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Field Manual
for the
Georgian National Forest Inventory

as of Decemeber 1, 2018

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1. Field Work and Measurements

1.1 Equipment and Materials

Each field team needs to be equipped with the following items for fieldwork:

Devices / Materials	Number	Check / Comment
Back pack for devices	1	
GPS Receiver	1	Check batteries and whether all necessary data are uploaded on the receiver
Combined instrument for distance, inclination and azimuth		Vertex Laser Geo 360°. Combines distance, inclination and azimuth measurement.
Rod	1	Stick for attaching the transponder at DBH height, e.g. stick delivered with Vertex
Briefcase Handle for tablet	1	The rubber briefcase handle provides a simple yet effective way to carry the device. 
SD Card	1	Storage device for the field computer
Diameter tape (Pi band) or/and	1	3 or 5 meters 
Calliper	1	With an inventory scale in mm  

Devices / Materials	Number	Check / Comment
Axe	1	For removing branches, ivy, etc. and bringing the iron poles into more solid grounds
Mobile computer with integrated camera	1	Mobile tablet or laptop: Sunlight readable display, 24-cm screen, Charger for the car, Android System. 
Iron pole	4	30 cm iron poles for marking the sample plot positions (including 1 spare pole)
Increment borer and storage box for bore cores	1 borer, 19 (max) straws	Bore cores from sample trees for age and diameter increment assessment have to be stored and delivered. A proper storage need to be secured. Any destruction must be avoided. Wrap cores in straws and note tree data on label. Storage of cores in a box or similar object.
Folding ruler	1	For regeneration assessment.
Tree Marker		Sufficient amount of tree markers to temporarily mark/number the trees
Measuring tape (10 m)	1	To calibrate the VERTEX
Stronger plastic bag	1	To efficiently protect the more sensitive electronic measurement devices in case of heavy rains.
Replacement batteries	4	Fresh batteries for GPS, Vertex, camera, and other electronic devices
External battery	1	External energy supply for Vertex, tablet and other electronic devices
Field manual and overview tables	1	Are also available via the mobile computer
Short manual for complicated devices		Shall be placed at the mobile computer or as print outs. GPS, Vertex, etc.
First aid kit	1	Check for completeness and validity

1.2 Locating the Sample Plot Centre in the Field

Geographic location of each sample plot centre is pre-defined by the sampling design and must not be modified nor changed. The grid coordinates are stored as waypoints on the GPS receiver or as shapefile and will be available to the field teams.

The way to the cluster, that starts from the car roadmust always be tracked and automatically saved in GPS receiver via "tracking" mode. (GPS receiver is permanently on).. This information is needed to define walking time and the difficulty of the road that will be an important data for the later field work optimization.

1.3 Navigation and Point Measurement with GPS

Navigation to a sample plot

It is important to realize that reaching the sample plot centre in the field is only possible by GPS. It must never be that the field team decides to shift a center point location except for the case mentioned in chapter 2.6.6

Marking the Point by GPS

While using GPS following must be considered:

- Wait nearly 3-5 minutes until the GPS signal is becoming more accurate.

1.4 Slopover Plots at the Forest Boundary

When a sample plot is located so close to a forest boundary that part of its area is outside the forest, then a boundary correction is necessary to guarantee that the data close to the forest boundary is included with the same probability as trees in the interior of the stand.

A clear definition of the forest boundary is necessary, which is sometimes difficult in the field. The boundary correction is necessary only when a part of the plot is outside the defined population which is "forest". It is not necessary in case of open areas or roads that belong to the forest areas.

The technique to be applied for the boundary correction is the "mirage method" that is illustrated in the following figure and in the annex 3.13

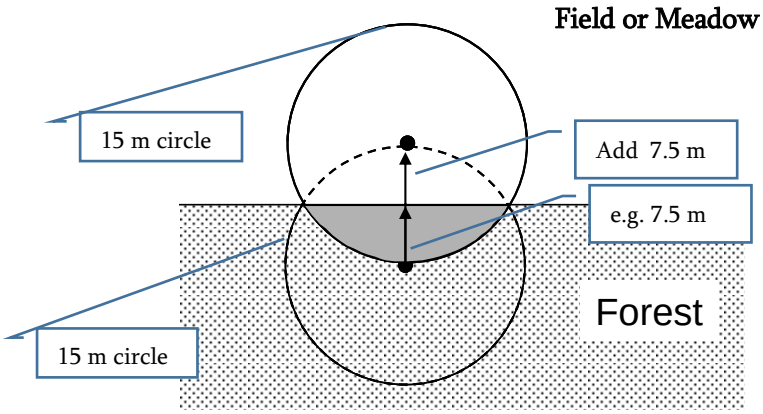


Figure: Mirage method to correct plots overlapping the forest boundary.

The centre of the plot is mirrored at the forest edge outside the forest. From that new point, again a circular plot is laid out with the same radius and all those trees in the forest are measured again which fall into it; that is: these trees are duplicated in the software by the measurer (the dark grey area in figure). As the respective trees are already recorded in the tablet, they don't need to be measured again: the entries are just copied and recorded twice.

If a regeneration sub-plot is split into 2 areas due to a boundary, this sub-plot falls into non-forest land automatically and shall not be measured.

What is a forest boundary? - Boundaries toward "Forest land" and "Other land" (agricultural fields, meadows, settlements, fenced gardens, waters).

In the case of forest roads, the following distinctions are made:

Land use categories	Road class
Forest	Skidding roads (temporary)
Forest lands	Forest roads (for wood transport by trucks (permanent road)
Other land	Public roads (Asphalt or gravel roads)

1.5 Marking the Sample Plot Center

Once the sample plot location is determined with sufficient accuracy, it is marked with an iron pole. As plots should be re-visited in the next inventory cycle (or during control measurements) they need to be marked permanently.

It is important that markings are invisible to ensure that the exact position of the sample plot is not directly revealed to the forest manager. Only then it is guaranteed that the sample plot will not be managed differently from the rest of the forest.

An iron pole (length ~ 30 cm) is driven into the ground. This iron pole can then be found again by means of a metal detector at later points in time so that the exact position of the plot centre is known for future measurements.

All marking on the sample plot area are only done temporarily with white chalk.

2. Assessment of Variables

2.1 Introduction

The variables that are observed in the context of each sample plot can be broken down into different categories according to their observation area, scale and / or the respective target object or entity they are describing.

Each variable is explicitly defined in terms of its subject matter meaning, its unit of measurement / observation, possible values / categories (in case of categorical variables) and their accuracy.

The following groups of variables are distinguished:

- **Variables assessed at cluster level** - This chapter subsequently describes the variables assessed / measured in the beginning of field work and procedures: Cluster ID; Field team member(s), starting time and GPS coordinates with respective error at the point from where the field team starts walk to the cluster. These variables are used for work organization, for monitoring and for assessing the time / spent for field work.
- **Variables assessed at sample plot level** - this chapter includes the variables connected with the sample plot centre: accessibility class of the sample plot; ASL, marking the sample plot centre and identifying respective reference objects, forest, forest lands and other lands. With the help of these variables basic information is obtained which defines the continuation, approaches and procedures on the sample plot. The sequence and procedures are strictly regimented.
- **Variables assessed on the 15-m radius sub-plot** - this chapter covers sample plot variables and measurement / assessment procedures, such as slope inclination, exposition, position on the slope, terrain, soil erosion, degradation, crown closure, forest type – ground component, vertical structure;
- **Variables assessed on the 5-m radius sub-plot** - ground cover type, sub-forest (including NWFP shrubs)
- **Variables assessed on 25-m radius sub-plot** - cattle grazing, wood species list, landscape features forest functions;
- **Assessment of down deadwood** - down deadwood is assessed in 5 and 10 m radius sub plots according to diameter classes;
- **Forest regeneration** is measured in 5 m distance from the centre of the sample plot to the North and South directions in sub-plots of 1.5 m radius;

- **Single forest tree variables** – single wood tree variables are assessed by observation of individual trees located in sub-plots of different radius. Certain variables, sequence and procedures are described in chapter 2.12
- **Tree height and identification of sampling trees** – the trees are drilled and the height of the trees are measured as soon as all the rest of the single tree variables are recorded.
- **Stump measurement** - stump measurement is done in different circles of the sample plot according to diameter classes.
- **End of work time –** it includes the break times as well, to calculate total time spent on field work

Below each variable is defined and described.

This overview will also help to construct a suitable data management framework as the basis for the database structure.

2.2 Applicable Projection

For all mapping activities and GPS measurement the following projection is used:

- UTM 37 N WGS84 (EPSG 32637)
- UTM 38 N WGS 84 (EPSG 32638)

2.3 GPS Coordinates Errors / Accuracy

The centre of the sample plot should be identified with the respective coordinates. Every GPS measurement is accompanied by certain error and the GPS error should be recorded.

The accuracy is important information for the repeated assessment of the plot and for the co-registration with remote sensing data.

For each data (coordinates) recorded from GPS, the errors should be indicated in meters (±/-)

2.4 Description of the Cluster and Sample Plot Design

One cluster contains three sample plots. The sample plot centres are located at pre-defined coordinates.

The sample plots of each cluster are arranged in the shape of the Latin letter "L". The centre of the sample plot #2 is always the crossing point of the (underlying) grid, and its centre defines the location of the entire cluster (the centres of the remaining sample plots are located exactly 100 m North (sample plot #1) and 100 m East (sample plot #3) of this location.

A sample plot consists of several concentric circles (nested sample plot design) with pre-defined radii (5, 10, 15 and 25 m, respectively). Trees are selected for measuring according to their diameter class and are assessed up to a specific radius (5, 10, 15, 25 m respectively). See Annex 3.1

2.5 Variables Assessed on Cluster Level

2.5.1 Cluster ID

Description:	Each cluster has its own pre-defined unique code, which is used for their identification.
Observation area	Cluster

2.5.2 Head of the Field Team

Description	Full name of the field team point person who is conducting fieldwork on this cluster is indicated.
Observation area:	Cluster

2.5.3 GPS Coordinates, when the Team Starts Walking towards the Cluster

Description	Field teams must have the navigation device (GPS) always switched on. As soon as the Field Team starts walking from the point, where they leave the car road, GPS coordinates are recorded as "waypoints". While walking "tracking modus" is used!
Unit	x / y coordinates
Observation area:	Cluster

2.5.4 GPS Error

Description	The GPS Error variable is asked for each time a GPS coordinate ("waypoint") is recorded.
Unit	Meter
Observation area:	Cluster; Sample Plot;

2.5.5 Time and Date when the Team Starts Walking towards the Cluster

Description	The starting time and date are recorded when the team starts walking from the car road to the cluster to define the total time spent on fieldwork.
Unit / accuracy	HH-MM / 1 minute
Date format	DD-MM-YY
Observation area:	Cluster

2.6 Variables Assessed on Sample Plot Level

General variables, which refer to all information that is specific to the entire sample plot, are sequentially recorded in tablet.

2.6.1 Sample Plot ID

Description	Pre-defined unique code of the sample plot, which is used for its identification, is recorded.
Observation area	Sample plot

2.6.2 Accessibility of the Sample Plot

Description	Accessibility is defined according to following classes	
Code list	Code	Class
	1	Accessible - no obstacles on the way;
	2	Difficult to access - some obstacles on the way but still accessible;
	3	Not accessible - sample plot was not measured;
	A text field should be filled obligatorily, if code 3 is selected, to provide an explanation why it was not possible to access the sample plot;	
Observation area:	Sample plot	

2.6.3 Forests, Forest Lands and Other Lands

Sample plots, where different variables are assessed can be either **Forest**, **Forest Land** or **Other Land**.

1. **Forest** – Forest in accordance with the forest definition: Land areas covered with trees with the width of not less than 10 meters and area of not less than 0.5 hectare covered with one or more forest tree species where the canopy cover is no less than 20% of this land plot, of trees that are able to reach a height of at least 3 m. Also, open lands with the size of less than 0.5 ha within the forest are considered as forest.

1.1 The term forest also applies the following:

- **Arid and sub-alpine forest** - land areas covered with trees where the canopy cover does not reach 20% due to the low moisture and/or other natural conditions.

