

# PROTECTED LANDSCAPE “VJOSA-NARTA”

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## I. DESCRIPTION OF THE AREA

**Country:** Albania

**Region:** Vlora

**Administrative Units:**Novosela Administrative Unit and Centre Administrative Unit

The Vjosa-Narta Protected Landscape Area (PLA) (Category IV IUCN) is a wetland complex which lies to Vlora Region. The area itself covers an area of 19738 hectares. The altitude of the complex ranges from 0-246 m above sea level. The highest point is between the villages of Hoshtime and Llakatund.

The potentials that make Vjosa-Narta to be proclaimed as Protected Landscape in Albania are:

- Vjosa-Narta is an area of international importance. Vjosa - Narta Protected Landscape is included in ecological networks: Emerald candidate Area under the Bern Convention as "Protected Landscape of wetland system Vjose - Narte" (ID AL0000008, surface: 19.412,00 hectares, "Protected Landscape of wetland system Vjose - Narte In addition, the site is known as an Important Area for Birds called "Narta Lagoon" with ID "AL005" as it meets the criteria A1, A4i, A4iii, B1i. It is known as the Key Biodiversity Area (KBA). globally named as "Vjosa - Narta (Vjose-Pishe Poro Lagoon of Narta)" with ID ALB24. The area meets Ramsar criteria for the total number of wintering water birds with more than 34 000 individuals/species (Ramsar Criteria is 20 000 individuals/species). For the three species, the area shelters more than 1% of the regional population, which is sufficient to list Vjosa-Narta as one of the most important poultry areas in Albania and the Eastern Mediterranean Region. 92 species belong to the group of valuable species.
- Narta is the second largest wetland in Albania. It has a large number of species, especially wintering birds. Narta Lagoon is the second most important wintering and nesting area for waterfowl in Albania.
- Vjosa-Narta harbours 26 Globally Endangered species and is thus an area, the protection of which has a worldwide interest. In addition, the complex records 189 Endangered Species in Albania, a fact that lists it in a precious area that deserves careful protection. The importance of the area is also demonstrated by the presence of 118 species protected nationally and internationally.
- The Vjosa-Narta Complex is a well-known area for its unique flora and habitat diversity. All of these species constitute an important national feature of particular economic and scientific value. Some species are very rare for Albania, others have important scientific value, and a high number of species are widely used in economics as medicinal, aromatic, industrial and ornamental plants. In the protected landscape of Vjosa-Narta 114 aromatic medicinal plants have been identified.
- The area is distinguished for its ecological, historical and archaeological values, habitat diversity and landscape mosaic. The valuable species and habitats make it very attractive

for the education and public awareness of school pupils, students, the general public and even decision makers.

- The presence of five Natural Monuments, the Zvernec Monastery (one of the most visited areas, a very beautiful attraction for the city of Vlora) and the Treport Archaeological Site give the whole area additional cultural and eco-tourism value, making it relevant on a local and national scale.
- The Vjosa-Narta area has been and currently is a research center for many scientific and educational institutions such as University of Vlora, University of Tirana, Institute of Hydraulics, Institute of Hydrology and Meteorology, Institute of Biological Research, Institute of Soil etc. The scientific fields covered by these institutions include hydraulics, hydrology, geomorphology, socio-economics and biology (zoology and botany).
- This area combines a variety of conditions suitable for tourism development as a healthy climate and favorable social and economic conditions. The area is famous for its natural and cultural assets which can support numerous eco-tourism activities such as hiking (Kallenga and Managed Reservuar of Pische-Poro/Pine-Poro), bird watching in the Narta lagoon and in Salines, cultural tourism in the historic areas of Zvernec and Treport.

Borders of PLA are the following :

- **North** – Vjosa River up to Mifor village,
- **East** – The line connecting the top of the hills “Mishikarta”, “Cecai”, “Ciplaku”, “Kisha”, “Mutreva” and “Babica e Vogël”,
- **South** – The line connecting the village of Narta with village of Zvërnec (Pusi i Mezinit/Mezini Well – Fusha e Kripores/Saline field- Pylli i Sodës/Soda Forest),
- **West**– Adriatic Sea (Vjosë -Treporti).

PL lies in the territory of two Administrative Units: Administrative Unit Novosela in the north and Central Administrative Unit in the south and 18 villages (Zvërnec, Narta, Panaja, Oshtime, Kikovo, Bestrovo, Aliban, Poro, Novosela, Mifol, Cerkovina, Skrofotina, Fitore, Trevllazer, Akerni, Bishan, Delisuf, Dellinje) with a population of 24,000 inhabitants. The nearest town is Vlora, one of Albania's largest cities with a population of 106,000 inhabitants. Neogene and Quaternary deposits are noticed in the Pine-Poros (Vlora) area. Quaternary deposits by genesis are divided into deluvial and alluvial. Quaternary alluvial deposits cover the entire Vjosa valley. They are mainly represented by light brown subargillias with a composition of 5-15% fine sand. In depth the clays gradually change color to dark blue and contain organic debris, a fact that indicates the lagoon character of subsequent quaternary deposits. The Pische-Poro (Vlora) area belongs to the coastal alluvial lowland region, which includes the coastal area and lowland delta river basins with areas of alluvial and marine origin. This region is divided into three sub-zones

- 1.Coastal area of beaches;
- 2.Open lowland of fluvio-alluvial sediments;
- 3.Wetlands, lagoons, salty coastal lakes.

1. The first sub zone includes coastal areas and flat or slightly elevated dune corridors. The dominant soils are Arenosols.
2. The second sub zone includes very mild lowland or hilly areas, which are already reclaimed. Their quotas range from 0 to 50 m above sea level. The dominant soils are Fluvic Cambisols or Fluvisols, with deeply sandy texture and above all with poor structure. Natural drainage is good even during winter.
3. The third subzone includes coastal depressions that have previously been covered by the sea.

In the Pish-Poro area (Vlora) the following types of land are observed:

- Salted soils constitute  $\frac{1}{4}$  of the protected area and are located directly after the dune area. A halophilic vegetation resistant to high salt concentration is prevalent in these soils. The phenomenon of salt dynamics in different months of the year is characteristic. It is noted that the salt content on the surface is inversely proportional to the amount of rainfalls. The highest salt levels are in August-October and the lowest in April and January. In summer the salts move towards the surface and form a salt bar on the surface, while in winter there is a massive rinsing of the salts. The most common herbaceous plants are saltwater (*Salicornia europea*), sea barley (*Hordeum maritime*), broom (*Limonium vulgare*) etc. Among the woody plants predominate are the marine (*Tamarix parviflora*), willow (*Salix sp.*), White poplar (*Populus alba*) and others.
- Sandy soils are concentrated along the entire coastline in the study area and sometimes in greater depths. They are unstructured or where horizons are missing, characteristic of other land types and the result of activity of sea waves and rivers over homogeneous deposits.
- Less developed sandy soils are more prevalent in lowlands. They stay covered with water for a long time. They are characterized by sandy deposits deposited on the surface with a layer of soil or subsoil of several cm thick. In some hearths very thin clayey clusters are formed. The characteristic vegetation is that of xerophytes, with morphological and anatomical features to adapt to high summer temperatures and a substantial lack of water and mineral salts. Generally in these environments there is a rare vegetation, covering a small part of the surface.
- Alluvial soils are noticed along the course of the Vjosa River and near the estuary. They are layered as a result of occasional deposits. Deposits near the riverbed are lighter in mechanical composition and are poorer in nutrients than those far away. Alluvial formations are usually characterized by two layers. In the first layer are deposited beds (similar to those of the riverbed) composed of sand, gravel and stones. In the second layer, which is above the first, subargillias and clays are laid in the form of horizontal bands, the thickness of which varies by country. Alluvial soils hold a lot of moisture especially during the winter season. They usually have little organic matter and humus (up to 2%). Subargillias and clays predominate.

- The marshy hydromorphic soils in the protected area are formed mainly under the influence of hydrological factors such as the accumulation of atmospheric precipitation waters in the lowlands, pits and river floods.

### **Places of interest:**

#### **Narta Lagoon**

Narta is the main water surface of the area. Its northern part has been transformed into saline which today covers an area of about 1,500 ha. The saline and lagoons are separated by a dike of 13.8 km<sup>2</sup>. The Narta Lagoon (2 900 ha) is separated from the sea by a sandy belt, covered most of it by pine forest. The lagoon communicates with the sea through two artificial channels. The southern channel is 200 m long, 6-48 m wide and 0.2 -1.8 m deep. The northern channel ( Dalani I Madh) is 800 m long, 11-60 m wide and 0.3-0.5 m deep. The channel has a debit of 2.2–4.3 m<sup>3</sup> / s. Both channels are often blocked due to sediment fill. The lagoon has an average depth of 1.2 m. The maximum depth reaches 2.08 m while the minimum depth is 1.08 m. Like any other lagoon here, the water regime depends on the tide. Winds have a big impact too. The south wind lowers the lagoon level by 20-25 cm while the north wind raises the level by 15-20 cm. The eastern part of the lagoon, which is slightly affected by marine waters, exhibits significant salinity fluctuations. The lagoon waters are slightly alkaline (pH 8.4-8.8). The amount of dissolved oxygen varies between 5-10 mg / l. When the amount of fresh water is low enough (especially during the summer) and when the channels of communication are blocked by fillings, an area of approximately 1000 ha dries while another portion of approximately 800 ha reaches a depth of 10 cm. This drought is quite damaging to the lagoon world

#### **Pishë–Poro/Pine Poro**

Pishë-Poro, until 2004 a Managed Nature Reserve represents well-developed sand dunes (up to 6-8 m high) as well as psamophyte, hygrophyll and halophyte vegetation. The main part of the reserve is covered by pine forest. Part of the Pine-Poro sand dunes have been destroyed as a result of illegal sand extraction. Despite the above damage, the former Managed Nature Reserve is still in good condition. Degraded parts can be recuperated if appropriate interventions are made.

#### **Kallenga**

The Kallenga is a shallow lagoon of 450 ha. It connects artificially to the sea via a channel that has only recently opened. It is used for fishing with nets while at channel gorge a dajlan/kind of dike has been built.

#### **Hills of Panaja**

The hills of Panaja lie in the eastern and southern parts of the PL. The highest peak reaches 246 m and is located between Trevllazër and Lakatundi. The Mediterranean meadow and oak forest once typical of the area are now replaced by olive groves.

## **Saline**

It includes the former northern part of the Narta lagoon transformed into saline of the early 50's. Today's area is approximately 1500 hectares. It consists of many shallow basins inside of which there are dams and small islands that turn salts into places of great interest to nesting waterfowls

## **Field of Akernia**

It lies north of the Narta Lagoon and the salines. Formerly a marshy land, today this space has been replaced by agricultural land. Until the early 1990s, the field was covered by a complete irrigation and drainage network. Subsequently, much of the irrigation and drainage network was destroyed. Much of the former agricultural land today has been abandoned or used for grazing.

## **Villages and Population (its distribution city and village)**

### ***Demographic trends and population distribution:***

The Vjosa-Narta Protected Landscape Area is inhabited by a population of approximately 24,000 inhabitants spread over 18 urban centers. The number of families is around 5 440, with an average of 4-5 persons per family. The average number of inhabitants in urban centers ranges from 573 inhabitants in the village of Skrofotina to 3693 inhabitants in the village of Narta.

The population density of Novosela is 108 inhabitants / km<sup>2</sup> while for the Administrative Unit itself, the density is only 35.5 inhabitants / km<sup>2</sup>. The density in the Center Administrative Unit is 189 inhabitants / km<sup>2</sup>, while the municipality does not exceed 49 inhabitants / km<sup>2</sup>. During the 90's the average number of births per Administrative Unit was 17.4 / 1000 inhabitants while in Novosela 14.2 / 1000 inhabitants. The population growth rate during 1989-1999 is approximately 13%. The average annual growth is 360 persons per year, one of the highest rates of growth in Albania. Future trends predict a further increase in the number of households and a decrease in the number of family members. .

