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Inter-species Competition in Case of Web Spinning Sawfly *Acantholyda Posticalis*

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Great Web-Spinning Sawfly
Acantholyda posticalis

Mass outbreaks in region

- Map shows recent outbreaks of *Acantholyda posticalis*.
- In Latvia only one mass outbreak recorded that started 1966 Krāslava region about 40 km from current outbreak location. This outbreak lasted until 1982.

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Mass outbreak history

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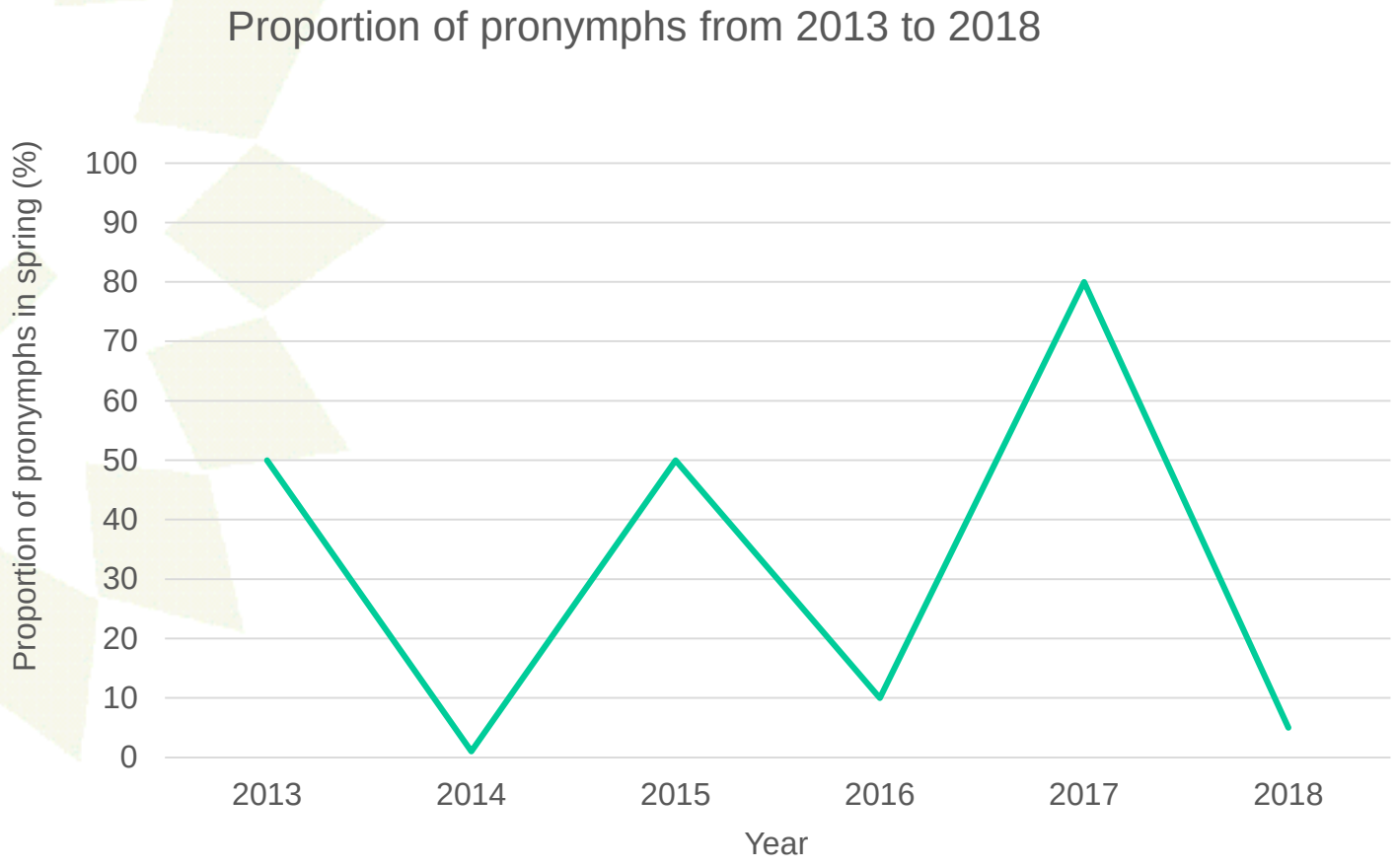
- Heavy defoliation was observed in summer 2013.
- Overwintering larvae count in soil surpassed 500 per m^2 in winter 2017/18.
- Proportion of pronyphs*:
  2013/14- 1%
  2014/15- 50%
  2015/16- 10%
  2016/17- >90%
  2017/18- <1%

