

Project co-funded by the European Union and national funds of the participating countries



Deliverable. 4.3.2

Improving accessibility and educational value in protected area - Demo Action

BIOPROSPECT: Conservation and sustainable capitalization of biodiversity in forested areas

Project title	Conservation and sustainable capitalization of biodiversity in forested areas (BIOPROSPECT)
Call identifier	Interreg V-B "Balkan-Mediterranean 2014-2020" Transnational Cooperation Programme
Project acronym	BIOPROSPECT
Starting date	October 20th, 2017
End date	July 31st, 2020
Funding scheme	European Regional Development Fund (ERDF), Pre-Accession Assistance (IPA) Fund / National Funds
Contract no.	BMP1/2.1/2336/2017
Deliverable no.	4.3.2
Partner	Business and Exhibition Researches and Development Institute (IEE)
Deliverable name	Improving accessibility and educational value in protected area - Demo Action
Work Package	WP 4
Date	13.07.2020

BIOPROSPECT Consortium

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Deliverable 4.3.2

“Study on the possible ways to improve accessibility and educational value in the protected area - Demo Action”

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VERSION HISTORY

Version	Completion date	Modifications
1.0	31.07.2019	Initial version
1.1	22.08.2019	Review by IEE
1.2	13.07.2020	Review by IEE

ABBREVIATIONS

Term	Explanation
CBD	Convention on Biological Diversity
CSO	Civil Society Organization
CWR	Crop Wild Relative(s)
FAO	Food and Agriculture Organization of the United Nations
FIGS	Focused Identification of Germplasm Strategy
GIS	Geographical Information System
GPA	Global Plan of Action
GPS	Global Positioning System
GSPC	Global Strategy for Plant Conservation
ITITPG	International Treaty International Treaty on Plant Genetic
IUCN	International Union for Conservation of Nature
NGP	Non-Governmental Organization
PA	Protected areas
ESD	Educations for sustainable development
PES	Payment for sustainable development
PGR	Plant Genetic Resourced
TDGW	Taxonomic Databases Working Group – developing Biodiversity Information Standards

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1. Introduction

Protected area is an area of land and/or sea especially dedicated to the protection and conservation of biological diversity and of natural and associated cultural resources which is managed through legal or other effective means. Accessibility is a very current subject of protected area management. It demands an interdisciplinary approach because this aspect is related to almost all fields of protected area management, like legislation, conservation of species and habitats, visitor management, safety and communication.

Accessibility refers to access to buildings, public spaces and any other place a person might need to go for work, recreation, education, business, services, etc. Physical access includes accessible routes, curb ramps, parking and passenger loading zones, elevators, signage, entrances, and restroom accommodations. Accessibility in protected areas ensures a high standard visitor management that results in very well planned tourism infrastructure and thought-out location. This way the ecological function of a protected area is ensured whereas possible damage and disturbing of species and habitats is minimized. Accessibility in protected areas also ensures additional incomes to local tourism service entrepreneurs, as well as it provides to the managers of protected possibility to apply in various foundations for additional funding for improvement of tourism infrastructure in the area. It also promotes higher standards of public transport service.

Another important factor regarding protected areas their perseverance and accessibility is education. More than 30 years after the concept of sustainability was born, there is still confusion over its definition and – as a logical consequence – weakness in its implementation. Along with the popularity of the term and the concept, there is a growing list of the phenomena one defines as “unsustainable” while it is not so simple to define what actually is sustainable. Differences occur starting from choosing the term itself: sustainable development or sustainability? The obvious connection between the term “development” and “unlimited growth” in the practice of economically dominant countries in recent decades, leads to the question whether sustainable development is an appropriate term at all. Following the western model of economic growth respecting consumers' needs more than the Earth's capacities, rapidly developing countries, such as China and India, are also under the risk of taking the wrong steps on sustainability path.

In the beginning of the 21st century, people are facing various contradictions. The highest awareness of sustainability issues in most developed countries is present along with the slowest acceptance of responsibility for processes such as climate change with

all its complex consequences. The strongest interest of business entities to improve their social corporate responsibility image and performance is present in the same countries where consumerism is reaching its highest rates. All these challenges become more complex and contradictory in the times of global economic crisis, when stress and dramatic changes require adjustments of life styles and redefinition of approaches to sustainability be more rapid than ever.

Along with the development of a market economy, decentralization of decision making, increased social mobility and the application of wiser approaches to exploitation of natural resources, the processes of transition of former socialist countries also result in less sustainable phenomena, such as declines in educational standards, increase of unemployment, and worsening economic and social inequalities.

Obviously, the definition of sustainability is evolving and, rather than trying to find one universal understanding of the concept, one should encourage different people to formulate their own definitions and means to work towards realizing them. In enabling them to do so, it is necessary to provide them with adequate competences and opportunities. Education is therefore seen today as “... the most effective means that society possesses for confronting the challenges of the future” (Unesco, 1997).

Education is highly valued in most relevant documents produced at a global level, such as Agenda 21, adopted during the Rio Conference in 1992. At the global level, it is currently largely promoted, through the United Nations Decade of Education for Sustainable Development (UNESCO, 2005), for which UNESCO is the lead agency. The goal of this decade is to promote integration of sustainable development into all aspects of education and learning.

At the very beginning of the century, in 2000, world leaders adopted the United Nations Millennium Declaration, setting out priority targets and 2015 as the deadline. These targets are widely known as millennium development goals – ranging from halting extreme poverty, to developing global partnerships and promoting universal education (goal 2) as well as environmental sustainability (goal 7).

In order to meet the complex demands of a “new era”, approaches to education need to be changed as well. The need to make a paradigm shift in education is emphasized by authors, claiming that objective should no longer be the quantity of knowledge acquired, but the effectiveness and responsibility in knowledge use. Creativity is becoming one of the major demands in this new context and innovation one of the strongest means of performing in a more effective and sustainable way. Modern managers in all fields need not only to invest in their own skills, but in the development

of their teams, providing them with a stimulating environment and an opportunity to participate in creative solutions and decision making.

All these trends and challenges affect protected area management at all levels. Growing interest in protected areas as places of high natural and cultural values or as potential models of sustainability, is not adequately followed by investments in human resources. Differences between countries are huge, but the general trend shows that this professional field is still not adequately recognized and supported. Growing demands for effective management of protected areas require strategic improvements in capacity development and education in the field. Finding the best mechanisms to do so requires better understanding of the (global) conce

2. Protected area management and governance

Since Yellowstone Park in USA was first officially protected, in year 1872, the number and popularity of protected areas is rapidly growing around the world. Growth is especially dramatic since the 1970s, initiated by the large environmental movement and growing environmental awareness. Today, there are over 120 000 nationally designated protected areas, covering 11.3 percent of territories (UNEP-WCMC, 2008).

However, designation of a protected area is only the first step in the process of effective management. Biodiversity is very important, but from the perspective of sustainability, it is even more important to look at the balance between diversified human population needs and biodiversity conservation. Potential criteria for sustainable governance of protected areas today are not only defined by their inner nature and complexity, but by their relation to the community, economic and social development at the local, national and global level. In their internal structure, there are several pillars of sustainability: ecological (preserving of biodiversity and ecosystems), economic (resources and services essential for human life; local economic development) and social (livelihood and cultural importance for local community; mutual relations and impacts). This is also reflected in the World Conservation Union's (IUCN) widely used definition of protected areas as “a clearly defined geographical space recognized, dedicated and managed, through legal or other effective means to achieve the long-term conservation of nature with associated ecosystem services and cultural values” (UNEP-WCMC, 2008).

In each of these trends, both within management and governance frameworks, there is a focus on social aspects of developing and running protected areas. Even in management of wilderness and strictly protected areas, and especially in the recently added category VI, where cooperation and sustainable use of natural resources by community is emphasized, there is a high expectation of the manager to have “people

skills,” including sensitivity towards human rights, diversity and the needs of the stakeholders. It is widely agreed today that scientific knowledge is not the most important, or at least not sufficient, for effective management of protected areas.

The concept of effective management is widely used today for the assessment of the management cycle in protected areas. The methodology is based on the IUCN World Commission on Protected Areas (WCPA) evaluation framework, modified and applied by a number of international organizations, such as WWF, World Bank, UNDP and UNEP. Assessment is made following the usual cycle of management – from the context, through planning, inputs, processes, outputs – to outcomes (Hockings et al., 2006). A significant portion of the activities and skills behind this concept belongs to communication with different actors in the protected area management – local community, authorities, researchers, media and other public entities.

Within the comprehensive description of the “emerging paradigm” of protected areas, authors emphasize cooperation with local community as a crosscutting element – in the context of objectives, governance, perception and skills:

Important elements of this endeavor are building a wide constituency that supports protected areas, locating protected areas within the wider agenda of sustainable development, and responding to calls from indigenous peoples and local communities for more recognition of their rights, needs and cultures. In sum, these constitute a “paradigm shift” in thinking about protected areas (Lockwood et al., 2006).

Furthermore, describing biosphere reserves, as the type of internationally designated areas under the UNESCO Man and Biosphere Program, in which management objectives are “supported by research, monitoring and training activities, as well as involving the cooperation and interests of the local population” authors directly relate these features with sustainability, claiming that they make biosphere reserves “... a potentially valuable operational tool for further sustainable development” (Bridgewater, 2002). From the places imagined primarily as naturally rich and unique recreation sites, protected areas are perceived more and more as common heritage, for which not only management, but all interested stakeholders – are accountable to preserve.

It is widely emphasized today that protected area management is a participatory, future-oriented, learning process. Changes are dynamic and therefore the management needs to be adaptive. Change management is one of the crucial concepts in defining set of skills needed for modern leaders in protected area field. Capacity development processes and projects are oriented towards setting up standards of competences

enabling professional staff and empowering community actors to meet high demands of modern protected area management.

Having all the above mentioned in mind, one may recognize the following elements of sustainability in protected area governance: integrated approach to natural, cultural and economic aspects; flexibility in responding to constant changes and pro-activity in finding innovative solutions; involving local community in planning, decision making and providing economic benefits with no harm to nature; respecting traditional knowledge as the basis for building up new learning approaches and programs; and connectivity to other protected areas, common issues and international developments.

Shifting from this general, to specific, operational level in evaluation of sustainability of governance, it is very important to include one more set of indicators: the practical actions and behavior of organizations managing protected areas. While it is necessary for them to learn about sustainable practices from community history and patterns of survival, community should learn from the protected area how to live sustainably in relation to energy efficiency, waste management, consumption and active response to potential threats and challenges of modern times. Common actions towards job creation and alleviation of poverty are important steps for gaining community support in further development of the protected area. It all requires a common understanding of sustainability principles and the ability to transfer them into realistic operational goals. The task is complex. Constant mutual learning and a high level of respect is among preconditions for the success.

3. Education for sustainability

Recent trends in understanding of sustainability in general and protected area sustainable governance in particular, are naturally reflected in the current approach to education in the field. In this paper education is considered as the process of acquiring and improving the skills, knowledge and experience needed for sustainable governance of the protected area. Within such an approach, the author targets not only the staff employed, but all the actors involved in protected area governance, including local community and national stakeholders. Author's focus is on non-formal adult education learning, both in-house and externally organized.

Education for sustainable protected area governance is based on the concept of education for sustainability (sustainable development) and is naturally rooted in the concept of lifelong learning. As with the concept of sustainability, this education is becoming more and more comprehensive, covering social and economic issues along with environmental ones. It increasingly addresses social equity, human rights, poverty

and health, beside the “usual” environmental concerns of the more traditional approach to protected area management.

The British Panel for Education for Sustainable development has recognized seven key concepts of education for sustainable development that may be easily applied in non-formal education as well:

1. Interdependence. Links between people, environment and the economy at all levels from local to global.
2. Citizenship and stewardship. The importance of taking individual responsibility and action to ensure the world is a better place.
3. Needs and rights of future generations. Implications for the needs of future generations of actions taken today.
4. Diversity. Respecting and valuing both human (cultural, social and economic) and biodiversity.
5. Quality of life. Social equity and justice are essential elements of sustainability.
6. Sustainable change. Understanding that resources are finite and that this has implications for people's lifestyles and for commerce and industry.
7. Uncertainty and precaution. Different approaches to sustainability and constant changes, indicating a need for flexibility and lifelong learning (Government Panel for Education for Sustainable Development, 1998).

These seven concepts, encapsulate essential characteristics of education for sustainability, offering a broad basis for thinking and developing of education for sustainable governance of protected areas.

Researchers studying education for sustainability in comparison with the previously dominant concept of environmental education, in the context of protected areas, claim that present practice “tends to be more community-oriented, interdisciplinary and sensitive to the realities people face in and around protected areas. It also tends to be more process-orientated, critical and includes a democratic process of reflection” (Working Group of Europarc Federation, 2001).

It is obvious that orientation towards community, critical thinking and interdisciplinary approach make strong pillars of education for sustainability – the elements already recognized within the framework of protected area sustainable governance.

