

Strasbourg, 14 March 2016  
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**T-PVS/Files (2016) 15**

CONVENTION ON THE CONSERVATION OF EUROPEAN WILDLIFE  
AND NATURAL HABITATS

**Standing Committee**

36<sup>th</sup> meeting  
Strasbourg, 15-18 November 2016

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**Complaints on stand-by**

**Wind energy: Possible threats to an endangered  
natural habitat in Izmir (Turkey)**

**- REPORT BY THE COMPLAINANT -**

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## **WIND ENERGY: POSSIBLE THREATS TO AN ENDANGERED NATURAL HABITAT IN İZMİR (TURKEY)**

Wind energy is often considered as an environmentally safe, renewable energy source, however no energy conversion method is free from environmental challenges.

The following report aims to explain why and how the wind turbines destroy and threaten the endangered habitat of the Çeşme peninsula, through out the process of construction and operation, respectively.

It is clearly evident that destruction and fragmentation of habitat caused during the pre-construction and construction phases should have stopped the projects in their planning period, rather than hundreds being installed and in operation. It is also evident that the present laws, regulations and agreements, both at national and at international levels have not been able to fulfill their mandates.

### **1. THE LAND**

Typical Mediterranean terrestrial habitats of forests, woodlands, shrubs and an impressive undisturbed coastline with coastal and marine habitats of the Çeşme peninsula in İzmir, Turkey, feature an extraordinary biodiversity of uniquely adopted animal and plant species.

The diversity of peninsular habitat can best be explained with the large number of *endangered natural habitat types from revised annex to resolution 4 of the Bern Convention*; at least 4 marine habitats, 6 coastal habitats, 2 inland surface water, 4 grasslands and lands dominated by forbs, mosses or lichens, 7 heathland, scrub and tundra, 5 woodland, forest and other wooded land, 2 inland unvegetated or sparsely vegetated habitats and 1 habitat complexes can be identified.

The Çeşme peninsula is the most westernly promontorium of the Anatolian mass towards the Aegean Sea, measuring 65km and 72km, widest in the north-south and longest in the east-west directions, respectively (Ref.1).

The total area of 2685 kmsq is divided amongst five towns, namely, Urla 704 kmsq, Karaburun 484 kmsq, Seferihisar 386kmsq, Çeşme 257kmsq and Güzelbahçe 110kmsq.

The climatic condition is “sub- humid Mediterranean” which is hot and dry in summer and cool and rainy in winter, average annual rain fall, temperature and humidity are 750mm, 17 degrees Celcius and 67%, respectively.

### **2. THE FLORA**

From coastal area to the highest peak at Bozdağ, Karaburun, 1112m, typical Mediterranean vegetation elements cover the peninsula. The forest, woodland and the underlying maquis foster 384 species from 70 families (Ref.2). The peninsular flora is also rich with 76 medicinal, 38 beekeeping, 30 food, 34 landscaping and 19 fodder plants.(Öner H.H. 2012)

According to WWF, “the Mediterranean Forests, Woodlands, and Scrub is one of only five shrublands of its kind, which together support 20 percent of the plant species on Earth. An incredible variety of plants grow in this ecoregion that covers coastal, plains, and highland regions. More than 25,000 species of plants occur here, and more than half are endemic.” (Ref.3)

Another mosaic of habitat on the coastal regions of the peninsula include garigue covering the seaside low hills, sand dunes, rocky formations and caves, which further continue with marshlands, shallow lakes and valleys. The shallow lakes are amongst habitats under protection (Ref.4).

As for the marine flora, *Posidonia oceanica* an important oxygen generator which is at the top of the food chain for small fish *and is amongst the Strictly protected floral species, App.1 Bern Convention*, can be seen in seas surrounding the peninsula.

## Endemic and rare plant species of the peninsula

There are several published works which specifically focus on the endemic and rare plants of the peninsula.

According to Bekat and Secmen; Ekim et al and Oner H.H, 15 endemic, 4 rare and 5 species under CITES agreement and 21 species from the IUCN list were identified on Karaburun peninsula. (Ref.5).

On a study conducted by the Izmir Development Agency , as a part of the 2014-2024 Izmir Regional Plan, “The Peninsular Sustainable Development Strategy”, (Ref.6) flora and fauna are identified according to three main vegetation elements, with endemics and rare species.

