

Spruce bark beetle monitoring program and Forest protection practices in Latvia.

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LVMI «Silava»



Ips typographus monitoring using pheromone traps

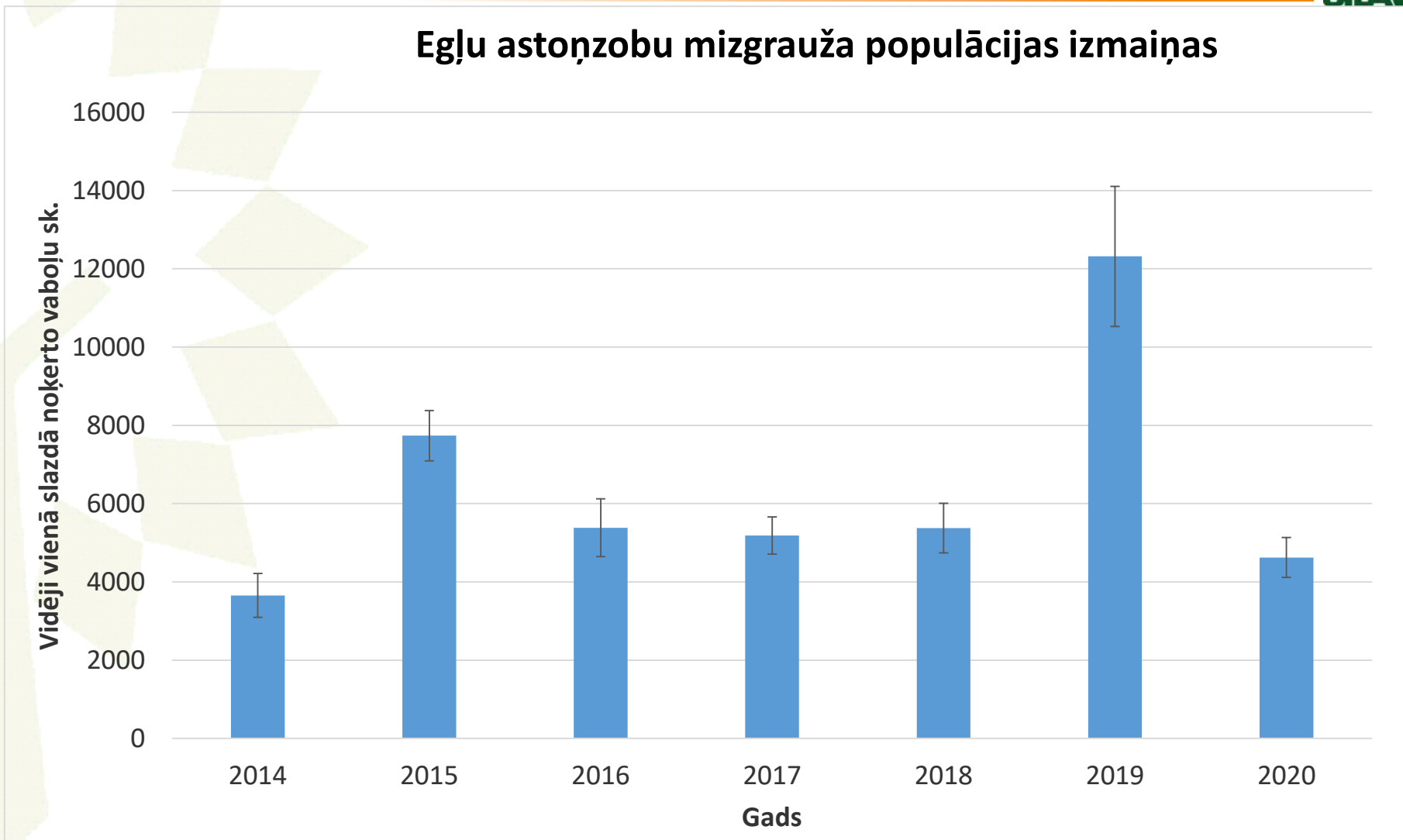


23.03.2021.

Egļu astonezobu mizgrauža populācijas izmaiņas



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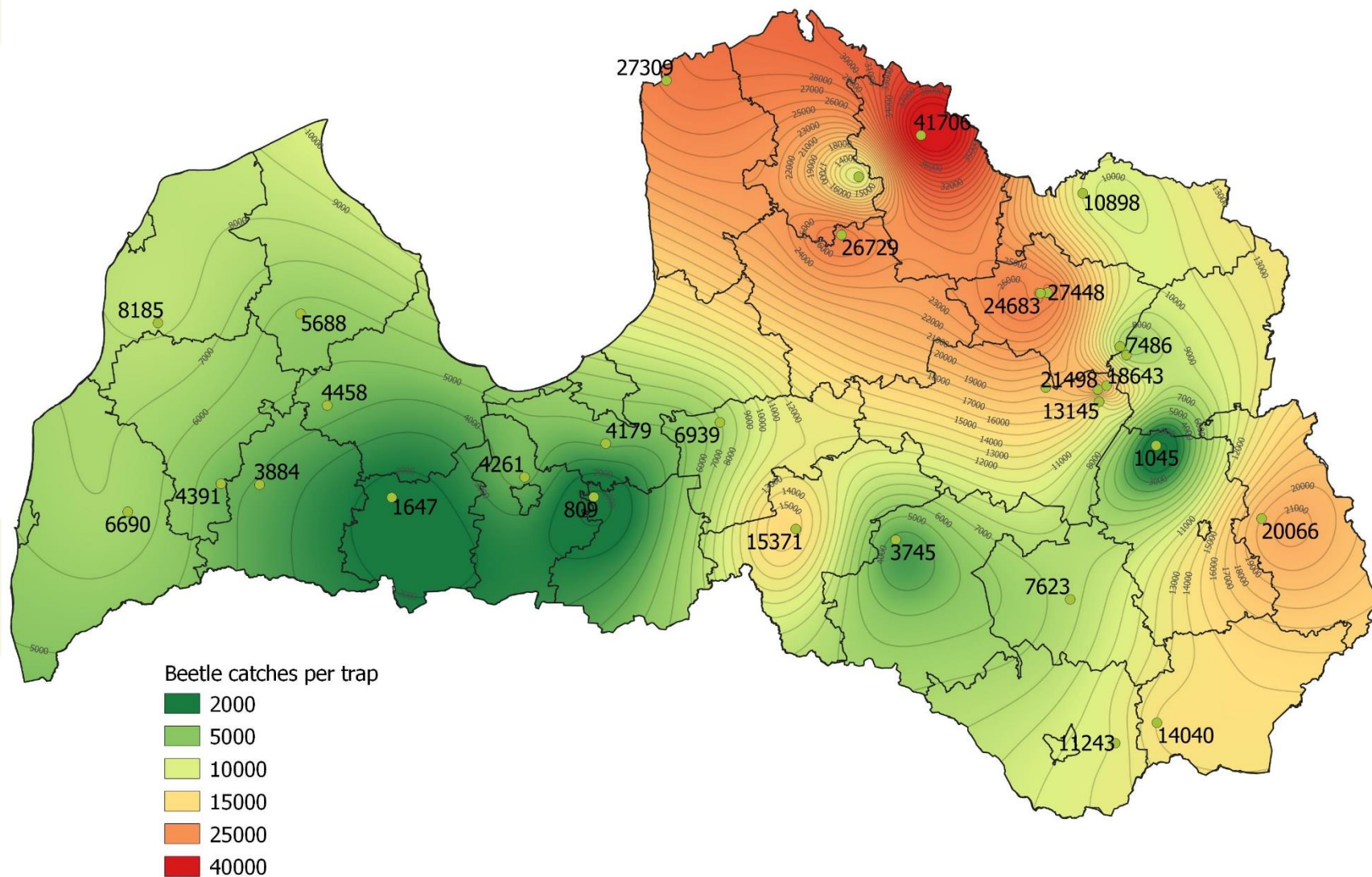