Therefore, the responsibility of protected area managers is not only in organizing learning opportunities for the employees, but for community stakeholders and visitors

as well. These programs are aimed at developing awareness, understanding, attitudes, skills and participatory opportunities for people interested to learn about and contribute to decision making and problem solving in the field. As shown in results of effective management studies in different parts of the world, organizing these education activities strongly correlates with success of protected area management.

1. Education aspects:

Education status of protected area:

- – individual level – formally gained degrees, participation of staff in education programs;
- – organizational level – staff qualifications, practice of in-house and external education programs (provided by the protected area authority).

Educational needs of protected area:

- – individual level – need to take particular programs and level of education, willingness to improve competences;
- – organizational level – demands for adequate education/qualification profile of employees and attitudes towards value of education for improving of protected area governance capacities.

Job analysis:

- Identifying number of existing jobs within the protected area system.
- Analyzing of activities incorporated in different jobs at different levels and categories of work.
- Recognizing skills needed for quality performance of jobs within the same category and at different levels.
- Recommending of set of skills and competences to incorporate in future jobs/jobs requirements in protected areas.

Understanding and practising sustainability:

- Recognizing main sustainability issues and global challenges of today.
- Recognizing the most important sustainability issues and challenges of local community.
- Identifying priorities of protected site towards more sustainable operation.

- Practice of sustainability – activities performed in accordance with sustainable principles.

A study comprising these elements should result in the data needed for drawing up the context and specific goals of future educational programs towards the sustainable governance of protected areas. It should help in understanding of a specific situation, including gaps and opportunities for improvements in protected areas, and provide the actors with the opportunity to define their own vision of goals and priorities towards sustainability. The design of future educational programs for both employees and stakeholders of protected areas may then follow the attitudes and needs expressed, the gaps in competences found and sustainability in practice observed – rather than general presumptions of training needs, job skills requirements or sustainability understanding based on experiences from other countries or on project-driven training initiatives.

Valuable international experience may then be used in choosing the content, methods and sources for education in balance with experience gained in previous delivery of the programs.

The concept of sustainability is evolving today, and it needs to be shifted from the general to the operational level in order to support implementation in any field. It affects changes in approach to education in developing capacities for protected areas governance. If one wants to achieve more than acquiring knowledge and skills relevant to a particular issue, then much more than a general training program applied in different environments is required. There is a need to carefully analyze the context, the role of education, gaps in competences (existing and required) and sustainability performance, in order to provide adequate education programs.

In that way, the power of education for sustainability may be put to use by linking global experiences with specific knowledge of the area, needs, demands and existing practice. Building the design of educational programs on both the expertise of outside expert and inside actor assessments, opens the space for quality participation in training/education programs and for more active knowledge implementation – on the way to the sustainable governance of protected area.

4. Current status in Northern Pindos National Park

The Northern Pindos National Park is located at Epirus and Western Macedonia regions and can be approached by the road network between the settlements of Northern Pindos. The

prefectures included in the National Park are Ioannina and Grevena. There are frequent public bus routes between those cities and Athens and Thessaloniki.

The protected area of Northern Pindos is one of the most important areas at both national and European levels. It uniquely combines natural and man-made environments and geographically unifies the pre-existing National Forests of Pindos (Valia Kalda) and Vikos-Aoos. Rich in natural resources, numerous religious and cultural monuments, the region brought about the development of traditional villages into centers of touristic attraction.

The Northern Pindos National Park is the largest terrestrial National Park in our country, with an area of 2.000 km², constituting unique ecologic and environmental values at national, European and global levels. The Vikos-Aoos and Pindos (Valia Kalda) National Forests, are two out of the 11 areas of the EU-wide network of NATURA 2000 protected areas. In addition, 11 wildlife refuges are included within the boundaries of the Northern Pindos Park, and Vikos-Aoos Geopark as well as a Biogenetic Reserve at the Valia Kalda core. Since 2002, the mission of the Northern Pindos National Park Management Agency is the vigilant protection and management of the area and its peripheral zones with the goal of promoting ecologic, aesthetic, cultural and local values in a sustainable development model in harmony with the human presence in this area of unparalleled beauty.

The special ecological value of Northern Pindos National Park, which is recognized globally, arises from the fact that within its limits two National Forests are enclosed:

1. the National Forest of Pindos (Valia Kalda)
2. the Vikos- Aoos National Forest

Apart from the two National Forests the protected area includes:

- Eleven areas listed in the European Network of Protected Areas "NATURA 2000" :

NAME	AREA CHARACTERIZATION	AREA CODE	AREA (ha)
Vasilitsa Mountain	SPZ	GR 1310001	8012.78
Valia Kalda and Aoos artificial lake	ZSP	GR 1310002	14660.48
Natural Park of Pindos (Valia Kalda) (Broader Area)	SPZ	GR 1310003	6838.25
Orliakas and Tsourgiakas Mountains	ZSP	GR 1310004	10230.24
National Forests of Vikos-Aoos	SPZ	GR	12794.25

NAME	AREA CHARACTERIZATION	AREA CODE	AREA (ha)
		2130001	
Peaks of Smolikas Mountain	SPZ–ZSP	GR 2130002	19975.72
Central Part of Zagori	SPZ	GR 2130004	33114.95
Metsovo Area (Anilio-Katara)	SPZ	GR 2130006	7328.82
Mitsikeli Mountain	SPZ	GR 2130008	8435.99
Tymfi (Gkamila) Mountain	ZSP	GR 2130009	27416.44
Central Part of Zagori and East Part of Mitsikeli Mountain	ZSP	GR 2130011	53407.84

For centuries, in the mountainous forest ecosystems of Northern Pindos, there has been a balanced relationship between nature and man. The rich forests of the area helped decisively in survival, won the respect of humans and determined the activities which were developed. Many traditional villages are located in the National Park's borders and are considered centers of touristic attraction, supported by numerous religious and other kinds of monuments. The cobble stone footpaths, the impressive buildings and the numerous stone bridges (single-arched, double-arched, triple-arched), were made by local artisans and represent the long and successful history as well as the possibilities of a successful future.

4.1 Information Centers

The Northern Pindos National Park operates five Information Centers. These provide tourists with the practical, cultural, and environmental background essential to enriching any visit to the Park. Exhibitions and video presentations take place in the Centers, illustrating the Park's sites of natural beauty, its flora and fauna, its traditional architecture, regional history and folklore. The staff is available for talks and questions. Educational groups from schools, universities, or special interest tours are welcome.

Brochures and information pamphlets are available free of charge. These include both educational material and maps for sightseeing, hiking, the location of observation sites and other activities held in the area of the Park. The Information Centers that operate in the area of the National Park are:

Aspraggeli Information Center, Zagori

Located within the the Zagori region, at the village's entrance, in southwestern part of the Northern Pindos National Park, is the Aspraggeli Information Center. The center is based around a central theme: the Vikos gorge. There the visitor can be informed about: the major geological formations, the wider region of the Vikos-Aoos National Forest, the unique architecture of Zagori, its history in both the past and present, as well as, the flora, the fauna, the mountains, the lakes, and the rivers of the region. In addition, a wide range of alternative activities are promoted for guests of the area to engage in (e.g. trekking, hiking, cycling, rafting etc.)

Metsovo Information Center

The southeastern part of Northern Pindos National Park is presented in the showroom of Metsovo Information Center, which is focusing on the two main natural formations that are located in the wider area of Metsovo: the Pindos (Valia Calda) National Forest and the sources of the river Aoos. The exhibition is devoted to the Village of Metsovo and refers to the human activity in the area in both the past and present, as well as, the flora, the fauna, the mountains, the lakes, and the rivers of the region. In addition, a wide range of alternative activities are promoted for guests of the area to engage in (e.g. trekking, hiking, cycling, etc.)

Mavranaioi Information Center, Grevena

The northeastern part of Northern Pindos National Park is presented in the showroom in Mavranaioi Information Center. The main focus is the Pindos National Forest (Valia Calda). The visitor can be informed about the unique terrain of Valia Calda (meaning "warm Valley"), the rich mushroom ecology and the extremely high geological importance of the area as well as, the flora, the fauna, the mountains, the lakes, and the rivers of the region. In addition, reference is made to the culture and history of the Vlachs and Kopatsaraioi of Pindos, and a wide range of alternative activities are promoted for guests of the area to engage in (e.g. trekking, hiking, cycling, rafting, skiing, etc.)

Vovousa Information Center, Zagori

In the showroom of the Vovousa Information Center, the tour focuses on the Pindos (Valia Calda) National Forest and the Aoos River. A large portion of the exhibition is devoted to the Village of Vovousa and the folklore of its people. In addition, reference is made to the flora, the fauna, the mountains, the lakes, and the rivers of the region. In addition, a wide range of alternative activities are promoted for guests of the area to engage in (e.g. trekking, hiking, cycling, etc.)

Papigo Information Center

In the showroom of the Papigo Information Centre, the tour focuses on the Vikos-Aoos National Forest, the history and architecture of the region of Zagori, the Vikos gorge, and the major geological formations of the region. In addition, reference is made to the flora, the fauna, the mountains, the lakes, and the rivers of the region. In addition, a wide range of alternative activities are promoted for guests of the area to engage in (e.g. trekking, hiking, cycling, rafting etc.)



4.2 Park protection

According
15 of Law
2742/ΦΕΚ



to article
no.

207/A'/07.10.1999, the Management Agency is responsible for supervision and guarding of the National Park grounds.

The implementation for the supervision and the guarding of the protected area of Northern Pindos National Park is coordinated by the staff of the Management Agency, in accordance to an approved plan that is adjusted on an annual basis, integrating the experience of the previous year and any new guarding needs as they appear.

For optimal coverage of the Northern Pindos National Park area, the Management Agency has four park ranger teams. In particular:

- The first team is based at the Aspraggeloi Information Center and its area of responsibility is south-western part of the Park
- The second team is based at Konitsa and its area of responsibility is the north-western part of the Park
- The third team is based at the Metsovo Information Center and its area of responsibility is the south-eastern part of the Park.
- The fourth team is based at the Mavranaioi Information Center and its area of responsibility is the north-eastern part of the Park.

Each of the four teams is comprised of two park rangers who are trained on an annual basis on efficient and correct execution of the patrolling program, such as the legal framework of the Park, visitor assistance, fire safety, environmental legislation, changes in prohibitions and handling of equipment.

Each team is supplied with its own four-wheel drive vehicle, which is fully equipped with fire extinguishing system, camera, binoculars, GPS, portable fire extinguisher, axe, chainsaw, and a portable pharmacy.

Park protection and patrolling is coordinated and supervised by the Chief Security Officer or by his deputy. In addition to the designated park rangers, all employees may participate in meeting additional park security needs.

Goals of the Protection-Patrolling Program:

1. The monitoring and frequent control of the area of the National Park with the goal of restricting illegal activities.
2. Participation in scientific monitoring programs carried out by the Management Agency.
3. Providing information and raising awareness with local residents and visitors of the area, in matters such as the protection of the natural environment.
4. Tracing and reporting of illegal activities to the appropriate authorities (Forest Department, Fire Department, Police).
5. Preventing and putting out small fires.

The effective implementation of the protection and patrolling program is based on the full cooperation between the Northern Pindos Park and the local emergency services (Fire Dept., Police etc), local government bodies, and other related agencies.

4.3 Actions in Schools

The student environmental awareness program is part of the information/awareness actions developed by the Northern Pindos National Park Management Agency. These themed activities include: Mountain forest ecosystems of Northern Pindos National Park, endangered wildlife species, rare plant species, geomorphology of Northern Pindos, and the unique historical and cultural elements of the man-made environment of the protected area.

Environmental Awareness Programs following the authorization of the Ministry of National Education and Religious Affairs are offered in schools and Information Centers (Asprangeloi Zagori, Metsovo, Mavranaioi and Grevena), alongside Environmental Interpretation Trips within the protected area. The Management Agency offers a remarkable set of actions for students aged between 6 and 12 years, approved by the Educational Policy Institute, about the environmental awareness entitled “Northern Pindos National Park... Let’s find out, let’s play”

All actions of the Management Agency are made without any financial burden to the school, following a request from the teacher or the principal to the Management Agency and are adjusted accordingly with the age of the participating pupils. The duration of Environmental Awareness Programs and Environment Interpretation Trips is about 3 hours.

The main goal of the Environmental Awareness Programs and Environment Interpretation Trips is for the understanding of basic environmental concepts by students, such as protected area, human-environment interactions, the environmental problems of the area and protective measures. The purpose of the trips is to familiarize students with scientific methodology and research, critical and creative approach to questions, and a general sense of scientific culture. Additionally, students are encouraged to work in teams in order to learn the benefit of cooperation for a common goal. Ultimately, the Northern Pindos National Park strives to promote the relationship between students and nature.

All the schools can take a tour at any of the five Information Centers of the Northern Pindos National Park (Asprangeloi, Papigko, Vovoussa, Metsovo, Mavranaioi), without necessarily being involved in any of the other programs or tours of the Management Agency.

4.4 Environmental Information-Raising awareness

The Northern Pindos National Park Management Agency has designed and implemented a series of actions, in accordance with the annual “Promotional Plan – Program of information and awareness”, with a goal of informing and raising awareness about the need for

protection and conservation of the natural and man-made environment within the protected area of Northern Pindos National Park.

