



Report on methodology

Improvement of forest resources for Serbia

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1 Introduction and objectives of the study

The objective of this project is the analysis of forestry sector documents and databases as a first step for the revision and upgrade of the National Forest Program of the Republic of Serbia (NFPS) and development of proposal for supporting measures and activities for the selected segments of NFPS.

The complete assignment will include the following:

- Analysis of the current and existing databases and documents within the forestry sector in Serbia
- Drafting proposal of measures and activities for the improvement and upgrade of the draft NFPS, and based on the results of the analysis, measures for the selected segments of the NFPS

1.1 Fields of action

The analysis focusses on five major topics of high relevance for the Serbian forestry sector, as included in the TORs for the project:

- Management in coppice forests in the aim of improvement of these forests and their conversion into high forests (direct and indirect conversion);
- Activities and measures for improvement of coppice forests in the Republic of Serbia;
- Program for utilization of over-mature stands. Find new management options and a management program for improved regeneration processes;
- Afforestation program and low cost afforestation strategies; and
- Action program for establishing short rotation forestry in northern lowlands, floodplains and valleys in the agricultural landscape.
- “Leverage” biomass utilization: Program to expand the biomass supply chain and influence/change current practices of public enterprises for forest management.

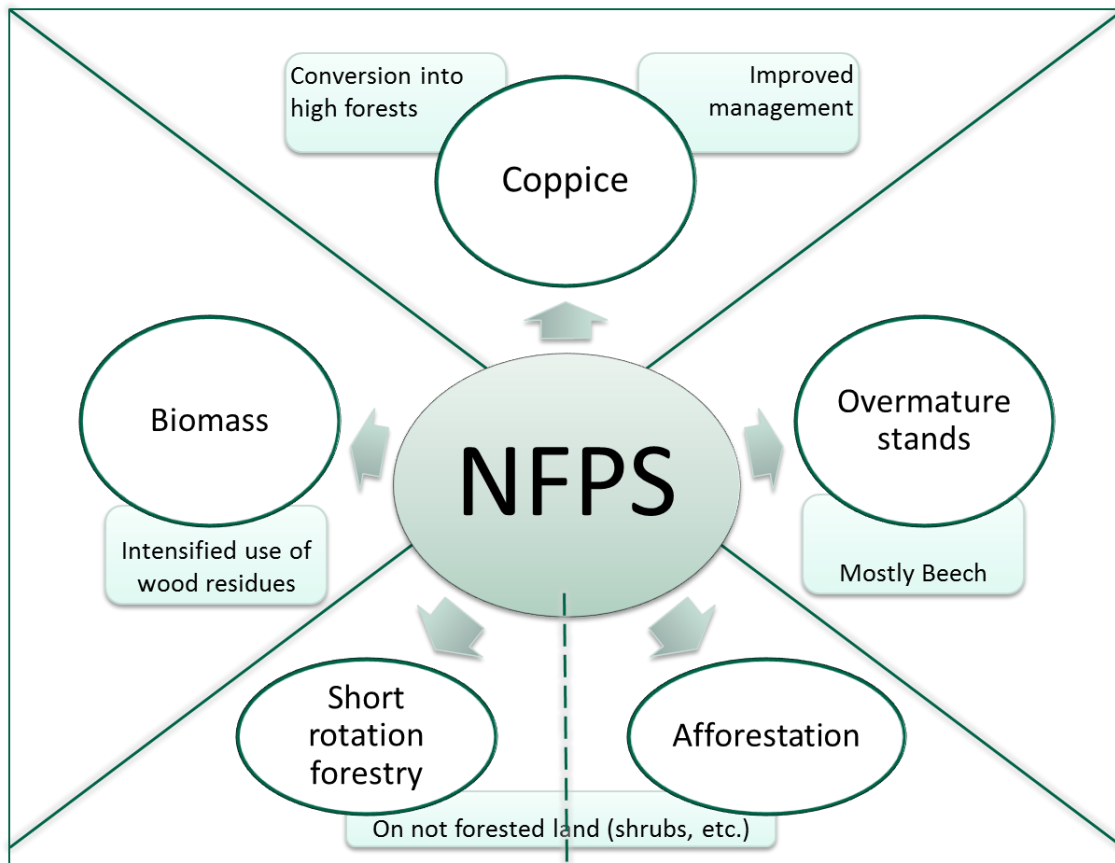


Figure 1: Fields of action overview

1.2 Outputs

The results of the current consultancy are presented in terms of the following products:

- Methodology for the data analysis with clearly defined reference documents and data-bases, a time line and milestones;
- Document describing the data analysis and the resulting set of measures and activities in the above listed identified fields relevant for the improvement of the forest resources
- Proposal of recommendations and measures for the improvement of the NFPS in the identified fields.

2 Information sources

2.1 Forestry databases

The different forestry databases, available in Serbia, are considered as the most important data sources for this study. Although these databases are often not compatible with each other or outdated, they will play a major role as information supplier. Following there is a brief overview of the databases available, showing their assets and drawbacks and their suitability for the project accordingly.

2.1.1 Forest management plans (FMP Database)

The main source of data for the analysis regarding the state forests is the database of the forest management plans (FMP Database). This is the most reliable source of information for this forest ownership type in Serbia, as stated by representatives of the Serbian Ministry of Agriculture and Environmental Protection (MoAEP).

Area

The database of the forest management plans is available for an area of 1.1 Mio ha **state forests**.

Availability

Available via MoAEP for project purposes (Sasa Stamatovic).

Technical database

SQL database (not working with MS Access).

Data quality

- Data is five years old on an average
- Data is partly not consistent
- Different codes could create problems
- Changes in attributes could be possible
- Data is only partly (for a restricted area) useable (this can be caused by errors in merging date)
- Some old management plans should be replaced by current ones
- Data on forest roads is included

Open questions

Connection to GIS is technically possible, if the information is provided by forest enterprises. This task is not part of the TORs but should be taken into account for future analysis. Worth mentioning the advantages in the report.

Conclusion for the study

This is the main source for detailed information of forest related data.

Additional measures (to be proofed):

- License for OSNOVA Software from A. Vasiljevic
- GIS data collection (Nat.).
 - Stand map
 - Odelenje / Compartment map
 - Forest roads

2.1.2 National Forest inventory data

The National Forest inventory data may be used as a complementary source of information for the state forests and as a main information source for the private forest areas. This approach has been suggested by representatives of MoAEP.

Area

State and private forests in the country

Availability

Dragan has access to maps and database.

Technical database

Access database (author A. Vasiljevic)

Data quality

- Nearly outdated (data collected: 2004-2006)
- 4 x 4 km, permanent sample plots
- 2. NFI will take place from 2017 onwards

Open questions

-

Conclusion for the study

National forest inventory data serve as a database for the global information on total forests in Serbia as well as for deeper understanding of private forests.

2.1.3 Private forest resources inventory

The private forest resources inventory uses a different grid than the National Forest Inventory. It is recommendable to use the National Forest Inventory instead (MoAEP).

Area

Private forests (samples)

Availability

Dragan could provide the data

Technical database

Data quality

- Represents a small part of the total area (Includes attributes such as: Increment, Volume, species, forest type; but no planning data)
- Grid: first: 250 x 250 (faculty Forestry), Cluster system (forest management planning unit of Serbiasume)
- Result: for about 30 % of the area is data available

Open questions

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Conclusion for the study

Must be proofed in which way information of private forest resources inventory could be used for further analysis.

2.1.4 Performance data "Annual operational plan" + "Evidencia"

This database is not suitable for this study due to the fact that the most information is only available on paper. No information can be provided digitally.

Information on harvesting is published on the websites of Vojvodinasume & Serbiasume and may be used if needed (for the bigger forest enterprises only).

Area

State forests

Availability

Unclear

Technical database

- Weak point (because not available in digital form)

Data quality

- Different systems used, data may not be completely consistent
- Documentation on stand level
- Reflects the timber cut, differentiated in diameter / species / assortments
- Difference between cut volume and documented volume remains unclear (clarify)

Open questions

- Demand is a full dataset over the period of validity of the FMU!
- Is evidence available in digital form: Some FMU data need to be handed in into EVID software optimally?
- How long is EVID software used in VS?

