Instruction and codes for the fourth inventory 2015 of the “Swiss-Ukrainian Plot” in Mala Uholka

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A. Introduction

The “Swiss-Ukrainian” Plot in Mala Uholka was established in 2000. Measurements took place in 2000, 2005 and 2010. The plot measures 10 ha in total (200 x 500 m) and is divided in 40 subplots of 50x50 meters. The corners of these subplots are generally marked with blue poles. An overview map can be found in the Appendix.

B. Stand Inventory

1. Survey season

The measurements of the trees should be made outside the growing season, during the vegetative dormancy (September/October to April).

2. Preparatory Work

The poles marking the subplot corners have - if necessary – to be replaced.

3. Calibration of instruments

The Vertex has to be calibrated at the beginning of every workday in flat terrain. A measuring tape is used to calibrate the Vertex at the exact distance of 10.0 m between the front of the transponder and the Vertex.

4. Status assessment of sample trees from last inventory

The survey team checks the AHC/DEC status of every tree and numbers new ingrowth trees on the respective subplot. If tree-numbers are not readable but a tree number is feasible (relative position to other trees on the map etc.), that number is written on the tree with an Ink-Pen (Jax). All trees that are measured (AHC/DEC 11, 15, 35, 36, 37, 38, 96, 97, 98) have to be numbered – for the definition of sample trees see below. On each subplot, the numbering starts with 1. On trees, which stand on the border between two subplots, the number of the subplot is also marked. New trees growing into the calliper threshold (ingrowth) are numbered consecutively within each subplot. It is essential that a tree number exists only once on each subplot (the number belongs to the tree, even if the tree has vanished; it may not be given to another tree).

The dbh-measuring position is marked on each tree on the side of the tree facing the slope at the height of 1.3 m (see page 3 for rules for diameter measuring). The measuring position has to be repainted as soon as it is not clearly visible anymore. Once a dbh-measuring position is marked on a tree, it remains and has to be repainted at exatly the same spot even if it is not at the right position. The measuring position of d_2 is marked with a blue circle.

s

5. Sample Trees

During the inventory of standing trees, the following trees must be measured:

- Living trees ≥ 6 cm dbh (mean dbh, measured cross-wise). The centre of the stem base must lie within the border of the plot/subplot.
- Dead standing trees and part of trunks ≥ 1.3 m high and ≥ 6 cm dbh (mean dbh, measured cross-wise); the centre of the stem base must lie within the border of the plot/subplot. Dead (fallen) trees leaning against another tree are considered as standing, if the axis of the trunk deviates less than 50 gon (45°) from the vertical line, and if the trunk is still connected to the root plate.
- Dead standing stumps (part of trunks) which are 0.5-1.29 m of height with a minimum diameter of 6 cm at the place of the fracture. The height of stumps (part of trunks) is measured at the point, where still 75% of the crosssection area is intact (see Figure 1)
- Lying dead trees ≥ 6 cm dbh, which were still living during the last inventory (AHC/DEC=3/5), and which can be clearly identified (by the tree number) and measured. (It is necessary to know the diameter of these trees for the increment calculation).

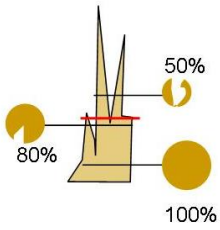


Figure 1. Height measurement on broken trunks/stumps. The red line marks the height, where 75% of the crosssection area is intact and up to which the stump height is measured.

6. Measurements and Assesments

The abbrevations in Italics refer to the respective field in the StandInv program.

Tree Number (*BNR*)

See Above (Section 4)

Tree species (*BA*)

Code with three digits (see Annex for codes).

Diameter at breast height (dbh) [mm] *(BHD)*

The dbh is measured at the tree height of 1.3 m and noted in mm.

$d_{1.3}$ (1) [in mm]

$d_{1.3}$ (2) [in mm] measured crosswise to $d_{1.3}$ (1)

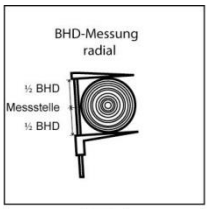
On slopes, the $d_{1.3}$ (1) is measured on side of the tree facing the slope (at right angle to the slope direction), the $d_{1.3}$ (2) at the same height but at 90° to the position of $d_{1.3}$(1).

The measurement are always taken at the same position as they were during the last inventory. The middle of the caliper rule must be place on the measuring point which is marked on the tree.

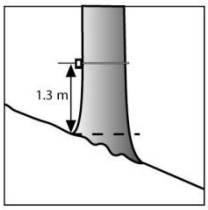
The caliper threshold is 6 cm (mean diameter); thus all trees ≥ 5.5 cm are measured.

All dbh ≥ 80 cm must be measured with the diameter tape (be aware to read the diameter scale, not the circumference!). Figure 2 illustrates the general rules for diameter measuring.

