THE ROAD INFRASTRUCTURE AGENCY

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REPORT
on the
Impact Assessment of Investment Proposal for

IMPROVING THE ROAD BED OF LOT 3.2
OF STRUMA
MOTORWAY

On the subject-matter and the objectives for protection of protected zones BG0000366 'Kresna-Ilindentsi', for the protection of natural habitats and wild fauna and flora and BG0002003 'Kresna' for the protection of wild birds

PART TWO

Sofia
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List of Contents

List of abbreviations

Abbreviation	Significance
MoEW	Ministry of Environment and Water
MH	Ministry of Health
MRDPW	Ministry of Regional Development and Public Works
RIEW	Regional Inspectorate of Environment and Water
EEA	Executive Agency for the Environment
NCSIP	The National Company 'Strategic Infrastructure Projects',
RIA	The “Road Infrastructure” Agency
EEC	European Economic Community
The EU	The European Union
EC	The European Commission
NSI	The National Statistical Institute
BSPB	Bulgarian Society for the Protection of Birds
BD	Basin Directorate
NGO	Non-governmental organization
EPA	Environmental Protection Act
BDA	Biodiversity Act
WA	The Water Act
PTA	the Protected Territories Act
WMA	The Waste Management Act
EIA	Environmental Impact Assessment (EIA)
REIA	Environmental Impact Assessment Report
CA	Compatibility Assessment
IRAR	Impact Rate Assessment Report
SG	State Gazette
DCM	Decree of the Council of Ministers
SG	State Gazette
BSS (BDS)	The Bulgarian State Standard
ETEC	Expert Technical and Economic Council
TC	Technical Council
TP	Technical project
DPDP	Detailed (property) development plan
PRC	Plan for regulation and construction
M (MW)	Motorway/Highway
MV	Motor vehicle
RV	Road vehicle
AgR	An agricultural road
RW	Railway / Rail
BCP	Border Checkpoint
CAW	Construction and assembly works
RDS	Road design standards
IP	Investment proposal
RBMP	River Basin Management Plans
HMS	Hydrometric station
UWB	Underground water body
NEMS	National Environmental Monitoring System
SPZ	Sanitary protection zone
SF	State Forestry

Forest	Forest management project
NtP	National Park
NP	Nature Park
RB	Red Book of Bulgaria
PZ	Protected zone
PA	Protected area
FNCS	Favourable Nature Conservation Status
NL	Natural Landmark
LV	Limit values
ICE	Internal combustion engines
TSD	Total suspended dust
FDP	Fine dust particles
VOCs	Volatile Organic Compounds
PAH / PAHs	Polycyclic aromatic hydrocarbons
AARPHH	The average annual rate of protection for human health

5. Description and analysis of the impact of the investment proposal on the subject and objectives of protection of protected areas.

5.1. Description and analysis of the impact of the investment proposal on types of natural habitats and species subject to conservation in protected areas.

- BG 0002003 Protected zone for birds 'Kresna'

86 species of birds have been found in the IP area during field studies (Table V.1.2-1), 21 of which are subject to conservation in the Protected Zone.

Table V.1.2-1: Species of birds that have been observed in the different options of the IP area during field studies and their conservations status. RBB – Red Book of Bulgaria (Golemanski, 2011): EN - Endangered; VU - Vulnerable; CR - critically endangered. BDA - application number from the BDA.

No	*Species*	The	BDA		No	*Species*	The	BDA
1.	*Tachybaptus ruficollis*	VU	3		44	*Parus caeruleus*		3
2	*Phalacrocorax carbo*				45	*Parus major*		3
3	*Ardea cinerea*	VU	3		46	*Alauda arvensis*		3
4	*Ardea purpurea*	VU	2, 3		47	*Galerida cristata*		3
5	*Egretta alba*	CR	2, 3		48	*Hirundo rustica*		3
6	*Egretta garzetta*	VU	2, 3		49	*Hirundo daurica*		3
7	*Ciconia ciconia*	VU	2, 3		50	*Ptyonoprogne rupestris*		3
8	*Gyps fulvus*	VU	2, 3		51	*Delichon urbicum*		3
9	*Pernis apivorus*	VU	2, 3		52	*Acrocephalus arundinaceus*		3
10	*Buteo buteo*		3		53	*Hippolais pallida*		3
11	*Aquila chrysaetos*	VU	2, 3		54	*Phylloscopus collybita*		3
12	*Circus aeruginosus*	VU	2, 3		55	*Sylvia atricapilla*		3
13	*Accipiter brevipes*	VU	2, 3		56	*Sylvia communis*		3
14	*Accipiter gentilis*	VU	3		57	*Sylvia curruca*		3
15	*Accipiter nisus*	VU	3		58	*Sitta neumayer*	VU	3
16	*Circaetus gallicus*	VU	2, 3		59	*Troglodytes troglodytes*		3
17	*Pandion haliaetus*	CR	2, 3		60	*Cinclus cinclus*		3
18	*Falco subbuteo*	VU	3		61	*Turdus merula*		3
19	*Falco tinnunculus*		3		62	*Muscicapa striata*		3
20	*Actitis hypoleucos*		3		63	*Erithacus rubecula*		3
21	*Anas platyrhynchos*				64	*Luscinia megarhynchos*		3
22	*Perdix perdix*				65	*Phoenicurus ochruros*		3
23	*Gallinula chloropus*		3		66	*Saxicola rubetra*		3
24	*Columba palumbus*				67	*Oenanthe sp.*		3
25	*Streptopelia decaocto*				68	*Sturnus vulgaris*		
25	*Streptopelia turtur*				69	*Passer domesticus*		
27	*Cuculus canorus*		3		70	*Passer hispaniolensis*		3
28	*Merops apiaster*				71	*Passer montanus*		3
29	*Alcedo atthis*		2, 3		72	*Anthus trivialis*		3
30	*Upupa epops*		3		73	*Motacilla alba*		3
31	*Dendrocopos syriacus*		2, 3		74	*Motacilla cinerea*		3

No	*Species*	The	BDA	No	*Species*	The	BDA
32	*Picus viridis*		3	75	*Motacilla flava*		3
33	*Oriolus oriolus*		3	76	*Fringilla coelebs*		3
34	*Lanius collurio*		2, 3	77	*Coccothraustes coccothraustes*		3
35	*Lanius minor*		2, 3	78	*Chloris chloris*		3
36	*Lanius senator*		3	79	*Acanthis cannabina*		3
37	*Garrulus glandarius*			80	*Carduelis carduelis*		3
38	*Pica pica*			81	*Emberiza calandra*		3
39	*Corvus corax*		3	82	*Emberiza cia*		3
40	*Corvus cornix*			83	*Emberiza cirlus*		3
41	*Corvus monedula*			84	*Emberiza citrinella*		3
42	*Parus ater*		3	85	*Emberiza hortulana*		2, 3
43	*Parus lugubris*		3	86	*Emberiza melanocephala*		3

Ardea cinerea * - a species subject to conservation in the PZ

Within the ranges of the different options are comprised 10 of the 11 types of land cover, as described in the standard form of the zone (all without N19 - Mixed forests), plus one, which has not been described - N20 - Artificial forest plantations, including plantations of Acacia (Table V.1.2-2, Appendix. 7.3).

Table V.1.2-2: Types of land covering in the PZ and area of each zone, falling within the ranges of the individual options (in ha).

No.	Code	Area PZ	Red G20	Blue G20	Long tunnel	Eastern G10.5	Eastern G20
1.	N06	2349.559	12.734	13.123	21.000	3.099	2.613
2	N08	86933.666	69.095	63.546	18.799	83.520	243.694
3	N09	21146.027	97.316	94.045	156.438	117.821	357.941
4	N12	28194.702	19.022	15.646	39.319	19.897	19.017
5	N15	4699.117	40.884	3.588	0.000	27.387	0.000
6	N16	44641.612	133.216	166.899	17.726	160.019	467,254
7	N17	14097.351	26.164	37.241	0.000	77.066	237.728
8	N19	23495.585	0.000	0.000	0.000	0.000	0.000
9	N20	No	57.098	44.036	1.083	4.598	4.460
10	N21	4699.117	4.748	5.019	12.531	8.514	24.628
11	N22	1174.779	1.133	0.815	0.000	0.000	0.000
12	N23	4699.117	186.713	167,988	9.946	17.094	39.499

Impacts from the implementation of the investment proposal on wild birds included in Article 4 of the Birds Directive 2009/147 / EC in PZ BG0002003 "Kresna"

1. Dalmatian Pelican (*Pelecanus crispus*)

Species Biology: Nesting and migratory, passing and partly wintering species. From Mid-20th century. it nests only in the Srebarna Lake. During the migration and during the winter it is common along the Black Sea coast and, more rarely, in the interior of the country. It inhabits freshwater lakes and marshes, dams and micro-reservoirs, fish farms and fish ponds. During migrations and wintering, it is common mainly along the coastal brackish water reservoirs and frost-free reservoirs inside the country. The species nests in lakes and marshes with vast and difficult to reach reed beds, usually from

early February. When searching for food, adult birds move away some 20-30 km of nesting colonies. The small ones start flying in July-August. It feeds exclusively on fish (Golemanski 2011).

Assessment of the species in the Protected Zone:

According to the standard form of the protected zone, 10 - 30 representatives of the species pass through the zone during migration.

Assessment of the species on territory of the Investment Proposal

The species has not been found in the IP area during field studies. The area does not provide suitable habitats for the species - larger water bodies, in which individuals can land for rest / feeding during migration (the Struma River in the area of the gorge is too narrow, shallow and fast). The species can fly over the gorge, but it flies at high altitudes (personal observations).

Impacts:

Option G20 - Red

Direct destruction of habitats

The road route under this option does not affect habitats of the species. No impact (Rate 0).

Fragmentation of habitats

The road route under this option does not affect habitats of the species. No impact (Rate 0).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. Additionally, the species occurs in the zone during migration by flying sufficiently high. No impact (Rate 0).

Disturbance

The road route under this option does not pass near habitats of the species. Additionally, the species occurs in the zone during migration by flying sufficiently high. No impact (Rate 0).

Mortality

The road route under this option does not pass near habitats of the species. Additionally, the species occurs in the zone during migration by flying sufficiently high. No impact (Rate 0).

Option G20 - Blue

Direct destruction of habitats

The road route under this option does not affect habitats of the species. No impact (Rate 0).

Fragmentation of habitats

The road route under this option does not affect habitats of the species. No impact (Rate 0).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. Additionally, the species occurs in the zone during migration by flying sufficiently high. No impact (Rate 0).

Disturbance

The road route under this option does not pass near habitats of the species. Additionally, the species occurs in the zone during migration by flying sufficiently high. No impact (Rate 0).

Mortality

The road route under this option does not pass near habitats of the species. Additionally, the species occurs in the zone during migration by flying sufficiently high. No impact (Rate 0).

Eastern Option G10.50

Direct destruction of habitats

The road route under this option does not affect habitats of the species. No impact (Rate 0).

Fragmentation of habitats

The road route under this option does not affect habitats of the species. No impact (Rate 0).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. Additionally, the species occurs in the zone during migration by flying sufficiently high. No impact (Rate 0).

Disturbance

The road route under this option does not pass near habitats of the species. Additionally, the species occurs in the zone during migration by flying sufficiently high. No impact (Rate 0).

Mortality

The road route under this option does not pass near habitats of the species. Additionally, the species occurs in the zone during migration by flying sufficiently high. No impact (Rate 0).

Long Tunnel Option, 'Kresna' tunnel

Direct destruction of habitats

The road route under this option does not affect habitats of the species. No impact (Rate 0).

Fragmentation of habitats

The road route under this option does not affect habitats of the species. No impact (Rate 0).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. Additionally, the species occurs in the zone during migration by flying sufficiently high. No impact (Rate 0).

Disturbance

The road route under this option does not pass near habitats of the species. Additionally, the species occurs in the zone during migration by flying sufficiently high. No impact (Rate 0).

Mortality

The road route under this option does not pass near habitats of the species. Additionally, the species occurs in the zone during migration by flying sufficiently high. No impact (Rate 0).

Eastern Option G20

Direct destruction of habitats

The road route under this option does not affect habitats of the species. No impact (Rate 0).

Fragmentation of habitats

The road route under this option does not affect habitats of the species. No impact (Rate 0).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. Additionally, the species occurs in the zone during migration by flying sufficiently high. No impact (Rate 0).

Disturbance

The road route under this option does not pass near habitats of the species. Additionally, the species occurs in the zone during migration by flying sufficiently high. No impact (Rate 0).

Mortality

The road route under this option does not pass near habitats of the species. Additionally, the species occurs in the zone during migration by flying sufficiently high. No impact (Rate 0).

2. The Gray Heron (*Ardea cinerea*)

Species Biology: Nesting and migratory, passing and wintering species.

The breeding season is from the beginning of March to the end of July. It nests in isolated or mixed colonies of herons, brilliant ibises, spurts and small cormorants. The nests are located in reedbeds of trees (white willow, white and hybrid poplar, oak, ash, lime, beech) and rarely rocks in and around freshwater lakes and marshes, floodplains, dams and reservoirs, fishponds and fish farms, the larger rivers. It feeds on fish, amphibians, reptiles, mouse-rodents. It looks for its food also during migrations and wintering, in coastal watersheds, lakes, marshes, dams and reservoirs, fish farms and fish ponds, rivers, as well as in the fields, rice fields, irrigation channels, mainly in the lower parts of the country. The migration is from February to April and in September - October (Golemanski 2011, Simeonov et al.; 1990, personal observations).

Assessment of the species in the Protected Zone:

According to the standard form of the protected zone, 2 representatives of the species pass through the zone during migration. This number is strongly underestimated. In the field studies, the species has been found repeatedly, also during the breeding season, including groups of several species representatives. In our opinion the zone is inhabited all year round, even without nesting, as in the periods of passage the number increases. The potential habitats of the species in the area are the larger rivers and ponds (habitat N06 from the Standard Zone Form), with a total area of 2,349.559 decares. Arable areas are not suitable for this species, due to their small size and their xerophilic nature.

Assessment of the species on territory of the Investment Proposal

The species has been encountered many times in the Kresna region and south of it, as well as in the northern part of the gorge. As potential habitats of the species in the region of the IP should be considered the Struma River and downstream of Vlachinska River, as well as the microorganisms in the region of the eastern options (N06).

Impacts:

Option G20 - Red

Direct destruction of habitats

During construction, 12.734 decares will be affected, or 0.54% of the trophical habitats of the species in the zone (habitat N06 - on Struma River and the Vlahinska River). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1). During the operation of the highway, the affected areas outside the pillars and bridge facilities will recover as habitats of the species, and the permanently affected area will be even smaller.

Fragmentation of habitats

During the construction of bridge facilities, temporary fragmentation of habitats is expected, yet their recovery will occur promptly after completion of construction works. Given the large length and area of the fragments formed and the temporary nature of the impact, we could assume that the impact would be insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species does not nest in the area but outside the breeding site, the individual representatives of the species tolerate the presence of vehicles (personal observations), but not of people. The so called

disturbance is expected during bridge construction, but given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. The species does not nest in the area, so there will be no endangered small birds or eggs. During operation, however, it is possible to kill individual representatives of the species in vehicle collisions (personal observations). Since the migratory population in the area depends on species populations in other parts of the species scope, no changes in the number of species population is expected, so the impact is considered insignificant (Rate 1).

Option G20 - Blue

Direct destruction of habitats

During construction, 13.123 decares will be affected, or 0.56% of the habitats of the species in the zone (habitat N06 - on Struma River and the Vlahinska River). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1). During the operation of the highway, the affected areas outside the pillars and bridge facilities will recover as habitats of the species, and the permanently affected area will be even smaller.

Fragmentation of habitats

During the construction of bridge facilities, temporary fragmentation of habitats is expected, yet their recovery will occur promptly after completion of construction works. Given the large length and area of the fragments formed and the temporary nature of the impact, we could assume that the impact would be insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact
(0).

Disturbance

The species does not nest in the area but outside the breeding site, the individual representatives of the species
tolerate the presence of vehicles (personal observations), but not of people. Therefore some disturbance may be expected during bridge construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. The species does not nest in the area, so there will be no endangered small birds or eggs. During the operation of the motorway, mortality of representatives of the species is possible in vehicle crashes. Since the migratory population in the area depends on species populations in other parts of the species scope, no changes in the number of species population is expected, so the impact is considered insignificant (Rate 1).

Eastern Option G10.50

Direct destruction of habitats

During construction, 3.099 decares will be affected, or 0.13% of the trophical habitats of the species in the zone (habitat N06 - on the Struma River and the Vlahinska River, as well as 3 small artificial ponds in the region of Mechkul village and Oshtava village). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1). During the operation of the highway, the affected areas outside the pillars and the supports of bridge facilities

of the Struma River and Vlahinska River will recover as habitats of the species, and the permanently affected area will be even smaller.

Fragmentation of habitats

During the construction of bridge facilities, temporary fragmentation of habitats is expected, yet their recovery will occur promptly after completion of construction works. Given the large length and area of the fragments formed and the temporary nature of the impact, we could assume that the impact would be insignificant (Rate 1). Two of the artificial ponds shall be partially affected yet, as a result, their entire area is likely to be destroyed. The affected area will thus increase by 1.187 decares, or together with the directly affected area it would amount to 4.286 decares or 0.18% of the trophical habitats of the species in the zone. The impact on the species will be insignificant - Rate 1.

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species does not nest in the area but outside the breeding site, the individual representatives of the species tolerate the presence of vehicles (personal observations), but not of people. Therefore some disturbance may be expected during bridge construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. The species does not nest in the area, so there will be no endangered small birds or eggs. During the operation of the motorway, mortality of representatives of the species is possible in vehicle crashes. Since the migratory population in the area depends on species populations in other parts of the species scope, no changes in the number of species population is expected, so the impact is considered insignificant (Rate 1).

Long Tunnel Option, 'Kresna' tunnel

Direct destruction of habitats

21 decares will be affected during construction, or 0.89% of the trophical habitats of the species in the zone (habitat N06 - on the Struma River). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1). During the operation of the highway, the affected areas outside the pillars and bridge facilities will recover as habitats of the species, and the permanently affected area will be even smaller.

Fragmentation of habitats

During the construction of bridge facilities, temporary fragmentation of habitats is expected, yet their recovery will occur promptly after completion of construction works. Given the large length and area of the fragments formed and the temporary nature of the impact, we could assume that the impact would be insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species does not nest in the area but outside the breeding site, the individual representatives of the species tolerate the presence of vehicles (personal observations), but not of people. The so called

disturbance is expected during bridge construction, but given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. The species does not nest in the area, so there will be no endangered small birds or eggs. During the operation of the motorway, mortality of representatives of the species is possible in vehicle crashes. Since the migratory population in the area depends on species populations in other parts of the species scope, no changes in the number of species population is expected, so the impact is considered insignificant (Rate 1).

Eastern Option G20

Direct destruction of habitats

During construction 2,613 decares will be affected, or 0.11% of the habitats of the species in the area (habitat N06 - 4 small artificial ponds in the region of Mechkul and Oshtava). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

One of the artificial ponds shall be partially affected, yet, as a result, their entire area is likely to be destroyed. The affected area will thus increase by 0.1 decares, or together with the directly affected area it would amount to 2.713 decares, or 0.12% of the trophical species habitats in the zone. The impact on the species will be insignificant - Rate 1.

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species does not nest in the area but outside the breeding site, the individual representatives of the species tolerate the presence of vehicles (personal observations), but not of people. Therefore some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. The species does not nest in the area, so there will be no endangered small birds or eggs. The mortality of species representatives from vehicle crashes is low, as the area under this option does not offer larger water bodies, where large number of representatives is expected. Moreover, since the migratory population in the area depends on species populations in other parts of the species scope, no changes in the number of species population is expected, so the impact is considered insignificant (Rate 1).

3. The White Stork (*Ciconia ciconia*)

Species Biology: Nesting - migratory and passing species. The white stork is synantropic species - nesting in residential areas (excluding the central parts of larger cities) on electric poles, chimneys, church bells, larger trees. During reproduction and migration, it feeds on wetlands of natural and artificial origin, meadows, swamps, wet lands, arable fields (lucerne fields, rice fields, broken ground), along canals. It feeds on frogs and their larvae, lizards, snakes, fish, water insects, locusts, larvae, worms, rodents, young birds. Reproduction is from early April to late July - early August. It migrates

from the beginning of March to the middle of April and from the beginning of August until the end of September (Jonsson 2006, Simeonov et al. 1990, Simeonov and Michev 1991, personal notes).

Assessment of the species in the Protected Zone:

According to the standard form for the Protected Zone, 5 couples nest in the zone. The species is synantropic and nests exclusively in residential areas. Also present during migrations. The potential trophical habitats of the species in the zone are wider grassland, bushes and arable land (habitats N09 and N12 from the Zone Standard Form), with a total area of 49,340.729 decares.

Assessment of the species on territory of the Investment Proposal

The species was observed during the field studies as nesting in the village of Cherniche (one nest) and Strumyani (two nests), and in the Kresna region during the bird passage. As a potential trophical habitats of the species in the region of the investment proposal, the broader grasslands and arable land in the southern, wider part of the Kresna Gorge and South of it, as well as in the eastern options (N09 and N12) . No nesting habitats will be affected.

Impacts:

Option G20 - Red

Direct destruction of habitats

68.508 decares will be affected during the construction or 0.14% of the trophic habitats of the species in the area (habitats N09 and N12, including the more extensive herbaceous sites and arable land around the road crossing for the Oshtava village, in the crossing of the Struma River, North of Kresna and the Melo area). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects small, peripheral parts of large polygons with potential trophic habitats of the species. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species is a distinctly synantropic type and is practically insensitive to human presence. No impact is expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. No breeding/nesting habitats would be affected, the small birds leave the nest as relatively good flyers. During the operation of the motorway, mortality of representatives of the species is possible in vehicle crashes when taking off or landing in the feeding areas, when they are in the vicinity of the road and on one level with the road (personal observations), yet the probability is small, given the short sections, in which the species habitats are affected. The impact on the population in the zone will be insignificant (Rate 1).

Option G20 - Blue

Direct destruction of habitats

59.121 decares will be affected or 0.12% of the trophical habitats of the species in the area (habitats N09 and N12 - more extensive grassy places and arable land around the road junction in the village of Oshtava, at the intersection of the Struma River, North of Kresna and the Melo area). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects small, peripheral parts of large polygons with potential trophic habitats of the species. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species is a distinctly synantropic type and is practically insensitive to human presence. No impact is expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. No breeding/nesting habitats would be affected, the small birds leave the nest as relatively good flyers. During the operation of the motorway, mortality of representatives of the species is possible in vehicle crashes when taking off or landing in the feeding areas, when they are in the vicinity of the road and on one level with the road (personal observations), yet the probability is small, given the short sections, in which the species habitats are affected. The impact on the population in the zone will be insignificant (Rate 1).

Eastern Option G10.50

Direct destruction of habitats

136.509 decares will be affected during the construction or 0.28% of the trophic habitats of the species in the area (habitats N09 and N12, including the more extensive herbaceous sites and arable land around the crossing of the Struma River, North of Kresna and the Melo area). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects small parts of large polygons with potential trophical habitats of the species. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species is a distinctly synantropic type and is practically insensitive to human presence. No impact is expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. No breeding/nesting habitats would be affected, the small birds leave the nest as relatively good flyers. During the operation of the motorway, mortality of representatives of the species is possible in vehicle crashes when taking off or landing in the feeding areas, when they are in the vicinity of the road and on one level with the road (personal observations), yet the probability is small, given the short sections, in which the species habitats are affected under such circumstances. The impact on the population in the zone will be insignificant (Rate 1).

Long Tunnel Option, 'Kresna' tunnel

Direct destruction of habitats

190.240 decares will be affected during the construction or 0.39% of the trophic habitats of the species in the zone (habitats N09 and N12 - the more extensive grassy sites and arable lands around the southern tunnel portal and the Struma River, after it, as well as one of the landfills around it and the site of Intermediate Access No.7). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons with potential trophic habitats of the species. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species is a distinctly synantropic type and is practically insensitive to human presence. No impact is expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. No breeding/nesting habitats would be affected, the small birds leave the nest as relatively good flyers. During the operation of the motorway, mortality of representatives of the species is possible in vehicle crashes when taking off or landing in the feeding areas, when they are in the vicinity of the road and on one level with the road (personal observations), yet the probability is small, given the short sections, in which the species habitats are affected. The impact on the population in the zone will be insignificant (Rate 1).

Eastern Option G20

Direct destruction of habitats

During construction, 376.958 decares will be affected, or 0.76% of the trophical habitats of the species in the zone (habitat N09 and N12). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects small parts of large polygons with potential trophical habitats of the species. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species is a distinctly synantropic type and is practically insensitive to human presence. No impact is expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. No breeding/nesting habitats would be affected, the small birds leave the nest as relatively good flyers. During the operation of the motorway, mortality of representatives of the species is possible in vehicle crashes when taking off or landing in the feeding areas, when they are in the vicinity of the road and on one level with the road (personal observations), yet the probability is small, given the short sections, in which the species habitats are affected under such circumstances. The impact on the population in the zone will be insignificant (Rate 1).

4. The Black Stork (*Ciconia nigra*)

Species Biology: Nesting and migratory, passing and partly wintering species. Two types of nests are known - trees in forests and rocks in plains and up to 800 m above sea level in mountains, rarely up to 1,300 m above sea level. The eggs are laid in May. The little ones hatch at the end of May and the beginning of June. They leave the nests from the second half of July to the beginning of August. Autumn migration is from the second half of August to the end of October. Spring migration is from early March to early April. During breeding, it feeds around dams, reservoirs, fishponds, rice fields, swamps, damp grasslands, rivers. During the migration - it also feeds in drier grassy places and in arable land (Golemanski 2011, Simeonov et al. 1990, personal observations).

Assessment of the species in the Protected Zone:

According to the standard form for the Protected Zone, 4 couples nest in the zone. Also present during migrations. Potential breeding habitats of the species in the area are broad-leaved forests and rocks (habitats N16 and N22 of the Standard Zone Form) with a total area of 45,816.392 dca. The potential trophical habitats are grassland, bushes and arable land (habitats N06, N09 and N12 from the Zone Standard Form), with a total area of 51,690.288 decares.

Assessment of the species on territory of the Investment Proposal

The species has not been observed during field studies. Deciduous forests and rocks should be considered as potential nesting habitats of the species on the territory of the IP (N16 and N22), although large portion of the forests in the area of the eastern options have shrubby habitus and are not suitable for nesting, and those in the area of the gorge near the existing road are unfit, as the species is sensitive to disturbance in the area of the nest.

As potential trophical habitats of the species in the region of the IP should be considered the Struma River, as well as the open areas of its triutaries, in the region of the Eastern Options (N06) and in the migration period, the grasslands and arable land areas further away from settlements (N09 and N12).

Impacts:

Option G20 - Red

Direct destruction of habitats

Potential breeding habitats within the scope of this option are virtually unfit for the species, as it is highly sensitive to disturbance in the breeding area; such disturbance is also caused at the moment by the traffic of the first-class road and by the presence of people in the farmlands alongside the Kresna bypass.

129.072 decares will be affected during construction, or 0.25% of the trophical habitats of the species in the zone (habitat N06 - on Struma River and the Vlahinska and habitats N09 and N12). Given the small area affected, the impact has been assessed as insignificant (Rate 1), which is practically even smaller, since the polygons near the existing road are unlikely to be used. During the operation of the highway, the affected areas outside the pillars and bridge supports, will recover their functionality as habitats of the species, and the permanently affected area will be even smaller.

Fragmentation of habitats

Temporary fragmentation of habitats is expected during the construction of bridge facilities (habitat N06 - on the Struma river and the Vlachinska River), yet their recovery as species habitats will occur promptly upon completion of construction activities. Given the large length and area of the fragments formed and the temporary nature of the impact, we could assume that the impact would be insignificant (Rate 1). The road route under this option mainly affects peripheral parts of large polygons of the species habitats. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species is highly sensitive to disturbance in the nesting habitats, therefore those, comprised within the scope of this option are virtually inappropriate for the species, due to the existing traffic on the first-class road and the presence of people in the agricultural lands along the Kresna bypass.

Some disturbance may be expected during construction outside the nesting areas, yet given its temporary nature and the restricted territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the highway, the impact on individual representatives of the species, feeding in the region of the investment Proposal region will not be different from the current, so the impact is considered insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. No breeding/nesting habitats would be affected, the small birds leave the nest as relatively good flyers. No mortality is expected during the operation of the highway, as the species is cautious enough to avoid moving vehicles. There will be no impact (rate 0).

Option G20 - Blue

Direct destruction of habitats

Potential breeding habitats within the scope of this option are virtually unfit for the species, as it is highly sensitive to disturbance in the breeding area; such disturbance is also caused at the moment by the traffic of the first-class road and by the presence of people in the farmlands alongside the Kresna bypass.

122.814 decares will be affected during construction, or 0.24% of the trophical habitats of the species in the zone (habitat N06 - on Struma River and the Vlahinska and habitats N09 and N12). Given the small area affected, the impact has been assessed as insignificant (Rate 1), which is practically even smaller, since the polygons near the existing road and near Kresna are unlikely to be used. During operation, the affected areas of the bridges, outside the pillars and

their supports, will recover as habitats of the species, and the permanently affected area will be even smaller.

Fragmentation of habitats

Temporary fragmentation of habitats is expected during the construction of bridge facilities (habitat N06 - on the Struma river and the Vlachinska River), yet their recovery as species habitats will occur promptly upon completion of construction activities. Given the large length and area of the fragments formed and the temporary nature of the impact, we could assume that the impact would be insignificant (Rate 1). The road route under this option mainly affects peripheral parts of large polygons of the species habitats. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species is highly sensitive to disturbance in the nesting habitats, therefore those, comprised within the scope of this option are virtually inappropriate for the species, due to the existing traffic on the first-class road and the presence of people in the agricultural lands along the Kresna bypass.

Some disturbance may be expected during construction outside the nesting areas, yet given its temporary nature and the restricted territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the highway, the impact on individual representatives of the species, feeding in the region of the investment Proposal region will not be different from the current, so the impact is considered insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. No breeding/nesting habitats would be affected, the small birds leave the nest as relatively good flyers. No mortality is expected during the operation of the highway, as the species is cautious enough to avoid moving vehicles. There will be no impact (rate 0).

Eastern Option G10.50

Direct destruction of habitats

160.019 acres will be affected during construction or 0.35% of the potential breeding habitats of the species in the area (habitats N16), although a large part of the forests in the area have a shrubby habitus and are not suitable for breeding. Given the small area affected and its sub-optimal nature, the impact has been estimated as insignificant (Rate 1).

140.817 decares will be affected during construction, or 0.27% of the trophical habitats of the species in the zone (habitat N06 - on Struma River and the more exposed parts of its tributaries, as well as the micro water bodies in the area and the habitats N09 and N12). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1). During the operation of the highway, the affected areas outside the pillars and bridge supports, will recover their functionality as habitats of the species, and the permanently affected area will be even smaller.

Fragmentation of habitats

The road route in this option affects relatively small portions of large polygons of the N16 habitat. In the majority of cases, the remaining intact part of these polygons will have sufficient area to perform its function of nesting habitat of the species, even more so that it is microhabitately conditioned - the nests are

made on bigger trees. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Temporary fragmentation of habitats is expected during the construction of bridge facilities (habitat N06 - on the Struma River and the more open parts of its tributaries, but their recovery will take place soon after the completion of the construction works. Given the large length and area of the fragments formed and the temporary nature of the impact, we could assume that the impact would be insignificant (Rate 1). The road route in this option mainly affects small parts of large polygons of the species habitats N09 and N12. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species is highly sensitive to disturbance in the nesting habitats, when construction activities commence, the impact during construction might be significant (Rate 3), as parents may abandon their nests with eggs or poorly flying small ones, located in the vicinity at a distance of up to 300 m from the construction site. Mitigation measures are needed. During the operation of the highway, the breeding/nesting habitats in the area of this option will be practically unfit. Given the relatively low rate of traffic, expected through the species habitats (no more than 7,000 vehicles per day by 2040 on the left roadway) and the relatively small area of affected habitats, combined with their suboptimal nature, the impact has been estimated to be insignificant.

Some disturbance may be expected during construction outside the nesting areas, yet given its temporary nature and the restricted territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the highway, it is possible that the trophical habitats in the vicinity of the road may become unsuitable for the species. Given the relatively low rate of traffic, expected through the species habitats (no more than 7,000 vehicles per day by 2040 on the left roadway) and the relatively small area of affected habitats, combined with their suboptimal nature, the impact has been estimated to be insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. Affecting a nest of eggs or poorly flying small ones is unlikely due to the low number of breeding pairs and the sub-optimal nature of the habitats. However, if it happens, the impact might be significant (Rate 3). Mitigation measures are needed. Mortality, caused by disturbance has been considered before.

No mortality is expected during the operation of the highway, as the species is cautious enough to avoid moving vehicles. There will be no impact (rate 0).

Measures:

Construction in individual sections should begin outside the breeding season of the species (1 May - 15 August). The construction may only commence during that period if, in the days immediately prior to it, an ornithological monitoring has proven the absence of nesting within a perimeter of 300 m from the construction site boundaries. The methodology of monitoring and the monitoring itself should be developed and carried out by an expert

Ornithologist / ornithologists. The methodology must be approved by the competent authority in advance.

Long Tunnel Option, 'Kresna' tunnel

Direct destruction of habitats

Potential breeding habitats within the scope of this option are virtually unfit for the species, as it is very sensitive to disturbance in the breeding area; such disturbance is also caused at the moment by the traffic of the first-class road and by the presence of people, south of the Kresna gorge.

216.757 decares will be affected durung construction, or 0.42% of the trophical habitats of the species in the zone (habitat N06 - on the Struma River and habitats N09 and N12). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1). During the operation of the highway, the affected areas of the bridge faciliity after the South portal, outside the pillars and its supports will recover their functionality as habitats of the species, and the permanently affected area will be even smaller.

Fragmentation of habitats

Temporary fragmentation of habitats is expected during the construction of bridge facilities (habitat N06 - on the Struma River), yet their recovery as species habitats will occur promptly upon completion of construction activities. Given the large length and area of the fragments formed and the temporary nature of the impact, we could assume that the impact would be insignificant (Rate 1). The road route under this option mainly affects peripheral parts of large polygons of the species habitats. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species is highly sensitive to disturbance in the nesting habitats, those, comprised within the scope of this option are virtually inappropriate for the species, due to the existing traffic on the first-class road and the strong presence of people south of Kresna.

Some disturbance may be expected during construction outside the nesting areas, yet given its temporary nature and the restricted territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the highway, it is possible that the trophical habitats in the vicinity of the road may become unsuitable for the species. Given the relatively small area of affected trophic habitats and their sub-optimal value, caused by the proximity of a residential area (Kresna), the impact has been assessed as insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. No breeding/nesting habitats would be affected, the small birds leave the nest as relatively good flyers. No mortality is expected during the operation of the highway, as the species is cautious enough to avoid moving vehicles. There will be no impact (rate 0).

Eastern Option G20

Direct destruction of habitats

467.254 acres will be affected during construction or 1.02% of the potential breeding habitats of the species in the zone (habitats N16), although a large part of the forests in the area have a shrubby habitus and are not suitable for breeding.

Given the sub-optimal nature of the habitats, the impact has been assessed as moderate - (Rate 2). Due to the large number of affected polygons, mitigation measures shall be impossible.

379.571 decares will be affected durung construction, or 0.73% of the trophical habitats of the species in the zone (habitat N06 - on the open areas of the tributaries of the Struma River, as well as the micro water -bodies in the area, and habitats N09 and N12). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1). During the operation of the highway, the affected areas of bridge facilities will recover as habitats of the species, and the permanently affected area will be even smaller.

Fragmentation of habitats

The road route in this option affects relatively large sections of polygons of the N16 habitat. In the majority of cases, the remaining intact part of these polygons will have sufficient area to perform its function of nesting habitat of the species, even more so that it is microhabitately conditioned - the nests are made on bigger trees. Given that, the impact rate has been assessed as insignificant (Rate 1).

Temporary fragmentation of habitats is expected during the construction of bridge facilities (habitat N06 - on the open parts of the tributaries of Struma River), yet their recovery as species habitats will occur promptly upon completion of construction activities. Given the large length and area of the fragments formed and the temporary nature of the impact, we could assume that the impact would be insignificant (Rate 1). The road route in this option mainly affects small parts of large polygons of the species habitats N09 and N12. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species is highly sensitive to disturbance in the nesting habitats,

when construction activities commence, the impact during construction might be significant (Rate 3), as parents may abandon their nests with eggs or poorly flying small ones, located in the vicinity at a distance of up to 300 m from the construction site. Mitigation measures are needed. During the operation of the highway, the breeding/nesting habitats in the area of this option will be practically unfit. Given the relatively high traffic expected (not less than 13,000 cars per day by 2040) and the relatively large area of affected habitats, the impact has been assessed as Moderate (Rate 2).

Some disturbance may be expected during construction outside the nesting areas, yet given its temporary nature and the restricted territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the highway, it is possible that the trophical habitats in the vicinity of the road may become unsuitable for the species. Given the relatively high traffic expected (not less than 13,000 cars per day by 2040) and the relatively large area of affected habitats, the impact has been assessed as Moderate (Rate 2). Due to the large number of affected polygons and its large area, mitigation measures shall be impossible.

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. Affecting a nest of eggs or poorly flying small ones is unlikely due to the low number of breeding pairs and the sub-optimal nature of the habitats. However, if it happens, the impact might be significant (Rate 3). Mitigation measures are needed. Mortality, caused by disturbance has been considered before.

No mortality is expected during the operation of the highway, as the species is cautious enough to avoid moving vehicles. There will be no impact (rate 0).

Measures:

Construction in individual sections should begin outside the breeding season of the

species (1 May - 15 August). The construction may only commence during that period if, in the days immediately prior to it, an ornithological monitoring has proven the absence of nesting within a perimeter of 300 m from the construction site boundaries. The methodology of monitoring and the monitoring itself should be developed and carried out by an expert ornithologist /expert ornithologists. The methodology must be approved by the competent authority in advance.

5. The mallard / wild duck (*Anas platyrhynchos*)

Species Biology: Permanent, wintering and migrating. In the breeding period inhabits rivers, marshes and lakes with rich coastal vegetation, dams, fishponds, artificial lakes in parks. During migration, it is also found in the sea. It nests on the ground, or in the branches of trees, almost always next to the water. It lays its eggs from the end of March to the end of June, with the hatching containing up to 13 eggs. Brooding/incubation lasts for 27-28 days. The young birds learn to fly after 50-60 days. The passage is from February to mid-March, and from October to November. The wintering birds migrate depending on the conditions of a given water body throughout the winter. The feed on the green parts of plants, seeds, including cultural species, insects, larvae, molluscs (Nankinov et al. 1997).

Assessment of the species in the Protected Zone:

According to the standard form, the PZ has a permanent residence of 1 to 9 pairs. (8 individuals) were observed during the field studies near the village of Mechkul, as well as south of Kresna. The potential habitats of the species in the area are the larger rivers and ponds (habitat N06 from the Standard Zone Form), with a total area of 2,349.559 decares.

Assessment of the type species on territory of the Investment Proposal

(8 individuals) were observed during the field studies near the village of Mechkul, in a small artificial dam, as well as south of Kresna. As potential habitats of the species in the region of the IP should be considered the Struma River and downstream of the Vlachinska River, as well as the microorganisms in the region of the Eastern Options (N06), although many of the latter dry in the summer.

Impacts:

Option G20 - Red

Direct destruction of habitats

12.734 decares will be affected during construction, or 0.54% of the trophical habitats of the species in the zone (habitat N06 - on Struma river and the Vlahinska River). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1). During the operation of the highway, the affected areas outside the pillars and bridge facilities will recover as habitats of the species, and the permanently affected area will be even smaller.

Fragmentation of habitats

During the construction of bridge facilities, temporary fragmentation of habitats is expected, yet their recovery will occur promptly upon completion of construction works. Given the large length and area of the fragments formed and the temporary nature of the impact, we could assume that the impact would be insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

Even in the nestings sites, individual representatives of the species would tolerate the presence of

vehicles (personal observations), but not of people. Therefore some disturbance may be expected during bridge construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. Given the high fertility of the species, the impact on the population in the area would be insignificant (Rate1).

No mortality is expected during the operation of the highway, as grown-up representatives of the species are cautious enough to avoid moving vehicles. As the road route crosses the potential habitats of the species by way of high bridges, there is no chance of affecting non-flying small ones on the roadway. There will be no impact (rate 0).

Option G20 - Blue

Direct destruction of habitats

During construction, 13.123 decares will be affected, or 0.56% of the habitats of the species in the zone (habitat N06 - on Struma river and the Vlahinska River). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1). During the operation of the highway, the affected areas outside the pillars and bridge facilities will recover as habitats of the species, and the permanently affected area will be even smaller.

Fragmentation of habitats

During the construction of bridge facilities, temporary fragmentation of habitats is expected, yet their recovery will occur promptly after completion of construction works. Given the large length and area of the fragments formed and the temporary nature of the impact, we could assume that the impact would be insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

Even in the nestings sites, individual representatives of the species would tolerate the presence of vehicles (personal observations), but not of people. Therefore some disturbance may be expected during bridge construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are

within the construction boundaries. Given the high fertility of the species, the impact on the population in the area would be insignificant (Rate1).

No mortality is expected during the operation of the highway, as grown-up representatives of the species are cautious enough to avoid moving vehicles. As the road route crosses the potential habitats of the species by way of high bridges, there is no chance of affecting non-flying small ones on the roadway. There will be no impact (rate 0).

Eastern Option G10.50

Direct destruction of habitats

3.099 decares will be affected during construction or 0.13% of the trophical habitats of the species in the zone (habitat N06 - on the Struma River and the Vlahinska River, as well as 3 small artificial ponds in the region of Mechkul village and Oshtava village). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1). During the operation of the highway, the affected areas outside the pillars and the supports of bridge facilities on the Struma River and Vlahinska River will recover as habitats of the species, and

the permanently affected area will be even smaller.

Fragmentation of habitats

During the construction of bridge facilities, temporary fragmentation of habitats is expected, yet their recovery will occur promptly after completion of construction works. Given the large length and area of the fragments formed and the temporary nature of the impact, we could assume that the impact would be insignificant (Rate 1). Two of the artificial ponds shall be partially affected yet, as a result, their entire area is likely to be destroyed. The affected area will thus increase by 1.187 decares, or together with the directly affected area it would amount to 4.286 decares or

0.18% of the habitats of the species in the zone. The impact on the species will be insignificant (Rate1).(0).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact

Disturbance

Even in the nestings sites, individual representatives of the species would tolerate the presence of vehicles (personal observations), but not of people. Therefore some disturbance may be expected during bridge construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. Given the high fertility of the species, the impact on the population in the area would be insignificant (Rate1).

No mortality is expected during the operation of the highway, as grown-up representatives of the species are cautious enough to avoid moving vehicles. As the road route crosses the potential habitats of the species by way of high bridges, there is no chance of affecting non-flying small ones on the roadway. There will be no impact (rate 0).

Long Tunnel Option, 'Kresna' tunnel

Direct destruction of habitats

21 decares will be affected during construction or 0.89% of the habitats of the species in the zone (habitat N06 - on the Struma River). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1). During

the operation of the highway, the affected areas outside the pillars and bridge facilities will recover as habitats of the species, and the permanently affected area will be even smaller.

Fragmentation of habitats

During the construction of bridge facilities, temporary fragmentation of habitats is expected, yet their recovery will occur promptly after completion of construction works. Given the large length and area of the fragments formed and the temporary nature of the impact, we could assume that the impact would be insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact

(0).

Disturbance

Even in the nestings sites, individual representatives of the species would tolerate the presence of

vehicles (personal observations), but not of people. Therefore some disturbance may be expected during bridge construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. Given the high fertility of the species, the impact on the population in the area would be insignificant (Rate1).

No mortality is expected during the operation of the highway, as grown-up representatives of the species are cautious enough to avoid moving vehicles. As the road route crosses the potential habitats of the species by way of high bridges, there is no chance of affecting non-flying small ones on the roadway. There will be no impact (rate 0).

Eastern Option G20

Direct destruction of habitats

2,613 decares will be affected during construction or 0.11% of the habitats of the species in the area (habitat N06 - 4 small artificial ponds in the region of Mechkul and Oshtava). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

One of the artificial ponds shall be partially affected, yet, as a result, their entire area is likely to be destroyed. The affected area will thus increase by 0.1 decares, or together with the directly affected area it would amount to 2.713 decares, or 0.12% of the species habitats in the zone. The impact on the species will be insignificant - Rate 1.

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

Even in the nestings sites, individual representatives of the species would tolerate the presence of vehicles (personal observations), but not of people. Therefore some disturbance may be expected during bridge construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. Given the high fertility of the species, the impact on the population in the area would be insignificant (Rate1).

No mortality is expected during the operation of the highway, as grown-up representatives of the species are cautious enough to avoid moving vehicles. There is no probaility that small birds that have not yet learnt to fly may fall on the road, as the route under this option will practically destroy the potential habitats of the species in the vicinity. There will be no impact (rate 0).

6. The cinereous vulture (*Aegypius monachus*)

Species Biology: Permanent and wandering species. It nests in extensive, old deciduous forests in plains and low parts of the mountains. The nests are in the crown of trees, rarely on rocks. In 2006, an episodic nesting of no more than 2 pairs is assumed in the country. Birds that are observed in Bulgaria nest in Greece and visit the country in search of food. It feeds mainly on medium and large carcasses of domestic and wild animals looking for open spaces

(Golemanski 2011, Simeonov et all. 1990).

Assessment of the species in the Protected Zone:

According to the standard form of the protected zone, 1 - 2 representatives of the species pass through the zone during migration. The species does not nest in the zone. According to data from the Wild Flora and Fauna Fund (WFFF) in 2013, in the Protected Zone, and in particular the feeding site for the Griffon Vulture, reintroduced in the Area, is regularly visited by species representatives, and by 2015 the number was 4 (Peshev et al. 2015). The species is trophical related with the large ungulates, on whose carcasses it feeds (in the present - mostly domestic ones); in this sense it does not depend on certain types of trophic habitats, especially in the conditions of existing artificial feeding.

Assessment of the species on territory of the Investment Proposal

The species has not been observed during field studies. The species does not nest in the zone. Individual representatives of the species are fed at the Vulture Feeding Site, which is located more than 500 m above the road route of the IP in this option.

Impacts:

Option G20 - Red

Direct destruction of habitats

The species is trophical related with the large ungulates, on whose carcasses it feeds (in the present - mostly domestic ones); in this sense it does not depend on certain types of trophic habitats, especially in the conditions of existing artificial feeding. There will be no impact (rate 0).

Fragmentation of habitats

The species is trophical related with the large ungulates, on whose carcasses it feeds (in the present - mostly domestic ones); in this sense it does not depend on certain types of trophic habitats, especially in the conditions of existing artificial feeding. There will be no impact (rate 0).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species does not nest in the zone. Individual representatives of the species are fed at the Vulture Feeding Site, which is located more than 1,000 m above the road route of the IP in this option. No impact is expected (Rate 0) during construction and during the operation of the highway.

Mortality

The species is tropically related to the large ungulates, on whose carcasses it feeds (in the present - mostly domestic ones); since their presence in the area of the road route is excluded, respectively, the presence of vultures and their mortality is also excluded. No impact is expected (Rate 0).

Option G20 - Blue

Direct destruction of habitats

The species is trophical related with the large ungulates, on whose carcasses it feeds (in the present - mostly domestic ones); in this sense it does not depend on certain types of trophic habitats, especially in the conditions of existing artificial feeding. There will be no impact (rate 0).

Fragmentation of habitats

The species is trophical related with the large ungulates, on whose carcasses it feeds (in the present - mostly domestic ones); in this sense it does not depend on certain types of trophic habitats, especially in the conditions of existing artificial feeding. There will be no impact (rate 0).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species does not nest in the zone. Individual representatives of the species are fed at the Vulture Feeding Site, which is located more than 1,000 m above the road route of the IP in this option. No impact is expected (Rate 0) during construction and during the operation of the highway.

Mortality

The species is tropically related to the large ungulates, on whose carcasses it feeds (in the present - mostly domestic ones); since their presence in the area of the road route is excluded, respectively, the presence of vultures and their mortality is also excluded. No impact is expected (Rate 0).

Eastern Option G10.50

Direct destruction of habitats

The species is trophical related with the large ungulates, on whose carcasses it feeds (in the present - mostly domestic ones); in this sense it does not depend on certain types of trophic habitats, especially in the conditions of existing artificial feeding. There will be no impact (rate 0).

Fragmentation of habitats

The species is trophical related with the large ungulates, on whose carcasses it feeds (in the present - mostly domestic ones); in this sense it does not depend on certain types of trophic habitats, especially in the conditions of existing artificial feeding. There will be no impact (rate 0).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species does not nest in the zone. Individual representatives of the species are fed at the Vulture Feeding Site, which is located more than 550 m above the road route of the IP in this option. No impact is expected (Rate 0) during construction and during the operation of the highway.

Mortality

The species is tropically related to the large ungulates, on whose carcasses it feeds (in the present - mostly domestic ones); since their presence in the area of the road route is excluded, respectively, the presence of vultures and their mortality is also excluded. No impact is expected (Rate 0).

Long Tunnel Option, 'Kresna' tunnel

Direct destruction of habitats

The species is trophical related with the large ungulates, on whose carcasses it feeds (in the present - mostly domestic ones); in this sense it does not depend on certain types of trophic habitats, especially in the conditions of existing artificial feeding. There will be no impact (rate 0).

Fragmentation of habitats

The species is trophical related with the large ungulates, on whose carcasses it feeds (in the present - mostly domestic ones); in this sense it does not depend on certain types of trophic habitats, especially in the conditions of existing artificial feeding. There will be no impact (rate 0).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species does not nest in the zone. Individual representatives of the species are fed at the Vulture Feeding Site, which is located more than 1,500 m above the road route of the IP in this option. No impact is expected (Rate 0) during construction and during the operation of the highway.

Mortality

The species is tropically related to the large ungulates, on whose carcasses it feeds (in the present - mostly domestic ones); since their presence in the area of the road route is excluded, respectively, the presence of vultures and their mortality is also excluded. No impact is expected (Rate 0).

Eastern Option G20

Direct destruction of habitats

The species is trophical related with the large ungulates, on whose carcasses it feeds (in the present - mostly domestic ones); in this sense it does not depend on certain types of trophic habitats, especially in the conditions of existing artificial feeding. There will be no impact (rate 0).

Fragmentation of habitats

The species is trophical related with the large ungulates, on whose carcasses it feeds (in the present - mostly domestic ones); in this sense it does not depend on certain types of trophic habitats, especially in the conditions of existing artificial feeding. There will be no impact (rate 0).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species does not nest in the zone. Individual representatives of the species are fed at the Vulture Feeding Site, which is located more than 500 m above the road route of the IP in this option. No impact is expected (Rate 0) during construction and during the operation of the highway.

Mortality

The species is tropically related to the large ungulates, on whose carcasses it feeds (in the present - mostly domestic ones); since their presence in the area of the road route is excluded, respectively, the presence of vultures and their mortality is also excluded. No impact is expected (Rate 0).

7. The Griffon Vulture (*Gyps fulvus*)

Species Biology:

Permanent and wandering species. It nests on rocks in rocky areas in the valleys of large rivers (gorges, couloirs), in single or in colonies. It lays its eggs in January - February. The young leave the nests from mid-July to mid-August. It feeds on large mammal carcasses, dependent on free-grazing domestic animals (Golemanski 2011, Simeonov et al. 1990).

Assessment of the species in the Protected Zone:

According to the standard form of the PZ, in the zone nest 2 - 4 pairs and pass 10-30 species representatives. The population in the area is the result of WFFF's efforts to reintroduce the species in the area, whereas the project started in 2010. According to the organization's data (Peshev et al. 2015) by 2015 the gorge is inhabited by more than 30 permanent birds and more than 100 passers-by, flying or hibernating species representatives. The formed couples are 6, two of them have laid eggs, but have not hatched small birds. The successful breeding of two couples, with 2 small offspring, occurred in 2016 (Peshev et al. 2017). The species is trophically related with the large ungulates, on whose carcasses it feeds (in the present - mostly domestic ones); in this sense it does not depend on certain types of trophical habitats, especially in the conditions of existing artificial feeding. Nesting habitats

are in the higher and inaccessible rocks in the zone (habitat N22 of the Standard Area Form), with a total area of 1,174.779 decares.

Assessment of the species on territory of the Investment Proposal

The species is regularly observed during field studies in the Northern part of the Kresna Gorge, as well as in the area of the site. The higher and inaccessible rocks (habitat N22) should be considered as potential breeding habitats of the species in the area of the investment proposal.

Impacts:

Option G20 - Red

Direct destruction of habitats

The construction works shall affect 4 polygons with a total area of 1.133 decares of habitat N22, yet in all cases the affected rocks shall be of low height and in close proximity to the existing first-class road or railway line, which would define them as unfit for nesting habitats of the species. There will be no impact (rate 0).

The species is trophicly related with the large ungulates, on whose carcasses it feeds (in the present - mostly domestic ones); in this sense it does not depend on certain types of trophic habitats, especially in the conditions of existing artificial feeding. There will be no impact (rate 0).

Fragmentation of habitats

The affected rocks are of low height and in close proximity to the existing first-class road or the railway line, which would make them unfit for nesting habitats of the species. The species is trophicly related with the large ungulates, on whose carcasses it feeds (in the present - mostly domestic ones); in this sense it depends on a certain type of habitat, especially in the conditions of existing artificial feeding. There will be no impact (rate 0).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species is adapted to human presence. Besides, the optimal resting and / or nesting habitats are sufficiently distant from the road route under this option to avoid any disturbance (Rate 0), during construction and during operation.

The Feeding Site is located more than 1,000 m above the road route of the IP in this option. No impact is expected (Rate 0) during construction and during the operation of the highway.

Mortality

The species is tropically related to the large ungulates, on whose carcasses it feeds (in the present - mostly domestic ones); since their presence in the area of the road route is excluded, respectively, the presence of vultures and their mortality is also excluded. No impact is expected (Rate 0).

Option G20 - Blue

Direct destruction of habitats

The construction works shall affect 2 polygons with a total area of 0.815 decares of habitat N22, yet in all cases the affected rocks shall be of low height and in close proximity to the existing first-class road or railway line, which would define them as unfit for nesting habitats of the species. There will be no impact (rate 0).

The species is trophicly related with the large ungulates, on whose carcasses it feeds (in the present - mostly domestic ones); in this sense it does not depend on certain types of trophic habitats, especially in the conditions of existing artificial feeding. There will be no impact (rate 0).

Fragmentation of habitats

The affected rocks are of low height and in close proximity to the existing first-class road, which would make them unfit for nesting habitats of the species. The species is trophicly

related with the large ungulates, on whose carcasses it feeds (in the present - mostly domestic ones); in this sense it does not depend on certain types of trophic habitats, especially in the conditions of existing artificial feeding. There will be no impact (rate 0).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species is adapted to human presence. Besides, the optimal resting and / or nesting habitats are sufficiently distant from the road route under this option to avoid any disturbance (Rate 0), during construction and during operation.

The Feeding Site is located more than 1,000 m above the road route of the IP in this option. No impact is expected (Rate 0) during construction and during the operation of the highway.

Mortality

The species is tropically related to the large ungulates, on whose carcasses it feeds (in the present - mostly domestic ones); since their presence in the area of the road route is excluded, respectively, the presence of vultures and their mortality is also excluded. No impact is expected (Rate 0).

Eastern Option G10.50

Direct destruction of habitats

The road route in this option does not affect the N22 habitat. The species is trophicly related with the large ungulates, on whose carcasses it feeds (in the present - mostly domestic ones); in this sense it does not depend on certain types of trophic habitats, especially in the conditions of existing artificial feeding. There will be no impact (rate 0).

Fragmentation of habitats

The road route in this option does not affect the N22 habitat. The species is trophicly related with the large ungulates, on whose carcasses it feeds (in the present - mostly domestic ones); in this sense it does not depend on certain types of trophic habitats, especially in the conditions of existing artificial feeding. There will be no impact (rate 0).(0).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact

Disturbance

The species is adapted to human presence. Besides, the optimal resting and / or nesting habitats are sufficiently distant from the road route under this option to avoid any disturbance (Rate 0), during construction and during operation.

The Vulture Feeding Site is located more than 550 m above the road route of the IP in this option. No impact is expected (Rate 0) during construction and during the operation of the highway.

Mortality

The species is tropically related to the large ungulates, on whose carcasses it feeds (in the present - mostly domestic ones); since their presence in the area of the road route is excluded, respectively, the presence of vultures and their mortality is also excluded. No impact is expected (Rate 0).

Long Tunnel Option, 'Kresna' tunnel

Direct destruction of habitats

The road route in this option does not affect the N22 habitat. The species is trophicly related with the large ungulates, on whose carcasses it feeds (in the present - mostly domestic ones); in this sense it does not depend on certain types of trophic habitats, especially in the conditions of existing artificial feeding. There will be no impact (rate 0).

Fragmentation of habitats

The road route in this option does not affect the N22 habitat. The species is trophicly related with the large ungulates, on whose carcasses it feeds (in the present - mostly domestic ones); in this sense it does not depend on certain types of trophic habitats, especially in the conditions of existing artificial feeding. There will be no impact (rate 0). (0).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact

Disturbance

The species is adapted to human presence. Besides, the optimal resting and / or nesting habitats are sufficiently distant from the road route under this option to avoid any disturbance (Rate 0), during construction and during operation.

The Feeding Site is located more than 1,500 m above the road route of the IP in this option. No impact is expected (Rate 0) during construction and during the operation of the highway.

Mortality

The species is tropically related to the large ungulates, on whose carcasses it feeds (in the present - mostly domestic ones); since their presence in the area of the road route is excluded, respectively, the presence of vultures and their mortality is also excluded. No impact is expected (Rate 0).

Eastern Option G20

Direct destruction of habitats

The road route in this option does not affect the N22 habitat. The species is trophicly related with the large ungulates, on whose carcasses it feeds (in the present - mostly domestic ones); in this sense it does not depend on certain types of trophic habitats, especially in the conditions of existing artificial feeding. There will be no impact (rate 0).

Fragmentation of habitats

The road route in this option does not affect the N22 habitat. The species is trophicly related with the large ungulates, on whose carcasses it feeds (in the present - mostly domestic ones); in this sense it does not depend on certain types of trophic habitats, especially in the conditions of existing artificial feeding. There will be no impact (rate 0). (0).*Disruption of bio-corridors*

Roads do not present an insurmountable barrier for birds. No impact

Disturbance

The species is adapted to human presence. Besides, the optimal resting and / or nesting habitats are sufficiently distant from the road route under this option to avoid any disturbance (Rate 0), during construction and during operation.

The Vulture Feeding Site is located more than 500 m above the road route of the IP in this option. No impact is expected (Rate 0) during construction and during the operation of the highway.

Mortality

The species is tropically related to the large ungulates, on whose carcasses it feeds (in the present - mostly domestic ones); since their presence in the area of the road route is excluded, respectively, the presence of vultures and their mortality is also excluded. No impact is expected (Rate 0).

8. The Egyptian Vulture (*Neophron percnopterus*)

Species Biology: Nesting - migratory species. The spring flight begins from the middle of February, and in autumn latest October. It nests in niches on rocks in rocky areas, gorges, couloirs, in the past - and in niches in loess walls, in trees, up to 400, less often up to 900 m above sea level. The pairs use up to 4-5 different nests. The distance between them is 3 - 4

km. It lays its eggs in late April - early May. The young leave the nest at the end of August and in the beginning of September. Feeding on carrion, less often feeding on turtles and other reptiles, small mammals, etc. Seeking its food in a variety of predominantly open habitats (Golemanski 2011, Simeonov et al. 1990, personal bservations).

Assessment of the species in the Protected Zone:

According to the standard form of the protected zone, only one couple nests in the zone. According to WFFF data from 2010, the feeding site of the Griffon vulture reintroduced in the area, is regularly visited by species representatives, whereas in 2014-2016 the number is 2-3 per year (Peshev et al. 2015; Peshev et al. 2017). Nesting habitats are in the higher and inaccessible rocks in the zone (habitat N22 of the Standard Area Form), with a total area of 1,174.779 decares. The species uses a variety of food resources and in this sense it does not depend on a particular type of trophical habitat, especially in the conditions of existing artificial feeding.

Assessment of the species on territory of the Investment Proposal

The species has not been observed during field studies. The higher and inaccessible rocks (habitat N22) should be considered as potential breeding habitats of the species in the area of the investment proposal.

Impacts:

Option G20 - Red

Direct destruction of habitats

The construction works shall affect 4 polygons with a total area of 1.133 decares of habitat N22, yet in all cases the affected rocks shall be of low height and in close proximity to the existing first-class road or railway line, which would define them as unfit for nesting habitats of the species. There will be no impact (rate 0).

The species uses a variety of food resources and in this sense it does not depend on a particular type of trophical habitat, especially in the conditions of existing artificial feeding. There will be no impact (rate 0).

Fragmentation of habitats

The affected rocks are of low height and in close proximity to the existing first-class road or the railway line, which would make them unfit for nesting habitats of the species. The species uses a variety of food resources and in this sense it does not depend on a particular type of trophical habitat, especially in the conditions of existing artificial feeding. There will be no impact (rate 0).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The potential nesting habitats are far enough from the road route in this option, to avoid any disturbance (Rate 0), during construction and during operation.

The Feeding Site is located more than 1,000 m above the road route of the IP in this option. No impact is expected (Rate 0) during construction and during the operation of the highway.

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. No breeding/nesting habitats would be affected, the small birds leave the nest as relatively good flyers. Collision with vehicles during the operation of the highway is not expected either, as safety grids will not allow mortality of larger animals, and the present feed ground will reduce the "attractiveness" of smaller ones. No impact is expected (Rate 0).

Option G20 - Blue

Direct destruction of habitats

The construction works shall affect 2 polygons with a total area of 0.815 decares of habitat N22, yet in all cases the affected rocks shall be of low height and in close proximity to

the existing first-class road or railway line, which would define them as unfit for nesting habitats of the species. There will be no impact (rate 0).

The species uses a variety of food resources and in this sense it does not depend on a particular type of trophical habitat, especially in the conditions of existing artificial feeding. There will be no impact (rate 0).

Fragmentation of habitats

The affected rocks are of low height and in close proximity to the existing first-class road or the railway line, which would make them unfit for nesting habitats of the species. The species uses a variety of food resources and in this sense it does not depend on a particular type of trophical habitat, especially in the conditions of existing artificial feeding. There will be no impact (rate 0).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The potential nesting habitats are far enough from the road route in this option, to avoid any disturbance (Rate 0), during construction and during operation.

The Feeding Site is located more than 1,000 m above the road route of the IP in this option. No impact is expected (Rate 0) during construction and during the operation of the highway.

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. No breeding/nesting habitats would be affected, the small birds leave the nest as relatively good flyers. Collision with vehicles during the operation of the highway is not expected either, as safety grids will not allow mortality of larger animals, and the present feed ground will reduce the "attractiveness" of smaller ones. No impact is expected (Rate 0).

Eastern Option G10.50

Direct destruction of habitats

The road route in this option does not affect the N22 habitat. The species uses a variety of food resources and in this sense it does not depend on a particular type of trophical habitat, especially in the conditions of existing artificial feeding. There will be no impact (rate 0).

Fragmentation of habitats

The road route in this option does not affect the N22 habitat. The species uses a variety of food resources and in this sense it does not depend on a particular type of trophical habitat, especially in the conditions of existing artificial feeding. There will be no impact (rate 0).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The potential nesting habitats are far enough from the road routein this option, to avoid any disturbance (Rate 0), during construction and during operation.

The Vulture Feeding Site is located more than 550 m above the road route of the IP in this option. No impact is expected (Rate 0) during construction and during the operation of the highway.

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. No breeding/nesting habitats would be affected, the small birds leave the nest as relatively good flyers. Collision with

Collision with vehicles during the operation of the highway is not expected either, as safety grids will not allow mortality of larger animals, and the present feedground will reduce the "attractiveness" of smaller ones. No impact is expected (Rate 0).

Long Tunnel Option, 'Kresna' tunnel

Direct destruction of habitats

The road route in this option does not affect the N22 habitat. The species uses a variety

of food resources and in this sense it does not depend on a particular type of trophical habitat, especially in the conditions of existing artificial feeding. There will be no impact (rate 0).

Fragmentation of habitats

The road route in this option does not affect the N22 habitat. The species uses a variety of food resources and in this sense it does not depend on a particular type of trophical habitat, especially in the conditions of existing artificial feeding. There will be no impact (rate 0).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The potential nesting habitats are far enough from the road route in this option, to avoid any disturbance (Rate 0), during construction and during operation.

The Feeding Site is located more than 1,500 m above the road route of the IP in this option. No impact is expected (Rate 0) during construction and during the operation of the highway.

