



National Environmental Institute




CASE STUDIES IN HUNGARY ON LAKE MANAGEMENT


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Workshop about Good Practices and Implementation Plans

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The National Environmental Institute participates in the LakeAdmin project as a subcontractor, our task is to inventorize lake rehabilitation activities that can be identified as good practice in lake management.

- Lakes in Hungary, in general
 - Aspects of selection for detailed data collection and analysis
 - Experiences with the selected lakes so far
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LAKE IN HUNGARY

Registered : 3813 lakes , total area: 1828 km² ~2% of Hungary

Largest lakes:

Balaton 594 km²

Fertő-tó 75 km² (including the Austrian part: 292 km²)

Tisza-tó 121 km²

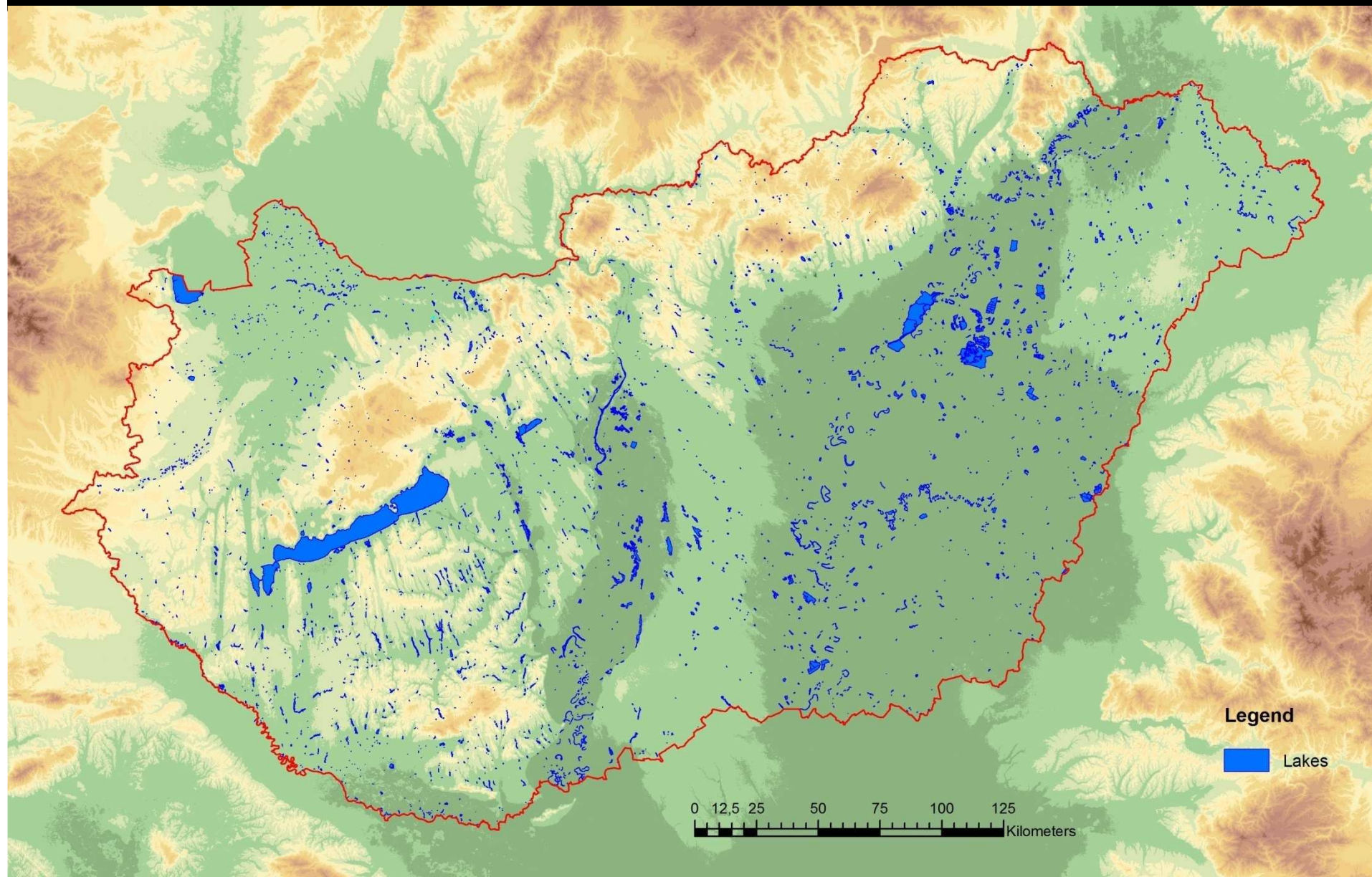
Velencei-tó 24 km²

Name unknown: 1230 lakes, 32% of the total

Owner unknown: 2711 71%

Average size of those lakes that neither the name, nor the owner is known: 6,4 ha

LAKES IN HUNGARY



LAKES IN HUNGARY

Are there more lakes?

