

Hydro power development within the territory of Mavrovo National Park ("the former Yugoslav Republic of Macedonia")



**On-the-spot appraisal , June 2015
Pierre Galland, Switzerland**

Strasbourg, 3 December 2015

Mavrovo National Park

- One of the richest and best preserved mountain protected area in South Eastern Europe
- One of the 3 national parks in Macedonia
- High biodiversity, from broadleaf forest to high rocky peaks with many specialized habitats



National Parks in MK

Sar Planina NP
(Kosovo)

NP Mavrovo
73'000 ha

NP Galicica
22'700 ha

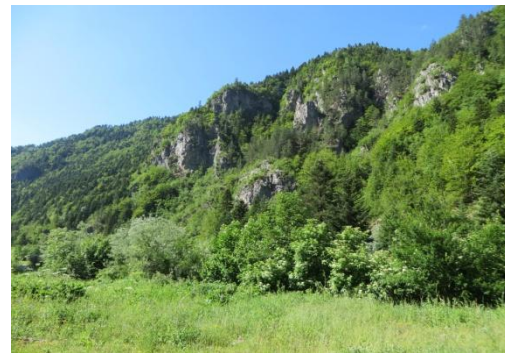
NP Pelister
12'000 ha

TOT: 1'100 Km²
(= ca. 4.6% of
nat. territory)



Mavrovo National Park

- Established in 1949; extended in 1952. Boundaries recently slightly adjusted. Largest NP in Makedonia
- Broad altitudinal range (600 – 2'750m)
- Encompass the southern branches of the Sar Planina, Korab massif and the adjacent watershed of the river Radika.



- IUCN cat. II (National Park);
- High landscape and habitat diversity, including broadleaf forest, subalpine mixed forest, subalpine and alpine meadows and pastures, rocky peaks and scree slopes



- specialized habitats of high conservation value at various elevations of the Park (peat bogs, riparian vegetation, meadows, etc.).



- Many rare and threatened species

The National Park Mavrovo has been identified as:

- (1) Important bird area: Radika river catchment and partially Shar Planina. Both sites are evaluated with criteria A3 and B2 (Global and European importance)**
- (2) an Important plant area and**
- (3) a Prime butterfly area.**
- (4) Part of the MK ecological network**
- (5) A candidate Emerald site (to become a Natura 2000 site upon EU accession)**

Species conservation

- Mammals: ca. 50 species, including wolf, bear, lynx, wild cat, otter, etc.
- Birds: 130 species, including Golden Eagle, Eagle Owl,
- Amphibian and reptiles: ca 30 species
- Fish: 2 species of trout
- Invertebrate: > 900 species
- Plants: > 1400 species

Many species are listed in Appendix of Bern Convention and Red Data Book

Hydropower development

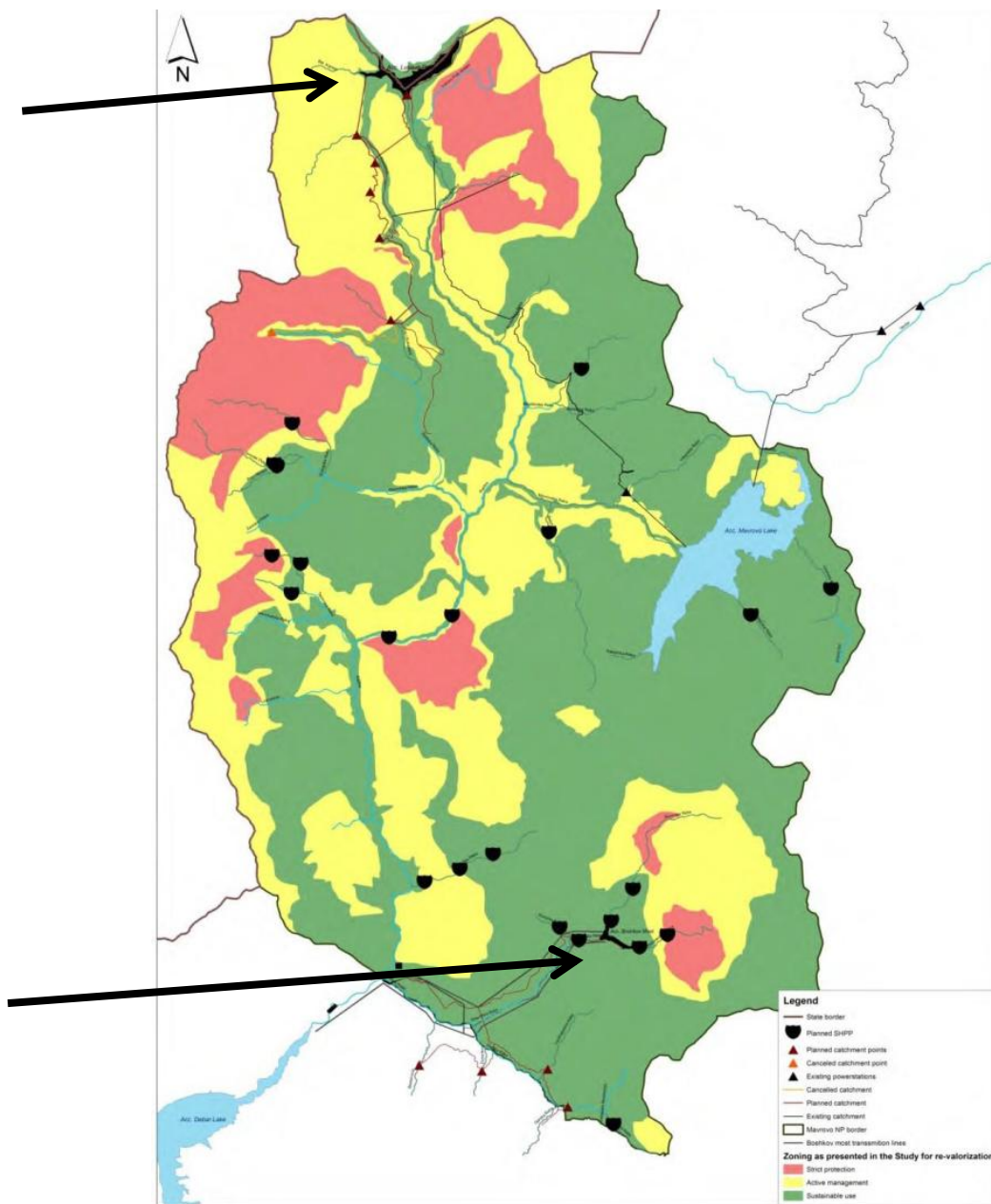
- Water resources have been used for several decades. Waters from the Radika catchment have been diverted to the artificial Mavrovo Lake and then into the Vardar River (1950's)