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. No breeding/nesting habitats would be affected, the small birds leave the nest as relatively good flyers. Collision with vehicles during the operation of the highway is not expected either, as safety grids will not allow mortality of larger animals, and the present feed ground will reduce the "attractiveness" of smaller ones. No impact is expected (Rate 0).

Eastern Option G20

Direct destruction of habitats

The road route in this option does not affect the N22 habitat. The species uses a variety of food resources and in this sense it does not depend on a particular type of trophical habitat, especially in the conditions of existing artificial feeding. There will be no impact (rate 0).

Fragmentation of habitats

The road route in this option does not affect the N22 habitat. The species uses a variety of food resources and in this sense it does not depend on a particular type of trophical habitat, especially in the conditions of existing artificial feeding. There will be no impact (rate 0).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The potential nesting habitats are far enough from the road route in this option, to avoid any disturbance (Rate 0), during construction and during operation. The Vulture Feeding Site is located more than 500 m above the road route of the IP in this option. No impact is expected (Rate 0) during construction and during the operation of the highway.

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. No breeding/nesting habitats would be affected, the small birds leave the nest as relatively good flyers. Collision with vehicles during the operation of the highway is not expected either, as safety grids will not allow mortality of larger animals, and the present feed ground will reduce the "attractiveness" of smaller ones. No impact is expected (Rate 0).

9. The golden eagle (*Aquila chrysaetos*)

Species Biology: Permanent and wandering species. It breeds on wide, tall, inaccessible rock walls and rocky river valleys near the open spaces where it hunts. The pairs build 2 to 3 nests. It lays in the second half of April. The little ones leave the nest around mid-August. In autumn and winter they often wander away from rocky terrain. It feeds on small and medium mammals, reptiles, birds, and also carrion (Golemanski 2011, Simeonov et al. 1990, personal observations).

Assessment of the species in the Protected Zone:

According to the standard form of the protected zone, only one couple nests in the

zone. According to Peshev et al. (2015) in 2012 a second pair nests in the northern part of the gorge. Nesting habitats are in the higher and inaccessible rocks in the zone (habitat N22 of the Zone Standard Form), with a total area of 1,174.779 decares. The potential trophical habitats are grassland and bushes (habitats N08 and N09 from the Zone Standard Form), with a total area of 108,079.693 decares.

Assessment of the species on territory of the Investment Proposal

The species was found during the field studies in the Kresna Gorge, near the Red Rock. The higher and inaccessible rocks (habitat N22) should be considered as potential breeding habitats of the species in the area of the investment proposal and as potential trophical habitats - the more distant grassy sites and shrubs (habitat N08 and N09).

Impacts:

Option G20 - Red

Direct destruction of habitats

Potential breeding habitats within the scope of this option are virtually unfit for the species, as it is highly sensitive to disturbance in the breeding area; such disturbance is also caused at the moment by the traffic of the first-class road.

During construction, 166.411 decares will be affected, or 0.15% of the habitats of the species in the zone (habitat N06 and N09). Given the small area affected, the impact has been assessed as insignificant (Rate 1), which is practically even smaller, since the polygons near the existing road are unlikely to be used.

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08 and N09. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species is highly sensitive to disturbance in the nesting habitats, therefore those, comprised within the scope of this option are virtually unfit for the species, due to the existing traffic on the first-class road.

Some disturbance may be expected during construction outside the nesting areas, yet given its temporary nature and the restricted territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the highway, the impact on individual representatives of the species, feeding in the region of the investment Proposal region will not be different from the current, so the impact is considered insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. No breeding/nesting habitats would be affected, the small birds leave the nest as relatively good flyers. No mortality is expected during the operation of the highway, as the species is cautious enough to avoid moving vehicles. There will be no impact (rate 0).

Option G20 - Blue

Direct destruction of habitats

Potential breeding habitats within the scope of this option are virtually unfit for the species, as it is highly sensitive to disturbance in the breeding area; such disturbance is also caused at the moment by the traffic of the first-class road.

During construction, 157.591 decares will be affected, or 0.15% of the trophical habitats of the species in the zone (habitat N08 and N09). Given the small area affected, the impact has been assessed as insignificant (Rate 1), which is practically even smaller, since the polygons near the existing road are unlikely to be used.

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08 and N09. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species is highly sensitive to disturbance in the nesting habitats, therefore those, comprised within the scope of this option are virtually unfit for the species, due to the existing traffic on the first-class road.

Some disturbance may be expected during construction outside the nesting areas, yet given its temporary nature and the restricted territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the highway, the impact on individual representatives of the species, feeding in the region of the investment Proposal region will not be different from the current, so the impact is considered insignificant (Rate 1).

Mortality

Adult representatives of the species are fast and cautious enough to avoid construction equipment and heavy construction machinery. The option would not affect nesting

habitats and the small birds leave the nests as relatively good flyers No mortality is expected during the operation of the highway, as the species is cautious enough to avoid moving vehicles. There will be no impact (rate 0).

Eastern Option G10.50

Direct destruction of habitats

The road route in this option does not affect the N22 habitat. 201.341 decares will be affected during construction, or 0.19% of the habitats of the species in the zone (habitat N08 and N09). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route in this option does not affect the N22 habitat. The road route under this option mainly affects considerably small parts of large polygons of habitats N08 and N09. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The potential nesting habitats are far enough from the road route in this option, to avoid any disturbance (Rate 0), during construction and during operation.

Some disturbance may be expected during construction outside the nesting areas, yet given its temporary nature and the restricted territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the highway, it is possible that the trophical habitats in the vicinity of the road may become unsuitable for the species. Given the relatively low rate of traffic, expected through the species habitats (no more than 7,000 vehicles per day by 2040 on the left roadway) and the relatively small area of affected habitats, combined with their suboptimal nature, the impact has been estimated to be insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. No breeding/nesting habitats would be affected, the small birds leave the nest as relatively good flyers. No mortality is expected during the operation of the highway, as the species is cautious enough to avoid moving vehicles. There will be no impact (rate 0).

Long Tunnel Option, 'Kresna' tunnel

Direct destruction of habitats

The road route in this option does not affect the N22 habitat. During construction, 175.237 decares will be affected, or 0.16% of the habitats of the species in the zone (habitat N08 and N09). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route in this option does not affect the N22 habitat. The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08 and N09. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The potential nesting habitats are far enough from the road route in this option, to avoid any disturbance (Rate 0), during construction and during operation.

Some disturbance may be expected during construction outside the nesting areas, yet given its temporary nature and the restricted territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the highway, it is possible that the trophical habitats in the vicinity of the road may become unsuitable for the species. Given the relatively small area of affected trophic habitats and their sub-optimal value, caused by the proximity of a residential area (Kresna), the impact has been assessed as insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. No breeding/nesting habitats would be affected, the small birds leave the nest as relatively good flyers. No mortality is expected during the operation of the highway, as the species is cautious enough to avoid moving vehicles. There will be no impact (rate 0).

Eastern Option G20

Direct destruction of habitats

The road route in this option does not affect the N22 habitat. During construction, 601.635 decares will be affected, or 0.56% of the habitats of the species in the zone (habitat N08 and N09). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route in this option does not affect the N22 habitat. The road route under this option mainly affects considerably small parts of large polygons of habitats N08 and N09. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The potential nesting habitats are far enough from the road route in this option, to avoid any disturbance (Rate 0), during construction and during operation.

Some disturbance may be expected during construction outside the nesting areas, yet given its temporary nature and the restricted territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the highway, it is possible that the trophical habitats in the vicinity of the road may become unsuitable for the species. Despite the relatively high traffic (expected to be not less than 13,000 vehicle per day by 2040), given the relatively small area of directly affected trophic habitats, the impact has been assessed as insignificant (Rate 1).

Mortality

Adult representatives of the species are fast and cautious enough to avoid construction equipment and heavy construction machinery. The option would not affect nesting

habitats and the small birds leave the nests as relatively good flyers No mortality is expected during the operation of the highway, as the species is cautious enough to avoid moving vehicles. There will be no impact (rate 0).

10. The greater spotted eagle *(Clanga clanga)*

Species Biology: A passing, wintering and probably nesting species for the country. The spring passing of birds is in April and autumn passing - from September to November. It nests on tall trees in floodplains or in flat deciduous trees near wetlands. It feeds on waterfowl, small and medium sized mammals, snakes, frogs, carrion. It hunts over marshes, swamp to damp grassy places, as well as in arable lands in the place of wetlands (Golemanski 2011, Simeonov et al. 1990, BirdLife International 2016a, Dombrovski 2010).

Assessment of the species in the Protected Zone:

According to the standard form of the protected zone, 5 representatives of the species pass through the zone during migration. The species has been included as a subject of conservation in the zone recently, possibly as a result of its detection in the monitoring of reintroduced Griffon Vultures, with two birds being reported between 2010 and 2016 (one in 2010 and another one in 2014), visited the feeding site (Peshev et al. 2015). The presence of the species here is obviously the result of feeding (the species feeds on carrion), because there are practically no trophical habitats in the zone.

Assessment of the species on territory of the Investment Proposal

The species has not been found in the IP area during field studies. The area does not provide suitable habitats for the species - marshes, swamp to damp grassy places. (0).

Impacts:

Option G20 - Red

Direct destruction of habitats

The road route under this option does not affect habitats of the species. No impact (Rate 0).

Fragmentation of habitats

The road route under this option does not affect habitats of the species. No impact (Rate 0).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact

Disturbance

The species does not nest in the zone. Individual representatives of the species are fed at the Vulture Feeding Site, which is located more than 1,000 m above the road route of the IP in this option. No impact is expected (Rate 0) during construction and during the operation of the highway.

Mortality

The road route under this option does not pass near habitats of the species. There will be no mortality of the species (0).

Option G20 - Blue

Direct destruction of habitats

The road route under this option does not affect habitats of the species. No impact (Rate 0).

Fragmentation of habitats

The road route under this option does not affect habitats of the species. No impact (Rate 0).

Disturbance

The species does not nest in the zone. Individual representatives of the species are fed at the Vulture Feeding Site, which is located more than 1,000 m above the road route of the IP in this option. No impact is expected (Rate 0) during construction and during the operation of

the highway.

Mortality

The road route under this option does not pass near habitats of the species. There will be no mortality of the species (0).

Eastern Option G10.50

Direct destruction of habitats

The road route under this option does not affect habitats of the species. No impact (Rate 0).

Fragmentation of habitats

The road route under this option does not affect habitats of the species. No impact (Rate 0).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species does not nest in the zone. Individual representatives of the species are fed at the Vulture Feeding Site, which is located more than 550 m above the road route of the IP in this option. No impact is expected (Rate 0) during construction and during the operation of the highway.

Mortality

The road route under this option does not pass near habitats of the species. There will be no mortality of the species (0).

Long Tunnel Option, 'Kresna' tunnel

Direct destruction of habitats

The road route under this option does not affect habitats of the species. No impact (Rate 0).

Fragmentation of habitats

The road route under this option does not affect habitats of the species. No impact (Rate 0).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species does not nest in the zone. Individual representatives of the species are fed at the Vulture Feeding Site, which is located more than 1,500 m above the road route of the IP in this option. No impact is expected (Rate 0) during construction and during the operation of the highway.

Mortality

The road route under this option does not pass near habitats of the species. There will be no mortality of the species (0).

Eastern Option G20

Direct destruction of habitats

The road route under this option does not affect habitats of the species. No impact (Rate 0).

Fragmentation of habitats

The road route under this option does not affect habitats of the species. No impact (Rate 0).

Disturbance

The species does not nest in the zone. Individual representatives of the species are fed at the Vulture Feeding Site, which is located more than 500 m above the road route of the IP in this option. No impact is expected (Rate 0) during construction and during the operation of the highway.

Mortality

The road route under this option does not pass near habitats of the species. There will be no mortality of the species (0).

11. The Eastern imperial eagle *(Aquila heliaca)*

Species Biology:

Nesting and migratory, passing and partly wintering species. The spring passage of birds is from the second half of February until the end of March, and the autumn passage - from the beginning of September to the end of November. It nests on tall trees in deciduous and coniferous forests and their outskirts, oasis groves and land protective belts, single trees in or near open spaces, but always close to running water at a distance of 300-350 m. It also nests on electric poles. It feeds on mammals, mostly on hamsters (*Spermophylus citillus*), rarely with birds, hunting in open spaces or wetlands (*Heredia* 1996, Golemanski 2011, Simeonov et al. 1990).

Assessment of the species in the Protected Zone:

According to the standard form of the protected zone, single representatives of the species pass through the zone during migration and summer wandering. According to the WFFF (Peshev et al. 2015) in recent years (2013-2015), there are regularly registered 1-2 species representatives, visiting the site for feeding or transit passing. The species does not nest in the zone. Potential trophical habitats of the species in the area are the more extensive herbaceous sites (habitat N09 of the Standard Zone Form), with a total area 21,146.027 decares. They are however suboptimal, as its primary prey is missing.

Assessment of the species on territory of the Investment Proposal

The species was not observed in the IP area during field studies. As potential trophical habitats of the species in the region of the investment proposal, the broader grasslands in the southern, wider part of the Kresna Gorge and south of it, as well as in the eastern options (N09). They are however suboptimal, as its primary prey is missing.

Impacts:

Option G20 - Red

Direct destruction of habitats

49.486 decares will be affected during the construction or 0.23% of the trophic habitats of the species in the area (habitats N09 -the more extensive herbaceous sites and arable land around the road crossing for the Oshtava village, in the crossing of the Struma River, North of Kresna and the Melo area). Given the small area affected and its sub-optimal nature, the impact has been estimated as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects small, peripheral parts of large polygons with potential trophic habitats of the species. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact has estimated as insignificant (Rate 1)

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species does not nest in the zone. Outside the nesting site, disturbance is expected during construction works, yet given its temporary nature and restricted territory (only around the construction site, the impact will be insignificant (Rate 1). During the operation of the highway, the impact on individual representatives of the species, feeding in the region of the investment Proposal region will not be different from the current, so the impact is considered insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. The species does not nest in the area, so there will be no endangered small birds or eggs. No mortality is expected during the operation of the highway, as the species is cautious enough to avoid moving vehicles. There will be no impact (rate 0).

Option G20 - Blue

Direct destruction of habitats

43.475 acres will be affected during the construction, or 0.21% of the trophic habitats of the species in the area (habitat N09 - the more extensive grassy places around the road junction in the village of Oshtava, at the crossing of the Struma River, North of Kresna and the Melo area). Given the small area affected and its sub-optimal nature, the impact has been estimated as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects small, peripheral parts of large polygons with potential trophic habitats of the species. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species does not nest in the zone. Outside the nesting site, disturbance is expected during construction works, yet given its temporary nature and restricted territory (only around the construction site, the impact will be insignificant (Rate 1). During the operation of the highway, the impact on individual representatives of the species, feeding in the region of the investment Proposal region will not be different from the current, so the impact is considered insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. The species does not nest in the area, so there will be no endangered small birds or eggs. No mortality is expected during the operation of the highway, as the species is cautious enough to avoid moving vehicles. There will be no impact (rate 0).

Eastern Option G10.50

Direct destruction of habitats

During construction, 117.821 decares will be affected, or 0.56% of the habitats of the species in the zone (habitat N09, including the wider grass

places around the crossing of the Struma River, North of Kresna and the Melo area). Given the small area affected and its sub-optimal nature, the impact has been estimated as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects small parts of large polygons with potential trophical habitats of the species. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species does not nest in the zone. Outside the nesting site, disturbance is expected during construction works, yet given its temporary nature and restricted territory (only around the construction site, the impact will be insignificant (Rate 1). During the operation of the highway, it is possible that the trophical habitats in the vicinity of the road may become unsuitable for the species. The impact is assessed as insignificant (Rate 1), given the relatively low traffic expected through habitat types (no more than 7,000 cars per day by 2040 on the left roadway) and therefore the relatively small area of affected trophic habitats and the sub-optimal nature of the habitats.

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. The species does not nest in the area, so there will be no endangered small birds or eggs. No mortality is expected during the operation of the highway, as the species is cautious enough to avoid moving vehicles. There will be no impact (rate 0).

Long Tunnel Option, 'Kresna' tunnel

Direct destruction of habitats

150.921 decares will be affected during the construction or 0.71% of the trophic habitats of the species in the zone (habitats N09 - the more extensive grassy sites and arable lands around the southern tunnel portal and the Struma River after it, as well as one of the landfills around it). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons with potential trophic habitats of the species. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species does not nest in the zone. Outside the breeding site, disturbance is expected during construction, yet given its temporary nature and limited territory

(only around the construction site, the impact will be insignificant (Rate 1). During the operation of the highway, it is possible that the trophical habitats in the vicinity of the road may become unsuitable for the species. Given the small length of intersection of these habitats and the relatively small area of affected trophical habitats and their sub-optimal nature, the impact has been assessed as insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. The species does not nest in the area, so there will be no endangered small birds or eggs. No mortality is expected during the operation of the highway, as the species is cautious enough to avoid moving vehicles. There will be no impact (rate 0).

Eastern Option G20

Direct destruction of habitats

During construction, 357.941 decares will be affected or 1.69% of the trophical habitats of the species in the zone (habitat N09). Given the sub-optimal nature of the habitats, the impact has been assessed as moderate - (Rate 2). Due to the large number of affected polygons, mitigation measures shall be impossible.

Fragmentation of habitats

The road route under this option affects parts of large polygons with potential trophic habitats of the species. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the sub-optimal nature of affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species does not nest in the zone. Outside the nesting site, disturbance is expected during construction works, yet given its temporary nature and restricted territory (only around the construction site, the impact will be insignificant (Rate 1). During the operation of the highway, it is possible that the trophical habitats in the vicinity of the road may become unsuitable for the species. Despite the sub-optimal nature of the habitats, given the relatively high traffic (expected to reach as much as 13,000 vehicles per day by 2040) and the relatively large area of affected trophical habitats, in combination with the relatively large directly affected area, the impact on the species population in the zone has been assessed as moderate - Rate 3.

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. The species does not nest in the area, so there will be no endangered small birds or eggs. No mortality is expected during the operation of the highway, as the species is cautious enough to avoid moving vehicles. There will be no impact (rate 0).

12. The lesser spotted eagle (*Aquila pomarina*)

Species Biology: A migratory and passing species. Spring migration is from mid-February to early April and in the autumn - from early August to mid-October. During passage, it is found all over the open air. It breeds in deciduous and mixed forests near river valleys, pastures, meadows, swamps, arable land. The nest is located on trees at the edge of the forest at an altitude of 6 - 25 m. It lays its eggs in early May. Brooding/incubation lasts for 38 to 41 days. The young leave the nest at about 55 days of age. It feeds on small mammals,

lizards, frogs, insects (Jonsson 2006, Simeonov et al. 1990).

Assessment of the species in the Protected Zone:

According to the standard form for the Protected Zone, one couple nests in the zone. Also present during migrations. The potential nesting habitats of the species in the area are forests (habitats N16, N17 and N19 from the Zone Standard Form), with a total area of 82,234.5489 decares. The potential trophical habitats are grassland, bushes and arable land (habitats N09 and N12 from the Zone Standard Form), with a total area of 49,340.729 decares.

Assessment of the species on territory of the Investment Proposal

The species has not been observed during field studies. Forests should be considered as potential nesting habitats of the species on the territory of the IP, including coniferous forests (N16 and N17), although large portion of the forests in the area of the eastern options are scrubby and not suitable for nesting, and those in the area of the gorge near the existing road are unfit, as the species is sensitive to disturbance in the area of the nest.

The herbaceous and bushy sites and arable land (N09 and N12) should be considered as potential trophical habitats of the species on the territory of the Investment Proposal.

Impacts:

Option G20 - Red

Direct destruction of habitats

Potential breeding habitats within the scope of this option are virtually unfit for the species, as it is highly sensitive to disturbance in the breeding area; such disturbance is also caused at the moment by the traffic of the first-class road and by the presence of people in the farmlands alongside the Kresna bypass.

During construction, 116.338 decares will be affected or 0.24% of the trophical habitats of the species in the zone (habitat N09 and N12). Given the small area affected, the impact has been assessed as insignificant (Rate 1), which is practically even smaller, since the polygons near the existing road are unlikely to be used.

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species is highly sensitive to disturbance in the nesting habitats, therefore those, comprised within the scope of this option are virtually inappropriate for the species, due to the existing traffic on the first-class road and the presence of people in the agricultural lands along the Kresna bypass.

Some disturbance may be expected during construction outside the nesting areas, yet given its temporary nature and the restricted territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the highway, the impact on individual representatives of the species, feeding in the region of the investment Proposal region will not be different from the current, so the impact is considered insignificant (Rate 1).

Mortality

Adult representatives of the species are fast and cautious enough to avoid construction equipment and heavy construction machinery. The option would not affect nesting

habitats and the small birds leave the nests as relatively good flyers No mortality is expected during the operation of the highway, as the species is cautious enough to avoid moving vehicles. There will be no impact (rate 0).

Option G20 - Blue

Direct destruction of habitats

Potential breeding habitats within the scope of this option are virtually unfit for the species, as it is highly sensitive to disturbance in the breeding area; such disturbance is also caused at the moment by the traffic of the first-class road and by the presence of people in the farmlands alongside the Kresna bypass.

During construction, 109.691 decares will be affected or 0.22% of the trophical habitats of the species in the zone (habitat N09 and N12). Given the small area affected, the impact has been assessed as insignificant (Rate 1), which is practically even smaller, since the polygons near the existing road are unlikely to be used.

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact
(0).

Disturbance

The species is highly sensitive to disturbance in the nesting habitats, therefore
those, comprised within the scope of this option are virtually inappropriate for the species, due to the existing traffic on the first-class road and the presence of people in the agricultural lands along the Kresna bypass.

Some disturbance may be expected during construction outside the nesting areas, yet given its temporary nature and the restricted territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the highway, the impact on individual representatives of the species, feeding in the region of the investment Proposal region will not be different from the current, so the impact is considered insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. No breeding/nesting habitats would be affected, the small birds leave the nest as relatively good flyers. No mortality is expected during the operation of the highway, as the species is cautious enough to avoid moving vehicles. There will be no impact (rate 0).

Eastern Option G10.50

Direct destruction of habitats

237.085 acres will be affected during construction or 0.29% of the potential breeding habitats of the species in the area (habitats N16 and N17), although a large part of the forests in the area have a shrubby habitus and are not suitable for breeding. Given the small area affected and its sub-optimal nature, the impact has been estimated as insignificant (Rate 1).

During construction, 137.718 decares will be affected or 0.28% of the trophical habitats of the species in the zone (habitat N09 and N12). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects considerably small parts of large polygons of habitats N16 and N17. In the majority of cases, the remaining intact part of these polygons will have sufficient area to perform its function of nesting habitat of the species, even more so that it is microhabitatly conditioned - the nests are made on older and bigger trees, also in groups of such trees. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

The road route in this option mainly affects small parts of large polygons of the species habitats N09 and N12. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species is highly sensitive to disturbance in the nesting habitats, therefore when construction activities commence, the impact during construction might be significant (Rate 3), as parents may abandon their nests with eggs or poorly flying small ones, located in the vicinity at a distance of up to 300 m from the construction site. Mitigation measures are needed. During the operation of the highway, the breeding/nesting habitats in the area of this option will be practically unfit. Given the relatively low rate of traffic, expected through the species habitats (no more than 7,000 vehicles per day by 2040 on the left roadway) and the relatively small area of affected habitats, combined with their suboptimal nature, the impact has been estimated to be insignificant.

Some disturbance may be expected during construction outside the nesting areas, yet given its temporary nature and the restricted territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the highway, it is possible that the trophical habitats in the vicinity of the road may become unsuitable for the species. Given the relatively low rate of traffic through the species habitats (expected to reach no more than 7,000 vehicles per day in the left roadway by 2040) and the relatively small area of affected trophical habitats, combined with the low sensitivity of the species to human presence in the hunting habitats, the impact has been estimated as insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. Affecting a nest of eggs or poorly flying small ones is unlikely due to the low number of breeding pairs and the sub-optimal nature of the habitats. However, if it happens, the impact might be significant (Rate 3). Mitigation measures are needed. Mortality, caused by disturbance has been considered before.

No mortality is expected during the operation of the highway, as the species is cautious enough to avoid moving vehicles. There will be no impact (rate 0).

Measures: (the same as for *Ciconia nigra*).

Long Tunnel Option, 'Kresna' tunnel

Direct destruction of habitats

Potential breeding habitats within the scope of this option are virtually unfit for the species, as it is sensitive to disturbance in the breeding area; such disturbance is also caused at the moment by the traffic of the first-class road and by the presence of people, south of the Kresna gorge.

During construction, 195.757 decares will be affected, or 0.4% of the trophical habitats of the species in the zone (habitat N09 and N12). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species is sensitive to disturbance in the nesting sites, therefore those, comprised within the scope of this option are virtually inappropriate for the species, due to the existing traffic on the first-class road and the strong presence of people south of Kresna.

Some disturbance may be expected during construction outside the nesting areas, yet given its temporary nature and the restricted territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the highway, it is possible that the trophical habitats in the vicinity of the road may become unsuitable for the species. Given the relatively small area of affected trophic habitats and their sub-optimal value, caused by the proximity of a residential area (Kresna), the impact has been assessed as insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. No breeding/nesting habitats would be affected, the small birds leave the nest as relatively good flyers. No mortality is expected during the operation of the highway, as the species is cautious enough to avoid moving vehicles. There will be no impact (rate 0).

Eastern Option G20

Direct destruction of habitats

704.982 acres will be affected during construction or 0.86% of the potential breeding habitats of the species in the area (habitats N16 and N17), although a large part of the forests in the area have a shrubby habitus and are not suitable for breeding. Given the sub-optimal nature of the habitats and the relatively small area affected, the impact has been assessed as insignificant (Rate 1).

During construction, 376.958 decares will be affected, or 0.76% of the trophical habitats of the species in the zone (habitat N09 and N12). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects considerably small parts of large polygons of habitats N16 and N17. In the majority of cases, the remaining intact part of these polygons will have sufficient area to perform its function of nesting habitat of the species, even more so that it is microhabitatly conditioned - the nests are made on older and bigger trees, also in groups of such trees. Given that and because of

the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

The road route in this option mainly affects small parts of large polygons of the species habitats N09 and N12. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species is highly sensitive to disturbance in the nesting habitats, therefore when construction activities commence, the impact during construction might be significant (Rate 3), as parents may abandon their nests with eggs or poorly flying small ones, located in the vicinity at a distance of up to 300 m from the construction site. Mitigation measures are needed. During the operation of the highway, the breeding/nesting habitats in the area of this option will be practically unfit. Despite the relatively high traffic (expected to reach more than 13,000 vehicles per day by 2040) and the relatively large area of affected nesting habitats, given the sub-optimal nature of the habitats, the impact on the species population in the zone has been assessed as insignificant (Rate 1).

Some disturbance may be expected during construction outside the nesting areas, yet given its temporary nature and the restricted territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the highway, it is possible that the trophical habitats in the vicinity of the road may become unsuitable for the species. Despite the relatively high traffic (expected to reach more than 13,000 vehicles per day by 2040) and respectively the relatively large area of affected trophical habitats, given the lower sensitivity of the species to human presence in the hunting habitats, the impact on the species population in the zone has been assessed as insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. Affecting a nest of eggs or poorly flying small ones is unlikely due to the low number of breeding pairs and the sub-optimal nature of the habitats. However, if it happens, the impact might be significant (Rate 3). Mitigation measures are needed. Mortality, caused by disturbance has been considered before.

No mortality is expected during the operation of the highway, as the species is cautious enough to avoid moving vehicles. There will be no impact (rate 0).

Measures: (the same as for *Ciconia nigra*).

13. The short-toed snake eagle (Circaetus gallicus)

Species Biology: It breeds in old scattered deciduous, less coniferous forests, near dry deserts, eroded slopes, pastures, meadows. The nest is located on trees, at height of 6-10 m. Incubated in the second half of May for 45-47 days. The young leave the nest at 70-75 days of age or in the first half of August. Migratory species. Spring migration is in March and the autumn migration from the beginning of August to the end of October. During passage, it is also found in open arable areas with single trees. It feeds mainly on snakes, lizards, frogs, and rarely with small mammals and insects (Simeonov et al. 1990).

Assessment of the species in the Protected Zone:

According to the standard form, 3 to 6 pairs are nesting. Also present during migrations. The potential nesting habitats of the species in the area are forests (habitats N16, N17 and N19 from the Zone Standard Form), with a total area of 82,234.5489 decares. The potential trophical habitats are grassland, bushes and arable land (habitats N08, N09 and N12 from the Zone Standard Form), with a total area of 136,274.395 decares.

Assessment of the species on territory of the Investment Proposal

Observed during field studies in the northern part of the Kresna Gorge - 1 species representatives during the breeding season. Forests should be considered as potential nesting habitats of the species on the territory of the IP, including coniferous forests (N16 and N17), although large portion of the forests in the area of the eastern options are scrubby and not suitable for nesting, and those in the area of the gorge near the existing road are unfit, as the species is sensitive to disturbance in the area of the nest.

The herbaceous and bushy sites and arable land (N08, N09 and N12) should be considered as potential trophical habitats of the species on the territory of the Investment Proposal.

Impacts:

Option G20 - Red

Direct destruction of habitats

Potential breeding habitats within the scope of this option are virtually unfit for the species, as it is highly sensitive to disturbance in the breeding area; such disturbance is also caused at the moment by the traffic of the first-class road and by the presence of people in the farmlands alongside the Kresna bypass.

During construction, 185.433 decares will be affected or 0.14% of the trophical habitats of the species in the zone (habitat N08, N09 and N12). Given the small area affected, the impact has been assessed as insignificant (Rate 1), which is practically even smaller, since the polygons near the existing road are unlikely to be used.

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08, N09 and N12. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species is highly sensitive to disturbance in the nesting habitats, therefore those, comprised within the scope of this option are virtually inappropriate for the species, due to the existing traffic on the first-class road and the presence of people in the agricultural lands along the Kresna bypass.

Some disturbance may be expected during construction outside the nesting areas, yet given its temporary nature and the restricted territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the highway, the impact on individual representatives of the species, feeding in the region of the investment Proposal region will not be different from the current, so the impact is considered insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. No breeding/nesting habitats would be affected, the small birds leave the nest as relatively good flyers. No mortality is expected during the operation of the highway, as the species is cautious enough to avoid moving vehicles. There will be no impact (rate 0).

Option G20 - Blue

Direct destruction of habitats

Potential breeding habitats within the scope of this option are virtually unfit for the species, as it is highly sensitive to disturbance in the breeding area; such disturbance is also caused at the moment by the traffic of the first-class road and by the presence of people in the farmlands alongside the Kresna bypass.

During construction, 173.237 decares will be affected, or 0.13% of the trophical habitats of the species in the zone (habitat N08, N09 and N12). Given the small area affected, the impact has been assessed as insignificant (Rate 1), which is practically even smaller, since the polygons near the existing road are unlikely to be used.

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08, N09 and N12. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact
(0).

Disturbance

The species is highly sensitive to disturbance in the nesting habitats, therefore
those, comprised within the scope of this option are virtually inappropriate for the species, due to the existing traffic on the first-class road and the presence of people in the agricultural lands along the Kresna bypass.

Some disturbance may be expected during construction outside the nesting areas, yet given its temporary nature and the restricted territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the highway, the impact on individual representatives of the species, feeding in the region of the investment Proposal region will not be different from the current, so the impact is considered insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. No breeding/nesting habitats would be affected, the small birds leave the nest as relatively good flyers. No mortality is expected during the operation of the highway, as the species is cautious enough to avoid moving vehicles. There will be no impact (rate 0).

Eastern Option G10.50

Direct destruction of habitats

237.085 acres will be affected during construction or 0.29% of the potential breeding habitats of the species in the area (habitats N16 and N17), although a large part of the forests in the area have a shrubby habitus and are not suitable for breeding. Given the small area affected and its sub-optimal nature, the impact has been estimated as insignificant (Rate 1).

During construction, 221.238 decares will be affected or 0.16% of the trophical habitats of the species in the zone (habitat N08, N09 and N12). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects considerably small parts of large polygons of habitats N16 and N17. In the majority of cases, the remaining intact part of these polygons will have sufficient area to perform its function of nesting habitat of the species, even more so that it is microhabitately conditioned - the nests are made on bigger trees and also in scattered forests. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

The road route in this option mainly affects comparatively small parts of large polygons of the species habitats N08, N09 and N12. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species is highly sensitive to disturbance in the nesting habitats, therefore when construction activities commence, the impact during construction might be significant (Rate 3), as parents may abandon their nests with eggs or poorly flying small ones, located in the vicinity at a distance of up to 300 m from the construction site. Mitigation measures are needed. During the operation of the highway, the breeding/nesting habitats in the area of this option will be practically unfit. Given the relatively low rate of traffic, expected through the species habitats (no more than 7,000 vehicles per day by 2040 on the left roadway) and the relatively small area of affected habitats, combined with their suboptimal nature, the impact has been estimated to be insignificant.

Some disturbance may be expected during construction outside the nesting areas, yet given its temporary nature and the restricted territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the highway, it is possible that the trophical habitats in the vicinity of the road may become unsuitable for the species. Given the relatively low rate of traffic through the species habitats (expected to reach no more than 7,000 vehicles per day in the left roadway by 2040) and the relatively small area of affected trophical habitats, combined with the low sensitivity of the species to human presence in the hunting habitats, the impact has been estimated as insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. Affecting a nest of eggs or poorly flying small ones is unlikely due to the low number of breeding pairs and the sub-optimal nature of the habitats. However, if it happens, the impact might be significant (Rate 3). Mitigation measures are needed. Mortality, caused by disturbance has been considered before.

No mortality is expected during the operation of the highway, as the species is cautious enough to avoid moving vehicles. There will be no impact (rate 0).

Measures: (the same as for *Ciconia nigra*).

Long Tunnel Option, 'Kresna' tunnel

Direct destruction of habitats

Potential breeding habitats within the scope of this option are virtually unfit for the species, as it is sensitive to disturbance in the breeding area; such disturbance is also caused at the moment by the traffic of the first-class road and by the presence of people, south of the Kresna gorge.

During construction, 214.556 decares will be affected or 0.16% of the trophical habitats of the species in the zone (habitat N08, N09 and N12). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08, N09 and N12. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species is highly sensitive to disturbance in the nesting habitats, therefore those, comprised within the scope of this option are virtually inappropriate for the species, due to the existing traffic on the first-class road and the strong presence of people south of Kresna.

Some disturbance may be expected during construction outside the nesting areas, yet given its temporary nature and the restricted territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the highway, it is possible that the trophical habitats in the vicinity of the road may become unsuitable for the species. Given the relatively small area of affected trophic habitats and their sub-optimal value, caused by the proximity of a residential area (Kresna), the impact has been assessed as insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. No breeding/nesting habitats would be affected, the small birds leave the nest as relatively good flyers. No mortality is expected during the operation of the highway, as the species is cautious enough to avoid moving vehicles. There will be no impact (rate 0).

Eastern Option G20

Direct destruction of habitats

704.982 acres will be affected during construction or 0.86% of the potential breeding habitats of the species in the area (habitats N16 and N17), although a large part of the forests in the area have a shrubby habitus and are not suitable for breeding. Given the sub-optimal nature of the habitats and the relatively small area affected, the impact has been assessed as insignificant (Rate 1).

During construction, 620.652 decares will be affected, or 0.46% of the trophical habitats of the species in the zone (habitat N08, N09 and N12). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects considerably small parts of large polygons of habitats N16 and N17. In the majority of cases, the remaining intact part of these polygons will have sufficient area to perform its function of nesting habitat of the species, even more so that it is microhabitately conditioned - the nests are made on bigger trees and also in scattered forests. Given that and because of

the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

The road route in this option mainly affects comparatively small parts of large polygons of the species habitats N08, N09 and N12. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species is highly sensitive to disturbance in the nesting habitats, therefore when construction activities commence, the impact during construction might be significant (Rate 3), as parents may abandon their nests with eggs or poorly flying small ones, located in the vicinity at a distance of up to 300 m from the construction site. Mitigation measures are needed. During the operation of the highway, the breeding/nesting habitats in the area of this option will be practically unfit. Despite the relatively high traffic (expected to reach more than 13,000 vehicles per day by 2040) and the relatively large area of affected nesting habitats, given the sub-optimal nature of the habitats, the impact on the species population in the zone has been assessed as insignificant (Rate 1).

Some disturbance may be expected during construction outside the nesting areas, yet given its temporary nature and the restricted territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the highway, it is possible that the trophical habitats in the vicinity of the road may become unsuitable for the species. Despite the relatively high traffic (expected to reach more than 13,000 vehicles per day by 2040) and respectively the relatively large area of affected trophical habitats, given the lower sensitivity of the species to human presence in the hunting habitats, the impact on the species population in the zone has been assessed as insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. Affecting a nest of eggs or poorly flying small ones is unlikely due to the low number of breeding pairs and the sub-optimal nature of the habitats. However, if it happens, the impact might be significant (Rate 3). Mitigation measures are needed. Mortality, caused by disturbance has been considered before.

No mortality is expected during the operation of the highway, as the species is cautious enough to avoid moving vehicles. There will be no impact (rate 0).

Measures: (the same as for *Ciconia nigra*).

14. The booted eagle (*Hieraaetus pennatus*)

Species Biology: Breeds in old deciduous and mixed forests, or preserved groups of old trees among younger forests in plains and mountains at approx. up to 1,400 m above sea level. It lays its eggs in late April - early May. Incubation lasts for 36-39 days. The young leave the nest at 45-55 days of age. Migratory species. Spring migration is in March-April and autumn - from the second half of August to the end of October. During migration, it is also found in open spaces with singles and groups of trees, riparian forests. It feeds on small and medium-sized birds and small mammals that it catches both in forests and in open places (Simeonov et al. 1990, Yankov 2007).

Assessment of the species in the Protected Zone:

According to the standard form for the Protected Zone, one couple nests in the zone. Also present during migrations. The potential nesting habitats of the species in the area are forests (habitats N16, N17 and N19 from the Zone Standard Form), with a total area of 82,234.5489 decares. The potential trophical habitats are grasslands, bushes, arable land and forests (habitats N08, N09, N12, N16, N17 and N19 from the Zone Standard Form), with a total area of 218,508.944 decares.

Assessment of the species on territory of the Investment Proposal

The species has not been observed during field studies. Forests should be considered as potential nesting habitats of the species on the territory of the IP, including coniferous forests (N16 and N17), although large portion of the forests in the area of the eastern options are scrubby and not suitable for nesting, and those in the area of the gorge near the existing road are unfit, as the species is sensitive to disturbance in the area of the nest.

The herbaceous and bushy sites, arable lands and forests, including coniferous forests N08, N09, N12, N16 and N17) should be considered as potential trophical habitats of the species on the territory of the Investment Proposal.

Impacts:

Option G20 - Red

Direct destruction of habitats

Potential breeding habitats within the scope of this option are virtually unfit for the species, as it is highly sensitive to disturbance in the breeding area; such disturbance is also caused at the moment by the traffic of the first-class road and by the presence of people in the farmlands alongside the Kresna bypass.

During construction, 344.813 decares will be affected or 0.16% of the habitats of the species in the zone (habitat N08, N09, N12, N16 and N17). Given the small area affected, the impact has been assessed as insignificant (Rate 1), which is practically even smaller, since the polygons near the existing road are unlikely to be used.

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08, N09, N12, N16 and N17. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species is highly sensitive to disturbance in the nesting habitats, therefore those, comprised within the scope of this option are virtually inappropriate for the species, due to the existing traffic on the first-class road and the presence of people in the agricultural lands along the Kresna bypass.

Some disturbance may be expected during construction outside the nesting areas, yet given its temporary nature and the restricted territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the highway, the impact on individual representatives of the species, feeding in the region of the investment Proposal region will not be different from the current, so the impact is considered insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. No breeding/nesting habitats would be affected, the small birds leave the nest as relatively good flyers. No mortality is expected during the operation of the highway, as the species is cautious enough to avoid moving vehicles. There will be no impact (rate 0).

Option G20 - Blue

Direct destruction of habitats

Potential breeding habitats within the scope of this option are virtually unfit for the species, as it is highly sensitive to disturbance in the breeding area; such disturbance is also caused at the moment by the traffic of the first-class road and by the presence of people in the farmlands alongside the Kresna bypass.

During construction, 377.377 decares will be affected or 0.17% of the habitats of the species in the zone (habitat N08, N09, N12, N16 and N17). Given the small area affected, the impact has been assessed as insignificant (Rate 1), which is practically even smaller, since the polygons near the existing road are unlikely to be used.

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08, N09, N12, N16 and N17. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species is highly sensitive to disturbance in the nesting habitats, therefore those, comprised within the scope of this option are virtually inappropriate for the species, due to the existing traffic on the first-class road and the presence of people in the agricultural lands along the Kresna bypass.

Some disturbance may be expected during construction outside the nesting areas, yet given its temporary nature and the restricted territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the highway, the impact on individual representatives of the species, feeding in the region of the investment Proposal region will not be different from the current, so the impact is considered insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. No breeding/nesting habitats would be affected, the small birds leave the nest as relatively good flyers. No mortality is expected during the operation of the highway, as the species is cautious enough to avoid moving vehicles. There will be no impact (rate 0).

Eastern Option G10.50

Direct destruction of habitats

237.085 acres will be affected during construction or 0.29% of the potential breeding habitats of the species in the area (habitats N16 and N17), although a large part of the forests in the area have a shrubby habitus and are not suitable for breeding. Given the small area affected and its sub-optimal nature, the impact has been estimated as insignificant (Rate 1).

During construction, 458.323 decares will be affected or 0.21% of the habitats of the species in the zone (habitat N08, N09, N12, N16 and N17). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects considerably small parts of large polygons of habitats N16 and N17. In the majority of cases, the remaining intact part of these polygons will have sufficient area to perform its function of nesting habitat of the species, even more so that it is microhabitately conditioned - the nests are made on older and bigger trees, also in groups of such trees. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

The road route under this option mainly affects considerably small parts of large polygons of habitats N08, N09, N12, N16 and N17. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species is highly sensitive to disturbance in the nesting habitats, therefore when construction activities commence, the impact during construction might be significant (Rate 3), as parents may abandon their nests with eggs or poorly flying small ones, located in the vicinity at a distance of up to 300 m from the construction site. Mitigation measures are needed. During the operation of the highway, the breeding/nesting habitats in the area of this option will be practically unfit. Given the relatively low rate of traffic, expected through the species habitats (no more than 7,000 vehicles per day by 2040 on the left roadway) and the relatively small area of affected habitats, combined with their suboptimal nature, the impact has been estimated to be insignificant.

Some disturbance may be expected during construction outside the nesting areas, yet given its temporary nature and the restricted territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the highway, it is possible that the trophical habitats in the vicinity of the road may become unsuitable for the species. Given the relatively low rate of traffic through the species habitats (expected to reach no more than 7,000 vehicles per day in the left roadway by 2040) and the relatively small area of affected trophical habitats, combined with the low sensitivity of the species to human presence in the hunting habitats, the impact has been estimated as insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. Affecting a nest of eggs or poorly flying small ones is unlikely due to the low number of breeding pairs and the sub-optimal nature of the habitats. However, if it happens, the impact might be significant (Rate 3). Mitigation measures are needed. Mortality, caused by disturbance has been considered before.

No mortality is expected during the operation of the highway, as the species is cautious enough to avoid moving vehicles. There will be no impact (rate 0).

Measures: (the same as for *Ciconia nigra*).

Long Tunnel Option, 'Kresna' tunnel

Direct destruction of habitats

Potential breeding habitats within the scope of this option are virtually unfit for the species, as it is sensitive to disturbance in the breeding area; such disturbance is also caused at the moment by the traffic of the first-class road and by the presence of people, south of the Kresna gorge.

During construction, 232.282 decares will be affected or 0.11% of the trophical habitats of the species in the zone (habitat N08, N09, N12 and N16). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08, N09, N12 and N16. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species is highly sensitive to disturbance in the nesting habitats, therefore those, comprised within the scope of this option are virtually inappropriate for the species, due to the existing traffic on the first-class road and the strong presence of people south of Kresna.

Some disturbance may be expected during construction outside the nesting areas, yet given its temporary nature and the restricted territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the highway, it is possible that the trophical habitats in the vicinity of the road may become unsuitable for the species. Given the relatively small area of affected trophic habitats and their sub-optimal value, caused by the proximity of a residential area (Kresna), the impact has been assessed as insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. No breeding/nesting habitats would be affected, the small birds leave the nest as relatively good flyers. No mortality is expected during the operation of the highway, as the species is cautious enough to avoid moving vehicles. There will be no impact (rate 0).

Eastern Option G20

Direct destruction of habitats

704.982 acres will be affected during construction or 0.86% of the potential breeding habitats of the species in the area (habitats N16 and N17), although a large part of the forests in the area have a shrubby habitus and are not suitable for breeding. Given the sub-optimal nature of the habitats and the relatively small area affected, the impact has been assessed as insignificant (Rate 1).

1,325.634 decares will be affected during construction or 0.15% of the habitats of the species in the zone (habitat N08, N09, N12, N16 and N17). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects considerably small parts of large polygons of habitats N16 and N17. In the majority of cases, the remaining intact part of these polygons will have sufficient area to perform its function of nesting habitat of the species, even more so that it is microhabitately conditioned - the nests are made on older and bigger trees, also in groups of such trees. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

The road route under this option mainly affects considerably small parts of large polygons of habitats N08, N09, N12, N16 and N17. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species is sensitive to disturbance in the nesting habitats therefore the impact during construction might be significant (Rate 3), as parents may abandon their nests with eggs or poorly flying small ones, located in the vicinity at a distance of up to 300 m from the construction site. Mitigation measures are needed. During the operation of the highway, the breeding/nesting habitats in the area of this option will be practically unfit. Despite the relatively high traffic (expected to reach more than 13,000 vehicles per day by 2040) and the relatively large area of affected nesting habitats, given the sub-optimal nature of the habitats, the impact on the species population in the zone has been assessed as insignificant (Rate 1).

Some disturbance may be expected during construction outside the nesting areas, yet given its temporary nature and the restricted territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the highway, it is possible that the trophical habitats in the vicinity of the road may become unsuitable for the species. Despite the relatively high traffic (expected to reach more than 13,000 vehicles per day by 2040) and respectively the relatively large area of affected trophical habitats, given the lower sensitivity of the species to human presence in the hunting habitats, the impact on the species population in the zone has been assessed as insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. Affecting a nest of eggs or poorly flying small ones is unlikely due to the low number of breeding pairs and the sub-optimal nature of the habitats. However, if it happens, the impact might be significant (Rate 3). Mitigation measures are needed. Mortality, caused by disturbance has been considered before.

No mortality is expected during the operation of the highway, as the species is cautious enough to avoid moving vehicles. There will be no impact (rate 0).

Measures: (the same as for *Ciconia nigra*).

15. The red kite *(Milvus milvus*)

Species Biology: Permanent and passing species. Mainly encountered during migration or as a wintering species, mainly single birds. Nests on trees with

12-15 m high, on the outskirts of deciduous forests in the plains, near open spaces - grassy and bushy areas, arable fields, wetlands up to about 1,200 m altitude in which they are looking for food. It feeds on invertebrate and vertebrate animals, including carrion, mainly on amphibians, reptiles, rodents (BirdLife International 2016c, Golemanski 2011).

Assessment of the species in the Protected Zone:

According to the standard form of the protected zone, 1 - 2 representatives of the species pass through the zone during migration. The species has been included as a subject of conservation in the zone recently, probably as a result of its detection in the monitoring of reintroduced Griffon Vultures, with one representative of the species (November 2012) visiting the feeding site (Peshev et al. 2015). The potential trophical habitats are grassland, bushes and arable land (habitats N08, N09 and N12 from the Zone Standard Form), with a total area of 136,274.395 decares.

Assessment of the species on territory of the Investment Proposal

The species was not observed in the IP area during field studies. The herbaceous and bushy sites and arable land (N08, N09 and N12) should be considered as potential trophical habitats of the species on the territory of the Investment Proposal.

Impacts:

Option G20 - Red

Direct destruction of habitats

During construction, 185.433 decares will be affected or 0.14% of the trophical habitats of the species in the zone (habitat N08, N09 and N12). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08, N09 and N12. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact
(0).

Disturbance

The species does not nest in the zone. Outside the nesting site, disturbance is expected during construction works, yet given its temporary nature and restricted territory (only around the construction site, the impact will be insignificant (Rate 1). During the operation of the highway, the impact on individual representatives of the species, feeding in the region of the investment Proposal region will not be different from the current, moreover that the species is not sensitive to disturbance from passing vehicles (see below), so the impact is considered insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. The species does not nest in the area, so there will be no endangered small birds or eggs. During operation, however, it is possible to kill individual representatives of the species in collisions with the vehicles, since the species is attracted to the carcasses of the run down animals (Evans et al. 1999, Viñuela
1997). Since the migratory population in the area depends on species populations in other parts of the species scope, no changes in the number of species population is expected. Also protective

safety grids will not allow mortality of larger animals, and the present feedground will reduce the "attractiveness" of smaller ones. Therefore, the impact is considered insignificant (Rate 1).

Option G20 - Blue

Direct destruction of habitats

During construction, 173.237 decares will be affected, or 0.13% of the trophical habitats of the species in the zone (habitat N08, N09 and N12). Given the small area affected, the impact has been assessed as insignificant (Rate 1), which is practically even smaller, since the polygons near the existing road are unlikely to be used.

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08, N09 and N12. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species does not nest in the zone. Outside the nesting site, disturbance is expected during construction works, yet given its temporary nature and restricted territory (only around the construction site, the impact will be insignificant (Rate 1). During the operation of the highway, the impact on individual representatives of the species, feeding in the region of the investment Proposal region will not be different from the current, moreover that the species is not sensitive to disturbance from passing vehicles, so the impact is considered insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. The species does not nest in the area, so there will be no endangered small birds or eggs. During operation, however, it is possible to kill individual representatives of the species in collisions with the vehicles, since the species is attracted to the carcasses of the run down animals. Since the migratory population in the area depends on species populations in other parts of the species scope, no changes in the number of species population is expected. In addition, safety grids will not allow mortality of larger animals, and the present feedground will reduce the "attractiveness" of smaller ones. Therefore, the impact is considered insignificant (Rate 1).

Eastern Option G10.50

Direct destruction of habitats

During construction, 221.238 decares will be affected, or 0.16% of the trophical habitats of the species in the zone (habitat N08, N09 and N12). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route in this option mainly affects comparatively small parts of large polygons of the species habitats N08, N09 and N12. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species does not nest in the zone. Some disturbance may be expected during construction outside the nesting areas, yet given its temporary nature and the restricted territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the highway, the impact on individual representatives of the species, feeding in the region of the investment Proposal region will not be different from the current, moreover that the species is not sensitive to disturbance from passing vehicles, so the impact is considered insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. The species does not nest in the area, so there will be no endangered small birds or eggs. During operation, however, it is possible to kill individual representatives of the species in collisions with the vehicles, since the species is attracted to the carcasses of the run down animals. Since the migratory population in the area depends on species populations in other parts of the species scope, no changes in the number of species population is expected. In addition, safety grids will not allow mortality of larger animals, and the present feedground will reduce
the "attractiveness" of smaller ones. Therefore, the impact is considered insignificant (Rate 1).

Long Tunnel Option, 'Kresna' tunnel

Direct destruction of habitats

214.556 decares will be affected during construction or 0.16% of the trophical habitats of the species in the zone (habitat N08, N09 and N12). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08, N09 and N12. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact
(0).

Disturbance

The species does not nest in the zone. Outside the nesting site, disturbance is expected during construction works, yet given its temporary nature and restricted territory (only around the construction site, the impact will be insignificant (Rate 1). During the operation of the highway, the impact on individual representatives of the species, feeding in the region of the investment Proposal region will not be different from the current, moreover that the species is not sensitive to disturbance from passing vehicles, so the impact is considered insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. The species does not nest in the area, so there will be no endangered small birds or eggs. During operation, however, it is possible to kill individual representatives of the species in collisions with the vehicles, since the species is attracted to the carcasses of the run down animals. Since the migratory population in the area depends on species populations in other parts of the species scope, no changes in the number of species population is expected. In addition, safety grids will not allow mortality of larger animals, and the present feedground will reduce
the "attractiveness" of smaller ones. Therefore, the impact is considered insignificant (Rate 1).

Eastern Option G20

Direct destruction of habitats

620.652 decares will be affected during construction or 0.46% of the trophical habitats of the species in the zone (habitat N08, N09 and N12). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route in this option mainly affects comparatively small parts of large polygons of the species habitats N08, N09 and N12. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species does not nest in the zone. Some disturbance may be expected during construction outside the nesting areas, yet given its temporary nature and the restricted territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the highway, the impact on individual representatives of the species, feeding in the region of the investment Proposal region will not be different from the current, moreover that the species is not sensitive to disturbance from passing vehicles, so the impact is considered insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. The species does not nest in the area, so there will be no endangered small birds or eggs. During operation, however, it is possible to kill individual representatives of the species in collisions with the vehicles, since the species is attracted to the carcasses of the run down animals. Since the migratory population in the area depends on species populations in other parts of the species scope, no changes in the number of species population is expected. In addition, safety grids will not allow mortality of larger animals, and the present feedground will reduce the "attractiveness" of smaller ones. Therefore, the impact is considered insignificant (Rate 1).

16. The western marsh harrier (*Circus aeruginosus*)

Species Biology: Nesting and migratory, passing and wintering species. Spring migration is in March and the autumn migration from the beginning of August to the end of October. It inhabits marshes, lakes and estuaries of rivers with dense vegetation of reed and cane. During migration and wintering, there are various natural and artificial wetlands, meadows, arable land in the lower parts of the country. It feeds on waterfowl (waterfowl, ducks, the little ringed plover (Charadrius dubiu), small mammals, frogs, water snakes (Jonsson 2006, Golemanski 2011, Simeonov et al. 1990, personal observations).

Assessment of the species in the Protected Zone:

According to the standard form of the PZ, the species is presented in it only during the bird passage. There are no trophical habitats in the area - grassy habitats and arable land are too dry for the species.

Assessment of the species on territory of the Investment Proposal

The species was observed during field studies in the Kresna region during a transit - passage over the gorge, at high altitudes. The area does not provide suitable trophic habitats for the species - herbaceous habitats and arable land are too dry.

Impacts:

Option G20 - Red

Direct destruction of habitats

The road route under this option does not affect habitats of the species. No impact (Rate 0).

Fragmentation of habitats

The road route under this option does not affect habitats of the species. No impact (Rate 0).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. Additionally, the species occurs in the zone during migration by flying sufficiently high. No impact (Rate 0).

Disturbance

The road route under this option does not pass near habitats of the species. Additionally, the species occurs in the zone during migration by flying sufficiently high. No impact (Rate 0).

Mortality

The road route under this option does not pass near habitats of the species. Additionally, the species occurs in the zone during migration by flying sufficiently high. No impact (Rate 0).

Option G20 - Blue

Direct destruction of habitats

The road route under this option does not affect habitats of the species. No impact (Rate 0).

Fragmentation of habitats

The road route under this option does not affect habitats of the species. No impact (Rate 0).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. Additionally, the species occurs in the zone during migration by flying sufficiently high. No impact (Rate 0).

Disturbance

The road route under this option does not pass near habitats of the species. Additionally, the species occurs in the zone during migration by flying sufficiently high. No impact (Rate 0).

Mortality

The road route under this option does not pass near habitats of the species. Additionally, the species occurs in the zone during migration by flying sufficiently high. No impact (Rate 0).

Eastern Option G10.50

Direct destruction of habitats

The road route under this option does not affect habitats of the species. No impact (Rate 0).

Fragmentation of habitats

The road route under this option does not affect habitats of the species. No impact (Rate 0).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. Additionally, the species occurs in the zone during migration by flying sufficiently high. No impact (Rate 0).

Disturbance

The road route under this option does not pass near habitats of the species. Additionally, the species occurs in the zone during migration by flying sufficiently high. No impact (Rate 0).

Mortality

The road route under this option does not pass near habitats of the species. Additionally, the species occurs in the zone during migration by flying sufficiently high. No impact (Rate 0).

Long Tunnel Option, 'Kresna' tunnel

Direct destruction of habitats

The road route under this option does not affect habitats of the species. No impact (Rate 0).

Fragmentation of habitats

The road route under this option does not affect habitats of the species. No impact (Rate 0).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. Additionally, the species occurs in the zone during migration by flying sufficiently high. There will be no impact (Rate 0).

Disturbance

The road route under this option does not pass near habitats of the species. Additionally, the species occurs in the zone during migration by flying sufficiently high. There will be no impact (Rate 0).

Mortality

The road route under this option does not pass near habitats of the species. Additionally, the species occurs in the zone during migration by flying sufficiently high. There will be no impact (Rate 0).

Eastern Option G20

Direct destruction of habitats

The road route under this option does not affect habitats of the species. There will be no impact (Rate 0).

Fragmentation of habitats

The road route under this option does not affect habitats of the species. There will be no impact (Rate 0).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. Additionally, the species occurs in the zone during migration by flying sufficiently high. There will be no impact (Rate 0).

Disturbance

The road route under this option does not pass near habitats of the species. Additionally, the species occurs in the zone during migration by flying sufficiently high. There will be no impact (Rate 0).

Mortality

The road route under this option does not pass near habitats of the species. Additionally, the species occurs in the zone during migration by flying sufficiently high. There will be no impact (Rate 0).

17. The Common buzzard (*Buteo buteo*)

Species Biology: A permanent and migratory species, common for the entire country. It breeds in deciduous, mixed and coniferous forests with meadows, on their outskirts, in open spaces with groups or even with single trees. The nest is on a tree, usually at an altitude of 6 - 20 m, but sometimes much lower. The eggs are laid in May. Brooding/incubation lasts for 28 to 33 days. The young leave the nests at 40-49 days of age. It feeds mostly on small rodents (mice, quails, plums), less with birds, rarely with reptiles, amphibians and invertebrates, which hunts most commonly on arable land, but also on a variety of herbaceous and bush habitats, reed beds, etc. (Simeonov et al. 1990, Yankov 2007, personal notes).

Assessment of the species in the Protected Zone:

According to the standard form, the PZ has a permanent residence of 7 to 15 pairs. Potential breeding habitats of the species in the zone are practically any territory because its breeding is micro-habitually conditioned, and it is sufficient to have one tree in order for the species to breed. The potential trophical habitats are grassland, bushes and arable land, including vineyards and orchards (habitats N08, N09, N12, N15 and N21 from the Zone Standard Form), with a total area of
145,672.629 decares.

Assessment of the species on territory of the Investment Proposal

Observed during field studies ubiquitously in the area of all options. Potential breeding habitats of the species in the area are practically any territory because its breeding is micro-habitually conditioned, and it is sufficient to have one tree in order for the species to breed.

The herbaceous and bushy sites, arable lands, including vineyards and orchards (habitats N08, N09, N12, N15 and N21) should be considered as potential trophical habitats of the species on the territory of the Investment Proposal.

Impacts:

Option G20 - Red

Direct destruction of habitats

Potential breeding habitats of the species in the area are practically any territory because its breeding is micro-habitually conditioned, and it is sufficient to have one tree in order for the species to breed. Therefore, the impact on them will be insignificant (Rate 1).

231.065 decares will be affected during construction or 0.16% of the trophical habitats of the species in the zone (habitat N08, N09, N12, N15 and N21). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

Potential breeding habitats of the species in the area are practically any territory because its breeding is micro-habitually conditioned, and it is sufficient to have one tree in order for the species to breed. Therefore no fragmentation of breeding habitats will actually occur (Rate 0).

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08, N09, N12, N15 and N17. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact
(0).

Disturbance

The species has low sensitivity to disturbance, even in nesting habitats
(personal observations), therefore the impact during construction and operation is assessed as insignificant (Rate 1). Outside the nesting site, there will practically be no disturbance (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. Given the high number and adaptavity of the species, the impact on the population in the area would be insignificant (Rate1).

Mortality during the operation of the highway is also possible because the species are not disturbed by moving vehicles (Kambourova-Ivanova et al. 2012, personal observation), and regularly feeds close to roads of heavy traffic during the migration and wintering. The impact on the population in the area will be insignificant (Rate 1) due to its relatively high population size and adaptability, as well as the fact that the migratory population in the area, exposed to higher risk is dependent on populations in other parts of the species scope.

Option G20 - Blue

Direct destruction of habitats

Potential breeding habitats of the species in the area are practically any territory because its breeding is micro-habitually conditioned, and it is sufficient to have one tree in order for the species to breed. Therefore, the impact on them will be insignificant (Rate 1).

181.844 decares will be affected during construction or 0.12% of the habitats of the species in the zone (habitat N08, N09, N12, N15 and N21). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

Potential breeding habitats of the species in the area are practically any territory because its breeding is micro-habitually conditioned, and it is sufficient to have one tree in order for the species to breed. Therefore no fragmentation of breeding habitats will actually occur (Rate 0).

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08, N09, N12, N15 and N17. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species has low sensitivity to disturbance, even in nests habitats, therefore the impact during construction and operation is assessed as insignificant (Rate 1). Outside the nesting site, there will practically be no disturbance (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. Given the high number and adaptavity of the species, the impact on the population in the area would be insignificant (Rate1).

Mortality during the operation of the highway is also possible because the species are not disturbed by moving vehicles and regularly feeds close to roads with heavy traffic during migration and hibernation. The impact on the population in the area will be insignificant (Rate 1) due to its relatively high population size and adaptability, as well as the fact that the migratory population in the area, exposed to higher risk is dependent on populations in other parts of the species scope.

Eastern Option G10.50

Direct destruction of habitats

Potential breeding habitats of the species in the area are practically any territory because its breeding is micro-habitually conditioned, and it is sufficient to have one tree in order for the species to breed. Therefore, the impact on them will be insignificant (Rate 1).

257.139 decares will be affected during construction or 0.18% of the habitats of the species in the zone (habitat N08, N09, N12, N15 and N21). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

Potential breeding habitats of the species in the area are practically any territory because its breeding is micro-habitually conditioned, and it is sufficient to have one tree in order for the species to breed. Therefore no fragmentation of breeding habitats will actually occur (Rate 0).

The road route under this option mainly affects considerably small parts of large polygons of habitats N08, N09, N12, N15 and N21. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact
(0).

Disturbance

The species has low sensitivity to disturbance, even in nests
habitats, therefore the impact during construction and operation is assessed as insignificant (Rate 1). Outside the nesting site, there will practically be no disturbance (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. Given the high number and adaptavity of the species, the impact on the population in the area would be insignificant (Rate1).

Mortality during the operation of the highway is also possible because the species are not disturbed by moving vehicles and regularly feeds close to roads with heavy traffic during migration and hibernation. The impact on the population in the area will be insignificant (Rate 1) due to its relatively high population size and adaptability, as well as the fact that the migratory population in the area, exposed to higher risk is dependent on populations in other parts of the species scope.

Long Tunnel Option, 'Kresna' tunnel

Direct destruction of habitats

Potential breeding habitats of the species in the area are practically any territory because its breeding is micro-habitually conditioned, and it is sufficient to have one tree in order for the species to breed. Therefore, the impact on them will be insignificant (Rate 1).

227.087 decares will be affected during construction or 0.16% of the trophical habitats of the species in the zone (habitat N08, N09, N12 and N21). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

Potential breeding habitats of the species in the area are practically any territory because its breeding is micro-habitually conditioned, and it is sufficient to have one tree in order for the species to breed. Therefore no fragmentation of breeding habitats will actually occur (Rate 0).

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08, N09, N12 and N21. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact
(0).

Disturbance

The species has low sensitivity to disturbance, even in nests
habitats, therefore the impact during construction and operation is assessed as insignificant (Rate 1). Outside the nesting site, there will practically be no disturbance (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. Given the high number and adaptavity of the species, the impact on the population in the area would be insignificant (Rate1).

Mortality during the operation of the highway is also possible because the species are not disturbed by moving vehicles and regularly feeds close to roads with heavy traffic during migration and hibernation. The impact on the population in the area will be insignificant (Rate 1) due to its relatively high population size and adaptability, as well as the fact that the migratory population in the area, exposed to higher risk is dependent on populations in other parts of the species scope.option

Eastern Option G20

Direct destruction of habitats

Potential breeding habitats of the species in the area are practically any territory because its breeding is micro-habitually conditioned, and it is sufficient to have one tree in order for the species to breed. Therefore, the impact on them will be insignificant (Rate 1).

645.280 decares will be affected during construction or 0.44% of the trophical habitats of the species in the zone (habitat N08, N09, N12 and N21). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

Potential breeding habitats of the species in the area are practically any territory because its breeding is micro-habitually conditioned, and it is sufficient to have one tree in order for the species to breed. Therefore no fragmentation of breeding habitats will actually occur (Rate 0).

