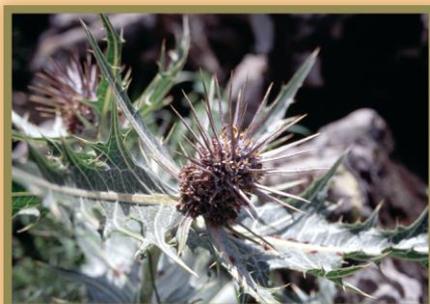


SC-SEC-2018-04

SURVEYS AND ASSESSMENTS ON BIODIVERSITY,
SOCIO-ECONOMIC AND SOCIO-CULTURAL ASPECTS,
ONGOING GRAZING ACTIVITIES AND LIVESTOCK
SITUATION



TEK TEK MOUNTAINS

National Park



FINAL REPORT SUMMARY

SUMMARY

1. General Landscape Features

1.1. Main Results; the size of the area is 19.335 ha with a low plateau character surrounded by the plains of Harran in the west and Ceylanpinar plains in the east. Geological structure consists mainly of limestones. Approximately 80% of the Tek Tek Mountains National Park area is meadow-pasture, 13% is agricultural land. Tek Tek Mountains Region as well as its surroundings is a region rich in terms of historical and cultural heritage. The discovery of Karahan Hill, which was dated to the same period and same size as Göbekli Hill, once again made the region important. The area has two Landscape Character Types and two Landscape Character Areas

1.2. Recommendations; the major threat for the area is poor coordination and cooperation among local institutions and organizations related to the land management and protection. The historical places and assets in the NP should be managed with an integrated and collaborative management approach and the current management plan should be updated and revised according to the latest findings. The ancient settlements Soğmatar and Şuayb City within the borders of NP should be managed and protected professionally. The information and sign boards in the NP should be designed well and installed in the necessary places for visitors.

2. Biodiversity

2.1. Main Results; In terms of vegetation, Tek Tek Mountains NP is in the Iran-Turanian phytogeographical region with Iran-Turanian steppes classified as low mountain steppes depending on the elevation and as malacophile and tragantic steppe in terms of physiological features. According to the EUNIS habitat types classification, it is located in Iran-Anatolian steppe habitat class defined as E1.2E habitat code. The vascular plants of the NP represent 44 families, 172 genera and 254 taxa. Ten of these taxa were identified as new locational records. There are nearly 70 taxa and 47 genera belonging to 25 families of all Cryptogamae group. All Cryptogam taxa are reported for the first time from the NP. There are 108 species belonging to 13 orders and 44 families in NP under the Insects group. In terms of Herpetofauna, there are 14 species including 3 species of amphibians, 7 species of lizards, 3 species of snakes and 1 species of turtle. In terms of avifauna, there are 85 bird species belonging to 33 families, 12 species were recorded as new records for this area. There are 14 species belonging to the Rodentia (Rodents), Chiroptera (Bats) and Eulipotyphla (Insectivorous) order identified under the small mammals and 5 species belonging to Rabbits and Predators identified under the large mammals. One wild relatives of barley and 4 wild relatives of wheat (*T. diccoccoides*, *A. triuncialis*, *A. biuncialis*, *A. columnaris*) were identified in the NP. Wild crops known as the primary ancestors of chickpea (*Cicer pinnatifidum*), pea (*Pisum sativum*), oriental wild lentil (*Lens culinaris* subsp. *orientalis*) and lentil (*Lathyrus cicero* subsp. *orientalis*) belonging to Fabaceae family were observed in Tek Tek Mountains.

2.2. Recommendations; *Pistacia palaestina* is recommended for monitoring and preparation of a Species Conservation Action Plan. Besides pistachio, the population of *Centaurea obtusifolia* and *Asphodeline damascena* subsp. *gigantea* taxa should be monitored and the species action plan should be prepared. Rüstem Valley and Silesor Creek, located to the north of the NP, should be protected strictly. The wild Lens and Cicer are less dense due to their poor competitive capabilities; stony and rocky hillsides are important habitats for them. The most important habitat for *Pisum sp.* is the river bed and valley floor of Rüstem Valley in Tek Tek Mountains NP. So this valley is a genetic reserve area for wild crops.

3. Socio-Cultural and Socio-Economic Aspects

3.1. Main Results; The tribal system has long been strong in the settlements. The economy is generally based on agriculture and animal husbandry, and trade is low.

3.2. Recommendations; Basic recommendations for social aspects include; conducting studies on product diversity, performing demo studies on closed soilless vegetable production encouraging villagers to be carried out through cooperative initiatives, establishment of forage supply facilities, mushroom cultivation for women, pilot activities such as poultry farming, development of products for rural tourism and integration of tourism activities with agriculture.

4. Ongoing Grazing Activities

4.1. Main Results; There are 10771 ruminants and 205 cattle in 7 settlements within NP. There is a pasture area of 105463 ha in the NP jointly used with cattle, ruminants and wild animals. There is a grazing below the grazing capacity in the NP.

4.2. Recommendations; The quality of pastures is poor in the NP. Due to its conservation status, the grazing should be carried out according to the grazing management plan.

5. Livestock Situation

5.1. Main Results; Ruminant and cattle breeding in the region are carried out by traditional methods based on pasture management system. The animals are grazed in the pasture from spring to late autumn. The cattle breeds in the area include both culture and hybrids.

5.2. Recommendations; Grazing plan is necessary for the area due to its conservation category. Thus, a grazing plan and monitoring program should be developed according to its conservation status. Producers should be provided with basic training information (care-feeding) and general health protection rules.

