





## **Integrated ESIA Greece Annex 6.5.5 - West - Avifauna Baseline Study**

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Supplement I - Threatened bird species recorded in the wider study area

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## 1 INTRODUCTION

### 1.1 General Information on Bird Fauna of Western and Central Macedonia



Bird studies in the wider study area have up to now focused on the wetlands, mainly the Axios Delta and the lakes of Kastoria, Chimaditis and Zazari (Bourdakis and Vareltzidou 2000, Bousbouras 2009). The mountainous areas, including Mt Vermio, have received much less attention. As for the lowlands, including areas of farmland and grassland, there is information mainly for those areas that are close to the aforementioned wetlands.

In the area influenced by the TAP Project, many bird species of conservation interest have been recorded, including 68 that are threatened in Greece, Europe or even globally (Handrinos and Akriotis 1997, BirdLife International 2004, Legakis and Maragou 2009). Many of them are waterbirds or at least associated with wetlands such as the Dalmatian Pelican (*Pelecanus crispus*), the White Pelican (*Pelecanus onocrotalus*), the Pygmy Cormorant (*Phalacrocorax pygmeus*), the Glossy Ibis (*Plegadis falcinellus*) and the Ferruginous Duck (*Aythya nyroca*). However, there are threatened species also in the mountains, like the Golden Eagle (*Aquila chrysaetos*), and in farmland, including the Lesser Kestrel (*Falco naumanni*) and the Montague's Harrier (*Circus pygargus*). The latter is a very rare breeding species in Greece, up to now recorded as a breeder only in a few farmland areas in western and central Macedonia.

### 1.2 Main Legislative Issues



The great majority of the birds in the wider area are protected by national legislation; the rest can be hunted in compliance with hunting seasons and quotas. At a national level, 12% of the species are Critically Endangered, 16% are endangered, 20% are Vulnerable and 13% are Near Threatened.

The major wetlands of the region are Important Bird Areas (IBAs) protected as Specially Protected Areas (SPAs). These include the Axios, Aliakmonas and Loudias rivers' deltas (GR028, also a National Park), River Axios (GR025) and the lakes Chimaditis and Zazari (GR046) and Kastoria (GR048).

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### 1.3 Scope of Work

Since the TAP route avoided the major wetlands, the study tried to record mainly the species occurring in deciduous and riparian forests, natural grassland and farmland. Greater emphasis was given to raptors and, to a lesser extent, woodpeckers and certain passerines, such as shrikes (*Lanius* spp.), since these are known to be sensitive to habitat degradation and disturbance (Tucker and Heath 1994). Particular attention was paid in the Montague's Harrier, since the wider area is known to be the stronghold of this rare breeder in Greece (Handrinos and Akriotis 1997, Legakis and Maragou 2009), as well as Lesser Kestrel and Levant Sparrowhawk (*Accipiter brevipes*).

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## 2 METHODOLOGY

### 2.1 Sampling Methodology

A field survey was conducted in June 2011. An additional field survey took place in May 2012 in order to assess bird populations on certain areas (River Axios, Giannitsa, Mt Vermio and Eordea Plain) where modifications in the original route have been adopted,

The birds were sampled by the point count method (Bibby *et al.* 2000). In total, 54 waypoints were taken randomly within a distance of 250 m of the pipeline route. In the deciduous forests, farmland and grassland random points were taken, but all river crossings, temporary and permanent installations were sampled. About 10 minutes were spent in each waypoint, and all birds were counted.

A Principal Component Analysis (PCA) was performed, in order to give a general view of the bird distribution in the various habitats (*Figure 3-1*). This was based on the bird species recorded in at least three waypoints (out of the total 61) in order to eliminate undue influence of rare, possibly not representative, observations. A Cluster Analysis was also performed, using the same data set, in order to classify the waypoints themselves according to the birds observed in them, and give an idea of how birds relate to various habitats (*Figure 3-2*).

In May 2012, 18 points were visited.

### 2.2 Study Sites

The sampling locations are presented in *Table 2-1*.

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**Table 2-1 Sampling Locations**

Way Point (WP).	Site code (as shown on map)	Name	Area	Habitat type	Shortest distance to pipeline centreline (m)	KP
1	Axios 1	Axios 1	Axios River	Riparian forest	0	370.2
2	148	Axios 2	Vardarovasi	Riparian forest	2,200	369.9
3	Loudias	Loudias	Loudias River	Riparian forest	0	394.8
4	141	<i>Quercus</i> forest remains	S of Loutrohorion	Mainly farmland, little forest remaining	295	421.5
5	112	Vermio- <i>Quercus</i> forest	Eastern Vermio, east of Agia Fotini	<i>Quercus</i> forest near orchards	155	432.6
6	116	As above	As above	As above	75	431.1
7	118	As above	As above	<i>Quercus</i> forest	55	430.3
8	126	As above	As above	As above	200	429.5
9	153	As above	Eastern Vermio, west of Polla Nera	Degraded <i>Quercus</i> forest, scrub	1,135	426.8
10	154	Polla Nera	Polla near village	Farmland and built up areas	210	423.8
11	092	Vermio, <i>Fagus</i> forest	Vermio, east of Ano Grammatikon	<i>Fagus</i> forest, subalpine meadows	465	436.9
12	093	As above	As above	As above	195	436.9
13	085	As above	As above	As above	280	438.0
14	083	As above	As above	As above	245	439.3
15	Grammatikon Stream	Grammatikon Stream	Near Ano Grammatikon	Stream in <i>Quercus</i> forest	0	444.0
16	155	Western Vermio, <i>Quercus</i> forest	As above	<i>Quercus</i> forest	15	442.5
17	072	As above	As above	As above	170	442.8
18	067	As above	As above	As above	35	443.0
19	098	Vermio- <i>Fagus</i> forest	Vermio- west of Agia Fotini	<i>Fagus</i> forest, <i>Pinus</i> plantation	380	435.7
20	108	Vermio- <i>Quercus</i> forest	Vermio- north of Agia Fotini	<i>Quercus</i> & <i>Fagus</i> forest	420	434.9
21	109	As above	As above	<i>Quercus</i> forest (also <i>Acer</i> , <i>Fagus</i> )	100	433.4
22	156	Maniaki	Near Maniaki	Farmland, grassland	20	474.7
23	Kastro River	Kastro River	Lowlands west of Vermio	Riparian forest	0	448.2
24	Kilada Stream	Kilada Stream	Lowlands west of Vermio	Riparian forest	0	460.3
25	157	Varikou	East of Varikon	Farmland	20	474.7
26	061	Lehovo area- <i>Quercus</i> forest	West of Lehovo	<i>Quercus</i> forest	40	485.5

