ICAS

For sustainable forest management

FOREST RESEARCH AND MANAGEMENT INSTITUTE

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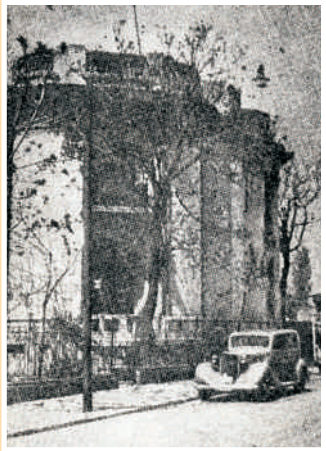
1. Brief history. Juridical status

The Forest Research and Management Institute was founded in 1933 through the Journal of Ministries Council no. 561 from 16th of May 1933, issued in the Official Monitor no. 115 the 22nd of May 1933, under the name of "Institutul de Cercetări şi Experimentație Forestieră" (ICEF).

Before the establishment of ICEF as a self-standing forest research institution the Forest Research Station of Sinaia was founded within the House of State-owned Forests in 1922, then it worked along with the Office of Studies and Documentation which was founded in 1930 within the Autonomous House of State-owned Forests (CAPS).

From the very beginning, the declared scope of the institute has been the promotion of a scientifically based national forest economy. In its initial structure the institute included 5 research departments all of them located in the headquarters, 4 research stations located countrywide (Sinaia – 1922, Gurghiu – Mureş – 1935, Casa Verde – Timişoara – 1937), and 3 experimental bases (Comorova Experimental Forest – 1938, Mihăieşti Experimental Forest District, Ţigăneşti Experimental Forest District – 1942). In its 75 years of activity, ICAS has evolved towards topic diversification, development of new subunits at the territorial level, and has come to maturity.

Nowadays ICAS is a public institution of national interest with a juridical status, specialised in scientific researching, technological planning and investment, national forest inventory, technical consulting and implementation of new technologies towards a sustainable forest management.



The first headquarters of ICEF (1933)
1 Clopotarii Vechi St., Bucharest

The second headquarters of ICEF (1940) – 55 Kisselef Av., Bucharest

The present headquarters of ICAS
(1976, transferred from 46 Pipera Av., Bucharest)
128 Eroilor Blv., Voluntarii

2. Mission and objectives

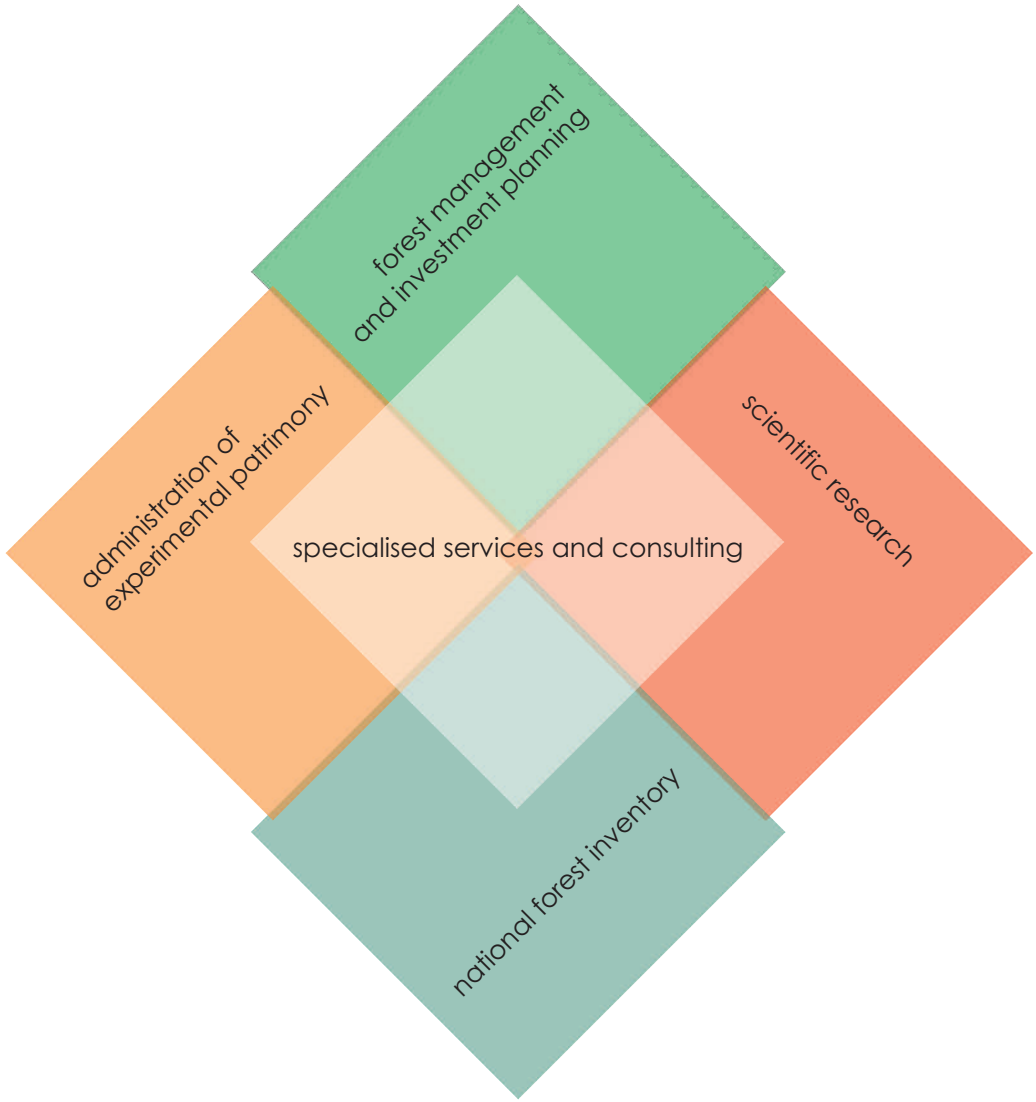
The **mission** of ICAS is to scientifically promote the development of Romanian forest sector by producing and disseminating scientific and technical information, providing professional consulting, generating, transferring and implementing technologies, developing innovative products aiming at increasing the competitiveness of the forest sector, contributing to the society's welfare and well-being.

