




# Appendix 5-3-4

## Provincial Environmental Protection Area Maps And PSPP Location Maps

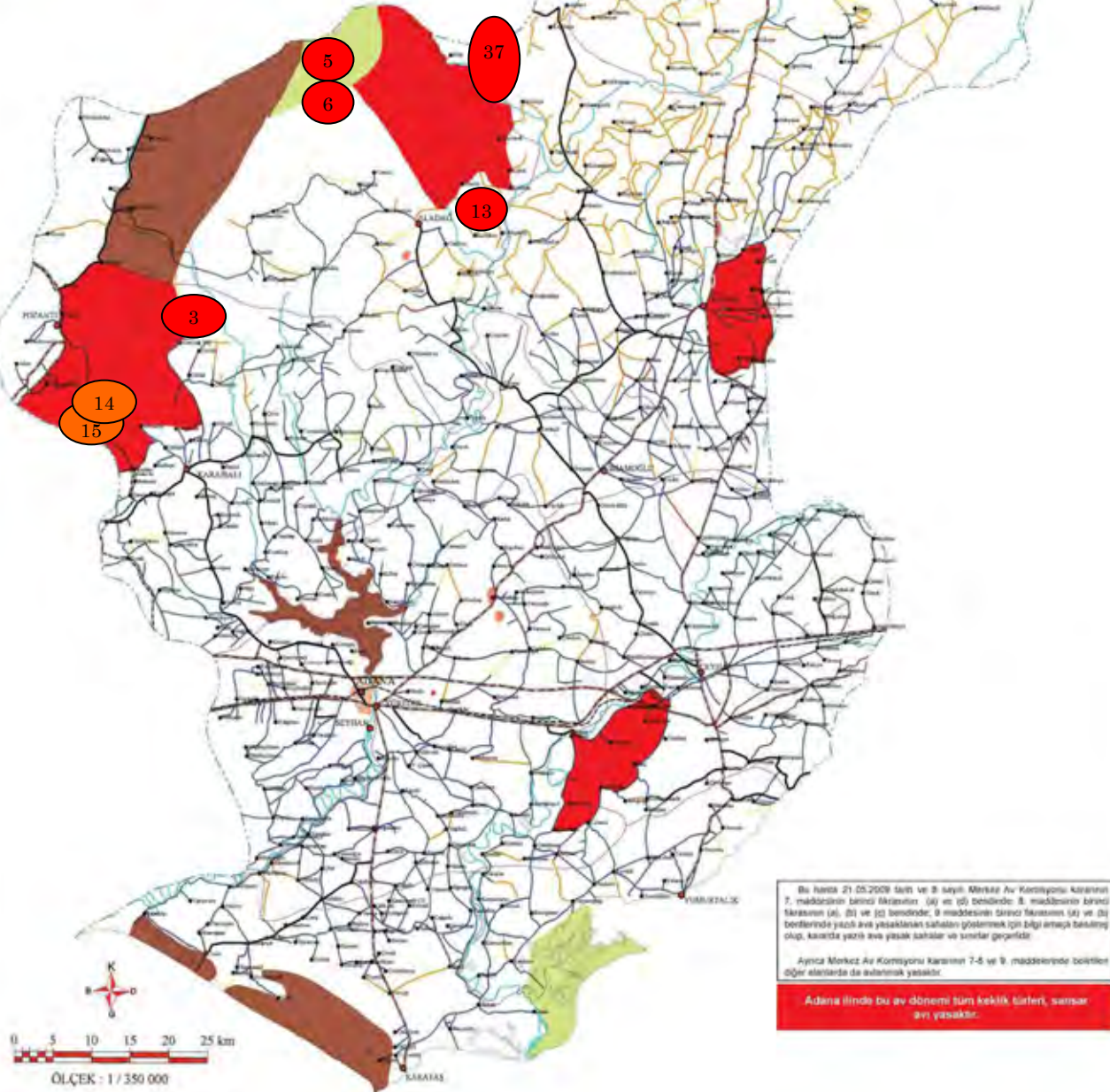
### Legend

	Forest Recreation Site		National Park
	Wildlife Protection Site		Nature Conservation Site
	Wildlife Reproduction Site		Nature Park
	Special Environmental Protection Area		2009-2010 Hunting Prohibited Area
	Game Animal Reproduction Site		

Adana(3,5,6,13,14,15,37)

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ADANA  
İLİ  
AVA AÇIK ve KAPALI ALANLAR  
HARİTASI



Bu harita 21.05.2009 tarih ve 9 sayılı Merkez Av Komisyonu Kararının 7. maddesinin birinci fıkrasının (a) ve (b) bendinde; 8. maddesinin birinci fıkrasının (a), (b) ve (c) bendinde; 9. maddesinin ikinci fıkrasının (a) ve (b) bentlerinde yazılı av yasaklanan sahaları göstermek için bilgi amaçlı hazırlanmış olup, avcılara yazılı av yasak sahaları ve sınırları geçmez.

Ayrıca Merkez Av Komisyonu Kararının 7-8 ve 9. maddelerinde belirtilen diğer alanlarda da avlanmak yasaktır.

Adana ilinde bu av dönemi tüm kekik türleri, sansar avı yasaktır.

Bu harita, Bakanlar Kurulunun 03.07.1994 tarih ve 94/5058 Karar Sayısı ile "Yönerme" ile değiştirilmiştir. Harita, Bakanlar Kurulunun 03.07.1994 tarih ve 94/5058 Karar Sayısı ile "Yönerme" ile değiştirilmiştir. Harita, Bakanlar Kurulunun 03.07.1994 tarih ve 94/5058 Karar Sayısı ile "Yönerme" ile değiştirilmiştir. Harita, Bakanlar Kurulunun 03.07.1994 tarih ve 94/5058 Karar Sayısı ile "Yönerme" ile değiştirilmiştir.

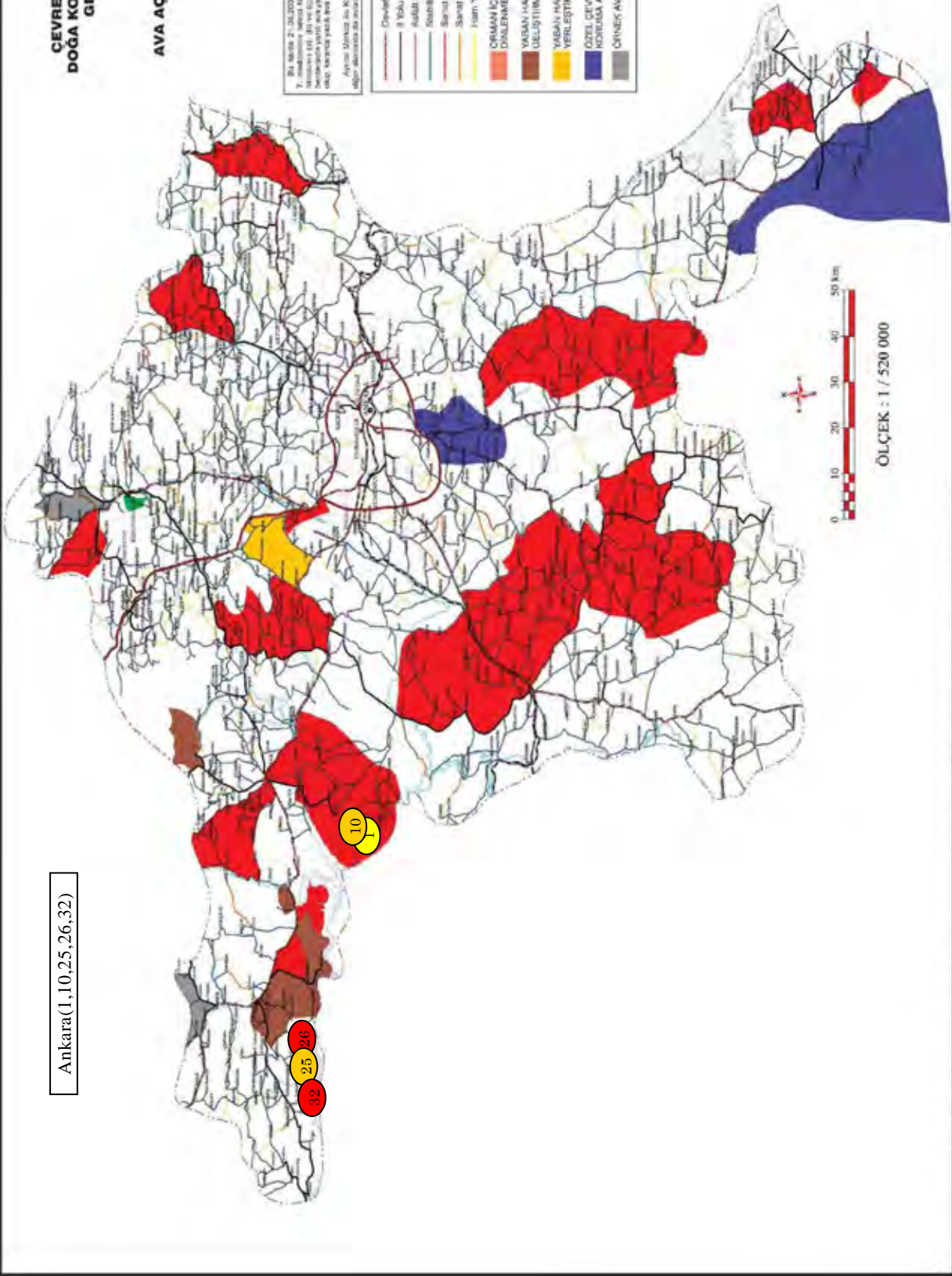
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GENEL MÜDÜRLÜĞÜ**

**ANKARA  
İLİ  
AVA AÇIK VE KAPALI ALANLAR  
HARİTASI**

Bu harita 27.03.2009 tarih ve 8 sayılı Mevzuat Anonim Kuruluşu Kurulması ile ilgili olarak hazırlanmıştır. Harita, 1/50000 ölçekli harita esas alınarak hazırlanmıştır. Harita, 1/50000 ölçekli harita esas alınarak hazırlanmıştır. Harita, 1/50000 ölçekli harita esas alınarak hazırlanmıştır.

Ayrıca; Türkiye'nin Milli Parkları Kanunu'nun 7-8 ve 9 maddelerinde belirtilen diğer alanlarda da ayrı ayrı belirtilmiştir.

Devlet Yolu	Demiryolu
İl Yolu	İl Müdürlüğü
Araba Kullanma	İpe Meydanı
Satış Alanı	Buzağı
Sarımsak Yolu	Köy
Sarımsak Yolu	Emlak ve Mülkiyet
İlham Yolu	MİLLİ PARK
ORMAN İÇİ DİNLENME YERİ	TABİATİ KORUMA ALANI
YABAN HAYVANI VE BİTKİLERİNİN YAŞAMA ALANI	TABİATİ KORUMA ALANI
YABAN HAYVANI VE BİTKİLERİNİN YAŞAMA ALANI	TABİATİ KORUMA ALANI
ÖZEL ÇEVRE KORUMA ALANI	2509-2010 AN DÖNEMİ MİK KAMU İZİNİ ALAN SAHALAR
ÖZEL ÇEVRE KORUMA ALANI	2509-2010 AN DÖNEMİ MİK KAMU İZİNİ ALAN SAHALAR
ÖZEL ÇEVRE KORUMA ALANI	2509-2010 AN DÖNEMİ MİK KAMU İZİNİ ALAN SAHALAR