1. The forest vegetation is predominantly *Pinus brutia*.
2. The **woodland vegetation**, often mentioned as **maquis**, is very rich and diverse with some endemic plants. Some examples are:
  - Anacardiaceae: *Pistacio lentiscus* L., *Pistacio terebinthus*
  - Cupressaceae: *Juniperus oxycedrus magnacarpa*
  - Ericaceae: *Arbutus andrachne*, *Arbutus unedo*
  - Fagaceae: *Quercus coccifera* L.
  - Myrtaceae: *Myrtus communis* L.
  - Oleaceae: *Olea europaea* var *sylvestris*, *Phillyrea latifolia* L.
  - Rosaceae: *Crataegus monogyna*, *Pyrus amygdaliformis*, *Rosa canina*, *Rubus canescens*
3. Some examples for the **shrub vegetation** are:
  - Cistaceae: *Cistus creticus*, *Cistus salvifolius*, *Cistus parviflorus*
  - Fabaceae: *Anthyllis hermanniae*
  - Lamiaceae: *Lavandula stoechas*, *Origanum onites*, *Thymus vulgaris*
  - Rosaceae: *Sarcopoterium spinosum*
  - Scrophulariaceae: *Verbascum sinuatum*

In the same study the endemics and the rare plant species were identified and evaluated according to IUCN Red Data Book categories:

### Endemics:

**Aristolochiaceae/** *Aristolochia hirta* (LR), **Boraginaceae/** *Symphytum anatolicum* (LR), **Campanulaceae/** *Campanula lyrata* ssp.*lyrata* (LR), **Caryophyllaceae/** *Minuartia anatolica* var. *anatolica*, *Minuartia juressi* ssp. *Asiatica* (LR), *Saponaria chlorifolia* (LR), **Compositae/** *Centaurea acicularis* var.*Urvellei* (VU), *Centaurea caleopsis* (LR), *Centaurea cariansis* ssp.*maculiseps* (LR), *Centaurea Lydia* (LR), **Euphorbiaceae/** *Euphorbia erythron* (LR), *Euphorbia falcata* ssp.*macrostegis* (LR), **Fabaceae/** *Colutea malanocalyx* ssp.*davisiana* (LR), **Geraniaceae/** *Erodium absinthoides* ssp. *Absinthoides* (LR), **Hypericaceae/** *Hypericum avicularifolium* ssp. *Balabsae* (LR), **Iridaceae/** *Crocus fleischeri* (LR), *Crocus oliveri* ssp.*balansae* (LR), *Gladiolus anatolicus*, **Lamiaceae/** *Nepeta cadmea* (LR), *Phlomis nissolii* (LR), *Salvia smyrnea* (EN), *Sideritis sipylea* (LR), *Thymus cilicicus* (LR), **Liliaceae/** *Chionodoxa forbesii* (LR), *Fritillaria carica* ssp.*carica* (LR), *Fritillaria fleischeniana* (LR), **Linaceae/** *Linum tmoleum* (LR), **Papaeraceae/** *Papaver argemone* ssp.*davisii* (VU), *Papaver purpureomarginatum* (CR), **Rubiaceae/** *Galium pendiflorum* (LR), **Scrophulariaceae/** *Scrophularia floribunda* (LR), *Verbascum antinori* (VU), *Verbascum smyrnaeum* (DD), *Veronica pectinata* var. *glandulosa* (LR), **Umbelliferae/** *Heracleum platytaenium* (LR).

**Rare species:**

**Araceae/** *Arum nickelii* (VU), **Caryophyllaceae/** *Limnium graecum* (VU), *Limonium sieberi* (VU), **Compositae/** *Centaurea amplifolia* (VU), **Crucifereae/** *Erysimum pusillum* (VU), **Iridaceae/** *Crocus biflorus* (VU), **Liliaceae/** *Allium albotunicatum* (VU), *Lilium candidum* (VU), **Primulaceae/** *Cyclamen hederifolium* (VU), **Scrophulariaceae/** *Cymbalaria muralis* (VU).

ICUN Red Data Book categories: EX(extinct), EW(extinct in the wild), CR(critically endangered),

EN(endangered), VU(vulnerable), NT(near threatened), LC(least concern), DD(data deficient), LR(least risk)