## **The year of proclamation as PA and grounds (value of PA)**

**Name of Protected Area** :Protected Landscape Vjosa-Narta

**Category**:Fifth

**Decision by which it is proclaimed**:No.680, date 22.10.2004

Some of the main Vjosa-Narta environments are wetlands, agricultural lands, forests and urban areas (Table 1). Wetlands occupy 37% of the total area. The other main environment is agricultural land that occupies approximately 33% of the area. Forests constitute the third habitat and cover 6% of the territory. The central part of the PL is the Narta Lagoon, a shallow lagoon of 2 900 hectares, surrounded by hills to the south and east, farmland to the north and two small lagoons to the northwest.

The whole area is distinguished for its biodiversity of habitats and richness of flora and fauna. Most of them are precious because of their local, national or international rarity. A range of typical wetland habitats are observed in the project area: Mediterranean bushes and mosses in the hilly area, alluvial forests of the Vjosa River, sweet water aquifers in Zver nec and Panaja hills, coastal lagoons of Narta and Kallenge, salt marshes of Akernia and so on. The richness of

habitats also explains the presence of a high number of plants, vertebrates and pre-vertebrates such as birds, mammals, reptiles, insects and fish.

Among the many habitats that make up the protected area, it is worth noting the presence of three typical habitats for the region: (i) sand dunes (ii) Narta lagoon and (iii) Narta Saline.

- In past times, sand dunes have been widely distributed on the Albanian coast but most of them have been destroyed due to sand taking. Currently the sand dunes of the Vjosa-Narta wetland complex constitute the last remaining dunes of the Albanian coast.
- Narta Lagoon is the second largest coastal lagoon in Albania. This particular habitat is well known for its great biodiversity values.
- Narta salines also constitute a typical habitat, bearing in mind that no more salines exist in Albania. Although a semi-industrial habitat, salts are important for their biodiversity, especially for nesting and migratory birds.

### **Historical and archaeological value of the area**

The historical and archaeological values of the area, as mentioned above, are unique and interesting to visit and enjoy. But these values must be preserved, emphasized, and allowed access and use for visitors. Some of these values, such as the Zverneci Monastery, need rehabilitative interventions in order to restore and emphasize their values and make them more attractive to visitors.

### **Church of Saint Mary**

It is located on the island of Zvernec, in the southern part of the Narta lagoon. It is a Cultural Monument dating from the 13th century. The church is well known for its wall paintings as well as wood carvings showing flowers and various animals. The church today has been restored and used as a place of worship. Every August 15th on the island of Zvrneci is organized the feast of the year, of course of religious origin.

### **Triporti**

It is located west of the Narta Lagoon, near the village of Zvërnec. Archaeological excavations have shown that the area has ancient buildings dating from the Greco-Roman period. Triport has been an important port connecting the city with other ancient centers such as Aulona, Apollonia, Orikos and Amantia.

### **Spinarica.**

According to 12th century documents, Spinarica was one of the Mediterranean cities of the Adriatic Sea. It was in the vicinity of the Narta lagoon, at the outfall of Vjosa River. Spinarica was an important trading center especially for cereals, livestock, wool and iron. After the 15th century, the city lost its importance and is no longer mentioned in historical documents. Its ruins have not yet been discovered due to major natural and human changes in the coastal area.

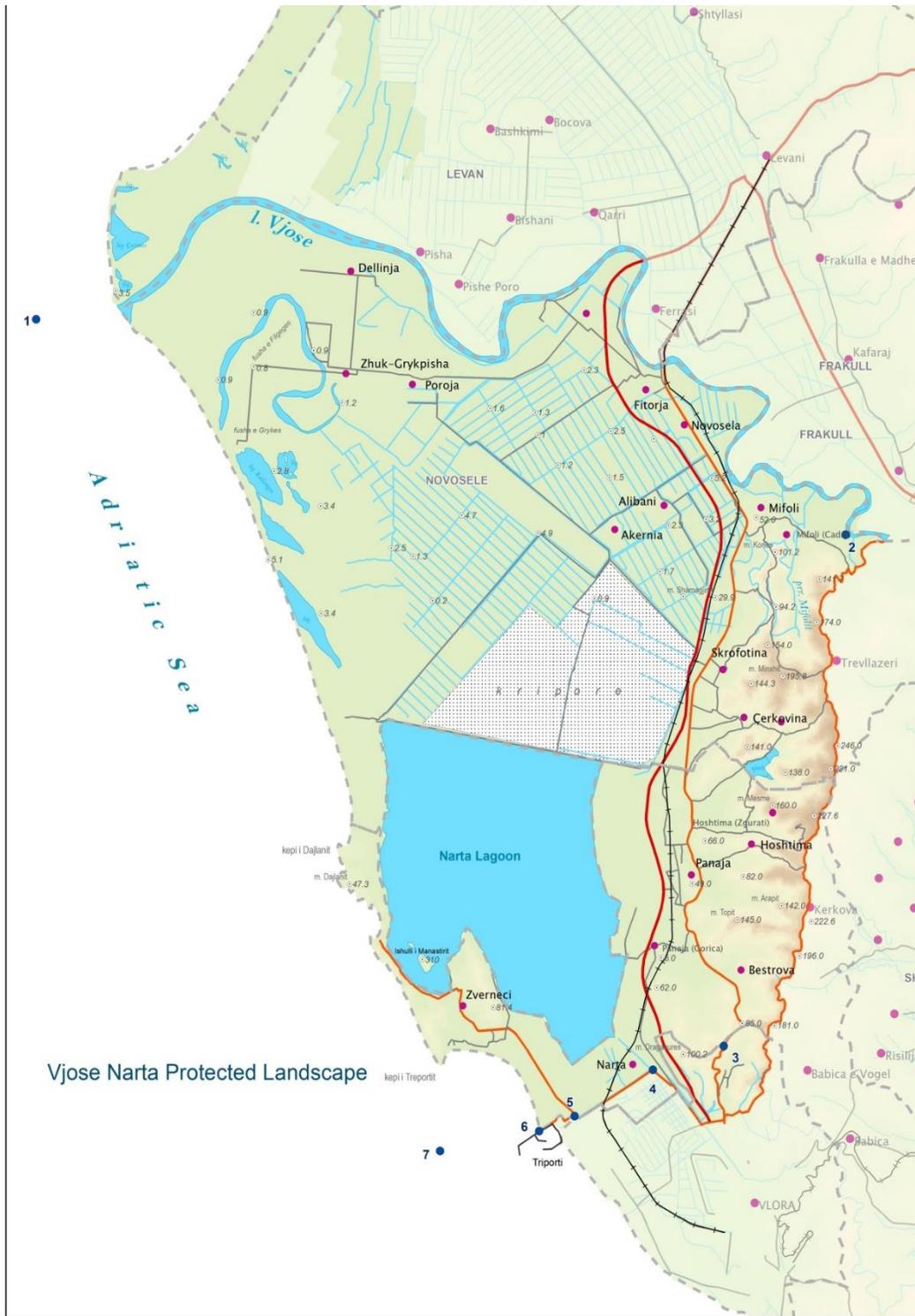
### **Artistic, cultural, religious and landscape values**

Artistic and landscape value, the presence of five Natural Monuments, the Treport Archaeological Site, the aforementioned Cultural Monuments give the whole area additional cultural and eco-tourism added value, making it important locally and nationally. An important cultural event is the Narta Carnival, a cultural event that returned on 11 April 2004 after many years of secession.

**Table 1.** Use of territory in the Vjosa-Narta Protected Landscape Area

Main habitats	Surface (in hectare)
Wetlands	10,210
Forests	1,167
Agricultural land	7,798
Urban Areas	277
Aeroport	286
Total	19,738 ha

The main subareas inside the complex are: Narta Lagoon and Salines, Former Pine-Poro Reservoir, Kallige Lagoon, Panaja Hills, and Akernia Field.



Vjose Narta Protected Landscape



## Geographical extent of PL Vjosa-Narta .

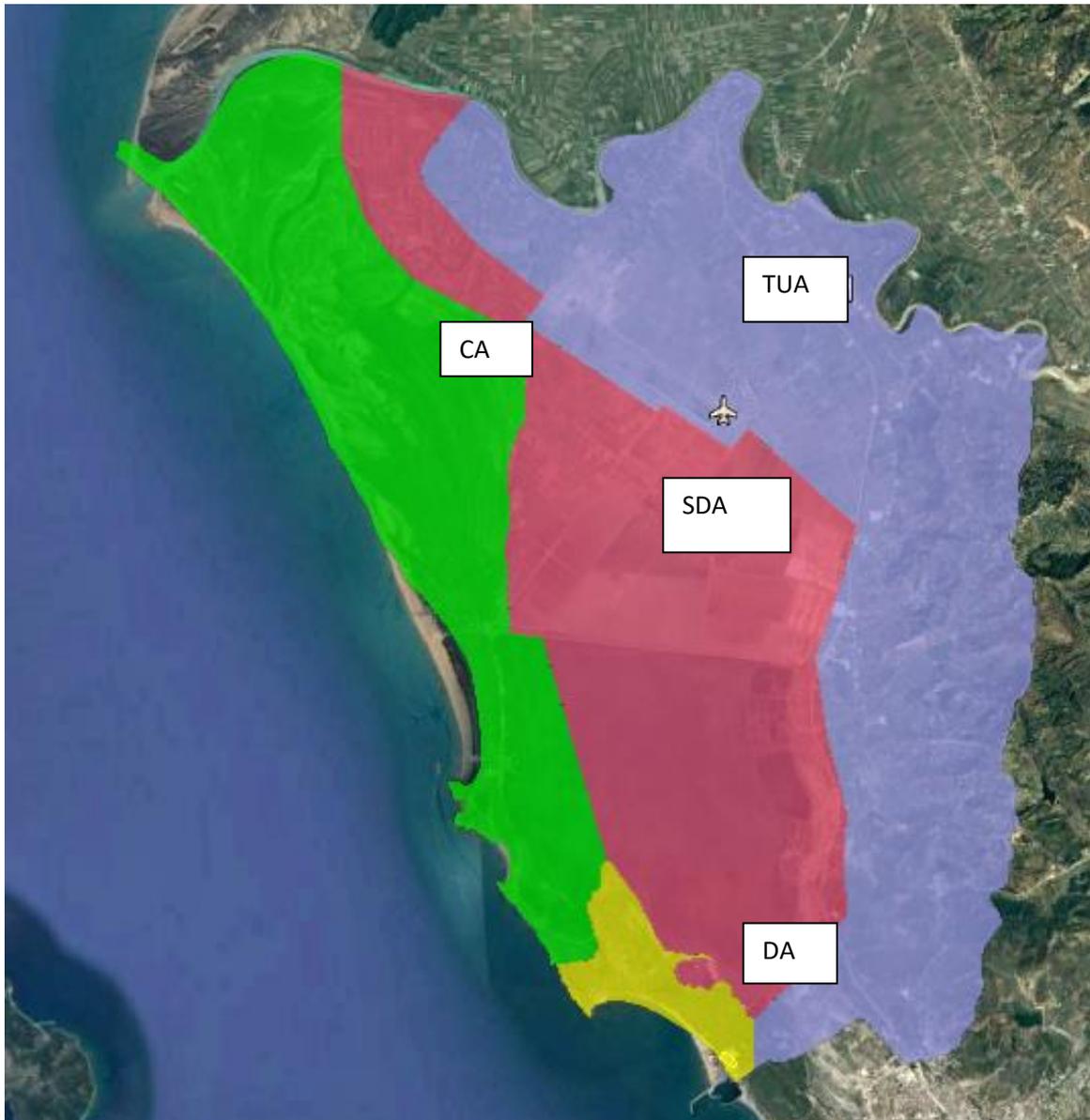


Chart 1. Map of the area of Protected Landscape Vjosa-Narta

The territory of the area of Protected Landscape Vjosa-Narta is divided in four major sub- areas :

1. Central Area
2. Traditional Use Area
3. Sustainable Development Area
4. Development Area

## II. CLIMATE

Air humidity is related to temperature. The monthly average of humidity varies from 62 - 69%, while the annual average is 66%. The main wind is sea breeze, especially visible during the summer. The winter season is generally dominated by the east wind with an average speed of 3.5 m / s. The main wind direction is the eastern one (24.4%) followed by the northeast direction. The summer is dominated by the westward sea breeze. The main direction is northwest (17.6%) and west (9.4%.) The average wind speed is 4.4 m / s and 5.2 m / s, respectively. The study area is located in the Western Lowlands of Albania and as such is characterized by the Central Mediterranean climate. The winters are generally mild, with heavy rainfall while the summers hot and dry. Rainfall mainly falls in the form of rain. Snowfalls are extremely short and of very short duration. Solar radiation as one of the major climatic factors is quite uniform throughout the area. The average annual value of solar radiation is 1540 kwh / m<sup>2</sup>. The highest value was recorded in July (216.5 kh / m<sup>2</sup>) and the lowest value in December (52.1 kh / m<sup>2</sup>). The average annual temperature ranges from 15.4 ° C in Lakatund to 16.3 ° C in Vlora. The maximum annual temperature is 30.0 ° C in July / August and the lowest in January with 4.8 ° C. Due to the limited depth, the thermal regime of the lagoon waters is similar to the air temperature. Seawater entering the lagoon has a major impact on the thermal regime, especially near the channels of communication itself. The lowest temperatures in the lagoon are recorded in December-January and the highest in July-August. The average annual temperature is 14.9 ° C. Average rainfall in the area reaches 892 mm per year. 80% of rainfall falls during the wet season (October-May) and only 20% during the dry season. The average annual evaporation value is 1173 mm (56% of it during the hot period of the year). This value indicates that evaporation is higher than rainfall, a fact that clearly indicates that the ecosystem needs water flow.

