

Forest Monitoring and Observation System (FMOS)

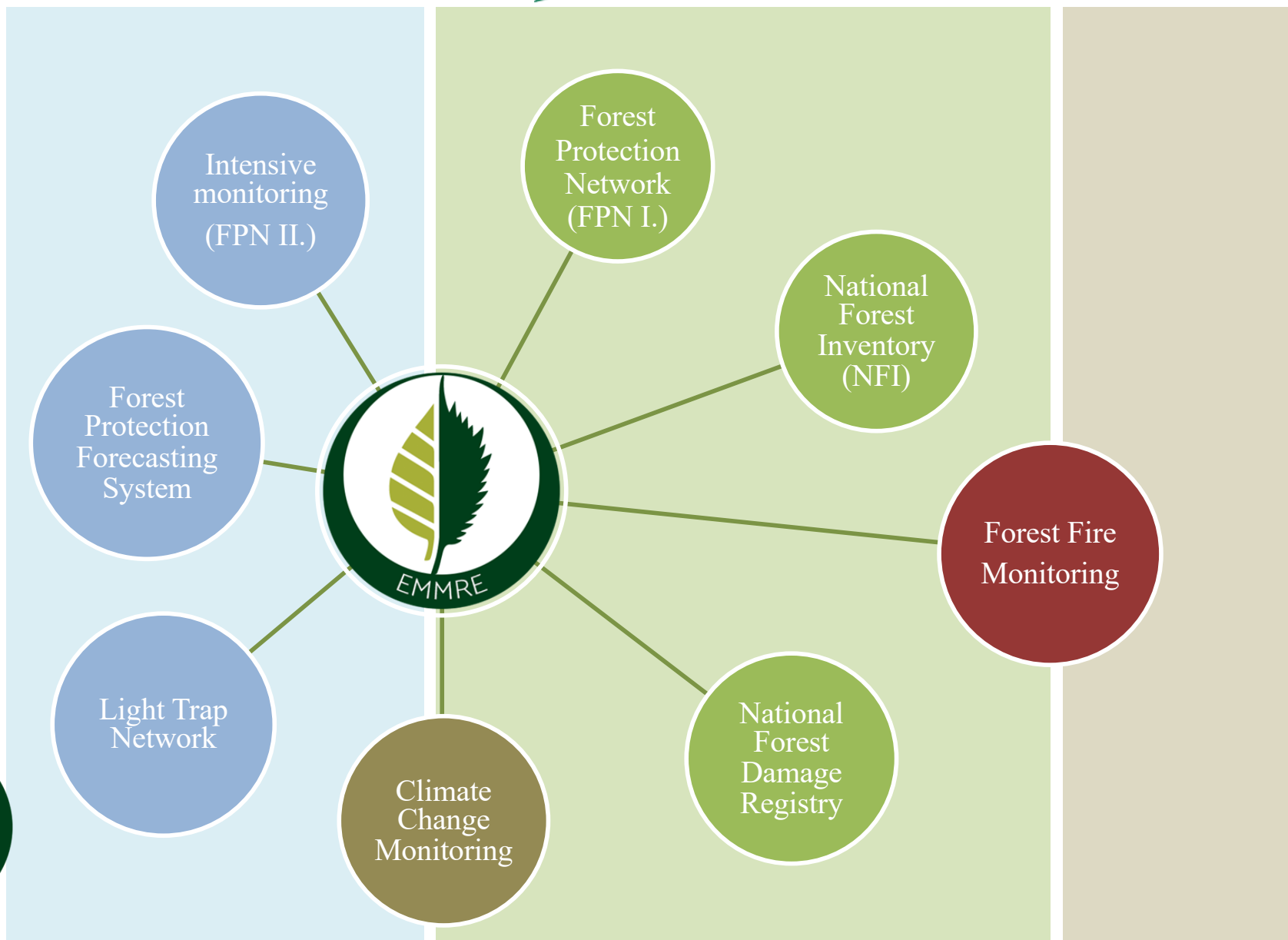
Kinga Nagy, National Land Centre,
Forestry Department, FMOS Division

&

Ferenc Lakatos, University of Sopron



Sub-systems of FMOS



FMOS webpage (2023. 03. 10.)



NEMZETI
FÖLDÜGYI KÖZPONT

keresés



Elektronikus Pályázati Rendszer

FŐOLDAL

NFK

FŐOSZTÁLYOK

HÍREK

KÖZLEMÉNYEK

TÁJÉKOZTATÓK

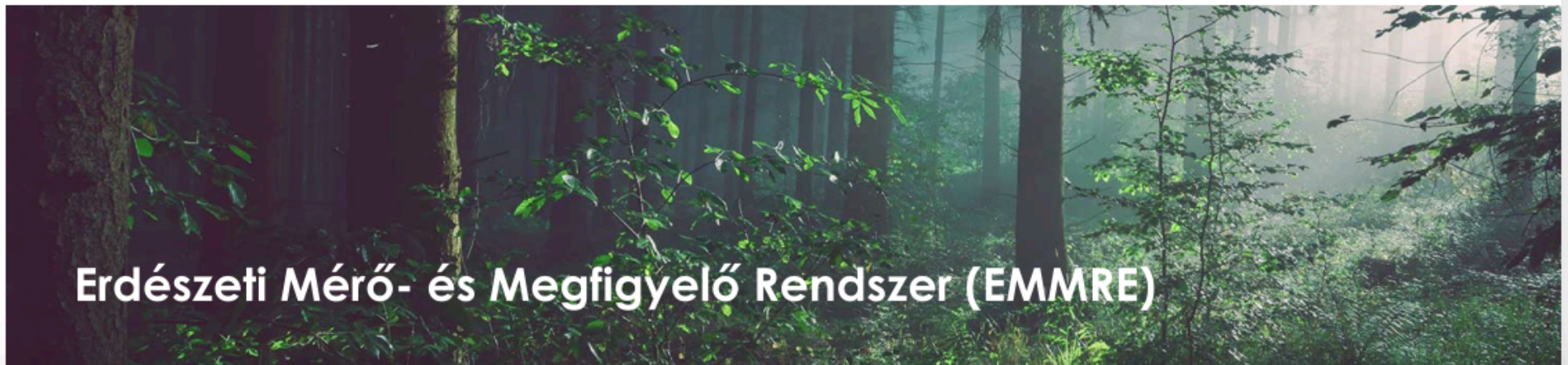
DOKUMENTUMTÁR

GYIK

OSZTATLAN

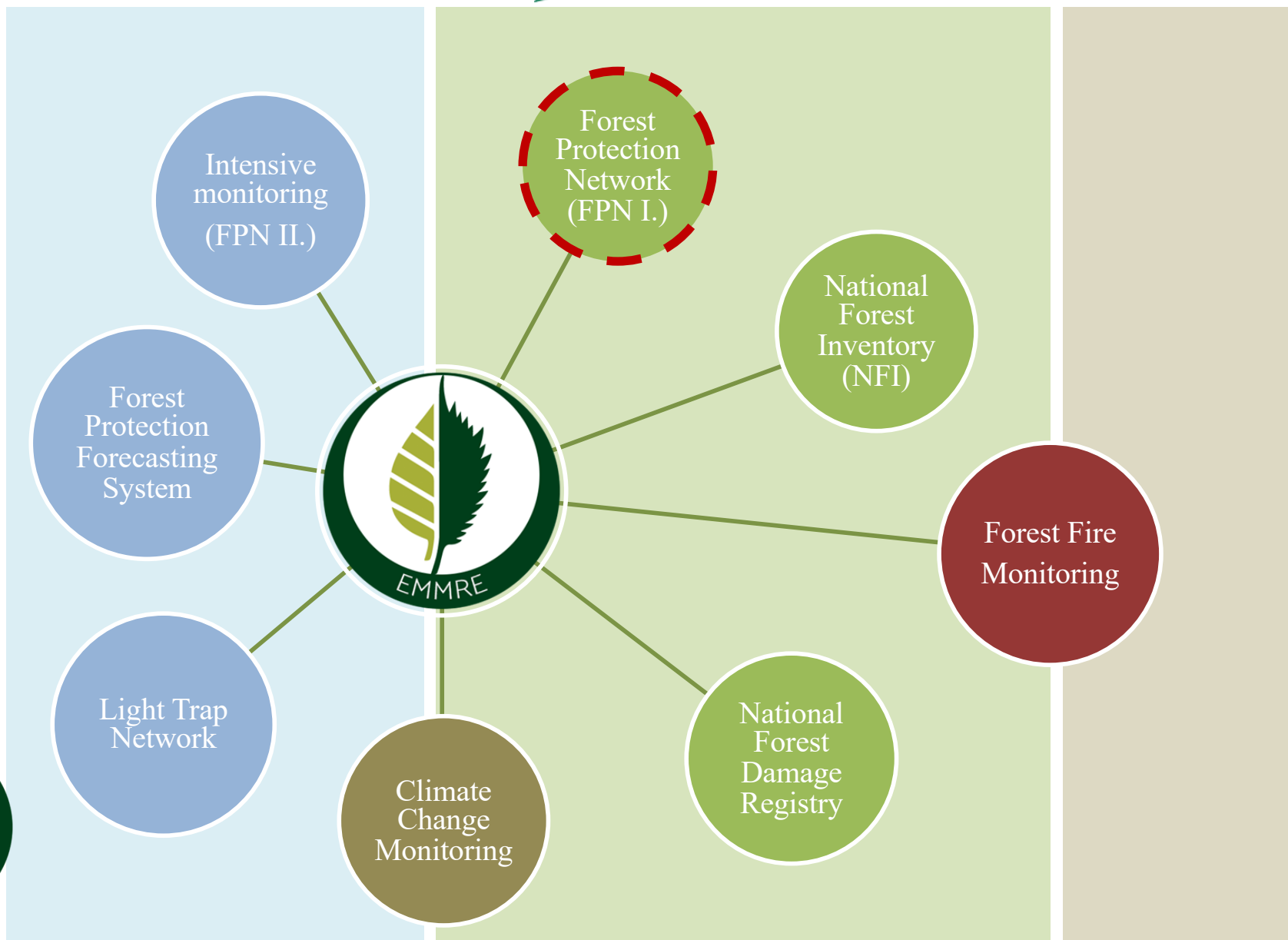
Erdészeti Mérő- és Megfigyelő Rendszer (EMMRE)

