ECOTOURISM PROMOTION IN A GREEK NATIONAL PARK:
THE DEVELOPMENT AND MANAGEMENT OF FARMAKIDES TRAIL ON MT OITI

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Abstract
Recreational trail systems have been poorly developed in Greek protected areas. In recent years there is a surge of interest in riparian trails in upland valleys; this case study describes the aspects of development and management for such a trail on the northern slopes of Mount Oiti National Park in Central Greece.

The purpose of the present research is to describe the strategy for developing the Farmakides trail and to highlight the biodiversity, landscape, geology, geomorphology and ancient history and mythology, of this area in order to propose improvements over the management and its sustainable ecotourism promotion. This case study expresses some of the prospects, problems and challenges involved in developing a trail system within a protected area in Greece.

Key words: environment, ecotourism, geomorphology, oiti mountain, nature trail management, farmakides trail

1. INTRODUCTION

Protected areas play a central role in the policy of sustainable development, emphasizing the benefits which these areas can offer to civil society (Katris et al., 2015). The trails that run through Natural Parks or other high standing protected areas, offer visitors opportunities for recreation, such as enjoying the scenery, exercise and learning about the environment, ecology, biodiversity, geology, archeology, culture, history, mythology, local traditions, and in many cases, culinary experiences (Figures 1,2,3&4).

The concept of protected areas rose as a consequence of the need to protect the flora and fauna and the natural landscape in general. It could be said that an area can be identified and delineated as an protected area, primarily if it incorporates outstanding natural, ecological and cultural values (Katris et al., 2015). Protected areas are areas under special protection status (Efthimiou 2015a,b). These areas are increasingly recognized for their importance in addressing biodiversity loss (Eken et al., 2004, Garcia-Frapoli et al., 2009), in the conservation of biodiversity (Dudley & Philips 2006, Dudley 2008) and in the development of recreation and environmental education (Tsitsoni et al., 2002, Papageorgiou et al., 2003, Efthimiou 2014).

The International Union for Conservation of Nature defines a protected area as an area of land and/or sea, especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, managed through legal or other effective means (IUCN 1994).
Figures 1, 2, 3, 4: Recreation and environmental education at the canyons of Asopos (Fig. 1) and Rodokalos (Fig. 2) of Mt. Oiti (Photo 2 by Athanasios Skouras). Waterfall rappelling-canyoning at Kremastos of Rodokalos (Fig. 3). Climbing at “Grammenes Spilies” of Mt. Oiti, located above the Kompotades village (Figures 3&4). (Photos by Loukas Pratilas).

The "National Park of Oiti" is a protected area, in order to preserve and protect the rich fauna and flora, as well as the mountain’s unique geomorphological features. The Park along with the wider landscape, including the Farmakides trail area, is also included in the EU Natura 2000 Network.

Hiking in “Protected Areas”, following various types of trails (hiking trails, biking trails, etc.), are key activities promoted in sustainable tourism and ecotourism. Where an organized trail is within a protected area and provides important interpretive values, it could have important ecotouristic value. These ecotourism routes, offering organized and safe trail networks within ecologically interesting areas may be an important attraction ecotourism development. It should be noted that “sustainable tourism” and “ecotourism” encompass the responsible use of the environment and natural resources for recreation. Also, another form of tourism that can be developed in protected areas, is “adventure tourism”, a form of “alternative tourism” that includes various activities, such as: trekking, mountaineering, ski mountaineering, canyoning, mountain biking, rafting, canoeing and kayaking, caving, rappelling and rock climbing (Figures 5,6,7&8).

The development of ecotourism in a protected area is a "multifactorial" system. Proper assessment requires a multidisciplinary approach and detailed study, in order to carry out its objectives efficiently. More and more visitors are attracted to protected areas nowadays, bringing about economic development, but sometimes the recreational pressures cause adverse impact on the ecological environment (Wenjun et al., 2005). Ecotourism should have minimal impact on both the environment and the local culture.

The difficulty of successfully implementing ecotourism development is due to the sensitivity of the natural environment and the cumulative effects of tourism on it (Vlami et al., 2000). In protected areas, trails are linkage between visitors and natural ecosystem, so they concentrate most of the
adverse impacts caused by visitors (Wenjun et al., 2005). Well-designed ecotourism activities can create new environmental professions, mainly trades with low “environmental footprint”, these are often termed “green jobs”. These new jobs, employing local manpower contribute to the revitalization of the local economy of these areas and boost sustainable development in general.

**Figures 5, 6, 7, 8**: Ski mountaineering, in Livadies plateau (Fig. 5) and at Pyrgos peak (2,152 m.) of Mt Oiti (Fig. 6). Parts of the trail network of Mt Oiti, have been included in the route of various races, namely the two annual MTB (Mountain Bike) Marathons ITI EPIC (35 & 60 km) (Fig. 7). Climbing area “Grammenes Spilies” (Fig. 8) (Photos by Loukas Pratilas).

The so-called thematic trails, such as the “nature trails”, “geological trails”, “botanical trails”, “rural trails”, etc, offer outdoor recreation and physical activity, but they have been proven to be an indispensable tool, used by the specialists to highlight the characteristics of the natural environment, ecology, biodiversity, geological-geomorphological characteristics and water resources, as well as the historical background, mythology and culture of certain areas. To facilitate these scientific endeavors, the thematic trails have to be developed and managed accordingly. An interesting case of a trail that presents several of the aforementioned features, is “Farmakides trail”, located within the protected area (Natura 2000 Network) and the limits of the National Park of Oiti (Oiti National Park) on the northwestern slopes of Mt. Oiti, in Central Greece (Figures 9&10).

The purpose of this paper is to: a. highlight the natural environment of Mt Oiti and the area of the Farmakides trail, focusing on the particular geomorphological and the natural beauty of the landscape, identified in the region, b. highlight the biodiversity (flora, fauna), the ancient history and mythology, and c. describe the strategy for developing the Farmakides trail, in order to propose improvements over the management and its sustainable ecotourism promotion.
Figure 9: Sketch of the wider area of Farmakides trail at Mt Oiti (Designed by Stavroula Syleouni).

2. MATERIALS AND METHODS

2.1 Geographical location of the study area

Farmakides trail, the subject of the present research, is located in the north-western side of Mt Oiti in Central Greece (Figure 10). Oiti, with Pyrgos (2,152m) and Greveno (2,114m) being the highest peaks, is one of the most easily accessible mountains of Central Greece and it is part of the massif of eastern Central Greece that also includes the mountains Parnassos, Gkiona, Vardousia, Kallidromos and Tymfristos. For the most part, this trail follows the riverbed of Xerias Ypatis, Anemotrypa cave and Rodokalos canyon, in altitudes between 364 and 542 m. The area’s nearby villages are Ypati (400m) and Kapnohori (588m).

Figure 10: The north-western side of Mt Oiti and the Quaternary deposits of Spercheios valley (Photo by Stylianos Syleounis).