* *Pronymphs are larvae that exit diapaus and emerge upcoming season*

Mass outbreak history



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Study aim

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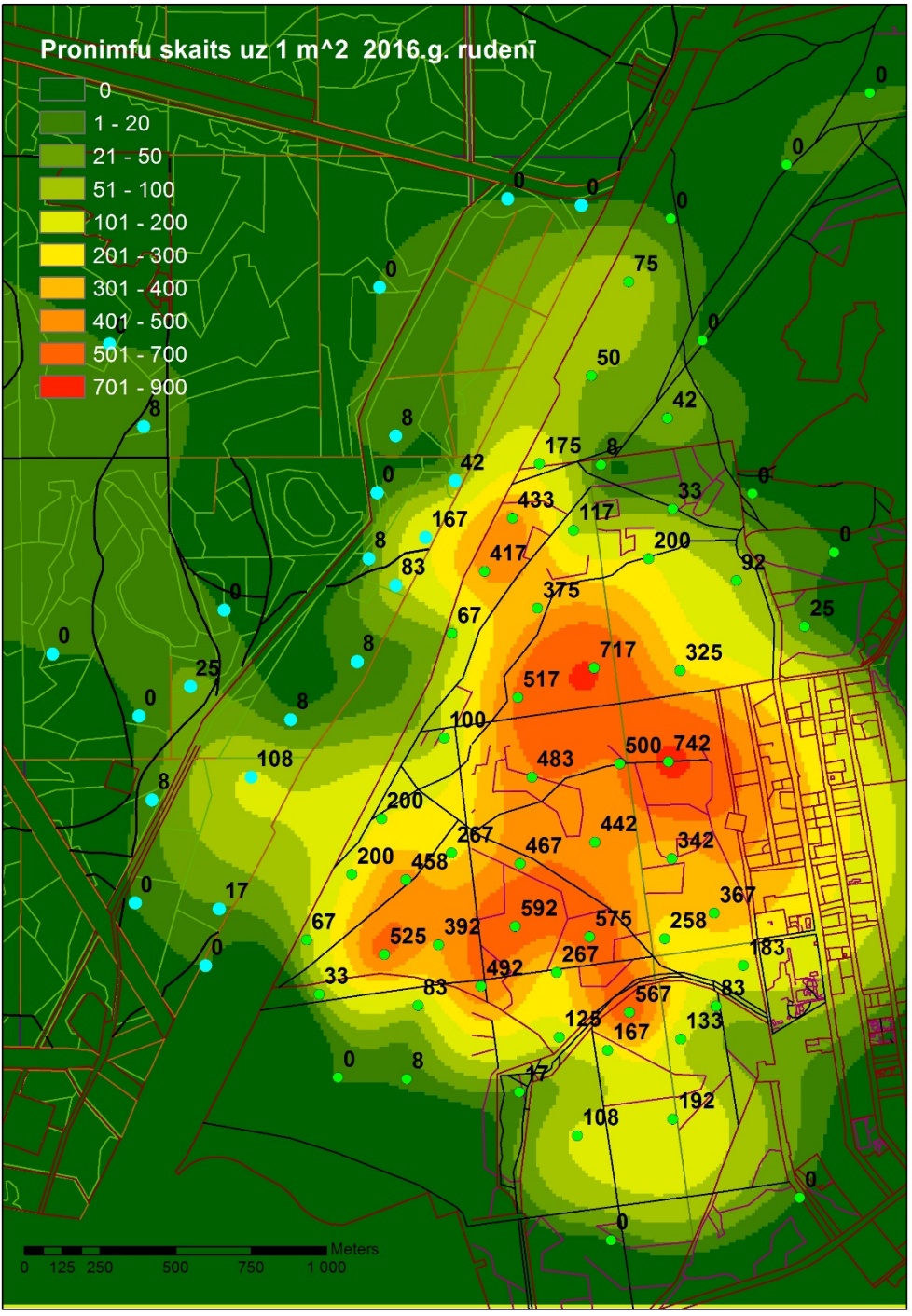
Study aim was to estimate the effect of inter-species competition on *Acantholyda posticalys* population

Count of pronymphs in spring 2017



High flight activity expected in summer 2017. More than 500 sawflies per m^2 were expected to emerge in outbreak epicentre.

