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Eustaška mountain forest – three censuses by Field-Map

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Field-Map equipment

The Silva Tarouca Research Institute for Landscape and Ornamental Gardening
Department of Forest Ecology

- 3x Field-Map software
- 2x Hammerhead + 1x Getac
- 4x MapStar Module II
- 2x Impulse +1x ForestPro
- Analogue calippers
- Li-Ion external batteries

Research by Field-Map

The Silva Tarouca Research Institute for Landscape and Ornamental Gardening
Department of Forest Ecology

- Using Field-Map since 2001
- Czech natural forest (reserves)
- Foreign sites (BY, UA, USA)

- ❑ Repeated detailed research (stem) – 24 plots (360 ha)
- ❑ Repeated statistical inventory – 12 plots (750 ha)

...more at naturalforests.cz

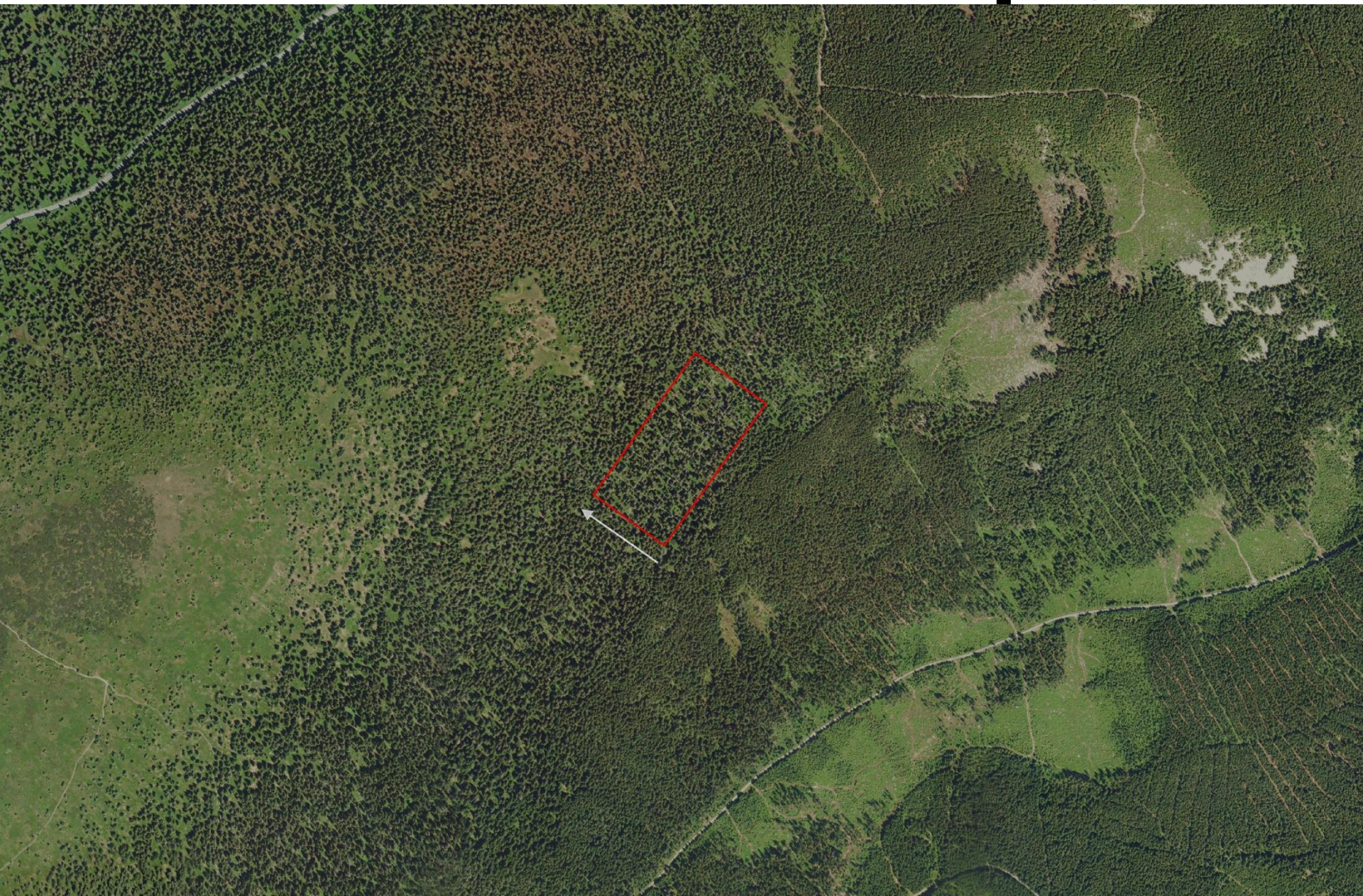
Eustaška research plot

- Area of 4.5ha (300 x 150m)
- Altitude of 1210-1266m a.s.l.
- N 50°04’, E 17°16’
- Slope avg. of 22°

- Mountain spruce (Calamagrostio villosae-Piceetum)
- Jeseníky Mts. Protected Landscape Area (74400 ha),
- National nature reserve Praděd (2030 ha)
- Established by IFER in 1999