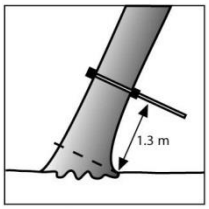
Figure 2: General rules for diameter measuring



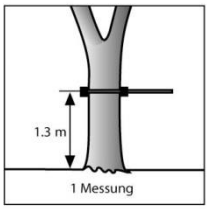
1 The caliper rule must touch the stem at the measurement position. The caliper is oriented in such a way that the measurement position is in the middle of the caliper rule.



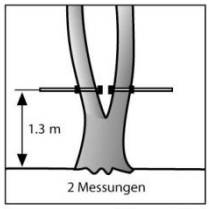
2 On slopes, the height for measuring the dbh (1.3 m) is determined on the side of the tree facing the slope.



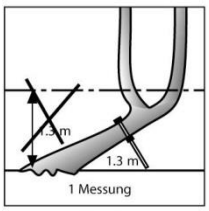
3 The dbh must be measured at right angles to the stem axis.



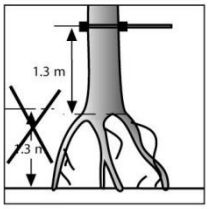
4 Trees, which fork above 1.3 m are considered to be one tree. (Give the remark F7 for forked/twin tree.)



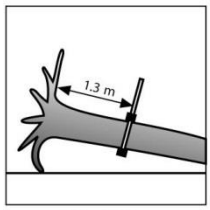
5 Trees, which fork below 1.3 m: consider all stems ≥ 6 cm as separate trees. (Give all of them the remark F4 for double/multiple stem).



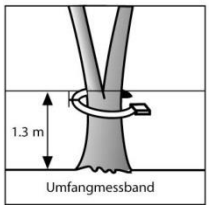
6 Tilted trees: The “breast height” is determined parallel to the stem axis at a distance of 1.3 m from the stem base.



7 Trees with stilt roots: The “breast height” is determined at a distance of 1.3 m from the stem base (not from the ground).



8 See point 6 and 7



9 Trees which fork at a height of exactly 1.3 m are considered one tree. The dbh is measured with the diameter tape just below the fork. (Give the remarks F7 for forked/twin tree and A7 for measurement with diameter tape).

Diameter of stumps < 1.3 m height [mm]

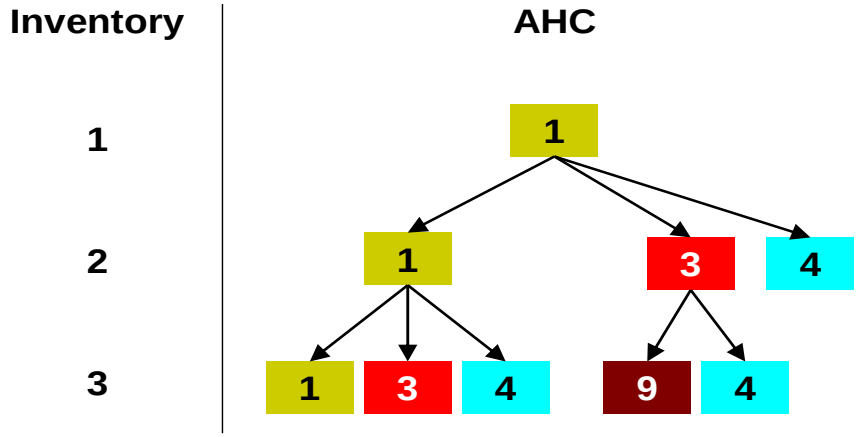
The diameter of stumps < 1.3 m height (AHC/DEC = 3/8 or 9/8 + REM A9) is measured at the mean stump height. The height of stumps (part of trunks) is measured at the position, where 75% of the crossection area is still intact (see Figure 1).

AHC/DEC code (tree status) (*C* / *Z*)

The AHC/DEC code (code with 2 digits) is a combination of the two codes AHC (*C*) and DEC (*Z*). It defines which further tree characteristics have to be measured and assessed.

The AHC (first digit of the code) describes whether the tree is living, or whether the tree died since the last inventory, or whether the tree was already dead at the last inventory. Figure 3 illustrates the possible development of the AHC from one inventory to the other.

Figure 3: Development of the AHC



AHC	DEC	Description
1	1	Living tree, standing
1	5	Living tree, lying (tree crown lies on the ground)
3	5	New dead lying tree (died since last inventory, old AHC=1). Entire tree with root plate and crown and trees broken below 0.5 m. Dead (fallen) trees leaning against another tree are considered as standing, if the axis of the trunk deviates less than 50 gon (45°) from the vertical line, and if the trunk is still connected to the root plate.
3	6	New dead entire standing tree with crown (died since last inventory, old AHC=1), entire standing tree with crown. Branches < 3 cm in diameter are still present.
3	7	New dead entire standing trunk (died since last inventory, old AHC=1), entire standing trunk with main branches > 3 cm or branch stubs.
3	8	New dead (died since last inventory, old AHC=1), standing part of trunk.
4	4	Not found, tree disappeared, old AHC = 1
9	5	Dead during last inventory (old AHC = 3), now lying. → no measurement (inventory of lying deadwood)
9	6	Dead during last inventory (old AHC = 3), entire standing tree with

		crown. Branches < 3 cm in diameter are still present.
9	7	Dead during last inventory (old AHC = 3), entire standing trunk with main branches > 3 cm or branch stubs.
9	8	Dead during last inventory (old AHC = 3), standing part of trunk.
9	9	Dead during last inventory (old AHC = 3 or 9). Now decomposed and/or not measurable any.

