implementation of town and regional plans.

Thus, institutional arrangements facilitating implementation of the overall buffer management strategy, and cooperation among protected area and local government authorities and various agencies in the private sector, must be seen as the second (in addition to legal provisions) of the two main factors ensuring that a given buffer zone will function properly and that its main aims are achieved. Good institutional arrangements provide a platform upon which all parties concerned can influence management and development programmes in areas adjoining parks and reserves. Both protected area authorities and various landowners (public and private) can then raise objections to changes in the use of land adjacent to their own land or to the protected area.

Discussing this problem Sayer (1991) points out that in some circumstances effective initiatives could be based even upon informal arrangements negotiated among protected area staff and their local counterparts in government and/or private agencies operating in the buffer zone. This may be particularly useful where protected areas are located in remote areas and where government agencies are either weak or not much interested in addressing buffer and protected area problems. According to Sayer it is, above all, imperative that the protected area authority be seen as a credible manager of its own area before it can also become a credible partner and advocate of improved buffer zone management. He argues convincingly that the authority "... must be perceived by local people and local authorities as being an important regional resource. It will help if the protected area is seen to be important; if it receives many visitors or is a location for educational activities for local children. Its staff should maintain high professional standards and the protected area infrastructure should be well maintained ... "(Sayer 1991: 11). Indeed it will be very difficult to generate support for buffer zone initiatives and to organise around it an effective institutional framework if the protected area concerned is itself a neglected and forsaken place.

'Guiding principles' for institutional provisions in buffer zones may, thereby, include those proposed by Sayer (1991) who argued that:

Cooperative agreements and/or informal institutional arrangements with individuals, local communities and appropriate agencies (public or private), may become an essential factor permitting the establishment and management of buffer zones.

The protected area authority should be a 'referral agency' for land use decisions in the buffer zone, while not necessarily having operational responsibility for managing buffer zone development activities. The management authority may depend upon local circumstances and the specific competence of the agencies involved.

A variety of institutional mechanisms can be used to manage buffer zones. These can range from appointing a 'community relations officer', to partial or total development and management control of the land use by the private sector, local indigenous tribe, state corporation, sectoral government agencies or, in specific circumstances, by the protected area authority itself.

Conclusion

The Australian and Polish applications of the BZP methodology confirm its practical validity, as in all cases the method ensured the development of a comprehensive buffer, one that recognised the heterogeneous nature of the environment and devised land use policies in relation to the differing needs for protection of the various park resources in relation to the nature of the external threat concerned. The methodology recognised the importance of ecological principles in the determination of the buffer and, through the identification of potential threats, the buffer plays a very important role as a form of proactive planning, ensuring that future threats do not develop, or at least are minimised in their impact. The methodology also has a distinct multidisciplinary character, as the approach requires the involvement of, or consultation with, specialists from many disciplines, before planning synthesis can be reached.

An important aspect of the methodology is to ensure the implementation of the Buffer Protection Zone through physical development plans, these providing the main basis for the steering and control of human activities within the areas

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concerned. A source of potential difficulty for the future implementation of the recommended land use policies derived from BZP may be that final Buffer Protection Zones are bound to cover relatively extensive areas. This problem need not necessarily become serious as one of the main objectives of the method is to limit the policies to only those that are indispensable. Where effective community consultation and involvement has occurred, the buffer policies are more likely to be acceptable to surrounding communities and to be supported by them.

Certainly, the boundaries of buffer zones and their land use policies cannot be of an absolute character and must be continually verified and accommodated to the ever changing reality. The development of knowledge as well as continuous input from the monitoring of interrelations between protected areas and their surroundings would also imply the need for periodic changes to criteria and methods of environmental protection and management. Therefore, it seems necessary to link closely further research on buffer zones and their introduction and verification with economic and physical planning systems in such a way that fresh input is always provided at the beginning of a new phase in a cyclical planning process.