**PLANTS IDENTIFIED ON KARABURUN PENINSULA**

FAMILY	SPECIES NAME	HABITAT	ABUNDANCE	IUCN
ASTERACEAE	<i>Centaurea cyanus</i>	Forest, rocky areas	2	
	<i>Helichrysum stoechas</i>	Maquis, rocky areas	2	
	<i>Jurinea mollis</i>	Forest, maquis, shrub	3	
	<i>Leontodon tuberosus</i> L.	Forest, dunes, shrub	2	
	<i>Senecio aquaticus</i> ssp <i>erraticus</i>	Forest, maquis, wet lands	3	
<b>ARISTOLOCHIACEAE</b>	<b><i>Aristolochia hirta</i> (ENDEMIC)</b>	<b>Forest floor, vin-yards</b>	<b>2</b>	<b>LC</b>
BORAGINACEAE	<i>Alkanna tinctoria anatolica</i>	Forest, shrub	2	DD
	<i>Alkanna tinctoria subleicorpa</i>	Forest, shrub	2	DD
	<i>Alkanna tubulosa</i>	Forest, shrub	2	LC
	<b><i>Minurata anatolica</i> var.anatolica (ENDEMIC)</b>	<b>Rocky slopes</b>		<b>LC</b>
<b>CAMPANULACEAE</b>	<b><i>Campanula lyrata</i> spp. Lyrata (ENDEMIC)</b>	<b>Garrulous fields, steep slopes</b>		<b>LC</b>
CYPERACEAE	<i>Carex pendula</i>	Forest, coastal line	3	
ERICACEAE	<i>Arbutus andrachne</i>	Forest, maquis	3	
	<i>Arbutus unedo</i>	Forest, maquis	3	
FABACEAE	<i>Anyllis hermanniae</i>	Maquis, shrub	3	
	<i>Calicotome villosa</i>	Forest, maquis	3	
	<b><i>Colutea melanocalyx</i> spp.davisiana (ENDEMIC)</b>	<b>Forest, rocky slopes, shrub</b>		<b>LC</b>
	<i>Dorycnium hirsutum</i>	Forest, maquis, slopes	3	
	<i>Genista accanthoclada</i>	Forest, maquis	2	
	<i>Calicotome villosa</i>	Forest, maquis	3	
	<i>Lathyrus setifolius</i>	Forest, maquis, shrub, slopes	3	
	<i>Medicago coronata</i>	Forest, maquis	2	
	<i>Ononis pubescens</i>	Forest, maquis	3	
	<i>Trifolium boisseti</i>	Forest, maquis	2	
	<i>Trifolium glandiniferum</i>	Forest, maquis	2	
	<i>Trifolium boissieri</i>	Forest, maquis	2	
	<i>Trifolium latium</i>	Forest, maquis	2	
	<b><i>Trigonella smyrnea</i> (ENDEMIC)</b>	<b>Sotney slopes, calcereous rock formations</b>		<b>DD</b>
<b>GERANIACEAE</b>	<b><i>Erodium absinthoides</i> spp.absinthoides(ENDEMIC)</b>			<b>DD</b>
GUTTIFERAE	<i>Hypericum empetrifolium</i>	Maquis	2	
LAMIACEAE	<i>Lavandula stoechas</i>	Forest, maquis, shrub	4	
	<i>Micromeira myrtilifolia</i>	Forest, maquis, shrub, slopes	4	
	<b><i>Sideritis sipylea</i> (ENDEMIC)</b>	<b>Pinus brutia nigra forest, calcereous slopes</b>		<b>NT</b>
LILIACEAE	<i>Colchicum boissieri</i>	Forest, stoney fields	2	
ORCHIDACEAE	<i>Ophrys fusca</i>	Forest, maquis, slopes	2	CR
	<i>Orchis moria</i> ssp.picta	Grassland	3	
	<i>Orchis provincialis</i>	Forest, shrub		CR
<b>PAPAVERACEAE</b>	<b><i>Papaver purpureomarginatum</i> (ENDEMIC)</b>	<b>Roadsides, open fields</b>		
POACEAE	<i>Aegilops umbellata</i> spp. <i>umbellata</i>	Shrub, woodlands, calcareous soil	3	
	<i>Anthoxanthum odoratum</i>	Dry and loose sand dunes	3	
	<i>Pipthatherum miliaceum</i>	Forest, maquis, crop fields	3	
RAFFLESIIACEAE	<i>Cytinus hypocistis</i>	Shrub, maquis	3	

RUBIACEAE	<i>Crucianella angustifolia</i>	Forest, maquis, slopes	3	
SCROPHULARIACEAE	<i>Verbascum splendidum</i>	shrub	2	
SOLANACEAE	<i>Mandroga autumnalis</i>	Historic heritage sites	3	
HYMELAECEAE	<i>Thymelaea tatonaira argentea</i> <i>var.angustifolia</i>	Shrub, grassland, coast line	3	

Abundance: 1-very rare, 2-rare, 3- medium rare, 4-Abundant, 5- Very abundant

Resources: Türkiye Bitkileri Veri Servisi (TÜBİVES), Baytop T., 2007: Türkçe Bitki adları sözlüğü, TDK, Ankara, 2000: Türkiye Bitkileri Kırmızı kitabı

### 3. THE FAUNA

(All pictures in this section are from Ref.17)

The mountain, forest, woodland, shrub and coastal vegetation areas of the peninsula provide rich and diverse habitats for all living organisms. Numerous species of vertebrates and invertebrates inhabit these regions. This wide range includes likes of *Sus scrofa*, *Vulpes vulpes*, *Martes sp.*, *Meles meles*, *Lepus capensis*, *Sciurus vulgaris*, to chameleons and many diverse bird species, butterflies, bugs, beetles, bees, freshwater turtles and crabs (Ref.7).

