ACWA POWER ELECTRICITY OPERATION AND MANAGEMENT INDUSTRY AND TRADE CO.

ACWA POWER KIRIKKALE

OVERHEAD TRANSMISSION LINE PROJECT



ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT REPORT

ANNEXES

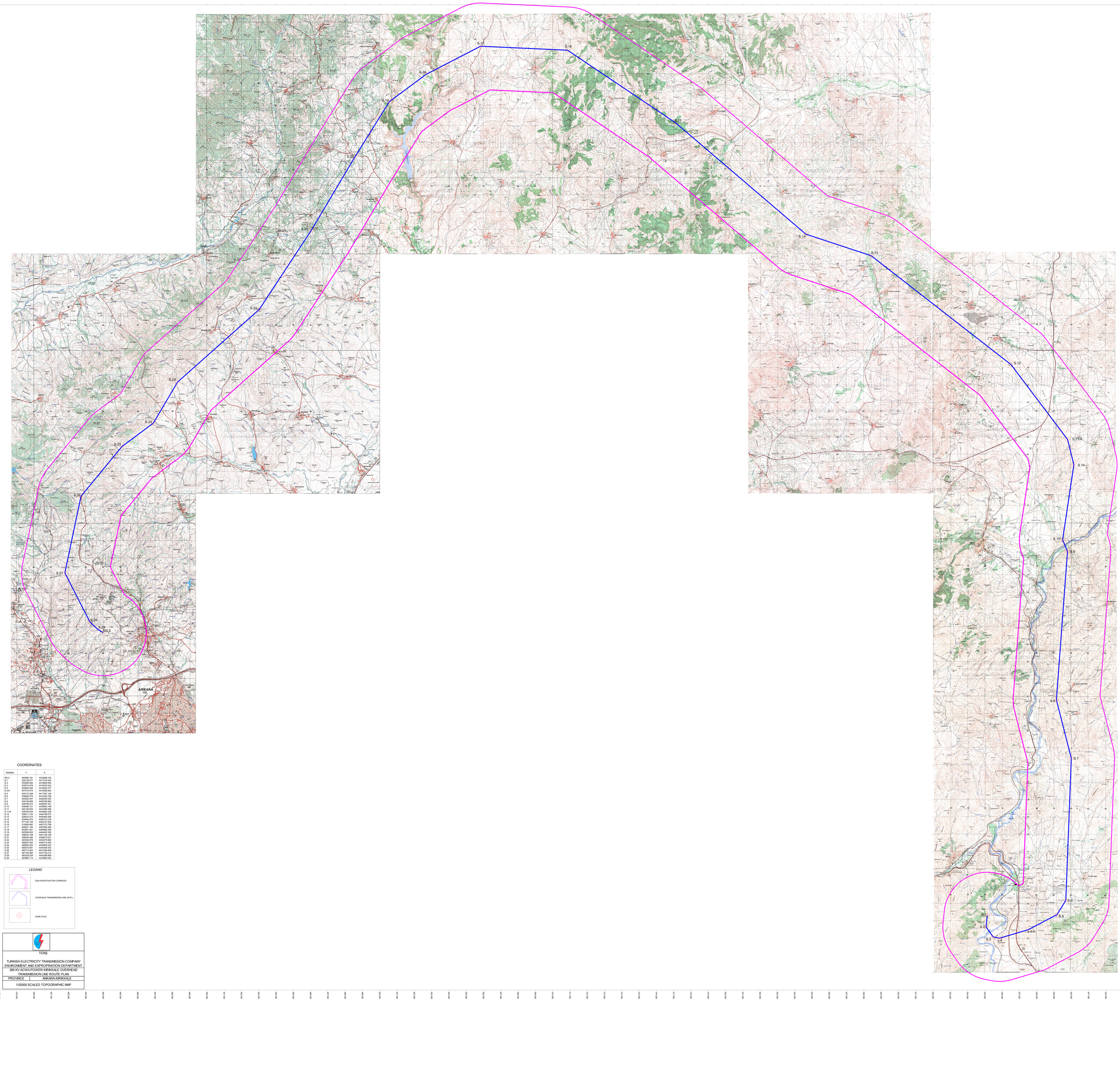
APPENDIX-1: 1/25.000 Scaled Topographic Map
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MGS PROJECT CONSULTANCY ENGINEERING TRADE CO.

ANKARA – JUNE/2014

APPENDIX-1

1/25.000 SCALED
TOPOGRAPHIC MAP



COORDINATES

NoktaNo	Y	X
ND.2	483990.191	4433688.162
S.1	535138.577	4417310.642
S.2	535069.494	4416656.564
S.3	535472.978	4416079.033
S.4	535850.455	4416000.377
S.4/A	536172.508	4416000.377
S.5	539172.508	4417367.184
S.6	539682.470	4418185.768
S.7	540005.547	4429409.302
S.8	539138.889	4429786.864
S.9	539138.889	4439580.189
S.10	539488.121	4439850.189
S.11	540148.833	4443389.588
S.11/A	539785.644	4444852.238
S.12	536511.743	4449188.273
S.13	529644.670	4459733.279
S.14	529644.670	4459733.279
S.15	517100.149	4463181.925
S.16	510659.952	4467373.799
S.17	505831.184	4467605.356
S.18	502991.821	4465985.290
S.19	500536.748	4464406.108
S.20	490049.385	4456973.831
S.21	483026.978	4452375.689
S.22	486297.832	4448172.090
S.23	486905.933	4445805.223
S.24	485713.003	4443564.846
S.25	482713.003	4441564.846
S.27	481783.950	4437136.213
S.28	483229.226	4434268.890
S.29	483686.114	4433865.045

LEGAND

ESIA INVESTIGATION CORRIDOR

OVERHEAD TRANSMISSION LINE (OHTL)

SOME POLE

TEİAŞ

TURKISH ELECTRICITY TRANSMISSION COMPANY
ENVIRONMENT AND EXPROPRIATION DEPARTMENT

380 KV ACWA POWER KIRIKKALE OVERHEAD
TRANSMISSION LINE ROUTE PLAN

PROVINCE	ANKARA-KIRIKKALE

1/25000 SCALED TOPOGRAPHIC MAP

APPENDIX-2

1/100.000 SCALED

LAND CLASSIFICATION MAP

ÇANKIRI
(Eldivan)

ÇANKIRI

ANKARA

KEÇİÖREN

YENİMAHALLE

MERKEZ

ÇANKAYA

ALTINDAĞ

ELMADAĞ

KALECİK

HASANOĞLAN

ESENBOĞA Hv.

BAYINDIR BARAJI

LEGEND

ESIA INVESTIFATION CORRIDOR

OVERHEAD TRANSMISSION LINE

SOME POLE

APPENDIX-3

FLORA AND FAUNA TABLES

FLORA TABLES

FAMİLIA/SPECIES NAME	TURKISH NAME	PHYTOGEOGRAPHICAL REGION	ENDEMISM	RED DATA BOOK	BERN	DETECTION METHOD
FLORA LIST OF KIRIKKALE PROVINCE						
CISTACEAE						
Fumana procumbens (DUN.) GREN. ET GODR.	-		-	-	-	L
CHENOPODIACEAE						
Kochia scoparia (L.) SCHRAD.	-		-	-	-	L
Atriplex lasiantha BOISS.	-	-	-	-	-	L,G
Camphorosma monspeliaca L. subsp. lessingii (LITW.) AELLEN	-	-	-	-	-	L
Chenopodium botrys L.	-	-	-	-	-	L,G
Chenopodium sosnowskyi KAPELLER	-	İran-Turan	-	-	-	L
FABACEAE						
Sophora alopecuroides L. var. alopecuroides L.	Tilki kuyruğumsu sofora		-	-	-	L
Alhagi pseudalhagi (BIEB.) DESV.	Deve dikeni	-	-	-	-	L,G,D
Anthyllis vulneraria L. subsp. boisseri (SAG.) BORNM.	Çoban gülü	-	-	-	-	L
Astragalus corrugatus BERTOL.	Geven	İran-Turan	-	-	-	L
Astragalus hamosus L.	Geven	-	-	-	-	L
Coronilla scorpioides (L.) KOCH	-	-	-	-	-	L
Genista sessilifolia DC.	Sapsız katırtırnağı	İran-Turan	-	-	-	L
Medicago falcata L.	Sarı yonca	-	-	-	-	L
Melilotus officinalis (L.) DESR.	Eşek yoncası	-	-	-	-	
Ononis pusilla L.	-	Medıterranean	-	-	-	L
ASTERACEAE						
Logfia arvensis (L.) HOLVB			-			L
Achillea phrygia BOISS. ET BAL.	Civan perçemi	İran-Turan	+	LR/lc	-	L
Centaurea patula DC.	-	İran-Turan	-			L
Centaurea urvillei DC. subsp. urvillei DC.	Anadolu kaktüsü	D. Medıterranean	-	-	-	L
Anthemis cretica L. subsp. tenuiloba (DC.) GRIERSON	-		-	-	-	L
Cnicus benedictus L. var. benedictus L.	Şevketlibostan		-	-	-	L,G
Tragopogon longirostis BISCH. EX SCHULTZ BiP. var. abbreviatus BOISS.	-		-	-	-	L
Crepis foetida L. subsp. rhoeadifolia (BIEB.) CELAK.	Tüylü kanak,		-	-	-	L,G
Picnomon acarna (L.) CASS.	Tarla devedikeni	Medıterranean	-	-	-	L,G
Scorzonera laciniata L. subsp. laciniata L.	-	-	-	-	-	L
CAMPANULACEAE						
Campanula kirikkaleensis DÖNMEZ ET GÜNER	Çançiçeği	İran-Turan	+	LR/nt	-	
POACEAE						
Agropyron cristatum (L.) GAERTNER subsp. pectinatum (BIEB.)	Otlak ayrığı	-	-	-	-	L

TZVELEV var.pectinatum (L.) GAERTNER						
Amblyopyrum muticum (BOISS.) EIG var. muticum (BOıSs.) EIG	-	-	-	-	-	L
Vulpia ciliata DUMORT subsp. ciliata DUMORT	Kirpikliçim	-	-	-	-	L
Glyceria plicata (FRIES) FRIES	-	-	-	-	-	L
Pennisetum orientale L. C. M. RICHARD	-	İran-Turan	-	-	-	L
Spodiopogon pogonanthus (BOISS ET BAL EX BAL.) BOISS.	-	East Medıterranean	-	-	-	L
BORAGINACEAE						
Buglossoides arvensis (L.) JOHNSTON	Tarla sedefotu	-	-	-	-	L
Heliotropium europaeum L.	Siğil otu	Medıterranean	-	-	-	L
EUPHORBIACEAE						
Euphorbia peplis L.	Sütleğen	Medıterranean	-	-	-	L
Mercurialis annua L.	Yer fesleğeni	-	-	-	-	L

FLORA LIST OF ANKARA PROVINCE

APIACEAE						
Anthriscus nemorosa (BIEB.) SPRENGEL	Peçek	-	-	-	-	L
Astrodaucus orientalis (L.) DRUDE	-	İran-Turan	-	-	-	L,G
Biforia radians BIEB.	-	-	-	-	-	L,G
Bupleurum odontites L.	-	-	-	-	-	L
Caucalis platycarpos L.	-	-	-	-	-	L,G
Conium maculatum L.	Baldıran	-	-	-	-	L,G
Echinophora tournefortii JAUB. ET SPACH	Çöyürotu	İran-Turan	-	-	-	L,G
Eryngium campestre L. var. virens LINK	Boğa dikeni	-	-	-	-	L,G
Falcaria vulgaris BERNH.	Kazayağı	-	-	-	-	L
Heracleum platytaenium BOISS.	Tavşancıl otu	Black Sea Region	+	LR/lc		L
Heracleum sphondylium L. subsp. montanum (SCHLEICHER EX GAUDIN) BRIQ.	Tavşancıl otu	Europe-Siberia	-	-	-	L
Laser trilobum (L.) BORKH.	Kefe kimyonu	-	-	-	-	L
Laserpitium hispidum BIEB.	-	Europe-Siberia	-	-	-	L
Malabaila secacul BANKS ET SOL.	-	-	-	-	-	L
Oenanthe silaifolia BIEB.	-	-	-	-	-	L
Opopanax hispidus (FRIV.) GRIS.	Kaymak otu	-	-	-	-	L,G
Scandix australis L. subsp. grandiflora (L.) THELL.	-	-	-	-	-	L
Seseli tortuosum L.	Horoz gözü	-	-	-	-	L,G
Torilis arvensis (HUDS.) LINK subsp. neglecta (SPRENGEL) THELLUNG	-	-	-	-		L