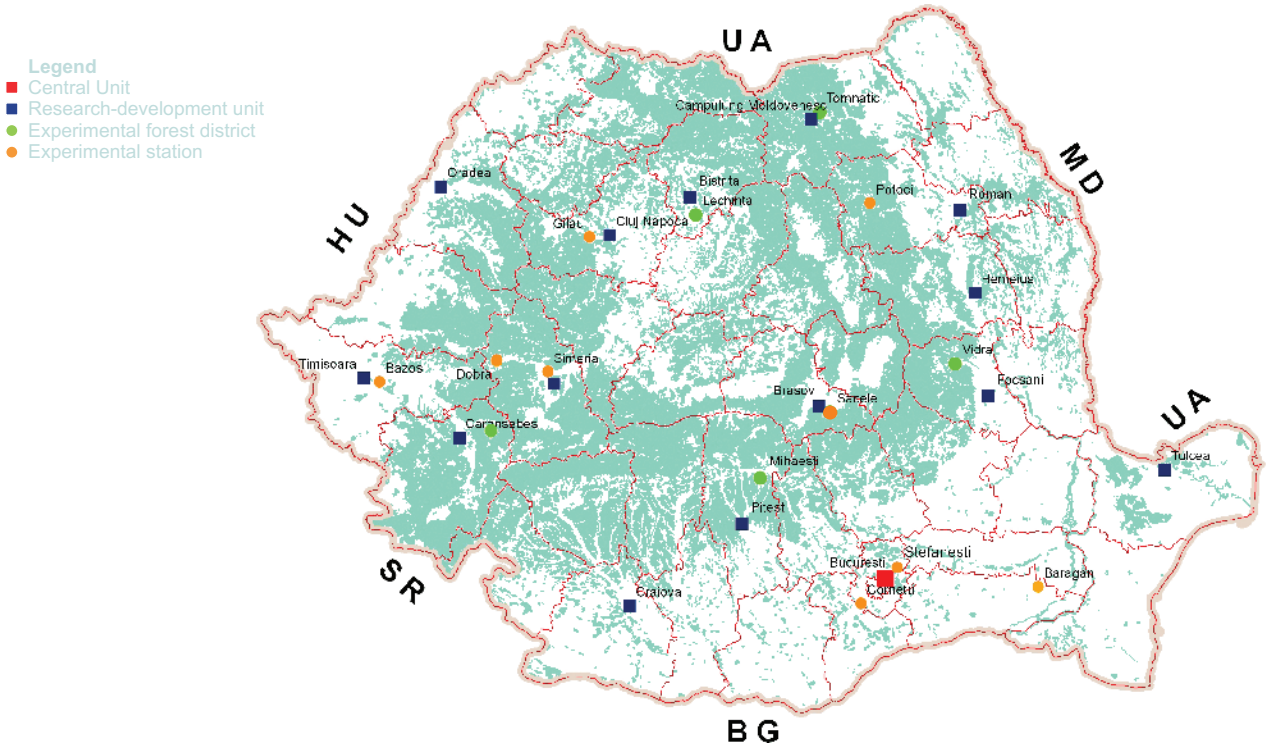
The **strategic objectives** of ICAS:

· conducting fundamental and applicative scientific research in silviculture and connected fields aiming at setting up sustainable forest management;
· conducting technological engineering projects, forest management plans and studies on forest vegetation;
· laying out technical-economic documentation for investments in silviculture;
· administering its own experimental patrimony, primarily acting for making use of it as a base for research studies and experiments, for testing and implementing the research results as well as for carrying out economic activities while protecting, preserving and developing the forests in a sustainable perspective;
· developing competences and building human resources capacities;
· carrying out the national forest inventory;
· performing the tasks assigned by the central authority in charge of silviculture regarding forest monitoring, forest genetic resources preservation and management, providing scientifically and technical backgrounds for new procedures, methods, instructions and technical norms for forestry and game management;
· publishing and disseminating the research outcomes to potential beneficiaries.

3. Fields of activity

ICAS carries out activities in the following fields relevant to Romanian forestry sector: i).scientific research; ii).forest management and investment planning; iii).national forest inventory; iv). administration of experimental patrimony; v).specialised services and consulting.



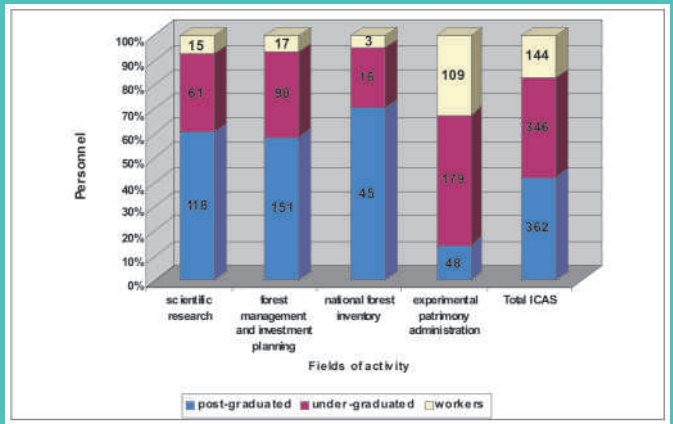


4. Structure

ICAS, the main public institution of forest research and development in Romania, has a complex national-wide organisation, comprising:
- central unit, located in the town of Voluntari, close to Bucharest, in charge of the following activities: scientific research, management planning, investment planning, national forest inventory, administering of its own experimental patrimony, forest production.
territorial sub-units, located in the main ecological regions of the country, and organised into research stations, labs, experimental forest bases and districts.

5. Human resources

The permanent staff of ICAS encompasses 852 persons, distributed as follows: 194 involved in research activity, 258 in technological development along with investment planning in silviculture, 64 in the national forest inventory activity, whereas 336 contribute to the experimental forest patrimony administration. Approximately 200 persons are working in the central headquarters and in the experimental bases located in its proximity, while 650 are working in the territorial sub-units of the institute. The post-graduated staff accounts for 45% of the personnel (around 370-380 persons), graduated staff represents 40% of the total staff (345 persons), whereas workers account for around 15 % (125-135 persons). The figure below reports the ICAS permanent employees configuration considering the qualification levels according to activity fields.



Over 90 post-graduated persons are licensed as researchers whilst other 110 persons are licensed to carry out technological development and forest investment planning activities. Over 50 of them hold a PhD diploma.


The ICAS Tulcea Research Station headquarters


The ICAS Craiova Research Station headquarters


The ICAS Hemeiuş Experimental Base headquarters


The ICAS Timişoara Research Station headquarters


The ICAS Simeria Research Station headquarters

6. Experimental forest patrimony

ICAS manages an experimental forest patrimony stretching on 58,558 ha. This patrimony comprising forests for research purpose, forest seedling nurseries, orchards, arboretums, dendrological collections, and lands intended for forest administration and production, constitutes the basis for long-term research studies and experiments, on extended areas. The experimental forest patrimony's administration is organized into 5 experimental forest districts, 8 forest experimental bases, and one research station.

Current situation of experimental patrimony managed by ICAS in 2008

No.	Experimental forest district, experimental base	Area (ha) referred to 2008
1	OSE Mihăeşti	10 434
2	OSE Lechinţa	17 768
3	OSE Caransebeş	5 230
4	OSE Vidra	9 392
5	OSE Tomnatic	11 347
6	BE ICAS Săcele	2 481
7	BE ICAS Bărăgan	327
8	BE ICAS Cornetu	212
9	BE ICAS Tîrgu Mureş	179
10	BE ICAS Timişoara	71
11	BE ICAS Tulcea	472
12	BE ICAS Craiova	20
13	BE ICAS Ştefăneşti	456
14	Statiunea ICAS Simeria	119
	Total ICAS	**58 558**

Note: OSE = experimental forest district; BE = experimental base;

7. Publications

From its foundation, ICAS has been interested in publishing scientific and technical books and journals covering forestry sciences. ICAS holds a publishing house called "Editura Silvică" (www.editurasilvica.ro), without any juridical status, whose mission is to publish scientific and technical books and journals in the forestry and environmental fields. The publications issued by "Editura Silvica" encompass 5 series as follows:

·**Series I** – Periodicals includes two journals, Annals of Forest Research (www.e-afr.ro) and Bucovina Forestieră (www.bucovinaforestiera.ro). Annals of Forest Research has been evaluated by the Romanian National University Research Council (CNCSIS) and ranked B+ (= scientific journals with high potential to be internationally recognised). This journal is also indexed in the most relevant forestry-related international abstract data bases such as: Forestry Abstracts, Forest Products Abstracts, Grassland and Forage Abstracts, Plant Genetic Resources Abstracts, Plant Breeding Abstracts, Plant Genetics and Breeding Database, Plant Protection Database, Review of Plant Pathology, Soils and Fertilizers, Soil Science Database, Zoological Record etc.