6. Core Areas, Buffer Zone and Ecological Corridors

6.1. Main Results; Within the scope of the study, it is requested to plan one corridor between the core areas in order to complete the ecological networks. Two different species, gazelle and hyena, are identified as focal/target species in order to represent both carnivores and herbivores. The most important reason of this was the fact that those species could be accepted as umbrella species. The proposed buffer zone for the NP is 13732 Ha. Recommended lengths of corridors between Kızılkuşu WDA and Tek Tek Mountains NP are 106 km 156 km for gazelle. For Hyena, however, the proposed corridor lengths between Kızılkuşu WDA, Tek Tek Mountains NP and Karacadağ are 87 km (Kızılkuşu -Tek Tek NP), 145 km (Kızılkuşu-Karacadağ) and 83 km (Tek Tek NP-Karacadağ)

6.2. Recommendations; A corridor for gazelle can naturally be established between Kızılkuşu WDA and Tek Tek Mountains NP, but there is no connection between Karacadağ and Kızılkuşu, and Karacadağ and Tek Tek Mountains NP. The creation of ecological networks involves considerable economic power, time and labor. Any error in the design and planning phase of the corridors will cause economic loss. Therefore, it would be more appropriate to revise the current work right after collecting more scientific data (species data, land data, etc.) to increase the accuracy of the study in determining the location of potential corridors.

1. GENERAL LANDSCAPE FEATURES

Tek Tek Mountains National Park is approximately 42 km east of the city center of Şanlıurfa and extends in the north-south direction to the south of the Şanlıurfa-Mardin highway between the Harran Plain and the Viransehir Plains. The size of the national park is 19.335 ha. Geological structure consists mainly of limestones. Tek Tek Mountains National Park has a low plateau character surrounded by the plains of Harran in the west and Ceylanpinar plains in the east. Two different erosion surfaces, namely Upper Miocene Denudational Surface and Upper Pliocene Denudational Surface, are identified in the National Park.

Continental climate is dominant in the area. Summers are very dry and hot, winters are rainy and relatively temperate. Tek Mountains National Park has a seasonal drainage network and there is no continuous flowing stream. There is no lake or surface water body in the area.

Most of the soils in the Tek Tek Mountains National Park are in the Brown and Red Brown Soil group. Local soils are neutral, salt-free, low level of organic matter, high amount of lime and fine textured soils. According to the Land Use Capability classification of the Tek Tek Mountains pilot area, it is generally described as Class VII, small part of the NP is of Class III Land with Class III is 2.9%, Class VII is 92.1%. The sum of the other classes is 5% (Cula, 2014).

Tek Tek Mountains Region and its surroundings are a region rich in terms of historical and cultural heritage. The discovery of Karahan Hill, which was dated to the same period and same size as Göbekli Hill, once again made the region important (Çelik 2011).

In the past, the presence of figs, almonds and Menengic trees used in grafting Pistachio in the region is known. In the excavations carried out at Karahan Hill and Harbetsuvan Hill, both bone remains and archaeological remains belonging to Rabbits, Gazelle and Wild Donkeys were found (Çelik, 2000; 2011).

According to CORINE 2012 data; The actual land use in the study area consists mainly of natural meadows, agriculture, pasture and poor vegetation area, except rural settlements. Approximately 80% of the Tek Tek Mountains National Park area is meadow-pasture, 13% is agricultural land, 5.21% is covered with poor vegetation and 1.76% is other land use form (settlement, construction, waterways).

Two Landscape Character Types and two Landscape Character Areas were defined in Tek Tek Mountains National Park.

1.1. Threats and Recommendations

There is a discrepancy between the Tek Tek Mountains National Park data and CORINE data. For this reason, it is necessary to revise the LTDP data by using the up-to-date data.

It is not within the boundaries of the Tek Tek Mountains National Park, the stone and marble quarries in the immediate vicinity are potential threats. Particulate matter (PM) measurements (PM_{2.5} and PM₁₀) were made in the vicinity of quarries with potential threat to the region. According to these measurements, PM values exceeded the limit values in some places. Although the quarries are outside the borders of the National Park, the particles are

transported by wind. Routine inspections by local authorities should be carried out without interruption. Otherwise, these particles are a potential threat, especially for the vegetation.

Soils in Tek Tek Mountains NP have some problems such as depth, slope, low organic matter, high clay, stony and rocky, but have sufficient root depth for steppe plant development.

In addition, untreated/unmanaged lands in Tek Tek Mountains NP are important in terms of protection of natural life. The parts cultivated and managed in this region should be used effectively in a way that less chemicals are used, different organic agriculture productions are supported and high income is obtained from small areas that should be protected.

Although the animal husbandry in the area damages the steppe vegetation, there are larger areas for the maintenance of plant diversity. In spite of all these, for the maintenance of plant diversity, certain regions should be protected and overgrazing should not be allowed in this region.

The historical and cultural assets in the Tek Tek Mountains are protected by the local people. However, especially since the large stone blocks in the trap areas are used as platforms in the foundations of modern houses, the trap areas are under great threat. The trap areas should be registered by the relevant units.