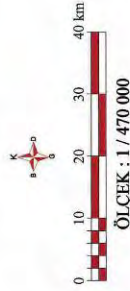
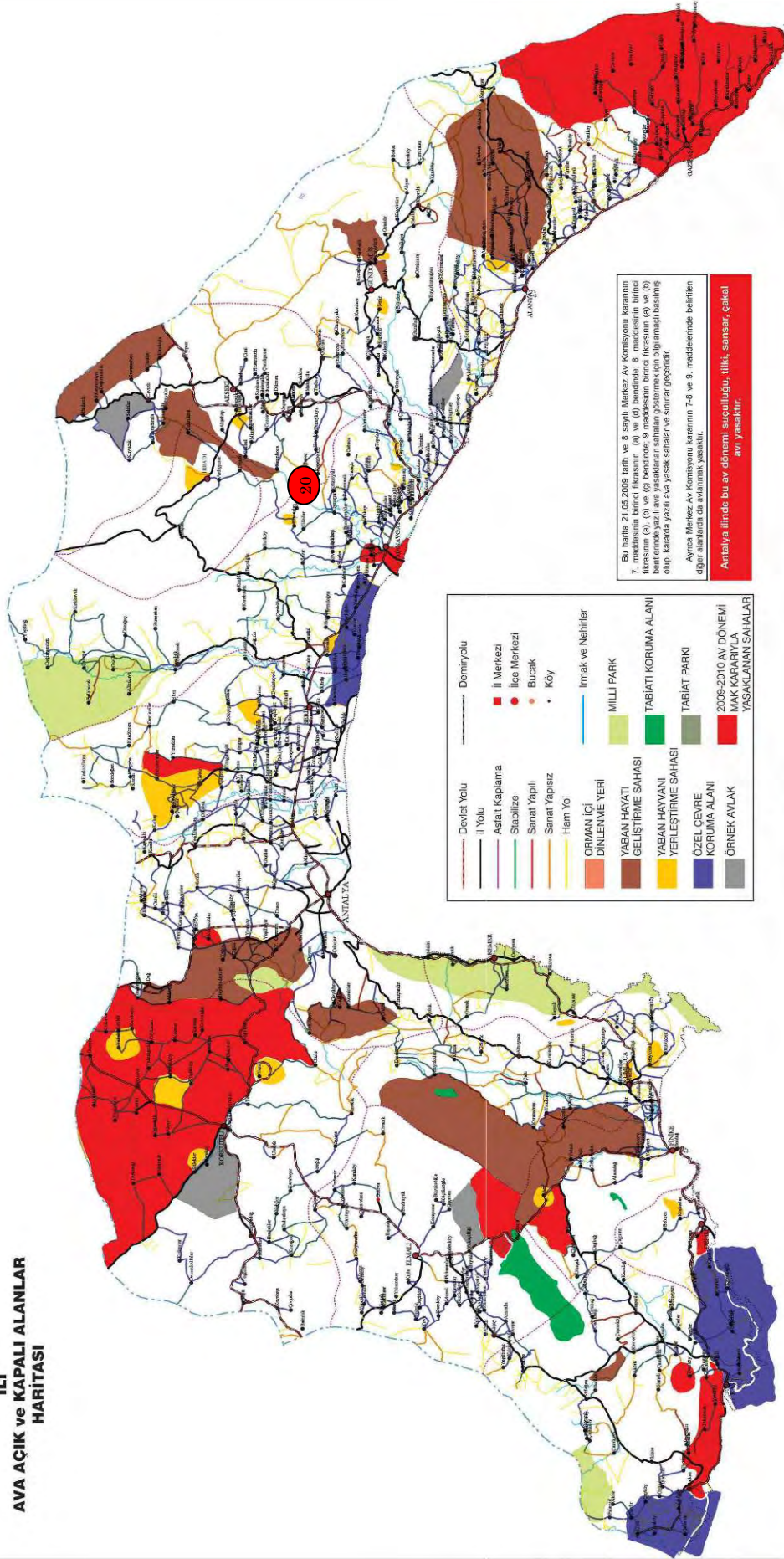


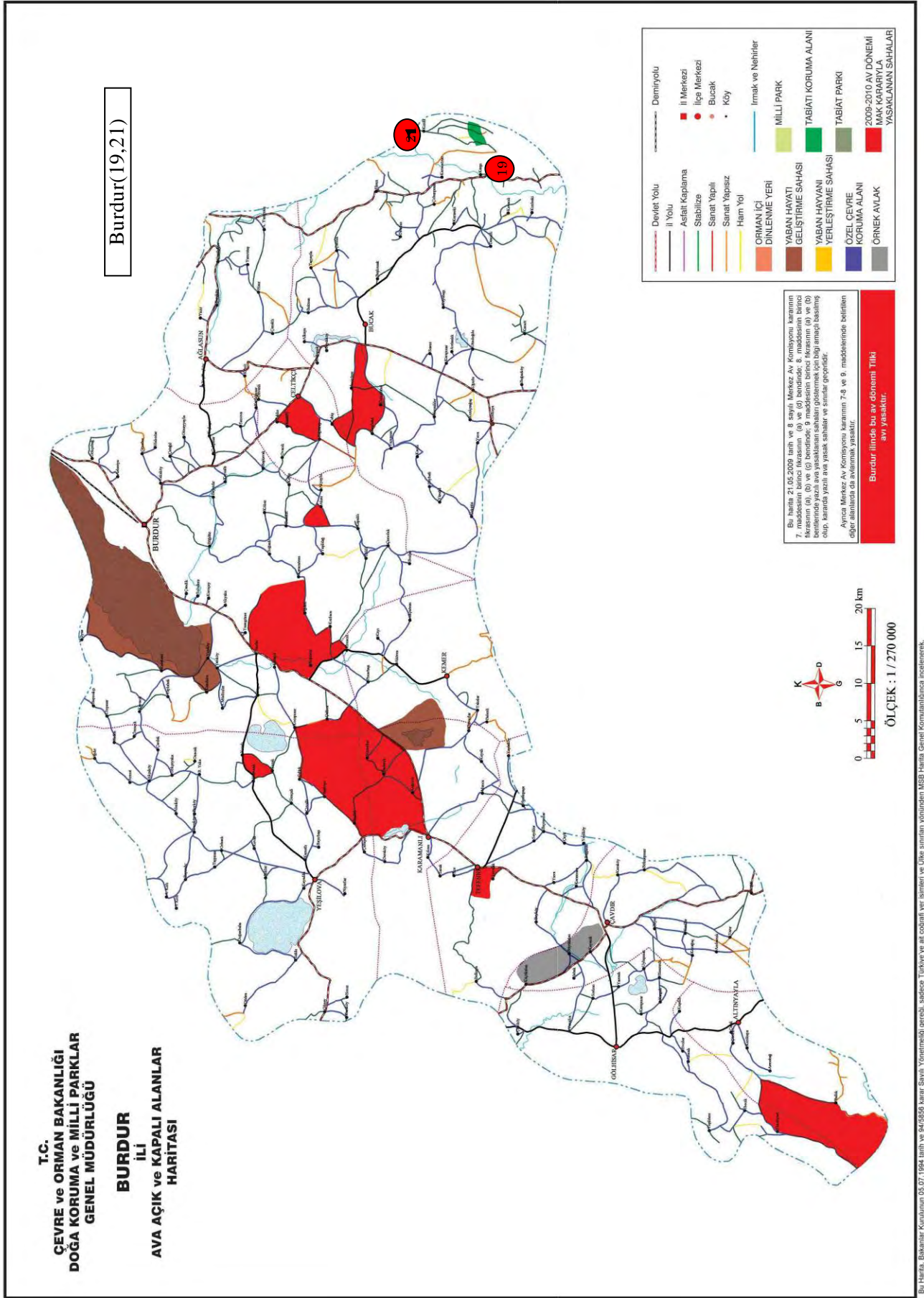
Ankara(1,10,25,26,32)

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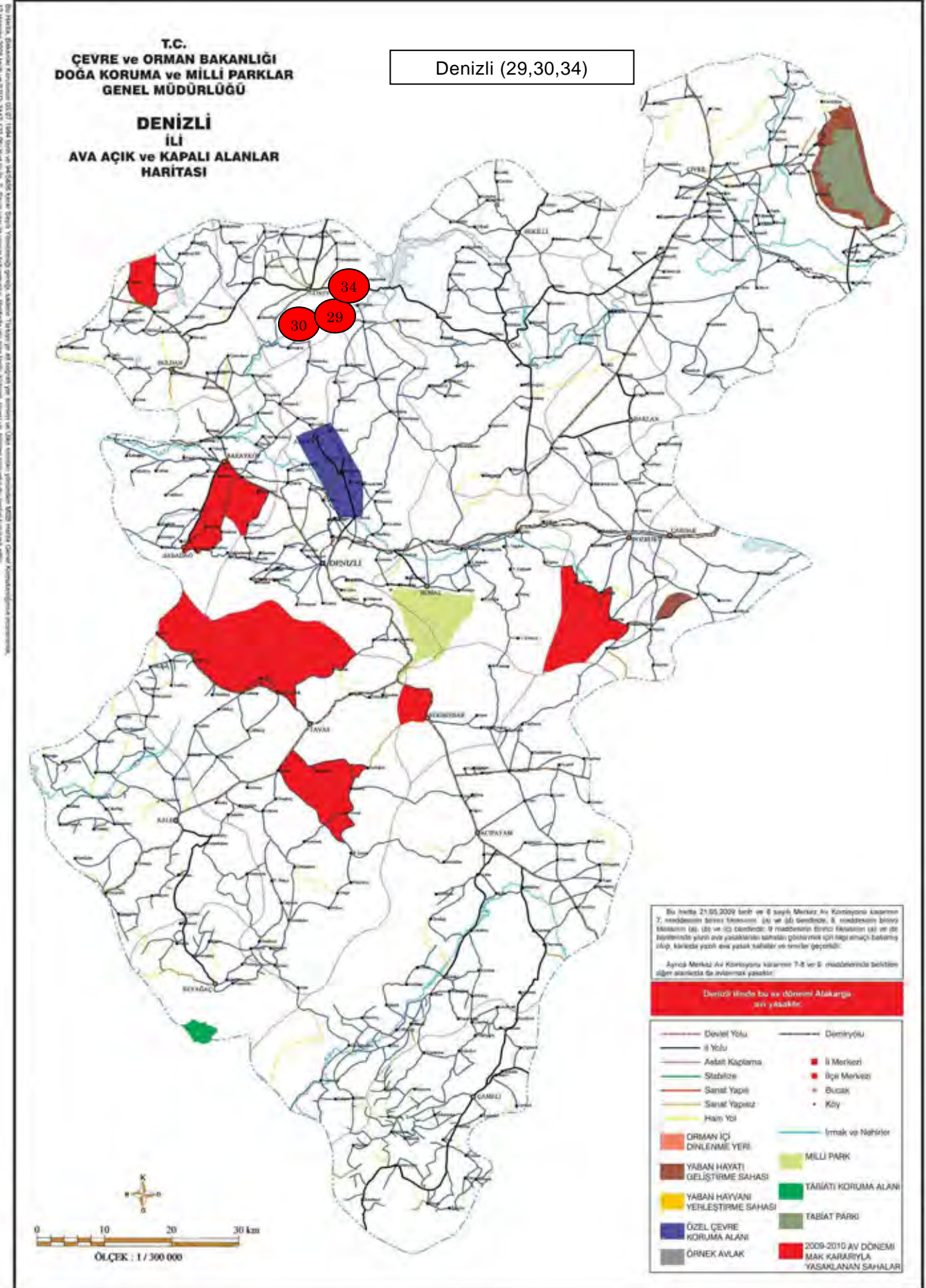
ANTALYA  
İLİ  
AVA AÇIK ve KAPALI ALANLAR  
HARİTASI

Antalya(20)



