



PROTECT OUR FORESTS AGAINST INSECTS OR PROTECT CARIBOU? CAN'T WE DO BOTH?

Mathilde Robitaille • May 3rd

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Since 1985, 10 millions ha of forests in Canada have been sprayed against outbreaking insects...



... but no study has evaluated the effects of these sprayings on understory communities

Why is understory vegetation important?



It is therefore important to consider understory vegetation in our forest management practices

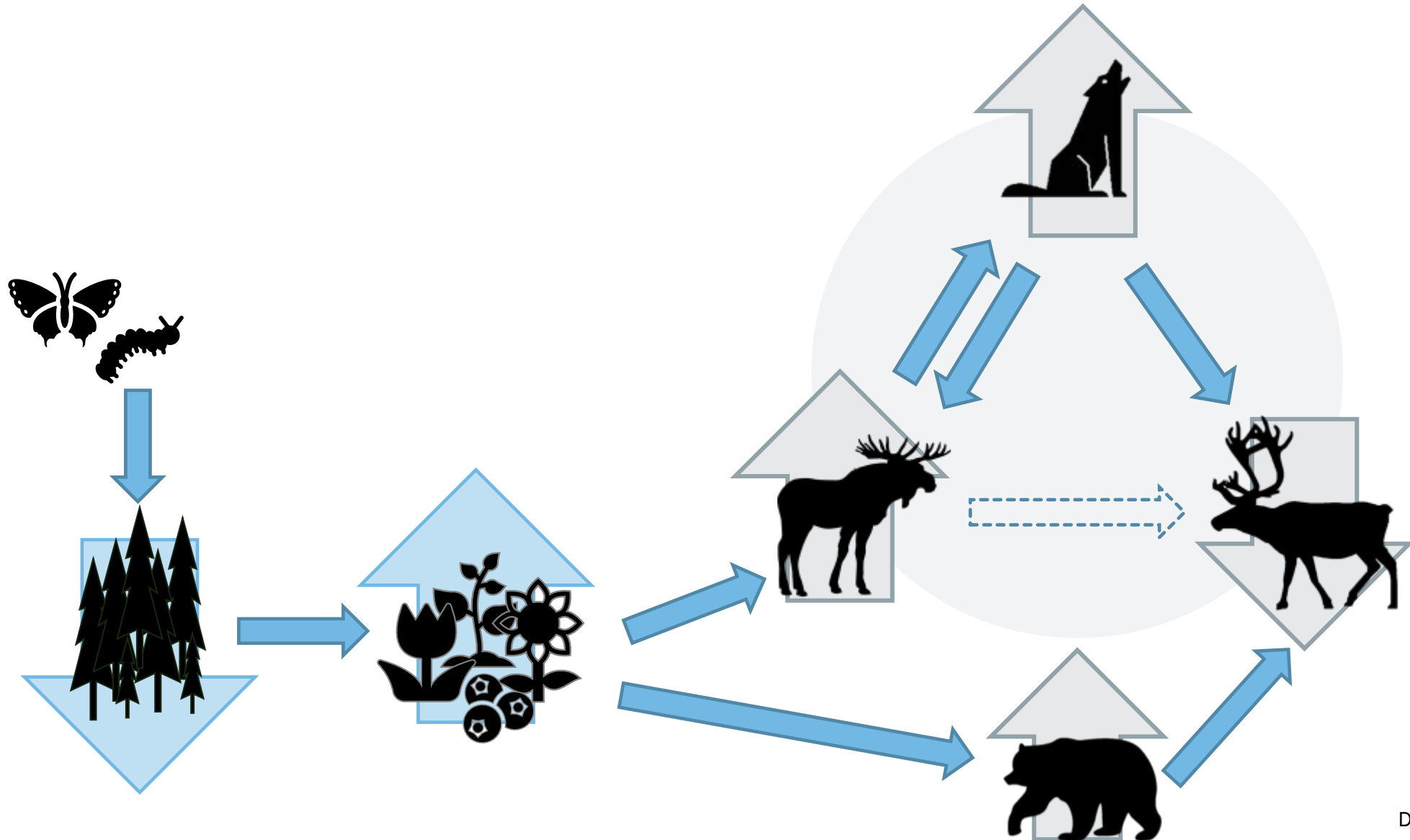
Spruce budworm (SBW) is the most damaging outbreaking insect in North American boreal forests



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SBW epidemics can alter predator-prey interactions