It should be noted that the proposed approach can be applied not only to the protection of the natural environment of national parks, nature reserves, or water reservoirs, but also to such protected objects as, for instance, buildings of historic or architecture values (Vass-Bowen 1994, Izaat 1995, Kozlowski and Vass-Bowen in press).

Above all however, BZP seems to offer great potential in the field of planning for the long term conservation of wildlife. The rapid rate of depletion and the extinction of many species, especially as a result of habitat destruction, is of increasing concern to planners. Research is currently being undertaken in Australia to devise a planning strategy to aid in the protection of koala habitat. The Australian Koala Foundation which is sponsoring this research regards the koala as an animal at 'great risk', for although it is a protected species, its habitat is not, and koalas have become vulnerable in many ways due to the destruction of their habitat, and the fragmentation of that which remains. The planning strategy aims in part to:

Examine and evaluate existing habitats (i.e. supporting communities) and potential habitats.

Describe inter-relations between the present and potential threats and the sensitivity of the particular species and habitat to these threats.

Define Buffer Protection Zones with land management principles to ensure the continuous protection of the species' habitat.

Thus BZP may be useful not only in promoting the conservation of protected areas, through the creation of buffer zones, but it may be a promising methodological springboard to help devise a more universal technique for examining the sensitivity of wildlife habitat to threats and for developing buffer zones aimed at minimisation or elimination of these threats.

A methodology for defining buffer zones has been one of the blank spots in the field of physical planning and this justifies putting forward some ideas for discussion and testing. The proposed approach does not purport to be perfect or to be a thoroughly tested planning tool. This is, however, one of the most common dilemmas in planning practice – the often pressing need to make decisions, which may be irreversible, once implemented. This frequently forces planners to make a choice – should such decisions be totally arbitrary, or should some attempt be made to provide

a rational base for them, as far as possible within existing experience, available time and knowledge? This paper clearly supports the latter approach, even though it means that ideas, concepts and methods which are not fully prepared and matured have to be formulated and applied in the field. This may lead to controversy and criticism, but also can help to expose errors and shortcomings and enable any refinements to be made more quickly. This is essential in our current situation where time to find effective solutions to the definition and management of buffer zones is clearly running out.

References

- Hruza, K.A. 1993. Buffer Zone Planning a Possible Management Tool for Fraser Island. Bachelor of Regional and Town Planning (BRTP) Thesis, University of Queensland, Brisbane.
- International Union for Conservation of Nature. 1992. The Caracas Declaration. Forest Conservation Programme Newsletter 13: 4–5.
- Izaat, C. 1995. Heritage Buffers. Bachelor of Regional and Town Planning Thesis, University of Queensland, Brisbane.
- Kozlowski, J., Baranowska-Janota, M., and Ptaszycka-Jackowska, D. 1979. The Tatry National Park, *Architektura*, No.383–384.
- Kozlowski, J., and Ptaszycka-Jackowska, D. 1987. Planning for Buffer Zones. In P. Day (ed): *Planning and Practice*. Department of Regional and Town Planning, University of Queensland, St Lucia. 200–215.
- Kozlowski, J., Ptaszycka-Jackowska, D., and Peterson. A. 1992. Buffer Zones for Protected Areas: A Planning Approach. Paper presented at the IV World Congress on National Parks and Protected Areas, Caracas, Venezuela.
- Kozlowski, J., and Vass-Bowen. In press. Buffering External Threats to Heritage Conservation Areas: A Planner's Perspective. *Landscape and Urban Planning*.
- Lichfield, N., Kettle, P., and Whitbread, M. 1975. *Evaluation in the Planning Process*. Pergamon Press, Oxford.
- McNeely, J., and Miller, K. 1984. National Parks, Conservation and Development. Proceedings of the World Congress on National Parks, Bali, 1982, Smithsonian Institution Press, Washington.
- Noss, A.S., and Harris, L.D. 1986. Nodes, Networks and MUMs: Preserving Diversity at All Scales. *Environmental Management 10(3)*: 299–309.
- Peterson, A. 1991. Buffer Zone Planning for Protected Areas: Cooloola National Park. Master of Urban and Regional Planning Thesis, University of Queensland, Brisbane.
- Peterson, A. In prep. Planning for the Protection of Wildlife (Koala) Habitat. PhD thesis, University of Queensland, Brisbane.
- Ptaszycka-Jackowska, D. 1990. Protection zones of natural protected objects. Polish Academy of Sciences, Proceedings of the Mining and Geodesy Commission, *Geodesy 35*: 77–82.
- Roughan, J. 1986. *Planning for Buffer Zones An Application of Protection Zone Planning to Nicoll Rainforest*. Bachelor of Regional and Town Planning Thesis, University of Queensland, Brisbane.
- Sayer, J. 1991. *Rainforest Buffer Zones. Guidelines for Protected Area Managers.* IUCN The World Conservation Union, Forest Conservation Programme, Berkshire.
- Vass-Bowen, N. 1994. A Role for Buffer Zone Planning in Urban Heritage Conservation? Bachelor of Regional and Town Planning Thesis, University of Queensland, Brisbane.
- Wells, M.T., and Brandon, K.E. 1993. The Principles and Practice of Buffer Zones and Local Participation in Biodiversity Conservation. Ambio 22 (2-3): 157–162.
- WRI, IUCN, UNEP. 1992. Global Biodiversity Strategy. Guidelines for Action to Save, Study and Use Earth Biotic Wealth Sustainably and Equitably. World Resources Institute, International Union for Conservation of Nature, United Nations Environment Programme, Gland, Switzerland.