Conclusion for the study

Decision on whether to use these dataset. If the utilization is recommendable than the availability must be checked.

Additional measures

1. Clarification, if dataset is available and in what format (EVID would be perfect)
2. Clarify with AV and S. Stamatovic, if software can be provided (OSNOVA and EVID)
3. If not in digital form: Ask for data input from paper format into EVID
4. Eventually reduce number of FMU, if time consumption is too high.

2.2 Land use statistics

- These statistics could mainly form the base for the analysis of the topics afforestation and development of short rotation forestry.
- It is important that new forest area (every year new agricultural areas are naturally afforested) should be included in the statistics.
- Up to this point there is no clear vision of data and its quality.
- The CORINE land cover (based on satellite images) may provide important data – to be proofed
- Soil Institute (data is available – but probably not for free)

2.3 Additional information

2.3.1 Framework documents

A set of Serbian framework documents regarding the examined topic will be used for the conduction of the analysis. Among those documents,

- the National Forest Action Plan plays an important role. Also, the database of
- the international Wisdom project may be useful for the purposes of this study.

2.3.2 Other information

Other information could be found in the below mentioned sources:

- Data of official Gazette (statistical yearbook)
- Nature protection institute (areas 1. Degree of protection: forest use is not allowed) – information is restricted
- Forest road data for the 12 FMU (map)

Result: further information must be defined whether it's actually helpful and the cost-benefit effect is positive.

3 Management types and Treatment phases as reporting structure

The current chapter describes the methodology of the data analysis in the scope of this study.

3.1 Database/forest area

During this first step of the data analysis, it should be investigated whether the database is complete or not. This step is crucial for the further proceeding. **During the step, it should be proofed whether the total of forest area matches the total forest area according to the OSNOVA database.**

3.2 Forest function ('Purpose')

As a next step, the areas with a 'first degree of protection' should be filtered out of the forest area according to the database. As a result, we would receive an overview of the area, available for wood production (theoretically available).

3.3 Wood production

At this step, a further exclusion of areas takes place. This exclusion should be based on other (e.g. technical) reasons. As a result, all the forest areas, possible for wood production are selected.

3.3.1 Site quality

For this **aspect**, it is necessary to analyze high forests and coppice according to the site quality. As a first **stage**, we need a clear division between a good, average and bad site quality. This Division should be determined based on several attributes, which are:

- bonitet
- soil type (eventually more attributes),
- soil depth,
- altitude,
- aspect,
- shape of terrain,
- elevation

As soon as these categories are set, it is important to allocate following parameters:

- Area
- Growing stock
- Increment
- Prescribed cuts

These predefined categories (for high forests and coppice, respectively) should be structured as following:

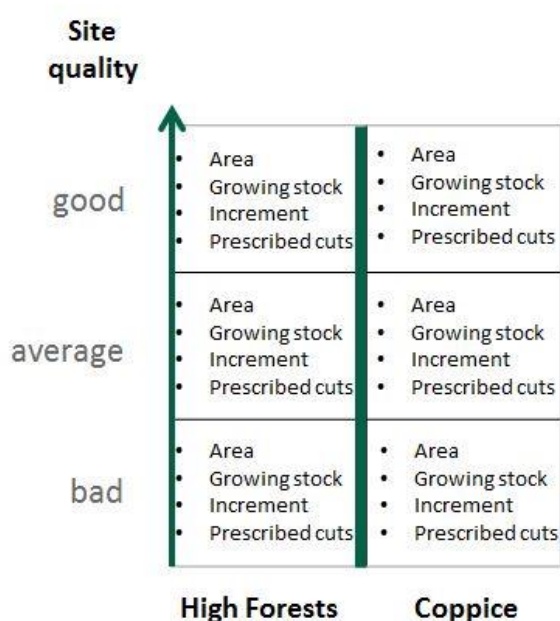


Figure 2: Analyzing approach based on the site quality

This analysis should be carried out both for state and private forests. The analysis for the state forests is based on the OSNOVA **database**. It should be clarified whether it is possible to make this kind of analysis for private forests, based on the National Forest Inventory data.