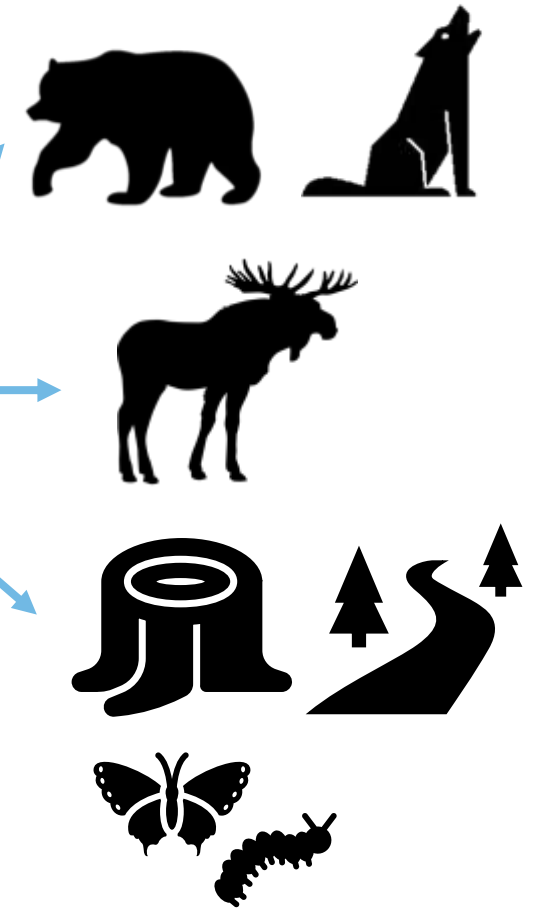


The main threat on woodland caribou is habitat loss

✓ Selects



✗ Avoids

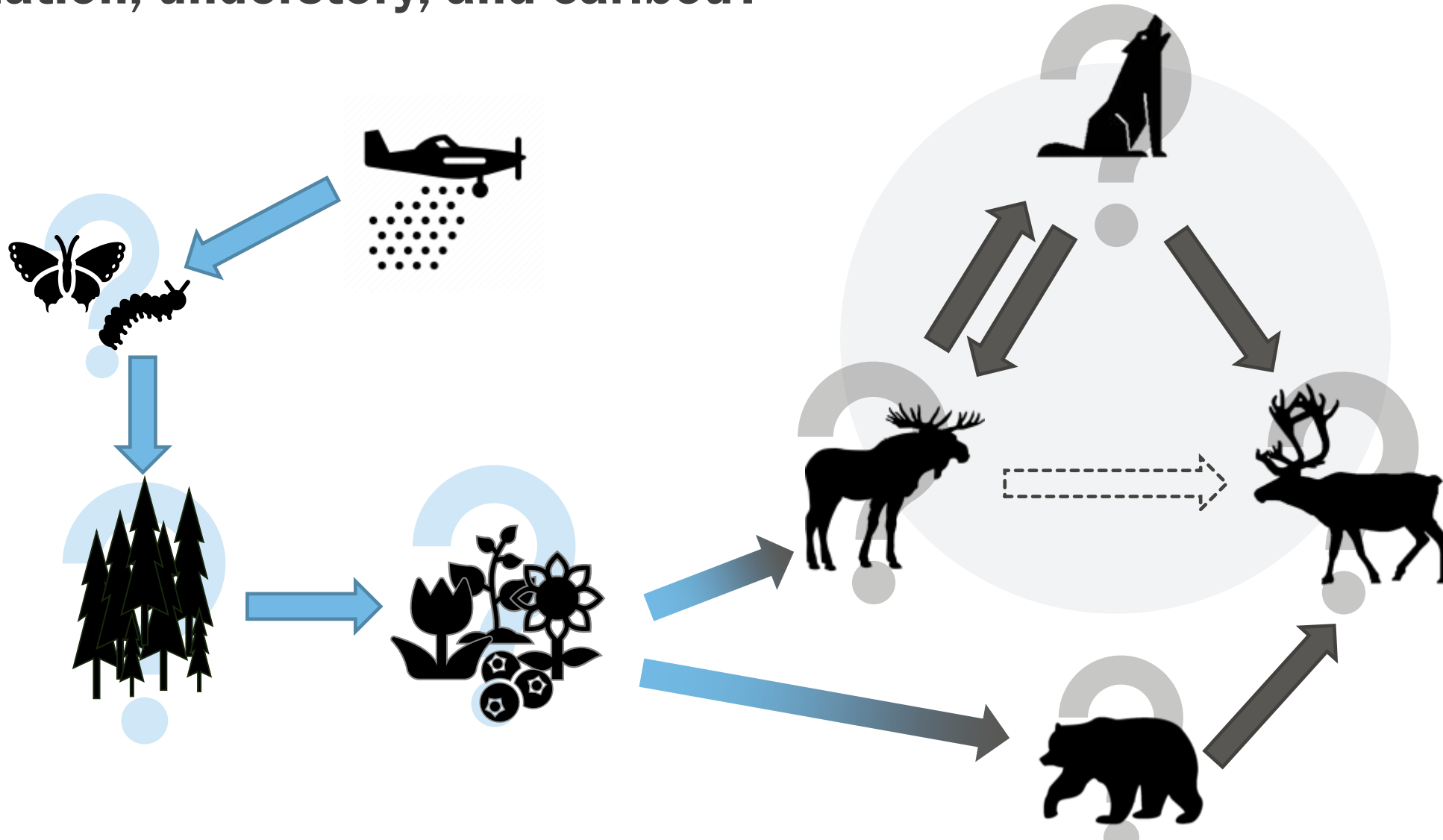


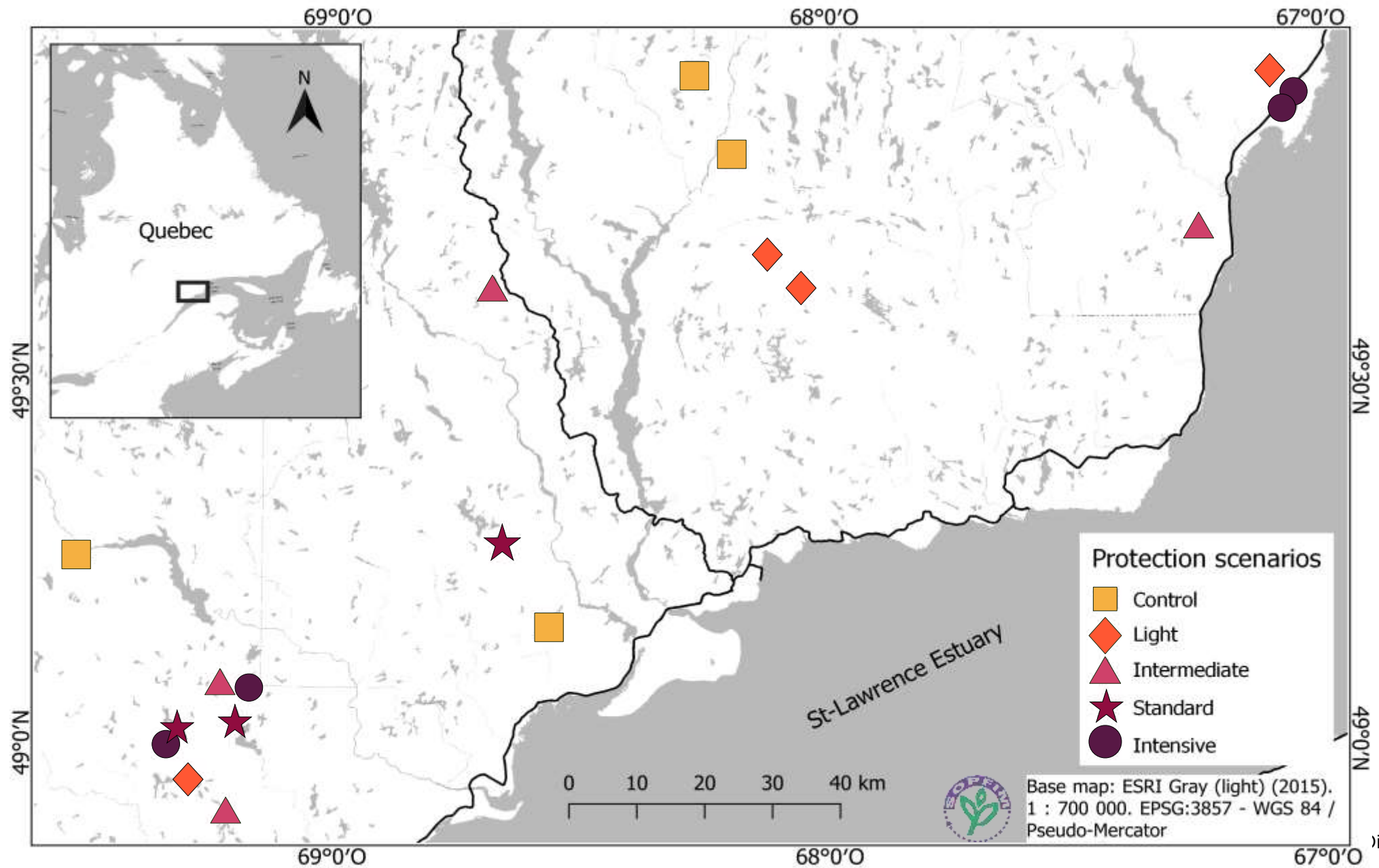
SBW epidemics can be controlled with Btk formulation insecticide