·**Series II** – Research Works includes research studies „in extenso" (studies, research reports, monographs etc) presenting original scientific research outcomes in the field of forestry sciences;

·**Series III** – PhD theses comprises theses in forestry and environmental science areas;

·**Series IV** – Dissemination/Promotion. This collection includes general presentation works and publications intended for knowledge dissemination to the general public;

·**Series V** – Technical Guidelines for Forestry. It includes works presenting technical issues (technical guidelines, norms, recommendations for practitioners, good practice guidelines etc) intended for experts in forest administration as well as to forest owners.

8. Scientific national and international relevance

ICAS is the main provider and manager of the scientific and technical information in the Romanian forestry sector. ICAS is certified by the National Authority for Scientific Research (ANCS) as a component institution of the national research-development system (Decision no. 9666/2008), and as a Centre of Excellence in silvobiology and forest management. Besides the specific activities in its field, ICAS is certified by the national authorities to carry out the following activities: environmental impact assessment studies, cadastral, photogrammetry and geodesy works, conditioning, preserving and testing forest seeds quality, testing pesticides for homologation in forestry.

The quality management system is in compliance with the ISO 9001 standards.

ICAS is a member or closely collaborator with prestigious international organisations such as: IUFRO (International Union of Forest Research Organizations), EFI (European Forest Institute), IPGRI (International Plant Genetic Resources Institute), ICPForests, ECE/UN (United Nations Economic Commission for Europe), ISTA (International Seed Association), EARSeL (European Association of Remote Sensing Laboratories), FTP (Forest-Based Sector Technology Platform) etc.

9. Activity funding

ICAS's turnover is approx. 10-12 million Euro/year. Its distribution by main activity areas looks as follows: approx. 30-35 % pertain to research activity, approx. 30 % to activity concerning technological development and investment planning, approx. 10-15% are dedicated to national forest inventory and around 20-25% is devoted to the forest experimental patrimony administration.

The main sources of funding for the ICAS's activities come from the programmes financially supported by the following entities: the Ministry of Agricultural and Rural Development, the Ministry of Education, Research and Youth, as well as the Romanian National Forest Administration ROMSILVA. To the abovementioned funding sources it may be added small-scale financial support derived from other public authorities (such as the Ministry of Environment and Sustainable Development), from EU-programmes, from state/private-owned companies, foundations etc.

10. Products and services offered by ICAS

· Research studies in all forest sector areas;
· Management plans for state- and private-owned forests;
· Valuation studies on standing wood and timber;
· Projects on ecological reconstruction of degraded lands and management planning of torrential watersheds;
· Projects on forest road construction and maintenance;
· Setting up, restoring and developing forest shelterbelts;
· Projects on forest pest forecasting, preventing and controlling;
· Forest health monitoring (national- and European-level);
· Game management planning;
· Green urban planning;
· Topographic measurements and digital photogrammetric restitution;
· Scanning, plotting and printing facilities;
· Geo-database building and exploitation, GIS analyses, digital and hardcopy maps, digital terrain modelling (DTM), remote sensing applications, satellite imagery processing, including high spatial resolution imagery, analysing and interpretation;
· Conditioning, preserving and quality testing of forest seeds:
· Developing technical normative and documentation for forestry sector;
· Providing technical assistance and technology transfer to forestry sector;
· Environmental impact assessment of activities impacting state/private-owned forest;
· Providing access to a large (bibliographic) data base (over 30,000 volumes, numerical and spatial data bases, studies and projects etc.) for the Romanian forestry sector ;
· Certificate service: making, issuing phyto-sanitary bulletin of seedling or nursery stock, willow and osier stock etc.;
· Pesticides and herbicides testing to facilitate their homologation;
· Marketing assortments of broadleaf and coniferous timber;
· Marketing forest seedlings of a diverse range of species for afforestation works;
· Marketing over 100 varieties of ornamental trees and shrubs;
· Breeding and marketing trout and pheasant to consumers.

11. Brief presentation of ICAS activity fields

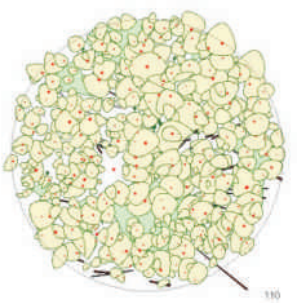
I. Scientific research

FOREST ECOLOGY

Scope
Investigation of forest ecosystems in terms of typology, structure, biologic diversity and dynamics aiming at substantiating forest biodiversity conservation and its sustainable management.

Research priorities

√typology of forest ecosystems;
√ecology of forest species and their distribution range;
√biodiversity of forest ecosystems;
√dynamics and structure of natural forest ecosystems;
√forest meteorology and climatology and influence of climatic factors on forest ecosystems;
√phenological observations within the national network of forest phenology (FENOFOR);
√fragile forest ecosystems (riparian forests, forest steppe, upper limit forests, etc.) and ways to improve their stability;
√forest ecosystem conservation and ecological restoration of degraded ecosystems;
√climate change impacts on forest ecosystems.



Staff
18 permanent employees, 13 of which researchers, 6 of them PhD degree holders (Ion Barbu – CS I, Radu Cenuşă – CS I, Lucian Dincă – CS I, Iovu-Adrian Biriş – CS II, Carmen Iacoban – CS II, Marius Teodosiu – CS III, Dan Turcu– CS III, Eugen Frățilă– CS III, Ion Voiculescu– CS III, Ana Maria Pană– CS III, Maria Dincă– CS III, Oliver Merce– CS, Ioan Steța– CS).

Infrastructure and equipment
· The Forest Ecology Laboratory is equipped with all facilities (ICAS Câmpulung Moldovenesc Research Station);
· Botanical scientific collection (herbarium ICAS Bucureşti).
· Field work equipment: Field Map Data Collector, digital tree callipers, Vertex III Hypsometer, increment borers, Tracing Radiation and Architecture in Canopies (TRAC), instrument for leaf area index measurement, HemiVIEW canopy system, LAI – 2000 plant canopy analyser, chainsaws, digital meteorological stations, portable meteorological stations, etc.
Experimental plots and long-term experimental networks (FENOFOR, NATFORMAN network, draught risk assessment of Romanian Forests network).

Relevant projects

•Mapping Romanian forests;

•Structure and dynamics of natural forest ecosystems, supporting close-to-nature silvicultural activities and sustainable forest management (NATFORMAN);

•Inventory and strategy for sustainable management and protection of Virgin Forests in Romania;

•Draught risk assessment in Romanian Forests;

•Conservation and integrated management of Danube islands;

•Inventory of natural protected sites of community importance Natura 2000 according to the EU Directives "Birds" and "Habitats" provisions;

•Grounding the operational management of socio-ecological systems;

•Defining, assessing and zoning risks for Romanian forests;

•National Phenologycal Network setting-up and use;

•Study on atmospheric deposits assessment within the framework of the forest ecosystem monitoring network;

•Modelling and forecasting drought and fire risks in Romanian forests;

Study on forest ecosystems within specific protected areas, delimited in Romanian natural and national parks.




FOREST ECOPHYSIOLOGY

Scope
Research on physiological processes of trees and stands aiming at increasing forest ecosystems productivity and stability





Research priorities

√understanding ecophysiological processes in tree growth in order to substantiate the measures for sustainable forest management;
√assessment of the carbon stocks and fluxes in forest ecosystems;
√research on biogeochemical circuits in forest ecosystems under the conditions of change in atmosphere composition due to pollution;
√research on tree and stand physiology under stress conditions;
√substantiating silvicultural measures targeting sustainable forest management;
√climate change impact monitoring and assessment on physiological processes in forest ecosystems.