2021-11-03 11:26:53



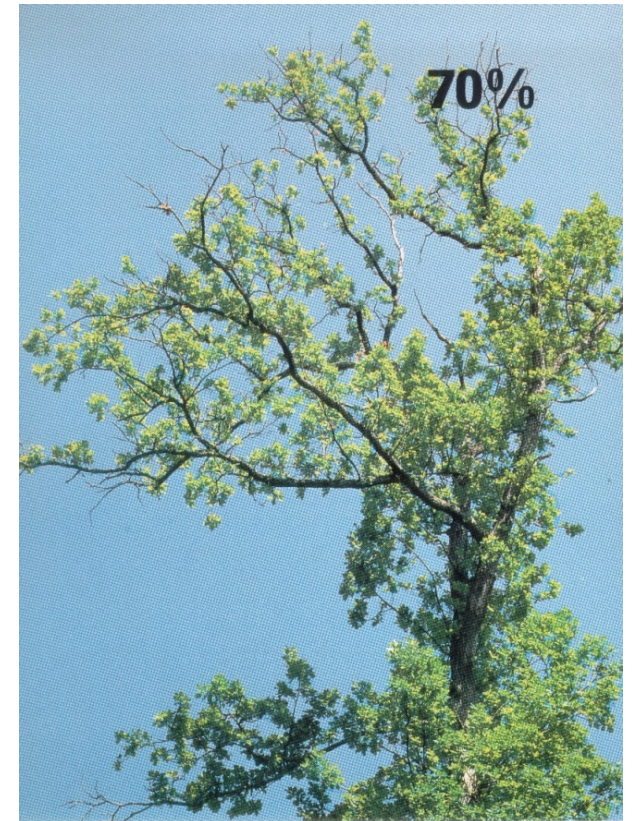
https://nfk.gov.hu/Erdeszeti_Mero__es_Megfigyelo_Rendszer__EMMRE__news_537

Sub-systems of FMOS

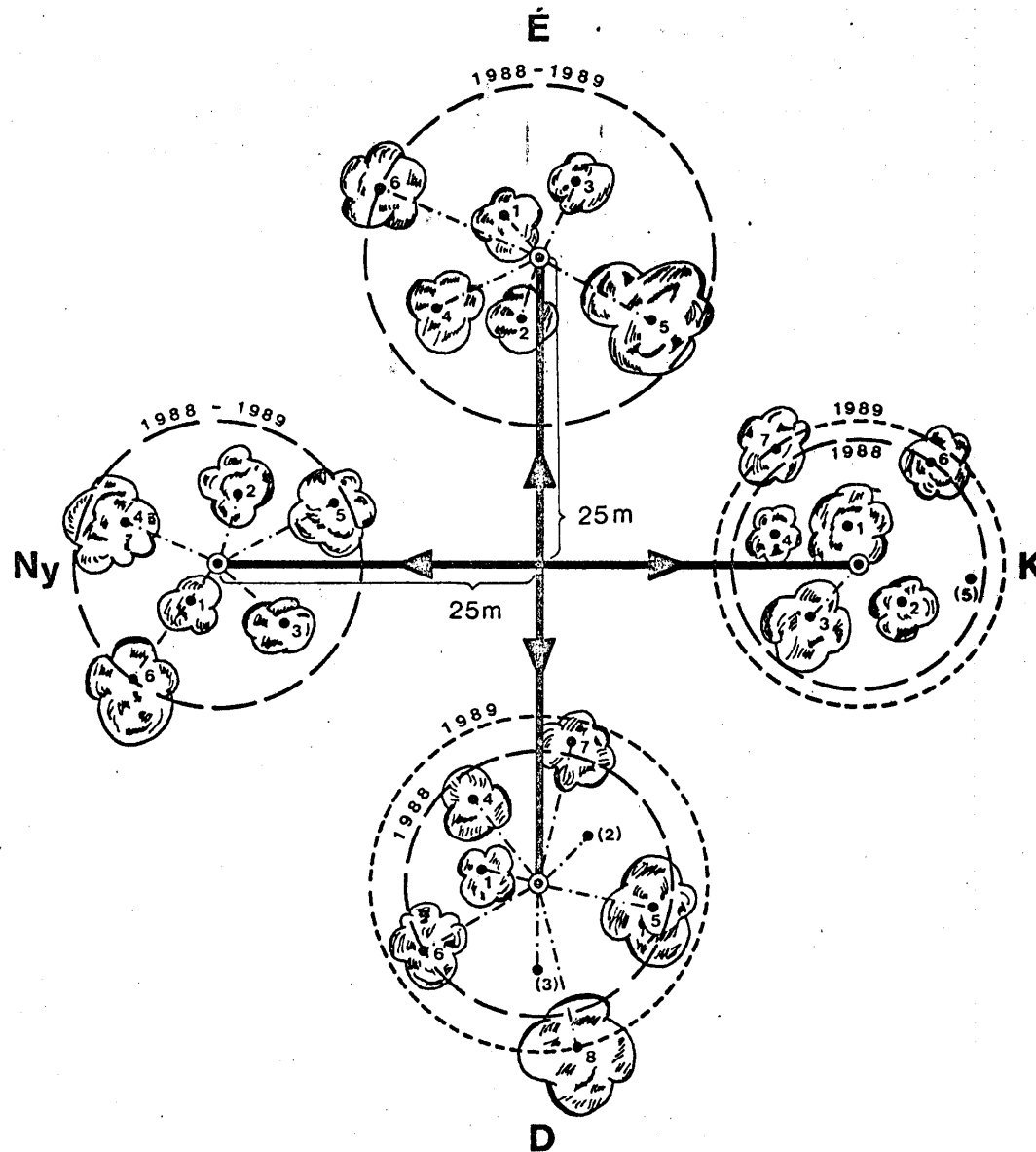


Forest Protection Network (FPN I.)

- ICP Forests as an international organisation established for assessment and monitoring of air pollution effects on forests
- Objective: to establish a continuous and systematic observation network tracing the effects of harmful environmental influence on forest
- Hungary takes part in this program as a founder

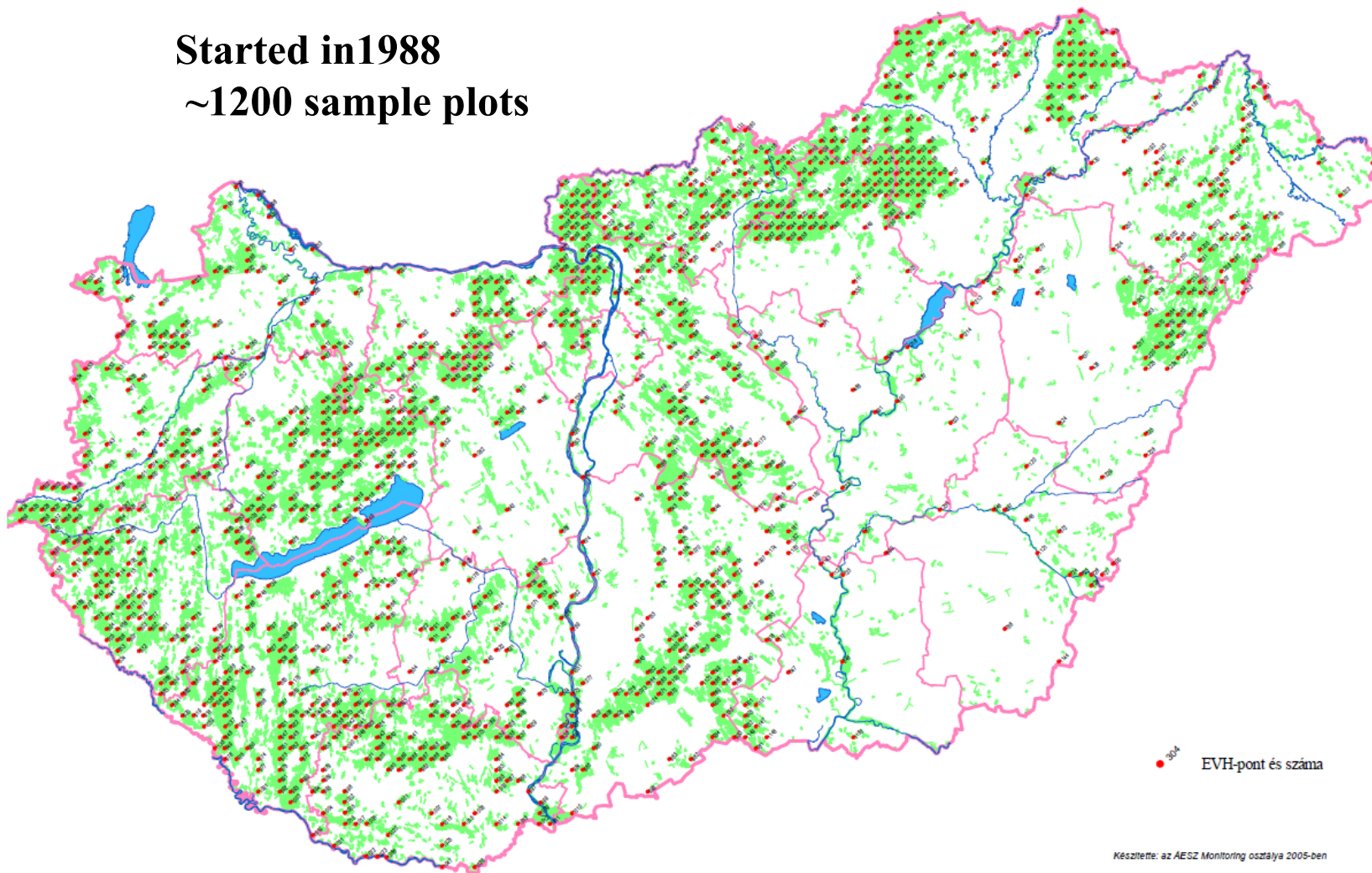


Forest Protection Network (FPN I.)



