Aristotle University of Thessaloniki,
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and Sustainable Exploitation of Native Plants”

Course: 8.1 Advanced Practical Exercise

Wild flora, potential use and conservation of coastal areas of the AUTh Farm

supervisors: Prof. Stella Kokkini, Yannis Tsougrakis
examiner: Prof. Ioannis Tsiripidis

ECO–AUTH

in cooperation with the Eco-AUTh office

Marion Dorsch, 22.01.15

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1 Abstract

The coastal area of the AUTh Farm is on of the only places that contains natural habitats between built-up areas along the coast near the city of Thessaloniki. Therefore it is important for many plant and animal species and should remain as a natural area. There are many problems at the site, such as pollution, trash dumps and the accessibility by cars. It would be a great achievement to solve those problems and use the area in a way that is beneficial for nature and society. This practical was a preparatory work in order to detect values and problems and suggest possibilities for the use of the site in the future.

2 Introduction

The coastal area on both sides of the airport of Thessaloniki consists of unstructured and fallow land extending from Peraia to the southwest region of IKEA in the northeast (Figure 2.1). The site includes a part of the Aristotle University Farm on the northeast side of the airport. In my internship I concentrated on the coastal, uncultivated area of the AUTh Farm and a patch next to it (smaller framed area). This area covers approximately 0.37 km^2 and has the major characteristics of a wetland.

Figure 2.1: General view of the surrounding coastal areas of the airport of Thessaloniki.

In my internship I concentrated on the smaller framed part, which is the coastal area of the AUTh Farm and a patch next to it (rotated Google earth satellite image, changes made by Yannis Tsougrakis and Marion Dorsch).

The natural conditions on the wetland site are similar to those of the nearby Natura 2000 sites, therefore it is reasonable to assume that the site covers significant habitat types, that are important for the conservation of several rare plant and animal species.

Since the late 1980s occasional bird observations indicate the presence of significant, even major bird species during both the breeding season and the migration. These sites are of importance for birds because they are some of the only remnants of wetland areas between built-up areas along the coast (Y. Tsougrakis, 2015, pers.comm.).

In my internship I didn't collect information about the birds, because of the restricted options during the winter season. I concentrated on the wild flora of the site and its categorization into habitat types.

The aims of this thesis were to estimate the values and problems of the site through identification of habitat types and comparison to the nearby Natura 2000 sites Angelochori and Epanomi. Another goal was to suggest conservation measures and find some ideas for the potential use of the site in the future.

3 Methods

In order to collect data and information about the site the following methods were used. During the field work the site was examined, photos were taken to document the vegetation and the conservation status and plants were collected in order to identify them. With the following identification I had at first some difficulties, because I was not familiar with such vegetation types. Furthermore many members of the halophytic vegetation are generally difficult to identify and in the period of the collection I was mostly not able to get specimens with flowers and fruits. The next step was to assign the plant species and conditions to habitat types. Therefore the classification of the Natura 2000 habitat types was used. These habitat types were mapped with the use of photos of the site and their GPS coordinates on a Google earth satellite map. In order to compare the habitat types and their condition to a Natura 2000 site with similar natural circumstances, I visited the site Angelochori.

4 Results

4.1 Habitat types

The most conspicuous plants that cover a major part of the coastal area are halophilous scrubs that belong to the *Sarcocornetea fruticosi* class. This vegetation represents the habitat type “1420 Mediterranean and thermo-Atlantic halophilous scrubs”. It is described as: “Perennial vegetation of marine saline muds (schorre) mainly composed of scrub, essentially with a Mediterranean-Atlantic distribution (*Salicornia, Limonium vulgare, Suaeda* and *Atriplex* communities) and belonging to the *Sarcocornetea fruticosi* class” (Interpretation Manual of European Union Habitats, 2007). Typical plants of this habitat type are *Halimione portulacoides, Sarcocornia perennis, Arthrocnemum macrostachyum, Halocnemum strobilaceum* and *Limonium* spp.. The present saline and muddy soils, that are partly covered by water are typical conditions for this habitat type (Interpretation Manual of European Union Habitats, 2007).