North-western Oiti, especially Farmakides trail, is accessible to the visitor that comes from Athens via Thermopylae and Ypati village, where the trail starts. A trip from Athens to Thermopylae is 195 km long (around 2h by car) and to Ypati is 235 km (around 2h30 by car).
2.2 Study Methods

This study used both secondary and primary data. Secondary data collection involved review of existing reports (unpublished, gray and published literature) from libraries and documentation centers in various institutions in Athens, Lamia, Ypati and Amfissa. Some reports were also made available through internet search. The environmental situation of Mt. Oiti was evaluated by using the existing bibliographic data.

For the depiction of the environmental situation (vegetation, flora, fauna, geology, geomorphology, water resources, landscape) and mythology, of Mt Oiti and of the Farmakides trail, involved a series of different stages: the study of bibliographical references, systematic in situ observations (field-work), measurements using the Global Positioning System (GPS) satellite signals, observation and direct digitizing on the basis of different aged aerial photos and satellite images (Google Earth). All primary data were imported in an aposite database and were transferred in topographical map and onto satellite images (Google Earth). Thus the database was developed and updated with data deriving from different sources. Data were analyzed quantitative and qualitative, while different thematic maps were created.

2.3 Mt Oiti (geology, geomorphology, water resources, ecology)

Mt Oiti is the fifth highest mountain in Central Greece (Sterea Ellada), after the mountains Gkiona (Pyramida 2,510 m), Vardousia (Korakas 2,495 m), Parnassos (Liakoura 2,457 m) and Tymfristos (Velouchi 2,315 m). The morphology of the land relief, in the wider region of the Mt Oiti National Park, is defined by the mountainous massif of Oiti with mild to steep slopes and intense morphological contrasts. The dominant structural elements are it’s limestone steep tops, with highest peak Pyrgos (2,152 m) and Greveno (2,114 m), that are located in the core of the Park, as well as a line of lower peaks, in it’s southern part, that approach or exceed 1,500 m (Tourkos, Xerovouni, Petsalouda, etc). At first glance, Mt Oiti appears to be a rough mountain. The natural slopes and particularly those in the north and north-eastern side, present strong morphologic inclinations, with deep canyons such as Rodokalos canyon; yet as one approaches its core, a different image emerges. Intense karstic crests, plateaus and meadows full of wildflowers are located, such as those at Amaliolaka, Livadies, Zapantolaka and Katavothra, where small temporary ponds are formed.

Northern and to the north-east, in lower altitudes, quaternary deposits of Spercheios river and its tributaries, Asopos, Gorgopotamos and Xerias Ypatis, are shaped. These deposit include the alluviums of the valley, the weathering and erosion products of the background shapings, the alluvial fan, that constitute dynamically evolving geomorphological features and compose in their total, the alluvial extents of the Lamia plain. It should be noted that Asopos canyon is located to the east of Mt Oiti, constituting the natural border between Mt Oiti and Mt Kallidromos. The wester natural border, between Mt Oiti and Mt Vardousia, is Inachos river (r. Vistriza). Also, the southeastern natural border, between Mt Oiti and Mt Gkiona, is Mornos river. An important element for the dynamic geomorpholocical evolution of the region, is constituted by the big size alluvial fan (r. Asopos, r. Gorgopotamos, r. Xerias Ipatis, r. Xerias Ano Vardaton and r. Inachos), that have been created in the places of hydrographic systems unloading at the low deposit area of Spercheios river and that owe their creation in the production of important quantities of parent materials, upstream and in the transport and deposition, downstream, from the hydrographic systems that drain the wider region of Mt Oiti (Figures 11&12).

A large part of the Mt Oiti, drains in the hydrologic basin of Spercheios river (M.E.P.P.P.W, 2003). The main direction of the hydrographic network development, that drains at this region (tributaries Vistriza or Inahos, Asopos, Gorgopotamos, Xerias Ypatis and the Xeria Ano Vardates, etc.) is north north-east and discharges in the bed of Spercheios river. These hydrographic systems present intense stream action during the rainy months. Also, important part of Oiti’s mountainous massif (62.562 acres), falls into the basin of Mornos river and contributes to the homonymous tank (Mornos reservoir) that supplies Attica region, with water, while comparatively a small part (6.140 acres), belongs to the Viotikos Kifissos basin, which flows towards Copais plain and Yliki lake (Mertzanis et al., 2007).
The diverse geological formations and the presence of limestone and flysch define the flow of the surface water as well as its subterranean movement, within the “labyrinthine” network of sinkholes and caves. As a result, one encounters many springs and traditional water fountains, such as Amaliovrisi, Perdikovrisi, Vrisi Kalogerou, etc. (M.B.M.O.N.P. 2013).

In terms of vegetation, Mt Oiti is dominated by Greek fir forests (Abies cephalonica) and there is a small area in the northeast of the National Park in which the black pine (Pinus nigra) is encountered (www.oiti.gr). Evergreen broadleaved formations consist most of the vegetation of Mt Oiti at lower altitudes, followed by deciduous oaks forests (Quercus sp.), near the localities of Koumaritsi - Pauliani and Mesoxori - Pyrgos.

**Figures 11, 12**: View of the alluvial fan of r. Xerias Ypatis and in the background the lower Spercheios river valley, from the Ypati Castle (Photo 12 by Athanasios Skouras). The oversized alluvial fan, is due to the torrential character of r. Xerias Ypatis (Fig. 11) (Photo 11 by Stylianos Syleounis).

Greek fir forests (Abies cephalonica) can be found in the mountainous massif above 600 m and, finally, mountainous meadows in higher altitudes (Fig. 13). Kermes oaks (Quercus coccifera), which have a broader altitude distribution, are also encountered. 15 different types of ecotopes are formed in this broad distribution, according to the Natura 2000 recording, 13 of which are included in the Annex I of the Directive 92/43/EEC, while two more have been added for Greece (Fasoulas et al., 2001). According to recent researches in the wider region of Mt Oiti, 10 plant societies and 18 new plant communities exist that have been described for the first time (Karetsos, 2002). Mt Oiti National Park and Gorgopotamos canyon are characterized as Sites of Community Interest (SCI) and Asopos valley is characterized as Special Protection Area (SPA) (M.E.P.P.P.W, 2003, Dimopoulos et al., 2005).

A total of 99 species of flora that have been evaluated as important for Mt. Oiti, based on their integration and protection in National Lists (P.D. 67/81), the Red Data Book of Rare, Threatened Plants of Greece (Foitos et al., 1996, Foitos et al., 2009) and Threatened Categories according to European and International Lists. Oiti is known as the mountain of flowers boasting invaluable flora. An impressive variety of ecological conditions, due to the mountain’s geological history, the special climatic conditions and the diversity of the landscape, is ideal for the occurrence of a wide variety of plants (M.B.M.O.N.P. 2013). Mt Oiti also hosts a relatively large number of plant species endemic to Greece, as well as the Balkans. 41 out of 77 endemic species of Mt Oiti, are included in one of the Lists mentioned earlier. 53,2% of Mt Oiti total endemic species are included in one of the Threatened Categories (Rare, Endangered, Threatened).