IUFRO CODE (*1,2,3,4,5,6*)

The **first three digits of the IUFRO Code** refer to the height class, the physical class (vitality) and the dynamic class, (biological aspects). It is **actual state** of the tree that is relevant for this classification.

Height class *(1)*	1 upper storey (the height of the tree is > 2/3 of h_{dom}) 2 middle storey (the height of the tree is 1/3-2/3 of h_{dom}) 3 lower storey (the height of the tree is < 1/3 of h_{dom}) *h_{dom} = mean height of 100 trees per ha (25 trees per subplot of 50x50 m)*
Physical class (vitality) *(2)*	*The physical class refers to the actual state of health and growth energy of the trees. Tree species and site conditions have to be considered when assessing the physical state of a tree.* 1 luxuriant (very strong vitality, large crown) 2 healthy (“normally” developed trees with “normal” crowns) 3 stunted (poor vitality; e.g. sparse or discolored leaves; might die in a few years)
Dynamic class *(3)*	*The dynamic class is assessed **in relation to the neighboring trees of the same height class**.* 1 strong growth (tree with a well-developed top shoot; showing more vigorous growth than other trees of the same height class) 2 average growth (hight increment corresponds to the average of trees in the same height class) 3 restrained (height increment is clearly lower than that of other trees in the same height class; tree without visible height growth; often flat crown;)

The **second three digits of the IUFRO Code** refer to economic aspects, i.e. the silvicultural class, the stem quality class and the crown class. The **actual state** of the tree is relevant for classification.

IUFRO 2 was developed for managed (commercial) forests. Nevertheless, it could be interesting to assess these classes in a virgin forest in order to be able to compare them with managed forests. The crown class is the most relevant of these classes in a virgin forest.

Silvicultural class ***(4)***	*The silvicultural class is assessed **in relation to the neighboring trees of the same height class**.* 4 elite tree (tree one would select and cultivate in a commercial forest as future elite tree with high economic value) 5 useful secondary tree (all trees that are neither 4 nor 6) 6 harmful secondary tree (e.g. whip tree, tree rubbing against or growing into the crown of a neighboring potential elite tree; would be removed in a commercial forest in the course of a selective thinning)
Stem quality class ***(5)***	*The **actual state** of the tree is relevant for this classification. **A formerly flawless tree, which is now devalued by age (e.g. infested by fungi, becoming rotten) would belong to class 6.*** 4 flawless (strait, without any faults; could be used for high grade special assortments) 5 average (suitable for sawing timber of normal quality) 6 strongly flawed (suitable only as fire wood or for industrial wood)
Crown class ***(6)***	*The length of the crown is assessed from the crown base (see. Figure 5) to the top.* 4 long crown (more than 1/2 of total tree height) 5 medium crown (1/4-1/2 of total tree height) 6 short crown (less than 1/4 of total tree height)

Remarks (*B1, B2, B3*)

An additional description can be added to the remarks with an asterisk (e.g. F53: Open crack larger than 1 m).

Remarks with grey background are ‘habitat structures’,

A: Technical remarks

A1	bark fallen off	negative increment
A3	measurement of dbh not possible	tree inaccessible
A4	measurement position changed	
A6	Tree has been felled	stump with clearly identifiable traces of sawing or cutting

F: Tree form

F1	coppice tree	only if clearly recognizable as tree grown out of a coppice shoot
F2(*)	tilted, bent tree	*(only on living trees)* 1 tilted (straight line from stem base to tree top deviates more than 15 gon from the vertical line) 2 bent (tip of the crown is no longer the highest point of the tree) 9 «saber»-growth
F3	stilt roots	*(only on living trees)* cavity between roots, indicating that the tree had grown on top of a lying stem or stump, which rotted away
F4	double/multiple stem	stems growing apart below 1.3 m; the dbh of at least two of the stems must be ≥ 6 cm (caliper threshold) but can be either living or dead.
F5*	Open cracks (wood must be visible) / overgrown cracks	1 open or overgrown crack of ≤ 1m length 2 overgrown crack of > 1 m length 3 open crack of > 1 m 4 open crack of > 2m 5 several cracks of > 1 m length
F6	bulge, lump	*(only on living trees)* if cancer, then remark = P2
F7	forked tree, «twin» tree	*(on living and dead trees)* stem forked between 1.3 and 10 m of height (but below crown base); the dbh of the smaller “twin” must be at least half the one of the larger “twin”.

