Ecological status assessment of the water ecosystems of the Jablanica Mountain

Valentina Slavevska Stamenković & Biljana Rimcheska
Ecological status assessment of the water ecosystems of the Jablanica Mountain

Financed by Critical Ecosystem Partnership Fund (CEPF); implemented by Macedonian Ecological Society (MES)
The aim of this project:

- to raise public awareness;
- education of local community;
- enabling NGOs to engage in protecting and preserving the Drim watershed
ECOLOGICAL STATUS ASSESSMENT OF THE WATER ECOSYSTEMS OF THE JABLANICA MOUNTAIN

- MACROINVERTEBRATE ANALYSE-
SUBLIMATE OF THE ESTABLISHED RECOMMENDATIONS FOR THE NECESSARY CONSERVATION ACTIONS OF AQUATIC ECOSYSTEMS
SERVIVLE OF THE LIFE ON EARTH

COSES DISRUPTION OR LOSS OF SPECIES HABITATS...
Aquatic ecosystems
...AQUATIC ECOSYSTEMS ARE ONE OF THE MOST ENDANGERED ECOSYSTEMS...
What are the major threats for survival of freshwater biodiversity?
...for protection of surface water and groundwater in associate and member states of EU...

WFD - Water Framework Directive

Good Status 2015
INTRODUCTION

Biological elements

Hydro-morphological elements

Physical-chemical elements
BIological Elements

1. Phytobentos
2. Macrophytes
3. Macroinvertebrates
4. Fish fauna
MACROINVERTEBRATES
Macroinvertebrates

- Artificially established terminology refers to the part of the groups of invertebrate animals that inhabit the water ecosystem -

“Macro”

♣ large enough (> 500 µm) visible with naked eye and to be captured in the net with mesh of the size ≥ 200-500 µm

“Invertebrates”

♣ animals without vertebra
AIMS

... ESTABLISHING OF BIODIVERSITY OF MACROINVERTEBRATES ... 

... IDENTIFICATION OF MAIN TREATS FOR THE AQUATIC ECOSYSTEMS ...
AIMS

...ASSESSMENT OF THE ECOLOGICAL STATUS OF THE RIVERS AND LAKES FROM JABLANICA MOUNTAIN...

... MEASURES FOR IMPROVEMENT OF THE PRESENT CONDITION...
Monitored 30 water bodies from Jablanica mountain.
MATERIALS AND METHODS


Water framework directive (WFD)
Separation by groups

Preparation of microscope slides

Determination

Processing the collected material
Analyze of the biological component

Biodiversity analyze

SI, BMWP and ASPT

EPT
RESULTS
Macroinvertebrates diversity

Around 200 species
10 rare species
Local and Balkan endemic species
Glacial relict species
Concerned species
1 new species for the science
<table>
<thead>
<tr>
<th>Location</th>
<th>Species</th>
<th>Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vevchani springs, Lakavica River, Belichka reka, Springs of Podgorechka lake</td>
<td><em>Isoperla vevčianensis</em></td>
<td>Macedonian endemic species, only at Jablanica Mt.</td>
</tr>
<tr>
<td>Vevchani River</td>
<td><em>Protonemura miačense</em></td>
<td>Macedonian endemic species, found only in rivers in the West part of Macedonia</td>
</tr>
<tr>
<td>Lakavica Reka River</td>
<td><em>Bythinella drimica drimica</em></td>
<td>Balkan endemic species</td>
</tr>
<tr>
<td>Jablanichka Reka River</td>
<td><em>Epeorus yougoslavicu</em>s</td>
<td>Endemic species for Balkan and Apennine Peninsula</td>
</tr>
<tr>
<td>Lenishka Reka River</td>
<td><em>Thremma anomalum</em></td>
<td>Balkan and Carpathian endemic species</td>
</tr>
<tr>
<td>Vevchani Lake</td>
<td><em>Chirocephalus diaphanus</em></td>
<td>Relict species (for glacial lakes)</td>
</tr>
<tr>
<td>Rivers: Modrichka Reka, Lenishka Reka, Lakavichka Reka, Jablanichka Reka, Podgorechka Reka, Vevchanska Reka</td>
<td><em>Gammarus balcanicus</em></td>
<td>Balkan endemic species</td>
</tr>
</tbody>
</table>
Bythinella melovskii n.sp., a new species from R. Macedonia
(Gastropoda: Hydrobiidae)

PETER GLOER1* and VALENTINA SLAVEVSKA-STAMENKOVIĆ2

1 Biodiversity Research Laboratory, Schulstr. 3, D-25491 Helingen, Germany. E-mail: gloer@malaco.de
2 Institute of Biology, Faculty of Natural Science and Mathematics, Ss. Cyril and Methodius University, P.O. Box 162, 1000 Skopje, Republic Of Macedonia. E-mail: vstamen@yahoo.com

* Corresponding author
WATER BODIES SEPARATED BY THE RICHNESS OF RARE, ENDEMIC AND CONCERNED SPECIES

- **lakes:** Podgorechko, Vevchansko and Golemo Labunishko;

- **Wetlands:** Krstec bogs and swamps Ezerca;

- **Rivers:** Belichka Reka, Podloga (Crveno Kladenche), Lenishka Reka and Jablanichka Reka.
PROPOSALS FOR ZONATION OF THE PROPOSED NATIONAL PARK JABLANICA