Test area:

North-Transdanubian Water Directorate (12 directorates in Hungary)

Number of registered lakes: 330

Counted on areal photos and Google Earth: ~800

A conservative estimate: there might be ~ 5000 -6000 lakes altogether

How is it possible?

There are many intermittent lakes, not holding water all year or every year.
(wetlands, old oxbows)

New (unregistered, unlicensed) lakes since the last surveys of the 1:10.000 topographic maps (since 1986-1995)

LAKE TYPES

Major lakes

Natural lakes

Reservoirs

Fishponds

Oxbow lakes

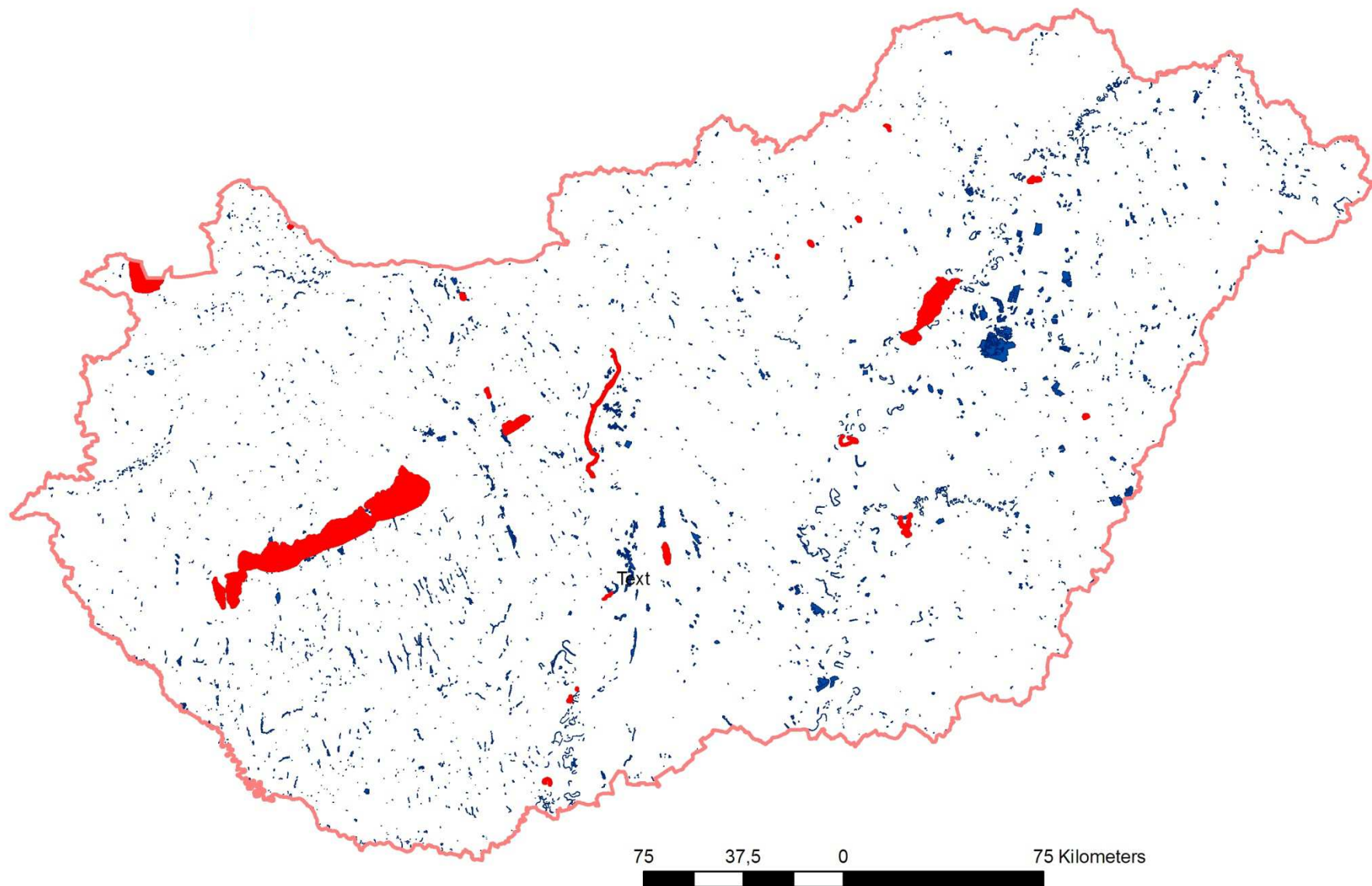
Impounded river sections and side-branches