HPP LUKOVO POLE
Dam height: 71m

**SMALL HYDROPOWER
PLANTS (15 - 20)**

HPP BOSHKOV MOST
Dam height: 33m



HPP LUKOVO POLE

This project is planned to be constructed on the territory of Mavrovo National Park on the junction of the Shara and Korab Mountains on the Macedonia, Kosovo and Albania border. The water will be diverted from several tributaries of river Radika

- Dam height 71m
- Output 6 MW, estimated at 159 GWh per year with respect to additional benefits from existing HPPs
- Max daily flush 6 m³/s
- Construction/ widening of roads > 20 km road widening and bitumisation
- New supply channels 19.95 km
- Directly affected area inside NP Mavrovo 35.46 km²

HPP BOSHKOV MOST

The dam project Boskov Most is located in the upper Mala Reka valley in the southernmost part of the National park. The main source of funding for this dam project is the EBRD – the European Bank for Reconstruction and Development. The HPP is designed to produce peak energy. T-PVS/Files (2015) 37 - 6 -

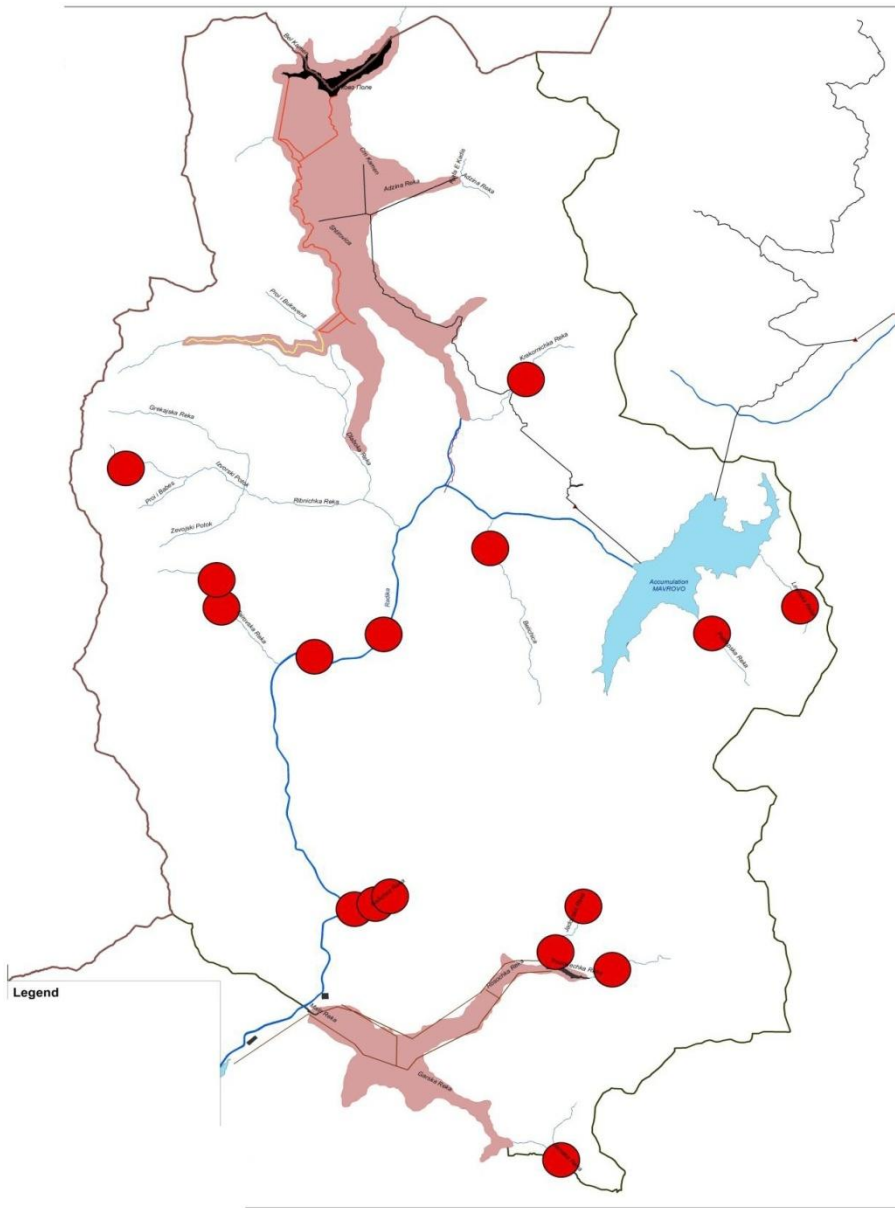
For that purpose the discharge of Mala River as well as its two major tributaries and several smaller streams in the area will be diverted into a reservoir via pipes and canals. On demand, the water will be released once a day.