Eustaška mountain forest – three censuses by Field-Map

Eustaška research plot



Overview of the censuses

Year	Team	Trees	Deadwood	Regeneration
1999	IFER	7cm+	7cm+	Stubs+Individ.+Biogr.+Seedl.
2011	Silva Tarouca R.I.	7cm+	7cm+	Individ.+Biogr.+Seedl.
2016	Silva Tarouca R.I.	1cm+	7cm+	Sampling individ. at sqr. plots

Census 1999

IFER

Pilot project

1999 – Project

PROJECT:

One Field-Map project covered whole area

LAYERS:

Reference points [Point]

Subplots [Line]

Trees [Tree]

Deadwood [Deadwood]

Stubs [Point]

Regeneration points [Point]

Regenariton polygons [Polygon]

SUBORDINATED TABLES

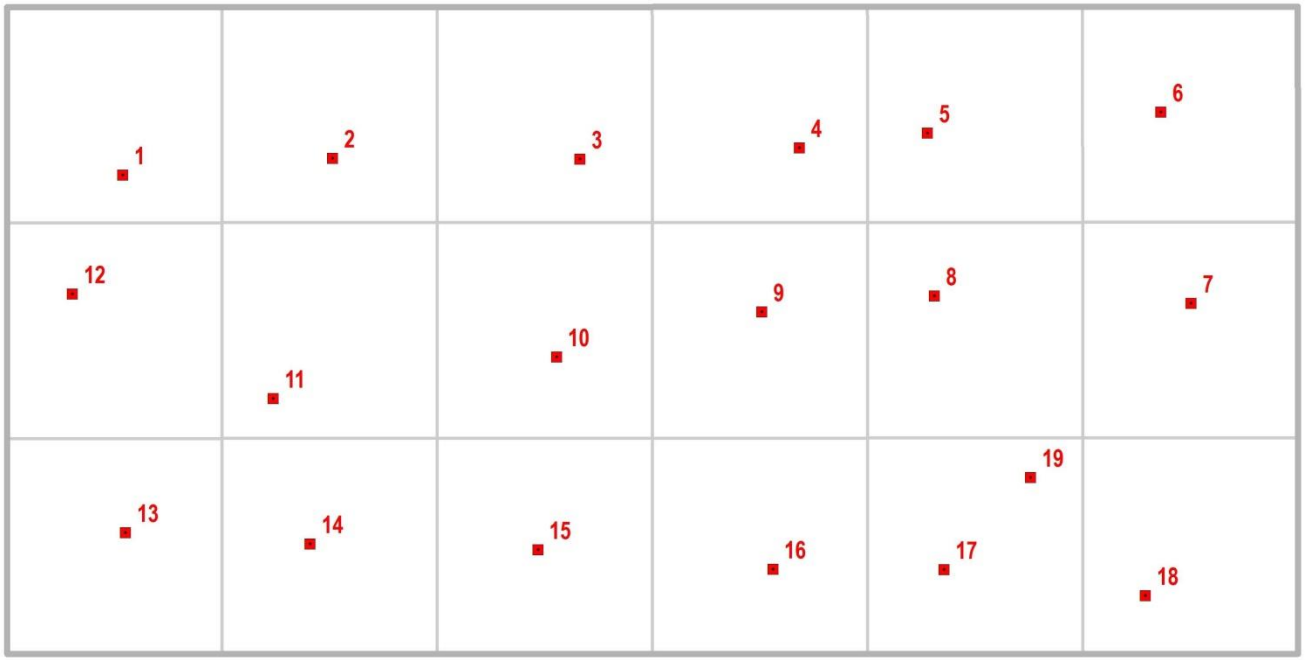
- RegenerationStubs
- RegenerationDeadwood
- SpeciesPolygons

LOOKUP TABLES

- DecayStatus (4 classes)
- RegCover (10 classes)