Risk of *Ips typographus* attack to spruce stands based on beetle captures

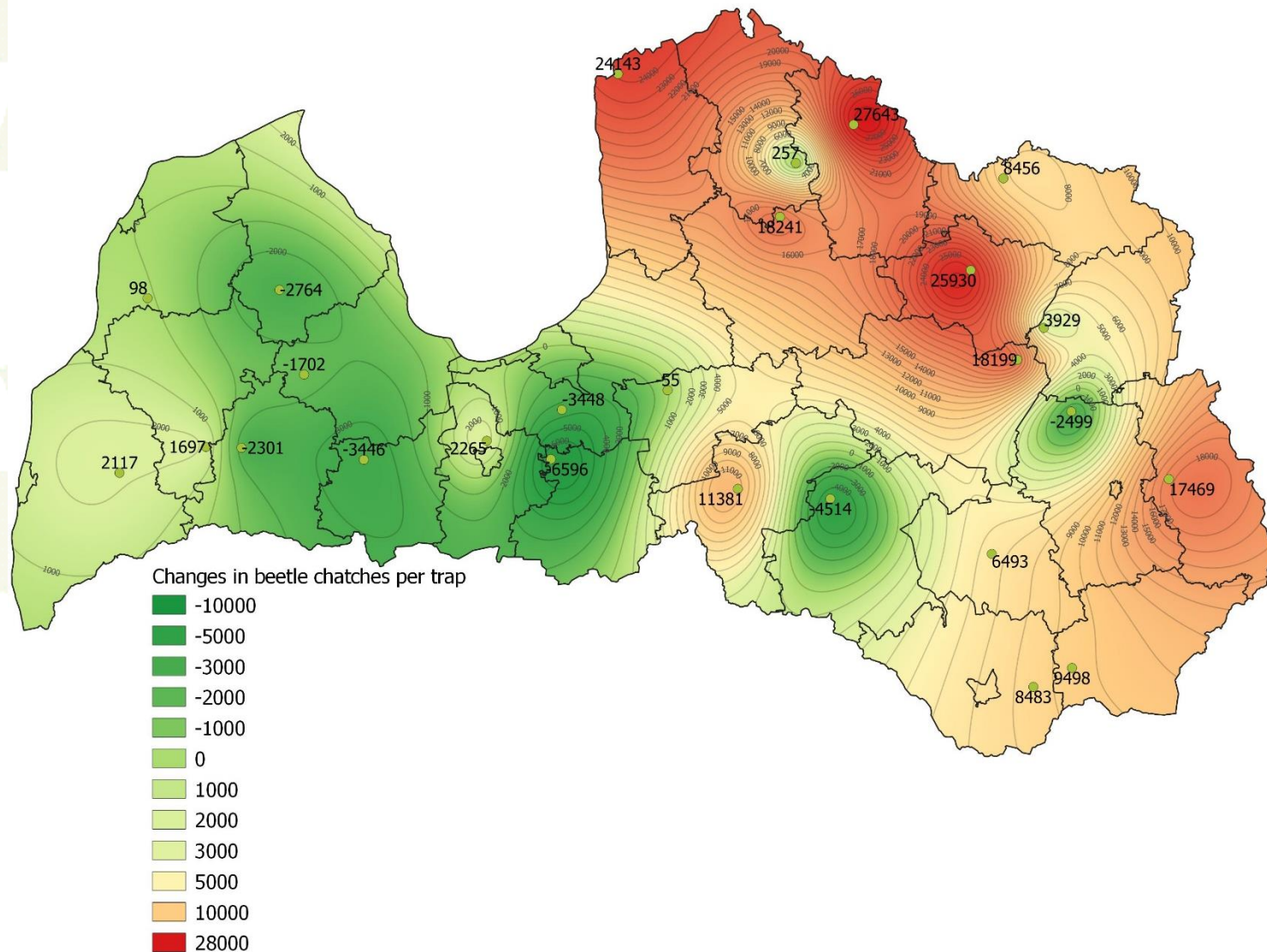


Average number of beetles per trap		Risk to spruce stands in the region	Recommended measures*
Maximum per 1 day	During 30 days		
100>	500>	none	not needed
100-200	500-3000	low	SS
200-1000	3000-8000	moderate	SS, PT
1000-2000	8000-20000	high	SS, PT, CC
2000<	20000<	Very high	SS, PT, CC

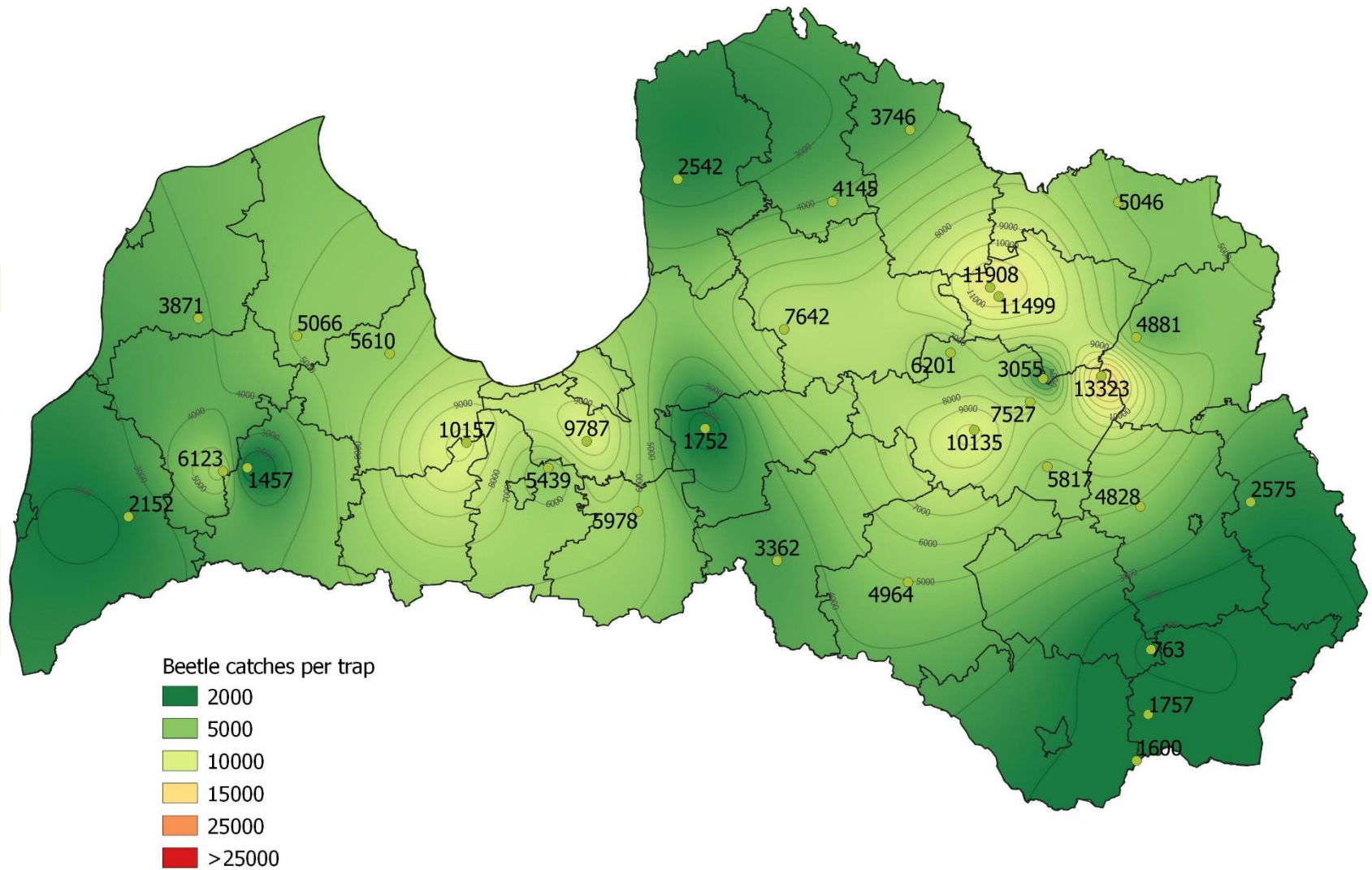
Spruce bark beetle flight activity in 2019



