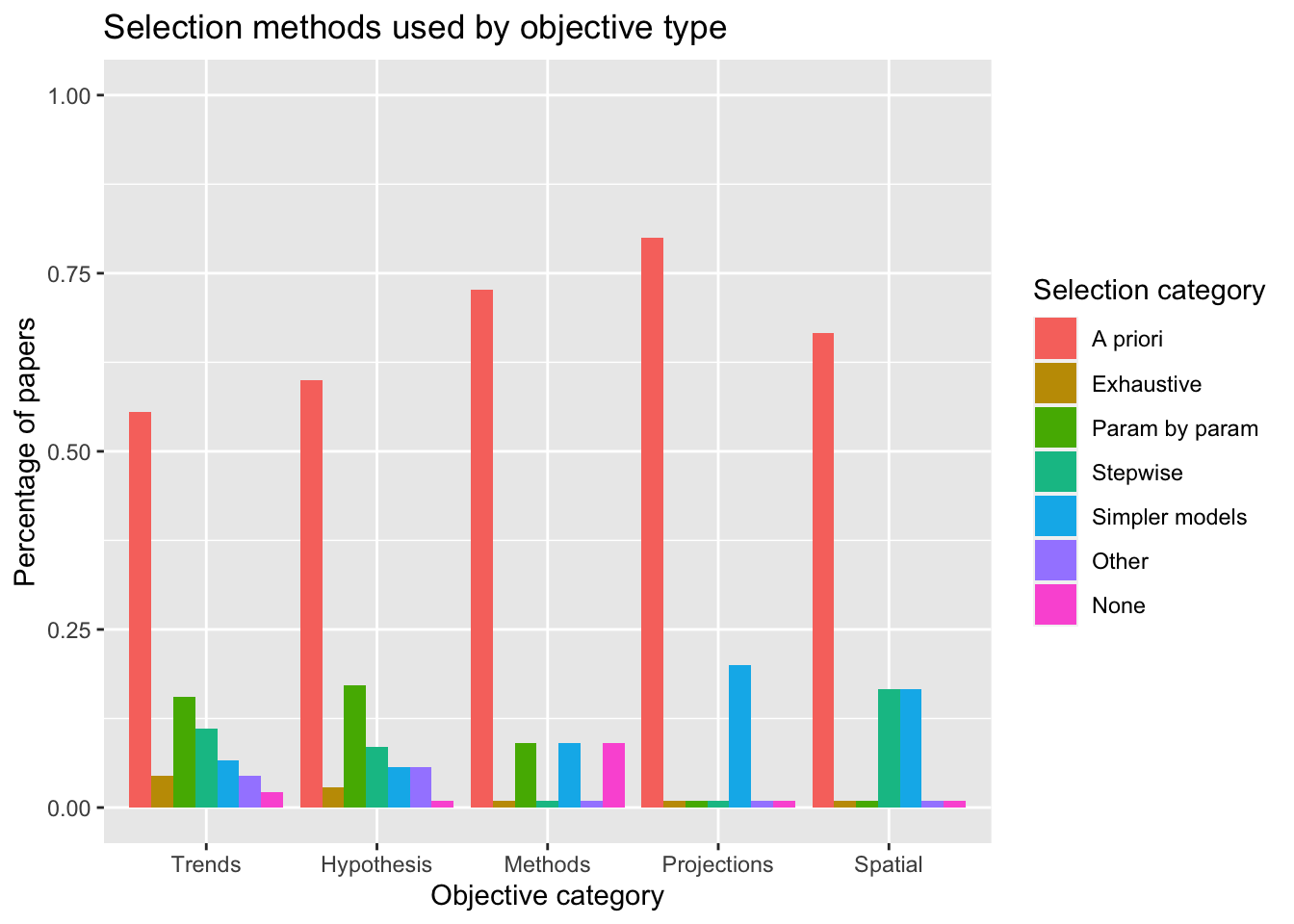
# Discussion

* DOMs are widely used, for many species, with many different types of data, in studies of all sizes.
* Good diversity of covariates are used reflecting different system; but number considered varies dependent on study objective

