EXECUTIVE FOREST AGENCY

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FORESTS AND WATER RESOURCES IN BULGARIA
Assessment of Ecosystem Services from forests

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EXECUTIVE FOREST AGENCY

Content

- General information on forest resources
- Legal and strategic framework
- Assessment of forest ecosystems
- Assessment of ecosystem services from forests

REPUBLIC OF BULGARIA

EXECUTIVE FOREST AGENCY

Of all nature resources in Bulgaria the forests present the biggest share and are of primary importance

General information

The forests in Bulgaria
(data towards 31.12.2016)

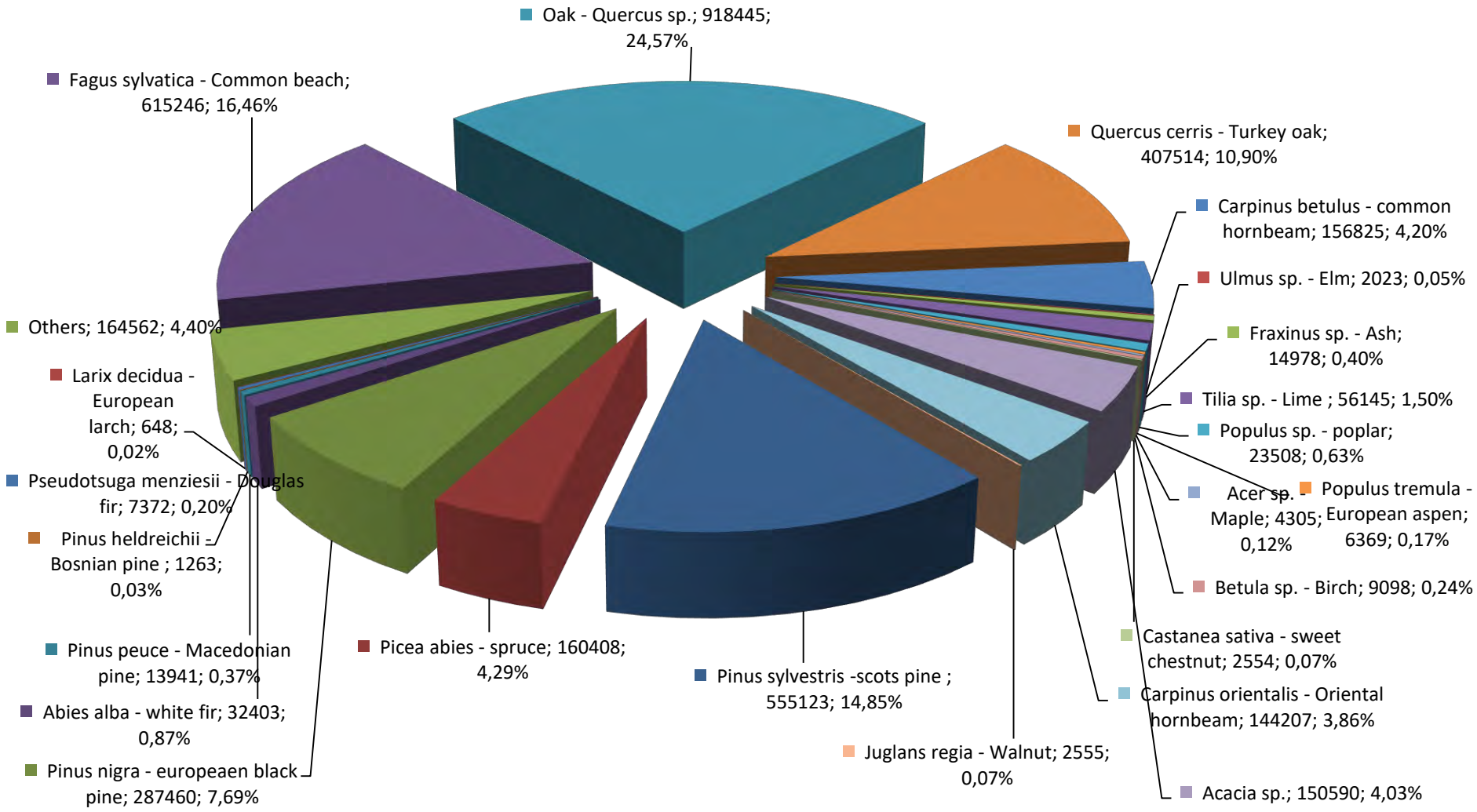
Forest data:

- 4 230 825 ha forest territories (about 37,4% of the country's territory);
- Over 70 % broadleaved forests;
- Over 680 000 000 м3 total volume;
- 14 million м3 annual increment;
- 3.8 м3 – average annual increment per ha;
- 8 415 300 м3 annual harvesting (standing timber)