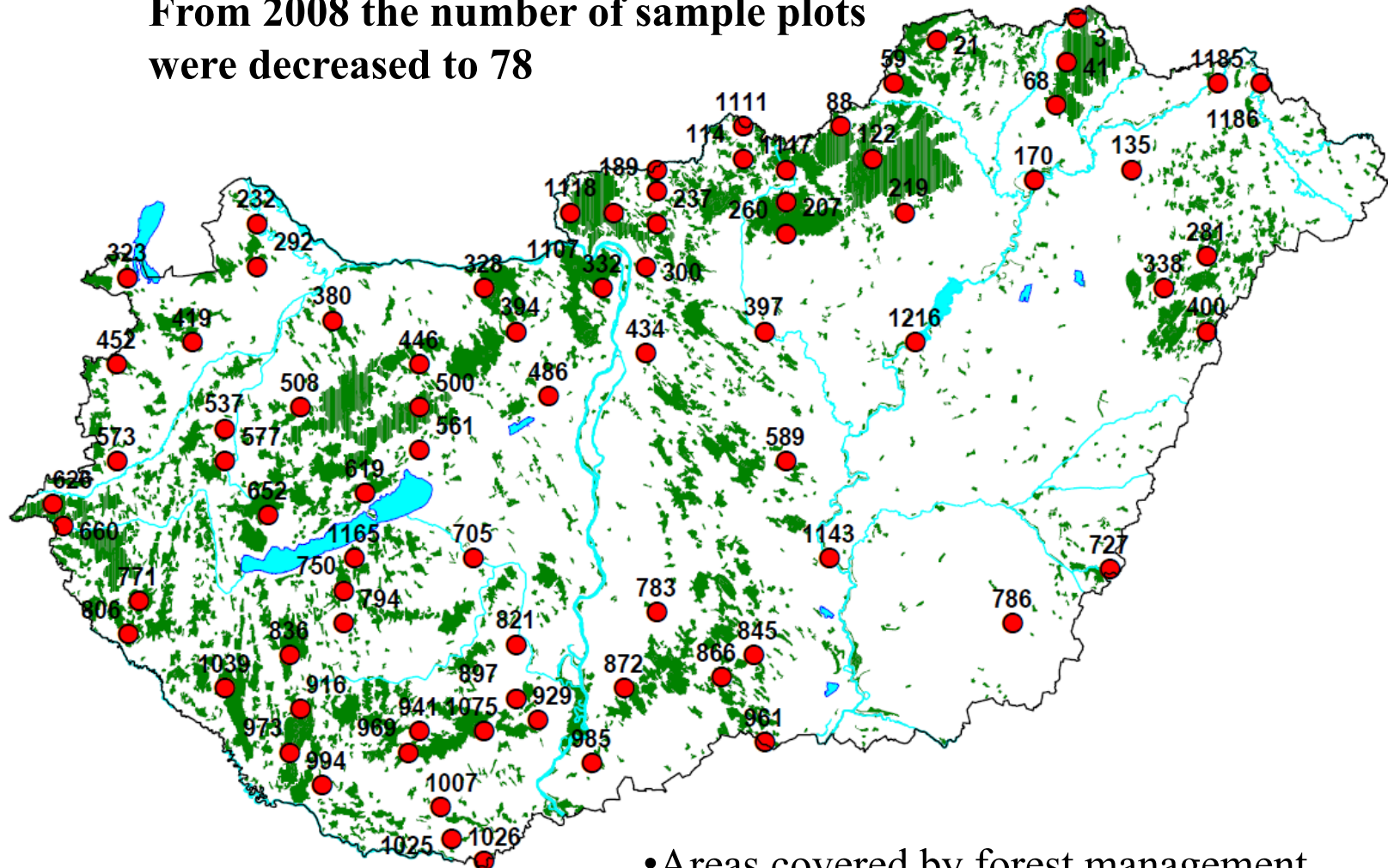
FPN level I. (4x4 km)

Started in 1988
~1200 sample plots



FPN level I. (16x16 km)

From 2008 the number of sample plots were decreased to 78



- Areas covered by forest management planning are involved exclusively
- ~1600 sample trees annually
- Annual data service to ICP Forests



FPN level I. - Assessed parameters



Crown
condition

Defoliation
Discoloration
Crown dieback

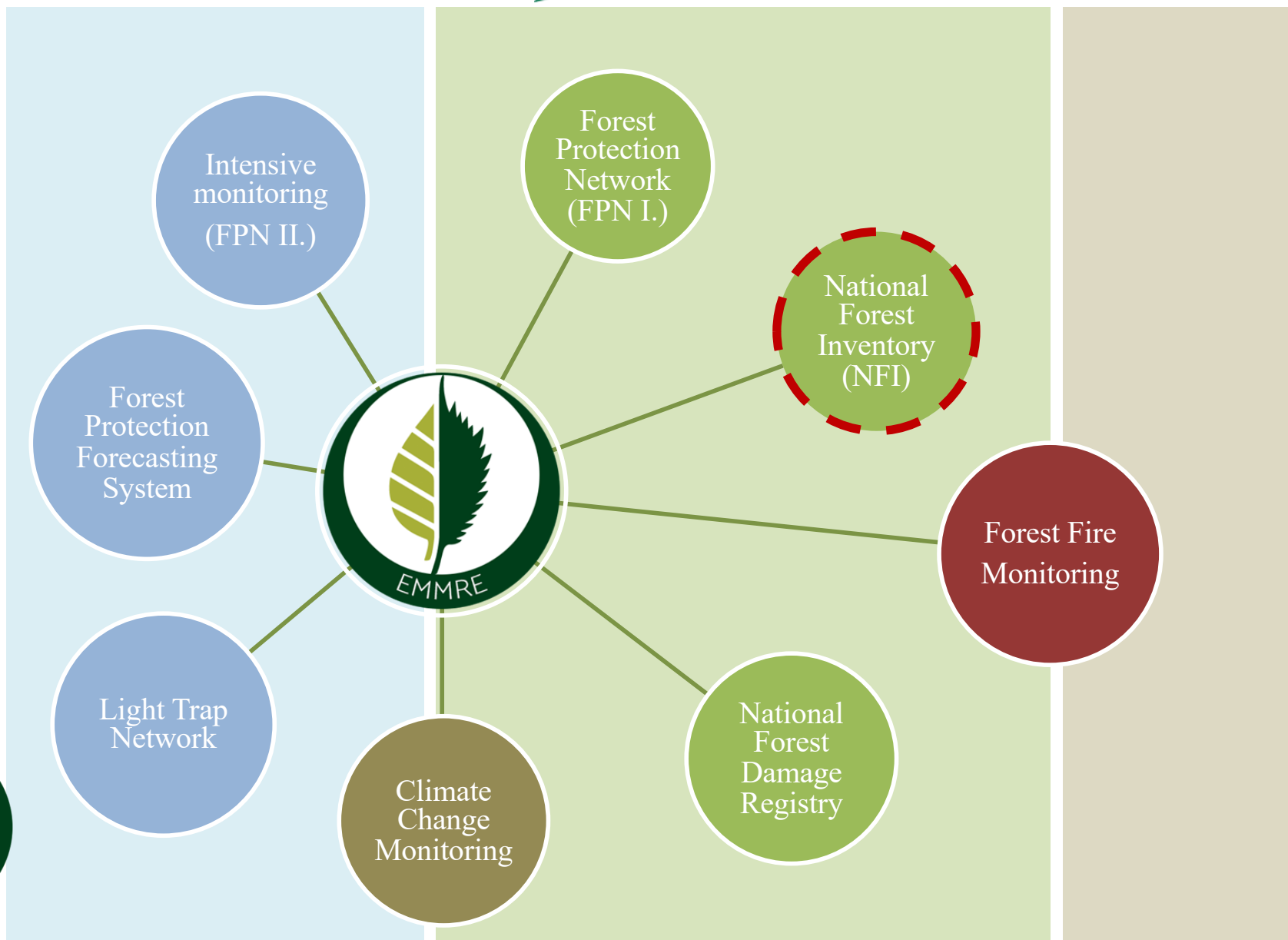
Stem damage

Root swelling damage

Soil (periodically)

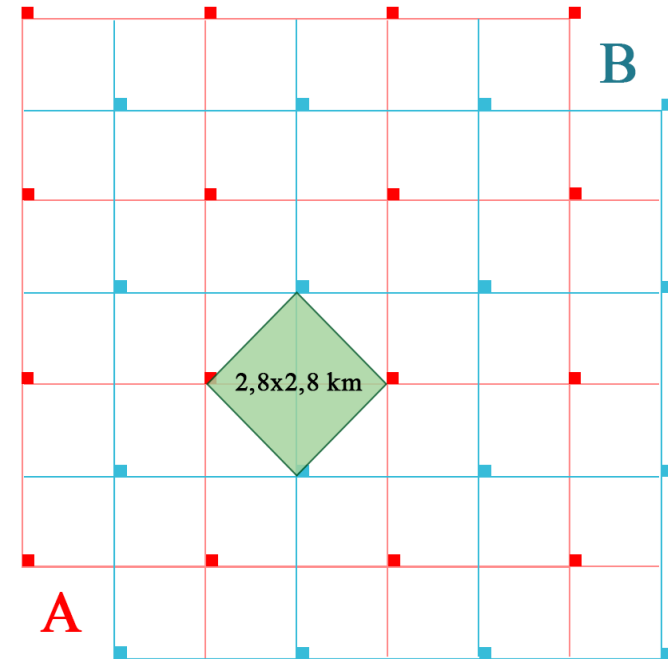


Sub-systems of FMOS



National Forest Inventory (NFI)

- Growth Monitoring System (GMS) was launched in 1993 based on the methodology of Austrian NFI
- GMS is the predecessor of Hungarian NFI
- The grid of GMS was 2.8x2.8 km (red and blue grid together)
- Due to the lack of resources the NFI grid is 4x4 km (red and blue grid points are assessed in two separated cycles)
- Near future plan is to return to the original (2.8x2.8 km) grid



National Forest Inventory (NFI)

General features:

- Launched in 2010
- Harmonised methodology on European level (ENFIN / European National Forest Inventory Network) – 29 countries
- Harmonised definitions (FAO/COST E43 definitions)
- Permanent sampling plots
- 5-year cycles

- Field work from April to October
- 2 experts per team
- Forest definition independent from forest management
- More than hundred parameters are collected
- All elements of the ecosystem are covered by the collected parameters



National Forest Inventory (NFI)



National Forest Inventory (NFI) website

NLC NATIONAL LAND CENTRE

GENERAL BACKGROUND METHODOLOGY DATA APPENDIX CONTACT

Hungarian National
FOREST INVENTORY
since 2010

MAIN | FOREST INVENTORY

DEAR VISITOR,

Welcome to the Hungarian National Forest Inventory's website!