ASCLEPIADACEAE						
Cynanchum acutum L. subsp. acutum L.	Sütlü sarmaşık	-	-	-	-	L
Cynanchum acutum L. subsp. sibiricum (WILLD.) RECH. FIL	-	-	-	-	-	L
ASTERACEAE						
Achillea biebersteinii AFAN.	Civan perçemi	İran-Turan	-	-	-	L
Achillea wilhelmsii C. KOCH	Civan perçemi	İran-Turan	-	-	-	L
Acroptilon repens (L.) DC.	Kekra	İran-Turan	-	-	-	L
Anthemis austriaca JACQ.	-	-	-	-	-	L
Anthemis coelopoda BOISS. var. bourgaei BOISS.	-	-	-	-	-	L
Anthemis tinctoria L. var. pallida DC.	-	-	-	-	-	L
Anthemis wiedemanniana FISH. ET MEY.	-	-	+	LR/lc	-	L
Artemisia absinthium L.	Pelin	-	-	-	-	L
Bidens tripartita L.	-	-	-	-	-	L
Carduus pycnocephalus L. subsp. albidus (BIEB.) KAZMI	-	-	-	-	-	L
Carlina corymbosa L.	Domuz dikeni	Medıterranean	-	-	-	L
Carthamus glaucus BIEB. subsp. glaucus BIEB.	-	-	-	-	-	L
Centaurea iberica TREV. EX SPRENGEL	Deligözdikeni	-	-	-	-	L
Centaurea patula DC.	-	İran-Turan	-			L
Centaurea urvillei DC. subsp. urvillei DC.	Anadolu kaktüsü	East Medıterranean	-	-	-	L
Centaurea virgata LAM.	-	İran-Turan	-	-	-	L
Chondrilla juncea L. var. acantholepis (BOISS.) BOISS.	-	-	-	-	-	L
Cichorium intybus L.	Yabani hindiba	-	-	-	-	L
Cirsium alatum (GMELIN) BOBROV subsp. pseudocreticum DAVIS ET PARRIS	-	İran-Turan	+	LR/lc	-	L
Cirsium lappaceum (BIEB.) FISCHER subsp. anatolicum PETRAK	-	İran-Turan	-	-	-	L
Cnicus benedictus L. var. kotschyi BOISS.	Şevketlibostan	-	-	-	-	L
Crepis alpina L.	-	-	-	-	-	L
Crepis macropus BOISS. ET HELDR.	-	İran-Turan	+	LR/lc	-	L
Onopordum acanthium L.	Kalagan	-	-	-	-	L
Picnomon acarna (L.) CASS.	Tarla devedikeni	Medıterranean	-	-	-	L,G
Scorzonera laciniata L. subsp. laciniata L.	-	-	-	-	-	L
BORAGINACEAE						
Buglossoides arvensis (L.) JOHNSTON	Tarla sedefotu	-	-	-	-	L
Heliotropium europaeum L.	Siğil otu	Medıterranean	-	-	-	L
Lappula barbata (BIEB.) GÜRKE	Çiğitotu	İran-Turan	-	-	-	L
Neatostema apulum (L.) JOHNSTON	-	Medıterranean	-	-	-	L
BRASSICACEAE						

Aethionema arabicum (L.) ANDRZ. EX DC.	-	-	-	-	-	L
Alyssum desertorum STAPF. var. desertorum STAPF.	-	Turkey	-	-	-	L
Cardaria draba (L.) DESV. subsp. draba (L.) DESV.	Kediotu	-	-	-	-	L
Crambe orientalis L. var. orientalis L.	Akyumak	İran-Turan	-	-	-	L
Hirschfeldia incana (L.) LAG.-FOSS.	-	-	-	-	-	L
Neslia apiculata FISCH., MEY. ETAVE-LALL	-	-	-	-	-	L
CARYOPHYLLACEAE						
Minuartia hamata (HAUSSKN.) MATTF.	-	-	-	-	-	L
Silene dichotoma EHRH. subsp. dichotoma EHRH.	Tüylü bodur yapışkanotu	-	-	-	-	
Silene noctiflora L.	-	-	-	-	-	
CHENOPODIACEAE						
Atriplex lasiantha BOISS.	-	-	-	-	-	L,G
Camphorosma monspeliaca L. subsp. lessingii (LITW.) AELLEN	-	-	-	-	-	L
Chenopodium botrys L.	-	-	-	-	-	L,G
Chenopodium sosnowskyi KAPELLER	-	İran-Turan	-	-	-	L
CISTACEAE						
Fumana procumbens (DUN.) GREN. ET GODR.	-	-	-	-	-	L
Helianthemum ledifolium (L.) MILLER var. ledifolium (L.) MILLER	-	-	-	-	-	L
CONVOLVULACEAE						
Convolvulus arvensis L.	Tarla sarmaşığı	-	-	-	-	L,G
Convolvulus assyricus GRISEB.	Çoban döşeği	İran-Turan	+	LR/lc		L
Convolvulus lineatus L.	-	-	-	-	-	L
CORYLACEAE						
Carpinus betulus L.	Yaygın gürgen	Europe-Siberia	-	-	-	
CUPRESSACEAE						
Juniperus oxycedrus L. subsp. oxycedrus L.	Ardıç	-	-	-	-	
CYPERACEAE						
Bolboschoenus maritimus (L.) PALLA var. maritimus (L.) PALLA	-	-	-	-	-	L
Carex acuta L.	-	Europe-Siberia	-	-	-	L
Carex diluta BIEB.	-	İran-Turan	-	-	-	L
Cyperus fuscus L.	-	Europe-Siberia	-	-	-	L
Schoenoplectus lacustris (L.) PALLA subsp. lacustris (L.) PALLA	Saz otu	-	-	-	-	L
ELAEAGNACEAE						
Elaeagnus angustifolia L.	İğde	-	-	-	-	L
EUPHORBIACEAE						
Euphorbia peplis L.	Sütleğen	Medıterranean	-	-	-	L
Mercurialis annua L.	Yer fesleğeni	-	-	-	-	L
FABACEAE						

Alhagi pseudalhagi (BIEB.) DESV.	Deve dikeni	-	-	-	-	L,G,D
Anthyllis vulneraria L. subsp. boisseri (SAG.) BORNM.	Çoban gülü	-	-	-	-	L
Astragalus corrugatus BERTOL.	Geven	İran-Turan	-	-	-	
Astragalus hamosus L.	Geven	-	-	-	-	L
Astragalus odoratus LAM.	Geven	-	-	-	-	L
Coronilla scorpioides (L.) KOCH	-	-	-	-	-	L
Genista sessilifolia DC.	Sapsız katırtırnağı	İran-Turan	-	-	-	L
Medicago falcata L.	Sarı yonca	-	-	-	-	L
Melilotus officinalis (L.) DESR.	Eşek yoncası	-	-	-	-	
Ononis pusilla L.	-	Medıterranean	-	-	-	L
Trifolium hybridum L. var. hybridum L.	-	-	-	-	-	L
Trifolium repens L. var. repens L.	Ak üçgül	-	-			L
FAGACEAE						
Quercus pubescens WILLD.	Tüylü meşe	-	-	-	-	L
LAMIACEAE						
Acinos rotundifolius PERS.	Alp nanesi	-	-	-	-	L
Ajuga chamaepitys (L.) SCHREBER subsp. chia (SCHREBER) ARCANGELI var. chia (SCHREBER) ARCANGELI	Yer çamı	-	-	-	-	L,G
Clinopodium vulgare L. subsp. vulgare L.	Yaygın yabani fesleğen	-	-	-	-	
Lamium garganicum L. subsp. reniforme (MONTBRET ET AUCHER EXBENTHAM) R. MILL	Böbreksi dağcıl ballıbaba	-	-	-	-	L
Lycopus europaeus L.	-	Europe-Siberia	-	-	-	L
Salvia syriaca L.	-	İran-Turan	-	-	-	L
LILIACEAE						
Allium flavum L. subsp. tauricum (BESSER EX REICHB.) STEARN var. tauricum L.	-	Medıterranean	-	-	-	L
Ornithogalum armeniacum BAKER	-	East Medıterranean	-	-	-	L
Ornithogalum wiedemannii BOISS.	-	-	-	-	-	L
MALVACEAE						
Alcea pallida WALDST. ET KIT.	Hatmi çiçeği	-	-	-	-	L,G,D
Althaea cannabina L.	Kenevirsi hatmi	-	-	-	-	L
OLEACEAE						
Fraxinus angustifolia VAHL subsp. angustifolia VAHL	Dişbudak	-	-	-	-	L
Ligustrum vulgare L.	Yaygın kurtbağrı	Europe-Siberia	-	-	-	L
ORCHIDACEAE						
Epipactis helleborine (L.) CRANTZ	Noel gülümsü bataklık salebi	-	-	-	-	L
Listera ovata (L.) R. BR.	-	Europe-Siberia	-	-		L
Orchis coriophora L.	-	-	-	-	-	L
PAPAVERACEAE						

Fumaria asepala BOISS.	-	İran-Turan	-	-	-	L
Glaucium grandiflorum BOISS. ET HUET. var. grandiflorum BOISS. ET HUET.	Kellale	İran-Turan	-	-	-	L,G
Papaver argemone L. subsp. argemone L.	Kum haşhaşı	-	-	-	-	L,G
PINACEAE						
Pinus nigra ARN. subsp. pallasiana (LAMB.) HOLMBOE	Karaçam	-	-	-	-	L
POACEAE						
Aegilops triuncialis L. subsp. triuncialis L.	Buğday otu	-	-	-	-	
Agrostis stolonifera L.	Sürünücü tavus	Europe-Siberia	-	-	-	L
Alopecurus aequalis SOBOL.	-	Europe-Siberia	-	-	-	L
Bromus sterilis L.	-	-	-	-	-	L
Catabrosa aquatica (L) P. BEAUV.	Dereçimi	-	-	-	-	L
Cynodon dactylon (L.) PERS. var. dactylon (L.) PERS.	Köpekdişi	-	-	-	-	L
Elymus hispidus (OPIZ) MELDERIS subsp. barbulatus (SCHUR) MELDERIS	Elimotu	-	-	-	-	L
Festuca arundinacea SCHREBER subsp. arundinacea SCHREBER	Çayır yumağı	-	-	-	-	L
Hordeum bulbosum L.	Yabani arpa	-	-	-	-	L
Koeleria cristata (L.) PERS.	Sorguçotu	-	-	-	-	L,G
Melica ciliata L. subsp. ciliata L.	Kirpikli inci	-	-	-	-	L
RANUNCULACEAE						
Adonis flammea JACQ.	Kızılkan damlası	-	-	-	-	L,G
Ceratocephalus falcatus (L.) PERS.	-	-	-	-	-	L,G
Clematis orientalis L.	Doğu orman asması	-	-	-	-	L
Consolida hellespontica (BOISS.) CHATER	Çanakkale hezeranı	-	-	-	-	L
Ranunculus constantinopolitanus (DC.) D'URV.	İstanbul düğünçiçeği	-	-	-	-	L
ROSACEAE						
Amygdalus orientalis MILLER	-	İran-Turan	-	-	-	L
Cerasus incana (PALLAS) SPACH var. incana (PALLAS) SPACH	-	İran-Turan	-	-	-	L
Rosa canina L.	Kuşburnu	-	-	-	-	L
SALICACEAE						
Populus alba L	Akça kavak	Europe-Siberia	-	-	-	L
Populus nigra L. subsp. nigra L.	Kara kavak	-	-	-	-	L
Salix alba L.	Ak söğüt	Europe-Siberia	-	-	-	L
SCROPHULARIACEAE						
Chaenorhinum minus (L.) LANGE subsp. minus (L.) LANGE	-	-	-	-	-	L

Linaria genistifolia (L.) MILLER subsp. genistifolia (L.) MILLER	Katırtırnağı yapraklı ketenotu	Europe-Siberia	-	-	-	L
Verbascum glomeratum BOISS.	Kümemsi sığırkuyruğu	İran-Turan	-	-	-	L
Veronica anagalloides GUSS. subsp. heureka M. A. FISCHER	-	İran-Turan	-	-	-	L
TYPHACEAE						
Typha angustifolia L.	Hası rotu	-	-	-	-	L
Typha domingensis PERS.	Hası rotu	-	-	-	-	L