- Dam height 33 m
- Output 22 m³/s in 5h per day (average discharge of Mala Reka:
- 5.75 m³/s)
- Construction/ widening of roads 16.4 km
- New supply channels 19.70 km
- Directly affected area inside National Park Mavrovo 9.35 km²

20 SMALL HYDROPOWER PLANTS

- According to the Public call for concessions published by the Ministry of Environment and Physical Planning, Ministry of Economy another 20 Small hydropower plants are to be built on the territory of National Park Mavrovo.
- The small hydropower plants (SHPP) as projected will affect the rivers and streams in Bogdevska Reka, Ribnichka Reka, Mavrovska Reka, Tairovska Reka, Galichka Reka and Rosochka Reka watersheds. Two of the planned SHPP are already build and operational

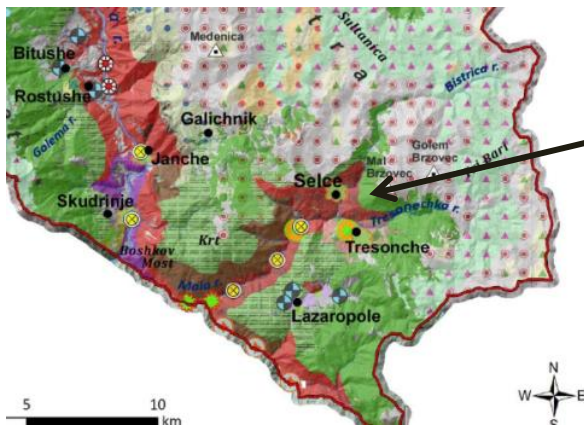




Area affected by the 2 new artificial lakes

➔ *It is essential to consider the **global impact of all the HPP planned in the National Park**, including the small ones widely distributed across the Park*

Boskov Most HPP



Area with high
habitat and
vegetation
diversity
(vegetation map)



