

First Action Plan for Transportation infrastructure and habitat fragmentation in Greece.

Ilias ARAVIDIS⁴, Alexios GIANNAKOPOULOS¹, Yorgos ILIOPOULOS², Yorgos KORAKIS³, Yannis MACHAIRAS², Yorgos MERTZANIS², Pantoula NIKOLAKAKI⁵, Kyriakos SELINIDIS^{2,2}, Kostas TSIOKANOS², Theodora ZISOPOULOU²

(1): University of Aegean, Dept. of Environmental Studies, Lab. Of Biodiversity Management, Xenia Hills, 81100, Mytilene Island, Greece, (2): N.G.O. "Callisto", Wildlife and Nature Conservation Society, Mitropoleos 123, 54621, Thessaloniki, Greece. (3): Democritus University of Thrace, Dept. of Forestry and Management of the Environment and Natural Resources, 68200, Orestiada, Greece, (4) Development Society of Prefecture of Thessaloniki, Greece.

The SE Balkan region remains the only region of S. Europe where brown bear and wolf populations still maintain a continuous distribution range, extending over a large area shared by as many as eight different contiguous countries. Conservation of trans-border connectivity between shared populations of the two species is among the key issues for a long term overall conservation policy in this important bio-geographic region of Europe.

Egnatia highway routes by or through

- 17 "Natura 2000" Network sites.
- 4 wetlands under Ramsar Convention
- 70 wildlife reserves
- Most of the largest rivers in Greece (Evros, Nestos, Strymonas, Axios, Aliakmonas, Arachthos etc)

From the legal aspect, although "umbrella" systems, such as the Bern Convention and the EU directives, allow a generalized approach of the issue on a common ground, the need of elaborating and/or adjusting common management strategies and practices which would take into account local conditions, is a growing challenge.



Present distribution status of the brown bear (*Ursus arctos*) in Europe

Importance of Greece in terms of biodiversity

- 408 bird species
- 99 mammal species
- 5500 flora species
- 270 "NATURA 2000" sites
- 11 RAMSAR wetlands
- 25 National Parks



New problems arising: construction of the new highway E65 connecting Egnatia to SE Greece. Increased fragmentation at a large scale. More fragmentation problems at a local scale (junction area with Egnatia highway), new Railway network and a lot of new dams

Over the last 15 years, planning and construction of new transportation infrastructure throughout Greece have increased markedly and so have the areas planned to be or already occupied by highways thus affecting natural habitats. For many fauna species, the main impact of roads is related to increased disturbance, mortality, habitat and population disruption



Present distribution status of the wolf (*Canis lupus*) in the S. Balkans

Egnatia highway cuts through natural habitats of threatened and vulnerable LC species



Over the Dinaric – Pindos bear and wolf ranges, this challenge becomes a necessity given the mosaic of the existing differences in fields such as : current status (ranging from protection to harvest) and practices, priorities set by national policies, social & cultural values regarding wildlife and conservation issues, socio-economic context, accessibility to funding tools, existing methodologies and scientific capacity levels, bureaucratic procedures and political will.

Until now, several steps to meet local conditions under the overall objective have been made, with the establishment of a Balkan network of cooperation and the refinement of the CoE Action Plans as milestones.

Regarding specifically the EU policy, special emphasis should be given on conflicting funding tools which compromise biodiversity and therefore bear and wolf survival in cases such as the construction/extension of transport networks related to habitat fragmentation. This situation is illustrated by the Egnatia highway case study in Pindos range (Greece).



Total surface of high risk fragmentation zones within 14 fauna species distribution range	6.273 km ² .
Total surface of high risk fragmentation zones in Ramsar Sites	235 km ²
Total surface of high risk fragmentation zones in Protected Areas (National Parks etc.)	1.252 km ²



Habitat Fragmentation Risk - Brown Bear (*Ursus arctos*) case

A/A	Total surface of Linkage zones (km ²)	Total surface of impacted linkage zones (km ²)	Linkage zone category	Sector-Mountain Massif/Range
0	265,000	-	recolonization corridor	Vorras-Paiko
1	91,400	25,800	recolonization corridor	Vitsi - Vorras
2	27,000	-	recolonization corridor	E. Pindos - Vourinos
3	44,500	-	recolonization corridor	Vourinos - Askio
4	88,300	16,100	recolonization corridor	Vourinos - Askio
5	291,400	51,320	recolonization corridor	E. Pindos - Antixassia
6	470,000	67,640	recolonization corridor	Antixassia - Kamvounia
7	172,650	-	recolonization corridor	S. Pindos - Agrafa
8	59,100	-	recolonization corridor	S. Pindos-Tzoumerka
9	128,700	73,300	3/s (permanent presence)	Pindos
10	32,700	19,350	2/s (permanent presence)	Pindos
11	103,400	31,600	3/s (permanent presence)	Pindos
12	46,200	-	3/s (permanent presence)	Pindos

In Greece, lack of global environmental policy urged the need for the elaboration of a comprehensive Action Plan focusing on the habitat fragmentation impact of (6) transportation axes and their associated network upon (6) mammal species, all IBA's, (1) amphibian species and reptiles taxa. This Action Plan is the first official attempt at a national scale for establishing a frame of concrete rules, guidelines, standards and practices in order to minimize habitat fragmentation impact associated to transportation infrastructure.