3.3.2 Stand quality

As a further step, if possible, the stand quality should be evaluated for both coppice and high forests. For this step it is crucial to know where we could find information on the stand description. The criteria for setting the stand quality as good, average or bad, is formed by namely by the stand description, as well as by the following attributes:

- degree of degradation
- preservation (part of the classification 'stand unit')
- quality of the stand.

It is recommendable to undertake this analyzing step for four management types for coppice **and** for four management types for high forests. Due to the fact that the OSNOVA database delivers a very detailed listing of forest management types (tab "types of forests") it would be necessary to group those types into up to four types of high forests and up to four types of coppice. As for the site quality assessment (see 3.3.1), the analysis should deliver numbers on the following parameters:

- area,
- growing stock,

- increment and
- prescribed cuts,

divided in the three categories of stand quality: good, average and bad. You can find a graphic overview of this task below. Data should be, as far as possible, provided for both state and private forests. It is very important to clarify, whether it is possible to undertake such detailed analysis and, if yes, to what extent.

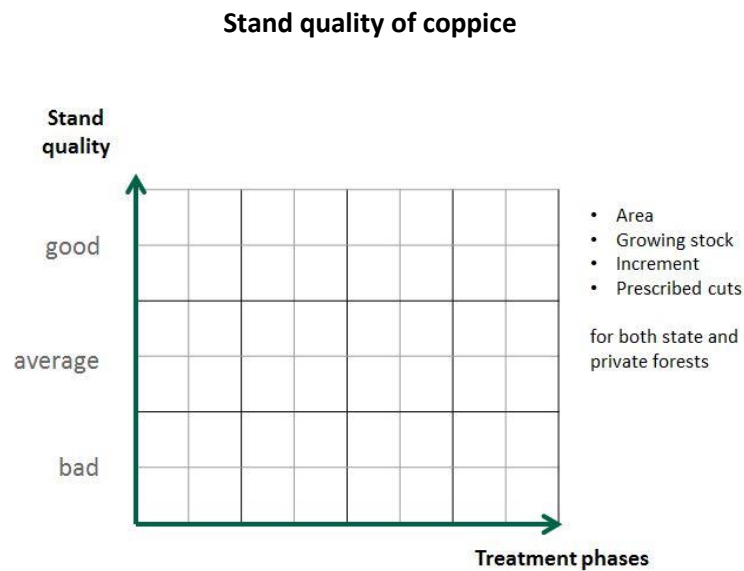


Figure 3: Analyzing approach for coppice based on the stand quality

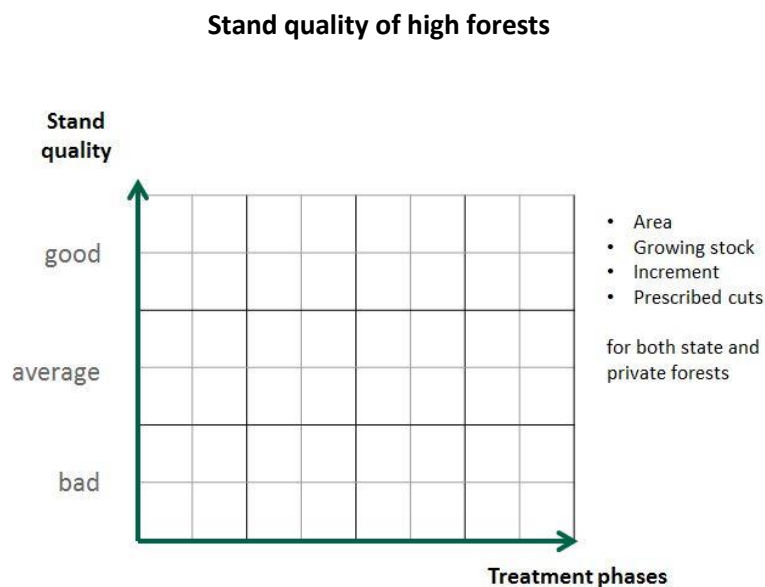


Figure 4: Analyzing approach for high forests based on stand quality

The following figure describes roughly the whole process on data collection, the further derivation of measures for an improved sustainable forest management, specifically for the state forests. Experiences from state forests will be revised and applied for the specific situation of private forests. For private forests that are supposed to be under management, silvicultural measures to be applied in the future were suggested.