Overwintering larvae and proportion of pronymphs estimated based on 81 sample plot with 3 samples per plot

Sawfly flight activity

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Plenty of eggs

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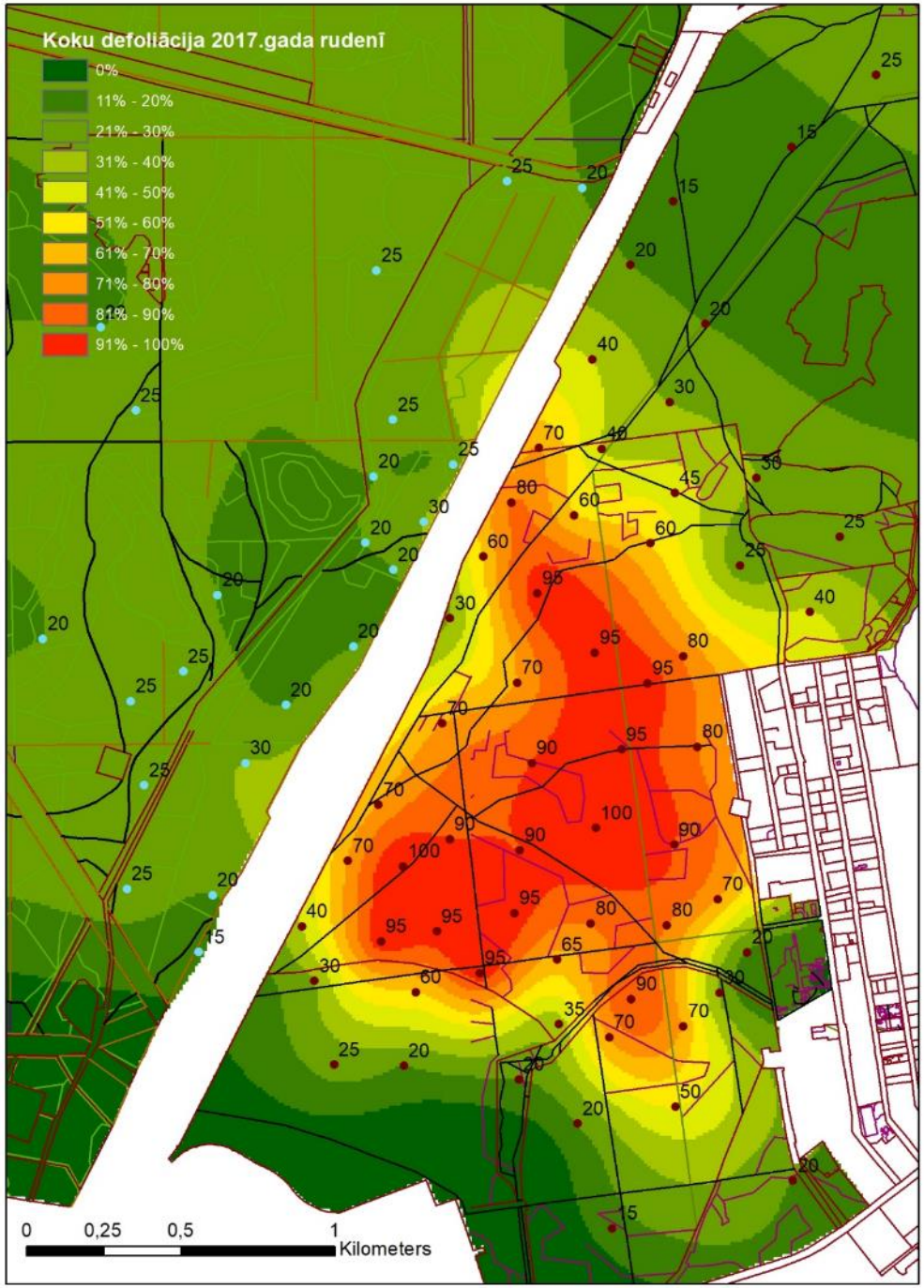
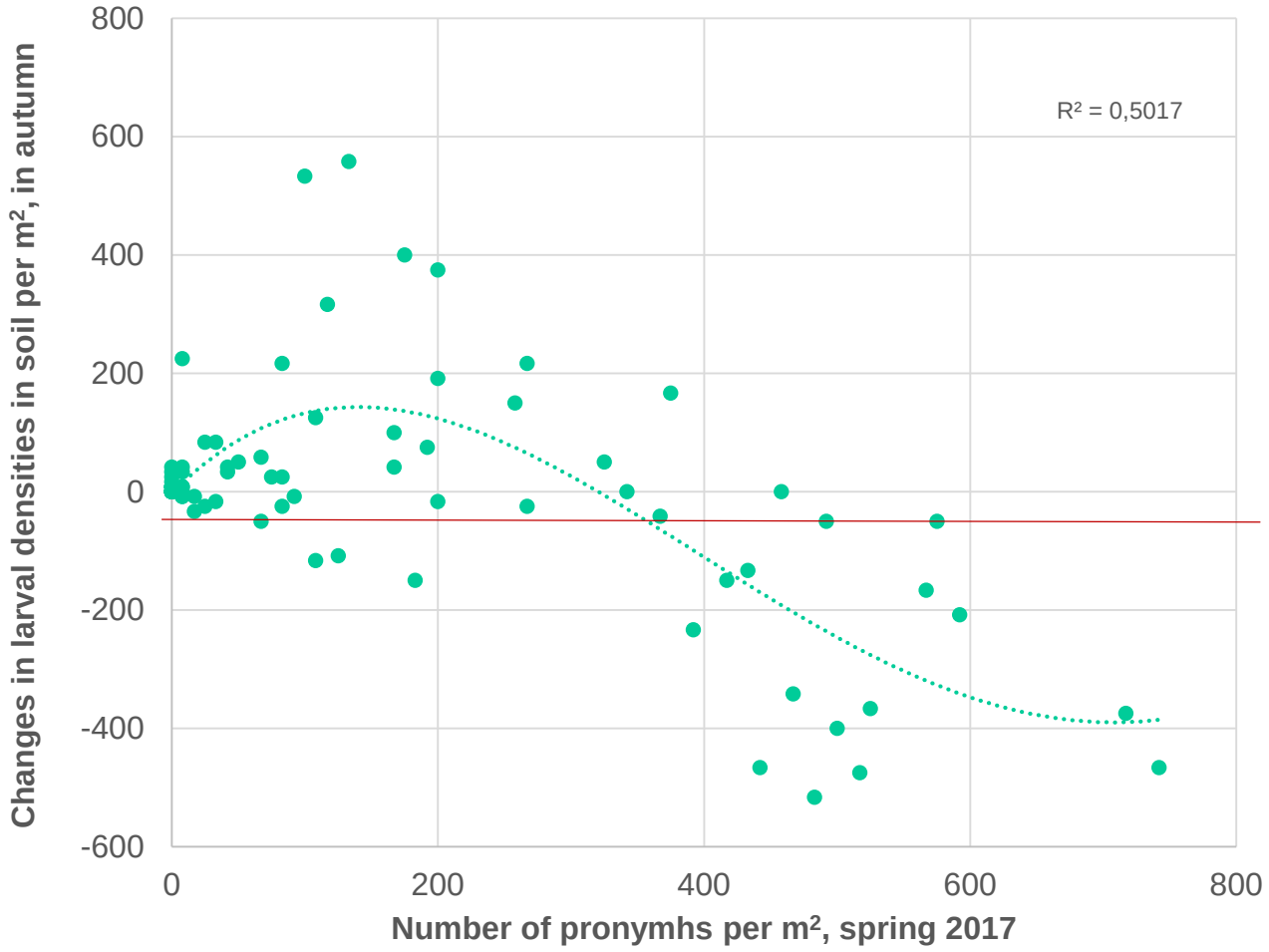
Defoliation of pine stands in autumn 2017