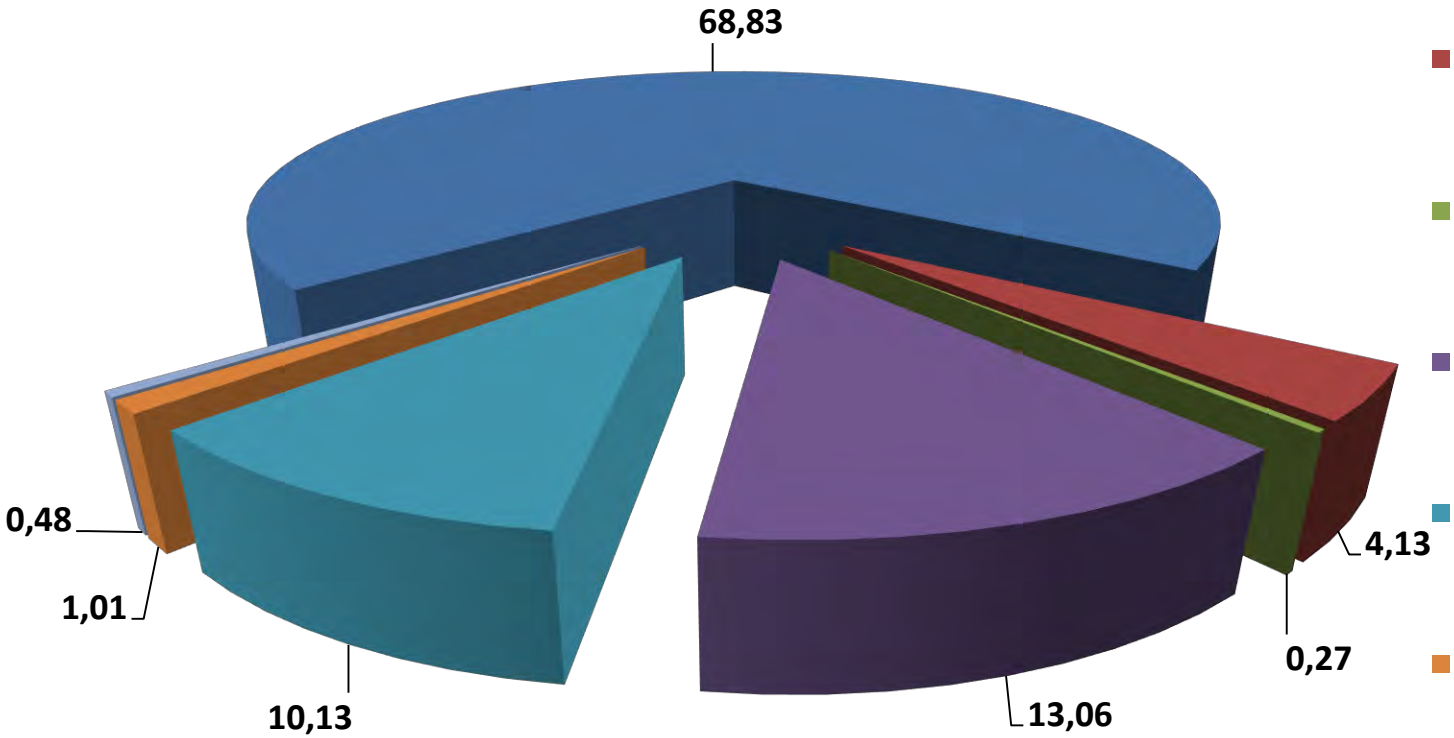
Regarding their functions forests are divided as follows:

- economic;
- special;
- Protective – 423 138 ha.