## III. ECOSYSTEM SERVICES

### **Reproduction and harbour of living creatures**

The Vjosa-Narta wetland complex provides ideal conditions for wintering and nesting of a large number of bird species associated with aquatic environments. From winter counts it is recorded that there are about 30,000 birds in the lagoon and accommodate more than 23% of wintering water species in Albania. The high diversity of habitats and aquatic environments provide conditions for food and reproduction making it the second most important waterfowl area in our country. The highest number of wintering birds is found in the aquatic environment of the Narta Lagoon and the Saline. During the nesting season, the lagoon serves as breeding ground for 630-830 pairs of water birds. The largest number of species are concentrated inside the Narta Saline belts, where nests such as the Vraponjesi Gushebardhe (*Charadius alexandrines*), Kaloresi (*Himantopus himantopus*) and Sqepbiza (*Recurvirostra avosetta*) .

## **Agriculture**

For Novosela Administrative Unit, most of the land belongs to categories VI, VII and III. Whereas in the Administrative Unit Center are dominated by categories V, VIII and IV. According to the relevant specialists, the best quality of soil generally belongs to categories 1-3. According to agricultural statistics, the largest area of land is used for the production of various forage, wheat and vegetables. These same crops also occupy the main weight in production. In recent years, the area of agricultural land used for cereals has been reduced in favor of vegetables. Part of the agricultural land has been transformed into greenhouses for tomato and cucumber production. Despite its low importance, agricultural activity suffers from the lack of an organized agricultural market, transport infrastructure, poor development of the agro-industry, lack of bank lending to farmers, poor agronomic services, etc.

## **Fruit production**

Fruit production has become an important economic activity and a valuable source of income. It relies on good soil conditions, geomorphology, climate and tradition. In the Administrative Center, fruit production accounts for 21% of agricultural production and in Novosela only 8.4%. The Administrative Center also has 118,000 olive roots that account for 60% of the total olive production in Vlova district. In recent years, there has been a growing interest in viticulture used for wine and brandy production. This area is increased annually by 8 ha in the Administrative Center and by 5-6 ha in Novosela.

## **Livestock**

Livestock is an economic activity that generates lots of income. In the Center Administrative Unit, livestock activity accounts for 34% of the income while in Novosela where activity is even more important with 57% of the income. Most of the livestock is made up of sheep, cows and goats. The number of chickens is also high. Each family has on average one cow, two sheep and several chickens for family needs. Some farmers have started breeding small farms producing meat, milk, eggs and honey. The final destination of livestock products is the domestic market as well as its own use.

Like agricultural production, livestock production also suffers from a lack of an organized livestock market, lack of transport infrastructure, poor development of the agro-industry, lack of bank lending, poor veterinary services, etc.

## **Agro- Industry**

The agro-industry is not well developed despite the variety and prosperity of agricultural and livestock products. Attention has already been drawn to domestic production but the lack of agricultural infrastructure and logistics remains an important obstacle. In the area are established various processing plants of various products such as cheese, olive oil, medicinal herbs, alcoholic and refreshing drinks, sausages, leather, wool etc.

There is also a frog processing and trading plant in Novosela. This branch of the food industry has been operating for 30 years. During the last 10 years, the average amount of production collected is approximately 2 700 kv / year. The company employs approximately 60 seasonal workers each year. Modernization and further investment in the agro-industry is believed to turn it into a strong supporter of the tourism industry in the area and beyond.

## **Tourism**

The area combines a variety of conditions suitable for tourism development as a healthy climate and favorable social and economic conditions. Despite the growing demand for tourism, this branch is still not well developed due to a lack of infrastructure and proper urban plans. In addition, it appears that the Albanian government does not yet have a clear strategy for tourism development in the Vlora area. Recent government decisions such as oil exploration, the creation of an industrial and energy park undermine the tourist prospects of the area. Despite the aforementioned shortcomings, daily tourism in the Novosela Administrative Unit continues to be practiced. During summer weekends, the number of daily tourists reaches up to 250-270 persons. The tourist peak is reached between July 15 and August 15. Family tourism is still in its infancy. About 150 families come to the area for balnear tourism every year.

### **Fishing**

During the period 1975–1990, annual catches were approximately 55 kg / ha (i.e. 1 590 kv / year) with a maximum of 70 kg / ha (2 023 kv / year) in 1980–87. About 30% of annual production consisted of crabs (*Carcinus aestuarii*). According to the latest data, the number of fishermen and catches have decreased respectively. The number of legal fishermen has dropped to 50 people, while catches in 2003 are 46 kg / ha or 1,340 kv / year.

The main types of fish are shellfish (four different species), eel, sea bass, kite and atherin. The fish structure is dominated by shellfish, which has a low market value. The highest value species such as sea bass and kite make up only 25% of catches. These amounts are 2-4 times lower than in other coastal lagoons of Albania. Today fishing employs 50-100 people. Fishing areas include the Narta Lagoon, Limopuan, the old Vjosa River Spill, the Kallega Lagoon, the Vjosa River and the littoral belt. Fishing is organized in several organized fishing entities that fish either in the channels of the communication channels (2 groups with 8 and 6 fishermen each) or with different nets in the lagoon waters (10 groups licensed with 3 fishermen each). In addition to legal fishermen, there are also around 20 unlicensed fishermen who do not pay any taxes to state authorities in the lagoon. The fish is mainly sold in the restaurants of Vlora, Fier, etc. A small part goes for family consumption. Fish catches are generally considered to be scarce due to a number of human or nature-driven factors. As previously mentioned, the Narta lagoon suffers from eutrophication, which results from a lack of communication with the sea, excessive saltwater uptake, lack of fresh water, wastewater discharge, introduction of industrial organic pollutants, etc. In addition, illegal fishing is quite common. The mesh goggles are often much smaller than the norms allowed, thus leading to the catch of very small fish (size and age). Fishing also takes place in protected areas such as Shamodura, in the northwestern part of the Narta lagoon. Large fishing boats fish in marine cectins and thus destroy the fish stocks that are expected to enter the lagoon waters.

### **Salt Production**

The saline now covers an area of 1,472 ha. Salt production began in 1958. In the early years, the salts produced about 25-30,000 tonnes / year (Fig. 7) and employed approximately 250 people from the villages of the Vlora area and city. Production increased in 1970 by 70,000

tonnes and employed up to 800 people. In 1975, the salters launched the marketing of iodized salt with a capacity of 5,000 tonnes / year. Production peaked in 1975-1985 with a total of 140,000 tons of salt. At that time, salines employed about 1250 people..

### **Erosion control**

Although to a limited degree, erosion is a natural phenomenon in the study area, given the geological, physical characteristics and climatic conditions of the area. It is mainly observed in the hilly range which forms the eastern boundary of the project area. But erosion also emerges as a recent phenomenon driven by uncritical logging, overgrazing and fires. As such it is certainly a problem to consider in the management plan. The rehabilitation of degraded habitats would prevent erosion from becoming a common phenomenon.

Maintain water quality and reduce pollution.

The area is rich in water resources, especially surface water which are vital for the water supply of the area and its economic development. Although water pollution is not a problem at present, it may sooner or later be due to planned developments, especially those coming from the transport and tourism industry. Conservation of natural habitats is therefore a concern that should be emphasized by this management plan.

### **Grazing and livestock**

As mentioned above, grazing and livestock are the main economic activities of the area. In total the area has 4 100 cattle, 25 200 sheep etc. Any improvement in pasture quality and water supply for livestock would certainly increase such activity as well as its economic importance.

### **Forestry**

Forest areas are used for grazing, firewood and mowing. Wood use is not an acute problem at present. Some of the activities mentioned above need to be controlled in order to prevent further degradation of forests and shrubs.

### **Agricultural farms**

It is certain that the key economic activity in the project area is based on large areas of agricultural land and especially olive groves. Much of the agricultural land today has been abandoned due to the lack of a drainage and irrigation network. In the event of such a network being rehabilitated, agriculture may again be the area's most promising economic activity.

### **Arboriculture**

It is not very well developed despite recent initiatives, particularly in Bishan and Narta, which have increased its importance in the local economy.

### **Medicinal plants**

In the Vjosa-Narta protected landscape, 114 aromatic medicinal plants have been identified, including *Alkanna tinctoria Tausch.*, *Allium sativum L.*, *Anethum graveolens L.*, *Bellis perennis L.*, *Brassica nigra (L.) Koch.*, *Capsicum annum L.*, *Cichorium. intybus L.*, *Daucus*

*carota L., Dianthus caryophyllus L., Juniperus oxycedrus L., Matricaria camomila L., Myrtus communis L., Ocimum basilicum L., Papaver rhoeas L., Phragmites communis Trin., Portulaca oleracea L., Rosa canina L., Urtica dioica L. etc.*

### **Contribution to climate sustainability**

Sand dunes, forests and wetlands have an impact on the local climate. Forests and dunes reduce the impact of wind on the interior of the complex. Wetlands serve to reduce and mitigate the stressful effects of air temperature.

### **Raising public awareness and education**

The area is distinguished for its ecological, historical and archaeological values, habitat diversity and landscape mosaic. At the same time, it provides examples of people's good and bad behavior towards nature and the wild world. The area has many opportunities for sustainable development and prosperity. The valuable species and habitats make it very attractive for the education and public awareness of school students, students, the general public and even decision makers.

### **Leisure and tourism activities**

The project area offers high potentials for tourism and leisure activities. As mentioned above tourism activities can be based on well developed infrastructure as well as accommodation services. The area is famous for its natural and cultural assets which can support numerous eco-tourism activities such as hiking ( Kallenda and Managed Reserve of Pine-Poro), bird watching in the Narta lagoon and in the Salines, cultural tourism in the historic areas of Zvernec and Treport. Unfortunately, little has been done so far to develop environmentally friendly tourism. Some of the areas used today for leisure activities are not controlled and have caused wildlife pollution and disturbance.

### **Researches and studies**

The Vjosa-Narta area has been and currently is a research center for many scientific and educational institutions such as University of Vlora, University of Tirana, Institute of Hydraulics, Institute of Hydrology and Meteorology, Institute of Biological Research, Institute of Soil etc. The scientific areas covered by these institutions include hydrics, hydrology, geomorphology, socio-economics and biology (zoology and botany)

## **IV. HYDRIC, ROAD NETWORK AND WATER RESOURCES**

**Roads to Destination:** Following the Vlora-Fier National Road (Vlora-Kriporja-Narta-Hidrovori coast), or Vlora-Soda Forest-Zvernec village.

### **Roads**

The road network in Vlora district has an extension of 200 km. Its existence enables the development of tourism, although it should be noted that the quality of the road network is not very good. It is estimated that this network can reach about 4,000 cars a day during the

summer and about 5,000 cars during the summer weekend. Public transport between Vlora and Narta is by bus.