Pit mine lakes (gravel lakes)

Saline lakes (500-750 mg/l sodium carbonate)

Wetland lakes (intermittent)

SELECTED LAKES



SELECTED LAKES

Major lakes

Balaton	recreation
Velencei-tó	nature conservation, recreation
Fertő-tó	nature conservation, recreation
Tisza-tó	nature conservation, recreation

Reservoirs

Tatai-Öreg-tó	scenic lake - fish breeding
Zámolyi-tározó	water retention for Lake Velencei
Lázbérci-tározó	drinking water reservoir
Markazi-tározó	industrial water supply
Laskó-völgyi tározó	irrigation water supply, angling
Gyöngyös-Nagyrédei-tározó	irrigation water supply, angling
K-XI-tározó	nature conservation (Natura 2000)

Oxbow lakes

Lipóti Morotva-tó	nature conservation
Kis-Decsi-holtág	nature conservation
Nagy-Decsi-holtág	nature conservation
Forgó-tó	nature conservation
Riha-tó	nature conservation
Tiszadobi-Holt-Tisza	recreation
Alcsi-Holt-Tisza	recreation
Szarvas-Békésszentandrás-holtág	nature conservation, recreation, irrigation

Impounded side-arm

Ráckevei-Soroksári-Duna	recreation
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Reconstructed wetlands

Kis-Balaton I.	nature conservation, water quality improvement	Reconstruction of ecosystems and water depth
Kis-Balaton II.	nature conservation, water quality improvement	Reconstruction of ecosystems and water depth

Saline (sodic) lakes

Kolon-tó	nature conservation
Szelidi-tó	nature conservation

Wetlands

Nyirkai-Hany vizes élőhely	nature conservation
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Nutrient retention in Kis-Balaton, sewage export from catchment, erosion reduction, dredging

Nutrient retention in reedbeds, sewage export, from catchment dredging

Dredging, improving conditions for breeding fish

Retention of sediments in a settling lake

Sewage export from catchment, retainment of floating litter

Increasing inflow, ecological rehabilitation,

Improvement of water exchange by lowering inflow threshold

Improvement of water exchange by lowering inflow threshold

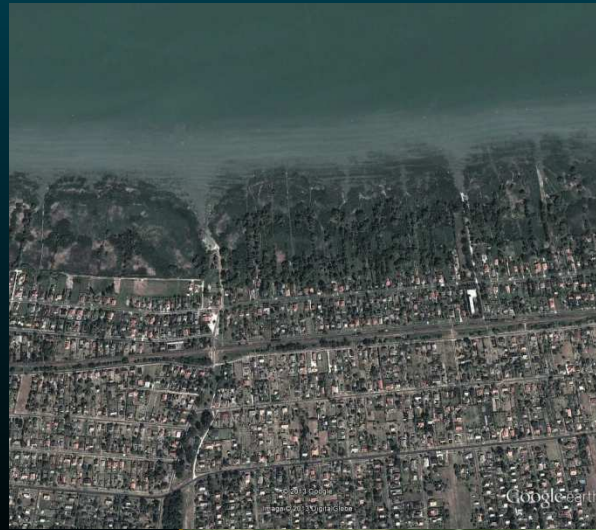
Increasing ecological low flows by improved water intake (surface+gw.)

Improvement of water exchange with the Tisza River

Reconstruction of ecosystems, increasing efficiency of sewage treatment

Sewage export from catchment, dredging of the channel

Balaton and Kis-Balaton



Nutrient retention in
Kis-Balaton,
sewage export
from catchment,
erosion reduction,
dredging