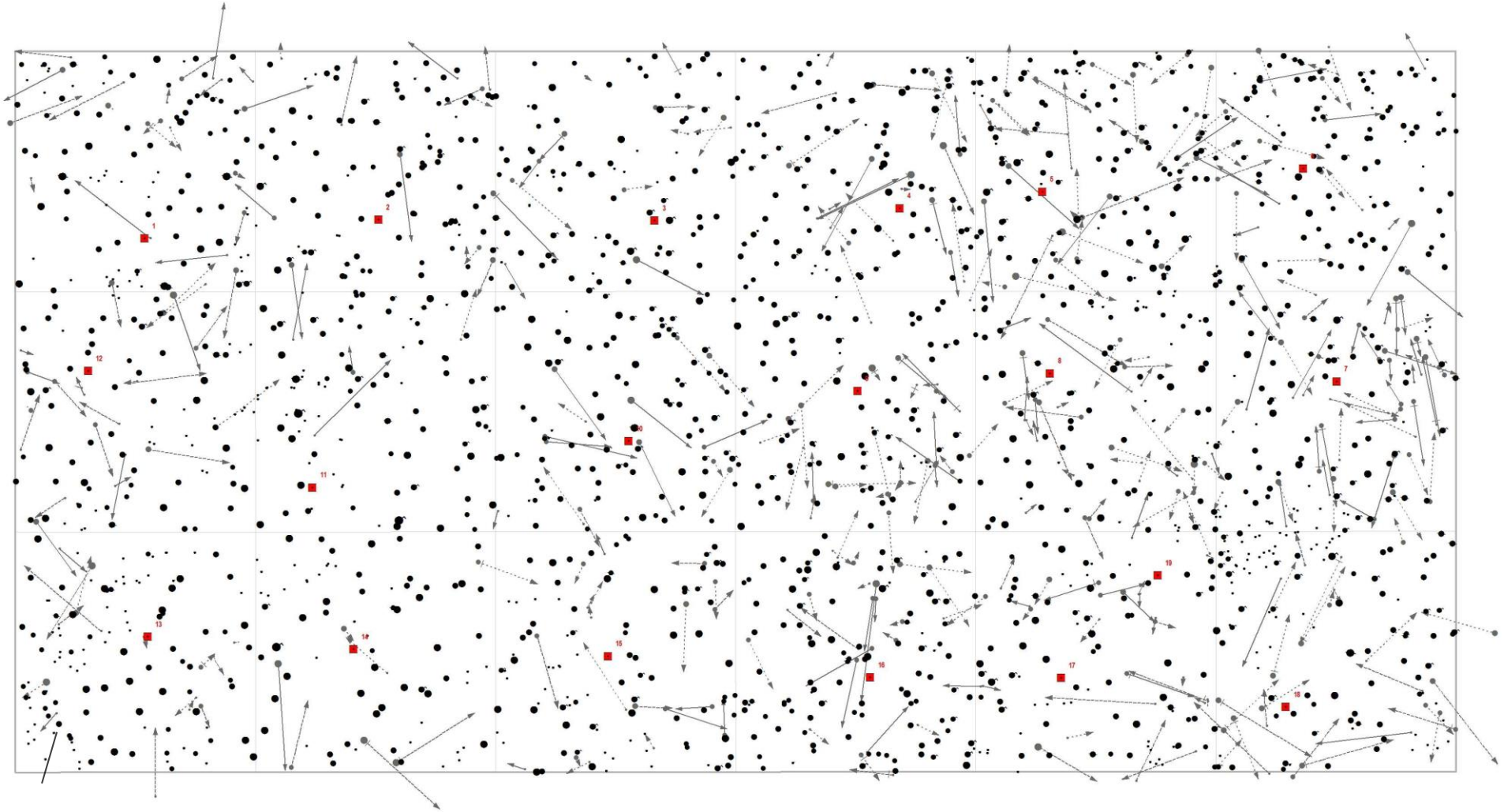
1999 – Georeference

19 reference points (1 pt. / subplot)



Census 2011 – array reused…

1999 – Dendrometry



Trees (1298)
Stubs (381)
Deadwood (380)

1999 – Regeneration

Stubs

Dead standing trees (stumps)

- Position
- Diameter
- Height
- Species
- Decay Status (classes)
- Regeneration Cover (classes)

Regeneration points

D.B.H. < 7cm, Height > 0.5m

- Position
- D.B.H.
- Height
- Species
- Crown Projection
- Nibbling (classes)