The backbone of the website is the [Data downloader](#). In addition to the tabular form, graphs and maps assist interpretation. Their further use is also supported by the opportunity to export the data in excel format.

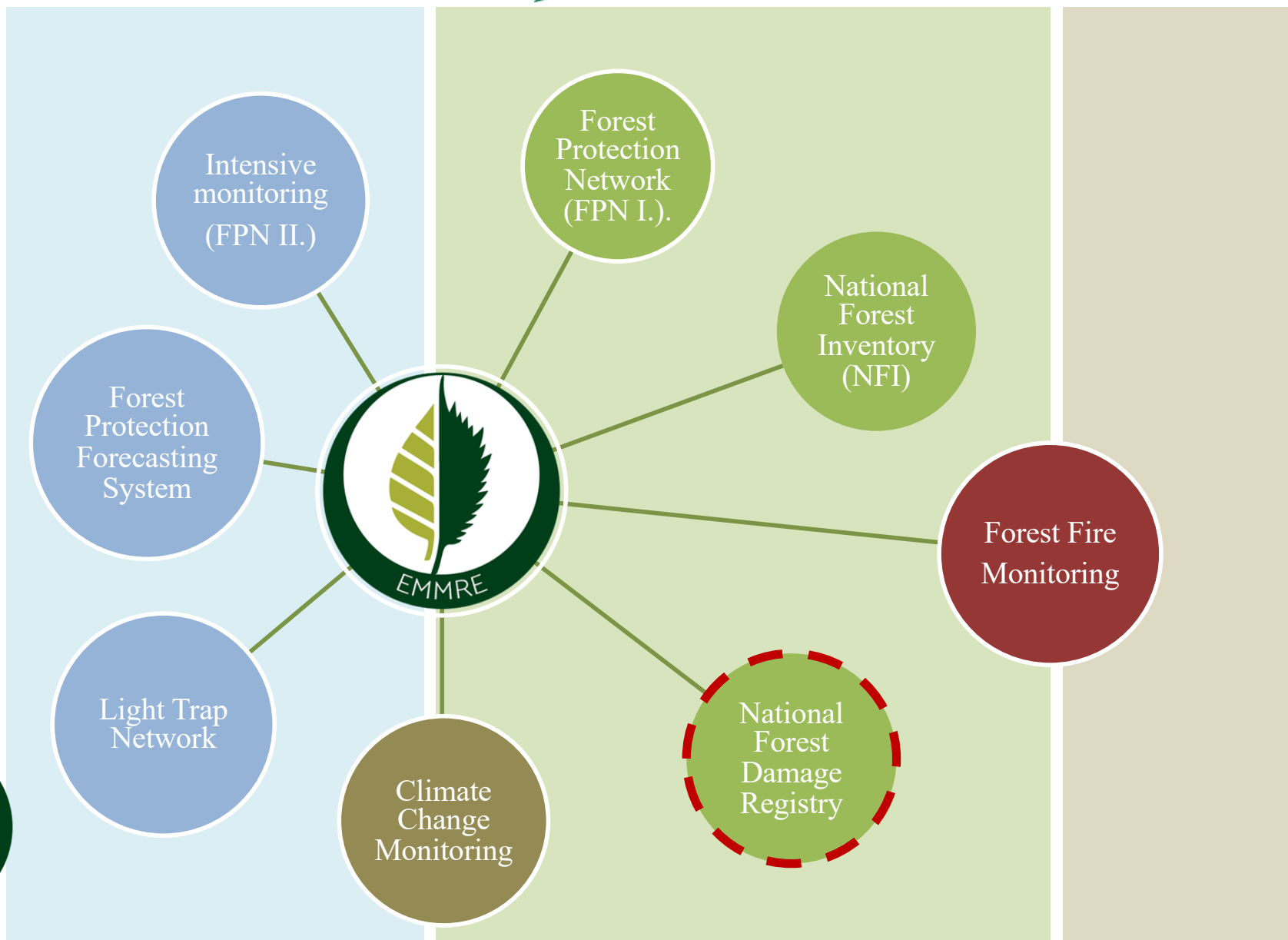
The results of two consecutive five-year survey cycles of the Hungarian NFI, launched in 2010, are available on the website in the form of detailed statistical data. In addition to the quantified results, the site presents the methodology of the NFI's preparation, implementation and data processing, as well as the role of forest inventory as a data source in national and international data provision.

- Methodology described in details
- Data downloader – data from first 2 cycles
- Maps, tables and graphs
- **Free to use – required to cite the source!**



<https://nfi.nfk.gov.hu>

Sub-systems of FMOS



National Forest Damage Registry

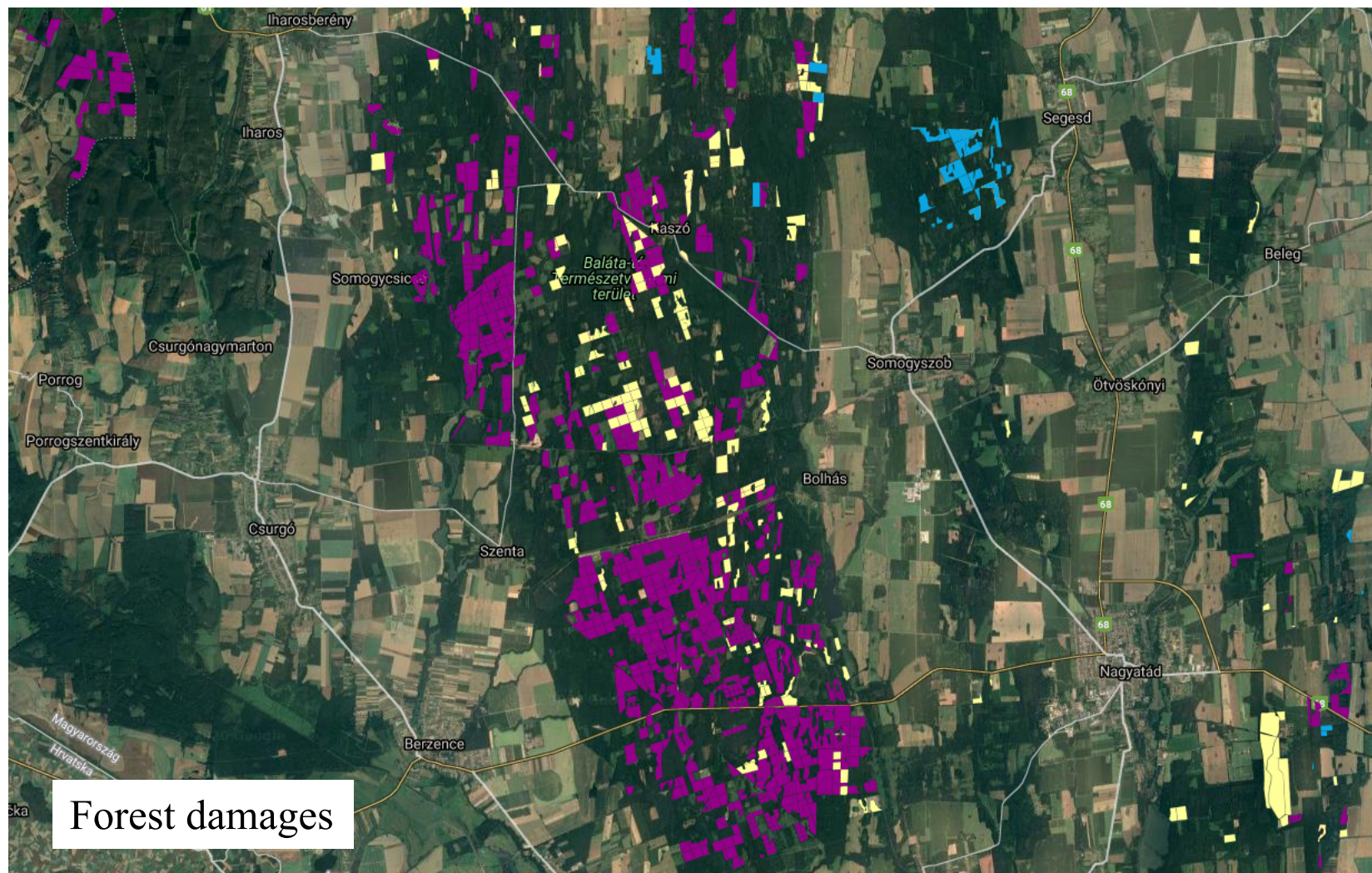
- Collecting data on forest damages since 2012 based on **records sent by Entitled Forestry Experts**
- Strict relation to **Forest Protection Forecasting System**

Objectives:

- Recording the health condition of forests
- Monitoring the location and the spread of damaging agents
- Promote preventive and protective measurements



