



Impact of environmental variables on benthic invertebrates community structure in Comana Marsh, Romania

Catalina Stoica^{a*}, Gabriela Ioana-Toroimac^b, Ionut Andrei Sandor^b, Gabriela Adina Morosanu^{b,c}, Dana-Maria Constantin^b, Ana-Maria Fulgheci^a, Iuliana Paun^a, Florinela Pirvu^a, Laura Florentina Chiriac^a and Mihai Nita-Lazar^a

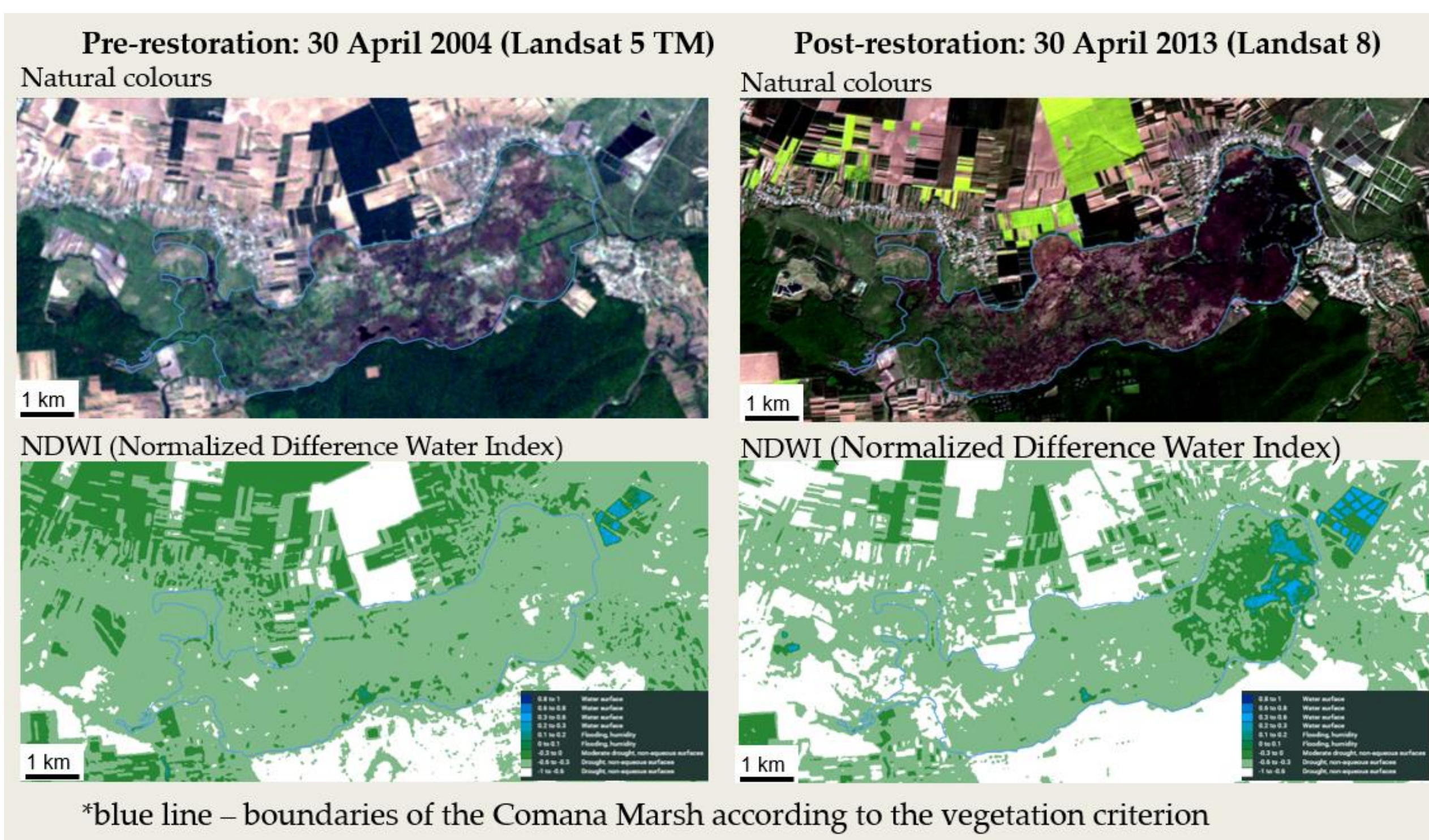
^a National Research and Development Institute for Industrial Ecology-ECOIND, Bucharest, Romania