Staff
8 permanent employees, 4 of which researchers, 3 of them PhD degree holders (Valentin Bolea – CS I, Viorel Blujdea – CS II, Marian Oneață – CS III).

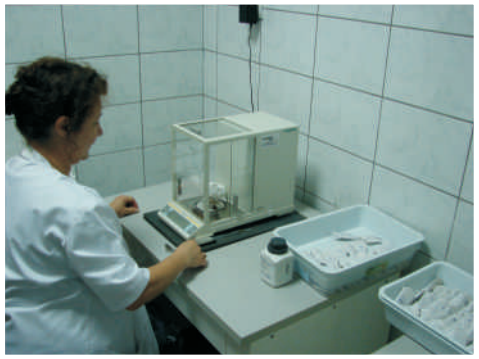
Infrastructure and equipment

• Laboratory specific and field equipment devoted to physiological research (foliage gas exchange analyser, diffusion-based soil respiration chamber, Parnas apparatus, spectrophotometer, Unicam atomic absorption spectrophotometer, oven, plant material grinder, calcinatory oven, analytical laboratory scales, meteorological stations, data loggers, hygro-thermo-animometer, soil moister humidometer, pH meter, Digitech callipers, Vertex hypsometers etc).
• The Laboratory of Physiology is ergonometrically-furnished, according to ISO 9001 standards.
Long-term experimental plots on carbon sequestration in forest ecosystems, monitoring for tree- and stand-level physiological processes etc.

Relevant projects

· FORLUC- Modelling carbon sequestration in transitory ecosystem forms associated with forest land-use change in Romania;
· Assessing and monitoring global environmental changes on forest ecosystems;
· Biodiversity restoration/conservation for forest ecological reconstruction;
·Implementation of monitoring plan within Emission Reduction Purchase Agreement for Afforestation of Degraded Lands in Romania;
· Study on developing harmonized methods for assessing carbon sequestration in European Forest;
· Estimation of carbon budget and fluxes from land use to Black Sea basin;
· Quantifying and Understanding the Earth System (QUEST)- A Research Project accompanying a Demonstrator Forestry Project for Climate Mitigation.

Scope
Research on forest soils and sites to substantiate measures for sustainable forest management



FOREST PEDOLOGY AND SITES

Research priorities
√Research on genesis, classification and mapping forest soils;
√Refining and updating the classification of forest sites;
√Creating and developing a Romanian forest soil database;
√Establishing analytical diagnosis indexes for the main forest soil units;
√Monitoring forest soils quality within national and pan-European monitoring networks;
√Developing technologies for the improvement of forest soils quality in case of degrading processes;
√Conducting studies and projects on ecological reconstruction of forest lands;
√Conducting studies on environmental restoration for lands to be included in forest land use;
√Conducting studies on site quality classes for afforestation lands;
√Pedological and edaphological investigations;
√Pedological and edaphological mapping within the national forest fund;
√Improving laboratory methodology for cost-effective approaches.

Staff
9 permanent employees, 3 of which researchers, one PhD degree holder (Florin Dănescu - CS III, Monica Ionescu – CS III, Elena Edu –

Infrastructure and equipment
· Laboratory specialised in physico-chemical forest soil and vegetation analyses in a 300 m2 area ergonomically furnished according to ISO 9001 standards, with niches for exhausting nocive gases and modern equipment (atomic absorption spectrophotometer, distillator, ultrapure water system, air purificator, rotary agitator, digestion-oven, high-performance system for simultaneously digesting 10 samples for atomic absorption, inductively-coulpled plasma ICP OES, CNS analyser for detecting total N, S and C in soil and plant material, water softener station, analytical laboratoy scales, ovens, electric heater, grinder for plant material).
· Fieldwork equipment and apparatus for pedological research.

Relevant projects
· Assessment of forest soil quality within national and pan-European monitoring networks;
· Pedological and sites research on forest ecosystems in Dobrogea to substantiate management measures;
· Identifying high risk forest areas subject to flooding and rain water stagnation in plain region.

Scope
Forest genetics and tree breeding by conventional methods and biotechnologies

FOREST GENETICS

Research priorities
√establishing, using and sustainable management of sources of genetic material for producing forest reproductive material genetically improved;
√certifying forest reproductive materials destined to international trade harmonized with the OECD scheme;
√establishing, preserving, handling and sustainable management of forest genetic resources;
√testing for genetic value of sources of reproductive forest materials in comparative multi-site cultures to designate the most valuable source testing by ecological regions;
√tree breeding for enhancing resistance to disease and pests as well as for increasing wood production and quality;
√selection of valuable tree populations based on biosystemic studies and genetic variability established in multi-site comparative cultures;
√"In vitro" multiplying of valuable genotypes by organogenesis and somatic embryogenesis;
√study on genetic diversity based on molecular genetic markers;
conditioning, preserving and testing forest seeds for quality in compliance with national and international ISTA regulations.

Staff
27 permanent employees, 16 of which researchers, 9 PhD degree holders (Gheorghe Pârnuță-CS I, Ioan Blada – CS I, Georgeta Mihai –CS II, Lucia Ioniță - CS I, Magdalena Palada Nicolau – CS I, Flaviu Popescu-CS I, Dragoş Postolache-CS I, Mihai Filat-CS I, Elena Stuparu-CS I)

Infrastructure and equipment

·Equipment devoted to molecular genetics research, genetic markers and "in vitro" cultures:
magnetic stirrer, incubator-stirrer, ice maker, water distiller, sterilizer, ultrasonic bath, analytical balance, technical balance, SIGMA cooling bench centrifuge, climetizer, cooling combine, low temperatures freezer -800 C, cryoconservator (liquid Nitrogen can and accessories), horizontal electrophoresis, 12 and 24 cm vertical electrophoresis, 50 cm sequencing vertical electrophoresis, Memmert drying stove with ventilation, CONSORT Generator, PolyLabo 500 V generator, climatized enclosure with programmed illumination, climatized enclosure without illumination, incubator-agitator, U.V. antibacterial lamp, Eppendorf microcentrifugator , grinder, Eppendorf multipipette, recesses for handling chemical substances, automatic adjustable pipette, image analysis system, Docu-Print editing image system, gels images visualization system, binocular stereomicroscope, termocycler, U.V viewer for electrophoresis, vortex, pH-meter, electric furnace, spectrocolorimeter Spekol 10, system for documentation and interpretation of gels, data processing software.

·Tree breeding equipment: Hagloff electronic calipers, Vertex III hipsometers, Rotfinder instrument, palmtops, Trimble GPS, table PC, SPSS statistical software, telescopic scales, tree bicycle, full tree climbing equipment.