H: Hollow Stems

H0	Hollow stem	*(on living and dead trees)* the opening of the cavity lies below 1.5 m on stem; the vertical dimension of the cavity is at least 50 cm; at least 50% of the stem diameter is rotten
H1	Cavity with decayed wood / duff /mould	*(on living and dead trees)* Opening of cavity must be at least the size of a fist. crumbly to powdery organic material (fragments of decomposed wood, dead and living organisms and fecal material) must be present within cavity (fragments of decomposed wood, dead and living organisms and fecal material)

S: Damages

	bark lesion (wood is visible)	*(only on living trees)*
S0*	cause unknown (not S1-S8)	* size of damage (also strips less than 10 cm wide)
S1*	caused by rock-fall	1 size of damage is less than the area of 2 hands (paper with A5 format, 311 cm^2); if strip, then less than 0.5 m long
S2*	caused by falling tree (or logging/ skidding damage)	2 size of damage is between the area of 2 to 4 hands (paper with A5-A4 format); if strip, then 0.5-1 m long
S3*	caused by sunburn	3 extensive damage, size of damage is larger than the area of 4 hands or A4 page; if strip then longer than 1 m
S5*	caused by fire	*Several separate lesions are added.*
S6*	caused by lightning	
*S8**	*caused by ungulates*	
	caused by insects →P9	
S4	sap flow	*(only on living trees)*

G: Damages in crown area

G1*	Crown (stem) breakage (tree still alive)	*(on living trees)* breakage of the whole crown; only epicormic branches below the break 0 simple crown breakage 1 fracture with many (long) splinters 2 substitute (new) crown 3 fracture with splinters and substitute crown
G2*	Treetop (crown) breakage , breakage of part of the crown	Breakage must be within crown area, otherwise see G1. Broken off part must be at least 10% of

	(large branches)	the crown volume 1 Crown is missing less than 50% of its volume 2 Crown is missing more than 50% of its volume
G5*	top dry, dead branches (in crown of living tree)	1 dead branches account for less than 50% of the total crown volume 2 dead branches account for more than 50% of the total crown volume
G6	Old treetop (crown) breakage	In case G2* was used during last inventory

P: Parasites / Diseases

P2	cancer on the trunk	*(only on living trees)*
P3	fungi (polypores) on the trunk	*(on living and dead trees)* Only bracket fungi are assessed. The size of the fungi must be no less than 5 cm.
P4*	hole (cavity)	*(on living and dead trees)* Hole must have a minimum diameter of 3 cm. 1 one hole 2 more than 1 hole
P7	Hedera helix	If dbh of Hedera is greater than 6, it must be assessed and measured as a sample tree.
P9*	insect damages	Feeding traces must be visible. 1 10-50% of leaves (crown volume) have been eaten by insects 2 ≥ 50% of leaves have been eaten by insects 3 fallen off bark with feeding traces, surface less than 1 hand 4 fallen off bark, surface 1-4 hands 5 fallen off bark, surface ≥ 4 hands

7. Selection of tariff trees

Five beeches per subplot are selected as tariff trees: the tree with the largest diameter and four other trees according to the diameter distribution within the subplot. The tariff trees are preselected. If a tariff tree has been selected it will be continually selected as tariff tree. If has died or is missing or does not fulfill the criteria below, a new tree will be selected within a similar dbh range.

The tariff trees must fulfill the following criteria: they must be living and standing trees (AHC/DEC code =1/1) without any of the following remarks: F2 (tilted/bent), F7 (forked tree), G1* (crown breakage) or G2* (crown-top breakage).

Additionally, the height of all sample trees with AHC/DEC = 38 or 98 must be measured.

Tree height / height of snags/stumps [dm]

The heights of the following trees are measured:

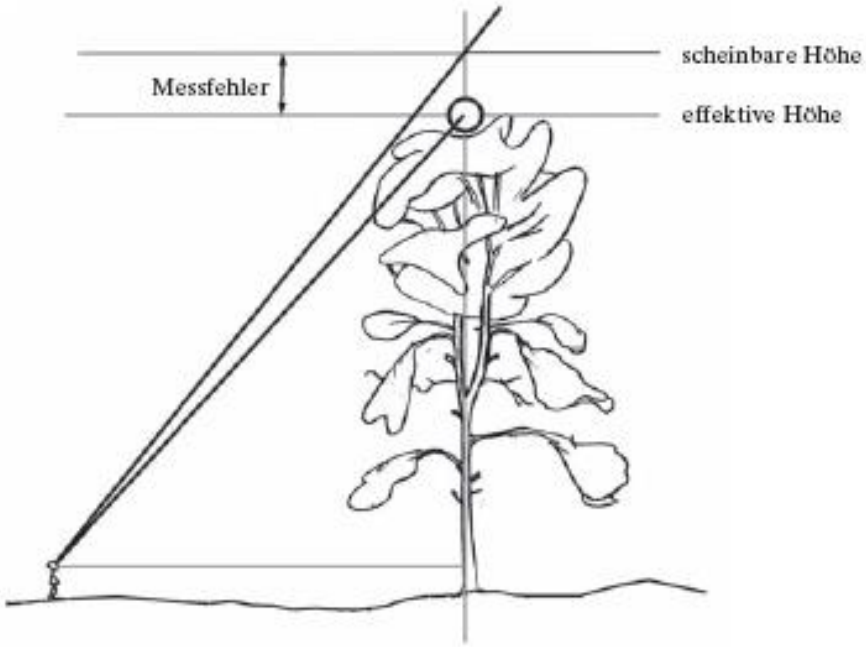
Tariff trees (see above)

Broken snags / stumps (trees with AHC/DEC =38).

