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REALIZATION OF TOPOGRAPHIC WORKS FOR UPDATING THE FORESTRY MANAGEMENT PLAN IN THE LOCALITY OF DRINOVA, TIMIȘ COUNTY

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Abstract

This work is a forest management work that aims to develop the cartographic base of the forestry fund, the public property of the state, administered by the Timiș Forestry Directorate, through the Lugoj Forest District, in compliance with the forestry regime. In this work is presented only the production unit III Drinova within the Lugoj Forest District. In order to achieve the topographic elevations of the limits of the forest bodies, a GPS was used using the RTK method, and for the processing and preparation of the cartographic documentation for the thematic digital maps, was used the computer environment Autodesk Raster design. In order to determine the areas and create the production unit maps, there were used the returned aerophotogrammetric plans with level curves at a scale of 1:5000 for the entire area of 12185.39 ha, corrected with recent orthophotoplans and measurements executed with GPS technology.

Key words*: Forest management plan, production unit, cartographic base*

INTRODUCTION

The Forest Management Plan is the basic document in forest management, with technical-organizational and economic content, ecologically based (https://derevoproiect.ro/amenajamente-silvice).

The management plans are elaborated for the entire forest fund, regardless of the form of ownership: public or private and regardless of the form of administration: state forest districts or private forest districts. The arrangements are valid for 10 years (https://tehnosilv.ro/servicii/amenajarea-padurilor/).

The Lugoj Forestry District, a subunit of the Timiș Forestry Directorate, has as its object of activity the application of the strategy of the National Directorate of Forests - Romsilva for the forests received under administration, the conservation and sustainable development of the forest fund that is the public property of the state, the management of the hunting and fishing funds assigned according to the law, the harvesting and valorization of specific forest products according to the legal provisions under conditions of economic efficiency, also exercising public service attributions with specific forestry.

The use of satellite systems from a topographical point of view. Digitalization of plans from analog system to digital system.

MATERIALS AND METHODS

The methods used to carry out the work are GPS and AutoCad. To carry out the GPS measurements, the following operations were carried out: planning and designing the kinematic measurements, performing the kinematic measurements, processing the kinematic measurements. In the case of kinematic measurements, some of the principles of static measurements are valid. The fundamental condition that must be respected in the case of kinematic measurements is the permanent reception of the signals emitted by at least four satellites, both during the stationing

and during the time intervals in which the movement is made from one station to another. AutoCad was used to process the data collected from the field, but also AutoCad RasterDesign. (https://ro.scribd.com/doc/269444014/rtk)

RESULTS AND DISCUSSIONS

1. Neighborhoods. Limits. Borders.

The borders are highlighted and materialized with signs frequently used to delimit the forest fund, but also with border milestone.

The limits of the state-owned forest fund are made with conventional signs, applied to the border trees and through milestone.

Within the territorial limits of the production unit in the study, the state-owned forest fund bordering with the forest fund owned by legal entities, individuals, with pastures and hayfields owned by local residents from the neighbouring villages.

The borders are represented by the tree line, being materialized by limit parcel signs, by the production unit or by the detour (executed with red paint on the limit trees) and milestone. The limits with the forest fund belonging to other holders, are materialized in the field, on the limit trees (Forest Management Plan Lugoj Forest Management, 2021).

Table 1. Neighborhoods. Limits. Borders.

Cardinal Points	Neighborhoods	Limits		Borders
		Sorts	Name	
North	U.P.II Valea Lungă	artificial	DC125i intersection 681C-Pogăneşti-Barna	Tree lines and milestones
		artificial	DJ681C Barna-Săceni	
	O.S Făget	artificial	DC122 Săceni-Surducu Mic	
		artificial	DJ681A Surducu Mic-Fârdea	
East	O.S Făget	natural	Surducului Peak	
		natural	Făgetului Peak	
South	O.S Ana-Lugojana	natural	Crivinei Peak	
West	U.P. I Tapia	natural	Criciovei Peak	
		natural	Smida Hill	

2. The constitution and materialization of the parcel and under-parcel.

The parcel limits are mostly natural, thus having clear relief forms, waters or tree lines in the case of isolated parcels. The intersections of parcel lines with the limit of the forest fund, at the intersections of the parcel lines between them and at the main contour points, tree lines were placed (Rucăreanu, 2007).

Figure 1. Conventional sign for the parcel

Figure 2. Conventional sign for the under-parcel

As a result of the measurements made on the parcel limits materialized in the field and their transposition on the basic topographical plans, it was found that, in some situations, the limit materialized in the field does not correspond to the existing one on the development plan.

