

## PROTECTION OF BIODIVERSITY IN YUGOSLAVIA AFTER NATO AGGRESSION

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### ABSTRACT

In comparison with other countries Yugoslavia is very rich by great genetic, species and ecosystem diversity. The territory of Yugoslavia is 102173 km<sup>2</sup>, it is only 0,07% of world's land and 2,1% of the European continent. We have 6 biomes, 5 of the 12 terrestrial biomes of the world and biome of the sea as sixth biome. According to the international criteria the territory of Yugoslavia is one of the six European and one of the 153 world's centers of biological diversity. In period from March 24. until June 10. 1999. NATO carried out more than 35000 assaults against the Yugoslavia. All these have lasting consequences on the health of the entire population and the environment with prominent transboundary effects. Many species have become extinct due to the NATO bombings, and wildlife has started migrating and abandoning its natural habitat.

The necessity of future scientifically based monitoring is evident and also very strong protection of biodiversity.

Key words: Yugoslavia, biodiversity, protection, NATO aggression, monitoring.

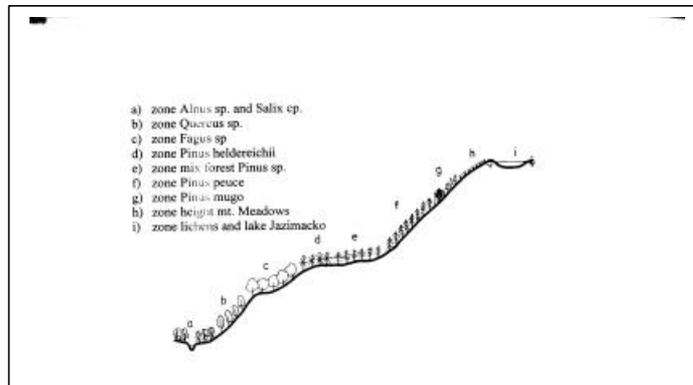
Yugoslavia belong to the Mediterranean Europe regions, in comparison with other regions of the temperate belt of the western Holarctic, it is distinguished, proportionate to its size and extending direction of its territory, by great genetic, species and ecosystem diversity. Such a great biodiversity is conditioned by various climatic, geomorphological, hydrological and historical factors, and by its geographical position on the Balkan Peninsula in southern Europe. The territory of Yugoslavia was one of the most important refugial regions in Europe during the Ice Age. The centers of species, ecosystem and geographical diversity are several ecological-biogeographical entities; we shall designated as true and potential biodiversity centers of Yugoslavia:

Sea, seashore and continental salt-marshes and sandy sea strands,

High-mountain regions,  
 Canyons and gorges,  
 The remaining steppes and sands,  
 Marsh, pond and swamp areas,  
 Mountain peat bogs,  
 Old oligo or polydominant forest stands on mountains and in canyons,  
 Caves, pits and shasms with ground waters in Carpathian-Balkan and Dinaric karst, rich in endemic relict fauna.

On the territory of Yugoslavia we can find 38,93% of vascular plants of Europe, 51,16% of the fish fauna of Europe, 74,03% of the bird fauna of Europe and 67,61% of the mammalian fauna of Europe. Around 1600 wild plant and animal species have the status of internationally significant species, which live on our territory. Exceptional richness of plant and animal species and their communities what includes 4182 species of higher plants, around 1400 species of freshwater algae, 1500 species of marine algae, 565 species of mosses, 516 species of lichens and 650 species of macromycetes.etc. Yugoslavia is still rich in forests, in Serbia around 27% and in Montenegro 52% territory. Serbia is regulated five percent of the territory for nature protection, with 5 national parks. Around 8% of the territory of Montenegro is regulated for nature protection with 4 national parks. A large number of nature areas in Yugoslavia is registered or nominated for attainment of an international status, as Tara, Durmitor, Sopocani etc.

For example as rich of biogeographically and phitocenological diversity, we can see one vertical zone stratification of forest ecosystem in future national park Prokletije, as relict and god preserved climatic vegetation, what is center of World biodiversity.



Also for example we can **expect new species** for Europe flora as recently reported plant species *Aristolochia merxmulleri*, Greuter and Mayer, and *Tulipa serbica*, Tatic and Krivosej, who live on serpentin soil what is especially important for biodiversity.

Barbarian NATO aggression against Yugoslavia started March 24. and finished June 10. 1999. after more than 35000 assaults against people and nature of Yugoslavia. More than 79 000 tons of explosives were dropped including 35450 cluster bombs, thermo-visual and graphite bombs what is prohibited with international war low. Especially crime was bombing with depleted uranium.