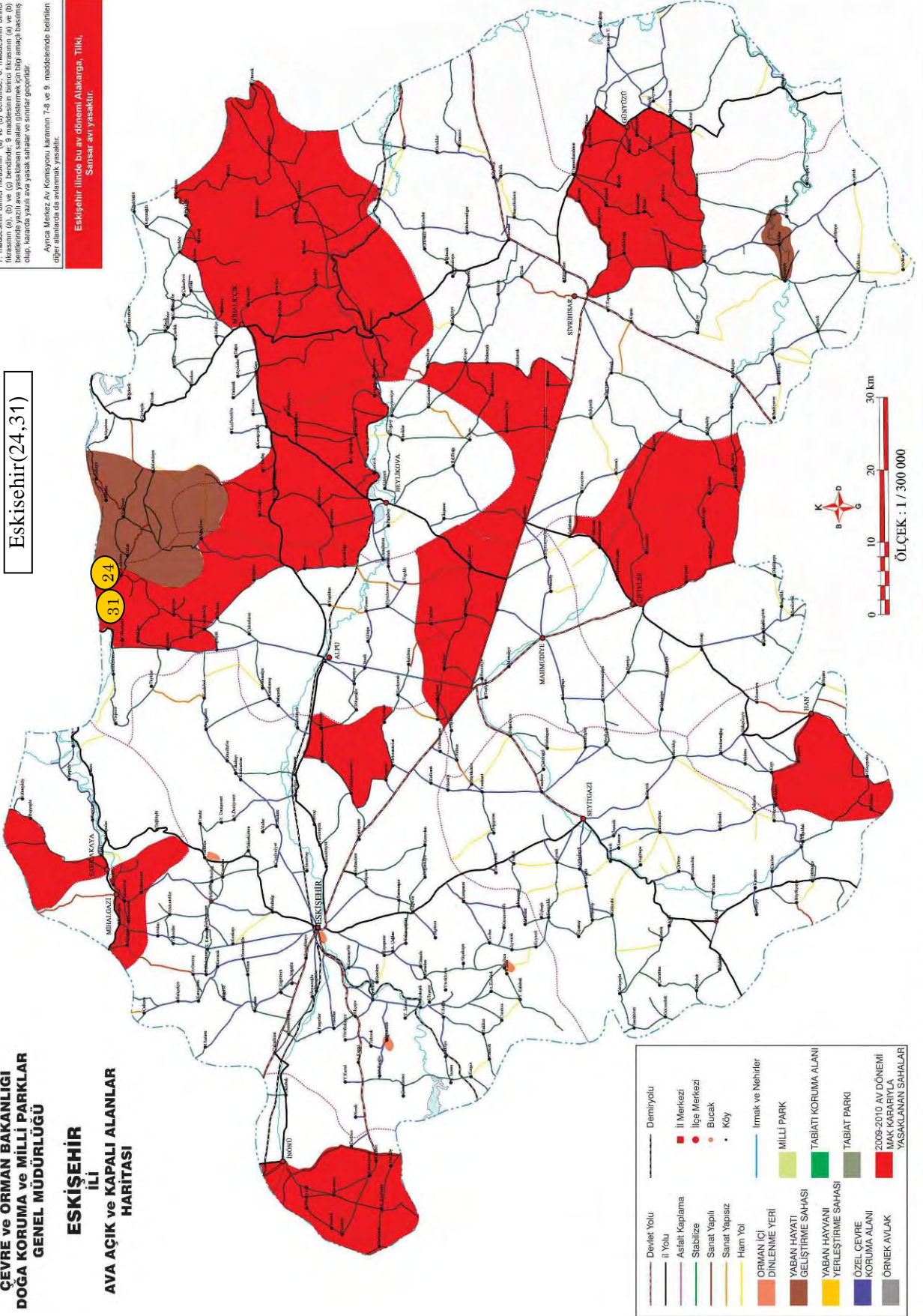


Bu Harita, Bakanlar Kurulunun 05.07.1994 tarih ve 84/5856 karar Sayılı Yönetmeliği gereği, sadece Türkiye ye ait coğrafi yer isimleri ve ülke sınırlarını göstermektedir. Haritada yer alan tarih, kültür, sayı vb. bilgilerin sorumluluğu üretici kuruluşa aittir.  
12 Haziran 2008 tarih ve P.P.D. 3442/125-06' yurtdışı ile. Ş. Sayılı yazı ile uygun bulunmaktadır.



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GENEL MÜDÜRLÜĞÜ

ESKİŞEHİR  
İLİ  
AVA AÇIK ve KAPALI ALANLAR  
HARİTASI

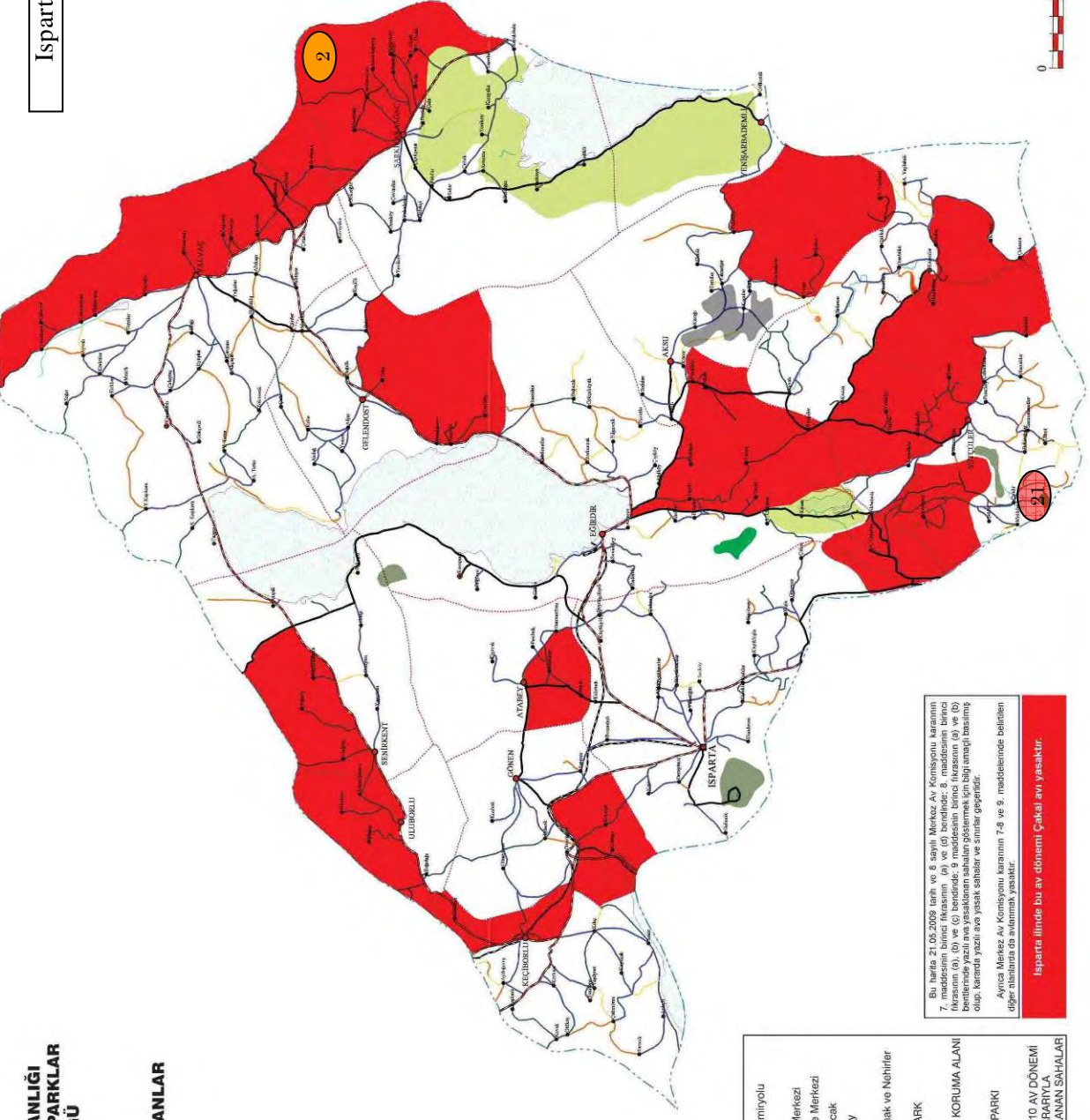


Bu harita 21.05.2009 tarih ve 8 sayılı Mevkeç Av Komisyonu kararının 7. maddesindeki hükümler çerçevesinde hazırlanmıştır. Harita, Mevkeç Av Komisyonu kararının (a), (b) ve (c) bentlerinde, 9 maddesinin birinci fıkrasının (a) ve (b) bentlerinde yazılı avı yasaklayan sahalari göstermek için bilgi amaçlı beslenmiş olup, haritada yazılı avı yasak sahalari ve sınırları göstermektedir.

Ayrıca Mevkeç Av Komisyonu kararının 7-8 ve 9. maddelerinde belirtilen diğer alanlarda da avlanmak yasaktır.

Eskişehir ilinde bu av dönemi Alakarga, Tilkı, Sansar avı yasaktır.

Isparta(2,21)



ÖLÇEK : 1 / 300 000

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GENEL MÜDÜRLÜĞÜ

ISPARTA  
İLİ  
AVA AÇIK ve KAPALI ALANLAR  
HARİTASI

Devlet Yolu	Demiroyolu
İl Yolu	İl Merkezi
Asfalt Kaplı	İlçe Merkezi
Stabilize	Bucak
Sanat Yapılı	Köy
Sanat Yapısız	İmkan ve Nehirler
Ham Yol	MİLLİ PARK
ORMAN İÇİ	TABİAT KORUMA ALANI
DİNLENME YERİ	TABİAT PARKI
YABAN HAYATI	2009-2010 AV DÖNEMİ
GELİŞTİRME SAHAŞI	MAK KARARIYLA
YABAN HAYVANI	YASAKLANAN SAHALAR
YERLEŞTİRME SAHAŞI	
ÖZEL ÇEVRE KORUMA ALANI	
ÖRNEK AVLAK	

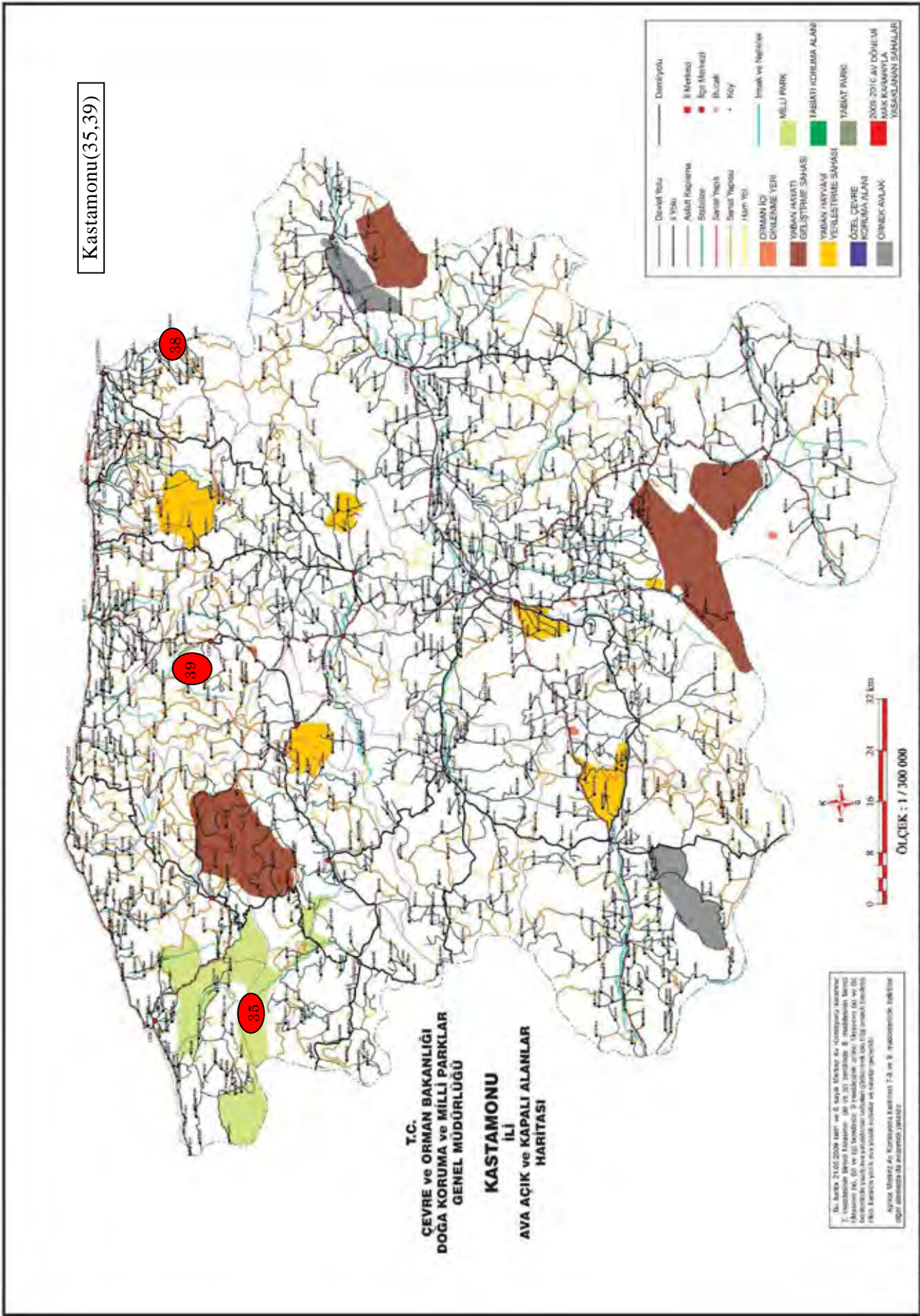
Bu harita 21.05.2009 tarih ve 8 sayılı Merkez Av Komisyonu kararını (kararın 6), (b) ve (c) bağlarında 9 maddesinin birinci fıkrasının (a) ve (b) bentlerinde yazılı av yasaklarının sahaları göstermek için bilgi amaçlı basılmış olup, kararda yazılı av yasak sahaları ve sınırlar geçerlidir.

Ayrıca Merkez Av Komisyonu kararının 7-8 ve 9. maddelerinde belirtilen diğer hususlara da avlanmamalıdır.

Isparta ilinde bu av dönemi Çıkal av yasaktır.