2. BIODIVERSITY

Tek Tek Mountains are located in the Iran-Turanian phytogeographical region. In terms of vegetation, most of the region is composed of Iran-Turanian steppe. Steppe ecosystem, located within the biome of the temperate zone meadows of the terrestrial ecosystem, is dominant in Tek Tek Mountains NP. Tek Tek Mountains steppes can be classified as low mountain (plain) steppes depending on the elevation, whereas these steppes can be classified as malacophile and tragantic steppe in terms of physiological features. One association belonging to shrub vegetation and two association belonging to steppe vegetation were determined in the area. According to the EUNIS habitat types classification, Tek Tek Mountains NP is located in Iran-Anatolian steppe habitat class defined as **E1.2E** habitat code and within the **E1** Dry Meadows sub-category of the Landfills and Pastures category of Moss, Lichen and Non-Weed Plants (Forbs) defined under “**E category**”.

✓ **Seed Plants (Vascular Plants):** As a result of the studies carried out within the scope of the project, 45 families, 172 genera and 6 of them were endemic, 254 taxa were identified. 10 of these taxa were identified as new locational records for the area.

The rate of endemism was approximately 2.4%. Due to the proximity of the Tek Tek Mountains to the Syrian border, the similarity of climatic conditions and the absence of any geographic isolation, the rate of endemism in the area is very low.

✓ **Cryptograms:** According to the results of field survey, observations and identification, nearly 70 taxa and 47 genera belonging to 25 families of all Cryptogamae groups were identified in Tek Tek Mountains NP. A number of taxa identified in the working area were also observed outside the working area. All cryptogam taxa collected from the field and given in this table are reported for the first time from the Tek Tek Mountains.

✓ **Insects:** 108 species belonging to 13 orders and 44 families were identified in the Tek Tek Mountains NP. The Rüstem valley and its surrounding areas, especially in the north of the region, are rich in insect fauna. Towards the south of the Tek Tek Mountains, species diversity decreases and biodiversity becomes poorer.

Chilades trochylus and *Carcharodus alceae* from Butterfly and *Pimelia bajula* and *Adesmia fischeri* from Bark Beetles are relatively common species. Although only an observation record from Bitlis has been reported in our country, it has not been photographed and documented so far. An individual was found in the Rüstem Creek of Tek Tek Mountains NP for the first time under the scope of this project. Almost all of the species identified in the region are the species that have spread in other similar regions of our country. However, a healthy population of *Isophya sikorai* is an endemic species especially seen in the slopes and valleys of Rüstem Creek and its vicinity in March-May.

✓ **Herpetofauna:** In the field survey conducted in Tek Tek Mountains NP, 14 species, 3 species of amphibians, 7 species of lizards, 3 species of snakes and 1 species of turtle, were identified. In the literature, two of the 10 recorded species were identified during field surveys. The number of species identified at the end of literature and field survey is 22.

✓ **Aves:** As a result of field studies, 85 bird species belonging to 33 families were identified and 12 species were included as new records for this area.

The number of Desert Lark (*Ammomanes deserti*) individuals, which is the recommended species to be monitored, observed in the Akmağara neighborhood countryside during 2018 year field survey studies in Tek Mountains National Park is 2.

41% of the species observed in Tek Tek Mountains NP (18 bird species belonging to 14 families) were observed in Rüstem valley.

✓ **Small Mammals:** 14 species belonging to Rodentia (Rodents), Eulipotyphla (Insectivorous) Chiroptera (Bats), which are small mammals, were identified in the Tek Tek Mountains NP.

✓ **Large Mammals:** As a result of field studies conducted directly and indirectly in the region, 5 species belonging to Rabbits (Lagomorpha) such as *Lepus europaeus* (Wild rabbits), Predators (Carnivora) such as *Canis lupus* (Wolf) *Vulpes vulpes* (Red fox), *Mustela nivalis* (Least Weasel) and *Martes foina* (Rock marten) were identified in the Tek Tek Mountains NP steppes with direct and indirect observations.

As a result of field studies and face-to-face interviews on gazelles (*Gazella marica*) in the National Park, no traces of gazelle were encountered within the borders of the National Park.

However, upon a sensation/hearing received in July (2019), a field study was carried out within the boundaries of Bağış Village adjacent to the eastern border of Tek Tek Mountains National Park on 25 July 2019 and the gazelle feces were photographed and UTM coordinates were recorded. Six days after the survey, the mentioned gazelles were imaged.

Whether or not these gazelles are natural and their population status should be examined.

✓ **Agricultural Biodiversity:** In the localities visited in Tek Tek Mountains NP, 1 wild relative of Barley (*H. spontaneum*) and 4 wild relatives of wheat (*T. diccoccoides*, *A. triuncialis*, *A. biuncialis*, *A. columnaris*) were identified.

Wild crops known as the primary ancestors of chickpea (*Cicer pinnatifidum*), pea (*Pisum sativum*), oriental wild lentil (*Lens culinaris* subsp. *orientalis*) and lentil (*Lathyrus cicero* subsp. *orientalis*) belonging to Fabaceae family were observed in Tek Tek Mountains. When the previous studies were investigated, it was observed that there was no evidence that both cereals and legumes were spread in these areas.

In particular, the wild *Lens* and *Cicer* are less dense due to their poor competitive capabilities; stony and rocky hillsides are important habitats for them. It can be stated that the most important habitat for *Pisum* sp. is the river bed and valley floor of Rüstem Valley in Tek Tek Mountains NP.

2.1. Threats and Recommendation for Biodiversity

The biodiversity threats encountered in Tek Tek Mountains NP are; **1.** Human-induced threats and damages to be restored; (Converting natural habitats to agriculture and settlement areas, Unconscious livestock and overgrazing, Unconscious agricultural activities (use of artificial fertilizer and unnecessary pesticides etc.), Environmental and plastic pollution, Other human activities that reduce soil quality, Replacement of natural river beds and pollution of waters, especially in winter and early spring periods, Stubble burning etc.) and **2.** Natural threats; (Global warming, Falling rainfall rates or irregular rainfall regime, Reduction of groundwater resources)

Recommendations for eliminating the threats factors for biodiversity conservation in Tek Tek Mountains NP are given below.