The information-awareness measures aim in promoting the concept of the protected area and raising environmental consciousness within the local population, schools and visitors of the Northern Pindos Park. Thus, these measures contribute to the success of management actions of the Management Agency.

LOCAL SOCIETY

The Management Agency organizes, on a yearly basis, local meetings with target groups of the local population (farmers, tourist operators, teachers, etc) with the purpose to inform and raise awareness within the local society. These meetings take place within Regional Sections of the National Park of Ioannina and within Grevena, with a goal of developing an open dialogue between all groups active in the area as well as strengthening and consolidating the role of the Northern Pindos National Park.

During the summer period, the Management Agency also organizes exhibitions which show the particular characteristics of the National Park, trail and settlement maintenance, guided tours, environmental workshops for children, etc.

The Management Agency organizes annual guided hiking events in honor of the World Environment Day (5th of June). Annual events are also held on the Pan-european birdwatch day— in early October—at the Aspragelloi and Mavranaioi Information Centers, in cooperation with the Hellenic Ornithological Society.

The agency also supports special events within the protected area such as the Mushroom Feasts, the Mountain Marathon at Zagori, the race run “Mountain in the footprints of bears...” in Metsovo, the mountain bike race Protect Aooos mtb ultra, the Orliakas Mountain Race, in Grevena, skiing and snowboarding events in Vasilitsa Ski Center, etc.

In addition, the Management Agency grants electrified fences to farmers and beekeepers and supplies Greek Shepherd puppies to livestock farmers in the area of the National Park. These puppies are derived from the network of Greek Shepherd owners that has been created within the project “LIFE ARCPIN” by the Management Agency and the Callisto Organization.

The Management Agency also participates as a member in the “Network against Unauthorized Poison Use”, which is a particularly important initiative for the creation of a network of organizations, services and citizens, dealing with the use of poison as an illegal and cruel mean of animal population control undertaken by individuals that threatens not only animals but also humans.

PARK VISITORS - GENERAL PUBLIC

The Management Agency operates five Information Centers in selected locations within the National Park with the main purpose to highlight the ecological, geomorphological and cultural complexity of the area and accommodate visitor's needs for an enjoyable and educational stay. Their aim is also to formulate interesting proposals for both the local community and the general public, by creating an attractive and successful infrastructure network that will stand as a reference point for the Northern Pindos National Park.

Furthermore, the Management Agency distributes free printed and electronic material and relevant maps with the boundaries and the areas of the National Park, the road network, the sights and the hiking trails for tourists. Also in collaboration with the Regions of Epiros and Western Macedonia, the informational material for the Northern Pindos National Park is distributed in their stands on domestic and international tourist exhibitions. Marketing has been forwarded to the Embassy of Greece in London and to some major tourist offices within Greece. It should be noted that publications are frequently made in local and national press for the Northern Pindos National Park and the actions of the Management Agency.

STUDENTS

The environmental information/awareness-raising program for students is designed by the Management Agency, with the purpose of educating and instilling values of environmental and cultural consciousness. The presence of student activity in the area of the National Park strengthens the role of the protected area and its infrastructure and contributes to raising the level of student awareness, as well as that of their siblings and friends.

The Information Centers give special presentations to students that visit the National Park and organize Environment Interpretation Trips which are designed by the Management Agency. The Agency's staff will also visit schools at schools that want a presentation of an Environmental Awareness Program.

4.5

Access

Northern Pindos National Park can be approached from North, South, East and West. Its southeast and east borders are connected to the Egnatia Highway. Grevena is 165km (approximately 1h and 40min by car) from Thessaloniki and 414km from Athens (approximately 5h and 31min by car). Ioannina is 262km (approximately 2h and 30min by car) from Thessaloniki and 454km from Athens (approximately 5h and 45min by car).

In order to get to Grevena from Thessaloniki take the Egnatia Road E90/A2 and take the exit 9. In order to get to Ioannina from Thessaloniki take the Egnatia Road E90/A2 and take the exit 5. From Ioannina, someone can access Zagori and Konitsa regions, which are located at

the south west and west part of the Park. Metsovo region is 218km from Thessaloniki, through the Egnatia exit to Metsovo.

The rest of the Egnatia Road interchanges access the east and northeastern part of the Park. Someone can access East Zagori from interchange 06-Arachthos-Zagori, and from interchange 07 at Metsovo area someone can reach the Park area in about 20 km. Consequently, from Egnatia Road interchange to Thessaly (interchange 07B-Panagias) someone can follow the old National road and through Katara access the National Park (not possible during winter). Finally, from interchange 08A-Venetikos at Grevena area the visitor can follow the old local roads to Metsovo, Perivoli or Vasilitsa and access the area of the Pindos (Valia Kalda) National Forest. Also, the visitor can follow the road to Samarina and reach the northern part of Smolikas and from there through mountainous passages they can reach the part of the Park that leads to the Ioannina region. Finally, from Grevena and following the road to Dotsiko and Eptachori someone can reach the northern part of the Park.

The southwest and west part of the Park can be reached from Ioannina-Konitsa-Kozani national road and more particularly from 19th km at Metamorphosi village; from 34th km at historical Kalpaki and from 38th and 48th km someone can reach Zagorochoria and the area of National Park of Vikos-Aoos.

Also, from 63rd km where Konitsa settles to 80rd km, the western boundaries of the Park perfectly match the national road of Ioannina-Konitsa-Kozani. So, from 63rd km someone reaches Konitsa and from there he can reach the inner part of the National Park following the local road to the villages of Lakkas Aoos at the hillsides of Smolikas. Also, from 80rd km (junction to Agia Paraskevi) the borders of the Park turn east from where someone can reach the northern part of Smolikas (which matches the northern boundaries of the park) and through mountainous passages unites the part of the Park which settles into Grevena region.

From Athens take the E75, E65 and E92 motorways in order to visit the Grevena region of the Park and then follow the district street from Kalambaka to Grevena. To go to Ioannina take the E75, E65 and E92 and from Malakasi follow the E90 motorway to district road Arta/Ioannina E951/EO5.

The National Park can also be reached from Albania. Zagori and Konitsa which are located in the southwest part of the Park and are 15 km away from the border stations of Kakavia, and Mertzani (Tris Gefires). Of course, the visitor of the Park following the opposite direction can easily access Albania (Argirokastro and Premeti regions).

5. United Nations Resolution adopted by the General Assembly on 19 December 2014

The UN have adopted a resolution stating that it is necessary to develop accessibility by increasing awareness towards the conservation of natural and cultural assets, both among locals and tourists, with the aim of ensuring that tourism contributes to the purposes of protected areas and does not undermine them.

Inaccessible areas, offer intrinsic possibilities for conservation. However, management of resources contained in these areas is often more costly (control of forest fires, patrolling, rescue of visitors, research, etc.). Social and Administrative Factors the importance of these factors are generally underestimated when identifying protected areas, and very often this seriously impedes effective protection and management. Social and administrative factors are critical to effective planning and management of protected areas.

The General Assembly

1. Welcomes the report of the Secretary-General of the World Tourism Organization transmitted by the Secretary-General of the United Nations;
2. Recognizes that sustainable tourism, including ecotourism, represents an important driver of sustainable economic growth and decent job creation, that it can have a positive impact on income generation and education, and thus on the fight against poverty and hunger, and that it can contribute directly to achieving the internationally agreed development goals, including the Millennium Development Goals;
3. Also recognizes the potential of sustainable tourism, including ecotourism, to reduce poverty by improving individual livelihoods in local communities and to generate resources for community development projects;
4. Emphasizes the need to optimize the economic, social, cultural and environmental benefits stemming from sustainable tourism, including ecotourism activities, in all countries, particularly developing countries, including African countries, the least developed countries and small island developing States;
5. Also emphasizes that sustainable tourism, including ecotourism, can contribute to sustainable development, in particular environment protection, and can improve the well-being of indigenous peoples and local communities;
6. Recognizes that sustainable tourism, including ecotourism, creates significant opportunities for the conservation, protection and sustainable use of biodiversity and of natural areas by encouraging indigenous peoples and local communities in host countries and tourists alike to preserve and respect the natural and cultural heritage;
7. Underlines, in this regard, the importance of establishing, at the national level, where necessary, appropriate policies, guidelines and regulations, in accordance with national priorities and legislation, for promoting and supporting sustainable tourism, including ecotourism, and minimizing any potential negative impact;

1. Invites Governments, international organizations, other relevant institutions and other stakeholders, as appropriate, to encourage and support best practices in relation to the implementation of relevant policies, guidelines and regulations in sustainable tourism, including the ecotourism sector, and to implement and disseminate existing guidelines;
2. Encourages Governments at all levels to use sustainable tourism, including ecotourism, as a tool to support poverty eradication, environmental protection and/or conservation and the sustainable use of biodiversity and to base tourism components on clear evidence of market demand and on a sound economic and environmental foundation;
3. Encourages Member States to promote investment in sustainable tourism, including ecotourism, in accordance with their national legislation, which may include creating small and medium-sized enterprises, promoting cooperatives and facilitating access to financing through inclusive financial services, including microcredit initiatives for the poor, for indigenous peoples and for local communities in areas, including rural areas, with high potential for sustainable tourism, including ecotourism;
4. Encourages Governments, the United Nations and the specialized agencies to support the coordination of regional and/or international sustainable tourism development frameworks, as appropriate, in order to assist countries in promoting sustainable tourism, including ecotourism, for poverty eradication and environmental protection;
5. Underlines the importance of conducting an environmental impact assessment, in accordance with national legislation, for the development of sustainable tourism, including ecotourism opportunities;
6. Stresses that indigenous cultures, traditions and knowledge, in all their aspects, are to be fully considered, respected and promoted in policy development for sustainable tourism, including ecotourism, and underlines the importance of promoting the full and early participation and involvement of indigenous peoples and local communities in decisions that affect them and of integrating their knowledge, heritage and values in sustainable tourism, including ecotourism initiatives, as appropriate;
7. Emphasizes the need for effective measures, in the context of sustainable tourism, including ecotourism initiatives, to ensure the full empowerment of women, including the equal participation of women and men at all levels and in decision-making processes in all areas;
8. Also emphasizes the need for effective measures, in the context of sustainable tourism, including ecotourism initiatives, to help ensure the equal participation of youth, persons with disabilities and older persons at all levels and in decision-making processes in all areas and to promote the effective economic empowerment,

- including through international cooperation, of women, youth, persons with disabilities and older persons, in sustainable tourism, including ecotourism activities, mainly through decent job and income creation;
9. Calls upon the United Nations system, in the context of the global campaign for the Millennium Development Goals, to promote sustainable tourism, including ecotourism, as an instrument that can contribute to achieving those Goals, in particular the Goals of eradicating extreme poverty and of ensuring environmental sustainability, and to support the efforts and policies of developing countries in this field;
 10. Encourages the regional and international financial institutions to provide adequate support to programmes and projects related to sustainable tourism, including ecotourism, taking into account the economic, social, cultural and environmental benefits of such activities;
 11. Invites relevant specialized agencies, in particular the World Tourism Organization, United Nations bodies and other organizations, to provide technical assistance to Governments, upon request, and to assist, as appropriate, in strengthening legislative or policy frameworks for sustainable tourism, including ecotourism, including those for environment protection and the conservation of natural and cultural heritage;
 12. Invites relevant specialized agencies, United Nations bodies, other organizations and multilateral financial institutions to provide technical assistance to Governments, upon request and as appropriate, in identifying needs as well as opportunities to improve the contribution of sustainable tourism, including ecotourism, to poverty eradication, including through securing wider community benefits from sustainable tourism, including ecotourism activities, as a viable and sustainable economic development option;
 13. Encourages all stakeholders to cooperate in supporting, as appropriate, the participation of indigenous peoples and local communities in sustainable tourism, including ecotourism activities;
 14. Encourages the public and private sectors and relevant stakeholders to provide, upon request, assistance for capacity-building, the development of specific guidelines and awareness-raising materials and training for people involved in sustainable tourism, including ecotourism activities, such as language training and training in specific skills in tourism services, as well as to develop or strengthen partnerships, especially in protected areas;
 15. Invites relevant stakeholders to provide, upon request and as appropriate, technical assistance to assist in building the capacity, including for marketing and product positioning, of local communities, cooperatives and small and medium sized businesses involved in sustainable tourism, including ecotourism activities;

16. Recognizes the role of North-South cooperation in promoting sustainable tourism, including ecotourism, as a means to achieve economic growth, to reduce inequalities and to improve living standards in developing countries, and also recognizes that South-South and triangular cooperation, as complements to North-South cooperation, have the potential to promote sustainable tourism, including ecotourism;
17. Invites Governments and other stakeholders to consider joining the framework of the Global Observatory of Sustainable Tourism of the World Tourism Organization as a way to promote socioeconomic and environmentally sustainable tourism, including ecotourism, and to support better informed sustainable tourism policies around the world, mainly through the identification and dissemination of best practices and enhanced awareness of and capacity-building for sustainability among tourism stakeholders;
18. Requests the Secretary-General to submit to the General Assembly at its seventy-first session, in collaboration with the World Tourism Organization and other relevant United Nations agencies and programmes, a report on the implementation of the present resolution, including recommendations on ways and means to promote sustainable tourism, including ecotourism, as a tool for fighting poverty and promoting sustainable development, taking into account relevant reports prepared by the World Tourism Organization in this field.