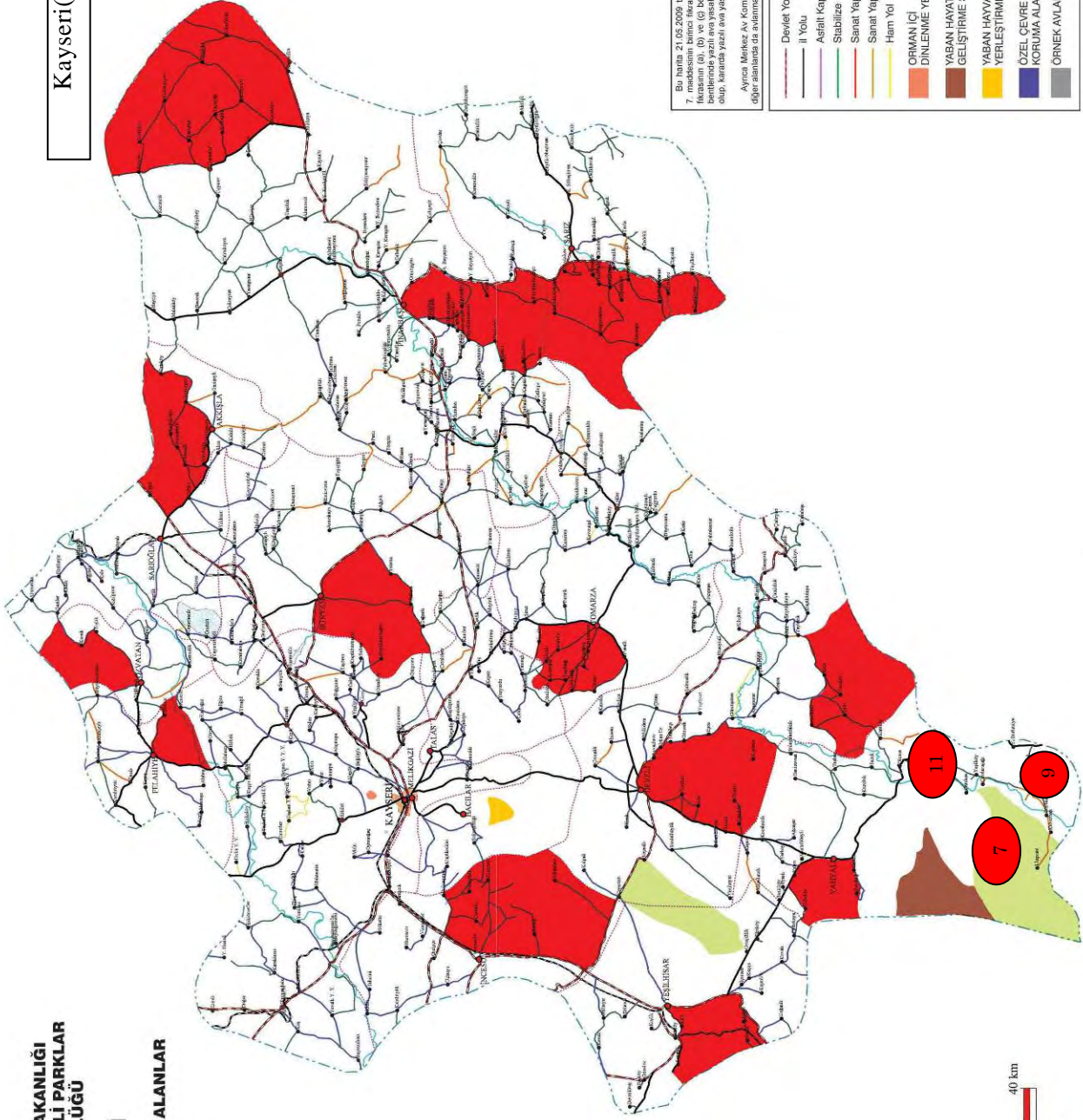
Kastamonu(35,39)



## Kayseri(7,9,11)

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DOĞA KORUMA ve MİLLİ PARKLAR  
GENEL MÜDÜRLÜĞÜ

**KAYSERİ  
İLİ**  
AVA AÇIK ve KAPALI ALANLAR  
HARİTASI



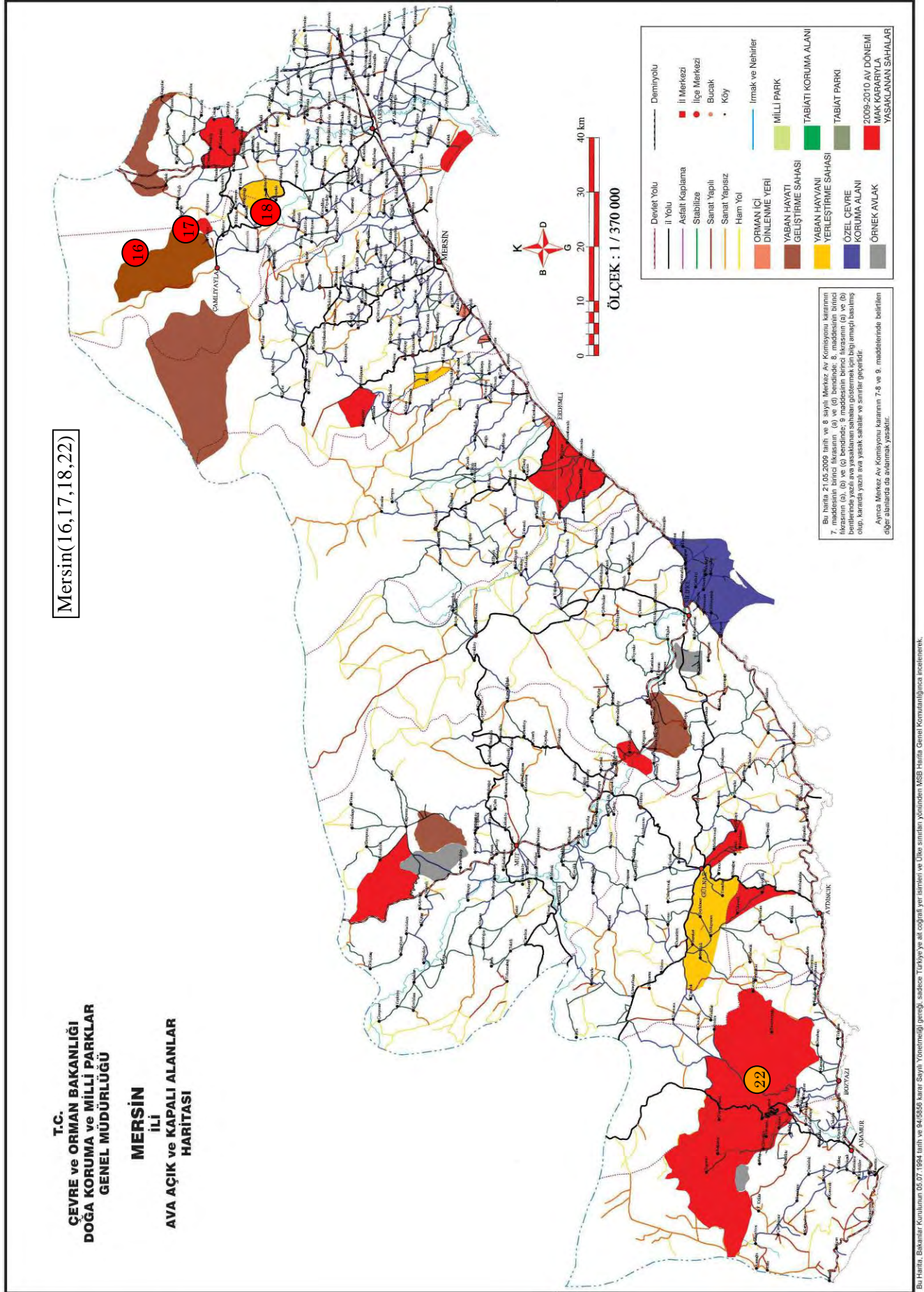
ÖLÇEK : 1 / 400 000



Bu harita 21.05.2009 tarih ve 8 sayılı Merkez AV Komisyonu kararının 7. maddesinin birinci fıkrasının (a) ve (d) bendinde; 8. maddesinin birinci fıkrasının (a), (b) ve (c) bendinde; 9. maddesinin birinci fıkrasının (d) ve (e) bendinde; 10. maddesinin birinci fıkrasının (a) ve (b) bendinde yer alan hükümler doğrultusunda hazırlanmıştır. Haritada yer alan bölgeler, kararda yazılı av açık sahaları ve alanları göstermektedir.

Ayrıca Merkez AV Komisyonu kararının 7-8 ve 9. maddelerinde belirtilen diğer alanlarda da avlanmak yasaktır.

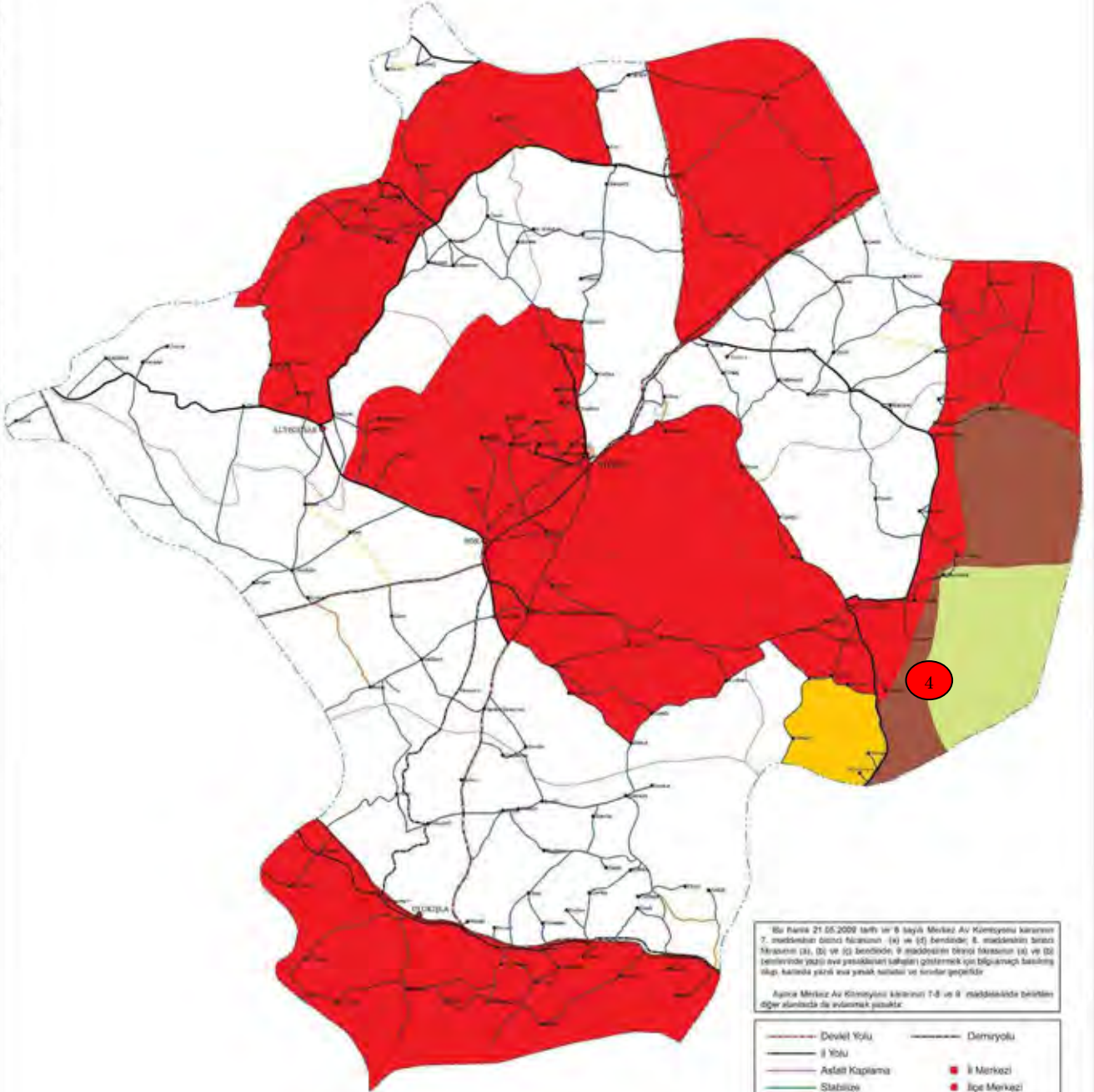
Devlet Yolu	Demiryolu
İl Yolu	İl Merkezi
Asfalt Kaplama	İlçe Merkezi
Stabilize	Bucak
Sanat Yapılı	Köy
Sanat Yapısız	İrmak ve Nehirler
Ham Yol	MİLLİ PARK
ORMAN İÇİ DİNLENME YERİ	TABİATİ KORUMA ALANI
YABAN HAYATI GELİŞTİRME SAHAŞI	TABİATİ KORUMA ALANI
YABAN HAYATI YERLEŞTİRME SAHAŞI	2009-2010 AV DÖNEMİ MAK KAPALIYLA YASAKLANAN SAHALAR
ÖZEL ÇEVRE KORUMA ALANI	
ÖRNEK AVLAK	



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DOĞA KORUMA ve MİLLİ PARKLAR  
GENEL MÜDÜRLÜĞÜ