The road route under this option mainly affects considerably small parts of large polygons of habitats N08, N09, N12 and N21. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species has low sensitivity to disturbance, even in nesting habitats, therefore the impact during construction and operation is assessed as insignificant (Rate 1). Outside the nesting site, there will practically be no disturbance (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. Given the high number and adaptability of the species, the impact on the population in the area would be insignificant (Rate1).

Mortality during the operation of the highway is also possible because the species are not disturbed by moving vehicles and regularly feeds close to roads with heavy traffic during migration and hibernation. The impact on the population in the area will be insignificant (Rate 1) due to its relatively high population size and adaptability, as well as the fact that the migratory population in the area, exposed to higher risk is dependent on populations in other parts of the species scope.

18. The long-legged buzzard (*Buteo rufinus*)

Species Biology: The species is permanent and migrating in Bulgaria. It nests predominantly on

rocks in gorges, couloirs, defiles and other rocky terrain, among deforested mountains skirts, hilly areas and open dry fields. It lays its eggs in late March, early April. The little ones leave the nest late in July. The spring migration is from mid-March to early April and the autumn migration - from early August to end of October. It feeds on small mammals, birds, snakes, lizards, frogs (Simeonov et al. 1990, Yankov 2007).

Assessment of the species in the Protected Zone:

According to the standard form, the PZ has a permanent residence of 7 to 15 pairs. Nesting habitats are in the higher and inaccessible rocks in the zone (habitat N22 of the Standard Area Form), with a total area of 1,174.779 decares. The potential trophical

The potential trophical habitats are grassland and bushes (habitats N08 and N09 from the Zone Standard Form), with a total area of 108,079.693 decares.

Assessment of the species on territory of the Investment Proposal

The species has not been observed during field studies. The higher and inaccessible rocks (habitat N22) should be considered as potential breeding habitats of the species in the area of the investment proposal and as potential trophical

habitats - the more distant grassy sites and shrubs (habitat N08 and N09).

Impacts:

Option G20 - Red

Direct destruction of habitats

Potential breeding habitats within the scope of this option are virtually unfit for the species, as it is highly sensitive to disturbance in the breeding area; such disturbance is also caused at the moment by the traffic of the first-class road.

During construction, 166.411 decares will be affected, or 0.15% of the habitats of the species in the zone (habitat N06 and N09). Given the small area affected, the impact has been assessed as insignificant (Rate 1), which is practically even smaller, since the polygons near the existing road are unlikely to be used.

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08 and N09. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species is highly sensitive to disturbance in the nesting habitats, therefore those, comprised within the scope of this option are virtually unfit for the species, due to the existing traffic on the first-class road.

Some disturbance may be expected during construction outside the nesting areas, yet given its temporary nature and the restricted territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the highway, the impact on individual representatives of the species, feeding in the region of the investment Proposal region will not be different from the current, so the impact is considered insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. No breeding/nesting habitats would be affected, the small birds leave the nest as relatively good flyers. No mortality is expected during the operation of the highway, as the species is cautious enough to avoid moving vehicles. There will be no impact (rate 0).

Option G20 - Blue

Direct destruction of habitats

Potential breeding habitats within the scope of this option are virtually unfit for the species, as it is highly sensitive to disturbance in the breeding area; such disturbance is also caused at the moment by the traffic of the first-class road.

During construction, 157.591 decares will be affected, or 0.15% of the trophical habitats of the species in the zone (habitat N08 and N09). The impact on them has been assessed as insignificant (Rate 1), given the small area affected; it is practically even smaller since the polygons near the existing road are unlikely to be used.

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08 and N09. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of

directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species is highly sensitive to disturbance in the nesting habitats, therefore those, comprised within the scope of this option are virtually unfit for the species, due to the existing traffic on the first-class road.

Some disturbance may be expected during construction outside the nesting areas, yet given its temporary nature and the restricted territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the highway, the impact on individual representatives of the species, feeding in the region of the investment Proposal region will not be different from the current, so the impact is considered insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. No breeding/nesting habitats would be affected, the small birds leave the nest as relatively good flyers. No mortality is expected during the operation of the highway, as the species is cautious enough to avoid moving vehicles. There will be no impact (rate 0).

Eastern Option G10.50

Direct destruction of habitats

The road route in this option does not affect the N22 habitat. 201.341 decares will be affected during construction, or 0.19% of the habitats of the species in the zone (habitat N08 and N09). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route in this option does not affect the N22 habitat. The road route under this option mainly affects considerably small parts of large polygons of habitats N08 and N09. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact

(Rate 0).

Disturbance

The potential nesting habitats are far enough from the road route in this option, to avoid any disturbance (Rate 0), during construction and during operation.

Some disturbance may be expected during construction outside the nesting areas, yet given its temporary nature and the restricted territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the highway, it is possible that the trophical habitats in the vicinity of the road may become unsuitable for the species. The impact on them has been assessed as insignificant (Rate 1), given the low rate of traffic, expected through the species habitats (no more than 7,000 vehicles per day by 2040 on the left roadway) and the relatively small area of affected habitats, combined with their suboptimal nature, the impact has been estimated to be insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and

heavy construction machinery. No breeding/nesting habitats would be affected, the small birds leave the nest as relatively good flyers. No mortality is expected during the operation of the highway, as the species is cautious enough to avoid moving vehicles. There will be no impact (Rate 0).

The Long Tunnel Option, 'Kresna' tunnel

Direct destruction of habitats

The road route in this option does not affect the N22 habitat. During construction, 175.237 decares will be affected, or 0.16% of the habitats of the species in the zone (habitat N08 and N09). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route in this option does not affect the N22 habitat. The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08 and N09. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The potential nesting habitats are far enough from the road route in this option, to avoid any disturbance (Rate 0), during construction and during operation.

Some disturbance may be expected during construction outside the nesting areas, yet given its temporary nature and the restricted territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the highway, it is possible that the trophical habitats in the vicinity of the road may become unsuitable for the species. Given the relatively small area of affected trophic habitats and their sub-optimal value, caused by the proximity of a residential area (Kresna), the impact has been assessed as insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. No breeding/nesting habitats would be affected, the small birds leave the nest as relatively good flyers. No mortality is expected during the operation of the highway, as the species is cautious enough to avoid moving vehicles. There will be no impact (Rate 0).

Eastern Option G20

Direct destruction of habitats

The road route in this option does not affect the N22 habitat. During construction, 601.635 decares will be affected, or 0.56% of the habitats of the species in the zone (habitat N08 and N09). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route in this option does not affect the N22 habitat. The road route under this option mainly affects considerably small parts of large polygons of habitats N08 and N09. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The potential nesting habitats are far enough from the road route in this option, to avoid any disturbance (Rate 0), during construction and during operation.

Some disturbance may be expected during construction outside the nesting areas, yet given its temporary nature and the restricted territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the highway, it is possible that the trophical habitats in the vicinity of the road may become unsuitable for the species. Despite the relatively high traffic (expected to be not less than 13,000 vehicle per day by 2040), given the relatively small area of directly affected trophic habitats, the impact has been assessed as insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. No breeding/nesting habitats would be affected, the small birds leave the nest as relatively good flyers. No mortality is expected during the operation of the highway, as the species is cautious enough to avoid moving vehicles. There will be no impact (rate 0).

19. The European honey buzzard(*Pernis apivorus*)

Species Biology:

It breeds in extensive forests, mostly beech, streaked with meadows or near meadows and pastures, in plains and mountains at about 1,600 – 1,700 m above sea level The nests are on 4 - 25 m tall trees. The eggs are laid in May. Brooding/incubation lasts for 28 - 37 days. The young leave the nest at 40-45 days of age but become self-sufficient at 75-100 days of age. A migratory and passing species. Spring migration is from mid-March to early April and in autumn - from early August to end of October. During the migration it is also found in open spaces with small forests and trees. It feeds on stinging insects, their eggs and larvae, caterpillars, large beetles, rarely with frogs, small birds and rodents (Golemanski 2011, Simeonov et al. 1990).

Assessment of the species in the Protected Zone:

According to the standard form, 4 to 6 pairs are nesting in the protected zone. Also present during migrations. The potential nesting habitats of the species in the area are forests (habitats N16, N17 and N19 from the Zone Standard Form), with a total area of 82,234.5489 decares. The potential trophical habitats are grassland, bushes and agricultural lands (habitats N08, N09 and N12 from the Zone Standard Form), with a total area of 136,274.395 decares.

Assessment of the species on territory of the Investment Proposal

The species has been observed during the field studies south of Kresna. As potential breeding habitats of the species in the area of the Investment Proposal, forests should be considered, incl. coniferous forests (N16 and N17), although much of the forests in the area of

the eastern options have shrubby habitus and are not suitable for breeding, and those in the area of the gorge, near the existing road are inappropriate because the species is sensitive to disturbance in the area of the nest.

The herbaceous and bushy sites and agricultural lands (N08, N09 and N12) should be considered as potential trophical habitats of the species on the territory of the Investment Proposal.

Impacts:

Option G20 - Red

Direct destruction of habitats

Potential breeding habitats within the scope of this option are virtually unfit for the species, as it is highly sensitive to disturbance in the breeding area; such disturbance is also caused at the moment by the traffic of the first-class road and by the presence of people in the farmlands alongside the Kresna bypass.

During construction, 185.433 decares will be affected or 0.14% of the trophical habitats of the species in the zone (habitat N08, N09 and N12). Given the small area affected, the impact has been assessed as insignificant (Rate 1), which is practically even smaller, since the polygons near the existing road are unlikely to be used.

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08, N09 and N12. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species is highly sensitive to disturbance in the nesting habitats, therefore those, comprised within the scope of this option are virtually inappropriate for the species, due to the existing traffic on the first-class road and the presence of people in the agricultural lands along the Kresna bypass.

Some disturbance may be expected during construction outside the nesting areas, yet given its temporary nature and the restricted territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the highway, the impact on individual representatives of the species, feeding in the region of the investment Proposal region will not be different from the current, so the impact is considered insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. No breeding/nesting habitats would be affected, the small birds leave the nest as relatively good flyers. No mortality is expected during the operation of the highway, as the species is cautious enough to avoid moving vehicles. There will be no impact (Rate 0).

Option G20 - Blue

Direct destruction of habitats

Potential breeding habitats within the scope of this option are virtually unfit for the species, as it is highly sensitive to disturbance in the breeding area; such disturbance is also caused at the moment by the traffic of the first-class road and by the presence of people in the farmlands alongside the Kresna bypass.

During construction, 173.237 decares will be affected, or 0.13% of the trophical habitats of the species in the zone (habitat N08, N09 and N12). The impact has been

assessed as insignificant (Rate 1), which is practically even smaller, since the polygons near the existing road are unlikely to be used.

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08, N09 and N12. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species is highly sensitive to disturbance in the nesting habitats, therefore those, comprised within the scope of this option are virtually inappropriate for the species, due to the existing traffic on the first-class road and the presence of people in the agricultural lands along the Kresna bypass.

Some disturbance may be expected during construction outside the nesting areas, yet given its temporary nature and the restricted territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the highway, the impact on individual representatives of the species, feeding in the region of the investment Proposal region will not be different from the current, so the impact is considered insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. No breeding/nesting habitats would be affected, the small birds leave the nest as relatively good flyers. No mortality is expected during the operation of the highway, as the species is cautious enough to avoid moving vehicles. There will be no impact (rate 0).

Eastern Option G10.50

Direct destruction of habitats

237.085 acres will be affected during construction or 0.29% of the potential breeding habitats of the species in the area (habitats N16 and N17), although a large part of the forests in the area have a shrubby habitus and are not suitable for breeding. Given the small area affected and its sub-optimal nature, the impact has been estimated as insignificant (Rate 1).

During construction, 221.238 decares will be affected or 0.16% of the trophical habitats of the species in the zone (habitat N08, N09 and N12). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects considerably small parts of large polygons of habitats N16 and N17. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a nesting habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

The road route in this option mainly affects comparatively small parts of large polygons of the species habitats N08, N09 and N12. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species is highly sensitive to disturbance in the nesting habitats, therefore, when construction activities commence, the impact during construction might be significant (Rate 3), as parents may abandon their nests with eggs or poorly flying small ones, located in the vicinity at a distance of up to 300 m from the construction site. Mitigation measures are needed. During the operation of the highway, the breeding/nesting habitats in the area of this option will be practically unfit. Given the relatively low rate of traffic, expected through the species habitats (no more than 7,000 vehicles per day by 2040 on the left roadway) and the relatively small area of affected habitats, combined with their suboptimal nature, the impact has been estimated to be insignificant.

Some disturbance may be expected during construction outside the nesting areas, yet given its temporary nature and the restricted territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the highway, it is possible that the trophical habitats in the vicinity of the road may become unsuitable for the species. Given the relatively low rate of traffic through the species habitats (expected to reach no more than 7,000 vehicles per day in the left roadway by 2040) and the relatively small area of affected trophical habitats, combined with the low sensitivity of the species to human presence in the hunting habitats, the impact has been estimated as insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. Affecting a nest of eggs or poorly flying small ones is unlikely due to the low number of breeding pairs and the sub-optimal nature of the habitats. However, if it happens, the impact might be significant (Rate 3). Mitigation measures are needed. Mortality, caused by disturbance has been considered before.

No mortality is expected during the operation of the highway, as the species is cautious enough to avoid moving vehicles. There will be no impact (rate 0).

Measures: (the same as for *Ciconia nigra*).

Long Tunnel Option, 'Kresna' tunnel

Direct destruction of habitats

Potential breeding habitats within the scope of this option are virtually unfit for the species, as it is sensitive to disturbance in the breeding area; such disturbance is also caused at the moment by the traffic of the first-class road and by the presence of people, south of the Kresna gorge.

During construction, 214.556 decares will be affected or 0.16% of the trophical habitats of the species in the zone (habitat N08, N09 and N12). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08, N09 and N12. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species is highly sensitive to disturbance in the nesting habitats, therefore those, comprised within the scope of this option are virtually inappropriate for the species, due to the existing traffic on the first-class road and the strong presence of people south of Kresna.

Some disturbance may be expected during construction outside the nesting

areas, yet given its temporary nature and the restricted territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the highway, it is possible that the trophical habitats in the vicinity of the road may become unsuitable for the species. Given the relatively small area of affected trophic habitats and their sub-optimal value, caused by the proximity of a residential area (Kresna), the impact has been assessed as insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. No breeding/nesting habitats would be affected, the small birds leave the nest as relatively good flyers. No mortality is expected during the operation of the highway, as the species is cautious enough to avoid moving vehicles. There will be no impact (rate 0).

Eastern Option G20

Direct destruction of habitats

704.982 acres will be affected during construction or 0.86% of the potential breeding habitats of the species in the area (habitats N16 and N17), although a large part of the forests in the area have a shrubby habitus and are not suitable for breeding. Given the sub-optimal nature of the habitats and the relatively small area affected, the impact has been assessed as insignificant (Rate 1).

During construction, 620.652 decares will be affected, or 0.46% of the trophical habitats of the species in the zone (habitat N08, N09 and N12). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects considerably small parts of large polygons of habitats N16 and N17. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a nesting habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

The road route in this option mainly affects comparatively small parts of large polygons of the species habitats N08, N09 and N12. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species is highly sensitive to disturbance in the nesting habitats, therefore the impact during construction may be significant (Rate 3) if, at the start of construction activities, up to 300 m from the construction site, there is a nest of eggs or poorly flying young birds, as it can be abandoned by its parents.

Mitigation measures shall be needed.

During the operation of the highway, the breeding/nesting habitats in the area of this option will be practically unfit. Despite the relatively high traffic (expected to reach more than 13,000 vehicles per day by 2040) and the relatively large area of affected nesting habitats, given the sub-optimal nature of the habitats, the impact on the species population in the zone has been assessed as insignificant (Rate 1).

Some disturbance may be expected during construction outside the nesting areas, yet given its temporary nature and the restricted territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the highway, it is possible that the trophical habitats in the vicinity of the road may become unsuitable for the species. Despite the relatively high traffic (expected to reach more than 13,000 vehicles per day by 2040) and respectively the relatively large area of affected trophical habitats, given the lower sensitivity of the species to human presence in the hunting habitats, the impact on the species population in the zone has been assessed as insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. Affecting a nest of eggs or poorly flying small ones is unlikely due to the low number of breeding pairs and the sub-optimal nature of the habitats. However, if it happens, the impact might be significant (Rate 3). Mitigation measures are needed. Mortality, caused by disturbance has been considered before.

No mortality is expected during the operation of the highway, as the species is cautious enough to avoid moving vehicles. There will be no impact (rate 0).

Measures: (the same as for *Ciconia nigra*).

20. The Levant sparrowhawk (*Accipiter brevipes*)

Species Biology:

Nesting - migratory and passing species. Autumn migration is mainly in September, and the spring migration begins in late April. It nests in scattered deciduous forests, afforested river valleys, groups of trees in open spaces in plains and foothills up to about 700 m above sea level. The nest is on a tree, located near the trunk at a height of 6-12 m. It lays its eggs in May. The female only incubates the eggs in about 30-35 days. The little ones stay in the nest for about 45 days. They leave it before their stroke and the steering feathers have grown completely. They stick close to the nest, spending much of the time on land. It mostly feeds on murial rodents, songbirds, lizards, locusts. It also hunts in open spaces and agricultural areas (Jonsson 2006, Golemanski 2011, Simeonov et al. 1990, Yankov 2007).

Assessment of the species in the Protected Zone:

According to the standard form, 4 to 7 pairs are nesting in the protected zone. Also present during migrations. The potential breeding habitats of the species in the area are broad-leaved forests, including riparian (habitat N16 of the Standard Area Form), with a total area of 44,641.612 decares. The potential trophical habitats are grassland, bushes and agricultural lands (habitats N08, N09 and N12 from the Zone Standard Form), with a total area of 136,274.395 decares.

Assessment of the species on territory of the Investment Proposal

The species has been observed during the field studies south of Kresna. As potential breeding habitats of the species in the area of the IP, forests should be considered, incl. riparian forests (N16), although much of the oak forests in the area of the eastern options have shrubby habitus and are not suitable for breeding, and those in the area of the gorge, near the existing road are inappropriate, as the species is sensitive to disturbance in the area of the nesting.

The herbaceous and bushy sites and agricultural lands (N08, N09 and N12) should be considered as potential trophical habitats of the species on the territory of the Investment Proposal.

Impacts:

Option G20 - Red

Direct destruction of habitats

Potential breeding habitats within the scope of this option are virtually unfit for the species, as it is highly sensitive to disturbance in the breeding area; such disturbance is also caused at the moment by the traffic of the first-class road and by the presence of people in the farmlands alongside the Kresna bypass.

During construction, 185.433 decares will be affected or 0.14% of the trophical habitats of the species in the zone (habitat N08, N09 and N12). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08, N09 and N12. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species is highly sensitive to disturbance in the nesting habitats, therefore those, comprised within the scope of this option are virtually inappropriate for the species, due to the existing traffic on the first-class road and the presence of people in the agricultural lands along the Kresna bypass.

Outside of the nesting site, the species is less sensitive to disturbance (personal observations), so the impact during construction and operation is assessed as insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. No breeding/nesting habitats would be affected, the small birds leave the nest as relatively good flyers. During the operation of the motorway, mortality of representatives of the species is possible in vehicle crashes. The impact on the breeding population in the area may be significant (Rate 3). if a bird that is part of it is killed. Mitigation measures shall be necessary.

Measures:

All bridges shall be fitted with 2 m high protection fences on both sides. When using transparent or translucent materials (e.g. net), they shall be provided with silhouettes of raptors to avoid collisions with the birds.

Option G20 - Blue

Direct destruction of habitats

Potential breeding habitats within the scope of this option are virtually unfit for the species, as it is highly sensitive to disturbance in the breeding area; such disturbance is also caused at the moment by the traffic of the first-class road and by the presence of people in the farmlands alongside the Kresna bypass.

During construction, 173.237 decares will be affected, or 0.13% of the trophical habitats of the species in the zone (habitat N08, N09 and N12). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08, N09 and N12. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species is highly sensitive to disturbance in the nesting habitats, therefore those, comprised within the scope of this option are virtually inappropriate for the species, due to the existing traffic on the first-class road and the presence of people in the agricultural lands along the Kresna bypass.

Outside of the nesting site, the species is less sensitive to disturbance (personal observations), so the impact during construction and operation is assessed as insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. No breeding/nesting habitats would be affected, the small birds leave the nest as relatively good flyers. During the operation of the motorway, mortality of representatives of the species is possible in vehicle crashes. The impact on the breeding population in the area may be significant (Rate 3). if a bird that is part of it is killed. Mitigation measures shall be necessary.

Measures:

All bridges shall be fitted with 2 m high protection fences on both sides. When using transparent or translucent materials (e.g. net), they shall be provided with silhouettes of raptors to avoid collisions with the birds.

Eastern Option G10.50

Direct destruction of habitats

160.019 acres will be affected during construction or 0.36% of the potential breeding habitats of the species in the area (habitats N16), although a large part of the forests in the area have a shrubby habitus and are not suitable for breeding. Given the small area affected and its temporary nature, the impact has been estimated as insignificant (Rate 1).

During construction, 221.238 decares will be affected or 0.16% of the trophical habitats of the species in the zone (habitat N08, N09 and N12). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route in this option affects relatively small portions of large polygons of the N16 habitat. In the majority of cases, the remaining intact part of these polygons will have sufficient area to perform its function of nesting habitat of the species, even more so that it is micro-habitately conditioned - the nests are made on older and bigger trees, also in groups of such trees. Given that and because of the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

The road route in this option mainly affects comparatively small parts of large polygons of the species habitats N08, N09 and N12. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species is highly sensitive to disturbance in the nesting habitats, therefore, when construction activities commence, the impact during construction might be significant (Rate 3), as parents may abandon their nests with eggs or poorly flying small ones, located in the vicinity at a distance of up to 300 m from the construction site. Mitigation measures are needed. During the operation of the highway, the breeding/nesting habitats in the area of this option will be practically unfit. Given the relatively low rate of traffic, expected through the species habitats (no more than 7,000 vehicles per day by 2040 on the left roadway) and the relatively small area of affected habitats, combined with their suboptimal nature, the impact has been estimated to be insignificant.

Outside of the nesting site, the species is less sensitive to disturbance (personal observations), so the impact during construction and operation is assessed as insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. Affecting a nest of eggs or poorly flying small ones is unlikely due to the low number of breeding pairs and the sub-optimal nature of the habitats. However, if it happens, the impact might be significant (Rate 3). Mitigation measures are needed. Mortality, caused by disturbance has been considered before.

During the operation of the motorway, mortality of representatives of the species is possible in vehicle crashes. The impact on the breeding population in the area may be significant (Rate 3), if a bird that is part of it is killed. Mitigation measures shall be necessary.

Measures:

1. (The same as for *Ciconia nigra*).

2. All bridge facilities (including such on the right roadway) shall be fitted with 2 m high protection fences on both sides. When using transparent or translucent materials (e.g. net), they shall be provided with silhouettes of raptors to avoid collisions with the birds.

Long Tunnel Option, 'Kresna' tunnel

Direct destruction of habitats

17.726 decares will be affected during construction or 0.04% of the potential nesting habitats of the species in the zone (habitat N16). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

214.556 decares will be affected during construction or 0.16% of the trophical habitats of the species in the zone (habitat N08, N09 and N12). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route in this option affects small portions of comparatively large polygons of the N16 habitat. In the majority of cases, the remaining intact part of these polygons will have sufficient area to perform its function of nesting habitat of the species, even more so that it is microhabitately conditioned - the nests are made on older and bigger trees, also in groups of such trees. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

The road route in this option mainly affects comparatively small parts of large polygons of the species habitats N08, N09 and N12. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species is highly sensitive to disturbance in the nesting habitats, therefore when construction activities commence, the impact during construction might be significant (Rate 3), as parents may abandon their nests with eggs or poorly flying small ones, located in the vicinity at a distance of up to 300 m from the construction site. Mitigation measures are needed. During the operation of the highway, the breeding/nesting habitats in the area of this option will be practically unfit. The impact has been assessed as insignificant given the small length of intersection of potential nesting habitats and the relatively small area affected.

Outside of the nesting site, the species is less sensitive to disturbance (personal observations), so the impact during construction and operation is assessed as insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. Affecting a nest of eggs or poorly flying small ones is unlikely due to the low number of breeding pairs. However, if it happens, the impact might be significant (Rate 3). Mitigation measures are needed. Mortality, caused by disturbance has been considered before.

During the operation of the motorway, mortality of representatives of the species is possible in vehicle crashes. The impact on the breeding population in the area may be significant (Rate 3), if a bird that is part of it is killed. Mitigation measures shall be necessary.

Measures:

1. (The same as for *Ciconia nigra*).

2. All bridges shall be fitted with 3 m high protection fences on both sides. When using transparent or translucent materials (e.g. net), they shall be provided with silhouettes of raptors to avoid collisions with the birds.

Eastern Option G20

Direct destruction of habitats

467.254 decares will be affected during construction or 1.05% of the potential nesting habitats of the species in the zone (habitat N16), although most of the oak forests in the area have shrubby habitus and are not suitable for nesting.

Given the sub-optimal nature of the habitats, the impact has been assessed as moderate - (Rate 2). Due to the large number of affected polygons, mitigation measures shall be impossible.

620.652 decares will be affected during construction or 0.46% of the trophical habitats of the species in the zone (habitat N08, N09 and N12). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route in this option affects relatively large sections of polygons of the N16 habitat. In the majority of cases, the remaining intact part of these polygons will have sufficient area to perform its function of nesting habitat of the species, even more so that it is microhabitately conditioned - the nests are made on older and bigger trees, also in groups of such trees. Given that, the impact rate has been assessed as insignificant (Rate 1).

The road route in this option mainly affects comparatively small parts of large polygons of the species habitats N08, N09 and N12. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species is sensitive to disturbance in the nesting habitats therefore the impact during construction might be significant (Rate 3), as parents may abandon their nests with eggs or poorly flying small ones, located in the vicinity at a distance of up to 300 m from the construction site. Mitigation measures are needed. Despite the relatively high traffic (expected to reach more than 13,000 vehicles per day by 2040) and the relatively large area of affected nesting habitats, given the sub-optimal nature of the habitats, the impact on the species population in the zone has been assessed as insignificant (Rate 1).

Outside of the nesting site, the species is less sensitive to disturbance (personal observations), so the impact during construction and operation is assessed as insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. Affecting a nest of eggs or poorly flying small ones is unlikely due to the low number of breeding pairs and the sub-optimal nature of the habitats. However, if it happens, the impact might be significant (Rate 3). Mitigation measures are needed. Mortality, caused by disturbance has been considered before.

During the operation of the motorway, mortality of representatives of the species is possible in vehicle crashes. The impact on the breeding population in the area may be significant (Rate 3). if a bird that is part of it is killed. Mitigation measures shall be necessary.

Measures:

1. (The same as for *Ciconia nigra*).

2. All bridge facilities (including such on the right roadway) shall be fitted with 3 m high protection fences on both sides. When using transparent or semi-transparent materials (e.g. net), they shall be provided with silhouettes of raptors to avoid collisions with the birds.

21. The Eurasian sparrow hawk (*Accipiter nisus*)

Species Biology:

A permanent and migratory species. It breeds in deciduous, mixed and coniferous forests and their vicinity, incl. less often in open spaces with groups of trees, mostly in foothills and mountains to the upper limit of the forest. The nests are made on 4 - 22 m trees. Laying of eggs happens in May. Brooding/incubation lasts for 30 to 35 days. The young leave the nests at 30-35 days of age. In autumn and winter it occurs in various habitats, incl. open areas, agricultural lands, parks, outskirts of settlements. It feeds mainly on birds, less with mammals, and hunts practically everywhere (Jonsson 2006, Marquiss & Newton 1982, Wyllie 1985, Simeonov et al. 1990).

Assessment of the species in the Protected Zone:

According to the standard form, the PZ has a permanent residence of 4 to 5 pairs. According to Nikolov and Spasov (2005), only in the southern part of the Kresna Gorge, on an area of about 17,000 decares, nest between 2 and 4 pairs. The potential nesting habitats of the species in the area are forests (habitats N16, N17 and N19 from the Zone Standard Form), with a total area of 82,234.5489 decares. The potential trophical habitats are grasslands, bushes, agricultural lands and forests (habitats N08, N09, N12, N15, N16, N17, N19 and N21 from the Zone Standard Form), with a total area of 227,907.178 acres.

Assessment of the species on territory of the Investment Proposal

It was observed during field studies in the Kresna region and south of it. Forests should be considered as potential nesting habitats of the species on the territory of the IP, including coniferous forests (N16 and N17), although large portion of the forests in the area of the eastern options are scrubby and not suitable for nesting, and those in the area of the gorge near the existing road are unfit, as the species is sensitive to disturbance in the area of the nest.

The herbaceous and bushy sites, agricultural lands and forests, including coniferous forests N08, N09, N12, N15, N16, N17 and N21) should be considered as potential trophical habitats of the species on the territory of the Investment Proposal.

Impacts:

Option G20 - Red

Direct destruction of habitats

Potential breeding habitats within the scope of this option are virtually unfit for the species, as it is highly sensitive to disturbance in the breeding area; such disturbance is also caused at the moment by the traffic of the first-class road and by the presence of people in the farmlands alongside the Kresna bypass.

390.445 decares will be affected during construction or 0.17% of the trophical habitats of the species in the zone (habitat N08, N09, N12, N15, N16, N17 and N21). The impact has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08, N09, N12, N15, N16, N17 and N21. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species is sensitive to disturbance in the nesting habitats, therefore those, comprised within the scope of this option are virtually inappropriate for the species, due to the existing traffic on the first-class road and the presence of people in the agricultural lands along the Kresna bypass.

Outside of the nesting site, the species is less sensitive to disturbance (personal observations), so the impact during construction and operation is assessed as insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. No breeding/nesting habitats would be affected, the small birds leave the nest as relatively good flyers. During the operation of the motorway, mortality of representatives of the species is possible in vehicle crashes (Kambourova-Ivanova et al. 2012, Karaivanov 2015, personal notes). The impact on the breeding population in the area may be significant (Rate 3). if a bird that is part of it is killed. Mitigation measures shall be necessary.

Measures: (See *Accipiter brevipes*).

Option G20 - Blue

Direct destruction of habitats

Potential breeding habitats within the scope of this option are virtually unfit for the species, as it is highly sensitive to disturbance in the breeding area; such disturbance is also caused at the moment by the traffic of the first-class road and by the presence of people in the farmlands alongside the Kresna bypass.

385.984 decares will be affected during construction or 0.17% of the trophical habitats of the species in the zone (habitat N08, N09, N12, N15, N17 and N21). The impact has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08, N09, N12, N15, N16, N17 and N21. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species is highly sensitive to disturbance in the nesting habitats, therefore those, comprised within the scope of this option are virtually inappropriate for the species, due to the existing traffic on the first-class road and the presence of people in the agricultural lands along the Kresna bypass.

Outside of the nesting site, the species is less sensitive to disturbance (personal observations), so the impact during construction and operation is assessed as insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. No breeding/nesting habitats would be affected, the small birds leave the nest as relatively good flyers. During the operation of the motorway, mortality of representatives of the species is possible in vehicle crashes. The impact on the breeding population in the area may be significant (Rate 3). if a bird that is part of it is killed. Mitigation measures shall be necessary.

Measures: (See *Accipiter brevipes*).

Eastern Option G10.50

Direct destruction of habitats

237.085 acres will be affected during construction or 0.29% of the potential breeding habitats of the species in the area (habitats N16 and N17), although a large part of the forests in the area have a shrubby habitus and are not suitable for breeding. Given the small area affected and its sub-optimal nature, the impact has been estimated as insignificant (Rate 1).

494.224 decares will be affected during construction or 0.22% of the trophical habitats of the species in the zone (habitat N08, N09, N12, N15, N16, N17 and N21). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects considerably small parts of large polygons of habitats N16 and N17. In the majority of cases, the remaining intact part of these polygons will have sufficient area to perform its function of nesting habitat of the species, even more so that it is microhabitately conditioned - the nests are made on older and bigger trees, also in groups of such trees. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

The road route under this option mainly affects considerably small parts of large polygons of habitats N08, N09, N12, N15, N16, N17 and N21. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species is highly sensitive to disturbance in the nesting habitats, therefore when construction activities commence, the impact during construction might be significant (Rate 3), as parents may abandon their nests with eggs or poorly flying small ones, located in the vicinity at a distance of up to 300 m from the construction site. Mitigation measures are needed. During the operation of the highway, the breeding/nesting habitats in the area of this option will be practically unfit. Given the relatively low rate of traffic, expected through the species habitats (no more than 7,000 vehicles per day by 2040 on the left roadway) and the relatively small area of affected habitats, combined with their suboptimal nature, the impact has been estimated to be insignificant.

Outside of the nesting site, the species is less sensitive to disturbance (personal observations), so the impact during construction and operation is assessed as insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. Affecting a nest of eggs or poorly flying small ones is unlikely due to the low number of breeding pairs and the sub-optimal nature of the habitats. However, if it happens, the impact might be significant (Rate 3). Mitigation measures are needed. Mortality, caused by disturbance has been considered before.

During the operation of the motorway, mortality of representatives of the species is possible in vehicle crashes. The impact on the breeding population in the area may be significant (Rate 3). if a bird that is part of it is killed. Mitigation measures shall be necessary.

Measures:

1. (The same as for *Ciconia nigra*).
2. (See *Accipiter brevipes*).

Long Tunnel Option, 'Kresna' tunnel

Direct destruction of habitats

17.726 decares will be affected during construction or 0.02% of the potential nesting habitats of the species in the zone (habitat N16). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

During construction, 244.813 decares will be affected or 0.11% of the habitats of the species in the zone (habitat N08, N09, N12, N16 and N21). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route in this option affects small portions of comparatively large polygons of the N16 habitat. In the majority of cases, the remaining intact part of these polygons will have sufficient area to perform its function of nesting habitat of the species, even more so that it is microhabitately conditioned - the nests are made on older and bigger trees, also in groups of such trees. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08, N09, N12, N16 and N21. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species is highly sensitive to disturbance in the nesting habitats, therefore when construction activities commence, the impact during construction might be significant (Rate 3), as parents may abandon their nests with eggs or poorly flying small ones, located in the vicinity at a distance of up to 300 m from the construction site. Mitigation measures are needed. During the operation of the highway, the breeding/nesting habitats in the area of this option will be practically unfit. The impact on them has been assessed as insignificant, given the small length of intersection of potential nesting habitats and, accordingly, the relatively small affected area.

Outside of the nesting site, the species is less sensitive to disturbance (personal observations), so the impact during construction and operation is assessed as insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. Affecting a nest of eggs or poorly flying small ones is unlikely due to the low number of breeding pairs. However, if it happens, the impact might be significant (Rate 3). Mitigation measures are needed. Mortality, caused by disturbance has been considered before.

During the operation of the motorway, mortality of representatives of the species is possible in vehicle crashes. The impact on the breeding population in the area may be significant (Rate 3), if a bird that is part of it is killed. Mitigation measures shall be necessary.

Measures:

1. (The same as for *Ciconia nigra*).
2. (See *Accipiter brevipes*).

Eastern Option G20

Direct destruction of habitats

704.982 acres will be affected during construction or 0.86% of the potential breeding habitats of the species in the area (habitats N16 and N17), although a large part of the forests in the area have a shrubby habitus and are not suitable for breeding. Given the sub-optimal nature of the habitats and the relatively small area affected, the impact has been assessed as insignificant (Rate 1).

1,350.262 decares will be affected during construction or 0.59% of the trophical habitats of the species in the zone (habitat N08, N09, N12, N15, N16, N17 and N21). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects considerably small parts of large polygons of habitats N16 and N17. In the majority of cases, the remaining intact part of these polygons will have sufficient area to perform its function of nesting habitat of the species, even more so that it is microhabitately conditioned - the nests are made on older and bigger trees, also in groups of such trees. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

The road route under this option mainly affects considerably small parts of large polygons of habitats N08, N09, N12, N16, N17 and N21. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species is highly sensitive to disturbance in the nesting habitats, therefore the impact during construction may be significant (Rate 3) if, at the start of construction activities, up to 300 m from the construction site, there is a nest of eggs or poorly flying young birds, as it can be abandoned by parents.

Mitigation measures shall be needed.

During the operation of the highway, the breeding/nesting habitats in the area of this option will be practically unfit. Despite the relatively high traffic (expected to reach more than 13,000 vehicles per day by 2040) and the relatively large area of affected nesting habitats, given the sub-optimal nature of the habitats, the impact on the species population in the zone has been assessed as insignificant (Rate 1).

Outside of the nesting site, the species is less sensitive to disturbance (personal observations), so the impact during construction and operation is assessed as insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. Affecting a nest of eggs or poorly flying small ones is unlikely due to the low number of breeding pairs and the sub-optimal nature of the habitats. However, if it happens, the impact might be significant (Rate 3). Mitigation measures are needed. Mortality, caused by disturbance has been considered before.

During the operation of the motorway, mortality of representatives of the species is possible in vehicle crashes. The impact on the breeding population in the area may be significant (Rate 3). if a bird that is part of it is killed. Mitigation measures shall be necessary.

Measures:

1. (The same as for *Ciconia nigra*).
2. (See *Accipiter brevipes*).

22. The lanner falcon (*Falco biarmicus*)

Species Biology: A rare permanent species.

It nests most often in tall, hard-to-reach rocks in plains and mountains (also over 2,000 m above sea level) near vast open spaces. It occupies nests of other birds - raptors, crows, etc., or lays in a dimple on a rock shelf. It occupies nests of other birds when placed on trees or electric poles. It hunts in open or lightly afforested terrains - various herbaceous places, bush terrains of Mediterranean type, etc. It feeds mainly on small and medium sized birds - quails, pigeons, turtles, big insects. It hunts most often in flight near the ground (Golemanski 2011, Simeonov et al. 1990, Del Hoyo et al. 1994, Stephenson 2001).

Assessment of the species in the Protected Zone:

According to the standard form of the protected zone, 1 representative of the species pass through the zone during migration. The species has been included as a subject of conservation in the zone recently, possibly as a result of its detection in the monitoring of reintroduced Griffon Vultures, whereas in the period between 2010 and 2016, single representatives were reported in 2011, 2012 and 2013 (Peshev et al. 2015). The potential trophical habitats are grassland and bushes (habitats N08 and N09 from the Zone Standard Form), with a total area of 108,079.693 decares.

Assessment of the species on territory of the Investment Proposal

The species has not been observed during field studies. The species does not nest in the protected zone. Potential trophical habitats should be considered grassland and shrubs (habitats N08 and N09).

Impacts:

Option G20 - Red

Direct destruction of habitats

The species does not nest in the protected zone. During construction, 166.411 decares will be affected, or 0.15% of the habitats of the species in the zone (habitat N06 and N09). Given the small area affected, the impact has been assessed as

insignificant (Rate 1), which is practically even smaller, since the polygons near the existing road are unlikely to be used.

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08 and N09. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species does not nest in the Protected zone. Outside of the nesting area, disturbance is expected during construction, yet given its temporary nature and restricted territory (only around the construction site, the impact will be insignificant (Rate 1). During the operation of the highway, the impact on individual representatives of the species, feeding in the region of the investment Proposal region will not be different from the current, so the impact is considered insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. The species does not nest in the area, so there will be no endangered small birds or eggs. No mortality is expected during the operation of the highway, as the species is cautious enough to avoid moving vehicles. There will be no impact (rate 0).

Option G20 - Blue

Direct destruction of habitats

The species does not nest in the protected zone. During construction, 157.591 decares will be affected, or 0.15% of the trophical habitats of the species in the zone (habitat N08 and N09). Given the small area affected, the impact has been assessed as insignificant (Rate 1), which is practically even smaller, since the polygons near the existing road are unlikely to be used.

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08 and N09. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species does not nest in the Protected zone. Outside of the nesting area, disturbance is expected during construction, yet given its temporary nature and restricted territory (only around the construction site, the impact will be insignificant (Rate 1). During the operation of the highway, the impact on individual representatives of the species, feeding in the region of the investment Proposal region will not be different from the current, so the impact is considered insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. The species does not nest in the area, so there will be no endangered small birds or eggs. No mortality is expected during the operation of the highway, as the species is cautious enough to avoid moving vehicles. There will be no impact (rate 0).

Eastern Option G10.50

Direct destruction of habitats

The species does not nest in the protected zone. 201.341 decares will be affected during construction, or 0.19% of the habitats of the species in the zone (habitat N08 and N09). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects considerably small parts of large polygons of habitats N08 and N09. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species does not nest in the Protected zone. Outside of the nesting area, disturbance is expected during construction, yet given its temporary nature and restricted territory (only around the construction site, the impact will be insignificant (Rate 1). During the operation of highway, it is possible that the trophical habitats in the vicinity of the road may become unsuitable for the species. The impact is assessed as insignificant (Rate 1), given the relatively low traffic expected through habitat types (no more than 7,000 cars per day by 2040 on the left roadway) and therefore the relatively small area of affected trophic habitats.

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. The species does not nest in the area, so there will be no endangered small birds or eggs. No mortality is expected during the operation of the highway, as the species is cautious enough to avoid moving vehicles. There will be no impact (rate 0).

The Long Tunnel Option, 'Kresna' tunnel

Direct destruction of habitats

The road route in this option does not affect the N22 habitat. During construction, 175.237 decares will be affected, or 0.16% of the habitats of the species in the zone (habitat N08 and N09). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The species does not nest in the protected zone. The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08 and N09. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species does not nest in the Protected zone. Outside of the nesting area, disturbance is expected during construction, yet given its temporary nature and restricted territory (only around the construction site, the impact will be insignificant (Rate 1). During construction works, yet given its temporary nature and restricted territory (only around the construction site, the impact will be insignificant (Rate 1). During the operation of the highway, it is possible that the trophical habitats in the vicinity of the road may become unsuitable for the species. Given the relatively small area of affected trophic habitats and their sub-optimal value, caused by the proximity of a residential area (Kresna), the impact has been assessed as insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. The species does not nest in the area, so there will be no endangered small birds or eggs. No mortality is expected during the operation of the highway, as the species is cautious enough to avoid moving vehicles. There will be no impact (rate 0).

Eastern Option G20

Direct destruction of habitats

The species does not nest in the protected zone. During construction, 601.635 decares will be affected, or 0.56% of the habitats of the species in the zone (habitat N08 and N09). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects considerably small parts of large polygons of habitats N08 and N09. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species does not nest in the Protected zone. Outside of the nesting area, disturbance is expected during construction works, yet given its temporary nature and restricted territory (only around the construction site, the impact will be insignificant (Rate 1). During the operation of the highway, it is possible that the trophical habitats in the vicinity of the road may become unsuitable for the species. Despite the relatively high traffic expected (by 2040 not less than 13,000 vehicle per day), given the relatively small area of directly affected trophic habitats, the impact has been assessed as insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. The species does not nest in the area, so there will be no endangered small birds or eggs. No mortality is expected during the operation of the highway, as the species is cautious enough to avoid moving vehicles. There will be no impact (rate 0).

23. The Saker Falcon (*Falco cherrug*)

Species Biology: A permanent and passing species, in the past widespread and multi-numbered species. The last confirmed nesting is from 1998. Despite intensive field studies in the period 2006 - 2013, nesting has not been established. Observations during the nesting period are single, probably non-multiplying / wandering birds. It breeds in two types of habitats - on trees in riparian or oasis forests or groups of trees in vast open habitats in plains or on rocks, near vast pastures in plains and mountains. It does not build nests - it uses nests of other large birds and nests, located on electric poles. It feeds mostly on petty mammals, especially hawks, who hunt in open habitats (Ragyov et al. 2009, Ragyov et al. 2014, Golemanski 2011).

Assessment of the species in the Protected Zone:

According to the standard form of the protected zone, only one couple nests in the zone. The last successful nesting in the country, however, was registered in 1997, and another probably in 2005 (Golemanski 2011). Despite intensified field studies (with respect to the need for reintroduction of the species in the country) in the period 2006 - 2013, nesting was not established (Ragyov et al. 2009, Ragyov et al. 2014). The area of the Kresna Gorge and the eastern options were also the subject of these studies (Ragyov et al. 2014). The species has not been identified as being passing through the monitoring of reintroduced Griffon Vultures for the entire period from 2010 to 2016 inclusive (Peshev et al. 2017, Peshev et al. 2015). All this indicates that the saker falcon (Falco cherrug) has probably not been nesting in the area, at least since its announcement so far. However, it is possible, except during bird passage, as recorded in the standard form, that single, non-reproducing species representatives fly by during the summer season. Potential trophical habitats of the species in the area are the herbaceous sites (habitat N09 of the Standard Zone Form), with a total area
21,146.027 decares. They are however suboptimal, as its primary prey is missing.

Assessment of the species on territory of the Investment Proposal

The species has not been observed during field studies. The species does not nest in the protected zone. Potential trophical habitats should be considered herbaceous sites (habitat N09). They are however suboptimal, as its primary prey is missing.

Impacts:

Option G20 - Red

Direct destruction of habitats

During construction, 97.316 decares will be affected or 0.46% of the trophical habitats of the species in the zone (habitat N09). Given the small area affected and its temporary nature, the impact has been estimated as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects small, peripheral parts of large polygons with potential trophic habitats of the species. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species does not nest in the zone. Some disturbance may be expected during construction outside the nesting areas, yet given its temporary nature and the restricted territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the highway, the impact on individual representatives of the species, feeding in the region of the investment Proposal region will not be different from the current, so the impact is considered insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. The species does not nest in the area, so there will be no endangered small birds or eggs. No mortality is expected during the operation of the highway, as the species is cautious enough to avoid moving vehicles. There will be no impact (Rate 0).

Option G20 - Blue

Direct destruction of habitats

During construction, 94.045 decares will be affected or 0.44% of the trophical habitats of the species in the zone (habitat N09). Given the small area affected and its temporary nature, the impact has been estimated as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects small, peripheral parts of large polygons with potential trophic habitats of the species. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species does not nest in the zone. Outside the nesting site, disturbance is expected during construction works, yet given its temporary nature and restricted territory (only around the construction site, the impact will be insignificant (Rate 1). During the operation of the highway, the impact on individual representatives of the species, feeding in the region of the investment Proposal region will not be different from the current, so the impact is considered insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. The species does not nest in the area, so there will be no endangered small birds or eggs. No mortality is expected during the operation of the highway, as the species is cautious enough to avoid moving vehicles. There will be no impact (rate 0).

Eastern Option G10.50

Direct destruction of habitats

During construction, 117.821 decares will be affected or 0.56% of the trophical habitats of the species in the zone (habitat N09). Given the small area affected and its temporary nature, the impact has been estimated as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects small parts of large polygons with potential trophical habitats of the species. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform

its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species does not nest in the zone. Outside the nesting site, disturbance is expected during construction works, yet given its temporary nature and restricted territory (only around the construction site, the impact will be insignificant (Rate 1). During the operation of the highway, it is possible that the trophical habitats in the vicinity of the road may become unsuitable for the species. The impact is assessed as insignificant (Rate 1), given the relatively low traffic expected through habitat types (no more than 7,000 cars per day by 2040 on the left roadway) and therefore the relatively small area of affected trophic habitats and the sub-optimal nature of the habitats.

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. The species does not nest in the area, so there will be no endangered small birds or eggs. No mortality is expected during the operation of the highway, as the species is cautious enough to avoid moving vehicles. There will be no impact (rate 0).

The Long Tunnel Option, 'Kresna' tunnel

Direct destruction of habitats

During construction, 156.438 decares will be affected or 0.74% of the trophical habitats of the species in the zone (habitat N09). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons with potential trophic habitats of the species. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species does not nest in the zone. Outside the nesting site, disturbance is expected during construction works, yet given its temporary nature and restricted territory (only around the construction site, the impact will be insignificant (Rate 1). During the operation of the highway, it is possible that the trophical habitats in the vicinity of the road may become unsuitable for the species. Given the small length of intersection of these habitats and the relatively small area of affected trophical habitats and their sub-optimal nature, the impact has been assessed as insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. The species does not nest in the area, so there will be no endangered small birds or eggs. During operation mortality is expected during the operation of the highway either, as the species is cautious enough to avoid moving vehicles. There will be no impact (rate 0).

Eastern Option G20

Direct destruction of habitats

During construction, 357.941 decares will be affected or 1.69% of the trophical habitats of the species in the zone (habitat N09). Given the sub-optimal nature of the habitats, the impact has been assessed as moderate - (Rate 2). Due to the large number of affected polygons, mitigation measures shall be impossible.

Fragmentation of habitats

The road route under this option affects parts of large polygons with potential trophic habitats of the species. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the sub-optimal nature of affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species does not nest in the zone. Outside the nesting site, disturbance is expected during construction works, yet given its temporary nature and restricted territory (only around the construction site, the impact will be insignificant (Rate 1). During the operation of the highway, it is possible that the trophical habitats in the vicinity of the road may become unsuitable for the species. Despite the sub-optimal nature of the habitats, given the relatively high traffic (expected to reach as much as 13,000 vehicles per day by 2040) and the relatively large area of affected trophical habitats, in combination with the relatively large directly affected area, the impact on the species population in the zone has been assessed as moderate - Rate 3.

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. The species does not nest in the area, so there will be no endangered small birds or eggs. No mortality is expected during the operation of the highway, as the species is cautious enough to avoid moving vehicles. There will be no impact (rate 0).

24. The Mediterranean falcon/Eleonora's falcon (*Falco eleonorae*)

Species Biology: In Bulgaria it is a non-nesting summer visitor. It reproduces colonial on steep rocky coasts and islands from mid-July to August-September, taking advantage of the autumn migration of songbirds for food. Before reproduction, it may wander away from the colony. During wandering, it is common in rocky and eroded terrains, open spaces, sometimes inland. It feeds predominantly on large insect species and songbirds, which it hunts in the air (Del Hoyo et al. 1994, Mitchev et al. 2012, Simeonov et al. 1990).

Assessment of the species in the Protected Zone:

According to the standard form of the protected zone, 20 - 50 representatives of the species pass through the zone during migration. The species has been included as a subject of conservation in the zone recently, probably as a result of its detection in the monitoring of reintroduced Griffon Vultures, with representatives of the species, registered between 2010 and 2016 and in 2011, 2012, 2013 (Peshev et al. 2015). The potential trophical habitats are grassland, bushes and rock areas (habitats N08, N09 and N22 from the Zone Standard Form), with a total area of 109,254.472 decares.

Assessment of the species on territory of the Investment Proposal

The species has not been observed during field studies. The species does not

nest in the protected zone. Potential trophic habitats should be grassland, shrubs, rocky areas (habitats N08, N09 and N22).

Impacts:

Option G20 - Red

Direct destruction of habitats

The species does not nest in the protected zone. During construction, 167.544 decares will be affected or 0.15% of the trophical habitats of the species in the zone (habitat N08, N09 and N22). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08, N09 and N22. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species does not nest in the protected zone. Outside the nesting site, disturbance is expected during construction works, yet given its temporary nature and restricted territory (only around the construction site, the impact will be insignificant (Rate 1). During the operation of the highway, the impact on individual representatives of the species, feeding in the region of the investment Proposal region will not be different from the current, so the impact is considered insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. The species does not nest in the area, so there will be no endangered small birds or eggs. No mortality is expected during the operation of the highway either, as the species flies high and hunts in the air.

Option G20 - Blue

Direct destruction of habitats

The species does not nest in the protected zone. 158.406 decares will be affected during construction or 0.14% of the trophical habitats of the species in the zone (habitat N08, N09 and N22). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08, N09 and N22. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species does not nest in the protected zone. Some disturbance may be expected during construction outside the nesting areas, yet given its temporary nature and the restricted territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the highway, the impact on individual representatives of the species, feeding in the region of the investment Proposal region will not be different from the current, so the impact is considered insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. The species does not nest in the area, so there will be no endangered small birds or eggs. No mortality is expected during the operation of the highway either, as the species flies high and hunts in the air.

Eastern Option G10.50

Direct destruction of habitats

The species does not nest in the protected zone. 201.341 decares will be affected during construction, or 0.18% of the habitats of the species in the zone (habitat N08 and N09). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects small parts of large polygons of the species habitats N08 and N09. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species does not nest in the protected zone. Outside the nesting site, disturbance is expected during construction works, yet given its temporary nature and restricted territory (only around the construction site, the impact will be insignificant (Rate 1). During operation, the impact on species representatives who may be feeding on the territory of the IP will also be insignificant (Rate 1) as the species flies high and hunts in the air.

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. The species does not nest in the area, so there will be no endangered small birds or eggs. No mortality is expected during the operation of the highway either, as the species flies high and hunts in the air.

The Long Tunnel Option, 'Kresna' tunnel

Direct destruction of habitats

The species does not nest in the protected zone. During construction, 175.237 decares will be affected, or 0.16% of the habitats of the species in the zone (habitat N08 and N09). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08 and N09. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitats of the species.

Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species does not nest in the protected zone. Outside the nesting site, disturbance is expected during construction works, yet given its temporary nature and restricted territory (only around the construction site, the impact will be insignificant (Rate 1). During operation, the impact on species representatives who may be feeding on the territory of the IP will also be insignificant (Rate 1) as the species flies high and hunts in the air.

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. The species does not nest in the area, so there will be no endangered small birds or eggs. No mortality is expected during the operation of the highway either, as the species flies high and hunts in the air.

Eastern Option G20

Direct destruction of habitats

The species does not nest in the protected zone. 601.635 decares will be affected during construction or 0.55% of the habitats of the species in the zone (habitat N08 and N09). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects parts of large polygons of the species habitats N08 and N09. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species does not nest in the protected zone. Some disturbance may be expected during construction outside the nesting areas, yet given its temporary nature and the restricted territory (only around the construction site), it will be insignificant (Rate 1). During operation, the impact on species representatives who may be feeding on the territory of the IP will also be insignificant (Rate 1) as the species flies high and hunts in the air.

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. The species does not nest in the area, so there will be no endangered small birds or eggs. No mortality is expected during the operation of the highway either, as the species flies high and hunts in the air.

25. The peregrine falcon (*Falco peregrinus*)

Species Biology:

A wandering species. In Bulgaria it nests on rocks in gorges, defiles and other rocky terrains close to open spaces. The eggs are laid in March. Eggs hatch for about 30 days or in April. The young leave the nest at 32-45 days of age or end of May, at the latest. In Eastern Europe, autumn wandering begins in August, and from November to February it is common for the wintering areas.

During the wandering and wintering, it occurs in a variety of habitats where there are

clusters of birds - its main food - including wetlands, residential areas, industrial complexes (bakery plants, silos). It feeds on wild and domestic pigeons (especially in winter), crows, the common starlings, larks, the hermit thrush, as well as larger species - ducks, partridges. It hunts in the air (Simeonov et al. 1990, Jonsson 2006; Ragyov et al. 2007, personal observations).

Assessment of the species in the Protected Zone:

According to the standard form for the Protected Zone, 3-5 couples nest in the zone. The nesting habitats are in the higher and inaccessible rocks in the zone (habitat N22 of the Zone Standard Form), with a total area of 1,174.779 decares. The species hunts in a variety of habitats, yet grasslands, shrubs, agricultural lands, rocks (habitats N08, N09, N12, N15, N21 and N22 from the Standard Area Form) are preferred the most, with a total area of 146,847.409 decares.

Assessment of the species on territory of the Investment Proposal

The species has not been observed during field studies. The higher, hard to reach rocks (habitat N22) should be considered as potential breeding habitats of the species in the area of the investment proposal and as potential trophical habitats - the more distant grassy sites and shrubs (habitat N08, N09, N12, N15, N21 and N22).

Impacts:

Option G20 - Red

Direct destruction of habitats

Potential breeding habitats within the scope of this option are virtually unfit for the species, as it is highly sensitive to disturbance in the breeding area; such disturbance is also caused at the moment by the traffic of the first-class road.

232.198 decares will be affected during construction or 0.16% of the trophical habitats of the species in the zone (habitat N08, N09, N12, N15, N21 and N22). Given the small area affected, the impact has been assessed as insignificant (Rate 1), which is practically even smaller, since the polygons near the existing road are unlikely to be used.

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08, N09, N12, N15, N21 and N22. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species is highly sensitive to disturbance in the nesting habitats, therefore those, comprised within the scope of this option are virtually unfit for the species, due to the existing traffic on the first-class road.

Some disturbance may be expected during construction outside the nesting areas, yet given its temporary nature and the restricted territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the highway, the impact on individual representatives of the species, feeding in the region of the investment Proposal region will not be different from the current, so the impact is considered insignificant (Rate 1). Nevertheless, the species has low sensitivity to disturbance outside of the nesting habitats (personal observations).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. No breeding/nesting habitats would be affected, the small birds leave the nest as relatively good flyers. No mortality is expected during the operation of the highway, as the species is cautious enough to avoid moving vehicles. It also hunts high in the air. There will be no impact (rate 0).

Option G20 - Blue

Direct destruction of habitats

Potential breeding habitats within the scope of this option are virtually unfit for the species, as it is highly sensitive to disturbance in the breeding area; such disturbance is also caused at the moment by the traffic of the first-class road.

182.659 decares will be affected during construction or 0.12% of the habitats of the species in the zone (habitat N08, N09, N12, N15, N21 and N22). Given the small area affected, the impact has been assessed as insignificant (Rate 1), which is practically even smaller, since the polygons near the existing road are unlikely to be used.

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08, N09, N12, N15, N21 and N22. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species is sensitive to disturbance in the nesting sites, therefore those, comprised within the scope of this option are virtually inappropriate for the species, due to the existing traffic on the first-class road.

Some disturbance may be expected during construction outside the nesting areas, yet given its temporary nature and the restricted territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the highway, the impact on individual representatives of the species, feeding in the region of the investment Proposal region will not be different from the current, so the impact is considered insignificant (Rate 1). Nevertheless, the species has low sensitivity to disturbance, outside of the nesting habitats (personal observations).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. No breeding/nesting habitats would be affected, the small birds leave the nest as relatively good flyers. No mortality is expected during the operation of the highway, as the species is cautious enough to avoid moving vehicles. It also hunts high in the air. There will be no impact (rate 0).

Eastern Option G10.50

Direct destruction of habitats

The road route in this option does not affect the N22 habitat. 257.139 decares will be affected during construction or 0.18% of the habitats of the species in the zone (habitat N08, N09, N12, N15, N21). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route in this option does not affect the N22 habitat. The road route

under this option mainly affects considerably small parts of large polygons of habitats N08, N09, N12, N15, N21. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The potential nesting habitats are far enough from the road route in this option, to avoid any disturbance (Rate 0), during construction and during operation.

Some disturbance may be expected during construction outside the nesting areas, yet given its temporary nature and the restricted territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the highway, it is possible that the trophical habitats in the vicinity of the road may become unsuitable for the species. Given the relatively low rate of traffic, expected through the species habitats (no more than 7,000 vehicles per day by 2040 on the left roadway) and the relatively small area of affected habitats, combined with their suboptimal nature, the impact has been estimated to be insignificant (Rate 1). Nevertheless, the species has low sensitivity to disturbance outside of the nesting habitats (personal observations).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. No breeding/nesting habitats would be affected, the small birds leave the nest as relatively good flyers. No mortality is expected during the operation of the highway, as the species is cautious enough to avoid moving vehicles. It also hunts high in the air. There will be no impact (rate 0).

Long Tunnel Option, 'Kresna' tunnel

Direct destruction of habitats

The road route in this option does not affect the N22 habitat. 227.087 decares will be affected during construction or 0.15% of the trophical habitats of the species in the zone (habitat N08, N09, N12 and N21). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route in this option does not affect the N22 habitat. The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08, N09, N12, N21. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The potential nesting habitats are far enough from the road route in this option, to avoid any disturbance (Rate 0), during construction and during operation.

Some disturbance may be expected during construction outside the nesting areas, yet given its temporary nature and the restricted territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the highway, it is possible that the trophical habitats in the vicinity of the road may become unsuitable for the species. Given the relatively small area of affected

trophical habitats, combined with the short length of their intersection by the road route, the impact has been estimated to be insignificant (Rate 1). Nevertheless, the species has low sensitivity to disturbance outside of the nesting habitats (personal observations).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. No breeding/nesting habitats would be affected, the small birds leave the nest as relatively good flyers. No mortality is expected during the operation of the highway, as the species is cautious enough to avoid moving vehicles. It also hunts high in the air. There will be no impact (rate 0).

Eastern Option G20

Direct destruction of habitats

The road route in this option does not affect the N22 habitat. 645.280 decares will be affected during construction or 0.44% of the trophical habitats of the species in the zone (habitat N08, N09, N12, N21). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route in this option does not affect the N22 habitat. The road route under this option mainly affects considerably small parts of large polygons of habitats N08, N09, N12, N21. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The potential nesting habitats are far enough from the road route in this option, to avoid any disturbance (Rate 0), during construction and during operation.

Some disturbance may be expected during construction outside the nesting areas, yet given its temporary nature and the restricted territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the highway, it is possible that the trophical habitats in the vicinity of the road may become unsuitable for the species. Despite the relatively high traffic (expected to be not less than 13,000 vehicle per day by 2040), given the relatively small area of directly affected trophic habitats, the impact has been assessed as insignificant (Rate 1). Despite that, the species has low sensitivity to disturbance outside of the nesting habitats (personal observations).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. No breeding/nesting habitats would be affected, the small birds leave the nest as relatively good flyers. No mortality is expected during the operation of the highway, as the species is cautious enough to avoid moving vehicles. It also hunts high in the air. There will be no impact (rate 0).

26. The Eurasian hobby (*Falco subbuteo*)

Species Biology: It inhabits rare, sunny deciduous, mixed and coniferous forests with meadows, near pastures, fields, agricultural lands and other open spaces, small oasis and riparian forests, forest protection belts, tree groups. It uses old nests of other birds - mainly of crows. It rarely nests on high voltage poles and rocks. The eggs are laid in May. Brooding/incubation lasts for 28 days. The young leave the nest at about 30 days of age. Migratory species. Spring migration starts early April to the middle of May, the autumn migration - from the second half of August to the end of October. It feeds mainly on small birds and large insects that it catches in the air, less often on bats, young terrestrial mammals and reptiles (Golemanski 2011, Simeonov et al. 1990, Simeonov and Michev 1991, personal notes).

Assessment of the species in the Protected Zone:

According to the standard form for the Protected Zone, one couple nests in the zone. Given the relatively high flexibility of the habitats, and given the nature of the territory within the area, we believe the number of nesting pairs is larger. Potential nesting habitats for the species in the area is practically any territory, as its nesting is microhabitately conditioned - old nests of other birds, which may be located almost everywhere. The species hunts in a variety of habitats, yet grasslands, shrubs, agricultural lands, rocks (N08, N09, N12, N15 and N21 from the Standard Form of the Zone) are preferred the most, amounting to a total area of 146,847.409 decares.

Assessment of the species on territory of the Investment Proposal

During field studies, nesting was recorded south of Kresna (outside Lot 3.2). Potential nesting habitats for the species in the area is practically any territory, as its nesting is microhabitately conditioned - old nests of other birds, which may be located almost everywhere.

The herbaceous and bushy sites, agricultural lands, including vineyards and orchards (habitats N08, N09, N12, N15 and N21) should be considered as potential trophical habitats of the species on the territory of the Investment Proposal.

Impacts:

Option G20 - Red

Direct destruction of habitats

Potential breeding habitats within the scope of this option are virtually unfit for the species, as it is highly sensitive to disturbance in the breeding area; such disturbance is also caused at the moment by the traffic of the first-class road and by the presence of people in the farmlands alongside the Kresna bypass.

231.065 decares will be affected during construction or 0.16% of the trophical habitats of the species in the zone (habitat N08, N09, N12, N15 and N21).

Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08, N09, N12, N15 and N17. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species is highly sensitive to disturbance in the nesting habitats, therefore those, comprised within the scope of this option are virtually inappropriate for the species, due to the existing traffic on the first-class road and the presence of people in the agricultural lands along the Kresna bypass.

Outside of the nesting site, the species is less sensitive to disturbance (personal observations), so the impact during construction and operation is assessed as insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. No breeding/nesting habitats would be affected, the small birds leave the nest as relatively good flyers. Mortality during the operation of the highway is not expected either, as the species hunts higher in the air. There will be no impact (rate 0).

Option G20 - Blue

Direct destruction of habitats

Potential breeding habitats within the scope of this option are virtually unfit for the species, as it is highly sensitive to disturbance in the breeding area; such disturbance is also caused at the moment by the traffic of the first-class road and by the presence of people in the farmlands alongside the Kresna bypass.

181.844 decares will be affected during construction or 0.12% of the habitats of the species in the zone (habitat N08, N09, N12, N15 and N21). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08, N09, N12, N15 and N17. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species is highly sensitive to disturbance in the nesting habitats, therefore those, comprised within the scope of this option are virtually inappropriate for the species, due to the existing traffic on the first-class road and the presence of people in the agricultural lands along the Kresna bypass.

