

Appendix 15.1 – Ecology Baseline Study

Winter Species Monitoring

The monitoring of species present in the winter period was carried out on March 7, 2019. The following sites along the highway route were selected and visited:

1. Area of the village of Chelopeci (N 41° 57' 43.95"; E 20° 57' 15.03", elev. ≈830 m)

Thermophilous Oak Forest – Mixed Italian Oak and Turkey Oak Forest

Reference to EUNIS Habitats: G1.762 Helleno-Moesian [*Quercus frainetto*] forests

Ass. Quercetum frainetto-cerris macedonicum Oberd. 1948 em. H-at. 1959 (well developed and degraded forest). The oak forest was intermixed with planted Scots pine (*Pinus sylvestris*) buried several years ago. The following species were identified:

Plants:

Quercus frainetto, *Q.cerris*, *Cornus mas*, *Carpinus orientalis*, *Crataegus monogyna*, *Rosa galica*, *Crocus veluchensis*, *Gagea lutea*, *Crocus chrysanthus*

Fungi:

Stereum hirsutum and *Trametes versicolor* (on oak stump), *Vuilleminia comedens* (on dry branches of living oak).

Lizards:

Zootoca vivipara

Birds:

Fringilla coelebs, *Passer domesticus*, *Pica pica*, *Sturnus vulgaris* and *Turdus merula*.



Mixed Italian and Turkey oak forest



Buried Scots pine plantation



Crocus veluchensis



Gagea lutea



Tussilago farfara

2. Along Zajaska Reka Stream, close to the village of Zajas (N 41° 35'41,89"; E 20° 57'14,43", elev. 700 m)

The area is characterised with **abandoned fields and meadows** with ruderal vegetation. Along the Zajaska Reka stream the riparian willow-poplar belt (EU HD Annex I: 92A0 *Salix alba* and *Populus alba* galleries) is developed. It belongs to the *Salicetum albae-fragilis* Issler 1926 association. The following species were identified:

Plants:

Abandoned fields - *Lolium spp.*, *Bromus spp.*, *Verbascum sp.*, *Veronica hederifolia*, *Ficaria verna*, etc
Riparian vegetation - *Salix alba*, *Populus tremula*, *Alnus glutinosa*, *Sambucus nigra*, *Amorpha fruticosa*.

Fungi:

Bovista plumbea (on meadow), *Phellinus tremulae* (parasite on living *Populus tremula*), *Phellinus igniarius* and *Fomes fomentarius* (parasites on living *Salix alba*)

Lichens:

Xanthoria parietina (on living branch of poplar)

Snails:

Helix lucorum



Abandoned fields and riparian willow-poplar belt along the Zajashka Reka stream



Veronica hederifolia (above)
The lichen *Xanthoria parietina* (below)



Ornithogalum umbelatum



Bovista plumbea



The snail *Helix lucorum*

3. Along Zajaska Reka stream, close to the village of Crvica (N 41° 33'00,76"; E 20° 58'21,76", elev. ≈ 640 m)

The area is characterised with mixed riparian gallery community with common alder as the main dominant tree species. Such good developed forest is part of EY 92/43/EEC (Annex I): 91E0* Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (ass. *Carici elongatae*-*Alnetum glutinosae*) and has a **high priority for protection**. It belongs to the EUNIS Habitats: G1.131 - Southern *Alnus glutinosa* galleries.



Riparian gallery community with common alder



Ficaria verna (above)
The yellow-bellied toad - *Bombina variegata* (below)

Plants:

Riparian vegetation - *Alnus glutinosa*, *Amorpha fruticosa*, *Clematis vitalba*, *Ficaria verna*, *Humulus lupulus*, *Lamium purpureum*, *L. maculatum*, *Populus tremula*, *Salix alba*, *Salix amplexicaulis*, *Sambucus nigra*

Fungi:

Panellus stipticus (on trunk of *Alnus glutinosa*), *Fomes fomentarius* (parasite on living *Salix alba*)

Lichens:

Xanthoria parietina (on living branches of poplar)

Snails:

Helix lucorum

Frogs:

Bombina variegata, *Pelophylax ridibundus*

Birds:

Motacilla cinerea, *Parus* spp. and *Dendrocopos major*.