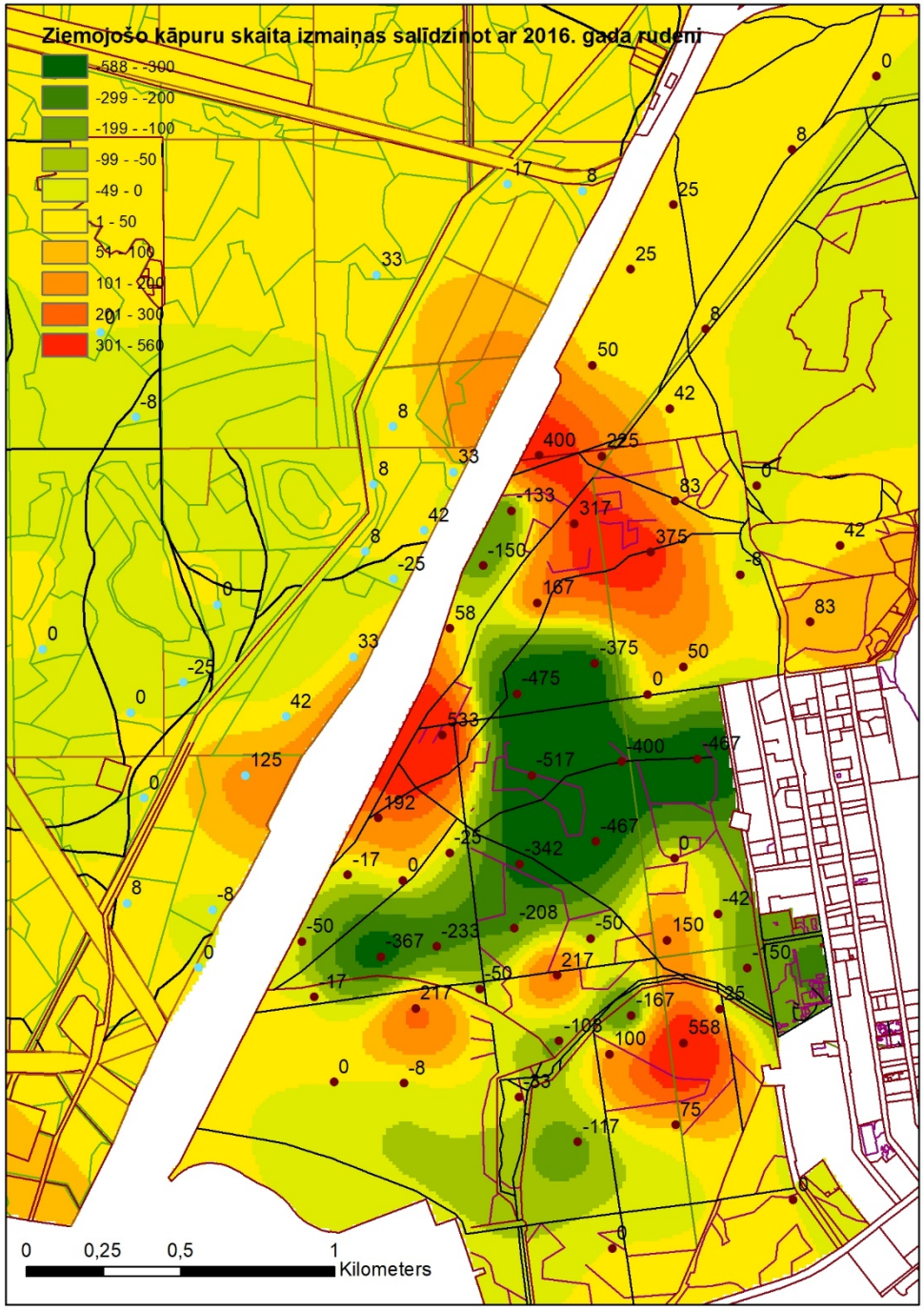


Defoliation estimated visually in 81 sample plot with 10%increment.