**NİĞDE**  
İLİ  
AVA AÇIK ve KAPALI ALANLAR  
HARİTASI

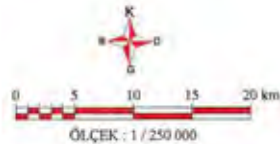
Nigde(4)

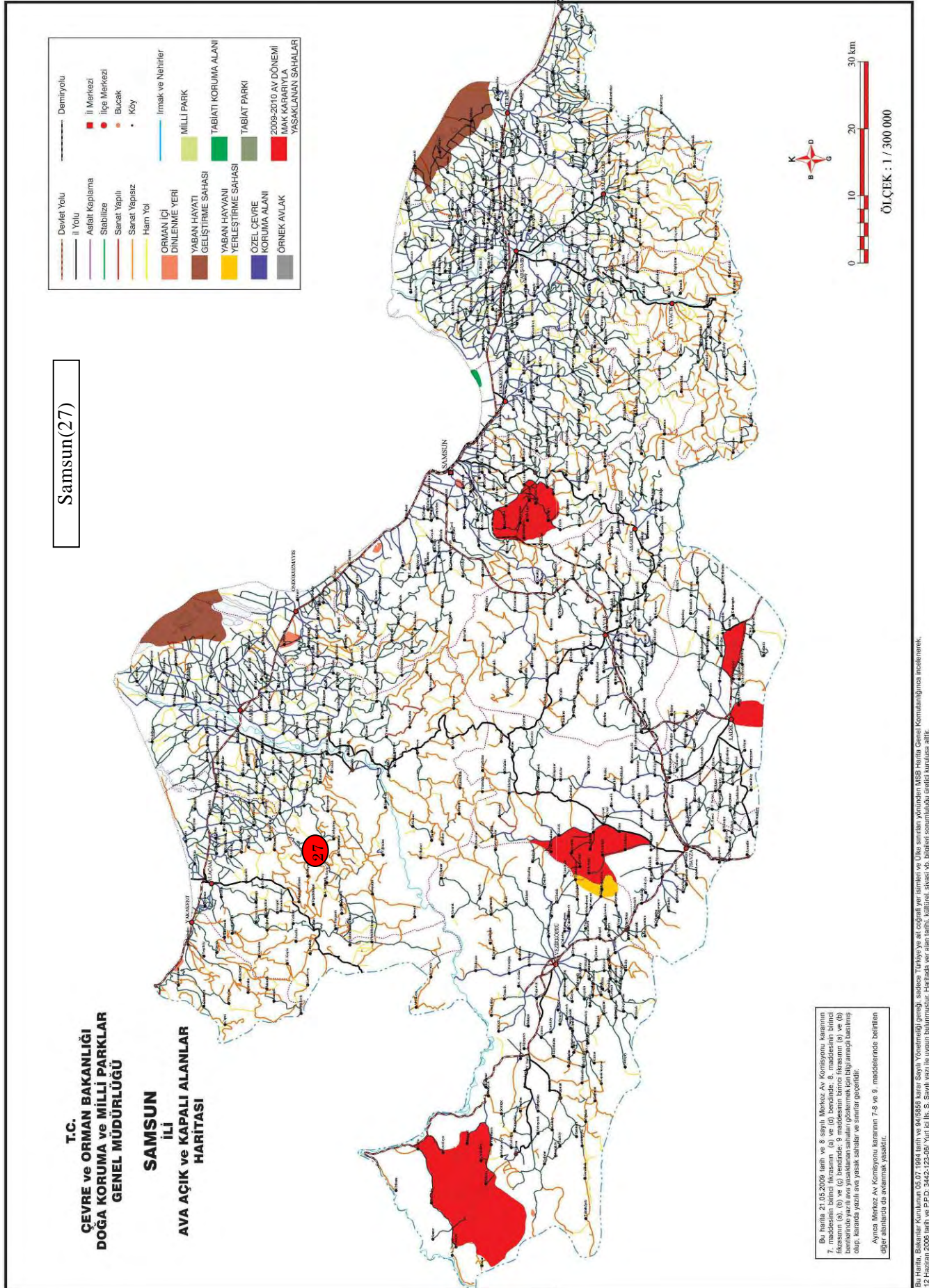


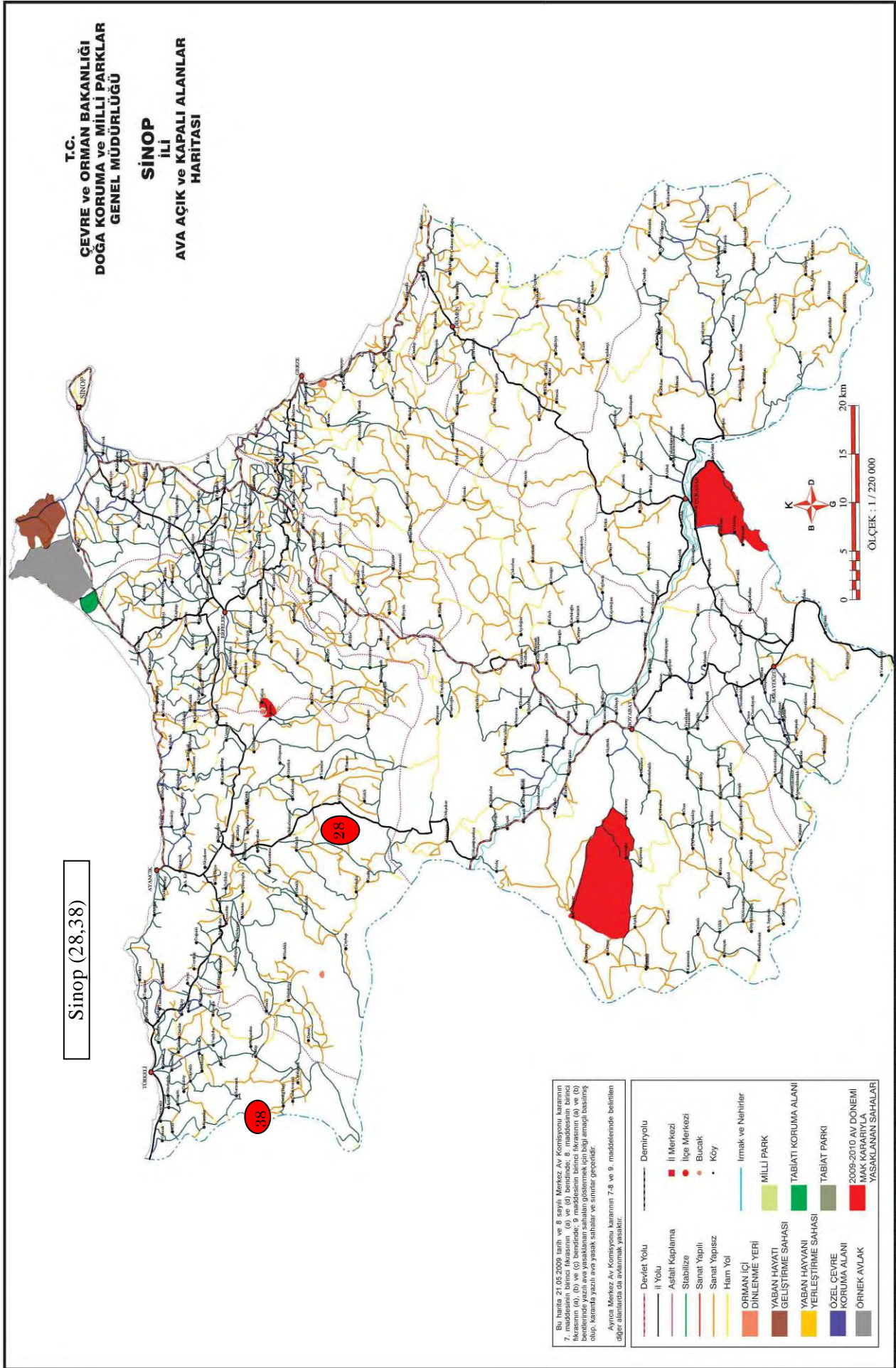
Bu harita 21.05.2009 tarih ve 9 sayılı Merkez Av Komisyonu kararının 7. maddesindeki diğer hükümlerine (a) ve (b) bendinde; 8. maddesindeki Sanayi Bölgesi (2), (3) ve (4) bendinde; 9. maddesindeki diğer hükümlerine (1) ve (2) bentlerinde yazılı av yasaklarını tahafatlı göstermek için bilgiansız basılmış olup, kararda yazılı av yasak tutulmuş ve sınırlar geçirilmiştir.

Ayrıca Merkez Av Komisyonu kararının 7-8 ve 9. maddelerinde belirtilen diğer alanlarda da avlanmak yasaktır.

Devlet Yolu	Demiryolu
İl Yolu	İl Merkezi
Araçlı Kaplıama	İlçe Merkezi
Stabilizör	Bucak
Sanayi Yapılı	Köy
Sanayi Yapısız	
Hatır Yolu	
ORMAN İÇİ DİNLENME YERİ	İrmak ve Nehirler
YABAN HAYATI GELİŞTİRME SAHAŞI	MİLLİ PARK
YABAN HAYVANI YERLEŞTİRME SAHAŞI	TABİATİ KORUMA ALANI
ÖZEL ÇEVRE KORUMA ALANI	TABİATİ PARKI
ÖRNEK AVLAK	2009-2010 AV DÖNEMİ MAK KARARIYLA YASAKLANAN SAHALAR







## **Appendix 5-3-5**

### **Evaluation of PSPP Candidate Sites**

Evaluation of PSPPP Candidate Sites (1/5)

No.	1	6	9	10	11-1	11-2
Town (Village)	Yainzcaam	Hizar Bolgesefligi	Divrikcaakiri	Kargi	Farasa	Farasa
District	Beypazari	Aladag	Yahvali	Beypazari	Yahvali	Yahvali
Province	Ankara	Adana	Kayseri	Ankara	Kayseri	Kayseri
Map No.	I27-A2, B1	M34-C1	M34-B3	I27-A2, B1	M34-B2, M35-A1	M34-B2, M35-A1
1/500,000 Geologic Quadrangle	Ankara	Adana	Adana	Ankara	Adana	Adana
Latitude North	39° 56' 51"	37° 39' 31"	37° 48' 30"	39° 58' 24"	37° 58' 08"	37° 57' 36"
Longitude East	31° 46' 29"	35° 15' 43"	35° 28' 08"	31° 42' 17"	35° 28' 23"	35° 28' 56"
HWL (m)	1065.0	1580.0	1380.0	1000.0	1650.0	1590.0
LWL (m)	1045.0	1530.0	1350.0	980.0	1630.0	1580.0
Dam Vol. (10 <sup>6</sup> m3)	1.6	15.6	2.9	1.741	1.75	2.496
Latitude North	39° 55' 59"	37° 40' 08"	37° 47' 07"	39° 58' 24"	37° 57' 04"	37° 57' 04"
Longitude East	31° 44' 36"	35° 18' 30"	35° 26' 03"	31° 42' 17"	35° 30' 05"	35° 30' 05"
HWL (m)	557.5	1125.0	700.0	510.0	1060.0	1050.0
LWL (m)	552.6	1100.0	690.0	500.0	1040.0	1030.0
Crest Length (m)	320	460	200	330	70	140
Dam Height (m)	43	110	95	65	175	165
Dam Vol. (10 <sup>6</sup> m3)	9.10	6.4	2.3	2.1	6.5	5.1
Max. Head (m)	512.4	470.0	690.0	500.0	610.0	560.0
Waterway Length (m)	3,246	3,674	2,148	3,846	1,613	2,150
L/H	6.33	7.82	3.11	7.69	2.64	3.84
Variable head (H <sub>pmax</sub> /H <sub>gmin</sub> )	1.11	1.17	1.13	1.13	1.13	1.16
Cost (US\$/kW)	<b>696</b>	<b>887</b>	<b>704</b>	<b>727</b>	<b>709</b>	<b>706</b>
Distance from Demand Center						
Length of power line (km)	10	30	30	10	30	30
Civil design	No storage capacity for PSPPP in the low reservoir No Headrace Surgetunk due to geographical condition Upper reservoir : Artificial pond and full facing might be needed	Large upper dam Project cost : Over 800\$/kW	Construction of alternative public road around Lower reservoir would be hard.	No Headrace Surgetunk due to geographical condition Upper reservoir : Artificial pond and full facing might be needed	Penstock : Vertical type No Tailrace Suregetunk Upper reservoir : Artificial pond and full facing might be needed	Penstock : Vertical type Economies of scale is large
Geological condition	Upper dam and Waterway; Upper Miocene- Pliocene/Evaporite sedimentary rocks Lower dam; Lower - Middle Miocene/lacustrine Limestone or Upper Miocene- Pliocene/Evaporite sedimentary rocks	Whole area is in Mesozoic Dunitite block of Ophiolite	whole area; Jurrasic- Cretaceous /Neritic Limestone	Upper dam; Upper Miocene- Pliocene/Evaporite sedimentary rocks Lower dam; Upper Paleozoic - Trissic / Schist, Phillite, Marble, Metabasite Waterway; similar to both upper and lower dam's and Granitoids of Paleocene	Upper dam and Waterway; Middle Miocene/Continental clastic rocks Lower dam; Mesozoic / Dunitite of Ophiolitic rocks (*Dunitite : occurrence:sill, often has Mylonitic facies)	Upper dam and Waterway; Middle Miocene/Continental clastic rocks Lower dam; Mesozoic / Dunitite of Ophiolitic rocks (*Dunitite : occurrence:sill, often has Mylonitic facies)
Environmental condition	KBA (ORT002);Upper Reservoir KBA (ORT001); Lower Reservoir Hunting Prohibited Area	KBA (AKD 053)	KBA (AKD 053)	KBA (ORT002);Upper Reservoir KBA (ORT001); Lower Reservoir Hunting Prohibited Area A community exists on the surface of UGPH	KBA (AKD 053) Normal Wet Land	KBA (AKD 053) Normal Wet Land
Primary Evaluation	▲	X	○	△	○	◎
Preliminary Survey Site					○	○