Velencei-tó/Velencei lake

Nutrient retention
in reedbeds,
sewage export,
from catchment,
dredging



Gemenc

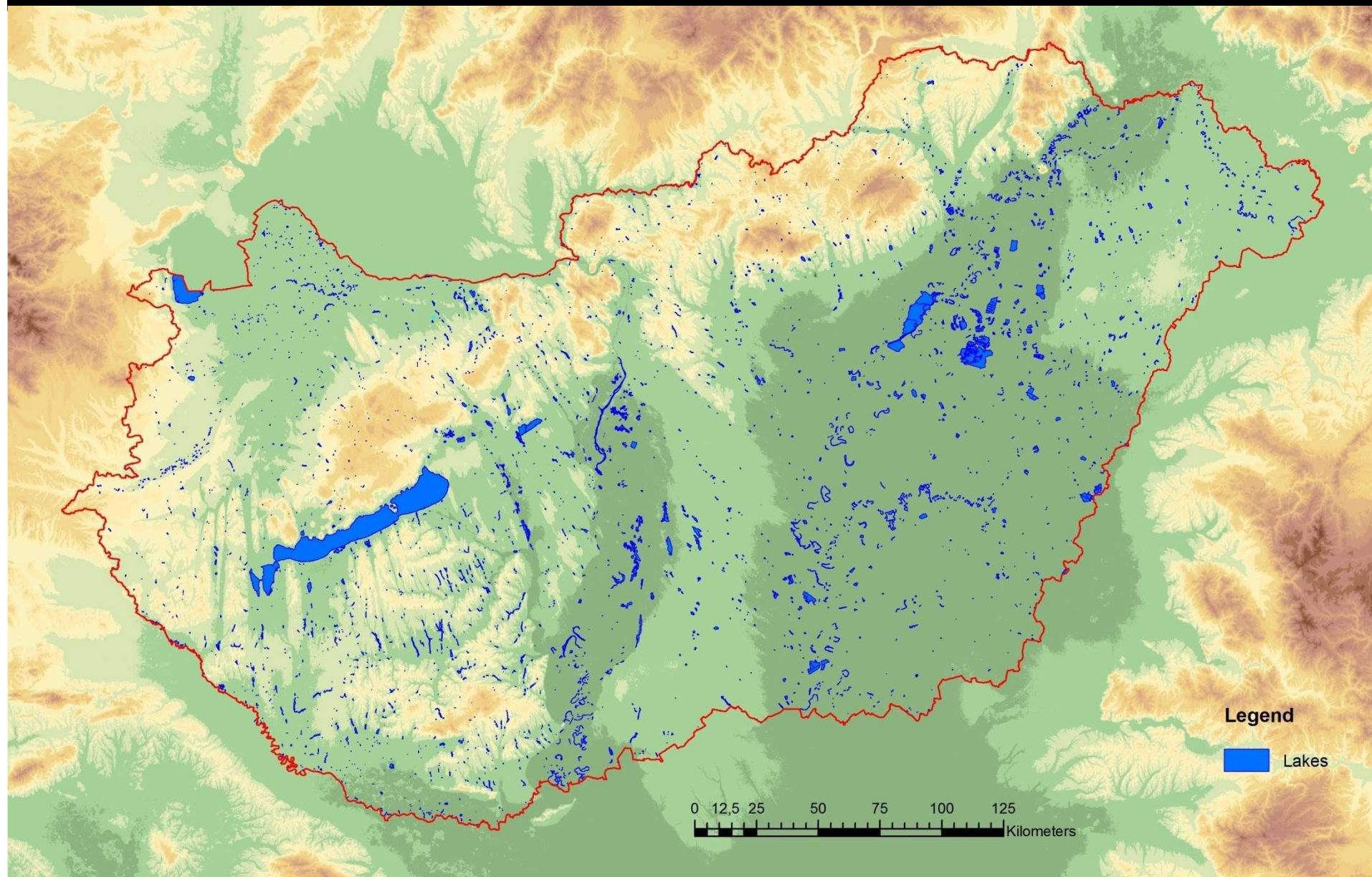
Danube and oxbow lakes on a wide floodplain;

Riverbed degradation is 1 cm/year, due to river regulation and hydropower station retaining gravel;

Dredging of oxbow entrances, thresholds and inflow channels.