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Legal brief Declaration on the Protection of the Arctic Environment

JAN PETTER HUBERTH HANSEN AND FINN KATERÅS

The Declaration on the Protection of the Arctic Environment was signed by representatives of eight Arctic countries in 1991. The Declaration included the adoption of the Arctic Environmental Protection Strategy (AEPS), and identified habitat conservation as an area of special attention. The signatories to AEPS are Canada, Denmark/Greenland, Finland, Iceland, Norway, Russia, Sweden and the United States.

The Arctic, with its unique features and biodiversity, is shared among eight countries: Canada, Denmark/Greenland, Finland, Iceland, Norway, Russia, Sweden and the United States. Following a period with low population densities, moderate land use conflicts and a perception among people living in lower latitudes of endless areas of unexploited lands and resources, parts of the Arctic are today on the threshold of large-scale development and resource utilisation, urbanisation, and infrastructure expansion.

In June 1991 the Declaration on the Protection of the Arctic Environment was signed by representatives of the eight Arctic countries, at Rovaniemi in Finland. The Declaration included the adoption of the Arctic Environmental Protection Strategy (AEPS). The Declaration identified habitat conservation as an area of special attention, and one integral component of this is the programme for Conservation of Arctic Flora and Fauna (CAFF).

Protected areas are recognised by all the Arctic countries as an effective and necessary means of conserving Arctic biodiversity and supporting the sustainable use of biological resources. The eight Arctic countries are therefore developing a Circumpolar Protected Areas Network (CPAN) under the programme for the Conservation of Arctic Flora and Fauna. This is a cooperative effort to protect important areas of the unique Arctic environment, including its biological diversity, through habitat conservation in the form of protected areas.

CPAN is intended to assist member states in a number of ways, not least by providing a baseline for identifying the most significant gaps in the national networks of protected areas and by being an instrument for practical cooperation among participants. A number of protected areas have already been established in the Arctic, and the eight countries have also made proposals for new protected areas to be included in the network.

Even during the first years of the AEPS, it became clear that steps had to be taken towards defining necessary future actions in protecting important habitats in the Arctic, including the use of protected areas. At their meeting in Nuuk, Greenland, in September 1993, the AEPS Ministers requested CAFF "to prepare a plan for developing a network of Arctic protected areas that will ensure the necessary protection of Arctic ecosystems, recognise the role of indigenous cultures, and provide a common process by which Arctic countries may advance formation of circumpolar protected areas".