4. Intermittent stream near the village of Osoj (N 41° 31'44,02"; E 20° 56'29,93", elev. ≈670 m)

The area is characterised by the riparian willow-poplar belt (EU HD Annex I: 92A0 *Salix alba* and *Populus alba* galleries). It belongs to the *Salicetum albae-fragilis* Issler 1926 association. The intermittent stream has a water flow only during the humid period of the year. The following species were identified:



Riparian willow-poplar belt



The intermittent stream (locally called as Sushica)



Daedaleopsis confragosa on dry branch of willow



The common wall lizard *Podarcis muralis*

Plants:

Salix alba, *Populus tremula*, *Alnus glutinosa*, *Sambucus nigra*, *Amorpha fruticosa*.

Fungi:

Daedaleopsis confragosa (on dry trunk of *Salix alba*)

Snails:

Helix lucorum

Lizards:

Podarcis muralis

Frogs:

Pelophylax ridibundus

5. Intermittent stream near the village of Dolno Strogomishte (N 41° 35'46,44"; E 20° 57'56,21", elev. ≈710 m)

The area is characterised by the riparian willow-poplar belt (EU HD Annex I: 92A0 *Salix alba* and *Populus alba* galleries). It belongs to the *Salicetum albae-fragilis* Issler 1926 association. The intermittent stream has a water flow only during the humid period of the year. Around is agricultural land dominated by fields and acres.



The Strogomishka Reka stream



Agricultural land near the village of Dolno Strogomishte

The following species were identified:

Plants:

Salix alba, *Salix fragilis*, *Alnus glutinosa*, *Sambucus nigra*, *Amorpha fruticosa*, *Crocus chrysanthus*

Lichens:

Xanthoria parietina

Fungi:

Astraeus hygrometricus

Birds:

Corvus cornix, *Parus major*, *Pica pica* and *Turdus merula*

Spring Species Monitoring

The monitoring of species present in the spring period was carried out on April 18, 2019. The following sites along the highway route were selected and visited:

Loc. 1: Kichevo valley (10308): Zajaska Reka Stream m a.s.l. 700
Coordinates: 41.595514124961404,20.95283478498459
41.59595190901227,20.954283848404888
41.59602286685771,20.953777581453323

The area is characterised with **abandoned fields and meadows** with ruderal vegetation. Along the Zajaska Reka stream the **riparian willow-poplar belt** (EU HD Annex I: 92A0 *Salix alba* and *Populus alba* galleries) is developed. It belongs to the *Salicetum albae-fragilis* Issler 1926 association.

The following species were identified:

Plants:

Abandoned fields - *Taraxacum officinale*, *Plantago lanceolata*, *Belis perennis*, *Lolium spp.*, *Bromus spp.*, *Erodium cicutarium*, *Capsella bursa-pastoris*, *Veronica tournefortii*, *Draba sp.*, *Veronica hederifolia*, *Ficaria verna*, *Galium vernum*, *Equisetum arvense*, *Urtica dioica*, *Mentha piperita*, *Plantago major*, *Verbascum sp.*, *Rubus fruticosus*, etc.

Riparian vegetation - *Salix alba*, *Alnus glutinosa*, *Populus tremula*, *Petasites alba*, *Sambucus nigra*, *Amorpha fruticosa*.

Fungi:

Bovista plumbea (on meadow), *Phellinus tremulae* (parasite on living *Populus tremula*), *Phellinus igniarius* and *Fomes fomentarius* (parasites on living *Salix alba*), *Stereum gausapatum*, *Laetiporus sulphureus*, *Daedaleopsis conragosa* and *Ganoderma applanatum* (all on dead wood of *Salix alba*)

Lichens:

Xanthoria parietina (on living branch of poplar)

Snails:

Helix lucorum



Phellinus igniarius - parasite on living *Salix alba*



The snail *Helix lucorum* (above)



The fungus *Coprinus* sp.(below)

Loc. 2: Kichevo valley (10308): **Along Zajaska Reka stream, close to the village of Crvivci** m a.s.l. 640

Coordinates: 41.55268344577218,20.97058966755867
41.55283624526919,20.97160521894693
41.55256702686536,20.970395542681217
41.55270452158632,20.971632376313213
41.55072185955792,20.972163118422028
41.55541195385574,20.976255163550377
41.551655238779006,20.972210057079792
41.552530395010784,20.972338132560257

The area is characterised with mixed riparian gallery community with common alder as the main dominant tree species. Such good developed forest is part of EY 92/43/EEC (Annex I): 91E0* Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (ass. *Carici elongatae-Alnetum glutinosae*) and has a high priority for protection. It belongs to the EUNIS Habitats: G1.131 - Southern *Alnus glutinosa* galleries.