Veronica oetaea, which is exclusively endemic in Oiti, was recorded for the first time by Gustavsson (1978). Its biotopes are mentioned to be extremely small in extent. According to the Red Data Book of Rare and Threatened Plants in Greece (2009), it is one of the critically endangered species that are threatened with extinction, mostly because of the very limited region where it is found. It can only be found in and around three small temporary ponds of high altitude (Livadies, Trapeza and Alykaina),
when they dry up between late May and mid-June. The flowers appear for a short period (2-3 weeks) of time and they are not easily identified, for their small size (up to ~ 5 cm high) and small white flowers (M.B.M.O.N.P. 2013). Gustavsson (1978) himself has reported that they are threatened by the network of forest road and bauxite mining. The second mention is highly uncertain, because the exploitations are considerably distant from the biotopes of the specific species. Also a species of wild onion (*Allium lagarophyllum*) is endemic to Oiti.

The local flora includes a large number of plant species endemic to Greece while two local endemic species have been recorded: *Veronica oetaea* and *Allium lagarophyllum*. Moreover, there are meadows with species of impressive beauty that visitors can enjoy. Other endemic species at Oiti that should be mentioned due to their impressive beauty are: lilies (*Lilium chalcedonicum, Lilium martagon, Lilium candidum*), poet’s Narcissus (*Narcissus poeticus*), croci (*Crocus veluchensis, Crocus sieberi*), orchids (e.g. *Dactylorhiza sp., Orchis sp., Himantoglossum caprinum, Cephalanthera rubra*), violas (e.g. *Viola aetolica, Viola graeca*), wild onions (e.g. *Allium phthioticum*), bellflowers (e.g. *Campanula versicolor*), knapweeds (e.g. *Centaurea triumfettii*), cowslips (*Primula veris*), iris (*Iris pumila ssp. attica*) and many others (M.B.M.O.N.P. 2013, Karetsos, 2014). *Lilium candidum* is the rarest of the tree kinds of lilies that can be found in Mt Oiti (*Lilium chalcedonicum, Lilium martagon, Lilium candidum*) (Fig. 14). It can only be found in the basin of r. Xerias Ypatis, in the adjacent parts of Farmakides trail and on rocks in the vicinity of the river. This is the reason why the climbing area that the “Lamia Climbing Community” has created, near Farmakides trail, has been named “The White Lilium” (Figures 35&36).

![Figures 13, 14, 15, 16: Fir forest on the north slopes of Mt Oiti (Fig. 13). Lilies (*Lilium candidum*) (Fig. 14). The Balkan chamois (*Rupicapra rupicapra balcanica*) (Fig. 15&16). (Photos 13&14 by Athanasios Skouras, Photos 15&16 by Stylianos Syleounis).](image-url)

Forty (40) out of the one hundred sixty six (166) bird species that are found in the wider region of Mt Oiti (Karetsos et al., 1996), are considered strictly protected, according to the Community Directive 409/79 (Birds Directive, Directive 2009/147/EC). About half of the protected species (22) use the biotopes that exist in the core and the wider region of Mt Oiti National Park. The Convention of Bern
includes 129 bird species of the wider region, 83 of which are also found inside the Mt Oiti National Park. 24 species of mammals are also included, 15 of which are found inside the Park, mostly bats (chiroptera) and 17 species of amphibians and reptiles. Amongst the most significant mammals on Oiti, are the Balkan chamois (*Rupicapra rupicapra balcanica*), a Balkan sub-species that is included in the threatened species of Greece (Figures 15&16). The P.D. 67/1981 strictly protects 35 species of mammals, all of which except of the Wolf and the otter (*Lutra lutra*), are chiroptera and 32 species of amphibians and reptiles. The mountains of central Greece are the southernmost point of distribution of Balkan chamois in Europe. Balkan chamois and roe deers (*Capreolus capreolus*) in the area are endangered by uncontrolled hunting. Unfortunately, uncontrolled hunting drove the local population of rock partridge (*Alectoris graeca*), for which the canyon was the major habitat in the Mt Oiti area, into extinction.

In most of Katavothra’s ponds, a small amphibian, the alpine newt is often being observed. An endemic barbel, *Barbus sperchiensis*, confined to Thessaly and Central Eastern Greece, has also been observed in Xerias stream of Ypati and in the lower part of Rodokalos canyon (Figures 17&18).

![Figures 17, 18: The endemic fish, *Barbus sperchiensis* ponds (Fig 17) (Photo by D. Koutsogiannopoulos). In situ ichthyological surveying, by Dr. Zogaris, in Xerias stream, using a backpack electrofisher (Fig 18) (Photo by Stylianos Syleounis).](image)

Four (4) species are characterized as “Vulnerable” and 5 as “Rare”. Among the mammals of the core area, 13 species are characterized “Threatened”, 5 species “Vulnerable” and 2 species “Rare”.

### 3. RESULTS - DISCUSSION

#### 3.1 The network of trails on Mt Oiti

The “ecotourism routes” in environmentally protected areas are among the most important “tools” that experts use in order to illustrate the environmental features, but also historical data and culture of certain areas. The mountain of Oiti, crisscrossed by a dense network of trails, is one of the ten Mountainous National Parks of Greece (www.hellaspath.gr) (Fig. 23&Table 1). The strongly contrasting relief, with the plateaus (Livadies and Katavothra) and the canyons on the north slopes of Mount Oiti (Gorgopotamos, Rodokalos, Kostalexis, Kamariotis, Gerakaris, Kakavos, Potistis, Asopos, etc.), the distinct geomorphological features, such as Katavothra cave-sinkhole, Tripa of Ypati cave, Arsali cave (St. Jerusalem), St. Spirit cave, Anemotrypa cave and other karstic caves in the Rodokalos canyon, the waterfalls (Kremastos of Kompotades, Kremastos of Rodokalos canyon, etc.), the alluvial fan of r. Xerias Ypatis, the natural beauty of the landscape, the amazing views, the biodiversity, the uninterrupted tradition but also the mythology, attract the naturalist visitors, as much as the researchers, who wish to trek over the mountain (Figures 19,20,21&,22).

The trails of the Mt Oiti, are of great ecological, scientific and research interest. The most important of them belong to the categories “nature trails”, “geological trails”, “botanical trails” and “rural trails”
being among the major infrastructure of the mountain regarding outdoor and forest recreation. Oiti trail network also includes “hiking trails”, “walking trails”, “recreational trails”, “trekking trails” and “running trails”. Oiti’s network of trails includes numerous hiking and mountaineering routes, with various thematic interests and degrees of difficulty, such as the “Farmakides trail”, “Hercules’ trail”, “Trail of Railway workers” (Sidirodromikon trail)”, etc. Several cyclists-visitors, cross Oiti, on their bikes, specially designed for mountain biking, following numerous mild routes in the forest road network. Mt Oiti is, also, particularly interesting for experienced “canyoners” (Figures 19,20,21,22&34).

![Image](image.png)

**Figure 19:** The strongly contrasting relief, with the Quaternary deposits of Spercheios valley and the canyons (Potistis, Kostalexis, Gerakaris, Kakavos, Kamariotis, etc.) on the north slopes of Mt Oiti (Photo by Konstantinos Mertzanis).