LEGAL BRIEF

CAFF followed up on this and agreed to prepare a strategy and action plan for the development of what was termed the Circumpolar Protected Area Network (CPAN). It was further decided that Russia in cooperation with Norway and the CAFF Secretariat should take the lead on developing the plan. Advisory Groups of CAFF countries and international organisations assisted in the task.

The development of a strategy and action plan for a Circumpolar Protected Areas Network is CAFF's response to the challenge presented by the AEPS Ministers. The strategy and action plan was presented in March 1996, and is based on a series of studies and reports completed within CAFF to support the development of the network, and to provide the background for and input to the action to be taken both nationally and on a cooperative, regional basis.

The CPAN Strategy and Action Plan was endorsed by the AEPS Ministerial Meeting in Inuvik, Canada, in March 1996. The AEPS Ministers also highlighted CPAN as one of three priority projects under CAFF. Following this political endorsement, a more detailed implementation plan and timetable for CPAN was drawn up at the fifth annual CAFF Meeting in Rovaniemi, Finland, in September 1996. A report on progress so far will be presented to the AEPS Ministerial Meeting to be held in Alta, Norway, in June 1997.

CPAN - goals and actions to be taken

The goal for CPAN, as described in the Strategy and Action Plan, is to facilitate implementation of initiatives to establish an adequate and well-managed network of protected areas that has a high probability of maintaining the dynamic biological diversity of the Arctic region in perpetuity.

The resulting network is intended to represent as fully as possibly the wide variety of Arctic ecosystems and successional states across their natural range of variation, to contribute effectively to maintaining viable populations of all Arctic species in natural patterns of abundance and distribution, and to serve to maintain ecological and evolutionary processes.

To achieve the goal and to further implement CPAN, actions will be required at both the national and at the international (AEPS) level. In total 17 national actions have been identified that should be taken. Among the most salient of these are: to identify the most significant gaps in national networks of protected areas, and select candidate sites for further action; to identify needs and opportunities for modifying (i.e. expanding and buffering) existing protected areas, and for improving connectivity between them; and to provide relatively strict protection to areas representative of each ecozone within the Arctic part of the country.

At the international (AEPS) level nine actions have been identified that need to be taken. Of these priority has in the short term been given to looking at the further development of gap analysis as a tool for CPAN, marine protected areas as a part of CPAN and the development of linkages with other international efforts for migratory species.

Present situation

As of 1995, there were 285 protected areas in the Arctic (as described by CAFF) that qualify for inclusion on the United Nations List of Protected Areas. They cover approximately 2.1 million km², or a little over 14% of the Arctic area. This is the basis on which CPAN will be built. It should be pointed out, however, that the huge ice

cap in the North and East Greenland National Park makes up about half of this total. Furthermore, CAFF studies show that there is considerable variety with respect to the representativeness and coverage of critical habitats among the Arctic countries, and that among the major vegetation zones least protection is afforded to the northern boreal zone and inshore waters.

It was therefore obvious that more protected areas are needed, and CAFF countries and cooperating NGOs were requested to submit proposals for new protected areas to be included in CPAN. These proposals are presented in a 1996 CAFF report, where 118 new proposals are identified and described. If established, the proposals will, together with the existing 285 protected areas, improve and add substantially to a circumpolar protected areas network. A potential of over 400 protected areas will cover approximately 16% of the Arctic land area. However, even with the establishment of these proposed protected areas, there would still be major gaps in coverage of critical habitats and representative ecosystems to be filled, not least in providing further protection of coastal and marine areas.

Further development of CPAN

Further work is therefore needed in the Arctic if the goal set for CPAN is to be reached. Member countries have agreed that, in order to facilitate implementation of CPAN, CAFF should oversee and coordinate the implementation of the identified actions that need to be taken at the national and AEPS level, evaluate the progress made nationally and collectively, develop the plan further in accordance with CAFF objectives, to suggest further actions, and to regularly report to AEPS Ministerial Meetings on the status and progress of CPAN.