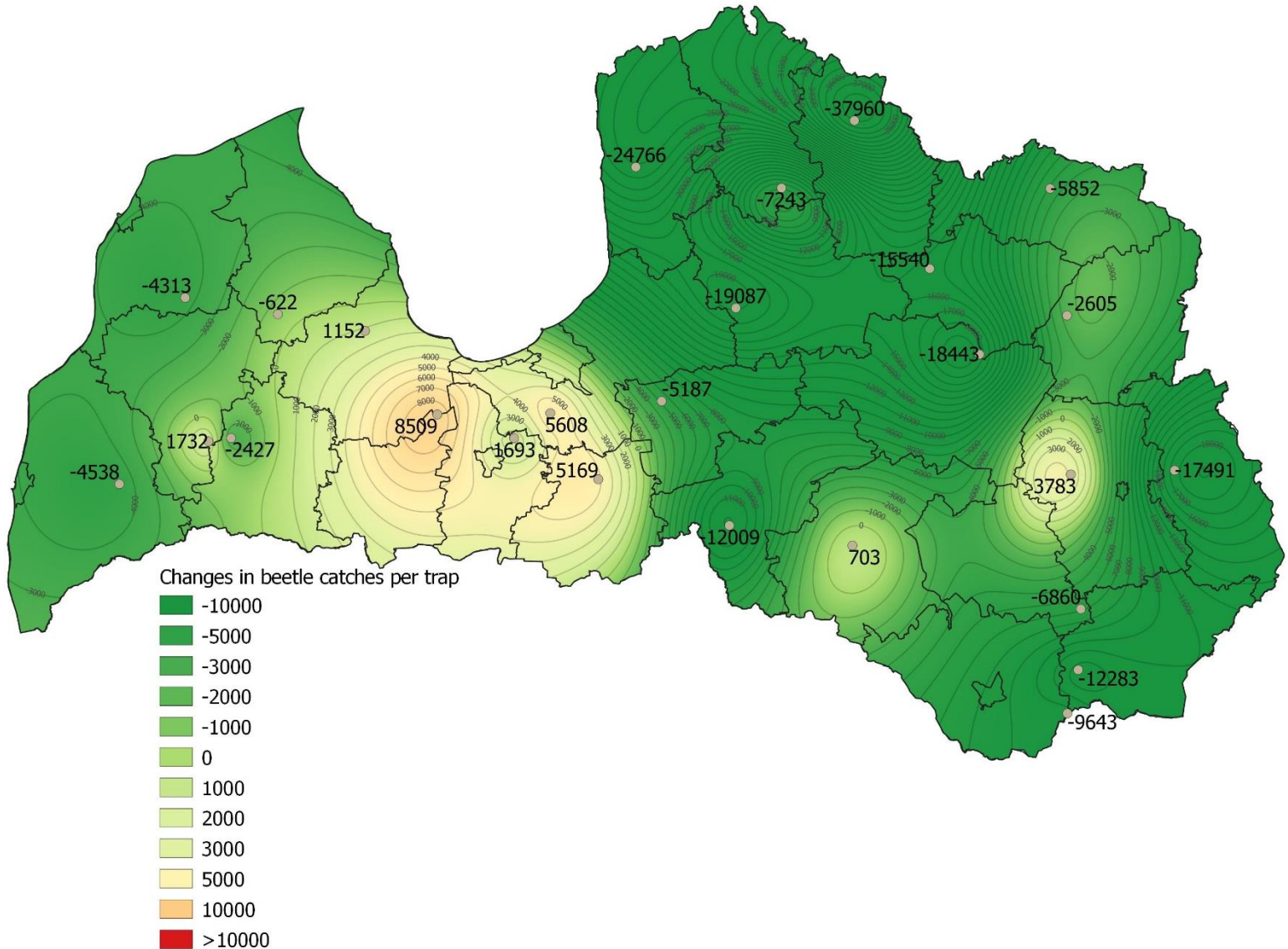
Spruce bark beetle population changes from 2018 to 2019

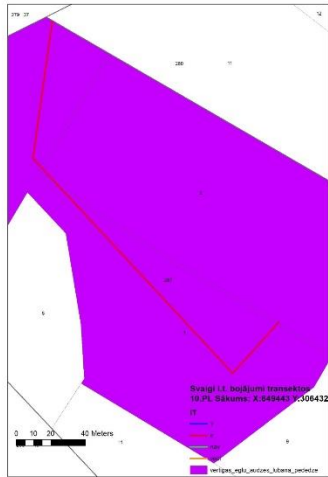


Spruce bark beetle flight activity in 2020



Spruce bark beetle population changes from 2019 to 2020





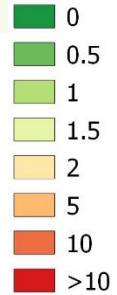
Survey of *Ips typographus* current year damage to spruce stands

- 373 mature spruce stands were surveyed and 22407 trees examined
- 90 infested spruce trees were found (0,4%)

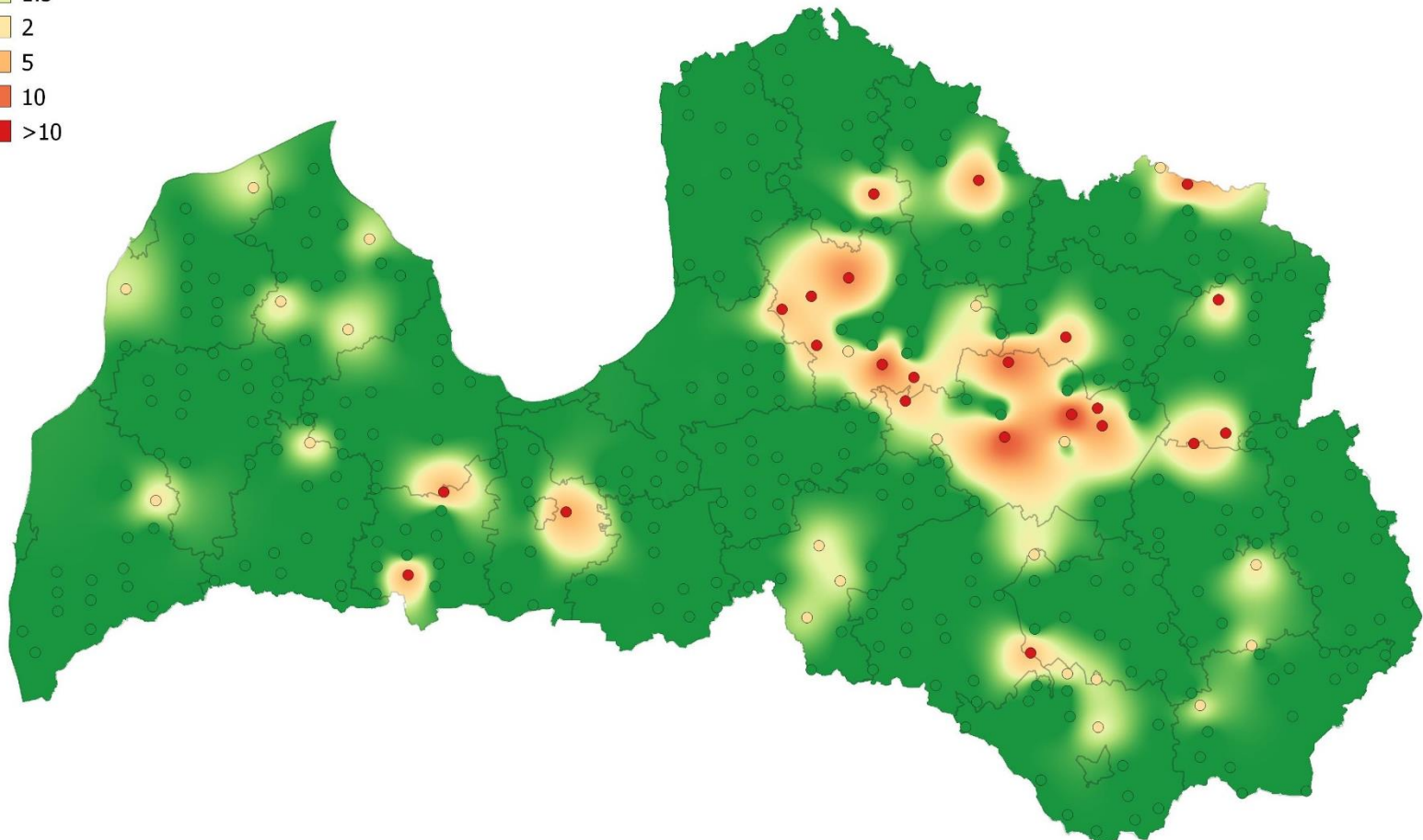
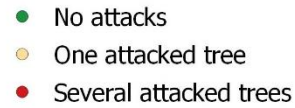
Current year attacks by spruce bark beetle