Canyoning trips are systematically conducted, for instance at the impressive and imposing canyon of Gorgopotamos, which, having a high degree of difficulty, ranks among the top three in Europe, and at the canyons of Rodokalos, Kamariotis, Gerakaris, Kakavos and Asapos, but require special expertise, fitness and specialized equipment.

In the past, most trails were opened to facilitate communication of mountain areas with the lowlands and larger towns, and between the villages. Many trails, especially those in rural areas, were also opened to serve the movement of people and animals, the local logistical needs and generally the agricultural and pastoral life of the residents. In modern times most of these trails are being used in different ways or have been abandoned altogether. Nowadays, many of these trails, in the area of Mt Oiti, have been mapped, upgraded and maintained under the responsibility of the relevant Forest Services, the Management Body of Mt Oiti National Park, the Hellenic Alpine Club of Lamia, and various groups of volunteers, leading to different degrees of alternation in their routes.
In this way, they can be used both for outdoor recreation and for the promotion of environmental, traditional and mythological features. Certain trails have been marked with appropriate direction and description signs (trailhead information signs, information/interpretive signs, destination signs, reassurance markers/blazes, You-Are-Here signs, identification signs, etc.). They have also been cleared from fallen trees and branches and they have been widened; improving their accessibility to hikers while protecting and preserving adjacent resources. In some cases their routes have been altered in order to promote certain local features.

**Figure 23:** Map of the hiking trails in the northwestern side of the protected area of Mt Oiti (Source: M.B.M.O.N.P.).

Parts of the trail network of Mt Oiti, have been included in the route of various races, namely, Hercules Mountain Marathon (42,350 m), Helleborus Half Marathon (16,200 m), Farmakides Trail (6,410 m), Filoktitios dromos (14,900 m), as well as the two annual MTB (Mountain Bike) Marathons ITI EPIC (35 & 60 km) (Fig. 24).

Important common features of these actions are the proper management, maintenance, and overhaul of Oiti’s trails, the appropriate measures for the promotion of the surrounding area and overall, protection and restoration of the natural and built environment. Alternative forms of races are also important for the protection of the local environment. These races appear more and more the last few years, replacing the rally racing events that used to take place in the area, such as the Acropolis Rally and various off-road 4x4 and motocross races, that brought detrimental effects on the wildlife.

**Figure 24:** The route of the race “Hercules Mountain Marathon” (42,350 m), passes through the three highest peaks of Mt Oiti and it starts and finishes at the Square of Ypati. It also includes an important segment of Farmakides trail (Photo by Loukas Pratilas).

### 3.2 Farmakides Trail - Route description

Farmakides trail is an interesting “hiking trail” that passes through a variety of changing sceneries, beautiful landscapes and amazing views. The ease and the relatively small altitude changes throughout the route, not exceeding 178 m. and the duration of about three hours, are the main features of the trail (Figures 25&26, Table 2). The part of the route that includes the first waterfall (roughly 80 m) is an exception; the degree of difficulty rises, therefore the hikers needs a higher level of physical fitness. The ascent in this part of the route, is facilitated by technical aids-construction (metal steps and firmly secured retaining ropes).
Figure 25: Elevation diagram of Farmakides Trail. Altitude range 178 m (364 to 542 m). Total Climb 266m (Designed by Stavroula Syleouni).

Following the Farmakides trail, the hikers can have the chance to enjoy, and learn about, the characteristics that have given Mt Oiti the names “mountain of colours”, “mountain of flowers”, but also “Neromana”, meaning the source of large quantities of water. Anemotrypa cave, where, according to mythology, the Farmakides witches would brew their potions and Rodokalos canyon, boasting thirty-three spectacular waterfalls, are just two of the impressive features that Farmakides trail. The local biodiversity, highlighted by the rare white lily (*Lilium candidum*), endemic fish *Barbus sperchiensis*, and Balkan Chamois (*Rupicapra rupicapra balcanica*), further adds to the distinctive attributes of Farmakides trail.

A relatively flat landform, known as Rodokalos plateau, is located in the south of Ypati Village, on the boundaries of Mt Oiti National Park. The water that drains the plateau, in combination with the surface runoff from higher parts of the drainage basin, is being discharged in river Xerias of Ypati through an intensely karstic limestone canyon, which is a typical specimen of large canyons on the northern side of Mt Oiti. The canyon was named “Rodokalos canyon” by canyoners and it includes thirty-three (33) waterfalls. A hiker following Farmakides trail, will reach the impressive Kremastos waterfall, the last, and hypsometrically lowest, but also tallest of the trail’s waterfalls, with a height of forty-five meters (45m). Two more waterfalls are also within the reach of a hiker willing to ascend to a higher elevation. These waterfalls are thirty meters (30m) and eighteen meters (18m) tall. Rodokalos canyon is located between the peaks Psilainos and Petrotos which are among the most important habitats for chamois (*Rupicapra rupicapra balcanica*), in Mt Oiti.

Farmakides trail starts from the square of village Ypati, at 400 m altitude (Figures 25,26,27&28, Table 2). The village of Ypati, located on the north-western slopes of Mt Oiti, has a population of 496 inhabitants (2011). It is located in Phthiotis, 22 km from the city of Lamia.
During the “Frankish rule” era, Ypati occupied by the Catalans and became the seat of the Duchy of Neopatras (or La Patria). The Duchy survived for 82 years, until it was conquered by the Ottoman Empire. Ypati, with its castle, has been the administrative center of the region for the better part of its 2,500 years of history. Today, Ypati appears to be a small semi-mountainous village but it is a cultural and naturalistic destination. The visitors can visit the Byzantine Museum of Phthiotis, the Kakogianneio Asteroscholeio of Ypati, the installations of the Center for Environmental Education and churches such as St. Nicholas (Aghios Nikolaos) and St. Sophia (Aghia Sofia), that are labeled Byzantine Monuments. The ruins of the Ypati Castle are also a tourist attraction. The castle is built on a hill above the town and has recently been restored and is now open to visitors.

Ypati is also included in the network “Martyr Town” of Greece, since it suffered extensive damage from the German occupation army, during World War II. In June 1944, the town was completely destroyed in retaliation to the support provided by the townspeople to resistance groups who were active in the mountains. The whole town was burnt to the ground, including public buildings among them, the cathedrals of St. George (Aghios Georgios) and the steeple of St. Herodion (Aghios Irodionas) that were blown up.

According to historical sources (Papapanagiotou 1971, Stahlin 2008), ruins and traces of habitation from the Neolithic period onward have been found on hillocks in Spercheios valley and in caves on the northern slopes of Mt Oiti. In historical times Spercheios valley was inhabited by two Greek tribes, the Malieis and the Ainians. Malida, the region inhabited by the Malieis, stretched the east coast with an administrative center initially in Trahina and later in Lamia. Ainida, the region inhabited by the Ainians was occupying the western part with the main town of Ypati, which was the seat of a mint and the meeting point of their leaders, called Ainiarchoi.
Table 2. Main characteristics of Farmakides trail

| Source: Observations of the study group, various literature sources and existing reports. |

- From the trailhead, the hikers follow the uphill road, which is paved with cobblestones, and at its end, in front of the town hall, they turn right. In about 100 m they reach the courtyard of the church of St. Nicholas. This post-Byzantine church presents special interest due to the fact that on its walls it incorporates architectural parts of older buildings, ancient inscriptions and Corinthian capitals on the arches. A part of the mosaic floor of the original 4th-6th century church was found near the foundations, has been placed in the courtyard in the early 70s. This 2x6 m² mosaic floor, adorned with geometric patterns and bird representations, remains covered by sand, in order to be protected until the reconstruction of the roof is possible.