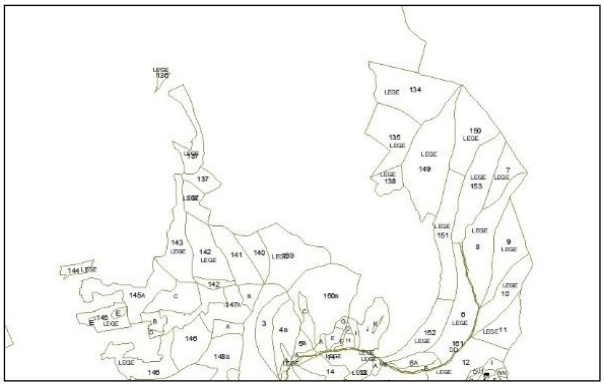

Figure 3. Parcel plan part 1

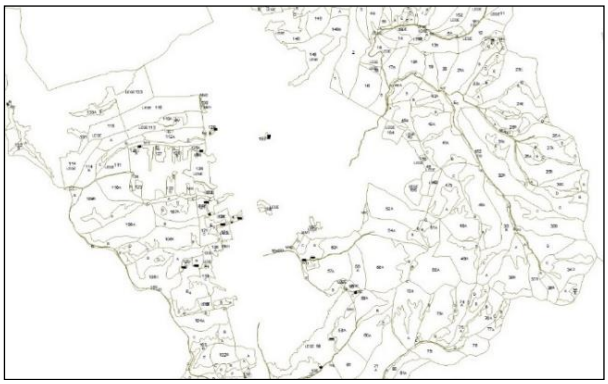

Figure 4. Parcel plan part 2

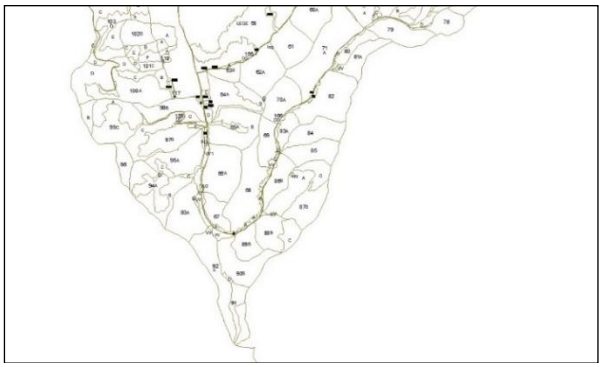

Figure 5. Parcel plan part 3

When correcting the parcel limits on the topographical plane in accordance with the reality on the field, the graphic surface differences between the existing assembly on the base plan and the reality on the field have registered under "compensations between parcels" (Forest Management Plan Lugoj Forest Management, 2021).

3. The situation of the milestones.

In the state-owned forest fund there are a number of 320 milestones, numbered as follows: 1-13, 25-80, 83, 84, 88-111, 113-224, 226-234, 236, 237, 241-250, 252-255, 257-263, 265¬277, 282, 284-289, 302-306, 308-310, 312, 314, 316-320, 323, 324, 341, 342, 11bis, 13bis, 27bis, 33bis, 34bis, 41bis, 46bis, 48bis, 50bis, 55bis, 77bis, 114bis, 122bis, 124bis, 128bis, 137bis, 158bis, 164bis, 168bis, 199bis, 205bis, 206bis, 220bis, 223bis, 229bis, 230bis, 232bis, 233bis, 242bis, 245bis, 249bis, 282bis, 284bis, 302bis, 303bis, 312bis, 314bis, 308bis-310bis, 317bis and 320bis.