6. Develop accessibility by increasing awareness towards the conservation of natural and cultural assets, both among locals and tourists, with the aim of ensuring that tourism contributes to the purposes of protected areas and does not undermine them

An indicator framework for assessing ecosystem services in support of the EU Biodiversity Strategy to 2020

In 2011 countries which are participating in the Convention of Biological Diversity (CBD) adopted a new strategic plan until 2020. This plan includes the so called Aichi biodiversity targets, 20 ambitious objectives to stop biodiversity loss and to ensure healthy ecosystems providing essential services to people. Following the adoption of this global strategic plan, the European Union (EU), which also signed the CBD, proposed a European Biodiversity Strategy to 2020 (European Commission, 2011). This strategy includes six targets. They cover the full implementation of the EU nature legislation, a better protection of ecosystems and the services they provide, more sustainable agriculture and forestry, better management of fish stocks, tighter controls on invasive alien species, and a bigger EU contribution to

averting global biodiversity loss. Target2, in particular, aims to maintain and enhance ecosystems and their services by establishing green infrastructure and restoring at least 15% of degraded ecosystems. To meet the targets the Biodiversity Strategy sets 20 actions. Three concrete actions are proposed to achieve target 2. Action 5 improves the knowledge base on ecosystems and ecosystem services; Action 6 sets priorities to restore ecosystems and promote the use of green infrastructure; Action 7 launches an initiative to ensure the no net loss of biodiversity and ecosystem services. Under Action 5 the Member States of the EU are committed to map and assess the ecosystems and their services on their national territory.' Mapping' stands for the spatial delineation of ecosystems as well as the quantification of their condition and the services they supply. Ecosystems are spatially explicit and so, too, are the pressures and impacts upon them. As a result the condition of ecosystems and the supply of ecosystem services are expected to be spatially heterogeneous as well, requiring the use of spatial data and indicators (Maes et al., 2012). 'Assessing' refers to the translation of this predominantly scientific evidence into information that is understandable for policy and decision making, e.g. through maps, indicators, narratives and graphs. The commitment of Action5, together with other commitments formulated in the Biodiversity Strategy, was formally adopted by the Council of the EU and endorsed by the European Parliament, two institutions that share decision power. This gives the European Commission, which is the executive arm of the EU, a strong mandate to implement Action5. In practice, the implementation of the mapping and assessment of ecosystems and their services (MAES) is in the hands of an expert working group. The working group MAES consists of official representatives of EU Member States, experts affiliated to different European Commission services and of the European Environment Agency, as well as independent scientists. The MAES working group has been setup within the Common Implementation Framework of the Biodiversity Strategy and reports back to the Co-ordination Group for Biodiversity and Nature (CGBN), which oversees the implementation of biodiversity policy in the EU. The working group meets two or three times per year with the aim to provide the best available guidance to Member States on how to map ecosystems, and assess their state and the services they provide. The essential challenge of Action 5 and of the working group is thus to make the best use of and to operationalize the information and scientific knowledge currently available on ecosystems and their services in Europe. Consequently, Action 5 and MAES build strongly on the outcomes of the Millennium Ecosystem Assessment (MA, 2005) and The Economics of Ecosystems and Biodiversity (TEEB, 2010) studies. Importantly, some countries in Europe have started or recently finished a national ecosystem assessment or national TEEB studies, for example the United Kingdom (UKNEA, 2011) and Spain (Santos-Martín et al., 2013). MAES

Developed a conceptual framework with the aim to provide support to future assessments by EU Member States. The first versions of the conceptual model were rooted in the ecosystem services cascade model (Haines-Young et al., 2012; Haines-Young and Potschin,

2010), the TEEB framework(de Groot et al., 2010), and the UK National Ecosystem Assessment (UKNEA,2011). It also contained elements of the DPSIR framework (Drivers-Pressures-State-Impact-Response) linked to the cascade model (Kandziora et al.,2013). The DPSIR approach has traditionally been used in the conception and implementation of environmental legislation in Europe (Niemeijerand de Groot,2008). The cascade model and its revised version adopted by the TEEB study connect ecosystem structure and ecosystem functioning to human well-being through the flow of ecosystem services (de Grootetal., 2010). However, further modifications to the conceptual framework were needed due to the particular European governance context. The Biodiversity Strategy is a non-binding communication and cannot be forced as for instance a directive. It follows that finding consensus among the different Member States of the EU is crucial to achieve desired policy outcomes. Some Member States preferred that a conceptual model emphasized the supply side of ecosystem services. They insisted focusing particularly on the proper functioning of ecosystems and the role of biodiversity in underpinning ecosystem services. Others states preferred a more profound emphasis on the demand site of ecosystem services with J. Maes et al./Ecosystem Services 17(2016). Additional focus on unravelling the benefits and values that arise from ecosystem services. These differences among Member States are driven by different motivations. An emphasis on state and functions of ecosystems and biodiversity, which underpin the supply of ecosystem services, can be closely aligned with present reporting obligations under for instance the Habitats Directive. Existing knowledge is thus framed in the new concept of ecosystem services. An emphasis on benefits and values of ecosystem services gives the opportunity to some Member States to gain new knowledge on the roles of biodiversity and ecosystems for human wellbeing. This is particularly relevant for Member States which have already carried out a national ecosystem assessment. After several rounds of iteration within the working group and following a consultation with several biodiversity research networks a final frame work was adopted. In its simplest version the conceptual framework links socioeconomic systems with ecosystems via the flow of ecosystem services, and through the drivers of change that exert pressures on ecosystems including their biodiversity either as consequence of using the services or as indirect impacts due to human activities in general(MA,2005). Ecosystems are shaped by the interaction of communities of living organisms with the abiotic environment. Biodiversity has several key roles in ecosystems which are essential to support ecosystem functions (e.g., Mace et al., 2012; Cardinale et al.,2012). A specific framework, based on the concept of ecosystem services providers (Luck et al.,2009), was developed for the specific context of MAES (Braat et al., 2015). It essentially links habitats and species protected under the EU Habitats Directive to the spatially explicit supply of ecosystem services by assigning different roles to service providers depending on their contribution in the delivery of ecosystem services. This is particularly relevant for protected habitats which cover nearly half of the EU. Ecosystem functions are defined as the capacity or the potential to deliver ecosystem

services (de Groot et al.,2010). Ecosystem services are, in turn, derived from ecosystem functions. For the purpose of this framework, ecosystem services also encompass the goods derived from ecosystems. People benefit from ecosystem (goods and) services. These benefits are, among others, nutrition, access to clean air and water, health, safety, and enjoyment. The benefits derived from ecosystem services cover various dimensions of human well-being, namely basic human needs, economic needs, environmental needs and subjective happiness (Summers et al.,2012). The focus on benefits implies that ecosystem services are open to economic valuation. However, the notion of value should not be restricted to the merely monetary value. Therefore, it is important to include other values as well, such as health value, sociocultural value or conservation value. The non-monetary values of nature may reflect not only the instrumental value of natural capital, but also inherent, fundamental and eudaimonistic values(Jax et al.,2013). The governance of the coupled socioeconomic-ecological systems an integral part of the framework: Institutions, stakeholders and users of ecosystem services affect ecosystems through direct or indirect drivers of change (Kenward et al.,2011). Policies concerning natural resource management (e.g. agriculture) aim to adapt drivers of change to achieve a desired future state of ecosystems.

7. Best practices

As a sustainable economic activity with implications for the preservation, promotion and valorization of biodiversity, tourism has been relatively recently imposed worldwide due to the transition of the European society from an economic structure focused on primary activities to one based on tertiary sector activities (Simonceska, 2012; Pekarskiene and Susniene, 2014; Masteikiene and Venckuviene, 2015; Herman et al., 2017; Ilieş et al., 2017). Economically advanced societies put a great emphasis on tourism activity, as an important feature of the social life and as a part of the consumer culture (Watson and Kopachevsky, 1996; Holden, 2006). Tourism choices, in terms of destinations and type of accommodation, point out the differences between social classes (Seaton, 1992; Urry, 1995; Holden, 2006). The evolution of the contemporary society had an impact also on the way tourism is approached. Due to the rapid development of the tourism activity, a new form has emerged quite recently: social tourism – settled mainly for people with low socio-economic status (Minnaert and Miller, 2009). On the other hand, sports with all its ways of manifestation, has spread worldwide in economic, social and cultural terms (Jarvie, 2006). The increased level of living standards and income have directed daily activities also towards the improvement of physical performance through sports and recreational activities. Moreover, according to various research in the field, as well as tourism activities (Gard Mc Gehee et al., 2010), sport may contribute to the construction of cultural and social capital (Bourdieu,

1990; Putnam, 2000; Skinner et al., 2008); in the last century sports such as golf or sailing were an attribute for people in middle and upper social classes (Bourdieu, 1990). Sporting practices have begun to transcend urban areas, represented mainly by fitness centres, sports halls, stadiums or even sports parks, and to be closer to nature, in harmony with environmental requirements and respect for nature. New sports and recreational activities have emerged and some of them have been adapted to natural requirements of the area in which they are practiced, respecting also the environment.

The concept of biodiversity defines after Wilson, 1992, the variability of Earth's living organisms and their «biological diversity»; the concept was extended in order to include «the diversity within species, between species and of ecosystems» (United Nations, 1993; Butler, 2006). Gray (2004, p. 8) gives a simple definition of the concept of geodiversity: «the natural range (diversity) of geological (rocks, minerals, fossils), geomorphological (landforms, physical process) and soil features. It includes their assemblages, relationships, properties, interpretations and systems».

In Romania, for example, the need to preserve and protect biodiversity within Natura 2000 sites, as well as the large areas on which they lie (5 555 854.13 ha, respectively 23% of Romania's surface) impose sustained efforts in order to identify optimal connections between man and nature. Starting from the premise that man is nature's main beneficiary and product, it is necessary to identify the economic activities that have a minimal impact on the biodiversity of Natura 2000 sites. The activities that can be carried out within Natura 2000 sites in Romania were established according to «Birds» 79/409/CEE regarding wild birds' conservation and «Habitats» 92/43/CEE regarding the conservation of natural habitats and species of wild plants and animals within OUG 57 / 2007: scientific and educational; ecotourism activities that do not require constructions-investments; the rational use of grassland for moving and/or grazing, only with domestic animals, property of community members who own pastures or have the right to use them in any form recognized by the national legislation, on the surfaces, in the periods and with the species and herds approved by the park management, and not affect the natural habitats and flora and fauna species; identification and operative extinction of fires; interventions for habitats maintenance in order to protect certain species, groups of species or biotic communities that are subjected to protection, based on the approval of the central public authority for environmental protection, the provisional action plan elaborated in this sense by the scientific council, valid until the management plan takes effect; interventions for the ecological reconstruction of natural ecosystems and rehabilitation of inadequate or degraded ecosystems, at the proposal of the administration and with the scientific council approval, based on the approval of the central public authority for environmental protection; actions for removing the effects of certain calamities, based on the proposal of the protected natural area administration, with the approval of the scientific council, and based on the approval of the central public authority for environmental protection. In case

the calamities affect forest areas, actions for removing their effects shall be made at the proposal of natural protected area administration, with the approval of the scientific council, based on the approval of the central public authority responsible for forestry; actions to prevent the mass multiplication of forest pests that do not require trees extraction, and monitoring actions; actions to combat the mass multiplication of forest pests that require the removal of wood material from the forest, in the case of propagation outbreaks, at the proposal of the protected natural area administration, with the approval of the scientific council and of the central public authority responsible for forestry» (OUG 57/2007, art 21, alin. 8). In this context, the implementation of a sustainable and responsible tourism in accordance with the environmental protection and sustainable development, through the involvement and co-involvement of local communities in what regards the development of specific activities in this sense, is becoming more and more present within sites` management plans (Kusakabe, 2013; Pravalie et al., 2014; Pintilii et al., 2016). An important contribution in this direction is the role and importance of nature as a tourism attraction, which led worldwide to the emergence and development of tourism in protected areas (Eagles, 2007; Balmford et al., 2009; Siikameaki et al., 2015; Tolvanen and Kangas, 2016). At the same time, we cannot ignore both positive and negative impacts of tourism on the environment (Cole and Landres, 1996; Liddle, 1997; Hammit and Cole, 1998; Ballantyne and Pickering, 2013; Rankin et al., 2015). Therefore, a new challenge is emerging: the need to conserve and protect biodiversity, as well as the economic valorisation of these areas based on tourism and leisure. As a consequence, the protection, preservation, promotion and management of Natura 2000 sites in Romania encloses the knowledge of system components, their functionality, interdependence and interconditioning, as well as their relation with the environment (Serrano et al., 2007; Ilieș et al., 2016; Ilieș et al., 2017).