Relationship between pronymph density and population increase



Population changes- number of overwintering larvae per m^2



1. Outbreak epicentre moves North
2. Population significantly decrease in former outbreak epicentre

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Ground traps

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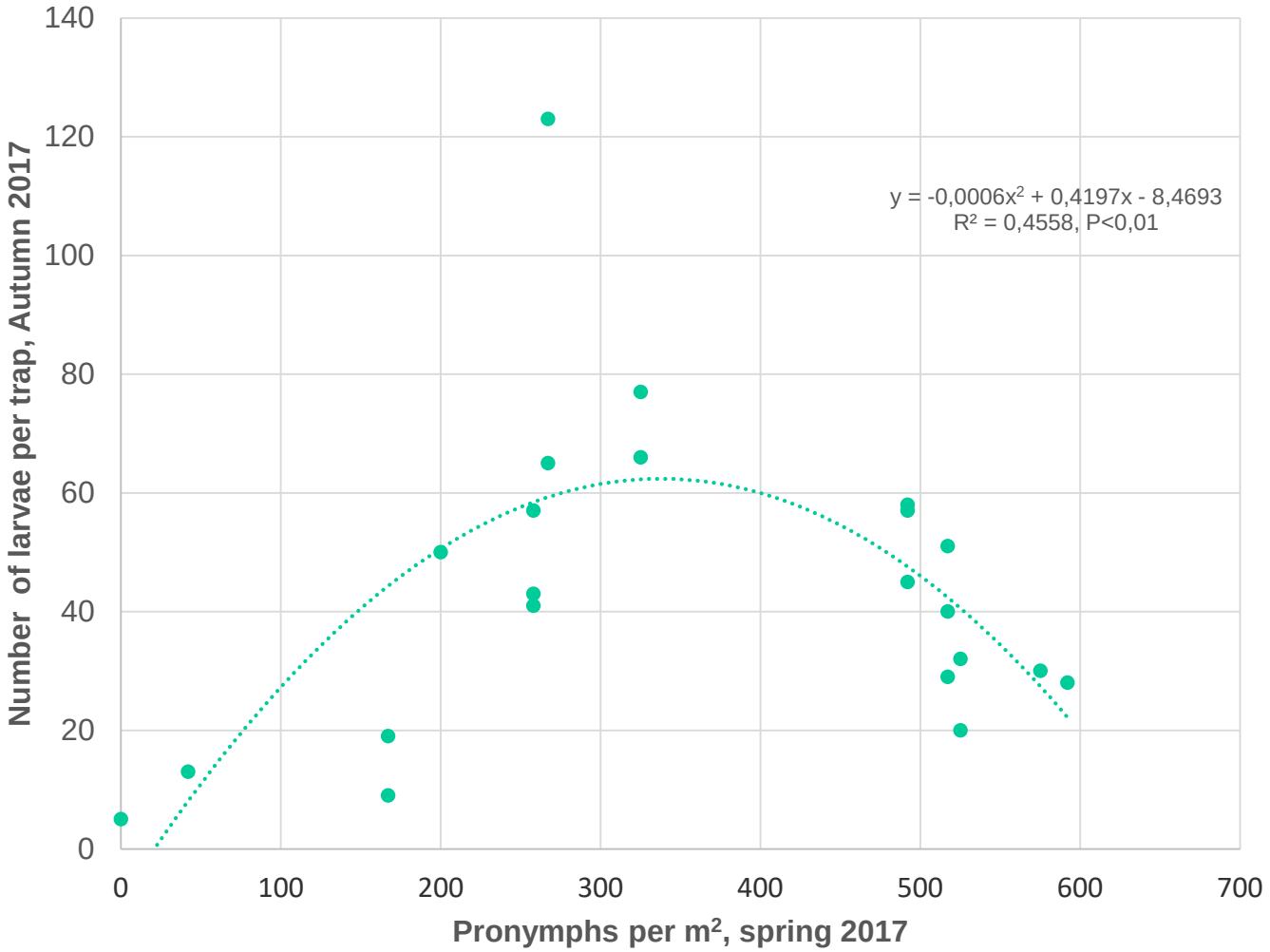
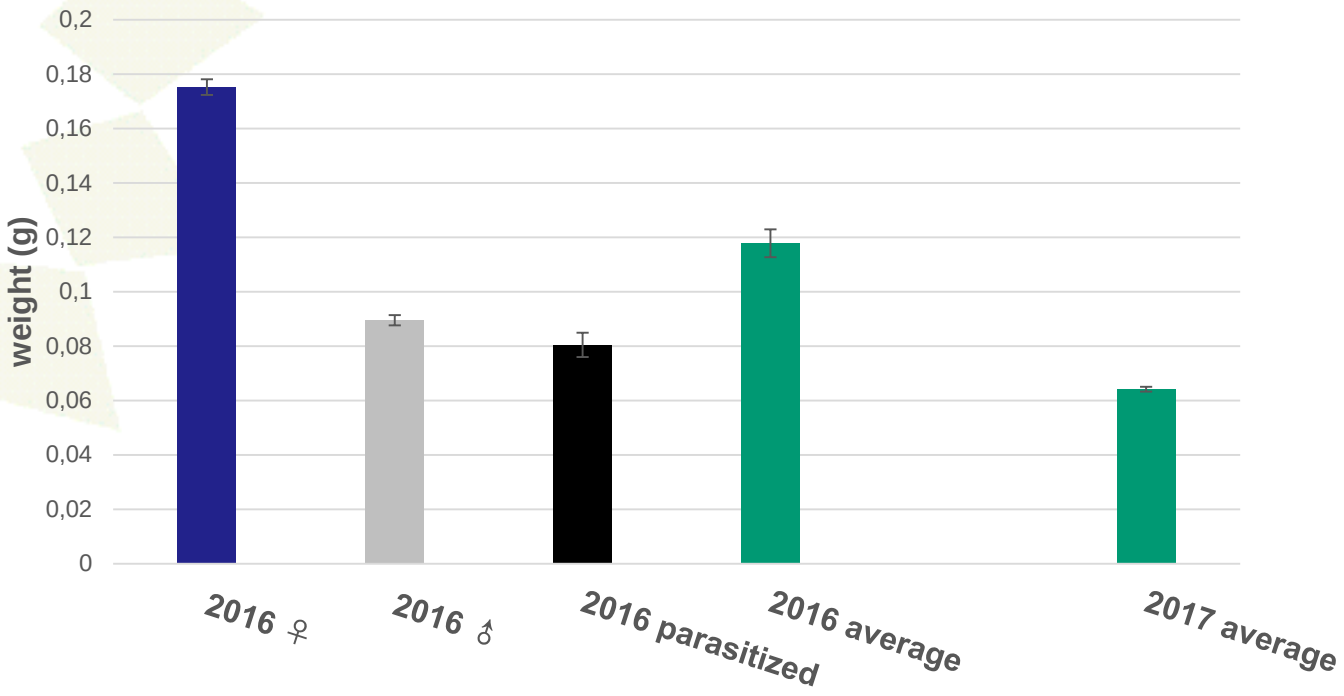
Relationship between pronymph density per m^2 in the spring and resulting larvae in autumn