### **Water Supply**

The Novosela Administrative Unit as well as a part of the Central Administrative Unit (Trevllazër, Panaja, Oshimetima) are supplied by the Novosela pumping station. Water is taken from 6 wells each with a capacity of 25 l / sec. Center is supplied from the source of " Uji i Ftohte" through station Nr. 4 with a capacity of 5 l / sec. Water is provided for 24 hours. Despite the large water reserves, water supply remains problematic for Novosela. Instead of the set quota of 150 l / person, today's supply is only 90 l / person. The shortage of water supply is related to the depreciation of the water distribution network, misuse, lack of electricity, etc. Water network rehabilitation plans are already completed. These plans provide Novosela with running water in 24 hours.

### **Irrigation**

Irrigation is based on the waters of the Vjosa River as well as the reservoirs of the Panaja. The irrigation infrastructure consists of a water station at Mifol with a capacity of 4,000 l / sec. The final destination of the irrigation system is the farmland of Akernia and the fishing reservoirs at Gorrica. The surface of irrigated land today is 1 100 ha (Tab. 5). The agricultural land of the Center is supplied by Panaja's artificial reservoir with a capacity of 1.4 million m<sup>3</sup> of water for an area of 300 hectare.

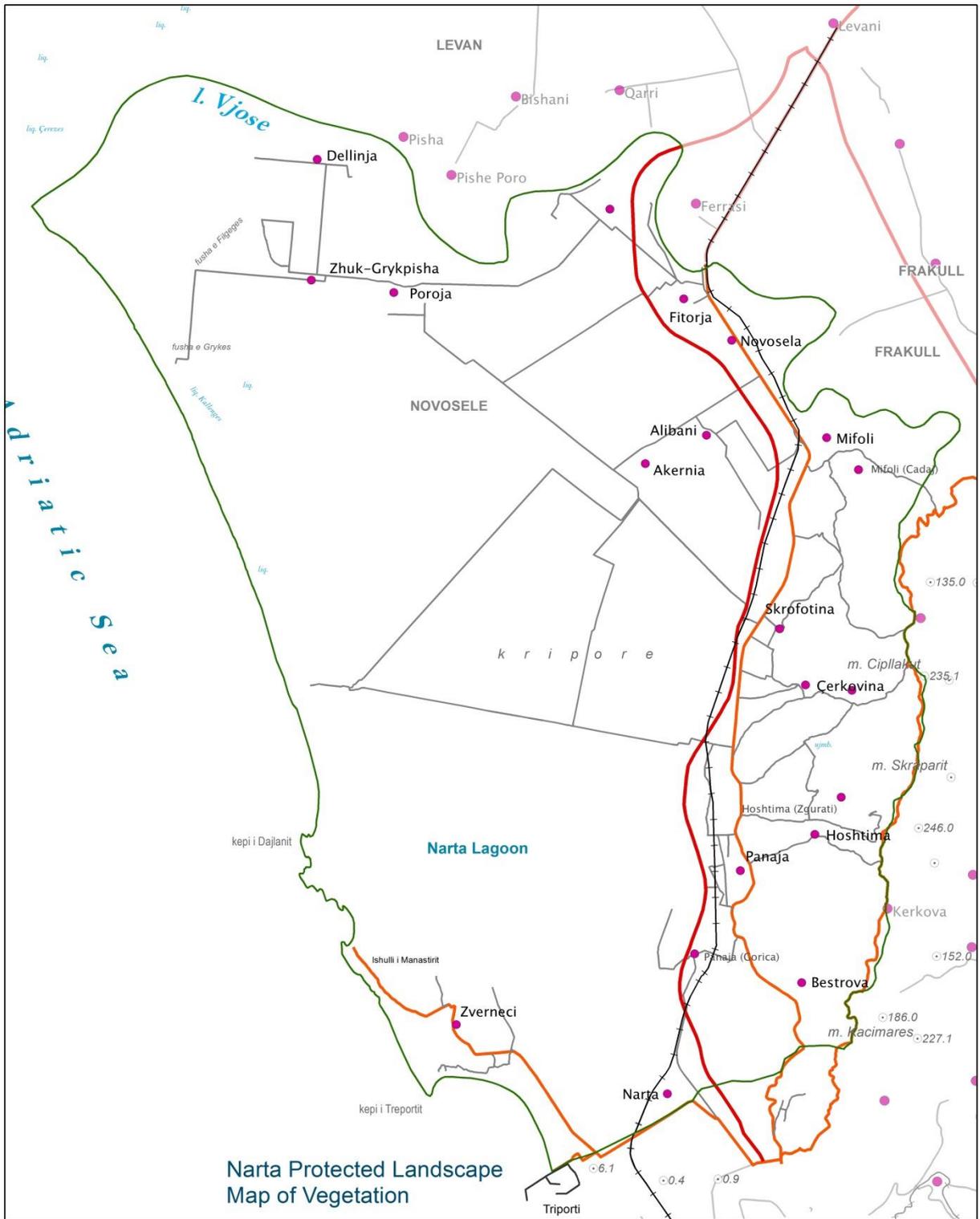
### **Hydrology**

#### **Ground water**

The complex is generally poor in groundwater. These waters accumulate in shallow sandy deposits; are of low quality and volume. Often water is provided by hand-dug wells. Groundwater depth varies from 1 to 10 m. The main groundwater stream is westward to the Adriatic Sea.

#### **Surface water: irrigation and drainage**

The main drainage area is the Vjosa River which flows into the Adriatic Sea and the Shushica River which is a tributary of the Vjosa River. The low hills east of the complex are linked to the northernmost extension of the Kurvelesh mountains.





**a. Irrigation**

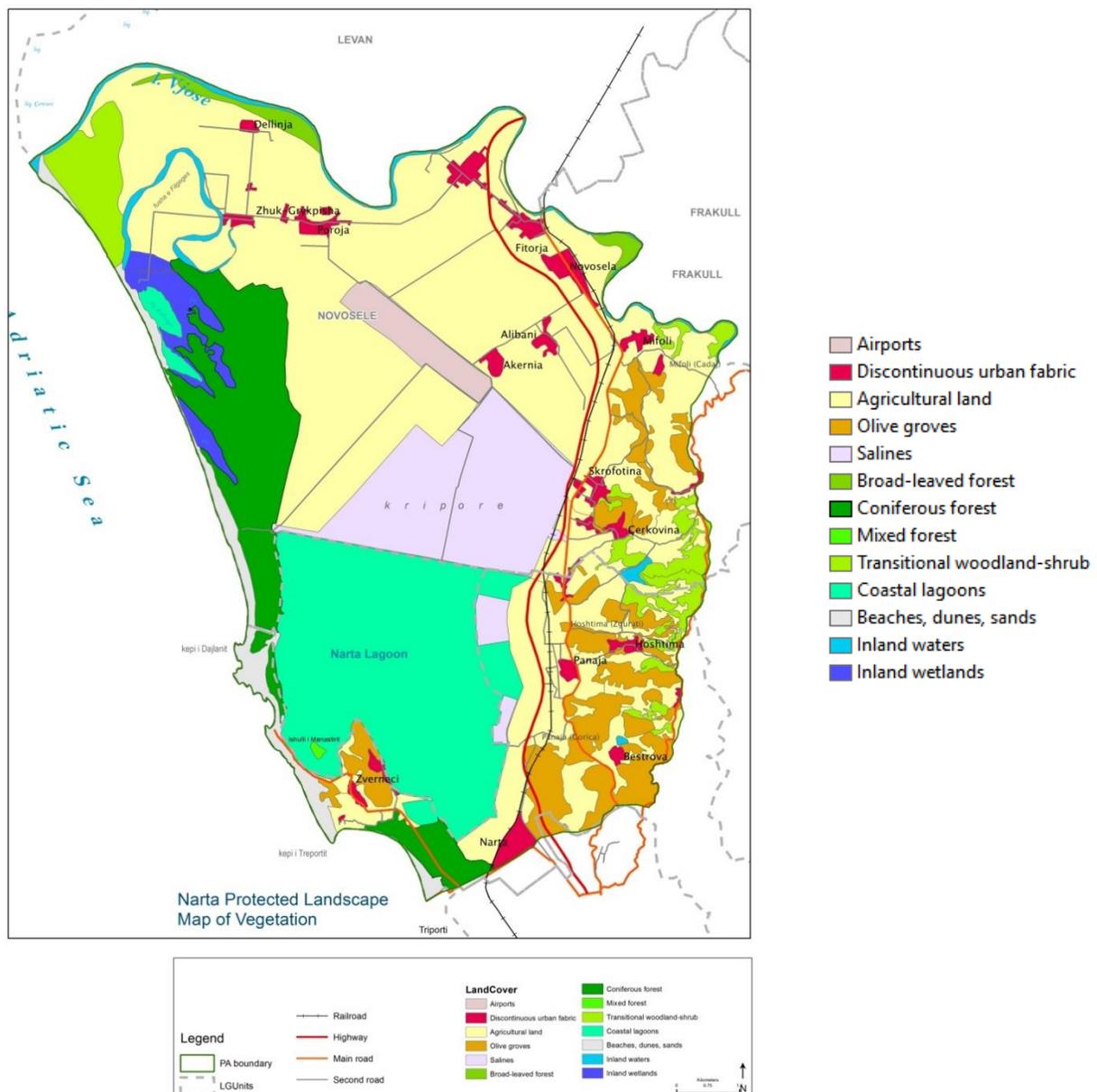
The entire agricultural land is covered by a dense network of irrigation canals. But most of them are destroyed today and as a result only a small portion of the land is under irrigation.

**b. Drainage**

The area has three hydrostations and several free-flowing canals. The drainage system is malfunctioning due to duct filling, pump failure, power outages, etc. During heavy rains, large tracts of agricultural land are flooded for weeks.

## V. FLORA

The Vjosa-Narta Complex is a well-known area for its unique flora and habitat diversity. All of these species constitute an important national feature of particular economic and scientific value. Some species are very rare for Albania, others have important scientific value, and a high number of species are widely used in economics as medicinal, aromatic, industrial and ornamental plants.



The Vlora region harbours about 1400 orchard plants, which make up 42% of Albania's flora. The Vjosa-Narta area itself is considered to have at least 800 vegetable plants (25% of the flora of Albania) again constituting an important area for flora in Albania. The area of Pine-Poros (Vlora) is rich in flora and vegetation. This is a reflection of the appropriate physico-geographical conditions, topography, geology etc. But for this area to continue to be

rich vegetation must be protected and not overused. Among the plant associations identified with the respective status are:

*Tamarici-Calicetum purpurae* (VU)

*Juncus maritimus-acutus* (VU)

*Limonetum vulgare*(VU)

*Ammophila arenaria-Medicago marina* (VU)

The flora of this area is closely related to the habitats that this area contains including natural and aquatic habitats. Natural habitats consist of different types of ecological units classified in accordance with functional and descriptive criteria such as presence / absence of water, salinity and physiognomy of vegetation. While aquatic habitats consist of many sub-habitats such as semi-permanent aquatic habitats, drainage and irrigation canals, marshes, freshwater reservoirs and river beds covered by alluvial forests.

## **Marshs**

### **1. Temporary marshes**

Temporary marshs are low depressions with no running water that dries out each year. The structure of the plants floor depends on the pressure of flooding, salinity and grazing. Salinity is usually low during the winter which is associated with numerous rainfall. Areas of low salinity are dominated by *Ranunculus spp*, *Callitriche truncata* as well as *Chara spp*. and *Tolypella spp*. In countries with higher salinity, fewer species are found which dominate the plant communities. Among them the most common are *Chara canescens*, *Chara galioides*, *Ruppia maritima* and *Zannichellia pedunculata*. During the summer, accompanied by long periods of drought, the temporary marshes are covered by *Suaeda maritima*, *Suaeda splendens*, etc.

Some of the sites under grazing pressure develop communities like *Scirpus spp* which in a few places are replaced by *Phragmites communis*.

### **2. Permanent marshes**

The permanent marshes are represented by the Narta Lagoon and the Kallinge Lagoon. Their bottoms are covered by *Zostera noltii* and *Ruppia cirrhosa*. *Zostera* is predominant with 30-40% of the total surface area. Both species, as well as some algae, represent the most important biocenosis of the Narta lagoon.

### **3. Salty marshes**

This habitat is widespread in the Vjosa-Narta natural ecosystems (around the Narta lagoon, south of the Vjosa River). These marshes are composed of a number of plant communities with varying degrees of salt tolerance. Some of the most common species are *Salicornia spp.*, *Arthrocnemum spp.*, *Salsola soda*, *Limonium spp*. As salinity declines, the species composition becomes more complex and variable. Communities are already made up of species such as *Arthrocnemum fruticosum*, *A. perenne*, *A. glaucum*, *salicornia europea*, *Salsola soda*, *Juncus acutus*, *Juncus maritimus*, *Inula crithmoides*, *Limonium vulgare*, *Artemisia coerulescens*, *Halimione portucaloides* etc.