^b University of Bucharest, Faculty of Geography, Bucharest, Romania

^c Romanian Academy, Institute of Geography, Bucharest, Romania

Correspondence e-mail: catalina.stoica@incdecoind.ro

Introduction

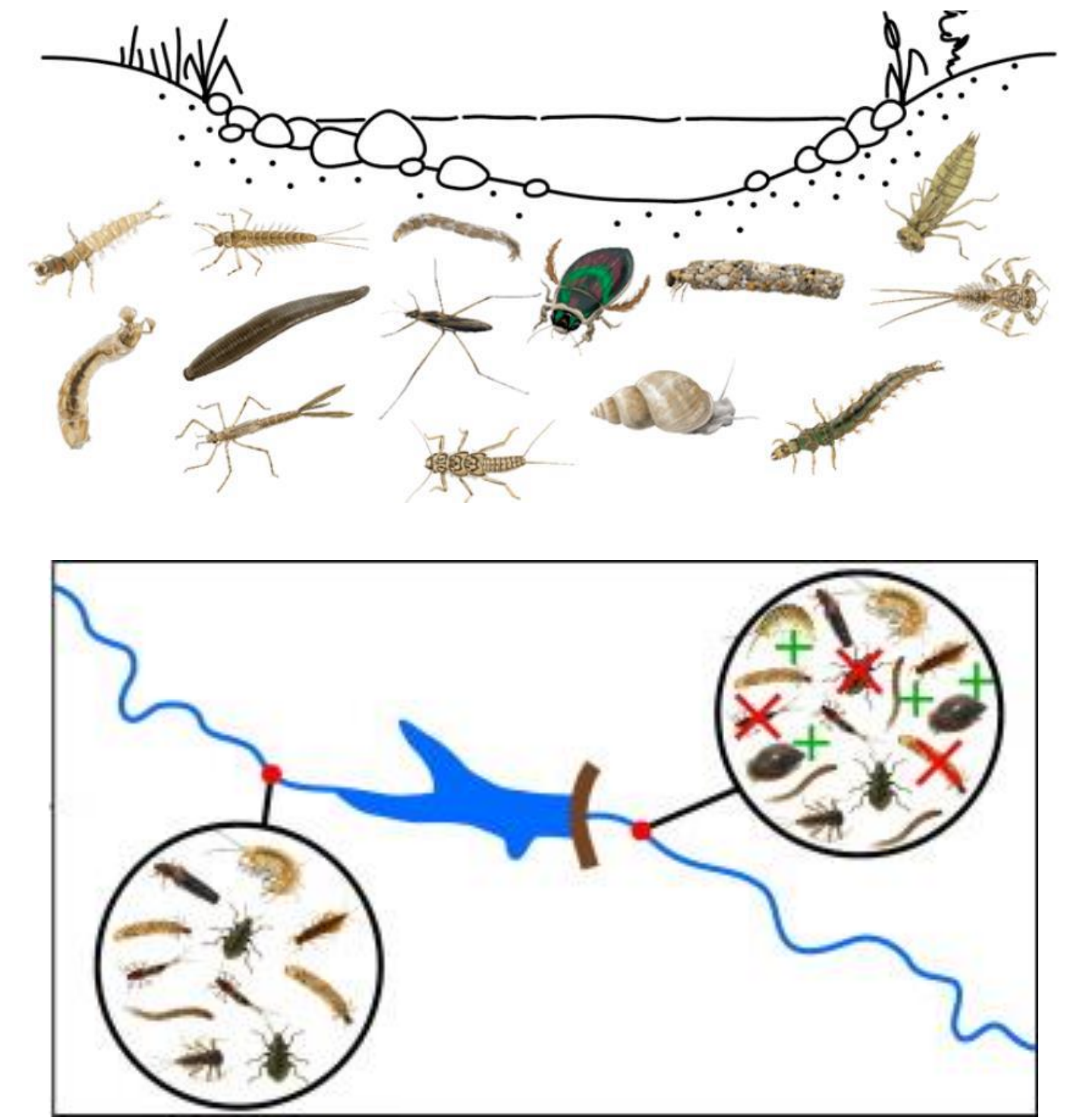


Comana Marsh: before and after restoration

Comana Marsh → restored in 2011

- a small side dam and a system of dykes were built on Neajlov River;
- to recreate the upstream marsh by a network of small natural connecting anabranching channels with hydrologically variable regime.
- improving the habitat of waterfowl – nesting and feeding on their migratory routes