FAUNA LIST OF KIRIKKALE PROVINCE

CLASSIS/ORDO	SPECIES NAME	TURKISH NAME	END	IUCN	BERN	MAK	KİZİROĞLU RDB.	LOCATION	DETECTION METHOD
Amphibia/ Anura	*Pelobates syriacus*	Toprak kurbağası	-	LC	II	-	*	*	L
	Bufo bufo	Siğilli kurbağa	-	LC	III	-	*	*	L
	Bufo viridis	Gece kurbağası	.	LC	II	.	*	*	L
Reptilia/ Testudınata	*Testudo graeca*	Yaygın tosbağa	-	VU	II	I	*	*	L
Reptilia/Squamata	*Cyrtopodion kotschyi*	İnce parmaklı keler	-	LC	III	I	*	*	L
	Ophisops elegans	Tarla kertenkelesi	-	-	II	I	*	*	L
	Coronella austriaca	Avusturya yılanı	-	-	II	I	*	*	L
	Natrix natrix	Yarı sucul yılan	-	LC	II	I	*	*	L
Aves/ Charadiiformes	*Lymnocryptes minimus*	Küçük suçulluğu	-	LC	III		T, KZ	B 2	L
	Tringa ochropus	Yeşil düdükçün	-	LC	II	I	T, KZ	B 2	L
Aves/ Cıconıiformes	*Egretta garzetta*	Küçük ak balıkçıl	.	LC	II	I	G, Y	A 4	L
	Egretta alba	Büyük ak balıkçıl	.	LC	III	I	Y, KZ	A 3	L
	Ardea cirenea	Gri balıkçıl	-	LC	III		Y	A 4	L
Aves/ Columbıformes	*Columba livia*	Kaya güvercini	-	LC	III	III	Y	A 4	L
	Streptopelia decaocta	Kumru	-	LC	III		Y	A 4	L
Aves/ Corasiiformes	*Merops apiaster*	Arıkuşu	.	LC	II	I	G	A4	L
Aves/ Falconıformes	*Circus aeruginosus*	Saz delicesi	-	LC	II	I	Y	A 3	L
	Buteo rufinus	Kızıl şahin	-	LC	II	I	Y, KZ	A 4	L
	Falco tinnuculus	Kerkenez	-	LC	II	I	Y	A4	L
Aves/ Gruıformes	*Fulica atra*	Sakarmeke	-	LC	III	III	Y	A 4	L
	Tringa ochropus	Yeşil düdükçün	.	LC	II	I	T, KZ	B 2	L
Aves/ Passerıformes	*Galerida cristata*	Tepeli toygar	-	LC	III		Y	A4	L
	Alauda arvensis	Tarla kuşu	-	LC	III		Y	A4	L
	Anthus pratensis	Çayır incirkuşu	-	LC	II	I	G, T, KZ	-	L
	Anthus spinoletta	Dağ incirkuşu	-	LC	II	I	Y, KZ	A 4	L
	Muscicapa striata	Benekli sinekkapan	.	LC	II	I	G	A4	L
	Parus major	Büyük baştankara	-	LC	II	I	Y	A4	L
	Lanius collurio	Kızılsırtlı örümcekkuşu	-	LC	II	I	G	A 4	L
	Pica pica	Saksağan	-	LC	-	III	Y	A4	L
	Corvus monedula	Küçük karga	-	LC	-	III	Y	A4	L
	Sturnus vulgaris	Sığırcık	.	LC	.		Y	A4	L
	Passer domesticus	Serçe	-	LC	-	III	Y	A 4	L
	Carduelis cannabina	Ketenkuşu	-	LC	II	I	Y, KZ	A 4	L
Aves/ Strıgıformes	*Athene noctua*	Kukumav	-	LC	II	I	Y	A4	L
Mammalia/ Erinaceomorpha	*Erinaceus concolor*	Kirpi	-	LC	-	I	*	*	L
Mammalia/ Soricomorpha	*Neomys teres*	Bataklık faresi	-	LC	III	-	*	*	L
	Crocidura suaveolens	Sivriburunlu bahçefaresi	-	LC	II	-	*	*	L
Mammalia/Chıroptera	*Myotis mystacinus*	Bıyıklı siyah yarasa	-	LC	II	I	*	*	L
	Plecotus macrobullaris	Kafkas Uzunkulaklı Yarasası	-	LC	II	-	*	*	L
Mammalia/ Rodentıa	*Microtus anatolicus*	Anadolu tarlafaresi	-	DD	-	-	*	*	L
	Myomimus roachi	Fare benzeri yediuyur	-	VU	II	I	*	*	L
Mammalia/ Carnivora	*Canis lupus*	Kurt	-	LC	II	I	*	*	L

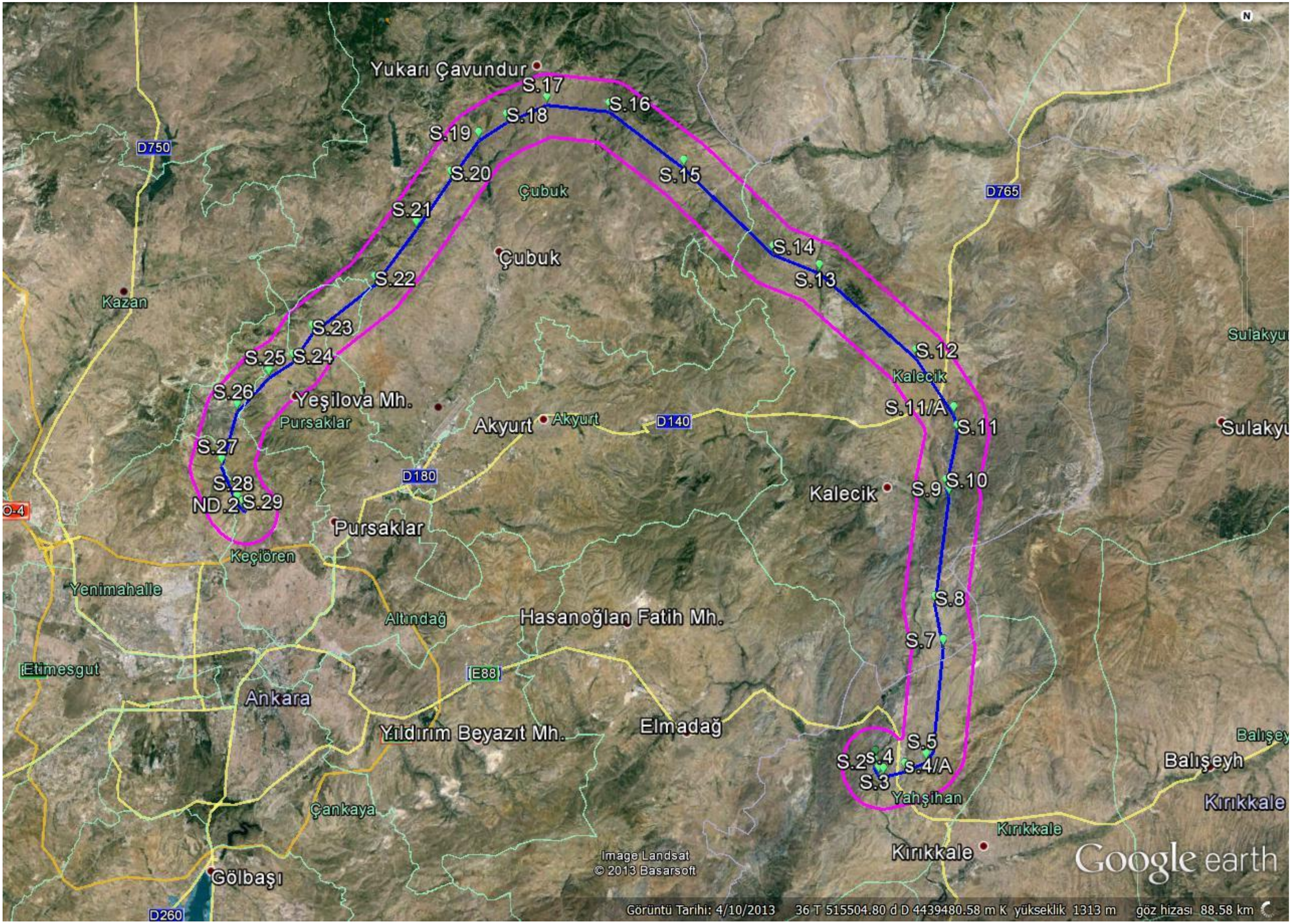
FAUNA LIST OF ANKARA PROVINCE

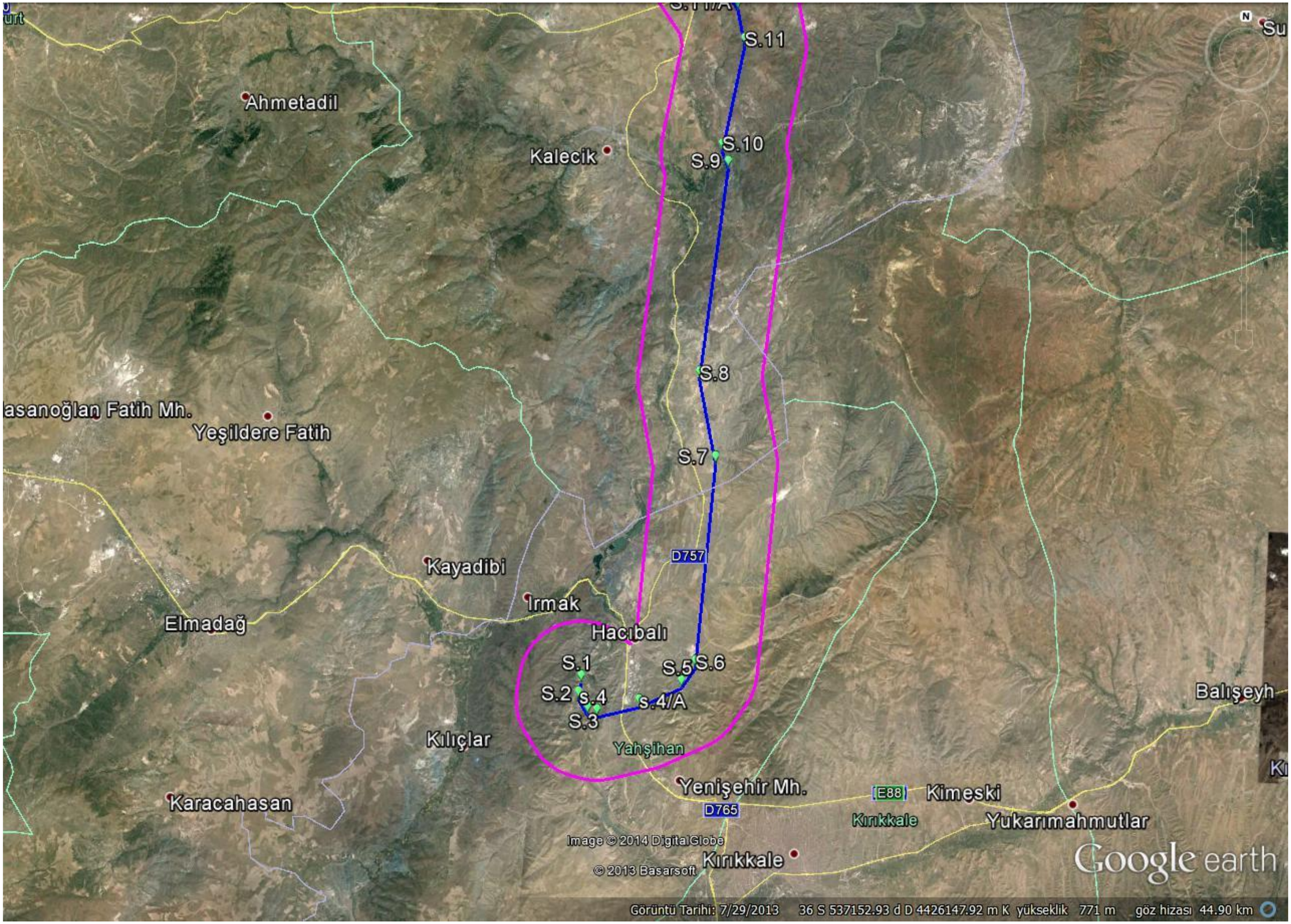
CLASS/ORDO	SPECIE NAME	TUKISH NAME	END.	IUCN	BERN	MAK	KİZİROĞLU RDB.	LOCATION	DETECTION METHOD
Amphibia/ Anura	*Pelobates syriacus*	Toprak kurbağası	-	LC	II	-	*	*	L
	Bufo bufo	Siğilli kurbağa	-	LC		-	*	*	L
	Bufo viridis	Gece kurbağası	.	LC	II	.	*	*	L
	Rana ridibunda	Ova kurbağası	-	LC		-	*	*	L
Reptilia/ Testudinata	*Testudo graeca*	Yaygın tosbağa	-	VU	II	I	*	*	L
Reptilia/Squamata	*Ablepharus kitaibellii*	İnce kertenkele	-	LC	II	I	*	*	L
	Ophisops elegans	Tarla kertenkelesi	-	-	II	I	*	*	L
	Coluber najadum	İnce yılan	-	LC	II	I	*	*	L
	Eirenis modestus	Uysal yılan	-	LC		I	*	*	L
	Natrix tesellata	Su yılanı	-	-	II	I	*	*	L
Aves/ Anseriformes	*Tadorna ferruginea*	Angıt	-	LC	II	I	Y	A 4	L
Aves/ Charadiiformes	*Himantopus himantopus*	Uzunbacak	-	LC	II	I	G	A 4	L
	Charadrius hiaticula	Halkalı cılıbıt	-	LC	II	I	T, KZ	B 2	L
	Vanellus vanellus	Kızkuşu	-	LC	III		Y, KZ	A 4	L
Aves/ Ciconiiformes	*Ardea cirenea*	Grî balıkçıl	-	LC	III		Y	A 4	L
	Ciconia ciconia	Leylek	-	LC	II	I	Y, G, T	A 3	L
Aves/ Columbiformes	*Columba livia*	Kaya güvercini	.	LC	III	III	Y	A 4	L
	Columba palumbus	Tahtalı güvercin	-	LC	-	III	Y	A4	L
	Streptopelia turtur	Üveyik	-	LC	III	III	G	A4	L
Aves/ Corasiiformes	*Merops apiaster*	Arı kuşu	-	LC	II	I	G	A4	L
	Upupa epops	İbibik	-	LC	II	I	G	A4	L
Aves/ Falconiformes	*Circaetus gallicus*	Yılan kartalı	-	LC	II	I	G	A4	L
	Circus aeruginosus	Saz delicesi	-	LC	II	I	Y	A 3	L
	Buteo buteo	Şahin	.	LC	II	I	Y, KZ, T	A 4	L
	Buteo rufinus	Kızıl şahin	-	LC	II	I	Y, KZ	A 4	L
	Aquila pomarina	Küçük orman kartalı	-	LC	II	I	G, T	A 3	L
	Aquila chrysaetos	Kaya kartalı	-	LC	II	I	Y, KZ	A 3	L
	Hieraaetus pennatus	Küçük kartal	-	LC	II	I	G, KZ, T	A 3	L
	Falco tinnuculus	Kerkenez	.	LC	II	I	Y	A4	L
Aves/ Gru formes	*Fulica atra*	Sakarmeke	-	LC		III	Y	A 4	L
	Grus grus	Turna	-	LC	II	I	G, Y, T	A 3	L
Aves/ Passeriformes	*Melanocorypha calandra*	Boğmaklı toygar	-	LC	II	I	Y	A4	L
	Calandrella brachydactyla	Bozkır toygarı	-	LC	II	I	G	A4	L
	Galerida cristata	Tepeli toygar	-	LC	III	II	Y	A4	L
	Lullula arborea	Orman toygarı	-	LC	III	II	Y	A4	L
	Alauda arvensis	Tarla kuşu	-	LC	III	II	Y	A4	L
	Hirundo rupestris	Kaya kırlangıcı	-	LC	II	I	G	A4	L
	Hirundo rustica	Kır kırlangıcı	-	LC	II	I	Y	A 4	L
	Delichon urbica	Ev kırlangıcı	-	LC	II	I	G	A 4	L
	Anthus pratensis	Çayır incirkuşu	-	LC	II	I	G, T, KZ	-	L
	Motacilla cinerea	Dağ kuyruksallayanı	-	LC	II	I	Y	A4	L
	Motacilla alba	Ak kuyruksallayan	.	LC	II	I	Y	A4	L
	Phoenicurus ochruros	Kara kızılkuyruk	-	LC	II	I	G		L
	Saxicola torquata	Taşkuşu	-	LC	II	I	Y	A4	L
	Oenanthe oenanthe	Kuyrukkakan	-	LC	II	I	G	A4	L
	Cettia cetti	Kamış bülbülü	-	LC	II	I	Y	A 4	L
	Sylvia curruca	Küçük Medıterranean gerdanlı ötleğen	.	LC	II	I	G	A4	L
	Phylloscopus collybita	Çıvgın	-	LC	II	I	Y, G, T	A 4	L
	Parus caeruleus	Mavi baştankara	-	LC	II	I	Y	A4	L
	Parus major	Büyük baştankara	-	LC	II	I	Y	A4	L
	Oriolus oriolus	Sarıasma	-	LC	II	I	G	A4	L
	Lanius isabellinus	Kızılkuyruklu örümcekkuşu	.	LC	II	I	T	.	L
	Lanius minor	Karaalınlı örümcekkuşu	-	LC	II	I	T, G	A 4	L
	Garrulus glandarius	Alakarga	-	LC	-	III	Y	A4	L
	Pica pica	Saksağan	-	LC	-	III	Y	A4	L
	Corvus monedula	Küçük karga	-	LC	-	III	Y	A4	L