The height is measured with the VERTEX IV (see the user manuals for the use of these instruments). The tree height is given in dm.

The height is measured to the highest point of the tree crown. It should be measured from a distance, which is about the same as the tree height. On slopes, the tree should be measured from a position, which is at the same altitude or a bit higher than the tree base. Be aware of the possible error when measuring trees, especially from a position too close to the tree or from below – see Figure 4.

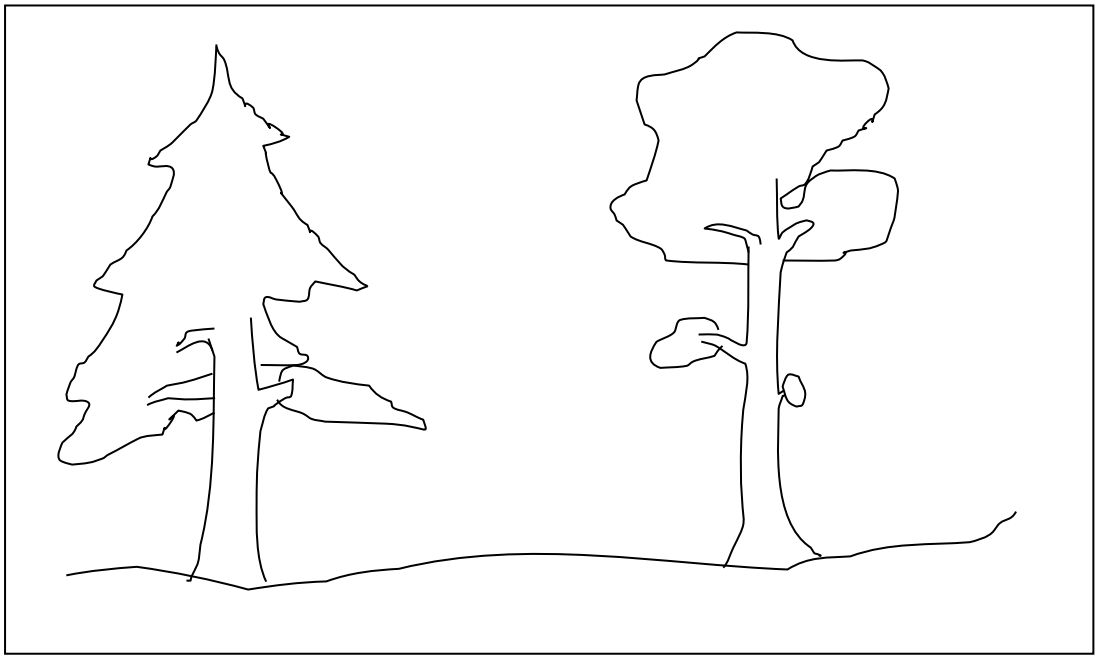
Figure 4: Source of error when measuring tree height



Height of crown base

The height of the crown base is measured only of tariff trees. The crown base defines the lower limit of the (continuous) green crown (point or line, where the branches with green leaves/needles branch off the stem, see Figure 5). Epicormic shoots and (dying) branches with only sparse leaves/needles below the continuous green crown are disregarded. Epicormic branches are considered to be part of the crown if they have approx. the same diameter as the nearby branches of the main crown and are integrated in the crown silhouette. The crown base of a twin tree is usually not at the point where the tree forks but at the lower limit of the green crown of the “twins”.