Figure 6. Milestone

Figure 7. Milestone

Figure 8. Milestone

Figure 9. The location plan of the milestones part 1

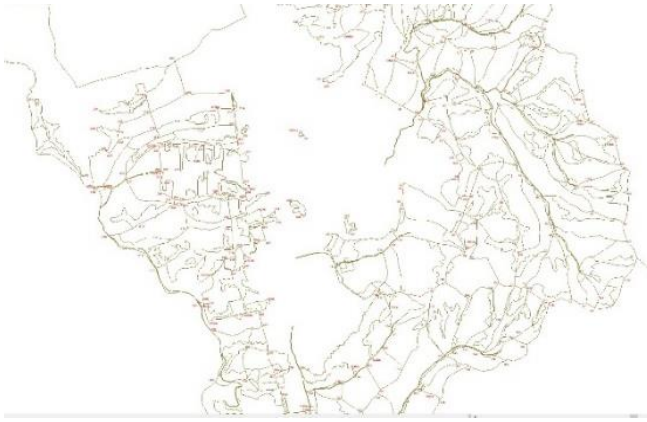

Figure 10. The location plan of the milestones part 2

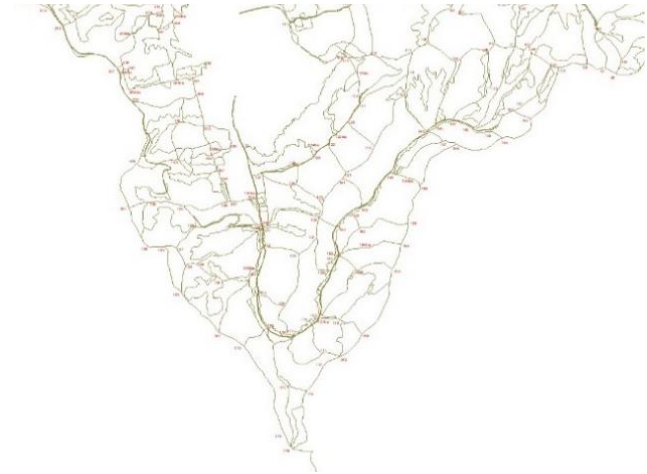

Figure 11. The location plan of the milestones part 3

The milestones are made of reinforced concrete, they have the number written in red paint on a white background, being also materialized on the nearest tree.

Figure 12. Concrete milestone

In order to determine the areas and create the production unit maps, restored aerophotogrametric plans (loose-leaf) with level curves at a scale of 1:5000 were used for the entire area of 12185.39 ha, corrected with recent orthophotoplans and measurements executed with GPS technology.

For the reambulation of the base plans, in situations where the parcel/under-parcel has modified, or where differences were found between the situations on the field and those on the landscaping maps were measured with a GPS device, in total length of 811.41 km, with 22562 points (Forest Management Plan Lugoj Forest Management, 2021).

Table 2. The situation of GPS measurements

The production unit		GPS measurements	
Number	Name	Km	Points
I	Tapia	57,76	1470
II	Valea Lunga	68,11	1386
III	Drinova	212,28	6108
IV	Honorici	21,38	643
V	Sacoșu Mare	18,46	646
VI	Leucușești	433,42	12309
Total O.S.		811,41	22562

The newly created under-parcel for the current arrangement, as well as a part of the forest tree line, were measured with the G.P.S., executing 212.28 km with 6108 points.

The measurements made with the G.P.S. were processed using techniques in AutoCad and were transposed on the base

plans. The base plans equipped in this way constituted the cartographic material on which the areas were determined and the landscaping maps were created to scale 1:20,000, which accompany this arrangement.

5. The area of the forest fund.

The area of the forest fund created following the measurements is 3156.85 ha, which is 40.15 ha less than the previous arrangement of 3197.00 ha. The difference between the two values is justified in the table.

Table 3. The area of the forest fund

The area in the current arrangement	The area in the previous arrangement	Differences		Justifications			
		+	-	Purchase of forest land	Update limit OS Ana Lugojana	Update limit OS Făget	Area retroceded according to the Law 1/2000
3156,85	3197,00	-	40,15	7,76	2,99	3,74	20,06

6. The inventory of the existing and necessary infrastructure for transport.

The existing roads largely satisfy the accessibility and transport needs of the production unit III Drinova. It was considered necessary to build two new forest roads, even if at the current level 92% accessibility is ensured. The main reasons regarding the proposal of the two necessary forest roads and their subsequent construction is the accessibility of some currently inaccessible trees, but also for the easier movement of staff in the field by car (through the connection of the two existing forest roads: Crucea cu Peri, respectively Dracoane).

Figure 13. Forest road

7. Forest constructions

Within the production unit III Drinova there are 4 buildings for the accommodation of forestry staff and workers. No forestry constructions were proposed, the existing ones being sufficient for the accommodation of forestry staff and workers. (Forest Management Plan Lugoj Forest Management, 2021)

Figure 14. Forest Canton of Drinova

Figure 15. Forest Canton of Drinova

CONCLUSIONS

Determining the non-correspondence of the parcel limits materialized in the field with the existing limit on the arrangement plan created by topographical measurements carried out on the parcel limits.

Through the current arrangement, the functional continuity of the forests within the O.S. Lugoj in full accordance with the new socio-economic objectives existing within the range of the forest detour.

Difficulty of measurements in open areas such as meadow.

Making measurements can be difficult due to the signal that is missing in some places but also because of the areas with a very steep slope.

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