- **Areas with temporal lack of tree cover -** Territories that are temporarily degraded or destroyed due to natural and/or anthropogenic impact

2. **Forest Lands –** areas associated with forests of more than 0,5 ha inside the forest boundaries which are inseparable parts of forest ecosystem:

- Agricultural lands (arable lands, grasslands, pastures, orchards and vineries) in case if these areas cover more than 0,5 ha inside the forest;
- Special purpose lands, which include hard surface roads, power transmission and telecommunication lines, oil, gas and water pipelines, quarries, ponds and industrial yards;
- Lands, which include marshes, cliffs, stony shores and other areas unsuitable for afforestation - if these areas cover more than 0,5 ha inside the forest;

3. **Other Lands -** Lands outside the forest boundaries and all other territories, which are not included in Forests or in Forest Lands classes:

- Gardens, squares, parks, hay lands, pastures, vine yards etc.
- Territories which are not located within the forest and are used for short term rotation of forest tree species during thirty years from its afforestation;
- Dendrology parks and Christmas tree plantations;
- Wood species plantations for producing fruits, berries and nuts (hazelnut, chestnut)

2.6.3.1 Forest, Forest Lands and Other Lands

Description	**Sample plots are assigned the classes of Forest, Forest Lands or Other Lands. Forest and non-forest classes are pre-assigned remotely. The results will be checked later by the field teams in nature. If the sample plot is crossed by different land classes then that sample plot is given the land class according to the sample plot centre location.**	
Code list	**Code**	**Class**

	1	Forest
	2	Forest Lands
	3	Other Lands
	4	Unknown(only if the plot is not accessible and cannot be classified from the distance)
Observation area	Within 15m radius of sample plot	

2.6.3.2 Categories of land cover for Forests, Forest Lands and Other Lands

Description	Forest (Forest Lands) and Other Lands category is identified according to corresponding characteristics on the sample plot. If the sample plot is crossed by different land categories, this sample plot is given the category according to the location of the sample plot centre.				
Code list11	Codes	Category	Forests	Forest lands	Other land
	1	Covered by the trees	Yes		
	2	Not covered by the trees	Yes		
	3	Fire affected forest	Yes		
	4	Plantations	Yes	Yes	Yes
	5	Grass land	Yes	Yes	Yes
	6	Arable land	Yes	Yes	Yes
	7	Hay land	Yes	Yes	Yes
	8	Pasture	Yes	Yes	Yes
	9	Shrubs	Yes	Yes	Yes
	10	Orchards	Yes	Yes	Yes
	11	Vine yards	Yes	Yes	Yes
	12	Building	Yes	Yes	Yes

	13	Roads	Yes	Yes	Yes
	14	Water Space	Yes	Yes	Yes
	15	Others (needs to be specified)	Yes	Yes	Yes
Observation unit	Within 15m radius of sample plot				

2.6.4GPS Coordinates of the Sample Plot Center

Description	Coordinates (X / Y) are recorded by GPS in the centre of the sample plot along with the GPS error (see 2.5.4 GPS Error).
Unit / accuracy	X / Y coordinates
Observation area:	Sample plot centre

2.6.5Elevation (above sea level)

Description	Elevation above sea level is recorded from GPS in the centre of the sample plot.
Unit	Meters
Observation Area	Sample plot centre

2.6.6Marking the Sample Plot Center

Description	Sample plot centre is marked by iron pole, which is rammed entirely into the ground and should not be visible above the ground. ▪ Only if the measurement from the defined centre coordinate is not possible due to an obstacle (tree at the centre, block at the centre), the sample plot centre can be moved exactly 3 m to north. If a sample plot centre has to be moved, the reason should be noted down. ▪ Only if the plot centre cannot be marked (rocky ground does not allow to put the metal pole in) the metal pole can be moved to the nearest possible point but the measurements will be done at the original point. The shift needs to be described by azimuth and distance from the defined sample plot centre towards the metal pole. The reason for shifting the metal pole needs to be noted down.	
Code list	Code	Class

	1	The centre location was not changed
	2	The sample plot centre location was changed (obstacle)
	3	The metal pole is not in the sample plot centre
Subsequent variable on reason for deviation	In case of class 2 and 3 the field must be filled with the explanation.	
Subsequent variable to define the location of the metal pole in case of class 3	Measure azimuth and horizontal distance from the metal pole to the plot centre.	
Description	Measure azimuth from sample plot centre	
Unit/accuracy	Degree / 1 degree	
Description	Measure horizontal distance from sample plot centre	
Unit/accuracy	m / 1 hundredth	
Observation Area	Sample plot	

2.6.7Reference Objects Related to the Sample Plot Center

The identification of easily identifiable reference objects helps to identify the location of the sample plot during controls and/or subsequent measurements. Using the known azimuth and horizontal distance from the sample plot centre to at least two reference objects (bigger stones, tree with the biggest diameter, rock, boulders, etc.), the exact location of the centre can be identified. Reference objects should be selected that have a high probability to be present even after 10 years. The distance from the sample plot centre to the reference object is recommended to be in the vicinity to the sample plot centre but within the 25-m radius.

2.6.7.1 Type of Reference Object

Description	After having marked the sample plot centre with the iron pole, minimum 2 reference objects should be identified.
Units	Descriptive keyword
Observation area	25 m radius is recommended

2.6.7.2 Azimuth - Reference Object

Description	Azimuth is measured from the centre to the reference object by compass. The azimuth of different reference objects should make the intersection point. Graphic image see annex 3.12
Unit / accuracy	Degrees (360° scale) /1°
Device	Compass
Observation area	25 m radius is recommended

2.6.7.3 Horizontal Distance - Reference Object

Description	After having measured the azimuth, horizontal distance between the sample plot centre and the object should be measured.
Units / accuracy	Meters / 1 hundredth
Device	Vertex Laser Geo
Observation area	25 m radius is recommended

2.6.7.4 Standard Photo of Reference Object

Description	Each reference object is taken one photo.
Device	Tablet camera
Observation area	25-m radius is recommended

2.6.8Start Time of Measurements on the Sample Plot

Description	Time recording starts when the sample plot centre is marked and the reference objects are recorded.
Units / accuracy	HH-MM / one-minute
Observation unit	Sample plot centre

2.6.9 Slopover Sample Plots at the Forest Boundary

Description	In case the area of the sample plot in not fully positioned in the forest, “mirror method” is used. See Annex 3.13	
Code list	Code	Class
	1	Complete sample plot

	2	Slopover sample plot
Observation area	Within 15m radius of sample plot	

2.6.10 Forest Boundary Points

Description	**In case the sample plot is not fully located in the forest, for measurements is used so called "Mirror Method". For the Mirror Method intersection points between the sample plot and the boundary are marked. (For the first and the second points only azimuth is measured, but for the third point azimuth and horizontal distance are recorded). Annex 3.13**	
Code list	Code	Class
	Point 1	Azimuth from the centre
	Point 2	Azimuth from the centre
	Point 3	Azimuth from the centre
		Horizontal distance from the centre
Observation area	Within 15m radius of sample plot	

2.7 Variables Assessed on the 15-m Radius Sample Plot

2.7.1 Terrain Shape on the Sample Plot

Description	Terrain shape within the area of the sample plot is defined by its physical forms. See Annex 3.3	
Code list	Code	Class
	1	Flat
	2	Peak
	3	Ridge
	4	Shoulder
	5	Spur
	6	Slope
	7	Pit
	8	Valley

	9	Foot slope
	10	Hollow
Observation area	Within 15m radius of sample plot	

2.7.2Position on the Slope

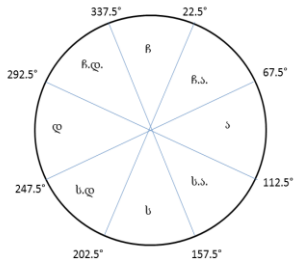
Description	The sample plot can be located on different parts of the slope. The plot position on the slope is recorded (Graphic illustration of the plot position - see in annex 3.2)	
Code list	Code	Class
	1	Top of the slope
	2	Upper slope
	3	Middle slope
	4	Lower slope
	5	Valley bottom
Observation area	Within 15m radius of sample plot	

2.7.3Slope Angle

Description	The slope angle is measured from the upper boundary of the sample plot downwards along the slope gradient through the centre. The slope angle is measured in degrees.
Units / accuracy	Degrees / 1°
Device	Vertex Laser Geo
Observation area	Within 15m radius of sample plot

2.7.4Exposition

Description	Sample plot exposition is determined by compass.			
Code list	Code	Compass points:	Explanation	

	1	North	337.5°- 22.5°	On the field form the respective direction is marked on the symbol 
	2	North-East	22.5°-67.5°	
	3	East	67.5°-112.5°	
	4	South-East	112.5° -157.5°	
	5	South	157.5°-202.5°	
	6	South-West	202.5°-247.5°	
	7	West	247.5°-292.5°	
	8	North-West	292.5° - 337.5°	
Unit / accuracy	Compass points			
Device	Vertex Laser Geo			
Observation area	Within 15m radius of sample plot			

2.7.5Soil Erosion

Description	Describes the erosion status on the plot area. The type and stage of erosion is assigned.	
Code list	Code	Class
	1	No erosion;
	2	Slight erosion - ground vegetation or top soil is partly damaged;
	3	Medium level of erosion - ground vegetation or top soil is damaged;
	4	Heavy erosion - top soil and ground cover is reduced
Observation area	Within 15 m radius of sample plot	

2.7.6Causes of Soil Erosion

Description	Erosion can be caused by different reasons. The reason of erosion that affected the soil can be eye-estimated according to following classes:	
Code List	Code	Class
	1	Natural - indicate the explanatory word
	2	Anthropogenic – indicate the explanatory word
	3	Unclear
Observation area	Within 15 m radius of sample plot	

2.7.7Forest Degradation Status

Description	The changes that has been occurred in the forest and negatively affected on Forest structure and functions. Degradation can be estimated according to its level of severity.		
Code list	Code	Class (multiple selection for classes 2-7 possible)	Levels of severity
	1	No damage	- -
	2	Stands of Low density (artificially loose stands)	1 Slightly degraded 2 Average degraded 3 Strongly degraded
	3	Quality reduction because of non-systematic cuts	1 Slightly degraded 2 Average degraded 3 Strongly degraded
	4	Damage caused by Phyto- and Ento- pests	1 Slightly degraded 2 Average degraded 3 Strongly degraded
	5	Fire affected	1 Slightly degraded 2 Average degraded 3 Strongly degraded
	6	Grazing	1 Slightly degraded 2 Average degraded 3 Strongly degraded
	7	Others (need to be specified)	1 Slightly degraded 2 Average degraded 3 Strongly degraded
Observation area	Within 15 m radius of sample plot		

2.7.8Forest Type – Ground Component

Description	Ground component of forest type is defined on the sample plot in 15-m radius. Forest type is identified according to this component.
Code list	List of forest types is provided in the annex 3.6
Observation area	Sub plot of 15 m radius

2.7.9Crown Closure

Description	Crown closure is defined as the proportion of the forest floor covered by the vertical projection of the tree crowns (see annex 3.4). It is eye-estimated in 10%-classes.	
Code list	Code	Class
	1	10%
	2	20%
	3	30%
	4	40%
	5	50%
	6	60%
	7	70%
	8	80%
	9	90%
	10	100%
Unit / accuracy	Percent / 10%	
Observation area	Within 15 m radius of sample plot	

2.7.10 Sample Plot Vertical Structure (Layers)

Description	To distinguish the layers in the vertical structure of the sample plot the difference between the layers must be minimum 1/3 of height and crown closure of each layer must consist of minimum 20%.	
Code list	Code	Class
	1	Single layer- Stand with only one well-defined layer;
	2	Two layers - two well-defined layers (the upper layer differs from lower layer by at least 1/3 of height and crown closure for each layer consists of minimum 20%);
	3	Three or more layers – three or more well-defined layers (each of the layers differ from lower layer by at least 1/3 of height and crown closure for each layer consists of minimum 20%);
Observation area	Sample plot of 15 m radius	

2.8 Variables Assessed on the 5m Radius Plot

2.8.1 Ground Cover Type

Description	To assess the ground cover, only the dominant cover type is defined in percentage.	
Code list	Code	Class
	1	*Litter*
	2	*Stones*
	3	*Rocks*
	4	*Grass (including herbs and perennial plants)*
	5	*Fern*
	6	*Moss*
	7	*Water (ponds; creeks)*
	8	*Bare soil*

Observation area	Sample plot of 5 m radius

2.8.2Ground Cover Type in Percentage

Description	Assessed existing coverage of ground in 10% step within the 5-m radius plot for the dominant cover type	
Code List:	Code	Class
	1	10%
	2	20%
	3	30%
	4	40%
	5	50%
	6	60%
	7	70%
	8	80%
	9	90%
	10	100%
Units / Accuracy	Percent / 10%	
Observation area:	Sub plot of 5 m radius	

2.8.3Sub-forest Species

Description	Wood species that do not and will never create an upper canopy layer under the present conditions. Assessment is done according to species. List of wood species - see annex 3.5
Observation area	Sub plot of 5 m radius

2.8.4Sub-forest Coverage

Description	Assessment is done by 5% gradation separately per species.	
Code List	Code	Class
	1	5%
	2	10%
	3	15%
	4	20%
	5	25%
	6	30%
	7	35%
	8	40%
	9	45%
	10	50%
	11	55%
	12	60%
	13	65%
	14	70%
	15	75%
	16	80%
	17	85%
	18	90%
	19	95%
	20	100%

Unit / Accuracy	Percent / 5%
Observation Area	**Sub plot of 5 m radius**

2.8.5Sub-forest Height

Description	**Average height of sub-forest is measured per species.**	
Code list	**Code**	**Class**
	1	**< 50 cm**
	2	**50 – 150 cm**
	3	**> 150 cm**
Observation area	**Sub plot of 5 m radius**	

2.9 Variables Assessed on the 25-m Radius Sample Plot

Landscape and forest characteristics should be described inside the sample plot. Observation is done in sample plot of 25-m radius.

2.9.1Cattle Grazing

Description	**Damage of regeneration and ground vegetation caused by browsing.**	
Code list	**Code**	**Class**
	1	**No evidence for grazing – regeneration exists and browsing damage is not evident;**
	2	**Only little signs of grazing are evident – regeneration browsed, ground vegetation browsed;**
	3	**Average grazing –regeneration is rare and browsed, ground vegetation is intensively browsed;**
	4	**Intensive signs of grazing - cattle trails, no regeneration and ground vegetation;**
Observation area	**Sub plot of 25 m radius**	

2.9.2Landscape Features

Description	Landscape features that contribute to the functionality of habitat or to the biodiversity maintenance are recorded.	
Code list	Code	Class
	0	No landscape feature
	1	Big rocks / boulders
	2	Stone wall
	3	Cave
	4	Stone field
	5	River / stream
	6	Lake
	7	Karst caves
	8	Swamp
	9	Sandy area
	10	Edge effect located on the sample plot and caused by area without trees
	11	Other (specify)
Observation area	Sub plot of 25 m radius	

2.9.3Forest Function

Considering ecological, social and economic functions, Georgian Forests can be broken down into categories according to forest management aims.

Each of the sample plots is assigned respective categories, which is defined according to forest function. This assignment can thus be utilized for establishing respective management type.

Forest functions are assessed prior to field work (independently from it) and during the field work.