This habitat type can be distinguished on the site in two different plant compositions (Figure 4.1). The area that is nearer to the sea and has a higher elevation consists of a wider variety of plants with big halophilous shrubs (Figure 4.2). On this area *Halimione portulacoides*, big shrubs of *Arthrocnemum macrostachyum*, *Plantago coronopus*, *Dactylis glomerata* and *Limonium* spp. were collected. The area with the other plant composition extends on a lower elevation and contains shorter halophilous shrubs with only single larger individuals in between (Figure 4.3). *Arthrocnemum macrostachyum, Halocnemum strobilaceum* and *Sarcocornia perennis* were collected.

Figure 4.1: Different plant composition of the habitat type 1420 on higher and lower elevation

On lower elevation the vegetation has a reddish color and consists of shorter shrubs, while bigger shrubs are mostly growing on higher elevation (12.11.2014, Marion Dorsch).

Figure 4.2: Plant composition of habitat type 1420 on higher elevation
(26.11.2014, Marion Dorsch)

Figure 4.3: Plant composition of habitat type 1420 on lower elevation
(26.11.2014, Marion Dorsch)

In this habitat type there were also very occasionally individuals of *Juncus* spp. found. As this is normally the case in the 1420 habitat type, these foundations were not enough to assume the presence of the 1410 habitat type "Mediterranean salt meadows (*Juncetalia maritimi*)", for which *Juncus* spp. are the major species.

Partly mixed with the habitat type 1420, remnants from the habitat type 2110 occur on the site. This habitat type "2110 Embryonic shifting dunes" is characterized as the first stages of dune construction at the coast. It is sparsely vegetated and close to the sea (Habitats Directive Article 17 Reporting, Interpretation Manual of European Union Habitats, 2007).

Figure 4.4: Remnants of habitat type 2110

Many plastic bottles and styrofoam between *Sporobolus pungens* and *Halimione portulacoides* (12.11.2014, Marion Dorsch).

Typical plants of this habitat type are *Elymus farctus* (*Agropyron junceum*), *Leymus arenarius, Honkenya peploides, Sporobolus pungens, Euphorbia peplis, Otanthus maritimus, Medicago marina, Anthemis maritima, A. tomentosa, Eryngium maritimum* and *Pancratium maritimum* (Interpretation Manual of European Union Habitats, 2007). *Sporobolus pungens* together with *Halimione portulacoides* has been collected on sandy soil only few meters from the sea (Figure 4.4). This habitat type is very much polluted with trash, which could be the reason why there are only remnants of 2110 left that are mixed with 1420. But it also has to be taken into account that the time of sampling was not in an optimal season to collect all plants of this habitat types.

Next to the sea indicators of the habitat type “1210 Annual vegetation of drift lines” have been collected. This habitat type consists of mostly annual plants that occupy accumulations of drift material and gravel rich in nitrogenous organic matter, frequently on flat and narrow sandy beaches. The vegetation belongs to the *Cakiletea maritimae* class (Interpretation Manual of European Union Habitats, 2007; Sykora K. V., et al., 2003). *Cakile maritima* has been collected between drift material on sandy ground (Figure 4.5). As there is also a lot of trash washed up at the drift lines, this habitat type seems very disturbed.

Figure 4.5: Indicators of habitat type 1210

At the drift line a lot of washed up trash accumulates (12.11.2014, Marion Dorsch).

On higher elevation, next to the habitat type 1420 single individuals of *Spartium junceum* and *Tamarix hampeana* have been recorded (Figures 4.6, 4.7). These are hints of the habitat type “92D0 Southern riparian galleries and thickets”. This type describes Tamarisk, oleander, and chaste tree galleries and thickets and also similar low lignieous formations of wetlands of the thermo-Mediterranean zone (Interpretation Manual of European Union Habitats, 2007).

Figure 4.6: *Tamarix hampeana*
(26.11.2014, Marion Dorsch)

Figure 4.7: *Spartium junceum*
(26.11.2014, Marion Dorsch)

The approximate location of the identified habitat types was mapped on a Google earth satellite map (Figure 4.8). The largest part of the site is covered by the 1420 habitat type on lower elevation, which is attached to the fields. More seawards the stripes of the habitat types 1420 on higher elevation, 2110 and 1210 extend along the coastline. Where 1420 lays more inland and 1210 on the narrow beach directly next to the sea.