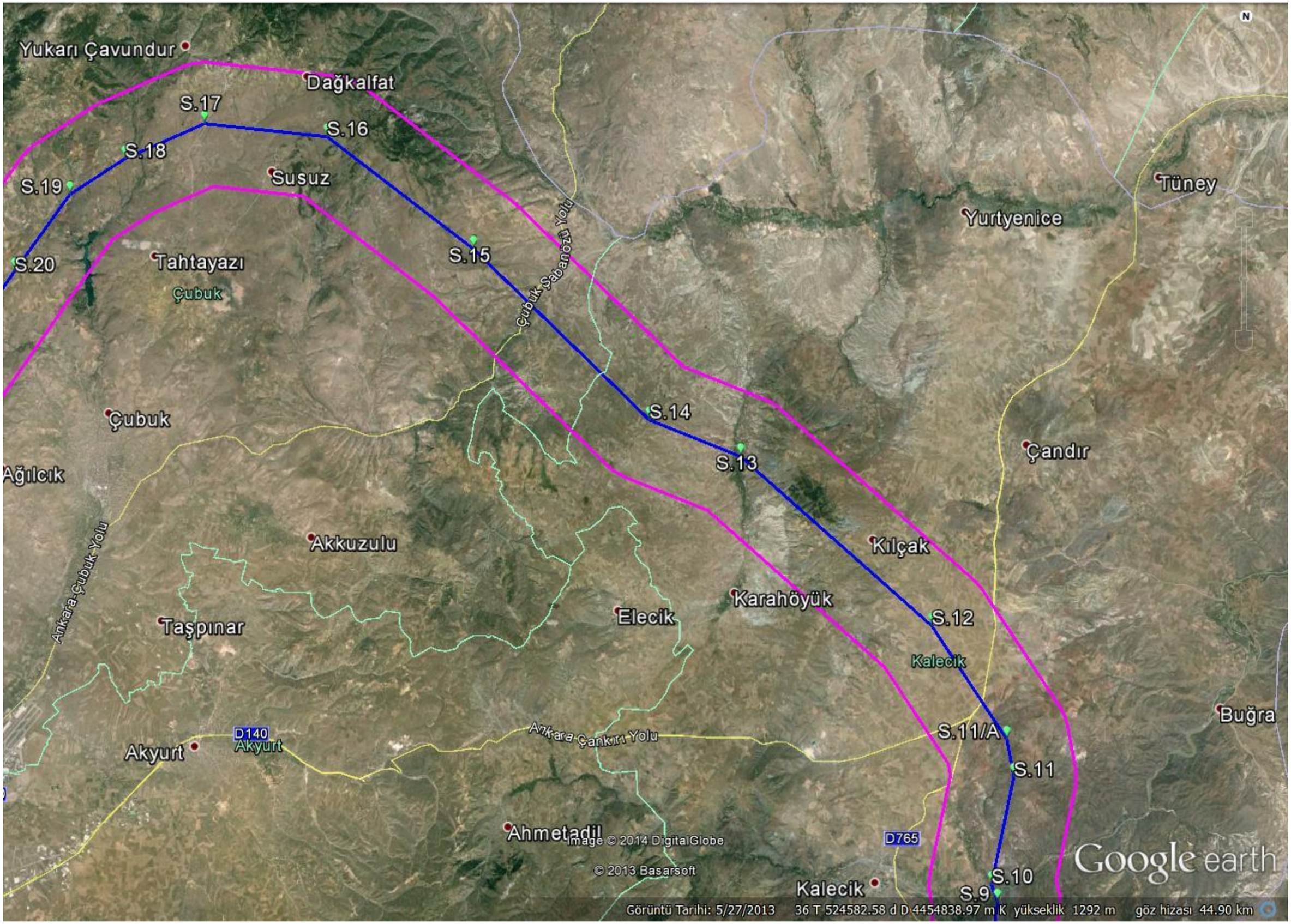
	Corvus corax	Kuzgun	-	LC	III	II	Y	A 4	L
	Sturnus vulgaris	Sığırcık	-	LC	-	II	Y	A4	L
	Passer domesticus	Serçe	-	LC	-	III	Y	A 4	L
	Passer montanus	Ağaç serçesi	-	LC	III		Y	A4	L
	Petronia petronia	Kaya serçesi	-	LC	III	I	Y	A4	L
	Fringilla coelebs	İspinoz	-	LC	III		Y	A4	L
	Serinus serinus	Küçük iskete	-	LC	II	I	Y	A4	L
	Carduelis carduelis	Saka	-	LC	II	I	Y	A4	L
	Carduelis cannabina	Ketenkuşu	-	LC	II	I	Y, KZ	A 4	L
	Coccothraustes coccothraustes	Kocabaş	-	LC	II	I	Y, KZ	A 4	L
Aves/ Piciformes	*Dendrocopos minor*	Küçük ağaçkakan	-	LC	II	I	Y	A4	L
Aves/ Podicipediformes	*Tachybaptus ruficollis*	Küçük batağan	-	LC	II	I	Y, G	A 3	L
	Podiceps cristatus	Bahri	-	LC		I	Y, KZ	A 3	L
Aves/ Strigiformes	*Athene noctua*	Kukumav	-	LC	II	I	Y	A4	L
Mammalia/ Soricomorpha	*Crocidura suaveolens*	Sivriburunlu bahçefaresi	-	LC	II		*	*	L
Mammalia/Chiroptera	*Hypsugo savii*	Savi'nin cüce yarasası	-	LC	II	I	*	*	L
	Plecotus austriacus	Gri Uzunkulaklı yarasa	-	LC	II	I	*	*	L
Mammalia/ Rodentia	*Microtus anatolicus*	Anadolu tarlafaresi	-	DD	-	-	*	*	L
	Microtus dogramacii	Doğramacı tarla faresi	-	LC	-	-	*	*	L
	Apodemus mystacinus	Kayalık orman faresi	-	LC	-	-	*	*	L
	Dryomys nitedula	Hasancık	-	LC	III	I	*	*	L
Mammalia/ Carnivora	*Canis lupus*	Kurt	-	LC	II	I	*	*	L

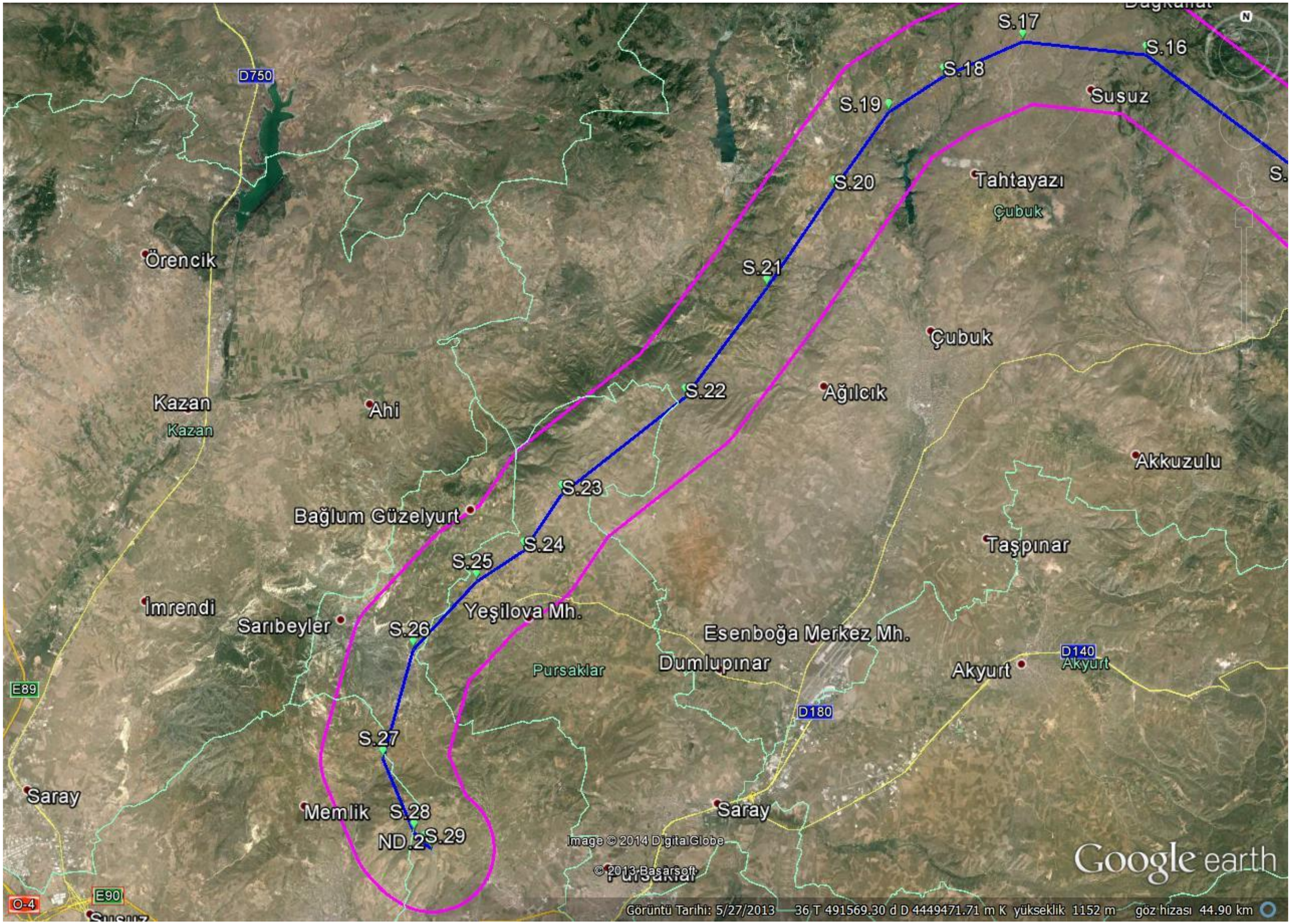
APPENDIX-4

SATELLITE IMAGES OF THE PROJECT AREA


Yukarı Çavundur
S.17
S.16
S.18
S.19
S.20
S.15
S.21
Çubuk
Çubuk
S.14
S.13
S.22
Kazan
S.23
S.25
S.24
S.12
Kalecik
S.26
Yeşilova Mh.
Pursaklar
S.11/A
S.11
Akyurt
Akyurt
S.27
S.28
ND.2
S.29
Pursaklar
Kalecik
S.9
S.10
Keçiören
Yenimahalle
S.8
Altındağ
Hasanoğlan Fatih Mh.
S.7
Etimesgut
Ankara
Elmadağ
Yıldırım Beyazıt Mh.
S.5
S.2
S.4
S.4/A
S.3
Balışeyh
Yahşihan
Çankaya
Kırıkkale
Kırıkkale
Gölbaşı
D750
D765
D140
D180
E88
D260
Sulakyu
Image Landsat
© 2013 Basarsoft
Google earth
Görüntü Tarihi: 4/10/2013
36 T 515504.80 d D 4439480.58 m K yükseklik 1313 m
göz hizası 88.58 km


S.11
Su
Ahmetadil
Kalecik
S.10
S.9
S.8
asanoğlan Fatih Mh.
Yeşildere Fatih
S.7
D757
Kayadibi
Irmak
Elmadağ
Hacıbalı
S.1
S.5
S.6
S.2
s.4
s.4/A
S.3
Balışeyh
Kılıçlar
Yahşihan
Yenişehir Mh.
E88
Kimeski
D765
Karacahasan
Kırıkkale
Yukarımahmutlar
Image © 2014 DigitalGlobe
© 2013 Basarsoft
Kırıkkale
Google earth
Görüntü Tarihi: 7/29/2013 36 S 537152.93 d D 4426147.92 m K yükseklik 771 m göz hizası 44.90 km