Evaluation of PSPP Candidate Sites (2/5)

No.	11-3	19	20	21-1	21-2	22-1
Town (Village)	Avluga	Kocayer	Karaahmetler	Yildiz	Sagrak	Kazkuyu
District	Yahyali	Bucak	Akseki	Sutculer	Sutculer	Aydinlik
Province	Kayseri	Burdur	Antalya	Isparta	Isparta	Mersin
Map No.	M34-B2, M35-A1	N25-B4	O27-A1	N25-B1, B2	N25-B1, B2	P30-A4
1/500,000 Geologic Quadrangle	Adana	Adana	Konya	Konya	Konya	Adana
Upper Reservoir	Latitude North	37° 17' 42"	36° 55' 43"	37° 24' 49"	37° 23' 24"	36° 17' 01"
	Longitude East	35° 30' 54"	31° 34' 46"	30° 55' 34"	30° 54' 46"	33° 01' 49"
	HWL (m)	1340.0	910.0	860.0	730.0	1180.0
	LWL (m)	1520.0	710.0	840.0	700.0	1150.0
Lower Reservoir	Dam Vol. (10 <sup>6</sup> m <sup>3</sup> )	5.23	1.2	1.2	5.4	2.4
	Latitude North	37° 57' 04"	37° 18' 15"	37° 24' 34"	37° 24' 01"	36° 15' 54"
	Longitude East	35° 30' 05"	30° 48' 58"	30° 52' 17"	30° 52' 02"	33° 03' 01"
	LWL (m)	1040.0	185.0	242.0	270.0	480.0
Civil design	Crest Length (m)	170	Existing reservoir	Existing reservoir	Existing reservoir	320
	Dam Height (m)	175	200	350	900	100
	Dam Vol (10 <sup>6</sup> m <sup>3</sup> )	6.5	33	50	45	3.9
	Max. Head (m)	500.0	0.4	1.3	2.8	730.0
Variable head (H <sub>pm</sub> max/H <sub>gmin</sub> )	Waterway Length (m)	842	744.0	618.0	488.0	2,754
	L/H	3.68	2.349	4.824	3.764	3.77
Distance from Demand Center	Length of power line (km)	1.15	3.30	7.81	7.71	1.12
	Cost (US\$/kW)	<b>758</b>	<b>695</b>	<b>706</b>	<b>754</b>	<b>770</b>
Environmental condition	Upper dam and Waterway; Artificial pond and full facing might be needed	Penstock : Vertical type Upper reservoir : Artificial pond and full facing might be needed	Coffer dam is needed for construction of Outlet No Tailrace Surgetunk Economies of scale is large Max. Head : close to the limit	Large coffer dam is needed for construction of Outlet Outlet : Morning glory type due to narrow dead space of Lower reservoir Economies of scale is large	Large coffer dam is needed for construction of Outlet Outlet : Morning glory type due to narrow dead space of Lower reservoir No Headrace and Headrace Surgetunk	Upper reservoir : Artificial pond and full facing will be needed Economies of scale is large
	Geological condition	Upper dam and Waterway; Middle Miocene/Continental clastic rocks Lower dam; Mesozoic /Dunite of Ophiolitic rocks (*Dunite : occurrences;ill, often has Mylonitic facies)	-In the Limestone dominant area whole area ; Upper Miocene/clastic rocks (generally Tortonian*)	-In the Limestone zone -Jurrasic-Cretaceous/ Neritic Limestone -Underflows from limestone cave exist (EIE)	-In the Limestone zone, but slightly batter than 21-1 -Jurrasic-Cretaceous/ Neritic Limestone or lower Triassic / calcschist, metasandstone,metaclaystone, metaconglomerate etc.,	-In the Limestone area whole area; Jurrasic-Cretaceous/ Neritic Limestone -Limestone caves exist (EIE)
Primary Evaluation	Environmental condition	No Issue	No Issue	No Issue	No Issue	Hunting Prohibited Area
	Preliminary Survey Site	△	△	○	△	△

Evaluation of PSPPP Candidate Sites (3/5)

No.	22-2	24	25	26	27-1	27-2
Town (Village)	Kopurubasi	Karakoren	Salaklar	Salaklar	Baskaya	Deretarla
District	Aydincik	Alpu	Nalihan	Nalihan	Bafra	Bafra
Province	Mersin	Eskisehir	Ankara	Ankara	Samsun	Samsun
Map No.	P29-C2, P30-D1	H26-D3, D4	H26-D3	H26-C4	F35-A1, A4	F35-A2, A3
1/500,000 Geologic Quadrangle	Konva	Zonguldak	Zonguldak	Zonguldak	Sinop	Sinop
	Latitude North	36° 12' 03"	40° 05' 28"	40° 05' 05"	41° 23' 48"	41° 23' 57"
	Longitude East	32° 58' 30"	31° 13' 41"	31° 13' 41"	31° 15' 50"	35° 37' 47"
	HWL (m)	860.0	970.0	980.0	810.0	820.0
	LWL (m)	840.0	1070.0	940.0	960.0	790.0
	Dam Vol. (10 <sup>6</sup> m <sup>3</sup> )	3.6	4.3	8.8	2.3	1.8
	Latitude North	36° 11' 36"	40° 03' 05"	40° 03' 30"	40° 03' 54"	41° 21' 10"
	Longitude East	33° 00' 51"	31° 05' 48"	31° 12' 47"	31° 16' 02"	35° 36' 33"
	H/L	140.0	389.0	389.0	389.0	190.0
	LWL (m)	1300	377.5	377.5	377.5	160.0
Reservoir	Upper	Existing reservoir	Existing reservoir	Existing reservoir	Existing reservoir	Existing reservoir
	Crest Length (m)	370	400	350	400	250
	Dam Height (m)	85	4	4	4	54
	Dam Vol. (10 <sup>6</sup> m <sup>3</sup> )	2.9	1.21	1.06	1.21	1.10
	Max. Head (m)	730.0	722.5	592.5	602.5	660.0
	Waterway Length (m)	2,693	3,815	4,039	2,977	5,302
	L/H	3.69	5.28	6.82	4.94	8.16
	Variable head (H <sub>max</sub> /H <sub>grmin</sub> )	1.11	1.12	1.14	1.12	1.15
	Cost (US\$/kW)	780	707	756	694	706
	716					
Distance from Demand Center						
Length of power line (km)	20	10	20	20	10	10
Civil design	Upper reservoir : Artificial pond and full facing will be needed	Coffer dam is needed for construction of Outlet Economies of scale is large	Large upper dam Coffer dam is needed for construction of Outlet Narrow col exists on the left bank of Reservoir	Coffer dam is needed for construction of Outlet No Headrace and Headrace Surgetunk Economies of scale is large	Coffer dam is needed for construction of Outlet Economies of scale is large	Coffer dam is needed for construction of Outlet
	-In the Limestone area whole area, Jurassic-Cretaceous/ Neritic Limestone Same condition as No.22-1	Upper reservoir (4 km east from No.31 candidate site); Precambrian and / or Paleozoic ; undifferentiated Gneiss, Schist, Amphibole, Marble etc.	Upper dam: Upper paleozoic-triassic / Schist, Phyllite, Marble, Metabasic rocks etc., Lower dam: Upper Cretaceous / Ophiolitic Melange	Upper dam: Upper paleozoic-triassic / Schist, Phyllite, Marble, Metabasic rocks etc., Lower dam: Upper Cretaceous / Ophiolitic Melange	Upper dam: Upper Cretaceous / Pillow lava and sedimentary rocks Outlet ; Upper Senonian / clastic and carbonate rocks	Upper dam: Upper Cretaceous / Pillow lava and sedimentary rocks Outlet ; Upper Senonian / clastic and carbonate rocks
Geological condition	Hunting Prohibited Area	KBA (ORT001) Wildlif Protection Area Hunting Prohibited Area	No Issue	No Issue	No Issue	Several Communes exist around Upper reservoir
	Primary Evaluation	△	△	◎	◎	△
Preliminary Survey Site		○	○	○	○	○

## Evaluation of PSPP Candidate Sites (4/5)

No.	28	29	31	32-1	32-2	34
Town (Village)	Koklen	Doganli	Kuyupinar	Osman	Egri	Cevizligolsamici
District	Ayancik	Denizli	Alpu	Nalihan	Nalihan	Gurey
Province	Sinop	Denizli	Eskisehir	Ankara	Ankara	Denizli
Map No.	E33-A3, A4, D1, D2	L22-D2, D3	H26-D4	H25-C3	H25-C3, H26-D4	L22-D2
1/500,000 Geologic Quadrangle	Sinop	Izmir	Zonguldak	Zonguldak	Zonguldak	Izmir
Upper Reservoir	Latitude North	38° 06' 47"	40° 00' 48"	40° 04' 04"	40° 03' 51"	38° 09' 19"
	Longitude East	34° 37' 58"	31° 04' 00"	30° 57' 50"	30° 59' 31"	29° 09' 08"
Lower Reservoir	HML (m)	1190.0	1010	805.0	800	770
	LWL (m)	1160.0	980	780.0	770	740
Upper Reservoir	Dam Vol. (10 <sup>6</sup> m <sup>3</sup> )	10.6	4.8	1.1	1.6	5.7
	Latitude North	41° 45' 49"	40° 02' 58"	40° 01' 57"	40° 02' 46"	38° 07' 57"
Lower Reservoir	Longitude East	34° 36' 48"	31° 04' 49"	30° 58' 00"	31° 01' 11"	29° 08' 35"
	HML (m)	700.0	389.0	273.1	389.0	300
Upper Reservoir	LWL (m)	680.0	377.5	272	377.5	290
	Dam Vol. (10 <sup>6</sup> m <sup>3</sup> )	1.35	44	55	44	45
Lower Reservoir	Crest Length (m)	340	Existing reservoir	Existing reservoir	Existing reservoir	Existing reservoir?
	Dam Height (m)	6.9	0.911	1.16	0.911	0.75
Upper Reservoir	Max. Head (m)	510.0	632.5	533.0	422.5	480.0
	Waterway Length (m)	3.26	4.20	3.78	3.649	2.263
Lower Reservoir	L/H	6.43	6.67	7.10	8.64	4.71
	Variable head (H <sub>pmax</sub> /H <sub>gmin</sub> )	1.18	1.13	1.11	1.18	1.16
Upper Reservoir	Distance from Demand Center	823	711	732	689	727
	Cost (US\$/kW)					
Lower Reservoir	Length of power line (km)	20	10	20	20	30
	Civil design	Large upper and lower dam Project cost : Over 800\$/kW	Coffer dam is needed for construction of Outlet	Coffer dam is needed for construction of Outlet Upper reservoir : Artificial pond and full facing might be needed Lower dam profile is not clear	Coffer dam is needed for construction of Outlet Penstock : Vertical type	Coffer dam is needed for construction of Outlet No Headrace and Headrace Surgetunk Lower dam profile is not clear
Upper Reservoir	Geological condition	Upper dam: Lower Cretaceous / Clastic and carbonate rocks Lower dam: Upper Senonian / clastic and carbonate rocks	Upper dam having existing forest road (4 km west from No.24 candidate site); Precambrian / undifferentiated Gneiss, Schist, Migmatite, Metagranite, Amphibole etc., An NE-SW fault is close to the waterway route	Same geological condition as No.26 candidate site Upper dam site : Upper paleozoic- triassic / Schist, Phyllite, Marble, Metabasic rocks etc.,	Same geological condition as No.32-1 candidate site (2.4 km to ESE) Upper dam site (in field area with path): Upper paleozoic- triassic / Schist, Phyllite, Marble, Metabasic rocks etc., Carbonates Lower dam : Paleozoic / Schist	Same geological and topographic condition as No.29 and 30 upper dam sites Upper dam site (in field area with path): Upper Miocene - Pliocene / Continental Carbonates Lower dam ; Paleozoic / Schist
	Environmental condition	KBA(EK02)	KBA (ORT001) Hunting Prohibited Area	No Issue	Big commune exists on the left bank of Upper reservoir Wide range of agricultural land will be affected	No Issue
Upper Reservoir	Primary Evaluation	x	o	Δ	o	Δ
	Preliminary Survey Site		o		o	