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Way Point (WP).	Site code (as shown on map)	Name	Area	Habitat type	Shortest distance to pipeline centreline (m)	KP
27	158	As above	As above	Farmland near <i>Quercus</i> forest	140	485.5
28	159	As above	As above	Riparian forest, <i>Quercus</i> forest	80	485.8
29	160	As above	As above	<i>Quercus</i> forest, farmland	70	489.6
30	162	As above	As above	<i>Quercus</i> forest, stream	120	491.1
31	163	Kleisoura	Subalpine meadow and <i>Fagus</i> forest northwest of Kleisura	Subalpine meadow (1.232 m.), <i>Fagus</i> forest	50	493.0
32	Aliakmonas I	Aliakmonas River	Aliakmonas River, west of Kastoria	Riparian forest	0	521.3
33	West of Aliakmonas	As above	As above	<i>Quercus</i> forest	0	521.6
34	164	Near the border with Albania	Southwest of Ieropigi	Farmland, <i>Quercus</i> stands	300	542.6
35	009	Akriton, <i>Quercus</i> forest	South of Ieropigi	As above	40	543
36	013	Kastraki, <i>Quercus</i> forest	Kastraki	<i>Quercus</i> & <i>Pinus</i> forest, grassland	1800	540.5
37	021	As above	As above	<i>Quercus</i> forest	2620	539
38	Aliakmonas III	Aliakmonas III	Northwest of Agia Kyriaki	Riparian forest	0	532.9
39	165	Agia Kyriaki	South of Agia Kyriaki	Farmland	130	533.0
40	Aliakmonas II	Aliakmonas II	Mesopotamia	Riparian forest	0	528.0
41	Parapotamos of Aliakmonas	Tributary of Alakmonas	Ampelokipi	Riparian forest	0	532.5
42	166	Ampelokipi pipeyard	As above	Farmland	270	511.8
43	167	Korystos	Korystos	Farmland	305	505.0
44	042	Kleisura	Kleisura, <i>Fagus</i> , <i>Quercus</i> forest	<i>Fagus</i> , <i>Quercus</i> forest	40	493.8
45	035	Verga	Verga, <i>Quercus</i> , <i>Fagus</i> forest	<i>Quercus</i> , <i>Fagus</i> forest, farmland	125	495.0
46	168	Agia Kyriaki	Agia Kyriaki	farmland	560	533.1
47	169	As above	As above	As above	535	533.9
48	170	As above	As above	As above	140	532.8
49	171	As above	As above	As above	260	532.9
50	173	Agia Kyriaki pipeyard	As above	As above	170	529.2

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Way Point (WP).	Site code (as shown on map)	Name	Area	Habitat type	Shortest distance to pipeline centreline (m)	KP
51	174	Galathea	South of Galathea	As above	20	482.3
52	175	As above	As above	As above	30	480.0
53	176	As above	As above	As above	315	479.0
54	177	Anatolikon pipeyard	Anatolikon	As above	2575	469.0
55	178	Verroia	Near Verroia	As above	1570	450.0
56	179	Loutrochori pipeyard	Loutrochori	As above	1920	421.5
57	180	Chalkidona pipeyard	Chalkidona	As above	380	379.6
58	181	Messimvria	Messimvria	As above	20	361.3
59	182	As above	As above	As above	1065	358.2
60	183	As above	As above	As above	210	359.5
61	184	As above	As above	As above	940	359.5
1cp	1cp	Near Axios	Near Axios River	As above	60	366.7
2cp	2cp	As above	As above	As above	120	368.0
3cp	3cp	As above	As above	As above	0	368.2
4cp	4cp	As above	As above	As above	120	368.4
5cp	5cp	As above	As above	As above	200	369.3
6cp	6cp	Axios	Axios River	Riparian forest, grassland	20	369.8
7cp	7cp	As above	As above	Riparian forest, farmland	320	371.3
8cp	8cp	Loudias	Loudias River	Farmland, riparian forest	40	393.2
9cp	9cp	Giannitsa	Giannitsa plain	Riparian forest	250	394
10cp	10cp	As above	As above	Farmland, canals	0	396.8
11cp	11cp	As above	As above	As above	100	396.5
12cp	12cp	As above	As above	As above	285	395.8
13cp	13cp	As above	As above	As above	90	394.5
14cp	14cp	Vermio	Mt Vermio	<i>Fagus</i> forest	0	479.0
15cp	15cp	As above	As above	As above	60	477.4
16cp	16cp	Pyrgoi	Near Pyrgoi	Farmland	405	438.7
17cp	17cp	Galathea	To Galathea - Drosero	Farmland, grassland, scrub	20	451.2
18cp	18cp	Drosero	To Drosero	Farmland	20	436.8

Source: ERM (Field Survey, June 2011 and May 2012)

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### 2.3 Limitations, Uncertainties and Biases

Due to the extent of the study area and the relatively limited duration of the field work it was not possible to survey all habitats equally, and although the survey work focused on areas considered to be of highest potential it is acknowledged some were probably not covered adequately. All river crossings (riparian forests) were surveyed, whilst in the other habitats random waypoints were selected. The daily activity of birds also influenced sightings and the survey data recorded; birds are mainly active in the morning and, to a lesser extent, in the afternoon, with relatively little activity during midday, especially in summer (late June) when the survey took place. It was therefore unavoidable to survey some of the waypoints at a time of little bird activity. This certainly underestimated the numbers and diversity of some species. At the waypoints all species were counted (i.e. no species were excluded from assessment), but special attention was paid in the more sensitive ones, such as raptors.