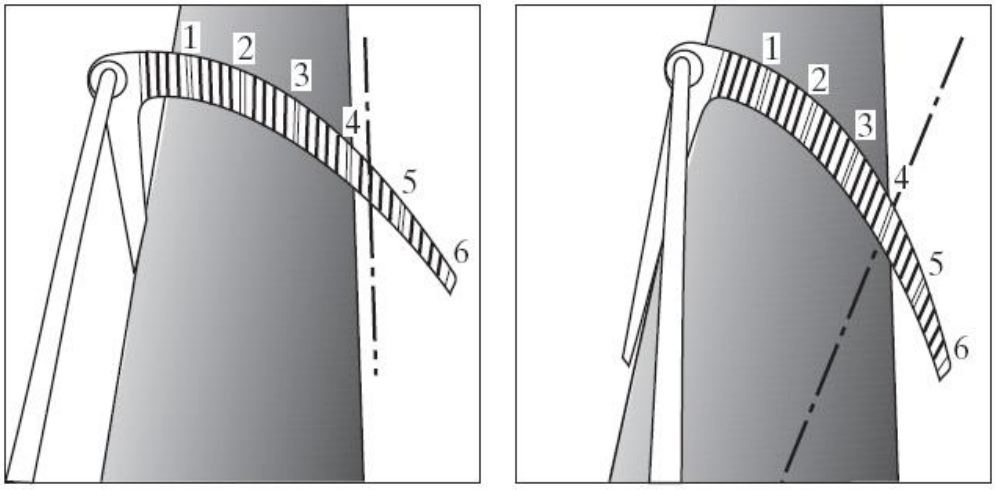
Figure 5: Height of crown base



Diameter at 7 m of height (d7) [cm]

The d7 is measured only of the tariff trees. It is measured in cm, with the special caliper (“Finnenkluppe”) set on the 7 m telescopic pole (see Figure 6).

Figure 6: Measuring with the "Finnenkluppe"



Left: Scale of calliper parallel to the stem axis. **Correct reading!**

Right: Scale not parallel to the right border of the stem**. Wrong!** (More than one possible value). It is necessary to move to see the scale from a correct angle.

C. Appendix

Plot design

40	39	38	37
36	35	34	33
32	31	30	29
28	27	26	25
24	23	22	21
20	19	18	17
16	15	14	13
12	11	10	9
8	7	6	5
4	3	2	1

Species codes

Conifers

Code	Latin name	English name	Growth form
390		Conifer, specis unknown	tree
120	Abies Mill.	(Silver) Fir, species unknown	tree
121	Abies alba Mill.	European Silver Fir	tree
160	Larix Mill.	Larch, species unknown	tree
161	Larix decidua Mill.	European Larch	tree
100	Picea sp.	Spruce, species unknown	tree
101	Picea abies (L.) H. Karst.	Norway Spruce	tree
140	Pinus L.	Pine, species unknown	tree
144	Pinus cembra L.	Arolla Pine, (Stone Pine)	tree
142	Pinus mugo Turra ssp. mugo	Mountain Pine	tree
145	Pinus nigra Arnold	Corsican Pine	tree
147	Pinus strobus L.	Weymouth Pine	tree
141	Pinus sylvestris L.	Scots Pine	tree
201	Taxus baccata L.	Commom Yew	tree

Deciduous (broadleaf) trees

Code	Latin name	English name	Growth form
800		Deciduous tree, specis unknown	tree
440	Acer L.	Maple, specis unknown	tree
443	Acer campestre L.	Field Maple	tree
446	Acer monspessulanum L.	Montpelier Maple	tree
444	Acer opalus Mill.	Italian Maple	tree
442	Acer platanoides L.	Norway Maple	tree
441	Acer pseudoplatanus L.	Sycamore	tree
731	Aesculus hippocastanum L.	Horse Chestnut	tree
490	Alnus Mill.	Alder, specis unknown	tree
491	Alnus glutinosa (L.) Gaertn.	European Alder	tree
492	Alnus incana (L.) Moench	Grey Alder	tree
470	Betula L.	Birch, specis unknown	tree
471	Betula pendula Roth	European White Birch	tree
472	Betula pubescens Ehrh.	Downy Birch	tree

Code	Latin name	English name	Growth form
561	Carpinus betulus L.	European Hornbeam	tree
460	Castanea Mill.	Chestnut, specis unknown	tree
461	Castanea sativa Mill.	Sweet Chestnut	tree
571	Celtis australis L.	Nettle Tree	tree
410	Fagus L.	Beech, specis unknown	tree
411	Fagus sylvatica L.	(European) Beech	tree
430	Fraxinus L.	Ash, specis unknown	tree
431	Fraxinus excelsior L.	European Ash	tree
432	Fraxinus ornus L.	Manna Ash	tree
481	Juglans regia L.	English Walnut	tree
602	Laburnum alpinum (Mill.) Brecht. et J. Presl	Scotch Laburnum	tree
601	Laburnum anagyroides Medik.	Common Laburnum	tree
581	Ostrya carpinifolia Scop.	European Hop Hornbeam	tree
721	Platanus x hispanica Münchh.	London Plane	tree
450	Populus L.	Poplar, specis unknown	tree
451	Populus alba L.	White Poplar	tree
455	Populus balsamifera L.	Balsam Poplar	tree
453	Populus nigra L.	Black Poplar	tree
454	Populus tremula L.	Aspen	tree
456	Populus x canadensis Moench	Canadian Poplar	tree
452	Populus x canescens (Aiton) Sm	Grey Poplar	tree
520	Prunus L.	Cherry, Plum, specis unknown	tree
521	Prunus avium (L.) L.	Wild Cherry	tree
420	Quercus L.	Oak, specis unknown	tree
424	Quercus cerris L.	Turkey Oak	tree
422	Quercus petraea (Matt.) Liebl.	Sessile Oak	tree
423	Quercus pubescens Willd.	Downy Oak	tree
421	Quercus robur L.	English Oak	tree
425	Quercus rubra L.	American Red Oak	tree
701	Robinia pseudoacacia L.	Black Locust	tree
530	Salix L.	Willow, specis unknown	tree
532	Salix alba L.	White Willow	tree
534	Salix caprea L.	Goat Willow	tree