Boskov Most HPP

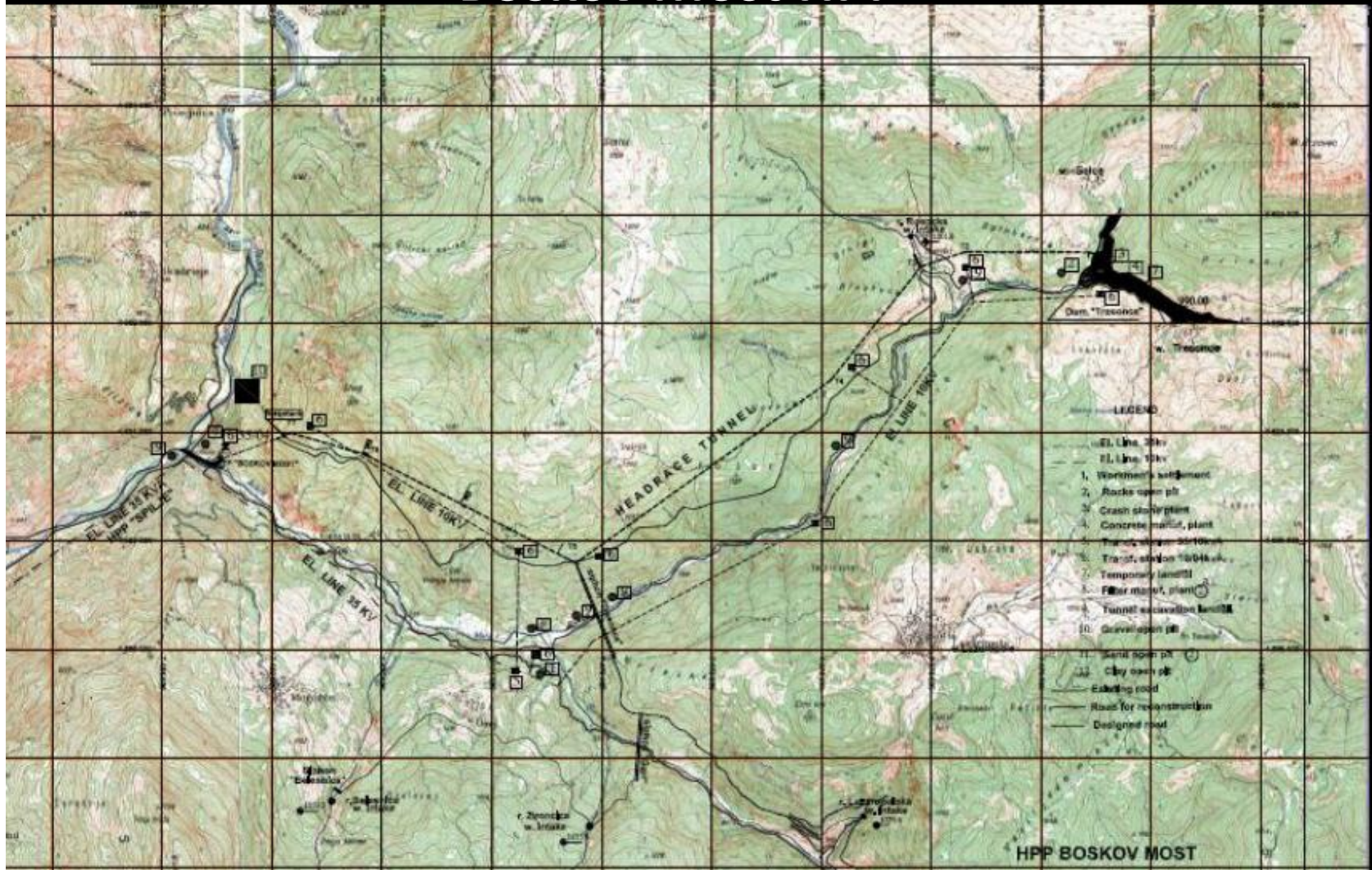
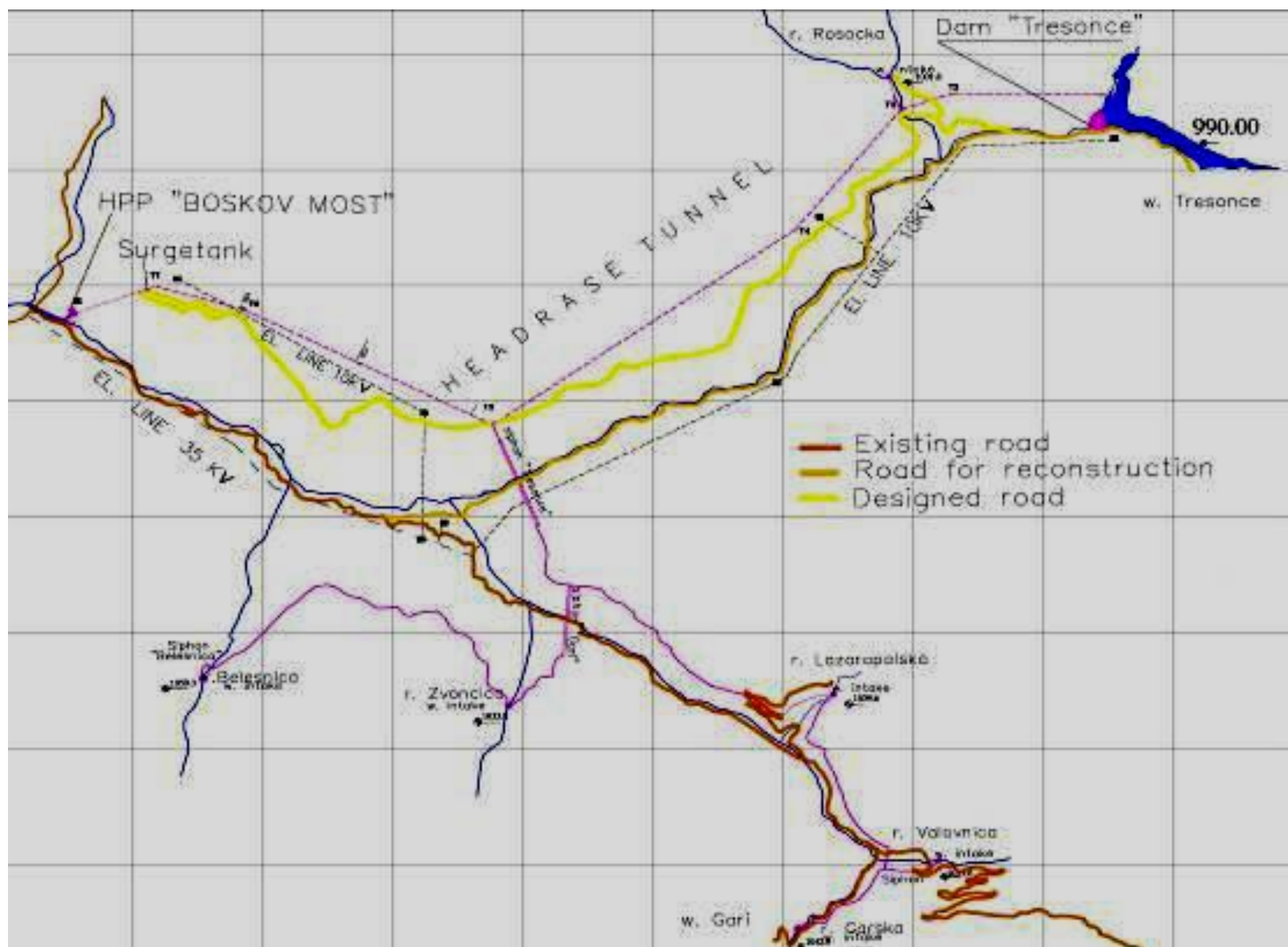
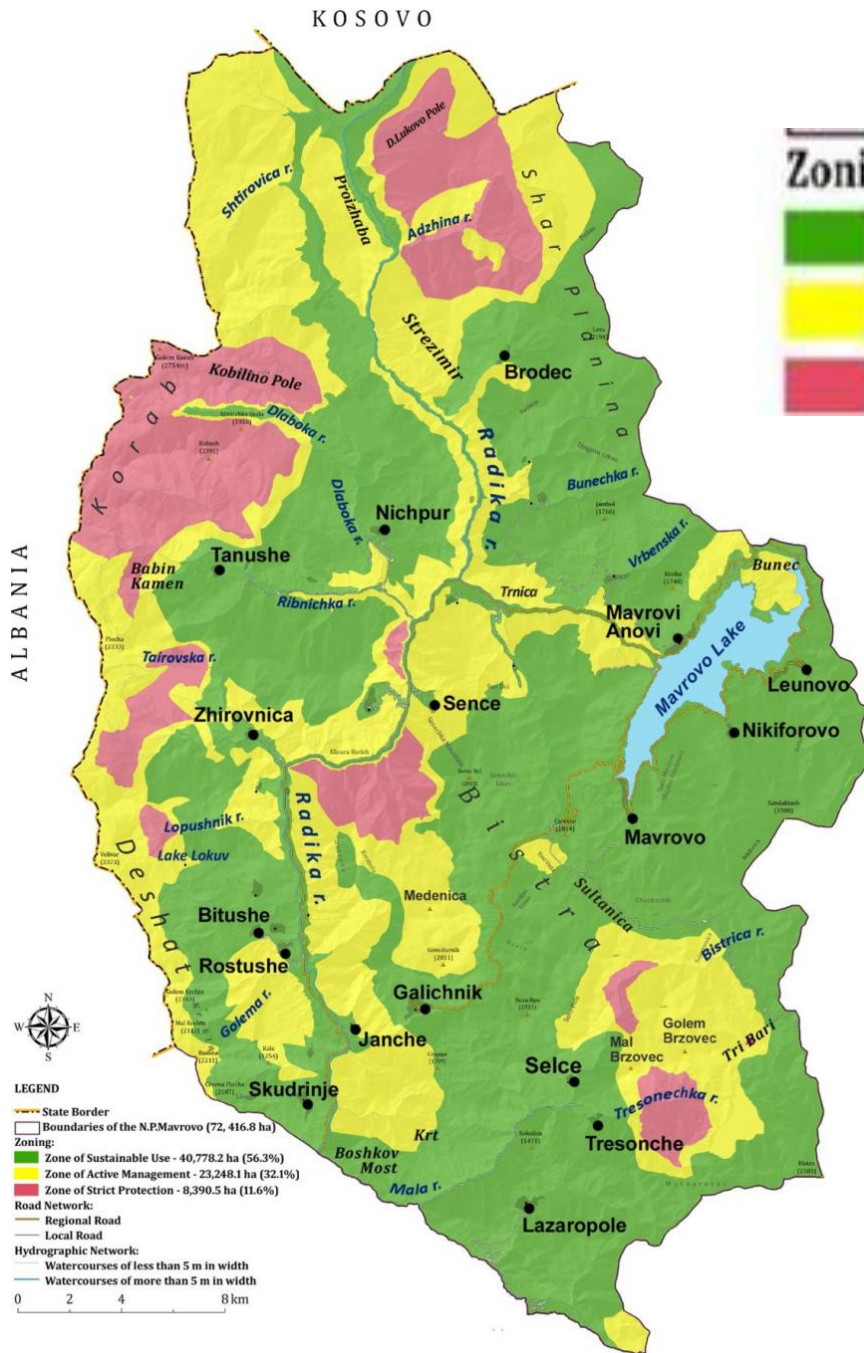