·Equipment for seed analysis: Sartorius 0,0001 g balance, electronic balance HF-300G, Ohaus electronic balances, Ohaus MB 45 thermo balance, Binder drying stove, Jacobsen 5301 5-400C, soil divider;

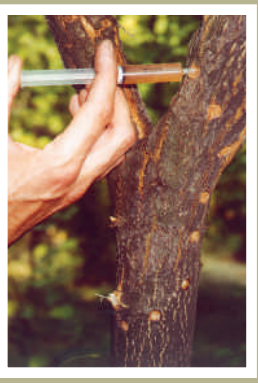
Long term experimental areas (over 50 ha in 22 different locations): conifers and broadleaves provenance trials, half sib and full sib trials, inter specific hybrids trials for Pinus and Picea genus, experimental fields in nurseries from Sinaia, Nufărul and from our own experimental

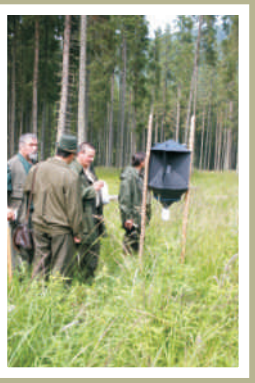
Relevant projects

- A working model network of tree improvement for competitive, multifunctional and sustainable European forestry (TREEBREEDEX)
- Ash for the future: defining European ash populations for conservation and regeneration (FRAXIGEN);
- Romanian Forest Genetic Resources Conservation and Sustainable Management (COREGE-FOREST);
- Study of genetic variability of the main forest tree species in order to establish the tested seeds sources an to harmonize with the E.U. regulations (TREE –VARGEN);
- Assessment and mapping of the genetic diversity for Romanian oak species for sustainable management of the forest ecosystems and dynamic conservation of genetic resources (OAKGIS);
- Advanced biotechnologies for micro multiplication, conservation and soma clone selection of ornamental trees and scrubs, for landscape rehabilitation (ARBOOR);
- Rehabilitation of forest habitats from the Pietrosul Rodnei Biosphere Reserve;
- Study concerning genetic assessment of the conifers seed orchards in order to obtain advanced generations of breeding;
- Study concerning regulations for forest reproductive material utilization and transfer;
- Study regarding the establishment and delineation of regions of provenances according to assimilated knowledge and their correlation with present regulations.

Scope
Maintaining forest health by developing new survey and control methods of the injuring agents

Research priorities
√pest and pathogen biology and ecology;
√advanced methods of identification, prognosis and control of biotic virulent factors;
√modern methods of biologic control of forest aggressive insects and fungi;
√role of biotic and abiotic factors in forest decline;
√modernised methods of forest sanitary state survey;
√new pesticide tests and homologation;





FOREST PROTECTION

Staff
20 permanent employees, 13 of which researchers, 7 PhD degree holders. 10 researchers are specialised in forest entomology (dr. Romică Tomescu, dr. Vasile Mihalciuc, dr. Constantin Ciornei, dr. Constantin Nețoiu, dr. Nicolai Olenici, Salvatore Vals, Mihai Bârcă, Valentina Olenici, Tatiana Blaga, Leonard Duduman, Octavian Bădele), 2 in forest pathology (dr. Dănuț Chira, dr. Ioan Tăut) and 1 in forest mycology (Florentina Chira).

Infrastructure and equipments
• Laboratory of forest entomology: growing chambers, microscopes, etc.;
• Laboratory of forest pathology and mycology: sterile chambers, incubators, microscopes, PCR, tomograph, etc.
• Fieldwork equipment and apparatus for forest protection research.

Relevant projects
• Defoliators control in broadleaved forests;
• Influence of long-term use of pesticide on ecologic equilibrium of oak forests affected by diseases and defoliators;
• Identification of alien invasive insect species in Romania;
• Forest sanitary state in trans-national network (16x16 km - EU Scheme and ICP – Forests);
• Viral products use to control defoliator insects in broadleaved forests;
• Technology improvement of ULV treatment against forest pests;
• New methods and pesticide for biological and integrated control of nursery and solarium pests;
• Integrated control of resinous stem insects in forest stands affected by wind falling and snow breaks;
• Defining, assessing and zoning of Romanian forest risks;
• Emerging threats to forest ecosystems from hybrid fungi – FORTHREATS;
• Declining factors for broadleaved and conifers species and proper management solutions for forests;
• Prevention and control of forest plantation diseases;
• Identification, prevention and control of nutrition disease in nurseries and plantations;
• Scientific substantiate of bio-indicator methodology to evaluate and survey the level of pollution in forest ecosystem and green spaces.

Scope
Dendrometry, auxology, dendrochronology, forest monitoring and forest economics

Research priorities
√Ecological and mathematical statistics grounds of biological processes from the forest biometrics standpoint;
√Biometric methodology and models for trees and stands;
√Dedrochronological and dendroclimatic approaches;
√Informatic system for forest management planning;
√Developing, monitoring and making the best use of the scientific potential on protected areas in the forest fund;
√Development of forest monitoring in Romania;
√Economic market and non-market valuation methodology of forest resources (goods and services);
√Monitoring forest condition and environmental component quality.

FOREST BIOMETRY

Staff
15 permanent employees, of which 10 researchers, 7 PhD degree holders: Ovidiu Badea – CS I, Marian Ianculescu – CS I, Cristian Stoiculescu – CS I, Ionel Popa – CS I, Radu Vlad – CS I, Corneliu Iacob – CS II, Radu Remus Brad – CS III, Simona Drăgoi – CS III, Ştefan Neagu – CS III, Cristian Sidor – CS

Infrastructure and equipment
· Equipment: Field Map system, digital positioning table for tree-ring analysis Lintab 5, Suunto Vertex Laser and Masser dendrometers, Masser and Haglof callipers;
· Long-term experimental plots: International Long Term Ecological Research (ILTER) and Long Term Ecological Research (LTER) networks Romania; RODENDRONET dendrochronological network; network of plots for impact assessment of local pollution on forest condition; research study network on substantiating methods, mathematical auxological models along with dendrometrical and production tables.

Relevant projects
• Long-term Effects of Air pollution on Forest Ecosystems in the Bucegi Natural Park;
• Population/Species role in generating goods and services – biodiversity conservation policy and strategy support;
• Dedrochronological and dendroclimatic research studies in the Muntii Rodnei National Park;
• Reconstitution of last centuries climate at the level of the Carpathians through dendroclimatological techniques;
• Auxological, dendrochronological and dendroclimatic research studies of forests under climate change impact targeting sustainable forest management;
• Research on damage assessment of fluoride pollution in Prahova Valley;
• Research on establishing the Coridorul Jiului as a Natural Park.

Scope
Natural, mixed and artificial stand regeneration, stand tending works, applying silvicultural systems, wood harvesting eco-technologies and forest nursery.

Research priorities
√methodologies and technologies for natural, artificial and mixed stand regeneration;
√stand tending and management methods to implement sustainable forest management;
√wood harvesting technologies and forestry prescriptions and regulations harmonization;
√improvement, restoration and substitution of degraded stands;
√research on setting up protective forest cultures;
√environmental impact assessment studies of activities impacting the forest fund;
√testing and using herbicides and fertilizers in forestry.

FORESTRY TECHNIQUES

Staff
13 permanent employees, 10 of which researchers, 6 PhD degree holders: Cornel Costăchescu – CS III, Constandache Cristinel – CS II, Mihaela Mănescu – CS II , Gheorghe Guiman – CS II, Elena Mihăilă – CS III, Manole Greavu – CS III, Virgil Scărlătescu – CS III, Horia Vlaşin – CS III, Alexandrina Gălan – CS III, Dănuț Cornici – CS

Infrastructure and equipment
·Davis Portable meteorological stations, Haglof dendrometers and callipers, fieldwork pH metres, GPS Trimble, LINTAB 5 digital positioning table for tree-ring analysis;
Long-term experimental plots located in the experimental districts and bases.