2.9.3.1 *Forest Categories*

Description	Forest Functions are assessed based on the categories of forests functions defined and described in the forest code Values given in brackets are referring to buffer zones or criteria describing the preconditions (e.g. slope)		
Code List	Forest Function	Code	Category
	Protected forests	1	Reserved Area – IUCN I
		2	National Park – IUCN II
		3	Preserved Area – IUCN III
		4	Nature Monument – IUCN IV
		5	Protected Landscape - IUCN V
		6	Multi-use Area - IUCN VI
		7	Flood plain forest
		8	Arid Forest
		9	Dominant Endemic and/or relict species area
		10	Dominant Red list species area
	Protective	11	Forests with up to 200 meters width located along permanent paths of avalanches and mudflows
		12	Forests located on the slopes with greater inclination than 35o
		13	Forest areas of up to 30 hectares located between non-forested territories
		14	Forests of up to 100 meters width located around landslides, eroded slopes, karstic formations, protrusions of mountain strata
		15	Forests of up to 100 meters width located along railways and motor roads (measured from the shoulders)
		16	Forests of up to 100 meters width located around rivers, lakes and water reservoirs
		17	Forests located around stone fall and rocky areas
		18	Forests around natural caves
		19	Forests, with the main function of protecting soil from erosion and snow restrain
		20	Forests located on creeping soils
		21	Forests located on slopes prone to landslides
		22	Subalpine forest
		23	Forests located within 100 meters radius area around water intake headworks
	Resorts and recreational	24	Forests located in the sanitary protection zone of resorts
		25	Forest areas located within 1 km radius area around medical institutions and mineral water springs. Established area is subject to restriction by natural boundaries of a watershed
		26	Forests adjacent to cities and settlements, which is used by population for public recreation, tourism and sport/health improving activities
	Commercial	27	Forest not included in above mentioned categories (1-26)
Observation area		Sample plot of 25 m radius	

2.10 Assessment of Down Dead Wood

Assessment of down dead wood – only fallen dead trees, broken and dig out trees, those fallen by wind, snow, as well as cut trees, felled dead wood left in the forest are aseesed.

The deadwood variables listed here only refer to down dead wood. (If the biggest part of the tree is located on the ground, then it is assessed as down deadwood. If the biggest part of the tree is not located on the ground then it is assessed as a standing deadwood.)

2.10.1 Down Dead-Wood Type

Description	Down dead-wood is assessed according to coniferous and broad-leaved types, which is necessary for carbon calculation.	
Code list	Code	Type
	1	Coniferous
	2	Broad-leaved
Observation area	Sample plot of 5 and 10 m radius	

2.10.2 Down Dead-Wood Diameter

Description	Down dead wood is recorded when thicker end of the tree or wood piece is located inside the 5 and/or 10 m sub-plots down dead-wood diameter is measured on its thick and on its narrow end. See annex 3.7 • Down dead wood ≥ 10cm at the thicker end it is recorded in 5 m radius sub plot. • Down dead wood ≥ 20cm at the thicker end is recorded in 10 m radius sub plot. In case the major part of the down deadwood is inside the sub plot, but the thicker end is outside of the respective sub plot, this down deadwood is not recorded.
Unit / accuracy	cm / mm accuracy
Instrument	Calliper / tape
Observation area	Sample plot of 5 and 10 m radius

2.10.3 Down Dead-Wood Length

Description	The length is measured for each piece of down deadwood that complies with the conditions of being recorded, where length refers to the part of a dead wood piece that is thicker than 10 cm in diameter.
Unit / accuracy	Meters / 1 hundredth
Instrument	Tape
Observation area	Sample plot of 5 and 10 m radius

2.10.4 Down Dead-Wood Decay Class

Description	Down deadwood is estimated according to decay class.	
Code list	Code	Class
	1	**Fresh** - bark is on and wood is hard
	2	**Medium decayed** - bark partly is off, wood is soft;
	3	**Heavily decayed** - bark is completely off, wood is rotten;
Observation area	Sample plot of 5 and 10 m radius	

2.11 Assessment of Regeneration

2.11.1 Regeneration Sub-plot Marking

Description	Regeneration is assessed in 5-m distance from the sample plot centre to the north and to the south in 1.5 m radius sub-sample plots. All wood species which are less than 8 cm DBH and later will be part of the main canopy or layer shall be described as regeneration.	
Code list	Code	Class
	1	Northern regeneration sample plot
	2	Southern regeneration sample plot

Observation area	Regeneration sample plot

2.11.2 Regeneration Species

Description	Regeneration species are recorded in the sample plot according to height classes and quantity. See the list in annex 3.5
Observation area	Regeneration sample plot

2.11.3 Regeneration Height

Description	Regeneration height is measured according to species and quantity.	
Code list	Code	Class
	1	< 50 cm
	2	50 – 150 cm
	3	150 cm and more
Observation area	Regeneration sample plot	

2.11.4 Regeneration Quantity

Description	Quantity of regeneration is recorded according to species and height classes. Damaged and healthy regeneration are counted separately.
Unit	Number
Observation area	Regeneration sample plot

2.12 Assessment of Single Forest Tree Species

Single wooden species variables are observed at the single sample trees (in case they reach the minimum ≥ 8 cm in DBH-value) at sub-plots of different radius (graphic image see annexes 3.8 & 3.93.9)

2.12.1 Tree Number / ID

Description:	Tree numbering is always done in a clockwise manner starting from North
Observation area:	Sample Plot of 15 m radius

2.12.2 Stem Number / ID

Description:	If a tree has one or more stems before 1.3 m height and the diameter of the stem is ≥ 8 cm, each stem is assigned individual number. (ID)
Observation area:	Sample plot of 15 m radius

2.12.3 Azimuth

Description	Azimuth is measured in degrees from the sample plot centre to the stem at Breast Height (defined as 1.3 m height). Azimuth is measured by compass for each tree stem, if the angle is different by more than 1° (see annex 3.9)
Unit/Accuracy	Degree / 1°
Device	Vertex Laser Geo
Observation area	Sample Plot of 15 m radius

2.12.4 Horizontal Distance to the Tree

Description	Horizontal distance is measured from the centre to the tree at DBH location. See annex 3.11 and 3.9
Unit / accuracy	m / 1 hundredth
Device	Vertex Laser Geo
Observation area	Sample Plot of 15 m radius

2.12.5 Tree Class

Description	Every tree is assigned to a relevant class: The tree class influences the variables measured for each tree.

Code list	Code	Class
	1	Growing tree (including low coppice)
	2	High coppice tree
	3	Standing dead tree (unbroken)
	4	Broken tree (living or dead)
Observation area	Sample plot of 15 m radius	

Overview of variables measured by tree class

Variables	1 Growing trees	2 High Coppice	3 Standing dead trees	4 Broken trees
Tree origin	Y	Y	Y	Y
Habitat trees	Y	Y	Y	Y
Tree position in layer	Y		Y	
DBH	Y		Y	
Stem quality of growing trees	Y			
Damages of trees	Y	Y	Y	Y
D for high coppice stem		Y		
H for height coppice stem		Y		
Quantity of high coppice sprouts		Y		
D for high coppice sprouts		Y		
H for high coppice sprouts		Y		
Decay class of standing dead tree			Y	
Broken trees status				Y
D for broken trees				Y
H for broken trees				y

Broken dead tree decay class				y

2.12.6 Tree Species

Description:	A complete list of all native and possibly occurring alien tree species needs to be available for each field team, including a brief identification key. The taxon field contains a column for the species code, the scientific and a local name (See annex 3.5). If a clear identification in the field is not possible, the tree should be sampled, transported to the lab and identified by the experts. The result is reported back to the inventory team.
Observation area:	Sample Plot of 15 m radius

2.12.7 DBH of Single Wood Species

Description	Stem DBH (diameter at breast height) is measured at 1.3 m from the surface of the ground in perpendicular of the stem with the tape or calliper. Calliper is used in case of slope with 30^0 or higher inclination. See annex 3.103.10 for the instruction of measurement by calliper.	
DBH classes according to sub-plots	5 m sub-plot	DBH of 8 cm and more
	10 m sub-plot	DBH of 15.1 cm and more
	15 m sub-plot	DBH of 30.1 cm and more
Unit / accuracy	Cm / mm	
Instrument	Diameter tape or calliper	
Observation area	5 m, 10 m, 15 m sub-plots	

2.12.8 Tree Origin

Description	Tree origin can be natural (seed growth; coppice) or artificial	
Code list	Code	Class
	1	Natural (seed growth) - Tree from naturally seed growth origin

	2	Natural (coppice)- Tree from vegetative origin
	3	Artificial - Tree which is originated from artificially planting or seeding
Observation area	Sample plot of 15 m radius	

2.12.9 Habitat Trees

Description	If a tree shows any habitat tree traits, each of these traits for each measured tree are recorded. Several traits can be selected in the software.	
Code list	Code	Class
	0	No habitat features
	1	Nest
	2	Bigger holes
	3	Water syphon (in root caves)
	4	Mossy stem
	5	Presented dead branches in crown
	6	Larger fungi at stem
	7	Populated by special insects
	8	Ivy, Viscum, other
	9	Signs of woodpecker
	10	Other (specify)
Observation area	Sample Plot of 15 m radius	

2.12.10 Single Tree Position in Layers

Description	Tree position is defined according to its position in vertical structure of the sample plot. The difference between the layers should be at least 1/3 of height.	
Code list	Code	Class
	1	First layer
	2	Second layer
	3	Third layer
	4	Remnant tree – the tree which is left from the previous generation.
Observation area	Sample plot of 15 m radius	

2.12.11 Stem Quality of Living Tree

Description	Each tree assessed according to quality classes that allow estimating volume according to quality. Quality is determined by stem shape and damage.	
Code list	Code	Class
	1	Construction timber - Tree belongs to construction category, if the length of undamaged, straight part of stem is ≥ 6.5 m; for trees less than 18 m high – the minimum of 1/3 m of tree height.
	2	Semi-Construction timber - Tree belongs to semi-construction category, if the length of undamaged, straight part of stem is 2.5 – 6.5 m;
	3	Firewood - Tree belongs to firewood category, if the length of undamaged, straight part of stem is < 2.5 m.
Observation area	Sample plot of 15 m radius	

2.12.12 Damage of the Tree

Description	Tree damage is assessed visually according to classes. In addition, the severity of damage is assessed. Several damage classes can occur on one tree (growing tree, high coppice tree, standing deadwood, broken tree).		
Code list	Code	Class	Classes for severity of damage
	1	Damage through logging and/or skidding activities;	A - slightly damaged B - middle damage C - strong damage
	2	Fire damage;	A - slightly damaged B - middle damage C - strong damage
	3	Pests / disease;	A - slightly damaged B - middle damage C - strong damage
	4	Animal damage;	A - slightly damaged B - middle damage C - strong damage
	5	Uprooted-broken tree (natural causes);	A - slightly damaged B - middle damage C - strong damage
	6	Other anthropogenic damage;	A - slightly damaged B - middle damage C - strong damage
	7	Other (specify);	A - slightly damaged B - middle damage C - strong damage
Observation area	Sample plot of 15 m radius		

2.12.13 High Coppice Measurement

High coppice tree is a tree, where coppicing was done at higher position (see 2.12.15) High coppice is measured according to the circles in the sample plot like growing trees, but with a special set of variables.

To calculate the volume of high coppice, tree the sprouts and its stem are measured in addition to the volume of the stem.

To calculate the volume of stem, the diameter of the stem is measured at its mid-point (according to designated sub plots of the sample plot (like with growing trees), and the height of the stem.

To calculate the volume of sprouts, the height and number of sprouts are measured and the mean diameter of sprouts is eye-estimated at the bottom of the sprout.

2.12.14 Diameter of High Coppice Stem

Description	To calculate the volume of the stem, the diameter of the stem is measured by tape. If the stem is too high to be measured, it is eye-estimated. Diameter is measured / eye-estimated at the mid-point of the stem.
Unit	Cm
Observation area	5 m, 10 m, 15 m sub-plots

2.12.15 Height of High Coppice Stem

Description	To calculate the volume of the stem the height of the stem is measured. Stem height is measured from ground surface up to the top of the stem.
Unit / accuracy	m / decimal
Device	Vertex Laser Geo
Observation area	Sample plot of 15 m radius

2.12.16 Quantity of High Coppice Sprouts

Description	To calculate the volume of sprouts, all the sprouts where the diameter at the bottom is ≥10 cm (eye-estimated) are counted.
Unit	Number of sprouts
Observation area	Sample plot of 15 m radius

2.12.17 Diameter of High Coppice Sprouts

Description	To calculate the volume of sprouts, the average diameter of all the sprouts is eye-estimated. The diameter at the bottom of sprout is estimated ≥10 cm from the sprout origin.
Unit	Cm
Observation area	Sample plot of 15 m radius

2.12.18 Height of High Coppice Sprouts

Description	To calculate the volume of sprouts of the high coppice, the height of the sprout with the average diameter is measured. Height is measured from the bottom of the sprout up to the top.
Units/Accuracy	m / decimal
Device	Vertex Laser Geo
Observation area	Sample plot of 15 m radius

2.12.19 Standing Dead Tree Decay Class

Description	Standing dead tree quality is eye-estimated according to quality classes	
Code list	Code	Class
	1	Not decayed – bark is on and wood is hard
	2	Medium decayed – bark is partly off, wood is soft
	3	Heavily decayed - bark is completely off, wood is rotten
Observation area	Within 15 m radius of the sample plot	

2.12.20 Broken Tree Status

Description	Broken trees are trees with a substantial loss of crown or stem volume. In addition, they are divided in two classes: Dead or living. Broken trees are measured according to sub plots like living trees.	
Code list	Code	Class
	1	Broken (dead)
	2	Broken (living)
Observation area	Sample plot of 15 m radius	

2.12.21 Diameter of Broken Trees

Description	To calculate the volume of the broken tree, the diameter at the midpoint of the stem is measured or eye-estimated. If broken tree is too high to be measured, diameter is eye-estimated at its midpoint.
Unit	Cm
Observation area	Sample plot of 15 m radius

2.12.22 Height of Broken Trees

Description	To calculate the volume of the broken tree, the height is measured. It is measured from ground surface up to the top of the broken tree.
Unit/Accuracy	m / decimal accuracy
Device	Vertex Laser Geo
Observation area	Sample plot of 15 m radius

2.12.23 Broken Dead Tree Decay Class

Description	Broken dead tree quality is eye-estimated according to quality classes	
Code list	Code	Class
	1	Not decayed – bark is on and wood is hard
	2	Medium decayed - bark partly is off, wood is soft;
	3	Heavily decayed - bark is completely off, wood is rotten;
Observation area	Within 15 m radius of the sample plot	

2.13 Measuring of Age, Height and Increment

Sample trees are selected for age, height and increment measurement. Do not select trees with broken crowns or any other irregular shape (leaned, crooked, bended, miss-formed high coppice).