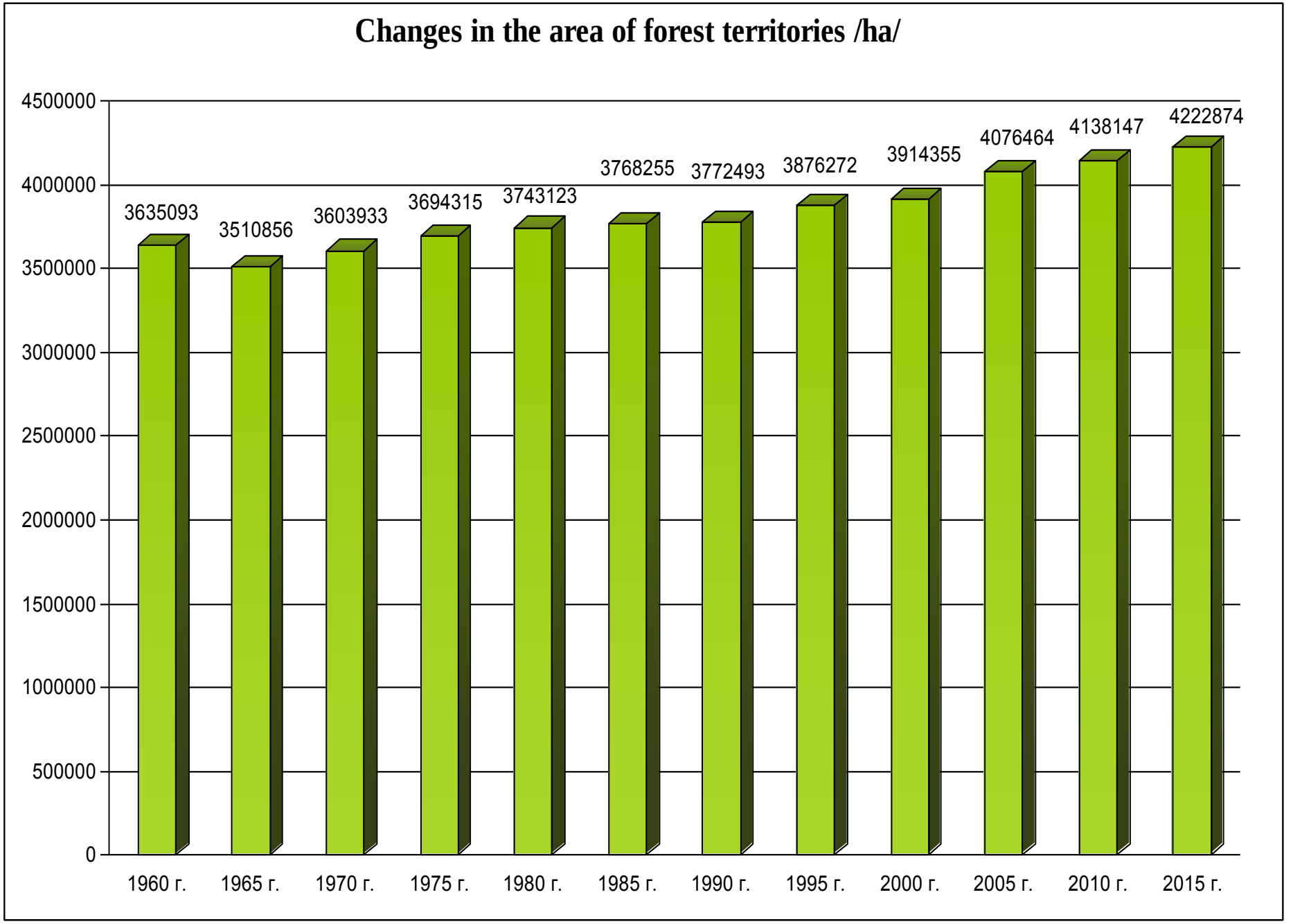
Tree species distribution

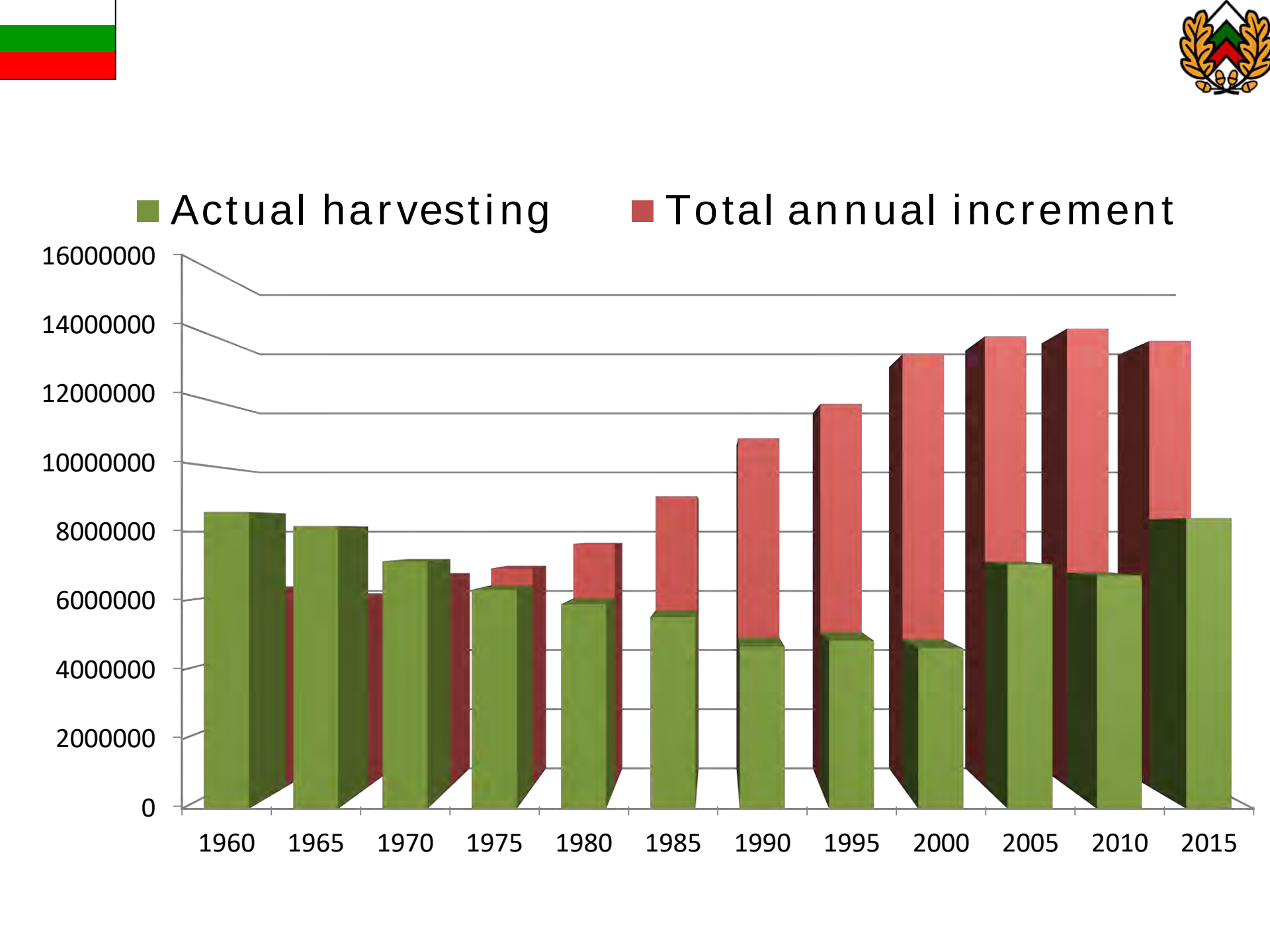


Forests ownership



- Forest territories managed by the State enterprises according to Art. 163 (Law on Forests)
- Forest territories managed by the Ministry of Environment and Waters
- forest territories consigned to Trial Forest Units
- Municipal forest territories
- Forest territories owned by physical bodies
- Forest territories owned by juridical bodies
- Forest territories owned by Bulgarian Orthodox Church


Changes in the area of forest territories /ha/
4500000
4000000
3500000
3000000
2500000
2000000
1500000
1000000
500000
0
3635093
3510856
3603933
3694315
3743123
3768255
3772493
3876272
3914355
4076464
4138147
4222874
1960 г.
1965 г.
1970 г.
1975 г.
1980 г.
1985 г.
1990 г.
1995 г.
2000 г.
2005 г.
2010 г.
2015 г.

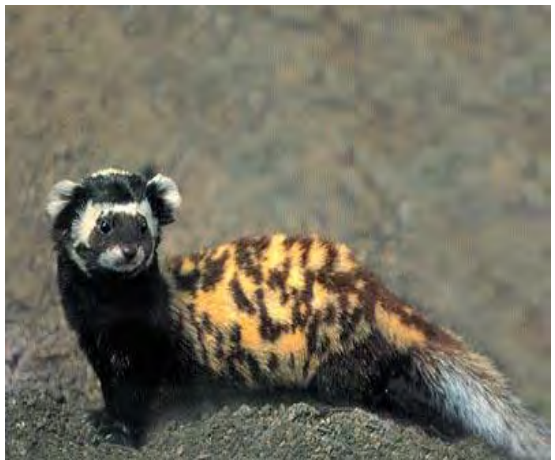

Actual harvesting
Total annual increment
16000000
14000000
12000000
10000000
8000000
6000000
4000000
2000000
0
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015

BIODIVERSITY

- 3 National parks, 11 Nature parks and more than 700 protected areas;

- Bulgarian forests protect:
  - More than 80 % of the endangered plants;
  - More than 60 % of the endangered animal species