Sea and the caves of the coastal region are the unique habitat for an an endangered species, under strict control of national and international agreements, i.e the sea mammal *Monachus monachus*. Amongst birds under same conservation care are *Larus audouinii*, *Falco naumanii*, *Falco eleonora*, *Aquila chrysaetos*, *Buteo rufinus* and *Phalacrocorax aritotellis*. Other endangered and very rare species are *Lutra lutra*, *Caracal caracal* and *Rhinophus hipposideros*. Karaburun peninsula alone, nurtures more than 204 land and marine bird species (Ref. 8).

#### 3.1 Birds of the peninsula

According to WWF, birds are amongst the most important indicators of biodiversity, they reflect the features of their habitats and other living organisms that share the same ecosystems. The peninsula's terrestrial regions with islands and coastal areas, host more than 200 species of birds, including marine birds.

FAMILY	SPECIES	HABITAT	IUCN	BERN	Birds Directives	Emerald Annex	CMS	CITES
ACCIPITRIDAE	<i>Accipiter nisus</i>	Forest, shub garden	LC	III, 6	I	I	II	II
	<i>Acquila chrysaetos</i>	Mountain, open fields	LC	III, 6	I	I	II	II
	<i>Buteo rufinus</i>	Shrub, open feds	I	III, 6	I	I	II	II
	<i>Circateus gallicus</i>	Mountain	LC	III,6	I	I	II	II
	<i>Hieraetus fasciatus</i>	Mountain, rocky slopes	LC	6				
APODIDAE	<i>Apus melba</i>	Woodland	LR	II				
COLUMBIDAE	<i>Streptopelia turtur</i>	Prairie, gardens	VU/NT	III	IIB		II	
CORVIDAE	<i>Garrulus glandarius</i>	Shrub, gard forest	LC	III	IIB			
CUCULIDAE	<i>Clamator glandarius</i>	Shrub, forest		II				
EMERIZIDAE	<i>Emerizidae caesia</i> <b>ENDEMIC to EUROPE</b>	Sunny hills, shrub	VU		I			
	<i>Emerezidae cinarea</i> <b>ENDEMIC TO EUROPE</b>	Rocky slopes, shrubs	VU	II, 6	I			
FALCONIDAE	<i>Falco biarmacus</i>	Rocky slopes	EN/VU	6	I	I	II	II
	<i>Falco cherrug</i>	Woodland, steep slopes	VU/VU	II,6	I	I	I;II	II

	<i>Falco eleonare</i> <b>-ENDEMIC TO EUROPE</b> <b>ENDEMIC TO EU27</b>	Small islands, islets	LC	6	I	I	I;II	II
	<i>Falco naumanii</i>	Woodland, shrub, forest	LC	II,6	I	I	I;II	II
	<i>Falco peregrinus</i>	Forest, mountain	LC	II	I	I	II	I
	<i>Falco tinniculus</i>	Shrub, woodland	LC	II			II	II
FRINGILLIDAE	<i>Carduelis carduelis</i>	Forest, shrub garden	LC	II				
	<i>Carduelis chloris</i> <b>ENDEMIC TO EUROPE</b>	Forest, shrub garden	LC	II				
LANIIDAE	<i>Lanius nubicus</i>	Shrub, fields, orchards	LC	6	I	I		
LARIDAE	<i>Larus audouinii</i> <b>ENDEMIC TO EUROPE</b>	Uninhabited islands	EN	II,6	I	II		
	<i>Larus gnei</i>	Wetlands	LC	II,6	I	I	II	I
	<i>Larus melanocephalus</i> <b>ENDEMIC TO EUROPE</b>	Coastal areas wetlands	LC	II,6	I	I	I;II	
	<i>Larus ridibundus</i>	Wetlands sea	LC	II	I	I	II	
MEROPIIDAE	<i>Merops apiaster</i>	Orchards, shrub	LC	II			II	
MUSCICAPIDAE (used to be under TURDINAE)	<i>Ficedula albicollis</i> <b>ENDEMIC TO EUROPE</b>	Shrub, garden forest	LC	II,6	I	I	II	
	<i>Ficedula hypoleuca</i>	Shrub, garden forest	LC	II	I	I	II	
	<i>Ficedula semitorquata</i> <b>ENDEMIC TO EUROPE</b>	Shrub, garden forest		II,6	I	I	II	
PARIDAE	<i>Parus ater</i>	Forest	LC	II	I	I		
	<i>Parus lugubris</i> <b>ENDEMIC TO EUROPE</b>	Forest, shrub garden	LC	II	I	I		
	<i>Parus major</i>	Forest, shrub garden		II				
PHALACROCORACIDEA	<i>Phalacrocorax aristotelis</i> <b>ENDEMIC TO EUROPE</b>	Marine habitats	EN	II,III	I			
PICIDAE	<i>Dendrocopus medius</i>	Forest, shrub garden	LC					
	<i>Dendrocopus syriacus</i>	Forest, shrub garden	LC	II,6				
	<i>Picus viridis</i>	Forest, shrub garden		II,6				
PSITTACIDAE	<i>Psittacula krameri</i>	Orchards farmlands	LC	III				
SITTIDAE	<i>Sitta kruepperi</i> <b>ENDEMIC TO EUROPE</b>	Pinus brutia	NT	II,6	I	I		
STRIGIDAE	<i>Bubo bubo</i>	Mountain with conifers	LC	II,6	I	I		I