The variable "2.7.10*Sample plot vertical structure (layers)*" needs to be set first. It fixes, if the sampling for age, height and increment needs to be done in 1 layer or in 2 – 3 layers.

2.13.1 Tree Height Measurement Steps

Work steps are as follows:

Dominant layer

Dominant layer is automatically given by the software – as the layer with the biggest BA percentage in the sample plot.

- Identify all tree species in the dominant layer.
- Select the 2 most dominant species by their share of BA in the dominant layer (dominant and co-dominant species)
- In dominant and co-dominant species, we measure 3 trees (3x tree for dominant and 3x for co-dominant species)
    - 1 x mean tree (according to its DBH) for dominant and co-dominant species (2 trees)
    - 1 x thin tree for dominant and co-dominant species (2 trees)
    - 1 x thick tree for dominant and co-dominant species (2 trees)
    - Identify all the species presented in the layer. Select the mean tree (with mean DBH) - data will be calculated automatically by the software;
- **Co-dominant layer**

Co-dominant layer is automatically given by the software as a layer with the second biggest BA.

- Identify all tree species in co-dominant layer
- Select the mean tree (mean DBH) in each species – calculations will be automatically done by the Software
- Height measurements: - 1 mean tree in each species

Subordinated layer

For the subordinated layer if existing: Repeat the steps described for the co-dominant layer.

2.13.1.1 Tree height

Description	**Tree height is defined as vertical distance between tree top and ground level at the stem base.** **Do not select the trees which do not have normal shape or broken trunk as they will be the outliers of the curve.** **The trees, of which heights are measured in the dominant layer, should span the entire existing diameter range.**
Unit/Accuracy	**m / with decimal accuracy**
Device	**Vertex Laser Geo**

Observation area	**Sample plot of 15 m radius**

2.13.2 Age of trees

If drilling to the core is not doable (e.g. diameter to big), drill AS DEEP AS RESPONSIBLY POSSIBLE by means of the device.

Work steps are as follows:

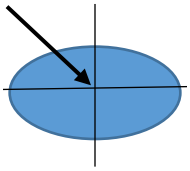
Dominant layer

- **Select the dominant layer**: It is given by the software – as the layer with the biggest BA percentage in the sample plot;
- Identify all tree species in the dominant layer
- For every identified species select 1 mean tree (according to its DBH). (data will be calculated by the software)
- Drilling: Drill one mean tree for dominant and co-dominant species (2 trees)

Other layer:

- **Select the co-dominant or subordinated layer (if existing)** - Repeat the steps described for the dominant layer.

2.13.2.1 Assessment of Tree Age

Description **Drilling position for an oval tree:** 	**Age of the trees is assessed to allow a grouping of trees by age classes.** **Age is assessed by drilling** ▪ **Standard is drilling with the borer** **Only select trees without stem or crown damages or abnormal forms (strong ovality, lean, crooks, bends, miss-formed high coppice).** **Tree is drilled up to the tree centre at the breast height.** **Oval trees (mostly occurring on slopes): The core shall be sampled between the maximum and minimum diameter.** Analysis: Cores will be analysed from the desk, Sample cores need to be labelled with cluster ID, sample plot ID and tree / stem number and saved safely. They have to be delivered to the NFI Coordinator/Control team.
Units / accuracy	**Years / 1 year**
Device	**Borer**
Observation area:	**Sample Plot of 15 m radius.**

2.13.3 Increment in Diameter for Single Tree

While selecting the sample trees for calculating the increment in diameter all the steps implemented for height measurement. Increment is measured for all those trees which were sampled for height.

Work steps are as follows:

Dominant layer

Select dominant layer: It is given by the software – as the layer with the biggest BA percentage in the sample plot.

- Identify all tree species in the dominant layer
- Identify dominant and co-dominant species – calculations will be done automatically by the software, according to the BA share in the layer.
- Measure 3 trees in dominant and co-dominant species (3 x trees dominant, 3 x trees co-dominant) so that in each species
- 1 mean tree presented. This will automatically be calculated by the software.

  1 x thin tree for dominant and co-dominant species (2 trees)

  1 x thick tree for dominant and co-dominant species (2 trees)

Other layer:

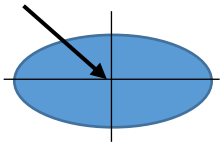
Select the co-dominant layer: It will be given by the software as layer with the second biggest BA %

- Identify all the tree species in the co-dominant layer
- Identify dominant and co-dominant species – calculations will be done automatically by the software, according to BA % in the layer.
- Select the mean tree in identified (dominant and co-dominant) species. Calculation will be done by the software automatically.

Subordinated layer:

- **Select the subordinated layer** if existing and repeat all the steps described in co-dominant layer.

2.13.3.1 *Increment in Diameter*

Description Drilling position for an oval tree: 	**Tree diameter increment is measured via drilling.** **All trees selected for age are also used to assess the increment.** **Only select trees without stem or crown damages or abnormal forms (lean, crooks, bends, high coppice).** Trees are drilled at the breast height and the width of last 10 rings (last 10 years) are measured. Analysis: Core analysis need to be done indoors. Sample cores need to be marked with cluster ID, plot ID and tree / stem number and saved safely. They **have to be delivered to the NFI Coordinator/Control team.**
Units / accuracy	**cm / with decimal accuracy**
Instrument	**Borer**
Observation area	**Tree Sample Plot of 15 m radius**

2.14 Stump Assessment Variables

2.14.1 Type of Stump

Description	Stumps are assessed according to coniferous and broad-leaved types which is necessary for carbon calculation.	
Code list	Code	Type
	1	Coniferous
	2	Broad-leaved
Observation area	5 m, 10 m and 15 m radius sub-plots	

2.14.2 Stump Diameter

Description	Stump diameter is measured at the middle point of the stump. The selection of the stumps follows the same sub-plot design like for standing trees. Minimum diameter 10 cm.
Units/ accuracy	Cm / with decimal accuracy
Instrument	Tape
Observation area	5 m, 10 m and 15 m radius sub-plots

2.14.3 Horizontal Distance to the Stump

Description	Horizontal distance is measured from the sample plot centre to the centre of stump top. See annex 3.11
Unit / accuracy	m / 1 hundredth accuracy
Device	Vertex Laser Geo
Observation area	Sample Plot of 15 m radius

2.14.4 Stump Azimuth

Description	Azimuth is measured in degrees from the sample plot centre to the central point where the stump was cut. Azimuth is measured by compass for each stump if the difference is more than 1°. (Graphic illustration see annex 3.9)
Unit / Accuracy	degree / 1°
Device	Vertex Laser Geo
Observation area	Sample Plot of 15 m radius

2.14.5 Stump Height

Description:	The height of the stump will be measured from the ground surface to the top of the stump.
Unit/accuracy:	m / with decimal accuracy
Instrument	Tape
Observation area	5 m, 10 m and 15 m radius sub-plots

2.14.6 Stump History

Description	Stump history is eye-estimated according to its quality.	
Code list	Code	Class
	1	Newly Felled – wood is light colour and the bark is on;
	2	Average - wood is still hard, bark is partly on;
	3	Old - wood is decayed, bark is off;
Observation area	5 m, 10 m and 15 m radius sub-plots	

2.15 Wood Species Mixture

Description	Identify all the species presented in 25-m radius sub plot and record the number of presented species.

Observation area	Sample plot of 25 m radius

2.16 Final Variables

2.16.1 Standard Photographs of Sample-Plot

Description	One picture is taken from the south position to the North direction through the centre point from 10 m distance.
Observation area	Sample plot of 10 m radius

2.16.2 Comments

Description	The field where the observation text about the sample plot and its surroundings should be written, the text later can be used to describe the plot location.
Unit / accuracy	Text
Observation area	Sample plot of 25 m radius

2.16.3 End of Measurements Time on the Sample Plot

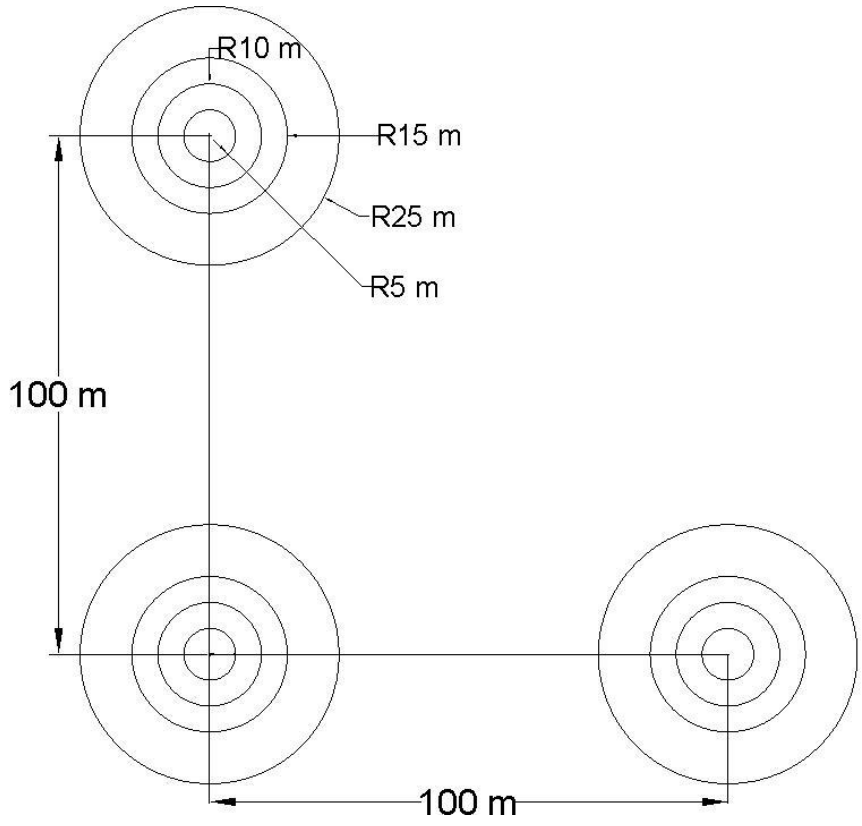
Description	End time of measurements, when all measurements are finished on the sample plot.
Unit / accuracy	HH-MM / one minute
Observation area	Sample plot

2.16.4 Time and Date at the End of Field Work in the Cluster

Description	End time and date of measurements, when all measurements are finished on the cluster.
Unit / Accuracy	HH-MM / one-minute
Unit / Format	Date / DD-MM-YY
Observation area	Cluster

3. Appendices

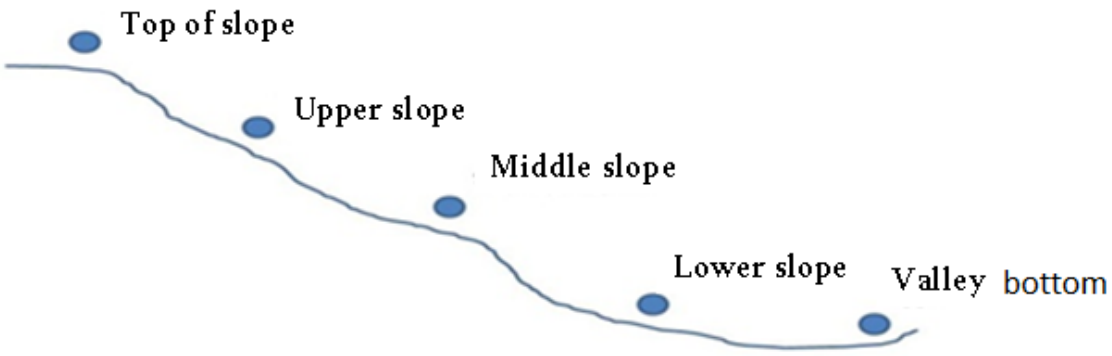
3.1 Design of Cluster Plots:



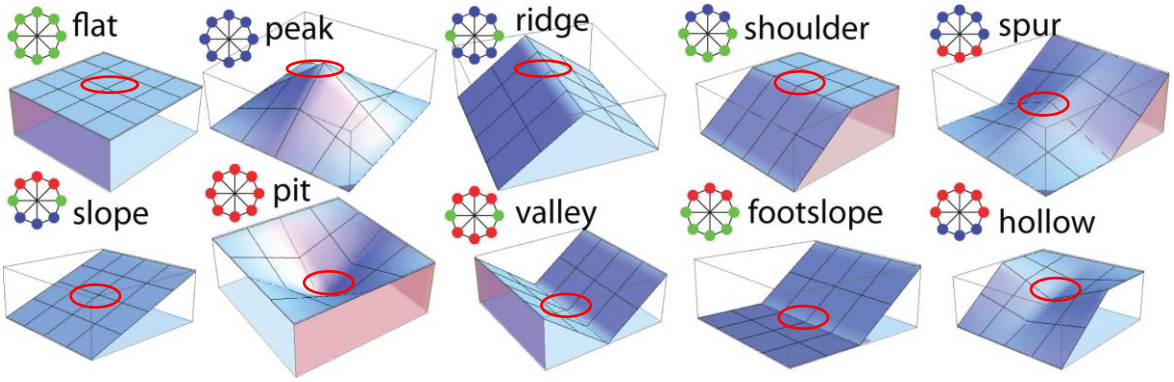
3.2 Sample Plot Position on the Slope

Evaluation of the sample plot position on the slope is done in the15 m radius of the sample plot). The slope position is relevant for the soil and water household on the sample plot. The evaluation should always consider the water run-off direction and erosion process. In which direction is the water running off and where do I have an accumulation of horizontal water flow or respective accumulation of fine soil.