## **Irrigation and drainage channels**

Irrigation and drainage channels, as well as freshwater reservoirs, harbour a complex vegetation which, depending on depth and salinity, exhibits a mix of different vegetation types commonly present in temporary and permanent marshes. Among these species the dominant halo-hygrophile vegetation represented by *Phragmites australis*, *Typha angustifolia*, *Typha latifolia*, *Scirpus lacustris*, *Scirpus maritimus*, etc. Other types of vegetation include floating algae *Lemna minor*, *Lemna minuta*, *Spyrodela polyrhiza* etc.

### **Freshwater reservoirs**

The vegetation of this habitat is very similar to that of irrigation and drainage channels. Reeds predominantly with *Phragmites australis*, *Typha angustifolia*, *Typha latifolia*, *Scirpus maritimus* and *Scirpus lacustris*. Today they constitute a valuable habitat because they are almost the only source of sweet water for a range of wildlife.

### **Aluvial forests**

The vegetation of this habitat is divided into two floors. The first floor is mainly represented by reeds and other water-related species. The amount and cover of the second floor depends on the level of flooding.

1. On the first floor, the main vegetation type is represented by the *Phragmitetalia Class*, where the predominant association is with *Phragmites australis*. This association exhibits a very high ecological plasticity and extends from river banks to distances. It is found along the irrigation channels, in some drainage channels, in some parts of the Vjosa River where the current is not very strong. *Lemna minor* is also developed in some countries. Ecological plasticity is also emphasized by floristic composition including *Typha angustifolia* (most common), *Lythrum salicaria*, *Polygonum hydropiper*, *Polygonum lapathifolium*, *Sium latifolium*, *Gratiola officinalis*, *Cladium mariscus*, *Alisma plantago-aquatica*, *Sparganium erectum* etc.

2. The second floor comprises riparian forests belonging to the *Alno-Populetea Class/Category* and *Salicetea purpurea*. The main species of this category are *Populus alba*, *Populus nigra*, *Salix alba*, *Salix purpurea*, *Salix amplexicaulis*, *Salix elaeagnos subsp. angustifolia*, *Alnus glutinosa*, *Alnus incana*, *Platanus orientalis*, *Ulmus minor*, *Ulmus glabra*, *Fraxinus angustifolia*, etc. The herbaceous vegetation is generally poor. The most common species are *Equisetum telmateia*, *Equisetum ramosissima*, *Prunella vulgaris* etc. In some parts of the river, with strong currents and gravel substrates, the trees are replaced by shrubby species such as *Salix willow* associated with trees such as *Platanus orientalis*, *Salix elaeagnos willow*, *Salix alba*, *Salix purpurea*, *Marina Tamarix parviflora*, etc. At the bottom of the river, where the current is weaker and with sandy and clay substrate, vegetation is dominated by *Alnus glutinosa*, *Fraxinus angustifolia*, *Ulmus minor*, *Quercus robur* (very scattered and very scattered individuals), *Populus alba* etc.

### **Sand Dunes**

Narta's wetland complex is famous for its coastal sand dunes some of which reach 6-8 meters. The sand dunes and sandy belt along the coastline are stripped of vegetation up to a length of 30 m. Fanerogame types appear first. These pioneer species include *Cakile*

*maritima*, *Xanthium strumarium* subsp. *italicum*, *Salsola horse* and typical dune species such as *Ammophila arenaria* subsp *arundinaceae*, *Elymus farctus*, *Echinophora spinosa* etc.

### The pine forest

The pine forest covers an area of 1,200 ha, a considerable part of the Narta area. It lies parallel to the dune system. The pines were planted 30-40 years ago to stabilize the coastline from erosion. This formation is represented by several species of pine trees where the most common are *Pinus maritima*, *P. pinea* and *P. pinaster*. The bush floor is represented by typical Mediterranean species such as *Pistacia lentiscus*, *Erica manipuliflora*, *Myrtus communis* etc. They are characteristic species of *Class Quercetea ilicis*, a class that covers 40-50% of the total area. Among these plant communities (sand dune vegetation and Mediterranean pine forest), there are several cultivated generations, dominated by introduced species of *Acacia saligna* (a large part of the belt near the Vjosa River was burned in 2003) and *Agave americana* (approximately 200 m to Zverneci beach).

On the other hand, on the island of Zvernec, located in the southern part of the lagoon, it is covered by the evergreen cypress forest of *Cupressus sempervirens* (8-10 m high trees) in association with *Quercus ilex*, *Quercus pubescens* and *Pinus spp.* The plant cover is quite dense, reaching up to 90-100% of the total area. The bush floor consists of species such as *Myrtus communis*, *Pistacia lentiscus*, *Laurus nobilis*, *Rubus spp.*, *Phillyrea angustifolia*, *Olea olaster*, etc. The vegetation cover of this 1-2 m high floor is 50–60%. Herbaceous floor is rare and with few species such as *Chrysopogon gryllus*, *Asparagus acutifolius*, *Dactylis glomerata*, *Desmazieria rigida* etc.

On the protected landscape of Vjosa-Narta 114 aromatic medicinal plants were identified, 20% of which belong to the Compositae family, 12% belong to the Labiatae family, 9% belong to the Leguminosae family, etc .; the majority of the medicinal plants of the study area belong to the biological form terophytes with 41%, hemicryptophytes with 31%, phanerophytes with 14%, and geophytes with 10%; most of the medicinal plants of the study area belong to the geographical element of Europe. with 21%, Medit. with 18%, Asia with 16% and Cosmop with 14% and Paleotemp. with 12%. Among the medicinal aromatic plants we mention *Alkanna tinctoria* Tausch., *Allium sativum* L., *Anethum graveolens* L., *Bellis perennis* L., *Brassica nigra* (L.) Koch., *Capsicum annum* L., *Cichorium intybus* L., *Daucus carota* L., *Dianthus caryophyllus* L., *Juniperus oxycedrus* L., *Matricaria camomila* L., *Myrtus communis* L., *Ocimum basilicum* L., *Papaver rhoeas* L., *Phragmites communis* Trin., *Portulaca oleracea* L., *Rosa canina* L. , *Urtica dioica* L. etj.

**Table 2.** Plants at risk in Vjosa-Narta area

Taxon	Risk Status	Distribution
<b>Origanum vulgare</b>	EN	In the Mediterranean maquis and forests
<b>Orchis sp</b>	EN	The whole area
<b>Olea europea var. sylvestris</b>	VU	In the Mediterranean maquis and forests

<i>Ceratonia siliqua</i>	EN	In the Mediterranean maquis and forests
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About 25 species of plants or 7.5% of the total number of endangered plant species of Albania (330 species in total) meet in the wetland complex. Among them, 9 plants are endangered locally while two species are endemic to Albania.

**Table 3.** National and Local Endangered Species of Plants

No	Latin Name	Endangered
1	<i>Agrimonia eupatoria</i> L.	E
2	<i>Ammophila arenaria</i> (L.) Lb.	E
3	<i>Anacamptis pyramydalis</i> (L.) Rich.	E
4	<i>Baldellia ranunculoides</i> (L.) Parl.	V, R
5	<i>Butomus umbellatus</i> L.	V
6	<i>Cladium mariscus</i> (L.) Pol.	V
7	<i>Desmazeria marina</i> (L.) Drude.	E, R
8	<i>Elymus farctus</i> P.B.	E
9	<i>Ephedra distachya</i> L.	E, R
10	<i>Hydrocotyle vulgaris</i> L.	E
11	<i>Hypericum perforatum</i> L.	E
12	<i>Marsilea quadrifolia</i> L.	V, R
13	<i>Narcissus poeticus</i> L.	R
14	<i>Nuphar lutea</i> (L.) Sibth. & Sm.	V, R
15	<i>Nymphaea alba</i> L.	V, R
16	<i>Nymphoides peltata</i> O.Kuntze.	V, R
17	<i>Orchis albanica</i> Goelz & Reinhard.	E, End
18	<i>Orchis coriophora</i> L.	E
19	<i>Orchis</i> x <i>pararisti</i> Goelz & Reinhard	E, End
20	<i>Origanum vulgare</i> L.	E
21	<i>Pancratium maritimum</i> L.	E, R
22	<i>Quercus robur</i> L.	Ex?
23	<i>Serapias lingua</i> L.	E
24	<i>Spiranthes spiralis</i> Koch.	E
25	<i>Stachys maritima</i> L.	E

Ex – Extinted, E –Endangered , V- Vulnerable, R – Rare. End- Endemic

Of particular interest is the presence of two endemic species: *Orchis albanica* and the hybrid form of *Orchis* x *pararisti*. 67 species (see Annex 5) are considered valuable in the Narta area for their economic and scientific values and interest.

## VI. FAUNA

The Vjosa-Narta wetland complex is an important area for a large number of animals including insects, fish, amphibians and reptiles, mammals and especially birds. According to previous studies (Area Diagnosis Report) the wetland complex accommodates at least 749 vertebrate and pre-vertebrate species.

**Table 4.** The animal species present in the Vjosa-Narta wetland complex

Group	Species	Endangered	Endangered	Status of	No.of types
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	Nationally	Globally	protection	n
mollusks	12	-		> 32
Insects (Lepid & Coleopt)	57	1	28	> 287
Crustaceans	9	-		> 61
Echinoderms	6	-		> 6
Fishes	16	5	1	> 102
Amphibious	9	2	5	9
Reptiles	23	5	20	26
Poultry	43	4	52	> 194
Mamals	14	9	12	> 32
<b>Total</b>	<b>189</b>	<b>26</b>	<b>118</b>	<b>&gt; 749</b>

The area is particularly important for birds, mammals as well as fish and reptiles.

### **Pre-vertebrates**

Research on pre-vertebrate types has largely relied on diagnostic studies as well as other later publications. According to previous studies, Vjosa-Narta shelters at least 390 pre-vertebrate species including: Molluscs, Butterflies, Beetles, Crustaceans and Echinoderms. The most common butterflies are Tabak, Cleopatra, Blue Butterflies etc. In addition to the drier environments of the area also record large and small orthopterans, stingrays, various ants, etc. Studies on molluscs (Beqiraj 2003) have shown that Narta is the habitat of 32 species of aquatic molluscs belonging to the Gastropoda and Bivalvia families.

### **Fishes**

Narta is an important wetland area for some fish species. Previous studies, studies that have covered the whole range of habitats (sea, brackish water and fresh water) have concluded that the area is used by at least 102 fish species. The main species of the lagoon are: Nigala (*Anguilla anguilla*), Kocja (*Sparus aurata*), Levreku (*Dicentrarchus labrax*), Shellfish (*Mugil cephalus*) and Aterines (*Aterina* sp.). A complete list of lagoon species is given in Annex 1.

### **Amphibians and Reptiles**

Narta shelters 9 species of amphibians and 26 species of reptiles. The most common amphibians are *Rana balcanica*, *Hyla arborea*, *Triturus vulgaris* etc. (Annex 2). The most commonly encountered reptiles are *Natrix natrix*, *Elaphe quatuorlineata*, *Malpolon monspensulanum*, *Testudo hermanni* and others.

### **Birds**

The complex is an important area for 192 species observed to date (Annex 3) but especially for wintering and nesting water birds.

The winter counts of 1995-2004 recorded 12 000 - 81 000 individuals with an average of 34 800 individuals (Fig. 4). Most winterers (about 91% of them) find refuge in lagoon waters. The most common birds are Ducks and Bajzat. During the nesting season, Narta returns to breeding grounds for 630-830 pairs of water birds. Most (about 88% of them) are concentrated in the Narta Saline.

During January 2016-2017-2018-2019, Vlora AdZM was involved in the implementation of the Winter Bird Census for the Narta Lagoon. The winter bird census has as its primary objective:

- to obtain annual information on waterfowl populations in the wetlands of Albania during the non-nesting period (January) of most species, as a basis for assessing wetland areas and populations monitoring,
- monitor the status and conditions of wetlands in Albania every year.