SYLVIIDAE	<i>Sylvia rueppelli</i> <b>ENDEMIC TO EUROPE</b>	Orchards woodlands	LC	II.6		I	II	
TURDINEA	<i>Erithacus rubecula</i> <b>ENDEMIC TO EUROPE</b>	Orchards farmlands	LC	II			II	
	<i>Oenanthe hispanica</i>	Open rocky areas, shrub	LC	II			II	
	<i>Phoenicurus phoenicurus</i>	Conifer woodland	LC	II			II	
UPUPIDAE	<i>Upupa epops</i>	Woodland shrub	LC	II			II	

*Resources:*

\* Demirsoy A.,2008: Genel Zoocoğrafya vre Türkiye Zoocoğrafyası “Hayvan Coğrafyası, Meteksan AŞ, Ankara

\* Turkish Ministry of Forest and Water Works, General Directorate of Nature Conservation and National Parks

\* IUCNREDLIST.org

\* Appendices, Bern Convention

### Birds of Prey

The peninsula is one of the richest reserve areas for birds of prey in Aegean region and in Turkey. The co-existence of many diverse natural habitats from coastal to shrub, woodlands and forests with rich nutrition resources increase the bird population and species diversity. *Circateus gallicus*, *Falco naumanii* and *Falco eleonora* are amongst the rare and diminishing categories internationally.



*Circateus gallicus*

One of the rarest predator bird of Turkey, *Hierraetus fasciatus* lives and breeds on the peninsula. *Falco eleonora* can be seen in high numbers during migration. *Falco peregrinus* and *Falco biarmacus* use the region for breeding (Ref.11).





*Falco peregrinus*

### Bats of peninsula

The peninsula provides a very rich habitat for bats who live in colonies of 10 000s and their nocturnal preying destroys about 75 kg of pathogenic organisms for plants per colony. (Ref.17)

According to App. 6 of Bern Convention all bats, except *Pipistrellus pipistrellus*, are listed as the species requiring specific habitat conservation measures.

Bats of Turkey and their habitats are under legal protection as a part of commitment to Bern Convention.

Bats of peninsula are also listed amongst the bats occurring in the EUROBATS area and listed under the agreement, which Turkey is a signature holder.

Bats of peninsula listed under EUROBATS are:

- **Molossidae:** *Tadarida teniotis*
- **Rhinolophidae:** *Rhinolophus hipposideros*, *Rhinolophus ferrumequinum*
- **Vespertilionidae:** *Eptesicus serotinus*, *Hypsugo savii*, *Pipistrellus nathusii*, *Pipistrellus pygmaeus*



*Rhinolophus hipposideros*



### Biome dependent birds of peninsula

The birds under this category depend on specific biomes where many species co-exist for their common ecological needs and continue to form new biomes with their ecological relatives. Any intervention to their habitats may lead to total extinction of the species (Kılıç ve Eken, 2004)

- **Emberizidae/** *Emberiza caesia*, *Emberiza cinaracea*
- **Laniidae/** *Lanius nubicus*
- **Sittidae/** *Sitta krueperi*
- **Strigidae/** *Bubo bubo*
- **Sylviinae/** *Sylvia rueppelli*, *Sylvia atricapilla*, *Sylvia melanocephala*, *Hippolais olivetorum*, *Phylloscopus collybita*
- **Turdineae/** *Oenanthe hispanica*



*Lanius nubicus*

### 3.2 Aquatic fauna

In a study on aquatic fauna found in inland waters, shallow lakes of the peninsula, 40 taxa were identified, of which 17 were Rotifera, 22 Arthropoda and 1 Chordata. Species identified were first to be recorded for the given localities (Ref.12).