To document efforts, plans and progress, countries have to develop and provide CAFF with national implementation plans. Countries are now beginning to develop such plans, and these will be discussed at CAFF's annual meeting in Greenland in September 1997. An indication of the initial progress made in developing a Circumpolar Protected Areas Network in the Arctic will be seen at this meeting.

Further information

The State of Protected Areas in the Circumpolar Arctic 1994 (CAFF Habitat Conservation Report No. 1).

Proposed Protected Areas in the Circumpolar Arctic (CAFF Habitat Conservation Report No. 2). National Principles and Mechanisms for Protected Area Selection in Arctic Countries (CAFF Habitat Conservation Report No. 3).

Circumpolar Protected Area Network (CPAN) – Principles and Guidelines (CAFF Habitat Conservation Report No. 4).

Gaps in Habitat Protection in the Circumpolar Arctic – a Preliminary Analysis (CAFF Habitat Conservation Report No. 5).

Circumpolar Protected Area Network (CPAN) – Strategy and Action Plan (CAFF Habitat Conservation Report No. 6).

These reports can be obtained from the authors: Jan Petter Huberth Hansen and Finn Katerås, Directorate for Nature Management, N-7005, Trondheim, Norway. Tel: + 47 73 58 05 00. Fax: + 47 73 91 54 33.

Résumés

Les zapovedniks de Russie et l'état moderne

V.B. STEPANITSKY

Cet article examine certains des principaux problèmes confrontant les zapovedniks en Russie. Au niveau de la politique de macro-économie de l'Etat russe, les principes favorisant une économie libérale pourraient affecter les bénéfices déjà acquis par les zapovedniks. Au niveau de la politique sectorielle, l'Etat a approuvé de nouvelles dispositions, comme l'interdiction de privatiser les biens des zapovedniks, ceci dans le but d'accorder un plus grand contrôle aux autorités chargées de la gestion des aires protégées. L'application efficace de ces nouvelles dispositions dépend cependant, dans une grande mesure, de la disponibilité des ressources humaines et financières. De nombreux zapovedniks sont endettés et ne peuvent même pas acheter certaines matières essentielles, comme le bois ou le mazout. En raison des faibles pouvoirs dont ils disposent, il leur est difficile d'empêcher la pénétration des réserves naturelles. Le problème de l'exploitation peu scrupuleuse des ressources naturelles des zapovedniks par les hauts fonctionnaires de l'état, qui y chassent et y pêchent illégalement, est aussi abordé. Le conflit entre les autorités des zapovedniks et les membres des organismes régionaux et gouvernementaux reflèterait les forces opposées d'une économie libéralisée et celles d'une défense de l'environnement stricte. De l'avis de l'auteur, l'avenir se présente plutôt mal pour les zapovedniks de Russie.

Les aires protégées dans le climat des changements démocratiques de la société russe

NATALIA DANILINA

Les zapovedniks furent établis en réserves naturelles intégrales où toutes activités humaines avaient donc été depuis longtemps proscrites. Ces aires protégées étaient cependant utilisées par l'élite dirigeante comme lieux de villégiature et de chasse, renforçant ainsi leur image de territoires interdits pour les populations locales. La participation des populations locales à la gestion des zapovedniks est maintenant jugée indispensable à la survie de la biodiversité. Une série de projets ont été exécutés sous la direction du "Centre d'Education Environnementale des Zapovedniks". Leur but est de sensibiliser à la fois les gestionnaires des zapovedniks et le public aux bénéfices des aires protégées. Ceci représente une tentative stimulante dans une société passant d'une économie planifiée à une économie libérale. Les activités promouvant l'éducation environnementale ont jusqu'ici réussi et laisserait suggérer que les bénéfices d'une politique de conservation ne sont pas perdus contrairement à ce que les changements sociaux et économiques pourraient laisser penser. L'auteur discute également de l'importance du soutien technique et financier de la communauté internationale pour la mise en œuvre réussie des programmes d'éducation environnementale.