- Improving the existing meadows and pastures in the study areas; supporting local plant species in breeding studies and looking for rotational grazing opportunities will provide significant improvement in terms of conservation,
- Investigating alternative opportunities (such as ornamental and medicinal plants, ecotourism) in livestock and agriculture-based areas; creating opportunities for cultivation of plants with significant potential in park and garden landscaping as ornamental plants,
- Sending rare and endemic plant specimens and seeds to gene banks and / or investigating onsite (*in-situ*) conservation opportunities,
- *Pistacia palaestina* is recommended for monitoring and preparation of a Species Conservation Action Plan.
- Ensuring the cooperation with administrative and local authorities and non-governmental organizations for the protection of plant diversity,
- Identifying the population of, *Centaurea obtusifolia* and *Asphodeline damascena* subsp. *gigantea* taxa, monitoring them and preparing an action plan,
- Preparing guidelines for training of plant pickers in the region and informing the

public,

- Strick protection of Rüstem Valley and Silesor Creek, located to the north of the Tek Tek Mountains National Park,
- Organizing periodical trainings, presentations, artistic and cultural activities in a visitor promotion center to be established in the region to guide and raise the awareness of tourists coming to the area correctly,
- Panels, educational materials and brochures for the promotion and awareness of the biodiversity of the study area for the stunning information and photographs about the resource values of the site in the visitors' introduction center,
- Preparing information and promotional materials for visitors in these buildings and explaining the importance of protection of wild relatives of cultivated species as well as other resource values,
- Implementing information, warnings, inspections and sanctions to the stakeholders in order to prevent the destruction of the areas within the scope of the study for reasons such as overgrazing, opening agricultural areas, road construction and extension, illegal building construction,
- Keeping as far away from the natural steppe ecosystem as possible due to all kinds of activities (overgrazing, creating agricultural areas, road expansion, construction, transportation, operation, incineration, demolition, waste storage, noise and light pollution, earthmoving, etc.) to be carried out in the area, conducting continuous control in the process,
- Providing the maintenance of the ancient settlements Soğmatar and Şuayb City within the borders of Tek Tek Mountains NP with the support of real and effective professional experts,
- Establishment of a mechanical barrier (fence, wall, etc.) between the floristic / faunistic and ecologically critical sensitive points determined by the project in order to preserve and maintain the natural structure of the steppe ecosystem in the study area,
- Implementation of conservation practices and conducting monitoring activities in areas where the distribution areas of Tortoise and Big Viper are concentrated in the area,
- Although outside the boundaries of the National Park, the gazelle population observed in the vicinity of Bağış Village on the eastern border of the National Park should be closely monitored and urgently protected,
- Considering the location, vegetation, pasture structure and land use characteristics of the National Park together, the evaluation of Tek Tek Mountains National Park, located in the historical habitat of gazelles and already observed with gazelle community, as a natural gazelle community,
- Controlling the activities of business establishments such as quarries that are around the National Park, though they are not within the boundaries of NP.

3. SOCIO-CULTURAL AND SOCIO-ECONOMIC FEATURES

Considering the social, economic, cultural and gender roles in Tek Tek Mountains NP, it is possible to list the results/observations and recommendations as follows:

✓ **Socio-cultural Features:** Family and kinship ties in the region are still important. Although formal educational institutions are the basic educational institutions, secondary educational institutions, health institutions, other institutions that support education and development in the context of agriculture and livestock husbandry development are relatively insufficient. Mobile education is one of the main problems of the region. Blood feuds, conflicts and hostility are greatly diminished. Social leaders are mediators in the conflicts that occur from time to time. It is recommended that social leaders be evaluated in the context of the successful implementation of the project. Although the traditional information systems and actors have been transformed to a great extent due to the mass media, the village's history, heritage, and the leadership of elderly and experienced people in agriculture and animal husbandry remain relatively important. The general groups of the regions are farmers, shepherds, traders and seasonal workers. Most of the villages do not have occupations or tradesmen. This is a major disadvantage for the development of villages. Land distribution in the region is mostly shared –joint titles are common. There are very few personal (single) title deeds. The joint ownership of the title deed creates problems in developing/implementing projects and supporting cooperatives. The landless family is quite high in the region. Landless families earn their living by working as seasonal workers. Market-oriented production is widespread in agricultural products but very limited in animal products. In general, production is aimed at meeting household needs. The products left over from the households are brought to the market. In the context of rural development, a conscious, systematic market culture has not been found. Multiple childhood is common. The reason for this is that both men love children and see children as labor force. Polygamy is rare.

✓ **Socio-economic Features:** Wheat, barley and cotton” are the most cultivated products in Project area. With the introduction of irrigated farming, the number of animals has decreased considerably in recent years. There is a seasonal migration out of the village-neighborhood in the project due to limitations in agricultural production, large family structure and limitation of employment opportunities. An important part of the population works under difficult conditions over 5-9 months of the year.

The basic livelihoods of families may vary according to the amount of agricultural land assets and labor force. The main source of livelihood is based on 70% crop production and 30% seasonal agricultural labor.