### 3.3 Mammalians

The rich habitat of the peninsula supports many mammalian species of which some are protected both by national and international laws, agreements and decrees.

The bat population was mentioned above, under the birds section.

Other mammalian species under protection both nationally and internationally and listed on App. 6 of the Bern Convention are:

FAMILY	SPECIES	IUCN	BERN
BOVIDAE	<i>Capra aegaeus</i>		6
CANIDAE	<i>Canis aureus</i>	LC	III,6
	<i>Canis lupus</i>	LC	II,6
	<i>Canis vulpes</i>	LC	III
CRICETIDAE	<i>Cricetus migratorius</i>	LC	II
FELIDAE	<i>Caracal caracal</i>	EN	III,6
GLIRIDAE	<i>Dryomys nitedula</i>	LC	III
LEPORIDAE	<i>Lepus europaeus</i>	LC	III
MUSTELIDAE	<i>Lutra lutra</i> Mediterranean endemic	EN/NT	II
PHOCIDAE	<i>Monachus monachus</i>	EN	III,6
RHINOLOPHIDAE	<i>Rhinolophus ferrumequinum</i>	LC	II
	<i>Rhinolophus hipposideros</i>	LC	II
SCIURIDAE	<i>Sciurus anomalus</i>	LC	II
SUIDAE	<i>Sus scrofa scrofa</i>	LC	III
URSIDAE	<i>Ursus arctos</i>	LC	II,6
	<i>Lutra lutra</i>	LC	II,6
VESPERTILIONIDAE	<i>Eptesicus serotinus</i>	LC	II
	<i>Nyctalus noctula</i>	LC	II
	<i>Hypsugo savii</i>	LC	
	<i>Pipistrellus pipistrellus</i>	LC	
	<i>Pipistrellus pygmaeus</i>	LC	

### ***Monachus monachus***

This beautiful mammalian is probably the most cited and protected animal of the region, both nationally and internationally. It travels daily 40km between the undisturbed coast lines of Karaburun, Çeşme, Chios and Foça, (Ref.17/ Kabaoğlu 2007), the town who got her name from “Phoea”, the ancient local name in Greek and in current Turkish given to *Monachus monachus*.

It is amongst the 12 species particularly mentioned and protected by the IUCN. Other international agreements are the Bern Convention, app. 2 and 6, Barcelona Convention/ Genoa declaration and CITES.

In Turkey there are two laws protecting *Monachus monachus*, namely:

TC Çevre ve Orman Bakanlığı, 2007-c ( Ministry of Environment and Forestry)

- 1380 sayılı Su Ürünleri Kanunu (can be translated as Aquatic Produce law, number 1380)
- 3167 sayılı Kara Avcılığı Kanunu (can be translated as Terrestrial Hunting Law, number 3167).



FOTOGRAF : AA

*Monachus monachus*

### 3.4 Amphibians of the peninsula

Some amphibians seen on the island and their conservation status can be seen below. (Ref. 13)

Family/Species	Habitat	IUCN	BERN
BUFFONIDAE <i>Buffo buffo</i>	under stones, in soil	LC	III
<i>Buffo viridis</i>	under stones, in soil	LC	II
HYLIDAE <i>Hyla arborea</i>	Woodlands	LC	II
PELOBATIDAE <i>Pelobates syriacus</i>	In soil	LC	II

### 3.5 Reptilia of The Peninsula

Some Reptilians seen on the island and their conservation status can be seen below. (Ref. 14).

FAMILY/SPECIES	HABITAT	IUCN	BERN
COLUBRIDAE <i>Coluber jugularis jugularis</i>	Woodland Mountain slopes	LC	II
GEKKOINIDAE <i>Hemidactylus turcicus turcicus</i>	Shrub, rocky areas Coastal areas	LC	III
LACERTIDAE <i>Lacerta trilineata</i>	Shrub, sand dunes Garden walls		II
TESTUDINIDAE <i>Testuda graeca</i>	Shrub, grassland	VU	II,6
TYPHLOPIDEA <i>Typhlos vermicularis</i>	In soil, shrub woodland	LC	III
SCINCIDAE <i>Ablepharus kitaibei</i>	Forest, maquis Stones, leaves	LC	II

#### **4. ADVERSE EFFECTS AND POSSIBLE THREATS OF WIND TURBINES AND WIND FARMS TO AN ENDANGERED NATURAL HABITAT IN İZMİR, TURKEY**

Wind energy is often considered as an environmentally safe, renewable energy source, however no energy conversion method is free from environmental challenges. New technologies for large scale energy production require serious screening through environmental impact assessment procedures. According to Birdlife international, potential cumulative effects of multiple installations are a particular concern.