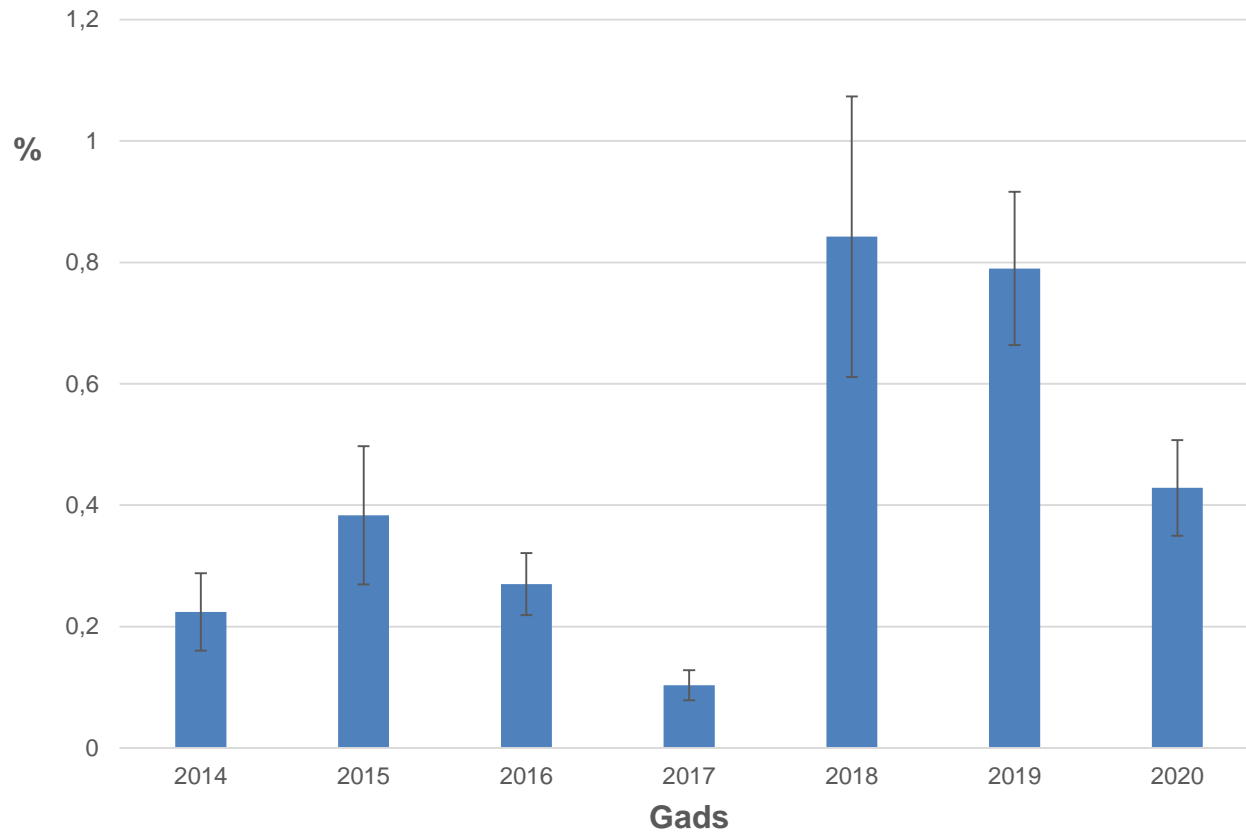
Percent of mature spruce trees attacked by *Ips typographus* in 2020.g.