More than 55% of the forest territories are in NATURE 2000



Forest ecosystem services

- Forests provide a wide range of ecological, economic, social, cultural services
- Forest management incorporates big variety of competing interests and oppinions, requiring political and strategic framework
- Increased economic and social pressure on forest resources combined with unfavorable climate change

Economic services

- Forests form the basis of a variety of industries -timber, processed wood and paper, rubber, furniture
- Products, necessary to rural communities - fodder, game, fruits, building materials, medicines and herbs
- Food security
- RES – mostly energy for heating
- Construction – timber as carbon reservoir







Sociocultural services

- Forests are home to millions of people world-wide, many of them dependent on the forests for their survival
- many people have strong cultural and spiritual attachments to the forests
- Indigenous knowledge, spirituality, aesthetics and beauty



Ecological services from forests

- regulation of water regimes by intercepting rainfall and control of the rain and snow waters flow through the hydrological system;
- maintenance of soil quality and the provision of organic materials through leaf and branch fall;
- limiting of erosion and protecting of soil from the direct impact of torrential water currents, prevention of floods;
- modulating climate;
- key components of biodiversity, habitat to about 80% of the terrestrial species



Forests and water resources

Forests are the most important terrestrial ecosystem for maintaining the water cycle

- Increase water resources
- Improve the quality of water
- Main source of drinking water – 85% in Bulgaria
- Prevention of torrents and floods

EROSION CONTROL

The successful erosion control dates more than 100 years. Main approach – complex utilization of hydro technical and forest melioration activities

Erosion control

- The successful erosion control dates more than 100 years
- Main approach – complex utilization of hydro technical and forest melioration activities
- Forest Watershed Management:
  - 617 000 m3 barrages and thresholds;
  - 395 000 m3 small stone thresholds;
  - 597 000 m2 wattles;
  - 428 000 m bank low wattles;
  - 194 000 ha anti erosion afforestation.

Afforestation of Central Balkan mountain

LEGAL AND STRATEGIC FRAMEWORK

NATIONAL STRATEGIC DOCUMENTS AND FOREST ECOSYSYTEM SERVICES

- NATIONAL STRATEGY FOR THE DEVELOPMENT OF THE FOREST SECTOR IN THE REPUBLIC OF BULGARIA 2013 – 2020
/Adopted by the Bulgarian Government on 27.11.2013/

MEASURE 4.4: Establishment of conditions for sustainable and compensational use of the ecosystem services provided by the forest territories

- STRATEGIC PLAN FOR THE DEVELOPMENT OF THE FOREST SECTOR IN THE REPUBLIC OF BULGARIA 2014 – 2023
/Adopted by the Minister of Agriculture and Food in August, 2014/

OPERATIVE GOAL 20: sustainable and compensational use of the ecosystem services provided by the forest territories

FOREST LAW

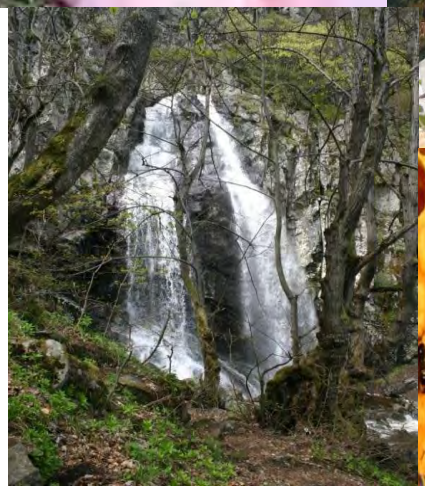
Chapter 17: PUBLIC ECOSYSTEM BENEFITS FROM THE FOREST TERRITORIES

Art. 248. (2) Public ecosystem benefits from the forest territories are:

1. protection against erosion of soil from avalanches and floods;
2. guaranteeing the quantity and quality of water;
3. maintaining biological diversity;
4. screening, noise and polutants absorbtion, micro-climate maintenance;
5. providing conditions for recreation and tourism;
6. maintainig the traditional landscape;
7. protection of the natural and cultural heritage;
8. protection of infrastructure objects and facilities;
9. slowing down and regulation of the influence from the climate changes.








Forest Law: Chapter 17
PUBLIC ECO-SYSTEM BENEFITS FROM THE FOREST TERRITORIES

Art. 249. (1) The public eco-system benefits under Art. 248, Para. 2, when they are in favour of performing economic activity shall be paid.

The Forest Law requires adoption of an Ordiance for payment of ecosystem services from forest territories:

- ✓ Determination of the zones, from which the forest ecosystem services are delivered
- ✓Determination of the payments /compensation/ of public forest ecosystem services;
- ✓Determination of users that shall pay for benefiting by ecosysytem services
- ✓Mode and methods for distribution of the payments , delivered from forest ecosystem services
- ✓Conditions, when the forest ecosystem services shall be paid

Ordinance № 18 from 7 October 2015

Inventory and planning in the forest territories

Aim, goals, object and contents of the regional plans

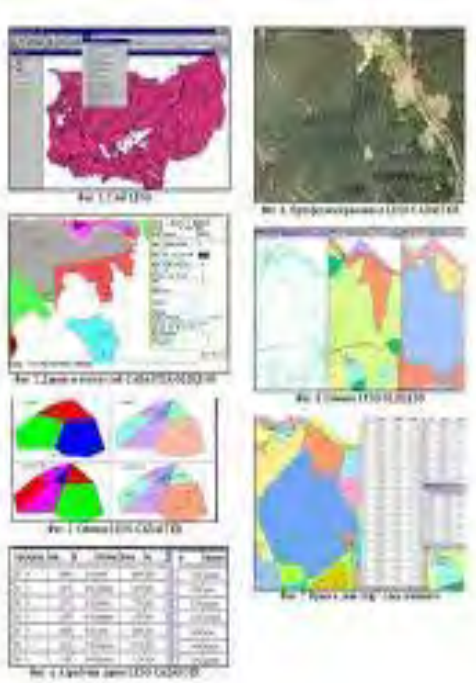
Art. 51. (1) The regional plans aim:

- 2. functional zonation of the forest territories;
- 3. compensational use of the forest ecosystem services;

(2) Main goals of the regional plans:

- 4. defining of the forest territories and the zones outside them where the use of the social ecosystem services in compensated;
- 5. defining the economic activities related to forest ecosystem services for which respective payment is required;

- Borders of the forest territories and zones which provide ecosystem services should be determined
- Within the zones the economic activities/ users making profits from ecosystem services and the users are defined



Art. 52. (5) The territories providing ecosystem services are defined based on the forest categories and according to a Table of compliance in Application 13 of this Ordinance

Application № 13 to art. 52, para. 5

Relation between the functional zonation and the ecosysytem services

Forest category (art.5)	**Ecosystem services (art.249 of the Forest Law)**
Protective forests	Water protection; erosion control; soil protection; prevention of landslides and avellanges Protection of urban territories Protection of infrastructure
Special forests	Protection of biodiversity and of forests with high conservation value Protection of cultural heritage Maintenance of basic material and seed orchards Recreation services Stands for scientific and research activities
Economic forests	

EEA Grant

- Methodology for assessment and mapping of woodland and forest ecosystems state and their services in Bulgaria
- Methodological support for ecosystem service assessment and biophysical valluation.
- FORests and woodlands - ecOsystem services mapping and assessment in the bUlgaRian Forest territories oUTside natURa 2000 nEtwork

Methodology for the assessment and mapping of the forest ecosystems and of the ecosystem services in Bulgaria

•**Defining the habitats according to EUNIS (**European nature information system) **based on inventory check lists and the types of forest ecosystems according to EUNIS on a stand level for the forests outside NATURA 2000.**

The algorithm is developed on the basis of information and parameters from the inventory check lists from the forest data base. Tree species, number of layers, species composition, origin, management class, forest type, type of the forest compartment, soil type, altitude, etc. To define each type of ecosystem forming level 4, a different combination of parameters is used. For each indicator there are unique values pointed out in order to define the very type of ecosystem.

Methodology for the assessment and mapping of the forest ecosystems and of the ecosystem services in Bulgaria

- **Assessment of the ecosystems conditions**

✓ Structural and functional indicators: biotic heterogeneity, abiotic heterogeneity, energy budget, matter budget, water budget.

✓ The total assessment of the ecosystems condition is performed on a stand level (sub compartment). System for assessment of the condition of the forest ecosystems, incl. algorithm for assessment of the biotic diversity, algorithm for abiotic diversity, methodic for assessment of the dead wood and tree cover (in percentage).

✓ IP-index for the forest ecosystems : IP 0-0,2 – very bad, 0,21-0,4 – bad, 0,41-0,6 – moderate, 0,61-0,8 – good, 0,81-1,0 – very good.

Assessment of the forest ecosystems – general assessment of the ecosystems state according to types - EUNIS – level 4

- The biggest group with a total area of 1 506 212 ha have **IP index 0,6-0,8 (good).** There are mostly forests from type G 1.7 (thermophilous coppice and high stem broadleaved forests– 536 713 ha), G 3.F (coniferous plantations – 302 730 ha), G 1.6 (beech woodland – 177 328 ha), G 1.A (meso- and eutrophic coppice and high stem broadleaved forests – 158 394 ha), G 1.C (planted coppice and high stem broadleaved deciduous plantations – 137 812 ha) и G 3.4 (Scots pine forests – 75 344 ha).
- In **very good** condition with an assessment **IP=(0,8 – 1,0)** are forest ecosystems with an area of 285 811 ha, mainly type G 1.7 (thermophilous coppice and high stem broadleaved forests – 196 970 ha) and G 1.A (meso- and eutrophic coppice and high stem broadleaved forests – 43 098 ha).
- The smallest area of 11 817 ha take the ecosystems with a **moderate condition IP= (0,4 – 0,6)**. Mainly G 3.F (planted coniferous – 6 063 ha) and G 1.7 (thermophilous coppice and high stem broadleaved forests – 3 213 ha).

Methodology for the assessment and mapping of the forest ecosystems and of the ecosystem services in Bulgaria

- **Assessment of the ecosystem services**

✓ Method of assessment of ESs - Burkhard system, which is a common matrix of the main types of forest ecosystems and the provided services is the used.

✓ The elaborated model for identification and assessment of the types of ESs uses mainly the present information from the forest data base and automatically calculates the results according to the 35 algorithms for each type of ESs on a 5-ranged scale.

Assessment of the types of ecosystem services - provisional, regulating, cultural

The model for identification and assessment of the types ESs uses mainly the present information from the forest data base and automatically calculates the results according to 35 algorithms for the respective type of ESs according to 5-ranged scale :

1 – low relevant capacity to provide the particular ES;

2 – relevant capacity;