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What would be the effect of various Btk spraying frequencies on defoliation, understory, and caribou?

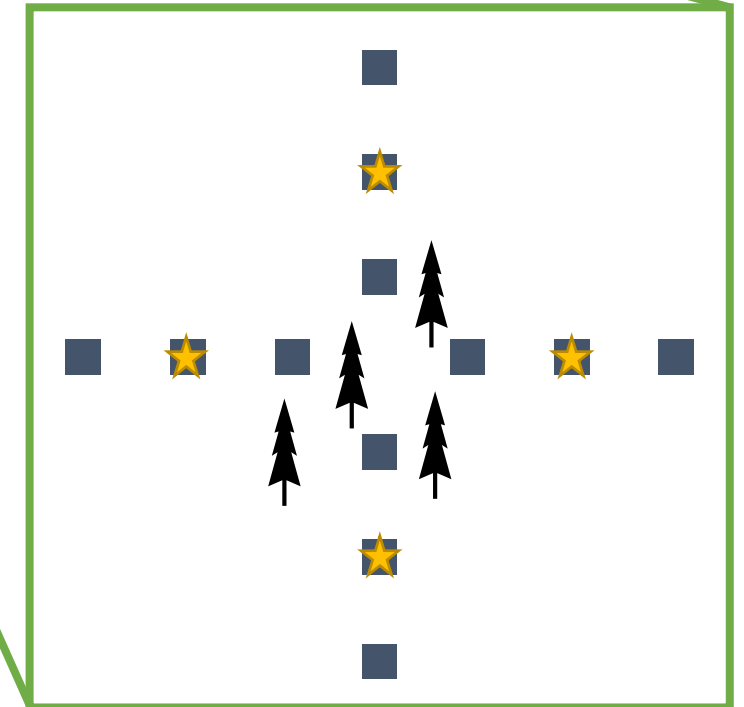
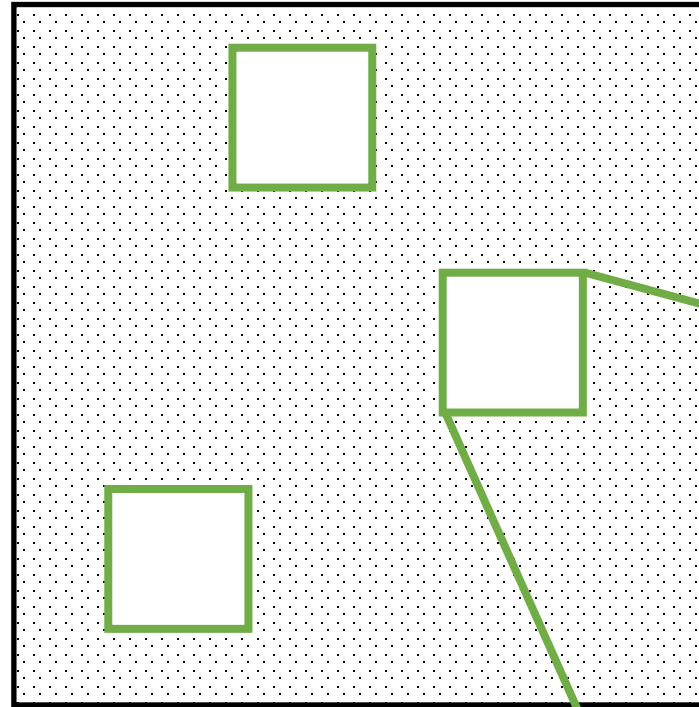