Regeneration polygons (**Biogroups)**

D.B.H. < 7cm, Height > 0.5m

Min. 3 trees - crowns touch/overlap

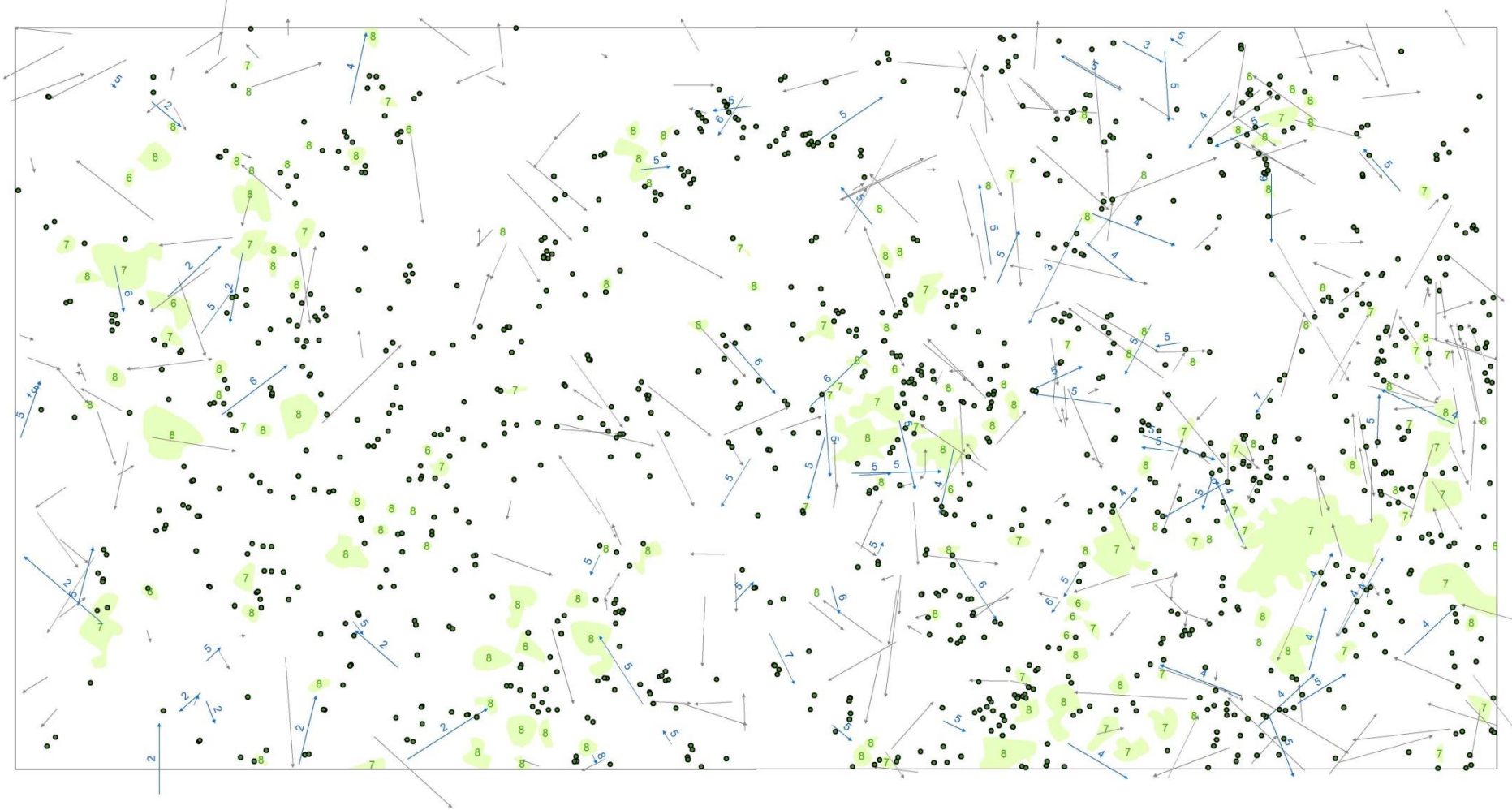
- Position (polygon)
- Count individuals
- Height (Min, Mean, Max)
- Coverage (%)
- Nibbling (%)

Seedlings at deadwood

Height > 0.5m

- Count
- Coverage (%)
- Species
- Mean height

1999 – Regeneration



Regeneration Points (1012, avg. height of 129cm, avg. crown radius of 58cm)
Biogroups (167 polygons, tot. area of 2565m^2 , avg. area of 15 m^2)
Seedlings at deadwood (at 84/380 stems)

Census 2011

Silva Tarouca R.I.

Czech Landscape Care Programme, PPK-69a/83/11, A1.1a

2011 – Project

PROJECT:

Two Field-Map projects – two Field-Maps at a time

LAYERS:

Reference points [Point]

Subplots [Line]

Standing stems (Trees&Stubs) [Tree]

Lying stems [Deadwood]

Standing stems 1999 [Point]

Lying stems 1999 [Line]

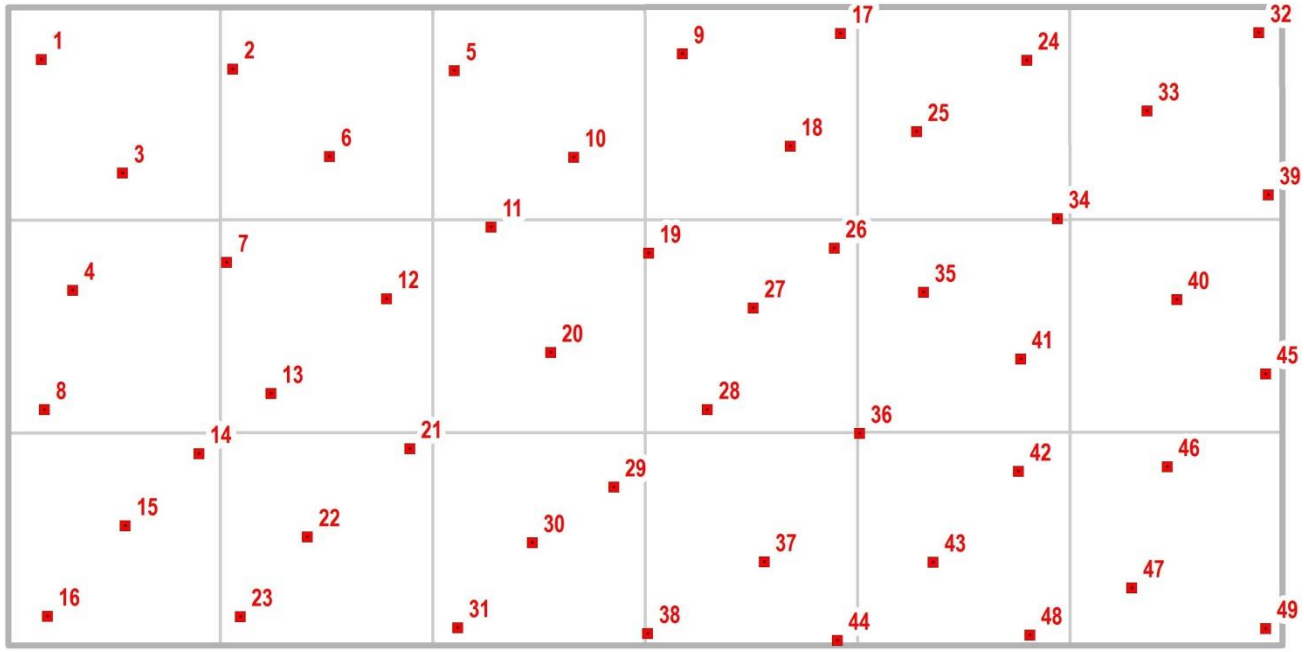
Regeneration points [Point]