Riparian gallery community with black alder, 91E0*_HD high priority habitat



Lathraea squamaria, a parasitic plant living on the roots of black alder



Fomes fomentarius, a parasite and saprobe on old alder trees



The marsh frog (*Pelophylax ridibundus*)



Art fungus (*Ganoderma applanatum*) a saprobe on old alder trees

The following species were identified:

Plants:

Riparian vegetation - *Alnus glutinosa*, *Amorpha fruticosa*, *Clematis vitalba*, *Ficaria verna*, *Humulus lupulus*, *Lamium purpureum*, *L. maculatum*, *Populus tremula*, *Salix alba*, *Salix amplexicaulis*, *Sambucus nigra*, *Latreia squamaria*, *Evonymus verrucosus*, *Petasites alba*,
Meadows - *Belis perennis*, *Plantago major*, *Taraxacum officinale*, *Rubus fruticosus*

Fungi:

Panellus stipticus (on trunk of *Alnus glutinosa*), *Fomes fomentarius* (parasite on living *Salix alba*), then lignicolous fungi that grows as a saprobes on *Alnus*: *Trametes versicolor*, *Trametes hirsute*, *Stereum hirsutum*, *Hypholoma fasciculare*, *Fomes fomentarius*, *Polyporus melanopus*, *Panelus stipticus*, *Polyporus badius*, *Laetiporus sulphureus*, *Physisporinus vitreus*, *Athelia* sp., *Hyphoderma pratermissum*, *Schizopora paradoxa*.

Lichens:

Xanthoria parietina (on living branches of poplar)

Snails:

Helix lucorum

Frogs:

Bombina variegata, *Pelophylax ridibundus*

Birds:

Corvus cornix, *Garrulus glandarius*, *Columba livia*, *Motacilla cinerea*, *Emberiza calandra*, *Parus* spp. *Pica pica*, *Turdus merula* and *Dendrocopos syriacus*.

Loc. 3: Kichevo valley (10308): Intermittent stream near the village of Osoj m a.s.l. ≈670 m

Coordinates: 41.52347254010244,20.946668051183224 41.52395473992442,20.947500877082348 41.52291176806499,20.947668179869655

The area is characterised by the riparian willow belt (EU HD Annex I: 92A0 *Salix alba* and *Populus alba* galleries). It belongs to the *Salicetum albae-fragilis* Issler 1926 association. The intermittent stream has a water flow only during the humid period of the year.

The following species were identified:

Plants:

Salix alba, *Populus tremula*, *Alnus glutinosa*, *Sambucus nigra*, *Amorpha fruticosa*, *Primula veris*, *Prunus spinosa*, *Prunus cerasifera*, *Juniperus oxycedrus*, *Posa* sp., *Malus* sp., *Lonicera caprifolium*

Fungi:

Daedaleopsis confragosa (on trunk of *Salix alba*), *Polyporus arcularius*, *Pleurotus eryngii*, *Psathyrella* sp., *Melanoleuca excissa*

Snails:

Helix lucorum

Lizards:

Lacerta trilineata

Frogs:

Pelophylax ridibundus

Birds: *Garrulus glandarius*, *Turdus merula*, *Streptopelia decaocto*, *Sturnus vulgaris*, *Pica pica*



Riparian willow belt (HD: 92A0 *Salix alba* and *Populus alba* galleries).



Intermittent stream Sushica



The Balkan green lizard (*Lacerta trilineata*)



Pleurotus eryngii, an edible mushroom

Loc. 4: Kichevo valley (10308): Dolno Strogomishte vill. (vicinity), m a.s.l. 700-750
Coordinates: 41.59722963975366,20.96114829182625

The area is characterised by the riparian willow-poplar belt (EU HD Annex I: 92A0 *Salix alba* and *Populus alba* galleries). It belongs to the *Salicetum albae-fragilis* Issler 1926 association. The intermittent stream has a water flow only during the humid period of the year. Around is agricultural land dominated by fields and acres. There are also small patches of hill pastures and meadows.