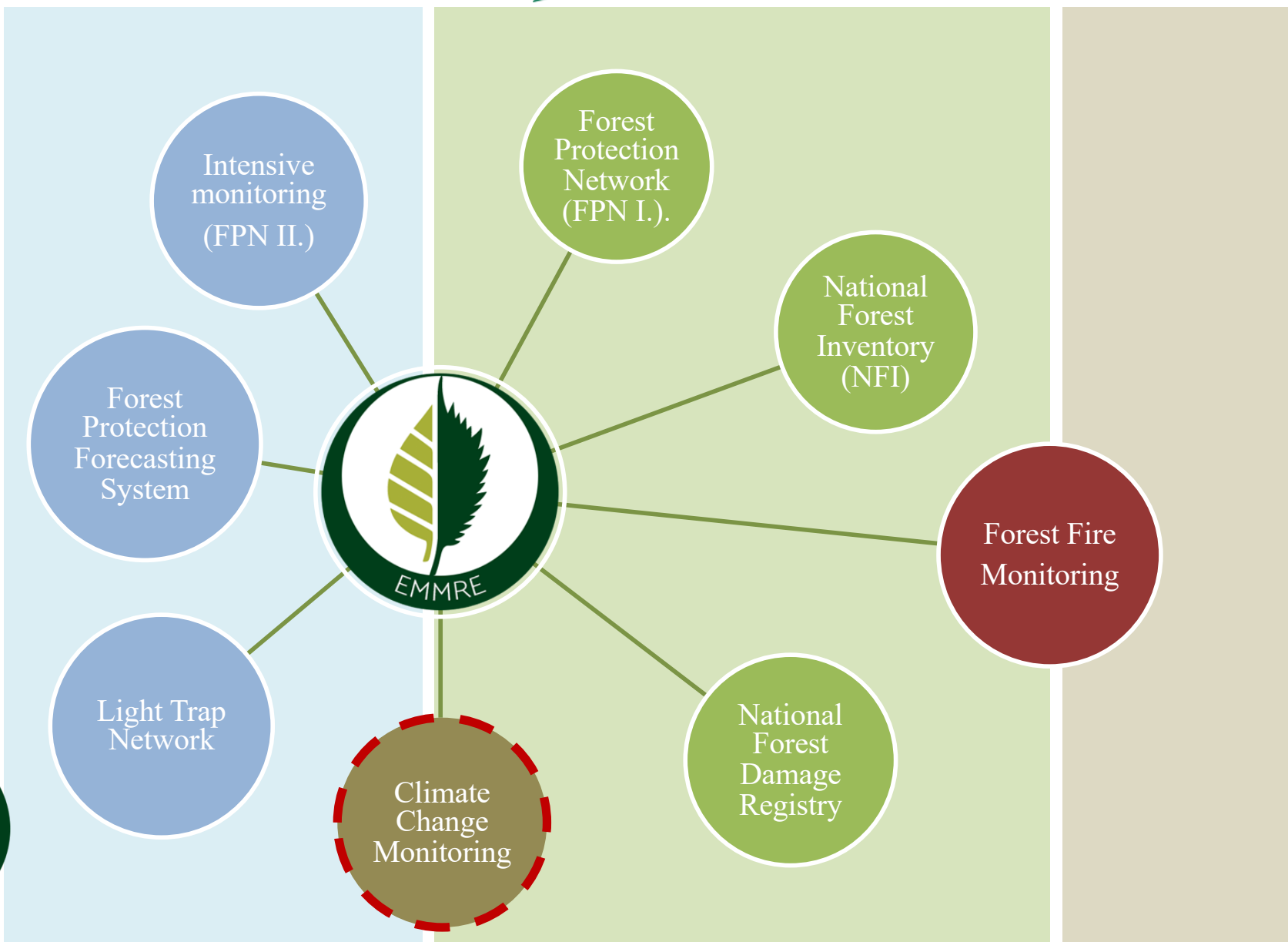
National Forest Damage Registry – Online map



Damages in Kaszó forest management district (Magenta – *Corythucha arcuata* ; Yellow – drought; Blue – frost)



Sub-systems of FMOS



Climate Change Monitoring (CChM)

- 2011. Elaborating the conception of CChM (contributors: University of Sopron, Forest Research Institute)
- 2012. Designation of 3 monitoring areas. Field assesement was launched

Objective:

Investigating the effects of climate change based on forest related and meteorological data



Climate Change Monitoring (CChM)

Examination on a beech monitoring area as the most endangered climatic zone

Periodical assessments

Forest stand

Vegetation

Soil

Soil-fauna (*Collembola*)