SAMPLING

-  100 ha experimental unit
-  400m² plot
-  1m² subplot: fruits and vegetation
-  Defoliation measures
-  Arboreal lichen biomass

ANALYSIS: GLMM



We used hemispherical photography to measure stand plant material and assess defoliation



$$\text{Plant Area Index (PAI)} = \frac{\text{Plant material area (m}^2\text{)}}{\text{Sky area (m}^2\text{)}}$$

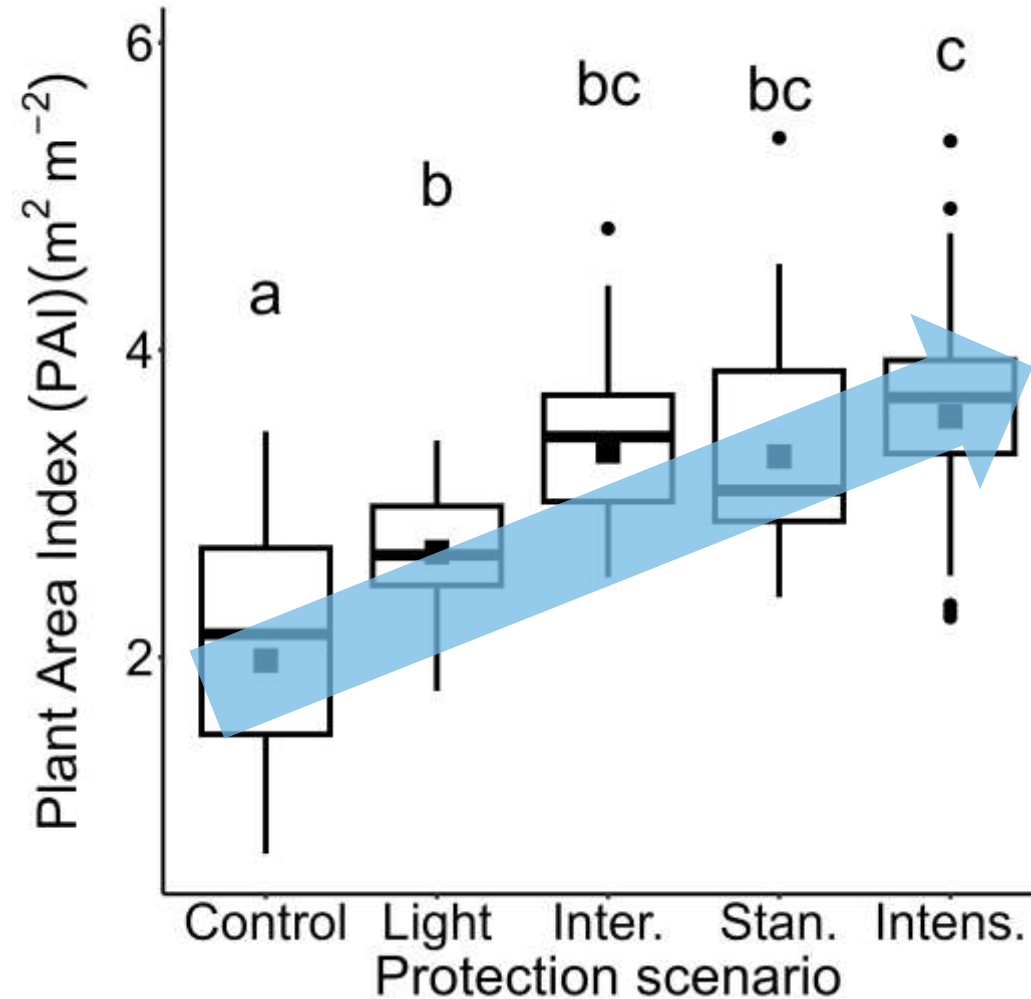


Low PAI

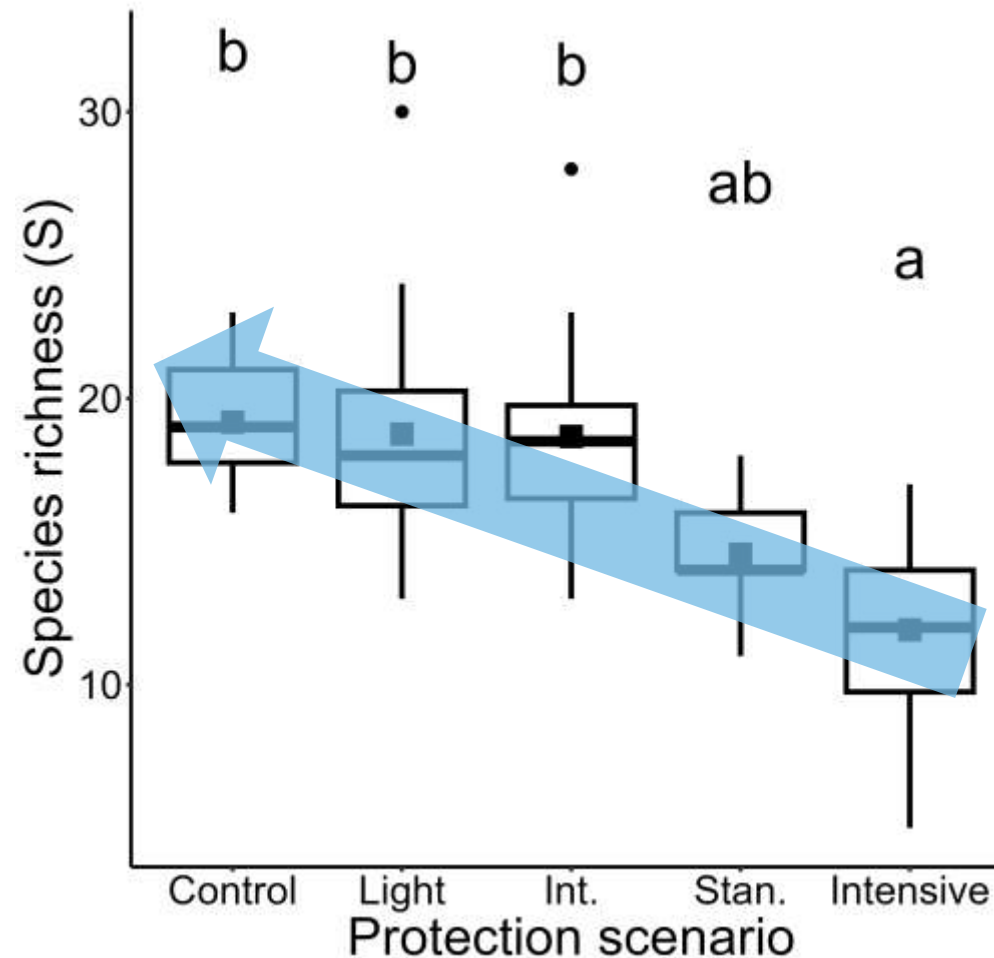


High PAI

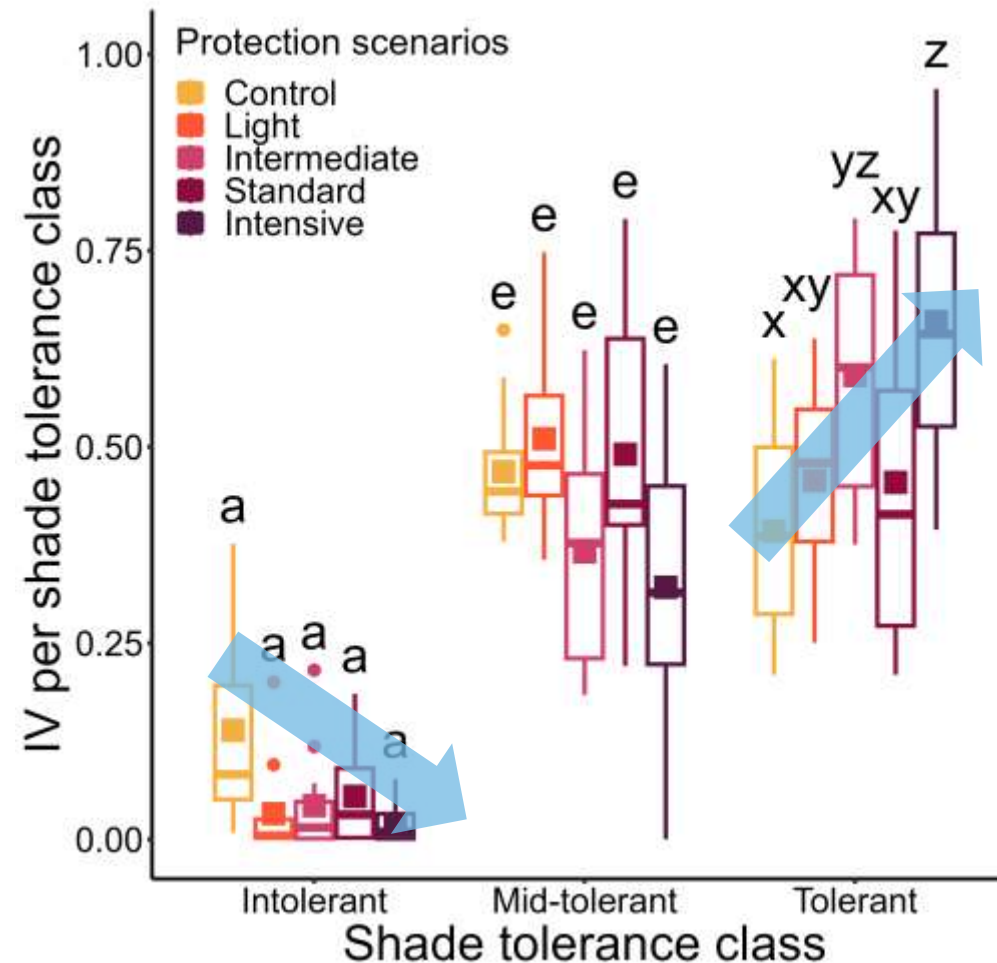
Stand plant material (PAI) increases with an increase in treatment frequency