✓ **Recreation and Tourism in Tek Tek Mountains NP:** There is an area for recreational purposes within the National Park area. There is one Administration Visitor Center in the area that is arranged for daily use and the internal arrangement of the center has not been completed yet.

The northern part of the National Park includes natural and cultural richness that will enable visitors to visit the area to take part in activities such as nature walks, photo safari, painting, landscape viewing, camping, flora and fauna, and visiting cultural, historical and archaeological sites.

Although the Tek Tek Mountains have important opportunities in terms of history and culture tourism, a general evaluation should be performed by taking this together with other fields in the context of “complementary tourism mobility”. From this point of view, potential tourism types that appear in the study area are as follows; **i. Rural Tourism – Ecotourism** (*Bird watching, Wildlife monitoring, Nature hiking, Photo safari*), **ii. Culture tourism**, **iii. Agro-tourism**.

3.1. Threats and Problems

- Greenhouses, apiculture, cooperatives and project-based economic activity seem to be absent with exceptions. Priority should be given to the necessary training and incentives.
- Rangeland is threatened by drought, misuse and construction.
- Both ruminant and cattle breeding are widespread in the region. However, there is a decrease and a slowdown in the sector due to the risks mentioned above.
- Infrastructure, superstructure and sewerage services are largely inadequate. While the roads are relatively good, in-village services are inadequate in most places.
- Recently, with the establishment of organized industry, the waste water of the industry passes through some villages in the region. Therefore, humans and animals become ill. The people of the village are disturbed both by the disease of the animals and the mosquitoes caused by this water.
- Protected wildlife in the region is at risk of hunting and theft.
- Vocational training and courses for women in the region are very poor. However, women demand training courses. Since most of the villages do not have health services, they go to city hospitals.
- The perception of girls or boys in the region is against girls because of dominant social relations and economic activity. The ratio of those who give equal value to both sexes is very small.
- Generally, the right to inheritance and property belongs to the man. No rights are generally granted to women. Women are often given low-value gifts to renounce their rights.
- The economy in Tek Tek Mountains NP and its vicinity is generally based on agriculture and animal husbandry, with little trade. However, animal husbandry is gradually decreasing due to the increase in costs and drought causing seasonal agricultural and paper collection to emerge. Crop plant production is generally not practiced in the villages. Existing plants are also exhausted due to incorrect collection.
- The villages close to the city in the region under investigation started to lose its structure as a result of the pressure/domination of the city. Poverty, drought, unemployment triggered migration from the region to the city and into different provinces, while the villagers turned to subcontracting.

3.2. Recommendation on Socio-cultural and Socio-economic Features

The proposals for working areas for rural development are discussed under four main sections. These are related to the economic, organizational, socio-cultural, environmental recommendations.

✓ **Basic recommendations for economic purposes;** increasing irrigation opportunities in crop production, increasing productivity in crop production, conducting studies on product diversity, performing demo studies on closed soilless vegetable production, providing input support to reduce costs, breeding on animal husbandry establishment of processing plants for milk and dairy products, diversification of products and marketing high value-added products, encouraging them to be carried out through cooperative initiatives, establishment of forage supply facilities, mushroom cultivation for women, pilot activities such as poultry farming, development of products for rural tourism and integration of tourism activities with agriculture.

✓ **For organizational purposes;** establishing co-operatives that will bring women's presence to the forefront in crowded populations and improving the existing cooperatives, common attitudes to reduce input costs, training for women and men on the subject of cooperatives.

✓ **For socio-cultural purposes;** establishment of social facilities to engage women in joint activities; creation of special programs for young people; vocational education, technology literacy, identifying activities that will facilitate the integration of home and work life for women and providing the folkloric values specific to the region.

✓ **For environmental purposes;** Rehabilitation of pasture and improving the productivity, village-settlement landscaping, initiation and completion of sewerage works, improvement of village-settlement roads, providing sustainable use of medicinal and aromatic plants and transforming them into economic value, conservation of biodiversity and awareness raising and taking measures for drinking water, especially in summer months.

The main activity components of the Strategic Plan in terms of Development in the study area can be grouped under 4 main areas such as;

1. Processing and selling of agricultural products,
2. Activating livestock potential,
3. Increasing the value added income from agriculture,
4. Development of tourism on the common basis of tourism-agriculture-history-culture.

4. ONGOING GRAZING ACTIVITIES

According to 2019 data of Şanlıurfa Provincial Directorate of Agriculture and Forestry in 7 settlements within Tek Tek Mountains NP; there are 10771 ruminants and 205 cattle. There is a pasture area of 105463 ha in the National Park that is jointly used with cattle, ruminants and wild animals.

There is a grazing below the grazing capacity in Tek Tek Mountains NP. This is a positive situation for pasture vegetation and animal nutrition.

10696 tons of roughage is produced from Tek Tek Mountains. Forage requirement of the existing animals in the study area is 5379 tons. Accordingly, there is an excess of 5317 tons of roughage for the existing animals in the project site.

4.1. Problems and Recommendation

In NP, the quality of pastures is poor. It is possible to increase the yields 2-3 times as a result of the protection of the pastures used in WDA for a period of 3-4 months.

The ratio of other pasture plants in the grazing area was higher than that of both cereals and legumes. This is not desirable situation. This is due to the fact that the animals in the pasture graze primarily plants which are delicious and of good quality. As these plants are grazed, the proportion of plants in the reproductive and invasive groups increases. Ideally, the ratio of cereals should be 70% and legumes should be 30% in a pasture. In order for this ideal cycle to occur, the animals should be grafted/ inoculated in the pasture and the seeds of the grass and legume plants compatible with the pasture should be grafted/inoculated. In addition, poisonous, prickly plants that are not grazed by animals should be controlled.