Number of attacked trees in transect

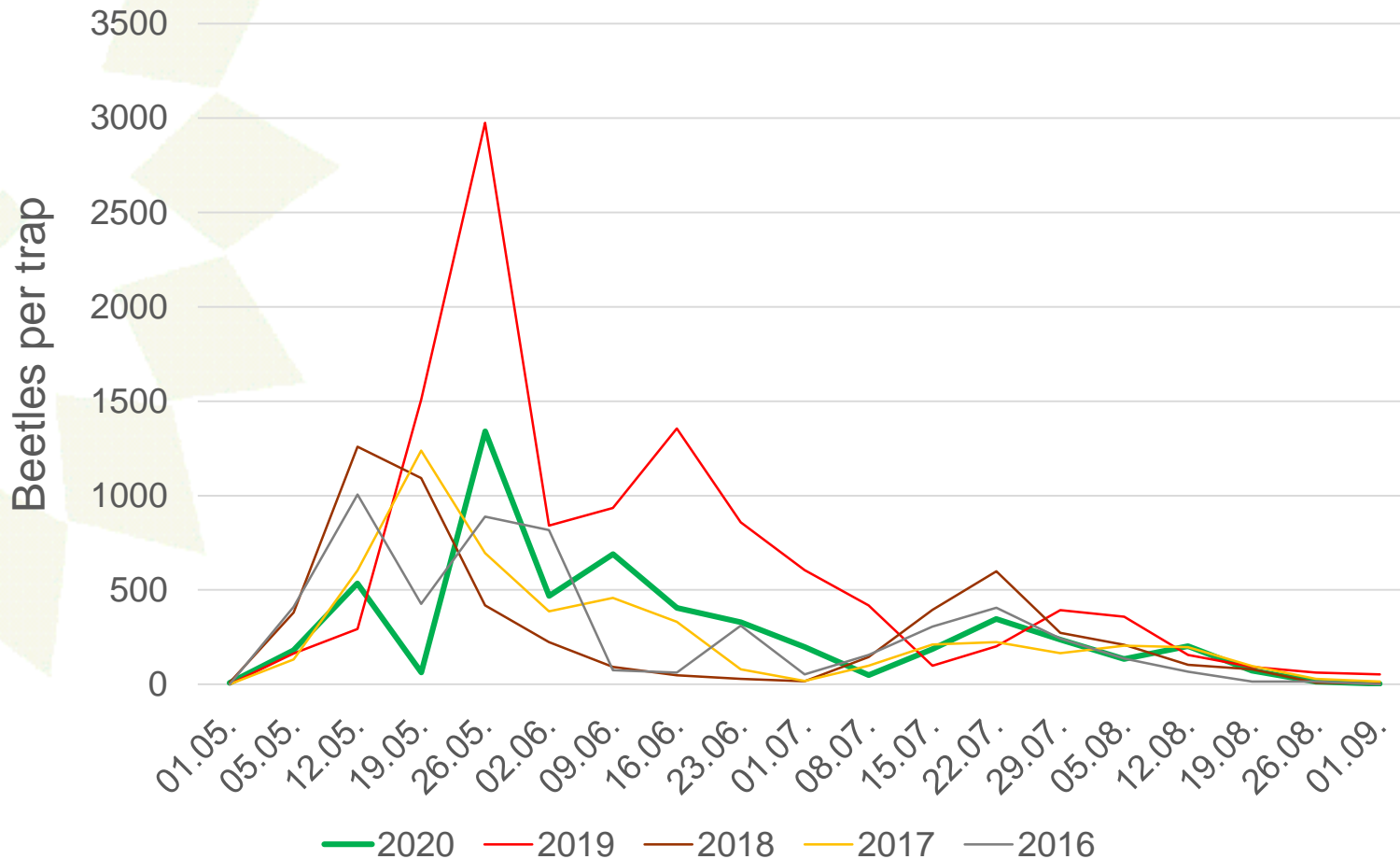


Fresh *Ips typographus* attacks to mature spruce trees



I. typographus flight dynamics

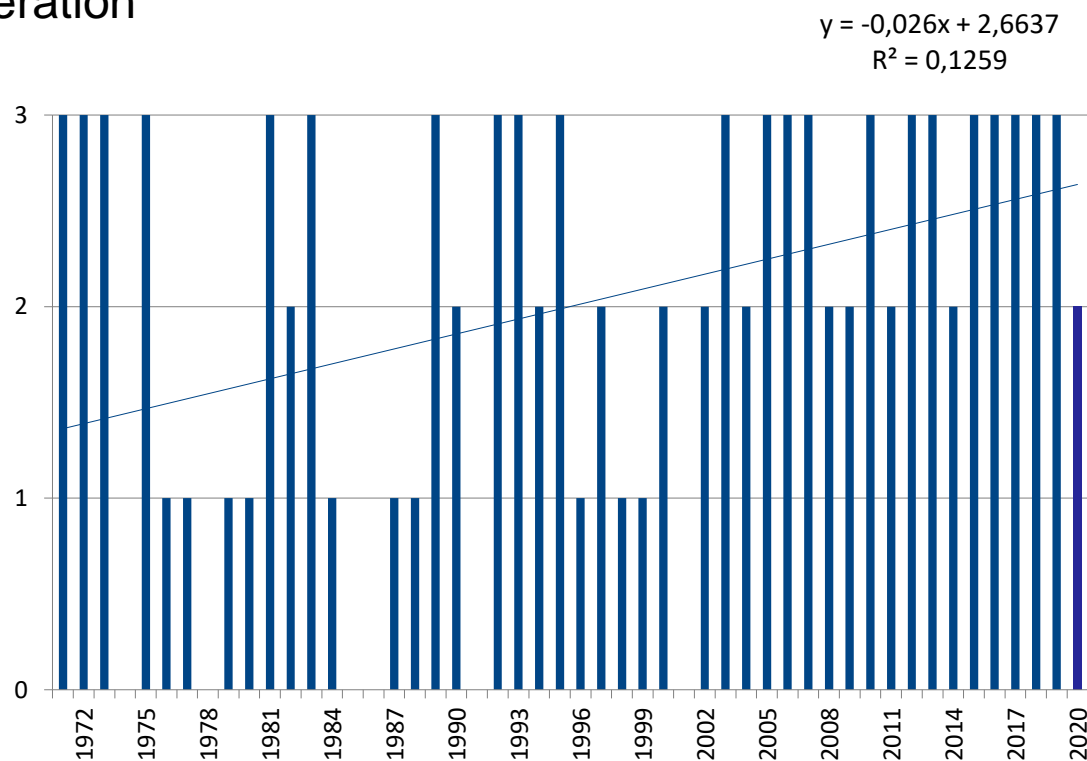
I. typographus flight activity 2016-2020



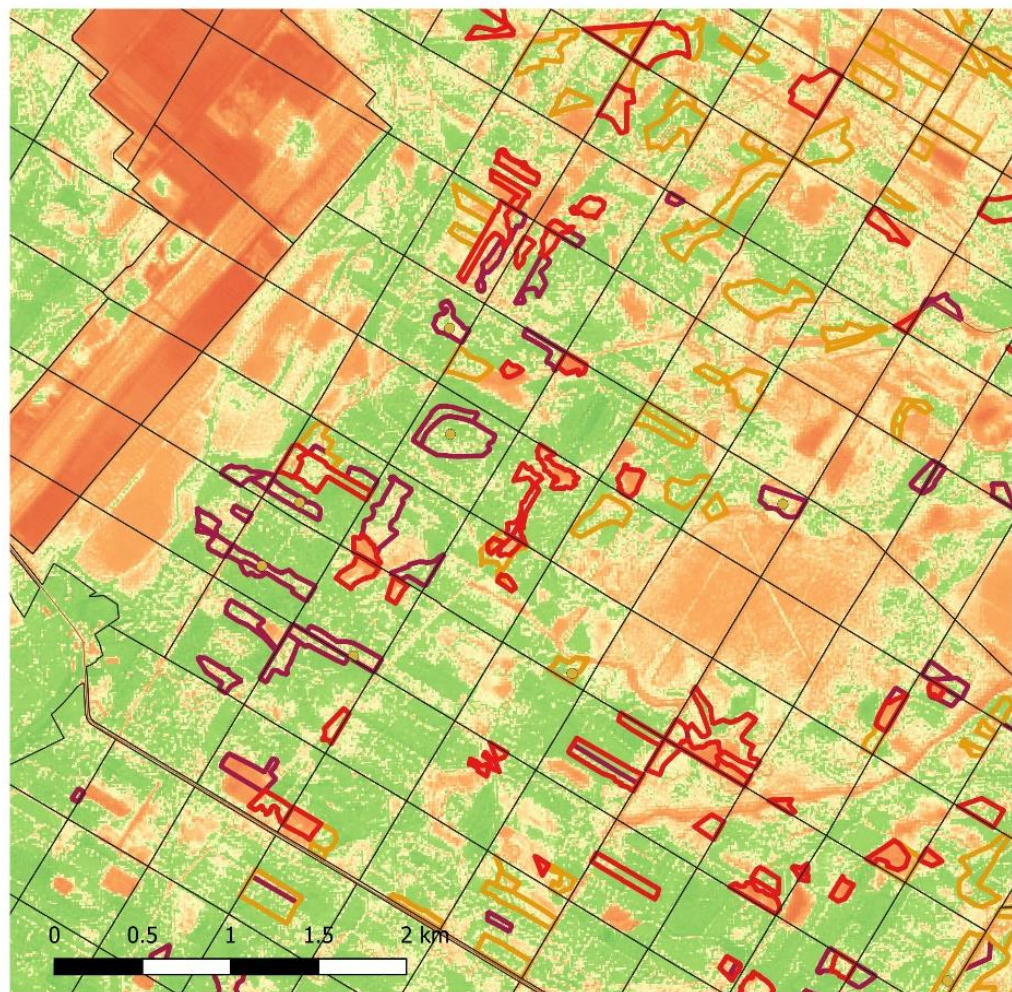
I. *Typographus* successful number of generations



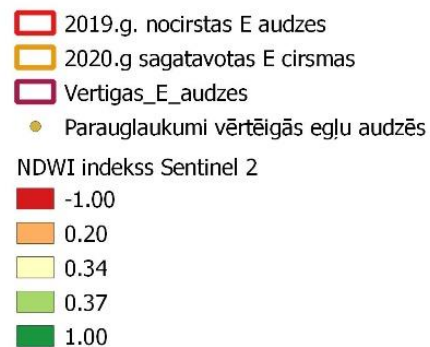
- 0- One generation
- 1- Unsuccessful second generation
- 2- Partially successful second generation
- 3- Successful second generation



Use of satellite images to recognise damaged spruce stands



NDWI indekss
2020.g. 18.jūnijs Sentinel 2



Protection measures

Protective measures



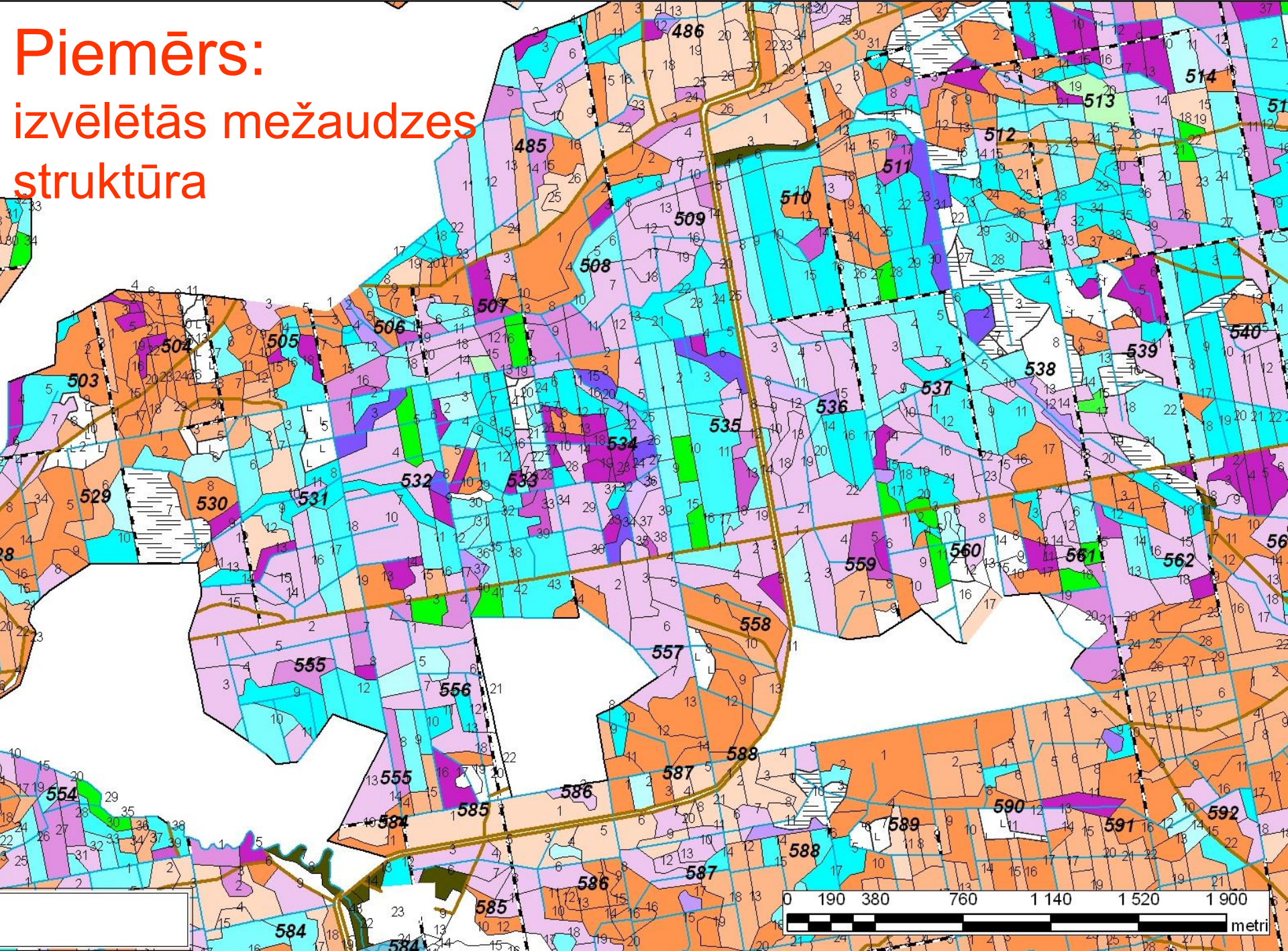
From 1st of November to 1st of April:

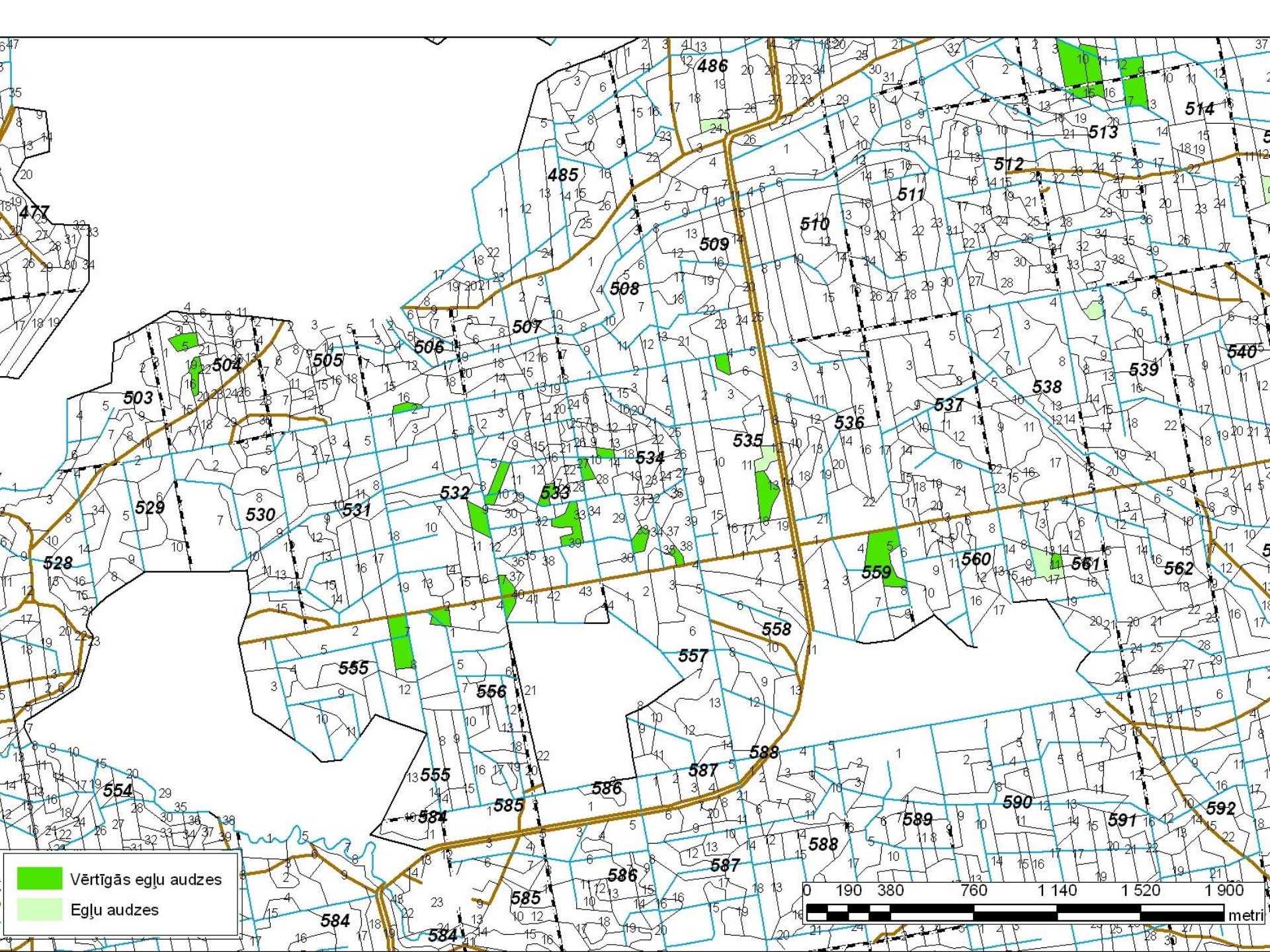
- All selective cuttings in mature spruce stands (sanitary and other), clear all windthrows, stormbreaks, and other kind of damaged spruce trees

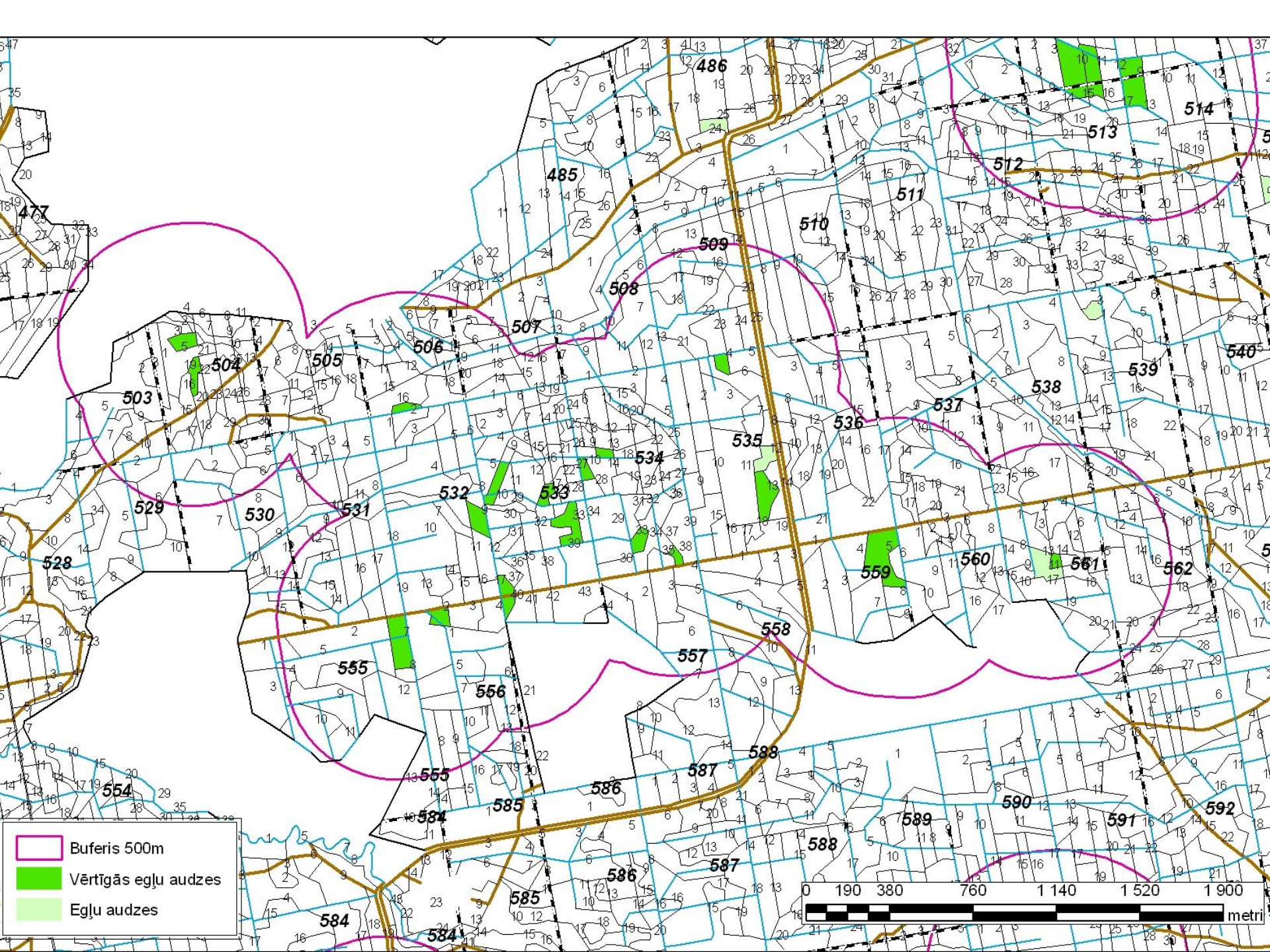
From 1st of April to 1st of September:

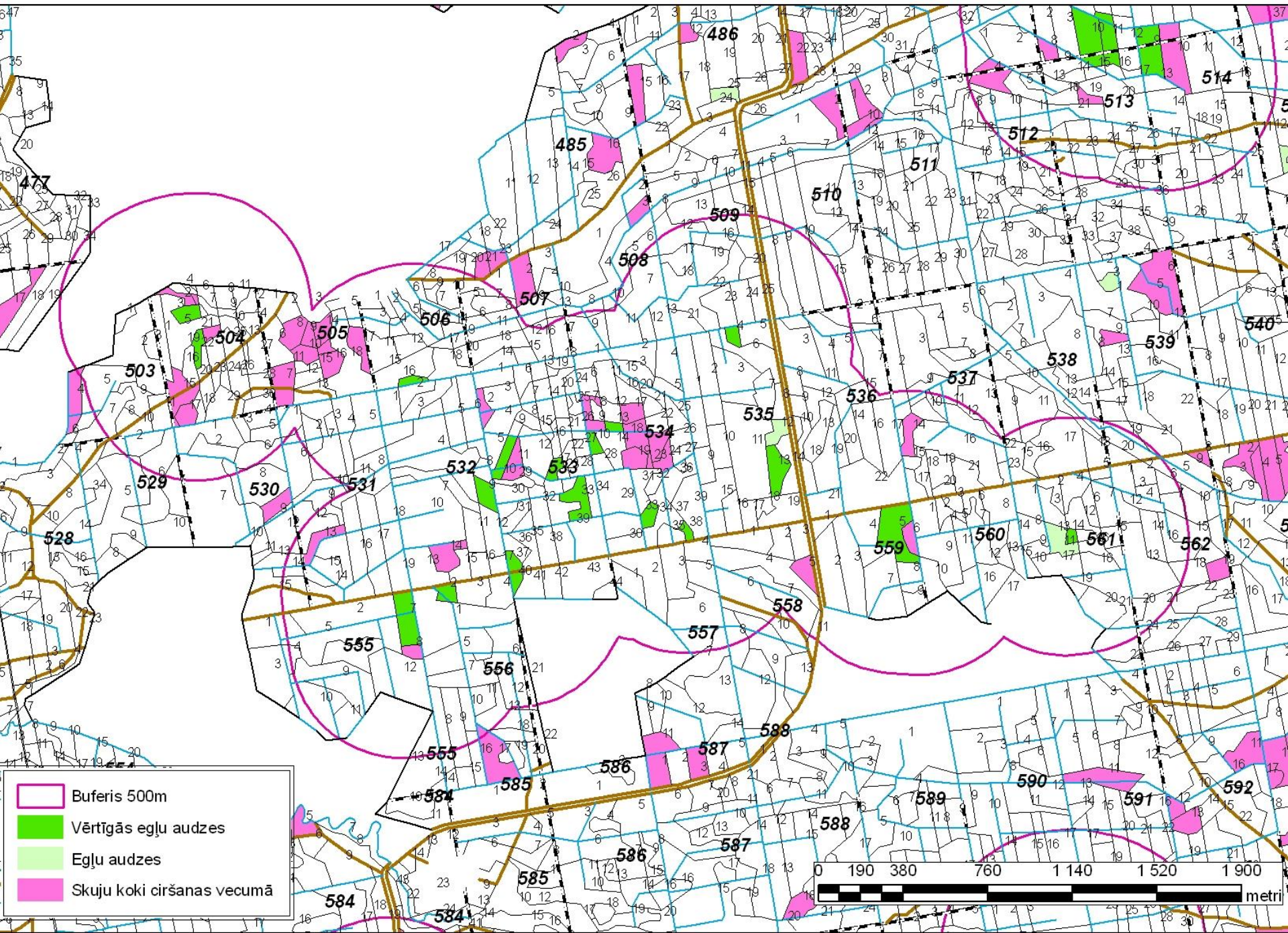
- No selective cuttings in mature spruce stands
- Legislation facilitates clearcuts in *I.typographus* infested spruce stands
- Use of pheromones if mature stands are within 500m from conifer clearcuts