Yukarı Çavundur
Dağkalfat
S.17
S.16
S.18
S.19
Susuz
S.20
Tahtayazı
Çubuk
S.15
Çubuk Şabanözü Yolu
Tüney
Yurtyenice
Çubuk
S.14
S.13
Çandır
Ağılcık
Akkuzulu
Kılçak
Ankara-Çubuk Yolu
Karahöyük
Taşpınar
Elecik
S.12
Kalecik
Buğra
S.11/A
D140
Akyurt
Akyurt
Ankara-Çankırı Yolu
S.11
Ahmetadil
Image © 2014 DigitalGlobe
© 2013 Basarsoft
D765
Kalecik
S.10
S.9
Google earth
Görüntü Tarihi: 5/27/2013
36 T 524582.58 d D 4454838.97 m K yükseklik 1292 m
göz hizası 44.90 km


S.17
S.16
S.18
S.19
Susuz
S.20
Tahtayazı
Çubuk
Örencik
S.21
Çubuk
Kazan
Kazan
Ahi
S.22
Ağılcık
Akkuzulu
S.23
Bağlum Güzelyurt
Taşpınar
S.24
S.25
İmrendi
Sarıbeyler
S.26
Yeşilova Mh.
Esenboğa Merkez Mh.
Dumlupınar
Pursaklar
Akyurt
D140
Akyurt
D180
S.27
Saray
Memlik
S.28
ND.2
S.29
Saray
Image © 2014 DigitalGlobe
© 2013 Basarsoft
Google earth
Görüntü Tarihi: 5/27/2013 36 T 491569.30 d D 4449471.71 m K yükseklik 1152 m göz hizası 44.90 km

APPENDIX-5

PHOTOGRAPHS OF THE PROJECT AREA



Figure 1. Photograph of the Project Area (S4 Some Pole)



Figure 2. Photograph of the Project Area (S6 Some Pole)



Figure 3. Photograph of the Project Area (S7 Some Pole)



Figure 4. Photograph of the Project Area (S8 Some Pole)



Figure 5. Photograph of the Project Area (S9 Some Pole)



Figure 6. Photograph of the Project Area (S10 Some Pole)



Figure 7. Photograph of the Project Area (S11 –S11/A Some Poles)



Figure 8. Photograph of the Project Area (S12 Some Pole)



Figure 9. Photograph of the Project Area (S13 Some Pole)



Figure 10. Photograph of the Project Area (S15 Some Pole)



Figure 11. Photograph of the Project Area (S17 Some Pole)



Figure 12. Photograph of the Project Area (S19-S20 Some Poles)



Figure 13. Photograph of the Project Area (S21-S22 Some Poles)



Figure 14. Photograph of the Project Area (S23 Some Pole)



Figure 15. Photograph of the Project Area (S24-S25 Some Poles)



Figure 16. Photograph of the Project Area (S26-S27 Some Poles)



Figure 17. Photograph of the Project Area (S28-S29 Some Poles)



Figure 18. Photograph of the Project Area (Bağlum Substation)

APPENDIX-6

METEOROLOGY BULLETINS

T.R.

FORESTY AND WATER AFFAIRS MINISTRY

GENERAL DIRECTORATE OF METEOROLOGY

Latitude	39
Longitude	32
Elevation	891

17130-ANKARA 1970 - 2011

Parameter	Observing Period. (Year)	January	February	March	April	May	June	July	August	September	October	November	December
Average Pressure (Hpa)	42	914.9	912.9	912.0	910.9	912.0	911.7	910.7	911.4	913.9	916.0	916.3	915.6
Maximum Pressure(Hpa)	42	935.1	929.6	933.2	923.9	921.3	921.0	918.9	918.8	923.1	926.7	927.6	932.6
Minimum Pressure (Hpa)	42	887.9	892.8	891.6	897.7	901.3	900.5	899.3	903.4	902.2	904.1	898.6	891.6
Avg. Temperature at 7am (°C)	42	-2.0	-1.1	2.1	7.5	12.6	16.5	19.2	18.4	13.6	8.4	3.0	0.0
Avg. Temperature at 2pm (°C)	42	3.2	5.5	10.4	15.6	20.6	25.0	28.7	28.8	24.7	18.6	11.3	5.1
Avg. Temperature at 9pm (°C)	42	0.1	1.9	6.2	11.1	15.5	19.6	23.3	22.9	18.3	12.5	6.2	2.0
Average Temperature (°C)	42	0.3	2.1	6.2	11.3	16.1	20.2	23.6	23.3	18.7	13.0	6.7	2.3
Average Temperature > 5,0 C (day) (°C)	42	4.9	8.4	19.5	28.5	30.9	30.0	31.0	30.9	29.9	29.8	20.2	7.9
Average Temperature > 10,0 C (day) (°C)	42	0.3	0.7	7.1	18.6	29.3	30.0	31.0	30.9	29.7	23.3	6.1	0.6
Average High Temperature (°C)	42	4.3	6.7	11.9	17.1	22.2	26.6	30.3	30.2	26.0	19.7	12.4	6.2
Average Low Temperature (°C)	42	-3.0	-2.0	1.1	5.7	9.7	13.1	16.1	16.1	12.0	7.4	2.2	-1.0
Maximum Temperature Day (°C)	42	2	24	23	12	23	27	30	7	3	3	2	4
Maximum Temperature Year (°C)	42	1995	1987	2008	1970	1995	1996	2000	2010	2007	1999	2004	2010
Maximum Temperature (°C)	42	16.6	19.9	26.4	30.6	33.0	37.0	40.8	40.4	36.0	32.2	24.4	19.8
The highest Temperature > 30,0 C (day)	42				0.1	1.0	6.3	16.8	16.7	5.3	0.5		
The highest Temperature > 25,0 C (day)	42			0.1	2.0	8.9	20.1	28.9	28.4	19.0	6.0		
The highest Temperature > 20,0 C (day)	42			2.1	8.7	21.6	28.5	30.9	30.8	27.3	15.4	1.5	
The highest Temperature >	42	6.1	2.9	0.3								0.1	2.9

-1,0 C (day)													

T.R.

FORESTY AND WATER AFFAIRS MINISTRY

GENERAL DIRECTORATE OF METEOROLOGY

Latitude	39	
Longitude	32	
Elevation	891	Elevation

Parameter	Observing Period. (Year)	January	February	March	April	May	June	July	August	September	October	November	December
Maximum Daily Temperature Difference (°C)	42	18.4	19.2	21.9	20.5	20.5	21.2	21.2	20.8	21.2	22.2	19.2	18.7
Minimum Temperature Day (°C)	42	21	22	2	11	1	2	5	28	30	19	25	31
Minimum Temperature Year (°C)	42	1976	1985	1985	1997	1981	1997	1985	1981	1970	1977	1995	1972
Minimum Temperature (°C)	42	-21.2	-21.5	-19.2	-6.7	-1.6	5.0	6.8	7.2	2.5	-3.4	-8.8	-17.2
Average Days With -0.1 and Lower Minimum Temperature	42	21.2	17.4	11.3	1.7	0.0					0.8	8.3	18.2
Average Days With -3 and Lower Minimum Temperature	42	14.4	10.0	5.0	0.3						0.1	3.1	9.8
Average Days With -5 and Lower Minimum Temperature	42	10.2	7.0	2.3	0.0							1.5	5.4
Average Days With -10 and Lower Minimum Temperature	42	3.5	2.0	0.3									0.5
Average Days With -15 and Lower Minimum Temperature	42	0.5	0.4	0.1									0.0
Average Days With -20 and Lower Minimum Temperature	42	0.0	0.1										
Average Days With 20 and Higer Minimum Temperature	42						0.1	2.6	2.9	0.1			
Average Days With 15 and Lower Minimum Temperature	42				0.1	1.4	7.5	21.2	21.0	4.5	0.3		
Average Days With 10 and Lower Minimum Temperature	42		0.1	0.5	3.5	14.6	26.3	30.6	30.2	22.8	7.6	0.4	0.1
Average Days With 5 and Lower Minimum Temperature	42	1.1	1.4	5.6	17.7	28.9	30.0	31.0	30.9	29.5	23.5	7.6	2.7
Average Minimum Temperature on Soil (°C)	42	-4.0	-3.2	-0.2	4.3	8.0	11.5	14.5	14.4	10.2	5.8	0.9	-1.8
Average Minimum Temperature on Soil (°C)	42	-23.0	-23.0	-20.6	-7.6	-4.2	2.0	4.6	5.0	0.2	-5.6	-10.5	-17.5
Average Days with -0.1 and Lower Temperature on Soil	42	21.6	18.7	14.2	3.1	0.3					2.2	11.2	20.3
Average Days with -3 and Lower Temperature on Soil	42	15.8	12.5	7.2	0.9	0.0					0.5	5.6	12.2

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FORESTY AND WATER AFFAIRS MINISTRY

GENERAL DIRECTORATE OF METEOROLOGY

Latitude	39	
Longitude	32	
Elevation	891	Elevation

Parameter	Observing Period. (Year)	January	February	March	April	May	June	July	August	September	October	November	December
Average Days with -5 and Lower Temperature on Soil	42	11.9	8.4	3.9	0.2						0.0	2.9	7.6
Average Days with -10 and Lower Temperature on Soil	42	4.6	3.1	0.5								0.1	1.5
Average Pressure hPa)	40	8.8	9.1	10.2	10.4	11.1	11.9	12.8	12.6	11.0	10.5	10.0	10.4
07 Average Relative Humidity (%)	42	83.9	81.6	78.2	74.9	71.9	67.4	62.0	62.8	67.9	76.7	83.7	84.4
14 Average Relative Humidity (%)	42	66.2	58.5	48.6	44.9	41.3	36.8	31.5	30.8	33.8	44.2	54.1	65.9
21 Average Relative Humidity (%)	42	77.9	72.1	63.2	60.2	57.6	52.7	45.2	44.2	48.7	62.1	72.7	78.8
Relative Humidity (%)	42	76.0	70.8	63.4	60.0	56.9	52.3	46.2	46.0	50.2	61.0	70.2	76.4
Minimum Humidity (%)	42	28	15	12	12	9	9	6	5	4	6	15	23
07 Average Cloud Cover	37	6.9	6.4	5.5	5.5	4.2	2.7	1.6	1.6	2.0	4.0	5.3	6.8
14 Average Cloud Cover	37	6.9	6.8	6.2	6.7	5.9	4.6	3.3	3.1	3.2	4.7	5.7	6.9
21 Average Cloud Cover	37	6.2	5.5	4.8	5.0	4.5	3.3	2.2	1.9	1.9	3.2	4.4	6.0
Average Cloud Cover	37	6.7	6.4	5.7	5.9	5.2	3.9	2.8	2.8	3.0	4.5	5.5	6.8
Average Open Days	37	3.5	3.2	5.0	3.4	4.5	8.9	15.0	14.9	14.6	9.6	5.8	3.1
Average Cloudy Days	37	12.9	14.5	17.1	18.4	21.9	18.2	13.8	13.3	12.4	15.5	15.8	14.4
Average Closed Cover Days	37	13.8	10.5	8.9	8.1	4.6	2.9	2.2	2.8	3.0	5.9	8.4	13.5

07 Total precipitation Average (mm)	37	14.5	11.2	13.7	19.4	13.7	9.4	3.5	3.3	5.2	11.9	12.3	15.5
14 Total precipitation Average (mm)	37	9.2	7.9	6.7	9.8	13.4	5.1	2.1	2.3	4.0	7.1	8.1	10.4
Total precipitation Average (mm)	37	10.2	10.2	10.0	16.0	18.2	16.3	8.2	5.9	6.4	8.0	10.5	10.6

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Parameter	Observing Period. (Year)	January	February	March	April	May	June	July	August	September	October	November	December
Total precipitation Average (mm)	42	39.2	33.4	36.7	50.0	50.3	35.3	15.5	12.0	17.5	33.2	35.4	42.5
Maximum precipitation (mm)	42	27.9	26.9	22.1	29.4	42.5	88.9	62.6	35.6	32.2	46.2	36.0	36.7
Precipitation over 0.10 mm (avg.day)	42	11.1	10.4	10.6	12.3	12.5	8.9	3.9	3.0	3.8	7.5	8.8	11.0
Precipitation over 10.0 mm (avg.day)	42	0.9	0.5	0.9	1.5	1.5	0.9	0.3	0.4	0.6	0.9	0.9	1.0
Precipitation over 50.0 mm (avg.day)	42						0.0	0.0					
Number of snowy days	42	9.2	7.2	5.1	1.1	0.0					0.1	2.0	5.9
Number of Snow Covered Days	42	9.7	6.4	2.1	0.1							0.4	3.9
Maximum Thickness OF Snow (cm)	42	30	30	26	7							10	25
Number of Foggy Days	42	3.8	1.3	0.3	0.1	0.0	0.0			0.0	0.1	1.0	2.8
Number of Hailing Days	42	0.1	0.5	0.5	0.8	1.0	0.3	0.0	0.1	0.1	0.1	0.2	0.1
Average. number of Hoarfrost Days	42	7.1	5.7	3.5	0.9	0.0				0.0	1.0	5.1	7.9
Average number of Thunder stormy Days	39	0.1	0.4	0.8	2.9	7.2	6.3	3.5	2.6	2.0	1.5	0.5	0.2
Avg. wind speed at 7am (m/s)	42	1.6	1.7	1.7	1.7	1.7	1.7	2.2	2.2	1.8	1.6	1.6	1.6
Avg. wind speed at 2pm (m/s)	42	2.2	2.6	2.8	2.9	2.7	2.6	2.7	2.6	2.3	2.2	2.0	2.1
Avg. wind speed at 9pm (m/s)	42	1.7	1.8	1.8	1.7	1.8	2.1	2.7	2.5	1.8	1.5	1.6	1.7
Avg. wind speed (m/s)	42	1.9	2.0	2.1	2.1	2.1	2.2	2.5	2.4	2.0	1.8	1.7	1.8