Regeneration polygons [Polygon]

Slight differences in LookUps (classifications) to 1999

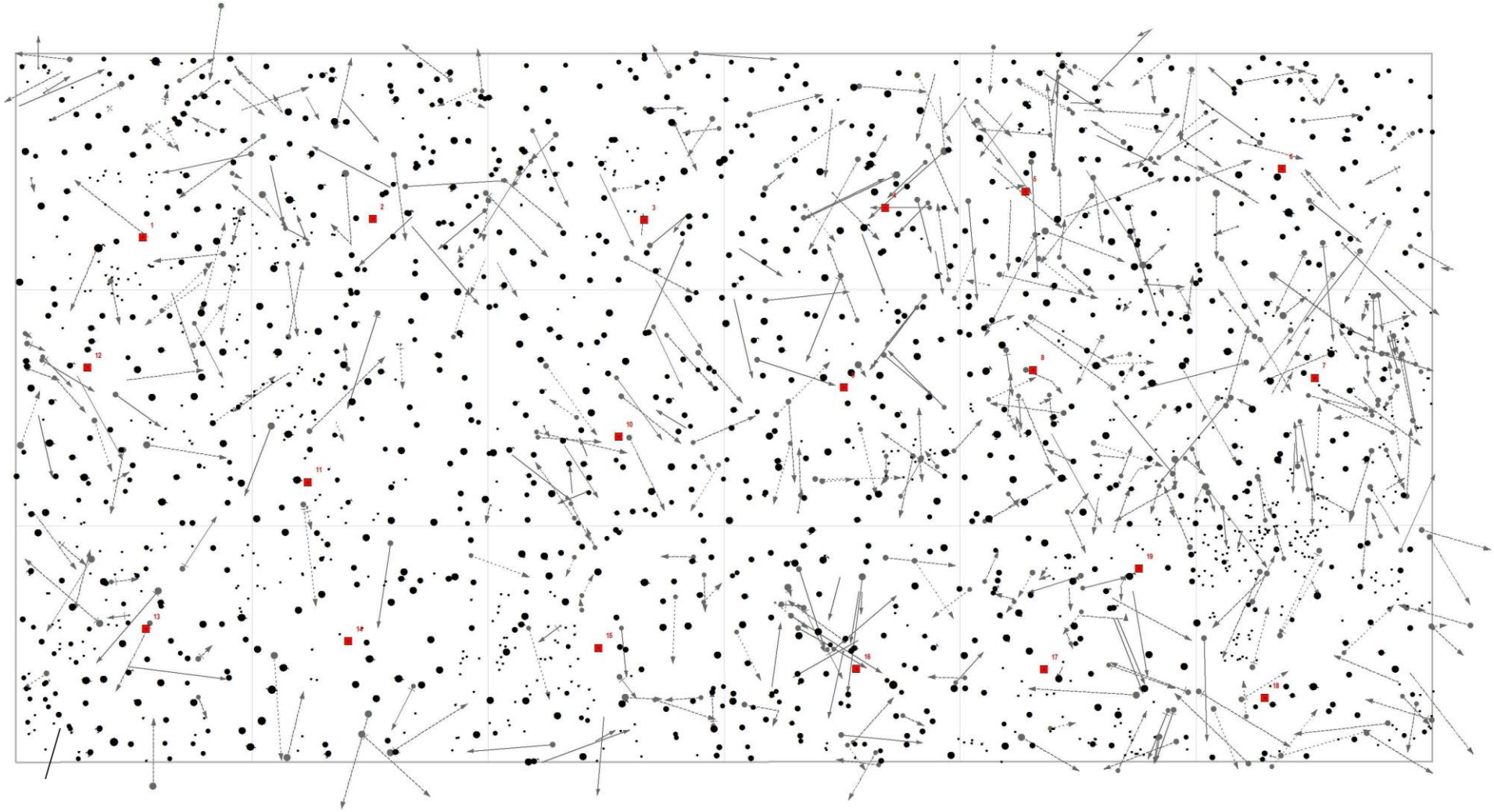
2011 – Georeference

49 reference points (min. distance of 25m)