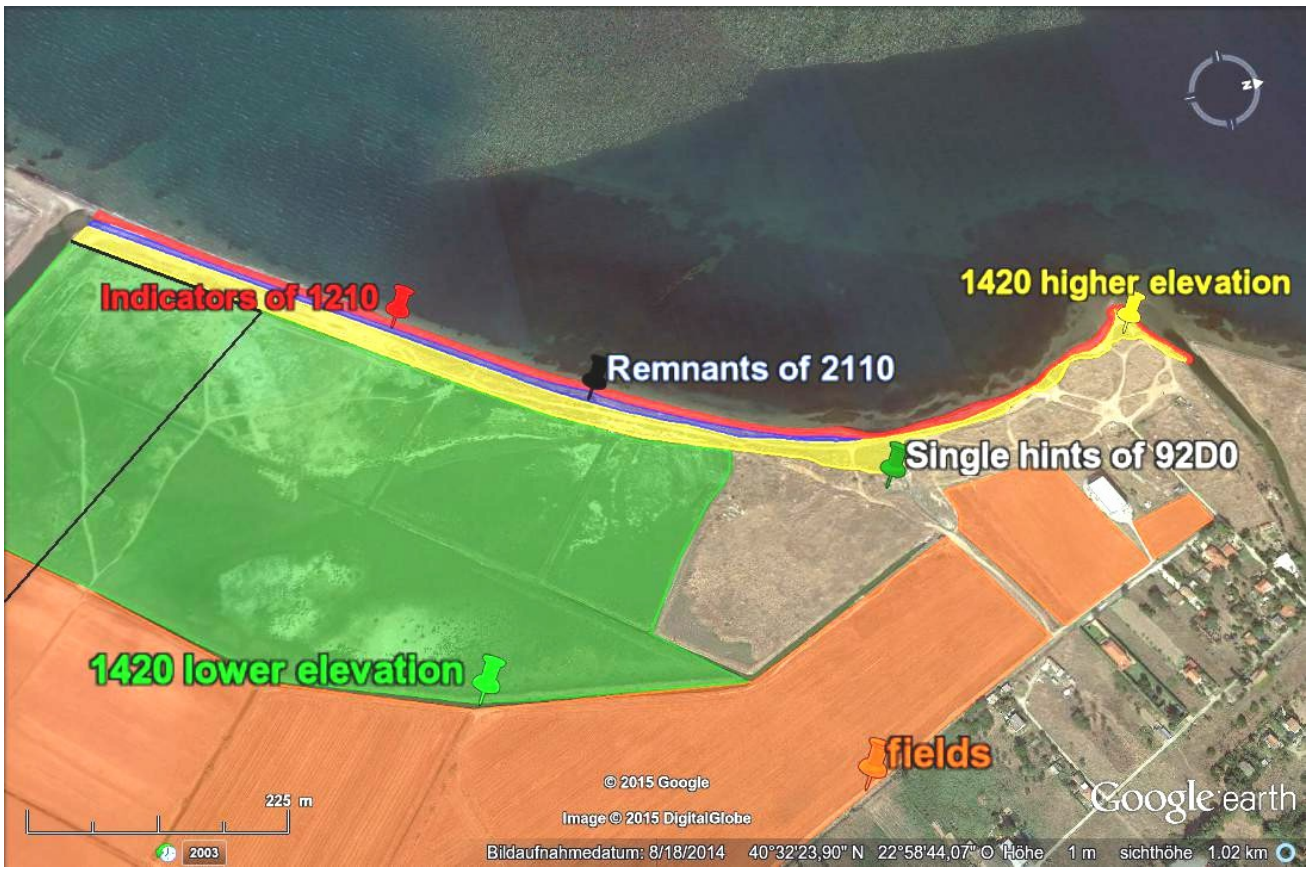

Figure 4.8: Habitat map

The location of the habitat types was mapped approximately on a Google earth satellite map. The habitat types are displayed in the following colors: 1420 on higher elevation in yellow, on lower elevation in green, remnants of 2110 in blue, indicators of 1210 in red and the fields are shown in orange. Additionally the location where single hints of the 92D0 habitat type have been collected is labeled in white.