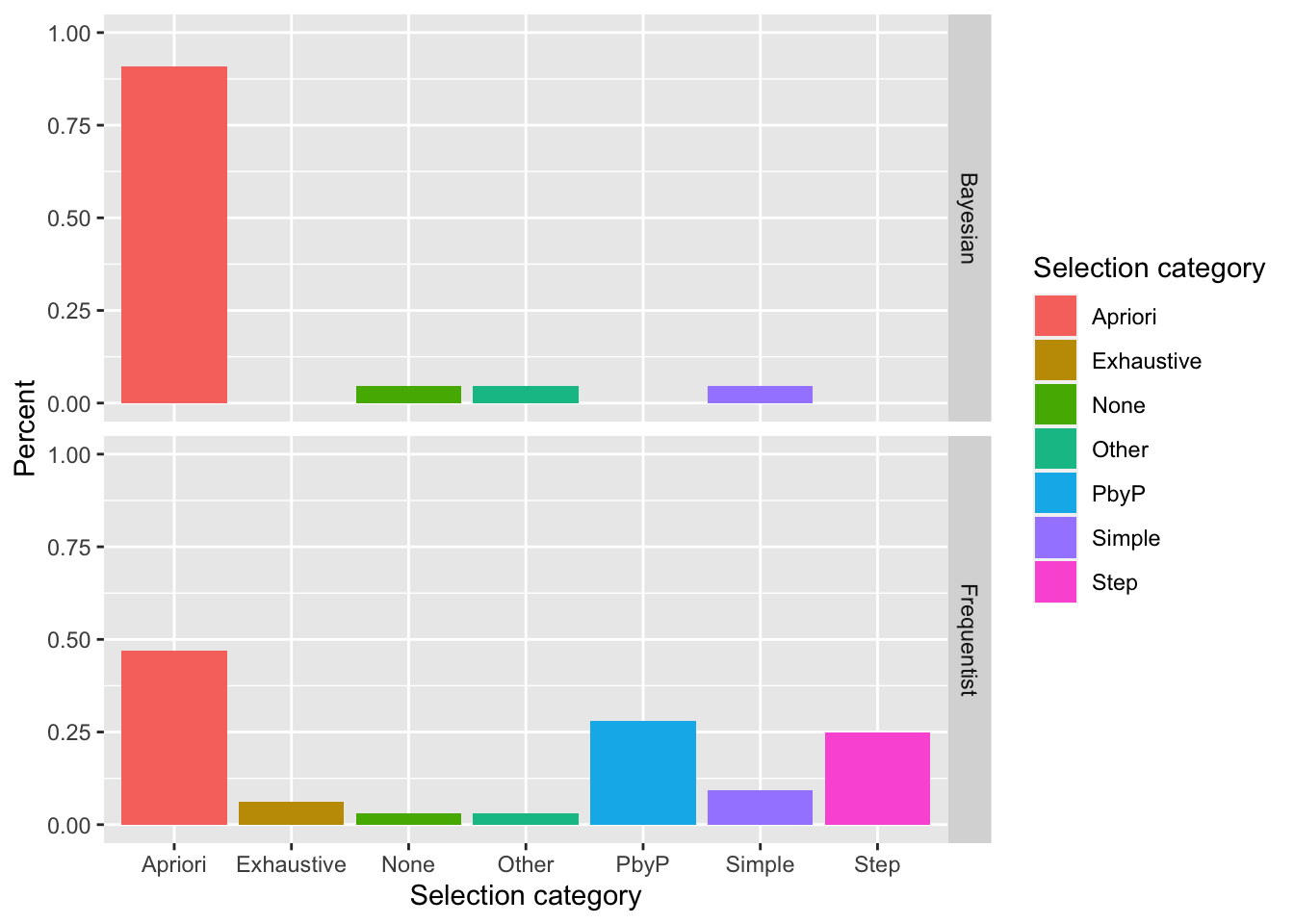
Chart

Description automatically generated

* Concerning that higher order and interactive covariates are rare, considering their importance in ecological relationships.
* Model selection methods also vary by the reason which authors used them for, this is of concern because of the heterogeneity assumption – variation unrelated to the main hypothesis still must be accounted for.



* There is quite a disparity between model selection in Bayesian vs Frequentist models, cause is unclear but possibly related to computing requirements.



* Model evaluation is particularly uncommon, very few studies go beyond AIC in assessing fit.

# Recommendations for developing dynamic occupancy models for applied ecology

* Considering the ‘candidate covariates,’ including those which pertain to specific hypothesis as well as background drivers of heterogeneity?
* Does the covariate type (i.e., static vs dynamic) appropriately fit the hypothesised relationship to the parameter?
* Considering the form statistical relationships between occupancy/detection and covariates take – are higher order terms or interaction terms necessary?
* What is an appropriate method for model selection given the system, data, and computing resources?
* Is there sufficient data available for more extensive evaluation of model fit, for example, out of sample validation?

# Conclusions

* Key points from review: DOMs are heavily used for important questions, but implementations are highly variable and some aspects are cause for concern – specifically in the model selection process.
* Lots of research has been done on closure but comparatively little on the heterogeneity assumption and what happens to estimates when they are violated.
* Rarity of meaningful model evaluation means that decisions are potentially being made without confirmation that models are appropriate fit.
* Guidelines are provided for best-practice considerations in the model building process to reduce risk of inappropriate model selection