The Ecological Network of Natura 2000 Sites in Romania «Nature 2000 is a European Union network of protected areas aiming to improve the conservation status of species and habitats of Community importance» (Niculae et al., 2016: 29). «Lately, as a result of an increased anthropogenic impact on the environment, some species of plants and animals in Europe, and beyond, are on the verge of extinction. To counteract this phenomenon, the European Union through its directives, «Birds» 79/409/CEE regarding wild birds` conservation and «Habitats» 92/43/CEE regarding the conservation of natural habitats and species of wild plants and animals, created Natura 2000 network consisting of Avifauna Special Protection Areas (SPA) and of Special Areas of Conservation (SAC) » (Herman et al., 2016a: 58) [SCI = Sites of Community Importance] The legislative documents based on which a part of the Romanian territory (17.89%) was introduced into Natura 2000 network were: GEO no. 57/20.06.2007 regarding the regime of natural protected areas, the conservation of natural habitats, wild flora and fauna, Order no. 1284/2007 regarding the declaration of avifauna special protection areas as an integral part of Natura 2000 European ecological

network in Romania; Order no. 1964/2007 of the Romanian Ministry of Environment and Sustainable Development regarding the establishment of protected natural habitat regime for areas of Community importance, as an integral part of Natura 2000 European ecological network in Romania; Law no. 49 of April 7, 2011 for the approval of Government Emergency Ordinance no. 57/2007 on the regime of natural protected areas, conservation of natural habitats, wild flora and fauna. Government Decision no. 971/2011 for the modification and completion of Government Decision no. 1284/2007 regarding the declaration of avifauna special protection areas as an integral part of Natura 2000 European ecological network in Romania; Order 2387/2011 amending the Order of the Minister of Environment and Sustainable Development no. 1964/2007 regarding the establishment of protected natural habitat regime for areas of Community importance, as an integral part of Natura 2000 European ecological network in Romania and Government Ordinance no. 20 of August 26, 2014 for the amendment of Government Emergency Ordinance no. 57/2007 regarding the regime of natural protected areas, the conservation of natural habitats, wild flora and fauna. Having a legislative support in the previously listed documents, established under the directives of “Birds” 79/409/CEE regarding wild birds` conservation and «Habitats» 92/43/CEE regarding the conservation of natural habitats and species of wild plants and animals, the ecological network Natura 2000 sites was created in Romania, identifying and declaring, on scientific basis, 383 Special Areas of Conservation (SAC) and 148 Special Protection Areas (SPA)¹. The purpose of Natura 2000 network is to conserve the species and habitats listed in the annexes of both directives: “Habitats” 92/43/CEE and “Birds” 79/409/CEE.

In order to create a current picture of the ecological network Natura 2000 sites in Romania, and based on the information from specific legislative documents, a time-based (the numerical and spatial evolution of Natura 2000 sites and also its evolution on typological categories) and a space-based analysis (the spatial evolution of Natura 2000 sites, and also on typological categories, according to the following indicators: site area, number of sites, number of sites with custodians and number of sites with management plans) was undertaken. ArcGIS 9.10 software was used for these analyses.

The analysis of the spatial distribution of the number and surfaces of Natura 2000 sites reveals the existence of major oscillations at biogeographical region, morphological unit and county level

Taking into consideration the wide surface of Natura 2000 sites, the need to ban the economic activities has not been called into question; but on the contrary, a number of activities are encouraged to be developed but in the spirit of sustainable development such as agriculture, forestry, tourism, in line with biodiversity protection and preservation. A detailed situation in this sense will be highlighted in our case study –Natura 2000 Valea Roșie (Red Valley) site ROSCI 0267.

Case Study: Natura 2000 Valea Roşie (Red Valley) Site - Rosci 0267

«The study area is located in the north-east of Romania, in Bihor County, in close proximity to Oradea City. From an orographic point of view Nature 2000 Valea Roşie (Red Valley) site is located in the morphological subunit of Oradea Hills in the Western Hills unit of Romania, North of the Crişul Repede River» (Herman et al., 2016 b).

In what regards the altitude, Valea Roşie (Red Valley) Natura 2000 site ROSCI 0267, having an area of 819 ha (93% deciduous forests, 4% transition forests and 3% pasturelands), is located between 158 m (minimum altitude) and 291 m (maximum altitude) in the continental biogeographic region. This was reflected in the development of an *Asperulo-Fagetum* forest habitat, that hosts three species of amphibians (*Triturus cristatus*, *Bombina variegata*, *Bombina bombina*) included in Annex II of Council Directive 92/43/EEC and other important flora and fauna species: (*Bufo bufo*, *Rana ridibunda*, *Aster sedifolius* ssp. *canus*, *Cimicifuga europaea*, *Dianthus guttatus*, *Leontodon croceus* ssp. *rilensis*, *Potentilla norvegica*, *Rumex thyrsoiflorus* ssp. *thyrsoiflorus*, *Vicia sparsiflora*) (Valea Roşie ROSCI 0267 site Standard Data Form).

Six routes that follow the existing forest roads were identified (Ilieş et al., 2017a; Herman et al., 2016) and mapped in the frame of tourist map and interactive tourist map, which will be synchronized with the site's management plan, very adapted for environmentally friendly sports activities and entertaining activities; in one of the proposed tourist routes, were performed the tests, after focus group discussions and results, being completed in four modes: walking, running, cycling and nordic walking; this kind of activities, are accessible regardless of the intensity of physical preparation and effort of people who go through it, generate health benefits and in harmony with the environment (Ilieş et al., 2017b; Dragoş et al., 2017).

Within the project «The impact of ecosystems from protected areas - in the custody of Bihor County Council and Muzeul Țării Crișurilor (Criş Country Museum) - on the main economic sectors», based on a detailed biodiversity assessment report, a series of proposals for specific measures have been developed in order to maintain or improve the conservation status of the habitats and species of Community importance within the protected natural area ROSCI0267 Valea Roşie (Red Valley) regarding: the operational and efficient administration and management of Natura 2000 site, the provision of 9130 habitat preservation - *Asperulo-Fagetum* forests and the conservation of amphibians species (1188 – *Bombina bombina*, 1193 – *Bombina variegata* and 1166 – *Triturus cristatus*).

General recommendations for an operational and efficient management of Natura 2000 site concerned the following: the update of Natura 2000 Standard Data Form (adding information in the IBIS application) by mentioning some Community interest species and types of habitat as being certainly present within ROSCI0267 Valea Roşie (Red Valley)

(Annexes no. 6, 7, 9 and 10); the elaboration of the Organizational Regulation for the protected natural area ROSCI0267 Valea Roșie (Red Valley); conducting additional investigations for the biodiversity inventory (identifying all phenological aspects of the annual development cycle for each species of Community interest); establishing a monitoring protocol for conserved species and habitats (of both Community and national interest); identifying financial funds and starting the elaboration of the Management Plan for ROSCI0267 Valea Roșie (Red Valley) as soon as possible; increasing the degree of public awareness, promotion and consultation on biodiversity importance within ROSCI0267 Valea Roșie (Red Valley) site.

Specific recommendations for the conservation of 9130 habitat - *Asperulo-Fagetum* forests in order to achieve a favourable conservation status: «inspecting forestry activities in the field and ensuring that care works for arboretums are followed and properly conducted (including the control of arboretums composition towards basic forest type and diverse horizontal and vertical structures) in accordance with the plans foreseen in the forestry arrangements; monitoring and limiting activities with a potential negative impact on the habitat (in particular, woodcutting processes based on «razor cuts», except for invasive / extraneous / non-indigenous arboretums);controlling the installation of invasive species from the habitat structure; banning both reforestation with non-indigenous species that are not characteristic of the basic forest type, and reforestation using a single species; banning vegetation burning within and in the immediate vicinity of ROSCI0267 Valea Roșie (Red Valley).

Specific recommendations for ensuring the conservation of amphibian species (1188 – *Bombina bombina*, 1193 – *Bombina variegata* and 1166 – *Triturus cristatus*), in order to achieve a favorable conservation status: creation of new breeding habitats (ponds with variable areas up to 5sq.m obtained by digging pits and ditches with depths of up to 0.5 m in the immediate vicinity of forest roads, meadows and forests habitats) in areas where natural water accumulation is favored; diminishing the impact that communal roads connecting Oradea city with neighboring localities, Husasău de Criș and Ineu, have on the amphibians, by installing longitudinal barriers and underground passage ways; monitoring and limiting activities with potential negative impact on amphibian species; reducing the running speed on all roads within Natura 2000 ROSCI0267 Valea Roșie (Red Valley) site at 20km/h, during the activity period for amphibians; the construction of paths in order to attract tourists to ROSCI0267 Valea Roșie (Red Valley) will be done without any new impacts on amphibians (natural materials will be used, land use will not be changed, water bodies will not be altered); encouraging the traditional exploitation of hay meadows within the site through regular mowing and removing unwanted shrubs.

After field investigations carried out within the project, it has been established that only two of the three amphibian species are present in the site; (*Bombina bombina* could not be identified). However, given that Natura 2000 ROSCI0267 Valea Roșie (Red Valley) site is

located at the limit of the distribution area for the two species of *Bombina* sp., it is possible that some specimens represent hybrids of these two species. So far, data cannot confirm nor the presence or absence of this species within Natura 2000 site, and further field investigations are required. Studies undertaken within the mentioned project have identified four pressures that have a negative impact on the species and habitats of conservation interest within the site: forest and plantation management, the existence of roads, exploitation roads and paths, and harvesting of mushrooms and berries. Although, these pressures have different intensities, there are no high-intensity pressures that could significantly affect the long-term viability of species and habitats of conservative interest.

Discussions with stakeholders (UATs, inhabitants) have revealed potential threats that could have a negative impact on biodiversity elements within the site. Thus, three threats could be identified: the possibility of seismic prospecting, the possibility of establishing a bison farm (*Bison bison*) in the North-Eastern part of the site, and the intention to exploit the touristic potential of the site by creating a cycling infrastructure and some tourism routes. Of the three identified elements that could be a threat for the species and habitat of conservative interest, one was considered to have a high intensity impact (seismic prospecting), another could have a medium intensity impact (the bison farm) and one with a low intensity impact (increasing the touristic potential of the site by creating a cycling infrastructure and tourist/thematic routes). Besides the species contained in the standard form, other 44 species and 3 habitats with different protection status were identified within the project. It is important to mention that five bird species and two invertebrate species listed in Annex 3 of GEO 57/2007, as well as two species of amphibians and four bird species listed in Annex 4B, have been identified» (Source: Detailed Biodiversity Assessment Report - Project: «The impact of ecosystems from protected areas - in the custody of Bihor County Council and Muzeul Țării Crișurilor (Criș Country Museum) - on the main economic sectors»).

Therefore, we can state that tourism, as the main anthropic activity, has an important role in the sustainable valorization of Natura 2000 Valea Roșie (Red Valley) site.

In this regard, several studies and research have been carried out; papers were presented at international conferences - Herman Grigore Vasile, Ilieș Dorina Camelia, Buhaș Raluca, Ilieș Alexandru, Baias Ștefan, Măduța Miron Florin, Gaceu Ovidiu, Josan Ioana, Buhaș Sorin, Gozner Maria (2016), Considerations on the planning interventions in designing Natura 2000 Sites and their importance in students' education through geography. A case study on the Natura 2000 Site Valea Roșie in Bihor County, to International Conference Perspectives of Geographical Approach on Territorial Development: Theories, Methods and Practices, Timișoara - Romania, 13 May 2016 (<http://geografie-uradea.ro//Evenimente/PDF/13.05.2016.pdf>); International Conference U.A.B.; at B.EN.A. Conference Environmental Engineering and Sustainable Development, 24-26 May 2017, Alba Iulia - Romania, authors: Ilieș Dorina Camelia, Buhaș Raluca, Wendt Jan A., Ilieș Alexandru, Gaceu Ovidiu, Pop Anca,

Marcu Florin, Buhaş Sorin, Gozner Maria, Baias Ştefan, the paper entitled: Sport Activities and Leisure in Natura 2000 Protected Area- Red Valley, Romania.

Natura 2000 protected areas are governed by a general legislation (Directive 92/43 of 1992 on the Conservation of Natural Habitats and Wild Flora and Fauna, Directive 79/409 from 1979 on the conservation of wild birds) and by national specific legislation, which allows and encourages the practice of sports in these areas (Probstl et al., 2010). Due to the fact that these areas are clearly delimited, their activity complies a legal framework, are organized and managed by custodians, they attract more and more visitors who spend their leisure time in nature. The activities practiced by these visitors are mainly related to sports and sporting activity.

