Table 1. Overview of the nine models and the time (in seconds) it takes to run each model in R,

 ADMB, and BUGS. The 'nmix' and 'skate' models could not be fitted in R.

Name	Application	Type of model	R	ADMB	BUGS	Notes
orange	Orange tree growth	Logistic NLME	0.05	0.34	1.83	
min	Mineralization of terbuthylazine	NLM with ODE	12	0.6	51	R optimizer 'nlminb' performed best
nmix	N-mixture models with random effects	Binomial mixture model	-	240	720	
owls	Owl nestling negotiation	Zero-inflated GLMM	15.5	4.5	725.9	R optimized with hand-coded EM algorithm
skate	Skate length-based stock assessment	State-space population model	-	13.0	174.2	
tadpole	Tadpole mortality as a function of size	Binomial MLE	0.066	0.031	0.194	
theta	Population growth	State-space theta-logistic	533.9	5.9	122.2	R solution used specialized code adapted from Matlab
weeds	Weed density over time	Logistic NLM	0.008	0.096	1.018	
wildflower	Flowering stage and seed production	Binomial GLMM	56	21	525	