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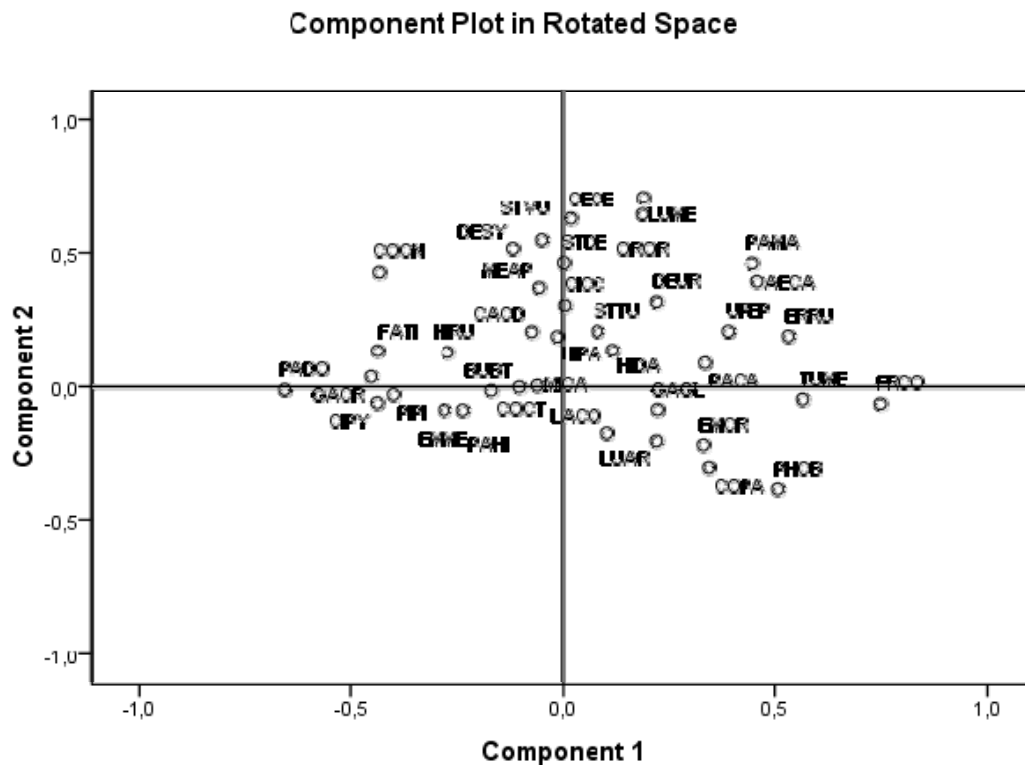
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### 3 RESULTS

#### 3.1 Bird Species Richness Estimation along the Route

The quality of the data gathered during the field survey in June 2011 does not allow for precise species richness estimation along the route. However, from the results of PCA analysis, based on the available data, it is obvious that the richest habitat were the riparian forests (upper central part of *Figure 3-1*), while *Fagus* and *Quercus* forests, grassland and farmland were less rich. In the Cluster Analysis, the main separation was between riparian forests (lowest part of *Figure 3-2*) and the other habitats. The latter are further subdivided, mainly into forested (*Quercus* and *Fagus* forests) and farmland.

**Figure 3-1** PCA analysis on the bird species in the area



Notes: In the right of the Component 1 Axis are species from forests, in the left those from farmland. In the upper part of Component 2 Axis are the species from riparian forests, in the lower part those from open areas.