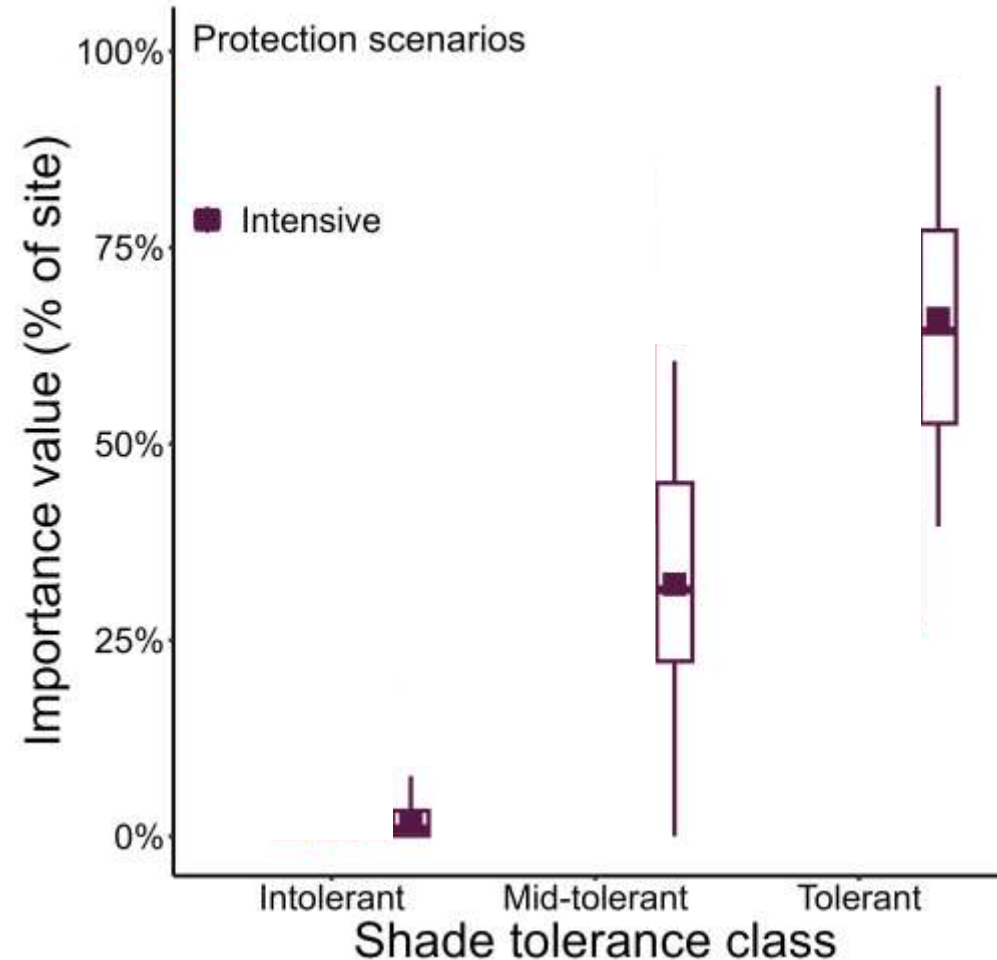
Species richness increases with decrease in treatments frequency



Treatment frequency influences community shade tolerance

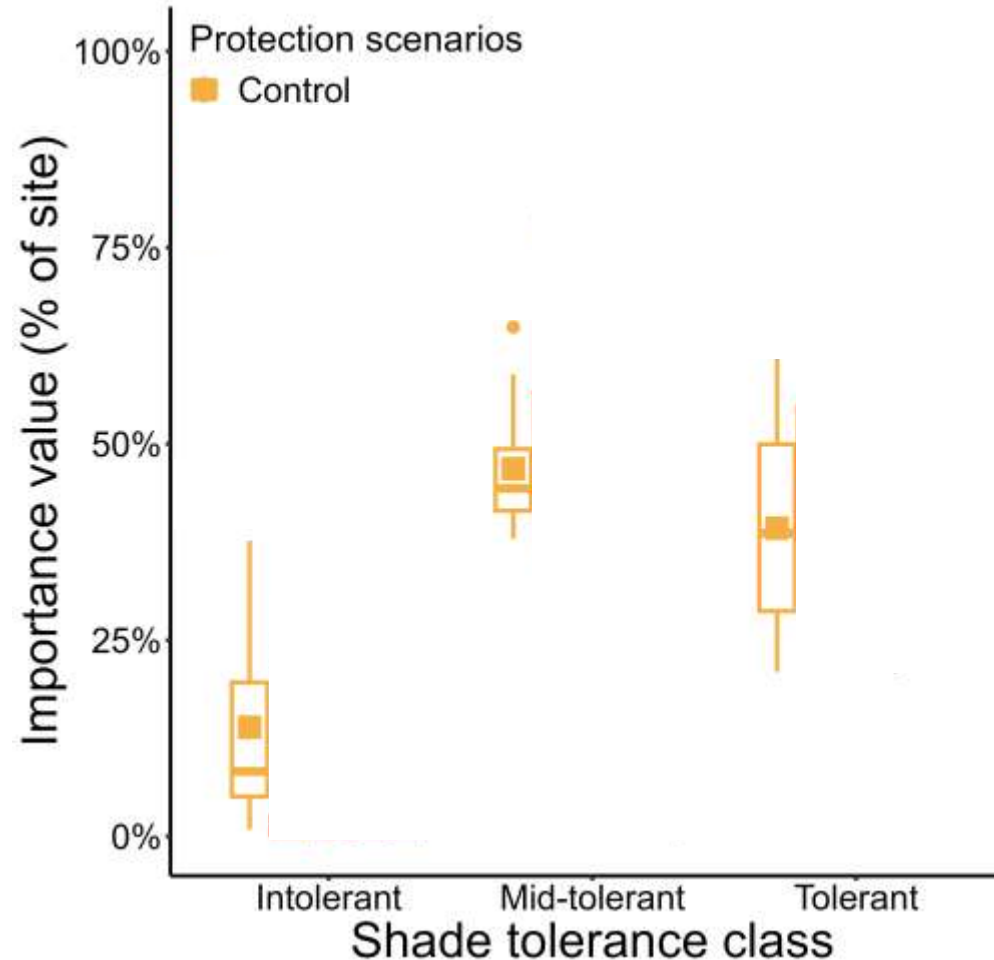
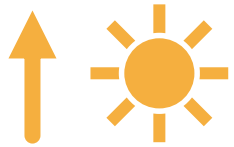


Frequently treated sites are almost only composed of shade-tolerant species...