Problèmes du développement des zapovedniks et de l'utilisation durable des terres en Ukraine

T.L. ANDRIENKO ET N.F. STETSENKO

Cette vue d'ensemble des aires protégées de l'Ukraine souligne l'importance du réseau des aires protégées pour les ressources naturelles du pays. Cet article démontre que le réseau d'aires protégées, bien qu'étendu par rapport à d'autres pays européens, n'offre pas une protection suffisante pour la très grande diversité de paysages et d'aires naturelles en Ukraine. Les forêts de steppes, en particulier, qui représentent un important biome en Eurasie, ne sont pas intégralement protégées. On y conclut que les responsables politiques doivent développer un réseau représentatif d'aires protégées reflétant la diversité des caractéristiques écologiques. Les auteurs suggèrent comment un tel système représentatif pourrait être constitué. Ils attirent également l'attention sur le problème de la dégradation des terres, liée aux activités de l'agriculture et au développement économique, et qui menace les aires protégées restantes. Il devient donc urgent d'élaborer et de mettre en œuvre un programme de réhabilitation des terres en Ukraine.

Les zapovedniks du Turkménistan et la conservation de la biodiversité

KH.I. ATAMURADOV

En raison de sa situation à la frontière entre différentes zones biogéographiques, le Turkménistan abrite une riche biodiversité, importante à la fois pour l'Eurasie et le monde. Les zapovedniks du Turkménistan abritent de nombreuses espèces endémiques et menacées. L'élevage en captivité d'espèces menacées, comme l'âne sauvage, a donné des résultats positifs et de nombreux autres projets de conservation, sur place et à l'extérieur, ont été menés dans les zapovedniks. Le succès de ces projets dépend cependant de la gestion

efficace des zapovedniks et du soutien financier apporté à la conservation de la biodiversité. Avec, en toile de fond, l'effondrement des dépenses publiques accordées aux aires protégées et la transformation de l'économie, les programmes d'élevage en captivité destinés à assurer la sauvegarde de nombreuses espèces ne reçoivent pas un soutien financier suffisant. L'auteur présente des propositions visant à l'application d'un plan destiné à protéger la biodiversité du Turkménistan.

Ecotourisme en Russie

VÉRA P. CHIZHOVA

Le développement d'une industrie de l'écotourisme pourrait être un moyen de financer la gestion des zapovedniks et des parcs nationaux. La Russie possède de magnifiques sites naturels qui pourraient être exploités à l'étranger, mais elle manque l'expertise permettant d'attirer les touristes vers ces régions. Certains zapovedniks et parcs nationaux commencent juste à développer une industrie de l'écotourisme et tentent quelques projets. Il existe aussi de nombreux petits organismes bénévoles ayant une certaine expérience des activités de l'écotourisme. Ces deux facteurs – richesses naturelles et expérience locale – pourraient former la base d'une industrie de l'écotourisme plus importante. Avec une industrie de l'écotourisme en phase de formation, la Russie doit s'inspirer de l'expérience d'autres pays qui ont développé, avec succès, des programmes d'écotourisme.

Pureté de l'air et de l'eau potable: contribution des aires protégées à la santé des êtres humains dans le Kazakhstan MANUEL CESARIO, ANDREY VERKHOVOD ET VLADIMIR UVAROV

La relation de cause à effet entre l'environnement et la santé des êtres humains est un sujet rarement examiné. Les aires protégées préservent les lignes de partage des eaux et assurent une stabilité climatique et, par conséquent, la pureté de l'air et de l'eau. Cet article examine une étude de cas au parc naturel de Ele-Alatau, dans le Kazakhstan, et explique comment le glacier environnant de Tuyuksu pourrait influer sur la qualité de l'air et de l'eau.