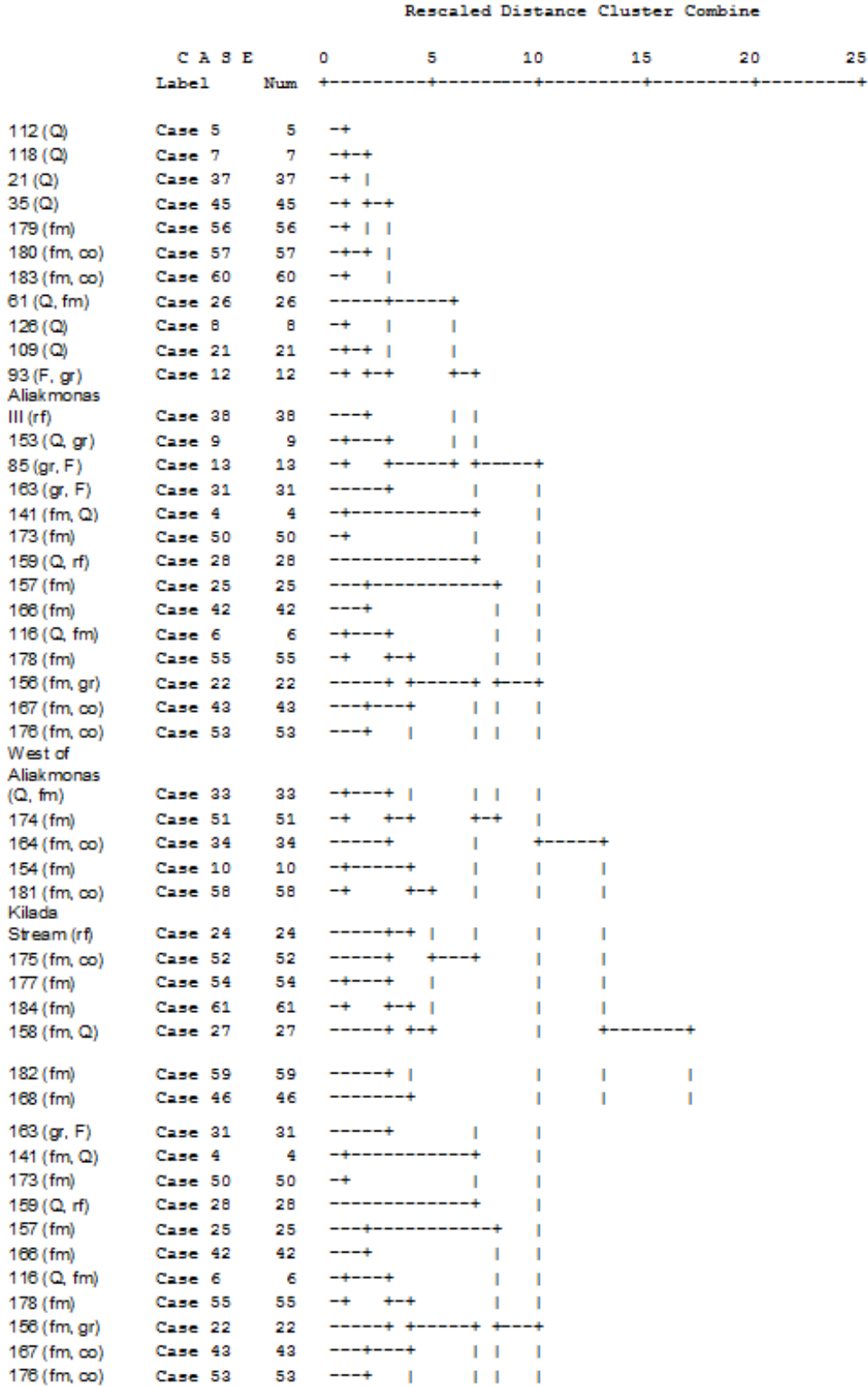
Source: Exergia (2011)

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**Figure 3-2 Cluster Analysis of the study waypoints**



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Location	Case	Code	Symbol	Symbol	Symbol	Symbol	Symbol
West of Aliakmonas (Q, fm)	Case 33	33	--+---+				
174 (fm)	Case 51	51	--+	++	++		
164 (fm, co)	Case 34	34	-----+		-----+		
154 (fm)	Case 10	10	-----+				
181 (fm, co)	Case 58	58	--+	++			
Kilada Stream (rf)	Case 24	24	-----+	+			
175 (fm, co)	Case 52	52	-----+	+	-----+		
177 (fm)	Case 54	54	-----+				
184 (fm)	Case 61	61	--+	++			
158 (fm, Q)	Case 27	27	-----+	++		-----+	
182 (fm)	Case 59	59	-----+				
168 (fm)	Case 46	46	-----+				
9 (fm, Q)	Case 35	35	-----+	+	-----+		
13 (Q, fm, gr)	Case 36	36	-----+				
170 (fm)	Case 48	48	-----+	+	-----+		
171 (fm)	Case 49	49	-----+				
Axios I (rf)	Case 1	1	-----+	+	-----+	+	+
Vardarovasi (rf)	Case 2	2	-----+			-----+	
160 (fm, co)	Case 29	29	-----+	+	-----+		
169 (fm)	Case 47	47	-----+	+	-----+		
Loudias (rf)	Case 3	3	-----+	+	-----+		
165 (fm)	Case 39	39	-----+				
155 (Q)	Case 16	16	-----+				
108 (F)	Case 20	20	-----+				
67 (Q)	Case 18	18	-----+	+	-----+		
98 (F)	Case 19	19	--+	+++			
83 (gr, F)	Case 14	14	-----+	++	-----+	+	+
72 (Q)	Case 17	17	-----+				
92 (gr, F)	Case 11	11	-----+	+	-----+		
Kastro River (rf)	Case 23	23	-----+	+	-----+		
Tributary of Aliakmonas (rf)	Case 41	41	-----+	+	-----+	+	+
Aliakmonas II (rf)	Case 40	40	-----+				
Grammatikou Stream (rf)	Case 15	15	-----+	+	-----+	+	+
Grammatikou Stream (rf, Q))	Case 15	15	-----+	+	-----+	+	+
42 (F)	Case 44	44	-----+	+	-----+		
Aliakmonas I (rf)	Case 32	32	-----+	+	-----+	+	+
162 (Q, rf)	Case 30	30	-----+	+	-----+		

Source: Exergia (2011)

The importance of the riparian forests is probably due to the fact that they support not only species that live in the forests themselves, but also species that simply nest there, but feed in the adjacent farmland. However, in the other habitats, including farmland, were recorded species of significant conservation interest.

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From a conservation point of view the most important species observed at particular sections of the route are the following:

- Axios River: Long-legged Buzzard (*Buteo rufinus*), Black Stork (*Ciconia nigra*), White Stork (*Ciconia ciconia*) and Roller (*Coracias garrulus*).
- Giannitsa plain: none Mt Vermio: Short-toed Eagle (*Circaetus gallicus*) (one pair).
- Eordea plain: none
- Greek – Albanian border – western Macedonia: *Circus pygargus* - one breeding pair in Agia Kyriaki (see below)

### 3.2 Confirmed Bird Species Presence along the Route

The species of conservation interest recorded along the route during the field surveys of June 2011 and May 2012 are presented in *Table 3-1*.