Outside of the nesting site, the species is less sensitive to disturbance (personal observations), so the impact during construction and operation is assessed as insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. No breeding/nesting habitats would be affected, the small birds leave the nest as relatively good flyers. Mortality during the operation of the highway is not expected either, as the species hunts higher in the air. There will be no impact (rate 0).

Eastern Option G10.50

Direct destruction of habitats

Potential breeding habitats of the species in the area are practically any territory because its breeding is micro-habitually conditioned, and it is sufficient to have one tree in order for the species to breed. Therefore, the impact on them will be insignificant (Rate 1).

257.139 decares will be affected during construction or 0.18% of the habitats of the species in the zone (habitat N08, N09, N12, N15 and N21). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

Potential breeding habitats of the species in the area are practically any territory because its breeding is micro-habitually conditioned, and it is sufficient to have one tree in order for the species to breed. Therefore no fragmentation of breeding habitats will actually occur (Rate 0).

The road route under this option mainly affects considerably small parts of large polygons of habitats N08, N09, N12, N15 and N21. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species is highly sensitive to disturbance in the nesting habitats, therefore when construction activities commence, the impact during construction might be significant (Rate 3), as parents may abandon their nests with eggs or poorly flying small ones, located in the vicinity at a distance of up to 300 m from the construction site. Mitigation measures are needed. During the operation of the highway, the breeding/nesting habitats in the area of this option will be practically unfit. Given the relatively low rate of traffic, expected through the species habitats (no more than 7,000 vehicles per day by 2040 on the left roadway) and the relatively comparatively small area of affected nesting habitats, combined with their large area in the zone, practically all territory, the impact has been estimated to be insignificant.

Outside of the nesting site, the species is less sensitive to disturbance (personal observations), so the impact during construction and operation is assessed as insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. However, if it happens, the impact might be significant (Rate 3).

Mitigation measures shall be needed.

Mortality, caused by disturbance has been considered before.

Mortality during the operation of the highway is not expected either, as the species hunts high in the air. There will be no impact (Rate 0).

Measures: (the same as for *Ciconia nigra*).

Long Tunnel Option, 'Kresna' tunnel

Direct destruction of habitats

Potential breeding habitats of the species in the area are practically any territory because its breeding is micro-habitually conditioned, and it is sufficient to have one tree in order for the species to breed. Therefore, the impact on them will be insignificant (Rate 1).

227.087 decares will be affected during construction or 0.16% of the trophical habitats of the species in the zone (habitat N08, N09, N12 and N21). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

Potential breeding habitats of the species in the area are practically any territory because its breeding is micro-habitually conditioned, and it is sufficient to have one tree in order for the species to breed. Therefore no fragmentation of breeding habitats will actually occur (Rate 0).

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08, N09, N12 and N21. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species is highly sensitive to disturbance in the nesting habitats, therefore when construction activities commence, the impact during construction might be significant (Rate 3), as parents may abandon their nests with eggs or poorly flying small ones, located in the vicinity at a distance of up to 300 m from the construction site. Mitigation measures are needed. During the operation of the highway, the breeding/nesting habitats in the area of this option will be practically unfit. The impact has been assessed as insignificant given the small length of intersection of potential nesting habitats and the relatively small area affected.

Outside of the nesting site, the species is less sensitive to disturbance (personal observations), so the impact during construction and operation is assessed as insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. However, if it happens, the impact might be significant (Rate 3). Mitigation measures are needed. Mortality, caused by disturbance has been considered before.

Mortality during the operation of the highway is not expected either, as the species hunts high in the air. There will be no impact (rate 0).

Measures: (the same as for *Ciconia nigra*).

Eastern Option G20

Direct destruction of habitats

Potential breeding habitats of the species in the area are practically any territory because its breeding is micro-habitually conditioned, and it is sufficient to have one tree in order for the species to breed. Therefore, the impact on them will be insignificant (Rate 1).

645.280 decares will be affected during construction or 0.44% of the trophical habitats of the species in the zone (habitat N08, N09, N12 and N21). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

Potential breeding habitats of the species in the area are practically any territory because its breeding is micro-habitually conditioned, and it is sufficient to have one tree in order for the species to breed. Therefore no fragmentation of breeding habitats will actually occur (Rate 0).

The road route under this option mainly affects considerably small parts of large polygons of habitats N08, N09, N12 and N21. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species is highly sensitive to disturbance in the nesting habitats, therefore when construction activities commence, the impact during construction might be significant (Rate 3), as parents may abandon their nests with eggs or poorly flying small ones, located in the vicinity at a distance of up to 300 m from the construction site. Mitigation measures are needed. During the operation of the highway, the breeding/nesting habitats in the area of this option will be practically unfit. Despite the relatively high traffic (expected to reach more than 13,000 vehicles per day by 2040) and the relatively large area of affected nesting habitats, given the large area of nesting habitats in the zone, practically every territory, the impact on the species population in the zone has been assessed as insignificant (Rate 1).

Outside of the nesting site, the species is less sensitive to disturbance (personal observations), so the impact during construction and operation is assessed as insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. However, if it happens, the impact might be significant (Rate 3). Mitigation measures are needed. Mortality, caused by disturbance has been considered before.

Mortality during the operation of the highway is not expected either, as the species hunts high in the air. There will be no impact (Rate 0).

Measures: (the same as for *Ciconia nigra*).

27. The common kestrel (*Falco tinnunculus*)

Species Biology:

It nests on rocks and vertical sandy and loess shores, trees, buildings, poles of power lines, occupying nests of winged and other birds. The nest may be located in rocky and karst terrains, pastures, river valleys, edges of thin forests, tree groups, shrubs, agricultural lands, settlements, including big cities. The nesting season begins in April. It lays its eggs in April - May, brooding/incubation lasts 28 to 31 days. The young leave the nests at 28-30 days of age. A migratory and permanent species. The spring migration is in March, and the autumn in September - October. It feeds on small mammals, birds, lizards, insects that hunt in open habitats (Simeonov et al. 1990, personal observations).

Assessment of the species in the Protected Zone:

According to the standard form, the PZ has a permanent residence of 25 to 30 pairs. Potential nesting habitats for the species in the area is practically any territory, as its nesting is microhabitately conditioned - old nests of other birds, which may be located almost everywhere. The potential trophical habitats are grassland, bushes and agricultural lands (habitats N08, N09, N12, N15 and N21 from the Zone Standard Form), with a total area of 145,672.629 decares.

Assessment of the species on territory of the Investment Proposal

It was established during field studies in the northern part of the gorge, in the area of Stara Kresna and south of Kresna. Potential nesting habitats for the species in the area is practically any territory, as its nesting is microhabitately conditioned - old nests of other birds, which may be located almost everywhere.

The herbaceous and bushy sites, agricultural lands, including vineyards and orchards (habitats N08, N09, N12, N15 and N21) should be considered as potential trophical habitats of the species on the territory of the Investment Proposal.

Impacts:

Option G20 - Red

Direct destruction of habitats

Potential breeding habitats of the species in the area are practically any territory because its breeding is micro-habitually conditioned, and it is sufficient to have one tree in order for the species to breed. Therefore, the impact on them will be insignificant (Rate 1).

231.065 decares will be affected during construction or 0.16% of the trophical habitats of the species in the zone (habitat N08, N09, N12, N15 and N21). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

Potential breeding habitats of the species in the area are practically any territory because its breeding is micro-habitually conditioned, and it is sufficient to have one tree in order for the species to breed. Therefore no fragmentation of breeding habitats will actually occur (Rate 0).

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08, N09, N12, N15 and N17. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species.

Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species has low sensitivity to disturbance, even in nesting habitats (personal observations), therefore the impact during construction and operation is assessed as insignificant (Rate 1). Outside the nesting site, there will practically be no disturbance (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. Given the high number and adaptability of the species, the impact on the population in the area would be insignificant (Rate1).

Mortality during the operation of the highway is also possible because the species are not disturbed by moving vehicles (Kambourova-Ivanova et al. 2012, Karaivanov, 2015, personal observation), and regularly feeds close to roads of heavy traffic during bird passage and wintering. The impact on the population in the area will be insignificant (Rate 1) due to its relatively high population size and adaptability, as well as the fact that the migratory population in the area, exposed to higher risk is dependent on populations in other parts of the species scope.

Option G20 - Blue

Direct destruction of habitats

Potential breeding habitats of the species in the area are practically any territory because its breeding is micro-habitually conditioned, and it is sufficient to have one tree in order for the species to breed. Therefore, the impact on them will be insignificant (Rate 1).

181.844 decares will be affected during construction or 0.12% of the habitats of the species in the zone (habitat N08, N09, N12, N15 and N21). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

Potential breeding habitats of the species in the area are practically any territory because its breeding is micro-habitually conditioned, and it is sufficient to have one tree in order for the species to breed. Therefore no fragmentation of breeding habitats will actually occur (Rate 0).

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08, N09, N12, N15 and N17. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

Even outside of the nesting habitats, the species is less sensitive to disturbance, therefore the impact during construction and operation is assessed as insignificant (Rate 1). Outside the nesting site, there will practically be no disturbance (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. Given the high number and adaptability of the species, the impact on the population in the area would be insignificant (Rate1).

Mortality during the operation of the highway is also possible because the species are not disturbed by moving vehicles and regularly feeds close to roads with heavy traffic during migration and hibernation. The impact on the population in the area will be insignificant (Rate 1) due to its relatively high population size and adaptability, as well as the fact that the migratory population in the area, exposed to higher risk is dependent on populations in other parts of the species scope.

Eastern Option G10.50

Direct destruction of habitats

Potential breeding habitats of the species in the area are practically any territory because its breeding is micro-habitually conditioned, and it is sufficient to have one tree in order for the species to breed. Therefore, the impact on them will be insignificant (Rate 1).

257.139 decares will be affected during construction or 0.18% of the habitats of the species in the zone (habitat N08, N09, N12, N15 and N21). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

Potential breeding habitats of the species in the area are practically any territory because its breeding is micro-habitually conditioned, and it is sufficient to have one tree in order for the species to breed. Therefore no fragmentation of breeding habitats will actually occur (Rate 0).

The road route under this option mainly affects considerably small parts of large polygons of habitats N08, N09, N12, N15 and N21. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species has low sensitivity to disturbance, even in nesting habitats, therefore the impact during construction and operation is assessed as insignificant (Rate 1). Outside of the nesting site, there will practically be no disturbance (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. Given the high number and adaptability of the species, the impact on the population in the area would be insignificant (Rate1).

Mortality during the operation of the highway is also possible because the species are not disturbed by moving vehicles and regularly feeds close to roads with heavy traffic during migration and hibernation. The impact on the population in the area will be insignificant (Rate 1) due to its relatively high population size and adaptability, as well as the fact that the migratory population in the area, exposed to higher risk is dependent on populations in other parts of the species scope.

Long Tunnel Option, 'Kresna' tunnel

Direct destruction of habitats

Potential breeding habitats of the species in the area are practically any territory because its breeding is micro-habitually conditioned, and it is sufficient to have one tree in order for the species to breed. Therefore, the impact on them will be insignificant (Rate 1).

227.087 decares will be affected during construction or 0.16% of the trophical habitats of the species in the zone (habitat N08, N09, N12 and N21). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

Potential breeding habitats of the species in the area are practically any territory because its breeding is micro-habitually conditioned, and it is sufficient to have one tree in order for the species to breed. Therefore no fragmentation of breeding habitats will actually occur (Rate 0).

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08, N09, N12 and N21. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species has low sensitivity to disturbance, even in nesting habitats; therefore the impact during construction and operation is assessed as insignificant (Rate 1). Outside the nesting site, there will practically be no disturbance (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. Given the high number and adaptability of the species, the impact on the population in the area would be insignificant (Rate1).

Mortality during the operation of the highway is also possible because the species are not disturbed by moving vehicles and regularly feeds close to roads with heavy traffic during migration and hibernation. The impact on the population in the area will be insignificant (Rate 1) due to its relatively high population size and adaptability, as well as the fact that the migratory population in the area, exposed to higher risk is dependent on populations in other parts of the species scope.

Eastern Option G20

Direct destruction of habitats

Potential breeding habitats of the species in the area are practically any territory because its breeding is micro-habitually conditioned, and it is sufficient to have one tree in order for the species to breed. Therefore, the impact on them will be insignificant (Rate 1).

645.280 decares will be affected during construction or 0.44% of the trophical habitats of the species in the zone (habitat N08, N09, N12 and N21). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

Potential breeding habitats of the species in the area are practically any territory because its breeding is micro-habitually conditioned, and it is sufficient to have one tree in order for the species to breed. Therefore no fragmentation of breeding habitats will actually occur (Rate 0).

The road route under this option mainly affects considerably small parts of large polygons of habitats N08, N09, N12 and N21. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species has low sensitivity to disturbance, even in nests habitats, therefore the impact during construction and operation is assessed as insignificant (Rate 1). Outside the nesting site, there will practically be no disturbance (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. Given the high number and adaptability of the species, the impact on the population in the area would be insignificant (Rate1).

Mortality during the operation of the highway is also possible because moving vehicles do not disturb the species and regularly feeds close to roads with heavy traffic during migration and hibernation. The impact on the population in the area will be insignificant (Rate 1) due to its relatively high population size and adaptability, as well as the fact that the migratory population in the area, exposed to higher risk is dependent on populations in other parts of the species scope.

28. The red-footed falcon (*Falco vespertinus*)

Species Biology: Nesting - migratory and passing species. It inhabits open spaces and agricultural lands with trees and small groves, scattered forests with vast meadows, pastures, meadows, often adjacent to wetlands. It feeds on small mycelial rodents and shrew mice, insects, mostly the order of Orthoptera and Coleoptera, but also dragonflies, lizards, during breeding - also young birds and frogs. During migration, it often hunts in fallow or stubble fields. The spring passage is April through

May and the autumn - from the end of August to October (Simeonov et al. 1990, Jonsson 2006, personal observations). In 2005 and 2006, only one breeding pair was found in a targeted search in the whole country (E. Todorov - unpublished data).

Assessment of the species in the Protected Zone:

According to the standard form of the PZ, the species is presented in it only during the bird passage. The potential trophical habitats are grassland, bushes and agricultural lands (habitats N09, N12 and N15 from the Zone Standard Form), with a total area of 54,039.846 decares.

Assessment of the species on territory of the Investment Proposal

The species has not been observed during field studies. The species does not nest in the protected zone. Grassland and agricultural lands (habitats N09, N12 and N15) should be considered as potential trophical habitats.

Impacts:

Option G20 - Red

Direct destruction of habitats

The species does not nest in the protected zone. 157.222 decares will be affected during construction or 0.29% of the trophical habitats of the species in the zone (habitat N09, N12 and N15). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N09, N12 and N15. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species does not nest in the protected zone. Outside the nesting site, disturbance is expected during construction works, yet given its temporary nature and restricted territory (only around the construction site, the impact will be insignificant (Rate 1). During the operation of the highway, the impact on individual representatives of the species, feeding in the region of the investment Proposal region will not be different from the current, so the impact is considered insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. The species does not nest in the area, so there will be no endangered small birds or eggs. During operation, however, it is possible to kill individual representatives of the species in vehicle collisions (personal observations). Since the migratory population in the area depends on species populations in other parts of the species scope, no changes in the number of species population are expected, so the impact is considered insignificant (Rate 1).

Option G20 - Blue

Direct destruction of habitats

The species does not nest in the protected zone. 113.279 decares will be affected during construction or 0.21% of the trophical habitats of the species in the zone (habitat N09, N12 and N15). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N09, N12 and N15. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact. (Rate 0).

Disturbance

The species does not nest in the protected zone. Outside the nesting site, disturbance is expected during construction works, yet given its temporary nature and restricted territory (only around the construction site, the impact will be insignificant (Rate 1). During the operation of the highway, the impact on individual representatives of the species, feeding in the region of the investment Proposal region will not be different from the current, so the impact is considered insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. The species does not nest in the area, so there will be no endangered small birds or eggs. During operation, however, it is possible to kill individual representatives of the species in vehicle collisions (personal observations). Since the migratory population in the area depends on species populations in other parts of the species scope, no changes in the number of species population are expected, so the impact is considered insignificant (Rate 1).

Eastern Option G10.50

Direct destruction of habitats

The species does not nest in the protected zone. 165.105 decares will be affected during construction or 0.31% of the trophical habitats of the species in the zone (habitat N09, N12 and N15). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects small parts of large polygons of the species habitats N09, N12 and N15. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species does not nest in the protected zone. Outside the nesting site, the species is less sensitive to disturbance (personal observations), therefore the impact during construction and operation is assessed as insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and

heavy construction machinery. The species does not nest in the area, so there will be no endangered small birds or eggs. During operation, however, it is possible to kill individual representatives of the species in vehicle collisions (personal observations). Since the migratory population in the area depends on species populations in other parts of the species scope, no changes in the number of species population are expected, so the impact is considered insignificant (Rate 1).

Long Tunnel Option, 'Kresna' tunnel

Direct destruction of habitats

The species does not nest in the protected zone. 195.757 decares will be affected during construction or 0.4% of the trophical habitats of the species in the zone (habitat N09 and N12). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species does not nest in the protected zone. Outside the nesting site, the species is less sensitive to disturbance (personal observations), therefore the impact during construction and operation is assessed as insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. The species does not nest in the area, so there will be no endangered small birds or eggs. During operation, however, it is possible to kill individual representatives of the species in vehicle collisions (personal observations). Since the migratory population in the area depends on species populations in other parts of the species scope, no changes in the number of species population are expected, so the impact is considered insignificant (Rate 1).

Eastern Option G20

Direct destruction of habitats

The species does not nest in the protected zone. During construction, 376.958 decares will be affected, or 0.76% of the trophical habitats of the species in the zone (habitat N09 and N12). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option affects parts of large polygons of the species habitats N09 and N12. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species does not nest in the protected zone. Outside the nesting site, the species is less sensitive to disturbance (personal observations), therefore the impact during construction and operation is assessed as insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. The species does not nest in the area, so there will be no endangered small birds or eggs. During operation, however, it is possible to kill individual representatives of the species in vehicle collisions (personal observations). Since the migratory population in the area depends on species populations in other parts of the species scope, no changes in the number of species population are expected, so the impact is considered insignificant (Rate 1).

29. The rock partridge (*Alectoris graeca*)

Species Biology:

A Permanent species. It is common for the areas in which it resides, all through the year. In snowy and severe winters it makes vertical migrations by going down 1,000 m above sea level. along the southern slopes of the mountains. It inhabits heavily broken ground, rocky terrain in mountains and foothills, overgrown with bush and grass vegetation (blackberries, hornbeam, juniper, fern, etc.). The nest is a grass-covered dimple, located in the grass and among the bushes on rocky slopes, terraces and talus. It has one or two hatchings. The female lays from late April to June. The incubation period lasts 24 to 26 days. The precocial young leave the nest immediately The young ones can fly unsteady on the 7^{th} - 10^{th} day. They become independent 60 days after hatching - from the first decade of August to the third decade of September. Out of the breeding period, it lives in the flock. Flocks of very small number, consisting of one-year old and / or adults, birds, which have not mated, are observed throughout the breeding season. It mainly feeds on plant food - in the spring - buds and green shoots, in the summer - weed and crop seeds, berries, herbs, ants, caterpillars, snails and others, invertebrates, in autumn - with seeds and insects. (Romao 2009, Sara 1989, Golemanski 2011, Simeonov et al. 1990).

Assessment of the species in the Protected Zone:

According to the standard form, the PZ has a permanent residence of 30 to 45 pairs. According to Nikolov and Spasov (2005), only in the southern part of the Kresna Gorge, on an area of about 17,000 decares, nest between 20 and 30 pairs. The species has not been observed during field studies. The potential habitats of the species in the area are grassy, shrubby and rocky habitats (habitats N08, N09 and N22 from the Standard Zone Form), with a total area of 109,254.472 decares.

Assessment of the species on territory of the Investment Proposal

The species has not been observed during field studies. The herbaceous, bushy sites and agricultural lands (N08, N09 and N22) should be considered as potential habitats of the species on the territory of the Investment Proposal.

Impacts:

Option G20 - Red

Direct destruction of habitats

167.544 decares will be affected during construction or 0.15% of the habitats of the species in the zone (habitat N08, N09 and N22). The impact has been assessed

Given the small area affected and the unsuitable nesting habitats of species due to disturbance that also exists at the moment, caused by the traffic of the first-class road, the impact has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08, N09 and N22. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species is highly sensitive to disturbance in the nesting habitats, therefore those, comprised within the scope of this option are virtually unfit for the species, due to the existing traffic on the first-class road.

Outside the nesting habitats, the individual representatives of the species tolerate the presence of vehicles (personal observations), but not of people. Therefore some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. No nesting habitats will be affected. During the operation, mortality is not expected either, as the road route will be equipped with a fence that does not allow the adults, respectively the accompanying children, to get on the roadway. There will be no impact (rate 0).

Option G20 - Blue

Direct destruction of habitats

During construction, 185.433 decares will be affected or 0.14% of the habitats of the species in the zone (habitat N08, N09 and N22). Given the small area affected and the unsuitable nesting habitats of species due to disturbance that also exists at the moment, caused by the traffic of the first-class road, the impact has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08, N09 and N22. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species is sensitive to disturbance in the nesting sites, therefore those, comprised within the scope of this option are virtually inappropriate for the species, due to the existing traffic on the first-class road.

Outside the nesting habitats, the individual representatives of the species tolerate the presence of vehicles (personal observations), but not of people. So some disturbance is expected during construction works, yet given its temporary nature and restricted territory (only around the construction site, the impact will be insignificant

(Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. No nesting habitats will be affected. During the operation, mortality is not expected either, as the road route will be equipped with a fence that does not allow the adults, respectively the accompanying children, to get on the roadway. There will be no impact (rate 0).

Eastern Option G10.50

Direct destruction of habitats

201.341 decares will be affected during construction, or 0.18% of the habitats of the species in the zone (habitat N08 and N09). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects small parts of large polygons of the species habitats N08 and N09. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species is sensitive to disturbance in the nesting habitats, therefore the start of the construction activities, if there is a nest of eggs at a distance of up to 300 m from the construction site, the parents may abandon it. Given the relatively high population of the species on the territory of the IP and its high fertility, the impact will be insignificant (Rate 1), During the operation of the highway, the breeding/nesting habitats in the area of this option will be practically unfit. Given the relatively low rate of traffic, expected through the species habitats (no more than 7,000 vehicles per day by 2040 on the left roadway) and the relatively small area of affected habitats, combined with their suboptimal nature, the impact has been estimated to be insignificant (Rate 1).

Outside the nesting habitats, the individual representatives of the species tolerate the presence of vehicles (personal observations), but not of people. Therefore some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). No impact is expected during the operation of the motorway, (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery, yet it is possible to affect egg nests. Should this happen, given the relatively high population of the species on the territory of the IP and its high fertility, the impact will be insignificant (Rate 1), During the operation, mortality is not expected either, as the road route will be equipped with a fence that does not allow the adults, respectively the accompanying children, to get on the roadway. There will be no impact (rate 0).

The Long Tunnel Option, 'Kresna' tunnel

Direct destruction of habitats

175.237 decares will be affected during the construction or 0.16% of the habitats of the species in the zone (habitat N08 and N09). Given the small area affected and the unsuitable nesting habitats of species due to disturbance that also exists at the moment, caused by the traffic of the first-class road, the impact has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08 and N09. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species is highly sensitive to disturbance in the nesting habitats, therefore those, comprised within the scope of this option are virtually inappropriate for the species, due to the existing traffic on the first-class road and the strong presence of people south of Kresna.

Outside the nesting habitats, the individual representatives of the species tolerate the presence of vehicles (personal observations), but not of people. Therefore some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). No impact is expected during the operation of the motorway, (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. No nesting habitats will be affected. During the operation, mortality is not expected either, as the road route will be equipped with a fence that does not allow the adults, respectively the accompanying children, to get on the roadway. There will be no impact (rate 0).

Eastern Option G20

Direct destruction of habitats

601.635 decares will be affected during construction or 0.55% of the habitats of the species in the zone (habitat N08 and N09). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects parts of large polygons of the species habitats N08 and N09. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species is sensitive to disturbance in the breeding habitats, so if there is a nest of eggs at the start of construction activities, at a distance of up to 300 m from the construction site, it may be abandoned by its parents. Given the relatively high population of the species on the territory of the IP and its high fertility, the impact will be insignificant (Rate 1), During the operation of the highway, the breeding/nesting habitats in the area of this option will be practically unfit. Despite the relatively high traffic (expected to be not less than 13,000 vehicle per day by 2040), given the relatively small area of directly affected trophic habitats, the impact has been assessed as insignificant (Rate 1).

Outside the nesting habitats, the individual representatives of the species tolerate the presence of vehicles (personal observations), but not of people. Therefore some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). No impact is expected during the operation of the motorway, (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery, yet it is possible to affect egg nests. Should this happen, given the relatively high population of the species on the territory of the IP and its high fertility, the impact will be insignificant (Rate 1), During the operation, mortality is not expected either, as the road route will be equipped with a fence that does not allow the adults, respectively the accompanying children, to get on the roadway. There will be no impact (rate 0).

30. The Corncrake (*Crex crex*)

Species Biology: A migratory and passing species. It dwells on moist meadows, hay meadows, drained marshes or the drier portions of them. It avoids too swampy places, banks of rivers and lakes, and exposed rocky places, as well as grassy places with very dense and tall vegetation. During passage, it is also found in alfalfa, fallow land, vineyards, bushes, cereals fields, golf courses. Breeding starts from the end of April to June, and there is often a second hatch after that. In the region of Sofia the mass passage is in the second half of April and the end of October. It feeds on insects, snails, spiders, myriapods/centipedes, earthworms, young frogs, green parts of plants, seeds (Simeonov et al. 1990, BirdLife International 2012, Jonsson 2006).

Assessment of the species in the Protected Zone:

According to the standard form for the Protected Zone, 3 couples nest in the protected zone. The potential breeding habitats for the species in the area are grassy and more scattered shrub habitats (habitats N08 and N09 from the Standard Form of the Zone) in the higher, respectively more mesophilic parts of the Malashevska Mountains. During passage, resting and / or feeding is possible in wider communities of herbaceous and scattered bush habitats, as well as in some agricultural lands (habitats N08, N09, N12 and N15 of the Standard Zone Form), with a total area of 140,973.512 decares.

Assessment of the species on territory of the Investment Proposal

The species has not been observed during field studies. No suitable nesting habitats are present in the area of the five options. During passage, resting and / or feeding is possible in herbaceous and scattered bush habitats, as well as in some arable areas (habitats N08, N09, N12 and N15).

Impacts:

Option G20 - Red

Direct destruction of habitats

No suitable nesting habitats are present in the area of the five options. 226.317 decares will be affected during construction or 0.16% of the trophical habitats of the species in the zone (habitat N08, N09, N12 and N15). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08, N09, N12 and N15. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

No suitable nesting habitats are present in the area of the five options.

Outside of the nesting site, the species is less sensitive to disturbance (Stoyanov & Donchev, personal observations), so the impact during construction and operation is assessed as insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. No nesting habitats will be affected. During the operation, mortality is not expected either, as the road route will be equipped with a fence that would not allow the birds to get on the roadway. There will be no impact (rate 0).

Option G20 - Blue

Direct destruction of habitats

No suitable nesting habitats are present in the area of the five options. 176.825 decares will be affected during construction or 0.13% of the trophical habitats of the species in the zone (habitat N08, N09, N12 and N15). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08, N09, N12 and N15. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

No suitable nesting habitats are present in the area of the five options.

The species has low sensitivity to disturbance outside of the nesting habitats (Stoyanov et Donchev, unpublished), therefore the impact during construction and operation is assessed as insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. No nesting habitats will be affected. During the operation, mortality is not expected either, as the road route will be equipped with a fence that would not allow the birds to get on the roadway. There will be no impact (rate 0).

Eastern Option G10.50

Direct destruction of habitats

No suitable nesting habitats are present in the area of the five options. 248.625 decares will be affected during construction or 0.18% of the trophical habitats of the species in the zone (habitat N08, N09, N12 and N15). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects small parts of large polygons of the species habitats N08, N09, N12 and N15. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact.

Disturbance

No suitable nesting habitats are present in the area of the five options.

Outside of the nesting site, the species is less sensitive to disturbance (Stoyanov & Donchev, personal observations), so the impact during construction and operation is assessed as insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. No nesting habitats will be affected. During the operation, mortality is not expected either, as the road route will be equipped with a fence that would not allow the birds to get on the roadway. There will be no impact (rate 0).

The Long Tunnel Option, 'Kresna' tunnel

Direct destruction of habitats

No suitable nesting habitats are present in the area of the five options. 214.556 decares will be affected during construction or 0.15% of the trophical habitats of the species in the zone (habitat N08, N09 and N12). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08, N09 and N12. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact

Disturbance

No suitable nesting habitats are present in the area of the five options.

Outside of the nesting site, the species is less sensitive to disturbance (Stoyanov & Donchev, personal observations), so the impact during construction and operation is assessed as insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. No nesting habitats will be affected. During the operation, mortality is not expected either, as the road route will be equipped with a fence that would not allow the birds to get on the roadway. There will be no impact (rate 0).

Eastern Option G20

Direct destruction of habitats

No suitable nesting habitats are present in the area of the five options. 620.652 decares will be affected during construction or 0.44% of the trophical habitats of the species in the zone (habitat N08, N09 and N12). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option affects parts of large polygons of the species habitats N08, N09 and N12. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

No suitable nesting habitats are present in the area of the five options.

Outside of the nesting site, the species is less sensitive to disturbance (Stoyanov & Donchev, personal observations), so the impact during construction and operation is assessed as insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. No nesting habitats will be affected. During the operation, mortality is not expected either, as the road route will be equipped with a fence that would not allow the birds to get on the roadway. There will be no impact (rate 0).

31. The common moorhen, also known as the waterhen or the swamp chicken (*Gallinula chloropus*)

Species Biology: Permanent and migratory species. This is a common breeding bird in marsh environments, well-vegetated lakes and even in city parks. The breeding season is from April to August. The brooding is twice a year. The nest is a basket built on the ground in dense vegetation - (bul)rush, reed, etc. The bird passage is in March - early April and early November. It feeds on insects and their larvae, water snails, aquatic plants (Simeonov et al. 1990, personal observations).

Assessment of the species in the Protected Zone:

According to the standard form, the PZ has a permanent residence of 1 to 3 pairs. The potential habitats of the species in the area are the larger rivers and ponds (habitat N06 from the Standard Zone Form), with a total area of 2,349.559 decares.

Assessment of the species on territory of the Investment Proposal

The species has been observed during the field studies south of Kresna. As potential habitats of the species in the region of the IP should be considered the Struma River and downstream of Vlachinska River, as well as the microorganisms in the region of the Eastern options (N06), yet they are unsuitable for breeding, since Struma River within the range is devoid of high aquatic vegetation, the Vlachinska River is too shallow and shallow, and micro-water bodies in the area of the Eastern options dry out in the summer.

Impacts:

Option G20 - Red

Direct destruction of habitats

12.734 decares will be affected during construction, or 0.54% of the trophical habitats of the species in the zone (habitat N06 - on Struma river and the Vlahinska River). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1). During the operation of the highway, the affected areas outside the pillars and bridge facilities will recover as habitats of the species, and the permanently affected area will be even smaller.

Fragmentation of habitats

During the construction of bridge facilities, temporary fragmentation of habitats is expected, yet their recovery will occur promptly after completion of construction works. Given the large length and area of the fragments formed and the temporary nature of the impact, we could assume that the impact would be insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

No suitable nesting habitats are present in the area of the five options.

Outside of the nesting site, the species is less sensitive to disturbance (personal observations), so there practically will be no impact during construction and operation (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. No nesting habitats will be affected. No mortality is expected during the operation of the highway either, as the route crosses the potential habitats of the species through high bridge facilities. There will be no impact (rate 0).

Option G20 - Blue

Direct destruction of habitats

During construction, 13.123 decares will be affected, or 0.56% of the habitats of the species in the zone (habitat N06 - on Struma river and the Vlahinska River). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1). During the operation of the highway, the affected areas outside the pillars and bridge facilities will recover as habitats of the species, and the permanently affected area will be even smaller.

Fragmentation of habitats

During the construction of bridge facilities, temporary fragmentation of habitats is expected, yet their recovery will occur promptly after completion of construction works. Given the large length and area of the fragments formed and the temporary

nature of the impact, we could assume that the impact would be insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

No suitable nesting habitats are present in the area of the five options.

Outside of the nesting site, the species is less sensitive to disturbance (personal observations), so there practically will be no impact during construction and operation (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. No nesting habitats will be affected. No mortality is expected during the operation of the highway either, as the route crosses the potential habitats of the species through high bridge facilities. There will be no impact (rate 0).

Eastern Option G10.50

Direct destruction of habitats

3.099 decares will be affected during construction or 0.13% of the trophical habitats of the species in the zone (habitat N06 - on the Struma River and the Vlahinska River, as well as 3 small artificial ponds in the region of Mechkul village and Oshtava village). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1). During the operation of the highway, the affected areas outside the pillars and the supports of bridge facilities on the Struma River and Vlahinska River will recover as habitats of the species, and the permanently affected area will be even smaller.

Fragmentation of habitats

During the construction of bridge facilities, temporary fragmentation of habitats is expected, yet their recovery will occur promptly after completion of construction works. Given the large length and area of the fragments formed and the temporary nature of the impact, we could assume that the impact would be insignificant (Rate 1). Two of the artificial ponds shall be partially affected yet, as a result, their entire area is likely to be destroyed. The affected area will thus increase by 1.187 decares, or together with the directly affected area it would amount to 4.286 decares or 0.18% of the habitats of the species in the zone. The impact on the species will be insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0)

Disturbance

No suitable nesting habitats are present in the area of the five options.

Outside of the nesting site, the species is less sensitive to disturbance (personal observations), so there practically will be no impact during construction and operation (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. The option would not affect nesting habitats.

Mortality during the operation of the highway is not expected either, as the route crosses the potential habitats of the species using high bridge facilities and the road route will be provided with a fence, preventing the birds from leaving the roadway. There will be no impact (rate 0).

The Long Tunnel Option, 'Kresna' tunnel

Direct destruction of habitats

21 decares will be affected during construction or 0.89% of the habitats of the species in the zone (habitat N06 - on the Struma River). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1). During the operation of the highway, the affected areas outside the pillars and bridge facilities will recover as habitats of the species, and the permanently affected area will be even smaller.

Fragmentation of habitats

During the construction of bridge facilities, temporary fragmentation of habitats is expected, yet their recovery will occur promptly after completion of construction works. Given the large length and area of the fragments formed and the temporary nature of the impact, we could assume that the impact would be insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

No suitable nesting habitats are present in the area of the five options. Outside of the nesting site, the species is less sensitive to disturbance (personal observations), so there practically will be no impact during construction and operation (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. No nesting habitats will be affected. No mortality is expected during the operation of the highway either, as the route crosses the potential habitats of the species through high bridge facilities. There will be no impact (rate 0).

Eastern Option G20

Direct destruction of habitats

2,613 decares will be affected during construction or 0.11% of the habitats of the species in the area (habitat N06 - 4 small artificial ponds in the region of Mechkul and Oshtava). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

One of the artificial ponds shall be partially affected, yet, as a result, their entire area is likely to be destroyed. The affected area will thus increase by 0.1 decares, or together with the directly affected area it would amount to 2.713 decares, or 0.12% of the species habitats in the zone. The impact on the species will be insignificant - Rate 1.

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

No suitable nesting habitats are present in the area of the five options. Outside of the nesting site, the species is less sensitive to disturbance (personal observations), so there practically will be no impact during construction and operation (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. No nesting habitats will be affected. During the operation, mortality is not expected either, as the road route will be equipped with a fence that would not allow the birds to get on the roadway. There will be no impact (rate 0).

32. The Eurasian stone curlew/stone-curlew (***Burhinus oedicnemus*)**

Species Biology: Nesting - migratory and passing species. The spring passing of the birds is in April and the autumn passing - from September to October. It inhabits steppe and flat areas near ponds: stony, sandy and clayey biotopes, abandoned fields, low mountain slopes with rare shrubs, dunes, broad sandy beaches and islands in and along larger rivers. Laying starts in May, directly on the ground. Eggs hatch at the end of May and June and the young take off in July. If chicks or eggs are lost, the pair may produce a second brood. It feeds on large insects, snails, worms, lizards, small rodents. Active mostly at night (Caccamo et al. 2011, Golemanski 2011, Nanjinkov et al. 1990, personal observations).

Assessment of the species in the Protected Zone:

According to the standard form of the protected zone, only one couple nests in the zone. The potential habitats of the species in the area during nesting are grassy habitats (habitat N09 from the Standard Zone Form), with a total area of 21,146.027 decares.

Assessment of the species on territory of the Investment Proposal

The species has not been observed during field studies. As potential habitats of the species in the region of the IP should be considered grassy habitats (Habitat N09).

Impacts:

Option G20 - Red

Direct destruction of habitats

97.316 decares will be affected during construction or 0.46% of the habitats of the species in the zone (habitat N09). Given the small area affected and the unsuitable nesting habitats of species due to disturbance that also exists at the moment, caused by the traffic of the first-class road, the impact has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route in this option affects relatively small portions of large polygons of the N09 habitat. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species is highly sensitive to disturbance in the nesting habitats, therefore those, comprised within the scope of this option are virtually unfit for the species, due to the existing traffic on the first-class road.

The individual representatives of the species tolerate the presence of vehicles, but not of people. (Taylor et al. 2007). Therefore some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. No nesting habitats will be affected. No mortality is expected during the operation of the highway, as the species is cautious enough to avoid moving vehicles. It also hunts high in the air. There will be no impact (rate 0).

Option G20 - Blue

Direct destruction of habitats

94.045 decares will be affected during construction or 0.44% of the habitats of the species in the zone (habitat N09). Given the small area affected and the unsuitable nesting habitats of species due to disturbance that also exists at the moment, caused by the traffic of the first-class road, the impact has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route in this option affects relatively small portions of large polygons of the N09 habitat. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species is highly sensitive to disturbance in the nesting habitats, therefore those, comprised within the scope of this option are virtually unfit for the species, due to the existing traffic on the first-class road.

The individual representatives of the species tolerate the presence of vehicles, but not of people. (Taylor et al. 2007). Therefore some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. No nesting habitats will be affected. No mortality is expected during the operation of the highway, as the species is cautious enough to avoid moving vehicles. It also hunts high in the air. There will be no impact (rate 0).

Eastern Option G10.50

Direct destruction of habitats

117.821 decares will be affected during construction or 0.56% of the habitats of the species in the zone (habitat N09). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route in this option affects relatively small portions of large polygons of the N09 habitat. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species is sensitive to disturbance in the nesting habitats therefore the impact during construction might be significant (Rate 3), as parents may abandon their nests with eggs or poorly flying small ones, located in the vicinity at a distance of up to 300 m from the construction site. Mitigation measures are needed. During the operation of the highway, the breeding/nesting habitats in the area of this option will be practically unfit. Given the relatively low rate of traffic, expected through the species habitats (no more than 7,000 vehicles per day by 2040 on the left roadway) and the relatively small area of affected habitats, combined with their suboptimal

nature, the impact has been estimated to be insignificant.

The individual representatives of the species tolerate the presence of vehicles, but not of people. (Taylor et al. 2007). Therefore some disturbance may be expected during construction outside of the nesting habitats, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. Affecting a nest of eggs or poorly flying small ones is unlikely due to the low number of breeding pairs. However, if it happens, the impact might be significant (Rate 3). Mitigation measures are needed. Mortality, caused by disturbance has been considered before.

No mortality is expected during the operation of the highway, as the species is cautious enough to avoid moving vehicles. There will be no impact (rate 0).

Measures: (the same as for *Ciconia nigra*).

The Long Tunnel Option, 'Kresna' tunnel

Direct destruction of habitats

156.438 decares will be affected during construction or 0.74% of the habitats of the species in the zone (habitat N09). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route in this option affects relatively small portions of large polygons of the N09 habitat. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species is highly sensitive to disturbance in the nesting habitats, therefore when construction activities commence, the impact during construction might be significant (Rate 3), as parents may abandon their nests with eggs or poorly flying small ones, located in the vicinity at a distance of up to 300 m from the construction site. Mitigation measures are needed. During the operation of the highway, the breeding/nesting habitats in the area of this option will be practically unfit. The impact has been assessed as insignificant given the small length of intersection of potential nesting habitats and the relatively small area affected.

The individual representatives of the species tolerate the presence of vehicles, but not of people. (Taylor et al. 2007). Therefore some disturbance may be expected during construction outside of the nesting habitats, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. Affecting a nest of eggs or poorly flying small ones is unlikely due to the low number of breeding pairs. However, if it happens, the impact might be significant (Rate 3). Mitigation measures are needed. Mortality, caused by disturbance has been considered before.

No mortality is expected during the operation of the highway, as the species is cautious enough to avoid moving vehicles. There will be no impact (rate 0).

Measures: (the same as for *Ciconia nigra*).

Eastern Option G20

Direct destruction of habitats

During construction, 357.941 decares will be affected or 1.69% of the habitats of the species in the zone (habitat N09). This impact has been assessed as **moderate (Rate 2**). Due to the large number of affected polygons, mitigation measures shall be impossible.

Fragmentation of habitats

The road route in this option affects portions of large polygons of the N09 habitat. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that, the impact rate has been assessed as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species is highly sensitive to disturbance in the nesting habitats, therefore when construction activities commence, the impact during construction might be significant (Rate 3), as parents may abandon their nests with eggs or poorly flying small ones, located in the vicinity at a distance of up to 300 m from the construction site. Mitigation measures are needed. During the operation of the highway, the breeding/nesting habitats in the area of this option will be practically unfit. Given the relatively high traffic (expected to reach as much as 13,000 vehicles per day by 2040) and the relatively large area of affected trophical habitats, in combination with the relatively large directly affected area, the impact on the species population in the zone has been assessed as moderate - Rate 3.

The individual representatives of the species tolerate the presence of vehicles, but not of people. (Taylor et al. 2007). Therefore some disturbance may be expected during construction outside of the nesting habitats, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. Affecting a nest of eggs or poorly flying small ones is unlikely due to the low number of breeding pairs. However, if it happens, the impact might be significant (Rate 3).

Mitigation measures shall be needed. Mortality, caused by disturbance has been considered before.

No mortality is expected during the operation of the highway, as the species is cautious enough to avoid moving vehicles. There will be no impact (rate 0).

33. The common sandpiper *(Actitis hypoleucos*)

Species Biology:

Breeding, migrating and rarely wintering species. It inhabits different water bodies. It prefers rivers, canals, but is also found in fish ponds, wetlands, swamps, dams, lakes, paddy fields. The breeding season starts from May to July. It nests on the ground, not far from the water. The precocial young leave the nest immediately. In the Czech Republic, the spring passage is in April - May. A month later it appears in Norway. The Autumn passage in England is in August - September, and in the Czech Republic in July and August. It feeds on insects and their larvae, crustaceans, worms, molluscs, parts of plants, extremely rarely with small fish (Nankinov et al. 1997, Adamík and Pietruszková 2008, Barrett 2002, Hubálek 2003, Newton et al. 2010).

Assessment of the species in the Protected Zone:

According to the standard form of the zone, there are 4 - 6 pairs nesting in it. According to Nikolov and Spasov (2005), only in the southern part of the Kresna Gorge, on an area of about 17,000 decares, nest between 4 and 6 pairs. The species is also present during migrations. The potential habitats of the species in the area are the larger rivers and ponds (habitat N06 from the Standard Zone Form), with a total area of 2,349.559 decares.

Assessment of the species on territory of the Investment Proposal

It has been observed during the field studies in the Kresna Gorge. As potential habitats of the species in the region of the IP should be considered the Struma River and downstream of Vlachinska River, as well as the microorganisms in the region of the Eastern Options (N06), although many of the latter dry in the summer.

Impacts:

Option G20 - Red

Direct destruction of habitats

12.734 decares will be affected during construction, or 0.54% of the trophical habitats of the species in the zone (habitat N06 - on Struma river and the Vlahinska River). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1). During the operation of the highway, the affected areas outside the pillars and bridge facilities will recover as habitats of the species, and the permanently affected area will be even smaller.

Fragmentation of habitats

During the construction of bridge facilities, temporary fragmentation of habitats is expected, yet their recovery will occur promptly after completion of construction works. Given the large length and area of the fragments formed and the temporary nature of the impact, we could assume that the impact would be insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species has low sensitivity to disturbance, even in nesting habitats (4 pairs were found in the southern part of the gorge, near the existing first-class road). Some disturbance is expected during the construction of the bridge facilities, but given its temporary nature and limited territory

(only around the construction site, the impact will be insignificant (Rate 1). No impact is expected during the operation of the motorway, (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. However, if it happens, the impact might be significant (Rate 3). Mitigation measures are needed.

Since the road route crosses the potential habitats of the species by high bridge facilities, during the nesting, there would be no probability that small birds that have not yet learnt to fly or adult birds might fall on the roadway (adults fly low - personal observations). No impact is expected (rate 0). During bird passage, mortality of representatives of the species is possible in vehicle crashes. Since the migratory population in the area depends on species populations in other parts of the species scope, no changes in the number of species population are expected, so the impact is considered insignificant (Rate 1).

Measures: (the same as for *Ciconia nigra*).

Option G20 - Blue

Direct destruction of habitats

During construction, 13.123 decares will be affected, or 0.56% of the habitats of the species in the zone (habitat N06 - on Struma river and the Vlahinska River). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1). During the operation of the highway, the affected areas outside the pillars and bridge facilities will recover as habitats of the species, and the permanently affected area will be even smaller.

Fragmentation of habitats

During the construction of bridge facilities, temporary fragmentation of habitats is expected, yet their recovery will occur promptly after completion of construction works. Given the large length and area of the fragments formed and the temporary nature of the impact, we could assume that the impact would be insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species has low sensitivity to disturbance, even in nesting areas (4 pairs were found in the southern part of the gorge, near the existing first-class road). Therefore some disturbance may be expected during bridge construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). No impact is expected during the operation of the motorway, (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. However, if it happens, the impact might be significant (Rate 3). Mitigation measures are needed.

Since the road route crosses the potential habitats of the species by high bridge facilities, during the nesting, there would be no probability that small birds that have not yet learnt to fly or adult birds might fall on the roadway (adults fly low - personal observations). No impact is expected (Rate 0). During bird passage, mortality of representatives of the species is possible in vehicle crashes. Since the

migratory population in the area depends on species populations in other parts of the species scope, no changes in the number of species population are expected, so the impact is considered insignificant (Rate 1).

Measures: (the same as for *Ciconia nigra*).

Eastern Option G10.50

Direct destruction of habitats

3.099 decares will be affected during construction or 0.13% of the trophical habitats of the species in the zone (habitat N06 - on the Struma River and the Vlahinska River, as well as 3 small artificial ponds in the region of Mechkul village and Oshtava village). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1). During the operation of the highway, the affected areas outside the pillars and the supports of bridge facilities on the Struma River and Vlahinska River will recover as habitats of the species, and the permanently affected area will be even smaller.

Fragmentation of habitats

During the construction of bridge facilities, temporary fragmentation of habitats is expected, yet their recovery will occur promptly after completion of construction works. Given the large length and area of the fragments formed and the temporary nature of the impact, we could assume that the impact would be insignificant (Rate 1). Two of the artificial ponds shall be partially affected yet, as a result, their entire area is likely to be destroyed. The affected area will thus increase by 1.187 decares, or together with the directly affected area it would amount to 4.286 decares or 0.18% of the habitats of the species in the zone. The impact on the species will be insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact.

Disturbance

The species has low sensitivity to disturbance, even in nesting habitats.

(4 pairs were found in the southern part of the gorge, near the existing first-class road). Therefore some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. However, if it happens, the impact might be significant (Rate 3). Mitigation measures are needed.

Since the road route crosses the potential habitats of the species by high bridge facilities, during the nesting, there would be no probability that small birds that have not yet learnt to fly or adult birds might fall on the roadway (adults fly low - personal observations). No impact is expected (rate 0). During bird passage, mortality of representatives of the species is possible in vehicle crashes. Since the migratory population in the area depends on species populations in other parts of the species scope, no changes in the number of species population are expected, so the impact is considered insignificant (Rate 1).

Measures: (the same as for *Ciconia nigra*).

The Long Tunnel Option, 'Kresna' tunnel

Direct destruction of habitats

21 decares will be affected during construction or 0.89% of the habitats of the species in the zone (habitat N06 - on the Struma River). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1). During the operation of the highway, the affected areas outside the pillars and bridge facilities will recover as habitats of the species, and the permanently affected area will be even smaller.

Fragmentation of habitats

During the construction of bridge facilities, temporary fragmentation of habitats is expected, yet their recovery will occur promptly after completion of construction works. Given the large length and area of the fragments formed and the temporary nature of the impact, we could assume that the impact would be insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species has low sensitivity to disturbance, even in nesting areas.
(4 pairs were found in the southern part of the gorge, near the existing first-class road). Therefore some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. However, if it happens, the impact might be significant (Rate 3). Mitigation measures are needed.

Since the road route crosses the potential habitats of the species by high bridge facilities, during the nesting, there would be no probability that small birds that have not yet learnt to fly or adult birds might fall on the roadway (adults fly low - personal observations). No impact is expected (rate 0). During bird passage, mortality of representatives of the species is possible in vehicle crashes. Since the migratory population in the area depends on species populations in other parts of the species scope, no changes in the number of species population are expected, so the impact is considered insignificant (Rate 1).

Measures: (the same as for *Ciconia nigra*).

Eastern Option G20

Direct destruction of habitats

2,613 decares will be affected during construction or 0.11% of the habitats of the species in the area (habitat N06 - 4 small artificial ponds in the region of Mechkul and Oshtava). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

One of the artificial ponds shall be partially affected, yet, as a result, their entire area is likely to be destroyed. The affected area will thus increase by 0.1 decares, or together with the directly affected area it would amount to 2.713 decares, or 0.12% of the species habitats in the zone. The impact on the species will be insignificant - Rate 1.

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact

Disturbance

The species has low sensitivity to disturbance, even in nesting areas.

(4 pairs were found in the southern part of the gorge, near the existing first-class road). Therefore some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. However, if it happens, the impact might be significant (Rate 3). Mitigation measures are needed.

As the route will practically destroy the potential habitats of the species close to it, during nesting, there is no probability for small birds that do not yet fly and adults to get on the roadway. There will be no impact (rate 0). During bird passage, mortality of representatives of the species is possible in vehicle crashes. Since the migratory population in the area depends on species populations in other parts of the species scope, no changes in the number of species population are expected, so the impact is considered insignificant (Rate 1).

Measures: (the same as for *Ciconia nigra*).

34. The little ringed plover (*Charadrius dubius*)

Species Biology:

Nesting and migratory, passing and wintering species. The spring migration starts early March to the middle of May, the autumn migration - from the second half of July to the end of October. It is found near water basins in the lower parts of the country - rivers, streams, permanent freshwater lakes, swamps and others. Standing ponds, canals, etc., nesting right next to the water along the gravel banks, sandy beaches, islands, dunes, etc. Pairing begins at the end of March. Nesting starts in April. Hatching is late May. It feeds on insects of the Coleoptera order and their larvae, the larvae of the stone crayfish, worms, small clams and seeds, etc. (Golemanski 2011, Nankinsov et al. 1997, personal observations).

Assessment of the population of the species in the area of the PZ and on the territory of the investment proposal: There are 25-35 breeding pairs and an indeterminate number of passing species representatives in the protected area (Standard Form of the PZ). There is high probability that part of the pairs in the area of the PZ may nest within the territory of the IP.

Assessment of the species in the Protected Zone:

According to the standard form of the zone, there are 25 - 35 pairs nesting in it. The species is also present during migrations. The potential habitats of the species in the area are the larger rivers and ponds (habitat N06 from the Standard Zone Form), with a total area of 2,349.559 decares.

Assessment of the species on territory of the Investment Proposal

The species has not been observed during field studies. As potential habitats of the species in the region of the IP should be considered the Struma River and downstream of the Vlachinska River, as well as the microorganisms in the region of the Eastern Options (N06), although many of the latter dry in the summer.

Impacts:

Option G20 - Red

Direct destruction of habitats

12.734 decares will be affected during construction, or 0.54% of the trophical habitats of the species in the zone (habitat N06 - on Struma river and the Vlahinska River). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1). During the operation of the highway, the affected areas outside the pillars and bridge facilities will recover as habitats of the species, and the permanently affected area will be even smaller.

Fragmentation of habitats

During the construction of bridge facilities, temporary fragmentation of habitats is expected, yet their recovery will occur promptly after completion of construction works. Given the large length and area of the fragments formed and the temporary nature of the impact, we could assume that the impact would be insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species has low sensitivity to disturbance, even in nesting sites (personal observations). Therefore some disturbance may be expected during bridge construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. Given the high number and adaptability of the species, the impact on the population in the area would be insignificant (Rate1).

Since the road route crosses the potential habitats of the species by high bridge facilities, during the nesting, there would be no probability that small birds that have not yet learnt to fly or adult birds might fall on the roadway (adults fly low - personal observations). No impact is expected (rate 0). During bird passage, mortality of representatives of the species is possible in vehicle crashes. Since the migratory population in the area depends on species populations in other parts of the species scope, no changes in the number of species population are expected, so the impact is considered insignificant (Rate 1).

Option G20 - Blue

Direct destruction of habitats

During construction, 13.123 decares will be affected, or 0.56% of the habitats of the species in the zone (habitat N06 - on Struma river and the Vlahinska River). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1). During the operation of the highway, the affected areas outside the pillars and bridge facilities will recover as habitats of the species, and the permanently affected area will be even smaller.

Fragmentation of habitats

During the construction of bridge facilities, temporary fragmentation of habitats is expected, yet their recovery will occur promptly upon completion of construction works.

Given the large length and area of the fragments formed and the temporary nature of the impact, we could assume that the impact would be insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species has low sensitivity to disturbance, even in nesting areas. Therefore some disturbance may be expected during bridge construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. Given the high number and adaptability of the species, the impact on the population in the area would be insignificant (Rate1).

Since the road route crosses the potential habitats of the species by high bridge facilities, during the nesting, there would be no probability that small birds that have not yet learnt to fly or adult birds might fall on the roadway (adults fly low - personal observations). No impact is expected (rate 0). During bird passage, mortality of representatives of the species is possible in vehicle crashes. Since the migratory population in the area depends on species populations in other parts of the species scope, no changes in the number of species population are expected, so the impact is considered insignificant (Rate 1).

Eastern Option G10.50

Direct destruction of habitats

3.099 decares will be affected during construction or 0.13% of the trophical habitats of the species in the zone (habitat N06 - on the Struma River and the Vlahinska River, as well as 3 small artificial ponds in the region of Mechkul village and Oshtava village). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1). During the operation of the highway, the affected areas outside the pillars and the supports of bridge facilities on the Struma River and Vlahinska River will recover as habitats of the species, and the permanently affected area will be even smaller.

Fragmentation of habitats

During the construction of bridge facilities, temporary fragmentation of habitats is expected, yet their recovery will occur promptly after completion of construction works. Given the large length and area of the fragments formed and the temporary nature of the impact, we could assume that the impact would be insignificant (Rate 1). Two of the artificial ponds shall be partially affected yet, as a result, their entire area is likely to be destroyed. The affected area will thus increase by 1.187 decares, or together with the directly affected area it would amount to 4.286 decares or 0.18% of the habitats of the species in the zone. The impact on the species will be insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact

Disturbance

The species has low sensitivity to disturbance, even in nesting sites. Therefore some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and

heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. Given the high number and adaptability of the species, the impact on the population in the area would be insignificant (Rate1).

Since the road route crosses the potential habitats of the species by high bridge facilities, during the nesting, there would be no probability that small birds that have not yet learnt to fly or adult birds might fall on the roadway (adults fly low - personal observations). No impact is expected (rate 0). During bird passage, mortality of representatives of the species is possible in vehicle crashes. Since the migratory population in the area depends on species populations in other parts of the species scope, no changes in the number of species population are expected, so the impact is considered insignificant (Rate 1).

The Long Tunnel Option, 'Kresna' tunnel

Direct destruction of habitats

21 decares will be affected during construction or 0.89% of the habitats of the species in the zone (habitat N06 - on the Struma River). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1). During the operation of the highway, the affected areas outside the pillars and bridge facilities will recover as habitats of the species, and the permanently affected area will be even smaller.

Fragmentation of habitats

During the construction of bridge facilities, temporary fragmentation of habitats is expected, yet their recovery will occur promptly after completion of construction works. Given the large length and area of the fragments formed and the temporary nature of the impact, we could assume that the impact would be insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. There will be no impact (Rate 0).

Disturbance

The species has low sensitivity to disturbance, even in nesting areas. Therefore some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. The impact on the population in the area will be

insignificant (Rate 1), given the high number and adaptavity of the species.

Since the road route crosses the potential habitats of the species by high bridge facilities, during the nesting, there would be no probability that small birds that have not yet learnt to fly or adult birds might fall on the roadway (adults fly low - personal observations). No impact is expected (rate 0). During bird passage, mortality of representatives of the species is possible in vehicle crashes. Since the migratory population in the area depends on species populations in other parts of the species scope, no changes in the number of species population is expected, so the impact is considered insignificant (Rate 1).

The Eastern Option G20

Direct destruction of habitats

2,613 decares will be affected during construction or 0.11% of the habitats of the species in the area (habitat N06 - 4 small artificial ponds in the region of Mechkul and Oshtava). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

One of the artificial ponds shall be partially affected, yet, as a result, their entire area is likely to be destroyed. The affected area will thus increase by 0.1 decares, or together with the directly affected area it would amount to 2.713 decares, or 0.12% of the species habitats in the zone. The impact on the species will be insignificant - Rate 1.

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact
(0).

Disturbance

The species has low sensitivity to disturbance, even in nesting areas.
Therefore some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate
Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. Given the high number and adaptavity of the species, the impact on the population in the area would be insignificant (Rate1).

As the route will practically destroy the potential habitats of the species close to it, during nesting, there is no probability for small birds that do not yet fly and adults to get on the roadway. There will be no impact (rate 0). During bird passage, mortality of representatives of the species is possible in vehicle crashes. Since the migratory population in the area depends on species populations in other parts of the species scope, no changes in the number of species population is expected, so the impact is considered insignificant (Rate 1).

35. The European nightjar/Eurasian nightjar *(Caprimulgus europaeus*)

Species Biology: Migratory species. It inhabits dilute deciduous, mixed and coniferous forests with meadows, throughcuts, clearings, groups of trees in open spaces, hilly slopes with shrubs up to 1,900 m above sea level. The nest is often unnoticeable depression on the ground, without cover. Migratory species. The spring migration starts in early May, and the autumn passage from August to mid-October. It feeds on insects that it hunts at night

in the air. It hunts in a variety of habitats, including residential areas around street lamps (Simeonov et al. 1990, Jonsson 2006, personal observations).

Assessment of the species in the Protected Zone:

According to the standard form, between 70 and 160 pairs are nesting in the protected zone. It is also found during migrations. The potential habitats of the species in the area are shrubby communities and deciduous forests (habitats N08 and N16 from the Standard Zone Form), with a total area of 131,575.278 decares. The potential trophical habitats are virtually any territory as it hunts in the air in a variety of habitats, including residential areas.

Assessment of the species on territory of the Investment Proposal

The species has not been observed during field studies. The herbaceous, bushy sites and deciduous forests (N08 and N16) should be considered as potential nesting habitats of the species on the territory of the Investment Proposal. The potential trophical habitats are virtually any territory as it hunts in the air in a variety of habitats, including residential areas.

Impacts:

Option G20 - Red

Direct destruction of habitats

During construction, 202.311 decares will be affected, or 0.15% of the habitats of the species in the zone (habitat N08 and N16). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

The potential trophical habitats are virtually any territory as it hunts in the air in a variety of habitats, including residential areas. Therefore, the impact on them will be insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08 and N16. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a nesting habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

The potential trophical habitats are virtually any territory as it hunts in the air in a variety of habitats, including residential areas. Therefore no fragmentation of nesting habitats will actually occur (Rate 0).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species has low sensitivity to disturbance, even in nesting sites (personal observations). Therefore some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During the operation of the motorway, mortality of representatives of the species is possible in vehicle crashes. Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

Option G20 - Blue

Direct destruction of habitats

230.445 decares will be affected during construction, or 0.18% of the habitats of the species in the zone (habitat N08 and N16). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

The potential trophical habitats are virtually any territory as it hunts in the air in a variety of habitats, including residential areas. Therefore, the impact on them will be insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08 and N16. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a nesting habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

The potential trophical habitats are virtually any territory as it hunts in the air in a variety of habitats, including residential areas. Therefore no fragmentation of nesting habitats will actually occur (Rate 0).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact
(0).

Disturbance

The species has low sensitivity to disturbance, even in nesting sites (personal observations). Therefore some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During the operation of the motorway, mortality of representatives of the species is possible in vehicle crashes. Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

Eastern Option G10.50

Direct destruction of habitats

243.539 decares will be affected during construction, or 0.19% of the habitats of the species in the zone (habitat N08 and N16). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

The potential trophical habitats are virtually any territory as it hunts in the air in a variety of habitats, including residential areas. Therefore, the impact on them will be insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects small parts of large polygons of the species habitats N08 and N16. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a nesting habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

The potential trophical habitats are virtually any territory as it hunts in the air in a variety of habitats, including residential areas. Therefore no fragmentation of nesting habitats will actually occur (Rate 0).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species has low sensitivity to disturbance, even in nesting sites (personal observations). Therefore some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During the operation of the motorway, mortality of representatives of the species is possible in vehicle crashes. Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

The Long Tunnel Option, 'Kresna' tunnel

Direct destruction of habitats

During construction, 36.525 decares will be affected, or 0.03% of the habitats of the species in the zone (habitat N06 and N16). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

The potential trophical habitats are virtually any territory as it hunts in the air in a variety of habitats, including residential areas. Therefore, the impact on them will be insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08 and N16. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a nesting habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

The potential trophical habitats are virtually any territory as it hunts in the air in a variety of habitats, including residential areas. Therefore no fragmentation of nesting habitats will actually occur (Rate 0).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species has low sensitivity to disturbance, even in nesting sites (personal observations). Therefore some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During the operation of the motorway, mortality of representatives of the species is possible in vehicle crashes. Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

The Eastern Option G20

Direct destruction of habitats

During construction, 710.948 decares will be affected, or 0.54% of the habitats of the species in the zone (habitat N08 and N16). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

The potential trophical habitats are virtually any territory as it hunts in the air in a variety of habitats, including residential areas. Therefore, the impact on them will be insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects parts of large polygons of the species habitats N08 and N16. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a nesting habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

The potential trophical habitats are virtually any territory as it hunts in the air in a variety of habitats, including residential areas. Therefore no fragmentation of nesting habitats will actually occur (Rate 0).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species has low sensitivity to disturbance, even in nesting sites (personal observations). Therefore some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During the operation of the motorway, mortality of representatives of the species is possible in vehicle crashes. Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

36. The Eurasian eagle-owl (*Bubo bubo*)

Species Biology: A Permanent species. All year round, it inhabits karst and volcanic rocks, gorges, defiles, eroded terrains, like nests on the rocks or in niches in the earth's shores. Laying starts in early April. Hatching is in the first half of May. The young birds leave the nest and are able to move away from it at 40-45 days of age, or at the latest at the end of June. It feeds on mammals, birds, frogs and invertebrates. The hunting area has a radius of 1-2 km from the nest (Penteriani et al. 2012, Simeonov et al. 1990).

Assessment of the species in the Protected Zone:

According to the standard form, the PZ has a permanent residence of 4 to 5 pairs. Nesting habitats are in the higher and inaccessible rocks in the zone (habitat N22 of the Standard Area Form), with a total area of 1,174.779 decares. The potential trophical habitats are grasslands, bushes, agricultural lands and forests (habitats N08, N09, N12, N15, N16, N17, N19 and N21 from the Zone Standard Form), with a total area of 227,907.178 decares.

Assessment of the species on territory of the Investment Proposal

The species has not been observed during field studies. The higher and inaccessible rocks (habitat N22) should be considered as potential breeding habitats of the species in the area of the investment proposal. The herbaceous and bushy sites, agricultural lands and forests, including coniferous forests N08, N09, N12, N15, N16, N17 and N21) should be considered as potential trophical habitats of the species on the territory of the Investment Proposal.

Impacts:

Option G20 - Red

Direct destruction of habitats

Potential breeding habitats within the scope of this option are virtually unfit for the species, as it is highly sensitive to disturbance in the breeding area; such disturbance is also caused at the moment by the traffic of the first-class road and by the presence of people in the farmlands alongside the Kresna bypass.

390.445 decares will be affected during construction or 0.17% of the trophical habitats of the species in the zone (habitat N08, N09, N12, N15, N16, N17 and N21). The impact has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08, N09, N12, N15, N16, N17 and N21. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species is highly sensitive to disturbance in the nesting habitats, therefore those, comprised within the scope of this option are virtually inappropriate for the species, due to the existing traffic on the first-class road and the presence of people in the agricultural lands along the Kresna bypass.