Our study aimed to conduct post-restoration monitoring on macroinvertebrates and to analyse their relation with environmental variable across Comana Marsh

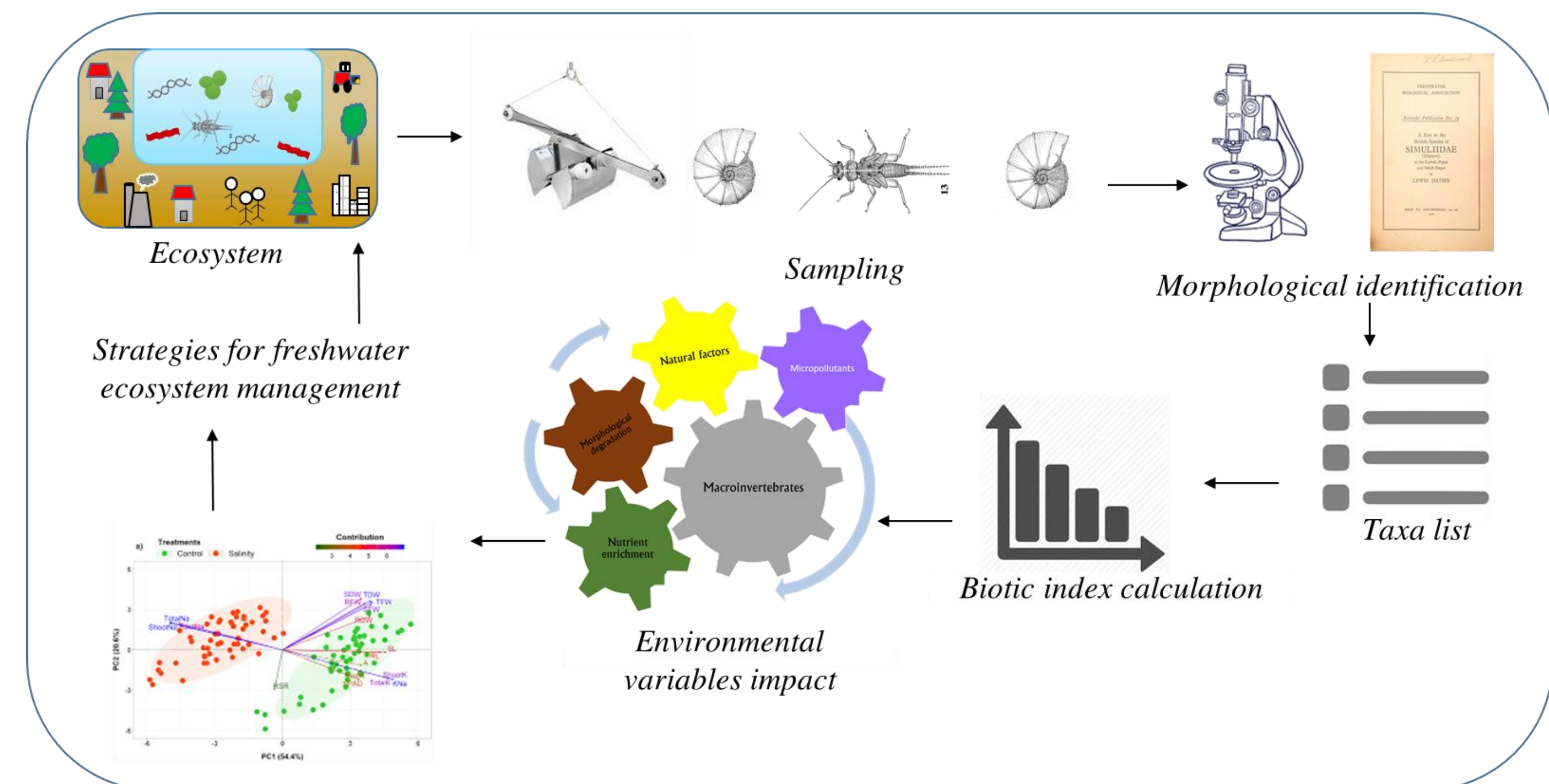
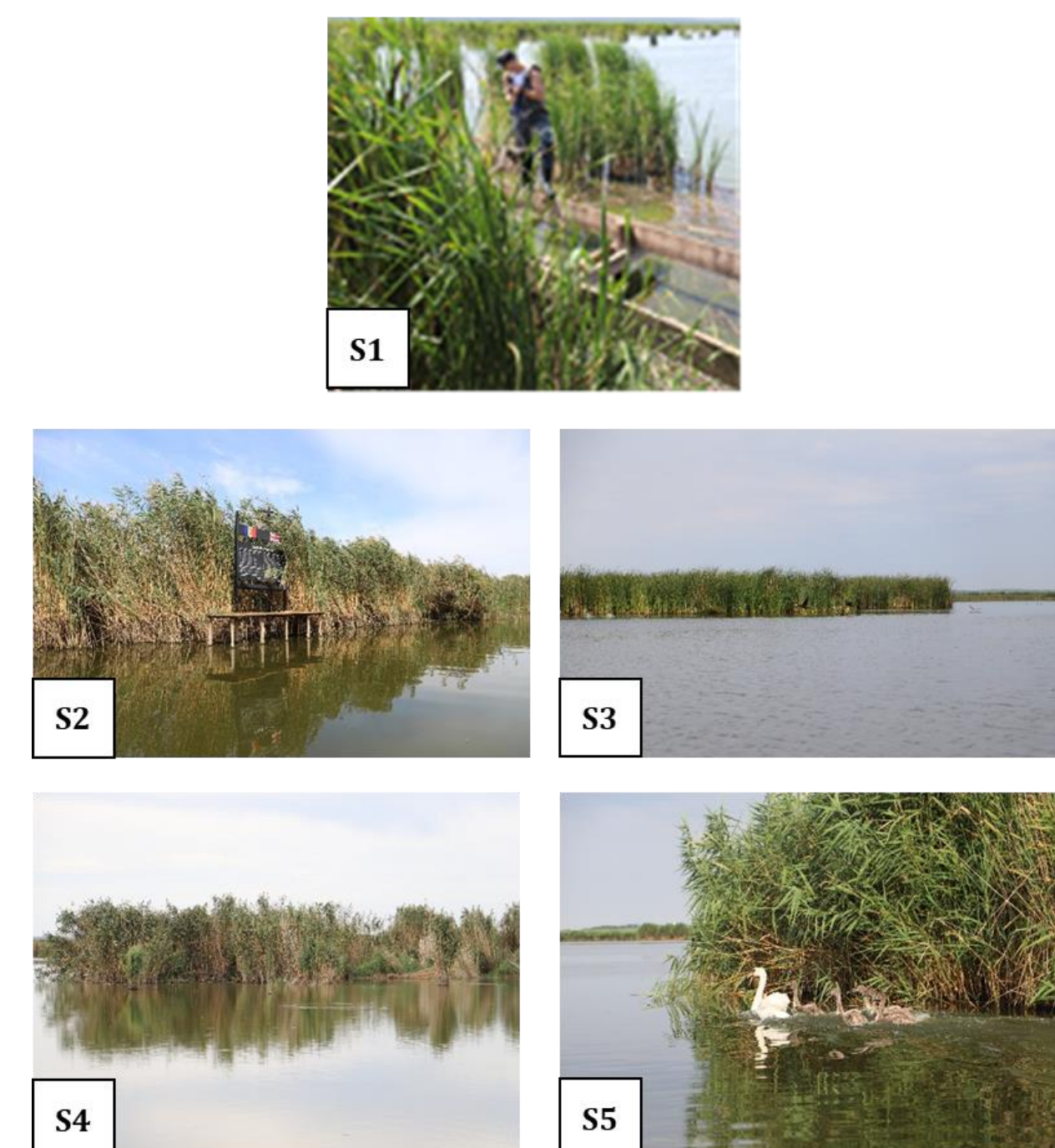