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**Table 3-1 Bird species of conservation interest present in the Study Area**

No.	Family name Latin name	Common name	Records within Project area (distance (m) from route centreline)	Anticipated range within Project area	Reason of conservation interest	General comments	Taxon in need of consideration/ special mitigation*
1	Phasianidae, <i>Coturnix coturnix</i>	Quail	WP 34 (300 m), WP 35 (40 m), WP 48 (140 m)	Widely in farmland and grassland	SPEC 3	Probably more widespread than records indicate	Unlikely according to current data
2	Phalacrocoracidae, <i>Phalacrocorax pygmaus</i>	Pygmy Cormorant	Wider area (Lake Kastoria)	Lakes and rivers	SPEC 1	Not recorded on the route	No
3	Pelecanidae, <i>Pelecanus onocrotalus</i>	White Pelican	Wider area (Lake Kastoria)	Mainly in the lakes in the area	SPEC 3, VU in Greece	Not recorded on the route	No
4	Pelecanidae, <i>Pelecanus crispus</i>	Dalmatian Pelican	WP 22 (20 m), WP 31 (50 m)	Mainly in the lakes of the area	IUCN- VU, SPEC 1, VU in Greece	Flying high	No
5	Ardeidae, <i>Nycticorax nycticorax</i>	Night Heron	WP 1 (0 m)	Major wetlands (lakes and rivers)	SPEC 3, NT in Greece	In flight	Unlikely according to current data
6	Ciconiidae, <i>Ciconia ciconia</i>	White Stork	WP 4 (295 m), WP 41 (0 m), WP 50 (170 m), WP 6cp (20 m)	Probably in many areas in farmland and near wetlands	SPEC 2, VU in Greece	Seen also in areas outside the route	Unlikely according to current data
7	Ciconiidae, <i>Ciconia nigra</i>	Black Stork	WP 6cp (20 m)	Local in forests and wetlands	SPEC 2, EN in Greece	In flight	Unlikely according to current data
8	Accipitridae, <i>Circaetus gallicus</i>	Short-toed Eagle	WP 58 (20m), WP 14cp (0 m)	Presumably widespread	SPEC 3, NT in Greece	Uncertain if nesting near the working strip	Unlikely according to current data (see text)
9	Accipitridae, <i>Circus pygargus</i>	Montague's Harrier	WP 39 (130 m), WP 46 (560 m), WP 47 (535 m), WP 48 (140 m), WP 49 (260 m)	Farmland south of Olympia and Galathea and near Vegora, possibly elsewhere	CR in Greece	At least one nest is right on the route	Yes (see text)
10	Accipitridae, <i>Accipiter brevipes</i>	Levant Sparrow hawk	WP 38 (0 m)	Probably widespread in the area	SPEC 2	Also seen in Naussa area	Unlikely according to current data (see text)
11	Accipitridae, <i>Buteo rufinus</i>	Long-legged Buzzard	WP 4cp (120 m)	Probably widesperad in the lowlands	SPEC 3, VU in Greece	Uncertain if nesting near the working strip	Unlikely according to current data(see text)

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No.	Family name Latin name	Common name	Records within Project area (distance (m) from route centreline)	Anticipated range within Project area	Reason of conservation interest	General comments	Taxon in need of consideration/ special mitigation*
12	Falconidae, <i>Falco naumannii</i>	Lesser Kestrel	Wider area (near Komnina)	Known to breed in farmland eats of Chimaditis Lake	IUCN- VU, SPEC 1, VU in Greece	Not observed on the route	No
13	Falconidae, <i>Falco tinnunculus</i>	Kestrel	WP 2 (2200 m), WP 3 (0 m), WP 10 (210 m), WP 22 (20 m), WP 40 (0 m), WP 46 (560 m), WP 47 (535 m), WP 50 (170 m), WP 58 (20 m), WP 59 (1065 m), WP 4cp (120 m), WP 16 cp (405 m), WP 17cp (20 m)	Widespread	SPEC 3	Many observations also outside the route	No
14	Falconidae, <i>Falco vespertinus</i>	Red-footed Falcon	WP 5cp (200 m)	Probably widesperad in migration	SPEC 3	-	No
15	Upupidae, <i>Upupa epops</i>	Hoopoe	Recorded in several WPs	Widespread	SPEC 3	-	No
16	Meropidae, <i>Merops apiaster</i>	Bee-eater	WP 25 (20 m), WP 40 (0 m), WP 41 (0 m), WP 1cp (60 m), WP 5cp (200 m), WP 17cp (20 m)	Probably widespread in lowlands near rivers	SPEC 3	Seen also outside the route	Unlikely according to current data
17	Coraciidae, <i>Coracias garrulus</i>	Roller	WP 4cp (120 m)	Probably widespread in the lowlands	IUCN- NT, SPEC 2, VU in Greece	-	Unlikely according to current data