It is risky for wild and cultivated animals to maintain their life and yield shares in a sustainable manner due to the poor and insufficient vegetation of the pastures in the project area. However, the region is threatened by drought, temperature and desertification in some seasons. In addition, yields of pastures decrease in terms of both quality and quantity due to early grazing in spring and overgrazing of pastures. As a result of this vicious cycle and continuity, plant and soil loss as well as erosion are significant problems in the pastures.

The way to prevent this is not to graze the animals in the pasture in early spring. A controlled grazing should be practices, if necessary, appropriate seeds from outside the region should be sowed in the pasture, and inoculation and fertilization should be conducted. Among the pasture restoration techniques, wells should be drilled for the purpose of animal watering in appropriate sections of Tek Tek Mountains NP and salt shakers, water-bowls, shades, pasture paths, itching stakes should be facilitated for the animals in the pasture.

A good pasture management planning is required for the sustainability of steppe areas. This plan has four basic principles. The success of these plans depends on their thorough implementation. **1-Grazing in appropriate season grazing, 2-Grazing with the appropriate type of animal, 3-Uniform grazing, 4-Grazing with the number of animals according to the grazing capacity.**

The reactions of plants against grazing in all seasons and every development and growth period are different. Therefore, it is extremely important for successful management to examine all the seasons thoroughly and determine the periods where the plants are not damaged. There are critical periods where pasture plants are sensitive to grazing and therefore should not be grazed at. These periods are; The Critical Period of Spring, The Period of Summer and The Critical Period of Fall.

For these three seasons, critical periods should be determined based on the characteristics of the grazing areas and the plant composition. These periods should be taken into consideration in planning the grazing activities.

In the grazing planning and pasture breeding studies, forage preferences of the animals and the plant composition of the pastures should be examined very well and planning should be carried out according to these characteristics.

In order to increase both pasture productivity and animal production in pastures, “Rotational Grazing System” should be applied in the study area.

5. LIVESTOCK SITUATION

Ruminant and cattle breeding in the region are carried out by traditional methods based on pasture management. The animals are grazed in the pasture from spring to late autumn, and in winter they are fed with ration mostly consisting of barley and straw. Cattle breeding in the field can be divided into three methods; fattening cattle for meat production, dairy cattle breeding for milk production and traditional cattle breeding to meet their own needs.

It is a common practice to rent pastures as wintering areas or barracks in the region. There are 46 pastures that are rented out as a wintering areas in Şanlıurfa province. The ones related to Tek Tek Mountains NP are given in Table 1. This mode of operation leads to intensive grazing of pastures not only in this area but also in other areas.

Table 1. Rangeland enterprises related to Tek Tek Mountains NP

RANGELAND ENTERPRISES		Location of protected areas and rangeland	Status of enterprises
Town	District		
EYYÜBİYE	PAYAMLI	Located within the project area of Tek Tek Mountains NP	Passive
HALİLİYE	TOPRAKLI	Located within the project area of Tek Tek Mountains NP	Active
HALİLİYE	KAPAKLI	Located within the project area of Tek Tek Mountains NP	Active
HALİLİYE	KÖSECİK	Located within the project area of Tek Tek Mountains NP	Active

There are a total of 11 thousand small cattle and 200 cattle in the villages located in Tek Tek Mountains National Park. Almost all of the small ruminants are native breeds, while 75% of the cattle are culture breeds and hybrids.

The following conclusions and suggestions are presented based on the results of observations and researches about animal husbandry activities.

1. An alternative marketing network (Marketing cooperative?) should be sought to change the favor of producers in introducing animal products to the market.
2. Because of sharing the same pasture, animals in the Tek Tek Mountains NP (especially small ruminants) should be vaccinated for epidemic diseases (Brucella, alum, smallpox, echtyma etc.) which carry the risk of contamination to the gazelles. As well, regular monitoring of vaccination should be ensured.
3. Producers should be provided with basic training information (care-feeding) and general health protection rules (**isolation**: keep disease factors away, **immunization**: vaccination against common diseases and hygiene: pay attention to healthcare).
4. Grazing should be prohibited in areas where intensive grazing is carried out and which are important for the steppe ecosystem and grazing activities should be limited by applying pasture rehabilitation activities in Rüstem Creek Valley.

5. Support for animal production (credit, direct income support, tax exemptions, reduction of input costs, marketing support, etc.) should be reviewed in favor of the producer and an integrated, coherent support policy should be established.
6. Cattle farming should be encouraged rather than sheep to reduce the intensive grazing pressure on pastures.
7. The rented areas in and around Tek Tek Mountains NP as wintering areas should be shut for operation.
8. Uncontrolled animal movements should be prevented to combat epidemic diseases.

6. BUFFER ZONES IN TEK TEK MOUNTAINS NP

Ecological, social pressure and threat characteristics were taken into consideration in the formation of buffer zone for Tek Tek Mountains NP by considering time and data accessibility limitations. Based on these characteristics, the criteria given in Table 2 are taken into consideration.