IFER's array thickened…

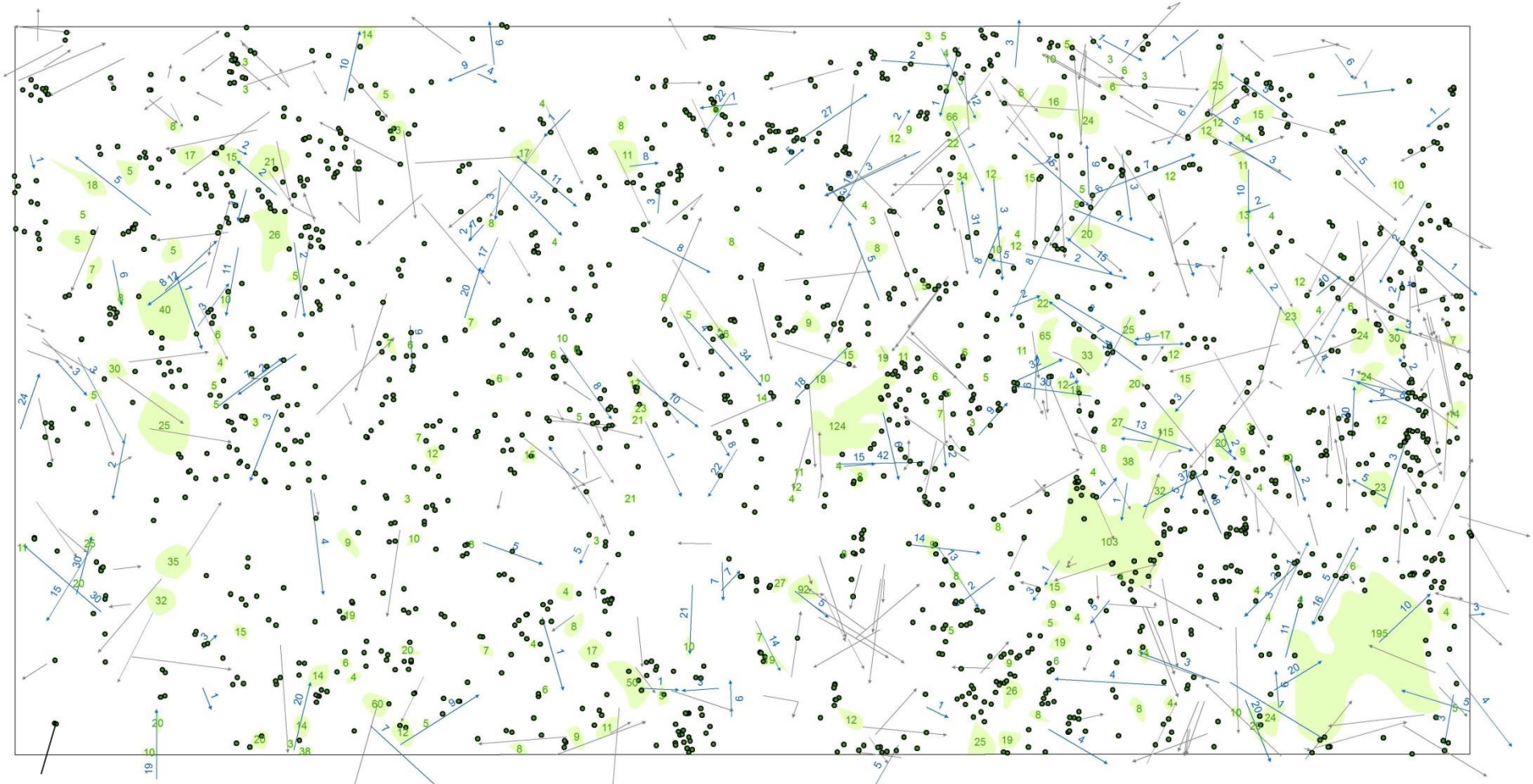
2011 – Dendrometry



Standing stems (1604/234 dead)
Lying stems (510)

2011 – Dendrometry

2011 – Regeneration



Regeneration Points (1490, avg. height of 153cm, avg. crown radius of 62cm)
Biogroups (221 polygons, tot. area of 3294m^2, avg. area of 15 m^2,
tot. 3379 individuals, avg. 15 individuals/polygon)
Seedlings at deadwood (at 177/508 stems, avg. 8/stem)

Census 2016

Silva Tarouca R.I.

Czech Science Foundation, P504/15-23242S

Do the laws of the metabolic scaling theory apply in European temperate old-growth forests? Testing at multiple spatial scales.