Some disturbance may be expected during construction outside the nesting areas, yet given its temporary nature and the restricted territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the highway, the impact on individual representatives of the species, feeding in the region of the investment Proposal region will not be different from the current, so the impact is considered insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. No breeding/nesting habitats would be affected, the small birds leave the nest as relatively good flyers. However, during the operation of the motorway, mortality of representatives of the species is possible in vehicle crashes (Aebischer et al. 2010). The impact on the breeding population in the area may be significant (Rate 3), if a bird that is part of it is killed. Mitigation measures shall be necessary.

Measures: (See *Accipiter brevipes*).

Option G20 - Blue

Direct destruction of habitats

Potential breeding habitats within the scope of this option are virtually unfit for the species, as it is highly sensitive to disturbance in the breeding area; such disturbance is also caused at the moment by the traffic of the first-class road and by the presence of people in the farmlands alongside the Kresna bypass.

385.984 decares will be affected during construction or 0.17% of the trophical habitats of the species in the zone (habitat N08, N09, N12, N15, N17 and N21). The impact has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08, N09, N12, N15, N16, N17 and N21. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact
(0).

Disturbance

The species is highly sensitive to disturbance in the nesting habitats, therefore
those, comprised within the scope of this option are virtually inappropriate for the species, due to the existing traffic on the first-class road and the presence of people in the agricultural lands along the Kresna bypass.

Some disturbance may be expected during construction outside the nesting areas, yet given its temporary nature and the restricted territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the highway, the impact on individual representatives of the species, feeding in the region of the investment Proposal region will not be different from the current, so the impact is considered insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. No breeding/nesting habitats would be affected, the small birds leave the nest as relatively good flyers. However, during the operation of the motorway, mortality of representatives of the species is possible in vehicle crashes (Aebischer et al. 2010). The impact on the breeding population in the area may be significant (Rate 3), if a bird that is part of it is killed. Mitigation measures shall be necessary.

Measures: (See *Accipiter brevipes*).

Eastern Option G10.50

Direct destruction of habitats

The road route in this option does not affect the N22 habitat. 494.224 decares will be affected during construction or 0.22% of the trophical habitats of the species in the zone (habitat N08, N09, N12, N15, N16, N17 and N21). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route in this option does not affect the N22 habitat. The road route under this option mainly affects considerably small parts of large polygons of habitats N08, N09, N12, N15, N16, N17 and N21. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species.

Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The potential nesting habitats are far enough from the road route in this option, to avoid any disturbance (Rate 0), during construction and during operation.

Some disturbance may be expected during construction outside the nesting areas, yet given its temporary nature and the restricted territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the highway, it is possible that the trophical habitats in the vicinity of the road may become unsuitable for the species. Given the relatively low rate of traffic, expected through the species habitats (no more than 7,000 vehicles per day by 2040 on the left roadway) and the relatively small area of affected habitats, combined with their suboptimal nature, the impact has been estimated to be insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. No breeding/nesting habitats would be affected, the small birds leave the nest as relatively good flyers. During the operation of the motorway, mortality of representatives of the species is possible in vehicle crashes. The impact on the breeding population in the area may be significant (Rate 3). if a bird that is part of it is killed. Mitigation measures shall be necessary.

Measures: (See *Accipiter brevipes*).

The Long Tunnel Option, 'Kresna' tunnel

Direct destruction of habitats

The road route in this option does not affect the N22 habitat. During construction, 244.813 decares will be affected or 0.11% of the habitats of the species in the zone (habitat N08, N09, N12, N16 and N21). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route in this option does not affect the N22 habitat. The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08, N09, N12, N16 and N21. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The potential nesting habitats are far enough from the road route in this option, to avoid any disturbance (Rate 0), during construction and during operation.

Some disturbance may be expected during construction outside the nesting areas, yet given its temporary nature and the restricted territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the highway, it is possible that the trophical habitats in the vicinity of the road may become unsuitable for the species.

The impact has been assessed as insignificant (rate 1), given the relatively small area of affected trophical habitats

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. No breeding/nesting habitats would be affected, the small birds leave the nest as relatively good flyers. During the operation of the motorway, mortality of representatives of the species is possible in vehicle crashes. The impact on the breeding population in the area may be significant (Rate 3). if a bird that is part of it is killed. Mitigation measures shall be necessary.

Measures: (See *Accipiter brevipes*).

The Eastern Option G20

Direct destruction of habitats

The road route in this option does not affect the N22 habitat. 1,350.262 decares will be affected during construction or 0.59% of the trophical habitats of the species in the zone (habitat N08, N09, N12, N16, N17 and N21). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route in this option does not affect the N22 habitat. The road route under this option mainly affects considerably small parts of large polygons of habitats N08, N09, N12, N16, N17 and N21. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The potential nesting habitats are far enough from the road route in this option, to avoid any disturbance (Rate 0), during construction and during operation.

Some disturbance may be expected during construction outside the nesting areas, yet given its temporary nature and the restricted territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the highway, it is possible that the trophical habitats in the vicinity of the road may become unsuitable for the species. Despite the relatively high traffic (expected to be not less than 13,000 vehicle per day by 2040), given the relatively small area of directly affected trophic habitats, the impact has been assessed as insignificant (Rate 1).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. No breeding/nesting habitats would be affected, the small birds leave the nest as relatively good flyers. During the operation of the motorway, mortality of representatives of the species is possible in vehicle crashes. The impact on the breeding population in the area may be significant (Rate 3). if a bird that is part of it is killed. Mitigation measures shall be necessary.

Measures: (See *Accipiter brevipes*).

37. The common kingfisher (*Alcedo atthis*)

Species Biology: A Permanent species. It inhabits rivers, swamps, lakes, dams, fishponds and other water basins in the vicinity (up to about 50 m) next to vertical, loamy, sandy

and gravel banks where it digs its nests. It breeds from May to June, sometimes for a second time in July - August. The incubation takes 18-21 days, the young leave the nest
23-27 days of age. During the winter, it leaves the water bodes it inhabits during the breeding season, and is found on the non-freezing parts of rivers, dams, fishponds and warm springs. It feeds on small fish, very rarely - on frogs and crustaceans (Nankinov et al. 1997).

Assessment of the species in the Protected Zone:

According to the standard form of the zone, there are 9 - 11 pairs, nesting in it. The potential habitats of the species in the area are the larger rivers and ponds (habitat N06 from the Standard Zone Form), with a total area of 2,349.559 decares.

Assessment of the species on territory of the Investment Proposal

The species has been observed during the field studies, near Kresna (the Vlahinska River) and south of it. As potential habitats of the species in the region of the IP should be considered the Struma River and downstream of Vlahinska river.

Impacts:

Option G20 - Red

Direct destruction of habitats

12.734 decares will be affected during construction, or 0.54% of the trophical habitats of the species in the zone (habitat N06 - on Struma river and the Vlahinska River). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1). During the operation of the highway, the affected areas outside the pillars and bridge facilities will recover as habitats of the species, and the permanently affected area will be even smaller.

Fragmentation of habitats

During the construction of bridge facilities, temporary fragmentation of habitats is expected, yet their recovery will occur promptly after completion of construction works. Given the large length and area of the fragments formed and the temporary nature of the impact, we could assume that the impact would be insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact
(0).

Disturbance

The species has low sensitivity to disturbance, even in nesting
(found near the existing first-class road). Therefore some disturbance may be expected during bridge construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate
Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. However, if it happens, the impact might be significant (Rate 3). Mitigation measures are needed.

During the operation of the motorway, mortality of representatives of the species is also possible in vehicle crashes (Kambourova-Ivanova et al. 2012, Karaivanov 2015). The impact on the breeding population in the area may be significant (Rate 3). if a bird that is part of it is killed. Mitigation measures shall be necessary.

Measures:

1. (the same as for Ciconia nigra).
2. (See *Accipiter brevipes*).

Option G20 - Blue

Direct destruction of habitats

During construction, 13.123 decares will be affected, or 0.56% of the habitats of the species in the zone (habitat N06 - on Struma river and the Vlahinska River). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1). During the operation of the highway, the affected areas outside the pillars and bridge facilities will recover as habitats of the species, and the permanently affected area will be even smaller.

Fragmentation of habitats

During the construction of bridge facilities, temporary fragmentation of habitats is expected, yet their recovery will occur promptly after completion of construction works. Given the large length and area of the fragments formed and the temporary nature of the impact, we could assume that the impact would be insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact
(0).

Disturbance

The species has low sensitivity to disturbance, even in nesting
(found near the existing first-class road). Therefore some disturbance may be expected during bridge construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate
Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. However, if it happens, the impact might be significant (Rate 3). Mitigation measures are needed.

During the operation of the motorway, mortality of representatives of the species is also possible in vehicle crashes (Kambourova-Ivanova et al. 2012, Karaivanov 2015). The impact on the breeding population in the area may be significant (Rate 3). if a bird that is part of it is killed. Mitigation measures shall be necessary.

Measures:

1. (the same as for Ciconia nigra).
2. (See *Accipiter brevipes*).

Eastern Option G10.50

Direct destruction of habitats

During construction, 1.817 decares will be affected, or 0.08 of the habitats of the species in the zone (habitat N06 - on Struma river and the Vlahinska River). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1). During the operation of the highway, the affected areas outside the pillars and the supports of bridge facilities on the Struma River and Vlahinska River will recover as habitats of the species, and the permanently affected area will be even smaller.

Fragmentation of habitats

During the construction of bridge facilities, temporary fragmentation of habitats is expected, yet their recovery will occur promptly after completion of construction works. Given the large length and area of the fragments formed and the temporary nature of the impact, we could assume that the impact would be insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species has low sensitivity to disturbance, even in nesting (found near the existing first-class road). Therefore some disturbance may be expected during bridge construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. However, if it happens, the impact might be significant (Rate 3). Mitigation measures are needed.

During the operation of the motorway, mortality of representatives of the species is also possible in vehicle crashes (Kambourova-Ivanova et al. 2012, Karaivanov 2015). The impact on the breeding population in the area may be significant (Rate 3). if a bird that is part of it is killed. Mitigation measures shall be necessary.

Measures:

1. (the same as for Ciconia nigra).
2. (See *Accipiter brevipes*).

The Long Tunnel Option, 'Kresna' tunnel

Direct destruction of habitats

21 decares will be affected during construction or 0.89% of the habitats of the species in the zone (habitat N06 - on the Struma River). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1). During the operation of the highway, the affected areas outside the pillars and bridge facilities will recover as habitats of the species, and the permanently affected area will be even smaller.

Fragmentation of habitats

During the construction of bridge facilities, temporary fragmentation of habitats is expected, yet their recovery will occur promptly after completion of construction works. Given the large length and area of the fragments formed and the temporary nature of the impact, we could assume that the impact would be insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species has low sensitivity to disturbance, even in nesting (found near the existing first-class road). Therefore some disturbance may be expected during bridge construction, yet given its temporary nature and limited territory (only around the construction site), it will be

insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. However, if it happens, the impact might be significant (Rate 3). Mitigation measures are needed.

During the operation of the motorway, mortality of representatives of the species is also possible in vehicle crashes (Kambourova-Ivanova et al. 2012, Karaivanov 2015). The impact on the breeding population in the area may be significant (Rate 3). if a bird that is part of it is killed. Mitigation measures shall be necessary.

Measures:

1. (the same as for Ciconia nigra).
2. (See *Accipiter brevipes*).

The Eastern Option G20

Direct destruction of habitats

The road route under this option does not affect habitats of the species. There will be no impact (Rate 0).

Fragmentation of habitats

The road route under this option does not affect habitats of the species. There will be no impact (Rate 0).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The road route under this option does not pass near habitats of the species. There will be no impact (Rate 0).

Mortality

The road route under this option does not pass near habitats of the species. There will be no impact (Rate 0).

38. The European roller (*Coracias garrulus*)

Species Biology: Nesting - migratory and passing species. It inhabits open fields and agricultural lands with old trees, riparian forests, woodland outcrops and seldom on rocky shores, gorges, couloirs. It breeds in tree hollows, rarely in rock cavities. The breeding season is heavily stretched, from the middle of May to the end of June. Migratory species. Spring migration is from the second half of April to the end of May and the autumn migration - from the end of July to the second half of September. It feeds on insects, worms, small frogs and others. It hunts in open spaces (Jonsson 2006, Nankinov et al. 1997).

Assessment of the species in the Protected Zone:

According to the standard form for the Protected Zone, 10 - 12 couples nest in the zone. Also present during migrations. The potential trophical habitats of the species in the zone are grassland, bushes and agricultural lands (habitats N09 and N12 from the Zone Standard Form), with a total area of 49,340.729 decares.

Assessment of the species on territory of the Investment Proposal

The species has not been observed during field studies. The herbaceous and bushy sites and agricultural lands (N09 and N12) should be considered as potential habitats of the species on the territory of the Investment Proposal.

Impacts:

Option G20 - Red

Direct destruction of habitats

During construction, 116.338 decares will be affected or 0.24% of the habitats of the species in the zone (habitat N09 and N12). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species has low sensitivity to disturbance, even in nesting sites (personal observations). Therefore some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. However, if it happens, the impact might be significant (Rate 3). Mitigation measures are needed.

During the operation of the motorway, mortality of representatives of the species is possible in vehicle crashes. The impact on the breeding population in the area may be significant (Rate 3). if a bird that is part of it is killed. Mitigation measures shall be necessary.

Measures:

1. (the same as for Ciconia nigra).
2. (See *Accipiter brevipes*).

Option G20 - Blue

Direct destruction of habitats

During construction, 109.691 decares will be affected or 0.22% of the habitats of the species in the zone (habitat N09 and N12). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species has low sensitivity to disturbance, even in nesting sites (personal observations). Therefore some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. However, if it happens, the impact might be significant (Rate 3). Mitigation measures are needed.

During the operation of the motorway, mortality of representatives of the species is possible in vehicle crashes. The impact on the breeding population in the area may be significant (Rate 3). if a bird that is part of it is killed. Mitigation measures shall be necessary.

Measures:

1. (the same as for Ciconia nigra).
2. (See *Accipiter brevipes*).

Eastern Option G10.50

Direct destruction of habitats

During construction, 137.718 decares will be affected or 0.28% of the habitats of the species in the zone (habitat N09 and N12). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route in this option mainly affects small parts of large polygons of the species habitats N09 and N12. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species has low sensitivity to disturbance, even in nesting sites (personal observations). Therefore some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. However, if it happens, the impact might be significant (Rate 3). Mitigation measures are needed.

During the operation of the motorway, mortality of representatives of the species is possible in vehicle crashes. The impact on the breeding population in the area may be significant (Rate 3). if a bird that is part of it is killed. Mitigation measures shall be necessary.

Measures:

1. (the same as for Ciconia nigra).

2. (See *Accipiter brevipes*).

The Long Tunnel Option, 'Kresna' tunnel

Direct destruction of habitats

During construction, 195.757 decares will be affected, or 0.4% of the habitats of the species in the zone (habitat N09 and N12). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species has low sensitivity to disturbance, even in nesting sites (personal observations). Therefore some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. However, if it happens, the impact might be significant (Rate 3). Mitigation measures are needed.

During the operation of the motorway, mortality of representatives of the species is possible in vehicle crashes. The impact on the breeding population in the area may be significant (Rate 3). if a bird that is part of it is killed. Mitigation measures shall be necessary.

Measures:

1. (the same as for Ciconia nigra).

2. (See *Accipiter brevipes*).

The Eastern Option G20

Direct destruction of habitats

During construction, 376.958 decares will be affected, or 0.76% of the habitats of the species in the zone (habitat N09 and N12). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option affects parts of large polygons of the species habitats N09 and N12. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species has low sensitivity to disturbance, even in nesting sites (personal observations). Therefore some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. However, if it happens, the impact might be significant (Rate 3). Mitigation measures are needed.

During the operation of the motorway, mortality of representatives of the species is possible in vehicle crashes. The impact on the breeding population in the area may be significant (Rate 3). if a bird that is part of it is killed. Mitigation measures shall be necessary.

Measures:

1. (the same as for Ciconia nigra).
2. (See *Accipiter brevipes*).

39. The European bee-eater *(Merops apiaster*)

Species Biology: Nesting - migratory species. It breeds colonically in holes in sheer loess, loess and sandy shores in open, sandy and dry places, along the banks of various reservoirs, landslides, erosion, sometimes in stone quarries. It lays its eggs in the last ten days of May and early June. Brooding/incubation lasts for 30 days. The young leave the nest at 26-31 days of age. Migratory species. Spring migration is in May and autumn migration - from August to the middle of September. It feeds on insects, at the end of the breeding season and outside of it mainly with bees, and during the breeding season also with other insects, hunting in a variety of habitats, incl. agricultural lands and residential places, especially during the migration (Nanjinkov et al. 1997, personal observations).

Assessment of the species in the Protected Zone:

According to the standard form for the Protected Zone, 60 couples nest in the zone. We believe there are many more, as the species has been repeatedly found (see below), also in two colonies, and the conditions in the area are particularly suitable for breeding of the species. It is also found during migrations. The breeding habitats of the species in the zone are micro-habitat conditioned, and the prerequisites for their existence exist in all types of soil coverings. The potential trophical habitats are virtually any territory as it hunts in the air in a variety of habitats, including residential areas.

Assessment of the species on territory of the Investment Proposal

It was observed during field studies in the Kresna region and south of it. Colonies of the species have been found between Kresna and Slyvnitsa, within the Southern portal of the Kresna tunnel, and near the Kresna - Vlahi road, in the region of the eastern options. Potential breeding grounds are within the scope of each option.

Potential trophical habitats of the species in the area of the IP should be considered practically any territory, as it hunts in a variety of habitats, also in residential places.

Impacts:

Option G20 - Red

Direct destruction of habitats

The breeding habitats of the species in the zone are micro-habitat conditioned, and the prerequisites for their existence exist in all types of soil coverings. Therefore, the impact on them will be insignificant (Rate 1).

The potential trophical habitats are virtually any territory as it hunts in the air in a variety of habitats, including residential areas. Therefore, the impact on them will be insignificant (Rate 1).

Fragmentation of habitats

The breeding habitats of the species in the zone are micro-habitat conditioned, and the prerequisites for their existence exist in all types of soil coverings. Therefore no fragmentation will actually occur (Rate 0).

The potential trophical habitats are virtually any territory as it hunts in the air in a variety of habitats, including residential areas. Therefore no fragmentation will actually occur (Rate 0).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species has low sensitivity to disturbance, even in nesting sites (personal observations). Therefore some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During operation, however, it is possible to kill individual representatives of the species in vehicle collisions (personal observations). Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

Option G20 - Blue

Direct destruction of habitats

The breeding habitats of the species in the zone are micro-habitat conditioned, and the prerequisites for their existence exist in all types of soil coverings. Therefore, the impact on them will be insignificant (Rate 1).

The potential trophical habitats are virtually any territory as it hunts in the air in a variety of habitats, including residential areas. Therefore, the impact on them will be insignificant (Rate 1).

Fragmentation of habitats

The breeding habitats of the species in the zone are micro-habitat conditioned, and the prerequisites for their existence exist in all types of soil coverings. Therefore no fragmentation will actually occur (Rate 0).

The potential trophical habitats are virtually any territory as it hunts in the air in a variety of habitats, including residential areas. Therefore no fragmentation will actually occur (Rate 0).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species has low sensitivity to disturbance, even in nesting sites (personal observations). Therefore some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During operation, however, it is possible to kill individual representatives of the species in vehicle collisions (personal observations). Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

Eastern Option G10.50

Direct destruction of habitats

The breeding habitats of the species in the zone are micro-habitat conditioned, and the prerequisites for their existence exist in all types of soil coverings. Therefore, the impact on them will be insignificant (Rate 1).

The potential trophical habitats are virtually any territory as it hunts in the air in a variety of habitats, including residential areas. Therefore, the impact on them will be insignificant (Rate 1).

Fragmentation of habitats

The breeding habitats of the species in the zone are micro-habitat conditioned, and the prerequisites for their existence exist in all types of soil coverings. Therefore no fragmentation will actually occur (Rate 0).

The potential trophical habitats are virtually any territory as it hunts in the air in a variety of habitats, including residential areas. Therefore no fragmentation will actually occur (Rate 0).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species has low sensitivity to disturbance, even in nesting sites (personal observations). Therefore some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During operation, however, it is possible to kill individual representatives of the species in vehicle collisions (personal observations). The impact on

the population in the area would be insignificant (Rate1), given its comparatively high number.

The Long Tunnel Option, 'Kresna' tunnel

Direct destruction of habitats

The breeding habitats of the species in the zone are micro-habitat conditioned, and the prerequisites for their existence exist in all types of soil coverings. Therefore, the impact on them will be insignificant (Rate 1).

The potential trophical habitats are virtually any territory as it hunts in the air in a variety of habitats, including residential areas. Therefore, the impact on them will be insignificant (Rate 1).

Fragmentation of habitats

The breeding habitats of the species in the zone are micro-habitat conditioned, and the prerequisites for their existence exist in all types of soil coverings. Therefore no fragmentation will actually occur (Rate 0).

The potential trophical habitats are virtually any territory as it hunts in the air in a variety of habitats, including residential areas. Therefore no fragmentation will actually occur (Rate 0).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species has low sensitivity to disturbance, even in nesting sites (personal observations). Therefore some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During operation, however, it is possible to kill individual representatives of the species in vehicle collisions (personal observations). Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

The Eastern Option G20

Direct destruction of habitats

The breeding habitats of the species in the zone are micro-habitat conditioned, and the prerequisites for their existence exist in all types of soil coverings. Therefore, the impact on them will be insignificant (Rate 1).

The potential trophical habitats are virtually any territory as it hunts in the air in a variety of habitats, including residential areas. Therefore, the impact on them will be insignificant (Rate 1).

Fragmentation of habitats

The breeding habitats of the species in the zone are micro-habitat conditioned, and the prerequisites for their existence exist in all types of soil coverings. Therefore no fragmentation will actually occur (Rate 0).

The potential trophical habitats are virtually any territory as it hunts in the air in a variety of habitats, including residential areas. Therefore no fragmentation will actually occur (Rate 0).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species has low sensitivity to disturbance, even in nesting sites (personal observations). Therefore some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During operation, however, it is possible to kill individual representatives of the species in vehicle collisions (personal observations). Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

40. The middle spotted woodpecker (*Dendrocopos medius*)

Species Biology: A Permanent species. It inhabits extremely large areas of old deciduous forests - from oak-hornbeam to beech, it seldom inhabits extensive, old riparian forests in the oak-hornbeam belt. It breeds in hollows, dug out in deciduous trees. It lays in April-May. Brooding/Incubation lasts 12-14 days. The young leave the nest at 20-23 days of age. During the winter, it is also found in plain forests and extensive parks. It feeds on insects - beetles, ants, etc. and their larvae, as well as other arthropods, looking for them mostly under the bark of old and / or decaying trees. In the winter the seeds, and plant food are more common (Nankinov et al. 1997, BirdLife International 2016b, Jonsson 2006, personal observations).

Assessment of the species in the Protected Zone:

According to the standard form for the Protected Zone, 20-30 couples nest in the zone. The potential habitats of the species in the area are deciduous forests, incl. riparian forests (Habitat N16 from the Standard Zone Form), with a total area of 44,641.612 decares, but some of the forests, especially those with predominantly pubescent oak, are very young, off-shore and not suitable for breeding. More suitable may be those in the higher parts of the zone.

Assessment of the species on territory of the Investment Proposal

The species has not been observed during field studies. Perennial forests can be considered as potential habitats of the species in the area, incl. riparian forests (habitat N16), although much of the forests, especially those with predominant pubescent oak, are very young, offspring, and are not suitable for nesting.

Impacts:

Option G20 - Red

Direct destruction of habitats

133.216 decares will be affected during construction or 0.3% of the potential nesting habitats of the species in the zone (habitat N16). The impact on them has been assessed as insignificant (Rate 1), given the small area affected and its sub-optimal nature.

Fragmentation of habitats

The road route in this option affects relatively small portions of large polygons of the N16 habitat. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the sub-optimal nature of affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species is not very sensitive to disturbance (Spear 2009). Therefore some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. Only potential habitats, which in their current state are not suitable for nesting, would be affected. During the operation of the motorway, mortality of representatives of the species is possible in vehicle crashes. Given the sub-optimal nature of the habitats, the likelihood of such an accident is very low. Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

Option G20 - Blue

Direct destruction of habitats

166.899 decares will be affected during construction or 0.37% of the potential nesting habitats of the species in the zone (habitat N16). The impact on them has been assessed as insignificant (Rate 1), given the small area affected and its sub-optimal nature.

Fragmentation of habitats

The road route in this option affects relatively small portions of large polygons of the N16 habitat. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the sub-optimal nature of affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species is not very sensitive to disturbance (Spear 2009). Therefore some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. Only potential habitats, which in their current state are not suitable for nesting, would be affected. During the operation of the motorway, mortality of representatives of the species is possible in vehicle crashes. Given the sub-optimal nature of the habitats, the likelihood of such an accident is very low. Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

Eastern Option G10.50

Direct destruction of habitats

160.019 decares will be affected during construction or 0.36% of the potential nesting habitats of the species in the zone (habitat N16). The impact on them has been assessed as insignificant (Rate 1), given the small area affected and its sub-optimal nature.

Fragmentation of habitats

The road route in this option affects small portions of large polygons of the N16 habitat. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the sub-optimal nature of affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species is not very sensitive to disturbance (Spear 2009). Some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1), During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. Only potential habitats, which in their current state are not suitable for nesting, would be affected. During the operation of the motorway, mortality of representatives of the species is possible in vehicle crashes. Given the sub-optimal nature of the habitats, the likelihood of such an accident is very low. Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

The Long Tunnel Option, 'Kresna' tunnel

Direct destruction of habitats

17.726 decares will be affected during construction or 0.04% of the potential habitats of the species in the zone (habitat N16). The impact on them has been assessed as insignificant (Rate 1), given the small area affected and its sub-optimal nature.

Fragmentation of habitats

The road route in this option affects relatively small portions of large polygons of the N16 habitat. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the sub-optimal nature of affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species is not very sensitive to disturbance (Spear 2009). Some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1), During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. Only potential

habitats are affected that in their current state are not suitable for nesting. During the operation of the motorway, mortality of representatives of the species is possible in vehicle crashes. Given the sub-optimal nature of the habitats, the likelihood of such an accident is very low. Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

The Eastern Option G20

Direct destruction of habitats

467.254 decares will be affected during construction or 1.05% of the potential habitats of the species in the zone (habitat N16), although Given their sub-optimal nature, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route in this option affects relatively small portions of large polygons of the N16 habitat. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the sub-optimal nature of affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species is not very sensitive to disturbance (Spear 2009). Some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. Only potential habitats, which in their current state are not suitable for nesting, would be affected. During the operation of the motorway, mortality of representatives of the species is possible in vehicle crashes. Given the sub-optimal nature of the habitats, the likelihood of such an accident is very low. Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

41. The Syrian woodpecker (*Dendrocopos syriacus*)

It inhabits residential places, incl. big cities, deciduous forests, parks, orchard gardens, roadside crops, forest shelters, riparian forests, tree groups and single trees in open spaces. It breeds in hollows, dug out in deciduous trees. Breeding probably starts from mid-February to mid-May. Brooding/incubation lasts for 10 - 11 days, the young stay in the hollow 17 - 21 days. It feeds on dendrophilian insects, ants, sometimes fruits (Nanjinkov et al. 1997, personal observations).

Assessment of the species in the Protected Zone:

According to the standard form for the Protected Zone, 35-50 couples nest in the zone. In our opinion, this number is highly underestimated, given the wide flexibility of the species. As confirmed by Nikolov and Spasov (2005), only in the southern part of the Kresna Gorge, on an area of about 17,000 decares, nest between 100 and 150 pairs. The potential habitats of the species in the area are broad-leaved forests, incl. riparian forests, tree groups, vineyards and orchards, other agricultural lands (with many trees) and residential places (habitats N16, N17, N21 and N23 of the Standard Area Form), with a total area of 68,137.198 decares. Part of the

these habitats contain a high proportion of unsuitable areas (e.g. habitat N23, whereto existing roads are comprised), on the account of other habitats, for example, the edges of the deciduous forests are also used by the species (e.g. a group of trees). Incorporating them, however, will overestimate too many potential habitats of the species.

Assessment of the species on territory of the Investment Proposal

Observed during the field research in the area of Cherniche and Kresna. The potential habitats of the species in the area are broad-leaved forests, incl. riparian forests, tree groups, vineyards and orchards, other agricultural lands (with many trees) and residential places (habitats N16, N17, N21 and N23 of the Standard Area Form).

Impacts:

Option G20 - Red

Direct destruction of habitats

350.841 decares will be affected during construction or 0.51% of the trophical habitats of the species in the zone (habitat N16, N17, N21 and N23). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N16, N17, N21 and N23. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that, the impact rate has been assessed as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact
(0).

Disturbance

The species is not very sensitive to disturbance (personal observations).
Some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During operation, however, it is possible to kill individual representatives of the species in vehicle collisions (personal observations). Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

Option G20 - Blue

Direct destruction of habitats

During construction, 377.147 decares will be affected or 0.55% of the habitats of the species in the zone (habitat N16, N17, N21 and N23). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N16, N17, N21 and N23. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a

habitats of the species. Given that, the impact rate has been assessed as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species is not very sensitive to disturbance (personal observations). Some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During operation, however, it is possible to kill individual representatives of the species in vehicle collisions (personal observations). Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

Eastern Option G10.50

Direct destruction of habitats

262.693 decares will be affected during construction or 0.39% of the trophical habitats of the species in the zone (habitat N16, N17, N21 and N23). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects small parts of large polygons of the species habitats N16, N17, N21 and N23. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that, the impact rate has been assessed as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species is not very sensitive to disturbance (personal observations). Some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During operation, however, it is possible to kill individual representatives of the species in vehicle collisions (personal observations). Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

The Long Tunnel Option, 'Kresna' tunnel

Direct destruction of habitats

40.203 decares will be affected during construction or 0.15% of the potential habitats of the species in the zone (habitat N16, N21 and N23).

Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N16, N21 and N23. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that, the impact rate has been assessed as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species is not very sensitive to disturbance (personal observations). Some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During operation, however, it is possible to kill individual representatives of the species in vehicle collisions (personal observations). Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

The Eastern Option G20

Direct destruction of habitats

769.109 decares will be affected during construction or 1.13% of the trophical habitats of the species in the zone (habitat N16, N17, N21 and N23). This impact has been assessed as moderate (Rate 2). Due to the large number of affected polygons, mitigation measures shall be impossible.

Fragmentation of habitats

The road route under this option affects parts of large polygons of the species habitats N17, N21 and N23. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that, the impact rate has been assessed as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species is not very sensitive to disturbance (personal observations). Some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During operation, however, it is possible to kill individual representatives of the species in vehicle collisions (personal observations). Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

42. The Black Woodpecker (*Dryocopus martius*)

Species Biology: A Permanent species. It inhabits old mountainous beeches, mixed and coniferous forests, seldom - mountainous and plain forests. It breeds in hollows, dug out in trees. The eggs are laid in May. Brooding/Incubation lasts 12-14 days. The young leave the nest at 27-28 days of age. During the winter, it is also found in plain forests and extensive parks. It feeds on eggs, larvae and adult crustaceans, lycodes, beetles, seedlings, lizards, ants, etc., rarely seeds of various deciduous and coniferous trees (Nanjenov et al. 1997).

Assessment of the species in the Protected Zone:

According to the standard form for the Protected Zone, 2 couples nest in the zone. The potential habitats of the species in the area are deciduous forests, incl. riparian forests (Habitats N16 and N17 from the Standard Zone Form), with a total area of 58,738.964 decares, but some of the forests, especially those with predominantly pubescent oak, are very young, offshoots and not suitable for breeding. More suitable may be those in the higher parts of the zone.

Assessment of the species on territory of the Investment Proposal

The species has not been observed during field studies. Perennial forests can be considered as potential habitats of the species in the area, incl. riparian forests (habitats N16 and N17), although much of the forests, especially those with predominant pubescent oak, are very young, offshoots, and are not suitable for nesting.

Impacts:

Option G20 - Red

Direct destruction of habitats

During construction, 159.38 decares will be affected, or 0.27% of the potential habitats of the species in the zone (habitat N16 and N17). The impact on them has been assessed as insignificant (Rate 1), given the small area affected and its sub-optimal nature.

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N16 and N17. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the sub-optimal nature of affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species is not very sensitive to disturbance (Spear 2009). Some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. Only potential habitats, which in their current state are not suitable for nesting, would be affected. During the operation of the motorway, mortality of representatives of the species is possible in vehicle crashes. Given the sub-optimal nature of the habitats, the likelihood of such an accident is very low. If this happens, the impact on the breeding population

in the zone may be significant (Rate 3), if a bird that is part of it is killed. Mitigation measures shall be necessary.

Measures: (See *Accipiter brevipes*).

Option G20 - Blue

Direct destruction of habitats

During construction, 204.14 decares will be affected, or 0.35% of the habitats of the species in the zone (habitat N16 and N17). The impact on them has been assessed as insignificant (Rate 1), given the small area affected and its sub-optimal nature.

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N16 and N17. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the sub-optimal nature of affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species is not very sensitive to disturbance (Spear 2009). Some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. Only potential habitats, which in their current state are not suitable for nesting, would be affected. During the operation of the motorway, mortality of representatives of the species is possible in vehicle crashes. Given the sub-optimal nature of the habitats, the likelihood of such an accident is very low. If that happens, the impact on the breeding population in the area may be significant (Rate 3), if a bird that is part of it is killed. Mitigation measures shall be necessary.

Measures: (See *Accipiter brevipes*).

Eastern Option G10.50

Direct destruction of habitats

237.085 decares will be affected during construction or 0.27% of the potential habitats of the species in the zone (habitat N16 and N17). The impact on them has been assessed as insignificant (Rate 1), given the small area affected and its sub-optimal nature.

Fragmentation of habitats

The road route under this option mainly affects considerably small parts of large polygons of habitats N16 and N17. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the sub-optimal nature of affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species is not very sensitive to disturbance (Spear 2009). Therefore some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. Only potential habitats, which in their current state are not suitable for nesting, would be affected. During the operation of the motorway, mortality of representatives of the species is possible in vehicle crashes. Given the sub-optimal nature of the habitats, the likelihood of such an accident is very low. If that happens, the impact on the breeding population in the area may be significant (Rate 3), if a bird that is part of it is killed. Mitigation measures shall be necessary.

Measures: (See *Accipiter brevipes*).

The Long Tunnel Option, 'Kresna' tunnel

Direct destruction of habitats

17.726 decares will be affected during construction or 0.03% of the potential habitats of the species in the zone (habitat N16). The impact on them has been assessed as insignificant (Rate 1), given the small area affected and its sub-optimal nature.

Fragmentation of habitats

The road route in this option affects relatively small portions of large polygons of the N16 habitat. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the sub-optimal nature of affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species is not very sensitive to disturbance (Spear 2009). Some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. Only potential habitats, which in their current state are not suitable for nesting, would be affected. During the operation of the motorway, mortality of representatives of the species is possible in vehicle crashes. Given the sub-optimal nature of the habitats, the likelihood of such an accident is very low. If that happens, the impact on the breeding population in the area may be significant (Rate 3), if a bird that is part of it is killed. Mitigation measures shall be necessary.

Measures: (See *Accipiter brevipes*).

The Eastern Option G20

Direct destruction of habitats

704.982 decares will be affected during construction or 1.2% of the habitats of the species in the zone (habitat N16 and N17). The impact is

has been assessed as insignificant (Rate 1), given the small area affected and its sub-optimal nature.

Fragmentation of habitats

The road route under this option affects small parts of large polygons of habitats N16 and N17. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the sub-optimal nature of affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species is not very sensitive to disturbance (Spear 2009). Some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. Only potential habitats, which in their current state are not suitable for nesting, would be affected. During the operation of the motorway, mortality of representatives of the species is possible in vehicle crashes. Given the sub-optimal nature of the habitats, the likelihood of such an accident is very low. If that happens, the impact on the breeding population in the area may be significant (Rate 3), if a bird that is part of it is killed. Mitigation measures shall be necessary.

Measures: (See *Accipiter brevipes*).

43. The grey-headed woodpecker (*Picus canus*)

Species Biology: A Permanent species. It inhabits primarily beech and oak forests up to 1,000 - 1,200 altitudes, rain forests/riparian forests. Secondary - wider riparian and other forests with old trees, city parks, orchards. It nests in dug out hollows in old deciduous trees, preferring ones with softer wood. The eggs are laid in May. Brooding/incubation lasts for 15-17 days. The young leave the nest at 24-27 days of age. A sedentary species. It feeds on eggs, larvae and adult ants, different insects, found on the bark of the trees and below. It also feeds on the seeds of various deciduous trees and shrubs (Golemanski 2011, Nankinsov et al. 1990, Jonsson 2006, personal observations).

Assessment of the species in the Protected Zone:

According to the standard form for the Protected Zone, 5-10 couples nest in the zone. The potential habitats of the species in the area are deciduous forests, incl. riparian forests (Habitat N16 from the Standard Zone Form), with a total area of 44,641.612 decares, but some of the forests, especially those with predominantly pubescent oak, are very young, off-shore and not suitable for breeding. The riparian forests are most suitable in the lower parts of the area.

Assessment of the species on territory of the Investment Proposal

The species has not been observed during field studies. Perennial forests can be considered as potential habitats of the species in the area, incl. riparian forests (habitat N16), although most of the forests, especially those with predominant pubescent oak, are very young, offspring, and are not suitable for nesting. The most suitable are the riparian forests around the the Struma River and the lower flows of the tributaries.

Impacts:

Option G20 - Red

Direct destruction of habitats

133.216 decares will be affected during construction or 0.3% of the potential nesting habitats of the species in the zone (habitat N16). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1),

Fragmentation of habitats

The road route in this option affects relatively small portions of large polygons of the N16 habitat. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that, the impact rate has been assessed as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species is not very sensitive to disturbance (personal observations). Some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. However, if it happens, the impact might be significant (Rate 3). Mitigation measures are needed.

During operation, however, it is possible to kill individual representatives of the species in vehicle collisions (personal observations). The impact on the breeding population in the area may be significant (Rate 3), if a bird that is part of it is killed. Mitigation measures shall be necessary.

Measures:

1. (the same as for Ciconia nigra).
2. (See *Accipiter brevipes*).

Option G20 - Blue

Direct destruction of habitats

166.899 decares will be affected during construction or 0.37% of the potential nesting habitats of the species in the zone (habitat N16). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1),

Fragmentation of habitats

The road route in this option affects relatively small portions of large polygons of the N16 habitat. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that, the impact rate has been assessed as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species is not very sensitive to disturbance (personal observations). Some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. However, if it happens, the impact might be significant (Rate 3). Mitigation measures are needed.

During operation, however, it is possible to kill individual representatives of the species in vehicle collisions (personal observations). The impact on the breeding population in the area may be significant (Rate 3), if a bird that is part of it is killed. Mitigation measures shall be necessary.

Measures:

1. (the same as for Ciconia nigra).
2. (See *Accipiter brevipes*).

Eastern Option G10.50

Direct destruction of habitats

160.019 decares will be affected during construction or 0.36% of the potential nesting habitats of the species in the zone (habitat N16). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1),

Fragmentation of habitats

The road route in this option affects small portions of large polygons of the N16 habitat. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that, the impact rate has been assessed as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact
(0).

Disturbance

The species is not very sensitive to disturbance (personal observations). Some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. However, if it happens, the impact might be significant (Rate 3). Mitigation measures are needed.

During operation, however, it is possible to kill individual representatives of the species in vehicle collisions (personal observations). The impact on the breeding population in the area may be significant (Rate 3), if a bird that is part of it is killed. Mitigation measures shall be necessary.

Measures:

1. (the same as for Ciconia nigra).
2. (See *Accipiter brevipes*).

The Long Tunnel Option, 'Kresna' tunnel

Direct destruction of habitats

17.726 decares will be affected during construction or 0.04% of the potential habitats of the species in the zone (habitat N16). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1),

Fragmentation of habitats

The road route in this option affects relatively small portions of large polygons of the N16 habitat. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that, the impact rate has been assessed as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species is not very sensitive to disturbance (personal observations). Some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. However, if it happens, the impact might be significant (Rate 3). Mitigation measures are needed.

During operation, however, it is possible to kill individual representatives of the species in vehicle collisions (personal observations). The impact on the breeding population in the area may be significant (Rate 3), if a bird that is part of it is killed. Mitigation measures shall be necessary.

Measures:

1. (the same as for Ciconia nigra).
2. (See *Accipiter brevipes*).

The Eastern Option G20

Direct destruction of habitats

467.254 decares will be affected during construction or 1.05% of the potential habitats of the species in the zone (habitat N16), although Given their sub-optimal nature, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route in this option affects relatively small portions of large polygons of the N16 habitat. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the sub-optimal nature of affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species is not very sensitive to disturbance (personal observations). Some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. Only potential habitats, which in their current state are not suitable for nesting, would be affected. During the operation of the motorway, mortality of representatives of the species is possible in accident crashes with

motor vehicles. Given the sub-optimal nature of the habitats, the likelihood of such an accident is very low. Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

44. The greater short-toed lark *(Calandrella brachydactyla*)

Species Biology: Nesting - migratory and passing species. It inhabits varied open habitats, bare or scanty grassy vegetation. It prefers dry stony steppes and pastures. Also found in dunes, agricultural lands and empty lands. It breeds on the ground. The eggs are laid in May. Brooding/incubation lasts for 11 to 13 days. The young leave the nests at 10-11 days of age. Migratory species. It arrives in April. Autumn migration probably starts in September. It feeds on ground insects, worms, larvae, seeds (Golemanski 2011, Constantin & Pocora 2005, Roth 2008).

Assessment of the species in the Protected Zone:

According to the standard form for the Protected Zone, 5-10 couples nest in the zone. Also present during migrations. The potential trophical habitats of the species in the zone are grassland, bushes and agricultural lands (habitats N09 and N12 from the Zone Standard Form), with a total area of 49,340.729 decares.

Assessment of the species on territory of the Investment Proposal

The species has not been observed during field studies. The herbaceous and bushy sites and agricultural lands (N09 and N12) should be considered as potential habitats of the species on the territory of the Investment Proposal.

Impacts:

Option G20 - Red

Direct destruction of habitats

During construction, 116.338 decares will be affected or 0.24% of the habitats of the species in the zone (habitat N09 and N12). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

Song birds are less sensitive to disturbance. Some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. However, if it happens, the impact might be significant (Rate 3). Mitigation measures are needed.

During the operation of the motorway, mortality of representatives of the species is also possible in vehicle crashes (Kambourova-Ivanova et al. 2012, Karaivanov 2015, personal notes). The impact on the breeding population in the area may be significant (Rate 3),

if a bird that is part of it perishes. Mitigation measures shall be necessary.

Measures:

1. (the same as for Ciconia nigra).
2. (See *Accipiter brevipes*).

Option G20 - Blue

Direct destruction of habitats

During construction, 109.691 decares will be affected or 0.22% of the habitats of the species in the zone (habitat N09 and N12). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

Song birds are less sensitive to disturbance. Some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. However, if it happens, the impact might be significant (Rate 3). Mitigation measures are needed.

During the operation of the motorway, mortality of representatives of the species is possible in vehicle crashes. The impact on the breeding population in the area may be significant (Rate 3). if a bird that is part of it is killed. Mitigation measures shall be necessary.

Measures:

1. (the same as for Ciconia nigra).
2. (See *Accipiter brevipes*).

Eastern Option G10.50

Direct destruction of habitats

During construction, 137.718 decares will be affected or 0.28% of the habitats of the species in the zone (habitat N09 and N12). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route in this option mainly affects small parts of large polygons of the species habitats N09 and N12. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

Song birds are less sensitive to disturbance. Some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. However, if it happens, the impact might be significant (Rate 3). Mitigation measures are needed.

During the operation of the motorway, mortality of representatives of the species is possible in vehicle crashes. The impact on the breeding population in the area may be significant (Rate 3). if a bird that is part of it is killed. Mitigation measures shall be necessary.

Measures:

1. (the same as for Ciconia nigra).
2. (See *Accipiter brevipes*).

The Long Tunnel Option, 'Kresna' tunnel

Direct destruction of habitats

During construction, 195.757 decares will be affected, or 0.4% of the habitats of the species in the zone (habitat N09 and N12). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

Song birds are less sensitive to disturbance. Some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. However, if it happens, the impact might be significant (Rate 3). Mitigation measures are needed.

During the operation of the motorway, mortality of representatives of the species is possible in vehicle crashes. The impact on the breeding population in the area may be significant (Rate 3). if a bird that is part of it is killed. Mitigation measures shall be necessary.

Measures:

1. (the same as for Ciconia nigra).
2. (See *Accipiter brevipes*).

The Eastern Option G20

Direct destruction of habitats

During construction, 376.958 decares will be affected, or 0.76% of the habitats of the species in the zone (habitat N09 and N12). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option affects parts of large polygons of the species habitats N09 and N12. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

Song birds are less sensitive to disturbance. Some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. However, if it happens, the impact might be significant (Rate 3). Mitigation measures are needed.

During the operation of the motorway, mortality of representatives of the species is possible in vehicle crashes. The impact on the breeding population in the area may be significant (Rate 3). if a bird that is part of it is killed. Mitigation measures shall be necessary.

Measures:

1. (the same as for Ciconia nigra).
2. (See *Accipiter brevipes*).

45. The Wood Lark (*Lullula arborea*)

Species Biology: It inhabits the outskirts of mountain and foothills, forest meadows, slopes and clearings, rocky and mountain places with scattered trees, shrubs with single trees. It breeds on the ground. The nest is located in thicker vegetation, at the base of a tree, bush or grass tuft. The breeding period starts in May and lasts till July. The young leave the nest at 11-13 days of age. It feeds on caterpillars, beetles, spiders and other small invertebrates, seeds that look in areas with low herbaceous vegetation or devoid of such grass (Michev et al. 2012, Bowden 1990, Jonsson 2006, Mallord et al. 2007).

Assessment of the species in the Protected Zone:

According to the standard form for the Protected Zone, 600-620 couples nest in the zone. The potential nesting habitats of the species in the area are shrubby communities and deciduous forests (habitats N08 and N16 from the Standard Zone Form), with a total area of 131,575.278 decares, as long as most of the forests are scattered.

Assessment of the species on territory of the Investment Proposal

The species has not been observed during field studies. The herbaceous, bushy sites and deciduous forests (N08 and N16) should be considered as potential habitats of the species on the territory of the Investment Proposal.

Impacts:

Option G20 - Red

Direct destruction of habitats

202.311 decares will be affected during construction or 0.15% of the habitats of the species in the zone (habitat N08 and N16). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08 and N16. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a nesting habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species has low sensitivity to disturbance, even in nesting sites (personal observations). Therefore some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During the operation of the motorway, mortality of representatives of the species is also possible in vehicle crashes (Kambourova-Ivanova et al. 2012, Karaivanov 2015, personal observations). The impact on the population in the area will be insignificant (Rate 1) due to its relatively high number.

Option G20 - Blue

Direct destruction of habitats

230.445 decares will be affected during construction, or 0.18% of the habitats of the species in the zone (habitat N08 and N16). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08 and N16. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species has low sensitivity to disturbance, even in nesting sites (personal observations). Some disturbance is expected during construction, yet having in mind

its temporary nature and restricted territory (only around the construction site, the impact will be insignificant even if it occurs (Rate 1), During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During the operation of the motorway, mortality of representatives of the species is possible in vehicle crashes. Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

Eastern Option G10.50

Direct destruction of habitats

243.539 decares will be affected during construction or 0.19% of the habitats of the species in the zone (habitat N08 and N16). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects small parts of large polygons of the species habitats N08 and N16. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species has low sensitivity to disturbance, even in nesting sites (personal observations). Therefore some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During the operation of the motorway, mortality of representatives of the species is possible in vehicle crashes. Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

The Long Tunnel Option, 'Kresna' tunnel

Direct destruction of habitats

36.525 decares will be affected during construction or 0.03% of the habitats of the species in the zone (habitat N08 and N16). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08 and N16. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species has low sensitivity to disturbance, even in nesting sites (personal observations). Therefore some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During the operation of the motorway, mortality of representatives of the species is possible in vehicle crashes. Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

The Eastern Option G20

Direct destruction of habitats

During construction, 710.948 decares will be affected, or 0.54% of the habitats of the species in the zone (habitat N08 and N16). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects parts of large polygons of the species habitats N08 and N16. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species has low sensitivity to disturbance, even in nesting sites (personal observations). Therefore some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During the operation of the motorway, mortality of representatives of the species is possible in vehicle crashes. Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

46. The calandra lark *(Melanocorypha calandra*)

Species Biology: It inhabits steppe areas, sandy and grassy deserted lands, pastures and agricultural lands. It breeds on the ground. Laying starts in the middle of April. Two hatchings on the Black Sea coast each year. It feeds on insects and outside the breeding season - mostly on seeds. (Golemanski 2011, Mitchev et al. 2012).

Assessment of the species in the Protected Zone:

According to the standard form for the Protected Zone, 5-10 couples nest in the zone. In our opinion, this number is greatly underestimated, given the widespread distribution of suitable habitats, especially in the lower parts of the area south of Kresna. This is

also supported by our observations of large flocks both in the region of Sandanski and around Blagoevgrad and Kocherinovo. The potential trophical habitats of the species in the zone are grassland, bushes and agricultural lands (habitats N09 and N12 from the Zone Standard Form), with a total area of 49,340.729 decares.

Assessment of the species on territory of the Investment Proposal

The species has not been observed during field studies. The herbaceous and bushy sites and agricultural lands (N09 and N12) should be considered as potential habitats of the species on the territory of the Investment Proposal.

Impacts:

Option G20 - Red

Direct destruction of habitats

During construction, 116.338 decares will be affected or 0.24% of the habitats of the species in the zone (habitat N09 and N12). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

Song birds are less sensitive to disturbance. Some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During operation, however, it is possible to kill individual representatives of the species in vehicle collisions (personal observations). Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

Option G20 - Blue

Direct destruction of habitats

During construction, 109.691 decares will be affected or 0.22% of the habitats of the species in the zone (habitat N09 and N12). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

Song birds are less sensitive to disturbance. Therefore some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1), During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During operation, however, it is possible to kill individual representatives of the species in vehicle collisions (personal observations). Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

Eastern Option G10.50

Direct destruction of habitats

During construction, 137.718 decares will be affected or 0.28% of the habitats of the species in the zone (habitat N09 and N12). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route in this option mainly affects small parts of large polygons of the species habitats N09 and N12. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

Song birds are less sensitive to disturbance. Some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During operation, however, it is possible to kill individual representatives of the species in vehicle collisions (personal observations). Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

The Long Tunnel Option, 'Kresna' tunnel

Direct destruction of habitats

During construction, 195.757 decares will be affected, or 0.4% of the habitats of the species in the zone (habitat N09 and N12). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

Song birds are less sensitive to disturbance. Some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During operation, however, it is possible to kill individual representatives of the species in vehicle collisions (personal observations). Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

The Eastern Option G20

Direct destruction of habitats

During construction, 376.958 decares will be affected, or 0.76% of the habitats of the species in the zone (habitat N09 and N12). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option affects parts of large polygons of the species habitats N09 and N12. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

Song birds are less sensitive to disturbance. Some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During operation, however, it is possible to kill individual representatives of the species in vehicle collisions (personal observations). Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

47. The sand martin or bank swallow (*Riparia riparia*)

Species Biology: It is a breeding and migrating bird. It is found everywhere in Bulgaria, along rivers and marshes where there are high shores. It inhabits high and steep earth banks, located near water basins, where there is a rich food base. It hunts over the water basins. It breeds in colonies. It prefers loess and sandy shores in the middle and lower rivers (Nankinov 2009, Jonsson 2006).

Assessment of the species in the Protected Zone:

According to the standard form of the zone, there are 100 pairs nesting in it. The potential habitats of the species in the area are the larger rivers and ponds (habitat N06 from the Standard Zone Form), with a total area of 2,349.559 decares.

Assessment of the species on territory of the Investment Proposal

The species was not observed during field studies and probably does not nest in the EP region due to lack of suitable microhabitates. As potential habitats of the species in the region of the IP should be considered the Struma River and downstream of Vlahinska river.

Impacts:

Option G20 - Red

Direct destruction of habitats

12.734 decares will be affected during construction, or 0.54% of the trophical habitats of the species in the zone (habitat N06 - on Struma river and the Vlahinska River). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1). During the operation of the highway, the affected areas outside the pillars and bridge facilities will recover as habitats of the species, and the permanently affected area will be even smaller.

Fragmentation of habitats

During the construction of bridge facilities, temporary fragmentation of habitats is expected, yet their recovery will occur promptly after completion of construction works. Given the large length and area of the fragments formed and the temporary nature of the impact, we could assume that the impact would be insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species has low sensitivity to disturbance, even in nesting sites (personal observations). Therefore some disturbance may be expected during bridge construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During operation, however, it is possible to kill individual representatives of the species in vehicle collisions (personal observations). Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

Option G20 - Blue

Direct destruction of habitats

During construction, 13.123 decares will be affected, or 0.56% of the habitats of the species in the zone (habitat N06 - on Struma river and the Vlahinska River). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1). During the operation of the highway, the affected areas outside the pillars and bridge facilities will recover as habitats of the species, and the permanently affected area will be even smaller.

Fragmentation of habitats

During the construction of bridge facilities, temporary fragmentation of habitats is expected, yet their recovery will occur promptly after completion of construction works. Given the large length and area of the fragments formed and the temporary nature of the impact, we could assume that the impact would be insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species has low sensitivity to disturbance, even in nesting areas. Therefore some disturbance may be expected during bridge construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During operation, however, it is possible to kill individual representatives of the species in vehicle collisions (personal observations). Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

Eastern Option G10.50

Direct destruction of habitats

During construction, 1.817 decares will be affected, or 0.08 of the habitats of the species in the zone (habitat N06 - on Struma river and the Vlahinska River). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1). During the operation of the highway, the affected areas outside the pillars and the supports of bridge facilities on the Struma River and Vlahinska River will recover as habitats of the species, and the permanently affected area will be even smaller.

Fragmentation of habitats

During the construction of bridge facilities, temporary fragmentation of habitats is expected, yet their recovery will occur promptly after completion of construction works. Given the large length and area of the fragments formed and the temporary nature of the impact, we could assume that the impact would be insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species has low sensitivity to disturbance, even in nesting areas. Therefore some disturbance may be expected during bridge construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During the operation, mortality is also possible

of species representatives in a collision with a vehicle (personal observations). Given the high number of the species population, the impact on the population in the zone would be insignificant (Rate1),

The Long Tunnel Option, 'Kresna' tunnel

Direct destruction of habitats

21 decares will be affected during construction or 0.89% of the habitats of the species in the zone (habitat N06 - on the Struma River). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1). During the operation of the highway, the affected areas outside the pillars and bridge facilities will recover as habitats of the species, and the permanently affected area will be even smaller.

Fragmentation of habitats

During the construction of bridge facilities, temporary fragmentation of habitats is expected, yet their recovery will occur promptly after completion of construction works. Given the large length and area of the fragments formed and the temporary nature of the impact, we could assume that the impact would be insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species has low sensitivity to disturbance, even in nesting areas. Therefore some disturbance may be expected during bridge construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During operation, however, it is possible to kill individual representatives of the species in vehicle collisions (personal observations). Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

The Eastern Option G20

Direct destruction of habitats

The road route under this option does not affect habitats of the species. There will be no impact (Rate 0).

Fragmentation of habitats

The road route under this option does not affect habitats of the species. There will be no impact (Rate 0).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The road route under this option does not pass near habitats of the species. There will be no impact (Rate 0).

Mortality

The road route under this option does not pass near habitats of the species. There will be no impact (Rate 0).

48. The tawny pipit (*Anthus campestris*)

Species Biology: A breeding and migrating species. It is found in dry, hot, open territories and pastures with scattered herbaceous vegetation and often sandy soil, small extensive fields or empty land. Sometimes in large, intensively used agricultural areas with trench vegetation. It avoids steep, heavy rock or bushy territories. It inhabits mainly the plains, from sea level to about
500 m above sea level, less frequently in the mountains to about 1,300 m above sea level. The nest is located in a hollow on the ground and well covered by grass vegetation. There are 1-2 hatchings per year. The laying of eggs from the first hatchery starts in the second half of May and the beginning of June. 3-6 eggs are laid. The young leave the nest in about 14 days, and at about 30 days they are completely self-sufficient. During migrations it does not form large clusters. Spring migration occurs mainly in April-May, and in the southernmost regions of the country the first birds come in the second half of March. Autumn migration in some areas begins in August, but it mainly runs in September-October. It feeds on different types of insects. In autumn and winter, it also feeds on seeds of various herbaceous plants (Ivanov 2011, Yankov 2007).

Assessment of the species in the Protected Zone:

According to the standard form for the Protected Zone, 5-10 couples nest in the zone. In our opinion, this number is highly underestimated, given the wide distribution of the suitable habitats. According to Nikolov and Spasov (2005), only in the southern part of the Kresna Gorge, on an area of about 17,000 decares, nest between 10 and 20 pairs. The species is also present during migrations. The potential trophical habitats of the species in the zone are grassland, bushes and agricultural lands (habitats N09 and N12 from the Zone Standard Form), with a total area of 49,340.729 decares.

Assessment of the species on territory of the Investment Proposal

The species has not been observed during field studies. The herbaceous and bushy sites and agricultural lands (N09 and N12) should be considered as potential habitats of the species on the territory of the Investment Proposal.

Impacts:

Option G20 - Red

Direct destruction of habitats

During construction, 116.338 decares will be affected or 0.24% of the habitats of the species in the zone (habitat N09 and N12). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact
(0).

Disturbance

Song birds are less sensitive to disturbance. Some disturbance
may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During operation, however, it is possible to kill individual representatives of the species in vehicle collisions (personal observations). Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

Option G20 - Blue

Direct destruction of habitats

During construction, 109.691 decares will be affected or 0.22% of the habitats of the species in the zone (habitat N09 and N12). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

Song birds are less sensitive to disturbance. Some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During operation, however, it is possible to kill individual representatives of the species in vehicle collisions (personal observations). Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

Eastern Option G10.50

Direct destruction of habitats

During construction, 137.718 decares will be affected or 0.28% of the habitats of the species in the zone (habitat N09 and N12). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route in this option mainly affects small parts of large polygons of the species habitats N09 and N12. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

Song birds are less sensitive to disturbance. Therefore some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1), During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During operation, however, it is possible to kill individual representatives of the species in vehicle collisions (personal observations). Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

The Long Tunnel Option, 'Kresna' tunnel

Direct destruction of habitats

During construction, 195.757 decares will be affected, or 0.4% of the habitats of the species in the zone (habitat N09 and N12). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

Song birds are less sensitive to disturbance. Some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During operation, however, it is possible to kill individual representatives of the species in vehicle collisions (personal observations). Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

The Eastern Option G20

Direct destruction of habitats

During construction, 376.958 decares will be affected, or 0.76% of the habitats of the species in the zone (habitat N09 and N12). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option affects parts of large polygons of the species habitats N09 and N12. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given

that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1),

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

Song birds are less sensitive to disturbance. Some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During operation, however, it is possible to kill individual representatives of the species in vehicle collisions (personal observations). Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

49. The barred warbler (*Sylvia nisoria*)

Species Biology: It inhabits the outskirts of deciduous and mixed forests with abundant sub-forests, bushes, hedges, orchards in plains and along river banks. The nest is usually located low, on low trees and shrubs. Laying starts in May-June. The young leave the nest in July. Migratory species. Spring migration is likely in April, and the autumn migration in August-September. It feeds on arthropods, which gathers from the bushes and the trees, and with fruits (Michev et al. 2012, Kuźniak et al. 2001, Payevsky 1999, Pearson and Lack 1992, Polak 2012).

Assessment of the species in the Protected Zone:

According to the standard form for the Protected Zone, 50-70 couples nest in the zone. The species is also present during migrations. Potential habitats of the species in the area are the shrub areas and the agricultural lands with a larger share of shrub vegetation (habitats N08, N15 and N21 from the Standard Zone Form), with a total area of 96,331.900 decares.

Assessment of the species on territory of the Investment Proposal

The species has not been observed during field studies. Potential habitats of the species in the IP region should be considered shrub areas and agricultural lands with a higher share of shrub vegetation (habitats N08, N15 and N21).

Impacts:

Option G20 - Red

Direct destruction of habitats

114.727 decares will be affected during construction or 0.12% of the habitats of the species in the zone (habitat N08, N15 and N21). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08, N15 and N21. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

Song birds are less sensitive to disturbance. Some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During operation, however, it is possible to kill individual representatives of the species in vehicle collisions (personal observations). Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

Option G20 - Blue

Direct destruction of habitats

72.153 decares will be affected during construction or 0.07% of the habitats of the species in the zone (habitat N08, N15 and N21), Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08, N15 and N21. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

Song birds are less sensitive to disturbance. Some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During operation, however, it is possible to kill individual representatives of the species in vehicle collisions (personal observations). Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

Eastern Option G10.50

Direct destruction of habitats

119.421 decares will be affected during construction or 0.12% of the habitats of the species in the zone (habitat N08, N15 and N21), Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects small parts of large polygons of the species habitats N08, N15 and N21. In the majority of cases the remaining intact part of the

these polygons will be of sufficient area to perform its function as a trophical habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

Song birds are less sensitive to disturbance. Some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During operation, however, it is possible to kill individual representatives of the species in vehicle collisions (personal observations). Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

The Long Tunnel Option, 'Kresna' tunnel

Direct destruction of habitats

31.330 decares will be affected during construction or 0.03% of the habitats of the species in the zone (habitat N08 and N21). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08 and N21. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

Song birds are less sensitive to disturbance. Some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During operation, however, it is possible to kill individual representatives of the species in vehicle collisions (personal observations). Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

The Eastern Option G20

Direct destruction of habitats

268.322 decares will be affected during construction or 0.28% of the habitats of the species in the zone (habitat N08 and N21), Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option affects parts of large polygons of the species habitats N08 and N21. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

Song birds are less sensitive to disturbance. Some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During operation, however, it is possible to kill individual representatives of the species in vehicle collisions (personal observations). Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

50. The olive-tree warbler *(Hippolais olivetorum*)

Species Biology: It inhabits the outskirts of deciduous forests, bright low forests, orchards, shrubs, incl. of tree juniper, parks, dry and hilly rocky places of thin vegetation. The nest is most often made in *Paliurus spina-christi*, also of tree juniper, or in the branches of low trees. Incubation of eggs in southwest Bulgaria starts in early May. The incubation period is no more than 13 days. Sometimes the couple have 2 hatchings. Migratory species. Spring migration is late April-early May, autumn migration is between late July and mid-September. It feeds on arthropods (Golemanski 2011, Mitchev et al. 2012, Kennerley and Pearson 2010, Pearson and Lack 1992).

Assessment of the species in the Protected Zone:

According to the standard form for the Protected Zone, 45-60 couples nest in the zone. The potential habitats of the species in the area are grassy, shrubby habitats (habitats N08, N09 and N22 from the Standard Zone Form), with a total area of 108,079.693 decares.

Assessment of the species on territory of the Investment Proposal

The species has not been observed during field studies. The herbaceous bushy sites (N08 and N09) should be considered as potential habitats of the species on the territory of the Investment Proposal.

Impacts:

Option G20 - Red

Direct destruction of habitats

166.411 decares will be affected during construction or 0.15% of the habitats of the species in the zone (habitat N08 and N09). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08 and N09. In the majority of cases the remaining intact part of these

polygons will be of sufficient area to perform its function as a habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

Song birds are less sensitive to disturbance. Some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During operation, however, it is possible to kill individual representatives of the species in vehicle collisions (personal observations). Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

Option G20 - Blue

Direct destruction of habitats

157.591 decares will be affected during construction or 0.15% of the habitats of the species in the zone (habitat N08 and N09). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08 and N09. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

Song birds are less sensitive to disturbance. Some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During operation, however, it is possible to kill individual representatives of the species in vehicle collisions (personal observations). Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

Eastern Option G10.50

Direct destruction of habitats

201.341 decares will be affected during construction, or 0.19% of the habitats of the species in the zone (habitat N08 and N09), Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects small parts of large polygons of the species habitats N08 and N09. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

Song birds are less sensitive to disturbance. Some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During operation, however, it is possible to kill individual representatives of the species in vehicle collisions (personal observations). Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

The Long Tunnel Option, 'Kresna' tunnel

Direct destruction of habitats

175.237 decares will be affected during the construction or 0.16% of the habitats of the species in the zone (habitat N08 and N09). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08 and N09. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

Song birds are less sensitive to disturbance. Some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During operation, however, it is possible to kill individual representatives of the species in vehicle collisions (personal observations). Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

The Eastern Option G20

Direct destruction of habitats

601.635 decares will be affected during construction or 0.56% of the habitats of the species in the zone (habitat N08 and N09). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects parts of large polygons of the species habitats N08 and N09. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

Song birds are less sensitive to disturbance. Some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During operation, however, it is possible to kill individual representatives of the species in vehicle collisions (personal observations). Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

51. The semicollared flycatcher *(Ficedula semitorquata*)

Species Biology: It inhabits old, mostly natural deciduous and mixed forests, riparian forests, and rarely old orchards, tree plantations, parks, outskirts of smaller residential places with tree vegetation in the plain and low-mountain belt. It has its nest in hollows (including artificial nests), usually at 3 - 6 m height. The eggs are laid in May. The incubation is carried out by the female for 12 - 14 days. There may be 2 hatchings. The young leave the nest at 15 days of age. Migratory species. Spring migration is in the first half of April and autumn migration - from July to September. It feeds on insects that catches in the air, stalking from a branch or other convenient place (Golemanski 2011, Mitchev et al. 2012, BirdLife International 2012, Georgiev and Iankov 2009, Pearson and Lack. 1992).