Meadows with *Taraxacum officinale* close to the village of Dolno Strogomishte



Degraded riparian willow belt along the Strogomishka Reka stream

The following species were identified:

Plants

Meadows: *Taraxacum officinale*, *Plantago lanceolata*, *Belis perennis*, *Euphorbia cyparissias*, *Erodium cicutarium*, *Capsella bursa-pastoris*, *Veronica tournefortii*, *Tanacetum vulgare*, *Eryngium vulgare*, *Rubus fruticosus*

Fungi

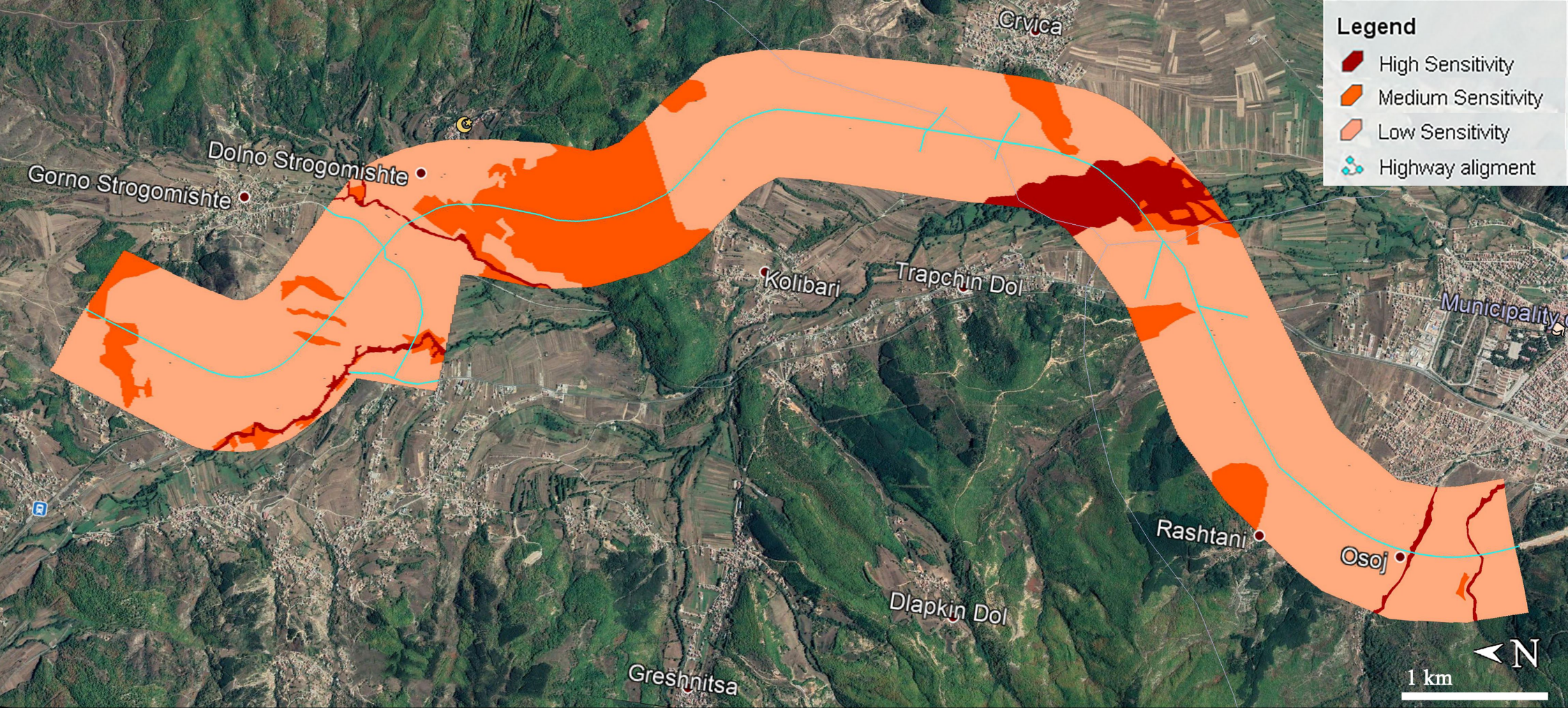
Meadows: *Bovista plumbea*, *Coprinus domesticus*

Lichens:

Xanthoria parietina

Birds:

Columba livia, *Emberiza calandra*, *Corvus cornix*, *Parus major*, *Pica pica*, *Turdus merula*, *Streptopelia decaocto*, *Hirundo rustica*, *Sturnus vulgaris*, *Columba palumbus* and *Fringila coelebs*.