Every biotope in Yugoslavia is destroyed or damaged, **air, water and soil**. Since the Nato aggression for almost three full months, **every of 9 national parks** and nature reserves of national and international importance, as well as numerous localities out of borders of protected nature areas, where rare, endangered and protected plant and animal species live, **were bombed** and to a more or less extent damaged. It is not possible to give the exact estimate of the recent consequences for ecosystems and diversity, but it is most certain that the actions caused a greatly increased risk of extinction for many species and local populations.

#### Overview of chemicals or substances emitted as a result of war destructions:

Ethylene monochloride, phosgene, pyralenes ( PCB`s), ethylene dichloride, chlorine, products of fuel combustion, soot, oil and oil products, hydrofluoric acid, heavy metals, ammonia, depleted uranium etc.

The NATO aggression on Yugoslavia has certainly given, after the Golf war, the most concrete contribution to the global warming and greenhouse effect, also acid rain formation, and depletion ozone layer.

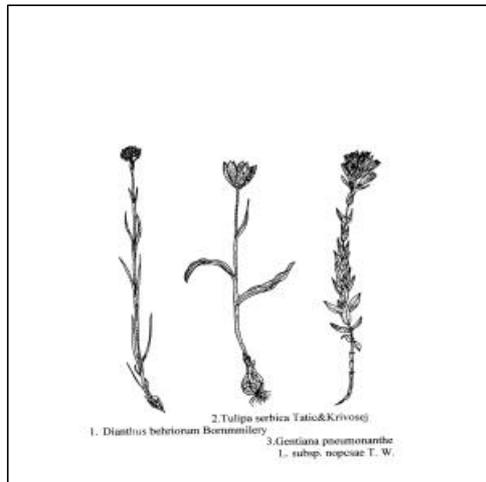
For example as destroyed environments, we can see especially and only locality where same butterfly live, its destroyed by NATO bombing:

Species	Locality	Date of bombing
<i>Leptidea morsei</i> Fenton	Fruska gora	25. March
<i>Colias caucasica balcanica</i> Rebel	Kopaonik	25. March
<i>Hipparchia volgensis delattini</i> Kudrna	Pristina, Grmija	26. March
<i>Lycia zonaria</i> D. und S.		
<i>Cygnia sordida</i> Hubner		
<i>Omphaloscelis lunosa</i> Hanjorth		
<i>Pyrgus andromedae</i> Njallen.	Sar planina	2. April
<i>Vacciniina optilete</i> Knoch		
<i>Scolitantides bavius</i> Eversmann		
<i>Erebia rhodopensis</i> Nicholl		
<i>Hepialus humuli</i> Linnaeus		
<i>Eublemma polugrama</i> Duponchel		
<i>Spialia phlomidis</i> H. und S.	Pashtrik	19. May

We can see also bombed habitats of 3 species that is critically endangered, species:

1. ***Tulipa serbica*** Taitic&Krivosej, its habitat is strongly affected by war activities, Srbovac near Kosovska Mitrovica town has been intensively bombed.
2. ***Dianthus behrriorum*** Bornmilery, Pastrk mountain has been already bombed.

***Gentiana pneumonanthe* L. subsp. *nopcsae*** (Jav.) T.Wraber, locuc classicus Kafa Morina was the place of heavy fighting and had been severely bombed.



## SUMMARY

Future negative consequences of NATO bombing on biodiversity and nature of Yugoslavia are difficult to perceive at the moment, and even more difficult to make any prediction in regard to the intensity of future ecological damages. Nevertheless, some elementary prognosis and estimations could be made even now:

- Present negative effects on reproduction, developed as a consequence of physical damaging of habitats and populations, as well as chemical and other types of contamination, can result in decrease of number or populations of the rarest most endangered species in Yugoslavia, and in migratory species even in the broader region,
- Accumulation of toxic and cancerous material in the soil and plants, in the future might result in decrease in number of populations of the most endangered species provoked by disturbance of their reproductive cycles,
- Accumulation of toxic and cancerous material in the soil and plants may provoke a food contamination, therefore we may expect harmful consequences for human health
- We expect reduction of biodiversity in Yugoslavia and Balkan Peninsula.

The necessity of future scientifically based ecological and biological monitoring is evident and also very strong protection of Yugoslav biodiversity, in that problem we need international support and cooperation for many projects.

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