At EU level, Natura 2000 protected areas have developed, implemented and cultivated the need to practice sport and recreational activities in these areas both for spending leisure time and also as a stress antidote. These recreational and sports activities are carried out only if all negative impacts that could affect the protected areas are avoided; these activities are defined also by the specificity and location of the protected area (mountain, hill, plains, etc.). For example, in Germany such sports cover a wide range: canoeing, climbing, kite surfing, mountain biking, nordic walking, diving, surfing, hiking, winter sports, mountaineering, paragliding; these are all adapted to environmental requirements and to the needs of those who practice them. Sailing sports are predominant in the Netherlands and they are practiced taking into account the rules of protected areas, in close collaboration with sports associations, which leads to a rational and conservationist exploitation of the environment, while the impact of such activities is minor (OECD, 2011). For example, in Oulanka National Park, Finland such activities are carried out exclusively under the guidance of local guides in order to reduce the environmental impact as much as possible (OECD, 2011). In Strangford Lough, Ireland sailing, windsurfing, diving and sometimes jet skiing are mainly practiced, although, most people come to this area for simple walks or for the landscape (Bruls et al., 2004).

Currently, the ecological situation of Natura 2000 sites in Romania is defined by: the number of sites (531 sites of which 383 are Community sites and 148 are Avifauna's Special Protection Areas; surface (5,555,854.13 ha, of which 4,076,693.943 ha are Sites of Community Importance and 3,694,397 are Avifauna's Special Protection Areas). The overlapping of the two categories of sites represents 2,215,236.813 ha; the number of custodians (160 custodians of which 131 are for Sites of Community Importance and 29 are for Special Protection Areas), and the number of approved management plans (282 management plans of which 204 are for Sites of Community Importance and 78 are for Avifauna's Special Protection Areas).

In conclusion, the recreational and sporting practices that can be undertaken within the ecological network Natura 2000 sites in Romania must be adapted to the specificity of each

protected area, in close connection with the environmental conditions; also, Governmental agencies for the preservation of the natural environment should be preoccupied to develop and maintain a close collaboration with tourism and sports associations that organize such activities in those areas.

Another example comes from the United Kingdom. In the UK, the Cairngorms Walking to Health project started in 2004 as a community health and learning initiative. Inspired by an initial demonstration health walk organized as part of a health fair, the project has since gone from strength to strength, extending geographically each year into new areas, and involving more people. In 2009, the original project, focused on Deeside and Donside in Scotland, was extended to include the whole of the Cairngorms National Park and surrounding area, and to include walk programs targeting specific health issues. The project is led by Cairngorms Outdoor Access Trust (COAT), which employs a part-time freelance project manager, and two part-time staff who support volunteer walk leaders. The project has established 37 different walking groups, led by 60 trained and active volunteers, attracting an average of 215 walkers each week, with the number of participants increasing weekly outdoor exercise in a safe and socially enjoyable way. The walks are targeted at people who would benefit from increasing their physical activity, ranging from people struggling to lose weight to those suffering from cancer or diabetes. Considerable time and effort have been invested in developing close links with doctors and encouraging direct referral, but participation by service users and their careers is entirely voluntary. Approximately 95% of participants are female, mainly aged over 55, but walks have also been established targeting younger people. Pedometer challenges have encouraged new mothers and vulnerable adults from Aviemore to increase how far they walk each day, while on Deeside, academic evidence of the benefits of walking in delaying symptoms of early onset Alzheimer's is used to encourage patients diagnosed with the condition to take part in health walks. Group walks are also part of the range of services on offer to support people after quitting smoking. To demonstrate the benefits of Cairngorms Walking to Health, COAT has collaborated with Paths for All, the Centre for Rural Health (a department of the University of the Highlands and Islands) and the Scottish Agricultural College in a comprehensive evaluation using six different research methods. New walker and follow-up physical activity questionnaires to monitor health improvements were complemented by focus groups, interviews, participant feedback postcards, case studies and longitudinal studies with participants and leaders. The evaluation clearly demonstrated that the project is making a very significant and highly cost-effective contribution to Scottish and local government priorities in relation to health improvement, volunteer development, long-term health condition and self-care strategies, community development and engagement, and in providing high quality access to the local environment. Cairngorms Walking to Health costs approximately £30 000 per annum to deliver, funded by Cairngorms National Park Authority, LEADER Programme, Scottish Natural Heritage and Paths for All, with additional

in kind support from NHS Grampian and NHS Highland. Per capita, the cost of running the project works out at approximately £140 per walker per year, which represents excellent value for money in terms of associated health and wider community benefits. Moreover, in Canada, The Thousand Islands National Park (TINP) is named after the larger Thousand Islands ecosystem of Eastern Ontario, Canada. The park was established in 1904 and is one of the smallest national parks in Canada. The total area is 22.3 sq km while the entire ecosystem covers an area of 3000 sq km that is bisected by the international border between Canada and the United States. Thousand Islands has historically been a rich area that has provided a host of ecosystem services (food, water, recreation) to First Nations, early settlers and modern day residents and visitors. The park itself was primarily created as a place for recreational activities such as picnicking, camping and boating. More recently, the park has become better known for protecting a unique Canada–United States trans-boundary ecosystem that is part of an extension of the Canadian Shield, connecting the Appalachian forest of the south-eastern United States to the northern boreal forest. The park provides critical habitat for a great diversity of plant and animal life, including more than 30 species at risk. The population of Eastern Ontario has grown significantly in recent years. In 2011, for example, approximately 2 million people lived within 100 km of the Thousand Islands ecosystem—an increase in population of 47% since 1981. Today, the TINP ecosystem is influenced by habitat fragmentation, pollution and other activities on the landscape that are associated with rapid population growth in the region. While population growth and other pressures have created challenges for the park, they have also highlighted the importance and value of the ecosystem services it protects. Parks Canada is working broadly with First Nations, adjacent communities, organizations and volunteers to protect and connect visitors with this special place while assessing and ensuring a lasting flow of ecosystem services. A land-cover analysis using satellite imagery formed the base data from which estimates of the value of ecosystem services were produced. Within the Thousand Islands ecosystem, the three primary land covers were forest (31%), cropland (24%) and water (22%), while wetlands and urban areas covered 7% and 6% of the area respectively. TINP has higher forest cover (82%) and wetlands (10%) and lower cropland/field (2%) and built-up areas (2%) compared with the entire ecosystem. Estimating monetary values from ecosystem services protected by and flowing from the TINP supports park management, policy development and public education purposes. Two methods were used to estimate the monetary values for ecosystem services. The first method reproduced the results of the study *Estimating ecosystem Services in Southern Ontario* by Troy and Bagstad (2009) for the case study area. The second method involved making estimates of selected ecosystem services by land-cover type, drawing from published valuation studies and transferring monetary values found in similar areas within the park. Using the first approach, estimates of the annual value of ecosystem services for the TINP were produced, ranging from C\$12.5 million to \$14.7 million. Using the second method, the value of the park's recreation

services as well as option, bequest and existence values associated with the park's wetlands were produced. The annual recreational services for all land-cover types in the park were valued at C\$3.9 million. Finally, the annual option, bequest and existence values of the park's wetlands ranged from C\$434 000 to \$531 000. The monetary values identified for the TINP are conservative estimates and represent an experimental effort by Canadian Government departments and agencies. Depending on the approach taken and the data sets used to support the analysis, a range of value estimates can be generated. Much consideration needs to be given to the valuation methods, the supporting data and the selection of the ecosystem service or suite of services measured and reported. As demonstrated by the TINP case study, even with the selection of a small data-rich area, the analysis does not represent the total value of the national park area. For further information concerning the case study and the production of the experimental monetary valuations for TINP, see Statistics Canada (2013).

Protected areas in Serbia – transition from 20th to 21st century

The long-lasting state of economic and political crisis, economic sanctions combined with consequences of war and the NATO air strikes in 1999, resulted in an enormous destruction of infrastructure and high foreign debts in Serbia. At the beginning of new century, the Serbian economy was half the size of what it was in 1990. Renewing its membership in relevant international institutions and bodies, such as IMF, World Bank, the European Bank for Reconstruction and Development (EBRD) and being supported by donors' assistance in different fields, Serbia made important steps towards economic, political and social revitalization.

Current development of cooperation with European institutions towards EU membership makes another opportunity for creating progress in the economy and all the other fields. Along with transition to a market economy and the strengthening of democratic institutions, the difficult process of privatization of already ruined companies is under way. In these circumstances Serbia is facing consequences of global economic crisis and striving to fight already high rate (18%) of unemployment (Cvijanovic et al., 2008).

It is therefore not surprising that protected areas in Serbia suffer from inadequate funding. According to the existing legal regulation, protected areas may be financed from the national budget, fund for environmental protection, taxes for use of natural resources, income from their own activities, projects and other donations. In most cases, the percentage of costs covered by public funds is approximately 5-10 percent of the total operational costs. The budget of the Ministry of Environment and Spatial Planning (MESPP) covers at best only part of the operational costs of the protected area

and its portion is decreasing. Therefore, most of the protected areas (PA) in Serbia are pushed to find their own sources of funding. The resulting shortage of funds is directly affecting development of all other capacities within PA management organization – including the investments in qualified staff and human resources.

This particularly applies to small public enterprises and nongovernmental organizations managing PAs in Serbia. Despite the lack of material resources, the number of NGOs still have an advantage in comparison with some state owned managing organizations, in terms of skills and experience in preparing and conducting projects, knowledge of the donor community's strategies and expectations, as well as flexibility in work. Besides that, NGOs and units within some other enterprises are usually protected from consequences of political decisions in appointing top management, which is especially influencing National Park enterprises and other state owned organizations.

At the same time, there is rich potential in natural resources and the system of protected areas developed in Serbia. Currently, 6.2% of the Serbian territory is legally protected.

The national system of protected areas in Serbia is composed of: national parks, nature reserves, nature parks, landscapes and natural monuments. Several protected areas in Serbia have international designation: one biosphere reserve (UNESCO Man and Biosphere Program), and nine Ramsar (Internationally recognized wetlands) sites. There are 38 important bird areas as well as ten green belt and transboundary areas.

Serbia is a party to a number of relevant international conventions, including the UN Convention on Biodiversity. The Law on Environmental Protection, as the main umbrella Law in the field is adopted in 2004, and Nature Protection Law in 2009. The National Strategy on Biodiversity Protection and Action Plan are in progress, coordinated by UNDP Serbia and supported by GEF. Laws and regulations in this field are as most of the others, in the process of harmonization with the EU legal framework.

Protected area governance in Serbia

Serbian protected areas are governed by public enterprises and in a few cases, by non-governmental and private business organizations. Areas can be proposed for designation by national authorities, legal or physical entities at the national, regional or local level. Management categories of PA in Serbia are harmonized with the IUCN classification and standards.

There is no professional association of protected areas management entities, or similar professional body – such as Ranger federation – in Serbia. Beside the Ministry, there is the Institute for the Protection of Nature of Serbia as the main technical agency in the

field. National and nature parks – members of Europarc Federation, were active in the Federation's national branch during the times of Serbia and Montenegro and that activity is seriously reduced since the independence of Montenegro was proclaimed in 2006. Only a few organizations from Serbia are members of the IUCN.

The lack of a systematic approach to financial sustainability and investments in human resources has resulted in an inadequate qualification structure and status of employees, especially threatened by inappropriate work conditions and reduced ability to provide necessary equipment in protected areas. Besides the above briefly mentioned support of international organizations and funds (UNDP, GEF, World bank, IUCN, EU-EAR), there are no sizeable investments in the improvement of protected area system at all levels, neither from the national nor the international side.

The results of a management effectiveness assessment of protected areas in Serbia, performed in February 2009 and supported by WWF Mediterranean, show that, according to representatives of 16 management bodies, the strengths of the system are in planning, legal security and partly in existing infrastructure – while the major weaknesses are in financial and human resources. The latter especially refers to opportunities for professional competence improvement – and the lack of educational initiatives – both of in-house training or externally supported ones. What also requires special attention from the sustainable governance perspective, is a proven weakness in cooperation with local communities, especially in common planning and decision making – including, again, education activities (Pišcevic and Orlovic-Lovren, 2009).

Having above briefly described circumstances and aspects of protected areas governance in Serbia in mind, it is not difficult to conclude that huge efforts in providing mechanisms and programs for its improvement are highly needed. The power of education to promote and support sustainability can be realized only if internal and external support in institutional, organizational and individual capacity development is provided. It is largely recognized today that one important aspect of sustainability is also internal initiative and pro activity in providing opportunities for improvement. In order to be able to take such steps, people involved with protected areas have to be adequately empowered and trained.

No matter how much experience is available today in Europe and worldwide in education/training in protected areas, any quality initiative of that kind should be supported by preliminary research, directed towards understanding of the existing needs and capacities of protected areas for sustainable governance.

8. Demo Action

Regarding the demo action we are investigating the relative factors in order to design and propose the best educational route. The route will be signed with the appropriate signs will be designed to show and include important species of the local biodiversity thus enhancing the accessibility of the area

For the purpose of uniform signage following specifications and enhancing the status of the North Pindos National Park, the Vicos - Aoos and Pindos National Parks Management Authority conducted a 2012 study on "Signal Categorization and Design". The study is concerned with the design of pilot plates accompanied by specific specifications (materials, dimensions, content design) for each marking category that may be used in the North Pindos National Park. The categories of marking, as defined in the Special Environmental Study of the National Park, are as follows:

- Signaling of main entrances to the North Pindos National Park
- North Pindos National Park protection zones
- Path marking
- Environmental information labeling and interpretation
- Orientation and direction marking

In the context of the BIOPROSPECT project, environmental information and interpretation category plates will be placed, as stated in the study.