## Evaluation of PSPPP Candidate Sites (5/5)

No.	37-1	37-2	38	39
Town (Village)	Kovkeleri	Kovkeleri	Catak Orenck	Burun
District	Aladag	Kozan	Catalzeytin	Kure
Province	Adana	Adana	Sinop	Kastamonu
Map No.	M34-B3, C2	M34-C2, M35-D1	E32B4	E31-A3, A4
1/500,000 Geologic Quadrangle	Adana	Adana	Sinop	Sinop
Latitude North	37° 45' 16"	37° 44' 37"	41° 50' 23"	41° 48' 33"
Longitude East	35° 28' 30"	35° 31' 47"	34° 18' 52"	33° 38' 40"
Upper	1250	1260	930	1140
HWL (m)	1220	1230	900	1110
LWL (m)	2.8	1.6	5.6	5.6
Dam Vol. (10 <sup>6</sup> m <sup>3</sup> )				
Latitude North	37° 42' 26"	37° 42' 26"	41° 49' 42"	41° 50' 51"
Longitude East	35° 28' 56"	35° 28' 56"	34° 16' 44"	33° 38' 09"
Lower	550.0	550	340	580
HWL (m)	540.0	540	330	570
LWL (m)				
Crest Length (m)	300	300	280	400
Dam Height (m)	95	95	85	105
Dam Vol. (10 <sup>6</sup> m <sup>3</sup> )	3.1	3.1	3.7	4.8
Max. Head (m)	710.0	720.0	600.0	570.0
Waterway Length (m)	3,768	4,740	2,731	3,341
L/H	3.31	6.58	4.35	5.86
Variable head (H <sub>pm</sub> /H <sub>gmin</sub> )	1.12	1.12	1.14	1.14
Cost (US\$/kW)	<b>709</b>	<b>713</b>	<b>730</b>	<b>749</b>
Distance from Demand Center				
Length of power line (km)	30	30	40	80
Civil design	Economics of scale is large	Long Headrace No Tailrace surgetunk Economics of scale is large	Tranmission Lines are submerged in Lower Reservoir	Economics of scale is large Long power line
Geological condition	Upper dam : Mesozoic Ophiolite (Peridotite) Lower dam : Upper Cretaceous / Ophiolitic melange Very close to Neritic limestone zone of Middle Jurassic-Cretaceous	Upper dam : Middle Jurassic-Cretaceous / Neritic limestone zone Lower dam (same point as 37-1) : Upper Cretaceous / Ophiolitic melange	Upper dam : Upper Senonian / Clastic and Carbonate rocks Lower dam : Lower Cretaceous / Clastic and carbonate rocks	Upper dam : Lower Cretaceous / Clastic and carbonate rocks Lower dam : Granitoid of Dogger epoch
Environmental condition	KBA(AKD053) Normal Wet Land Hunting Prohibited Area	KBA(AKD053) Normal Wet Land Hunting Prohibited Area	KBA(EK02)	KBA(EK02)
Primary Evaluation	○	○	○	△
Preliminary Survey Site	○	○	○	○

## **Appendix 5-4**

### **Site Survey Results**

### Characteristics of PSPP Potential Site

Site Name		No.11-1
Location (River name)		Upper Dam / Reservoir : Kayseri Yahyali Farasa Lower Dam / Reservoir : Kayseri Yahyali Farasa (Zamantı River)
Profile	Installed Capacity P (MW)	1,000
	Design Discharge Q (m <sup>3</sup> /s)	230
	Effective Head H (m)	550
	Peak Duration Hour (hrs)	7
Geography / Geology	General Geology	<ul style="list-style-type: none"> <li>- Subsurface geology of the area is in Sümbüldağı formation of middle Miocene period, which covers inconsistently Köroğlu formation of Jurassic to Cretaceous period. Köroğlu formation is covered by Güzelımköy formation of upper Cretaceous period and distributed in the eastern part of the project area. Around the site Sümbüldağı formation covers Köroğlu formation unevenly. (source;KOZAN-J20(1987),21(1988); 1/100,000 geologic map)</li> <li>- The unconformable boundary between Sümbüldağı formation and Köroğlu formation is rolling with around 50m depth at the lower dam site.</li> <li>- Some serpentinite may lie beneath the limestone of Köroğlu formation, because we confirmed it below limestone exposes near Çamlıca power house, which is 4 km downstream from the lower dam area. The rock is soft and weak, having N50E strike.</li> </ul>
	Upper Dam / Reservoir	<ul style="list-style-type: none"> <li>- The upper reservoir is located in a small basin on the right bank of Zamantı river.</li> <li>- The upper reservoir is located in Sümbüldağı formation of middle Miocene epoch.</li> <li>- The Sümbüldağı formation consists of conglomerate, sandstone, marl, and limestone.</li> <li>- An obvious vertical crack is seen on the right bank slope of Zamantı river which is close to the upper reservoir basin. There is declination of formation of both sides of the crack, but no fractured zone in the crack. Water leakage from the upper reservoir through the crack is anticipated.</li> <li>- Some farms exist in the reservoir area and the other area is a meadow. There are two transmission towers from the Çamlıca powerhouse in the upper reservoir.</li> <li>- Since water leakage from the upper reservoir due to limestone cave and high angle cracks is anticipated, an artificial pond with full facing type should be applied for the upper reservoir.</li> </ul>
	Waterway / Underground Power House	<ul style="list-style-type: none"> <li>- It is presumed that headrace and surgetank go through in Sümbüldağı formation, and penstock and underground power house (UGPH) go through in Köroğlu formation. The geologic boundary is estimated to locate approximately EL.1050m or lower.</li> <li>- Some caves are seen in the limestone of Köroğlu formation at Çamlıca village which is about 4km down stream of the lower dam site. It is necessary to investigate carefully caves distribution in the limestone body and its geologic boundary along the waterway.</li> <li>- Since the outlet is planned to locate at the bottom of a precipitous valley, location of access road and tunnel, and construction method are to be studied carefully.</li> </ul>

	Lower Dam / Reservoir	<ul style="list-style-type: none"> <li>- Originally, the lower dam site is planned at the same location of the lower dam of No.11-2. However, taking into consideration sedimentation and bottom elevation of outlet, it is judged to be economical that the site location is moved at around 1km upstream and the dam height is lowered.</li> <li>- Rock surrounding the alternative lower dam site belongs to K�rođlu formation. The alternative dam site is located at the narrow area where flow direction of Zamantı river changes from NS to EW.</li> <li>- An obvious normal fault is crossing Zamantı river at just upstream of the dam site. The dip of the fault is about 75 degrees to North with more than 10 meter declination.</li> <li>- The topography of dam site is a precipitous valley and the hard and massive rock crops out at the dam site. Judging from the above conditions, concrete gravity dam type is suitable to be applied.</li> <li>- However, it is necessary to investigate carefully with and without of limestone caves which connect upstream and downstream of the dam axis.</li> </ul>
Natural / Social Environment	Natural Park / Protected Area	- There is no designation of national parks, natural parks, or natural protection areas at the project site. However, the project site is located in Zamantı Nehri Wet Land, and Aladađlar Key Biodiversity Area (KBA No. AKD053).
	Prosperous fauna / flora	<ul style="list-style-type: none"> <li>- The upper dam and reservoir site is used for wheat fields and meadows.</li> <li>- According to interview with local people, the surrounding area of the project site is a habitat for wild pigs, wolfs, foxes and wild goats, which are mainly coming from Aladađlar National Park.</li> <li>- As mentioned above, the project site is located in the wet land and the KBA, detailed environmental survey and impact assessment on wildlife is required.</li> </ul>
	Resettlement / Compensatory assets	- No involuntary resettlement is anticipated. And also, there is no asset to be compensated.
	Historical / Cultural Heritage	- There is no historical and cultural heritage to be affected. And there is no important tourism resource to be affected.
	Others	- �amlıca village where the project site is located is one of the most important historical centers for iron products on the route of Silk Road. There are some historical and cultural heritage such as St. Merry Rock and an old castle in the village. Therefore, even if the project does not directly affect them, special attention to be taken.
	Others' Special Note	<ul style="list-style-type: none"> <li>- It is possible to access to the upper reservoir and upper penstock, but the access road is a punishing road and needs to be upgraded. The access roads from upstream end of the lower reservoir to the UPH, outlet and lower dam are to be constructed newly.</li> <li>- Length of new power line is estimated about 30km from the nearest 400kV substation.</li> </ul>



Photo 1 Upper dam site, viewing from the east

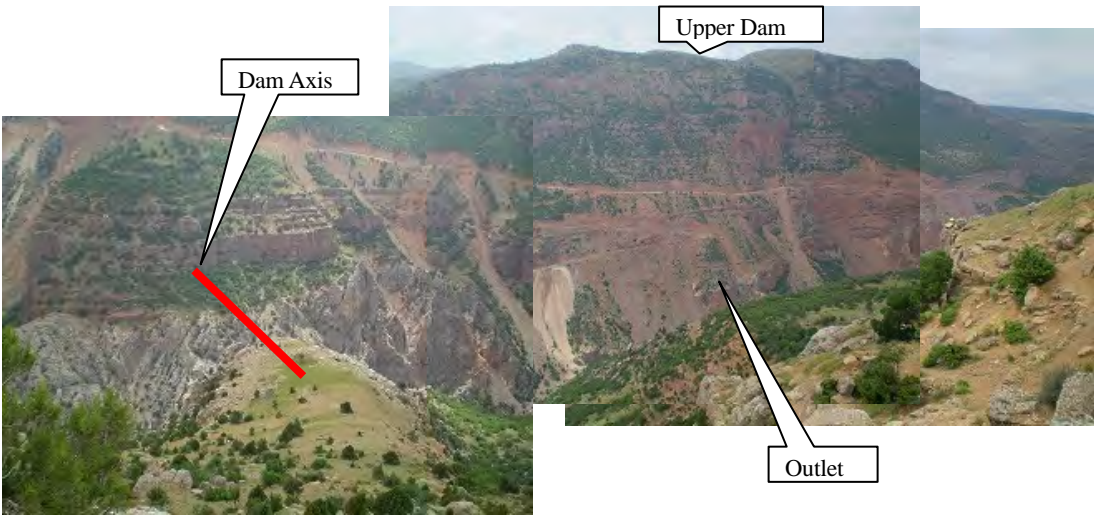
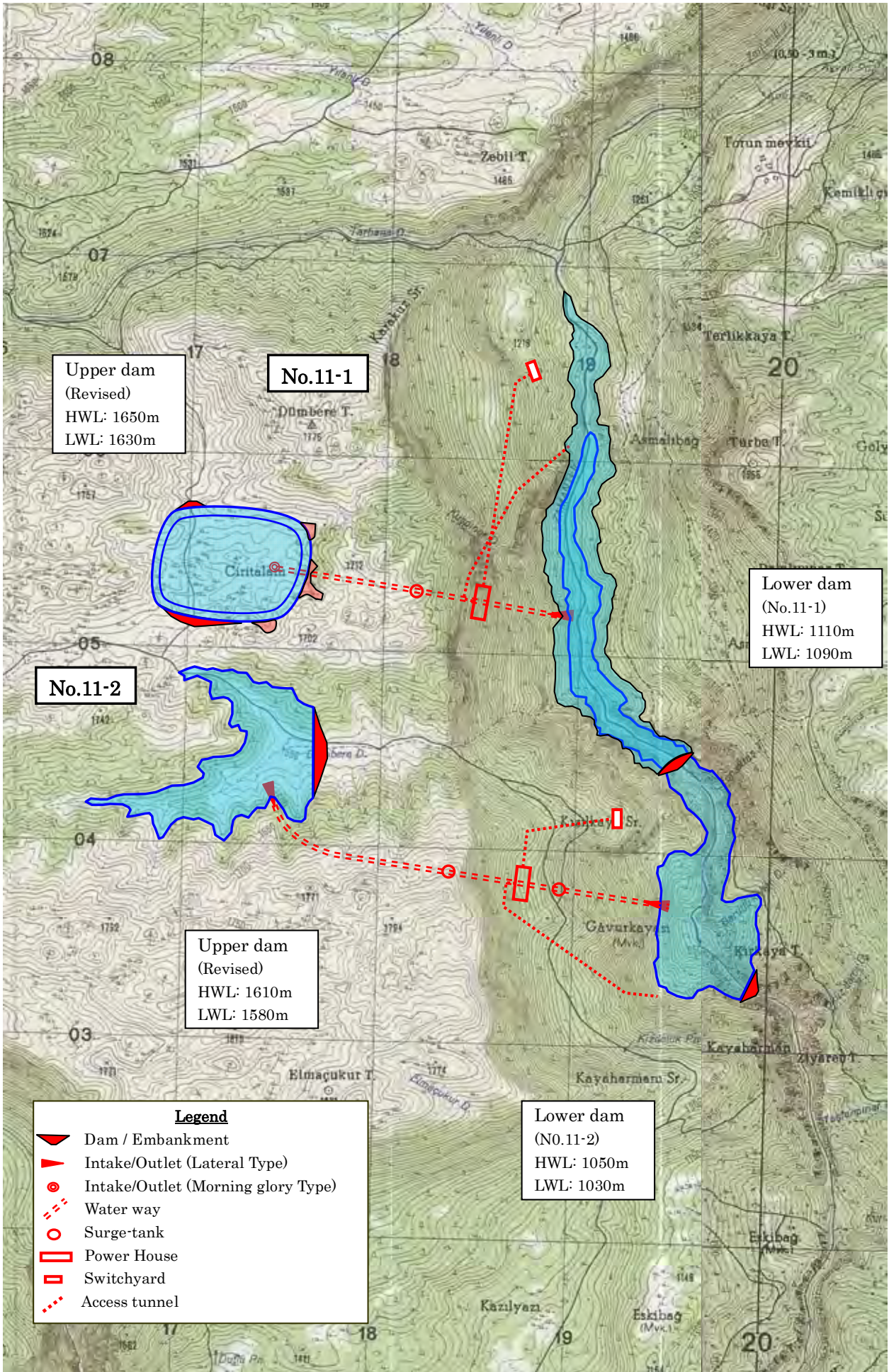