Materials and methods

- Comana Marsh – located on Neajlov River (mean annual discharge ~ 7 m³/s) – downstream of the mainly agricultural catchment
- Seasonal monitoring frequency (spring, summer, autumn of 2023)



Study area: Comana Marsh



Benthic invertebrates structure

- ✓ Taxonomical composition
- ✓ Taxa species
- ✓ Taxa individuals (ind./ sqm)
- ✓ Numerical abundance (%)

Environmental variables

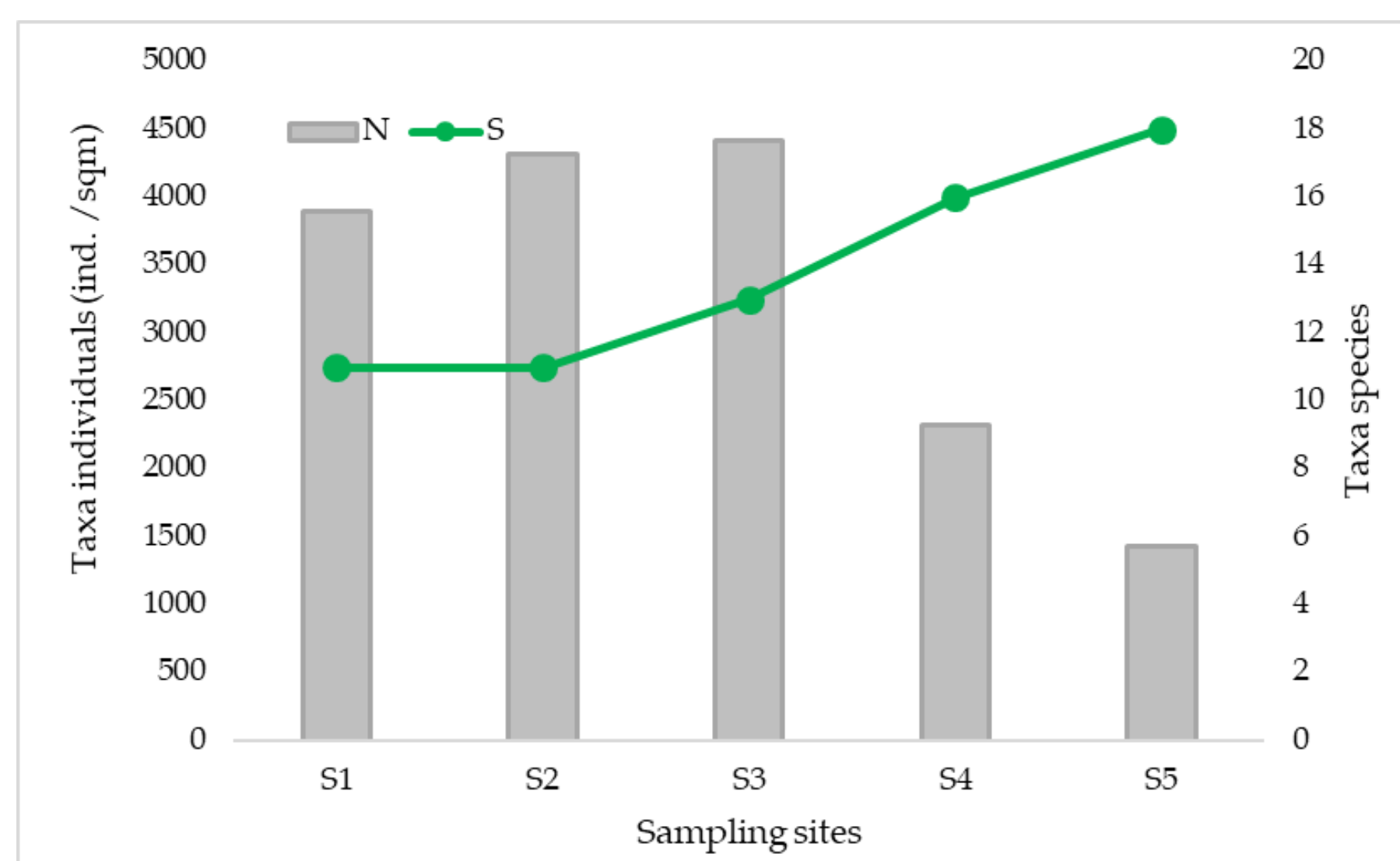
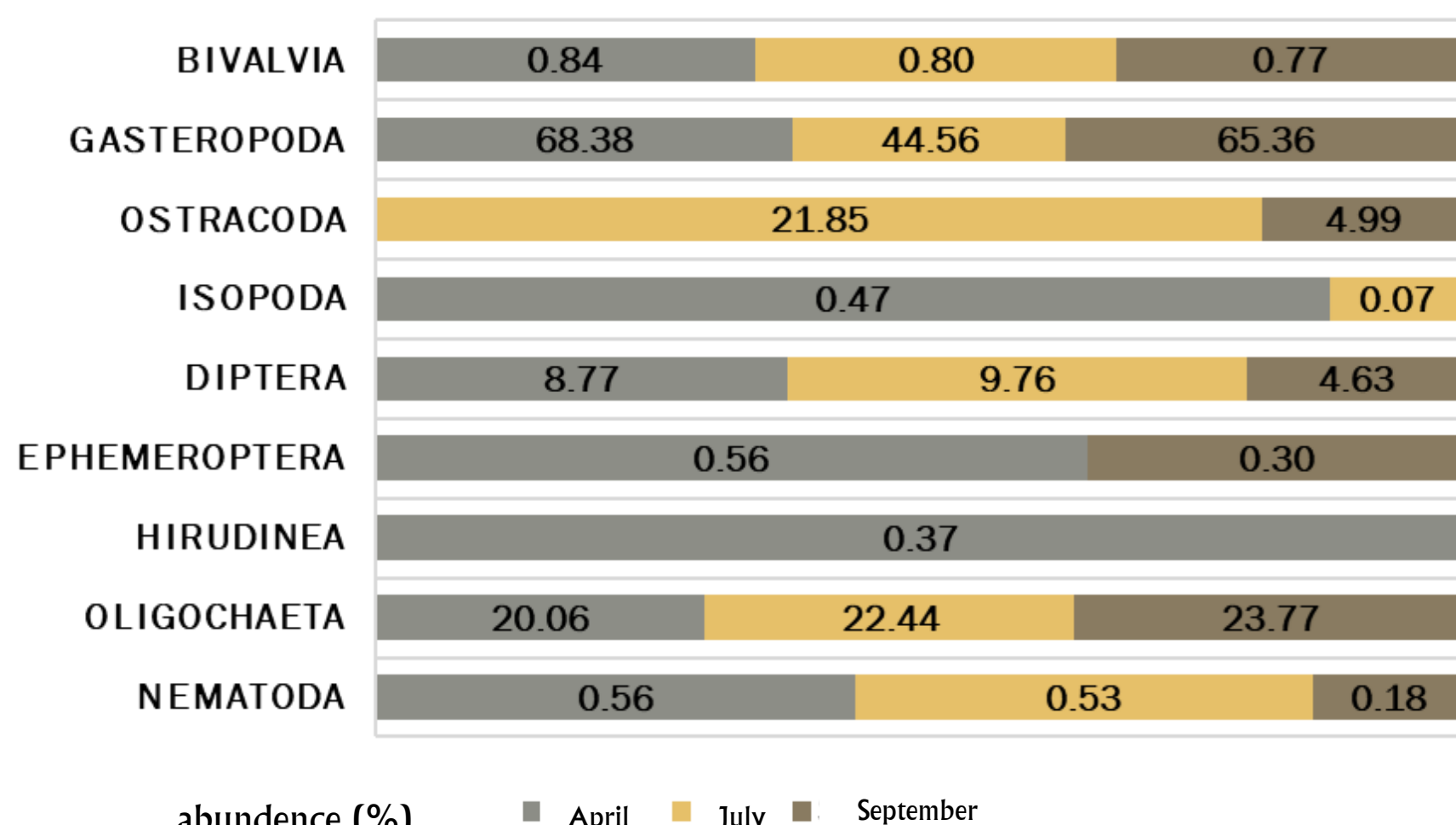
- ✓ salinity (EC, TDS, SO₄, Cl)
- ✓ oxygen regime (DO, BOD, COD, TOC)
- ✓ nutrients (TP, P-PO₄, TN, N-NH₃, N-NO₂, N-NO₃)
- ✓ hydromorphological parameters (FNU, WD)
- ✓ emerged vegetation surface (Eveg %)
- ✓ distance from the landscaped shore (ShLd)
- ✓ anthropization degree (AthD)