- Then, the hikers cross the courtyard of the church of St. Nicholas and follow the downhill cobblestone road for about 200 m, reaching the asphalt road Ypati - Monastery of Agathon (Moni Agathonos).

- The hikers turn to the left, following the direction to Kapnohori or the Monastery of Agathon for 40 m after the last house of the village. There they ascend a dirt road for the next 400 m until they reach the trail. 150 m after the start of the trail the hikers arrive at the Anemotrypa cave gulch (Figure 29). A current of air, of pleasant temperature, regardless of the seas on, can be felt coming through. This phenomenon is the reason for the name Anemotrypa, since “Anemos” and “Trypa” stand for wind and hole respectively, in Greek. This current of air has stimulated the imagination of people, leading to the conception of several myths about where may be the other end of the cave gulch. According Anagnostopoulos (1959), it has been traditionally believed that “Anemotrypa cave”, is one of two entrance points of two underground galleries that meet at some point, forming a single underground gallery to end up at the other exit, located in Loutra Ypati. Again, according to the local tradition, witches and various elves and fairies were coming down from “Anemotrypa cave” to take a bath in Hot Springs of Loutra Ypatis, which are about 5 km away.

According the Hellenic Speleological Society (2009), after exploring “Anemotrypa cave”, it has been proven it is a case of tectonic joint -open fissure- between two types of rock. The section near the entrance, with a total length of 11 m, consists of weathered bedrock and rock debris-talus. The main tectonic joint consists of limestone covered with stalactites and stalagmites. From the entrance point to the bottom, the depth is 9 m. Two cavers tried to descent from this point but they could not reach the bottom, because the tectonic joint has a very small width.

The direction of the cave is West-East. A brief survey has also taken place in the vicinity of “Anemotrypa cave”, near and below which a joint set of three more recent tectonic joints located. These are directed similarly to the “Anemotrypa cave”, they have small horizontal depth and lack speleological interest (Hellenic speleological Society, 2009). It should be noted that "tectonic joints" are joints formed by the relative displacement of the joint walls as the result of brittle deformation of bedrock in response to regional or local tectonic deformation of bedrock.
A visible, but unmarked, trail starts in front of the mouth of “Anemotrypa cave”. This trail leads, after 400 m, intersects the main trail Ypati-Refuge of Oiti. The hikers follow the main trail for about 500 m and then follow a short detour that leads to Ypati Castle.

-Figures 27, 28: Ypati village (Fig. 27) (Photo by Nicolaos Froutas). View of the lower Spercheios river valley and the alluvial fan of r. Xerias Ypatis. In the foreground, the ruins of Ypati Castle and in the background the Ypati village (Fig. 28) (Photo by Athanasios Skouras)

-From the position “Anemotrypa cave gulch” the hikers can enjoy the panoramic view of the western part of r. Spercheios valley. Rodokalos canyon can be seen in the south, one of the main attractions of Farmakides trail. To the north, the alluvial fan of river Xerias Ypatis is also visible, the width of which is disproportionately large compared to the catchment basin. The oversized alluvial fan is due to the torrential character of Xerias Ypatis, the geology and the relatively steep slopes in some parts of the catchment area that further torrential action and the erosion processes. A result of the erosion processes is the transfer of water and eroded material, such as weathered rocks of varying size (blocks of stone, pebbles, gravels, sands, etc.) and the deposition of these sediments in the discharge areas, enriching alluvial fan with sediment. The deposition process happens when a river loses energy. The energy is reduced proportionately as the speed of the current is reduced.

-Then, the downhill part of the trail begins, crossing typical brushwood (phrygana), dominated by ashfaca (Phlomis fruticosa) and ladanies (cistus sp.). The area is mostly consisted of abandoned crops, primarily vineyards, which had been suffering by the degradation of the ecosystem, as a result of long monoculture. The ecological succession process is visible here. Brushwood initially appear in the degraded ecosystem, creating overtime conditions for the emergence of arkefthos trees (Juniperus oxykedrus) and Kermes oaks (Quercus coccifera). These are in turn gradually displaced by larger trees. After walking for 500 m the hikers approach a small “suspension” bridge. At this point, the slope is full of Aleppo pine trees (Pinus halepensis); a result of planting carried out by the Forest Service of Lamia in order to step the soil erosion processes and landslides caused by rainfall and the erosive action of the river Xerias Ypatis.

-After 200 m of walking on the alluvial deposits of river Xerias Ypatis, the main trail will be reached. Turning left and walking 500 m more, will lead to a junction with two options.

-Following the one leading to the 1st waterfall and after 150 m reach the Rodokalos canyon. Here, the hikers have to climb about 150 m into the narrow canyon besides the water flowing in the riverbed of the torrent, forming many minor waterfalls. After a few minutes they arrive in front of the impressive, 45 m high, Kremastos waterfall (Figures 33&34). Climbing in this part is facilitated by metal steps and firmly secured retaining ropes (Figures 31&32). It should be noted that the surrounding area is characterized by narrow and deep canyons with steep rocky sides. These canyons, like Rodokalos canyon have been created by the erosive action of running waters which interact with geomorphic structures, forming in this way, a continuous recess of the limestone bedrock.
-Back to the intersection, this time following the choice to the steep hill leading 2nd waterfall. After 200 m of uphill walk the hikers reach a large plateau. Following the trail across the plateau for 400 m leads between the 3rd waterfall, height 30 m, and the 2nd waterfall, height 18 m (Andreou 2007).

-Following the trail for about 200 m in a westerly direction, the hikers enter a particular forest. From afar, to the non-specialist eyes, it gives the impression of a fir forest at low altitude. During the roughly 400 m inside the forest, one notices that there are no firs and in fact a dense understory dominates the place, mostly consisting of Kermes oaks (*Quercus coccifera*), broadleaved phillyrea (*Phillyrea latifolia*), Hop hornbeam (*Ostrya carpinifolia*) and many species of genus Acer (*Acer spp*.). The clumps of moss (*Bryophytes*) covering the stones and tree trunks create a “mysterious atmosphere”, that is rare, if not unique, to the forests of central and southern Greece.

-Coming out of the woods, the trail leads to a large area uncovered by forest vegetation, with an abandoned farm with walnut trees. Following it downhill for a short distance the hikers descend to the bed of Xerias Ypatis and walk onto the alluvial deposits (rocks, pebbles, gravel, sands).

-At this point, Farmakides trail meets the trail that crosses the river Xerias Ypatis and then follows a western uphill route towards the upstream area where are works mountainous torrent control technical works (dams, stairs, etc.) are located. Finally, this trail leads to Kapnochori.