### **International Winter Bird Census 2016** (BSPB/BirdLife Bulgaria dhe PPNEA)

**Narta:**Total number of individuals : 10672

Species: 34

**Tabela 5.** International Winter Bird Census2016

<b>Nr</b>	<b>Species ( Latin)</b>	<b>Specia ( Albanian)</b>	<b>NA</b>
1	Tachybaptus ruficollis	Kredharaku i vogel	52
2	Podiceps cristatus	Kredharaku i madh	24
3	Podiceps nigricollis	Kredharaku gushezi	41
4	Phalacrocorax carbo	Karabullaku i detit	206
5	Pelecanus crispus	Pelikani kacurrel	27
6	Egretta garzetta	Cafka e vogel	44
7	Ardea alba	Cafka e madhe	13
8	Ardea cinerea	Cafka e perhime	20
9	Phoenicopterus roseus	Lejleku krahekuq	904
10	Tadorna tadorna	Laroshja	1069
11	Mareca penelope	Kryekuqe e madhe	75
12	Mareca strepera	Rosa e perhime	18
13	Anas crecca	Rosa kere	1350
14	Anas platyrhynchos	Kuqlla qafegjelber	706
15	Anas acuta	Rosa bishtgjele	73
16	Spatula clypeata	Sqepluga	73
17	Rallus aquaticus	Gjeli i ujit	3
18	Gallinula chloropus	Puleza e ujit	19
19	Fulica atra	Bajza	2695
20	Vanellus vanellus	Gicvilja	317
21	Recurvirostra avosetta	Sqepbiza	150
22	Burhinus oedicephalus	Gjelaci symadh	13
23	Charadrius alexandrinus	Vrapsi gushebardhe	2
24	Pluvialis apricaria	Gjelaci ngjyre ari	362
25	Calidris minuta	Gjelaci i vogel	3
26	Calidris alpina	Gjeleza gushezeze	76
27	Gallinago gallinago	Shapka e ujit	2
28	Numenius arquata	Kojliku i madh	2
29	Tringa totanus	Qyryl. kembeqirize	170
30	Tringa nebularia	Qyrylyku i madh	20
31	Croicocephalus ridibundus	Puleb. e zakonshme	2018
32	Croicocephalus genei	Pulebardha roze	110
33	Larus michahellis	Puleb. kembeverdhe	4

34	Thalasseus sandvicensis	Sterni dimerak	11
	<b>Totali</b>		<b>10672</b>

**International Winter Birds Census 2017 (IPA 2013 Project “Strengthening National Capacities in Nature Protection - Protection and Nature 2000”)**

**Narta:** Total number of individuals: 8665

Species: 41

**Table 6.**International Winter Bird Census 2017

<b>Nr</b>	<b>Species ( Latin)</b>	<b>Species ( Albanian)</b>	<b>NA</b>
1	Podiceps cristatus	Kredharaku i madh	59
2	Podiceps nigricollis	Kredharaku gushezi	51
3	Phalacrocorax carbo	Karabullaku i detit	997
4	Microcarbo pygmeus	Karabullaku i vogel	101
5	Pelecanus crispus	Pelikani kacurrel	31
6	Bubulcus ibis	Cafka lopcare	1
7	Egretta garzetta	Cafka e bardhe e vogel	118
8	Ardea alba	Cafka e madhe e bardhe	55
9	Ardea cinerea	Cafka e perhime	78
10	Platalea leucorodia	Capka sqepluge	44
11	Phoenicopterus roseus	Lejleku krahekuq	601
12	Tadorna tadorna	Laroshja	426
13	Mareca penelope	Kryekuqe e madhe	58
14	Anas crecca	Rosa kere	189
15	Anas platyrhynchos	Kuqla qafegjelber	314
16	Anas acuta	Rosa bishtgjele	78
17	Spatula clypeata	Sqepluga	118
18	Melanitta fusca	Rosa e zezë krahëbardhë	5
19	Bucephala clangula	Rosa me kater sy	13
20	Mergus serrator	Zhytesi i mesem me callme	6
21	Rallus aquaticus	Gjeli i ujit	5
22	Fulica atra	Bajza	877
23	Vanellus vanellus	Gicvilja	13
24	Recurvirostra avosetta	Sqepbiza	30
25	Charadrius alexandrinus	Vrapsi gushebardhe	13
26	Pluvialis apricaria	Gjelaci pikalosh ngjyre ari	418
27	Pluvialis squatarola	Gjeleza pikaloshe	28
28	Arenaria interpres	Gjeleza laramane	1
29	Calidris minuta	Gjelaci i vogel	3
30	Calidris alpina	Gjeleza gushezeze	340
31	Numenius arquata	Kojliku i madh	1
32	Tringa erythropus	Qyrylyku i murme	25
33	Tringa totanus	Qyryl. kembeqirize	96
34	Tringa nebularia	Qyrylyku i madh	2
35	Tringa ochropus	Qyr. kembepershime	8
36	Actitis hypoleucos	Qyrylyku i vogel	2
37	Croicocephalus ridibundus	Puleb. e zakonshme	3247

38	<i>Croicocephalus genei</i>	Pulebardha roze	98
39	<i>Larus michahellis</i>	Puleb. kembeverdhe	68
40	<i>Larus sp.</i>	Pulbardha	40
41	<i>Thalasseus sandvicensis</i>	Sterni dimerak	7
	<b>Totali</b>		<b>8665</b>

**International Winter Birds Census 2018 (IPA 2013 Project “Strengthening National Capacities in Nature Protection - Protection and Nature 2000”)**

**Narta:** Total number of individuals : 8264

Species: 36

**Table 7.** International Winter Birds Census 2018

No	Species ( Latin)	Species ( In Albanian)	NA
1	<i>Tachybaptus ruficollis</i>	Kredharaku i vogël	3
2	<i>Podiceps cristatus</i>	Kredharaku i madh	31
3	<i>Podiceps nigricollis</i>	Kredharaku gushezi	40
4	<i>Phalacrocorax carbo</i>	Karabullaku i detit	161
5	<i>Microcarbo pygmeus</i>	Karabullaku i vogel	74
6	<i>Pelecanus crispus</i>	Pelikani kacurrel	33
7	<i>Egretta garzetta</i>	Cafka e bardhe e vogel	44
8	<i>Ardea alba</i>	Cafka e madhe e bardhe	59
9	<i>Ardea cinerea</i>	Cafka e perhime	64
10	<i>Platalea leucorodia</i>	Capka sqepluge	39
11	<i>Phoenicopterus roseus</i>	Lejleku krahekuq	1042
12	<i>Tadorna tadorna</i>	Laroshja	30
13	<i>Mareca penelope</i>	Kryekuqe e madhe	241
14	<i>Anas crecca</i>	Rosa kere	1986
15	<i>Anas platyrhynchos</i>	Kuqlla qafegjelber	417
16	<i>Anas acuta</i>	Rosa bishtgjele	8
17	<i>Spatula clypeata</i>	Sqepluga	127
18	<i>Aythya ferina</i>	Kryekuqe e mjeme	1
19	<i>Aythya fuligula</i>	Rosa laramane me cafkë	9
20	<i>Rallus aquaticus</i>	Gjeli i ujit	1
21	<i>Gallinula chloropus</i>	Pulëza e ujit	2
22	<i>Fulica atra</i>	Bajza	14
23	<i>Vanellus vanellus</i>	Gicvilja	1667
24	<i>Recurvirostra avosetta</i>	Sqepbiza	200
25	<i>Charadrius alexandrinus</i>	Vrapsi gushebardhe	81
26	<i>Pluvialis apricaria</i>	Gjelaci pikalosh ngjyre ari	21
27	<i>Calidris alpina</i>	Gjeleza gushezeze	492
28	<i>Philomachus pugnax</i>	Luftëtari	7
29	<i>Numenius arquata</i>	Kojliku i madh	27
30	<i>Tringa erythropus</i>	Qyrylyku i murrme	109
31	<i>Tringa totanus</i>	Qyryl. kembeqirize	155

32	Tringa nebularia	Qyrylyku i madh	7
33	Actitis hypoleucos	Qyrylyku i vogel	3
34	Croicocephalus ridibundus	Puleb. e zakonshme	473
35	Croicocephalus genei	Pulebardha roze	558
36	Larus michahellis	Puleb. kembeverdhe	20
	<b>Totali</b>		<b>8246</b>

International Winter Birds Census 2019 (AdZM Vlora staff in collaboration with PPNEA experts)

**Narta:** Total number of individuals: 10468

Species: 35

**Tabela 8.** International Winter Birds Census 2019 ( 2019

<b>Nr</b>	<b>Species (Latin)</b>	<b>Species (Albanian)</b>	<b>NA</b>
1	Alcedo atthis	Bilbili i ujit	2
2	Anas clypeata	Rosa shpatore	67
3	Anas crecca	Rosa kere	1943
4	Anas penelope		504
5	Anas platyrhynchos	Kuqlla qafegjelber	41
6	Anas strepera	Rosa e perhime	33
7	Ardea alba	Cafka e madhe e bardhe	27
8	Ardea cinerea	Cafka e perhime	50
9	Buteo buteo	Huta	5
10	Calidris alpina	Gjeleza gushezeze	4164
11	Charadrius alexandrinus	Vrapsi gushebardhe	42
12	Charadrius hiaticula	Vrapuesi i madhe	3
13	Circus aeruginosus	Shqipja e kenetes	5
14	Egretta garzetta	Cafka e bardhe e vogel	56
15	Falco tinnunculus	Skifteri kthetrazi	3
16	Fulica atra	Bajza	688
17	Larus michahellis	Pulebardha kembeverdhe	29
18	Chroicocephalus ridibundus		340
19	Microcarbo pygmaeus	Karabullaku i vogel	224
20	Pelecanus crispus	Pelican	19
21	Phalacrocorax carbo	Karabullaku i detit	179
22	Phoenicopterus roseus		875
23	Pluvialis apricaria	Gjelaci pikalosh ngjyre ari	113
24	Pluvialis squatarola	Gjeleza pikaloshe	5
25	Podiceps cristatus	Kredharaku i madh	8
26	Podiceps nigricollis	Kredharaku gushezi	1
27	Recurvirostra avosetta	Sqepbiza	211
28	Tachybaptus ruficollis	Kredharaku i vogel	10
29	Tadorna tadorna	Laroshja	560
30	Tringa erythropus	Qyrylyku i murme	52
31	Tringa nebularia	Qyrylyku i madh	9

32	Tringa ochropus	Qyr. kembepershime	2
33	Tringa stagnatilis	Qyrylyku sqep holle	21
34	Tringa totanus	Qyryl. kembeqirize	51
35	Vanellus vanellus	Gicvilja	126
	<b>Total</b>		<b>10468</b>

**Table 9.** List of Vjosa Narta Protected Landscape Birds, which directly or indirectly use abandoned or used agricultural habitats .