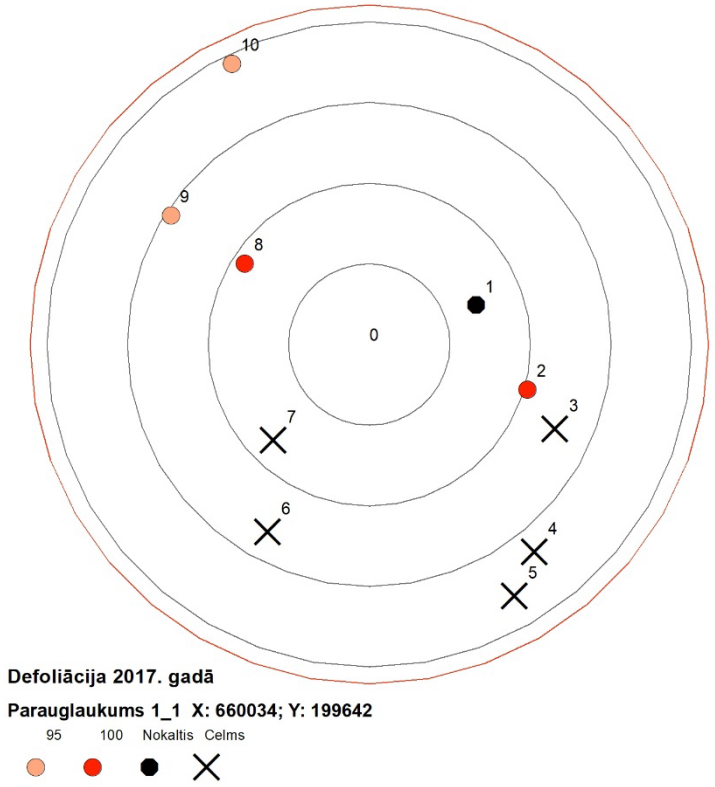


Larval weight

Overwintering larvae weight (g) resulting from larvae feeding in 2017 season compared to overwintering larvae weight in autumn 2016