Assessment of the species in the Protected Zone:

According to the standard form for the Protected Zone, one couple nests in the zone. The potential habitats of the species in the area are deciduous forests, incl. riparian forests (Habitat N16 from the Standard Zone Form), with a total area of 44,641.612 decares, but some of the forests, especially those with predominantly pubescent oak, are very young, off-shore and not suitable for breeding. More suitable may be those in the higher parts of the zone.

Assessment of the species on territory of the Investment Proposal

The species has not been observed during field studies. Deciduous forests can be considered as potential habitats of the species in the area, incl. riparian forests (habitat N16), although much of the forests, especially those

with predominant pubescent oak, are very young, offshoots, and are not suitable for nesting.

Impacts:

Option G20 - Red

Direct destruction of habitats

133.216 decares will be affected during construction or 0.3% of the potential nesting habitats of the species in the zone (habitat N16). The impact on them has been assessed as insignificant (Rate 1), given the small area affected and its sub-optimal nature.

Fragmentation of habitats

The road route in this option affects relatively small portions of large polygons of the N16 habitat. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the sub-optimal nature of affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species is not very sensitive to disturbance (personal observations). Some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. Only potential habitats, which in their current state are not suitable for nesting, would be affected. During the operation of the motorway, mortality of representatives of the species is possible in vehicle crashes. Given the sub-optimal character of the habitats, the probability of such an accident is very small, and only during the passage. Since the migratory population in the area depends on species populations in other parts of the species scope, no changes in the number of nesting population is expected, so the impact is considered insignificant (Rate 1).

Option G20 - Blue

Direct destruction of habitats

166.899 decares will be affected during construction or 0.37% of the potential nesting habitats of the species in the zone (habitat N16). The impact on them has been assessed as insignificant (Rate 1), given the small area affected and its sub-optimal nature.

Fragmentation of habitats

The road route in this option affects relatively small portions of large polygons of the N16 habitat. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the sub-optimal nature of affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species is not very sensitive to disturbance. Therefore some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. Only potential habitats, which in their current state are not suitable for nesting, would be affected. During the operation of the motorway, mortality of representatives of the species is possible in vehicle crashes. Given the sub-optimal character of the habitats, the probability of such an accident is very small, and only during the passage. Since the migratory population in the area depends on species populations in other parts of the species scope, no changes in the number of nesting population is expected, so the impact is considered insignificant (Rate 1).

Eastern Option G10.50

Direct destruction of habitats

160.019 decares will be affected during construction or 0.36% of the potential nesting habitats of the species in the zone (habitat N16). The impact on them has been assessed as insignificant (Rate 1), given the small area affected and its sub-optimal nature.

Fragmentation of habitats

The road route in this option affects small portions of large polygons of the N16 habitat. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the sub-optimal nature of affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact
(0).

Disturbance

The species is not very sensitive to disturbance. Some disturbance is expected
during construction works, yet given its temporary nature and restricted territory (only around the construction site, the impact will be insignificant even if it occurs (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. Only potential habitats, which in their current state are not suitable for nesting, would be affected. During the operation of the motorway, mortality of representatives of the species is possible in vehicle crashes. Given the sub-optimal character of the habitats, the probability of such an accident is very small, and only during the passage. Since the migratory population in the area depends on species populations in other parts of the species scope, no changes in the number of nesting population is expected, so the impact is considered insignificant (Rate 1).

The Long Tunnel Option, 'Kresna' tunnel

Direct destruction of habitats

17.726 decares will be affected during construction or 0.04% of the potential habitats of the species in the zone (habitat N16). The impact is

has been assessed as insignificant (Rate 1), given the small area affected and its sub-optimal nature.

Fragmentation of habitats

The road route in this option affects relatively small portions of large polygons of the N16 habitat. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the sub-optimal nature of affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species is not very sensitive to disturbance. Some disturbance is expected during construction works, yet given its temporary nature and restricted territory (only around the construction site, the impact will be insignificant even if it occurs (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. Only potential habitats, which in their current state are not suitable for nesting, would be affected. During the operation of the motorway, mortality of representatives of the species is possible in vehicle crashes. Given the sub-optimal character of the habitats, the probability of such an accident is very small, and only during the passage. Since the migratory population in the area depends on species populations in other parts of the species scope, no changes in the number of nesting population is expected, so the impact is considered insignificant (Rate 1).

The Eastern Option G20

Direct destruction of habitats

467.254 decares will be affected during construction or 1.05% of the potential habitats of the species in the zone (habitat N16), although Given their sub-optimal nature, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route in this option affects relatively small portions of large polygons of the N16 habitat. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the sub-optimal nature of affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

The species is not very sensitive to disturbance. Some disturbance is expected during construction works, yet given its temporary nature and restricted territory (only around the construction site, the impact will be insignificant even if it occurs (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. Only potential habitats, which in their current state are not suitable for nesting, would be affected. During the operation of the motorway, mortality of representatives of the species is possible in vehicle crashes. Given the sub-optimal nature of the habitats, the probability of such

an incident is very small, and only during a bird passage. Since the migratory population in the area depends on species populations in other parts of the species scope, no changes in the number of nesting population is expected, so the impact is considered insignificant (Rate 1).

52. The red-backed shrike *(Lanius collurio*)

Species Biology: It inhabits open spaces with shrubs, highly scattered outskirts of forests, clearings, shelter belts, gardens, yards, parks. It nests in shrubs, most often prickly shrubs. The breeding period is between May and July. Migratory species. The spring migration is in March and the autumn migration from the beginning of August to the end of October. It feeds on insects and other invertebrates, reptiles, birds and small murine rodents (Ivanov 2011, Stoyanov and Donchev, not publicized).

Assessment of the species in the Protected Zone:

According to the standard form for the Protected Zone, 740-900 couples nest in the zone. The species is also present during migrations. Potential habitats of the species in the area are grassland and shrubby areas, agricultural lands and residential areas (habitats N08, N09, N12, N15, N21 and N23 from the Standard Zone Form), with a total area of 150,371.747 decares. Some of these habitats contain a high proportion of unsuitable areas (e.g. habitat N23, whereto existing roads are comprised), on the account of other habitats, for example, the edges of the deciduous forests are also used by the species. Calculation of the area of this habitat is virtually impossible, and the inclusion of the entire N16 habitat area will overestimate too many potential habitats of the species.

Assessment of the species on territory of the Investment Proposal

The species has been observed many times during field studies, mostly north and south of the gorge, as well as in the eastern region. The herbaceous and bushy sites, agricultural lands and residential areas (habitats N08, N09, N12, N15, N21 and N23) should be considered as potential trophical habitats of the species on the territory of the Investment Proposal.

Impacts:

Option G20 - Red

Direct destruction of habitats

417.778 decares will be affected during construction or 0.28% of the habitats of the species in the zone (habitat N08, N09, N12, N15, N21 and N23). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08, N09, N12, N15, N21 and N23. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0).

Disturbance

Song birds are less sensitive to disturbance. Some disturbance is expected during construction, but given its temporary nature and

limited area (only around the building site), it will be insignificant
(Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During operation, however, it is possible to kill individual representatives of the species in vehicle collisions (personal observations). Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

Option G20 - Blue

Direct destruction of habitats

182.659 decares will be affected during construction or 0.12% of the habitats of the species in the zone (habitat N08, N09, N12, N15, N21 and N22), Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08, N09, N12, N15, N21 and N23. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate
1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact
(0).

Disturbance

Song birds are less sensitive to disturbance. Some disturbance
may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During operation, however, it is possible to kill individual representatives of the species in vehicle collisions (personal observations). Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

Eastern Option G10.50

Direct destruction of habitats

274.233 decares will be affected during construction or 0.18% of the habitats of the species in the zone (habitat N08, N09, N12, N15, N21 and N23). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08, N09, N12, N15, N21 and N23. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a habitat of the species. Given this, and because of the relatively small area of the

directly affected habitats, the impact is estimated to be insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (Rate 0). *Disturbance*

Song birds are less sensitive to disturbance. Some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During operation, however, it is possible to kill individual representatives of the species in vehicle collisions (personal observations). Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

The Long Tunnel Option, 'Kresna' tunnel

Direct destruction of habitats

237.033 decares will be affected during construction or 0.16% of the trophical habitats of the species in the zone (habitat N08, N09, N12, N21 and N23). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08, N09, N12, N21 and N23. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (Rate 0). *Disturbance*

Song birds are less sensitive to disturbance. Some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During operation, however, it is possible to kill individual representatives of the species in vehicle collisions (personal observations). Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

The Eastern Option G20

Direct destruction of habitats

684.779 decares will be affected during construction or 0.46% of the habitats of the species in the zone (habitat N08, N09, N12, N21 and N23). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option affects parts of large polygons of the species habitats N08, N09, N12, N21 and N23. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (Rate 0).

Disturbance

Song birds are less sensitive to disturbance. Some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During operation, however, it is possible to kill individual representatives of the species in vehicle collisions (personal observations). Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

53. The lesser grey shrike (*Lanius minor)*

Species Biology: It inhabits open spaces and pastures with trees and shrubs or groups of trees in them, natural and artificial riparian forests, edge of forests, bordering on pastures or agricultural lands, tree belts (also along roads), field shelters, orchards, vines with trees or bordering small forest, scattered artificial plantations, outskirts of smaller residential places. The nest is positioned high (5 - 6 to 12 m) in the main branch of trees. In the absence of trees - the nest will have lower position. Egg laying starts in the second half of May and lasts until June. Incubation is 15-16 days. The young leave the nest at 16-18 days of age. Migratory species. Spring migration is from the second half of April to the end of May, the autumn migration from August to September. It feeds on large insects, seldom with small mammals, birds, lizards, fruits (Ivanov 2011, personal observations).

Assessment of the population of the species in the area of the PZ and on the territory of the investment proposal: According to the standard form, about 20-25 pairs nest in the area and an unspecified number of species representatives pass by. The species was observed during field studies south of Kresna.

Assessment of the species in the Protected Zone:

According to the standard form for the Protected Zone, 20-25 couples nest in the zone. The species is also present during migrations. Potential habitats of the species in the area are grassland and shrubby areas, agricultural lands and residential areas (habitats N08, N09, N12, N15, N21 and N23 from the Standard Zone Form), with a total area of 150,371.747 decares. Some of these habitats contain a high proportion of unsuitable areas (e.g. habitat N23, whereto existing roads are comprised), on the account of other habitats, for example, the edges of the deciduous forests are also used by the species. Calculation of the area of this habitat is virtually impossible, and the inclusion of the entire N16 habitat area will overestimate too many potential habitats of the species.

Assessment of the species on territory of the Investment Proposal

The species has been observed during the field studies south of Kresna. The herbaceous and bushy sites, agricultural lands and residential areas (habitats N08, N09, N12, N15, N21 and N23) should be considered as potential trophical habitats of the species on the territory of the Investment Proposal.

Impacts:

Option G20 - Red

Direct destruction of habitats

417.778 decares will be affected during construction or 0.28% of the habitats of the species in the zone (habitat N08, N09, N12, N15, N21 and N23). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08, N09, N12, N15, N21 and N23. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (Rate 0).

Disturbance

Song birds are less sensitive to disturbance. Some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During operation, however, it is possible to kill individual representatives of the species in vehicle collisions (personal observations). Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

Option G20 - Blue

Direct destruction of habitats

349.832 decares will be affected during construction or 0.23% of the habitats of the species in the zone (habitat N08, N09, N12, N15, N21 and N23), Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08, N09, N12, N15, N21 and N23. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate (1),

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (Rate 0).

Disturbance

Song birds are less sensitive to disturbance. Some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During operation, however, it is possible to kill individual representatives of the species in vehicle collisions (personal observations). Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

Eastern Option G10.50

Direct destruction of habitats

274.233 decares will be affected during construction or 0.18% of the habitats of the species in the zone (habitat N08, N09, N12, N15, N21 and N23). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08, N09, N12, N15, N21 and N23. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (Rate 0)

Disturbance

Song birds are less sensitive to disturbance. Some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During operation, however, it is possible to kill individual representatives of the species in vehicle collisions (personal observations). Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

The Long Tunnel Option, 'Kresna' tunnel

Direct destruction of habitats

237.033 decares will be affected during construction or 0.16% of the trophical habitats of the species in the zone (habitat N08, N09, N12, N21 and N23). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08, N09, N12, N21 and N23. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (Rate 0).

Disturbance

Song birds are less sensitive to disturbance. Some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During operation, however, it is possible to kill individual representatives of the species in vehicle collisions (personal observations). Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

The Eastern Option G20

Direct destruction of habitats

684.779 decares will be affected during construction or 0.46% of the habitats of the species in the zone (habitat N08, N09, N12, N21 and N23). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option affects parts of large polygons of the species habitats N08, N09, N12, N21 and N23. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (Rate 0).

Disturbance

Song birds are less sensitive to disturbance. Some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During operation, however, it is possible to kill individual representatives of the species in vehicle collisions (personal observations). Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

54. The masked shrike *(Lanius nubicus)*

Species Biology: A nesting and migratory species. It inhabits pseudo-sized, scattered xerothermic oak forests of the sub-Mediterranean type, riparian hybrids of poplar, less frequent willow, ash and acacia in plain and hilly places. It builds its nest in prickly shrubs, in the main branch of thinner trees or along the horizontal branches of the larger ones. It lays its eggs in late May, early June. Incubation is 14-15 days. The young leave the nest at 18-20 days of age. Migratory species. Spring migration is likely to be from the second half of April and mostly in May, the autumn migration - in the second half of August. It feeds on insects, mostly locusts and beetles, seldom with lizards and small birds (Golemanski 2011, Ivanov 2011).

Assessment of the population of the species in the area of the PZ and on the territory of the investment proposal: According to the standard form, about 15-20 pairs nest in the area. The species has not been observed on the territory of the IP during field studies, but it certainly breeds and feeds on the territories, designated for the construction of the roadways.

Assessment of the species in the Protected Zone:

According to the standard form for the Protected Zone, 15-20 couples nest in the zone. The potential nesting habitats of the species in the area are shrubby communities and deciduous forests (habitats N08 and N16 from the Standard Zone Form), with a total area of 131,575.278 decares, as long as most of the forests are scattered.

Assessment of the species on territory of the Investment Proposal

The species has not been observed during field studies. The herbaceous, bushy sites and deciduous forests (N08 and N16) should be considered as potential habitats of the species on the territory of the Investment Proposal.

Impacts:

Option G20 - Red

Direct destruction of habitats

202.311 decares will be affected during construction or 0.15% of the habitats of the species in the zone (habitat N08 and N16). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08 and N16. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a nesting habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (Rate 0).

Disturbance

Song birds are less sensitive to disturbance. Some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During the operation, mortality is also possible

of species representatives in collision with a vehicles (Kambourova-Ivanova et al. 2012, Karaivanov
2015, personal observations). The impact on the population in the area will be insignificant (Rate 1) due to its relatively high number.

Option G20 - Blue

Direct destruction of habitats

230.445 decares will be affected during construction, or 0.18% of the habitats of the species in the zone (habitats N08 and N16). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08 and N16. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact
(Rate 0) e 0).

Disturbance

Song birds are less sensitive to disturbance. Some disturbance
may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During the operation of the motorway, mortality of representatives of the species is possible in vehicle crashes. Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

Eastern Option G10.50

Direct destruction of habitats

243.539 decares will be affected during construction, or 0.19% of the habitats of the species in the zone (habitats N08 and N16). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects small parts of large polygons of the species habitats N08 and N16. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact
(Rate 0)

Disturbance

Song birds are less sensitive to disturbance. Some disturbance
may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway,

possible destructions of egg nests or of poorly flying young birds, if they are within the construction boundaries. During the operation of the motorway, mortality of representatives of the species is possible in vehicle crashes. Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

The Long Tunnel Option, 'Kresna' tunnel

Direct destruction of habitats

36.525 decares will be affected during construction or 0.03% of the habitats of the species in the zone (habitat N08 and N16). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08 and N16. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact
Rate 0

Disturbance

Song birds are less sensitive to disturbance. Some disturbance
may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During the operation of the motorway, mortality of representatives of the species is possible in vehicle crashes. Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

The Eastern Option G20

Direct destruction of habitats

710.948 decares will be affected during construction or 0.54% of the habitats of the species in the zone (habitats N08 and N16). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects parts of large polygons of the species habitats N08 and N16. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact
(Rate 0.

Disturbance

Song birds are less sensitive to disturbance. Some disturbance
may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it will be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During the operation of the motorway, mortality of representatives of the species is possible in vehicle crashes. Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

55. The ortolan/ ortolan bunting *(Emberiza hortulana)*

Species Biology: It inhabits pastures and other open lawns with shrubs and heavily scattered groups of trees, forests outskirts, heavily scattered forest areas, bordering pastures and thin shrubs, agricultural lands with (field) boundary strips and shrubs between them, open, often stony hills with shrubs, vineyards, orchards, field protection belts, tree belts along the roads. It breeds on the ground, in the base of shrubs and trees. The eggs are laid in May-June. The young hatch after 11-12 days and leave the nest after 12 to 13 days, yet they can not fly well. They become independent after another week. Migratory species. Spring migration is from late March to early May, autumn migration is in August and September. It feeds on invertebrates (small ones are exclusively fed with them) and seeds that are collected on the ground and in the crowns of trees and shrubs (Ivanov 2011, personal observations).

Assessment of the species in the Protected Zone:

According to the standard form for the Protected Zone, 240-340 couples nest in the zone. The species is also present during migrations. Potential habitats of the species in the area are grassland and shrubby areas, agricultural lands and residential areas (habitats N08, N09, N12, N15, N21 and N23 from the Standard Zone Form), with a total area of 150,371.747 decares. Some of these habitats contain a high proportion of unsuitable areas (e.g. habitat N23, whereto existing roads are comprised), on the account of other habitats, for example, the edges of the deciduous forests are also used by the species. Calculation of the area of this habitat is virtually impossible, and the inclusion of the entire N16 habitat area will overestimate too many potential habitats of the species.

Assessment of the species on territory of the Investment Proposal

The species was observed during field studies in the southern part of the Kresna Gorge. The herbaceous and bushy sites, agricultural lands and residential areas (habitats N08, N09, N12, N15, N21 and N23) should be considered as potential trophical habitats of the species on the territory of the Investment Proposal.

Impacts:

Option G20 - Red

Direct destruction of habitats

417.778 decares will be affected during construction or 0.28% of the habitats of the species in the zone (habitat N08, N09, N12, N15, N21 and N23). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this option mainly affects peripheral parts of large polygons of the species habitats N08, N09, N12, N15, N21 and N23. In the majority of cases, the remaining intact part of these polygons will be of sufficient area to perform its function as a trophic habitat of the species. Given this, and because of the relatively small area of the directly affected habitats, the impact is estimated to be insignificant (Rate 1),

Disruption of bio-corridors
Roads do not present an insurmountable barrier for birds. No impact (Rate 0)

Disturbance
Song birds are less sensitive to disturbance. Some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it would be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During operation, however, it is possible to kill individual representatives of the species in vehicle collisions (personal observations). Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

Option G20 - Blue

Direct destruction of habitats

349.832 decares would be affected during construction or 0.23% of the habitats of the species in the zone (habitat N08, N09, N12, N15, N21 and N23), Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route in this option mainly affects peripheral parts of large polygons of the species habitats N08, N09, N12, N15, N21 and N23. In the majority of cases, the remaining intact part of these polygons would be of sufficient area to perform its function as a trophic habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact has been estimated as insignificant (Rate (1)

Disruption of bio-corridors
Roads do not present an insurmountable barrier for birds. No impact (Rate 0)

Disturbance
Song birds are less sensitive to disturbance. Some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it would be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During operation, however, it is possible to kill individual representatives of the species in vehicle collisions (personal observations). Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

Eastern Option G10.50

Direct destruction of habitats

274.233 decares would be affected during construction or 0.18% of the habitats of the species in the zone (habitat N08, N09, N12, N15, N21 and N23).

Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route in this option mainly affects peripheral parts of large polygons of the species habitats N08, N09, N12, N15, N21 and N23. In the majority of cases, the remaining intact part of these polygons would be of sufficient area to perform its function as a habitat of the species. Given that and due to the relatively small size of directly affected habitats, the

impact has been estimated as insignificant (Rate (1),

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (0)

Disturbance

Some birds are less sensitive to disturbance. Some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it would be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During operation, however, it is possible to kill individual representatives of the species in vehicle collisions (personal observations). Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

The Long Tunnel Option, 'Kresna' tunnel

Direct destruction of habitats

237.033 decares would be affected during construction or 0.16% of the trophical habitats of the species in the zone (habitat N08, N09, N12, N21 and N23). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this alternative mainly affects peripheral parts of large polygons of the species habitats N08, N09, N12, N21 and N23. In the majority of cases, the remaining intact part of these polygons would be of sufficient area to perform its function as a habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact has been estimated as insignificant (Rate (1)

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (Rate 0)

Disturbance

Song birds are less sensitive to disturbance. Some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it would be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During operation, however, it is possible to kill individual representatives of the species in vehicle collisions (personal observations). The impact on the population in the area would be insignificant (Rate1), given its comparatively high number.

The Eastern Option G20

Direct destruction of habitats

684.779 decares would be affected during construction or 0.46% of the habitats of the species in the zone (habitat N08, N09, N12, N21 and N23). Given the small area affected, the impact on them has been assessed as insignificant (Rate 1).

Fragmentation of habitats

The road route under this alternative affects parts of large polygons of the species habitats N08, N09, N12, N21 and N23. In the majority of cases, the remaining intact part of these polygons would be of sufficient area to perform its function as a habitat of the species. Given that and due to the relatively small size of directly affected habitats, the impact is

estimated as insignificant (Rate 1).

Disruption of bio-corridors

Roads do not present an insurmountable barrier for birds. No impact (Rate 0).

Disturbance

Song birds are less sensitive to disturbance. Some disturbance may be expected during construction, yet given its temporary nature and limited territory (only around the construction site), it would be insignificant (Rate 1). During the operation of the motorway, impact is not expected (Rate 0).

Mortality

Adults are fast and cautious enough to avoid construction equipment and heavy construction machinery. During the construction of the highway, it is possible to destroy a nest of eggs or poorly flying small ones, if they are within the construction boundaries. During operation, however, it is possible to kill individual representatives of the species in vehicle collisions (personal observations). Given the high number of the species, the impact on the population in the area would be insignificant (Rate1).

5.2. Description and analysis of the impact of the investment proposal on the integrity of the protected zone in terms of their structure, functions and conservation objectives (habitat loss, fragmentation, species disturbance, species destruction, chemical, hydrological and geological changes, etc.), during the implementation and during the operation of the investment proposal.

- **BG 0000366 - Kresna-Ilindentsi Protected Zone**

Option G20 - Red

Structure

The implementation of the investment proposal in this option would affect the territorial integrity of the Kresna-Ilindentsi protected area on a total area of **687.950 decares,** which represents **0.14%** of the protected zone. Given the small affected area, we could conclude that the implementation of the G20 Red Option **would not have a significant impact on the structure of the zone.**

Functions and conservation objectives

Loss of natural habitats.

The implementation of the investment proposal in this option would affect 9 types of natural habitats (Table 5.2-1) subject to protection in the area, of which 7 are considered insignificant. **Significant** impact is expected on

habitat 92A0 and 92C0. Due to the large area of affected polygons and terrain characteristics, mitigation measures such as reduction of scope in certain sections, would be impossible.

Table 5.2-1: Areas of natural habitats, subject to conservation in the zone, falling within the scope of Option G20 Red.

No.	Code	Area in the PZ/Decares	Affected area/decares	Affected Area /%
1	6210(*)	25,991.80	3.138	0.0121
2	6430	181.30	0.068	0.0375
3	8220	511.40	1.133	0.2215
4	91AA*	36927.50	94.149	0.2550
5	91E0*	899.50	0.530	0.0589
6	91M0	11616.60	13.771	0.1185
7	92A0	433.20	14.766	3.4086
8	92C0	785.10	10.079	1.2838
9	9560*	11325.90	0.011	0.0001

Loss of species habitats

Plants:

The implementation of the investment proposal in this option **would not affect the** localizations of the only plant species, subject to conservation in the zone - *Centaurea immanuelis loewii*.

Invertebrates:

The implementation of the investment proposal in this option would affect habitats of 14 invertebrate species, subject to conservation in the zone. The impact on them has been assessed as **insignificant**, given the small area affected.

Fish:

The implementation of the investment proposal in this option would affect habitats of three fish species, subject to conservation in the zone. During construction, there would be temporary damage with a moderate **rate of impact** on the habitats of 2 species - *Aspius aspius* and *Cobitis strumicae* (equivalent to *Cobitis taenia* for the Aegean catchment area). With mitigation measures, it would be reduced. During operation, the loss would only be due to the pillars of the bridge facilities and would be **insignificant** for all three species.

Amphibians and Reptiles:

The implementation of the investment proposal in this option would affect habitats of all amphibian and reptile species, subject to conservation in the zone. In 3 of them (*Emys orbicularis, Elaphe quatuorlineata, Elaphe situla*) the impact is estimated of moderate rate due to the larger area of affected optimal habitats. Due to the large number and large size of affected polygons, mitigating measures, such as reduced range in certain sections shall be impossible.

Bats:

The implementation of the investment proposal in this option would affect hunting habitats of 8 species of cave-loving bats, subject to conservation in the zone. Also the habitats of the two forest bats, subject to conservation in the zone will be affected *(Barbastella barbastellus* and *Myotis bechsteini)*. The impact has been assessed as **insignificant**, given the small area affected.

Land mammals:

The implementation of the investment proposal in this option would affect habitats of 2 species of mammals, subject to conservation in the zone *(Lutra lutra* and *Vormela peregusna)*. The impact has been estimated to be of moderate rate for the otter, given its temporary nature (only during construction). With mitigation measures, it would be reduced.

Barrier effect / Fragmentation

Natural habitats:

The implementation of the investment proposal in this option would fragment 6 of the affected natural habitats subject to conservation in the zone. The impact would be **significant** for habitats 92A0 and 92C0. Due to the large area of affected polygons and terrain characteristics, mitigation measures such as reduction of scope in certain sections, would be impossible.

Plants:

The implementation of the investment proposal in this option **would not affect the** localizations of the only plant species, subject to conservation in the zone - *Centaurea immanuelis loewii*.

Invertebrates:

The implementation of the investment proposal in this option will fragment the habitats of 11 invertebrate species, subject to conservation in the zone. The impact on them has been assessed as **insignificant**, given the small area affected. **No** barrier effect **is expected.**

Fish:

The implementation of the investment proposal in this option would temporarily fragment the habitats of three fish species, subject to conservation in the zone *(Aspius aspius, Rhodeus sericeus amarus* and *Cobitis strumicae)* during construction. The construction would also have a temporary barrier effect for these species. Given the large length and area of the fragments formed and the temporary nature of the impact, we could assume that the impact would be **insignificant** for all three species.

Amphibians and Reptiles:

The implementation of the investment proposal in this option would affect habitats of all amphibian and reptile species, subject to conservation in the zone. In four of them (*Testudo graeca, Testudo hermanni, Elaphe quatuorlineata, Elaphe situla*), the fragmentation would be **significant** because the habitats of these species would be mostly divided into two parts (east and west). This is likely to result in fragmentation of these species populations, i.e. two subpopulations would be formed, which would be largely isolated from each other. In addition, these species would experience disruption of bio-corridors, and both snakes species would be affected**significantly**. The nature of the impact would be such that it could not be mitigated by the implementation of measures.

Bats:

The implementation of the investment proposal in this option would fragment hunting habitats of 8 species of cave-loving bats and habitats of the two bats (*Barbastella barbastellus* and *Myotis bechsteini*), subject to conservation in the zone. The impact has been estimated as **insignificant** due to the small affected area of the habitats of these species, which would also cause minor changes in their functional characteristics. **No** barrier effect **is expected.**

Land mammals:

The implementation of the investment proposal in this option would fragment habitats of 2 species of mammals subject to conservation in the zone (*Lutra lutra* and *Vormela peregusna*). The impact has been estimated to be **insignificant** for the otter, given its temporary nature (only during construction), and the marbled polecat *(Vormela peregusna)* due to the large area of the remaining fragments. A barrier effect would occur for four species, subject to conservation in the zone (*Canis lupus, Ursus arctos, Lutra lutra* and *Vormela peregusna*). The impact has been estimated as **insignificant** for all four species.

Destruction of species representatives

Plants:

The implementation of the investment proposal in this option **would not affect the** localizations of the only plant species, subject to conservation in the zone - *Centaurea immanuelis loewii*. Destruction of representatives is not expected.

Invertebrates:

The implementation of the investment proposal in this option may cause mortality of single representatives of 14 bird invertabrate species, subject to conservation in the zone. The impact on the populations of these species in the area has been assessed as **insignificant**.

Fish:

The implementation of the investment proposal in this option could result in mortality of single species of 3 fish species, subject to conservation in the zone (*Aspius aspius, Rhodeus sericeus amarus* and *Cobitis strumicae*). The impact on the populations of these species in the area has been assessed as **insignificant**.

Amphibians and Reptiles:

The implementation of the investment proposal in this option may cause mortality of single representatives of all amphibians and reptiles species, subject to conservation in the zone. In four of them (*Testudo graeca, Testudo hermanni, Elaphe quatuorlineata, Elaphe situla*), the impact on the populations in the area may be **significant** as the planned route passes through high quality (optimal and appropriate) habitats. Applying mitigation measures could not be effective for the snakes, given the nature of the terrain in the larger part of the planned road route.

Bats:

The implementation of the investment proposal in this option may cause mortality of single representatives of 10 bat species, subject to conservation in the zone. In 5 of them (*Rhinolophus hipposideros, Rhinolophus ferrumequinum, Rhinolophus euryale, Miniopterus schreibersi* and *Myotis emarginatus*), the impact on the populations in the area was estimated to be of moderate rate. In *Myotis bechsteini, the* impact on populations in the area has been estimated to be **significant**. With mitigation measures, it would be reduced.

Land mammals:

The implementation of the investment proposal in this option could result in mortality of single species of 3 species of mammals subject to conservation in the zone (*Canis lupus, Lutra lutra* and *Vormela peregusna*). The impact on the populations of these species in the area has been assessed as **insignificant**.

Disturbance of species

Invertebrates:

Invertebrates have a primitive nervous system and are insensitive to disturbance. **There would be no** impact to any species.

Fish:

Fish are insensitive to disturbance. **There would be no** impact to any species.

Amphibians and Reptiles:

Amphibians and reptiles are less sensitive to disturbance. Some disturbance for representatives of all species, subject to conservation in the zone may be expected during construction but not during operation. The impact shall be **insignificant**.

Bats:

The implementation of the investment proposal in this option **would not lead** to disturbance for representatives of bat species that are subject to conservation in the zone.

Land mammals:

The implementation of the investment proposal in this option may cause **insignificant disturbance** for representatives from 4 species of mammals, subject to conservation in the zone (*Canis lupus, Ursus arctos, Lutra lutra* and *Vormela peregusna*).

Pollution of habitats of aquatic species.

Invertebrates:

The implementation of the investment proposal in this option may have an impact on the habitats of four invertebrate invertebrates, subject to conservation in the zone *(Unio crassus, Austropotamobius torrentium* and the larvae of *Cordulegaster heros* and *Ophiogomphus cecilia*). The impact has been estimated as **insignificant** for all four species.

Fish:

The implementation of the investment proposal in this option may have an impact on the habitats of three fish species, subject to conservation in the zone (*Aspius aspius, Rhodeus sericeus amarus* and *Cobitis strumicae*). The impact has been assessed as **moderate**, given the large area that may be affected. With mitigation measures, it would be reduced.

Disruption of species composition

The implementation of the investment proposal in this option may cast doubt on the long-term existence of the two subpopulations of the two species of snakes, subject to conservation in the zone *(Elaphe quatuorlineata* and *Elaphe situla)* likely to be formed as a result of the loss and fragmentation of optimal habitats, barrier effect and mortality during construction and operation. Due to the large number and large area of the affected polygons, and given the nature of the terrain over most of the planned road route, mitigation measures would not be possible.

Cumulative effect

From the investment proposals, plans, programs or projects/designs that have been in the procedure to date (November 2016) 29 would have cumulative impacts on the natural habitats or species, subject to conservation in the PZ (see paragraph 2). Considering that the IP in this option affects, to a moderate or significant extent, two natural habitats and habitats of 5 species, subject to conservation in the PZ, as mitigating measures would be impossible, then

the cumulative impact of this option and all other IPs has been estimated to be significant.

Option G20 - Blue

Structure

The implementation of the investment proposal in this option would affect the territorial integrity of the Kresna-Ilindentsi protected zone on a total area of **687.950 decares,** which represents **0.14%** of the protected zone. Given the small affected area, we could conclude that the implementation of the G20 Blue Option **would not have a significant impact on the structure of the zone.**

Functions and conservation objectives

Loss of natural habitats.

The implementation of the investment proposal in this option would affect 9 types of natural habitats (Table 5.2-2) subject to conservation in the zone, of which 7 are considered insignificant. A **significant** impact on habitats 92A0 and 92C0 is expected. Due to the large area of affected polygons and terrain characteristics, mitigation measures such as reduction of scope in certain sections, would be impossible.

Table 5.2-2: Areas of natural habitats, subject to conservation in the zone, falling within the scope of Option G20 Blue.

No.	Code	Area in PZ/Decares	Affected Area /	Affected Area /%
1	6210(*)	25,991.80	1.596	0.01
2	6430	181.30	0.139	0.08
3	8220	511.40	0.815	0.16
4	91AA*	36927.50	106.836	0.29
5	91E0*	899.50	21.575	0.19
6	91M0	11616.60	2.529	0.28
7	92A0	433.20	17.957	4.15
8	92C0	785.10	17.388	2.21
9	9560*	11325.90	1.355	0.01

Loss of species habitats

Plants:

The implementation of the investment proposal in this option **would not affect the** localizations of the only plant species, subject to conservation in the zone - *Centaurea immanuelis loewii*.

Invertebrates:

The implementation of the investment proposal in this option would affect habitats of 14 invertebrate species, subject to conservation in the zone. The impact on them has been assessed as **insignificant**, given the small area affected.

Fish:

The implementation of the investment proposal in this option would affect habitats of three fish species, subject to conservation in the zone. During construction, there would be temporary damage with a moderate **rate of impact** on the habitats of 2 species - *Aspius aspius* and *Cobitis strumicae* (equivalent to *Cobitis taenia* for the Aegean catchment area). With mitigation measures, it would be reduced. During operation, the loss would only be due to the pillars of the bridge facilities and would be **insignificant** for all three species.

Amphibians and Reptiles:

The implementation of the investment proposal in this option would affect habitats of all amphibian and reptile species, subject to conservation in the zone. In four of them (*Testudo graeca, Emys orbicularis, Elaphe quatuorlineata, Elaphe situla*) the impact is estimated of moderate rate due to the larger area of affected habitats. Due to the large number and large size of affected polygons, mitigating measures, such as reduced range in certain sections or other implementable measures shall be impossible.

Bats:

The implementation of the investment proposal in this option would affect hunting habitats of 8 species of cave-loving bats, subject to conservation in the zone. Also the habitats of the two forest bats, subject to conservation in the zone will be affected *(Barbastella barbastellus* and *Myotis bechsteini).* The impact has been assessed as **insignificant**, given the small area affected.

Land mammals:

The implementation of the investment proposal in this option would affect habitats of 2 species of mammals, subject to conservation in the zone *(Lutra lutra* and *Vormela peregusna).* The impact has been estimated to be of moderate rate for the otter, given its temporary nature (only during construction). With mitigation measures, it would be reduced.

Barrier effect / Fragmentation

Natural habitats:

The implementation of the investment proposal in this option would fragment 7 of the affected natural habitats subject to conservation in the zone. The impact would be **significant** for habitats 92A0 and 92C0. Due to the large area of affected polygons and terrain characteristics, mitigation measures such as reduction of scope in certain sections, would be impossible.

Plants:

The implementation of the investment proposal in this option **would not affect the** localizations of the only plant species, subject to conservation in the zone - *Centaurea immanuelis loewii*.

Invertebrates:

The implementation of the investment proposal in this option will fragment the habitats of 11 invertebrate species, subject to conservation in the zone. The impact on them has been assessed as **insignificant**, given the small area affected. **No** barrier effect **is expected.**

Fish:

The implementation of the investment proposal in this option would temporarily fragment the habitats of three fish species, subject to conservation in the zone *(Aspius aspius, Rhodeus sericeus amarus* and *Cobitis strumicae)* during construction. The construction would also have a temporary barrier effect for these species. Given the large length and area of the fragments formed and the temporary nature of the impact, we could assume that the impact would be **insignificant** for all three species.

Amphibians and Reptiles:

The implementation of the investment proposal in this option would affect habitats of all amphibian and reptile species, subject to conservation in the zone. In four of them (*Testudo graeca, Testudo hermanni, Elaphe quatuorlineata, Elaphe situla*), the fragmentation would be **significant** because the habitats of these species would be mostly divided into two parts (east and west). This is likely to result in fragmentation of the populations of these species, i.e. will be formed

two, largely isolated subpopulations. In addition, these species would experience disruption of bio-corridors, and both snakes species would be affected **significantly**. The nature of the impact would be such that it could not be mitigated by the implementation of measures.

Bats:

The implementation of the investment proposal in this option would fragment hunting habitats of 8 species of cave-loving bats and habitats of the two bats (*Barbastella barbastellus* and *Myotis bechsteini*), subject to conservation in the zone. The impact has been estimated as **insignificant** due to the small affected area of the habitats of these species, which would also cause minor changes in their functional characteristics. **No** barrier effect **is expected.**

Land mammals:

The implementation of the investment proposal in this option would fragment habitats of 2 species of mammals subject to conservation in the zone (*Lutra lutra* and *Vormela peregusna*). The impact has been estimated to be **insignificant** for the otter, given its temporary nature (only during construction), and the marbled polecat *(Vormela peregusna)* due to the large area of the remaining fragments. A barrier effect would occur for four species, subject to conservation in the zone (*Canis lupus, Ursus arctos, Lutra lutra* and *Vormela peregusna*). The impact has been estimated as **insignificant** for all four species.

Destruction of species representatives

Plants:

The implementation of the investment proposal in this option **would not affect the** localizations of the only plant species, subject to conservation in the zone - *Centaurea immanuelis loewii*. Destruction of representatives is not expected.

Invertebrates:

The implementation of the investment proposal in this option may cause mortality of single representatives of 14 bird invertabrate species, subject to conservation in the zone. The impact on the populations of these species in the area has been assessed as **insignificant**.

Fish:

The implementation of the investment proposal in this option could result in mortality of single species of 3 fish species, subject to conservation in the zone (*Aspius aspius, Rhodeus sericeus amarus* and *Cobitis strumicae*). The impact on the populations of these species in the area has been assessed as **insignificant**.

Amphibians and Reptiles:

The implementation of the investment proposal in this option may cause mortality of single representatives of all amphibians and reptiles species, subject to conservation in the zone. In four of them (*Testudo graeca, Testudo hermanni, Elaphe quatuorlineata, Elaphe situla*), the impact on the populations in the area may be **significant** as the planned route passes through high quality (optimal and appropriate) habitats. Applying mitigation measures could not be effective for the snakes, given the nature of the terrain in the larger part of the planned road route.

Bats:

The implementation of the investment proposal in this option may cause mortality of single representatives of 10 bat species, subject to conservation in the zone. In 5 of them (*Rhinolophus hipposideros, Rhinolophus ferrumequinum, Rhinolophus euryale, Miniopterus schreibersi* and *Myotis emarginatus*), the impact on the populations in the area was estimated to be of moderate rate. In *Myotis bechsteini, the* impact on populations in the area has been estimated to be **significant**. With mitigation measures, it would be reduced.

Land mammals:

The implementation of the investment proposal in this option could result in mortality of single species of 3 species of mammals subject to conservation in the zone (*Canis lupus, Lutra lutra* and *Vormela peregusna*). The impact on the populations of these species in the area has been assessed as **insignificant**.

Disturbance of species

Invertebrates:

Invertebrates have a primitive nervous system and are insensitive to disturbance. **There would be no** impact to any species.

Fish:

Fish are insensitive to disturbance. **There would be no** impact to any species.

Amphibians and Reptiles:

Amphibians and reptiles are less sensitive to disturbance. Some disturbance on representatives of all species, subject to conservation in the zone may be expected during construction but not during operation. The impact shall be **insignificant**.

Bats:

The implementation of the investment proposal in this option **would not lead** to disturbance for representatives of bat species that are subject to conservation in the zone.

Land mammals:

The implementation of the investment proposal in this option may cause **insignificant disturbance** for representatives from 4 species of mammals, subject to conservation in the zone (*Canis lupus, Ursus arctos, Lutra lutra* and *Vormela peregusna*).

Pollution of habitats of aquatic species.

Invertebrates:

The implementation of the investment proposal in this option may have an impact on the habitats of four invertebrate invertebrates, subject to conservation in the zone *(Unio crassus, Austropotamobius torrentium* and the larvae of *Cordulegaster heros* and *Ophiogomphus cecilia*). The impact has been estimated as **insignificant** for all four species.

Fish:

The implementation of the investment proposal in this option may have an impact on the habitats of three fish species, subject to conservation in the zone (*Aspius aspius, Rhodeus sericeus amarus* and *Cobitis strumicae*). The impact has been assessed as **moderate**, given the large area that may be affected. With mitigation measures, it would be reduced.

Disruption of species composition

The implementation of the investment proposal in this option may cast doubt on the long-term existence of the two subpopulations of the two species of snakes, subject to conservation in the zone *(Elaphe quatuorlineata* and *Elaphe situla)* likely to be formed as a result of the loss and fragmentation of optimal habitats, barrier effect and mortality during construction and operation. Due to the large number and large area of the affected polygons, and given the nature of the terrain over most of the planned road route, mitigation measures would not be possible.

Cumulative effect

From the investment proposals, plans, programs or projects/designs that have been in the procedure to date (November 2016) 29 would have cumulative impacts on the natural habitats or species, subject to conservation in the PZ (see paragraph 2). Considering that the IP in this option affects, to a moderate or significant extent, two natural habitats and habitats of 5 species, subject to conservation in the PZ, as mitigating measures would be impossible, the cumulative impact in this option and all other IPs has been defined as significant.

Eastern Option G10.50

Structure

The implementation of the investment proposal in this option would affect the territorial integrity of the Kresna-Ilindentsi protected zone on a total area of **525.279 decares** (excluding the area of the right roadway that would be on the existing road), which represents **0.11%** of the protected zone. Given the small affected area, we could conclude that the implementation of the investment proposal in the Eastern Option G10.50 **would not have a significant impact on the structure of the zone.**

Functions and conservation objectives

Loss of natural habitats.

The implementation of the investment proposal in this option would affect 8 types of natural habitats (Table 5.2-3), subject to protection in the zone, of which 7 are considered insignificant. A **significant** impact is expected on the 91E0 * habitat. With mitigation measures, it would be reduced.

Table 5.2-3: Areas of natural habitats, subject to conservation in the zone falling within the scope of Eastern Option G10.50.

No.	Code	Area in PZ/Decares	Affected Area / decares	Affected Area /%
1	6210(*)	25,991.80	14.084	0.05
2	6220 *	22069.50	55.861	0.25
3	5210	579.00	0.953	0.16
4	91E0*	899.50	10.231	1.14
5	92A0	433.20	2.151	0.50
6	91AA*	36927.50	144.737	0.39
7	91M0	11616.60	6.665	0.06
8	9560*	11325.90	2,900	0.03

Loss of species habitats

Plants:

The implementation of the investment proposal in this option **would not affect the** localizations of the only plant species, subject to conservation in the zone - *Centaurea immanuelis loewii*.

Invertebrates:

The implementation of the investment proposal in this option would affect habitats of 14 invertebrate species, subject to conservation in the zone. The impact on them has been assessed as **insignificant**, given the small area affected.

Fish:

The implementation of the investment proposal in this option would affect habitats of three fish species, subject to conservation in the zone. The impact would be

insignificant for all three species, during construction and during operation.

Amphibians and Reptiles:

The implementation of the investment proposal in this option would affect habitats of all amphibian and reptile species, subject to conservation in the zone. The impact has been estimated as **insignificant** for all species, due to the relatively small affected area of both potential and optimal habitats.

Bats:

The implementation of the investment proposal in this option would affect hunting habitats of 8 species of cave-loving bats, subject to conservation in the zone. Also the habitats of the two forest bats, subject to conservation in the zone will be affected *(Barbastella barbastellus* and *Myotis bechsteini)*. The impact has been assessed as **insignificant**, given the small area affected.

Land mammals:

The implementation of this investment proposal would affect habitats of 3 species of mammals, subject to conservation in the zone *(Canis lupus*, *Lutra lutra* and *Vormela peregusna*). The impact on them has been assessed as **insignificant**, given the small area affected.

Barrier effect / Fragmentation

Natural habitats:

The implementation of the investment proposal in this option would fragment 7 of the affected natural habitats subject to conservation in the zone. The impact on them has been assessed as **insignificant**, given the small area affected.

Plants:

The implementation of the investment proposal in this option **would not affect the** localizations of the only plant species, subject to conservation in the zone - *Centaurea immanuelis loewii*.

Invertebrates:

The implementation of the investment proposal in this option would fragment the habitats of 12 invertebrate species, subject to conservation in the zone. The impact on them has been assessed as **insignificant**, given the small area affected. **No** barrier effect **is expected.**

Fish:

The implementation of the investment proposal in this option would temporarily fragment the habitats of three fish species, subject to conservation in the zone *(Aspius aspius, Rhodeus sericeus amarus* and *Cobitis strumicae)* during construction. The construction would also have a temporary barrier effect for these species. Given the large length and area of the fragments formed and the temporary nature of the impact, we could assume that the impact would be **insignificant** for all three species.

Amphibians and Reptiles:

The implementation of the investment proposal in this option would affect habitats of all amphibian and reptile species, subject to conservation in the zone. In four of them (*Testudo graeca, Testudo hermanni, Elaphe quatuorlineata, Elaphe situla*), the fragmentation would be **significant**, since the habitats of these species in their greater part would be divided into two parts (eastern and western) by the right roadway. This is likely to result in fragmentation of the species populations, i.e. two subpopulations would be formed, which would be largely isolated from each other. In addition, these species would experience disruption of bio-corridors as a result of the traffic in the right roadway, with the impact on both snakes being **significant**. The impact can only be mitigated if the whole option (including the right

roadway), be subjected to effective design and implementation of defragmentation facilities, guaranteeing the unimpeded crossing of the roadway of amphibians and reptiles.

Bats:

The implementation of the investment proposal in this option would fragment hunting habitats of 8 species of cave-loving bats and habitats of the two bats (*Barbastella barbastellus* and *Myotis bechsteini*), subject to conservation in the zone. The impact has been estimated as **insignificant** due to the small affected area of the habitats of these species, which would also cause minor changes in their functional characteristics. **No** barrier effect **is expected.**

Land mammals:

The implementation of the investment proposal in this option would fragment habitats of 3 species of mammals subject to conservation in the zone *(Canis lupus, Lutra lutra* and *Vormela peregusna).* The impact is considered to be **insignificant** for the wolf and the otter, given its temporary nature (only during construction) and for the marbled polecat (Vormela peregusna), because of the sub-optimal nature of the habitats. A barrier effect would occur for four species, subject to conservation in the zone (*Canis lupus, Ursus arctos, Lutra lutra* and *Vormela peregusna*). The impact has been estimated as **insignificant** for all four species.

Destruction of species representatives

Plants:

The implementation of the investment proposal in this option **would not affect the** localizations of the only plant species, subject to conservation in the zone - *Centaurea immanuelis loewii*. Destruction of representatives is not expected.

Invertebrates:

The implementation of the investment proposal in this option may cause mortality of single representatives of 14 bird invertabrate species, subject to conservation in the zone. The impact on the populations of these species in the area has been assessed as **insignificant**.

Fish:

The implementation of the investment proposal in this option could result in mortality of single species of 3 fish species, subject to conservation in the zone (*Aspius aspius, Rhodeus sericeus amarus* and *Cobitis strumicae*). The impact on the populations of these species in the area has been assessed as **insignificant**.

Amphibians and Reptiles:

The implementation of the investment proposal in this option may cause mortality of single representatives of all amphibians and reptiles species, subject to conservation in the zone. In four of them (*Testudo graeca, Testudo hermanni, Elaphe quatuorlineata, Elaphe situla*), the impact on the populations in the area may be **significant** as the right roadway of the planned route passes through high quality (optimal and suitable) habitats. The impact can only be mitigated if effective defragmentation facilities can be designed for the entire option (including the right roadway) to guarantee unimpeded crossing of the amphibians and reptiles.

Bats:

The implementation of the investment proposal in this option may cause mortality of single representatives of 10 bat species, subject to conservation in the zone. In 5 of them (*Rhinolophus hipposideros, Rhinolophus ferrumequinum, Rhinolophus euryale, Miniopterus schreibersi* and *Myotis emarginatus*), the impact on the populations in the area was estimated to be of moderate rate. In *Myotis bechsteini, the* impact on populations in the area has been estimated to be **significant**. With mitigation measures, it would be reduced.

Land mammals:

The implementation of the investment proposal in this option could result in mortality of single representatives of 3 species of mammals, subject to conservation in the zone (*Canis lupus, Lutra lutra* and *Vormela peregusna*). The impact on the wolf population in the area has been estimated to be of moderate rate, as the species is vulnerable to collision with vehicles (Huber et al.
2001, Lovari et al. 2007). With mitigation measures, it would be reduced.

Disturbance of species

Invertebrates:

Invertebrates have a primitive nervous system and are insensitive to disturbance. **There would be no** impact to any species.

Fish:

Fish are insensitive to disturbance. **There would be no** impact to any species.

Amphibians and Reptiles:

Amphibians and reptiles are less sensitive to disturbance. Some disturbance for representatives of all species, subject to conservation in the zone may be expected during construction but not during operation. The impact shall be **insignificant**.

Bats:

The implementation of the investment proposal in this option could lead to disturbance in the shelter of one of the species, *Rhinolophus ferrumequinum*, subject to conservation in the zone). The impact has been assessed as **moderate**. Mitigation measures are needed.

Land mammals:

The implementation of the investment proposal in this option may cause **insignificant disturbance** for representatives from 4 species of mammals, subject to conservation in the zone (*Canis lupus, Ursus arctos, Lutra lutra* and *Vormela peregusna*).

Pollution of habitats of aquatic species.

Invertebrates:

The implementation of the investment proposal in this option may have an impact on the habitats of four invertebrate invertebrates, subject to conservation in the zone *(Unio crassus, Austropotamobius torrentium* and the larvae of *Cordulegaster heros* and *Ophiogomphus cecilia*). The impact has been estimated as **insignificant** for all four species.

Fish:

The implementation of the investment proposal in this option may have an impact on the habitats of three fish species, subject to conservation in the zone (*Aspius aspius, Rhodeus sericeus amarus* and *Cobitis strumicae*). The impact has been estimated as moderate for *Rhodeus sericeus amarus* and *Cobitis strumicae* , given the large area that may be affected. With mitigation measures, it would be reduced.

Disruption of species composition

The implementation of the investment proposal in this option may cast doubt on the long-term existence of the two subpopulations of the two species of snakes, subject to conservation in the zone *(Elaphe quatuorlineata* and *Elaphe situla),* likely to be formed as a result of barrier effect and mortality during the operation of the highway, caused by traffic on the right roadway. The impact can only be mitigated if for the whole option (including the right roadway) would be designed and

carried out effective defragmentation and partitioning facilities, ensuring unimpeded crossing and preventing the appearance on the roadway of amphibians and reptiles.

Cumulative effect

From the investment proposals, plans, programs or projects/designs that have been in the procedure to date (November 2016) 29 would have cumulative impacts on the natural habitats or species, subject to conservation in the PZ (see paragraph 2). Their impact on natural habitats and habitats of species is presented in Table 5.2-4.

Table 5.2-4a: Cumulative impact on natural habitats, subject to conservation in the PZ.

IP	**6210**	**6220***	**91E0***	**91AA***
Eastern G10.5 Option/	14.084	55.861	10.231	144.737
Eastern Option G10.50/%	0.05	0.25	1.14	0.39
4 *	32.373	33.755	0.000	0.000
25	0.500	0.000	0.250	0.000
31	0.000	0.000	0.000	1.000
55	0.000	0.400	0.000	0.000
71	0.000	24.927	0.000	0.000
58	1.960	0.000	0.000	0.000
59	No Data	No Data	0.000	0.000
62	0.000	21.894	0.000	0.000
Cumulative / decares	*48.917*	*136.837*	*10.481*	*145.737*
Cumulative /%	*0.19*	*0.62*	*1.17*	*0.39*

* - corresponds to the number in Table 2-1.

Table 5.2-4b: Cumulative impact on invertebrate habitats, protected in the PZ.

IP	***C. heros***	***O. Cecilia***	***C. Quadripunctata***	***E. catax***	***L. dispar***	***L. Cervus***	***M. funereus***	***R. Alpina***	***C. Cinnaberinus***	***P. Subrugosus***	***E. Ankeraria***
Eastern G10.5 / decares	146.074	291.681	352.742	208.384	93.036	180.963	39.631	6.889	30.225	178.059	144.737
Eastern G10.50/%	0.19	0.29	0.13	0.32	0.64	0.14	0.03	0.01	0.02	0.61	0.39
4	0.000	0.000	14.588	14.588	0.000	0.000	0.000	0.000	0.000	33.755	0.000
7	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	12.659	0.000
24&79	3.388	0.000	3.388	0.000	3.388	0.000	0.000	0.000	0.000	0.000	0.000
25	0.500	0.000	0.500	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000
30	5.030	5.030	5.030	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
31	1.000	0.000	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000

IP	*C. heros*	*O. Cecilia*	*C. Quadripunctata*	*E. catax*	*L. dispar*	*L. Cervus*	*M. funereus*	*R. Alpina*	*C. Cinnaberinus*	*P. Subrugosus*	*E. ankeraria*
32	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
53	1,728	1,728	1,728	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
56	2.400	2.400	0.000	2.400	0.000	0.000	0.000	0.000	0.000	0.000	0.000
71	0.000	0.000	0.000	2.141	0.000	0.000	0.000	0.000	0.000	24.927	0.000
78	No	0.000	No Data	No	0.000	No	No	No	No Data	0.000	0.000
85	0.000	0.000	0.000	6.721	0.000	0.000	0.000	0.000	0.000	0.000	0.000
86	0.000	0.000	0.000	0.000	0.000	0.000	12.328	12.328	4,000	0.000	0.000
100	0.000	0.000	7.500	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cumulative / decares	*160.620*	*300.839*	*386.476*	*234.234*	*96.424*	*182.213*	*51.959*	*19.217*	*34.225*	*249.400*	*145.737*
Cumulative / %	*0.21*	*0.30*	*0.15*	*0.35*	*0.66*	*0.14*	*0.04*	*0.02*	*0.02*	*0.86*	*0.39*

Table 5.2-4в: Cumulative impact on invertebrate habitats (without bats), protected in the PZ.

IP	*C. lupus*	*L. lutra*	*T. karelinii*	*T. graeca*	*T. hermanni*	*E. quatuorlineata*	*E. situla*
Eastern G10.5	217.670	47.789	525.272	399,774	524.312	355.456	262.369
Eastern Option	0.07	0.33	0.14	0.26	0.24	0.25	0.31
4	0.000	0.000	95.962	95.962	95.962	14.588	0.000
7	0.000	0.000	58.719	12.659	12.659	0.000	12.659
24&79	3.388	0.000	3.388	0.000	0.000	0.000	0.000
25	0.000	0.000	0.200	0.000	0.000	0.000	0.000
25	0.000	0.000	0.500	0.500	0.500	0.000	0.000
30	0.000	0.000	5.030	5.030	5.030	5.030	5.030
31	1.000	0.000	0.000	1.000	1.000	1.000	1.000
32	0.000	0.000	0.000	0.500	0.500	0.500	0.500
41	0.000	0.000	0.000	10.400	10.400	0.000	0.000

IP	*C. lupus*	*L. lutra*	*T. karelinii*	*T. graeca*	*T. hermanni*	*E. quatuorlineata*	*E. situla*
53	0.000	1,728	1,728	1,728	1,728	1,728	1,728
56	0.000	0.000	2.400	2.400	2.400	2.400	2.400
57	0.000	0.000	10.864	10.864	10.864	10.864	10.864
58	4.020	0.000	0.000	0.000	0.000	0.000	0.000
59	0.000	0.000	0.000	24.824	24.824	24.824	24.824
69	0.000	0.000	0.300	0.300	0.300	0.000	0.000
71	0.000	0.000	0.000	4.100	4.100	0.000	0.000
78	No Data	No Data	No	No	No Data	No Data	0.000
80	0.000	0.000	3.381	0.000	0.000	0.000	0.000
83	238.471	0.000	0.000	0.000	0.000	0.000	0.000
84	0.000	0.000	1.170	1.170	1.170	1.170	1.170
85	0.000	0.000	0.900	6.721	6.721	0.900	0.000
87	0.000	0.000	1.000	1.000	1.000	0.000	0.000
88	0.000	0.000	1.202	1.502	1.502	1.202	1.202
100	0.000	0.000	0.200	7.500	7.500	0.000	0.000
101	0.000	0.000	0.000	2.173	2.173	2.173	2.173
103	0.000	0.000	3.001	3.001	3.001	3.001	0.000
Cumulative /	*464.549*	*49.517*	*715.217*	*593.108*	*717,646*	*424.836*	*325.919*
Cumulative /%	*0.15*	*0.35*	*0.20*	*0.38*	*0.33*	*0.30*	*0.39*

Table 5.2-4d: Cumulative impact on habitats of bats, subject to conservation in the PZ.

IP	***R. Hipposideros***	***R. Ferrumequinum***	***R. Euryale***	***B. Barbastellus***	***M. Bechsteini***	***M. Myotis***	***M. Blythii***	***M. Emarginatus***	***M. Schreibersi***
Eastern G10.5 / decares	158.599	109,495	87.688	69.542	56.814	433.624	433.624	135.200	266.118
Eastern Option	0.18	0.14	0.14	0.06	0.12	0.14	0.14	0.07	0.21
4	14.588	95.962	0.000	0.000	0.000	0.000	81.374	0.000	95.962

IP	*R. Hipposideros*	*R. Ferrumequinum*	*R. Euryale*	*B. Barbastellus*	*M. Bechsteini*	*M. Myotis*	*M. Blythii*	*M. Emarginatus*	*M. schreibersi*
7	0.000	12.659	0.000	0.000	0.000	0.000	12.659	0.000	58.719
24&79	3.388	3.388	0.000	0.000	0.000	0.000	3.388	0.000	3.388
25	0.000	0.200	0.000	0.000	0.000	0.000	0.200	0.000	0.200
25	0.500	0.000	0.500	0.000	0.000	0.500	0.000	0.500	0.000
30	5.030	5.030	0.000	0.000	0.000	0.000	5.030	0.000	5.030
31	1.000	0.000	1.000	0.000	0.000	1.000	0.000	1.000	0.000
32	0.500	0.000	0.500	0.000	0.000	0.500	0.000	0.500	0.000
53	1,728	0.000	1,728	0.000	0.000	1,728	0.000	1,728	0.000
56	2.400	0.000	2.400	0.000	0.000	2.400	0.000	2.400	0.000
57	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	10.864
62	0.000	21.894	0.000	0.000	0.000	0.000	21.894	0.000	0.000
69	0.000	0.300	0.000	0.000	0.000	0.000	0.300	0.000	0.300
71	0.000	48.700	0.000	0.000	0.000	0.000	48.700	0.000	48.700
78	No Data	0.000	No	No Data	No Data	No	0.000	No Data	0.000
80	0.000	3.381	0.000	0.000	0.000	0.000	3.381	0.000	3.381
84	0.000	1.170	0.000	0.000	0.000	0.000	1.170	0.000	1.170
85	0.000	0.000	0.000	0.000	0.000	0.000	6.721	0.000	0.000
86	0.000	0.000	0.000	12.328	12.328	0.000	0.000	0.000	0.000
87	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	1.000
88	0.000	1.202	0.000	0.000	0.000	0.000	1.202	0.000	1.202
100	0.000	0.000	0.000	0.000	0.000	0.000	7.500	0.000	0.000
101	0.000	2.173	0.000	0.000	0.000	0.000	2.173	0.000	2.173
103	0.000	0.000	0.000	0.000	0.000	0.000	3.001	0.000	0.000
Cumulative / decares	*187.733*	*306.554*	*93.816*	*81.870*	*69.142*	*439.752*	*633.317*	*141.328*	*498.207*
Cumulative /%	*0.21*	*0.40*	*0.15*	*0.08*	*0.14*	*0.14*	*0.20*	*0.07*	*0.39*

As can be seen from Table 5.2-4, greater cumulative impact would be had by the natural habitat 91E0. This is due to the large area, affected by the current IP. With the implementation of appropriate measures (see paragraph 6), the total affected area would be reduced to 3,247 acres, or 0,36% of the habitat area in the area. The impact shall be insignificant. The cummulative impact on all natural habitats and habitats of species, subject to conservation in the PZ would also be insignificant.

None of the 29 IPs, plans, programs or projects/designs would imply significant mortality, barrier effect or disturbance for the species of animals, subject to conservation in the PZ. With the implementation of the relevant measures (see paragraph 6), the IP in this option would not imply significant impacts either. The cumulative impact shall be insignificant.

The Eastern Option G20

Structure

The implementation of the investment proposal in this option would affect The territorial integrity of Kresna-Ilindentsi protected zone on a total area of **1,571.419 decares** , representing **0.32%** of the protected area's territory. Given the small affected area, we could conclude that the implementation of the investment proposal of the G20 Eastern Option **will not have a significant impact on the structure of the zone**.

Functions and conservation objectives

Loss of natural habitats.

The implementation of the investment proposal in this option would affect 7 natural habitats (Table 5.2-6), subject to conservation in the zone. For 3 of them - 5210, 6220 * and 91AA*, the impact has been estimated to be of moderate rate and for 91E0* **- of significant** rate. Due to the large number and size of the affected polygons, it would be impossible to apply mitigation measures for habitats 6220 *, 91AA * and 91E0 *.

Table 5.2-6: Areas of natural habitats, subject to conservation in the zone, falling within the scope of Eastern Option G20.

No.	Code	Area in PZ/Decares	Affected Area / decares	Affected Area /%
1	6210(*)	25,991.80	105,805	0.41
2	6220 *	22069.50	199,417	0.90
3	5210	579.00	7.952	1.37
4	91E0*	899.50	29.348	3.26
5	91AA*	36927.50	468.077	1.27
6	91M0	11616.60	17,774	0.15
7	9560*	11325.90	12.594	0.11

Loss of species habitats

Plants:

The implementation of the investment proposal in this option **would not affect the** localizations of the only plant species, subject to conservation in the zone - *Centaurea immanuelis loewii*.

Invertebrates:

The implementation of the investment proposal in this option would affect habitats of 14 invertebrate species, subject to conservation in the zone. The impact was assessed as moderate of 4 of them (*Eriogaster catax, Lycaena dispar, Erannis ankeraria* and *Probaticus subrugosus*) due to the relatively large area affected. Due to the large number and large size of affected polygons, mitigating measures, such as reduced range in certain sections or other implementable measures would be impossible.

Fish:

The implementation of the investment proposal in this option will affect habitats of two fish species, subject to conservation in the zone *(Rhodeus sericeus amarus* and *Cobitis strumicae)* only during construction. The impact is considered **insignificant**. There would be practically **no impact** during the operation of the highway.

Amphibians and Reptiles:

The implementation of the investment proposal in this option would affect habitats of all amphibian and reptile species, subject to conservation in the zone. The impact has been estimated as **insignificant** for all species, due to the relatively small affected area of both potential and optimal habitats.

Bats:

The implementation of the investment proposal in this option would affect hunting habitats of 8 species of cave-loving bats, subject to conservation in the zone. Also the habitats of the two forest bats, subject to conservation in the zone will be affected *(Barbastella barbastellus* and *Myotis bechsteini)*. The impact has been assessed as **insignificant**, given the small area affected.