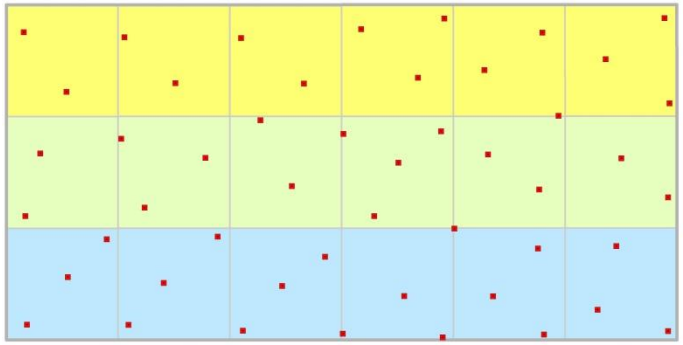
Czech Science Foundation, P504/16-18022S

Spatiotemporal differences in competition between tropical and temperate forest: diversity matters

2016 – Project

PROJECT:

One strip of subplots (6) represents one separate Field-Map project



Project 3–upper Tag prefix 3-NNNN

Project 2–middle Tag prefix 2-NNNN

Project 1–lower Tag prefix 1-NNNN

LAYERS:

Reference points [Point]

Subplots [Line]

Standing stems 2016 [Tree]

Lying stems 2016 [Deadwood]

Standing stems 2011 [Point]

Lying stems 2011 [Line]

2016 – Tagging in dendrometry

1cm ≤ D.B.H. < 15 cm

(Covered) wire

Hung up on a branch

D.B.H. ≥ 15 cm

Alluminium nail

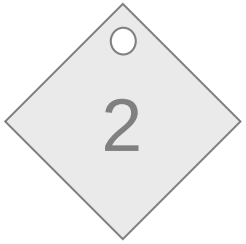
Hammered in a stem

2016 – Tagging in dendrometry

Single-stem tree

aluminium tag

„SubplotID-TreeID“ branded

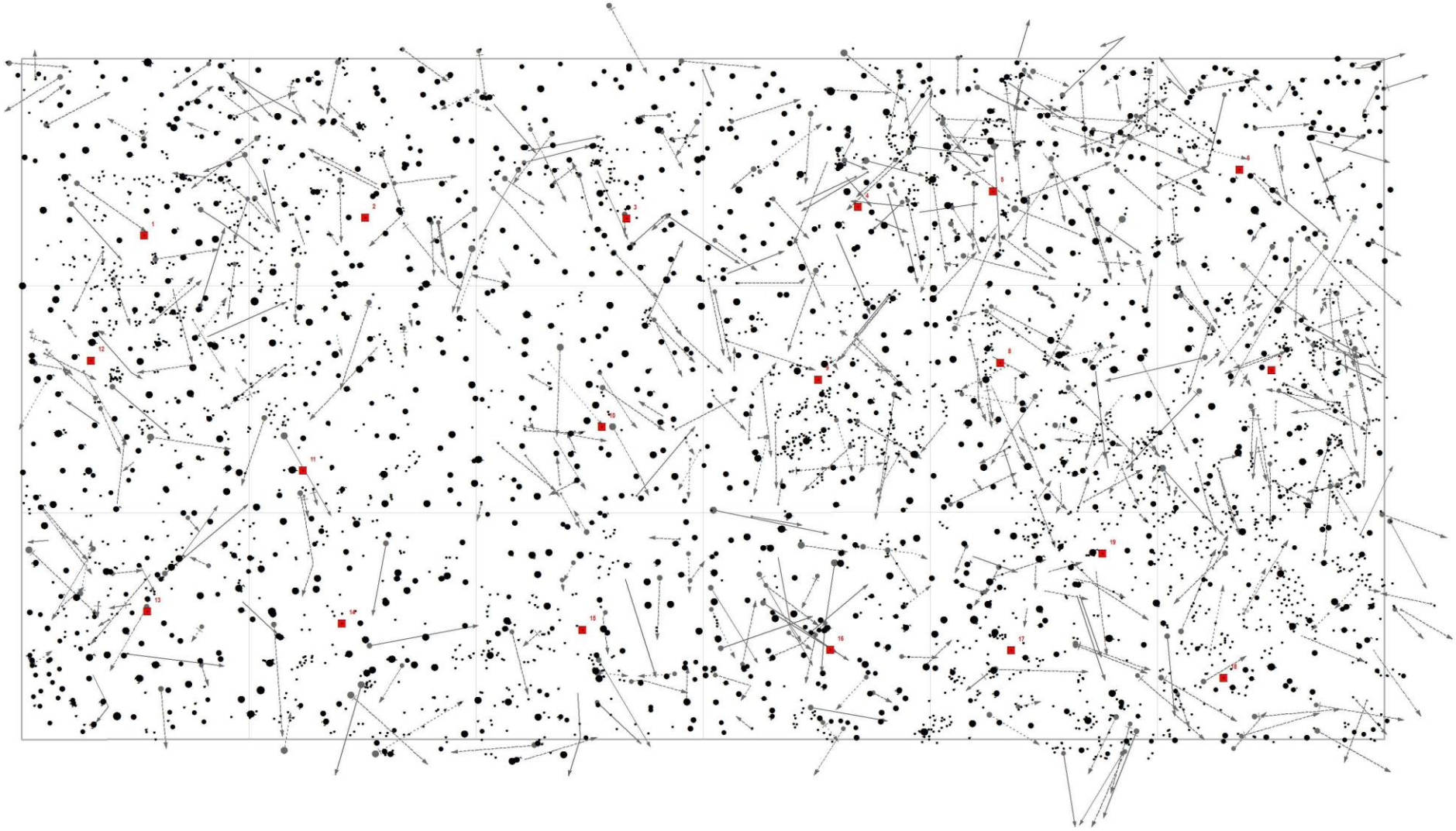


Multi-stem tree

aluminium tag

(2nd, 3rd…) „StemID“ branded

2016 – Dendrometry



Standing stems (3497/355 dead) 1775 live …1cm ≤ D.B.H. < 7cm)
Lying stems (590)