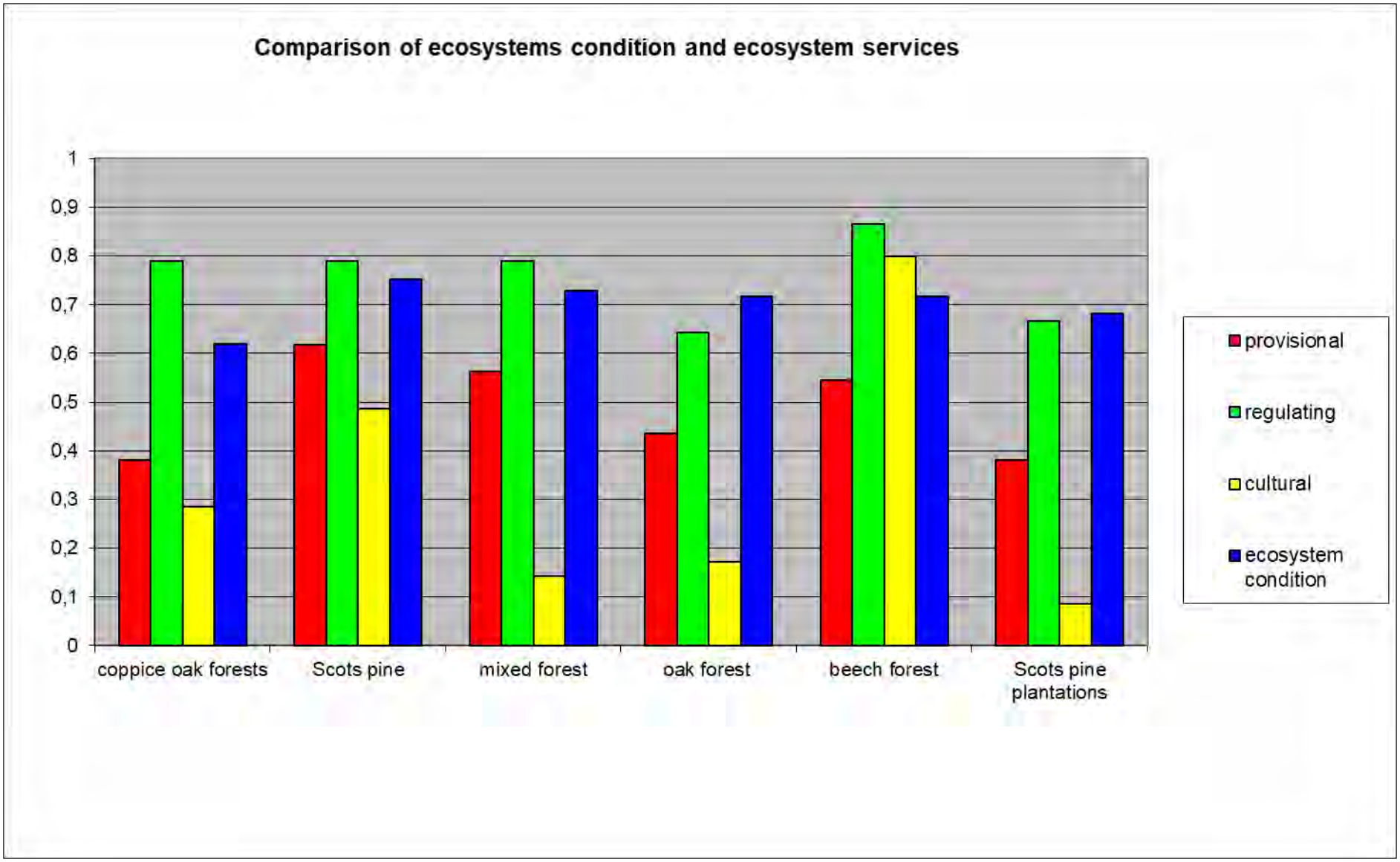
3 – medium relevant capacity;

4 – high relevant capacity;

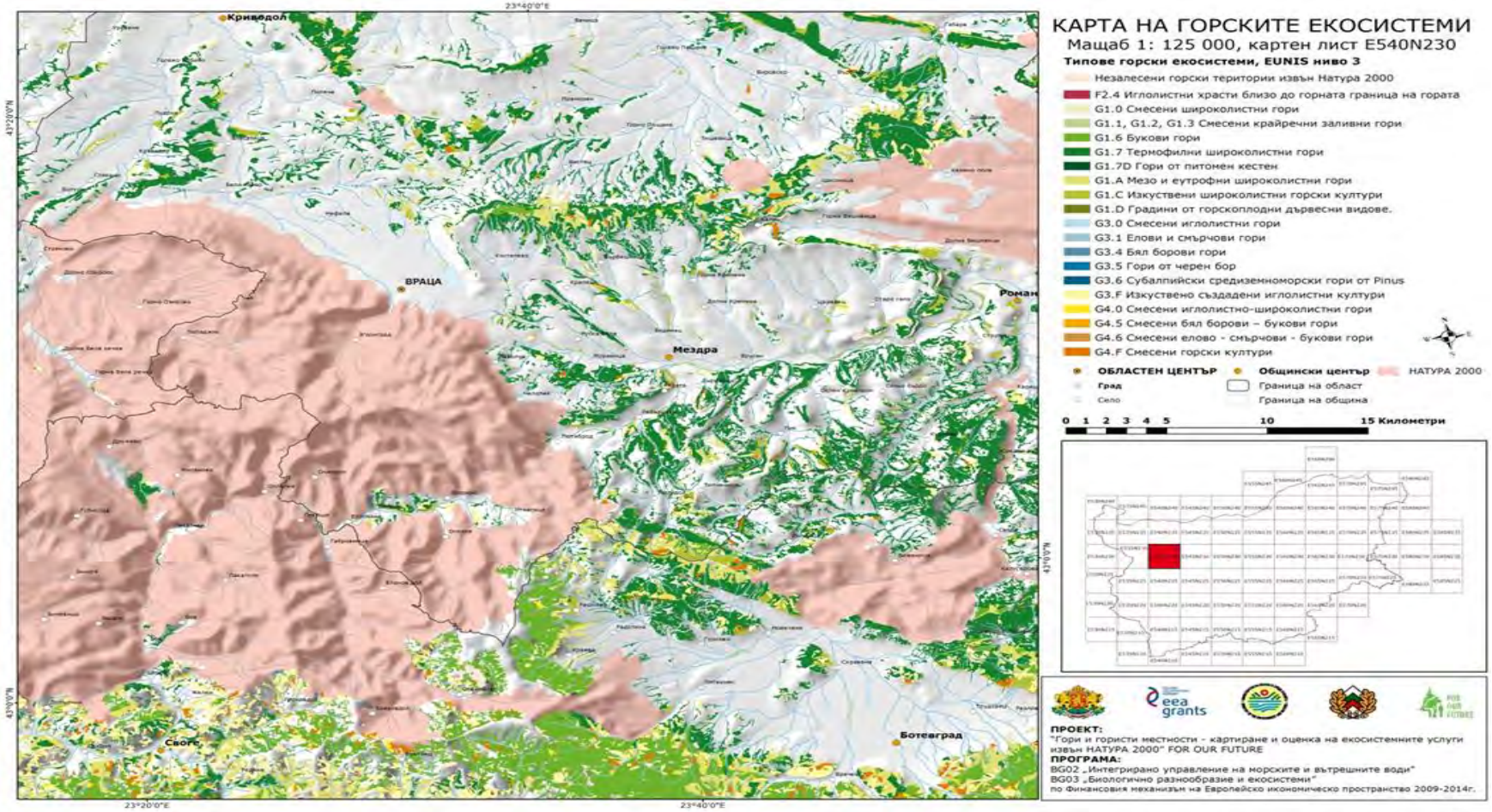
5 – very high relevant capacity.