Acantholyda posticalis defoliation causes tree mortality



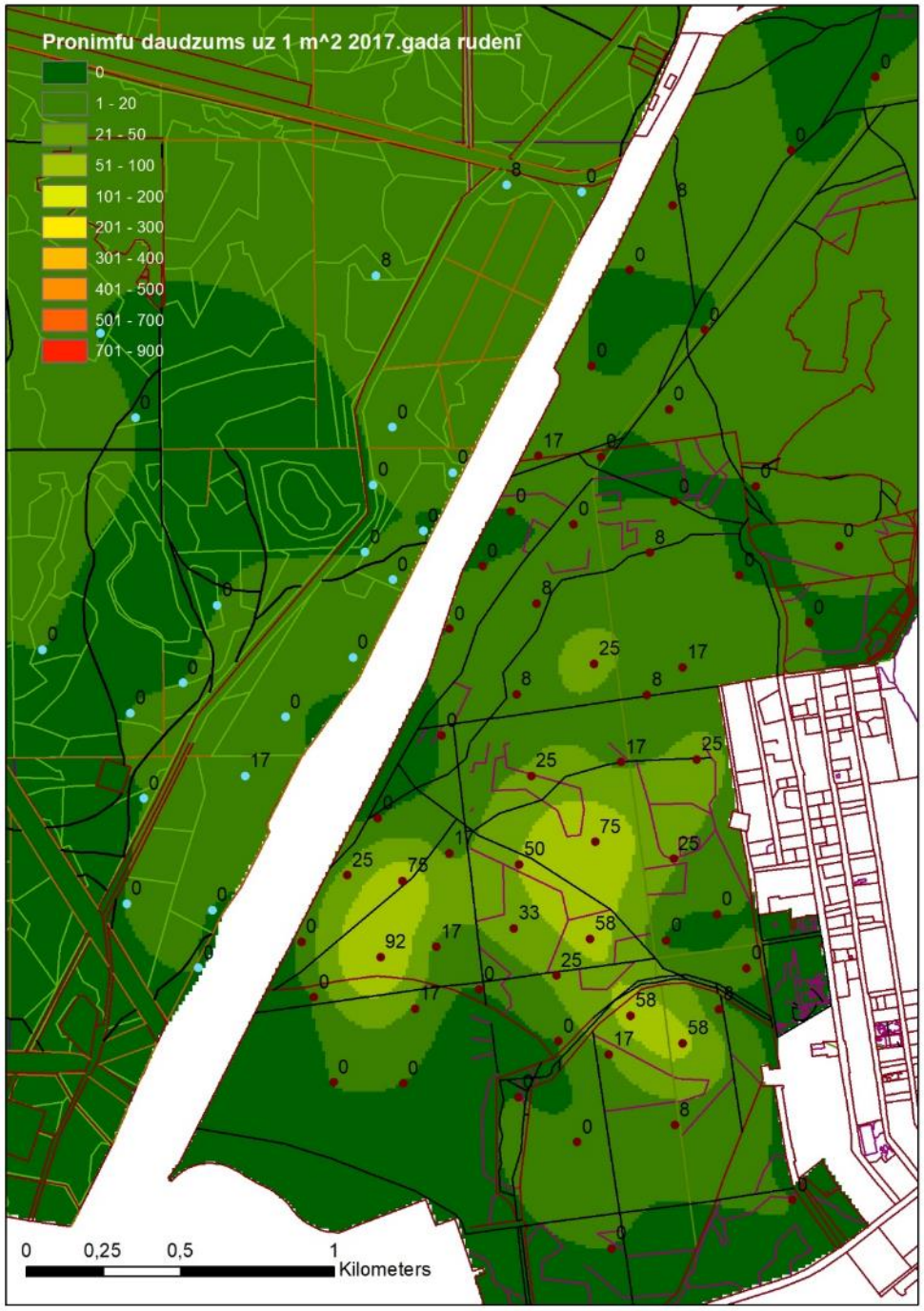
In August 2016 twelve sample plots (three control plots) 500 m^2 in size were established in order to evaluate effect of defoliation on pine growth

Natural enemies has chance to catch up

Parasitoids

- In autumn 2017 33% of *A.posticalis* larvae were parasitized
- Seven species of *Ichneumonidae* and 1 species of *Tachinidae* were identified, as well as one nematode

Prognosis for 2018



Most larvae fall in diapause, flight activity in 2018 is expected to be low

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Conclusions

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- High numbers of feeding *Acantholyda posticalis* larvae cause significant inter-species competition
- Pronymph densities exceeding 300 pronymphs per m^2 cause population decline
- Extensive flight in spring 2017 and consequently high larval competition for resources resulted in 46% decrease in weight of overwintering larvae
- Decreasing pest population increases impact from natural enemies
- Repeated defoliation by *A.posticalis* cause high tree mortality


Thank you for your attention!