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No.	Family name Latin name	Common name	Records within Project area (distance (m) from route centreline)	Anticipated range within Project area	Reason of conservation interest	General comments	Taxon in need of consideration/ special mitigation*
18	Picidae, <i>Picus viridis</i>	Green Woodpecker	WP 40 (0 m), WP 41 (0 m)	Probably fairly widespread in forests	SPEC 2	Probably more widespread than records may suggest	No
19	Alaudidae, <i>Alauda arvensis</i>	Skylark	WP 52 (30 m)	Probably widespread	SPEC 3, NT in Greece	Presumably more widespread	No
20	Alaudidae, <i>Lullula arborea</i>	Woodlark	Seen in several WPs	Probably widespread	SPEC 2	As above	No
21	Hirundinidae, <i>Hirundo rustica</i>	Swallow	Seen in many WPs	Very common	SPEC 3	Very widespread and common	No
22	Turdidae, <i>Oenanthe oenanthe</i>	Wheatear	WP 31 (50 m)	Presumably widespread	SPEC 3	-	No
23	Sylviidae, <i>Hippolais pallida</i>	Olivaceous Warbler	Observed in several WPs	Fairly widespread	SPEC 3	-	No
24	Sylviidae, <i>Phylloscopus orientalis</i>	Eastern Bonelli's Warbler	WP 31 (50 m), WP 44 (40 m)	Deciduous upland forests	SPEC 2 (as <i>Phylloscopus bonelli</i> )	-	No
25	Laniidae, <i>Lanius collurio</i>	Red-backed Shrike	Seen in a few WPs	Widespread and common	SPEC 3	-	No
26	Laniidae, <i>Lanius senator</i>	Woodchat Shrike	WP 22 (20 m), WP 34 (300 m)	Probably fairly widespread	SPEC 2	-	No
27	Sturnidae, <i>Sturnus vulgaris</i>	Starling	Seen in several WPs	As above	SPEC 3	-	No
28	Passeridae, <i>Passer domesticus</i>	House Sparrow	Seen in many WPs	Very common in lowlands	SPEC 3	-	No
29	Emberizidae, <i>Emberiza hortulana</i>	Ortolan	WP 11 (465 m)	Probably widespread in uplands	SPEC 2	-	No
30	Emberizidae, <i>Emberiza melanocephala</i>	Black-headed Bunting	Recorded in several WPs	Widespread in farmland	SPEC 2	-	No
31	Emberizidae, <i>Miliaria calandra</i>	Corn Bunting	Recorded in many WPs	Widespread in farmland and grassland	SPEC 2	-	No

Notes: \*: during the pre-construction / post-construction Project period.

Source: ERM (Field Survey, June 2011)

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## 4 CONCLUSIONS

### 4.1 Key Habitats and Species within the Study Area

In consideration of the gathered data, the richest habitats identified along the TAP route in Greece are the riparian forests.

Many species previously recorded in the area were not observed during the field survey, including many raptors, woodpeckers and passerines. The most important species recorded in the area were the Montague's Harrier, followed by the Short-toed Eagle (*Circaetus gallicus*) and Levant Sparrowhawk (*Accipiter brevipes*). Other species of conservation interest, like the Lesser Kestrel and the pelicans, were seen in situations where they are not expected to be affected by Project activities. The most important survey find was the discovery of breeding Montague's Harriers west of the known breeding range of the species in Greece (refer to



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Table 4-1).

During the May 2012 complementary field trip, the greatest variety of birds was observed at the Axios River area. Amongst these, the Roller is classified as Vulnerable in Greece and as Near Threatened globally. The Black Stork is classified as Endangered and the White Stork as Vulnerable in Greece, while the Long-legged Buzzard is also classified as Vulnerable in Greece. Of these species the storks are unlikely to be affected much by the TAP construction and operation activities. The Roller is likely to be affected only if the pipeline passes on or very near its nesting site, which does not seem very likely based on the observations of the pair seen. The Long-legged Buzzard also does not seem to be nesting very near the routing, but it does hunt there and it may be affected indirectly if construction works affect the populations of European Sousliks (*Spermophilus citellus*), its main prey. At Mt Vermio, a pair of Short-toed Eagles was recorded in *Fagus* forest; this species is classified as Near Threatened in Greece. It could be affected by the TAP pipeline by disturbance during construction, or even by destruction of its nest by the forest clearance (unfortunately there was no indication of the location of the nest). No species of particular conservation interest were located in Giannitsa area. The same applies for the Eordea plain.

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**Table 4-1 Hotspots for Montague’s Harrier (*Circus pygargus*)**

<i>Waypoint</i>	<i>Name</i>	<i>Area</i>	<i>Habitat type</i>	<i>Shortest distance to pipeline centreline (m)</i>	<i>Site code (as shown on map)</i>
39	Agia Kyriaki	South of Agia Kyriaki	Farmland	130	165
46	As above	As above	As above	560	168
47	As above	As above	As above	535	169
48	As above	As above	As above	140	170
49	As above	As above	As above	260	171

Source: ERM (Field Survey, June 2011)

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**SUPPLEMENT I - Threatened bird species recorded in the wider study area**

No	Latin Name	Greek name	English name	Observed (direct or indirect observation)	Presence within area	Habitat preference	Greece Threat Status	IUCN Threat Status	Annex I 79/409 Birds Directive	Study Area Abundance	Protection under Greek Law	Bird Behaviour in the area
1	<i>Tadorna tadorna</i>	Βαρβάρα	Shelduck		Axios Delta	Coastal wetlands	VU	LC		c. 1,400 winter	Protected	R, W
2	<i>Aythya nyroca</i>	Βαλιόπαπια	Ferruginous Duck		L. Kastoria, L. Chimaditis	Wetlands	NT	VU	I	<50 pairs	Protected	SV
3	<i>Mergus merganser</i>	Χηνοπρίστης	Goosander		L. Kastoria	Wetlands	CR	LC		5-10 (max. 94)	Protected	W
4	<i>Coturnix coturnix</i>	Ορτύκι	Quail	x	Widespread	Farmland mainly	NE	LC		Common	Not protected	SV, MP
5	<i>Phalacrocorax pygmaeus</i>	Λαγγόνα	Pygmy Cormorant	x	L. Kastoria, Chimaditis, Petron, Axios D.	Wetlands	LC	LC	I	<10 p. br., >5,000 winter	Protected	R, W
6	<i>Pelecanus onocrotalus</i>	Ροδοπελεκάνος	White Pelican	x	L. Chimaditis	Wetlands	VU	LC	I	<180	Protected	MP
7	<i>Pelecanus crispus</i>	Αργυροπελεκάνος	Dalmatian Pelican	x	L. Kastoria, Chimaditis, Axios, D.	Wetlands	VU	VU	I	>200	Protected	W
8	<i>Nycticorax nycticorax</i>	Νυχτοκόρακας	Night Heron	x	L. Kastoria, Chimaditis, Axios D.	Wetlands	NT	LC	I	420-800 p.	Protected	R, SV
9	<i>Ardeo ralloides</i>	Κρυπτοτσικνιάς	Squacco Heron		L. Kastoria, Chimaditis, Axios D.	Wetlands	VU	LC	I	150-300 p.	Protected	SV, MP