-Farmakides trail, on the other hand, drives the hikers towards the east. After 120 m, passing over some small wooden bridges and an old water mill well, the hikers reach a small park next to the bridge of the asphalt road Ypati-Monastery of Agathon. This park is used by canyoneers, that plan to visit Rodokalos canyon and by rock climbers who train in the “White Lilium” climbing area, created by Lamia Climbing Community at the vertical slope, on the rock on the far side of the river Xerias Ypatis (Figure 30).

**Figures 29, 30, 31:** Anemotrypa cave gulch (Fig. 29) (Photo by Styl. Syleounis). The Climbing area “The White Lilium” near Farmakides trail (Fig. 30). (Photo by Loukas Pratilas). Canyoning-rappelling at the waterfall Kremastos of Rodokalos canyon (Fig. 31) (Photo by Loukas Pratilas).

-The entrance of the cave at the bottom of “Anemotrypa”, is another point of interest; not only its natural beauty is stunning, but also the local mythology fascinates visitors since ancient times. This is where, according to various legends, Farmakides witches were engaged in occult rituals. These stories, attributed both to known authors and local traditions, span two and a half thousand years, during which they have been continued fairly consistently. These legends apparently have limited, if any, connection to historic events, but their continuity attests to the exceptional characteristics of the area, inspiring generations of locals and travelers to invent them. Unfortunately, visiting is currently practically blocked, as the entrance is partly fenced and partly blocked by a large fig tree.

According to mythology, Farmakides witches were meeting in the abrupt and deep fissure at the edge of Ypati and inside what is nowadays called “Anemotrypa”. There are some basin shaped excavations near the bottom of “Anemotrypa”. This is where the Farmakides witches were, supposedly, brewing their potions. These basins are not currently visible, due to slot accumulated dirt and rock inside the
fissure, coming from loose rocks created by physical weathering of the bedrock of the steep mountainside (Anagnostopoulos, 1959). Historical sources (Anagnostopoulos, 1959, Papapanagiotou 1971, Stahlin 2008) indicate that the most prominent position between the witches was held by the Thessalian ones, as the valley of Spercheios was also considered part of Thessaly. This can be better understood as the myth states that Thessaly was the initial point of settlement of Medea, when she fled Colchis. She had deep knowledge of magic herbs, all kinds of poisons and properties and qualities of roots; an art taught by her mother, the Goddess Hecate her aunt Circe, and which in turn she also spread to the witches.

Located approximately 50 m below the “entrance of Anemotrypa” a large carved rock is located. On the rock, there are two ancient carved graves (Figures 37&38). This position is called by the locals “Skafidakia”. Greek for “little troughs” because one of the graves is shaped similarly to a trough. These are old carved tombs on the rock, but the legend turned into tubs, in which the fairies of the river area Xerias Ypatis and “Anemotrypa” washed their clothes in the night, dancing and singing around the troughs while their clothes were drying up (Anagnostopoulos, 1959). Archaeologists’ estimates state that probably these cavities were indeed carved for use as graves, but their dating is impossible, in the absence of grave goods.

Finally, the hikers follow the asphalt road to the Ypati High School and through the cobbled alleys of the city they reach the square of Ypati, the point where they started from, namely the trailhead. End of Route.

3.3 Farmakides trail management and enhancement.

The minimum conditions required for the proper development and implementation of ecotourism activities in protected areas, is the proper design of the paths, the systematic maintenance and monitoring, the calculation of the ecosystem’s carrying capacity, the raising of awareness among the visitors to environmental protection, the application of conservation measures and procedures and the highlighting of particular characteristics of the natural environment, landscape and cultural heritage. Without the necessary planning, problems will inevitably emerge and the local environment will be depredated, as a direct effect of conventional or mass tourism (Vlami et al., 2000).

According to N.C.N.S.T. (1996), signs are probably the quickest and easiest way to leave the trail user with a positive impression. If the signs are high quality, well maintained, and properly located, other trail problems which are harder to solve are often over-looked (e.g., wet areas). Consistent signs are the quickest way to increase the trail’s identity and the public’s support for the trail. Other objectives are to: 1. Provide positive exposure of the trail to attract more users, 2. Educate the user about the trail through trailhead kiosks, 3. Reassure the user that he/she is on the right trail and will not get lost, and 4. Control trail usage and create a safer, more enjoyable, environmentally friendly experience. These objectives are to be balanced with aesthetic considerations to avoid “sign pollution”.

Some problems and proposals about the management of Farmakides trail are presented below, regarding the strategy for the development of the trail, while protecting and enhancing the environment of the wider area (Fig. 32, Table 3).

Sign maintenance is critical to the operation of a quality trail system (Table 3). Well maintained signs that are repaired promptly convey a sense of pride and reduce further vandalism. Signs are a highly visible representation of the quality of the trail. Their maintenance or lack of maintenance leaves the visitor with a positive or negative impression about the trail. Signs convey many kinds of information and it is critical that they be in good shape (N.C.N.S.T., 1996).
The visitors should be actively encouraged to avoid the misuse and vandalism (metal or wooden steps, firmly secured retaining ropes, wooden bridges, suspension bridges, boardwalks, information signs, kiosks, destination signs, etc.). This can save significant amounts of money through the reduction of maintenance cost and cleaning. Furthermore, the barriers should be removed from certain interesting point of the trail. An example of that is the entrance of “Anemotrypa cave”, the access in which is practically blocked by a fence and a large fig tree. The visitors should also be prompted, via proper signage, to reduce the volume of or to depose it in the appropriate bins that are located in the village of Ypati.

The condition and resulting maintenance demands of a trail is affected by the amount and type of use the trail receives. Each trail has a usage limit. The usage limit however, is determined by more than just the amount of use. The usage limit is influenced by the following factors: environmental conditions impacting the trail, quality of site selection, ground cover and terrain, trail construction, adherence to maintenance requirements, and the volume and types of trail use (V.T.A.-V.D.C.R., 2011).

The results of this monitoring & management program and the findings concerning the effects caused by the visitors in protected areas, can provide crucial information. Managers can systematically improve and apply a regularly updated set of “Rules & Regulations”. Consequently, this process contributes to the reduction of the environmental impact caused by the presence of visitors and use of the trail. Meanwhile, the “revolving monitoring program” of visitors and its systematic updating will enable the accurate identification of the appropriate target group of visitors.