Relevant projects
• Beech wood quality by age class, site conditions and silviculture operations;
• Harvesting indexes for tending works (tending, thinnings) according to high quality wood-oriented silviculture in beech stands;
• Integrated rehabilitation technologies by afforestation of lands affected by erosion and land sliding in the South of Moldova;
• Long-term experimental plot surveillance in the forest fund;
• National system of shelter belts in areas at high risk of desertification;
• Study on developing agroforestry systems in Romania;
• Research on natural regeneration of forests subject to special conservation regime;
• Non-conventional afforestation technologies of polders in the Danube Floodplain and of sandy soil lands in southern Oltenia;
• Natural regeneration methods of mixed beech and oak stands;
• Silvicultural systems and ecoprotective wood harvesting methods.

Scope
Wildlife conservation and management, freshwater ecology, game and salmonid management

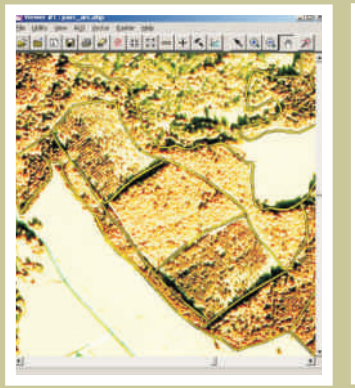
Research priorities
√biology, ecology, ethology and management of certain mammals and bird species enviewed as priority;
√reintroducing certain of extinct species in the Romanian fauna;
√natural habitat and endangered species conservation;
√establishment technologies of breeding and growing individuals in captivity to repopulate hunting grounds and freshwaters;
√managing freshwater fisheries;
√assessing biodiversity of mountainous freshwater ecosystems;
√research on cost-effective activities in trout farms;
√wild animal species capture and tranquillization;
√using GPS and GIS tools in wild fauna management in Romania;
√wild animal species distribution GIS thematic mapping;
√conflict management of wild fauna and human activities;
√consultancy, technical assistance and environmental impact assessment in wildlife and salmonid management;

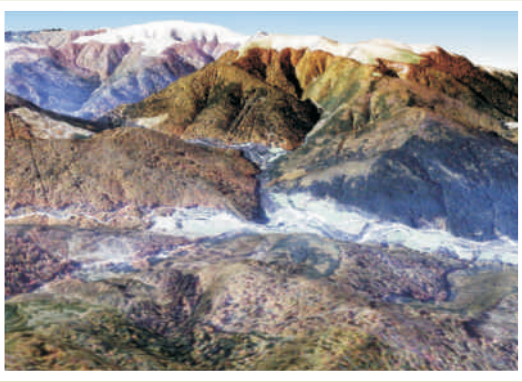
WILDLIFE AND SALMONID BIOLOGY AND MANAGEMENT

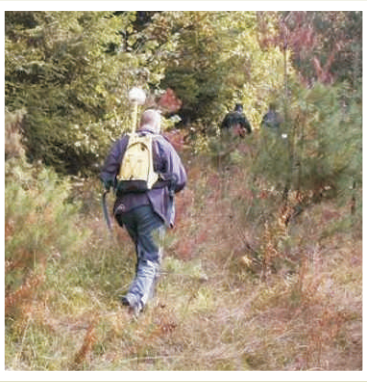
Staff
21 permanent employees, 12 of which researchers, 5 PhD degree holders: Ovidiu Ionescu – CS I, Vadim Nesterov – CS I, Georgeta Ionescu – CS II , Ion Cristea – CS II, Ion T. Cristea – CS III, Şerban Neguş – CS III, Aurel Gângă – CS III, Remus Unici – CS III, Ion Mirea – CS III, Marius Popa– CS III, Ramon Jurj – CS, Claudiu Paşca – CS.

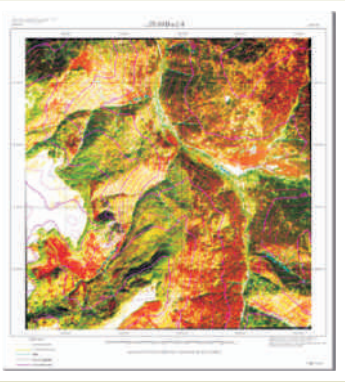
Infrastructure and equipment
·Wild animal tranquilizer and immobilization kit, live animal trap and capture kit, monitoring equipment (radiotelemetry system), GPS equipment, wildlife specific photo-video equipment, day and night-time visualisation equipment, laboratory boat, electrofishing equipment.
·Experimental plots: 12 hunting experimental grounds self-administred, 2 trout farms.
·Research Centre for large carnivores (ICAS Brasov Research Station).

Relevant projects
• Establishing national strategy for wildlife management;
• Large carnivores and wild cat population assessment in Romania;
• Setting up national-level information system for wildlife management;
• Wildlife management in protected forest areas;
• Setting up a model for implementing the legislation concerning Nature 2000 in Romania using as a case study animal species listed in the Directive Habitats 92/43/EEC;
• Research on beaver eco-ethology in Romania;
• BEAR – Bear Ethology Around Romania;
• Trout productivity class-based classification of mountainuous rivers/lakes;
Biotope reassessment for salmon trout and huchen.









Scope
GIS, teledetection, fotogrammetry and digital cartography applications in forestry

FORESTRY GEOMATICS

Research priorities
√geo-database building to assist cost-effective forest management and environment protection;
√exploiting geo-databases for GIS analyses, digital maps, building and exploiting digital terrain models;
√interpreting and analyzing standard products derived from existent satellite data;
√satellite image processing, analyzing and interpreting for different purposes, control and validation by field measurements using Laser and GPS tools;
√orthophotoplan making by means of aerial or high resolution satellite images to update the existent information of topographic plans;
√digital satellite fotogrammetry applications;
√integrating teledetection data with vectorial databases devoted to forestry and other kind of studies;

Staff
8 permanent employees, 4 of which researchers, 1 PhD degree holder: Vladimir Gancz - CS I, Marius Petrila - CS III, Adrian Lorenț – CS, Bogdan Apostol – CS, Joița Apostol – sing. principal, Alexandru Creț – analist programator, Cristiana Marcu – geograf.

Infrastructure and equipment
Geo-data server, Windows XP computer network, plotters, Trimble Pathfinder Pro XH GPS, ArcGIS ArcInfo 9.2, ArcView 3.2 software, teledetection imagery processing software - Erdas Image 9.0, eCognition 5.0, digital photogrammetry software - LPS Core, GPS data collecting software - Terrasync 3.1, ArcPad 5, GPS data processing software - GPS Pathfinder Office.

Relevant projects
• Mera - Forest Ecosystem Mapping – in collaboration with Joint Resarch Centre of the European Commision (Ispra, Italia).
• Research study on using orthophotoplans with high resolution digital image-based for forest management planning and forest cadastre, on a testing area.
• Technical Assistance to Support Forest Information Management in Romania (TAFIMRO) Romania – Flamand Region (Belgium) cooperation-based study with the Flemish Land Agency - OC GIS - Vlaanderen
• Forest vegetation classification technology by using satellite images and obtaining the geographical data base, as a support to adjusting the FAO-LCCS methodology to Romanian conditions;
• Spatial data infrastructure for environmental protection applications;
• Setting up a national network and a unified information system for land cover and use management to assist GMES application development;
• Developing new products derived from satellite data adjusted to end-users' requirements to assist in situations with hydro-meteorological high risk.