Annual assessments

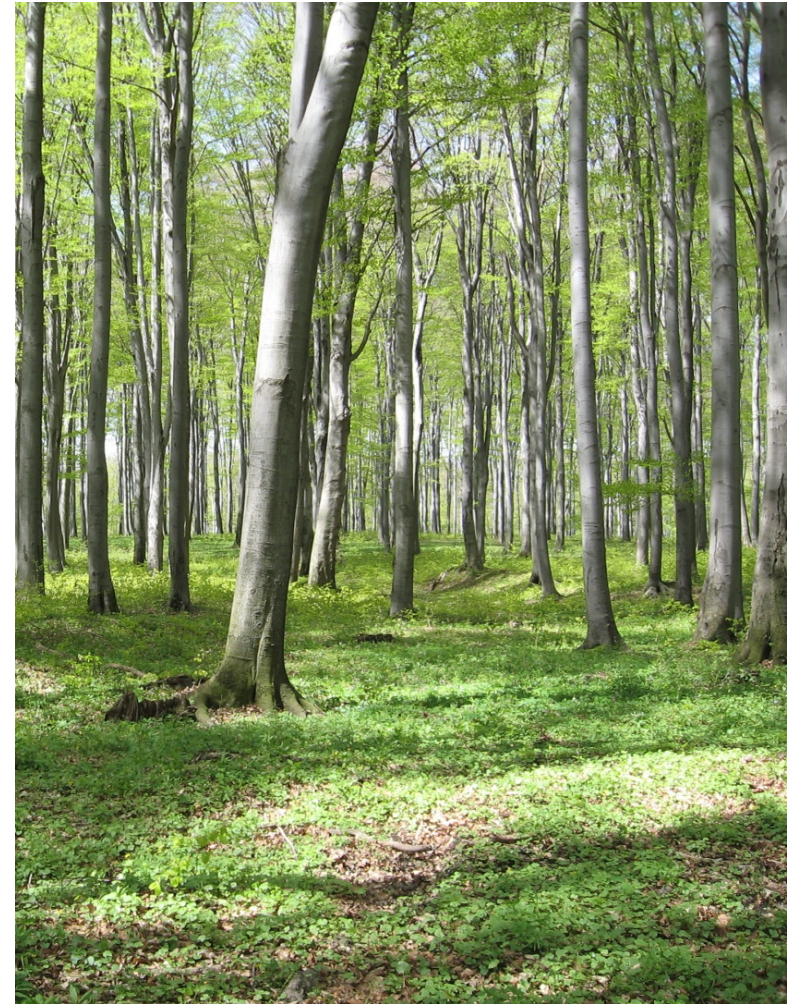
Fenology

Crown condition

Daily recording

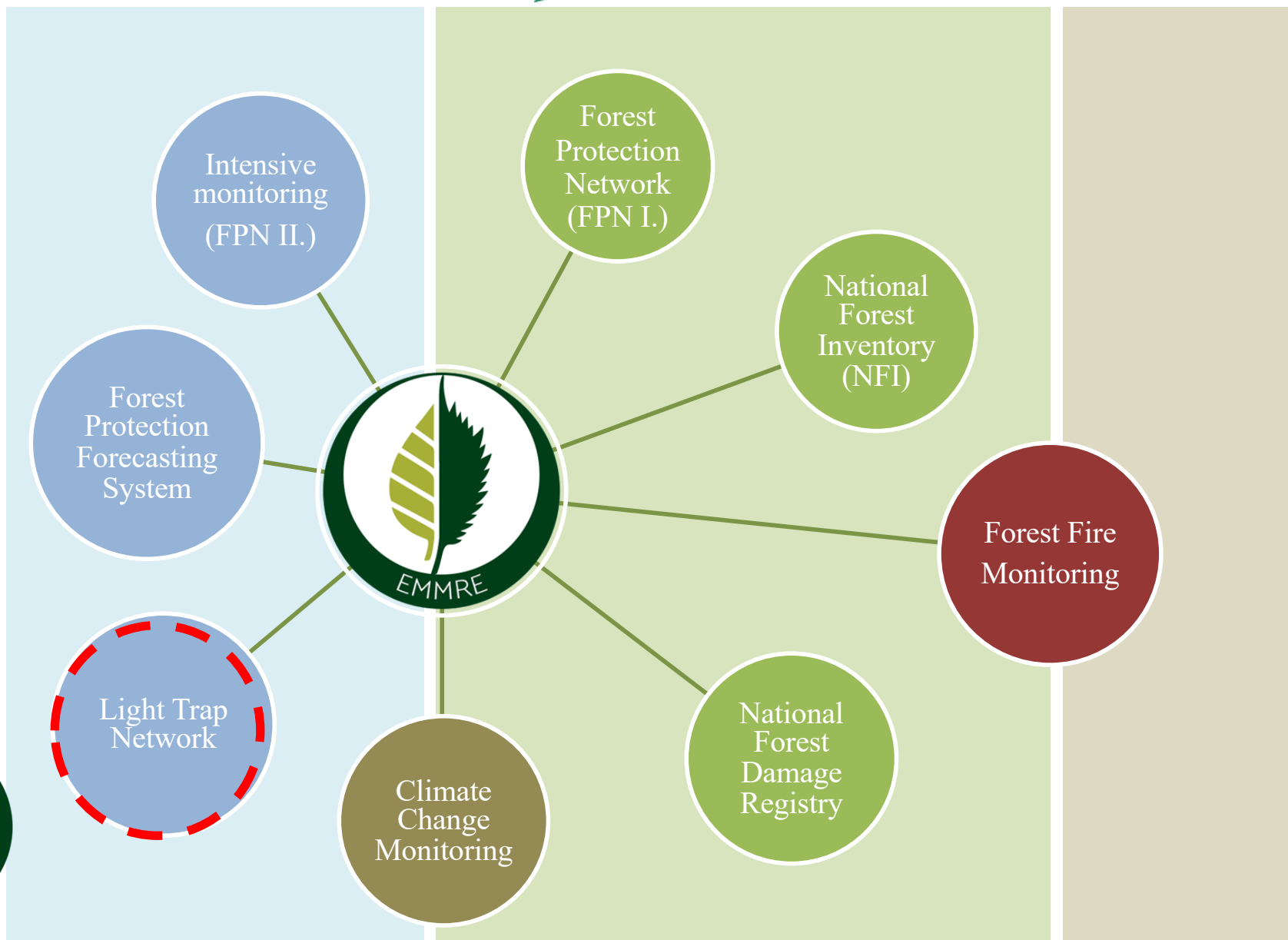
Meteorological data

precipitation, temperature,
air- and soil moisture





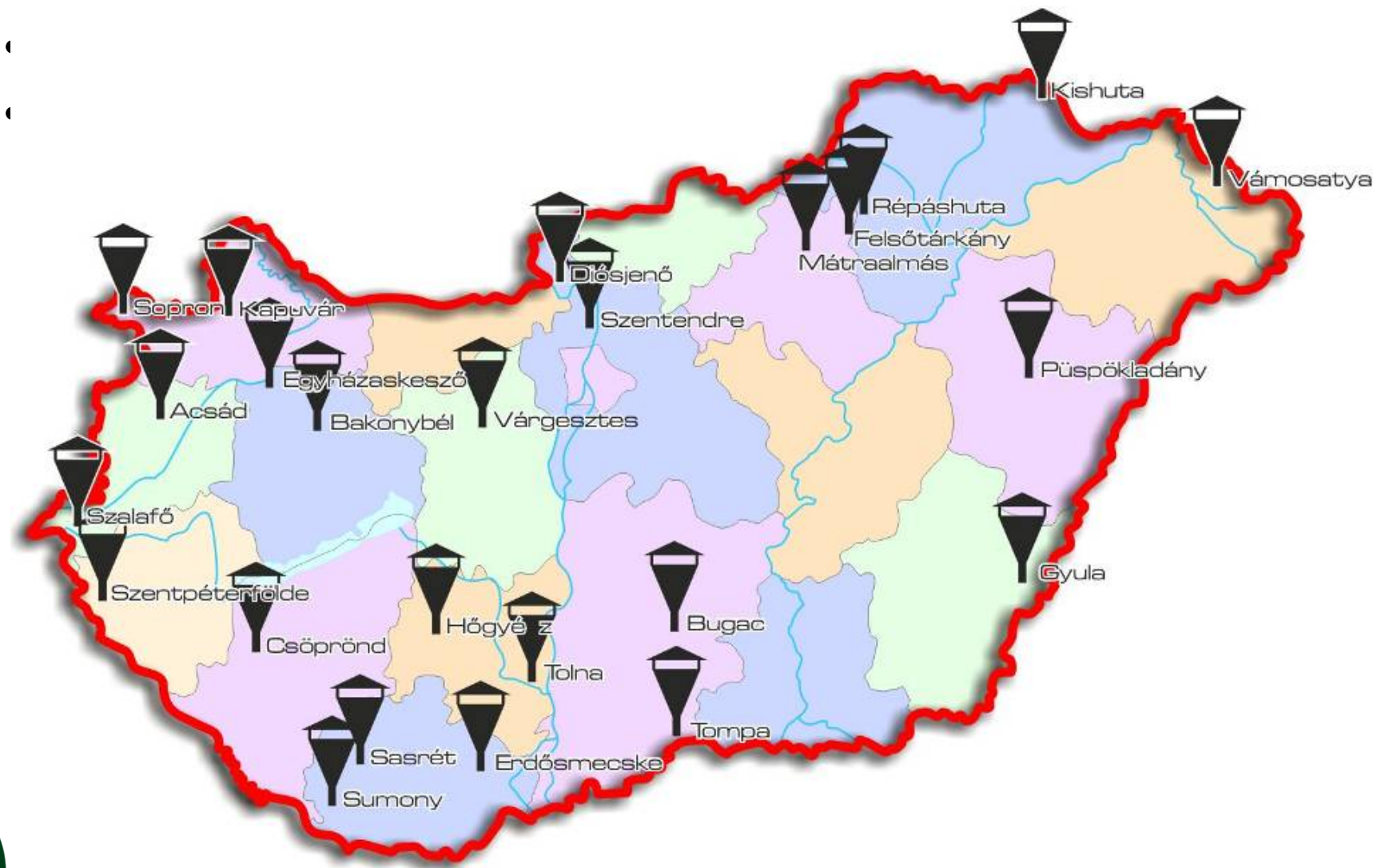
Sub-systems of FMOS



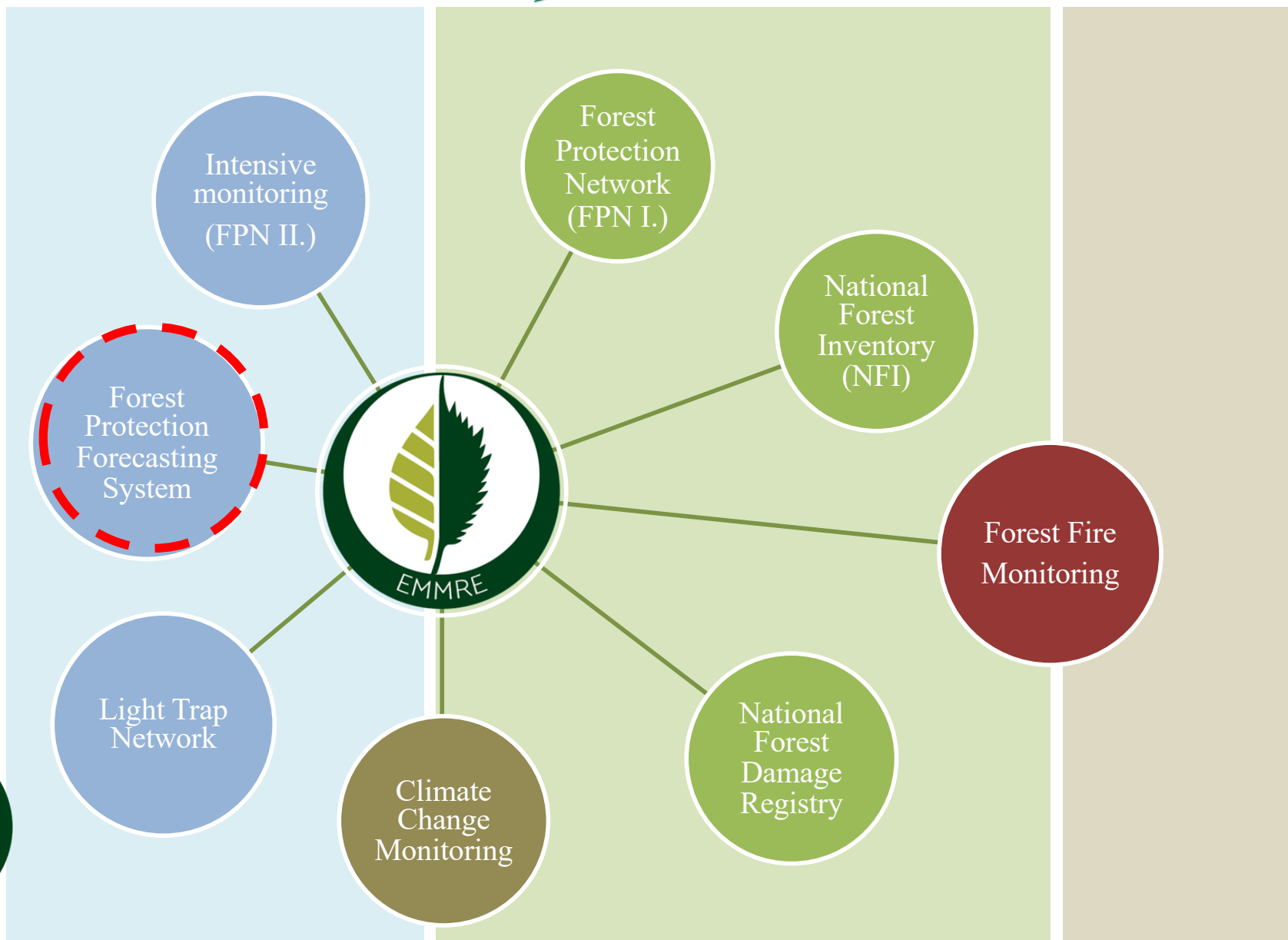
Light trap network



Forest light trap network of Hungary



Sub-systems of FMOS



Forest Protection Forecasting System (FPFS)



SOPRONI
EGYETEM

ERDÉSZETI
TUDOMÁNYOS
INTÉZET



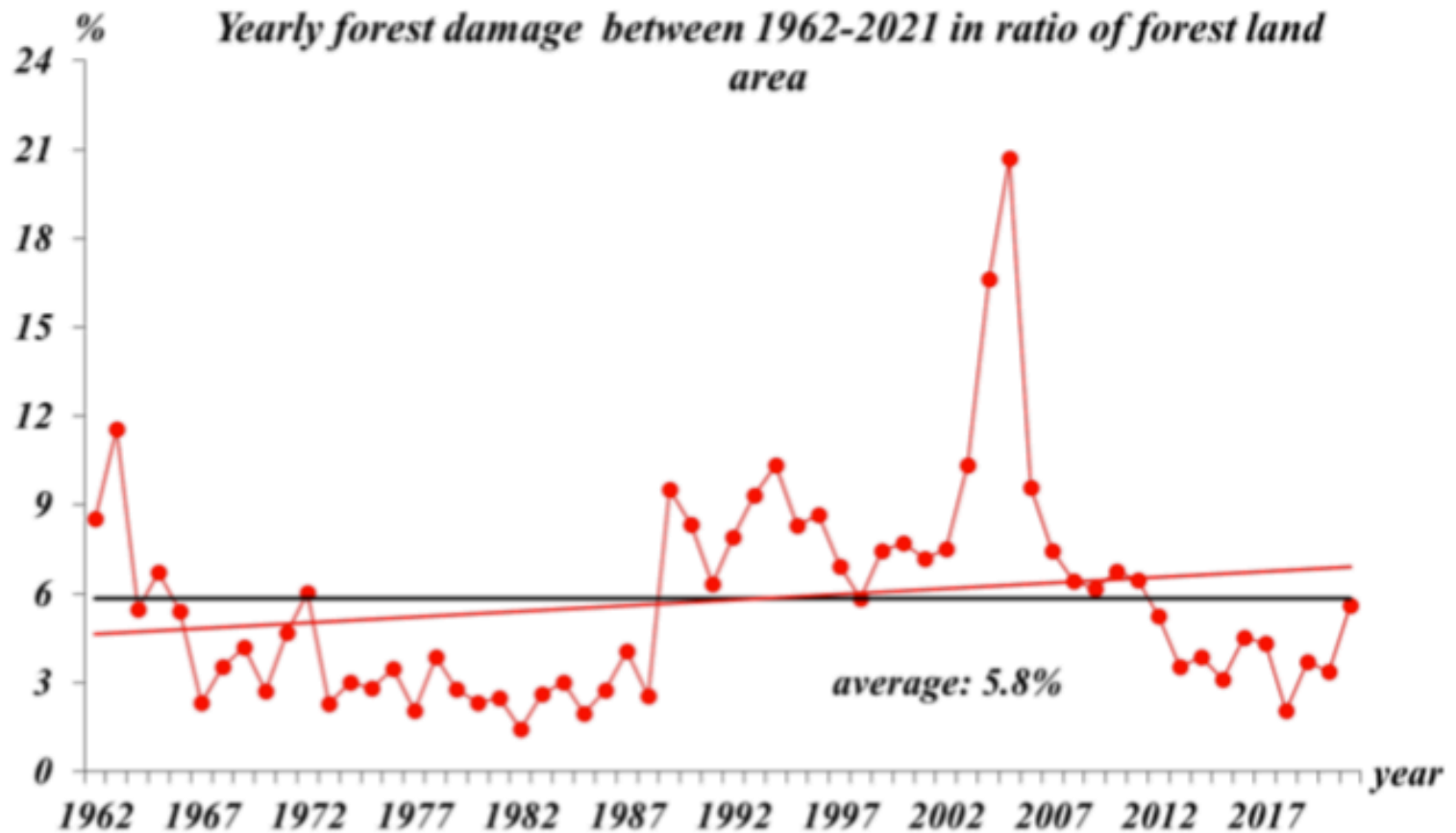
ORSZÁGOS ERDŐKÁR NYILVÁNTARTÁSI RENDSZER