Figure 2. This figure shows where the different parts of Boskov Most HPP will be located





Zoning:

- Zone of Sustainable Use - 40,778.2 ha (56.3%)
- Zone of Active Management - 23,248.1 ha (32.1%)
- Zone of Strict Protection - 8,390.5 ha (11.6%)

Ex. of facilities permitted in the Sustainable Use zone:

30. New facilities for water abstraction from springs and streams
31. New housing facilities
32. New tourism facilities (hotels, restaurants, camps and similar)
33. New facilities for other purposes (management facilities of PINPM)
34. New facilities for agricultural activities (e.g., sheepfolds)
35. New infrastructure - water pipelines
36. New infrastructure - tourism related
37. New infrastructure - electrical power related
38. New infrastructure - asphalt roads
39. New infrastructure - soil roads

Mavrovo NP - Zoning

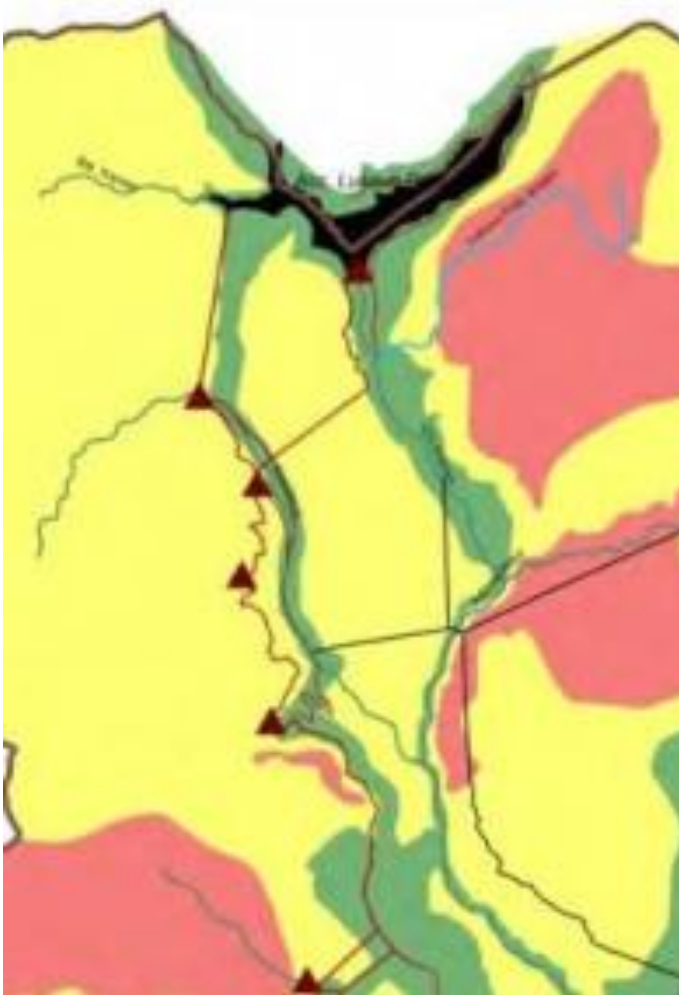
- The proposed **Zone of Sustainable Use** covers an area of 40,778.2 ha, which represents **56.3% of the total area of the Park**. In accordance with Article 106 of the Law on Nature Protection, the Zone of Sustainable Use is defined as “a significant part of the protected area **with no high values for protection**, with infrastructure facilities, objects of cultural heritage, and types of forest plantations that are not characteristic for the area, as well as inhabited places with the surrounding agriculture land”.
- With the next Management Plan (2021), as a result of the activities for sustainable use of natural resources that should be implemented in the next 10-Year period, 30% of the Zone of Sustainable Use could acquire characteristics of Zone of Active Management, which consecutively will create significant change in the zonation boundaries of the Mavrovo Protected Area.