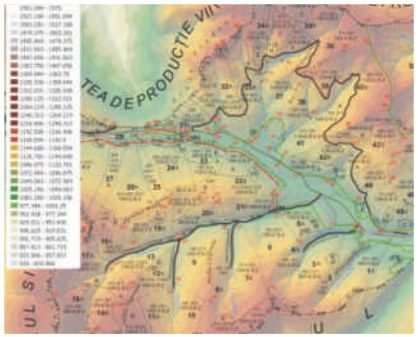
II. Forest management and investment planning

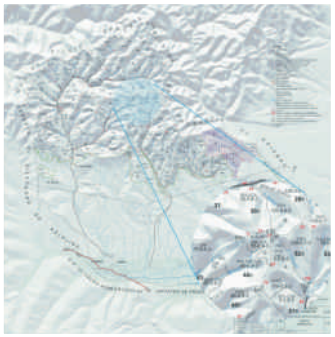
FOREST MANAGEMENT PLANNING

Scope
Forest and other wooded land management planning.

Priorities
√management planning for sustainable forest management;
√studies for converting and managing forested pastures;
√predicting prognoses on wood resources at regional and national level;
√conducting pedological studies and site mapping;
√forest cadaster, fotogrammetry and geodesy-based works;
√topographic planning (triangulation, fotogrammetric restitution and cartography);
√outlining forest planning maps and map replication.

Infrastructure and equipment
• Modern instruments and equipment for data collecting, storing and processing (total stations, GPS, Vertex III, callipers, Pressler borers, cartographic data base, GIS and alfanumeric data bases, suitable software and hardware, fieldwork jeeps).
• Equipment devoted to digital photogrammetry, digital mapping and GIS; computer network, scanners, plotters, GIS specific software - ArcGIS, ArcEditor 9.1 and ArcGIS, ArcEditor 9.2, ArcGIS Publisher, ArcView 9.1, Autodesk, Map 3D 2007 and Raster Design 2007, VP Raster, ACDSee, WideImage.
digital database consisting of the management plans designed after 1995 for all the forest districts, of a cartographical base (topographical plans) used for forest management planning as well as an archive compring the management plans dating back to 1948.

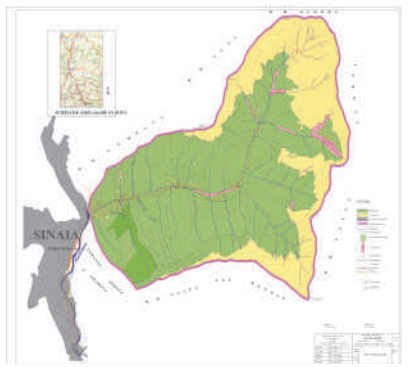




Staff
238 permanent employees, 142 of which are graduates. The activity is carried out in 9 subunits of ICAS (ICAS headquarters, Bacău, Bistrița, Braşov, Caransebeş, Craiova, Oradea, Piteşti, Roman).




Relevant outcomes
• Changing forest series oriented management planning system with conceptualized forest units oriented one;
• Outlining prescriptions and technical norms for management planning in 1948 and reviewing them in 1949, 1951, 1953, 1959, 1969, 1980, 1986 and 2000 by making the best use of the accumulated experience as well as of the experimental research outcomes in this field;
• Designing and conceptualizing new management planning methods devoted to allowable cut assessment, growth indicator for high forest, allowable cut assessment for coppice forest, for converssion from forest coppice to high forest, as well as for uneven-aged high forest (changeable harvesting area);
• Improving work procedures and techniques by making the best use of research studies in dendrometry, pedology, typology, biodiversity conservation etc. by using yield tables, sorting tables, key indicators for soil-, site- and forest types etc.
• Designing a software management planning specific (AS2-forest management planning) which enables computer-assisted stand description data processing;
• Approaching forest management planning from a systemic perspective, prioritising worktasks to be performed aiming at managing the forest structure towards achieving the highest effectiveness according to forest management tasks;
• Introducing GIS in forest management planning and building data bases in GIS in case of 47 forest districts and 6 experimental bases covering a total area of 612,000 ha (10% of the national forest fund);
• Improving main yield allowable cut setup for high forest and forest coppice;
• Management planning the entire Romanian forest fund during 1948-1956 and reviewing forest management plans every 10 years;
• Modernising conceptual grounds of the Romanian forest management planning by emphasizing forest management ecological goals by extending and interpreting the principles of forest management in an ecological sense and approaching it as a cybernetic system.

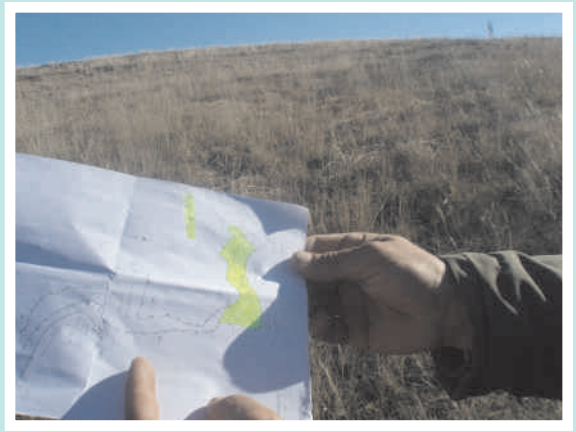


INVESTMENT PLANNING IN SILVICULTURE

Scope
Elaborating investment and land reclamation projects in silviculture. Carrying out applicative research on torrential watershed management and degraded lands reclamation.

Priorities
• Elaborating prefeasibility studies, feasibility studies, technical projects and providing technical assistance in the following domains: torrential watershed management planning; forest ecological reconstruction of degraded lands; forest roads planning; green urban areas planning; forest shelterbelts planning; afforestation of degraded or polluted lands; forest cadastre; avalanche combat planning; forest nurseries setting up; game management constructions and planning; forest constructions planning; accessibility of forests and extension of the roads network.
• Research in the field of torrential watershed management and degraded lands reclamation: dynamics of the torrent beds in small area watershed prevalently covered by forests; modelling and optimising land-use in terms of hydrological and anti-erosion processes in small torrential watershed.

Staff
20 permanent employees, 10 of them are graduates: :Şerban DAVIDESCU (IDT 1), Corina Gancz (IDT 1), Andrei ADORJANI (IDT 1), Cezar UNGUREANU (IDT 1), Adriana DAVIDESCU (IDT III), Adrian MOISE (IDT III), Costicş BABAN (IDT III), Şerban CHIVULESCU (ing), Dorel SPÂNU (ing), Costică ANASTASIU (ing).
The activity is carried out in 3 subunits of ICAS (ICAS headquarters in Bucharest, Braşov and Focşani).



Relevant projects

- Torrential watershed management planning; inventory of the works made between 1950 and 1992, effects and evolution;
- Forest ecological reconstruction on degraded lands in Dăbuleni area;
- Forest ecological reconstruction and forest shelterbelts planning on degraded agricultural lands of the Insula Mică a Brăilei;
- Ecological reconstruction and afforestation of the agricultural lands transferred to the Romanian National Forest Administration (ROMSILVA), according to the provisions H.G. Nr. 1542/2003, Forest Directorate Brăila. Batogu land reclamation area.
- Ecological reconstruction on the lands polluted by oil residuum located in Moineşti, Tg Ocna, Comăneşti, Dărmăneşti, Oituz forest districts;
- Study on the ways to increase the accessibility of the national forest fund;
- Afforestation of the polluted and degraded lands located in the Arcelor Mittal SA enclosure (Galaţi, Romania);
- Developing an information system for the inventory and monitoring of the torrential watershed management works;
- Inventory of degraded lands included into agricultural and forest funds, with the purpose of bringing them into the productive circuit, Prahova county;
- Ecological reconstruction, Copşa Mică, Romania;
- Torrential watershed management planning of the Vinderel basin;
- Torrential watershed management planning of the Scheii Brasov;
- Reclamation of the agricultural degraded lands transferred from the SC Hârşova (Constanţa county) to the Romanian National Forest Administration (ROMSILVA);
- Torrential watershed management planning of the Dobra-Sebes basin.