2016 – Regeneration

Stems with D.B.H. of 1cm+ … in Tree layer

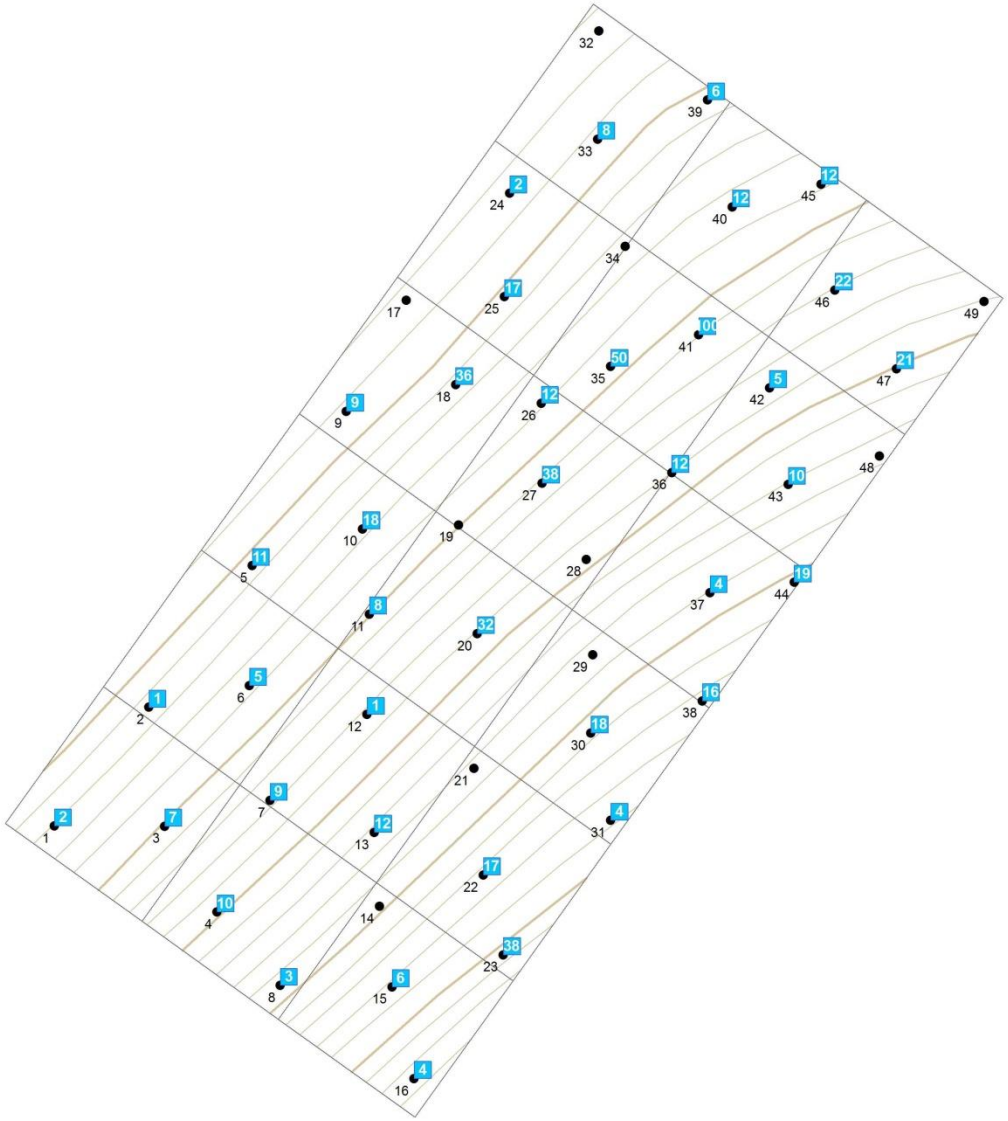
5m

All individuals (<1cm)

- Position
- Height
- Species
- Tag-Unique ID
- Note

RefPnt

5m



2016 – Regeneration tags

Conclusion – Perspectives

- Next dendrometry census (1cm+) 2021
- Next regeneration census (5x5m): 2017, (2018)

- Array of (standing, lying) stems – spatial base for specialists (mosses, mushrooms, insects, …)
- Stems position and diameter – verification base for preliminary results of TLS

❖ Using Field-Map (for the time being) AND/OR using TLS

This contribution has been resulted thanks to project

Czech Science Foundation P504/15-23242S

Do the laws of the metabolic scaling theory apply in European temperate old-growth forests? Testing at multiple spatial scales.