Legend

- █ High Sensitivity
- █ Medium Sensitivity
- █ Low Sensitivity
- Highway alignment

Gornostrogomishte

Dolno Strogomishte

Crivica

Kolibari

Trapchin Dol

Municipality

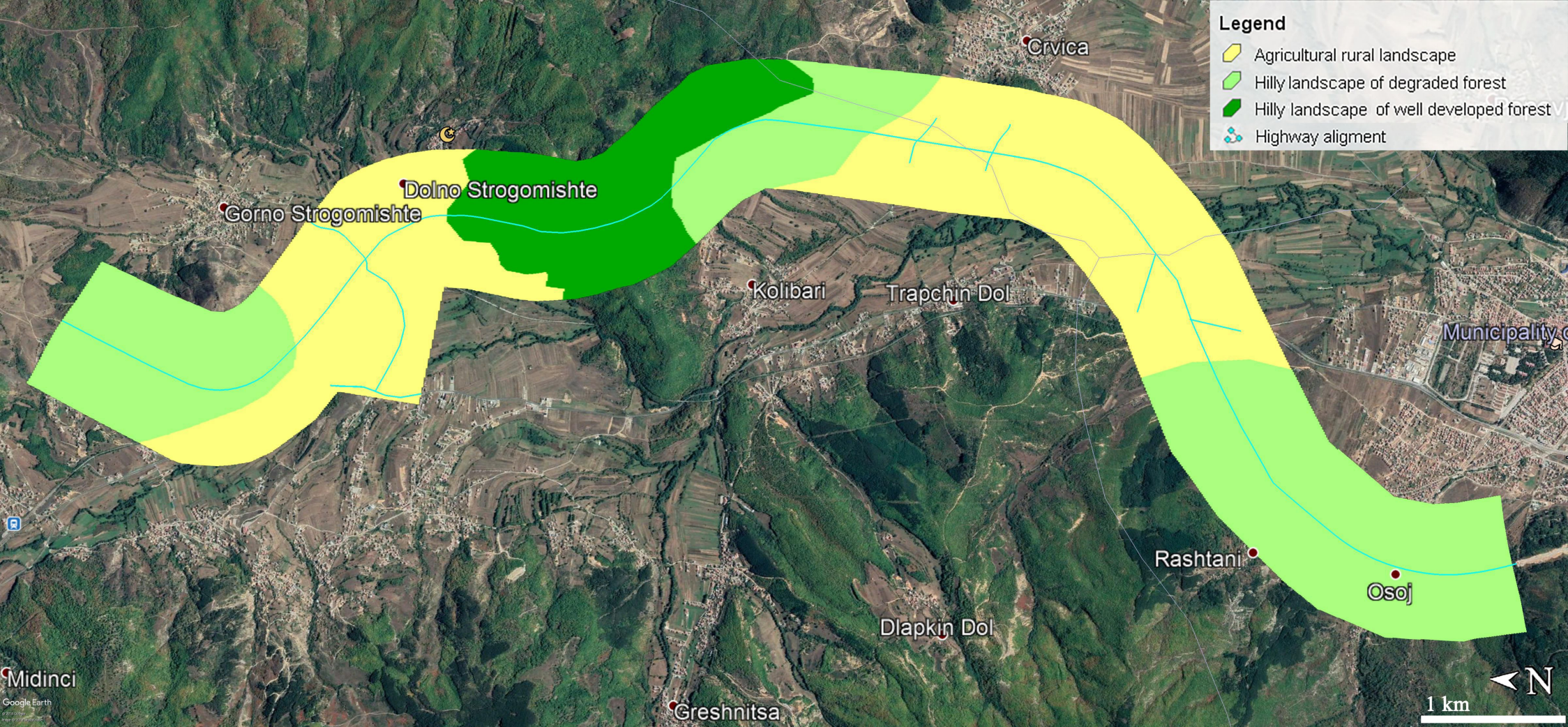
Rashtani

Osoj





Dlapkin Dol

Greshnitsa

1 km
N



Legend

-  Agricultural rural landscape
-  Hilly landscape of degraded forest
-  Hilly landscape of well developed forest
-  Highway alignment