Maximum wind speed (m/s)	42	22.0 SSE	26.5 SSE	29.2 N	22.9 SE	22.2 SSE	26.7 WSW	20.0 SE	18.0 WNW	24.4 SW	22.0 SW	21.7 SW	18.7 SSW

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Parameter	Observing Period. (Year)	January	February	March	April	May	June	July	August	September	October	November	December
Stormy Days Average	42	0.2	0.4	0.4	0.5	0.3	0.3	0.1	0.0	0.1	0.1	0.2	0.1
Strong Winds Days Average	42	2.9	3.2	4.4	5.4	4.6	5.0	5.0	4.0	2.0	1.9	1.9	2.7
Total no. of N wind blowing	42	1051	799	969	975	990	1023	1160	1125	1084	1266	1206	982
Avg. N wind speed	42	1.5	1.6	1.8	1.7	1.9	2.2	2.4	2.1	1.7	1.4	1.4	1.5
Total no. of NNE wind blowing	42	2270	2151	2097	1759	1782	2275	2801	2504	2072	2605	2308	2383
Avg. NNE wind speed	42	2.0	2.0	2.0	2.0	2.0	2.4	2.7	2.6	2.0	1.7	1.7	1.8
Total no. of NE wind blowing	42	6468	5719	5228	4834	5491	6254	7976	8932	6926	7086	6556	6469
Avg. NE wind speed	42	2.1	2.2	2.2	2.2	2.2	2.4	2.8	2.8	2.2	2.0	1.9	2.1
Total no. of ENE wind blowing	42	4869	4270	4244	3932	5413	5886	7614	6815	5943	5712	5140	4907
Avg. ENE wind speed	42	2.0	2.0	2.0	2.0	2.1	2.2	2.5	2.5	2.1	1.9	1.8	1.9
Total no. of E wind blowing	42	1616	1216	1629	1255	1767	1724	1659	1610	1473	1328	1310	1596
Avg. E wind speed	42	1.6	1.6	1.8	1.7	1.9	1.9	2.0	2.0	1.7	1.6	1.4	1.5
Total no. of ESE wind blowing	42	775	571	744	649	876	848	822	700	654	546	501	802
Avg. ESE wind speed	42	1.4	1.6	1.8	1.7	1.9	1.7	2.0	2.0	1.6	1.4	1.4	1.4
Total no. of SE wind blowing	42	675	621	840	861	838	632	762	781	613	439	463	798
Avg. SE wind speed	42	1.6	1.8	2.0	2.0	1.9	1.9	1.9	1.9	1.6	1.4	1.4	1.4
Total no. of SSE wind blowing	42	638	613	731	730	574	396	297	276	330	363	488	543
Avg. SSE wind speed	42	1.8	1.9	2.0	2.0	1.9	1.6	1.8	1.5	1.6	1.4	1.6	1.5

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Parameter	Observing Period. (Year)	January	February	March	April	May	June	July	August	September	October	November	December
Total no. of S wind blowing	42	715	909	780	680	543	381	247	251	391	488	561	646
Avg. S wind speed	42	1.7	2.1	1.9	1.8	1.8	1.5	1.5	1.4	1.4	1.5	1.6	1.7
Total no. of SSW wind blowing	42	1126	1147	1356	1145	953	654	529	538	762	812	1060	1176
Avg. SSW wind speed	42	1.6	1.9	1.8	1.8	1.6	1.6	1.6	1.5	1.4	1.3	1.6	1.5
Total no. of SW wind blowing	42	3170	2787	3175	3505	2428	1741	1371	1436	2001	2458	2447	3081
Avg. SW wind speed	42	1.6	1.9	1.9	2.0	1.9	1.8	1.8	1.7	1.7	1.5	1.5	1.6
Total no. of WSW wind blowing	42	4053	3697	4447	4402	4089	3008	1887	2097	3139	3511	3513	3883
Avg. WSW wind speed	42	1.6	1.8	2.1	2.1	2.0	2.0	2.0	2.0	1.9	1.7	1.6	1.6
Total no. of W wind blowing	42	1583	1744	2309	2635	2588	1948	1223	1425	1628	1479	1476	1655
Avg. W wind speed	42	1.5	1.7	2.1	2.1	2.2	2.1	2.2	2.0	2.0	1.6	1.4	1.5
Total no. of WNW wind blowing	42	668	764	960	982	1165	1262	953	866	1023	913	766	693
Avg. WNW wind speed	42	1.4	1.6	1.9	1.8	2.1	2.1	2.2	2.1	1.7	1.4	1.4	1.5
Total no. of NW wind blowing	42	410	492	679	692	696	917	851	785	769	536	576	427
Avg. NW wind speed	42	1.3	1.5	1.8	1.8	2.0	2.1	2.2	2.0	1.8	1.4	1.4	1.5
Total no. of NNW wind blowing	42	561	499	694	704	692	891	914	787	773	744	551	514
Avg. NNW wind speed	42	1.6	1.8	1.9	1.8	1.8	2.2	2.3	2.1	1.8	1.4	1.3	1.4
Average 5 cm Soil Temperature (°C)	42	1.0	2.3	6.9	12.8	18.7	23.7	27.8	27.4	22.2	14.4	6.6	2.5
Minimum 5 cm Soil Temperature (°C)	42	-15.2	-8.3	-6.0	0.1	3.3	9.8	13.4	11.0	5.5	0.2	-6.4	-8.6

Average 10 cm Soil Temperature (°C)	42	1.4	2.4	6.8	12.7	18.5	23.3	27.0	26.8	22.0	14.7	7.1	2.9
Minimum 10 cm Soil Temperature (°C)	42	-9.7	-5.9	-5.3	1.8	4.2	11.0	14.5	12.4	9.6	3.5	-1.4	-4.8

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Elevation	891	Elevation

Parameter	Observing Period. (Year)	January	February	March	April	May	June	July	August	September	October	November	December
Average 20 cm Soil Temperature (°C)	42	2.1	2.6	6.5	12.1	17.5	22.2	25.9	26.0	21.9	15.2	8.0	3.8
Minimum 20 cm Soil Temperature (°C)	42	-3.8	-5.2	-1.8	3.1	7.3	12.9	17.3	17.9	12.8	6.3	0.8	-2.6
Average 50 cm Soil Temperature (°C)	42	4.1	3.9	6.6	11.2	16.0	20.5	24.3	25.0	22.3	17.1	10.8	6.3
Minimum 50 cm Soil Temperature (°C)	42	-1.0	-0.9	0.9	5.6	9.0	13.3	18.8	20.6	16.3	10.4	3.3	0.8
Average 100 cm Soil Temperature (°C)	42	7.1	6.0	7.2	10.4	14.1	18.0	21.5	23.2	22.1	18.8	14.0	9.8
Minimum 100cm Soil Temperature (°C)	42	1.6	2.4	2.2	5.7	9.8	13.1	17.8	20.4	18.6	14.4	7.0	2.9
Average Open Surface Evaporation (mm)	40			0.9	89.5	149.7	190.2	245.8	226.0	153.9	87.2	22.7	0.7
Maximum Open Surface Evaporation (mm)	40			7.0	12.0	12.0	18.0	15.2	18.0	11.8	10.0	8.0	2.8
Average Daily Sun Duration (hr-min)	42	2.36	3.51	5.22	6.22	8.31	10.18	11.22	10.46	9.15	6.32	4.27	2.25
Average Global Sun Intensity (cal÷cm²)	42	144.50	216.10	315.00	391.80	487.30	546.20	561.40	506.80	415.20	279.20	177.30	121.60
Maximum Daily Total Sun Intensity (cal÷cm²)	42	1.34	1.80	1.75	1.89	1.97	1.95	2.00	1.75	1.64	1.92	1.20	0.98
Average 20 cm Soil Temperature (°C)													
Minimum 20 cm Soil Temperature (°C)													
Average 50 cm Soil Temperature (°C)													

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Elevation	747				17135-KIRIKKALE					1960 - 2012			
Parameter	**Years**	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**
Average Pressure (hPa)	47	932.0	930.3	928.8	927.4	928.2	927.5	926.4	927.2	930.0	932.4	933.3	932.6
Maximum Pressure (hPa)	47	950.7	947.3	949.0	944.4	941.7	938.3	937.8	937.9	941.2	944.1	947.7	949.2
Minimum Pressure (hPa)	47	898.7	909.8	907.9	912.5	917.1	915.3	915.4	917.6	917.9	919.8	914.9	912.2
Avg. Temperature at 7am (C)	53	-2.0	-1.1	2.4	7.8	13.0	17.4	20.1	19.0	14.0	8.6	3.3	0.3
Avg. Temperature at 2pm (C)	51	3.2	5.7	11.2	16.8	21.7	26.2	29.6	29.7	25.8	19.6	11.7	5.3
Avg. Temperature at 9pm (C)	51	0.1	2.0	6.8	11.9	16.3	20.7	24.3	23.9	19.2	13.1	6.5	2.3
Avg. Temperature (C)	51	0.4	2.1	6.8	12.2	16.9	21.2	24.6	24.1	19.5	13.6	6.9	2.5
Average Temperature > 5,0 C (day)	51	5.0	8.4	20.0	28.2	30.2	29.4	30.2	29.7	28.7	29.1	19.8	8.6
Average Temperature >= 10,0 C (day)	51	0.2	1.1	7.6	20.7	29.5	29.4	30.2	29.7	28.7	23.8	6.5	0.7
Average High Temperature	53	4.1	6.5	12.4	18.0	23.0	27.5	30.9	30.8	26.7	20.6	12.7	6.2
Average Low Temperature	51	-3.0	-2.0	1.4	6.1	10.1	13.8	16.6	16.3	12.1	7.4	2.2	-0.6
Maximum Temperature Day	53	29	28	24	22	23	27	26	1	10	2	2	1
Maximum Temperature Year	53	2005	2004	2008	2008	1995	1996	2012	2010	1963	1999	2004	1990
Maximum Temperature (C)	53	17.0	20.8	30.4	32.0	34.4	37.6	41.8	40.3	37.0	33.0	24.8	19.0
The highest Temperature >= 30,0 C (day)	53			0.0	0.2	1.8	8.7	19.0	18.4	6.8	0.7		
The highest Temperature >= 25,0 C (day)	53			0.2	2.6	10.7	22.4	29.5	28.7	19.8	7.0		
The highest Temperature >= 20,0 C (day)	53		0.0	2.7	10.5	22.8	29.1	30.8	30.4	27.6	16.4	1.8	
The highest Temperature <= -1,0 C (day)	53	6.3	3.2	0.4								0.1	2.2
Maximum Temperature Difference Druing Day	51	17.5	20.2	23.8	22.5	22.9	22.3	22.7	24.8	26.5	23.6	20.8	18.3

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Elevation	747				17135-KIRIKKALE					1960 - 2012			
Parameter	**Years**	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**
Minimum Temperature Day	51	16	6	3	4	6	5	5	31	29	30	26	31
Minimum Temperature Year	51	1980	1972	1985	1965	1990	1967	1985	1965	1974	1973	1995	1972
Minimum Temperature (C)	51	-22.4	-21.6	-19.8	-6.8	0.4	4.6	7.4	7.2	2.7	-5.0	-9.7	-18.0
Avg. Days With <=-0.1 and Lower Minimum Te	51	20.8	16.9	10.7	1.4						0.9	8.0	16.0
Avg. Days With <=-3 and Lower Minimum Temp	51	13.4	10.6	4.5	0.2						0.2	3.0	8.3
Avg. Days With <=-5 and Lower Minimum Temp	51	9.7	6.9	2.0	0.1						0.0	1.3	4.6
Avg. Days With <=-10 and Lower Minimum Tem	51	3.2	2.2	0.1									0.5
Avg. Days With <=-15 and Lower Minimum Tem	51	0.7	0.6	0.1									0.0
Avg. Days With <=-20 and Lower Minimum Tem	51	0.1	0.1										
Avg. Days With >=20 and Lower Minimum Temp	51						0.3	3.3	2.8	0.1			
Avg. Days With >=15 and Lower Minimum Temp	51				0.2	1.3	9.8	22.9	21.0	5.3	0.4		
Avg. Days With >=10 and Lower Minimum Temp	51		0.0	0.6	4.2	16.8	27.3	30.2	29.5	21.9	7.1	0.7	0.1
Avg. Days With >=5 and Lower Minimum Temp.	51	1.1	1.9	6.1	18.8	28.7	29.4	30.3	29.8	28.4	22.4	7.8	2.8
Average Minimum Temperature on Soil	40	-3.9	-3.1	-0.1	4.8	8.5	12.4	15.3	14.8	10.4	6.0	0.8	-1.7
Minimum Temperature on Soil	40	-24.0	-21.8	-19.9	-8.9	-1.0	2.9	7.0	5.5	1.0	-6.3	-10.8	-19.0
Minimum Temperature on Soil<=-0.1 and Lower	40	21.9	18.6	13.6	2.5	0.1					1.9	11.9	19.0
Minimum Temperature on Soil<=-3 and Lower	40	14.8	12.8	7.1	0.5						0.4	6.3	11.6
Minimum Temperature on Soil<=-5 and Lower	40	10.7	8.4	3.9	0.2						0.1	3.0	6.9
Minimum Temperature on Soil<=-10 and Lower	40	3.6	2.5	0.5								0.1	0.9
Average Pressure (hPa)	49	8.7	8.5	10.2	10.7	11.7	12.7	13.8	13.6	11.7	10.6	9.8	9.8
07 Local Average Realtive Humidity (%)	51	84.9	83.9	81.7	78.8	76.2	69.6	65.1	66.5	71.5	79.1	85.6	85.6
14 Local Average Realtive Humidity (%)	51	67.8	60.6	48.8	44.1	41.1	35.9	32.1	31.5	34.0	42.7	55.1	68.0
21 Local Average Realtive Humidity (%)	51	79.7	74.9	64.7	60.8	59.4	51.8	43.6	42.8	47.7	61.2	74.8	80.6