Table 2. Criteria used in determining buffer zone (taken from Anonymous 2004)

Criteria		High Sensitivity	Low Sensitivity
Ecologic	Slope	Steep slope > 10%	Plain or slight steep areas
	Aspect	Southern and western aspects	Northern and eastern aspects
	Available species	Important flora and fauna areas	General species and exotic species
	land use / land cover in vicinities	Steppe vegetation	Open areas
	Surface water	Spring waters, streams	
Cultural/Social	Historical / Archaeological sites	Registered and unregistered archaeological sites	
Pressure/threats	Structured Areas (Land use / land cover in the vicinity)	Urban Texture, Industry, Trade and Transportation Areas, Mine, Garbage Discharge and Construction Areas	

The buffer zones identified for the Tek Tek Mountains NP were determined based on both the evaluations of experts in the field survey and the literature data. Equal weight was given to the criteria used here. Land uses outside the boundaries of the project sites but which are important in terms of biodiversity, ecosystem representation, archaeological / historical elements and which create pressure / threat are also taken into consideration. The buffer zones were then created by overlying all these data in the ArcGIS environment.

The important habitats and buffer zones (Figure 1, Figure 2) proposed by the experts within the framework of their expertise in the Tek Tek Mountains NP are shown in Figure 3.

The sizes of buffer areas determined as a result of the studies are given in Table 3.

Table 3. The spatial data for Tek Tek Mountains NP and Buffer Zone

Name	Area (Ha)	Buffer zone (Ha)
Tek Tek Mountains NP	19335	13732

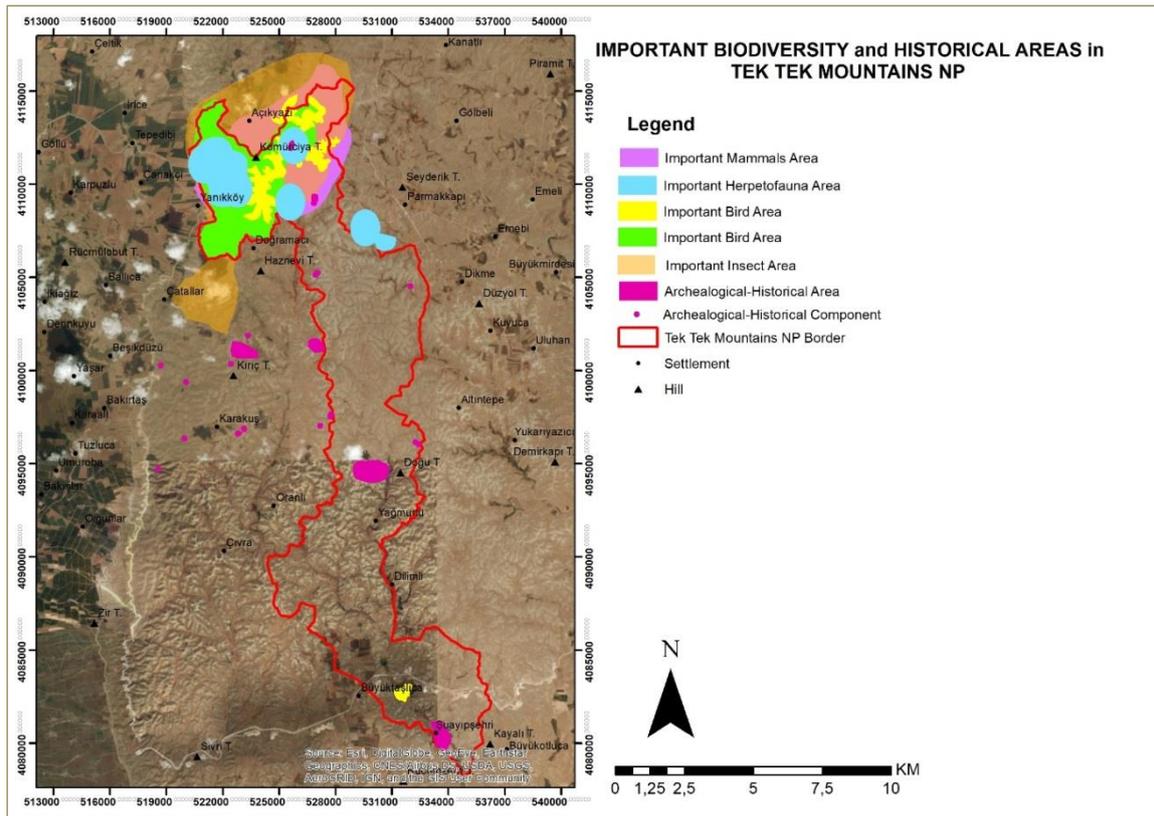


Figure 1. Ecological Criteria for Determining Buffer Zone for Tek Tek Mountains NP: Important Habitats and Recommended Buffer Areas