Gorno Strogomishte

Dolno Strogomishte

Crivica

Kolibari

Trapchin Dol

Municipality of

Rashtani

Osoj

Dlapkin Dol

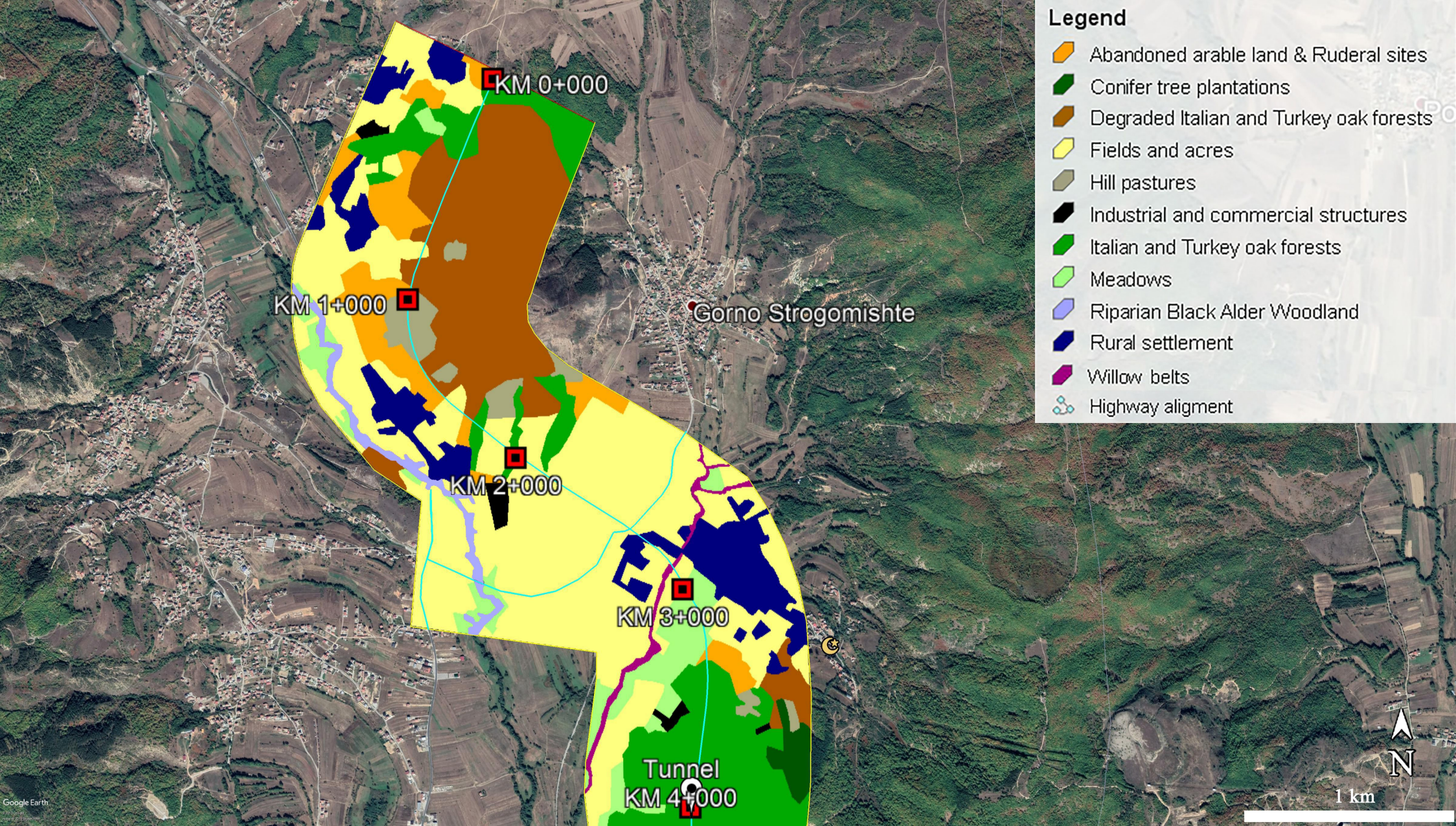
Greshnitsa

Midinci

Google Earth

1 km





Legend

- Abandoned arable land & Ruderal sites
- Conifer tree plantations
- Degraded Italian and Turkey oak forests
- Fields and acres
- Hill pastures
- Industrial and commercial structures
- Italian and Turkey oak forests
- Meadows
- Riparian Black Alder Woodland
- Rural settlement
- Willow belts
- Highway alignment