LAKES IN HUNGARY

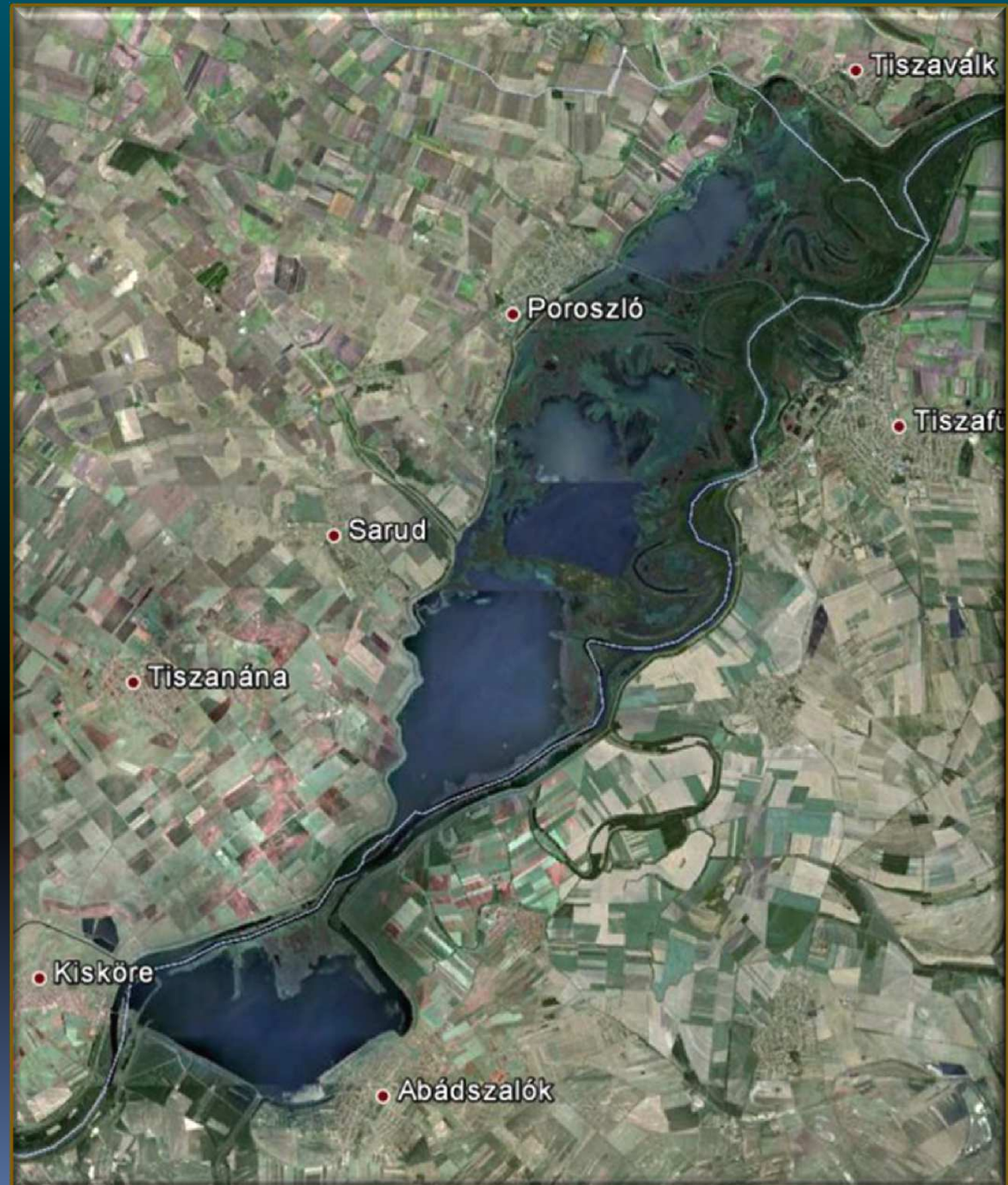


Tisza-tó

Tisza-tó/Tisza lake
Originally a reservoir to
provide
water for irrigation

Nowdays its declared main
functions are nature
protection and recreation

Dredging,



Experiences of the project till now

- There are/were very few well documented, monitored lake sanitation projects in Hungary.
- Monitoring data are very rare (mainly exist in case of bigger lakes, apart from biology data, which is rare here as well).
- In most cases lake improvement actions were motivated by recreation purposes, and has taken the form of increasing inflow, improving sewage treatment, exporting sewage from the catchment, decreasing pollution load, and dredging of the lake bed.
- There are several relatively undisturbed lakes with high biodiversity compared to other European regions, e.g. the oxbow lakes along the Danube and the Drava. Nevertheless, oxbow lakes are aging, especially as they are getting disconnected from the river due to riverbed degradation.

Experiences of the project till now

- In case of oxbow lakes dredging seems to be a necessary intervention or at least a basic part of the toolbox to counterbalance aging.
- Nature conservation, biodiversity, and habitat protection is a new aspect and its importance is increasingly realised. The share of lakes in this area is not very high, out of the 1500+ projects derived from the measures initiated by River Basin Management Plans there are only about 30 dealing with lakes.



Thank you for your attention