Protéger ce qui est protégé: un problème crucial

J. KOZLOWSKI ET A. PETERSON

On a pris conscience depuis longtemps que la valeur des écosystèmes et des paysages des aires protégées peut être affectée par des facteurs extérieurs aux aires protégées elles-mêmes. L'utilisation de zones tampon a souvent été recommandée comme moyen de lutter contre les menaces extérieures, mais il existe un désaccord sur la planification et la mise en plase de ces zones tampon. Cet article propose un modèle de méthode de "Planification des Zones Tampon" et examine les principes en cause, résume les mesures pratiques nécessaires, et donne en exemple des études de cas en Pologne et en Australie. On y discute également des conditions juridiques et institutionnelles nécessaires à une planification réussie des zones tampon. Les auteurs sont de l'avis que les aires protégées bénéficieront au plus d'une approche rigoureuse, mais cependant souple, de la planification des zones tampon.

Resumenes

Zapovedniks de Rusia y el estado moderno

B. STEPANITSKY

Este artículo da una idea general de algunos de los mayores problemas que enfrentan los zapovedniks (reservas naturales del estado) en Rusia. A nivel del programa macro-económico del Estado Ruso, la política a favor de la economía de mercado que se promueve, puede tener un impacto negativo en lo que los zapodevniks han logrado. A nivel del programa sectario, el estado ha aprobado reglas nuevas, tales como la prohibición de la privatización de la propiedad del zapovednik, con el fin de dar más control sobre las áreas protegidas a las autoridades que los manejan. Sin embargo, el enforzamiento efectivo de estas nuevas normas, depende en gran medida, de la disponibilidad de fuentes humanas y financieras. Muchos zapovedniks están en deuda y no pueden ni siquiera comprar materiales básicos, tales como leña o petróleo. La debilidad de los poderes que ponen en vigor estas normas, no facilita su tarea de prevenir la invasión de las reservas naturales. También se ha presentado el argumento de que los recursos naturales de los zapovedniks han sido inescrupulosamente explotados por oficiales de alta jerarquía que cazan y pescan ilegalmente. El confrontamiento entre las autoridades de los zapovedniks y miembros de los cuerpos

regionales y estatales, puede decirse que refleja las fuerzas opuestas de una economía liberada y aquellas de conservación estricta. El autor es de la opinión de que los zapovedniks en Rusia enfrentan un futuro muy incierto.

Areas protegidas dentro de las condiciones del cambio democrático en la sociedad rusa

NATALIA DANILINA

Los zapovedniks fueron establecidos estrictamente como reservas naturales y por consiguiente tienen una larga historia de excluir las actividades humanas. Sin embargo, estas áreas protegidas fueron usadas como colonias de vacaciones para las "élites" del gobierno, reinforzando de este modo la imagen de que los zapovedniks son territorios prohibidos para la población local. La participación de éstos últimos en el manejo de los zapovedniks es ahora considerada como esencial para la sobrevivencia de la biodiversidad. Se han implementado una serie de proyectos, bajo la dirección del "Centro de educación del medio ambiente de los zapovedniks". Tiene como fin educar a los directores y al público en los beneficios de las áreas protegidas. Es un desafío ambicioso dentro de una sociedad en transición, que está pasando de un mercado planeado a una economía de mercado. Las actividades que promueven la educación en lo que concierne al medio ambiente, han sido hasta ahora exitosas y ofrecen signos prometedores de que los valores de conservación no están completamente perdidos, aún cuando los cambios sociales y económicos apunten a lo contrario. El autor también argumenta que el apoyo técnico y financiero de la comunidad internacional es un ingrediente esencial para la implementación exitosa de los programas de educación sobre el entorno.

Problemas del desarrollo de los zapovedniks y el uso de tierras sustentables en Ucrania

T.L. ANDRIENKO Y N.F. STETSENKO

El relevamiento de las áreas protegidas de Ucrania enfatiza la importancia del sistema de áreas protegidas para mantener los recursos naturales del país. El artículo argumenta que el sistema de áreas protegidas, a pesar de ser extensivo comparado con otros países europeos, no es adecuado para proveer protección a la inmensa variedad de paisajes naturales y diferentes áreas que pueden encontrarse en Ucrania. Los bosques de las estepas, en particular, representan el mayor biome en Eurasia y no están totalmente protegidos. La conclusión general es que los políticos necesitan desarrollar un sistema representativo de las áreas protegidas que refleja las variadas características ecológicas de Ucrania. Los autores sugieren modos de lograr ese sistema. También llaman la atención sobre el hecho de que el degradamiento de la tierra, en conjunción con las actividades agrícolas y el desarrollo económico, pone en peligro el resto de las áreas protegidas. Es urgente, por lo tanto, que se desarrolle e implemente un programa para rehabilitación de la tierra de Ucrania.