Environmental information and interpretation signs

The category includes signs which are placed in selected places (eg sightseeing, observatories, points of interest). The purpose is to inform and raise awareness of the visitor about valuable elements of the natural and anthropogenic environment in order to realize the value of the area in which they are located.

They also aim to highlight the particular features of a path or protected area in general. The plates in this category contain a wide range of subject information and will be placed in a variety of places with different needs each time (eg sightseeing, observatories, along paths, settlement entrances, etc.). To serve all the information requirements of visitors to the study, five sub-categories of signs are proposed depending on the type of information:

Plate D1: large proportion

Plate D2: small and high lectern

Plate D3: small and low lectern

D4 plate: small scale vertical plate and

D5 sign: large scale vertical sign.

All plates in this category consist of a metal base painted with 'direct to metal' paint, a printed surface of iroko solid wood and anodized aluminum printed surface with digital printing.

In the context of the BIOPROSPECT project, it is selected to place Category D5 plates that meet the following specifications:

I. Technical Description

Large size vertical signboard. Metal trunk consisting of two stanchions 235 cm high with a cross section of 120 x 60 x 2.5 mm. The metal trunk carries 4mm thick blades, which secure the metal base of the inscription with 3cm metal spacers. The metal spacers are integrated into the mounting flaps. The entire trunk and metal base is painted with 'direct to metal' paint of IEE's choice. Stands are based on reinforced concrete soles 80 x 65 x 25 cm (height) each, 10 cm below the ground surface (See Figure). The metal base measures 180 x 144 cm and is made of scratched steel. Attached on the metal base is a sheet of self-adhesive, digital printing

II. Thematic Print Content

The information material on the sign will be given to the Contractor by the IEE. The Contractor is responsible for the graphic design and customization of the contents to the dimensions of the signboard.

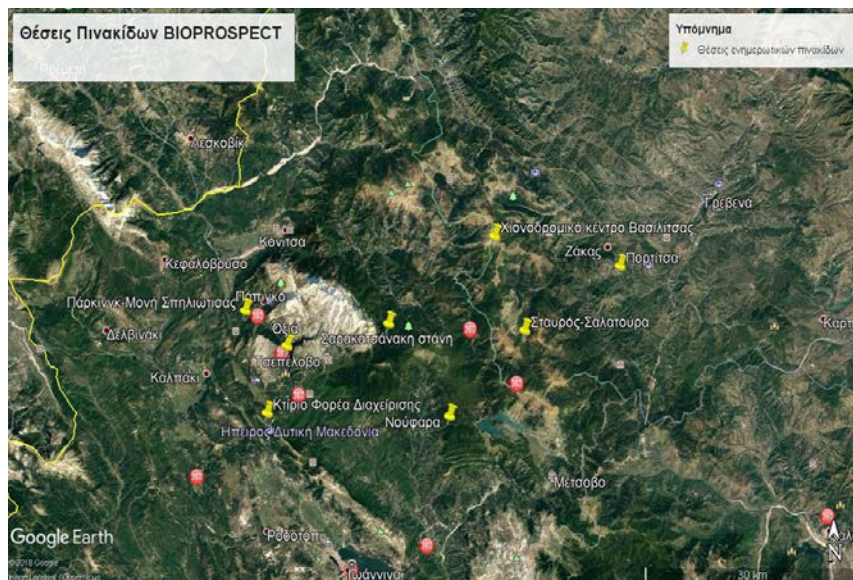


III. Quantity

Four (4) pieces

IV. Mounting points

(The final selection will be made in collaboration with the Vikos - Aaos and Pindos National Park Management Body)



9. Establishment of info signs

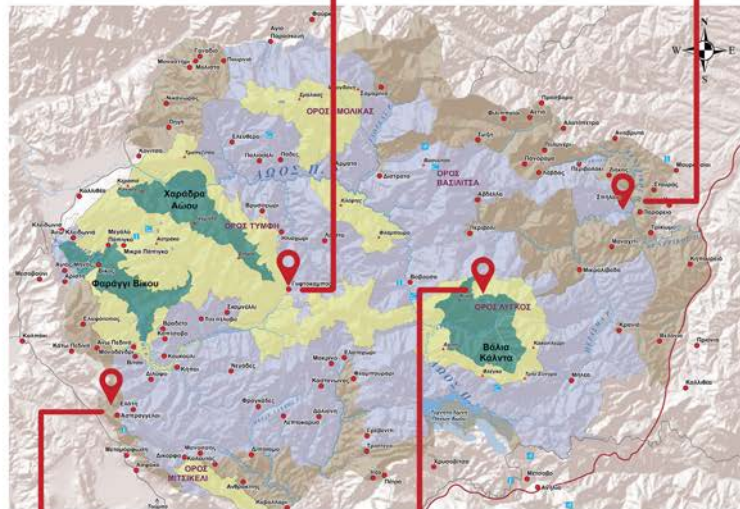
Four BIOPROSPECT signs were manufactured and installed in selected sites within the premises of Northern Pindos National Park. The signs were designed in wood in order to incorporate to the surrounding landscape and provide information about the Northern Pindos National Park, the goals of BIOPROSPECT and various information regarding each location. The selected locations present a variety of ecosystem services and were examined thoroughly throughout the project. Visitors of Northern Pindos National Park can find the signs in the following locations: 1. In Zagori, outside the Management Agency of Vikos-Aoos & Pindos National Parks, 2. In Portitsa gorge, in Giftokampos, 3. In Valia Calda and 4. In Sarakatsani Domed Hut site.



Sarakatsani Domed Hut



Portitsa Gorge and Bridge



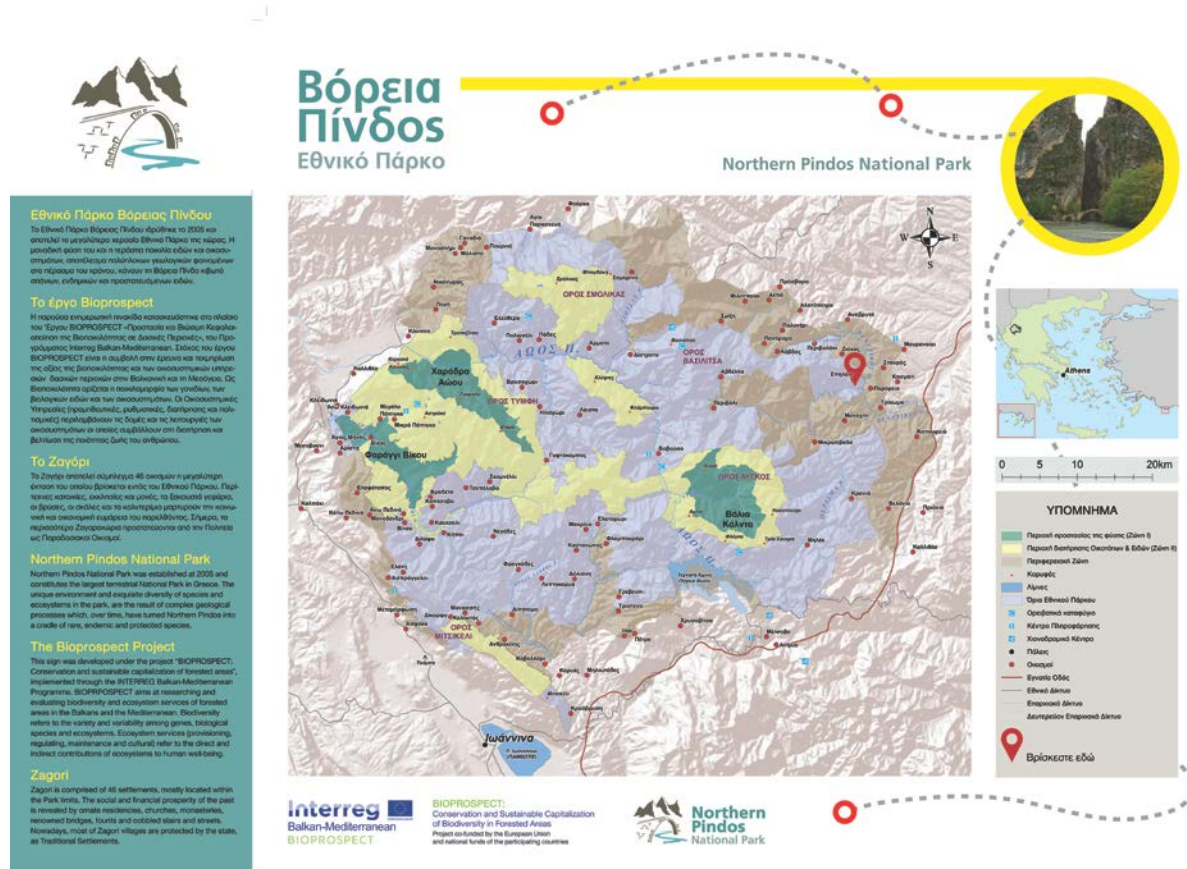
Zagori



Valia Kalda

The texts on the signs are in Greek and English and provide the following information:

1. Sign in Zagori, Management Agency of Vikos-Aoos & Pindos National Parks



Εθνικό Πάρκο Βόρειας Πίνδου

Το Εθνικό Πάρκο Βόρειας Πίνδου ιδρύθηκε το 2005 και αποτελεί το μεγαλύτερο χερσαίο Εθνικό Πάρκο της χώρας. Η μοναδική φύση του και η τεράστια ποικιλία ειδών και οικοσυστημάτων, αποτέλεσμα πολύπλοκων γεωλογικών φαινομένων στο πέρασμα του χρόνου, κάνουν τη Βόρεια Πίνδο κιβωτό σπάνιων, ενδημικών και προστατευόμενων ειδών.

Το έργο Bioprospect

Η παρούσα ενημερωτική πινακίδα κατασκευάστηκε στο πλαίσιο του Έργου BIOPROSPECT «Προστασία και Βιώσιμη Κεφαλαιοποίηση της Βιοποικιλότητας σε Δασικές Περιοχές», του Προγράμματος Interreg Balkan-Mediterranean. Στόχος του έργου BIOPROSPECT είναι η συμβολή στην έρευνα και τεκμηρίωση της αξίας της βιοποικιλότητας και των οικοσυστημικών υπηρεσιών δασικών περιοχών στην Βαλκανική και τη Μεσόγειο. Ως βιοποικιλότητα ορίζεται η ποικιλομορφία των γονιδίων, των βιολογικών ειδών και των οικοσυστημάτων. Οι Οικοσυστημικές Υπηρεσίες (προμηθευτικές, ρυθμιστικές, διατήρησης)

και πολιτισμικές) περιλαμβάνουν τις δομές και τις λειτουργίες των οικοσυστημάτων οι οποίες συμβάλλουν στη διατήρηση και βελτίωση της ποιότητας ζωής του ανθρώπου.

Το Ζαγόρι

Το Ζαγόρι αποτελεί σύμπλεγμα 46 οικισμών η μεγαλύτερη έκταση του οποίου βρίσκεται εντός του Εθνικού Πάρκου. Περίτεχνες κατοικίες, εκκλησίες και μονές, τα ξακουστά γεφύρια, οι βρύσες, οι σκάλες και τα καλντερίμια μαρτυρούν την κοινωνική και οικονομική ευμάρεια του παρελθόντος. Σήμερα, τα περισσότερα Ζαγοροχώρια προστατεύονται από την Πολιτεία ως Παραδοσιακοί Οικισμοί.

Northern Pindos National Park

Northern Pindos National Park was established at 2005 and constitutes the largest terrestrial National Park in Greece. The unique environment and exquisite diversity of species and ecosystems in the park, are the result of complex geological processes which, over time, have turned Northern Pindos into a cradle of rare, endemic and protected species.