Piemērs: izvēlētās mežaudzes struktūra

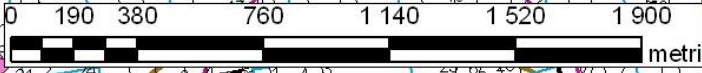


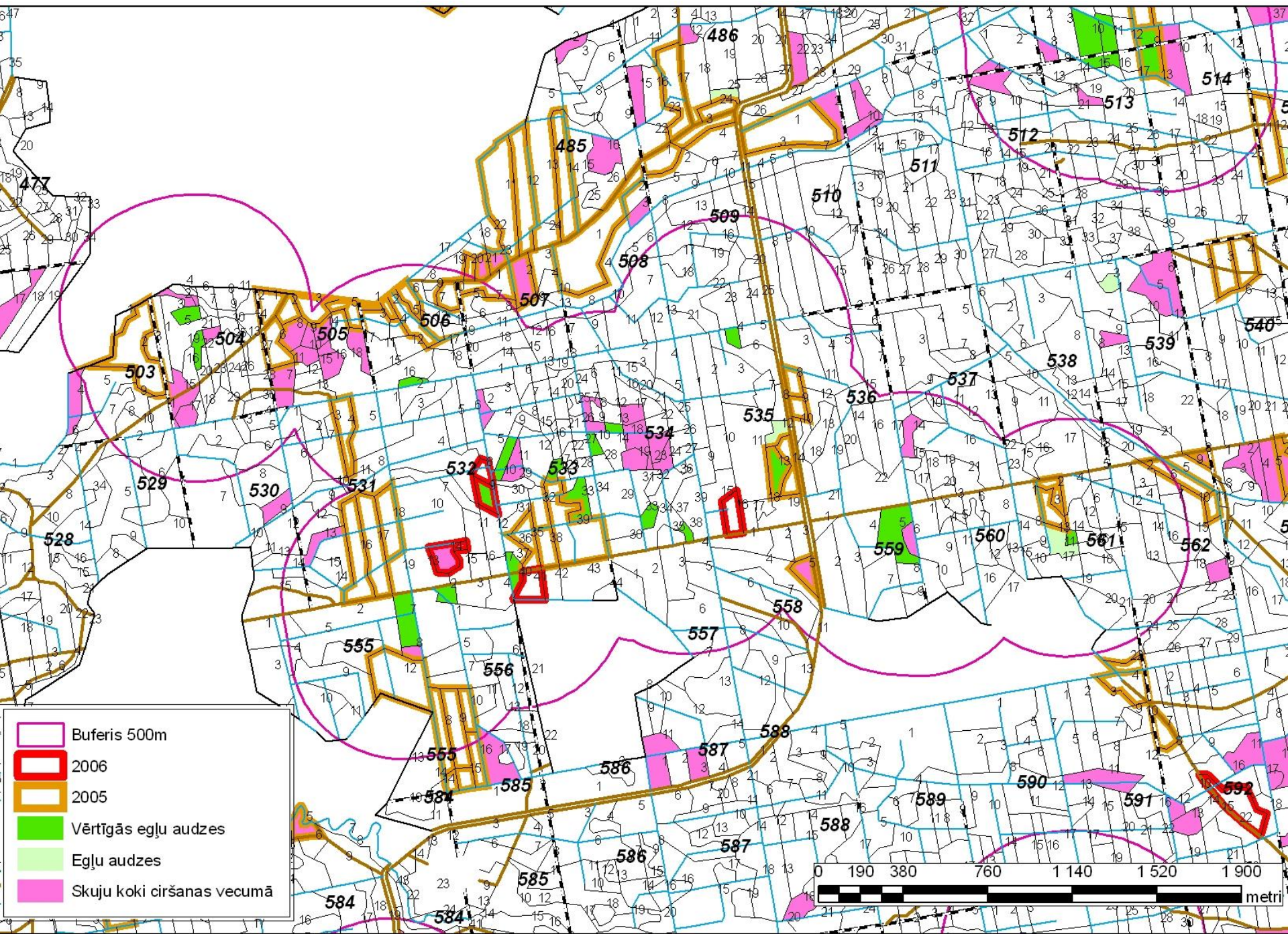




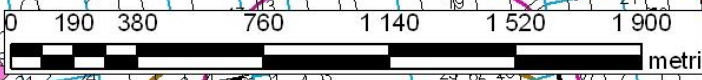


-  Buferis 500m
-  Vērtīgās egļu audzes
-  Egļu audzes
-  Skuju koki ciršanas vecumā





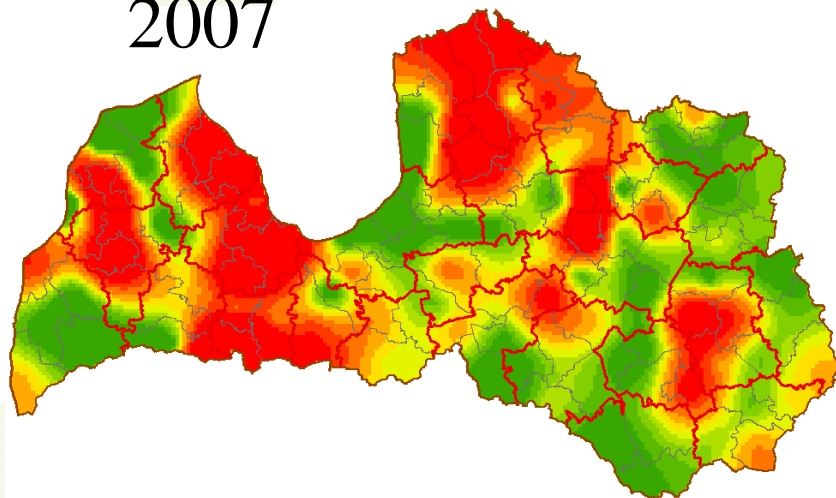
-  Buferis 500m
-  2006
-  2005
-  Vērtīgās egļu audzes
-  Egļu audzes
-  Skuju koki ciršanas vecumā



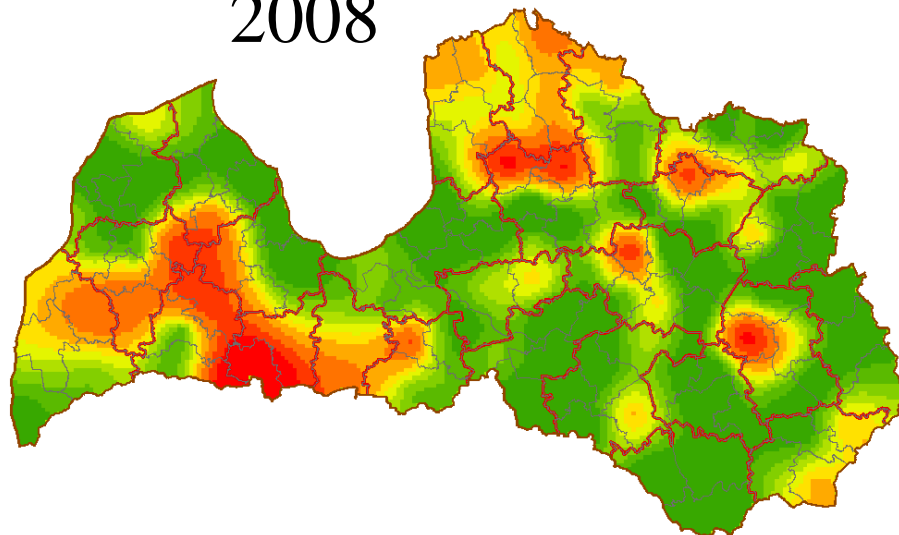
Effectiveness of forest protection measures against *I.typographus* after storm of 2005



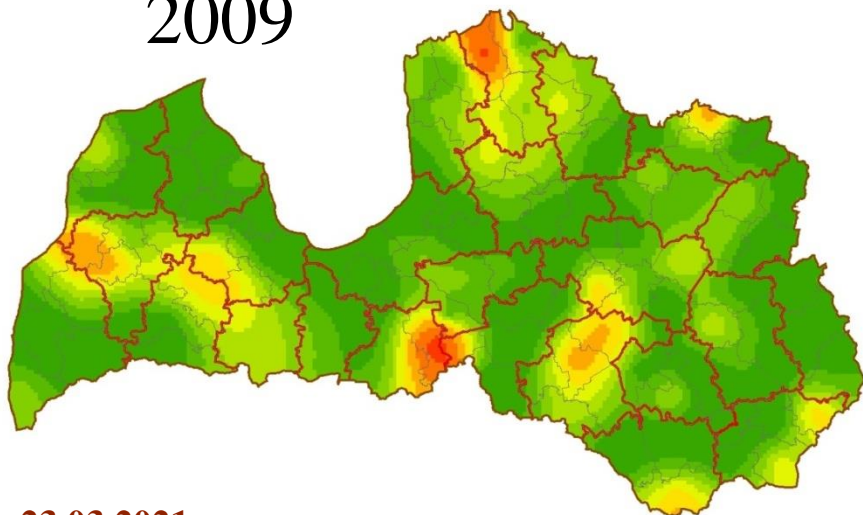
2007



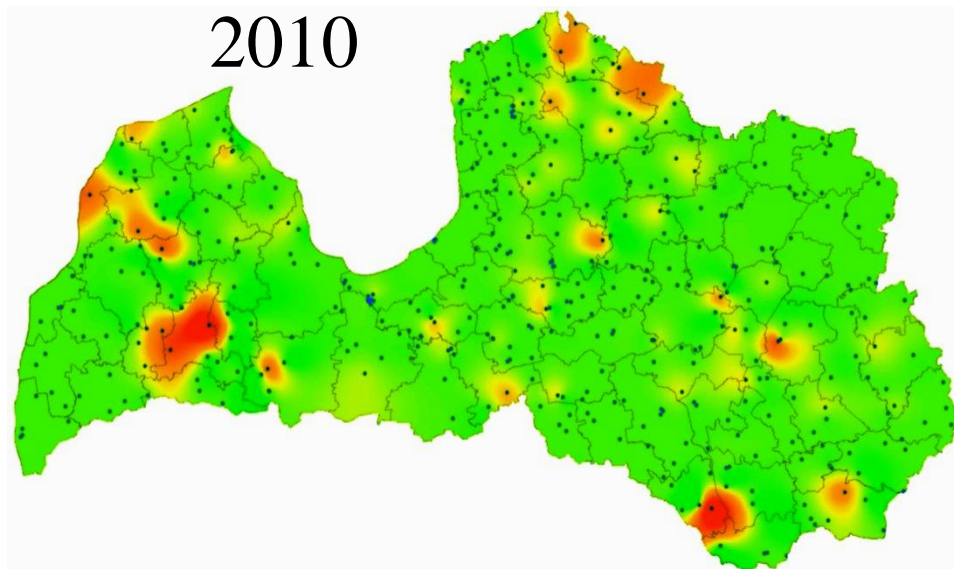
2008



2009



2010



Five rules to use pheromone traps

1. Must have valuable spruce stand to be protected
2. Must have a «fresh» conifer clearcut
3. Traps must be placed more than 30 m from living spruce trees
4. Traps must be placed in groups
5. Traps must be frequently emptied



**THANK YOU FOR
YOUR ATTENTION!**