725 000 sub compartments outside NATURA 2000 - 1 803 000 ha as a total.

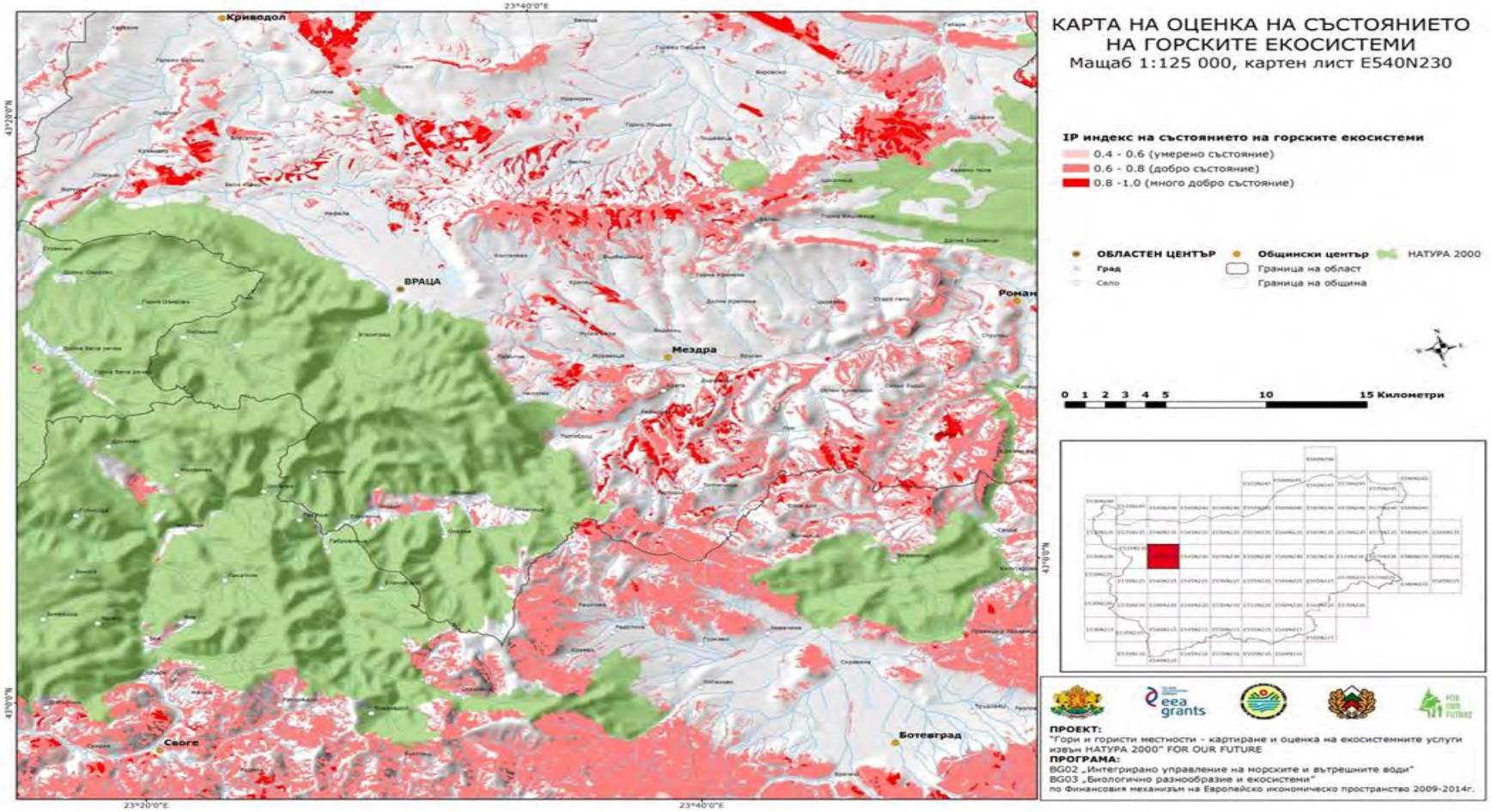
Representative ecosystems



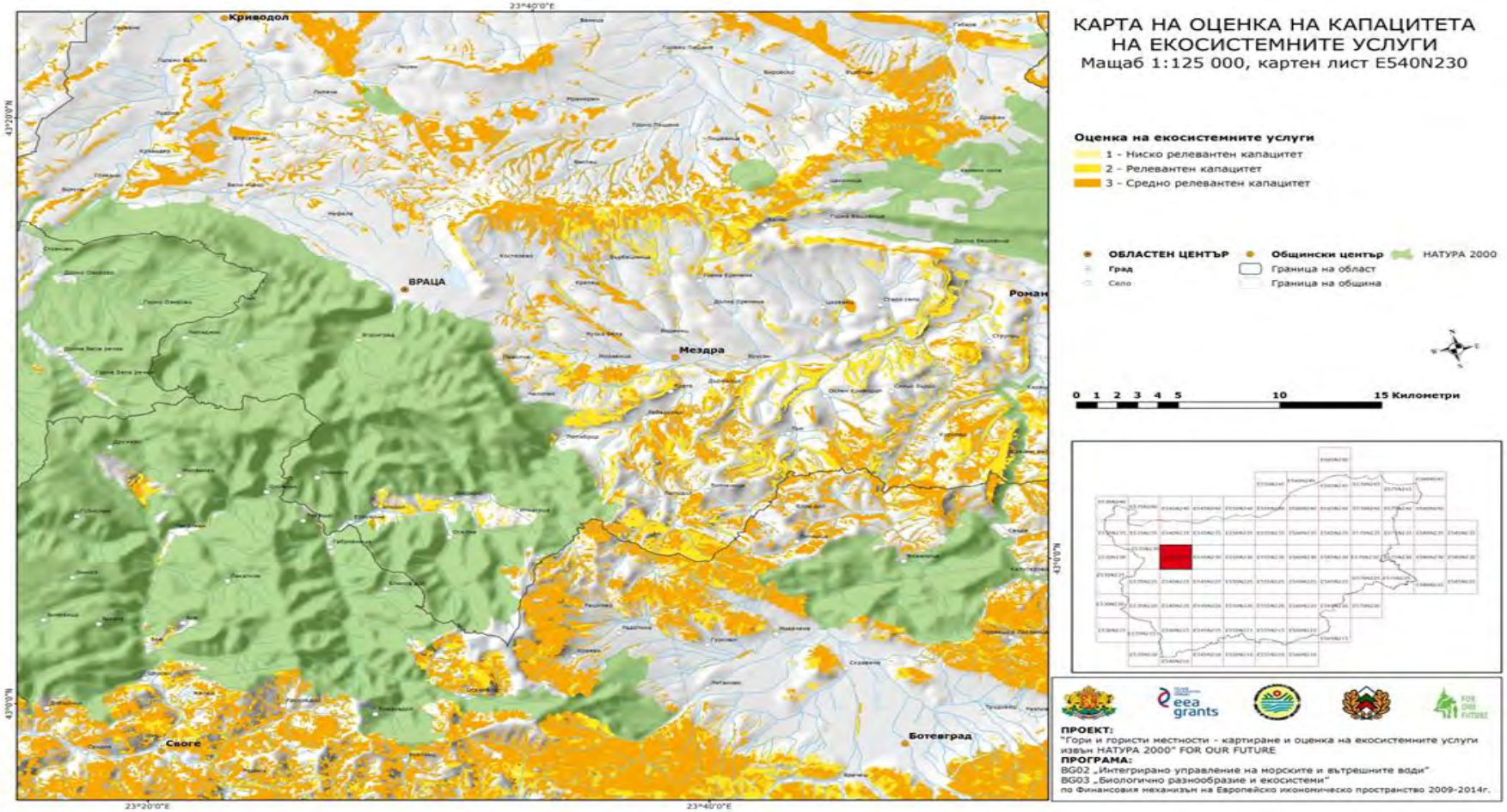
Map of the forest ecosystem types



MAP OF THE FORESTS ECOSYSTEMS CONDITION



MAPPING OF FOREST ECOSYSTEM SERVICES



Interreg
Danube Transnational Programme
CAMARO-D

„Cooperating towards Advanced MAnagement ROutines for land use impacts on the water regime in the Danube river basin“

Danube transnational programme

Priority axis 2 „ENVIRONMENT AND CULTURE RESPONSIBLE DANUBE REGION“
„Foster sustainable use of natural and cultural heritage and resources“

Partnership with traditions– CC-WaterS, CC-WARE

- 14 project partners
- 9 ASP
- 9 countries - AT, SI, HU, RO, BG, HR, SRB, CZE, DE

Interreg
Danube Transnational Programme
CAMARO-D

Main aim

CAMARO-D aims at improving land use practices for the protection of water resources and flood risk prevention in the transnational Danube River Basin. река Дунав

Project duration:
01/2017- 06/2019

Expected results

- Strategy for elaboration of Land use development plan /LUDP/
- 3 pilot Clusters
- Workshops and trainings with stakeholders
- Guideline for sustainable land use planning

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Danube Transnational Programme