Visualization:

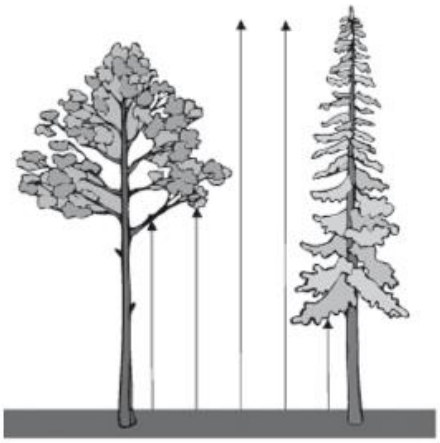


3.3 Terrain Shape of the Sample Plot



3.4 Crown Closure

The illustration is showing the principle of Crown Closure Assessment



3.5 List of Wooden Species

№	Code	Scientific Name	Genus, Species	Red List
1.	სჭ	*Abies nordmanniana*	სოჭი კავკასიური	No
2.	აკლ	*Acacia dealbata*	აკაცია ლეგა	No
3.	ნკნ	*Acer negundo*	ნეკერჩხალი ამერიკული	No
4.	ნკბ	*Acer pseudoplatanus*	ნეკერჩხალი ბოყვი	No
5.	ნკდბ	*Acer welutinum*	ნეკერჩხალი დიადი ბოყვი	No
6.	ნკმმ	*Acer trautvetteri*	ნეკერჩხალი მაღალი მთის	No
7.	ნკლ	*Acer platanoides*	ნეკერჩხალი მახვილფოთლოვანი	No
8.	ნკმ	*Acer campestre*	ნეკერჩხალი მინდვრის	No
9.	ნკ	*Acer ibericum*	ნეკერჩხალი ქართული	Yes
10.	ნკქ	*Acer laetum*	ნეკერჩხალი ქორაფი	No
11.	ნკთ	*Acer tataricum*	ნეკერჩხალი თათრული	No
12.	ნკუც	*Acer sp*	ნეკერჩხალი უცნობი	
13.	ცხწ	*Aesculus hippocastanum*	ცხენის წაბლი ჩვეულებრივი	No

14.	*ალნ*	*Ailanthus altissima*	აილანთუსი რYesნისებური	No
15.	*აბკ*	*Albizzia julibrissin*	ალბიცია ლენქორანის	No
16.	*ტნგჩ*	*Aleurites fordii*	ტუნგო ჩინური	No
17.	*ტნგ*	*Aleurites cordata*	ტუნგო იაპონური	No
18.	*ტნუც*	*Aleurites sp*	ტუნგო უცნობი	No
19.	*თხმ*	*Alnus barbata*	თხმელა ბუსუსიანი	No
20.	*თხმფ*	*Alnus subcordata*	თხმელა გულფოთოლა	No
21.	*თხლა*	*Alnus incana*	თხმელა ნაცNo	No
22.	*თხმშ*	*Alnus glutinosa*	თხმელა შავი	No
23.	*თხმუც*	*Alnus sp*	თხმელა უცნობი	No
24.	*ამრფ*	*Amorpha fruticosa*	ამორფა ბუჩქისებრი	No
25.	*ნშ*	*Amygdalus communis*	ნუში ჩვეულებრივი	No
26.	*ნშქ*	*Amygdalus georgica*	ნუში ქართული	Yes
27.	*ნშუც*	*Amygdalus sp*	ნუში უცნობი	
28.	*დურ*	*Anabasis aphylla*	დურღენი	Yes
29.	*ხემ*	*Arbutus andrachne*	ხემარწყვა	Yes
30.	*ჭრმ*	*Armeniaca vulgaris*	ჭერამი ჭერამი	No
31.	*გლრ*	*Astragalus caucasicus*	გლერძი კავკასიის	No
32.	*გლს*	*Astragalus sommieri*	გლერძი სომიეს	Yes
33.	*გლტ*	*Astragalus tanae*	გლერძი ტანას	Yes
34.	*გლუც*	*Astragalus sp*	გლერძი უცნობი	
35.	*ხრც*	*Atraphaxis caucasica*	ხორციფერა კავკასიის	No
36.	*კწხ*	*Berberis vulgaris*	კოწახური ჩვეულებრივი	No
37.	*კწქ*	*Berberis iberica*	კოწახური ქართული	No
38.	*კწუც*	*Berberis sp*	კოწახური უცნობი	
39.	*არყ*	*Betula litwinowii*	არყი ლიტვინოვის	No
40.	*არყლ*	*Betula medwedewii*	არყი მედვედევის	Yes

41.	არყვ	*Betula verrucosa*	არყი მეჭეჭებიანი	No
42.	არყრ	*Betula raddeana*	არყი რადეს	Yes
43.	არყმ	*Betula megrelica*	არყი სამეგრელოს	Yes
44.	არყუც	*Betula sp*	არყი უცნობი	
45.	ქაღ	*Broussonetia papyrifera*	ბრუსონეცია ბრუსონეცია	No
46.	ბზ	*Buxus colchica*	ბზა კოლხური	Yes
47.	აკყ	*Caragana arborescens*	კNoგანა ყვითელი	No
48.	ჯგ	*Carpinus orientalis*	რცხილა ჯაგრცხილა	No
49.	რც	*Carpinus caucasica*	რცხილა კავკასიური	No
50.	რცუც	*Carpinus sp*	რცხილა უცნობი	No
51.	ჰკნ	*Carya oliviformis*	კარია პეკანი	No
52.	წბ	*Castanea sativa*	წაბლი ჩვეულებრივი	Yes
53.	წბპ	*Castanea crenata*	წაბლი იაპონური	No
54.	წბუც	*Castanea sp*	წაბლი უცნობი	
55.	კტლ	*Cathalpha speciosa*	კატალპა დასავლური	No
56.	კდჰ	*Cedrus deodara*	კედარი ჰიმალაის	No
57.	კდ	*Cedrus libani*	კედარი ლიბანის	No
58.	კდუც	*Cedrus sp*	კედარი უცნობი	No
59.	აკს	*Celtis australis*	აკაYes სამხრეთის	Yes
60.	აკშ	*Celtis glabrata*	აკაYes შიშველი	Yes
61.	აკ	*Celtis caucasica*	აკაYes კავკასიის	No
62.	აკუც	*Celtis sp*	აკაYes უცნობი	
63.	ალბ	*Cerasus spp.*	ბალი ალუბალი	No
64.	ბლწმ	*Cerasus microcarpa*	ბალამწNo მცირენაყოფიანი	Yes
65.	იუდხ	*Cercis siliquastrum*	არღავანი (იუდას ხე)	No
66.	ქფ	*Cinnamonum camphora*	ცინამონუმი ქაფურის ხე	No
67.	საკპ	*Cistus greticus*	საკმელა პონტოური	Yes

68.	*საკს*	*Cistus salviifolius*	საკმელა სალბფოთოლა	No
69.	*საკუც*	*Cistus sp*	საკმელა უცნობი	
70.	*ლიმ*	*Citrus limon*	ლიმონი ლიმონი	No
71.	*მნდ*	*Citrus unchiu*	მანდარინი მანდარინი	No
72.	*კტლ*	*Clematis orientalis*	კატაბარდა აღმოსავლეთის	No
73.	*კტს*	*Clematis viticella*	კატაბარდა იისფერი	No
74.	*კტ*	*Clematis vitalba*	კატაბარდა	No
75.	*კტუც*	*Clematis sp*	კატაბარდა უცნობი	No
76.	*შინ*	*Cornus mas*	შინდი შინდი	No
77.	*თხ*	*Corylus avellana*	თხილი ჩვეულებრივი	No
78.	*თხრ*	*Corylus imeretica*	თხილი იმერული	No
79.	*თხკ*	*Corylus colchica*	თხილი კოლხური	Yes
80.	*თხპ*	*Corylus pontica*	თხილი პონტოური	No
81.	*დთხ*	*Corylus iberica*	თხილი ქართული	No
82.	*თხუც*	*Corylus sp*	თხილი უცნობი	
83.	*თრმ*	*Cotinus coggygria*	თრიმლი ჩვეულებრივი	No
84.	*სრვ*	*Cotoneaster integerrima*	სირვაშლა ჩვეულებრივი	No
85.	*კუნკ*	*Crataegus orientalis*	კუნელი კნაპა	No
86.	*კუნშ*	*Crataegus pentagina*	კუნელი შავი	No
87.	*კუნ*	*Crataegus microphylla*	კუნელი წითელი	No
88.	*კუნპ*	*Crataegus pontica*	კუნელი ყამბრო	Yes
89.	*კუნუც*	*Crataegus sp*	კუნელი უცნობი	
90.	*კრპ*	*Cryptomeria japonica*	კრიპტომერია იაპონური	No
91.	*კვჰ*	*Cupressus horisontalis*	კვიპაროსი ჰორიზონტალური	No
92.	*კვლ*	*Cupressus lusitanica*	კვიპაროსი ლუზიტანიის	No
93.	*კვპ*	*Cupressus pyramidalis*	კვიპაროსი პირამიდალური	No
94.	*კვპუც*	*Cupressus sp*	კვიპაროსი უცნობი	No

95.	კომ	*Cydonia oblonga*	კომში კომში	No
96.	ტც	*Cytisus caucasicus*	ტყის ცოცხი კავკასიის	No
97.	მჯა	*Daphne albowiana*	მაჯაღვერი ალაბოვის	Yes
98.	მჯკ	*Daphne transcaucasica*	მაჯაღვერი ამიერკავკასიური	Yes
99.	მჯც	*Daphne pseudosericea*	მაჯაღვერი ცრუაბრეშუმისებრი	Yes
100.	მჯჩ	*Daphne mezereum*	მაჯაღვერი ჩვეულებრივი	No
101.	მჯმ	*Daphne glomerata*	მაჯაღვერი მაღალმთის	No
102.	მჯპ	*Daphne pontica*	მაჯაღვერი პონტოური	No
103.	მჯრ	*Daphne axiliflora*	მაჯაღვერი რძიანი	No
104.	მჯღუც	*Daphne sp*	მაჯაღვერი უცნობი	
105.	ხრმ	*Diospyros lotus*	ხურმა ჩვეულებრივი	No
106.	ფშტ	*Elaeagnus angustifolia*	ფშატი ჭალის	No
107.	ძხშ	*Ephedra equisetina*	ჯორის ძუა შვიტისებრი	No
108.	ჯძწ	*Ephedra procera*	ჯორის ძუა ტანმაღალი	No
109.	ჯძუც	*Ephedra sp*	ჯორის ძუა უცნობი	No
110.	ეპ	*Epigaea gaultheroides*	ეპიგეა გაულთერიასმაგვარი	Yes
111.	მან	*Erica arborea*	მანანა ხემაგვარი	Yes
112.	ზღ	*Eriobotrya japonica*	ზღმარტლი იაპონური ერიობიოტა	No
113.	ევკც	*Eucalyptus cinerea*	ევკალიპტი ცისფერი	No
114.	ევკლ	*Eucalyptus globulus*	ევკალიპტი ლურჯი	No
115.	ევკტ	*Eucalyptus macarthuri*	ევკალიპტი მაკარტურის	No
116.	ევკნ	*Eucalyptus viminalis*	ევკალიპტი მანანის	No
117.	ევკ	*Eucalyptus amygdalina*	ევკალიპტი ნუშისებრი	No
118.	ევკუ	*Eucalyptus urnigera*	ევკალიპტი ურნისებრნაყოფიანი	No
119.	ევკწ	*Eucalyptus rostrata*	ევკალიპტი წითელი	No

120.	*ევკუც*	*Eucalyptus sp*	ევკალიპტი უცნობი	No
121.	*ევკმ*	*Eucommia ulmoides*	ევკომია თელისებრი	No
122.	*ევრნ*	*Eversmannia subspinosa*	ევერსმანია ნახევრადეკლიანი	Yes
123.	*ჯნჭ*	*Evonymus europaea*	ჭანჭყატი ჩვეულებრივი	No
124.	*ჯნჭტ*	*Evonymus latifolia*	ჭანჭყატი განიერფოთლიანი	No
125.	*ჯნჭმ*	*Evonymus verrucosa*	ჭანჭყატი მეჭეჭებიანი	No
126.	*ჯნჭუც*	*Evonymus sp*	ჭანჭყატი უცნობი	No
127.	*წფ*	*Fagus orientalis*	წიფელი აღმოსავლური	No
128.	*ლღვჩ*	*Ficus carica*	ლეღვი ჩვეულებრივი	No
129.	*ლღვ*	*Ficus colchica*	ლეღვი კოლხური	No
130.	*ლღვუც*	*Ficus sp*	ლეღვი უცნობი	No
131.	*ხეჭ*	*Frangula alnus*	ხეჭრელი ჩვეულებრივი	No
132.	*იფ*	*Fraxinus excelsior*	იფანი ჩვეულებრივი	No
133.	*იფმ*	*Fraxinus oxycarpa*	იფანი მახვილფოთოლა	No
134.	*იფუც*	*Fraxinus sp*	იფანი უცნობი	No
135.	*კცჭ*	*Genista adzharica*	კურდღლისცოცხა აჭარის	No
136.	*კცა*	*Genista abchasica*	კურდღლისცოცხა აფხაზეთის	Yes
137.	*კცუც*	*Genista sp*	კურდღლისცოცხა უცნობი	
138.	*გლდ*	*Gleditsia triacanthos*	გლედიჩია სამეკალა	No
139.	*ხრ*	*Grossularia reclinata*	ხურტკმელი ჩვეულებრივი	No
140.	*ჩინგმ*	*Halimodendron halodendron*	ჩინგილი მლაშობის	Yes
141.	*სრ*	*Hedera helix*	სურო ჩვეულებრივი	No
142.	*სრკ*	*Hedera colchica*	სურო კოლხური	No
143.	*სრპ*	*Hedera pastuchovii*	სურო პასტუხოვის	No
144.	*სრუც*	*Hedera sp*	სურო უცნობი	No
145.	*ქცვ*	*Hippophae rhamnoides*	ქაცვი ქაცვი	No
146.	*სვ*	*Humulus lupulus*	სვია სვია	No