Code	Latin name	English name	Growth form
538	Salix fragilis L.	Crack Willow	tree
540	Salix purpurea L.	Purple Willow	tree
531	Salix viminalis L.	Osier	tree
550	Sorbus L.	White Beam, Mountain Ash	tree
551	Sorbus aria (L.) Crantz	Whitebeam	tree
552	Sorbus aucuparia L.	Mountain Ash	tree
553	Sorbus domestica L.	Service Tree	tree
557	Sorbus latifolia		tree
558	Sorbus mougeotii		tree
554	Sorbus torminalis (L.) Crantz	Wild Service Tree	tree
556	Sorbus x hybrida L.	Hybrid Mountain Ash	tree
500	Tilia L.	Lime, Linden, specis unknown	tree
501	Tilia cordata Mill.	Little Leaf Linden	tree
502	Tilia platyphyllos Scop.	Large Leaved Lime	tree
511	Ulmus glabra Huds.	Scotch Elm	tree
510	Ulmus L.	Elm, specis unknown	tree
513	Ulmus laevis Pall.	Russian Elm	tree
512	Ulmus minor Mill.	European Field Elm	tree

Exotic tree species

Code	Latin name	English name	Growth form
122	Abies amabilis (Douglas ex Loudon) Douglas ex Forbes	Pacific Silver Fir	tree
123	Abies balsamea (L.) Mill.	Balsam Fir	tree
124	Abies concolor (Gordon et Glend.) Lindl. ex Hildebr.	Colorado Fir, White Fir	tree
125	Abies concolor Lowiana Grp.	Pacific White Fir, Sierra White Fir	tree
126	Abies firma Siebold et Zucc.	Japanese Fir, Momi Fir	tree
127	Abies grandis (Dougl. ex D.Don) Lindl.	Grand Fir	tree
128	Abies homolepis Siebold et Zucc.	Nikko Fir	tree
129	Abies nordmanniana (Steven) Spach	Caucasian Fir	tree
130	Abies procera Rehder	Noble Fir	tree

131	Abies sachalinensis (F. Schmidt) Mast.	Sakhalin Fir	tree
132	Abies veitchii Lindl.	Veitch Fir	tree
761	Ailanthus altissima	Tree of heaven	tree
476	Betula platyphylla var. Japonica (Miq.) Hara	Japanes White Birch	tree
211	Calocedrus decurrens (Torr.) Florin	Incense Cedar	tree
711	Carya ovata (Mill.) K. Koch	Shagbark Hickory	tree
462	Castanea crenata Sieb. et Zucc.	Japanese Chestnut	tree
468	Castanea Mill. X	Hybrid Chestnut	tree
463	Castanea mollissima Blume	Chinese Chestnut	tree
221	Cedrus deodara (Roxb.) G. Don	Indian Cedar	tree
751	Cercidiphyllum japonicum Sieb. et Zucc.	Katsura Tree	tree
231	Chamaecyparis Spach.	False Cypress	tree
771	Cinnamomum camphora	Camphorwood	tree
241	Cryptomeria japonica D. Don.	Japanese Cedar	tree
412	Fagus orientalis Lipsky	Oriental Beech	tree
433	Fraxinus americana L.	American Ash	tree
482	Juglans nigra L.	Black Walnut	tree
162	Larix kaempferi (Lamb.) Carrière	Japanese Larch	tree
163	Larix laricina (Du Roi) K. Koch	American Larch, Tamarack	tree
164	Larix x eurolepis Henry	Hybrid Larch-	tree
741	Liriodendron tulipifera L.	Tulip Tree	tree
251	Metasequoia glyptostroboides Hu et W.C. Cheng	Dawn Redwood	tree
107	Picea glehni (F. Schmidt) Mast.	Sakhalin Spruce	tree
105	Picea mariana (Mill.) Britton, Sterns et Poggenb.	Black Spruce	tree
102	Picea omorika (Panc.) Purk.	Serbian Spruce	tree
103	Picea pungens Engelm.	Colorado Spruce	tree
104	Picea sitchensis (Bong.) Carrière	Sitka Spruce	tree
153	Pinus banksiana Lamb.	Jack Pine	tree
148	Pinus contorta Douglas ex Loudon	Lodgepole Pine	tree