A 2021. ÉVI BIOTIKUS ÉS ABIOTIKUS ERDŐGAZDASÁGI KÁROK, VALAMINT A 2022-BEN VÁRHATÓ KÁROSÍTÁSOK

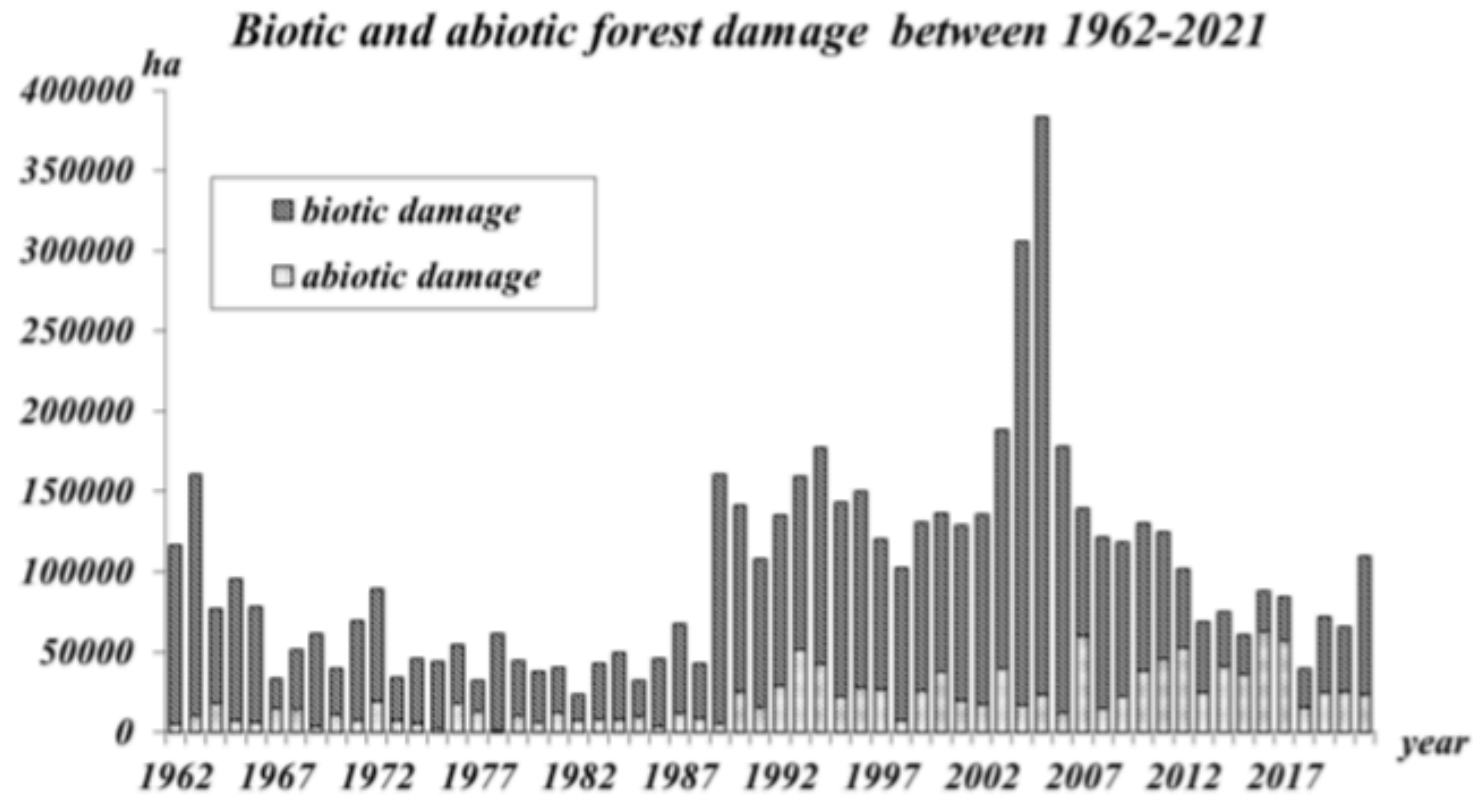
SZERKESZTETTE:
HIRKA ANIKÓ



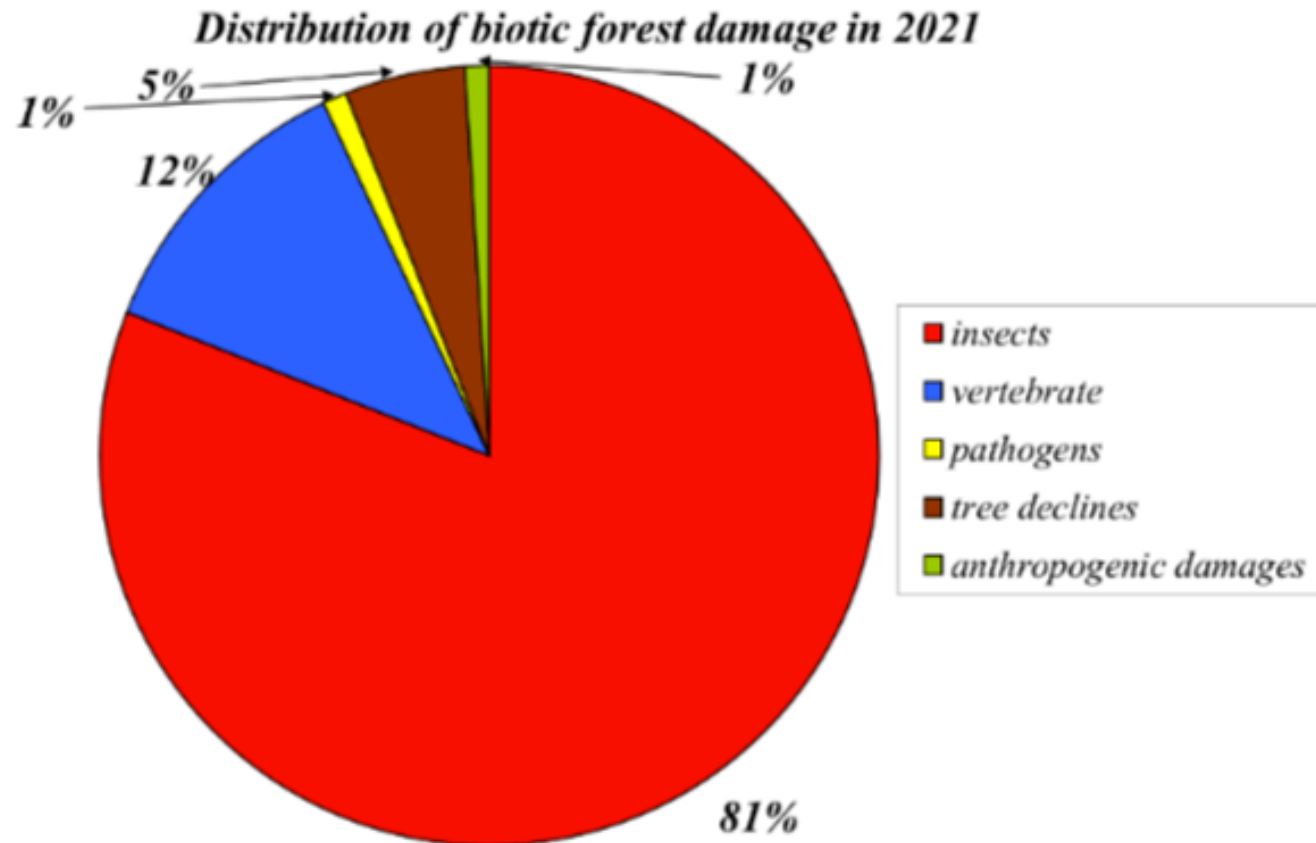
Forest Protection Forecasting System (FPFS)



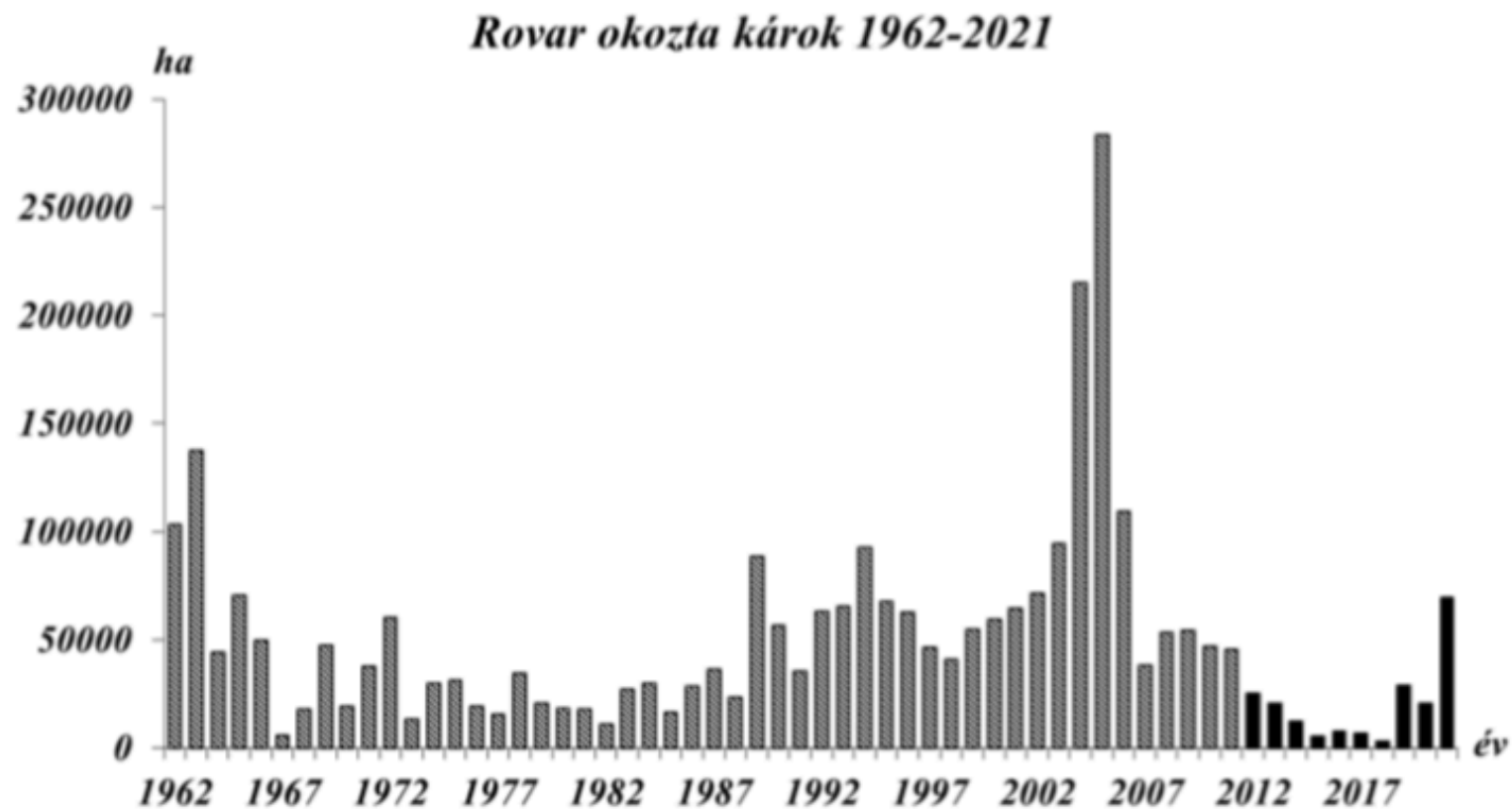
Forest Protection Forecasting System (FPFS)