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No	Latin Name	Greek name	English name	Observed (direct or indirect observation)	Presence within area	Habitat preference	Greece Threat Status	IUCN Threat Status	Annex I 79/409 Birds Directive	Study Area Abundance	Protection under Greek Law	Bird Behaviour in the area
10	<i>Ardea purpurea</i>	Πορφυροτσικνιάς	Purple Heron		L. Chimaditis	Wetlands	EN	LC	I	3-4 p.	Protected	SV
11	<i>Ciconia ciconia</i>	Λευκός Πελαργός	White Stork	x	widespreard	Wetlands, villages	VU	LC	I	?100s of p.	Protected	SV
12	<i>Ciconi nigra</i>	Μαύρος Πελαργός	Black Stork		x	Forests, rivers	EN	LC	I	Rare	Protected	SV
13	<i>Platalea leucorodia</i>	Χουλιανορύτα	Spoonbill		Axios D.	Wetlands	VU	LC	I	16-50 p.	Protected	R
14	<i>Plegadis falcinellus</i>	Χαλκόκοτα	Glossy Ibis		Axios D.	Wetlands	CR	LC	I	5-15 p.	Protected	SV
15	<i>Milvus migrans</i>	Τσίφτης	Black Kite		Widespread	Lowlands	CR	LC	I	Declining	Protected	MP
16	<i>Haliaeetus albicilla</i>	Θαλασσεατός	White-tailed Sea Eagle		Axios D.	Wetlands	CR	LC	I	1 p.	Protected	W
17	<i>Neophron percnopterus</i>	Ασπροπάρης	Egyptian Vulture		Widespread	Mainly mountains	CR	EN	I	Rare, declining	Protected	SV
18	<i>Gyps fulvus</i>	Όρνιο	Griffon Vulture		Old records	Mainly mountains	VU	LC	I	Unknown	Protected	MP
19	<i>Circaetus gallicus</i>	Φιδαετός	Short-toed Eagle	x	Widespread	Throughout the study area	NT	LC	I	Stable	Protected	SV

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20	<i>Circus aeruginosus</i>	Καλαμόκιρκος	Marsh Harrier		L. Kastoria, Chimaditis, Petron, Axios D.	Wetlands	VU	LC	I	?> 10 p.	Protected	R
21	<i>Circus pygargus</i>	Λιβαδόκιρκος	Montagu's Harrier	x	L. Chimadits, Florina, Kastoria, Kozani Pers.	Farmland mainly	CR	LC	I	?>20 p.	Protected	SV
22	<i>Accipiter brevipes</i>	Σαΐνι	Levant Sparrowhawk	x	Widespread	Throughout the study area	NE	LC	I	Common	Protected	SV
23	<i>Buteo rufinus</i>	Αετογερακίνα	Long-legged Buzzard		Widespread	Throughout the study area	VU	LC	I	?>20 pairs	Protected	R, SV
24	<i>Aquila pomarina</i>	Κραυγαετός	Lesser Spotted Eagle		L. Chimaditis	Forests, wetlands	EN	LC	I	? 1p.	Protected	SV
25	<i>Aquila clanga</i>	Στικταετός	Greater Spotted Eagle		Axios D.	Wetlands	EN	VU	I	> 5 winter	Protected	W
26	<i>Aquila heliaca</i>	Βασιλαετός	Imperial Eagle		Old records	Lowlands	CR	VU	I	Unknown	Protected	W
27	<i>Aquila chrysaetos</i>	Χρυσαιετός	Golden Eagle		Widespread	Mainly mountains	EN	LC	I	?<10 p.	Protected	R

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28	<i>Hieraetus pennatus</i>	Γερακαετός	Booted Eagle		General area	Forests	EN	LC	I	Rare	Protected	SV
29	<i>Falco naumanni</i>	Κιρκινέζι	Lesser Kestrel	x	L. Chimaditis	Farmland	VU	VU	I	8-15 p.	Protected	SV
30	<i>Falco tinnunculus</i>	Βραχοκιρκινέζο	Kestrel	x	Widespread	Throughout the study area	NE	LC		Common	Protected	R
31	<i>Falco biarmicus</i>	Χρυσογέρακο	Lanner Falcon		Mt Vourinos (probably elsewhere)	Throughout the study area	EN	LC	I	??1-5 p.	Protected	R
32	<i>Falco peregrinus</i>	Πετρίτης	Peregrine Falcon	x	Widespread	Throughout the study area	LC	LC	I	?10s of p.	Protected	R
33	<i>Tetrax tetrax</i>	Χαμωτίδα	Little Bustard		Axios D.	Lowlands	CR	NT	I	Unknown	Protected	W
34	<i>Recurvirostra avocetta</i>	Αβοκέττα	Avocet		Axios D.	Coastal wetlands	VU	LC	I	50-70 p.	Protected	r, W
35	<i>Glareola ptatincola</i>	Νεροχελίδονο	Collared Pratincole		Axios D.	Coastal wetlands	VU	LC	I	50-100 p.	Protected	SV
36	<i>Numenius tenuirostris</i>	Λεπτομύτα	Slender-billed Curlew		Axios D.	Coastal wetlands	CR	CR	I	Old records	Protected	MP