Llojet	Annexes II and III of Bern Convention	Annexes of Emerald Network	RAMSAR	Red List of IUCN For Europe	Red List of IUCN for United Europe	List of IUCN in Global Level	Annex I-III of Birds European Directive	Annexes of Convention for Migrating Birds	AEWA	Red List of Albanian 2013	Notes
<i>Accipiter brevipes</i>	III	I		LC	LC	LC	I	II		CR	
<i>Accipiter gentilis</i>	III	I*		LC	LC	LC	I*	II		VU	* A. g. arrigonii only
<i>Accipiter nisus</i>	III	I*		LC	LC	LC	I*	II		EN	* A. n. granti only
<i>Acrocephalus arundinaceus</i>	II			LC	LC	LC		II			
<i>Acrocephalus melanopogon</i>	II	I		LC	LC	LC	I	II		EN	
<i>Acrocephalus scirpaceus</i>	II			LC	LC	LC		II		LR	
<i>Actitis hypoleucos</i>	II		YES	LC	NT	LC		II	AEWA		

<i>Aegithalos caudatus</i>	III			LC	LC	LC					
<i>Alcedo atthis</i>	II	I	YES	VU	VU	LC	I				
<i>Anas acuta</i>	III		YES	LC	VU	LC	II/A; III/B	II	AE WA		
<i>Anas crecca</i>	III		YES	LC	LC	LC	II/A; III/B	II	AE WA		
<i>Anas platyrhynchos</i>	III		YES	LC	LC	LC	II/A; III/A	II	AE WA		
<i>Anthus campestris</i>	II	I		LC	LC	LC	I				
<i>Anthus spinoletta</i>	II			LC	LC	LC					
<i>Anthus trivialis</i>	II			LC	LC	LC					
<i>Apus apus</i>	III			LC	LC	LC					
<i>Apus pallidus</i>	II			LC	LC	LC				LR	
<i>Ardea alba</i>	II	I	YES	LC	LC	LC	I	II*	AE WA	EN	* A. a. alba (Western Palearctic populations) only
<i>Ardea cinerea</i>	III		YES	LC	LC	LC			AE WA	VU	
<i>Ardeola ralloides</i>	II	I	YES	LC	LC	LC	I		AE WA	EN	
<i>Arenaria interpres</i>	II		YES	LC	EN	LC		II	AE WA		
<i>Athene noctua</i>	II			LC	LC	LC					
<i>Aythya ferina</i>	III		YES	VU	VU	VU	II/A; III/B	II	AE WA		

<i>Aythya fuligula</i>	III		YES	LC	LC	LC	II/A; III/B	II	AE WA		
<i>Aythya marila</i>	III		YES	VU	VU	LC	II/B; III/B	II	AE WA		
<i>Aythya nyroca</i>	III	I	YES	LC	LC	NT	I	I/II	AE WA		
<i>Bubulcus ibis</i>	II		YES	LC	LC	LC			AE WA		
<i>Bucephala clangula</i>	III		YES	LC	LC	LC	II/B	II	AE WA		
<i>Burhinus oedicephalus</i>	II	I	YES	LC	LC	LC	I	II		CR	
<i>Buteo buteo</i>	III			LC	LC	LC		II		VU	
<i>Calandrella brachydactyla</i>	II	I		LC	LC	LC	I				
<i>Calidris alba</i>	II		YES	LC	LC	LC		II	AE WA		
<i>Calidris alpina</i>	II	I*	YES	LC	LC	LC	I*	II	AE WA		* C. a. schinzii only
<i>Calidris canutus</i>	III		YES	LC	LC	NT	II/B	II	AE WA		
<i>Calidris falcinellus</i>	II		YES	LC	LC	LC		II	AE WA		
<i>Calidris ferruginea</i>	II		YES	VU	VU	NT		II	AE WA		
<i>Calidris minuta</i>	II		YES	LC	LC	LC		II	AE WA		
<i>Calidris pugnax</i>	III	I	YES	LC	EN	LC	III/B	II	AE WA		
<i>Calidris temminckii</i>	II		YES	LC	LC	LC		II	AE WA		
<i>Caprimulgus europaeus</i>	II	I		LC	LC	LC	I			LR	

<i>Carduelis cannabina</i>	II			LC	LC	LC					
<i>Carduelis carduelis</i>	II			LC	LC	LC					
<i>Carduelis chloris</i>	II			LC	LC	LC					
<i>Certhia brachydactyla</i>	II	I*		LC	LC	LC	I*				* C. b. dorotheae only
<i>Certhia familiaris</i>	II			LC	LC	LC					
<i>Cettia cetti</i>	II			LC	LC	LC		II			
<i>Charadrius alexandrinus</i>	II	I	YES	LC	LC	LC	I	II	AE WA		
<i>Charadrius dubius</i>	II		YES	LC	LC	LC		II	AE WA		
<i>Charadrius hiaticula</i>	II		YES	LC	LC	LC		II	AE WA		
<i>Chlidonias hybrida</i>	II	I	YES	LC	LC	LC	I		AE WA		
<i>Chlidonias leucopterus</i>	II	I	YES	LC	LC	LC		II*	AE WA		* West Eurasian and African population only
<i>Chlidonias niger</i>	II	I	YES	LC	LC	LC	I	II*	AE WA		* C. n. niger only
<i>Ciconia ciconia</i>	II	I	YES	LC	LC	LC	I	II	AE WA	CR	
<i>Circaetus gallicus</i>	III	I		LC	LC	LC	I	II		VU	

<i>Circus aeruginosus</i>	III	I		LC	LC	LC	I	II			
<i>Circus cyaneus</i>	III	I		NT	LC	LC	I	II			
<i>Circus macrourus</i>	III	I		NT	EN <sup>o</sup>	NT	I	II			
<i>Circus pygargus</i>	III	I		LC	LC	LC	I	II		EN	
<i>Cisticola juncidis</i>	III			LC	LC	LC					
<i>Clamator glandarius</i>	II			LC	LC	LC					
<i>Clanga clanga</i>	III	I		EN	CR	VU	I	I/II		CR	
<i>Clanga pomarina</i>	III	I		LC	LC	LC	I	II		CR	
<i>Columba livia (livia)</i>	III			LC	LC	LC	II/A				
<i>Corvus corax</i>	III			LC	LC	LC					
<i>Corvus cornix</i>				LC	LC	LC	II/B				
<i>Cuculus canorus</i>	III			LC	LC	LC					
<i>Delichon urbicum</i>	II			LC	LC	LC					
<i>Dendrocygna syriacus</i>	II	I		LC	LC	LC	I				
<i>Dryobates minor</i>	II			LC	LC	LC	I				
<i>Egretta garzetta</i>	II	I	YES	LC	LC	LC	I		AE WA	VU	
<i>Emberiza cirius</i>	II			LC	LC	LC					

<i>Emberiza melanocephala</i>	II			LC	LC	LC					
<i>Emberiza pusilla</i>	II			LC	LC	LC					
<i>Emberiza schoeniclus</i>	II			LC	LC	LC					
<i>Erithacus rubecula</i>	II			LC	LC	LC		II			
<i>Falco peregrinus</i>	II	I		LC	LC	LC	I	II		VU	
<i>Falco subbuteo</i>	II			LC	LC	LC		II		VU	
<i>Falco tinnunculus</i>	II			LC	LC	LC		II		VU	
<i>Ficedula albicollis</i>	II	I		LC	LC	LC	I	II			
<i>Ficedula hypoleuca</i>	II			LC	LC	LC		II			
<i>Ficedula semitorquata</i>	II	I		LC	LC	LC	I	II			
<i>Fringilla coelebs</i>	III	I*		LC	LC	LC	I*				
<i>Fulica atra</i>	III		YES	NT	LC	LC	II/A; III/B	II*	AE WA		* F. a. atra (Mediterranean and Black Sea populations) only
<i>Galerida cristata</i>	III			LC	LC	LC	I				

<i>Gallinago gallinago</i>	III		YES	LC	LC	LC	II/A; III/B	II	AE WA		
<i>Gallinula chloropus</i>	III		YES	LC	LC	LC	II/B		AE WA		
<i>Garrulus glandarius</i>				LC	LC	LC	II/B				
<i>Gavia arctica</i>	II	I	YES	LC	LC	LC	I	II*	AE WA		* G. a. arctica only
<i>Gelochelidon nilotica</i>	II	I	YES	LC	LC	LC	I	II*	AE WA		* G. n. nilotica (West Eurasian and African populations) only
<i>Glareola nordmanni</i>	II	I	YES	VU	CR	NT		II	AE WA		
<i>Glareola pratincola</i>	II	I	YES	LC	LC	LC	I	II	AE WA		
<i>Grus grus</i>	II	I	YES	LC	LC	LC	I	II	AE WA		
<i>Haematopus ostralegus</i>	III		YES	VU	VU	NT	II/B		AE WA		
<i>Himantopus himantopus</i>	II	I	YES	LC	LC	LC	I	II	AE WA	EN	
<i>Hippolais icterina</i>	II			LC	LC	LC		II			
<i>Hippolais olivetorum</i>	II	I		LC	LC	LC	I	II			

<i>Hippolais pallida</i>	II			LC	LC	LC		II			
<i>Hirundo daurica</i>	II			LC	LC	LC					
<i>Hirundo rustica</i>	II			LC	LC	LC					
<i>Hydroprogne caspia</i>	II	I	YES	LC	NT	LC	I	II*	AE WA		* West Eurasian and African populations only
<i>Ixobrychus minutus</i>	II	I	YES	LC	LC	LC	I	II*	AE WA		* I. m. minutus (Western Palearctic populations only)
<i>Jynx torquilla</i>	II			LC	LC	LC					
<i>Lanius collurio</i>	II	I		LC	LC	LC	I				
<i>Lanius senator</i>	II			LC	LC	LC					
<i>Larus audouinii</i>	II	I	YES	LC	LC	LC	I	I/II	AE WA		
<i>Larus canus</i>	III		YES	LC	LC	LC	II/B		AE WA		
<i>Larus fuscus</i>			YES	LC	LC	LC	II/B		AE WA		
<i>Larus genei</i>	II	I	YES	LC	LC	LC	I	II	AE WA		
<i>Larus melanocephalus</i>	II	I	YES	LC	LC	LC	I	II	AE WA		
<i>Larus michahellis</i>	III		YES	LC	LC	LC	II/B *		AE WA		

<i>Larus ridibundus</i>	III		YES	LC	LC	LC	II/B		AE WA		
<i>Limosa lapponica</i>	III	I	YES	LC	LC	NT	III/B	II	AE WA		
<i>Limosa limosa</i>	III		YES	VU	EN	NT	II/B	II	AE WA		
<i>Luscinia megarhynchos</i>	II			LC	LC	LC		II			
<i>Luscinia svecica</i>	II	I		LC	LC	LC	I	II			
<i>Mareca penelope</i>	III		YES	LC	VU	LC	II/A; III/B	II	AE WA		
<i>Mareca strepera</i>	III		YES	LC	LC	LC	II/A	II	AE WA		
<i>Melanitta fusca</i>	III		YES	VU	VU	VU	II/B	II	AE WA		
<i>Melanocorypha calandra</i>	II			LC	VU	LC	I				
<i>Mergellus albellus</i>	II		YES	LC	LC	LC	I	II	AE WA		
<i>Mergus merganser</i>	III		YES	LC	LC	LC	II/B	II	AE WA	VU	
<i>Mergus serrator</i>	III		YES	NT	VU	LC	II/B	II	AE WA		
<i>Merops apiaster</i>	II			LC	LC	LC		II		EN	
<i>Microcarbo pygmaeus</i>	II		YES	LC	LC	LC	I	II	AE WA	CR	
<i>Miliaria calandra</i>	III			LC	LC	LC					
<i>Motacilla alba</i>	II			LC	LC	LC					
<i>Motacilla cinerea</i>	II			LC	LC	LC					
<i>Motacilla flava</i>	II			LC	LC	LC					

<i>Muscicap a striata</i>	II			LC	LC	LC		II			
<i>Numenius arquata</i>	III		YES	VU	VU	NT	II/B	II	AE WA		
<i>Numenius phaeopus</i>	III		YES	LC	LC	LC	II/B	II	AE WA		
<i>Nycticora x nycticora x</i>	II		YES	LC	LC	LC	I		AE WA	VU	
<i>Oenanthe hispanica</i>	II			LC	LC	LC		II			
<i>Oenanthe oenanthe</i>	II			LC	LC	LC		II			
<i>Oriolus oriolus</i>	II			LC	LC	LC					
<i>Oxyura leucoceph ala</i>	II		YES	EN	VU	EN	I	I/II	AE WA	CR	
<i>Pandion haliaetus</i>	III			LC	LC	LC	I	II		VU	
<i>Parus major</i>	II			LC	LC	LC					
<i>Passer domestic us</i>				LC	LC	LC					
<i>Passer hispaniol ensis</i>	III			LC	LC	LC					
<i>Passer montanus</i>	III			LC	LC	LC					
<i>Pelecanus crispus</i>	II		YES	LC	LC	NT	I	I/II	AE WA	CR	