These habitat types also occur in the nearby Natura 2000 sites Angelochori and Epanomi. Although they are much more polluted and disturbed on the present site, the site contains the natural conditions for these habitat types with their features for plant and animal species. Some habitat types of the Nautra 2000 sites cannot exist on the area, because of missing geomorphological conditions, for example " 2190 Humid dune slacks" or "2220 Dunes with *Euphorbia terracina*". Others may not exist because of disturbance or because they had been present in the past and have disappeared, like "1410 Mediterranean salt meadows (*Juncetalia maritimi*)" or "1150 * Coastal lagoons" for which the conditions would be given.

4.2 Problems on the site

In general there are many problems for the habitat types, that are present on the site, in Greece. The assessment on the conservation status of the habitats by the European Environmental Agency is mostly bad. The assessment of the habitat type 1420 as an example: “The habitat type 1420 is rather common on the Greek coastline, near the coastal lagoons and river mouths (Amvrakikos and Messolongi lagoons, Evros, Nestos, Axios-Aliakmon and Sperchios deltas). The overall assessment of this habitat type is bad, due to the important anthropogenic impact on this habitat type and the lack of an effective sustainable management. In the Natura 2000 sites the overall assessment is better, but still inadequate and deteriorating.” (Report on the main results of the surveillance under article 11 for annex I habitat types).

Threats and pressures that are present on the site are listed in the table below (Table 4.1). One of the main problems is the garbage that is spread on the site. Near the coast it is mostly trash that comes from the sea and is washed up at the beach. It consists mostly of plastic bottles, but there are also many very small plastic peaces and styrofoam from fisher boats and other fishing and shipping equipment (Figures 4.9, 4.10). But there is also a big amount of garbage present that has been dumped at the site. This garbage is a pressure for the plant and animal species and also pollutes the soil with its substances. There are for example piles of big stones, furniture, roof material or other construction waste and car parts laying around (Figures 4.11, 4.12). The huge amount of garbage partly derives from another problem, the easy accessibility by cars, which makes it possible for

people that dump their trash to get on the site. Furthermore it allows access to fishermen and hunters, who might also leave trash at the site.

Figure 4.9: Washed up trash (12.11.2014, Marion Dorsch)

Figure 4.10: Washed up trash, mainly plastic bottles (12.11.2014, Marion Dorsch)

Figure 4.11: Dumped roof material (12.11.2014, Marion Dorsch)

Figure 4.12: Dumped construction waste (12.11.2014, Marion Dorsch)

Moreover another problem is the widespread presence of the invasive species *Solanum elaeagnifolium* on the grassland, which displaces native plants. As there are protected bird species nesting on the site the straying dogs represent a danger for their eggs and nestlings. Furthermore the site is much polluted being exposed to the influence of the city by the sea and the airport.

Table 4.1 List of Threats and Pressures

(Reference list threats, pressures and activities, DG Environment, European Environment Agency (EEA), 2011)

Code	**Description**	**Explanations**	**Pressure /Threat**	**Impact**
A03.03	abandonment / lack of mowing	invasive species (*Solanum elaeagnifolium*) on the grassland	PT	M
A08	fertilization	from the near fields	PT	L
D01.01	paths, tracks, cycling tracks	roads and paths	P	H
D04	airports, flight paths	location next to the airport	PT	H
E03.01	disposal of household / recreational facility waste	trash dumps	PT	H
E03.03	disposal of inert materials	trash dumps	PT	H
F02.03	Leisure fishing	fishing from the coast	P	H
F03	Hunting and collection of wild animals (terrestrial)	occasional hunting	P	M
G01.03	motorized vehicles	cars	P	H
H01.04	diffuse pollution to surface waters via strom overlows or urban run-off	impacts of the city	PT	H
H03.03	marine macro-pollution (i.e. plastic bags, styrofoam)	fishing equipment	PT	H
H05.01	garbage and solid waste	from the sea and the trash dumps	PT	H
I01	invasive non-native species	*Solanum elaeagnifolium* on the grassland	PT	M
J02.01	Landfill, land reclamation and drying out, general	drainage ditches	PT	M
J03.01	reduction or loss of specific habitat features	polluted habitats	PT	H
K03.04	predation	straying dogs could eat eggs or nestlings of birds	T	H