III. NATIONAL FOREST INVENTORY

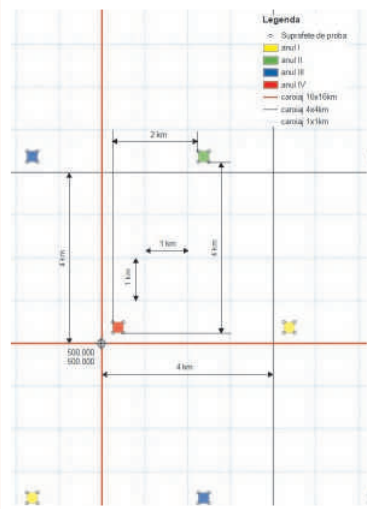
Scope

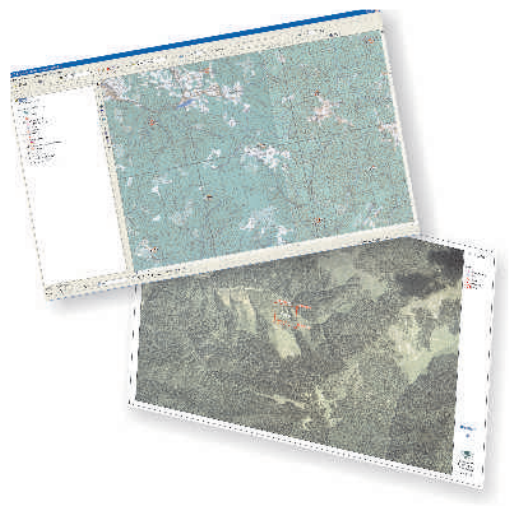
The National Forest Inventory (NFI) is the main instrument to assess country's forest resources. It has to answer to the still increasing need of information on forests, expressed by decision-makers in forestry sector, in order to support them: i). to build up a national forest policy, issue appropriate legislation and suitable forestry programmes; ii). to elaborate prognoses, development strategies and sustainable forest management measures.

The main task of NFI consists in collecting, storing, managing, processing and interpreting data and information regarding forest resources, as well as in publishing the studies outcomes. In addition, NFI conducts studies and prognoses on the evolution of forest resources and forestry sector development, aiming at contributing to cross-sectorial cooperation and elaborating forest policies.

NFI is meant to function as a continuous forest inventory, based on systematical sampling and comprehensive method, with 5-year time periodicity. The central state authority in charge of forestry is the main financial funding supplier for NFI's activities.

NFI is the main data supplier for sustainable forest management indicators reporting in compliance with the Romanian commitment within the framework of the Ministerial Conference on the Protection of Forests in Europe. It provides essential data for forest resources evaluation reporting with regularity to FAO, UN-Convention on Climate Change and to Convention on Biological Diversity.





NFI activities

The activity of NFI is very complex consisting in data collecting from the field, GIS analyses and digital photogrammetry, laboratory analyses and processing and statistic analyses of huge volume of data. NFI has 3 departments: i). inventory methods and models; ii). digital photogrammetry, photointerpretation and GIS; iii). logistics and databases.

i). Inventory methods and models department has as a main task the improvement of NFI project and is also responsible for data collecting from the field and their quality. Its main activities are:
· elaboration and development of working models and algorithms, based on statistic concepts;
· elaboration of fieldwork guidelines, establishing of the parameters needed to be measured, establishing quality data assessment and control methods;
· data collecting from the field and training of field work teams;
· data processing, analysing, interpreting and disseminating of results;
· establishing the parameters measured and the measurement methods for new aspects (biodiversity, carbon stocking);
· harmonization of NFI activities with the forest inventories done by other EU member states;

ii). Digital photogrammetry, photointerpretation and GIS department has as a main task the interpretation of cartographic sources and the development of GIS databases. Its main activities are:
· elaborating and continous developing of photointerpretation methods based on aerial photographs and on ortho-photoplans, in order to provide as many data as possible related to the Romanian forest vegetation;
· providing initial data on IFN clusters and sample plots;
· providing data on the land-use and land-use changing;
· creating and continuous development of GIS databases for NFI.

iii). Logistics and databases department has very important tasks for NFI functioning in term of logistic issues, of planning and implementing of NFI. Its main activities are:
· providing instruments and equipment for field work, appropriate hardware and software to each activity;
· elaborating specific software dedicated to the field data collection and to their checking;
· preparing and updating all data files (digital and analogical
· transferring, checking, stocking and making backups of field data;

Staff

64 permanent employees, either in ICAS headquarters and in 12 sub-units of ICAS. 45 of them are graduates and 16 are high-school graduates.

Infrastructure and equipment

NFI staff have very modern instruments and equipment for field data collecting, stocking and processing. Field work teams use tablet PC, GPS, Vertex III hypsometer, Pressler increment borers, callipers, jeeps, etc. The collected field data are stocked using an Oracle database management system and a specialised statistical analysis system (SAS) is used for data processing.

IV. THE ADMINISTRATION EXPERIMENTAL PATRIMONY AND FOREST PRODUCTION

Scope

· Managing the experimental bases and the experimental forest districts with an area of 58558 ha and organizing the production, harvesting, processing and marketing of wood and non-wood products;
· Testing in the field of research results in order to extend them into practice;
· Managing long-term experimental research areas in order to accomplish the scientific objectives for which they were set up.

Priorities

√ Managing the experimental bases and the experimental forest districts according to the management plans;
√ Testing in the field of research results in accordance with the research objectives for which they were set up;
√ Producing and marketing wood assortments;
√ Producing and marketing forest and ornamental seedlings assortments;
√ Producing and marketing forest seeds assortments;
√ Primary processing and marketing timber and wood products;
√ Marketing forest fruits, mushrooms, and medicinal;
√ Hunting and ecoturism.

Staff

337 permanent employees, 48 of them are graduates, 179 are high school graduates.

Experimental forest patrimony

5 experimental forest districts:

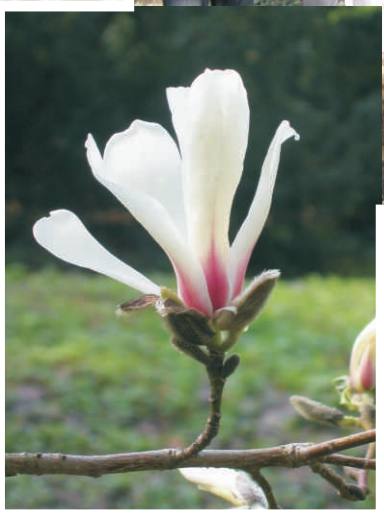
- Caransebeş (Caraş-Severin county)
- Lechința (Bistrița-Năsăud county)
- Mihăești (Argeş county)
- Tomnatic (Suceava county)
- Vidra (Vrancea county)

12 experimental bases :

- Craiova (Dolj county)
- Cornetu (Ilfov county)
- Voluntari (Ilfov county)
- Bărăgan (Calaraşi county)
- Tulcea (Tulcea county)
- Hemeiuş (Bacău county)
- Simeria (Hunedoara county)
- Targu-Mureş (Mureş county)
- Timişoara (Timiş county)
- Potoci (Neamț county)
- Gilău (Cluj county)
- Săcele (Braşov county)





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Legend
- Central Unit
- Research-development unit
- Experimental forest district
- Experimental station