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Latitude	39												
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Elevation	747				17135-KIRIKKALE						1960 - 2012		
Parameter	**Years**	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**
Average Humidity (%)	51	77.5	73.1	65.1	61.2	58.9	52.4	47.0	46.9	51.1	61.0	71.8	78.1
Minimum Humidity (%)	51	22	14	4	8	2	4	4	5	3	7	16	20
07 Local Average Cloudiness	45	7.5	6.9	5.7	5.3	4.1	2.6	1.7	1.6	2.3	4.0	5.6	7.2
14 Local Average Cloudiness	45	7.0	6.6	6.2	6.3	5.6	4.5	2.9	2.8	3.2	4.4	5.6	7.1
21 Local Average Cloudiness	45	6.2	5.4	4.5	4.6	4.0	3.1	1.6	1.4	1.7	3.0	4.3	6.1
Average Cloudiness	47	6.9	6.4	5.7	5.6	4.8	3.7	2.4	2.3	2.7	4.1	5.4	6.9
Average Open Day Number	47	2.6	2.6	4.8	4.1	5.1	9.2	16.6	16.8	14.4	10.0	5.8	2.8
Average Cloudiness Day Number	47	13.5	14.4	16.5	17.9	20.4	17.7	12.0	11.3	12.1	15.4	15.8	13.7
Average Closed Day Number	47	13.5	10.0	8.3	6.7	4.2	2.4	1.6	1.6	2.2	4.3	7.7	13.7
07 Total precipitation Average (mm)	45	15.3	10.6	13.2	15.8	14.0	6.9	4.5	3.0	4.3	9.0	12.2	15.0
14 Total precipitation Average (mm)	45	9.5	7.2	5.6	9.5	9.4	5.8	1.4	1.9	1.9	5.6	6.4	9.9
21 Total precipitation Average (mm)	45	9.7	7.9	9.1	14.7	19.9	16.1	3.5	3.1	4.1	7.2	8.2	10.8
Total precipitation Average (mm)	53	41.6	31.4	34.0	45.8	49.2	34.8	10.9	8.2	13.4	27.9	30.5	45.8
Daily Maximum Precipitation (mm)	53	36.5	36.0	30.2	33.0	35.8	100.6	52.7	26.1	29.4	39.2	40.0	34.6
Precipitation over 0.10 mm (avg.day)	53	11.1	10.2	9.9	11.4	11.0	7.7	3.1	2.4	3.5	6.5	8.2	10.7
Precipitation over 10 mm (avg.day)	53	1.2	0.6	0.9	1.5	1.4	0.9	0.3	0.2	0.3	0.8	0.8	1.2
Precipitation over 50 mm (avg.day)	53						0.0	0.0					
Avg. Number of snowy days	52	5.8	4.5	2.8	0.5							1.0	3.5
Number of Snow Covered Days	53	7.7	4.8	1.4	0.1							0.2	2.6
Maximum Thickness OF Snow (cm)	53	48	40	25	6							5	31
Number of Foggy Days	53	3.9	1.9	0.5	0.2					0.0	0.2	2.0	4.4
Number of Hailing Days	52	0.1	0.2	0.2	0.4	0.4	0.2	0.0		0.0	0.1	0.0	0.0
Average. number of Hoarfrost Days	53	6.6	5.9	3.8	0.5						0.8	6.9	7.1

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Latitude	39												
Longitude	33												
Elevation	747				17135-KIRIKKALE						1960 - 2012		
Parameter	**Years**	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**
Average number of Thunder stormy Days	47	0.0	0.1	0.4	2.5	5.8	4.9	2.0	1.8	2.0	0.9	0.1	0.0
07 Local Average Wind Speed (m_sec)	53	1.3	1.3	1.3	1.3	1.0	1.0	1.4	1.2	1.0	0.9	1.1	1.3
14 Local Average Wind Speed (m_sec)	53	2.3	2.7	3.1	3.1	2.9	2.8	2.9	2.7	2.4	2.2	2.0	2.2
21 Local Average Wind Speed (m_sec)	53	1.5	1.6	1.8	1.9	1.9	2.4	3.5	3.1	2.1	1.5	1.2	1.4
Average Wind Speed (m_sec) (m_sec)	53	1.7	1.9	2.1	2.1	1.9	2.1	2.6	2.3	1.8	1.5	1.4	1.6
Maxmimum Wind Speen (m_sec) and Direction	53	22.6 SW	25.9 SSW	28.1 W	27.7 SSW	24.3 WSW	28.0 W	24.4 W	23.0 WNW	23.9 S	22.0 WSW	22.6 NNW	22.6 N
Stormy Days Average	53	0.4	0.8	0.9	1.1	0.7	0.9	0.8	0.5	0.5	0.2	0.3	0.3
Strong Winds Days Average	53	2.5	2.8	4.5	5.0	5.5	6.2	7.0	5.8	3.3	2.4	2.2	2.2
Total no. of N direction wind blowing	53	1148	1095	1399	989	1542	2073	2340	2243	1662	1413	1169	1189
Avg. N direction wind speed (m/s)	53	2.1	2.4	2.8	2.3	2.6	3.0	3.7	3.2	2.6	1.9	1.8	2.1
Total no. of NNE direction wind blowing	53	1049	932	1146	1166	1330	1944	2947	2487	1679	1513	1163	985
Avg. NNE direction wind speed (m/s)	53	2.1	2.3	2.5	2.3	2.3	2.8	3.2	3.2	2.5	2.1	1.9	1.9
Total no. of NE direction wind blowing	53	3636	3464	4467	3943	5096	6260	9170	8514	6459	5532	4146	3503
Avg. NE direction wind speed (m/s)	53	1.7	1.8	2.1	2.1	2.1	2.4	3.1	2.7	2.1	1.8	1.5	1.6
Total no. of ENE direction wind blowing	53	3435	3309	3691	3540	4658	4890	6170	6692	5541	5499	3952	3652
Avg. ENE direction wind speed (m/s)	53	1.6	1.8	2.0	1.9	2.0	2.2	2.7	2.7	2.0	1.7	1.5	1.5
Total no. of E direction wind blowing	53	3422	3497	3698	3309	3823	3739	4031	4424	4641	4220	4000	3285
Avg. E direction wind speed (m/s)	53	1.3	1.4	1.5	1.4	1.5	1.5	1.8	1.7	1.4	1.2	1.1	1.2
Total no. of ESEE direction wind blowing	53	895	835	752	753	809	923	839	881	988	757	796	798
Avg. ESE direction wind speed (m/s)	53	1.1	1.2	1.3	1.3	1.4	1.4	1.6	1.6	1.4	1.2	1.0	1.1
Total no. of SE direction wind blowing	53	1129	901	936	823	1073	896	762	750	1017	1191	1119	1262
Avg. SE direction wind speed (m/s)	53	1.0	1.1	1.2	1.2	1.3	1.3	1.3	1.3	1.2	1.0	1.0	1.0
Total no. of SSE direction wind blowing	53	741	582	445	524	506	359	269	260	437	420	495	682

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Latitude	39												
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Elevation	747				17135-KIRIKKALE					1960 - 2012			
Parameter	**Years**	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**
Avg. SSE direction wind speed (m/s)	53	1.0	1.2	1.3	1.4	1.3	1.3	1.5	1.4	1.3	1.1	1.0	1.1
Total no. of S direction wind blowing	53	2207	1845	1850	1699	1481	1106	697	564	953	1250	2095	2035
Avg. S direction wind speed (m/s)	53	1.5	1.8	1.9	2.0	1.7	1.6	1.4	1.5	1.5	1.5	1.5	1.4
Total no. of SSW direction wind blowing	53	3501	3258	2983	2897	2014	1019	626	600	1092	1811	2562	3450
Avg. SSW direction wind speed (m/s)	53	2.0	2.4	2.5	2.4	2.1	1.9	1.7	1.7	1.7	1.9	1.9	2.1
Total no. of SE direction wind blowing	53	5695	4798	5004	4829	3689	2263	1566	1337	1889	2545	3641	5589
Avg. SW direction wind speed (m/s)	53	1.9	2.0	2.1	2.1	1.9	1.9	1.8	1.6	1.6	1.6	1.6	1.8
Total no. of WSW direction wind blowing	53	1683	1721	2214	2422	1983	1520	739	819	1394	1693	1709	1865
Avg. WSW direction wind speed (m/s)	53	1.7	1.9	2.2	2.3	2.2	2.1	1.9	1.9	1.9	1.6	1.5	1.6
Total no. of W direction wind blowing	53	1871	1960	2272	2726	2533	2315	1538	1311	1592	1725	1709	1758
Avg. W direction wind speed (m/s)	53	1.7	1.9	2.2	2.3	2.4	2.4	2.2	2.1	2.0	1.7	1.6	1.6
Total no. of WNW direction wind blowing	53	498	513	796	837	928	1040	691	657	961	723	556	695
Avg. WNW direction wind speed (m/s)	53	1.6	1.9	2.2	2.3	2.4	2.4	2.5	2.3	2.1	1.8	1.5	1.5
Total no. of NW direction wind blowing	53	518	716	858	813	891	1200	1189	1029	830	627	531	714
Avg. NW direction wind speed (m/s)	53	1.6	1.7	1.8	1.9	2.0	2.2	2.5	2.2	1.8	1.4	1.7	1.5
Total no. of NNW direction wind blowing	53	414	528	631	518	623	970	859	700	621	415	548	506
Avg. NNW direction wind speed (m/s)	53	2.2	2.7	2.4	2.4	2.5	2.8	3.0	3.0	2.5	2.0	2.1	2.0
Average 5 cm. Soil Temperature (°C)	48	1.5	3.0	8.0	14.3	20.4	25.8	29.8	28.9	23.5	15.4	7.6	3.1
Minimum 5 cm. Soil Temperature (°C)	48	-8.6	-8.7	-9.6	0.9	3.9	10.2	15.0	14.4	8.0	1.0	-3.3	-6.6
Average 10 cm. Soil Temperature (°C)	48	1.7	2.9	7.8	14.0	20.0	25.2	28.8	28.4	23.3	15.7	7.8	3.3
Minimum 10 cm. Soil Temperature(°C)	48	-7.1	-6.7	-7.1	2.0	5.4	10.4	15.6	16.5	10.2	3.2	-1.0	-5.6
Average 20 cm. Soil Temperature (°C)	48	2.5	3.3	7.6	13.4	19.2	24.1	27.7	27.5	23.2	16.3	8.8	4.3
Minimum 20 cm. Soil Temperature°C)	48	-5.1	-4.3	-3.7	3.0	7.9	12.6	18.3	19.8	13.4	6.0	1.6	-1.6

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MINISTRY OF FORESTY AND WATER WORKS
GENERAL DIRECTORATE OF METEOROLOGY

Latitude	39												
Longitude	33												
Elevation	747				17135-KIRIKKALE					1960 - 2012			
Parameter	**Years**	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**
Average 50 cm. Soil Temperature (°C)	31	4.6	4.6	7.7	12.7	17.5	22.0	25.7	26.7	23.9	18.5	11.6	6.7
Minimum 50 cm. Soil Temperature (°C)	31	1.2	1.1	0.2	6.9	10.2	14.4	21.4	22.3	18.4	11.2	5.2	2.4
Average 100 cm. Soil Temperature (°C)	31	7.1	6.3	7.9	11.6	15.6	19.5	23.1	24.7	23.5	19.8	14.5	9.8
Minimum 100 cm. Soil Temperature(°C)	31	0.3	3.2	3.6	8.1	11.1	14.6	19.8	21.7	19.6	13.1	9.0	6.4
Average Open Surface Evoparation (mm)	24				52.6	174.2	229.6	293.6	266.0	176.2	96.7	6.4	
Maxsimum Open Surface Evoparation (mm)	24				11.0	14.4	17.0	16.0	15.7	11.7	9.7	4.7	
Average Daily Total Insolation Duration (hr-min)	28	2.45	4.11	5.35	6.50	8.45	10.36	11.40	11.09	9.15	6.32	4.15	2.21
Average Global Insolation Intensity (cal÷cm²)	22	145.40	222.10	322.20	396.50	481.10	541.00	556.80	505.30	410.30	276.90	170.70	119.80
Maximum Dailiy Insolation Intensity (cal÷cm²)	22	1.05	1.23	1.55	1.56	1.65	1.62	1.58	1.51	1.55	1.26	1.80	0.97
Average Seawater Temperature (°C)													
Maximum Seawater Temperature (°C)													
Minimum Seawater Temperature (°C)													

APPENDIX-7

TEIAŞ EXPROPRIATION PROCEDURE

LAND ACQUISITION/EXPROPRIATION IN ENERGY TRANSMISSION LINES

Aim

The aim of energy transmission lines is to transmit electrical energy produced in production plants in an economic and uninterrupted manner. This aim is fulfilled by capacity increase in previous lines and erection of new plants.