<i>Pelecanus onocrotalus</i>	II		YES	LC	LC	LC	I	I*/II*	AE WA		* Western Palearctic populations
<i>Phalacrocorax carbo</i>	III		YES	LC	LC	LC			AE WA		
<i>Phalaropus lobatus</i>	II		YES	LC	LC	LC	I	II	AE WA		
<i>Phoenicopiterus roseus</i>	II		YES	LC	LC	LC	I	II	AE WA		
<i>Phoenicurus ochruros</i>	II			LC	LC	LC		II			
<i>Phoenicurus phoenicurus</i>	II			LC	LC	LC		II			
<i>Phylloscopus collybita</i>	II			LC	LC	LC		II			
<i>Phylloscopus sibilatrix</i>	II			LC	LC	LC		II			
<i>Phylloscopus trochilus</i>	II			LC	LC	LC		II			
<i>Pica pica</i>				LC	LC	LC	II/B				
<i>Platalea leucorodia</i>	II		YES	LC	LC	LC	I	II	AE WA	EN	
<i>Plegadis falcinellus</i>	II		YES	LC	LC	LC	I	II	AE WA	EN	
<i>Pluvialis apricaria</i>	III		YES	LC	LC	LC	III/B; III/B	II	AE WA		
<i>Pluvialis squatarola</i>	III		YES	LC	LC	LC	II/B	II	AE WA		

<i>Podiceps cristatus</i>	III		YES	LC	LC	LC			AE WA		
<i>Podiceps grisegena</i>	II		YES	LC	LC	LC		II*	AE WA		* P. g. grisengae
<i>Podiceps nigricollis</i>	II*; III*		YES	LC	LC	LC			AE WA		* P. n. caspicus only. ** all thers
<i>Rallus aquaticus</i>	III		YES	LC	LC	LC	II/B		AE WA		
<i>Recurvirostra avosetta</i>	II		YES	LC	LC	LC	I	II	AE WA		
<i>Remiz pendulinus</i>	III			LC	LC	LC					
<i>Riparia riparia</i>	II			LC	LC	LC					
<i>Saxicola rubetra</i>	II			LC	LC	LC		II			
<i>Saxicola torquatus</i>	II			LC	LC	LC		II			
<i>Spatula clypeata</i>	III		YES	LC	LC	LC	II/A; III/B	II	AE WA		
<i>Spatula querquedula</i>	III		YES	LC	VU	LC	II/A	II	AE WA		
<i>Sterna hirundo</i>	II		YES	LC	LC	LC	I	II*	AE WA		* S. h. hirundo (populations breeding in the Western Palearctic) only
<i>Sternula albifrons</i>	II		YES	LC	LC	LC	I	II	AE WA		

<i>Streptopelia decaocto</i>	III			LC	LC	LC	II/B				
<i>Streptopelia turtur</i>	III			VU	NT	VU	II/B	II*			* S. t. turtur only
<i>Sturnus vulgaris</i>				LC	LC	LC	II/B				
<i>Sylvia atricapilla</i>	II			LC	LC	LC		II			
<i>Sylvia borin</i>	II			LC	LC	LC		II			
<i>Sylvia cantillans</i>	II			LC	LC	LC		II			
<i>Sylvia communis</i>	II			LC	LC	LC		II			
<i>Sylvia curruca</i>	II			LC	LC	LC		II			
<i>Sylvia melanocephala</i>	II			LC	LC	LC		II			
<i>Sylvia rueppelli</i>	II			LC	LC	LC	I	II			
<i>Tachybaptus ruficollis</i>	II		YES	LC	LC	LC			AE WA		
<i>Tachymarptis melba</i>	II			LC	LC	LC					
<i>Tadorna ferruginea</i>	II		YES	LC	NT <sup>o</sup>	LC	I	II	AE WA		
<i>Tadorna tadorna</i>	II		YES	LC	LC	LC		II	AE WA		
<i>Thalassus sandvicensis</i>	II		YES	LC	LC	LC	I	II*	AE WA		* T. s. sandvicensis only

<i>Tringa erythropus</i>	III		YES	LC	NT	LC	II/B	II	AE WA		
<i>Tringa glareola</i>	II		YES	LC	LC	LC	I	II	AE WA		
<i>Tringa nebularia</i>	III		YES	LC	LC	LC	II/B	II	AE WA		
<i>Tringa ochropus</i>	II		YES	LC	LC	LC		II	AE WA		
<i>Tringa stagnatilis</i>	II		YES	LC	EN	LC		II	AE WA		
<i>Tringa totanus</i>	III		YES	LC	VU	LC	II/B	II	AE WA		
<i>Troglodytes troglodytes</i>	II			LC	LC	LC	I *				* T. t. fridariensis only
<i>Turdus merula</i>	III			LC	LC	LC	II/B				
<i>Tyto alba</i>	II			LC	LC	LC				VU	
<i>Upupa epops</i>	II			LC	LC	LC				VU	
<i>Vanellus vanellus</i>	III		YES	VU	VU	NT	II/B	II	AE WA		

### Mamals

The wetland complex records 32 species of mammals (Annex 4) of the 71 species observed in Albania. The mammalian community (Tab. 7) is dominated by rodents followed by nocturnal bats and carnivorous species

**Table 10.** Composition of mammalofauna of Vjosa-Narta area

<i>Taxa/Order</i>	<i>No. Of species</i>
<i>Insectivora</i>	5
<i>Chiroptera</i>	8
<i>Rodentia</i>	9
<i>Lagomorpha</i>	1
<i>Carnivora/Fissipedia</i>	6
<i>Artidactyla</i>	0
<i>Cetacea/Odontoceti</i>	3
<i>Pinnipedia</i>	0
<i>Total</i>	32

**Table 11.** Globally endangered categories

No .	Species	Category	Globaly	Endagered
1	<i>Lycaena ottomanus</i>	VU		
2 3 4	<i>Acipenser sturio</i> <i>Alosa fallax nilotica</i>	EN DD DD DD EN		
5 6	<i>Aphanius fasciatus</i> <i>Atherina boyeri</i> <i>Gambusia affinis</i>			
7 8	<i>Hyla arborea</i> <i>Triturus cristatus</i>	LRnt LRcd		
9 10	<i>Caretta caretta</i> <i>Dermochelys coriacea</i>	EN CR DD LR/nt LR/nt		
11 12	<i>Elaphe situla</i>			
13	<i>Emys orbicularis</i> <i>Testudo hermani</i>			
14 15	<i>Pelecanus crispus</i> <i>Haliaeetus albicilla</i>	LR/cd LR/nt VU VU		
16 17	<i>Aquila clanga</i> <i>Falco naumanni</i>			
18 19	<i>Rhinolophus blasii</i> <i>Rhinolophus euryale</i>	LRnt VU LRcd		
20	<i>Rhinolophus ferrumequinum</i> <i>Myotis myotis</i>	LRnt LRnt		
21 22	<i>Microtus (Pitymys) felteni</i> <i>Microtus (Pitymys) thomasi</i>	LRnt		
23	<i>Mus spicilegus (abbotti)</i> <i>Lutra lutra</i> <i>Stenella coeruleoalba</i>	LRnt VU LRcd		
24 25				
26				
Ex – Extincted ; CR – Critical Rist ; EN – Endangered ; VU – Vulnerable; DD – Data Deficiency ; LR/cd – Little Risk / cover dependancy ; LR/nt – Little risk / nearly threatened ;				

For some of the groups (amphibians, reptiles, birds and mammals) the data are almost complete. Other groups (especially molluscs, crustaceans, insects, echinoderms) need further study. A high number of species belong to endangered categories nationally and internationally. Vjosë-Narta houses 26 Globally Endangered Species (Tables 21 and 22) and is thus an area of conservation that has a worldwide interest. In addition, the complex records 189 Endangered Species in Albania, a fact that lists it in a precious area that deserves careful preservation. The importance of the area is also demonstrated by the presence of 118 species protected nationally and internationally. The above data clearly show that the Vjosa-Narta complex is a strong point of biodiversity in Albania.

Species globally endangered :

### 1. Amphibians and Reptiles

Some species are threatened nationally and internationally. It is important to mention the presence of some globally endangered species such as the Tree frog *Hyla arborea*, the sea turtle *Caretta caretta*, the earth turtle *Testudo hermanni*.

### 2. Birds

Recent years data point to the Vjosa-Narta area as the second most important waterfowl area in Albania. In winter the complex accommodates more than 23% of wintering water birds in Albania. For more than 35 species the area accounts for more than 6% of the national effectiveness (Table 23). For Flamingos *Phoenicopterus ruber roseus*, *Tadorna tadorna*,

*Anas acuta*, *Bucephala clangula*, *Duckling Charadrius alexandrinus* and the *Pluvialis squatarola*, Vjosa-Narta is a primary winter destination.

For three nesting species: *Charadrius alexandrinus*, *Hymantopus himantopus* and *Recurvirostra avosetta* (Tab. 24), the Vjosa-Narta Protected Landscape Area is the most important site in Albania. For other species, PM occupies the second place in Albania.

### **International importance**

Vjosa-Narta is also an area of international importance. The area fulfills the Ramsar criteria for the total number of wintering water birds with more than 34 000 individuals (Ramsar Criteria is 20 000 individuals). For the three species, the area accommodates more than 1% of the regional population (Tab. 25). These data are sufficient to list Vjosa-Narta as one of the most important poultry areas in Albania and the Eastern Mediterranean Region. 92 species belong to the group of precious species (Annex 6). This fact highlights the importance of management activities in improving the socio-economic conditions of the local population

### **Mammals**

The Vjosa-Narta area is again one of the most important coastal areas for mammals. The area is home to a range of habitats used by a large number of mammals of regional, national and international importance. Four species of small mammals are distinguished here, namely two insectivores (*Talpa caeca* and *Talpa stankovici*) and two rodents (*Pitymys thomasi* and *P. felteni*), which are endemic to the western Balkans and the Mediterranean region.

Four rare species are habitats or visitors to the area: *Rhinolophus blasii*, *Myotis myotis*, *Mus spicilegus* (abbot) and *Stenella coeruleoalba*. The area also houses some valuable species. At least 10 mammals, namely 2 insectivores, 4 bats, 1 species of rabbit, 2 carnivores and 1 dolphin are considered species of particular importance to the area. The importance of the area is enhanced if we assess its role in maintaining long-term survival of endangered species such as *Rhinolophus euryale*, *Canis aureus*, *Lutra lutra*, *Meles meles* and *Mustela putorius*.

PM Vjosa-Narta is an important area for flora and especially for fauna. Narta is the second largest wetland in Albania. It comprises a large number of species, especially wintering birds. Narta Lagoon is the second most important wintering and nesting area for waterfowl in Albania.

**Table 12.** Rare species by different biodiversity groups in Vjosa-Narta Area

<b>Taxones</b>	<b>Nr.of species</b>
<b>Plants</b>	9
<b>Insects</b>	30
<b>Mollusc</b>	10
<b>Amphibia</b>	3
<b>Reptiles</b>	17
<b>Birds</b>	31
<b>Mamals</b>	4
<b>Total</b>	104

About 104 species present in the area are considered rare in Albania (Tab. 26). As mentioned above, the wetland complex harbors two endemic species for Albania: *Orchis albanica* and *Orchis x paparazzi*. At least 3 species (one insecticide and two rodents) are considered endemic to the Western Balkans and the Mediterranean. Narta is also nationally known for its unique sand dunes with some reaching 6-8 m high. Such a unique habitat deserves recognition and strong conservation measures .

## VII. RISKS

### Fire Risk

This area has been threatened by fire for years, where we can mention the fire that fell during 2016 in the “Pine-Poro” Forest Economy. It turns out that an area of 555.4 ha of forest has been crossed by fire and an area of 324.3 ha of forest has been burnt.

**Table 13.** Crossed and burned area of properties in PL Vjosa-Narta

Property	Crossed (ha)	Burnt (ha)
Private	161.5	162
State	393.9	162.3
<b>Total</b>	<b>555.4</b>	<b>324.3</b>

### Floods

Due to the high intensity rains that may fall in the Vlora Region there are many areas, villages and crops that can be damaged. The most affected are the areas near the Vjosa River. The flood of this river affects many agricultural and livestock farms. Due to heavy rains in recent years there has been considerable damage to crops such as field crops, field vegetables, greenhouse vegetables, viticultural fruits, etc. Damage has been caused to both the livestock and the livestock food base.

### Tornado

Another risk of this area has been the tornado that occurred in October 2016, which caused the fall of a significant number of pine trees. In the forest economy “ Kume –shashic” and near the forest parcels there were counted about 60 pieces of fallen pine trees with an average height of 10-12 and a diameter of 20-30 cm .



Agricultural areas that most likely to be at risk from natural disasters are :

**The villages affected by the flooding of the Vjosa River are: Novoselë, Fitore, Bishan, Akërni, Aliban, Mifol, Poro, Delisuf, Dëllënjë.**