CAMARO-D

Work package T1 WP3

Investigative Danube

- **Peer review of land use practices and their impacts**
- **best management practices for land use management**
- **Stakeholders involvement**



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Danube Transnational Programme
CAMARO-D

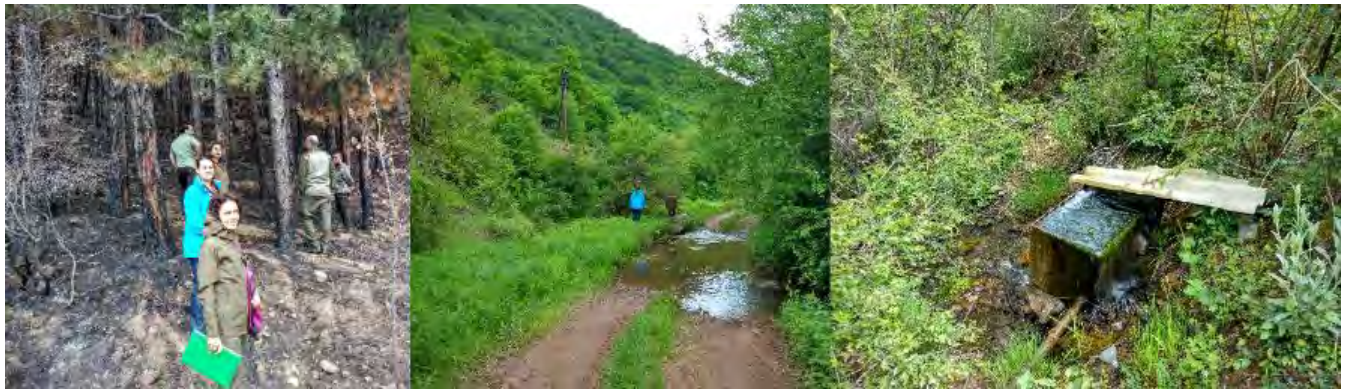
Work package T2 WP4 - Explorative Danube

Pilot clusters

- EFA is Leader of Cluster 2 “Land use and vegetation cover along torrents, small rivers and their catchments - erosion, floods, soil compaction, surface runoff, invasive plant species and water pollution
- Pilot actions
- Lessons learnt

Pilot activities, watershed “Ochindolska reka”

- Forest fire prevention
- Erosion control
- Control in water-protective forests and water protection zones
- Role of forest green belt around settlements
- Suggestions for integrated forest and water management in small watersheds



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Work package T3 WP5
Visionary Danube

- Transnational guideline for sustainable land use planning
- Stakeholders recommendations
- Stakeholders trainings

Work package T4 WP6
Progressive Danube

- Transnational strategy for elaboration of Land use development plan

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