Permitted and Restricted Activities in the Management Zones of the Park

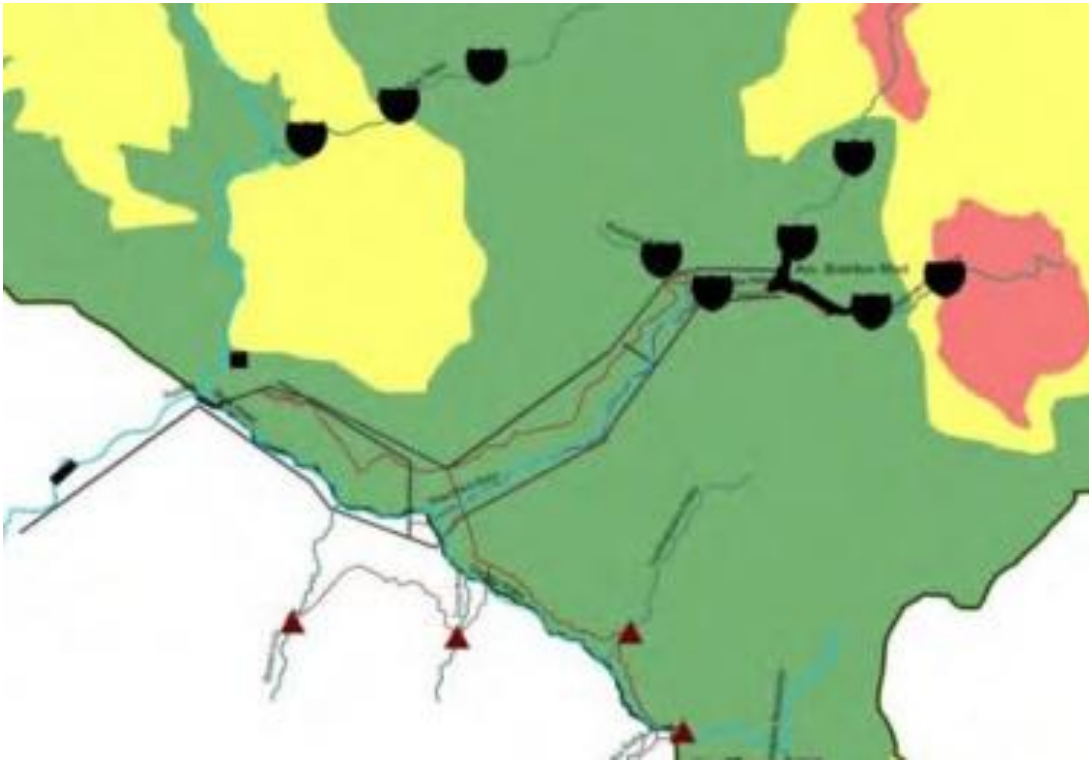
No.	Activity	Zone of Strict Protection	Zone of Active Management	Zone of Sustainable Use
1.	Scientific research (only with prior permit from MoEPP)	Yes	Yes	Yes
2.	Installation of Signposts	Yes	Yes	Yes
3.	Walking (along marked trails)	Yes	Yes	Yes
4.	Walking (off marked trails)	No	Yes	Yes
5.	Installation of info boards	No	Yes	Yes
6.	Designed picnic sites (tables, benches, shelters)	No	Yes	Yes
7.	Wilderness camping in specified locations	No	Yes	Yes
8.	Watching towers and viewpoints	No	Yes	Yes
9.	Making open fire	No	No	No
10.	Collecting mushrooms, wild fruits and plants (tea, blueberries, etc.)	No	Yes	Yes
11.	Collecting animals (butterflies, tortoises, frogs, lizards, snakes, birds, etc.)	No	No	No
12.	Collecting snails	No	Yes	Yes
13.	Livestock grazing	No	Yes	Yes
14.	Traditional agriculture	No	Yes	Yes
15.	Meadow mowing	No	Yes	Yes
16.	Beekeeping - temporary placement of beehives	No	Yes	Yes
17.	Beekeeping - temporary facilities	No	No	Yes
18.	Commercial forestry	No	No	Yes
19.	Intensive agricultural production	No	No	Yes
20.	Collection of deadwood and branches	No	No	Yes
21.	Sport fishing	No	No	Yes
22.	Hunting	No	No	Yes
23.	Ski running	No	Yes	Yes
24.	Downhill skiing (in undeveloped locations)	No	Yes	Yes
25.	Alpinism in undeveloped locations	No	Yes	Yes
26.	Mountain biking on designated trails	No	Yes	Yes
27.	Motor vehicles (off road and motorbikes)	No	No	Yes
28.	Horse riding	No	Yes	Yes
29.	Designing undeveloped springs	No	No	Yes
30.	New facilities for water abstraction from springs and streams	No	No	Yes
31.	New housing facilities	No	No	Yes
32.	New tourism facilities (hotels, restaurants, camps and similar)	No	No	Yes
33.	New facilities for other purposes (management facilities of PINPM)	No	Yes	Yes
34.	New facilities for agricultural activities (e.g., sheepfolds)	No	Yes	Yes
35.	New infrastructure - water pipelines	No	No	Yes
36.	New infrastructure - tourism related	No	No	Yes
37.	New infrastructure - electrical power related	No	No	Yes
38.	New infrastructure - asphalt roads	No	No	Yes
39.	New infrastructure - soil roads	No	Yes	Yes
40.	New infrastructure - sewerage	No	No	Yes
41.	New erosion control structures	No	Yes	Yes