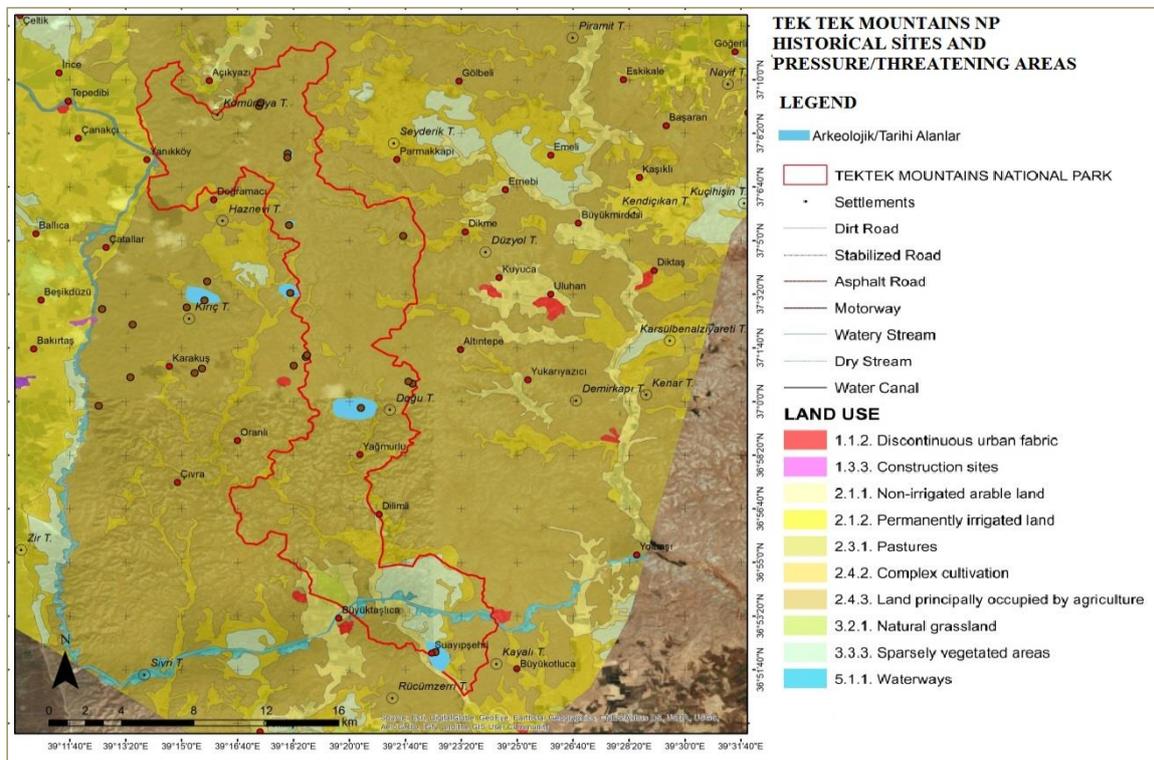


Figure 2. Cultural / Social Elements and Pressure / Threats Used in Determining Buffer Zone for Tek Tek Mountains NP

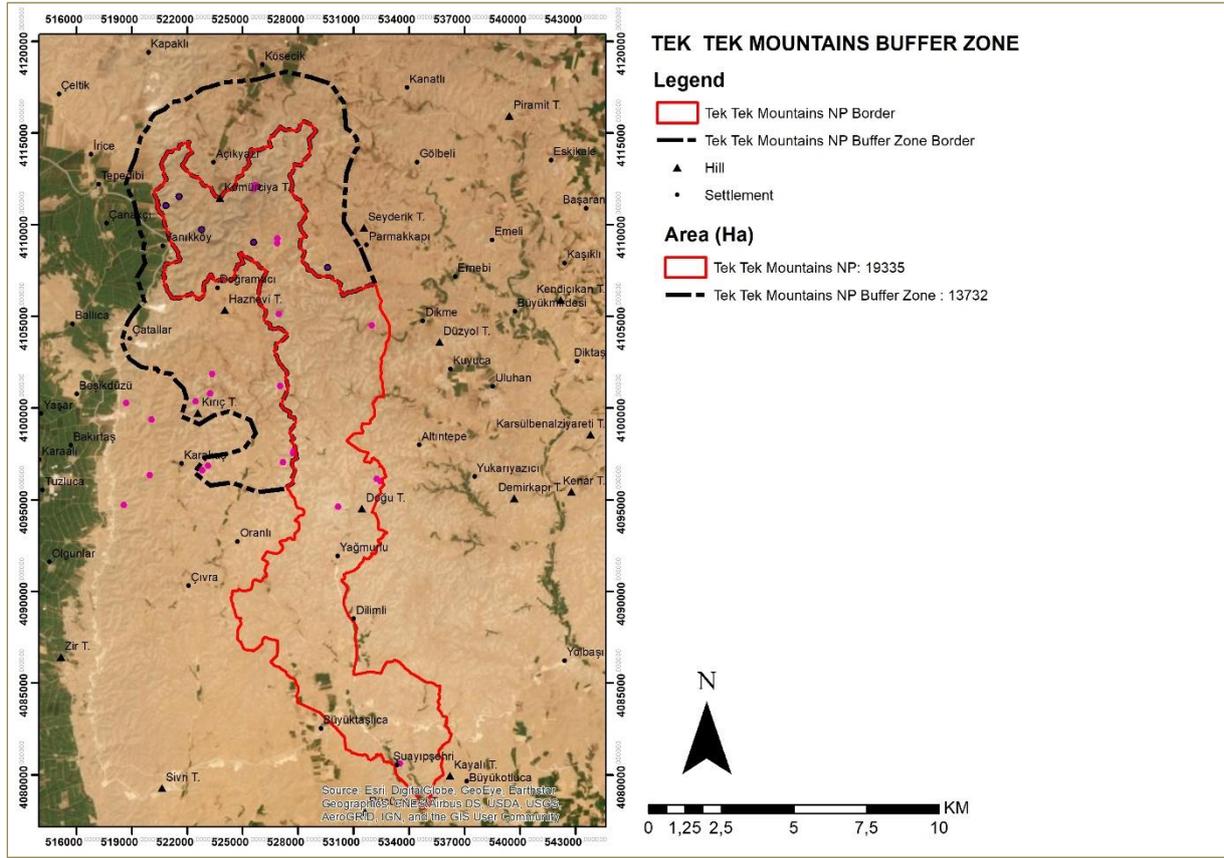


Figure 3. Determined Buffer Areas Around Tek Tek Mountains NP