Los zapovedniks de Turkmenistan y la conservación de la biodiversidad

KH.I. ATAMURADOV

La posición de Turkmenistan en el borde entre varias zonas biogeográficas diferentes, le da un alto nivel de biodiversidad, significante no sólo para la región de Eurasia sino globalmente. Los zapovedniks del Turkmenistan proveen el habitat para muchas especies endémicas y en peligro. La crianza en cautividad de estas especies, tales como el asno salvaje, ha producido resultados positivos y muchos proyectos de conservación han sido realizados en los zapovedniks tanto ex-situ como in-situ. El suceso de estos proyectos se basa en un manejo efectivo de los zapovedniks y en el soporte financiero para la conservación de la biodiversidad. Contra el telón de fondo del colapso del presupuesto destinado a las áreas protegidas y la transformación económica, los programas de crianza para salvar muchas especies no están recibiendo el soporte financiero necesario. También se hacen sugerencias para implementar el plan diseñado para la protección de la biodiversidad de Turkmenistan.

El ecoturismo en Rusia

VERA P. CHIZHOVA

El desarrollo de la industria del ecoturismo representa una alternativa en el financiamiento del manejo de los zapovedniks y los parques nacionales. Rusia tiene sitios naturales magníficos que pueden ser comerciables en el exterior, pero no tiene experiencia en atraer turistas hacia estas destinaciones. Algunos zapovedniks y parques nacionales han tomado los primeros pasos hacia el desarrollo de una industria basada en el ecoturismo y están experimentando con algunos proyectos. También existen algunas pequeñas organizaciones voluntarias con experiencia en este tipo de actividades. Estos factores combinados – riquezas naturales y experiencia local – pueden formar la base de una industria ecoturística mucho más grande. Ya

que muchas de las actividades ecoturísticas permanecen en un estado formativo, Rusia necesita aprender a través de la experiencia de otros países donde los programas de ecoturismo se han implementado con éxito.

Aire limpio y agua potable: las áreas protegidas contribuyen a la salud humana en Kazakhstan

MANUEL CESARIO, ANDREY VERKHOVOK Y VLADIMIR UVAROV

Los vínculos de "causa y efecto" entre el medio ambiente y la salud humana son explorados raramente. Las áreas protegidas conservan las vertientes y estabilizan el clima y pueden, por lo tanto, proveer aire limpio y agua. Este artículo considera el estudio del caso del parque nacional Ele-Alatau en Kazakshtan y explica como el glacial Tuyuksu que lo rodea podría tener influencia en la calidad del aire y el agua.

Protegiendo a los protegidos, una cuestión crítica

J. KOZLOWSKI Y A. PETERSON

Desde hace largo tiempo, ha sido reconocido que los valores de los ecosistemas y de los paisajes de las zonas protegidas han sido sugeridos frecuentemente como medios para combatir las amenazas exteriores; pero hay muy poco acuerdo en como se pueden planear e implementar estas "zonas amortiguadoras." Este artículo presenta un modelo del método "Planeamiento de una zona amortiguadora", delineando los principios que envuelve, describiendo los escalones prácticos necesarios para usar tal método y da ejemplos de casos estudiados en Polonia y Australia. También se discuten los requisitos legales e institucionales necesarios para el suceso del planeamiento de la zona de amortiguación. Los autores sugieren que una aproximación rigurosa pero flexible al planeamiento de esta zona, producirá los beneficios más grandes para las áreas protegidas.

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