Results and conclusions

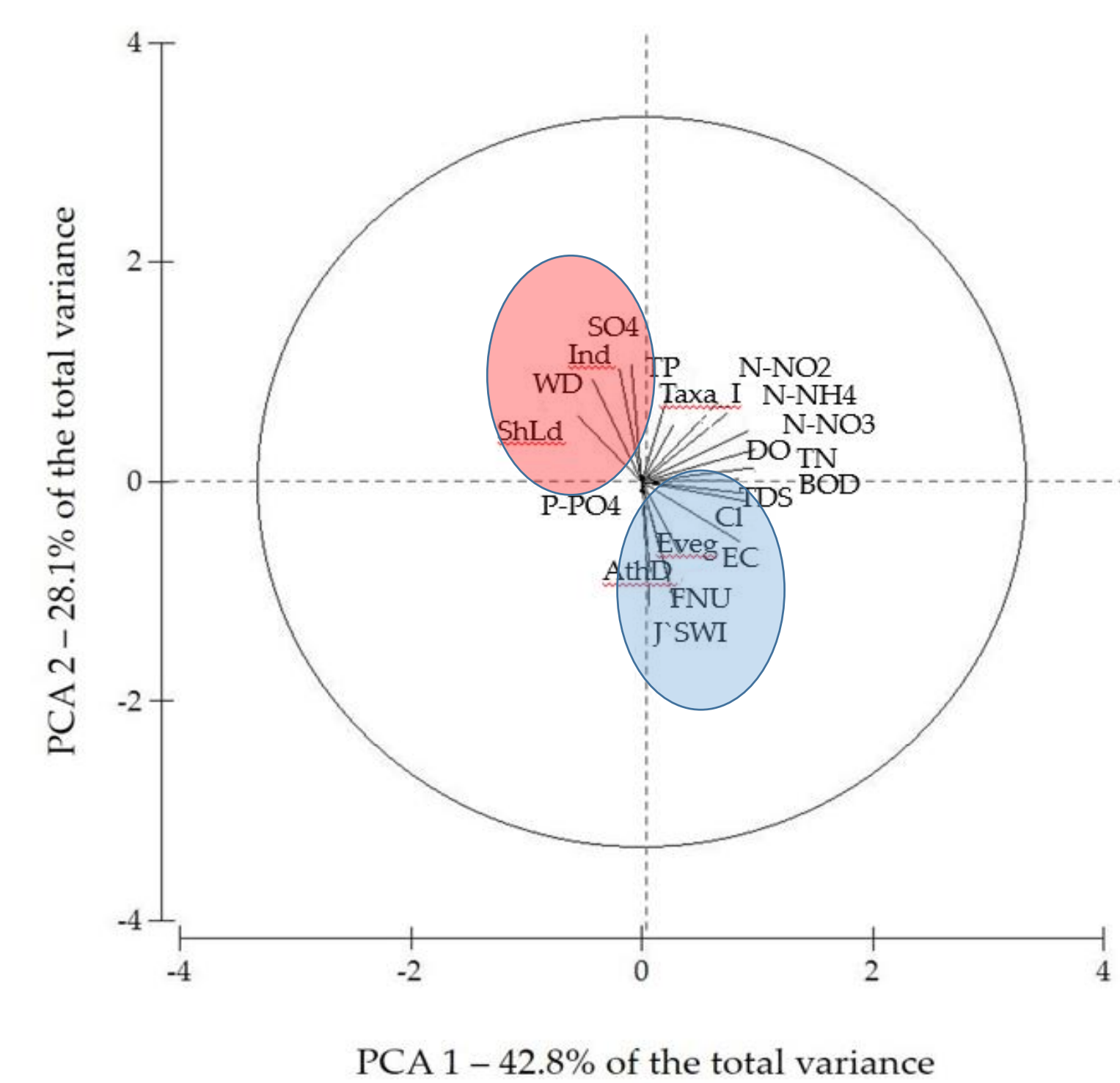
12 benthic invertebrates taxonomic groups of which:

- 8 groups at supraspecific level (Nematoda, Oligochaeta, Ephemeroptera, Diptera: Chironomidae, Ceratopogonidae, tabanidae, Culicidae, Ostracoda)
- 20 groups at species level

Macroinvertebrates structure during 2023 in Comana Marsh



Principal component analysis (PCA) showing the relationship between macroinvertebrates community structure and environmental variables



- Tolerant taxonomic groups characteristics for eutrophic/hipertrophic system;
- Colonization of semi-aquatic species (*Planorbis corneus*) & sensitive ones (Ord. Ephemeroptera);
- Benthic invertebrates fauna responded rather to environmental factors variability & anthropogenic impact, rather than restoration measures.



Comana Marsh in August 28th, 2024.
Photo credit George Calin, Inquam photos



The work was funded by the Ministry of Research, Innovation and Digitization, CNCS-UEFISCDI Romania, within PNCDI III, project number PN-III-PI-1.1-TE-2021-0600 and partially supported within NUCLEU Program, project no. PN 23 22 02 01.