146	Pinus peuce Griseb.	Macedonian Pine	tree
149	Pinus ponderosa Dougl. ex P. et C. Lawson	Ponderosa Pine	tree
150	Pinus resinosa Aiton	American Red Pine	tree
151	Pinus rigida Mill.	Northern Pitch Pine	tree
152	Pinus wallachiana A. B. Jacks.	Himalayan Pine	tree
524	Prunus cerasus L.	Sour Cherry	tree
181	Pseudotsuga menziesii (Mirb.) Franco	Douglas Fir	tree
426	Quercus castaneifolia C.A. Mey.		tree
427	Quercus palustris Münchh.	Pin Oak	tree
781	Rhus typhina	Staghorn Sumac	tree
535	Salix cinerea L.	Grey Willow	tree
536	Salix daphnoides Vill.	Violet Willow	tree
537	Salix elaeagnos Scop.	Bitter Willow	tree
539	Salix pentandra L.	Bay Willow	tree
533	Salix triandra L. ssp. triandra (Salix amygdalina)	Almond Leaved Willow	tree
253	Sequoia sempervirens (D. Don) Endl.	California Redwood	tree
252	Sequoiadendron giganteum (Lindl.) Buchholz	Wellingtonia	tree
261	Thuja plicata Donn ex D. Don	Western Red Cedar	tree
271	Tsuga heterophylla (Raf.) Sarg.	Western Hemlock	tree

Shrubs

Code	Latin name	English name	Growth form
493	Alnus viridis (Chaix) DC	Green Alder	shrub
902	Amelanchier ovalis Medik.		shrub
903	Berberis vulgaris L.	Common Barberry	shrub
473	Betula humilis Schrank		shrub
474	Betula nana L.	Dwarf Birch	shrub
936	Buddleia sp.	Buddleia	shrub
904	Buxus sempervirens L.	Box	shrub
937	Chamaerops humilis	Chamaerops	shrub
911	Clematis vitalba L.	Old Man's Beard	shrub
912	Cornus mas L.	Cornelian Cherry	shrub

Code	Latin name	English name	Growth form
913	Cornus sanguinea L.	Common Dogwood	shrub
901	Corylus avellana L.	Hazel	shrub
938	Cotinus coggygria	Eurasian smoketree	shrub
914	Cotoneaster integerrimus Medik.		shrub
915	Cotoneaster tomentosus (Guss.) K. Koch		shrub
939	Crateagus sp.		shrub
916	Crataegus laevigata (Poir) DC.	English Hawthorn	shrub
917	Crataegus monogyna Jacq.	English Hawthorn	shrub
908	Cytis scoparius ssp. scoparius	Scotch Broom	shrub
907	Cytisus Desf.	Broom	shrub
918	Evonymus europaeus L.	Common Spindle	shrub
919	Evonymus latifolius (L.) Mill.	Broad Leaved Spindle	shrub
940	Ficus carica	Common fig	shrub
930	Frangula alnus Mill.	Alder Buckthorne	shrub
920	Hedera helix L.	Ivy	shrub
921	Hippophae rhamnoides L.	Sea Buckthorne	shrub
591	Ilex aquifolium L.	English Holly	shrub
191	Juniperus communis L.	Juniper	shrub
922	Juniperus communis ssp. alpina (Suter) Celak.	Zwergwacholder	shrub
923	Juniperus sabina L.	Sabine	shrub
924	Ligustrum vulgare L.	Common Privet	shrub
925	Lonicera alpigena L.	Alpine Honeysuckle	shrub
926	Lonicera caerulea L.	Blue Honeysuckle	shrub
927	Lonicera nigra L.		shrub
928	Lonicera periclymenum L.	Woodbine	shrub
929	Lonicera xylosteum L.	Fly Honeysuckle	shrub
611	Malus sylvestris (L.) Mill.	Wild Crab	shrub/tree
631	Mespilus germanica L.	Medlar	shrub
143	Pinus mugo Turra ssp. pumilio (Haenke) Franco	Dwarf Mountain Pine	shrub
525	Prunus mahaleb L.	Mahaleb Cherry	shrub
522	Prunus padus L.	European Bird Cherry	shrub/tree
526	Prunus serotina Ehrh.	American Bird Cherry	shrub

Code	Latin name	English name	Growth form
523	Prunus spinosa L.	Blackthorne	shrub
621	Pyrus pyraster Burgsd.	Wild Pear	shrub/tree
931	Rhamnus alpina L.		shrub
932	Rhamnus cathartica L.	European Buckthorne	shrub
933	Rhamnus pumila Turra		shrub
934	Rhamnus saxatilis Jacq.	Stony Buckthorne	shrub
942	Ribes sp.	Ribes	shrub
935	Rosa spec.	Rose	shrub
905	Sambucus nigra L.	Common Elderberry	shrub
906	Sambucus racemosa L.	Red Elderberry	shrub
555	Sorbus chamaemespilus (L.) Crantz	False Medlar	shrub
943	Staphylea pinnata	Bladdernut	shrub
909	Viburnum lantana L.	Wayfaring Tree	shrub
910	Viburnum opulus L.	European Cranberrybush	shrub

Dead trees and stumps, species not identifiable

999	not identifiable dead tree/shrub/stump