Forest Protection Forecasting System (FPFS)



Forest Protection Forecasting System (FPFS)



Reported insect damage (in hectares) in Hungary between 1962 and 2021



Forest Protection Forecasting System (FPFS)



Csoportosan lerakott peték

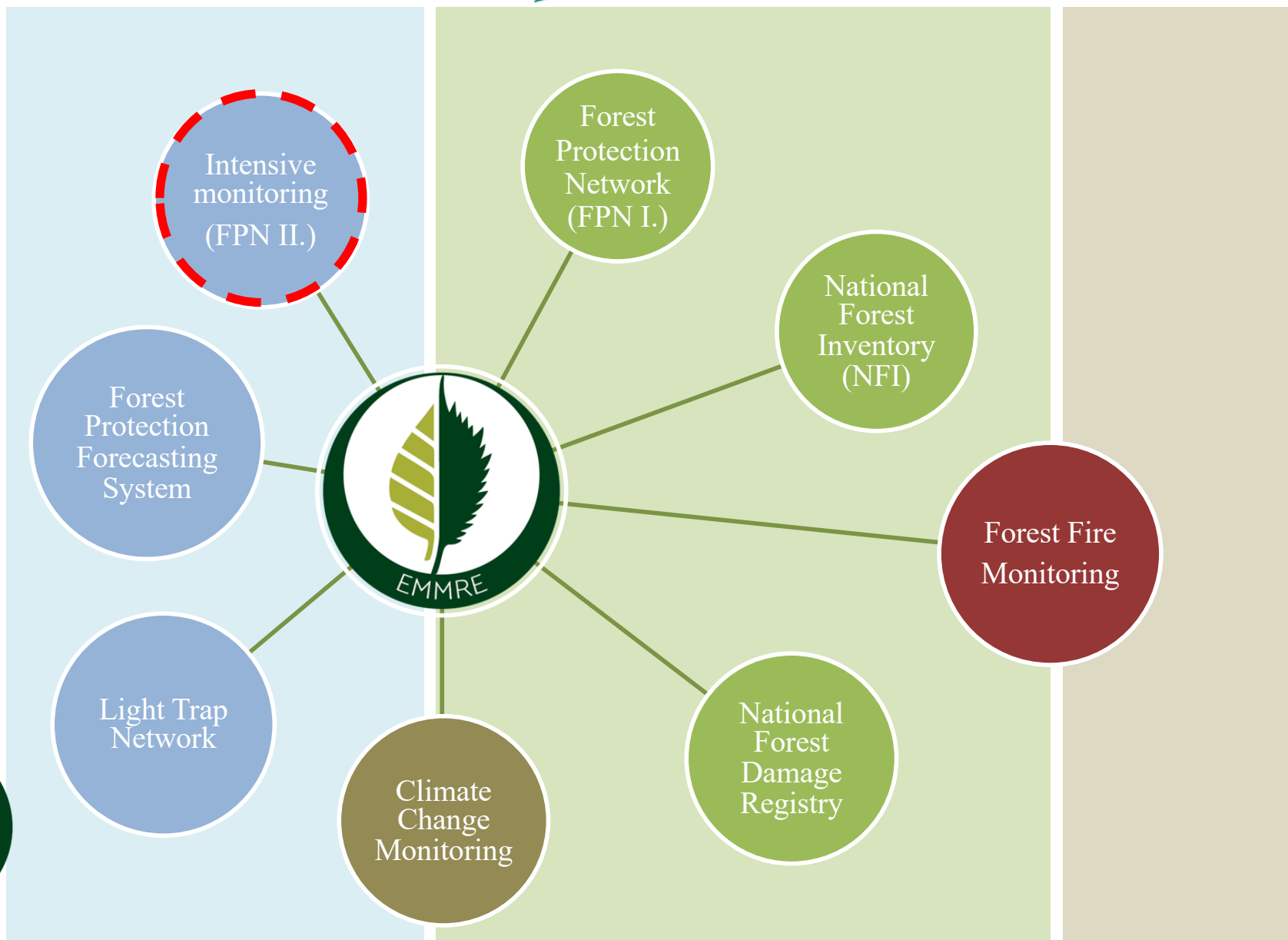


*Lárvák és kifejlett poloskák (balra)
Lárvák és levedlett lárvabőr (jobbra)*

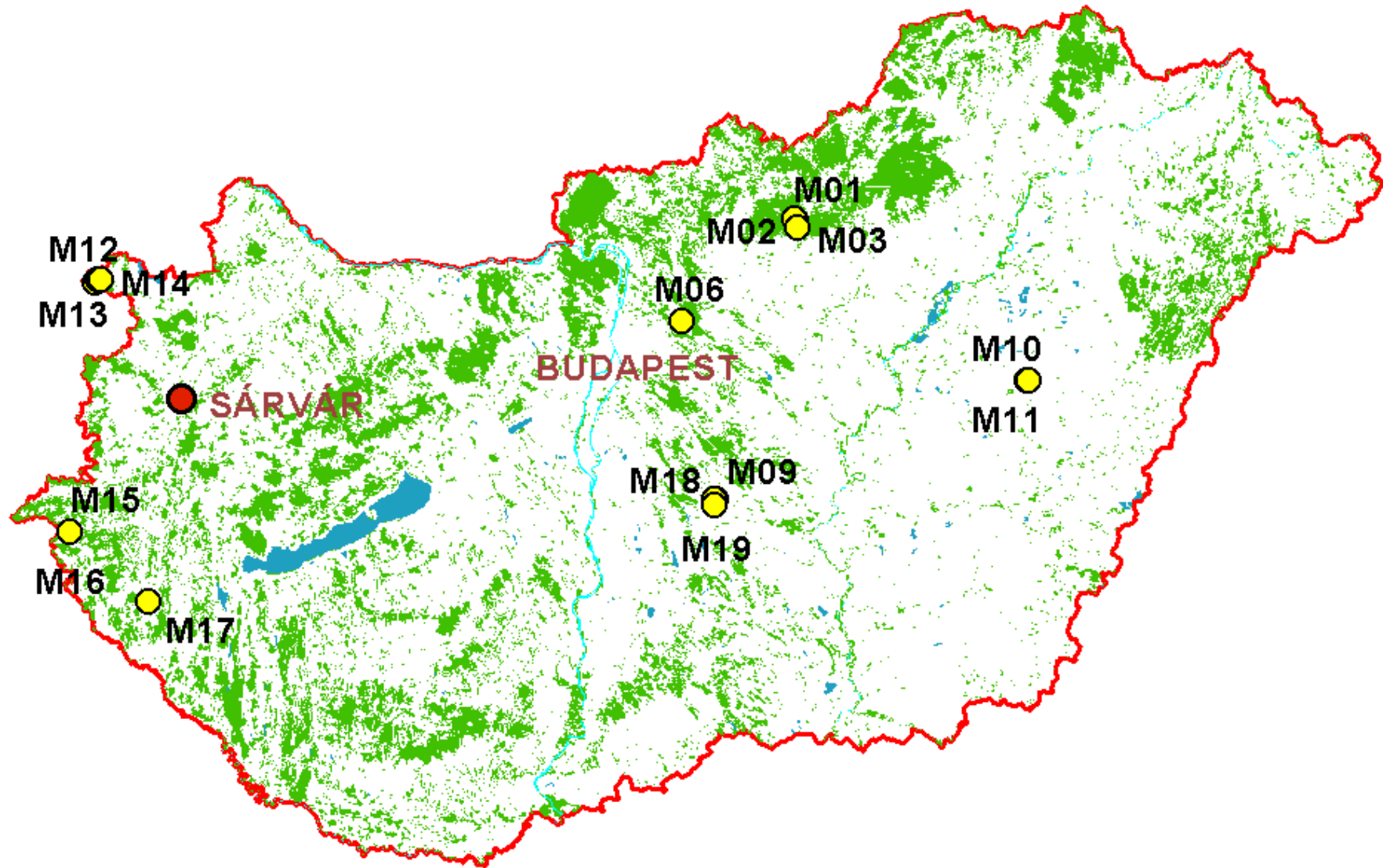
Városi fákon, de erdőkben is már július elejére/közepére látványos lombelszíneződést idézhet elő, ami jól elkülöníthető az aszály miatti, illetve az őszi levélsárgulástól. Egyes állományokban már júliusban jól elkülöníthetők a rendellenes elszíneződésű tölgyek, illetve az egészséges zöld lombozatú kőrisek, juharok stb. Aligha kétséges, hogy ez (főleg, ha több



Sub-systems of FMOS



Sample plots in Hungary



**Thank you for your
attention!**