30.	New facilities for water abstraction from springs and streams	No	No	Yes
31.	New housing facilities	No	No	Yes
32.	New tourism facilities (hotels, restaurants, camps and similar)	No	No	Yes
33.	New facilities for other purposes (management facilities of PINPM)	No	Yes	Yes
34.	New facilities for agricultural activities (e.g., sheepfolds)	No	Yes	Yes
35.	New infrastructure - water pipelines	No	No	Yes
36.	New infrastructure - tourism related	No	No	Yes
37.	New infrastructure - electrical power related	No	No	Yes
38.	New infrastructure - asphalt roads	No	No	Yes
39.	New infrastructure - soil roads	No	Yes	Yes
40.	New infrastructure - sewerage	No	No	Yes
41.	New erosion control structures	No	Yes	Yes

LUKOVO POLE



Boshkov Most location



Forest management

The Zone of Sustainable Use covers forest ecosystems which have undergone restoration activities and transformation into higher management category in the past and are currently used ***to generate income generation from wood*** and which are part of the macroeconomic interests of the state and ***critical for the financial support of the Park's management operations through self-financing*** in a situation where the income from non-consumptive uses is still at a very low level.

Article 26 - Mavrovo National Park proclamation law :

(1) Means of financing NP Mavrovo shall be provided by:

- The Budget of the Republic of Macedonia*
- Own revenues.*

Waters

- The construction of the reservoir Lukovo Pole is not expecting to cause any negative impact on the population of the Balkan Brook Trout (*Salmo farioides*), *which is the only fish species present in that area, since the same species exists quite successfully in the reservoir Mavrovsko Ezero Lake.*
- What will be the impact on the Montenegro Trout (*Salmo montenegrinus*) *by the construction of the reservoir between the villages of Tresonche and Seltse, as well as the water intake from the brooks and streams within the project on construction of the hydro-electric power plant Boshkov Most* **is unpredictable**, *since there are no existing studies on the biology of this species.*

Residual water flow

Law for proclaiming the protected area Mavrovo:

There is no mention of residual flow

Mavrovo Protected Area Management Plan

For the period 2012 - 2021

- Monitoring of Physico-chemical parameters (meteorological and hydrological).
 1. Physical (meteorological): standard parameters.
 2. Chemical: standard parameters.

PROJECT: HYDROPOWER PLANT “BOSKOV MOST” - NONTECHNICAL SUMMARY

- The “biological minimum flow” for the Boskov Most HPP was established by an expert biologist who estimated the water level that must be maintained in each river in each month of the year



Water uptake along
the Radika river



Species Conservation

“ NP Mavrovo is rich in exceptional and diverse biological diversity, represented by about 3757 taxa (species and subspecies) and presence of 115 endemic taxa:

- plants (13),*
- invertebrate fauna (86),*
- fish (3),*
- amphibians (3),*
- reptiles (5)*
- and mammals (5).*

Of the total number of endemic species and subspecies, 5 are local / national endemics, while the remaining 57 are Balkan endemites”.

Balkan Lynx:

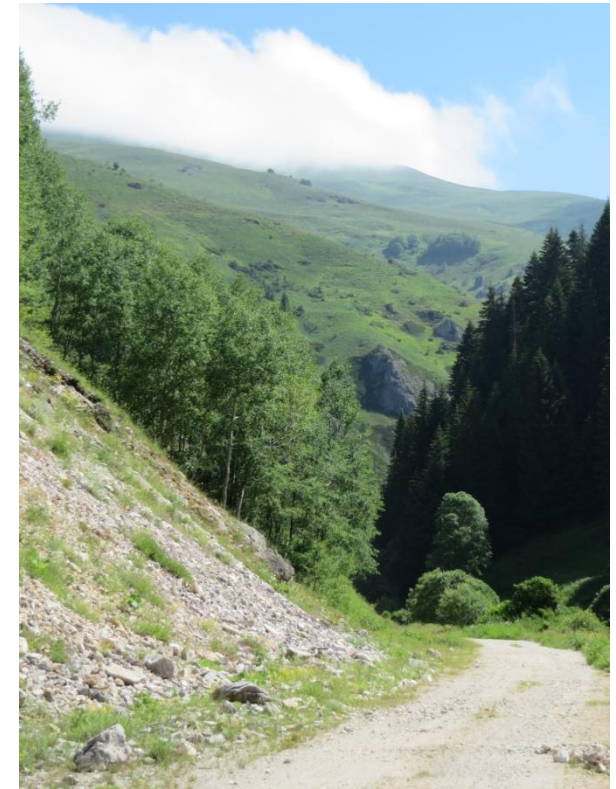
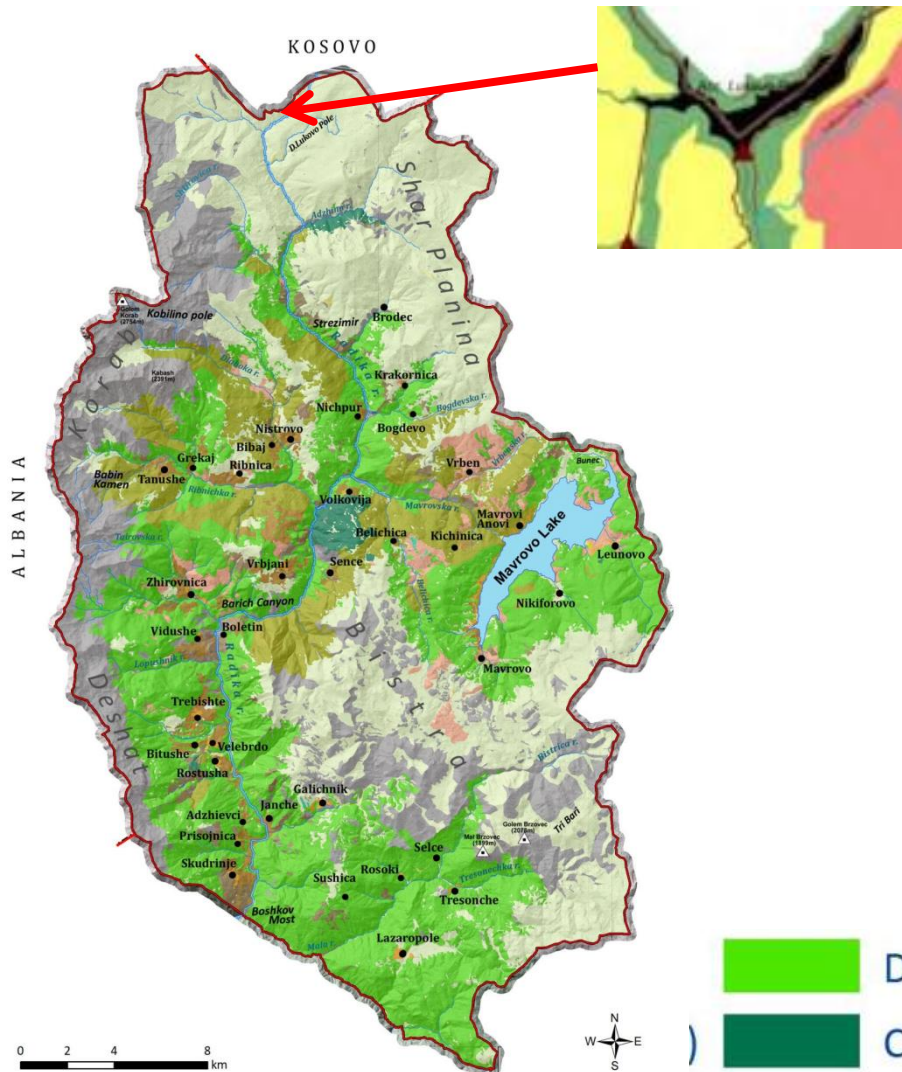
The Boskov Most HPP site is situated in prime lynx habitat and known to be used by several lynxes

“Mavrovo hosts [...] the last source of population with reproduction of the Balkan lynx [...]. Putting any additional stress on this source population may lead to the extinction of one of the most threatened mammal populations in Europe.”

Dr. Urs Breitenmoser, Co-Chair, IUCN-SSC Cat Specialist Group

“Although the planned construction site would cover only a very small part of the National Park, the current analyses have not documented in a convincing manner that the associated massive construction works [...] would not pose a high level of risk of major disturbance to and displacement of both to the prey species of the lynx and the lynx individuals themselves”

Positive impact of Lukovo artificial lake



Spruce – fir forest



The image shows the cover of a management plan. It features a yellow trapezoidal shape on the left and a photograph of a mountain landscape with green slopes and a few trees under a blue sky with clouds on the right. The title is written in yellow text on a dark green background.

Mavrovo Protected Area Management Plan for the period 2012-2021

3.1. A Vision for the Mavrovo Protected Area

- *The Protected Area National Park Mavrovo **with its natural beauties and exceptional natural values, remains a biodiversity hotspot**; an area in which the natural processes develop spontaneously, where the sustainable use of natural resources and the development of eco-tourism lead toward the development of the local communities respecting their economic, social and cultural needs.*
- *National Park Mavrovo is a **renowned brand, on National and International Level, where the authenticity of nature, the measures for its protection and the socio-economic development are developing through a holistic approach and participation of all stakeholders.***

Following the Law on Nature Protection (Article 72), Category II (National Park) is defined as follows:

(1) The National Park shall be a large, mainly unchanged area of land or water with particular multiple natural values, which encompasses one or more, preserved or insignificantly changed ecosystems, primarily designed for the protection of the ecological processes as well as the species and ecosystem features which are complementary to the area.

Conclusion

- There is an important contradiction between the general intention regarding the protection of the Mavrovo NP as expressed in the Law and some provisions in the management regime and their application.
- It appears already quite clearly that the extensions of the HPP in the park and their expected impacts would affect several species and habitat identified of European significance

For these reasons, the general conclusion from the mission is that the proposed hydropower construction planned in the Park is not compatible with the status of protection of the Park, its high value ecosystems and species.



**Thank you
for your
attention**