In selection of the route of energy transmission lines, although Türkiye Electricity Transmission Inc. Co. (TEİAŞ) avoids settlement areas and residential areas as much as possible and tries not to pass the line through houses or other buildings, when this is not possible, expropriation is kept at minimum level as technical requirements allow. TEİAŞ shows due diligence to follow good practice examples and national policies to protect natural structure such as forests, protected areas etc.

In this framework, the procedures presented in this document explain in detail the activities which were determined according to Turkish law and legislation (as listed below).

Legal Basis for the Acquisition of Facility Locations

Acquisition of the areas, where energy transmission lines will be located is based on one of several of the below given laws.

1- Article 46 of the Constitution,
2- Law on Expropriation no 2942 amended by law no 4650,
3- Law on Electric Market no 4628,
4- Civil Code no 4721,
5-Statutory Decree no 233 on State Economic Enterprises,
6- TEİAŞ Organization Main Status issued on 29.06.2001,
7- Zoning Law, Cadaster Law, Forest Law, Pasturage Law, Organized Industrial Zones Law,
8- Environmental Law, Agricultural reform Law and other relevant legislation.

These laws serve as a legal basis for the realization of investments in line with national interests (public services) and the Organization allows for the expropriation of the properties under private property.

The People Who are Affected from the Project

Affected people are the owners of the properties corresponding to the route of energy transmission plants. These people are determined by the preparation of application and expropriation plans of the project, which is included in investment. The land, which is lost, is generally restricted with pole locations in the lines that generally pass on a narrow line and agricultural activities can be continued during and after erection period under the line.

Expropriation performed/to be performed by the TEİAŞ does not require any resettlement. Although appropriated pole locations cover a very small area (approximately 150-250 sqm), in the areas where under the line servitudes are the case, no ownership change is made through expropriation, only right of way is given. Settlement and agricultural activities can be continued by acknowledging this liability.

In addition, according to national legislation, since the amount paid for the expropriated area is current value and since it is possible to purchase a new land under the same conditions in the same area, the owners, who are the affected people, are not injured thanks to expropriation payments.

Among the owners of the properties, the ones whose addresses were determined, purchase through negotiated tender is performed. For the owners with whom no deal is reached with negotiation or for those whose addresses are not determined or whose ownership status are controversial, a claim for price determination and registry is filed as per Article 10 of Law on Expropriation. The expropriation amount determined by the court during the legal action is deposited in the bank to be paid to the owners and right holders. On the other hand, expropriation amounts for the properties, whose right holders could not be determined are turned into deposit account with three moth maturity, thus preventing a loss of right for the owners and right holders of the property who will be determined in the future.

Determination of expropriation equivalent is made as per the criteria in article 11 of Law on Expropriation. The legislation does not involve paying compensation for the tenants of illegal users. However, the losses of the related people are compensated for the crops grown in another person's land for labor and monetary purposes.

Right to petition of the owner, who is affected from expropriation process, is reserved in national legislation both in administrative and legal means. Accordingly, the affected owner has the right to request the project to be established in another place in administrative terms and to demand that he/she does not accept the amount payable to him/her in monetary terms. The affected property owner has the right to file a lawsuit both in administrative court or legal court in the event that he/she does not receive his/her demands from TEİAŞ both in terms of relocation or the amount payable.

All damages on the route or during transport to the route are paid to the affected people after determination of necessary assessments. These compensations also include restoration to original condition of the property.

Responsibility and Finance

Land acquisition process for the Project investments are carried out under the responsibility of Türkiye Electricity Transmission Inc. Co. (TEİAŞ) by the power vested by the Ministry of Energy and Natural Resources. Expropriation transactions start with the "APPROVAL" of decision taken by the Board of Organization by the Ministry of Energy and Natural Resources. The finance is included in operating budget within the activity year and payments are made to relevant people over appraised values according to deal or decisions of the court.

Expropriation Process

a) Initiation of Expropriation

Expropriation starts with the "APPROVAL" of decision taken by the Board of Organization the Ministry of Energy and Natural Resources and in line with the prepared technical, economic documents.

b) Valuation

Appraisal commissions which consists of minimum three people within the Organization valuates the estimated value of the property that will be expropriated making use of information and documents obtained from three experts, organizations or institutions, when necessary from Chambers of Industry or Commerce, local property purchase-sale offices as per article 8 of Law on Expropriation.

c) Announcement

The Organization notifies the owner by registered mail that it wants to purchase the property by paying source or servitude amount in advance and by negotiation. In case of lawsuits for the owners whose addresses could not be found and for those whose ownership statuses are indefinite or disputed, summary of expropriation and documents is announced in a local and national newspaper by the court at least for once.

d) Purchase by Deal/Payment of the Amount/Registry

Reconciliation committee determined by the Organization, which is made up of minimum three people (Law on Expropriation Article 8) negotiates with the owners who responded to calls and who will take part in reconciliation. Registry transactions are conducted in title deed for the owners with whom reconciliation is reached and expropriation amounts are paid to the owners (Law on Expropriation Article 8).

e) Procedures to be Followed in Administrative Disputes

If expropriation cannot be made by purchasing procedures, a lawsuit is filed by the relevant court demanding determination of expropriation amount and registry on behalf of the Organization. Based on the court decision, expropriation amount is deposited in the bank on behalf of the receiver and a copy of the receipt is submitted to the court. Judgment for registry is final. The decision is executed by the relevant title deed directorate (Law on Expropriation article 10). Court charges (court committee charges, expert charges, application/decision fees, appeal costs, title deed fees, other legal fees) are payable by TEİAŞ Organization (Law on Expropriation Article 29)

Procedure of the above explanations are executed on the condition that they;

* comply with the legislation,
* don't damage ownership and legacy rights of the people violating public interest,
*are transparent and open to the general public,
*by paying expropriation amount fairly and in advance,
*according to national legislation no entry is allowed to the land before expropriation and payment of due amount,
*reserving the right of objection of the people who aren't satisfied with the amount,
*by documenting the whole process.

<u>Reporting Requirements</u>

Prior to starting construction of facilities, TEİAŞ expropriation summary will be submitted to the bank for each substation project. The plan consists of the ownership status and number of the parcels which will be expropriated to for which servitude will be executed, affecting amount of each parcel, estimated value (per sqm) of the land and assets which will be expropriated or for which servitude will be performed; expropriation program and execution responsibility. TEİAŞ submits necessary parcel ownership, number of parcels, objections and status of negotiations, proposed prices and paid amount of money (sqm of the area in proportion to the total title deed area of the expropriated land) in the form of land acquisition activities.

<u>The Procedure to be Followed for the Properties Belonging to Municipalities</u>

a) The Municipality prepares the document showing previous status of the property prior to transfer to TEİAŞ. This document contains real owners, real users, aims of uses, formal or informal agreements between the user and the owner and lease contracts. In case of a formal agreement or leasing, cancellation provisions in the agreement should be specified as well.

b) A document containing declaration for the areas under the control of the Municipality.

c) Cancellation status document of the owner and/or user includes amount of compensation, accounts of any transfer support and application calendar.

Table Indicating the Relationship Between the Variables

Components of the Project	Element	Effects of the Project	Class of the Individuals who are Affected from the Project	Rights held	Additional provisions
Transmission Line	The area where the feet of the Poles sit	Take over/expropriation of the area it covers	Owner	Validation over market value	
			Tenant	Price for above ground estate	owner/tenant agreement is applied
			Illegal user	Payment of above ground estate	
	The Area Under the Line	permanent servitude	Owner	difference between before and after expropriation of the property *Compensation of the loss given to crop and trees	the area which is restored to its original condition
			Tenant or Legal User	Compensation of the loss given to crop and trees	the area which is restored to its original condition
		Temporary use during the construction Tenant is paid by the constructing firm	Owner	renewal of the losses in estate(will be provided by the construction firm)	Owner/tenant (construction firm agreement is applied)
Substation	Substation Area	Take over /expropriation	Owner	Validation over market value	
			Tenant	compensation of the above ground estate	Owner/tenant (construction firm agreement is applied)
			Illegal user	compensation of the above ground estate	

TEİAŞ Expropriation Stage

TEİAŞ can acquire properties, sources and servitudes necessary to run public services or enterprises under its responsibility through expropriation by paying their prices in advance or in cash. On the other hand, instead of the expropriation of the property, if it is adequate for the objective, servitude can be established though expropriation on a certain part, depth or source of the property.

In expropriation carried out by TEİAŞ, a public interest decision is taken by the board and this decision is approved by the Ministry of Energy and Natural Sources.

As per Law on Expropriation, purchasing procedure is primarily implemented in expropriations about the properties registered in title deed Office.

After taking the decision for expropriation, a report is received from experts, organizations or institutions and when necessary, making use of information collected from Chambers of Industry and Commerce and local real estate purchase and sale offices, one or more appraisal committee consisting of minimum three people from TEAİŞ is formed to determine the value of the property.

In addition, TEİAŞ sets one or more reconciliation committees made up of minimum three people from the organization to run and finalize purchasing by negotiation over the estimated price. After this stage, without announcing the estimated price determined by the appraisal committee, it notifies the owner by registered mail that the price of the property which is decided to be expropriated or servitudes on these properties are wanted to be purchased by negotiation.

If the owner or his/her authorized representative applies to TEİAŞ within fifteen days after the notification date of this letter stating that he/she wants to sell the mentioned property by negotiation and agreement, negotiations are made on a date determined by the committee. If an agreement is reached on condition that it does not exceed the determined estimated value, a minute is kept regarding the agreement and the minute containing all legal and actual qualities and expropriation price of the mentioned property is signed by the owner or his/her authorized representative and the members of the commission.

Within at least forty five days after the issuance date of the agreement minute, the price stated in the minute is prepared; the situation is notified to the owner or to his/her authorized representative and they are requested to assign on behalf of TEİAŞ in the title deed office on the determined date. In case of assignment to TEİAŞ by the owner or his/her authorized representative in title deed office, expropriation price is paid to owner or his/her authorized representative.

The purchased property or servitude is deemed to be purchased from its owner and no action of objection can be filed against expropriation or price executed in this manner. In case of no agreement or assignment, TEİAŞ files a lawsuit to determine the expropriation price by the court and to register the property on behalf of TEAİŞ.

The court notifies the owner of the property hearing date, which is determined within maximum thirty days after the application date of the TEİAŞ, with copies of petition and the document submitted by TEİAŞ by plenary summons; or the court calls the owners whose addresses could not be found by TEİAŞ by notifying the hearing date by announcement as per Notification Law dated 11.2.1959 and numbered 7201.

If a local newspaper is issued in the area where the property which will be expropriated, summary of expropriation or the documents are published at least for once in one of those local newspapers and in a national newspaper.

In the hearing, which will be held on the date determined by the court, the judge once more invites the parties to reach an agreement on the price of the property. If the parties agree on the price, the judge accepts this price agreed by the parties as expropriation price and the transactions are finalized accordingly.

If the parties agree on the price in the hearing conducted by the court, the judge determines a date for reconnoiter and a date for hearing after thirty days and reconnoiters in the locality to appraise the property by means of sworn experts in the presence of all relevant people. To have the village or district headman in the locality in the reconnoiter, the headman is also sent an invitation and his declaration is taken by providing his presence in the reconnoiter.

Taking into account the statements of the parties or other relevant people, the experts submit their report specifying the value of the property to the court within fifteen days. The court discloses this report to the parties without waiting the date of hearing. The judge calls the parties or their proxies and the experts to the hearing. If the parties have objections to expert reports, their objections are heard and the declarations of the experts to these objections are taken.

If the parties fail to agree on the price, if necessary, a new expert committee is appointed by the judge to finalize the transactions within fifteen days and the judge determines a fair and just expropriation price based on the report or reports or the parties and experts. This price determined by the court is the expropriation price of the property, source or servitude. If the parties reach or don't reach an agreement, TEİAŞ is given a fifteen day period to deposit the amount determined by the judge as expropriation amount in cash and in advance in the specified bank on behalf of the right holder or, if the right holder is not determined, to be given to future right holder and to submit the bank receipt showing that the amount is deposited to bank account. When necessary, this period can be extended by the court for once only. In cases when TEİAŞ deposits the expropriation amount on behalf of the right holder or no right holder is determined, if the receipt showing that the amount is blocked in the bank to be paid to a future right holder is submitted to the court, the court decided to register the property of TEİAŞ and to pay the expropriation amount to the right holder and this decision is notified to the title deed office and the bank where the relevant amount is deposited.

Decision for registry is final and right to appeal for the amount is reserved. If people don't obey the call of the court, these transactions are conducted in the absence of the relevant people. When no right holder is determined, the court takes necessary precautions to turn expropriation amount into deposit account for three months maturity and to yield interest from expropriation amount.

If right holder files a cancellation court in administrative court against expropriation transactions and is the administrative court decided suspension of execution, the lawsuit filed in administrative court is considered as prejudicial question and the court acts accordingly.

In conclusion, the owner of the property has the right to file a lawsuit against expropriation or for the payment of the amount in administrative court due to expropriation, which seems as a difficult purchase in cases required by public interest. The owner can use right to sue at every stage and does not experience any loss of right or injury as current value is taken as a basis.

APPENDIX-8

TABLE OF PERSONNEL WHO PREPARED THE REPORT

TABLE OF PERSONNEL WHO PREPARED THE REPORT

Project Owner : TEIAŞ-TURKISH ELECTRICITY TRANSMISSION COMPANY

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Project Name : 380 kV ACWA Power Kırıkkale Overhead Transmission Line Project Environmental and Social Impact Assessment Report

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