Photo 2 Alternative lower dam site viewing from the left bank





No.11-1 Layout of Main Facilities

### Characteristics of PSPP Potential Site

Site Name		<b>No.11-2</b>
Location (River name)		Upper Dam / Reservoir : Kayseri Yahyali Farasa Lower Dam / Reservoir : Kayseri Yahyali Farasa (Zamanti River)
Profile	Installed Capacity P (MW)	1,000
	Design Discharge Q (m <sup>3</sup> /s)	249
	Effective Head H (m)	507
	Peak Duration Hour (hrs)	7
Geography / Geology	General Geology	<ul style="list-style-type: none"> <li>- Subsurface geology of the area is in Sümbüldağı formation of middle Miocene period, which covers inconsistently Köroğlu formation of Jurassic to Cretaceous period. Köroğlu formation is covered by Güzelımköy formation of upper Cretaceous period and distributed in the eastern part of the project area. Around the site Sümbüldağı formation covers Köroğlu formation unevenly. (source;KOZAN-J20(1987),21(1988); 1/100,000 geologic map)</li> <li>- The unconformable boundary between Sümbüldağı formation and Köroğlu formation is rolling with around 50m depth at the lower dam site.</li> <li>- Some serpentinite may underlie the limestone of Köroğlu formation, because those outcrops under limestone were observed near Çamlıca power house, which is 4 km downstream from the lower dam area. The rock is soft and weak, having N50E strike.</li> </ul>
	Upper Dam / Reservoir	<ul style="list-style-type: none"> <li>- The upper reservoir is located at the upper stream of Dömbere river which is a tributary of Zamanti river.</li> <li>- The dam axis was moved about 100m upstream from the original one, because the ridge of Left Bank is too narrow for fill type dam.</li> <li>- The upper reservoir area is in a meadow. There is a transmission tower from the Çamlıca powerhouse in the upper reservoir.</li> <li>- No water flow is detected at the river bed.</li> <li>- Both the right and left bank of the alternative dam site have gentle slope, where width of the valley at around EL.1600m, 50m high from river bed, is approximately 270m .</li> <li>- Geology of the upper reservoir belongs to Sümbüldağı formation of middle Miocene epoch.</li> <li>- The Sümbüldağı formation consists of conglomerate, sandstone, marl, and limestone.</li> </ul>
	Waterway / Underground Powerhouse	<ul style="list-style-type: none"> <li>- It is presumed that headrace and surgetank go through in Sümbüldağı formation, and penstock and underground powerhouse (UPH) go through in Köroğlu formation. The geologic boundary is estimated to locate approximately EL.1050m or lower.</li> <li>- Some caves are seen in the limestone of Köroğlu formation at Çamlıca village which is about 4km down stream of the lower dam site. It is necessary to investigate carefully caves distribution in the limestone body and its geologic boundary along the waterway.</li> <li>- Since the outlet is planned to locate at the gentle slope covered by debris, it is needed to select site location where base rock crops out.</li> <li>- The outlet site should be changed to some different site, because the former candidate site is covered by debris.</li> </ul>

	Lower Dam / Reservoir	<ul style="list-style-type: none"> <li>- Unused water after taking for electricity generation of Çamlıca HES flows in the river.</li> <li>- Geology of the lower dam site belongs to Koroğlu formation. The dam site is located at the narrow area where flow direction of Zamantı river changes from NS to SE.</li> <li>- The topography of dam site is a precipitous valley and the sound and hard rock exposes at the dam site. Judging from the above conditions, concrete gravity dam type or arch concrete dam type is suitable to be applied.</li> <li>- However, it is necessary to investigate carefully with and without of limestone caves which connect upstream and downstream of the dam axis.</li> </ul>
Natural / Social Environment	Natural Park / Protected Area	- There is no designation of national parks, natural parks, or natural protection areas at the project site. However, the project site is located in Zamantı Nehri Wet Land, and Aladağlar Key Biodiversity Area (KBA No. AKD053).
	Prosperous fauna / flora	<ul style="list-style-type: none"> <li>- The upper dam and reservoir site is used for wheat fields and meadows.</li> <li>- According to interview with local people, the surrounding area of the project site is a habitat for wild pigs, wolfs, foxes and wild goats, which are mainly coming from Aladağlar national Park.</li> <li>- As mentioned above, the project site is located in the wet land and the KBA, detailed environmental survey and impact assessment on wildlife is required.</li> </ul>
	Resettlement / Compensatory assets	- No involuntary resettlement is anticipated. And also, there is no asset to be compensated.
	Historical / Cultural Heritage	- A historical cistern or storage exists at the right bank of the upper dam site. It is still utilized by local people. Its historical value and impacts by the project should be evaluated.
	Others	- Çamlıca village where the project site is located is one of the most important historical centers for iron products on the route of Silk Road. There are some historical and cultural heritage such as St. Merry Rock and an old castle in the village. Therefore, even if the project does not directly affect them, special attention to be taken.
Others' Special Note		<ul style="list-style-type: none"> <li>- It is possible to access to the upper reservoir and upper penstock, but the access road is a punishing road and needs to be upgraded. The access roads from Çamlıca HES downstream of the lower reservoir are to be constructed newly.</li> <li>- Length of new power line is estimated about 30km from the nearest 400kV substation.</li> </ul>

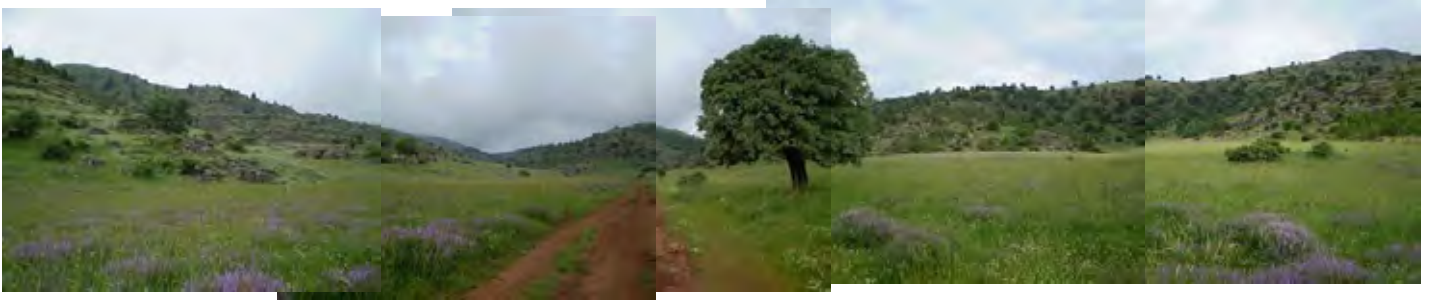


Photo 1 Upper dam site, viewing from the downstream



Right bank



Left bank

Photo 2 Upper dam site



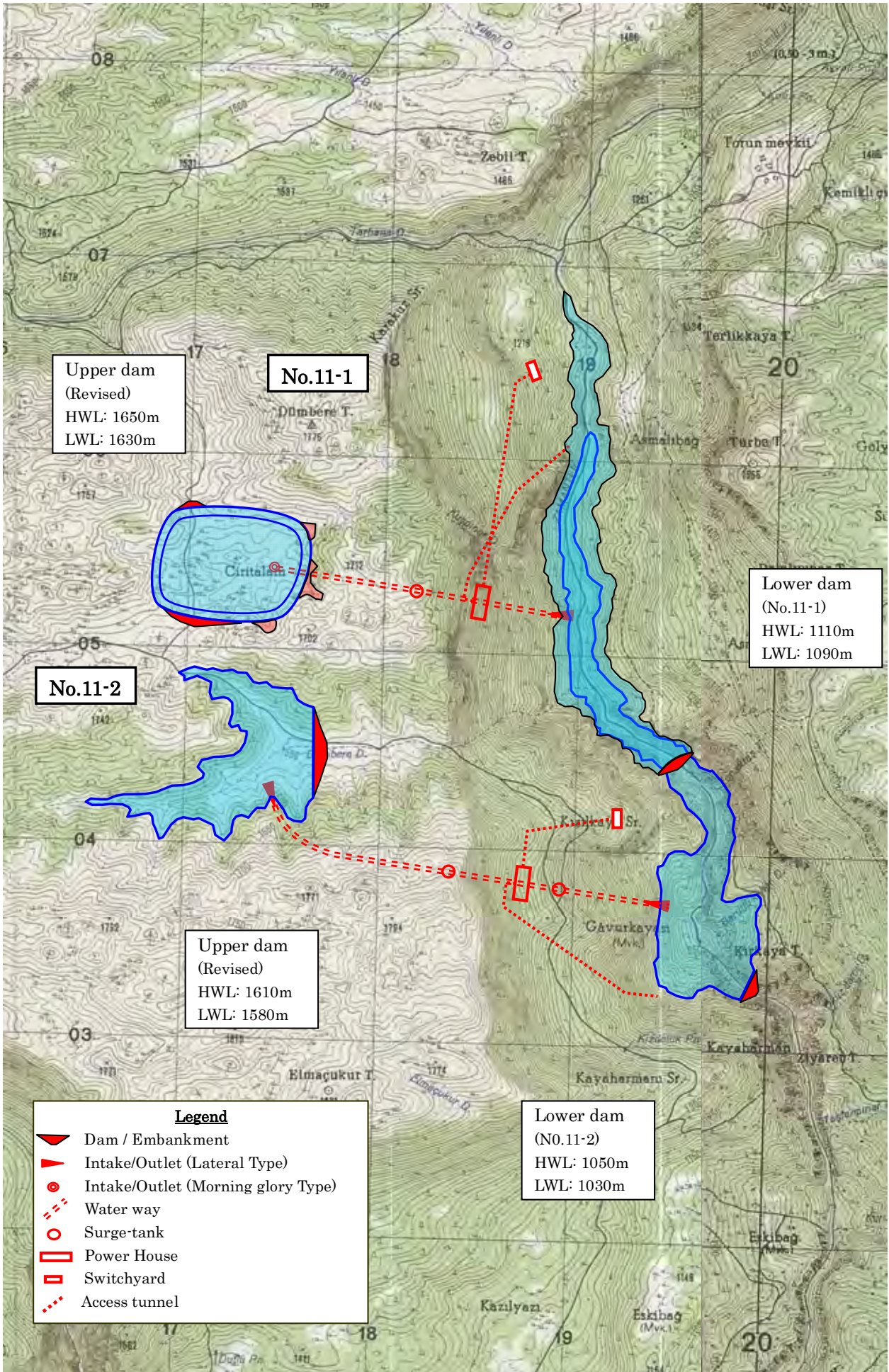
Photo 3 Historical cistern at the upper dam site



Photo 4 Transmission steel tower at the upstream of the upper reservoir



Photo 5 Lower dam site viewing from right bank



No.11-2 Layout of Main Facilities