147.	*ჭყ*	*Ilex colchica*	ჭყორი კოლხური	No
148.	*ჟას*	*Jasminum officinale*	ჟასმინი ნამდვილი	No
149.	*ჟასტ*	*Jasminum fruticans*	ჟასმინი ტანდაბალი	No
150.	*ჟასუც*	*Jasminum sp*	ჟასმინი უცნობი	No
151.	*კკხ*	*Juglans regia*	კაკალი ჩვეულებრივი	Yes
152.	*კკხმ*	*Juglans manechurica*	კაკალი მანჯურიის	No
153.	*კკხუც*	*Juglans sp*	კაკალი უცნობი	
154.	*ღხ*	*Juniperus oblonga*	ღვია გრძელწიწვიანი	No
155.	*ღღ*	*Juniperus excelsa*	ღვია მაღალი	No
156.	*ღნ*	*Juniperus polycarpos*	ღვია მრავალნაყოფა	Yes
157.	*ღმ*	*Juniperus foetidissima*	ღვია შავი	Yes
158.	*ღქ*	*Juniperus pigmala*	ღვია ქონდNo	No
159.	*ღწ*	*Juniperus rufescens*	ღვია წითელი	No
160.	*ღყ*	*Juniperus sabina*	ღვია ყაზახური	No
161.	*ღვუც*	*Juniperus sp*	ღვია უცნობი	
162.	*კლ*	*Koelreuteria paniculata*	კოელრეუტერია ყვავილედიანი	No
163.	*ოქრწ*	*Laburnum anagyroides*	ოქროწვიმა ჩვეულებრივი	No
164.	*ლქ*	*Larix spp.*	ლარიქსი ლარიქსი	No
165.	*წყ*	*Laurocerasus officinalis*	წყავი წყავი	No
166.	*დფ*	*Laurus nobilis*	დაფნა კეთილშობილი	Yes
167.	*კვჩ*	*Ligustrum vulgare*	კვიდო ჩვეულებრივი	No
168.	*კვ*	*Ligustrum japonicum*	კვიდო იაპონური	No
169.	*კვუც*	*Ligustrum sp*	კვიდო უცნობი	No
170.	*ლილ*	*Liriodendron tulipifera*	ლირიოდენდრონი ჩვეულებრივი ხეტიტა	No
171.	*ცხრტ*	*Lonicera iberica*	ცხრატყავა ცხრატყავა	No
172.	*ჯიქ*	*Lonicera carpifolum*	ცხრატყავა ჯიქა	No

173.	წერ	*Lonicera caucasica*	ცხრატყავა კავკასიური	No
174.	ცხრტუც	*Lonicera sp*	ცხრატყავა უცნობი	No
175.	თეთ	*Lycium barbarum*	თეთრეკალა წითელნაყოფა	No
176.	მკლ	*Maclura aurantiaca*	მაკლურა მაკლურა	No
177.	მჟლ	*Malus orientalis*	მაჟალო მაჟალო	No
178.	ვაშ	*Malus spp.*	ვაშლი ვაშლი	No
179.	ზღმ	*Mespilus germanica*	ზღმარტლი ზღმარტლი	No
180.	თთხშ	*Morus nigra*	თუთა შავი	No
181.	თთხ	*Morus alba*	თუთა თეთრი	No
182.	თთხუც	*Morus sp*	თუთა უცნობი	No
183.	ნიტშ	*Nitraria schoberi*	ნიტრარია შობერის	Yes
184.	ძთხ	*Olea europaea*	ზეთის ხილი ევროპის	No
185.	ორფ	*Orphanidesia gaultherioides*	ორფანიდეზია ორფანიდეზია	No
186.	ზთხ	*Osmanthus decorus*	ზეთის ხე	Yes
187.	უხ	*Ostrya carpinifolia*	უხრავი	Yes
188.	შთხ	*Padus racemosa*	შოთხვი შოთხვი	No
189.	ძძვ	*Paliurus spina-christi*	ძეძვი ჩვეულებრივი	No
190.	ხერ	*Parrotia persica*	პაროცია ხერYesნა	No
191.	პვლ	*Paulownia tomentosa*	პავლოვნია ბურძგლიანი	No
192.	ღვდ	*Periploca graeca*	ღვედკეცი ღვედკეცი	No
193.	ატმ	*Persica vulgaris*	ატამი ჩვეულებრივი	No
194.	ხვხ	*Phellodendron amurense*	ფელოდენდრონი ამურის	No
195.	წყვ	*Phillyrea vilmoriniana*	ფილირეა წყავმაზა	No
196.	უც	*Phyladelphus caucasica*	უცვეთელა კავკასიური	No
197.	ბმბ	*Phyllostachys bambusoides*	ბამბუYes იაპონიის	No
198.	ბმბმ	*Phyllostachys edulis*	ბამბუYes მოოსო	No
199.	ბმბუც	*Phyllostachys sp*	ბამბუYes უცნობი	No

200.	ნძ	*Picea orientalis*	ნაძვი აღმოსავლური	No
201.	ნძვ	*Picea excelsa*	ნაძვი ევროპული	No
202.	ნძუც	*Picea sp*	ნაძვი უცნობი	No
203.	ფჭბ	*Pinus pithyusa*	ფიჭვი ბიჭვინთის	Yes
204.	ფჭლ	*Pinus eldarica*	ფიჭვი ელდარის	No
205.	ფჭპ	*Pinus pinea*	ფიჭვი იტალიური	No
206.	ფჭკ	*Pinus hamata*	ფიჭვი კავკასიური	No
207.	ფჭშ	*Pinus nigra*	ფიჭვი შავი	No
208.	ფჭვ	*Pinus peuce*	ფიჭვი ვეიმუტის	No
209.	ფჭხ	*Pinus pentaphylla*	ფიჭვი ხუთწიწვიანი	No
210.	ფჭზ	*Pinus pinaster*	ფიჭვი ზღვისპირა	No
211.	ფჭ	*Pinus sosnowskyi*	ფიჭვი სოსნოვსYesს	No
212.	ფჭუც	*Pinus sp*	ფიჭვი უცპობი	
213.	ფს	*Pistacia vera*	ფსტა	No
214.	სლს	*Pistacia mutica*	საღსაღაჯი	Yes
215.	ფსუც	*Pistacia sp*	ფსტა უცნობი	
216.	ჭდ	*Platanus orientalis*	ჭადარი აღმოსავლეთის	No
217.	ჭდთ	*Platanus digitifolia*	ჭადარი თათისებრფოთლიანი	No
218.	ჭდუც	*Platanus sp*	ჭადარი უცნობი	No
219.	ვრხთ	*Populus euphratica*	ვერხვი ამიერკავკასიის თურანულა	Yes
220.	ვრხკ	*Populus canadensis*	ვერხვი კანადური	No
221.	ვრხ	*Populus tremula*	ვერხვი მთრთოლავი	No
222.	ალხ	*Populus pyramigalis*	ვერხვი პირამიდალური	No
223.	ვრხო	*Populus nigra*	ვერხვი შავი	No
224.	ვრხხ	*Populus hybrida*	ვერხვი ხვალო	No
225.	ვრხუც	*Populus sp*	ვერხვი უცნობი	No

226.	*ბლწ*	*Prunus cerasus*	ბალამწNo მწარე ნაყოფიანი	No
227.	*ბლ*	*Prunus avium*	ბალი ბალამწNo	No
228.	*კვრ*	*Prunus spinosa*	კვრინჩხი	No
229.	*ტყმ*	*Prunus cerasifera*	ტყემალი	No
230.	*ბლუც*	*Prunus sp*	ბალი უცნობი	No
231.	*ლფნ*	*Pterocarya pterocarpa*	ლაფანი	Yes
232.	*ბრწ*	*Punica granatum*	ბროწეული ჩვეულებრივი	No
233.	*ჩტვ*	*Pyracantha coccinea*	ჩიტავაშლა ჩვეულებრივი	No
234.	*ბერდ*	*Pyrus demetrii*	ბერყენა დიმიტრის	Yes
235.	*პნტ*	*Pyrus caucasica*	ბერყენა კავკასიური	No
236.	*ბერკ*	*Pyrus ketzkhovelii*	ბერყენა კეცხოველის	Yes
237.	*მსხ*	*Pyrus spp.*	ბერყენა	No
238.	*ბერს*	*Pyrus sachokiana*	ბერყენა სახოYesას	Yes
239.	*ბერ*	*Pyrus salicifolia*	ბერყენა ტირიფფოტოლა	No
240.	*მხრ*	*Quercus imeretina*	მუხა იმერული	Yes
241.	*მხჰ*	*Quercus hartwissiana*	მუხა კოლხური	Yes
242.	*მხკ*	*Quercus suber*	მუხა კორპის	No
243.	*მხმ*	*Quercus macranthera*	მუხა მაღალმთის	Yes
244.	*მხპ*	*Quercus pontica*	მუხა პონტოური	Yes
245.	*მხ*	*Quercus iberica*	მუხა ქართული	No
246.	*მხწ*	*Quercus castaneafolia*	მუხა წაბლფოთოლა	No
247.	*მხჭ*	*Quercus pedunculiflora*	მუხა ჭალის	Yes
248.	*მხხ*	*Quercus dschorochensis*	მუხა ჭოროხის	No
249.	*მხუც*	*Quercus sp*	მუხა უცნობი	
250.	*ხშვ*	*Rhamnus cathartica*	ხეშავი ჩვეულებრივი	No
251.	*ხშმ*	*Rhamnus imeretina*	ხეშავი იმერული	No
252.	*ხშშ*	*Rhamnus pallasii*	ხეშავი შავჯაგა	No

253.	*ხშვუც*	*Rhamnus sp*	ხეშავი უცნობი	
254.	*დეკ*	*Rhododendron caucsicum*	შქერი დეკა	No
255.	*იელ*	*Rhododendron luteum*	შქერი იელი	No
256.	*შქს*	*Rhododendron smirnowii*	შქერი სმირნოვის	Yes
257.	*შქრ*	*Rhododendron ponticum*	შქერი შქერი	No
258.	*შქუ*	*Rhododendron ungernii*	შქერი უნგერნის	Yes
259.	*შქრუც*	*Rhododendron sp*	შქერი უცნობი	
260.	*ლქხ*	*Rhus verniciflua*	თუთუბო ლაქის ხე	No
261.	*თთბ*	*Rhus coriaria*	თუთუბო თუთუბო	No
262.	*თთბუც*	*Rhus sp*	თუთუბო უცნობი	No
263.	*მცხღ*	*Ribes orientale*	მოცხარი აღმოსავლეთის	No
264.	*მცხ*	*Ribes biebersteinii*	მოცხარი კავკასიური	No
265.	*მცხმ*	*Ribes alpinum*	მოცხარი მაღალმთის	No
266.	*მხცუც*	*Ribes sp*	მოცხარი უცნობი	No
267.	*აკთ*	*Robinia pseudoacacia*	რობინია ცრუ აკაცია	No
268.	*ასკ*	*Rosa canina*	ვარდი ასYesლი	No
269.	*მაყ*	*Rubus sp*	მაყვალი	No
270.	*ჟოლ*	*Rubus bushii*	მაყვალი ჟოლო	No
271.	*თგვ*	*Ruscus ponticus*	თაგვისNo	No
272.	*ძმხ*	*Ruscus colchicus*	ძმერხლი	No
273.	*ძმხუც*	*Ruscus sp*	ძმერხლი თაგვისNo უცნობი	No
274.	*ტრბ*	*Salix vinimalis*	ტირიფი მანეული	No
275.	*მდგ*	*Salix caprea*	ტირიფი მდგნალი	No
276.	*ტრმ*	*Salix babilonica*	ტირიფი მტირალა	No
277.	*ტრქ*	*Salix kikodscae*	ტირიფი ქიქოძის	Yes
278.	*ტრწ*	*Salix alba*	ტირიფი წნორი	No
279.	*ტრუც*	*Salix sp*	ტირიფი უცნობი	

280.	სალგ	*Salvia garedji*	სალბი გარეჯის	Yes
281.	დგ	*Sambucus nigra*	დიდგულა შავი	No
282.	ანწ	*Sambucus tigranii*	ანწლი ტიგრანის	Yes
283.	ანწუც	*Sambucus sp*	ანწლი უცნობი	
284.	ეკლღ	*Smilax excelsa*	ეკალღიჭი ჩვეულებრივი	No
285.	სფრ	*Sophora japonica*	სოფორა იაპონური	No
286.	ამპ	*Sorbus graeca*	ცირცელი ამპურა	No
287.	თამ	*Sorbus torminalis*	ცირცელი თამელი	No
288.	ჭნვ	*Sorbus caucasigena*	ცირცელი ჭნავი	No
289.	ამს	*Sorbus fajastana*	ამპურა სომხური	Yes
290.	ცრცუც	*Sorbus sp*	ცირცელი უცნობი	
291.	შუშ	*Spartium junsceum*	შუშხუნა შუშხუნა	No
292.	გრკდ	*Spiraea erenata*	გრაკლა ფოთოლდაკბილული	No
293.	გრკ	*Spiraea hypericifolia*	გრაკლა კრაზანაფოთლიანი	No
294.	გრკუც	*Spiraea sp*	გრაკლა უცნობი	No
295.	უცნობი	*Ignoratus sp*	უცნობი	
296.	ჯონ	*Staphylea pinnata*	ჯონჯოლი ჩვეულებრივი	No
297.	ჯონკ	*Staphylea colchica*	ჯონჯოლი კოლხური	Yes
298.	ჯონუც	*Staphylea sp*	ჯონჯოლი უცნობი	
299.	შნდ	*Svida australis*	შინდანწლა შინდანწლა	No
300.	იას	*Syringa vulgaris*	იასამანი ჩვეულებრივი	No
301.	ილღ	*Tamarix ramosissima*	იალღუნი ჩვეულებრივი	No
302.	ტაქ	*Taxodium distichum*	ტაქსოდიუმი ჭაობის	No
303.	უთხ	*Taxus baccata*	უთხოვარი ჩვეულებრივი	Yes
304.	ჩაი	*Thea sinensis*	ჩაი ჩინური	No
305.	ბტ	*Biota orientalis*	ბიოტა აღმოსავლეთის	No
306.	ტუ	*Thuja occidentalis*	ტუია დასავლეთის	No