5 Discussion and future plans

From the observations made on the site it can be concluded that the site covers habitat types that are of local importance, as they are the only natural habitats that are left over in built-up areas. This habitat types are similar to the ones of the nearby Natura 2000 sites, but in a very bad condition. Furthermore observations of protected bird species, like waders for example, show that they use the site as a nesting and feeding ground (Y. Tsougrakis, 2015, pers.comm.). Therefore it would be desirable to improve the conditions and protect this site and its habitat types, that are a living space for important plant and animal species .

In order to protect the site, I suggest the following conservation measures to be implemented. The first step would be to get rid of the big amount of trash that is present on the site. For this a trash collection event by volunteers or incorporated in a school program for environmental education (see later explanations) would be a very useful tool. Such collection events should be taking part regularly, because as a big amount of the pollution comes from the sea, new trash will be washed up at the beach constantly.

Additionally the accessibility by cars should be forbidden. This would have the effect to minimize activities that introduce trash into the site, such as people who dump their garbage there. Also the trash produced by fishing and hunting can be reduced. It would be possible to block the access for cars at the northern boarder of the property of the AUTh Farm, this would be the responsibility of the municipality. Other roads that lead to the site are already blocked by the Farm.

Solutions against the invasive species *Solanum elaeagnifolium* have to be found.

For the farming it would be important to be considerate of the Grey Partridge (*Perdix perdix*), a bird who is nesting in the fields. The crops should be managed in such a way that this bird is influenced the least.

For a potential use of the site there are several projects possible to promote it to the public. As the site is in close proximity to the city of Thessaloniki it could be implemented as a protected site with environmental education for citizens. Therefore environmental interpretation signs would need to be put up to show the paths that lead to the site and also to explain the present habitat types and give information about the animal and plant species. In comparison to the surrounding protected areas this area would have the advantage that it is accessible by bus and therefore easily to reach for citizens. Also school classes could take this chance and incorporate visits to the site as a vivid element of environmental education in their program.

The site is in general one of the single places that are untilled and show natural habitats at the coast in proximity of the city. Thus it would be also attractive for citizens as an area of recreation for walks and observations. They would have a possibility there to come out of the city and enjoy their walk in a natural environment, as it is very hard to do that in the city because park areas are missing. For the easy access of citizens to the site it would be possible to use the northern coastal area that is outside of the property of the AUTh Farm as a parking lot. After that the road would be blocked so that the people leave their cars at the parking lot and walk from there into the site.

The location of the site in walking distance from the airport opens additional possibilities for its use. Passengers that have planned or unexpected waiting times at the airport could take a walk to the site and experience the environment. This

would be a pleasant opportunity as it is not advisable in such cases to depart far from the airport. Moreover there are also many tourists traveling through the airport that come to Greece for bird watching. For these people it would especially be of great interest to visit the site at a quick stop at the airport for casual birdwatching. Several bird species interesting for birdwatchers are regularly present at the site, like the Eurasian Stone-curlew (*Burhinus oedicnemus*), the Long-legged Buzzard (*Buteo rufinus*) and the Collared Pratincole (*Glareola pratincola*) (Y. Tsougrakis, 2015, pers.comm.). For the accessibility of the site from the airport a trail has to be built or an existing path has to be designated. Therefore signs need to be put up that show the way and inform the visitors. This path could also be used by visitors that come from the city with the bus. For the bird watchers visiting the site it would also be favorable to construct observation hides in the site. It should be investigated whether there is the need to plant some arrangements of trees on the site in order to provide a place that gives shadow for resting and a possibility to hide for bird observations for the visitors.

An implementation of those proposals would be an improvement for the conservation of the site and also for the citizens and visitors. To set up a management body that organizes, manages and controls these plans a cooperation of the AUTh Farm, the municipality and the airport would be ideal. There would be additional human resources needed to be assigned to this tasks. In this cooperation also the issue about birds and flight safety has to be discussed.

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