The Bioprospect Project

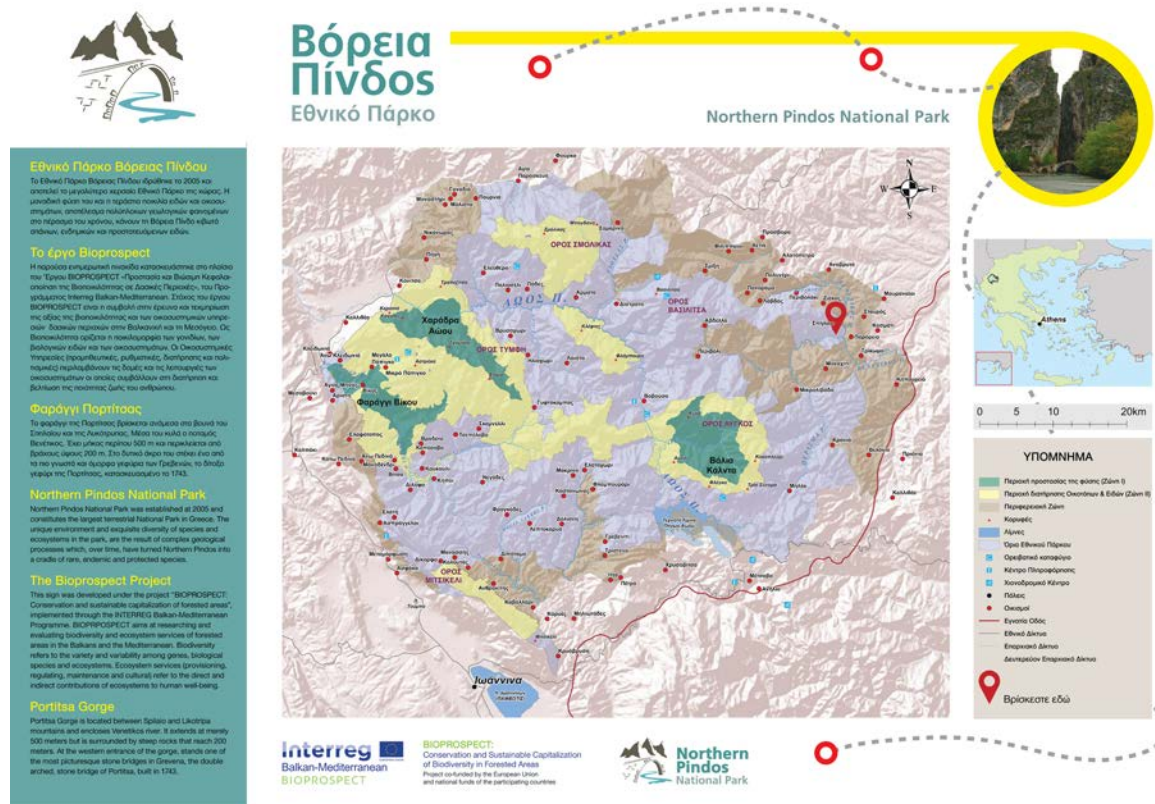
This sign was developed under the project “BIOPROSPECT: Conservation and sustainable capitalization of forested areas”, implemented through the INTERREG Balkan-Mediterranean Programme. BIOPROSPECT aims at researching and evaluating biodiversity and ecosystem services of forested areas in the Balkans and the Mediterranean. Biodiversity refers to the variety and variability among genes, biological species and ecosystems. Ecosystem services (provisioning, regulating, maintenance and cultural) refer to the direct and indirect contributions of ecosystems to human well-being.

Zagori

Zagori is comprised of 46 settlements, mostly located within the Park limits. The social and financial prosperity of the past is revealed by ornate residencies, churches, monasteries, renowned bridges, founts and cobbled stairs and streets. Nowadays, most of Zagori villages are protected by the state, as Traditional Settlements.



2. Sign in Portitsa Gorge, in Gyftokampos



Εθνικό Πάρκο Βόρειας Πίνδου

Το Εθνικό Πάρκο Βόρειας Πίνδου ιδρύθηκε το 2005 και αποτελεί το μεγαλύτερο χερσαίο Εθνικό Πάρκο της χώρας. Η μοναδική φύση του και η τεράστια ποικιλία ειδών και οικοσυστημάτων, αποτέλεσμα πολύπλοκων γεωλογικών φαινομένων στο πέρασμα του χρόνου, κάνουν τη Βόρεια Πίνδο κεντρικό σπινίτιν, ενδημικών και προστατευόμενων ειδών.

Το έργο Bioprospect

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Φαράγγι Πορτίτσας

Το φαράγγι της Πορτίτσας βρίσκεται ανάμεσα στα βουνά του Σπηλαίου και της Λυκότρυπας. Μέσα του κυλά ο ποταμός Βενέτικος. Έχει μήκος περίπου 500 m και περικλείεται από βράχους ύψους 200 m. Στο δυτικό άκρο του στέκει ένα από τα πιο γνωστά και όμορφα γεφύρια των Γρεβενών, το δίτοξο γεφύρι της Πορτίτσας, κατασκευασμένο το 1743.

Northern Pindos National Park

Northern Pindos National Park was established at 2005 and constitutes the largest terrestrial National Park in Greece. The unique environment and exquisite diversity of species and ecosystems in the park, are the result of complex geological processes which, over time, have turned Northern Pindos into a cradle of rare, endemic and protected species.

The Bioprospect Project

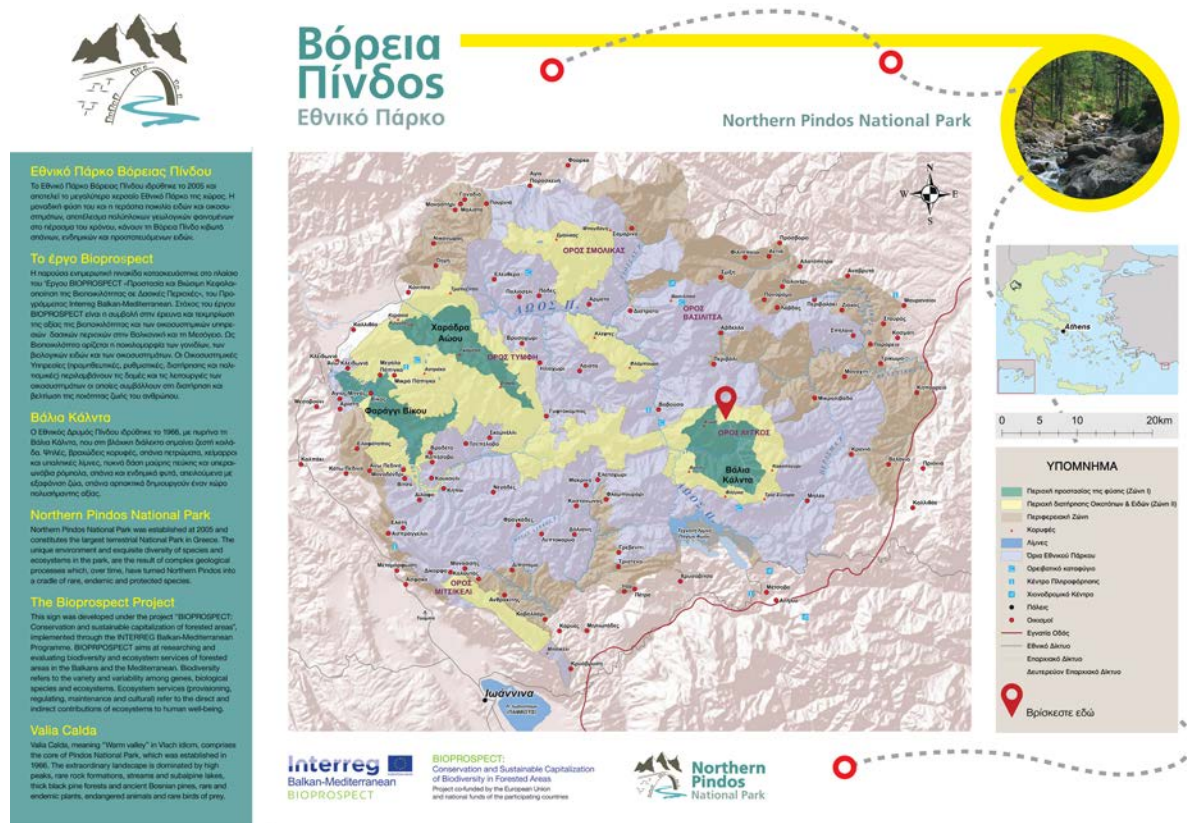
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Portitsa Gorge

Portitsa Gorge is located between Spilaio and Likotripa mountains and encloses Venetikos river. It extends at merely 500 meters but is surrounded by steep rocks that reach 200 meters. At the western entrance of the gorge, stands one of the most picturesque stone bridges in Grevena, the doublearched, stone bridge of Portitsa, built in 1743.



3. Sign in Valia Calda



Εθνικό Πάρκο Βόρειας Πίνδου

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Βάλια Κάλντα

Ο Εθνικός Δρυμός Πίνδου ιδρύθηκε το 1966, με πυρήνα τη Βάλια Κάλντα, που στη βλάχικη διάλεκτο σημαίνει ζεστή κοιλάδα. Ψηλές, βραχώδεις κορυφές, σπάνια πετρώματα, χείμαρροι και υπαλπικές λίμνες, πυκνά δάση μαύρης πεύκης και υπεραιώνόβια ρόμπολα, σπάνια και ενδημικά φυτά, απειλούμενα με εξαφάνιση ζώα, σπάνια αρπακτικά δημιουργούν έναν χώρο πολυσήμαντης αξίας.

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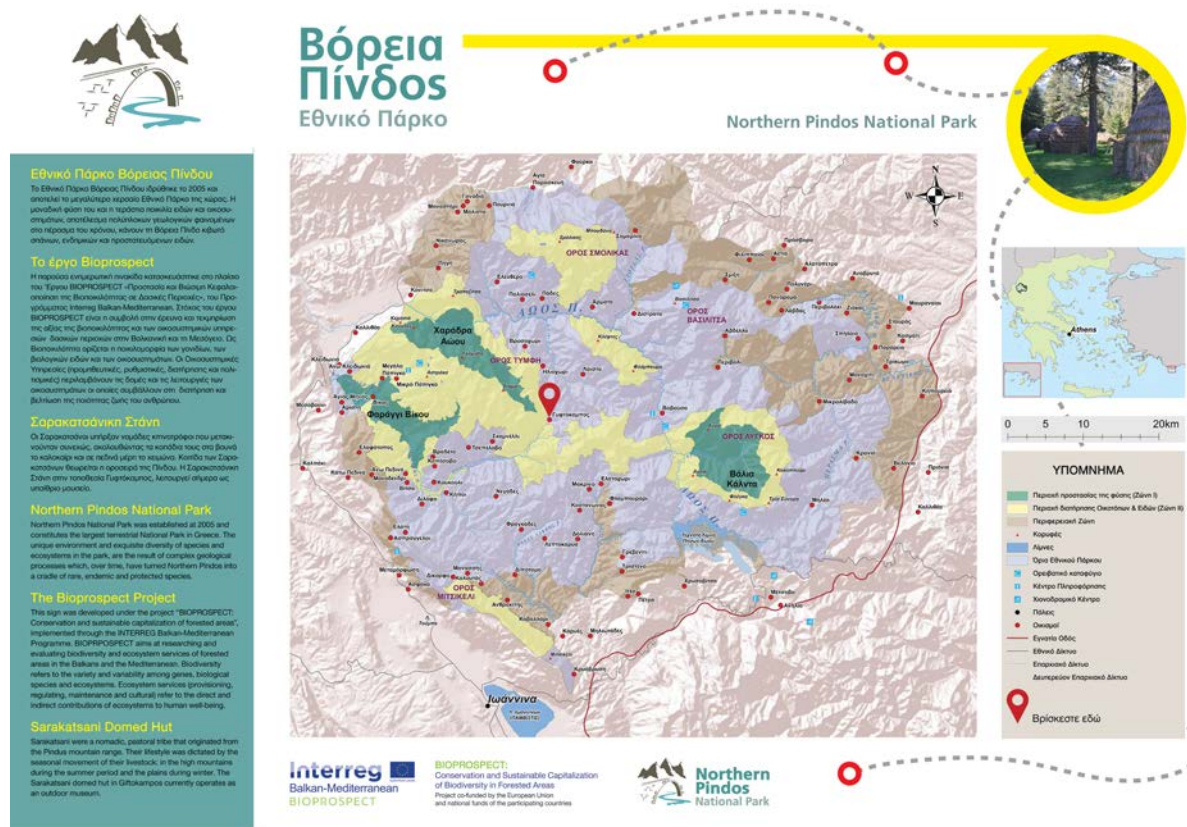
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Valia Calda

Valia Calda, meaning “Warm valley” in Vlach idiom, comprises the core of Pindos National Park, which was established in 1966. The extraordinary landscape is dominated by high peaks, rare rock formations, streams and subalpine lakes, thick black pine forests and ancient Bosnian pines, rare and endemic plants, endangered animals and rare birds of prey.



4. Sign in Sarakatsani Domed Hut site



Εθνικό Πάρκο Βόρειας Πίνδου

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και πολιτισμικές) περιλαμβάνουν τις δομές και τις λειτουργίες των οικοσυστημάτων οι οποίες συμβάλλουν στη διατήρηση και βελτίωση της ποιότητας ζωής του ανθρώπου.

Σαρακατσάνικη Στάνη

Οι Σαρακατσάνοι υπήρξαν νομάδες κτηνοτρόφοι που μετακινούνταν συνεχώς, ακολουθώντας τα κοπάδια τους στα βουνά το καλοκαίρι και σε πεδινά μέρη το χειμώνα. Κοιτίδα των Σαρακατσάνων θεωρείται η οροσειρά της Πίνδου. Η Σαρακατσάνικη Στάνη στην τοποθεσία Γυφτόκαμπος, λειτουργεί σήμερα ως υπαίθριο μουσείο.

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Sarakatsani Domed Hut

Sarakatsani were a nomadic, pastoral tribe that originated from the Pindus mountain range. Their lifestyle was dictated by the seasonal movement of their livestock: in the high mountains during the summer period and the plains during winter. The Sarakatsani domed hut in Giftokampos currently operates as an outdoor museum.