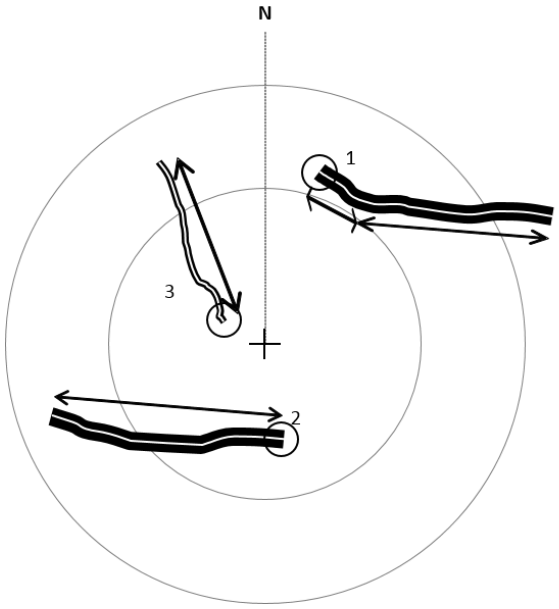
307.	*ბეგკ*	*Thymus karjaginii*	ბეგქონდNo კარიაგინის	Yes
308.	*ცხ*	*Tilia caucasica*	ცაცხვი კავკასიური	No
309.	*ცხგ*	*Tilia cordata*	ცაცხვი წვრილფოთლოვანი	No
310.	*ცხუც*	*Tilia sp*	ცაცხვი უცნობი	No
311.	*თლ*	*Ulmus carpinifolia*	თელა ჩვეულებრივი	No
312.	*თლდე*	*Ulmus elliptica*	თელა ელიფსური	No
313.	*თლკ*	*Ulmus suberosa*	თელა კორპის	No
314.	*თლდპ*	*Ulmus minor*	თელადუმა პატNo	Yes
315.	*თლქ*	*Ulmus georgica*	თელა ქართული	No
316.	*თლდ*	*Ulmus glabra*	თელადუმა შიშველი	Yes
317.	*თლმ*	*Ulmus scabra*	თელა თელამუშა	No
318.	*თლუც*	*Ulmus sp*	თელა უცნობი	
319.	*მოცმ*	*Vaccinium arctostaphylos*	მოცვი კავკასიის მაღალი	No
320.	*მოცლ*	*Vaccinium uliginosum*	მოცვი ლურჯი	No
321.	*მოც*	*Vaccinium myrtillus*	მოცვი მოცვი	No
322.	*მოცწ*	*Vaccinium idaea*	მოცვი წითელი	No
323.	*მოცუც*	*Vaccinium sp*	მოცვი უცნობი	No
324.	*მლზ*	*Viburnum orientalis*	ძახველი მოლოზანა	No
325.	*ძხლ*	*Viburnum lantana*	ძახველი უზანი	No
326.	*ძხძ*	*Viburnum opulus*	ძახველი	No
327.	*ძხუც*	*Viburnum sp*	ძახველი უცნობი	No
328.	*ფით*	*Viscum album*	ფითრი ჩვეულებრივი	No
329.	*ვაზ*	*Vitis silvestris*	ვაზი ტყის	No
330.	*ძლქ*	*Zelkova carpinifolia*	ძელქვა	Yes
331.	*უნბ*	*Ziziphus jujuba*	უნაბი ჩვეულებრივი	No

3.6 List of Forest Types - Ground Component

The combination of ground component and dominant wood species define the forest type. Ground component is an important element to define the forest type and it can be covered with grass or dominant species of sub-forest

Code	Forest Type
1	*Festuc*
2	*Vaccinium*
3	Fern
4	*Rubus*
5	*Ilex aquifolium*
6	*Prunus laurocerasus*
7	Alpestrine
8	Litter
9	*Viburnum orientalis*
10	*Rhododendron ponticum*
11	*Carex*
12	Mixed grass cover
13	*Rhododendron luteum*
14	*Oxalis spp.*
15	Nut
16	*Rhododendron caucasicum*
17	*Pistacia atlantica*
18	*Juniperuc sabina*
19	*Celtis spp.*
20	Dominated by other species – the species will be noted down in type field

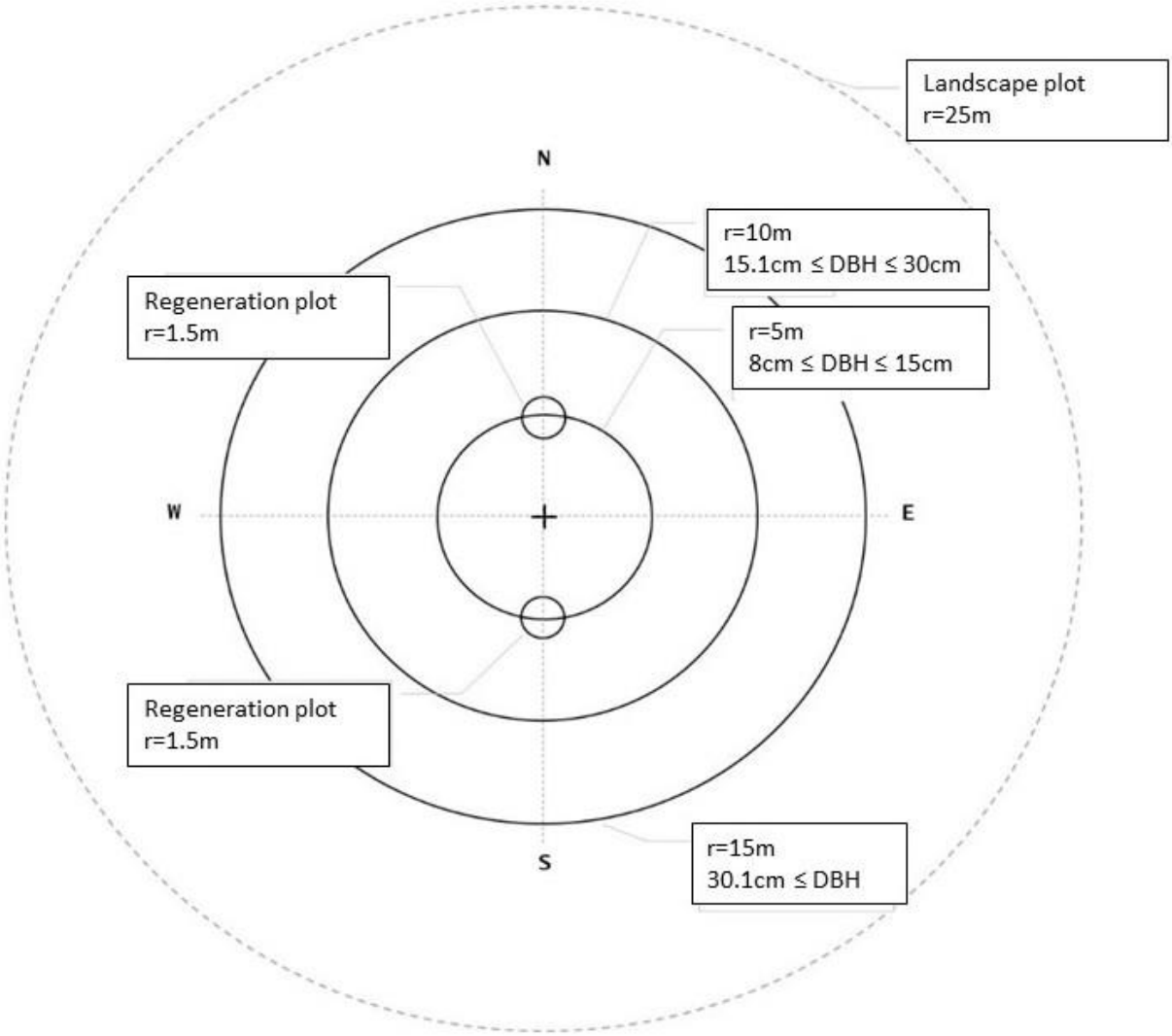
3.7 Assessment of Down Dead Wood



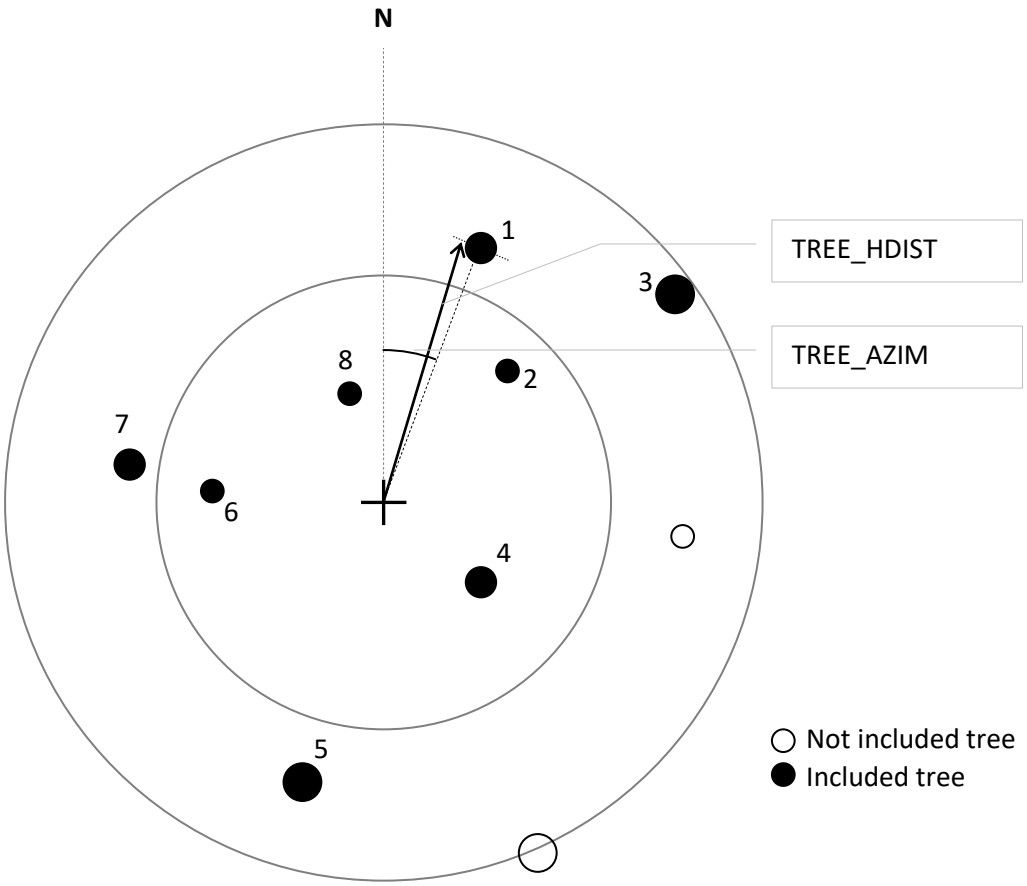
Both parts are measured separately in case of fork tree.

In case of non-cylindric deadwood pieces, diameter is measured in two perpendicular directions assessing the maximum and minimum value of the respective diameter. Arithmetic mean value is calculated and documented.

3.8 Graphical Reflection of Trees Measurement in Different Radius Cycles of Sample Plot



3.9 Selection of Single Tree Variables (Horizontal Distance, Azimuth, Tree ID)

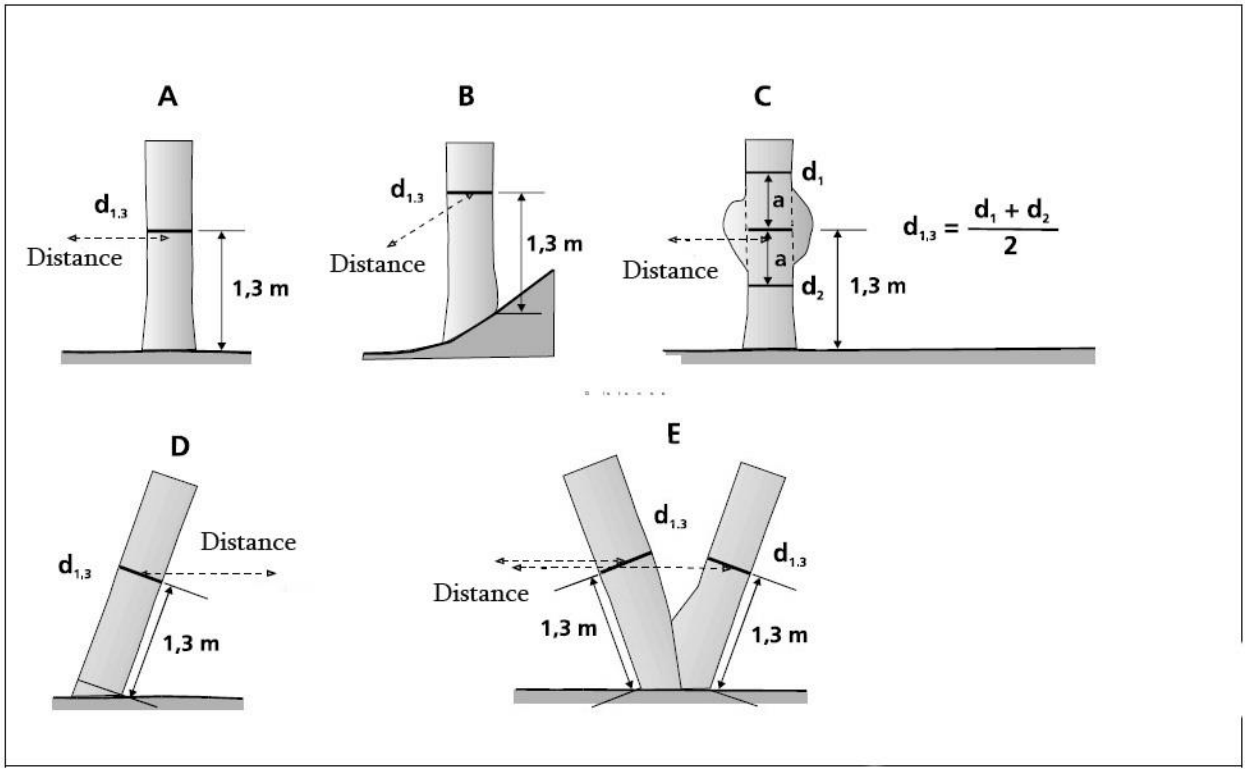


3.10 DBH of Single Forest Tree

Diameters are measured for all sample trees with a minimum *dbh* of 8 cm, and for dead wood pieces (if a deadwood assessment is included).