The competent bodies will have in this way a powerful tool in creating the appropriate conditions and infrastructure to meet the needs and requirements of visitors (eg. handicapped, mountaineers, climbers, mountain runners, canyoneers, cyclists, etc.).
Table 3. Inventory and Assessment of Farmakides trail. Problems and Suggestions about the Trail Management

<table>
<thead>
<tr>
<th>Geographical coordinates of the point, position</th>
<th>Place name</th>
<th>Point distance from the Trailhead (in meters)</th>
<th>Assessment of Trail Problems &amp; Proposals about the Farmakides trail Management (Works Needed - Operations - Maintenance - Management)</th>
</tr>
</thead>
<tbody>
<tr>
<td>38°52'16.072&quot;N 22°14'27.722&quot;E</td>
<td>Yorki Trailhead</td>
<td>0</td>
<td><img src="chart.png" alt="Assessment of Trail Problems &amp; Proposals about the Farmakides trail Management" /></td>
</tr>
<tr>
<td>38°52'16.072&quot;N 22°14'27.722&quot;E</td>
<td>Church Ag. Nicholas</td>
<td>300</td>
<td><img src="chart.png" alt="Assessment of Trail Problems &amp; Proposals about the Farmakides trail Management" /></td>
</tr>
<tr>
<td>38°52'16.072&quot;N 22°14'27.722&quot;E</td>
<td>Start of dirt road</td>
<td>500</td>
<td><img src="chart.png" alt="Assessment of Trail Problems &amp; Proposals about the Farmakides trail Management" /></td>
</tr>
<tr>
<td>38°52'16.072&quot;N 22°14'27.722&quot;E</td>
<td>Start of trail</td>
<td>900</td>
<td><img src="chart.png" alt="Assessment of Trail Problems &amp; Proposals about the Farmakides trail Management" /></td>
</tr>
<tr>
<td>38°52'16.072&quot;N 22°14'27.722&quot;E</td>
<td>Anemotyra cave grotto</td>
<td>1,950</td>
<td><img src="chart.png" alt="Assessment of Trail Problems &amp; Proposals about the Farmakides trail Management" /></td>
</tr>
<tr>
<td>38°52'16.072&quot;N 22°14'27.722&quot;E</td>
<td>Suspension bridge</td>
<td>1,500</td>
<td><img src="chart.png" alt="Assessment of Trail Problems &amp; Proposals about the Farmakides trail Management" /></td>
</tr>
<tr>
<td>38°52'16.072&quot;N 22°14'27.722&quot;E</td>
<td>Crossroad</td>
<td>1,850</td>
<td><img src="chart.png" alt="Assessment of Trail Problems &amp; Proposals about the Farmakides trail Management" /></td>
</tr>
<tr>
<td>38°52'16.072&quot;N 22°14'27.722&quot;E</td>
<td>Canyon entrance</td>
<td>2,000</td>
<td><img src="chart.png" alt="Assessment of Trail Problems &amp; Proposals about the Farmakides trail Management" /></td>
</tr>
<tr>
<td>38°52'16.072&quot;N 22°14'27.722&quot;E</td>
<td>1st waterfall (Kremastos)</td>
<td>2,150</td>
<td><img src="chart.png" alt="Assessment of Trail Problems &amp; Proposals about the Farmakides trail Management" /></td>
</tr>
<tr>
<td>38°52'16.072&quot;N 22°14'27.722&quot;E</td>
<td>2nd &amp; 3rd waterfalls</td>
<td>3,000</td>
<td><img src="chart.png" alt="Assessment of Trail Problems &amp; Proposals about the Farmakides trail Management" /></td>
</tr>
<tr>
<td>38°52'16.072&quot;N 22°14'27.722&quot;E</td>
<td>Forest entrance</td>
<td>3,150</td>
<td><img src="chart.png" alt="Assessment of Trail Problems &amp; Proposals about the Farmakides trail Management" /></td>
</tr>
<tr>
<td>38°52'16.072&quot;N 22°14'27.722&quot;E</td>
<td>Flat area</td>
<td>3,500</td>
<td><img src="chart.png" alt="Assessment of Trail Problems &amp; Proposals about the Farmakides trail Management" /></td>
</tr>
<tr>
<td>38°52'16.072&quot;N 22°14'27.722&quot;E</td>
<td>R. Kerias Bridge</td>
<td>4,750</td>
<td><img src="chart.png" alt="Assessment of Trail Problems &amp; Proposals about the Farmakides trail Management" /></td>
</tr>
<tr>
<td>38°52'16.072&quot;N 22°14'27.722&quot;E</td>
<td>Shafialaka</td>
<td>4,900</td>
<td><img src="chart.png" alt="Assessment of Trail Problems &amp; Proposals about the Farmakides trail Management" /></td>
</tr>
<tr>
<td>38°52'16.072&quot;N 22°14'27.722&quot;E</td>
<td>Anemotyra entrance</td>
<td>4,950</td>
<td><img src="chart.png" alt="Assessment of Trail Problems &amp; Proposals about the Farmakides trail Management" /></td>
</tr>
<tr>
<td>38°52'16.072&quot;N 22°14'27.722&quot;E</td>
<td>Square of Yorki</td>
<td>5,800</td>
<td><img src="chart.png" alt="Assessment of Trail Problems &amp; Proposals about the Farmakides trail Management" /></td>
</tr>
</tbody>
</table>

Source: Observations of the study group, various literature sources and existing reports.

Note: The dots (●) found at Table 3 indicate a problem/shortcoming in the infrastructure or maintenance of the corresponding point of the route. The dot also indicates that the management, promotion and marketing of the trail has been insufficient (or non-existent) and consequently there are measures that need to be taken both for the proper management and promotion of the trail but also for the protection and promotion of the natural environment of the area.

Remarks:

1: “Trailhead information sign/kiosk”. This structure should include a double or triple bulletin board structure or a different type of structure. The left display panel should contain general information about the trail (trail map/description). It should depict the general location of the trail in relation to other major landmarks (N.C.N.S.T., 1996). The right display panel should contain specific information about the trail segment, such as the natural environment of Mt Oiti, the local biodiversity and Oiti’s.
endemic plants, the Balkan chamois, the endemic fish (*Barbus sperchiensis*), as well the geological and geomorphological features (Rodokalos canyon, Anemotrypa cave gulch and other karstic caves in the Rodokalos canyon, Kremastos waterfall and other waterfalls, the alluvial fan of r. Xerias). Furthermore, important items required to cited are: the mythology, the archaeological resources and history of Ypati village as well Skafidakia place. The “trailhead information signs” should contain information on the kinds of use allowed on the trail, and which show acceptable and unacceptable uses (N.C.N.S.T., 1996). “Starting point” at the main square of the Ypati village: A Trailhead information sign and a kiosk are required. The route map, a brief description and some photographs of the most important elements should be available there.

2: The construction of a roof is advisable in order to allow the disclosure of the mosaic floor portion of the original church of St. Nicholas of the 4th century (Fig. 33). The mosaic of this Byzantine monument is currently covered with protected sand that should stay in place until the roof is completed.

![Figure 33: The construction of a roof is advisable in order to allow the disclosure of the mosaic floor portion of the original church of St. Nicholas of the 4th century (Designed by Stavroula Syleouni).](image)

3: “Destination signs”, show direction and distances to various spots along the trail. Appropriate places for these signs are: trailheads, major roads, shelters, trail junctions, and spur trail junctions (to indicate distance to water or shelter)(N.C.N.S.T., 1996).

4: “Reassurance Markers”, are the paint or nail-on “blazes” that mark the trail (Fig. 34). According to N.C.N.S.T. (1996), blazes are placed on trees or posts, slightly above eye level so that hikers can see them easily when traveling in either direction. In areas where the trail receives winter use, blazes are placed higher so they are visible above the snow. Blazes should be within “line of sight”-when standing at a blaze marker, the hiker should be able to see the next one. Blazes should be continuous-even along road segments and other unmistakable parts of the trail. Blazes should be placed immediately beyond any trail junction or road crossing-even if there is a directional sign.