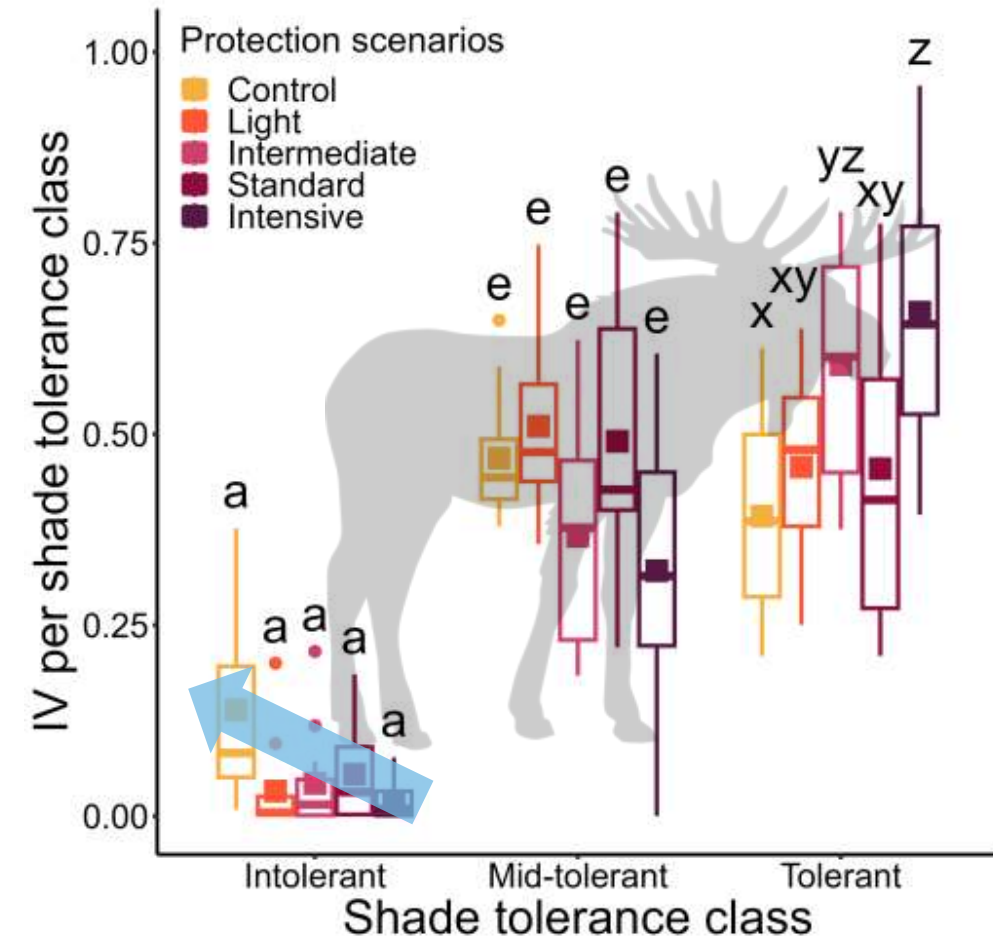


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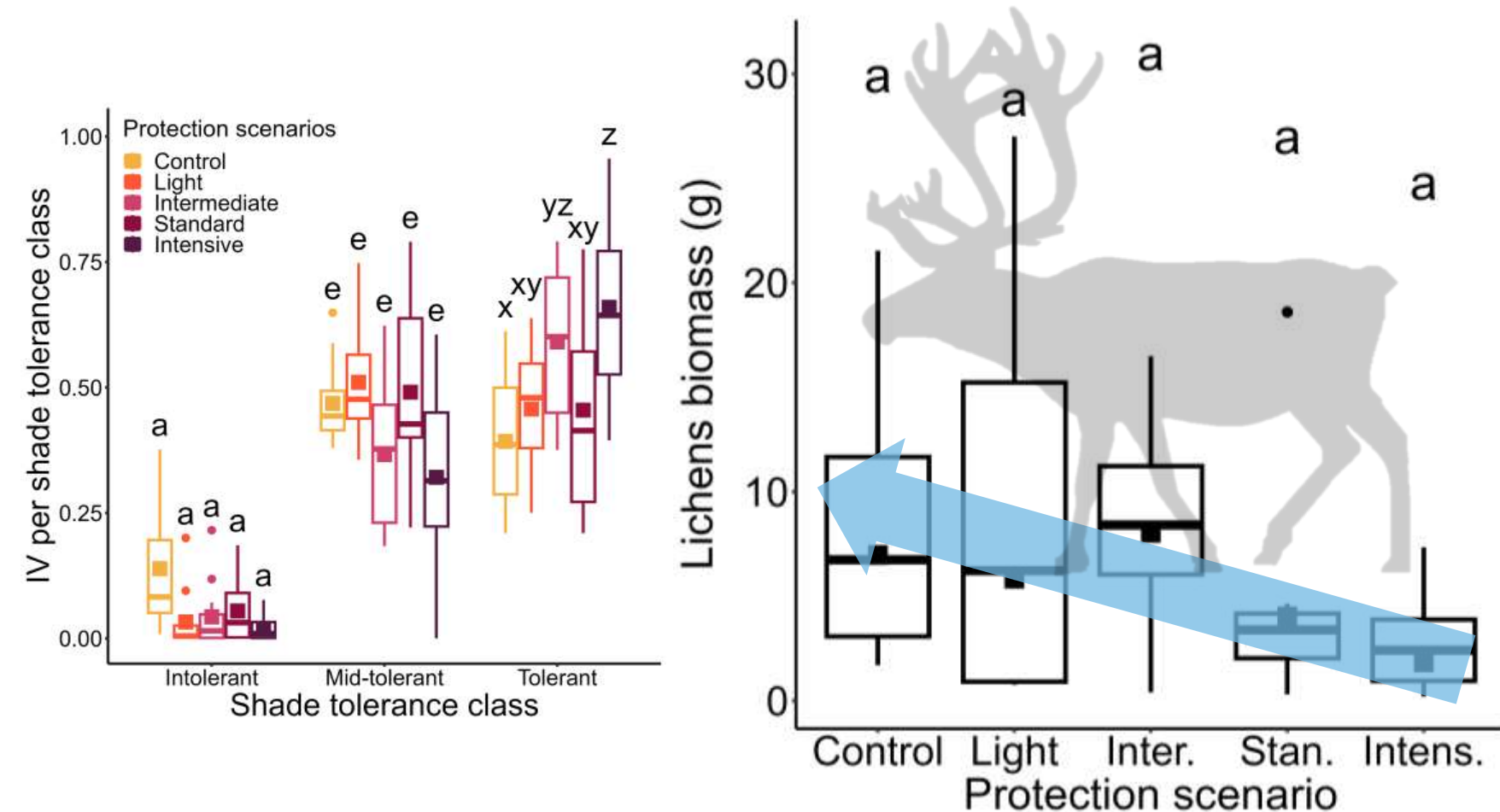
While low treatment frequency promotes BOTH shade-intolerant and shade-tolerant species