The figure shows some definitions how to measure DBH in special cases.

Definition of DBH and distance measurements for special cases.



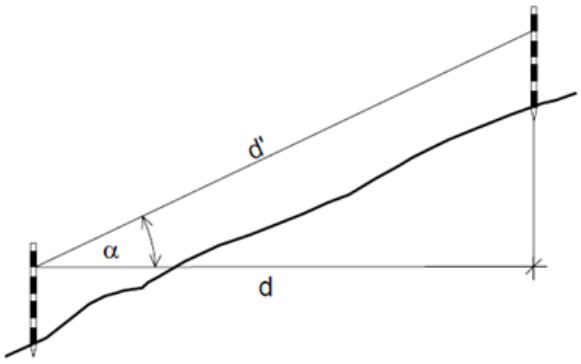
For the measurement with diameter tape:

The tape must be tightened perpendicular to the stem axis. Climbers growing at the stem have to be removed or the tape must be lanced below

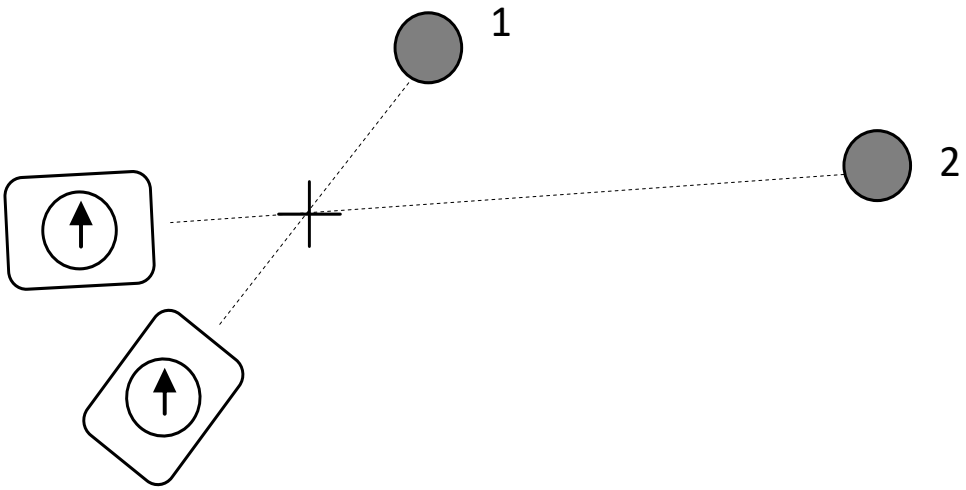
Measuring dbh with a caliper (left) and a diameter tape (right).

DBH measurement with caliper: Caliper is used perpendicular to the stem axis. Climbers growing on the stem have to be removed and measurement is done without climbers. The ending part of the tool should be directed towards the center of the sample plot as shown in the picture. If the tree diameter is too big and it is not possible to use a caliper, then it will be measured by tape.

3.11 Horizontal Distance towards the Tree and Stump

Description/Definition
Horizontal distance between the sample plot center and the tree stem center at the height of 1.3 m.
This distance can be measured by using Vertex Laser Geo, it can be measured from the sample plot center to the tree.    In case of stumps, the horizontal distance is measured from the sample plot center to the center of the stump top.

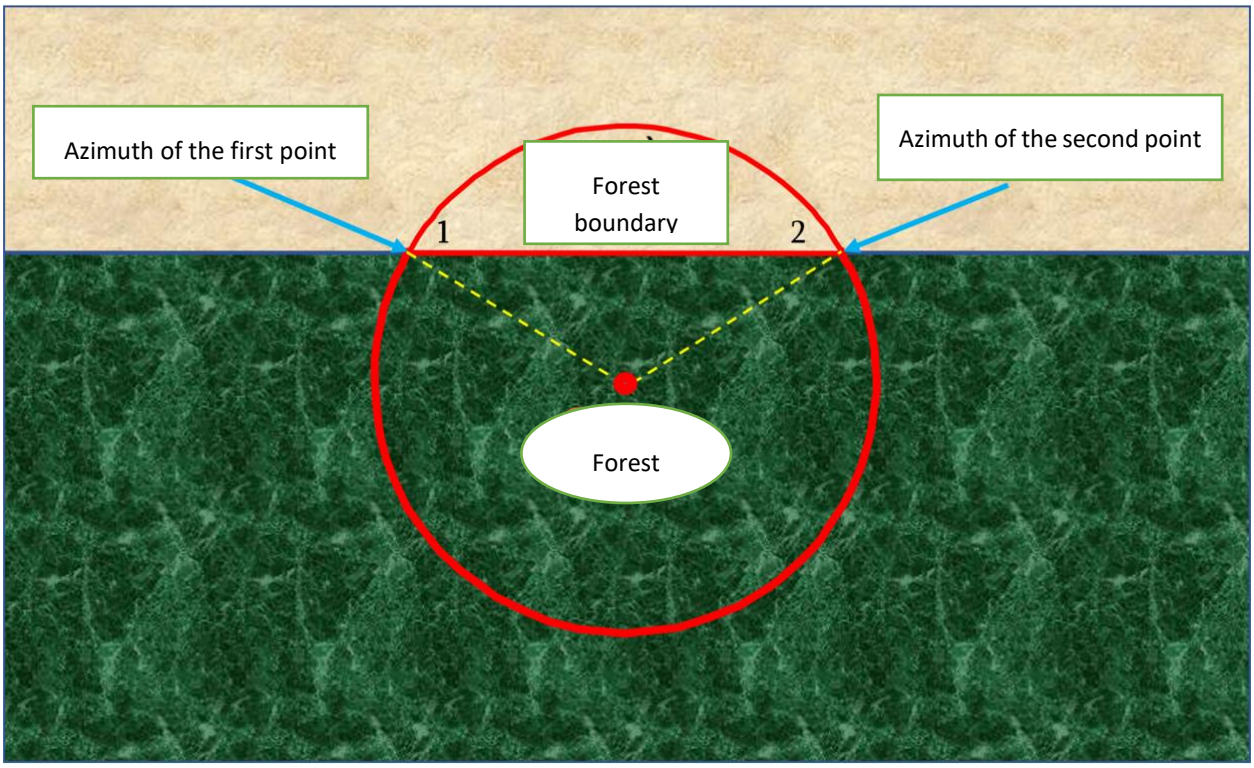
3.12 Graphic Imagery of Measuring Azimuth of Reference Objects



3.13 Forest Boundary Points

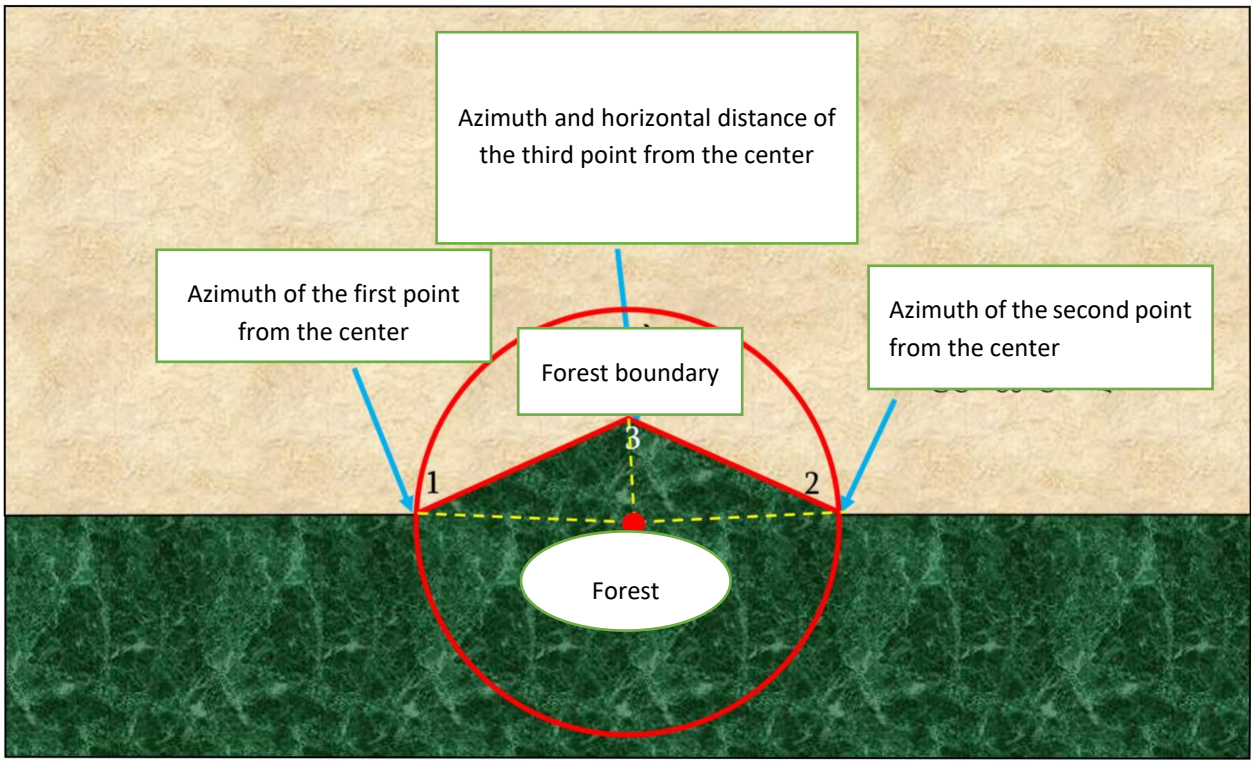
First figure shows an example when the sample plot is cut with the straight-line boundary. In this case it is necessary to record the azimuth of the first and the second points.

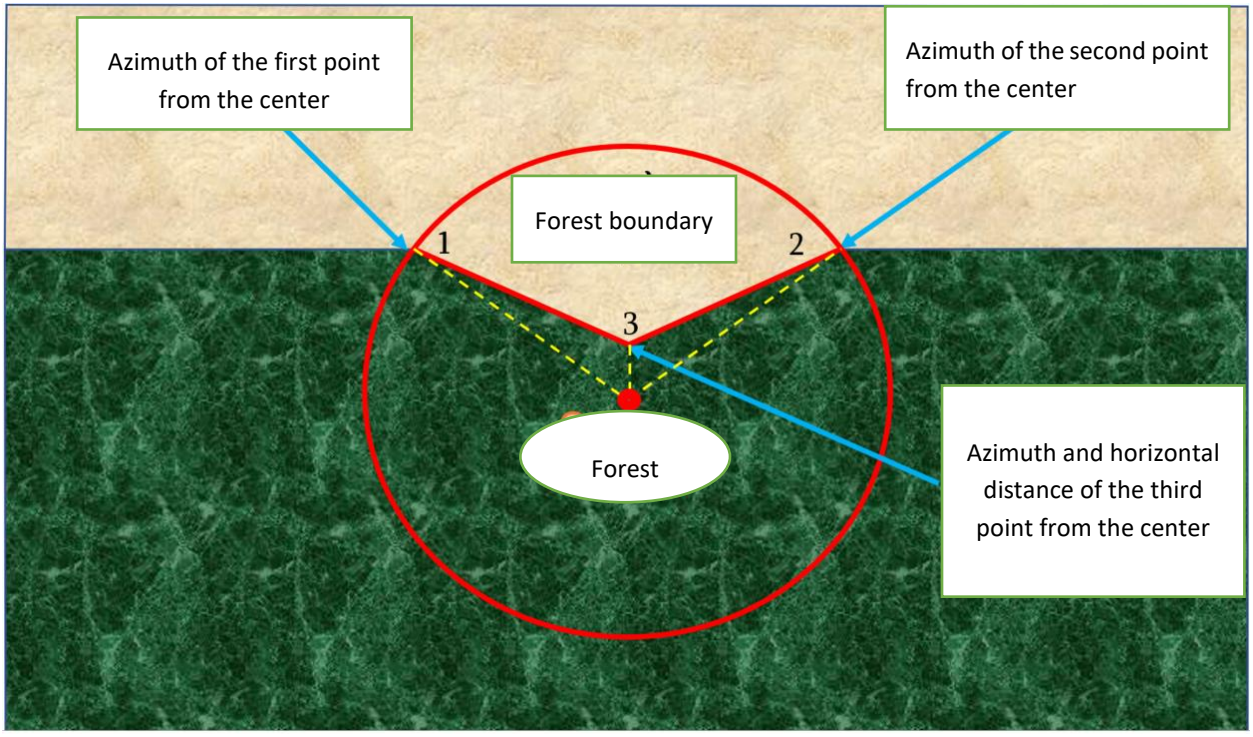
Order must always be followed as shown below:



The second and the third figures show examples when the sample plot is not crossed with straight-line forest boundary. In such case it is necessary to record the azimuth of the first and second points and for the third point – azimuth and horizontal distance from the center.

Order of the points must always be kept as shown below:


Azimuth and horizontal distance of the third point from the center
Azimuth of the first point from the center
Azimuth of the second point from the center
Forest boundary
3
1
2
Forest


Azimuth of the first point from the center
Azimuth of the second point from the center
Forest boundary
1
2
3
Forest
Azimuth and horizontal distance of the third point from the center