![Figure 34: Identification signs-Reassurance markers/blazes of the Farmakides trail. Hecate is the symbol of the trail; in Greek mythology this goddess is a patron of purifying rituals and as an extension of magical arts and people practicing them.](image)
5: “You-Are-Here signs”, may supplement maps at trailhead kiosks and other key locations, such as at trail intersections, along the route (N.C.N.S.T., 1996).

6: “Identification signs”. They are simple, routed wood, identification signs which allow the hiker to find their location on a map in relation to what they are seeing. They are short and concise. Generally, an identification sign is appropriate for all sites listed on destination signs (N.C.N.S.T., 1996). “Anemotrypa entrance” location: Making the entrance of “Anemotrypa cave” accessible again would be advisable.

7: This part of the canyon, from the drop point of the waterfall to the end of the canyon, offers beginner hikers a chance for a first contact with the “waterfall rappelling-canyoning”.

8: Metal steps and firmly secured retaining ropes should be places in places of high climbing difficulty. The renewal and enrichment of existing climbing devices is crucial. Wet rocks are very slippery, so visiting should be avoided both in rainy days and the day after that. The descent can be particularly dangerous.

9: An Information-Interpretive sign in the viewing area would be helpful. The position is ideal for this use due the panoramic view towards the western part of the valley of river Spercheios, various villages and the alluvial fan of river Xerias Ypatis (Fig. 35).

10: The construction of a parking area is recommended, in a short distance towards the northeast of the bridge on the road Ypati-Monastery Agathonos. Broadleaf trees could be planted to provide shading for cars of visitors; a convenient feature especially in summer.

Further actions can contribute to the enhancement of the landscape and generally to the rational management of a trail. These actions include the active promotion and attraction of publicity.

The identification, recording and evaluation of the problems that have been encountered as of now in Farmakides trail, are summarized in Table 3. This table is intended to serve as a tool for the trail manager, offering an overall mapping/visualization of problems and deficiencies.

The geographical coordinates of the corresponding position can be found below. This facilitates the visualization and interpretation of the problems identified in the trail, mostly related to the lack of constructions such as boardwalks and metal or wooden steps, wooden bridges, suspension bridges, the insufficient signage, the proper maintenance (trail widening & clearing, tree & shrub trimming, etc.), (Table 3). The trail manager can transfer the relevant data (geographical coordinates) on a topographic map, or any other relevant cartographic basis in order to use it in a more convenient way.

![Figure 35](image.png)

**Figure 35**: Anemotrypa cave gulch. An Information-Interpretive sign in the viewing area would be helpful. The position is ideal for this use due the panoramic view (Designed by Stavroula Syleouni).

Some proposals are made below, regarding the strategy for developing Farmakides trail while protecting and enhancing the environment of the wider area: a) Assessment of the trail's carrying
capacity. b) Development of an annual program regarding the monitoring, maintenance and cleaning of the trail. The time and frequency of these activities have to be specified in the program. c) Prompting the visitors to avoid acts of vandalism and misuse of the infrastructure (boardwalks, metal or wooden steps and retaining ropes, information signs, kiosks, destination signs, etc.). This information can be disseminated via adequate signage. d) Raising awareness among the visitors regarding the volume of waste and its proper disposal in specially designed bins that are currently located in Ypati village. This information can be disseminated via adequate signage. e) Raising awareness among the visitors about the “Rules & Regulations” and developing a program to monitor and control the trail (designations, closures, permit requirements and other restriction imposed under the discretionary authority of the superintendent, etc.). f) Development, systematic implementation and improvement of a frequently updated set of “Rules & Regulations”. This is expected to contribute to the containment of the negative effects caused by the presence of visitors and the use of the trail. g) Determination of the various target groups of visitor, in order to accommodate their needs and demands (e.g. people with disabilities, cyclists, canyoners, etc.).

4. CONCLUSIONS

Oiti’s network of trails includes numerous hiking and mountaineering routes, with various thematic interests and degrees of difficulty. Oiti trail network also includes “hiking trails”, “walking trails”, “recreational trails”, “trekking trails” and “running trails”. Mt Oiti is, also, particularly interesting for experienced “canyoners”. The trails of the Mt Oiti, are of great ecological, scientific and research interest. Among these trails, the Farmakides trail, is located within the protected area (Natura 2000 Network) and the limits of Oiti National Park. Farmakides trail, offer hikers opportunities for exercise, recreation and environmental education. Special feature of the trail landscape include, among others: 1. rare and impressive species of plants and rich fauna, 2. distinct geomorphological features, such as Anemotrypa cave, Rodokalos canyon and spectacular waterfalls and 3. outstanding scenic landscapes which combine areas of cultural and wilderness values.

The development and the efficient management of a trail, such as for example Farmakides trail, the protection and enhancement of the landscape and the natural and built environment that surround it, need compliance to the relevant rules in to be maintained. These rules include proper signage, regular maintenance and, in some cases, monitoring and guarding as well as promotion. The appropriate signage and maintenance are prerequisites for the safe use of the trails. Consequently, the trails have to be managed systematically, namely to be maintained in a satisfactory level of cleanliness and safety conditions. This applies to the maintenance of constructions too. The proper design and construction of new trails or “improved” routes in the pre-existing trails can reduce the cost of maintenance and management while increasing the promotion of the surrounding area and the quality of information provided to the visitor. Combining the above can create favorable conditions for the attainment of the purposes the trail is created for.

It is important to determining the carrying capacity, namely the maximum number of visitors the trail, and the “Protected area” of Mt Oiti, can accommodate without degrading the environment and the protected ecosystems. Furthermore, it is considered necessary to inform the visitors about the “Rules & Regulations” of the trail. At the same time a visitor monitoring & management program should be developed by the competent body.

The management of Farmakides trail, and the protection and promotion of the environment, namely of the vegetation, flora, fauna, landscape, geology, geomorphology and mythology, of this area, constitute the main subject of this paper. Farmakides trail, is an interesting route that passes through a variety of changing sceneries, beautiful landscapes and amazing views. The trail is free of strong signs of human intervention. It is one of the most interesting trails of Mt Oiti, especially as regards to the caves, canyons and waterfalls. A hiker can learn a lot about geomorphology, speleology, archaeology and mythology. An important feature of this route is the possibility for the hiker to both enjoy the scenery and learn without excessive physical strain.
According to both recent and older recordings that took place in Farmakides trail, there are no systematic interventions competent authorities to date. This is also admitted by the reports of travelers. These interventions are suggested for the efficient management of the trail and include: a. Appropriate infrastructure (construction of trail structures, boardwalks, metal or wooden steps and firmly secured retaining ropes, litter bins, etc.), b. Signage (Trailhead information signs, kiosks or Information/Interpretive signs, Destination signs, Reassurance markers/blazes, You-Are-Here signs, Identification signs, etc.), c. Improvement of the trail (trail widening & clearing, tree & shrub trimming, etc.), d. Trail maintenance (user safety, access, protect adjacent resources, preserve trail investment, cleaning, etc.), e. Visitor monitoring & management and f. Promotion & marketing (publicity).

REFERENCES