The previous sections of this report have described the endangered rich peninsular ecosystems with high biodiversity. This section aims to underline the imminent and future adverse effects of a wind farm project which is supported by the state and implemented by numerous companies.

##### **4.1 Conservation status**

The Turkish state has strictly defined and has put laws in action for Natural Heritage Areas of the country at three different conservation levels in order to comply with the national legislation and international agreements. Important natural areas of Turkey are protected under 18 different conservation agreements and laws. There are 13 national and 5 international conservation status which cover nearly 6% of the total surface area of the country. For details please see Ref. 16.

Roughly, 27 % of the Çeşme peninsula has been declared as National Heritage Site, predominantly at first and second levels.

On a recent report dated 2013, prepared by the Ministry of Environment and Water Works, İzmir Provincial Directorate (Ref. 17) which was initiated by a complaint from the local city assembly of Karaburun, the rich ecosystems, diverse habitats and high biodiversity are reported. Furthermore the report concludes by proposing a new conservation status, declaration of Karaburun as a Biosphere Region, to prevent further harmful human and industry activity and to support conservation efforts, under the Ministry of Environment and Water Works' "Decree on Identification, Registration and Approval of Conserved Areas", 1. and 2 sections of Articles 13 and 18.

At the time of publication wind energy installations were at their initial construction phase but their adverse effects had already placed them under the threats and risks section of the report due to negative impact on Karaburun's natural, social and cultural life.

*The report states that the "the combination of dense and extended installations of wind turbines, the area covered by each turbine, the electromagnetic impact of very high voltage energy transfer systems, side roads built for construction, heavy industrial equipment transportation and later for maintenance , dense and dangerous traffic conditions on state highways and small countryside roads, transitory construction sites have detrimental impact on habitat, limited agricultural land, grazing fields and prairies. The wide and large turbine blades, security lights on turbines and high voltage power cables create a serious life-threatening risk for bird populations with endangered species, which are listed on national and international conservation agreements.*

*The recent extension of wind farm to whole peninsula creates serious threat to the well-being of all species, including humans."*

Local and international NGOs are also producing studies and documents for conservation and protection.

BirdLife International has developed the **Important Bird Areas** (IBA) model as a methodology to provide the main frame for conservation and planning purposes.

*The European Court accepts the IBA Directive as a scientific reference for the identification of important areas to be under conservation and protection (Ref.15).*

Turkey's **Key Biodiversity Areas** (KBA) have been identified by Doğa Derneği, one of the global partners of BirdLife International in Turkey and IBA approach has been expanded to include 7 new taxonomic groups: plants, mammals, reptiles, amphibians, freshwater fish, butterflies and dragonflies. Vulnerability and irreplaceability were the two main principles guiding the evaluation criteria.

Out of 305 KBAs, measuring 20,280,149 ha area, covering around 26 % of Turkey's surface area, 292 fulfil the KBA criteria for one or more taxonomic group on a global scale and 13 sites are important on regional scale.

Four KBAs were identified on Çeşme peninsula, covering 154,963ha of 2,685,000 ha of the total peninsular surface area: Karaburun and Ildırı islands 87,274 ha, Alaçatı 56,759 ha, Çeşme West Cap 3,465 ha and Doğanbey coastline 7,465 ha. (Ref. 16 and [www.dogadernegi.org](http://www.dogadernegi.org)).

#### **4.2 Current status of wind turbines on Çeşme Peninsula and their adverse effects**

As the ever increasing number of construction and installation works of wind turbines are rapidly turning the peninsula to a one big wind farm, the number of licensed, under evaluation and only project approved projects are increasing also. It should be kept in mind that majority of the land occupied by wind turbines are natural heritage sites under strict conservation rules. So as their numbers increase their potential hazards on natural habitats increase as well.

According to data obtained from EMRA (Energy Market Regulatory Authority [www.emra.org.tr](http://www.emra.org.tr)) and the Turkish Wind Energy Association ([www.tureb.com.tr](http://www.tureb.com.tr))

The Aegean region of Turkey currently has 1779.55 MW installed capacity, which is 37.2 % of total of Turkey, the capital of the region Izmir has 807 MW, 17.11 %, of which **574 MW are actively functioning and 366 MW are under construction on the Çeşme peninsula, total of 739 MW**. If the capacities of licensed, under evaluation and approved projects without licensed of the future are also kept in perspective, roughly the total capacity will be doubled.