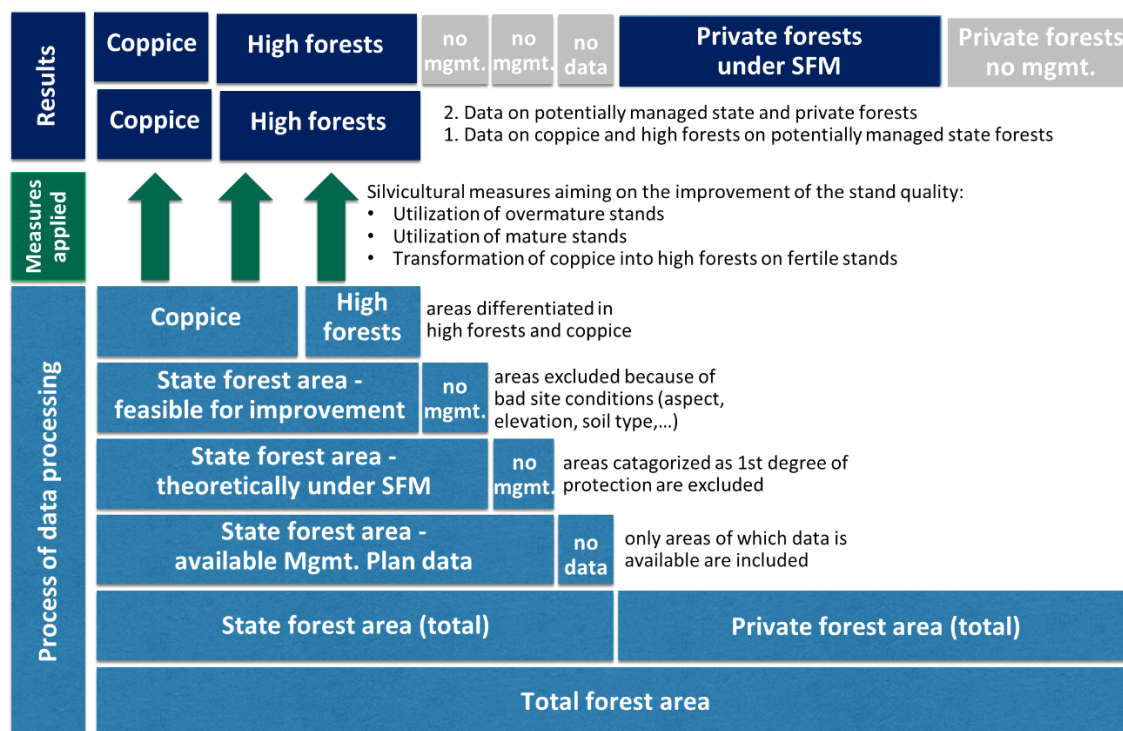


Figure 5: Overview of the data collection and analysis process

4 Time frame

The basic dates for the project are the following:

- The project started with a kick-off meeting on the 6th of May 2016.
- Presentation of the methodology (in form of the current document) has been handed over 3rd of June 2016.
- The project team will be working on the data analysis in June and July.
- In the first week of July 2016 a ground truthing mission will take place, on which the entire project team will participate (national and international experts).
- The draft of the final report will be submitted at the end of July 2016.
- A presentation and discussion of the results is planned to take place subsequently in August 2016.
- Upcoming commendations will be considered in the final version of the report which will be handed over in September 2016. Therefore, the project will be finished by the 30st of September 2016.