Land mammals:

The implementation of this investment proposal would affect habitats of 3 species of mammals, subject to conservation in the zone *(Canis lupus*, *Lutra lutra* and *Vormela peregusna*). The impact on them has been assessed as **insignificant**, given the small area affected.

Barrier effect / Fragmentation

Natural habitats:

The implementation of the investment proposal in this option would fragment 7 of the affected natural habitats subject to conservation in the zone. The impact has been estimated as moderate for two of the habitats - 6220 * and 91AA *. Due to the large number and large size of affected polygons, mitigating measures, such as reduced range in certain sections or other implementable measures would be impossible.

Plants:

The implementation of the investment proposal in this option **would not affect the** localizations of the only plant species, subject to conservation in the zone - *Centaurea immanuelis loewii*.

Invertebrates:

The implementation of the investment proposal in this option would fragment the habitats of 12 invertebrate species, subject to conservation in the zone. The impact on them has been assessed as **insignificant**, given the small area affected. **No** barrier effect **is expected.**

Fish:

The implementation of the investment proposal in this option will temporarily fragment the habitats of two fish species, subject to conservation in the zone *(Rhodeus sericeus amarus* and *Cobitis strumicae)* during construction. The construction would also have a temporary barrier effect for these species. Given the large length and area of the fragments formed and the temporary nature of the impact, we could assume that the impact would be **insignificant** for all three species.

Amphibians and Reptiles:

The implementation of the investment proposal in this option would affect habitats of all amphibian and reptile species, subject to conservation in the zone. In four of them *(Testudo graeca, Testudo hermanni, Elaphe quatuorlineata, Elaphe situla),* the fragmentation would be **of moderate rate.** In addition, these species would also have

interruption of local bio-corridors, with a moderate rate of impact. By applying mitigation measures, the impact can be reduced to insignificant.

Bats:

The implementation of the investment proposal in this option would fragment hunting habitats of 8 species of cave-loving bats and habitats of the two bats (*Barbastella barbastellus* and *Myotis bechsteini*), subject to conservation in the zone. The impact has been estimated as **insignificant** due to the small affected area of the habitats of these species, which would also cause minor changes in their functional characteristics. **No** barrier effect **is expected.**

Land mammals:

The implementation of the investment proposal in this option would fragment habitats of 3 species of mammals subject to conservation in the zone *(Canis lupus, Lutra lutra* and *Vormela peregusna).* The impact has been estimated to be of moderate rate for the marbled polecat *(Vormela peregusna),* because of the relatively large area affected and the sub-optimal nature of the habitats on the other hand. By applying mitigation measures, the impact can be reduced to insignificant. A barrier effect would occur for four species, subject to conservation in the zone (*Canis lupus*, *Ursus arctos*, *Lutra lutra* and *Vormela peregusna*). The impact has been estimated as **insignificant** for all four species.

Destruction of species representatives

Plants:

The implementation of the investment proposal in this option **would not affect the** localizations of the only plant species, subject to conservation in the zone - *Centaurea immanuelis loewii*. Destruction of representatives is not expected.

Invertebrates:

The implementation of the investment proposal in this option may cause mortality of single representatives of 14 bird invertabrate species, subject to conservation in the zone. The impact on the populations of these species in the area has been assessed as **insignificant**.

Fish:

The implementation of the investment proposal in this option could result in mortality of single species of 3 fish species, subject to conservation in the zone (*Aspius aspius, Rhodeus sericeus amarus* and *Cobitis strumicae*). The impact on the populations of these species in the area has been assessed as **insignificant**.

Amphibians and Reptiles:

The implementation of the investment proposal in this option may cause mortality of single representatives of all amphibians and reptiles species, subject to conservation in the zone. In four of them *(Testudo graeca, Testudo hermanni, Elaphe quatuorlineata, Elaphe situla),* the impact on the populations in the area may be **significant,** as the designed road route passes through high-quality habitats. By applying mitigation measures, the impact can be reduced to insignificant.

Bats:

The implementation of the investment proposal in this option may cause mortality of single representatives of 10 bat species, subject to conservation in the zone. The impact on the population of one of these species *(Rhinolophus ferrumequinum)* in the area is estimated to be **of moderate rate.** Mitigation measures are needed.

Land mammals:

The implementation of the investment proposal in this option could result in mortality of representatives of 2 species of mammals, subject to conservation in the zone *(Canis lupus* and *Vormela peregusna).* The impact on the wolf population in the area has been

assessed as **significant,** since the species is vulnerable to collision the vehicles (Huber et al. 2001, Lovari et al. 2007). With mitigation measures, it would be reduced.

Disturbance of species

Invertebrates:

Invertebrates have a primitive nervous system and are insensitive to disturbance. **There would be no** impact to any species.

Fish:

Fish are insensitive to disturbance. **There would be no** impact to any species.

Amphibians and Reptiles:

Amphibians and reptiles are less sensitive to disturbance. Some disturbance for representatives of all species, subject to conservation in the zone may be expected during construction but not during operation. The impact shall be **insignificant**.

Bats:

The implementation of the investment proposal in this option could lead to disturbance in the shelter of one of the species, *Rhinolophus ferrumequinum*, subject to conservation in the zone). The impact has been assessed as **moderate**. Mitigation measures are needed.

Land mammals:

The implementation of the investment proposal in this option may cause disturbance for representatives of 4 species of mammals, subject to conservation in the zone *(Canis lupus, Ursus arctos, Lutra lutra* and *Vormela peregusna)*. The impact on the wolf population in the area has been estimated to be of **moderate** rate, as in the impact area falls a polygon of habitats, suitable for a core area that is likely to become unusable for the species. The impact could not practically be mitigated, due to the highly developed senses of the species.

Pollution of habitats of aquatic species.

Invertebrates:

The implementation of the investment proposal in this option may have an impact on the habitats of four invertebrate invertebrates, subject to conservation in the zone *(Unio crassus, Austropotamobius torrentium* and the larvae of *Cordulegaster heros* and *Ophiogomphus cecilia*). The impact has been estimated as **insignificant** for all four species.

Fish:

The implementation of the investment proposal in this option may have an impact on the habitats of three fish species, subject to conservation in the zone (*Aspius aspius, Rhodeus sericeus amarus* and *Cobitis strumicae*). The impact has been assessed as **insignificant**, given the relatively small area that may be affected.

Disruption of species composition

The implementation of the investment proposal in this option would not lead to a change in the composition of the PZ.

Cumulative effect

From the investment proposals, plans, programs or projects/designs that have been in the procedure to date (November 2016) 29 would have cumulative impacts on the natural habitats or species, subject to conservation in the PZ (see paragraph 2). Having in mind that the IP in this option affects, to a moderate or significant extent, 4 natural habitats and habitats of 4 species, subject to conservation in the PZ, as mitigating measures would be impossible, then

the cumulative impact of this option and all other IPs has been estimated to be significant.

The Long Tunnel Option, 'Kresna' tunnel

Structure

The implementation of the investment proposal in this option would affect the territorial integrity of the Kresna-Ilindentsi protected zone on a total area of **298.789 decares,** which represents **0.06%** of the protected zone. Given the small affected area, we could conclude that the implementation of the investment proposal in the Long Tunnel Option **would not have a significant impact on the structure of the zone.**

Functions and conservation objectives

Loss of natural habitats.

The implementation of the investment proposal in this option would affect 6 types of natural habitats (Table 5.2-7), subject to conservation in the zone, of which 5 are considered insignificant. a moderate rate of impact should be expected on habitat 92C0. By applying mitigation measures, it would be eliminated.

Table 5.2-7: Areas of natural habitats, subject to conservation in the zone falling within the scope of Long Tunnel Option.

No.	Code	Area in PZ/Decares	Affected Area / decares	Affected Area /%
1	6210(*)	25,991.80	9.571	0.04
2	6220*	22069.50	12.724	0.06
3	92A0	433.20	0.814	0.19
4	92C0	785.10	8.543	1.09
5	91AA*	36927.50	40.391	0.11
6	91M0	11616.60	2.758	0.02

Loss of species habitats

Plants:

The implementation of the investment proposal in this option **would not affect the** localizations of the only plant species, subject to conservation in the zone - *Centaurea immanuelis loewii*.

Invertebrates:

The implementation of the investment proposal in this option would affect habitats of 10 invertebrate species, subject to conservation in the zone. The impact on them has been assessed as **insignificant**, given the small area affected.

Fish:

The implementation of the investment proposal in this option would have an impact on the habitats of three fish species, subject to conservation in the zone *(Aspius aspius, Rhodeus sericeus amarus* and *Cobitis strumicae).* During construction, there would be temporary damage with a moderate **rate of impact** of *Aspius aspius* habitats. With mitigation measures, it would be reduced. During operation, the loss would only be due to the pillars of bridge facilities and would be **insignificant** for all three species.

Amphibians and Reptiles:

The implementation of the investment proposal in this option would affect habitats of all amphibian and reptile species, subject to conservation in the zone. The impact has been estimated as **insignificant** for all species, due to the small affected area of both potential and optimal habitats.

Bats:

The implementation of the investment proposal in this option would affect hunting habitats of 8 species of cave-loving bats, subject to conservation in the zone. Also the habitats of the two forest bats, subject to conservation in the zone will be affected *(Barbastella barbastellus* and *Myotis bechsteini)*. The impact has been assessed as **insignificant**, given the small area affected.

Land mammals:

The implementation of the investment proposal in this option would affect habitats of 2 species of mammals, subject to conservation in the zone *(Lutra lutra* and *Vormela peregusna)*. The impact on them has been assessed as **insignificant**, given the small area affected.

Barrier effect / Fragmentation

Natural habitats:

The implementation of the investment proposal in this option would fragment 6 of the affected natural habitats, subject to conservation in the zone. A moderate rate of impact should be expected on habitat 92C0. By applying mitigation measures, it would be eliminated.

Plants:

The implementation of the investment proposal in this option **would not affect the** localizations of the only plant species, subject to conservation in the zone - *Centaurea immanuelis loewii*.

Invertebrates:

The implementation of the investment proposal in this option will fragment the habitats of 9 invertebrate species, subject to conservation in the zone. The impact on them has been assessed as **insignificant**, given the small area affected. **No** barrier effect **is expected**.

Fish:

The implementation of the investment proposal in this option would temporarily fragment the habitats of three fish species, subject to conservation in the zone *(Aspius aspius, Rhodeus sericeus amarus* and *Cobitis strumicae)* during construction. The construction would also have a temporary barrier effect for these species. Given the large length and area of the fragments formed and the temporary nature of the impact, we could assume that the impact would be **insignificant** for all three species.

Amphibians and Reptiles:

The implementation of the investment proposal in this option would not practically have a fragmentation or barrier effect on amphibians and reptiles, subject to conservation in the zone, because the land sections of the planned route would be of small length (less than 200 m). **No** impact would **be expected**.

Bats:

The implementation of the investment proposal in this option would fragment hunting habitats of 8 species of cave-loving bats and habitats of the two bats (*Barbastella barbastellus* and *Myotis bechsteini*), subject to conservation in the zone. The impact has been estimated as **insignificant** due to the small affected area of the habitats of these species, which would also cause minor changes in their functional characteristics. **No** barrier effect **is expected.**

Land mammals:

The implementation of the investment proposal in this option would fragment habitats of 2 species of mammals subject to conservation in the zone (*Lutra lutra* and *Vormela peregusna*). The impact has been estimated to be **insignificant** for the otter, considering

Its temporary nature (only during construction), and for the marbled polecat *(Vormela peregusna)*, given the large area of the fragments formed. A barrier effect would actually only exist for the otter, but it would be temporary during the construction. The impact is considered **insignificant**.

Destruction of species representatives

Plants:

The implementation of the investment proposal in this option **would not affect the** localizations of the only plant species, subject to conservation in the zone - *Centaurea immanuelis loewii*. Destruction of representatives is not expected.

Invertebrates:

The implementation of the investment proposal in this option may cause mortality of single representatives of 10 invertabrate species, subject to conservation in the zone. The impact on the populations of these species in the area has been assessed as **insignificant**.

Fish:

The implementation of the investment proposal in this option could result in mortality of single species of 3 fish species, subject to conservation in the zone (*Aspius aspius, Rhodeus sericeus amarus* and *Cobitis strumicae*). The impact on the populations of these species in the area has been assessed as **insignificant**.

Amphibians and Reptiles:

The implementation of the investment proposal in this option may cause mortality of single representatives of all amphibians and reptiles species, subject to conservation in the zone. In two of them *(Elaphe quatuorlineata, Elaphe situla)*, the impact on the populations in the area has been estimated to be of moderate rate, as it affects a relatively large area of optimal habitats. With mitigation measures, it would be reduced.

Bats:

The implementation of the investment proposal in this option may cause mortality of single representatives of 10 bat species, subject to conservation in the zone. The impact on the populations of these species in the zone has been assessed as **insignificant**.

Land mammals:

The implementation of the investment proposal in this option may cause mortality of single representatives of a mammal species, subject to conservation in the zone - *Vormela peregusna*. The impact on the species population in the area is estimated to be **insignificant,** as it affects peripheral parts of polygons with sub-optimal habitats where the presence of the species is unlikely.

Disturbance of species

Invertebrates:

Invertebrates have a primitive nervous system and are insensitive to disturbance. **There would be no** impact to any species.

Fish:

Fish are insensitive to disturbance. **There would be no** impact to any species.

Amphibians and Reptiles:

Amphibians and reptiles are less sensitive to disturbance. Some disturbance for representatives of all species, subject to conservation in the zone may be expected during construction but not during operation. The impact shall be **insignificant**.

Bats:

The implementation of the investment proposal in this option **would not cause** disturbance for representatives of bat species, subject to conservation in the zone due to the sufficient remoteness of the route from their shelters.

Land mammals:

The implementation of the investment proposal in this option may cause **insignificant disturbance** for representatives from 4 species of mammals, subject to conservation in the zone (*Canis lupus, Ursus arctos, Lutra lutra* and *Vormela peregusna*).

Pollution of habitats of aquatic species.

Invertebrates:

The implementation of the investment proposal in this option may have an impact on the habitats of 3 invertebrate invertebrates, subject to conservation in the zone *(Unio crassus, Austropotamobius torrentium* and the larvae of *Cordulegaster heros* and *Ophiogomphus cecilia*). The impact has been estimated as **insignificant** for all three species.

Fish:

The implementation of the investment proposal in this option may have an impact on the habitats of three fish species, subject to conservation in the zone (*Aspius aspius, Rhodeus sericeus amarus* and *Cobitis strumicae*). The impact has been estimated as **insignificant** for all three species.

Disruption of species composition

The implementation of the investment proposal in this option would not lead to a change in the composition of the PZ.

Cumulative effect

From the investment proposals, plans, programs or projects/designs that have been in the procedure to date (November 2016) 29 would have cumulative impacts on the natural habitats or species, subject to conservation in the PZ (see paragraph 2). Their impact on natural habitats and habitats of species is presented in Table 5.2-8.

Table 5.2-8a: Cumulative impact on natural habitats, subject to conservation in the PZ.

IP	**6210**	**6220***	**91AA***
Tunnel / decares	9.571	12.724	40.391
Tunnel /%	0.04	0.06	0.11
4	32.373	33.755	0.000
25	0.500	0.000	0.000
31	0.000	0.000	1.000
55	0.000	0.400	0.000
58	1.960	0.000	0.000
59	No	No	0.000
62	0.000	21.894	0.000
71	0.000	24.927	0.000
Cumulative /	44.404	93.700	41,391
Cumulative /%	0.17	0.42	0.11

Table 5.2-8b: Cumulative impact on invertebrate habitats, protected in the PZ.

IP	***C. Heros***	***O. Cecilia***	***C. Quadripunctata***	***E. Catax***	***L. dispar***	***L. Cervus***	***M. funereus***	***E. ankeraria***
Tunnel / decares	103.729	274.199	144.196	167.724	114.082	33.714	6.186	40.391
Tunnel /%	0.13	0.28	0.05	0.25	0.78	0.03	0.01	0.11
4	0.000	0.000	14.588	14.588	0.000	0.000	0.000	0.000
24&79	3.388	0.000	3.388	0.000	3.388	0.000	0.000	0.000
25	0.500	0.000	0.500	0.000	0.000	0.250	0.000	0.000
30	5.030	5.030	5.030	0.000	0.000	0.000	0.000	0.000
31	1.000	0.000	1.000	0.000	0.000	1.000	0.000	1.000
32	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.000
53	1,728	1,728	1,728	0.000	0.000	0.000	0.000	0.000

IP	*C. Heros*	*O. Cecilia*	*C. Quadripunctata*	*E. Catax*	*L. dispar*	*L. Cervus*	*M. funereus*	*E. ankeraria*
56	2.400	2.400	0.000	2.400	0.000	0.000	0.000	0.000
71	0.000	0.000	0.000	2.141	0.000	0.000	0.000	0.000
78	No	0.000	No Data	No	0.000	No	No	0.000
85	0.000	0.000	0.000	6.721	0.000	0.000	0.000	0.000
86	0.000	0.000	0.000	0.000	0.000	0.000	12.328	0.000
100	0.000	0.000	7.500	0.000	0.000	0.000	0.000	0.000
Cumulative /	*118.275*	*283.357*	*177.930*	*193.574*	*117.470*	*34.964*	*18.514*	*41,391*
Cumulative /%	*0.15*	*0.29*	*0.07*	*0.29*	*0.80*	*0.03*	*0.02*	*0.11*

Table 5.2-8c: Cumulative impact on invertebrate habitats (without bats), protected in the PZ.

IP	*L. Lutra*	*T. Karelinii*	*T. Graeca*	*T. Hermanni*	*E. Quatuorlineata*	*E. Situla*
Tunnel / decares	42.093	297,794	298.766	298.789	287,938	298.788
Tunnel /%	0.29	0.08	0.19	0.14	0.21	0.35
4	0.000	95.962	95.962	95.962	14.588	0.000
7	0.000	58.719	12.659	12.659	0.000	12.659
24&79	0.000	3.388	0.000	0.000	0.000	0.000
25	0.000	0.200	0.000	0.000	0.000	0.000
25	0.000	0.500	0.500	0.500	0.000	0.000
30	0.000	5.030	5.030	5.030	5.030	5.030
31	0.000	0.000	1.000	1.000	1.000	1.000
32	0.000	0.000	0.500	0.500	0.500	0.500
41	0.000	0.000	10.400	10.400	0.000	0.000
53	1,728	1,728	1,728	1,728	1,728	1,728
56	0.000	2.400	2.400	2.400	2.400	2.400

IP	***L. Lutra***	***T. Karelinii***	***T. Graeca***	***T. Hermanni***	***E. Quatuorlineata***	***E. situla***
57	0.000	10.864	10.864	10.864	10.864	10.864
59	0.000	0.000	24.824	24.824	24.824	24.824
69	0.000	0.300	0.300	0.300	0.000	0.000
71	0.000	0.000	4.100	4.100	0.000	0.000
78	No	No	No	No Data	No Data	0.000
80	0.000	3.381	0.000	0.000	0.000	0.000
84	0.000	1.170	1.170	1.170	1.170	1.170
85	0.000	0.900	6.721	6.721	0.900	0.000
87	0.000	1.000	1.000	1.000	0.000	0.000
88	0.000	1.202	1.502	1.502	1.202	1.202
100	0.000	0.200	7.500	7.500	0.000	0.000
101	0.000	0.000	2.173	2.173	2.173	2.173
103	0.000	3.001	3.001	3.001	3.001	0.000
Cumulative /	*43.821*	*487,739*	*492.100*	*492.123*	*357.318*	*362.338*
Cumulative /%	*0.31*	*0.13*	*0.32*	*0.22*	*0.26*	*0.43*

Table 5.2-8d: Cumulative impact on habitats of bats, subject to conservation in the PZ.

IP	***R. Hipposideros***	***R. Ferrumequinum***	***R. Euryale***	***B. Barbastellus***	***M. Bechsteini***	***M. Myotis***	***M. Blythii***	***M. Emarginatus***	***M. Schreibersi***
Tunnel / decares	56.647	46.073	34.94	61.242	33.299	244,999	244,999	69.146	121.154
Tunnel /%	0.06	0.06	0.05	0.06	0.07	0.08	0.08	0.04	0.09
4	14.588	95.962	0.000	0.000	0.000	0.000	81.374	0.000	95.962
7	0.000	12.659	0.000	0.000	0.000	0.000	12.659	0.000	58.719
24&79	3.388	3.388	0.000	0.000	0.000	0.000	3.388	0.000	3.388
25	0.000	0.200	0.000	0.000	0.000	0.000	0.200	0.000	0.200

IP	***R. Hipposideros***	***R. Ferrumequinum***	***R. Euryale***	***B. Barbastellus***	***M. Bechsteini***	***M. Myotis***	***M. Blythii***	***M. Emarginatus***	***M. schreibersi***
25	0.500	0.000	0.500	0.000	0.000	0.500	0.000	0.500	0.000
30	5.030	5.030	0.000	0.000	0.000	0.000	5.030	0.000	5.030
31	1.000	0.000	1.000	0.000	0.000	1.000	0.000	1.000	0.000
32	0.500	0.000	0.500	0.000	0.000	0.500	0.000	0.500	0.000
53	1,728	0.000	1,728	0.000	0.000	1,728	0.000	1,728	0.000
56	2.400	0.000	2.400	0.000	0.000	2.400	0.000	2.400	0.000
57	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	10.864
62	0.000	21.894	0.000	0.000	0.000	0.000	21.894	0.000	0.000
69	0.000	0.300	0.000	0.000	0.000	0.000	0.300	0.000	0.300
71	0.000	48.700	0.000	0.000	0.000	0.000	48.700	0.000	48.700
78	No Data	0.000	No Data	No Data	No Data	No Data	0.000	No Data	0.000
80	0.000	3.381	0.000	0.000	0.000	0.000	3.381	0.000	3.381
84	0.000	1.170	0.000	0.000	0.000	0.000	1.170	0.000	1.170
85	0.000	0.000	0.000	0.000	0.000	0.000	6.721	0.000	0.000
86	0.000	0.000	0.000	12.328	12.328	0.000	0.000	0.000	0.000
87	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	1.000
88	0.000	1.202	0.000	0.000	0.000	0.000	1.202	0.000	1.202
100	0.000	0.000	0.000	0.000	0.000	0.000	7.500	0.000	0.000
101	0.000	2.173	0.000	0.000	0.000	0.000	2.173	0.000	2.173
103	0.000	0.000	0.000	0.000	0.000	0.000	3.001	0.000	0.000
Cumulative / decares	*85.781*	*243.132*	*41.068*	*73.570*	*45.627*	*251.127*	*444,692*	*75.274*	*353.243*
Cumulative /%	*0.10*	*0.31*	*0.06*	*0.07*	*0.09*	*0.08*	*0.14*	*0.04*	*0.27*

As demonstrated by Table 5.2-8 below, the cumulative impact on all natural habitats and habitats of species, subject to conservation in the PZ would be insignificant.

None of the 29 IPs, plans, programs or projects/designs would imply significant mortality, barrier effect or disturbance for the species of animals, subject to conservation in the PZ. With the implementation of the relevant measures (see paragraph 6), the IP in this option would not imply significant impacts either. The cumulative impact shall be insignificant.

- **BG 0002003 - Kresna Protected Zone**

Option G20 - Red

Structure

The implementation of the investment proposal in this option would affect the territorial integrity of the Kresna-Ilindentsi protected zone on a total area of **648.123 decares,** which represents **0.28%** of the protected zone. Given the small affected area, we could conclude that the implementation of the investment proposal in the G20 Red Option **would not have a significant impact on the structure of the zone.**

Functions and conservation objectives

Loss of species habitats

The implementation of the investment proposal in this option would affect breeding and / or trophical habitats of 49 bird species, subject to conservation in the zone. The impact on them has been assessed as **insignificant**, given the small area affected.

Barrier effect / Fragmentation

The implementation of the investment proposal in this option would fragment breeding and / or trophical habitats of the 48 bird species, subject to conservation in the zone. The impact has been assessed as **insignificant**, given the small area affected. **No** barrier effect **is expected.**

Destruction of species representatives

The implementation of the investment proposal in this option might cause mortality of species representatives of 32 bird species, subject to conservation in the zone. The impact on populations in the area of 9 of these species - *Accipiter brevipes, Accipiter nisus, Actitis hypoleucos, Bubo bubo, Alcedo atthis, Coracias garrulus, Dryocopus martius, Picus canus* and *Calandrella brachydactyla*, has been estimated as **significant**. To mitigate the impact, measures need to be implemented.

Disturbance of species

The implementation of the investment proposal in this option may cause **insignificant** disturbance of representatives of 47 bird species, subject to conservation in the zone.

Disruption of species composition

No disruption of species is expected.

Cumulative effect

From the investment proposals, plans, programs or projects/designs that have been in the procedure to date (November 2016) 22 would have cumulative impacts on the bird species, subject to conservation in the PZ (see paragraph 2). Considering that the IP in this option affects, to a moderate or significant extent, two natural habitats and habitats of 5 species, subject to

conservation in the Kresna-Ilindentsi PZ, as mitigating measures would be impossible, the cumulative effect has been defined as significant.

Option G20 - Blue

Structure

The implementation of the investment proposal in this option would affect the territorial integrity of the Kresna protected zone on a total area of **611.946** decares, which represents **0.26%** of the protected zone. Given the small affected area, we could conclude that the implementation of the investment proposal in the G20 Blue Option **would not have a significant impact on the structure of the zone.**

Functions and conservation objectives

Loss of species habitats

The implementation of the investment proposal in this option would affect breeding and / or trophical habitats of 49 bird species, subject to conservation in the zone. The impact on them has been assessed as **insignificant**, given the small area affected.

Barrier effect / Fragmentation

The implementation of the investment proposal in this option would fragment breeding and / or trophical habitats of the 48 bird species, subject to conservation in the zone. The impact has been assessed as **insignificant**, given the small area affected. **No** barrier effect **is expected.**

Destruction of species representatives

The implementation of the investment proposal in this option might cause mortality of species representatives of 32 bird species, subject to conservation in the zone. The impact on populations in the area of 9 of these species - *Accipiter brevipes, Accipiter nisus, Actitis hypoleucos, Bubo bubo, Alcedo atthis, Coracias garrulus, Dryocopus martius, Picus canus* and *Calandrella brachydactyla*, has been estimated as **significant**. To mitigate the impact, measures need to be implemented.

Disturbance of species

The implementation of the investment proposal in this option may cause **insignificant** disturbance of representatives of 47 bird species, subject to conservation in the zone.

Disruption of species composition

No disruption of species is expected.

Cumulative effect

From the investment proposals, plans, programs or projects/designs that have been in the procedure to date (November 2016) 22 would have cumulative impacts on the bird species, subject to conservation in the PZ (see paragraph 2). Considering that the IP in this option affects, to a moderate or significant extent, two natural habitats and habitats of 5 species protected in the Kresna-Ilindentsi Protected Zone, as mitigating measures would be impossible, the cumulative impact has been defined as significant.

Eastern Option G10.50

Structure

The implementation of the investment proposal in this option would affect
The territorial integrity of Kresna Protected Area on a total area of **519.015 decares** (excluding the area of the right roadway that would be on the existing road), representing
0.22% of the territory of the protected zone. Given the small affected area, we could conclude that the implementation of the investment proposal in the G10.50 Eastern Option **would not have a significant impact on the structure of the zone.**

Functions and conservation objectives

Loss of species habitats

The implementation of the investment proposal in this option would affect breeding and / or trophical habitats of 49 bird species, subject to conservation in the zone. The impact on them has been assessed as **insignificant**, given the small area affected.

Barrier effect / Fragmentation

The implementation of the investment proposal in this option would fragment breeding and / or trophical habitats of the 48 bird species, subject to conservation in the zone. The impact has been assessed as **insignificant**, given the small area affected. **No** barrier effect **is expected.**

Destruction of species representatives

The implementation of the investment proposal in this option may cause mortality of species representatives of 40 bird species, subject to conservation in the zone. The impact on the populations in the area of 16 of these species - *Ciconia nigra, Aquila pomarina, Circaetus gallicus, Hieraaetus pennatus, Pernis apivorus, Accipiter brevipes, Accipiter nisus, Falco subbuteo, Burhinus oedicnemus, Actitis hypoleucos, Bubo bubo, Alcedo atthis, Coracias garrulus, Dryocopus martius, Picus canus* and *Calandrella brachydactyla* has been assessed as **significant**. To mitigate the impact, measures need to be implemented.

Disturbance of species

The implementation of the investment proposal in this option may cause disturbance to species representatives of 47 bird species, subject to conservation in the zone. For 9 of these species - *Ciconia nigra, Aquila pomarina, Circaetus gallicus, Hieraaetus pennatus, Pernis apivorus, Accipiter brevipes, Accipiter nisus, Falco subbuteo* and *Burhinus oedicnemus,* the impact has been estimated as **significant**. To mitigate the impact, measures need to be implemented.

Disruption of species composition

No disruption of species is expected.

Cumulative effect

From the investment proposals, plans, programs or projects/designs that have been in the procedure to date (November 2016) 22 would have impacts on the bird species, subject to conservation in the PZ, also affected by the present investment proposal (see paragraph 2). Their impact on habitats of bird species is presented in Table 5.2-9.

Table 5.2-9: Cumulative impact on habitats of birds, subject to conservation in the PZ.

IP	Eastern G10.5 / decares	Eastern G10.50/%	4	7	13	25	30	31	32	41	48	50&51	52	53
Caprimulgus europaeus	243.539	0.19	5.639	0.000	0.000	0.000	0.000	1.000	0.000	10.400	0.000	0.000	0.000	0.000
Ardea cinerea	3.099	0.13	0.000	0.000	3.699	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ciconia ciconia	136.509	0.28	28.383	101.356	354.251	0.200	0.000	0.000	0.000	131.106	9.598	13.058	10.036	0.000
Ciconia nigra	140.817	0.27	28.383	101.356	3.699	0.000	0.000	0.000	0.000	131.106	9.598	13.058	10.036	0.000
Aquila chrysaetos	201.341	0.19	34.022	13.775	0.000	0.000	0.000	0.000	0.000	141.506	0.000	0.000	0.000	0.000
Aquila heliaca	117.821	0.56	28.383	13.775	0.000	0.000	0.000	0.000	0.000	131.106	0.000	0.000	0.000	0.000
Aquila pomarina	137.718	0.28	28.383	101.356	0.000	0.000	0.000	0.000	0.000	131.106	9.598	13.058	10.036	0.000
Circaetus gallicus	221.238	0.16	34.022	101.356	354.251	0.200	0.000	0.000	0.000	141.506	9.598	13.058	10.036	0.000
Hieraaetus pennatus	458.323	0.21	34.022	101.356	354.251	0.200	5.030	1.000	0.000	141.506	9.598	13.058	10.036	1,728
Milvus milvus	221.238	0.16	34.022	101.356	354.251	0.200	0.000	0.000	0.000	141.506	9.598	13.058	10.036	0.000
Buteo buteo	257.139	0.18	34.022	101.356	358.352	0.200	0.000	0.000	0.000	141.506	9.598	13.058	10.036	0.000
Buteo rufinus	201.341	0.19	34.022	13.775	0.000	0.200	0.000	0.000	0.000	141.506	0.000	0.000	0.000	0.000
Pernis apivorus	221.238	0.16	34.022	101.356	354.251	0.200	0.000	0.000	0.000	141.506	9.598	13.058	10.036	0.000
Accipiter brevipes	221.238	0.16	34.022	101.356	354.251	0.200	0.000	0.000	0.000	141.506	9.598	13.058	10.036	0.000
Accipiter nisus	494.224	0.22	34.022	101.356	358.352	0.200	5.030	1.000	0.500	141.506	9.598	13.058	10.036	1,728
Falco biarmicus	201.341	0.19	34.022	13.775	0.000	0.200	0.000	0.000	0.000	141.506	0.000	0.000	0.000	0.000
Falco cherrug	117.821	0.56	28.383	13.775	0.000	0.200	0.000	0.000	0.000	131.106	0.000	0.000	0.000	0.000
Falco eleonorae	201.341	0.18	34.022	13.775	0.000	0.200	0.000	0.000	0.000	141.506	0.000	0.000	0.000	0.000
Falco peregrinus	257.139	0.18	34.022	101.356	358.352	0.200	0.000	0.000	0.000	141.506	9.598	13.058	10.036	0.000
Falco subbuteo	257.139	0.18	34.022	101.356	358.352	0.200	0.000	0.000	0.000	141.506	9.598	13.058	10.036	0.000
Falco tinnunculus	257.139	0.18	34.022	101.356	358.352	0.200	0.000	0.000	0.000	141.506	9.598	13.058	10.036	0.000
Falco vespertinus	165.105	0.31	28.383	101.356	354.251	0.200	0.000	0.000	0.000	131.106	9.598	13.058	10.036	0.000
Crex crex	248.625	0.18	7.520	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Gallinula chloropus	3.099	0.13	0.000	0.000	3.699	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Bubo bubo	494.224	0.22	34.022	101.356	0.000	0.200	5.030	1.000	0.000	141.506	9.598	0.000	10.036	1,728

IP	**Eastern G10.5 /**	**Eastern G10.50/%**	**4**	**7**	**13**	**25**	**30**	**31**	**32**	**41**	**48**	**50&51**	**52**	**53**
Anas platyrhynchos	3.099	0.13	0.000	0.000	3.699	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Burhinus oedicnemus	117.821	0.56	28.383	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Actitis hypoleucos	3.099	0.13	0.000	0.000	3.699	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Charadrius dubius	3.099	0.13	0.000	0.000	3.699	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Alcedo atthis	1.817	0.08	0.000	0.000	3.699	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Coracias garrulus	137.718	0.28	28.383	101.356	354.251	0.200	0.000	0.000	0.000	131.106	9.598	13.058	10.036	0.000
Dendrocopos syriacus	262,693	0.39	0.000	0.000	2.247	0.000	0.000	1.000	0.500	0.000	0.000	0.000	0.000	0.000
Calandrella brachydactyla	137.718	0.28	28.383	101.356	354.251	0.200	0.000	0.000	0.000	131.106	9.598	0.000	10.036	0.000
Lullula arborea	243.539	0.19	5.639	0.000	0.000	0.000	5.030	0.000	0.000	10.400	0.000	0.000	0.000	0.000
Melanocorypha calandra	137.718	0.28	28.383	101.356	354.251	0.200	0.000	0.000	0.000	131.106	9.598	13.058	10.036	0.000
Anthus campestris	137.718	0.28	28.383	101.356	0.000	0.200	0.000	0.000	0.000	131.106	9.598	0.000	10.036	0.000
Sylvia nisoria	119.421	0.12	5.639	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Hippolais olivetorum	201.341	0.19	34.022	13.775	0.000	0.000	0.000	0.000	0.000	10.400	0.000	0.000	0.000	0.000
Lanius collurio	274.233	0.18	34.022	101.356	360.488	0.200	0.000	0.000	0.500	141.506	9.598	13.058	10.036	0.000
Lanius minor	274.233	0.18	34.022	101.356	360.488	0.200	0.000	0.000	0.000	141.506	9.598	13.058	10.036	0.000
Lanius nubicus	243.539	0.19	5.639	0.000	0.000	0.000	0.000	0.000	0.000	10.400	0.000	0.000	0.000	0.000
Emberiza hortulana	274.233	0.18	34.022	101.356	360.488	0.200	0.000	0.000	0.000	141.506	9.598	13.058	10.036	0.000

IP	**56**	**57**	**62**	**64**	**69**	**80**	**84**	**87**	**101**	**103**	**108**	***Cumulative /***	***Cumulative /%***
Caprimulgus europaeus	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	*260.578*	*0.20*
Ardea cinerea	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	*6.798*	*0.29*
Ciconia ciconia	0.000	15.349	37.100	6.240	1.497	3.381	2.498	1.000	0.000	3.001	0.000	*854.563*	*1.73*
Ciconia nigra	0.000	15.349	37.100	6.240	0.000	0.000	0.000	0.000	0.000	3.001	0.000	*499,743*	*0.97*
Aquila chrysaetos	0.000	0.000	37.100	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	*427,744*	*0.40*
Aquila heliaca	0.000	0.000	37.100	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	*328.185*	*1.55*
Aquila pomarina	0.000	15.349	37.100	6.240	0.000	0.000	0.000	0.000	0.000	0.000	0.000	*489,944*	*0.99*

IP	56	57	62	64	69	80	84	87	101	103	108	*Cumulative /*	*Cumulative /%*
Circaetus gallicus	0.000	15.349	37.100	6.240	0.000	0.000	0.000	0.000	0.000	3.001	0.000	*946,955*	*0.69*
Hieraaetus pennatus	0.000	15.349	37.100	6.240	0.000	0.000	0.000	0.000	0.000	3.001	0.000	*1,191.798*	*0.55*
Milvus milvus	0.000	15.349	37.100	6.240	0.000	0.000	0.000	0.000	0.000	0.000	0.000	*943,954*	*0.69*
Buteo buteo	0.000	15.349	37.100	6.240	1.497	3.381	2.498	1.000	5.000	3.001	0.000	*1000.333*	*0.69*
Buteo rufinus	0.000	0.000	37.100	0.000	0.000	3.381	0.000	0.000	0.000	0.000	0.000	*431.325*	*0.40*
Pernis apivorus	0.000	15.349	37.100	6.240	0.000	0.000	0.000	0.000	0.000	3.001	0.000	*946,955*	*0.69*
Accipiter brevipes	0.000	15.349	37.100	6.240	0.000	0.000	0.000	0.000	0.000	3.001	0.000	*946,955*	*0.69*
Accipiter nisus	2.400	15.349	37.100	6.240	0.300	3.381	2.498	1.000	5.000	3.001	0.000	*1,246.879*	*0.55*
Falco biarmicus	0.000	0.000	37.100	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	*427,944*	*0.40*
Falco cherrug	0.000	0.000	37.100	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	*328.385*	*1.55*
Falco eleonorae	0.000	0.000	37.100	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	*427,944*	*0.39*
Falco peregrinus	0.000	15.349	37.100	6.240	0.000	3.381	0.000	0.000	0.000	0.000	0.000	*987.337*	*0.67*
Falco subbuteo	0.000	15.349	37.100	6.240	1.497	3.381	0.000	1.000	0.000	3.001	0.000	*992.835*	*0.68*
Falco tinnunculus	0.000	15.349	37.100	6.240	1.497	3.381	2.498	1.000	5.000	0.000	0.000	*997.332*	*0.68*
Falco vespertinus	0.000	15.349	37.100	6.240	0.000	0.000	0.000	0.000	0.000	0.000	0.000	*871,782*	*1.61*
Crex crex	0.000	15.349	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.001	0.000	*274,495*	*0.19*
Gallinula chloropus	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	*6.798*	*0.29*
Bubo bubo	0.000	15.349	37.100	0.000	0.000	3.381	0.000	0.000	0.000	3.001	0.000	*857.531*	*0.38*
Anas platyrhynchos	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	*6.798*	*0.29*
Burhinus oedicnemus	0.000	0.000	37.100	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	*183.304*	*0.87*
Actitis hypoleucos	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	*6.798*	*0.29*
Charadrius dubius	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	*6.798*	*0.29*
Alcedo atthis	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	*5.516*	*0.23*
Coracias garrulus	0.000	15.349	37.100	6.240	0.000	3.381	2.498	1.000	0.000	0.000	0.000	*851.274*	*1.73*
Dendrocopos syriacus	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	*266.440*	*0.39*
Calandrella brachydactyla	0.000	0.000	37.100	0.000	0.000	3.381	2.498	1.000	0.000	0.000	0.000	*816.627*	*1.66*
Lullula arborea	2.400	15.349	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	*282.357*	*0.21*

IP	**56**	**57**	**62**	**64**	**69**	**80**	**84**	**87**	**101**	**103**	**108**	***Cumulative /***	***Cumulative /%***
Melanocorypha calandra	0.000	0.000	37.100	6.240	0.000	3.381	2.498	1.000	0.000	0.000	0.000	*835,925*	*1.69*
Anthus campestris	0.000	0.000	37.100	0.000	0.000	3.381	0.000	0.000	0.000	0.000	0.000	*458.878*	*0.93*
Sylvia nisoria	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	*125.060*	*0.13*
Hippolais olivetorum	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	*259.538*	*0.24*
Lanius collurio	2.400	15.349	37.100	6.240	0.300	3.381	2.498	1.000	5.000	3.001	1.500	*1,022.766*	*0.68*
Lanius minor	0.000	15.349	37.100	6.240	0.000	3.381	2.498	1.000	5.000	0.000	1.500	*1,016.565*	*0.68*
Lanius nubicus	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	*259.578*	*0.20*
Emberiza hortulana	2.400	15.349	37.100	6.240	0.300	3.381	2.498	1.000	5.000	3.001	1.500	*1022.266*	*0.68*

As demonstrated by Table 5.2-9, a greater cumulative impact would be experienced on the habitats of *Ciconia ciconia, Aquila heliaca, Falco cherrug, Falco vespertinus, Coracias garrulus, Calandrella brachydactyla* and *Melanocorypha calandra* . It is due to the large area, affected by open habitats - grassy places and agricultural lands, which are mainly used as trophical habitats, yet with the European roller *(Coracias garrulus)* and the two larks - also as nesting habitats. According to the existing legislation, investment proposals that have not been implemented within 5 years of their approval (construction started or issued building permit) lose their approval. In this particular case, large part of the IPs under consideration present such investment proposals. Therefore, we could conclude that the cumulative impact on the habitats of all bird species, subject to conservation in the PZ would be insignificant.

Only one of the 22 IPs, plans, programs or projects/designs implies more significant mortality or disturbance for the bird species, subject to conservation in the Protected Zone - Lot 3.3 of the Struma River. However, by applying the relevant measures for the two lots, the cumulative effect would be insignificant.

The Eastern Option G20

Structure

The implementation of the investment proposal in this option would affect the territorial integrity of the Kresna protected zone on a total area of **1,396.834** decares, which represents **0.59%** of the protected zone. Given the small affected area, we could conclude that the implementation of the investment proposal in the G20 Eastern Option **will not have a significant impact on the structure of the zone**.

Functions and conservation objectives

Loss of species habitats

The implementation of the investment proposal in this option would affect breeding and / or trophical habitats of 47 bird species, subject to conservation in the zone. The impact on 5 of them has been estimated to be of **moderate rate**, due to the relatively large affected area of nesting and trophical habitats of *Burhinus oedicnemus*, of the nesting habitats of *Ciconia nigra* and *Accipiter brevipes*, and of the trophical habitats of *Aquila heliaca* and *Falco cherrug*. Due to the large number of affected habitats of these species, mitigation measures would be impossible.

Barrier effect / Fragmentation

The implementation of the investment proposal in this option would fragment breeding and / or trophical habitats of the 46 bird species, subject to conservation in the zone. The impact on them has been assessed as **insignificant**, given the small area affected. **No** barrier effect **is expected.**

Destruction of species representatives

The implementation of the investment proposal under this option may cause mortality of species representatives of 38 bird species, subject to conservation in the zone. The impact on the populations in the area of 14 of these species - *Ciconia nigra, Aquila pomarina, Circaetus gallicus, Hieraaetus pennatus, Pernis apivorus, Accipiter brevipes, Accipiter nisus, Falco subbuteo, Burhinus oedicnemus, Actitis hypoleucos, Bubo bubo, Coracias garrulus, Dryocopus martius Calandrella brachydactyla*, has been assessed as **significant**. To mitigate the impact, measures need to be implemented.

Disturbance of species

The implementation of the investment proposal in this option may cause disturbance of representatives of 45 bird species, subject to conservation in the zone. For 9 of these species - *Ciconia nigra, Aquila pomarina, Circaetus gallicus, Hieraaetus pennatus, Pernis apivorus, Accipiter brevipes, Accipiter nisus, Falco subbuteo* and *Burhinus oedicnemus*, the impact has been assessed as **significant**. To mitigate the impact, measures need to be implemented. For two species - *Aquila heliaca* and *Falco cherrug the* impact has been estimated as moderate. Due to the large number of affected habitats of these species, mitigation measures would be impossible.

Disruption of species composition

No disruption of species is expected.

Cumulative effect

From the investment proposals, plans, programs or projects/designs that have been in the procedure to date (November 2016) 22 would have cumulative impacts on the bird species, subject to conservation in the PZ (see paragraph 2). Considering that the IP in this option affects moderately habitats of 5 bird species, subject to conservation in the PZ, as mitigating measures would be impossible, the cumulative effect has been defined as significant.

The Long Tunnel Option, 'Kresna' tunnel

Structure

The implementation of the investment proposal in this option would affect the territorial integrity of the Kresna protected zone on a total area of **276.842** decares, which represents **0.12%** of the protected zone. Given the small affected area, we could conclude that the implementation of the investment proposal in the Long Tunnel Option **would not have a significant impact on the structure of the zone.**

Functions and conservation objectives

Loss of species habitats

The implementation of the investment proposal in this option would affect breeding and / or trophical habitats of 49 bird species, subject to conservation in the zone. The impact on them has been assessed as **insignificant**, given the small area affected.

Barrier effect / Fragmentation

The implementation of the investment proposal in this option would fragment breeding and / or trophical habitats of the 48 bird species, subject to conservation in the zone. The impact has been assessed as **insignificant**, given the small area affected. **No** barrier effect **is expected.**

Destruction of species representatives

The implementation of the investment proposal under this option may cause mortality of species representatives of 34 bird species, subject to conservation in the zone. The impact on populations in the area of 11 of these species - *Accipiter brevipes, Accipiter nisus, Actitis hypoleucos, Bubo bubo, Alcedo atthis, Coracias garrulus, Dryocopus martius, Picus canus* and *Calandrella brachydactyla*, has been estimated as **significant**. To mitigate the impact, measures need to be implemented.

Disturbance of species

The implementation of the investment proposal in this option may cause disturbance to species representatives of 47 bird species, subject to conservation in the zone. For 4 of these species - *Accipiter brevipes, Accipiter nisus, Falco subbuteo* and *Burhinus oedicnemus, the* impact has been assessed as **significant**. To mitigate the impact, measures need to be implemented.

Disruption of species composition

No disruption of species is expected.

Cumulative effect

From the investment proposals, plans, programs or projects/designs that have been in the procedure to date (November 2016) 22 would have impacts on the bird species, subject to conservation in the PZ, also affected by the present investment proposal (see paragraph 2). Their impact on habitats of bird species is presented in Table 5.2-10.

Table 5.2-10: Cumulative impact on habitats of birds, subject to conservation in the PZ.

IP	Tunnel / decares	Tunnel /%	4	7	13	25	30	31	32	41	48	50&51	52	53
Caprimulgus europaeus	36.525	0.03	5.639	0.000	0.000	0.000	0.000	1.000	0.000	10.400	0.000	0.000	0.000	0.000
Ardea cinerea	21.000	0.89	0.000	0.000	3.699	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ciconia ciconia	190.240	0.39	28.383	101.356	354.251	0.200	0.000	0.000	0.000	131.106	9.598	13.058	10.036	0.000
Ciconia nigra	216.757	0.42	28.383	101.356	3.699	0.000	0.000	0.000	0.000	131.106	9.598	13.058	10.036	0.000
Aquila chrysaetos	175.237	0.16	34.022	13.775	0.000	0.000	0.000	0.000	0.000	141.506	0.000	0.000	0.000	0.000
Aquila heliaca	150.921	0.71	28.383	13.775	0.000	0.000	0.000	0.000	0.000	131.106	0.000	0.000	0.000	0.000
Aquila pomarina	195.757	0.40	28.383	101.356	0.000	0.000	0.000	0.000	0.000	131.106	9.598	13.058	10.036	0.000
Circaetus gallicus	214.556	0.16	34.022	101.356	354.251	0.200	0.000	0.000	0.000	141.506	9.598	13.058	10.036	0.000
Hieraaetus pennatus	232.282	0.11	34.022	101.356	354.251	0.200	5.030	1.000	0.000	141.506	9.598	13.058	10.036	1,728
Milvus milvus	214.556	0.16	34.022	101.356	354.251	0.200	0.000	0.000	0.000	141.506	9.598	13.058	10.036	0.000
Buteo buteo	227.087	0.16	34.022	101.356	358.352	0.200	0.000	0.000	0.000	141.506	9.598	13.058	10.036	0.000
Buteo rufinus	175.237	0.16	34.022	13.775	0.000	0.200	0.000	0.000	0.000	141.506	0.000	0.000	0.000	0.000
Pernis apivorus	214.556	0.16	34.022	101.356	354.251	0.200	0.000	0.000	0.000	141.506	9.598	13.058	10.036	0.000
Accipiter brevipes	214.556	0.16	34.022	101.356	354.251	0.200	0.000	0.000	0.000	141.506	9.598	13.058	10.036	0.000
Accipiter nisus	244.813	0.11	34.022	101.356	358.352	0.200	5.030	1.000	0.500	141.506	9.598	13.058	10.036	1,728
Falco biarmicus	175.237	0.16	34.022	13.775	0.000	0.200	0.000	0.000	0.000	141.506	0.000	0.000	0.000	0.000
Falco cherrug	156.438	0.74	28.383	13.775	0.000	0.200	0.000	0.000	0.000	131.106	0.000	0.000	0.000	0.000
Falco eleonorae	175.237	0.16	34.022	13.775	0.000	0.200	0.000	0.000	0.000	141.506	0.000	0.000	0.000	0.000
Falco peregrinus	227.087	0.15	34.022	101.356	358.352	0.200	0.000	0.000	0.000	141.506	9.598	13.058	10.036	0.000
Falco subbuteo	227.087	0.16	34.022	101.356	358.352	0.200	0.000	0.000	0.000	141.506	9.598	13.058	10.036	0.000
Falco tinnunculus	227.087	0.16	34.022	101.356	358.352	0.200	0.000	0.000	0.000	141.506	9.598	13.058	10.036	0.000
Falco vespertinus	195.757	0.36	28.383	101.356	354.251	0.200	0.000	0.000	0.000	131.106	9.598	13.058	10.036	0.000
Crex crex	214.556	0.15	7.520	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Gallinula chloropus	21.000	0.89	0.000	0.000	3.699	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Bubo bubo	244.813	0.11	34.022	101.356	0.000	0.200	5.030	1.000	0.000	141.506	9.598	0.000	10.036	1,728
Anas platyrhynchos	21.000	0.89	0.000	0.000	3.699	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

IP	Tunnel / decare	Tunnel /%	**4**	**7**	**13**	**25**	**30**	**31**	**32**	**41**	**48**	**50 & 51**	**52**	**53**
Burhinus oedicnemus	156.438	0.74	28.383	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Actitis hypoleucos	21.000	0.89	0.000	0.000	3.699	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Charadrius dubius	21.000	0.89	0.000	0.000	3.699	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Alcedo atthis	21.000	0.89	0.000	0.000	3.699	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Coracias garrulus	195.757	0.40	28.383	101.356	354.251	0.200	0.000	0.000	0.000	131.106	9.598	13.058	10.036	0.000
Dendrocopos medius	17.726	0.04	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Dendrocopos syriacus	40.203	0.06	0.000	0.000	2.247	0.000	0.000	1.000	0.500	0.000	0.000	0.000	0.000	0.000
Dryocopus martius	17.726	0.03	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Picus canus	17.726	0.04	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Calandrella brachydactyla	195.757	0.40	28.383	101.356	354.251	0.200	0.000	0.000	0.000	131.106	9.598	0.000	10.036	0.000
Lullula arborea	36.525	0.03	5.639	0.000	0.000	0.000	5.030	0.000	0.000	10.400	0.000	0.000	0.000	0.000
Melanocorypha calandra	195.757	0.40	28.383	101.356	354.251	0.200	0.000	0.000	0.000	131.106	9.598	13.058	10.036	0.000
Riparia riparia	21.000	0.89	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Anthus campestris	195.757	0.40	28.383	101.356	0.000	0.200	0.000	0.000	0.000	131.106	9.598	0.000	10.036	0.000
Sylvia nisoria	31.330	0.03	5.639	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Hippolais olivetorum	175.237	0.16	34.022	13.775	0.000	0.000	0.000	0.000	0.000	10.400	0.000	0.000	0.000	0.000
Ficedula semitorquata	17.726	0.04	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Lanius collurio	237.033	0.16	34.022	101.356	360.488	0.200	0.000	0.000	0.500	141.506	9.598	13.058	10.036	0.000
Lanius minor	237.033	0.16	34.022	101.356	360.488	0.200	0.000	0.000	0.000	141.506	9.598	13.058	10.036	0.000
Lanius nubicus	36.525	0.03	5.639	0.000	0.000	0.000	0.000	0.000	0.000	10.400	0.000	0.000	0.000	0.000
Emberiza hortulana	237.033	0.16	34.022	101.356	360.488	0.200	0.000	0.000	0.000	141.506	9.598	13.058	10.036	0.000

IP	**56**	**57**	**64**	**69**	**80**	**84**	**87**	**101**	**103**	**108**	***Cumulative /***	***Cumulative /%***
Caprimulgus europaeus	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	*53.564*	*0.04*
Ardea cinerea	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	*24.699*	*1.05*
Ciconia ciconia	0.000	15.349	6.240	1.497	3.381	2.498	1.000	0.000	3.001	0.000	*871.194*	*1.77*
Ciconia nigra	0.000	15.349	6.240	0.000	0.000	0.000	0.000	0.000	3.001	0.000	*538.583*	*1.04*

IP	**56**	**57**	**64**	**69**	**80**	**84**	**87**	**101**	**103**	**108**	***Cumulative /***	***Cumulative /%***
Aquila chrysaetos	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	*364.540*	*0.34*
Aquila heliaca	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	*324.185*	*1.53*
Aquila pomarina	0.000	15.349	6.240	0.000	0.000	0.000	0.000	0.000	0.000	0.000	*510,883*	*1.04*
Circaetus gallicus	0.000	15.349	6.240	0.000	0.000	0.000	0.000	0.000	3.001	0.000	*903.173*	*0.66*
Hieraaetus pennatus	0.000	15.349	6.240	0.000	0.000	0.000	0.000	0.000	3.001	0.000	*928.657*	*0.42*
Milvus milvus	0.000	15.349	6.240	0.000	0.000	0.000	0.000	0.000	0.000	0.000	*900.172*	*0.66*
Buteo buteo	0.000	15.349	6.240	1.497	3.381	2.498	1.000	5.000	3.001	0.000	*933.181*	*0.64*
Buteo rufinus	0.000	0.000	0.000	0.000	3.381	0.000	0.000	0.000	0.000	0.000	*368.121*	*0.34*
Pernis apivorus	0.000	15.349	6.240	0.000	0.000	0.000	0.000	0.000	3.001	0.000	*903.173*	*0.66*
Accipiter brevipes	0.000	15.349	6.240	0.000	0.000	0.000	0.000	0.000	3.001	0.000	*903.173*	*0.66*
Accipiter nisus	2.400	15.349	6.240	0.300	3.381	2.498	1.000	5.000	3.001	0.000	*960.368*	*0.42*
Falco biarmicus	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	*364.740*	*0.34*
Falco cherrug	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	*329.902*	*1.56*
Falco eleonorae	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	*364.740*	*0.33*
Falco peregrinus	0.000	15.349	6.240	0.000	3.381	0.000	0.000	0.000	0.000	0.000	*920.185*	*0.63*
Falco subbuteo	0.000	15.349	6.240	1.497	3.381	0.000	1.000	0.000	3.001	0.000	*925,683*	*0.64*
Falco tinnunculus	0.000	15.349	6.240	1.497	3.381	2.498	1.000	5.000	0.000	0.000	*930.180*	*0.64*
Falco vespertinus	0.000	15.349	6.240	0.000	0.000	0.000	0.000	0.000	0.000	0.000	*865.334*	*1.60*
Crex crex	0.000	15.349	0.000	0.000	0.000	0.000	0.000	0.000	3.001	0.000	*240.426*	*0.17*
Gallinula chloropus	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	*24.699*	*1.05*
Bubo bubo	0.000	15.349	0.000	0.000	3.381	0.000	0.000	0.000	3.001	0.000	*571.020*	*0.25*
Anas platyrhynchos	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	*24.699*	*1.05*
Burhinus oedicnemus	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	*184.821*	*0.87*
Actitis hypoleucos	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	*24.699*	*1.05*
Charadrius dubius	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	*24.699*	*1.05*
Alcedo atthis	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	*24.699*	*1.05*
Coracias garrulus	0.000	15.349	6.240	0.000	3.381	2.498	1.000	0.000	0.000	0.000	*872.213*	*1.77*

IP	**56**	**57**	**64**	**69**	**80**	**84**	**87**	**101**	**103**	**108**	***Cumulative /***	***Cumulative /%***
Dendrocopos medius	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	*17.726*	*0.04*
Dendrocopos syriacus	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	*43.950*	*0.06*
Dryocopus martius	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	*17.726*	*0.03*
Picus canus	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	*17.726*	*0.04*
Calandrella brachydactyla	0.000	0.000	0.000	0.000	3.381	2.498	1.000	0.000	0.000	0.000	*837,566*	*1.70*
Lullula arborea	2.400	15.349	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	*75.343*	*0.06*
Melanocorypha calandra	0.000	0.000	6.240	0.000	3.381	2.498	1.000	0.000	0.000	0.000	*856.864*	*1.74*
Riparia riparia	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	*21.000*	*0.89*
Anthus campestris	0.000	0.000	0.000	0.000	3.381	0.000	0.000	0.000	0.000	0.000	*479.817*	*0.97*
Sylvia nisoria	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	*36.969*	*0.04*
Hippolais olivetorum	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	*233.434*	*0.22*
Ficedula semitorquata	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	*17.726*	*0.04*
Lanius collurio	2.400	15.349	6.240	0.300	3.381	2.498	1.000	5.000	3.001	1.500	*948.466*	*0.63*
Lanius minor	0.000	15.349	6.240	0.000	3.381	2.498	1.000	5.000	0.000	1.500	*942.265*	*0.63*
Lanius nubicus	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	*52.564*	*0.04*
Emberiza hortulana	2.400	15.349	6.240	0.300	3.381	2.498	1.000	5.000	3.001	1.500	*947,966*	*0.63*

As demonstrated by Table 5.2-10, a greater cumulative impact would be expected on the habitats of *Ardea cinerea, Ciconia ciconia, Ciconia nigra, Aquila heliaca, Aquila pomarina, Falco cherrug, Falco vespertinus, Gallinula chloropus, Anas platyrhynchos, Actitis hypoleucos, Charadrius Dubius, Alcedo atthis, Coracias garrulus, Calandrella brachydactyla,* and *Melanocorypha calandra*. It is due to the large affected area of 'aquatic' habitats - for the species *Ardea cinerea, Ciconia nigra, Gallinula chloropus, Anas platyrhynchos, Actitis hypoleucos, Charadrius dubius* and *Alcedo atthis*, open habitats - grass lands and agricultural lands, which are mainly used as trophical habitats, yet with the European roller (Coracias garrulus) and the two larks - also as nesting habitats. Under the existing legislation, IPs that have not been implemented by
5 years of their approval (construction started or building permit issued) lose their approval. In this particular case, large part of the IPs under consideration present such investment proposals. Taking into account the direct loss in 'aquatic' habitats, the whole body of water falling within the range (the bridge of the Struma River, after the southern portal). However, the impact on this area would be temporary, during construction. The permanently affected area (from the pillars of bridge facilites) would be about 20 times smaller. Therefore, we could conclude that the cumulative impact on the habitats of all bird species, subject to conservation in the PZ would be insignificant.

Only one of the 22 IPs, plans, programs or projects/designs implies more significant mortality or disturbance for the bird species, subject to conservation in the Protected Zone - Lot 3.3 of the Struma River. However, by applying the relevant measures for the two lots, the cumulative effect would be insignificant.

6. Proposals for mitigation measures designed to prevent, reduce and possibly eliminate the adverse impacts of implementing the investment proposal on protected areas and to determine their extent of impact on the subject of protection of protected areas, resulting from the application of proposed mitigation measures.

'Mitigating measures' present an integral part of project specifications and have the objective of minimizing or even eliminating negative impacts during or after implementation. They include: deadlines and timetable for implementation (e.g. no activities should be carried out during the breeding period of certain species); The type of activities and the methods to be carried out (e.g. nest nets, barriers or walkways to be installed at specified distances); access to certain places on the site should be restricted (e.g. winter sleeping places of some animal species). Mitigation measures differ from recovery / compensation measures.

Compensatory measures are independent of the project and are designed to compensate for identified negative impacts of the IP, so as to maintain the overall environmental coherence of the Natura 2000 network.

As demonstrated by the analysis in paragraph 5 - Options G20 - Red, G20 - Blue and Eastern Option G20 are incompatible with the objectives and subject of conservation of the PZ, the proposed measures are only for the Eastern option G10.50 and the Long tunnel option, tunnel 'Kresna'.

Eastern Option G10.50

1. When developing the project for rehabilitation of the existing road E79 (right roadway of the Eastern option G10.50) to design and implement the proposed defragmentation and partitioning devices for the smooth crossing and prevention of the exit of the roadway by amphibians and reptiles (according to Appendix 8). During operation, these equipment and facilities must be maintained in proper operational order. The location and design of the proposed mitigation measures were determined by the experts. The graphical appendix No.8 was prepared by a road engineer, according to the requirements of the experts. The measures are in line with the optimal habitats of the amphibians and reptiles, subject to conservation in the Kresna-Ilindentsi PZ, with their highest concentration, with the observations of mortality from the existing traffic (Karaivanov 2015) and with the technical possibilities. The measures proposed are feasible, agreed with and approved by the Contracting Authority.

In the next design phase, if necessary, deviations would be allowed up to 30 m from the proposed location of the passage facility.

Phase: Design.

Effect / Residual Impact: Mitigation of the impact of fragmentation and barrier effect for amphibians and reptiles, including those that are subject to conservation in Kresna-Ilindentsi Protected Zone. The location and size of the planned facilities, combined with the existing bridges and tunnels, would provide a connection between the parts of the populations of the species concerned, subject to conservation in the Kresna-Ilindentsi Protected Zone. Prevention of the risk of collision of amphibious and reptiles with motor vehicles, including those in the Protected Zone Kresna-

Ilindentsi. The foreseen barrier devices would prevent amphibians and reptiles from going into the roadway.

2. The range of the road route from km 384 + 300 to km 384 + 470 and from km 389 + 130 to km
389 + 280 (left roadway) to be reduced to the boundaries of the overall dimensions.

Phase: Design.

Effect / Residual Impact: Reduction of the affected area of habitat 91E0* to 2.997 decares, or 0.33% of the area of the habitat in the PZ
"Kresna-Ilindentsi"; Reducing the impact of direct destruction and fragmentation of the habitat to insignificant.

3. No construction sites and roads in areas of natural habitats beyond already assessed areas should be constructed.

Phase: Construction.

Effect / Residual Impact: There is no guarantee for the absence of direct destruction of natural habitats, subject to conservation in the Kresna-Ilindentsi PZ, in the areas outside the already assessed ones.

4. Installation of fire-fighting equipment at the tunnel portals.

Phase: Operation of the Motorway.

Effect / Residual Impact: Possibility to limit the impact on natural habitats and habitats of species, subject to conservation in the PZ
'Kresna-Ilindentsi' and 'Kresna', in case of fire.

5. Reclamation and landscaping can only be carried out with native species.

Phase: Construction.

Effect / Residual Impact: Prevention of invasion of non-native species in the natural habitats, subject to conservation in the Kresna-Ilindentsi Protected Zone.

6. During the construction of bridge facilities, the flow of rivers should be prevented from increasing turbidity (suspended materials concentration) by installing the so-called turbidity curtains or appropriate building technologies.

Phase: Construction.

Effect / Residual Impact: Mitigation of the risk of mortality and pollution and the damaged area of potential habitats of water invertebrates and fish, including those that are subject to conservation in Kresna-Ilindentsi Protected Zone;

7. Bridges are provided with a system for collecting the surface run-off and its discharge for purification in sludge and oil precipitators/sludge thickeners.

Phase: Design.

Effect / Residual Impact: Prevention of river pollution and conservation of the natural characteristics of habitats of aquatic invertebrates and fish, including those that are subject to conservation in Kresna-Ilindentsi Protected Zone; minimization of the impact of pollution in habitats of fish species that are subject to conservation in Kresna-Ilindentsi Protected Zone.

8. No disposal of inert materials/aggregate building materials should be allowed in river beds, washing of transport and construction equipment in rivers.

Phase: Construction.

Effect / Residual Impact: Prevention of river pollution and conservation of the natural characteristics of habitats of aquatic invertebrates and fish, including those that are subject to conservation in Kresna-Ilindentsi Protected Zone; minimization of the impact of pollution in habitats of fish species that are subject to conservation in Kresna-Ilindentsi Protected Zone.

9. Maintenance of the condition of drainage systems and treatment facilities along the route

Phase: Operation of the Motorway.

Effect / Residual Impact: Prevention of river pollution and conservation of the natural characteristics of habitats of aquatic invertebrates and fish, including those that are subject to conservation in Kresna-Ilindentsi Protected Zone; mitigation of the impact of pollution in habitats of fish species that are subject to conservation in Kresna-Ilindentsi Protected Zone.