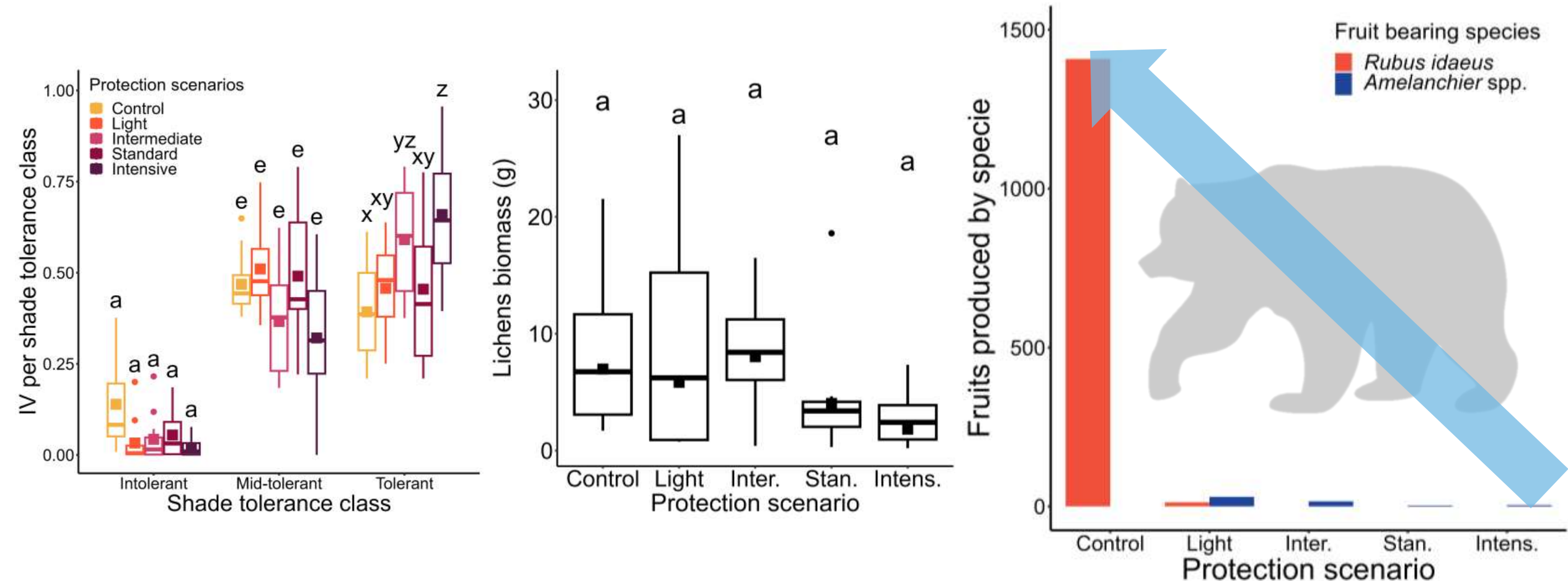
What are the effects of Btk treatments on wildlife forage?



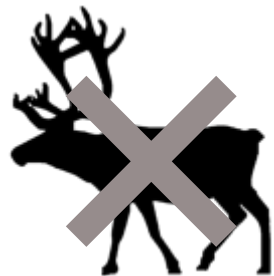
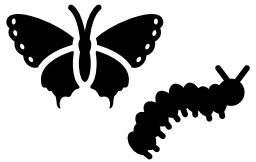
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What are the effects of Btk treatments on wildlife forage?












A decrease in Btk spraying frequency may lead to habitat loss for caribou



Intermediate treatment is a win-win-win treatment

What are the long-term effects on forest dynamic?

Treatments	1. Stand defoliation (PAI)	2. Understory diversity	3. Wildlife forage
Control			
Light			
Intermediate			
Standard			
Intensive			

Will treatments really affect habitat selection for caribou and interacting species?



THANK YOU! ANY QUESTIONS?

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