KM 0+000

KM 1+000

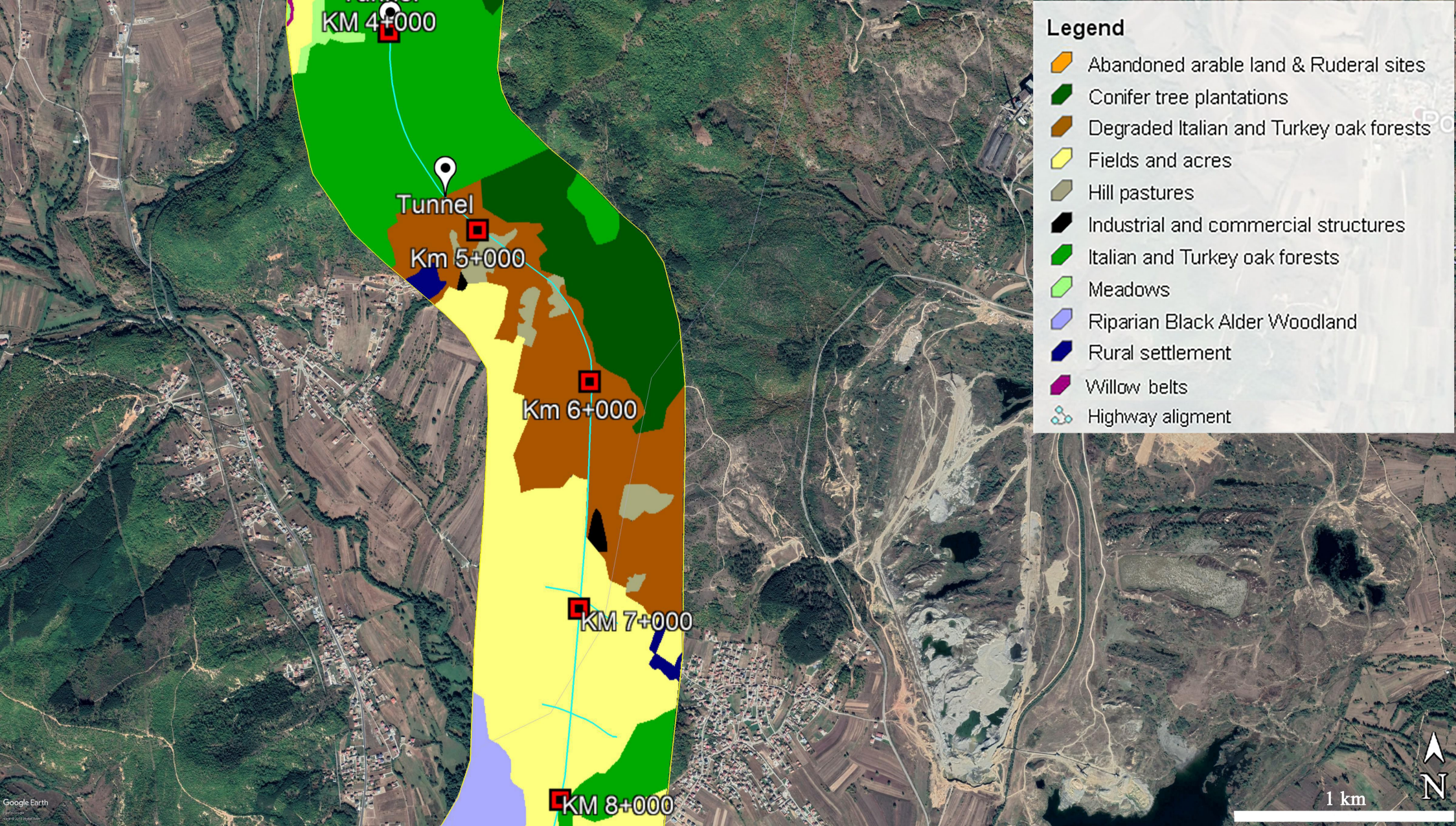
Gorno Strogomishte

KM 2+000

KM 3+000

Tunnel
KM 4+000





Legend

- Abandoned arable land & Ruderal sites
- Conifer tree plantations
- Degraded Italian and Turkey oak forests
- Fields and acres
- Hill pastures
- Industrial and commercial structures
- Italian and Turkey oak forests
- Meadows
- Riparian Black Alder Woodland
- Rural settlement
- Willow belts
- Highway alignment

KM 4+000

Tunnel

Km 5+000

Km 6+000

KM 7+000

KM 8+000

1 km