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37	<i>Chroicocephalus genei</i>	Λεππόραμφος Γλάρος	Slender-billed Gull		Aliakmonas D.	Coastal wetlands	VU	LC	I	100-130 p.	Protected	R, W
38	<i>Larus melanocephalus</i>	Μαυροκέφαλος Γλάρος	Mediterranean Gull		Axios D.	Coastal wetlands	EN	LC	I	800-1.400 p.	Protected	R, SV
39	<i>Sternula albifrons</i>	Νανογλάρονο	Little Tern		Axios D.	Coastal wetlands	NT	LC	I	70-130 p.	Protected	SV
40	<i>Chlidonia hybrida</i>	Μουστακογλάρονο	Whiskered Tern		L. Chimaditis	Wetlands	EN	LC	I	?<5 p.	Protected	SV, MP
41	<i>Chlidonias niger</i>	Μαυρογλάρονο	Black Tern		L. Chimaditis	Wetlands	EN	LC	I	?<5 p.	Protected	SV, MP
42	<i>Columba oenas</i>	Φασοπερίστερο	Stock Dove		Scattered	Throughout the study area	NT	LC		Rare	Protected	R, W
43	<i>Otus scops</i>	Γκιώνης	Scops Owl		Widespread	Throughout the study area	NE	LC		Common	Protected	SV
44	<i>Bubo bubo</i>	Μπούφος	Eagle Owl		Scattered	Throughout the study area	LC	LC	I	Stable	Protected	R
45	<i>Athene noctua</i>	Κουκουβάγια	Little Owl		Widespread	Farmland mainly	NE	LC		Common	Protected	R

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46	<i>Merops apiaster</i>	Μελισσοφάγος	Bee-eater	x	Widespread	Lowlands	NE	LC		Common	Protected	SV
47	<i>Coracias garrulus</i>	Χαλκοκουρούνα	Roller		Scattered	Lowlands	VU	NT	I	Declining	Protected	SV
48	<i>Picus canus</i>	Σταχτής Δρυοκολάπτης	Grey-headed Woodpecker		Scattered	Forests	NT	LC	I	Rare	Protected	R
49	<i>Dendrocopos leucotos</i>	Λευκονώτης Δρυοκολάπτης	White-backed Woodpecker		Scattered	Forests	NT	LC	I	Rare	Protected	R
50	<i>Calandrella brachydactyla</i>	Μικρογαλιάντρα	Short-toed Lark		Axios D.	Lowlands	NE	LC	I	Unknown	Protected	SV
51	<i>Galerida cristata</i>	Κατσουλιέρης	Crested Lark	x	Widespread	Open country	NE	LC		Common	Protected	R
52	<i>Alauda arvensis</i>	Σταρήθρα	Skylark	x	Widespread	Open country	NT	LC		Common	Not protected	R, W
53	<i>Hirundo rustica</i>	Σταυλοχελίδονο	Swallow	x	Widespread	Farmland mainly	NE	LC		Common	Protected	SV
54	<i>Delichon urbicum</i>	Λευκοχελίδονο	House Martin	x	Widespread	Mainly farmland and urban	NE	LC		Common	Protected	SV
55	<i>Anthus campestris</i>	Ωχροκελάδα	Tawny Pipit		Widespread	Open country	LC	LC	I	Common	Protected	SV
56	<i>Oenanthe oenanthe</i>	Σταχτοπετρόκλις	Wheatear	x	Widespread	Mainly mountains	NE	LC		Common	Protected	SV

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57	<i>Oenanthe hispanica</i>	Ασπροκωλίνα	Blac-eared Wheatear		Widespread	Open dry country	NE	LC		Common	Protected	SV
58	<i>Monticola saxatilis</i>	Πυρροκότσουφας	Rock Thrush		Widespread	Mountains	NE	LC		Common	Protected	SV
59	<i>Lanius collurio</i>	Αετομάχος	Red-backed Shrike	x	Widespread	Throughout the study area	NE	LC	I	Common	Protected	SV
60	<i>Lanius minor</i>	Σταχτοκεφαλάς	Lesser Grey Shrike	x	Mt. Vourinos (probably elsewhere)	Lowlands	NT	LC		Unknown, but generally declining	Protected	SV
61	<i>Lanius excubitor</i>	Διπλοκεφαλάς	Great Grey Shrike		Scattered	Lowlands	DD	LC		Rare	Protected	W
62	<i>Lanius senator</i>	Κοκκινοκεφαλάς	Woodchat Shrike	x	Widespread	Mainly scrub	NE	LC		Common	Protected	SV
63	<i>Sturnus vulgaris</i>	Ψαρόνι	Starling	x	Widespread	Farmland mainly	NE	LC		Common	Not protected	R, W
64	<i>Passer domesticus</i>	Σπιτοσπουργίτης	House Sparrow	x	Widespread	Urban areas, farmland	NE	LC		Common	Not protected	R
65	<i>Emberiza cia</i>	Βουνοσίχλονο	Rock Bunting	x	Widespread	Mountains	NE	LC		Common	Protected	R
66	<i>Emberiza hortulana</i>	Βλαχοσίχλονο	Ortolan Bunting	x	Widespread	Mainly mountains	LC	LC	I	Common	Protected	SV

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67	<i>Emberiza melanocephala</i>	Αμπελουργός	Black-headed Bunting	x	Widespread	Farmland	NE	LC		Common	Protected	SV
68	<i>Emberiza calandra</i>	Τσιφτάς	Corn Bunting	x	Widespread	Farmland mainly	NE	LC		Common	Protected	R

Notes: VU: Vulnerable, LC: Least Concern, NT: Near Threatened, CR: Critical Endangered, R: Resident and Breeder, W: Wintering, but does not breed, SV: Summer visitor and breeder, MP: Migration passage, EN: Endangered, NE: Not Evaluated.

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