A closer look at the development of wind energy installations and projects for the future shows a tremendous threat for the endangered natural habitat of the peninsula.

The adverse effects of wind farms are seen at three phases, namely pre-construction, construction and post construction, some of these effects are temporary but most are permanent effects. The imminent adverse effects are clearly seen and are obvious during pre-construction and construction phases but many studies worldwide are in their early phases for post construction effects. Site selection and implementation of environmental impact assessment are crucial in preventing adverse events. Unfortunately this hasn't been the case for the Çeşme peninsula.

During *the preconstruction phase*, field and road opening operations and foundation excavations for turbines, interconnecting power towers and underground power cables destruct the nature on all levels, trees are cut, rich forest, woodland and shrub floors are removed, animals are disturbed. Heavy equipment loaded giant trucks smash endangered species. Natural habitats and linkage habitats are fragmented, natural communities are highly sensitive to Fragmentation of habitats. Massive olive groves and other food plants are covered with heavy dust.

The *construction phase* adverse effects cause serious loss and damage to habitats.

A wind turbine of 100 m height and 100 m blade length, with the rotor will occupy 1ha of land. Other associated infrastructure construction area are not included. Current operational capacity and under construction capacity is close to 740 MW, roughly about 370 turbines, leading to loss of 370 ha of land (Ref. 20).

It should be noted that each turbine requires 550 tonnes of concrete for construction, if we assume that all the turbines are large sized 2 MW energy producers, it should roughly lead up to 370 turbines, multiplied by 550 tonnes of concrete per turbine gives us the amount of concrete poured and to be poured on the endangered habitats of the peninsula, 203,500 tonnes altogether. A rough guide for comprehension is that a five storied concrete building will require maximum of 400 tonnes of concrete.

Heavy machinery carrying giant trucks disturb and destroy nature and wild life, although some effects are temporary, the impact is very heavy.

The most important foreseeable adverse effects of the *post construction phase* are witnessed on birds, bees and butterflies. The red pine forest of the region and shrub elements are the foraging habitats for bees. Birds, bees and butterflies reflect the richness of a natural habitat and 80 % of all food are pollinated by bees.



On a report dated September 2003 prepared by BirdLife International on behalf of the Bern Convention (Ref. 18), **the main potential hazards of wind turbines and associated infrastructure were listed under disturbance, collision risk, mortality and loss of or damage to habitats.** BLI has meticulously gathered 10 years of collective expertise by partners worldwide and has shown on the following table the species groups and species that are considered to be particularly sensitive or potentially so, to wind farms. **It should be noted that *Phalacrocoracidae* / *Phalacrocorax aristotelis* and *Accipitradae*/*Aquila chrysaetos* are amongst the endangered birds of the peninsula.**

Species group (eg species)	Disturbance displacement	Barrier to movement	Collision	Direct habitat loss/damage
<i>Gaviidae</i> , divers (red-throated diver <i>Gavia stellata</i> )	√	√	√	
<i>Podicipedidae</i> grebes	√			
<i>Sulidae</i> gannets & boobies			√	
<i>Phalacrocoracidae</i> (shag <i>Phalacrocorax aristotelis</i> )				√
<i>Ciconiiformes</i> herons & storks			√	
<i>Anserini</i> , swans (whooper swan <i>Cygnus cygnus</i> ) and geese (pink-footed goose <i>Anser brachyrhynchus</i> , European white-fronted goose <i>A. albifrons</i> , barnacle goose <i>Branta leucopsis</i> , brent goose <i>B. bernicla</i> )	√		√	
<i>Anatinae</i> , ducks (eider <i>Somateria mollissima</i> , long-tailed duck <i>Clangula hyemalis</i> , common scoter <i>Melanitta nigra</i> )	√	√	√	√
<i>Accipitridae</i> raptors (red kite <i>Milvus milvus</i> , white-tailed sea eagle <i>Haliaeetus albicilla</i> , lammergeier <i>Gypaetus barbatus</i> , griffon vulture <i>Gyps fulvus</i> , imperial eagle <i>Aquila heliaca</i> , golden eagle <i>A. chrysaetos</i> , Bonelli's eagle	√		√	

There are many adverse effects mentioned and supported for the post construction phase, climate change due to wind blocking wall of turbines, desiccation of plants, raise in temperature may all lead to disruption of ecological relations. The continuous effect of sound, electromagnetic waves, sunlight and shadow flickering effects may confuse orientation for both terrestrial, avian and marine species, especially for nocturnal species like bats. Even though reported adaptation to adverse conditions cases are low, further scientific monitoring and reporting on all post construction effects are required.

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