- Strictly protected area
- Area of active management in the frame of the proposed National Park Jablanica
... in terms of biodiversity, reaffirms the importance of Jablanica mountain, simultaneously showing justification of the established proposal for declaring a part of the mountain in the category of protected area JABLANICA NATIONAL PARK.
ANTHROPOGENIC PRESSURE OF THE WATER ECOSYSTEMS
PRESSURES ANALYZE AND IMPACT ON WATER QUALITY

- Stronger influence at lower sections of the rivers;
- Intense flow of unpurified communal wastewater, e.g., Rivers Pskupshtinska, Labunishka and Podgorechka.
- Presence of solid waste
PRESSURES ANALYZE AND IMPACT ON WATER QUALITY

- Pollution of organic and non-organic origin in Modrichka Reka river (As a result of the separation of two active fishponds)
PRESSURES ANALYZE AND IMPACT ON WATER QUALITY

- Deterioration of the water quality condition of the river Jablanicka Reka;

- Shoddy building practices in the construction of hydropower above the village Piskupstina.
PRESSURES ANALYZE AND IMPACT ON WATER QUALITY

- Deterioration of the water quality condition of the river Jablanicka Reka;
- Shoddy building practices in the construction of hydropower above the village Piskupstina.
PRESSURES ANALYZE AND IMPACT ON WATER QUALITY

- Vevchansko lake - anthropogenic eutrophication
- Intensive livestock farming
- Presence of organic sediment on the lake bottom
PRESSURES ANALYZE AND IMPACT ON WATER QUALITY

- High anthropogenic influence: Podgorechko, Malo Labunishko and Golemo Labunishko Lake;
- Highly disturbed of the hydrological and ecological condition of the glacial lakes;
  - Unplanned and uncontrolled use of the lakes water.
CURRENT SITUATION WITH PODGORECHKO LAKE

With Ecological catastrophic consequences
CURRENT SITUATION WITH GOLEMO AND MALO LABUNISHKO LAKE

With Ecological catastrophic consequences
Golemo Labunishko (1) and Malo Labunishko Lake (2)
PRESSURES ANALYZE AND IMPACT ON WATER QUANTITY

- Over exploitation of freshwater resources (capturing of the water for agricultural and sanitarian uses);
- Situation with the rivers: Sushica, Podgorechka Reka, Belichka Reka;
- Belichka Reka in the village Dolna Belica is canalized with concrete river bed and completely dried up.
ECOLOGICAL STATUS OF THE WATER BODIES
OBJECTIVES FOR THE ENVIRONMENT

Environmental objectives are basic concept for providing sustainable water management and high level for environmental protection

- **Objective 1**: To prevent future disturbance of the surface waters and to achieve good ecological status of the water bodies;

- **Objective 2**: To control the water level in the rivers and lakes ecosystems (to prevent loss of water) on Jablanica mountain and to promote the concept for sustainable use of the water;

- **Objective 3**: To prevent future losses of hydrobiont diversity of Jablanica mountain try the adequate protection of its habitats.
MEASURES TO IMPROVE THE CURRENT ECOLOGICAL STATUS

1. **Project proposal for restoration** of Podgorechko Lake and its watershed;
   ✓ main objectives: *establishment* of the natural hydrological water condition of the lake and *protection* of the biodiversity.

2. **Project proposal for rehabilitation** of the current dam on the Podgorechko Lake;
   ✓ This measures are necessary for permanent solution with water supply of the region. The proposed proposals should be guided by the positive examples and experiences.

3. **Project proposal for rehabilitation** of the current system of tanks and pipelines under Golemo Labunishko lake.
MEASURES TO IMPROVE THE CURRENT ECOLOGICAL STATUS

4. **Project proposal for** closing the discharged canal build on Malo Labunishko Lake and restoring the natural charging of the lake;
   - The lake can be rehabilitate as aquatic sustainable system.

5. **Project proposal** with alternative solutions for long-term solutions of water supply;
   - Possibility to use ground waters whose available capacities are significantly used;
   - Possibility to connect the community to the water supply systems of Ohrid-Struga water system;
   - Even these proposed project are with higher cost, on long-term level they are cost effective and with long-term benefits to the local community and lakes ecosystems.
6. **Project proposal for** sewage systems in the villages Labunishta and Podgorci with treatment plants for wastewater treatment;
   - Treated wastewater can be used as potable water or released into riverbeds.

7. Construction of sewage systems;
   - To implement recommended practices for the design and performance of septic tanks and control pollution of the underground.

8. Future monitoring activities;
   - Assessment and monitoring of ecological status of surface water bodies, based on physic-chemical and biological parameters.

9. Introducing **practices for solid waste management** in the region.
High species diversity and rare water habitats on mountain Jablanica

Serious threat to water habitats and the important need for establishment of measures for its protection

Proposals for alternative water supplies for the local community

Result: lower environmental impact and improving of the ecological status of the water ecosystems
RECOMMENDATION

„The application of the proposed measures will enable to achieve the environmental goals, that will contribute to improve the quantitative and qualitative status of water resources and consequently will ensure the preservation of high species diversify, where in, is recognizable Jablanica mountain”
THANK YOU FOR YOUR ATTENTION