10. The construction of the bridge facilities should take place outside the fish breeding period from 15 April to 10 June.

Phase: Construction.

Effect / Residual Impact: Reducing impacts on fish species, including the species, subject to conservation in the Kresna-Ilindentsi Protected Zone, including the loss of fish roe, mortality of larvae and young representatives of species.

11. Maintenance of good technical condition of construction and transport equipment and prevention of leakage of petroleum products / grease and lubrication materials.

Phase: Construction.

Effect / Residual Impact: Prevention of river pollution and conservation of the natural characteristics of habitats of aquatic invertebrates and fish, including those that are subject to conservation in Kresna-Ilindentsi Protected Zone; mitigation of the impact of pollution in habitats of fish species that are subject to conservation in Kresna-Ilindentsi Protected Zone.

12. Monitoring of the populations of the two species of tortoises and two species of snakes that are subject to protection in the zone, in the area of the right roadway (existing road). The monitoring should start in the spring of 2018 and would continue for at least 5 years after commissioning of the right roadway. Its design should allow tracing of the population trends of the target species and the degree of isolation (or lack thereof) of the subpopulations west and east of the right roadway and should also allow for the assessment of the actual effectiveness of the intended defragmentation and partitioning facilities. The effectiveness of the mitigation measures to be applied should be assessed on an annual basis (within the monitoring period) after the second year of the commissioning of the right roadway.

Phase: Before, during construction and duing traffic/operation of the highway.

Effect / Residual Impact: Possibility to assess the actual effectiveness of envisaged defragmentation and barrier devices along theroadwat. If proven to be ineffective, corrective actions, including alternative solutions to be undertaken.

13. Design and construction of temporary thick fences* around the range of the route from km 396+600 to km 399+100 (left roadway) and around the range of Kresna bypass (right roadway), as well as subsequent organization of actions for collection and moving of animals that remained in fenced areas.

Specifications of fences: Continuous, smooth, vertical surface, 120 cm in height above ground, and underground part of 20 cm (buried). It may be made of plates (plexiglass, sheet iron, etc.), concrete elements or fine net (with openings no smaller than 0.5/0.5 cm). No joints, creases, supports, etc. between different elements. The fence should be so located that the openings of all drain pipes remain outside in relation to the roadway.

Method of carrying out the actions for moving animals: Walking around the entire area falling within the fencing and collection of the largest possible number of the noticed amphibias and reptiles. Releasing the collected animals, as soon as possible on the territory, located from 0.5 to 1.5 km west of km 397+000. That activity should be carried out at least three times in May in the year of starting the construction, as well as in the month, preceding the start of construction (unless it is in winter) and it should involve as many experts as possible. In any case, the activity should be planned and supervised by a skilled herpetologist.

Phase: Before construction.

Effect / Residual Impact: Mitigation of the risk of destroying species representatives of amphibians and reptiles to the possible minimum rate, including those, subject to conservation in the Kresna-Ilindentsi PZ during construction.

14. Design and construction of thick fences on both sides of the motorway in the following sections: From km 382 + 192 to km 382 + 466; From km 383 + 520 to km 384 + 770; From km 386 + 050 to km 386 + 770; From km 387 + 100 to km 387 + 220; From km 389 + 000 to km 390 + 900; From km 391 + 200 to km 391 + 580; From km 391 + 840 to km 392 + 610; From km 392 + 830 to km 393 + 250; From km 393 + 450 to km 393 + 850; From km 393 + 940 to km 394 + 360; From km 396 + 670 to km 398 + 140; From km 398 + 230 to km 399 + 050 (left roadway); Around the reach of the Kresna crossing (right roadway).

Specifications of fences: Continuous, smooth, vertical surface, 120 cm in height above ground, and underground part of 20 cm (buried). It may be made of plates (plexiglass, sheet iron, etc.), concrete elements or fine net (with openings no smaller than 0.5/0.5 cm). No joints, creases, supports, etc. between different elements. The fence should be so located that the openings of all drain pipes remain outside in relation to the roadway.

Phase: Design.

Effect / Residual Impact: Mitigation of the risk of destroying species representatives of amphibians and reptiles to the possible minimum rate, including those, subject to conservation in the Kresna-Ilindentsi PZ during the operation of Lot 3.2; Reducing the impact of mortality on the populations of tortoises and snakes, subject to conservation in the Kresna-Ilindentsi Protected Zone to insignificant (combined with measures 1 and 13).

15. Design and installation of additional culverts and drains beneath the roadway (if there is no design facility, capable of defragmentation), positioned as follows (+/- 25 m): Km 383 + 750; Km 384 + 200; Km 384 + 450; Km 384 + 650; Km 386 + 200; Km 386 + 300; Km 386 + 400; Km 386 + 500; Km 386 + 650; Km 389 + 150; Km 389 + 300; Km 389 + 400; Km 389 + 500; Km 389 + 600; 389 + 700;

Km 389 + 800; Km 389 + 900; Km 390 + 050; Km 390 + 150; Km 390 + 250; Km 390 + 450; Km 390 + 550; Km 390 + 650; Km 390 + 750; Km 390 + 900; Km 391 + 500; Km 392 + 050; Km 392 + 150; Km 392 + 250; Km 392 + 350; Km 392 + 450; Km 392 + 550; Km 392 + 950; Km 393 + 050; Km 393 + 150; Km 393 + 550; Km 393 + 650; Km 393 + 750; Km 394 + 050; Km 394 + 150; Km 396 + 850; Km 396 + 950; Km 397 + 050; Km 397 + 150; Km 397 + 250; 397 + 350; Km 397 + 450; Km 397 + 550; 397 + 650; Km 397 + 750; Km 397 + 850; Km 397 + 950; Km 398 + 050; Km 398 + 350; Km 398 + 450; Km 398 + 550; Km 398 + 650; 398 + 900 (left roadway); Km 393 + 800; Km 395 + 050; Km 395 + 200; Km 395 + 400; Km 395 + 550; Km 397 + 100 (bypass of Kresna).

Specifications of drain pipes: Rectangular (min. 150/150 cm) or tubular (diameter of at least 100 cm), without vertical shafts (if required, at least one of the wall of each shaft should be with a gradient of no more than 45 grades).

Phase: Design.

Effect / Residual Impact: Reducing the negative impact of Lot operation 3.2. in terms of fragmentation and disruption of bio-corridors of species representatives of amphibians and reptiles to the possible minimum rate, including those, subject to conservation in the Kresna-Ilindentsi PZ; Reducing the impact of fragmentation and disruption of bio-corridors of tortoises and snakes, subject to conservation in the Kresna-Ilindentsi Protected Zone, to insignificant level (combined with measure 1).

33. 16. No illuminated billboards should be installed along the roadside within the boundaries of the PZ.

Phase: Operation of the Motorway.

Effect / Residual Impact: Prevention of insect build-up in illuminated sections near the road and reducing the risk of collisions with vehicles of hunting bats, including the species, subject to conservation in the Kresna-Ilindentsi Protected Zone.

17. Any roadside lighting equipment should be installed at a height of at least 10 meters from the road surface, and at a distance of at least 5 meters from the last right/emergency lane.

Phase: Design.

Effect / Residual Impact: Prevention of clustering of insects in illuminated sections near the road and reducing the risk of collisions with vehicles of hunting bats, including the species, subject to conservation in the Kresna-Ilindentsi Protected Zone.

18. Installation of a 2 m high noise barrier from km 398 + 590 to 399 + 170, on the left in the direction of the increasing km, in the left roadway.

Phase: Design.

Effect / Residual Impact: Eliminating of disturbance in the shelter of *Rhinolophus ferrumequinum*.

19. All bridge facilities (including such on the right roadway) shall be fitted with 3 m high protection fences on both sides. When using transparent or translucent materials (e.g. net), they shall be provided with silhouettes of raptors to avoid collisions with the birds.

Phase: Design.

Effect / Residual Impact: Reducing the risk of collision with passing vehicles of bats and birds, including the species, subject to conservation in the Kresna-Ilindentsi PZ and Kresna PZ.

20. Construction in the individual sections to begin outside the breeding period of the birds (1 May - 15 August for species that are expected to be significantly affected by disturbance and / or destruction of egg nests / young birds). The construction may only commence during that period if, in the days immediately prior to it, an ornithological monitoring has proven the absence of nesting within a perimeter of 300 m from the construction site boundaries. The methodology of monitoring and the monitoring itself should be developed and carried out by an expert ornithologist /expert ornithologists. The methodology must be approved by the competent authority in advance.

Phase: Construction.

Effect / Residual Impact: Prevention of significant annoyance and / or destruction of egg nests for *Ciconia nigra, Aquila pomarina, Circaetus gallicus, Hieraaetus pennatus, Pernis apivorus, Accipiter brevipes, Accipiter nisus, Falco subbuteo, Burhinus oedicnemus, Actitis hypoleucos, Bubo bubo, Alcedo Atthis, Coracias garrulus, Dryocopus martius, Picus canus* and *Calandrella brachydactyla*. Reduce impacts to insignificant.

21. The security fence of the left roadway from km 386 + 020 to km 387 + 225 and from km 389 + 000 to km 398 + 000, on both sides (outside the tunnels and viaducts) to be at least 2.4 m high.

Phase: Design.

Effect / Residual Impact: Reducing the risk of vehicle collisions with the wolf and reducing the impact on its population in Kresna-Ilindentsi PZ to insignificant.

The Long Tunnel Option, 'Kresna' tunnel

1. Northwest border of the landfill at the southern portal of the Kresna Tunnel to be relocated 50 m inwards, so as not to affect the gully from the northwest, respectively a polygon of habitat 92C0.

Phase: Design.

Effect / Residual Impact: Elimination of the impact of direct destruction and fragmentation of 92C0 habitat, subject of conservation in the PZ "Kresna-Ilindentsi".

2. No construction sites and roads in areas of natural habitats beyond already assessed areas should be constructed.

Phase: Construction.

Effect / Residual Impact: There is no guarantee for the absence of direct destruction of natural habitats, subject to conservation in the Kresna-Ilindentsi PZ, in the areas outside the already assessed ones.

3. Installation of fire-fighting equipment at the tunnel portals.

Phase: Operation of the Motorway.

Effect / Residual Impact: Possibility to limit the impact on natural habitats and habitats of species, subject to conservation in the PZ 'Kresna-Ilindentsi' and 'Kresna', in case of fire.

4. Reclamation and landscaping can only be carried out with native species.

Phase: Construction.

Effect / Residual Impact: Prevention of invasion of non-native species in the natural habitats, subject to conservation in the Kresna-Ilindentsi Protected Zone.

5. During the construction of bridge facilities, the flow of rivers should be prevented from increasing turbidity (suspended materials concentration) by installing the so-called turbidity curtains or appropriate building technologies.

Phase: Construction.

Effect / Residual Impact: Mitigation of the risk of mortality and pollution and the damaged area of potential habitats of fish species and aquatic invertebrates, including those that are subject to conservation in the Kresna-Ilindentsi Protected Zone; mitigation of the impact from damage to habitats of fish species, subject to conservation in the Kresna-Ilindentsi Protected Zone to insignificant level.

6. Bridges are provided with a system for collecting the surface run-off and its discharge for purification in sludge and oil precipitators/sludge thickeners.

Phase: Design.

Effect / Residual Impact: Prevention of pollution of rivers and preservation of the natural characteristics of habitats of aquatic invertebrates and fish, including the species, subject to conservation in the Kresna-Ilindentsi Protected Zone.

7. No disposal of inert materials/aggregate building materials should be allowed in river beds, washing of transport and construction equipment in rivers.

Phase: Construction.

Effect / Residual Impact: Prevention of pollution of rivers and preservation of the natural characteristics of habitats of aquatic invertebrates and fish, including the species, subject to conservation in the Kresna-Ilindentsi Protected Zone.

8. Maintenance of the condition of drainage systems and treatment facilities along the route

Phase: Operation of the Motorway.

Effect / Residual Impact: Prevention of pollution of rivers and preservation of the natural characteristics of habitats of aquatic invertebrates and fish, including the species, subject to conservation in the Kresna-Ilindentsi Protected Zone.

9. The construction of the bridge facilities should take place outside the fish breeding period from 15 April to 10 June.

Phase: Construction.

Effect / Residual Impact: Reducing impacts on fish species, including the species, subject to conservation in the Kresna-Ilindentsi Protected Zone, including the loss of fish roe, mortality of larvae and young representatives of species.

10. Maintenance of good technical condition of construction and transport equipment and prevention of leakage of petroleum products / grease and lubrication materials.

Phase: Construction.

Effect / Residual Impact: Prevention of pollution of rivers and preservation of the natural characteristics of habitats of aquatic invertebrates and fish, including the species, subject to conservation in the Kresna-Ilindentsi Protected Zone.

11. Design and construction of temporary solid fences around each site, landfill and access road, as well as the subsequent organization of actions to collect and move the animals, left in the fenced areas. In the sections before the northern and southern tunnel portal, on either side of the motorway (within the protected zone), the fence must remain in operation with unchanged features.

Specifications of fences: Continuous, smooth, vertical surface, 120 cm in height above ground, and underground part of 20 cm (buried). It may be made of plates (plexiglass, sheet iron, etc.), concrete elements or fine net (with openings no smaller than 0.5/0.5 cm). No joints, creases, supports, etc. between different elements. The fence should be so located that the openings of all drain pipes remain outside in relation to the roadway.

Method of carrying out the actions for moving animals: Walking around the entire area, falling within the fencing and gathering of the largest possible number of the noticed amphibias and reptiles. Release of the collected animals as quickly as possible, at a distance up to
0.5 km of the respective, already fenced sites, landfills, etc. That activity should be carried out at least three times in May in the year of starting the construction, as well as in the month, preceding the start of construction (unless it is in winter) and it should involve as many experts as possible. In any case, the activity should be planned, implemented and supervised by a skilled herpetologist.

Phase: Before, during construction and during the operation of the highway.

Effect / Residual Impact: Mitigation of the risk of destroying species representatives of amphibians and reptiles to the possible minimum rate, including those, subject to conservation in the Kresna-Ilindentsi PZ during the construction and the operation of Lot 3.2; Reducing the impact of mortality on the populations of snake species, subject to conservation in the Kresna-Ilindentsi Protected Zone to insignificant.

12. No illuminated billboards should be installed along the roadside within the
PZ.

Phase: Operation of the Motorway.

Effect / Residual Impact: Prevention of insect build-up in
illuminated sections near the road and reducing the risk of collisions with vehicles of hunting bats, including the species, subject to conservation in the Kresna-Ilindentsi Protected Zone.

13. Any roadside lighting equipment should be installed at a height of at least 10 meters from the road surface, and at a distance of at least 5 meters from the last right/emergency lane.

Phase: Design.

Effect / Residual Impact: Prevention of clustering of insects in illuminated sections near the road and reducing the risk of collisions with vehicles of hunting bats, including the species, subject to conservation in the Kresna-Ilindentsi Protected Zone.

14. Two-sided securing of bridge facilities on the Struma River with 3 m high protection fences on both sides. When using transparent or translucent materials (e.g. net), they shall be provided with silhouettes of raptors to avoid collisions with the birds.

Phase: Design and building.

Effect / Residual Impact: Reducing the risk of collision with passing vehicles of bats and birds, including the species, subject to conservation in the Kresna-Ilindentsi PZ and Kresna PZ.

15. Construction in the individual sections to begin outside the breeding period of the birds (1 May - 15 August for species that are expected to be significantly affected by disturbance and / or destruction of egg nests / young birds). The construction may only commence during that period if, in the days immediately prior to it, an ornithological monitoring has proven the absence of nesting within a perimeter of 300 m from the construction site boundaries. The methodology of monitoring and the monitoring itself should be developed and carried out by an expert ornithologist /expert ornithologists. The methodology must be approved by the competent authority in advance.

Phase: Construction.

Effect / Residual Impact: Prevention of significant disturbance and / or destruction of egg nests for the species *Accipiter brevipes, Accipiter nisus, Falco subbuteo, Burhinus oedicnemus, Actitis hypoleucos, Bubo bubo, Alcedo atthis, Coracias garrulus, Dryocopus martius, Picus canus* and *Calandrella brachydactyla* .

7. Examined alternative solutions and assessment of their impact on protected areas, including the "Zero" alternative

7.1. Development of the investment proposal

The design and construction of Struma Motorway is a process that has lasted for more than 25 years.

Numerous studies have been carried out with respect to the design of the motorway 'Struma' motor highway:

- Feasibility study, prepared by the 'Patproect' Company (1990);
- Pre- design survey by the company SPEA (2000/2002);
- Options/Alternatives, prepared by the Company 'Krasi-Bo' (2002);
- Simultaneously with the work done by SPEA, the Bulgarian design company carries out preliminary surveys;
- Surveys, prepared by NSI-2000 (2007/2008);
- EIA Decision (2008).

On the grounds of the recommendations, given in the EIA report and the relevant assessment studies of 2007, the EIA Decision No 1-1 / 2008 gives approval of an option for the whole length of the Struma motorway, which is a combination of several, already explored options for the road route, the combination being based mainly on the brown option, developed by 'Krassi-Bo' Company. The EIA Decision 1-1 / 2008 also includes numerous recommendations for improving the route in the next stages of study and design.

The consideration of the Options, proposed for implementation of the road route of Lot 3.2 was started in 2013 by the National Company of Strategic Infrastructure Projects. In 2016, due to its restructuring, the National Company Strategic Infrastructure Projects (NCSIP) was closed as an organization and the project implementation activities, including the EIAs that were not completed were taken over by the Road Infrastructure Agency. The procedure has been described in chronological order.

National Company Strategic Infrastructure Projects has developing terms of reference for the development of a design for Struma Motorway, Lot 3.2 that satisfies to the maximum possible extent the requirements of EIA Decision No.1-1/2008.

In its majority, Lot 3.2 passes through the Kresna Gorge – an area that is exceptionally sensitive in environmental respect. The conditions are further aggravated by the complex physico-geographic features (landslides and collapses, narrow gorge, etc.), a fault zone with a complex geological structure and high seismic risk in tectonic terms.

All these conditions predetermine respectively high construction and operation risk and require a number of restrictions and conditions in the design of the road route.

The decision to develop a long tunnel, taken in 2008 (EIA Decision No 1-1 / 2008 of MoEW), is based on very limited environmental and technical data. At that time only the environmental consequences of the operation of the tunnel were taken into account, without taking into account those from its excavation, as well as the maintenance of the complex engineering equipment.

In the course of the progress of the long-tunnel design, commissioned by the NCSIP in the Kresna Gorge in 2013-2015, there are a number of challenges that complicate project implementation, as well as the operation of the site in the future related to:

- The requirement for large landfills to accommodate the disposal of earth and rock material; the estimated excavated rock volume would be about 5,900,000 m^3;
- Passing of heavy construction equipment through the gorge during construction over a very long period of time, which, in addition to increased discomfort and increased risk of incidents of passing cars, increases the possibility of mortality of vertebrate animals - an increase of about 25% in heavy truck traffic through the gorge during the construction, i.e. for a period of not less than 6 - 7 years;
- The need of at least three interim accesses for digging the tunnel in order to ensure that it can be completed within the programme period would create even bigger trouble for the traffic, with respect to to the safe entry of the heavy equipment into the existing road I-1;
- The requirement to complete construction works in the specific time frame (by the end of 2014-2020 programming period), including the grace period;
- Extremely high and energy-intensive operating and maintenance costs;
- Significant geological hazards (the Kresna Gorge region is one of the most seismically active in the country) - after the additional geological surveys and experiments proved that the seismic and common geological risk was significant;
- The geological surveys made have shown that the drainage waters from the tunnel would be about 11,000 m3/day.
- In the conclusions of several expert reports (of BAS, of Bulgarian Seismologists and International Experts), serious reservations have been expressed about the construction of a very long tunnel in the gorge, with serious construction problems and the operation of the highway risks.

In line with the Environmental Strategy for the Lot 3 design of the Struma Motorway (developed by JASPERS and adopted in 2012) after the completion of the long tunnel design, the environmental consequences should be assessed.

According to this assessment, a decision needs to be made on how to proceed with the project.

Taking into account the above considerations and following consultations of the Contracting Authority NCSIP, with the Ministry of Environment and Waters, it is assumed that an additional option of the Kresna Gorge passage should be developed, which should be evaluated in terms of risk to human health and environmental performance.

In 2014, the NCSIP assigned to the Company 'Patproekt 2000' OOD, a feasibility (pre-investment) study for an option solution of the Struma Motorway in the region of Kresna Gorge from km 378 + 600 to km 399 + 788.84 = 397 + 600.

The designer makes surveys and proposes a new solution, in conformity with the statutory requirements, applicable to roads and the optimal technical characteristics.

This design solution of 2014 proposes not a single long tunnel, but the construction of many short tunnels allowing their simultaneous construction in shorter terms. The division of the roadways allows trouble-free and conflict-free traffic, as the traffic would be allowed in one of the roadways, while construction is being performed on the other and vice-versa and the division of the roadways would also allow stage-by-stage construction, if need arises. The close distance between the roadways allows the quick switching of the traffic from one to the other, which secures the temporary arrangements during the construction of motorway, upon the road operation, as well as redirecting of the traffic in case of a car accident, emergencies, natural disasters, etc.

In the ***G20-Blue*** Option, offered in the end of 2014, the design road route should be developed with a G20 overall dimension and a design speed of V_{des} = 80 km / h. The two roadways are developing independently from each other, as the distance between them gets bigger and smaller in situational and grade line terms. The aim is to use as much as possible the route of the existing road to minimize the use of surrounding areas.

Where possible, the existing road is followed and used, and in other sections tunnels and viaducts are envisaged. Where necessary, supporting walls have been provided.

The notification of the NCSIP to the MoEW for the investment proposal "Improvement of the road route of Lot 3.2 of the Struma Motorway", under Art. 4 of the *Ordinance on the Terms and Procedure for Environmental Impact Assessment* examines two options for implementation of Lot 3.2: The "Long Tunnel Option" and "Option G20" (Project Design from 2014), subsequently designated as ***Option G20 - Blue***.

In 2015, an assignment was given for an option option solution, compared to the ***G20-Blue Option.*** The later would have the same overall dimensions and would not provide either for the construction of a long tunnel in the Kresna Gorge, yet it offers other technical solutions.

In this relation an examination was made of the possibilities of using the terrains occupied by the existing road E79, so as to minimize the occupied territories in the Kresna Gorge.

In the same time a design solution is being sought for a Option that, in addition to satisfying the ecological criteria, is technically feasible, compliant with the legal framework of road construction, the safety requirements and possibilities for maintenance of the roadway and the scope of the road.

By the end of 2015, an option was developed for passing through the Kresna Gorge with overall dimensions G20 - ***Option G20 - Red.***

On the grounds of the notice of the investment proposal, submitted to the Ministry of Environment and Waters, instructions have been given by letter of the Ministry of Environment and Waters, of outgoing reference No. EIA-85 / 13 May 2015, in Section II, Paragraph 9: *"Propose and evaluate "Alternative solutions" within the meaning of § 3, subparagraph 7 of the Additional Provisions of the Ordinance on EIA including different location of the route, different scales, incl. different clearance, model of performance of the activities or use of Alternative technologies. Propose and evaluate an "alternative solution" for the passing of the road route outside the Kresna Gorge, being in conformity with: Recommendation No.98 (2002) of the Standing Committee of the Berne Convention, in particular paragraph 3 (Recommendation No. 98 (2002) of the Standing Committee, adopted on 5 December 2002, on the project to build a motorway through the Kresna Gorge (Bulgaria); the requirement of the condition in Para.3.2, Bullet 7 of the EIA Decision, which foresees the possibility of "future exploration and designing options, analogous to the "alternatives", presented East of the Kresna Gorge and 'Tissata'.*

In response, the Contracting Authority - NCSIP examined three alternatives:

- Eco A Eastern Alternative;
- Eco B Eastern alternative;
- Western alternative;

Eco A Eastern Alternative would affect the 'Kresna Gorge' Protected Area. According to item b of the prohibitive regime introduced by Order No.130/22 February 1985 "the construction of buildings and roads is prohibited" within the protected area. In this respect and given the fact that this alternative is related to the construction of a new road route, it is inadmissible for the protected area restrictions.

ECO B EASTERN ALTERNATIVE

This alternative starts with a road junction at the town of Simitli, at 300 m altitude, and continues southeast to km 389 + 500. From there the highway makes a turn east to km 390 + 000 and then another turn south. During this ascension, the slopes are quite steep, including a 2 km part with an inclination of 5%. At km 391 + 900, the road route reaches its highest point at 747 m above sea level. To reach this point, the highway would have to pass through four bridges and viaducts (respectively 270, 390, 630, 510 m long) and three tunnels (495, 2600, 1330 m long). The inclination of the downhill for the most part is 4.2%, with the highway reaching the village of Strumyani at 130 meters above sea level. During the descent, the route crosses three bridges and viaducts (660, 690, 480 meters long) and three tunnels (respectively 3140, 2180 and 8500 m). The total length of the road route is 32,608 km, with a overall highway dimension of A 29. The designed speed is 120 km/h, but the operational speed is expected to be much lower, considering the extreme inclinations. In the tunnel sections the speed limit is accepted to be up to 80 km/h.

The route passes through two Natura 2000 protected zones – habitat protected zone BG0000366 "Kresna-Ilindentsi" and bird protected zone BG0002003 "Kresna". It would not affect the 'Tissata' reserve, the 'Moravska' protected area and the 'Kresna Gorge' protected area.

WESTERN ALTERNATIVE

With respect to the instructions of the Competent Authority to consider options of the road route beyond the Kresna Gorge in 2015, a new design alternative was explored. Considering the fact that the opportunities for the gorge to be bypassed from the East have been studied,

the study is carried out on the west side of the gorge. The so-called "Western alternative" was thus obtained.

The project route has been designed for two roadways with overall dimension G20 and V_{des} = 120 km / h. It begins at km 276 + 000 after the bridge on the Struma River, developing in the southwest direction
along the village of Cherniche, west of the village of Krupnik and Polena, then the direction south of km 380 + 000.

It crosses the mountain, passes north of the village of Gorna Breznitsa, continues along the river valley of Breznishka River. Crosses the Struma River, the existing road I-1 and the existing railway line Sofia - Kulata, then along the river valley of Vlachinska River bypasses Kresna from the northeast, and then from the east. This option ends at km 400 + 200 (beginning of Lot 3.3).

It provides for the construction of 7 tunnels and 6 viaducts. The tunnels will a total length of 11,275 m. The longest would be the first tunnel - 9,175 m, which starts at km 381 + 541. The other 6 tunnels are less than 1,000 meters long.

The viaducts are between 50 and 745 meters long. The total length of the viaducts is 2,180 m.

Following a multi-criteria analysis (developed by 'ARUP' and NCSIP), both alternatives have been rejected for financial, economic and environmental criteria. These Alternative are not developing in detail.

EASTERN OPTION OF NGO, 2002.

The option was developed in 2002 by 'Votan Consult' and was considered in the EIA procedure in 2007 for the Struma Motorway. The description below is on the alternatives under consideration in the 2007 EIAR and the development of Votan Consult.

This option has been rejected as unacceptable, which is reflected in the published Decision 1-1 / 2008 of MOEW.

- Green - alternative (Votan), length 29.41 km

It provides for redirection of the road route about 4 km to the east from the gorge.

The road route starts from the existing E79 road after a semi-round road junction at the town of Simitli and is heading eastward, tanging to the 'Long Mahala' residential area from the south. The route then heads south, crosses the Brezhany River, enters westward into the massif of Vertichovitsa peak (811.4) and heads south. A road route was looked for west of the existing road Brezhani-Mechkul-Senokos in the slopes of the adjacent mountain ranges. The situation plan crossed the road from Stara Kresna to Oshtava and the road route passes westward of the "Hladkata Voda" mineral spring, then goes from the east to the other mineral spring - "Toplata Voda". The route extends westwards from the village of Vlahi, crosses the Vlahinska River East of the valley and goes to the third mineral spring "Gradeshki Mineral Spas", where it passes from the east and then along the ridge of the 'Padinata' to the village of Dolna Gradeshnitsa. A tangential passage to the east from the village is proposed because the existing development around road E79 would not allow for technical options of running overall dimensions of 25.5 metres. After passing by the village the route joins the existing road E79.

The highest level of passage is at km 10.146 and is 670.11 metres.

The difficult terrain led to the design of 6 tunnels, respectively
3900 m; 305 m; 505 m; 565 m; 1350 m and 4300 m long or a total length of 10,925 m.

The length of the designed 8 bridge facilities is respectively 480 m; 480 m; 1320 m; 1 160 m; 240 m; 160 m; 480 m and 1 320 m or a total of 5 640 metres.

With a road route length of 29.41 km and a total facility length of 16,565 m, the length of the facility section over the entire length is about 56%.

It is included in the road routes of "Speya" at D. Gradeshnitsa - after the boundary of M4-
M5.

- Green dotted line – alternative (Votan) – length 31.32 km

This option has been developed as a suboption for the first one, and pursuant to the assignment of
the investor should explore the possibility of going east of the village of Vlahi.

The route of the second option is situationally and horizontally separated from the 1st option at km
15.4 and after going east to the village of Vlahi, it re-enters the route of I
option as a situation at Km 27.

It passes east of the Tissata buffer zone and would not affect it.

The highest point of passage is the same as the 1st option, at km
10.146 and is 670.11 meters high.

To overcome the complex terrain, the option includes 6 m tunnels, respectively 305; 505; 2850; 670 and 5,700 m long or a total length of 13,930 meters.

The designed bridge facilities are 8 and have respective lengths of 480 m; 480 m; 1 320 m; 1 200 m; 440 m; 480 m; 480 m; and 560 m or a total length of 5 440 m.

The total length of the facilities is 19,370 meters, compared to the road route length of 31.32 km, presenting 61.3% of facilities.

This option has been rejected as unacceptable, which is reflected in the published Decision 1-1 / 2008 of MoEW.

The arguments are presented in the EIAR of 2007 and are related to the fact that this option would not meet the requirements of Art. 6 of Directive 92/43 / EEC, since for some species, subject to conservation in the BG0000366 Kresna-Ilindentsi Habitat Protected Zone, significant negative impacts remain, despite the possible mitigation measures and compensatory measures under the meaning of Art. 6, Para. 4 of the Directive.

In the meantime a conclusion is made that there is no need to apply Art.33 of the Biological Diversity Act, respectively Art.6.4 of Directive 92/43/EEC, as long as there are feasible Alternatives allowing the avoidance of the significant impacts on the protected areas subject to observance of the compulsory measures for decreasing the impacts.

As the construction of Lot 3.2 of the Struma Motorway is financed under the OP "Transport and Transport Infrastructure", the project as a whole must meet a number of requirements that besides environmental ones include technical and economic criteria that may not be ignored.

As regards linear facilities, including the road in the section through the Kresna Gorge (Lot 3.2 of the Struma Motorway), the requirements of the Road Design Norms and Ordinance No.4 on the scope and Contents of Investment Projects, as well as other legal instruments related to the design and evaluation of projects are taken into account as early as in the stage of pre-project surveys. Based on the known data and geographic specifications of the region and the statutory requirements, an assessment has been made with respect to the options that could be implemented with the known and available technologies, construction practices and building materials, taking into account the financial capacity of the Contracting Authority.

The designs are adopted by the Expert Technical and Economic Council (ETEC), which is competent to evaluate the design in its entirety and in all possible aspects.

Taking into consideration the financial parameters and the time constraints, set out in the programming period for projects, financed under the OP 'TTI' for technically unsound and infeasible options, there is no reason to require

financing for their implementation. Under these conditions, no design, project evaluation, including by environmental indicators and consideration is given to other possible options.

In connection with the instructions of the Ministry of Environment and Water, in letter of outgoing ref. No. EIA-85 / 13 May 2015, in Section II, paragraph 9: *"Propose and evaluate "Alternative solutions" within the meaning of § 3, subparagraph 7 of the Additional Provisions of the Ordinance on EIA including different location of the route, different scales, incl. different clearance, model of performance of the activities or use of Alternative technologies. To propose and evaluate an "alternative solution" for the passing of the route outside of the Kresna Gorge ... "* in 2016, the Contracting Authority RIA (successor of the activities started by the NCSIP) explored two new options for passing of the route outside the Kresna Gorge, namely:

- Eastern option G 10.50 - the left roadway on a new terrain outside the gorge and the right roadway along the existing road E79 in the gorge and eastern bypass of the town of Kresna on a new terrain;

- Eastern Option G 20 – left and right roadway outside the gorge.

These two options (in addition to the Long Tunnel Option, G20 - Blue and G20 Red options) have been detailed and evaluated in the EIA and in the EIA Report.

7.2. The „Zero" alternative

The existing E79 road crosses the Kresna Gorge in a longitudinal direction. Research on its impact on the fauna in the area has been carried out twice by NGOs (see Beshkov et al. 2007) and by assignment of the NCSIP (Karaivanov 2015) monitoring of animal mortality from the traffic. Although the data obtained are insufficient to determine the absolute values of this mortality and do not allow for statistically reliable conclusions about its increase with increasing traffic or its reduction by decreasing the population size of the species affected, it is obvious that we have negative impact.

8. Cartographic material with the location of the elements of the investment proposal in relation to the protected areas and their elements.

Appendix No. 7 - maps of the distribution of natural habitats and habitats of species, incl. birds, subject to conservation in the PZ.

9. Conclusion on the type and rate of the negative impact, according to the criteria under Article 22 of the Ordinance.

9.1. Option G20 - Red

- **Protected Zone BG0000366 'Kresna - Ilindentsi'**
  Rate of Influence on the Protected Zone

The implementation of the investment proposal for the construction of the Struma Motorway, Lot 3.2 according in the Option G20 - Red, affects the territorial integrity of 'Kresna – Ilindentsi' Protected Zone over the total surface area of **687.950 decares** or **0.14%** of the territory of the protected zone.

Scope and rate of impact

Types of natural habitats

The implementation of Struma Motorway, Lot 3.2 in the G20 - Red Option will have **significant** impact on habitats 92A0 and 92C0, subject to conservation in the protected zone.

Due to the large area of affected polygons and terrain characteristics, mitigation measures such as reduction of scope in certain sections, would be impossible.

Species, subject to conservation

The implementation of Struma Motorway, Lot 3.2 in the G20 - Red Option will have **Significant** impact on four species of reptiles, subject to conservation in the PZ. Due to the large area of the affected polygons and the nature of the terrain, mitigation measures would not be possible.

We could conclude that the implementation of Struma Motorway, Lot 3.2 under option G20 - Red would have a significant impact on the integrity and structure of the zone, as well as on the natural habitats and the species, subject to conservation in the zone. IP under Option G20 - red is incompatible with the subject and the objectives of protection of BG0000366 "Kresna - Ilindentsi" protected zone.

- **Protection zone BG0002003 'Kresna'**

Degree of influence on the protected zone

The implementation of the investment proposal for the construction of the Struma MW, Lot 3.2 according to Option G20-Red affects the territorial integrity of Kresna protected zone over total surface area **648.112** decares, representing **0.28%** of the protected zone territory.

Scope and rate of impact

The implementation of Struma Motorway, Lot 3.2 in the G20 - Red Option will have **Significant** impact on 9 bird species, subject to conservation in the PZ. By implementing the appropriate measures, the impact would be mitigated to **insignificant.**

We could conclude that by applying appropriate measures, the implementation of Struma Motorway, Lot 3.2 under Option G20 - Red would have insignificant impact on the integrity and structure of the zone, as well as on the natural habitats and the species, subject to conservation in the zone. The IP under Option G20 - Red is compliant with the subject and the objectives of protection of BG0002003 "Kresna" protected zone.

9.2. Option G20 - Blue

- **Protected Zone BG0000366 'Kresna - Ilindentsi'**

Rate of Influence on the Protected Zone

The implementation of the investment proposal for the construction of the Struma Motorway, Lot 3.2 under Option G20 Blue affects the territorial integrity of the protected zone "Kresna - Ilindentsi" on a total area of **684,921 decares,** which represents **0.14%** of the territory of the protected zone.

Scope and rate of impact

Types of natural habitats

The implementation of Struma Motorway, Lot 3.2 under Option G20 - Blue would have **significant** impact on habitats 92A0 and 92C0, subject to conservation in the protected zone. Due to the large area of affected polygons and terrain characteristics, mitigation measures such as reduction of scope in certain sections, would be impossible.

Species, subject to conservation

The implementation of Struma Motorway, Lot 3.2 under Option G20 - Blue would have **Significant** impact on four species of reptiles, subject to conservation in the PZ. Due to the large area of the affected polygons and the nature of the terrain, mitigation measures would not be possible.

We could conclude that the implementation of Struma Motorway, Lot 3.2 under Option G20 - Blue would have a significant impact on the integrity and structure of the zone, as well as on the natural habitats and the species, subject to conservation in the zone. The IP under Option G20 - Blue is incompatible with the subject and the objectives of protection of BG0000366 "Kresna - Ilindentsi" protected zone.

- **Protection zone BG0002003 'Kresna'**

Degree of influence on the protected zone

The implementation of the investment proposal for the construction of the Struma Motorway, Lot 3.2 under Option G20 Blue affects the territorial integrity of the protected zone 'Kresna' on a total area of **609.079 decares,** which represents **0.26%** of the protected zone territory.

Scope and rate of impact

The implementation of Struma Motorway, Lot 3.2 under Option G20 - Blue would have **significant** impact on 9 bird species, subject to conservation in the PZ. By implementing the appropriate measures, the impact would be mitigated to **insignificant.**

We could conclude that the implementation of the Struma Motorway, Lot 3.2 under Option G20 - Blue would have insignificant impact on the integrity and structure of the zone, as well as on the natural habitats and the species, subject to conservation in the zone. The IP of the Option G20 - Blue is compatible with the subject and the objectives of conservation in the protected zone BG0002003 'Kresna'.

9.3. Eastern Option G10.50

- **Protected Zone BG0000366 'Kresna - Ilindentsi'**

Rate of Influence on the Protected Zone

The implementation of the investment proposal for the construction of the Struma Motorway, Lot 3.2 in the Eastern G10.50 Option affects the territorial integrity of Kresna - Ilindentsi Protected Zone on a total area of **525.279 decares** (excluding the area of the right roadway that would be on the existing road), which represents **0.11%** of the territory of the protected zone.

Scope and rate of impact

Types of natural habitats

The implementation of Struma Motorway, Lot 3.2 in the Eastern option G10.50 would have **significant** impact on habitat 91E0 *, subject to conservation in the PZ. C by implementing the appropriate measures, the impact would be mitigated to **insignificant.**

Species, subject to conservation

The implementation of Struma Motorway, Lot 3.2 in the Eastern option G10.50 would have

Significant impact on four species of reptiles, subject to conservation in the PZ. The impact can only be mitigated if the whole option (including the right roadway) would be subjected to designed and implemented effective defragmentation and partitioning devices.

We could conclude that by applying the appropriate measures, the implementation of the Struma Motorway, Lot 3.2 in the Eastern option G10.50 would have insignificant impact on the integrity and the structure of the zone, and on the natural habitats and the species protected in the zone. The IP in the eastern option G10.50 is compatible with the subject matter and objectives of conservation in the protected zone BG0000366
'Kresna - Ilindentsi' only provided that for the whole option (including the right roadway) the recommended defragmentation and partitioning devices are designed and executed.

- **Protection zone BG0002003 'Kresna'**

Degree of influence on the protected zone

The implementation of the investment proposal for the construction of the Struma Motorway, Lot 3.2 in the Eastern G10.50 Option affects the territorial integrity of Kresna Protected Zone on a total area of **519.120 decares** (excluding the area of the right roadway that would be on the existing road), which represents **0.22%** of the territory of the protected zone.

Scope and rate of impact

The implementation of Struma Motorway, Lot 3.2 in the Eastern option G10.50 would have **significant** impact on 16 species of birds, protected in the PZ. By implementing the appropriate measures, the impact would be mitigated to **insignificant.**

We could conclude that by applying appropriate measures, the implementation of the Struma Motorway, Lot 3.2 under the Eastern Option G10.50 would have insignificant impact on the integrity and structure of the zone, as well as on the bird species, subject to conservation in the zone. The IP in the Eastern option G10.50 is compatible with the subject and objectives of conservation in the protected zone BG0002003 'Kresna'.

9.4. The Long Tunnel Option

- **Protected Zone BG0000366 'Kresna - Ilindentsi'**

Rate of Influence on the Protected Zone

The implementation of the investment proposal for the construction of the Struma Motorway, Lot 3.2 according in the Eastern Option G20 affects the territorial integrity of 'Kresna – Ilindentsi' Protected Zone over the total surface area of **298.789 decares** or **0.06%** of the territory of the protected zone.

Scope and rate of impact

Types of natural habitats

The implementation of Struma Motorway, Lot 3.2 in the Long Tunnel Option would have **moderate** impact on habitat 92C0, subject to conservation in the protected zone. By implementing the appropriate measures, the impact would be mitigated to **insignificant.**

Species, subject to conservation

The implementation of Struma Motorway, Lot 3.2 in the Long Tunnel Option would

have
moderate impact on two species of reptiles and one species of fish, subject to conservation in the PZ. By implementing the appropriate measures, the impact would be mitigated to **insignificant.**

We could conclude that by applying the appropriate measures, the implementation of the Struma Motorway, Lot 3.2 in the Long Tunnel Option would have insignificant impact on the integrity and the structure of the zone, and on the natural habitats and the species, protected in the zone. The IP of the Long Tunnel Option is compatible with the subject matter and the objectives of conservation in the protected zone BG
0000366 Kresna – Ilindentsi.

- **Protection zone BG0002003 'Kresna'**

Degree of influence on the protected zone

The implementation of the investment proposal for the construction of the Struma Motorway, Lot 3.2 according in the Long Tunnel Option affects the territorial integrity of 'Kresna' Protected Zone over the total surface area of **340.594 decares** or **0.14%** of the territory of the protected zone.

Scope and rate of impact

The implementation of Struma Motorway, Lot 3.2 in the Long Tunnel Option would have **significant** impact on 11 species of birds, protected in the PZ. By implementing the appropriate measures, the impact would be mitigated to **insignificant.**

We could conclude that by applying appropriate measures, the implementation of Struma Motorway, Lot 3.2 under the Long Tunnel Option would have insignificant impact on the integrity and structure of the zone, as well as on the natural habitats and the species, subject to conservation in the zone. The IP of the Long Tunnel Option is compatible with the subject and the objectives of conservation in the protected zone BG0002003 'Kresna'.

9.5. The Eastern Option G20

- **Protected Zone BG0000366 'Kresna - Ilindentsi'**

Rate of Influence on the Protected Zone

The implementation of the investment proposal for the construction of the Struma MW, Lot 3.2 according to the Eastern Option G20 affects the territorial integrity of Kresna – Ilindentsi protected zone over the total surface area of **1,571.419 decares** or **0.32%** of the protected zone territory.

Scope and rate of impact

Types of natural habitats

The implementation of Struma Motorway, Lot 3.2 in the Eastern option G20 would have
moderate impact on habitats 5210, 91AA * and 6220 *, subject to conservation in the PZ, and **significant** impact on habitat 91E0*. Due to the large area of affected polygons, it is impossible to apply mitigation measures for 91AA *, 6220 * and 91E0 * habitats.

Species, subject to conservation

The implementation of Struma Motorway, Lot 3.2 in the Eastern option G20 would have
moderate impact on four invertebrate species and two species of mammals, subject to

conservation in the PZ. Implementation of mitigation measures would be impossible.

We could conclude that the implementation of Struma Motorway, Lot 3.2 under the Eastern Option G20 would have a significant impact on the integrity and structure of the zone, as well as on the natural habitats and the species, subject to conservation in the zone. The IP in Eastern Option G20 is not compatible with the subject and objectives of conservation in the protected zone BG0000366 'Kresna' - Illindentsi.

- **Protection zone BG0002003 'Kresna'**

Degree of influence on the protected zone

The implementation of the investment proposal for the construction of the Struma MW, Lot 3.2 according to the Eastern Option G20 affects the territorial integrity of Kresna protected zone over the total surface area of **1,397.015** decares, representing 0.59% of the protected zone territory.

Scope and rate of impact

The implementation of Struma Motorway, Lot 3.2 in the Eastern option G20 would have **moderate** impact on 5 bird species, subject to conservation in the protected zone. Due to the large area of the affected polygons, it would be impossible to apply mitigating measures.

We could conclude that the implementation of the Struma Motorway, Lot 3.2 under the Eastern Option G20 would have moderate rate of impact on the integrity and structure of the zone, as well as on the bird species, subject to conservation in the zone. The IP in the Eastern option G20 is not compatible with the subject and objectives of conservation in the protected zone Kresna BG 0002003.

The evaluation/score system of ranking the options, by giving them a number of points was used for the selection of an option in the EIA report, in accordance with the expected impacts under the different components and factors of the environment and human health, as defined in Section V. The preferred implementation option gets 5 points. The option, classified in the second place receives 4 points. The options, ranked in third, fourth and fifth place respectively receive 3, 2 and 1 points. Some of the Options have an equal score due to similar impacts.

Component /factor	**Option G20 - Blue** [1/]	**Option G20 - Red** [1/]	**Eastern Option G10.50**	**The Long Tunnel Option**	The Eastern Option G20[1/]
Ambient air	1	4	5	2	3
Surface waters	4	5	3	1	2
Ground water	4	5	3	1	2
The Earth bowels	4	5	3	1	2
Land and soils	2	3	3	5	1
Vegetable life	2	3	3	5	1
Animal world	1	2	4	5	3
Waste	4	5	3	1	2
Noise, Hazardous Power Sources	1	3	5	4	2
Landscape	3	3	2	5	1
Cultural heritage	1	2	5	3	4
Health and hygienic aspects	2	3	5	1	3
Total:	**2**	**4**	**4**	**3**	**2**

[1/] ***Options G20 – Blue and Red, and the Eastern option G20 are incompatible with the scope and objectives of affected protected zones.***

As a result of the environmental impact assessment performed in Section V and in accordance with the report on the degree of impact, the identified feasible Options of the investment proposal are Eastern Option G10.50 and the Long tunnel Option, and according to the scoring system in the EIAR the Eastern Option G10.50 gets 44 points while the Long tunnel Option gets 34 points.

Summary assessment of the EIA report of the possible options for implementation under the specific components, environmental and human health factors

Ambient air

The carbon dioxide equivalent amount of greenhouse gas emissions for the Eastern Alternative G10.50 in the time of construction shall be 1,900 tons eq. CO2 per year. The estimated volume of blasting works for the tunnels shall be approximately 1,160 tons of blasting powder.

Moderate impact significance for the Eastern Alternative G10.50 of Lot 3.2 of Struma Motorway in the construction period.

Moderate impact significance for the Eastern Alternative G10.50 of Lot 3.2 of Struma Motorway in the operation period. There are only two single residential buildings around E79 in the town of Simitli and an adjoining farm/utility building in the vicinity of the road Vlahi - Kresna. The carbon dioxide equivalent amount of greenhouse gas emissions for the Eastern Option G10.50 in the time of operation shall be 24,693 tonnes of equivalent CO2 per year.

The carbon dioxide equivalent amount of greenhouse gas emissions for the Long Tunnel Option in the time of construction shall be 1,500 tonnes of equivalent CO2 per year. The estimated volume of blasting works for the tunnels shall be approximately 7,560 tons of blasting powder.

High impact significance for the Long tunnel Option of Lot 3.2 of Struma Motorway in the

construction period. In the implementation of the tunnel blasting works it would be possible to affect the Poleto village and the residential areas of the town of Kresna. High impact significance for the Long tunnel Option of Lot 3.2 of Struma Motorway in the operation period. Affected will be the residential areas of the 'Dalgata' residential area, town of Simitli, located around the E79 Road. The carbon dioxide equivalent amount of greenhouse gas emissions for the Long Tunnel Option in the time of operation shall be **23,259** tonnes of equivalent CO2 per year.

Due to the above, when the two options, ranked in the first places, are compared and considered by the component air, it is recommended to implement the Eastern Option G10.50.

Surface waters

The insufficient degree of exploration of the territory, in which the Long Tunnel Option is provided to be made, may

lead to the drainage of the right tributaries of the Struma River - the Divilska River, the Breznishka River, as well as other smaller tributaries, when crossing the fault zones, these tributaries usually run along. Regardless of the construction of the tunnel lining, the drainage in question will be carried out using the drainage system, located outside the enclosure (between the rock mass and the enclosure).

In the **Eastern Option G10.50**, the surface water - of the rivers Gradevska, Brejanska, Ludata, Mechkulska, Oshtavska (Dyavolska), Vlahinska intersect mainly with bridges and viaducts and are not affected by their discharge quantities. The impact will be only during construction.

Due to the above, when the two options, ranked in the first places, are compared and considered by the surface water component,, it is recommended to implement the Eastern Option G10.50.

Ground water

The drainage of groundwater will start at the beginning of the construction of the Long Tunnel Option. The magnitude of this draining upon completion of the facility is estimated at approximately 129 l/s, and parallel with that there will be draining, concentrated at the tunnel portals (along the drainage system). Unlike the possible draining of surface waters, for which no data is available in respect of the presence of pollutants, the ground waters may contain pollutants (U, NH4 – according to analytical data). Draining will proceed “inwards” into the rock strata, away from the river Struma, hence the draining effect will be more pronounced.

The tunneling works along the Eastern Option G10.50 will be carried out in the "high" parts of the region (Brezhinski and Oshtavski grabeni), above the erosion base - the Struma river, with the drainage effect being considerably lower. These tunnel parameters, such as length and cross section are incomparably smaller than those of the Long tunnel option.

Due to the above, when the two options, ranked in the first places, are compared and considered by the component ground waters, it is recommended to implement Eastern Option G10.50

The Earth bowels

The implementation of the Long Tunnel Option is associated with an extremely large volume of earthworks, which is formed around

4.5 million cubic meters of extra rock with unknown mineral and chemical composition, including the presence and spread of radioactive substances. Due to the late construction stage of the Struma Motorway, they may not be used as embankment of the facilities and should be landfilled, and the sites required for the purpose would be in the range of tens to hundreds of decares. The existing experience in the construction of similar sites - highways and other road projects, reveals a distinct trend of manifestation of the unregulated phenomenon of "geological surprises", which requires modification of the structural features of the roadway and its facilities – such as lots of the Struma Motorway, demanding additional activities of drying the earth foundation or removing a coal layer and the like. Under the construction terms of the Long Tunnel Option, these "geological surprises" are practically priceless, due to the small number of exploration wells, given the environmental considerations - their passing through protected zones. Last but not least, the complexity of the facility and the lack of experience in building tunnels of such length and dimensions.

Insufficient research of the territory is a prerequisite for accidents and human casualties in these emergency situations, which is also the issue in our case.

In the specialized literature (Assoc.Prof., Dr. of science, Engineer K. Angelov, Engineering Geoecology, Sofia, 2009), such examples are mentioned, including human casualties. The following extracts from the reference source can be added:

"... at the intersecting of two faults of the "Vitinya" tunnel, the shattered mass totally tears the currently built concrete casing of a 200 m section."

"... 74 workers were killed in the course of digging out of the Bataski water-power road."

“Hundreds died in the beginning of the construction works of the undergrounds in Moscow, London, Berlin and many more.”

The above observations - increased requirements for the study, probability of "geological surprises", probability of fatalities, are valid also during tunneling along the Eastern Option G10.50, yet in this case their length does not exceed 1,320 m, whereas the tunnel lengths and cross sections are incomparably smaller than those of the Long Tunnel option. Last but not least, this option forms an earth mass deficiency (the necessary masses for embankments are more than the excavation tables), therefore the unsuitable earth masses, requiring landfill sites would be incomparable.

Given the above, when the two options, ranked in the first places, are compared and considered

by the component earth bowels, the implementation of Eastern Option G10.50

Waste

The estimated quantities of waste generated in the construction period: earth and rock volumes non-compliant with the project specifications for input in the facilities for the two ranked Alternatives are: the Eastern Option G10.50 – 1,856,432 m3 and the Long Tunnel Option – 4,579,586 m3.

The excavated earth and rock masses in the Long Tunnel Option that do not meet the project design specifications, the results of the radiation dose range studies and the analysis of the specific activity of natural radionuclides show values two to three times higher than the background ones and the excess earth and rock masses may not be used for construction works.

The large content of natural radionuclides in these rock quantities will pose a serious risk for the implementation of the Long tunnel Alternative and will require pre-construction of a special landfill for disposal of rock volumes. Such landfill site is subject to approval by EIA Decision for the landfill itself and it may be commissioned upon issuance of a Comprehensive Building Permit.

Due to the above, when comparing the expected amount of earth and rock masses that do not meet the project design specifications for the construction of the two ranked options, it is recommended to implement the Eastern version G10.50.

Noise

When performing the construction activities in the Long tunnel option, the expected exceedance of the regulated limit

noise level values are up to 29.0 dBA. In the course of implementation of the Eastern Option G10.50, the expected exceedance above the statutory limit values of the noise levels is up to 26.0 dBA.

During the operation, the expected exceedances for the Long tunnel option, they are are up to 16.0 dBA, for the Eastern option G10.50 they are up to 13.0 dBA.

Due to the above, upon comparison of the expected exceedance in the statutory limit values of noise levels in the two compared options, it is recommended that the Eastern Alternative G10.50 should be implemented.

Health Assessment

The construction works of the 'Long Tunnel Option' will present serious health hazards to the workers on the site

for the following reasons:

- The geological structure poses the risk of manifestation of 'geological surprises,' including probable collapses and landslides during the construction of the tunnels, which may lead to many casualties among the construction workers;
- The available data of high values of radioactive substances in drainage water, obtained during the monitoring of the water in the area of closed down uranium mining sites – “Simitli” and “Senokos” or from some exploration sites, for example “Brezhani”, as well as from the exploration of the “Kresna“ tunnel (Long tunnel Option), where one of the water samples has shown values, exceeding the limits for water radioactivity, indicate a potential risk of excessive radioactivity of the water in the region, used for irrigation and household purposes;

- The results from measurements of dose rate of radioactive radiation and the analysis of the specific activity of natural radionuclides show values two or three times higher than the natural backgrounds.

The large content of natural radionuclides will pose serious risks for the full-shift workers during the performance of longer tunnel work as a consequence of their long-term exposure to the excessive radioactive radiation.

In the operation period the gravest risks for the health of the population are associated with:

- Emergencies and car crashes in the long tunnel installations that have a negative impact not only on the drivers and occupants of the vehicles, involved in the incidents but also on the people, passing through the tunnel due to the rapid concentration and spreading of toxic gases in the enclosed tunnel space;
- The maintenance of the life supporting parameters of the ambient air environment in the long tunnel requires fault-free operation of the ventilation system which depends on the power supply. Any blocking of the ventilation system (power system failure, terrorist attack or defect) will result in very rapid depletion of the oxygen in the tunnel tubes, with consequent risks for the health and lives of those travelling through them at that point of time.

In the Eastern option of G10.50, the longest tunneling work is 1,320 m, which dramatically reduces the risks in terms of the period of exposure on construction workers, especially during the period of operation, when in the event of accident, , fewer people will be exposed to the hazard and to a lesser extent.

Due to the above, when comparing the risks to the population and human health of the two compared options, it is recommended to implement the Eastern option G10.50.

When choosing the option for implementation of Lot 3.2 of the Struma Motorway, as a result of the environmental impact assessment and the assessment of the degree of impact on the protected areas, **there is a certain advantage in the Eastern Option G10.50**.

10. Existence of circumstances under Art. 33 BDA, incl. Evidence of this

and a proposal for specific compensatory measures under Art. 34 of the Law on Biological Diversity - when the conclusion under item 9 is that the subject of protection of the respective protected area will be significantly damaged by the realization and operation of the investment proposal and that no other alternative solution has been found

When applying other precautionary measured, such as mitigating measures are not sufficient to limit the impact and a significant residual negative impact is expected, in the absence of any other alternative solution and the existence of reasons of overriding public interest / of primary public importance, compensatory measures should be considered and applied. The provisions of Art. Article 6 (4) shall apply where the results of the assessment, pursuant to Article 6 (3) are negative or uncertain. It would mean that:

• the project will have an adverse effect on the good condition of the territory;

• there are doubts about the absence of harmful effects on the good condition of the territory, related to the project in question.

Since the Habitats Directive does not define the term "compensatory measures", the following distinction is made from a practical point of view:

• mitigating measures, in the broader sense of the word, are those measures which aim at minimizing or even eliminating the negative impact on a certain territory that may arise as a result of the implementation of the project. These measures are an integral part of the project specifications, and

• the compensatory measures (sensu stricto) are independent of the project (including all relating mitigating measures). They are designed to offset the negative impacts of the project and to maintain the overall environmental coherence of the Natura 2000 network.

Compensatory measures are therefore not a means to enable the project to be implemented, while avoiding the obligations under Article 6. They should only be considered, once a significant negative impact has been identified on the well-being of a Natura 2000 site (Guidance on Article 6 (4) of Directive 92/43 / EEC on Habitats 2007/2012).

According to the conclusion under Paragraph 9, two of the five options, proposed by the contracting authority and considered are compatible with the subject and the objectives of conversation of the protected zones, provided that the conditions and measures, prescribed in paragraph 6 are applied. Therefore, compensatory measures within the meaning of Art. 34 of the BDA are not imposed.

11. Information on the used study methods, including the duration and period of field studies, forecasting methods and impact assessment, sources of information, difficulties in gathering the necessary information.

Methodology

The study of the habitats and species was conducted between 2014 and 2016 Data from field studies in the area from 2012 to 2013 were also used. The assessment of the expected direct impacts was carried out within the scope of the different options, where the areas of depopulated natural habitats and habitats of species are identified.

An assessment was made of all natural habitats and species, included both in the SDF and those established under the project "Mapping and Determination of the Conservation Status of Natural Habitats and Species - Phase I" (MoEW 2013).

The studies and assessments take into account the data and analyses of previous assessments (Karaivanov et al. 2012, Beshkov et al. 2008), according to the requirements of the MOEW. Given the different levels of detail in the different assessments and the differences in specific routes and technologies, the analyses are mainly used for reference.

The study of the natural habitats and species, subject to conservation in the considered protected zones has been carried out within the 300 m buffer zone on both sides of the highway route under the different options. This buffer is perceived as the maximum distance that can be expected to affect species, subject to conservation in the areas under consideration. Only those parts of the areas, falling within the 300-meter buffer zone of the surface parts of the road route are assessed with the assumption that the underground parts during the construction could not have a direct impact on the natural habitats and species, protected in the zones.

A map of the distribution of habitats (under EUNIS) has been prepared within the scope of each option in both areas. The mapping was carried out by the remote method (Brainerd et al. 2007). With the help of Quantum GIS 2.14.8-Essen, based on the orthophotomaps, available on the MRDPW GIS server (http://212.122.182.101/MRRB/) on a 1: 5,000 scale as well as on satellite imagery (Google Earth, 7.1.8.3036) were manually outlined by visual interpretation at a maximum magnification of 1:2,000, polygons with homogeneous habitats, WGS 84 / UTM 35N coordinate system. The principles and methods of this mapping are based on the CORINE land cover methodology (Commission of the European Communities 1994). The results of the project "Mapping and Determination of the Conservation Status of Natural Habitats and Species - Phase I" (MoEW 2013), provided by the MOEW under the APIA were also used. During the fieldwork, verification of pre-defined polygons was performed. Subsequent corrections were made and the EUNIS habitat classification was made (Davies et al. 2004).

The spatial analysis is performed in the GIS environment by crossing the vector layer with the elements of the IP (generated on the basis of the spatial data, provided by the designer) with the maps of the potential habitats of the target species (provided by MOEW).

Natural habitats and plant species

The inventory of the flora used the stationary and the route transect method (Line transects). In the determination of species was used "The Determinant of the higher plants in Bulgaria" (Kojuharov, 1992), "Determinant of Plants in Bulgaria" (Delipavlov and Cheshmedzhiev 2003), "Flora of the Republic of Bulgaria" (Volume IX), Flora of Bulgaria, (part I, II). The determination of habitats used the "Guide for the determination of habitats of European significance in Bulgaria" (Kavrakova et al. 2009).

Fish

The assessment of the condition of the ichthyofauna used data on the territory studies, conducted during the period November - December 2015, by sampling with electric current, according to BDS EN 14011, published data from previous studies and previous assessments (Vasilev and Pehlivanov 2002, Stefanov 2001), information from the local population. The territorial scope of the studies includes the section of the Struma valley along the route of the project Lot 3 from the Struma Motorway. 7 field points were surveyed, including 3 points on the Struma River and points of the tributaries in the area, in potentially affected sections, according to proposed design alternatives

- one point downstream of the Sushichka River (right tributary) and the Rezena River (left tributary), and two - of the Vlahinska river.

Amphibians and Reptiles

The field study was performed under the transect method (Line transects) - with a moderate stroke, whereas the researcher looks at the terrain on both sides. The specific microhabitats - e.g. piles of stones, puddles, troughs of fountains were studied in more detail. The found representatives of the species were registered using GPS devices. Within the boundaries of the studied area, an

assessment was made of the suitability of the individual sites as habitats of the target species. In the characterization and assessment of the different species, special attention was given to the models of the potential habitats from the reports on the target species in the Kresna - Ilindentsi PZ under the "Mapping and Determination of the Conservation Status of Natural Habitats and Species - Phase I" (MoEW 2013) .

Mammals (without bats)

The study of this group essentially follows the same methodology as the one in the study of amphibians and reptiles. Found representatives of the species or traces of their activity (steps, excrement, shelters, etc.) were registered using GPS devices. Within the boundaries of the studied area, an assessment was made of the suitability of the individual territories as habitats of the target species. In addition to direct field studies, reference literature was used as well (Golemanski 2011, MOEW 2013, Peshev et al. 2004) and information from the local population.

Bats

The field studies were conducted in February, August and September 2016 for the purpose of registering representatives of the target species of bats, traces of their activities in shelters, etc. A verification of the suitability of potential bat habitats within the scope of the route options within the Protected Zone was made. The selection of a field work methodology and analysis of the species composition and activity of the bats was performed according to the recommendations of Limpens et al. (2005), the National Roads Authority (2005), Mitchell-Jones (2004) and Petrov (2008) on the assessment of the impact of road infrastructure on bat populations. The following field study methodology and approach has been repeatedly applied in batch monitoring studies of bats in the Republic of Bulgaria.

As a specific method for assessing the species composition and activity of bats, the method of registration and analysis of echolocation and social ultrasound using the Pettersson D 240 and Transect Tranquility detectors was used. The resulting records were analysed using the specialized BatSound software 3.1 for Windows, taking into account the following basic sound parameters: the duration of separate sounds (ms), the sound interval between consecutive sounds (ms), the sound frequency with maximum energy (kHz), the highest and lowest frequencies (kHz), and the specific shape of the sonogram.

The common methods for collecting bat data follow the pan-European methodologies for species-specific studies of this group for the purposes of environmental impact assessment, as recommended by EUROBATS.

Birds

To evaluate the condition of the ornithofauna, basic methods and methods are used Approaches to direct field research on birds. These are the route or the transect method (Line transects) and the point count method (Point counts) (Bibby et al. 1992). Each of them has certain advantages and depends on the objectives and the nature of the site. The disturbance and damaged bird habitats were calculated based on the range of the road route - directly damaged habitats and 300 m buffer zone - disturbance. The percentage of the areas, affected for each species of birds, expected to be affected is relative to the classes of land cover (in the standard form) in the zone, suitable for the species - trophical, nesting, shelter habitats, etc.

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12. Documents under Art. 9, para. 2 and 3

Appendix No. 9

List of Appendices

Appendix No.1 Letter of outgoing ref. No. EIA-85 / 13 May 2015 of MOEW;

Appendix No.2 and 2a
A layout plan/situation of the project route, Option G20 – blue, on a topographic map, in scale of 1:25,000, in ".*shp" format.

Appendix No.3 and 3a
A layout plan/situation of the project route, Option G20 – Red, on a topographic map, in scale of 1:25000, in ".*shp" format.

Appendix No.4 and 4a
A layout plan/situation of the project route, Eastern Option G10.50, on a topographic map, in scale of 1:25,000, in ".*shp" format.

Appendix No.5 and 5a
A layout plan/situation of the project route, Eastern Option G20, on a topographic map, in scale of 1:25,000, in ".*shp" format.

Appendix No.6 and 6a	A layout plan/situation of the project route, Long Tunnel Option G20, on a orthographic map, in scale of 1:5,000, in ".*shp" format.
Appendix No.7	Distribution maps of natural habitats and habitats of species, including birds, subject to conservation in the PZ (digital);
Appendix No.7.1	Natural habitats (pril. 7.1_habitat_cover_zz_habitats)
Appendix No. 7.2 Habitats of Species (App.	7.2_habitat_species_zz_habitats)
Appendix No. 7.3 Bird Habitats (App. 7.3_habitat_cover_zz_birds)	
Appendix No. 8	Layout plan/Situation, type and design of defragmentation and partitioning devices for unobstructed crossing and preventing the exit of the amphibian and reptile roadway
Appendix No. 9	Documents under Art. 9, Para. 1 of the Ordinance on the Compatibility Assessment