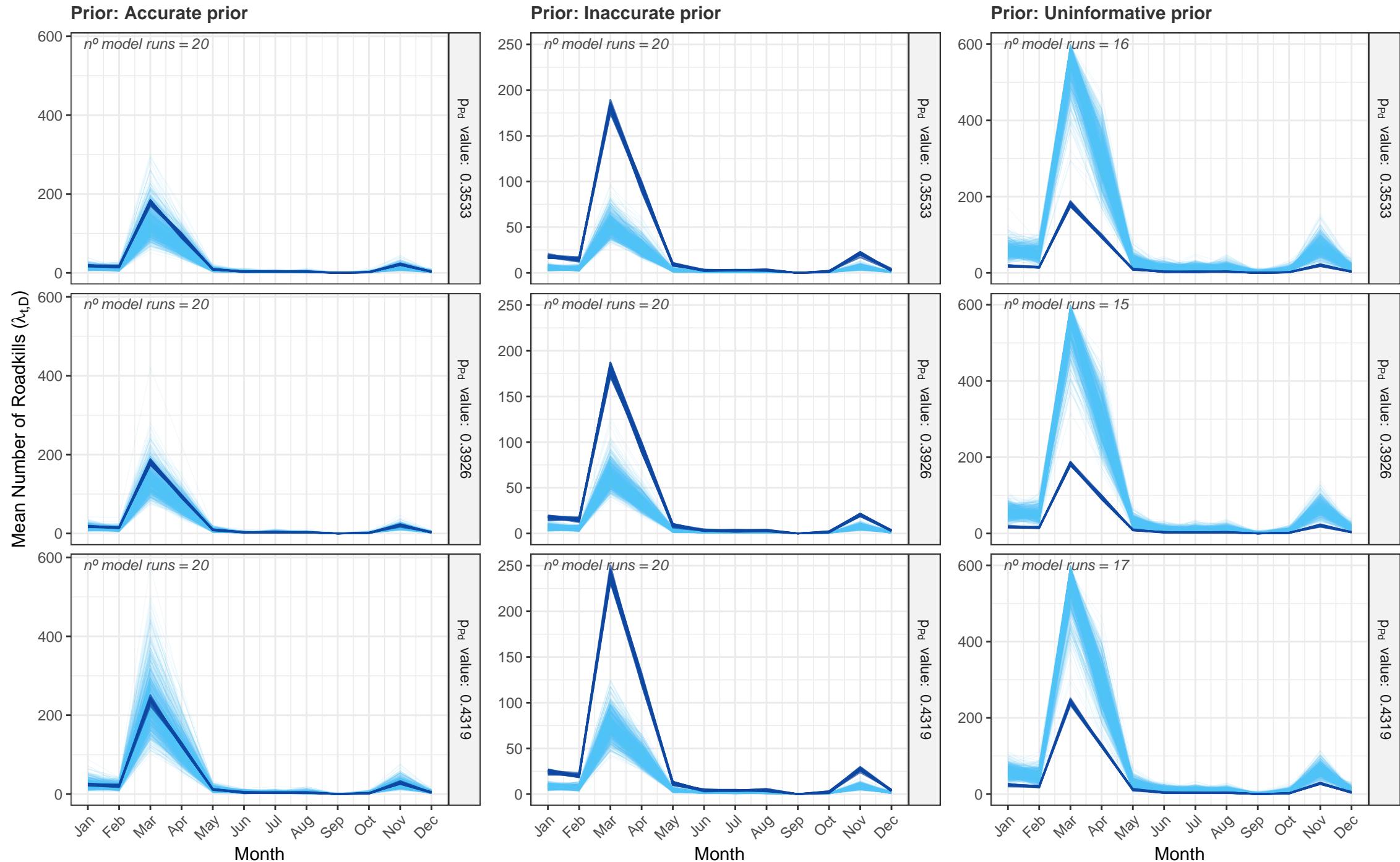


A method to estimate actual infrastructure-induced mortality by integrating sampling biases

Supplementary material S17: Results of the prior sensitivity analyses. Posterior estimation overlap for total number of roadkills and carcass bias probabilities across vertebrate groups. The analysis compares three p_L and/or p_P prior information scenarios (Accurate, Inaccurate, and Uninformative) across datasets generated using p_L and/or p_{Pd} values derived from literature and values deviated by $\pm 10\%$. The annotation "n° model runs" specifies the number of valid simulations (out of 20 replicates) where the model successfully converged. Time-series plots: Comparison between the true simulated values (dark blue lines) and the Bayesian posterior estimation (light blue bands representing 50 posterior samples per simulation) for the mean ($\lambda_{t,D}$) and total ($N_{t,D}$) number of roadkills throughout the year. Violin plots: Posterior distributions of the recovered carcass location (p_L), persistence (p_P), and observation (p_{Om} : walking, cycling, driving) probability, red horizontal dashes indicate the true simulated parameter values used to generate the data.

Amphibians: Posterior Estimation Overlap per Simulation Scenario

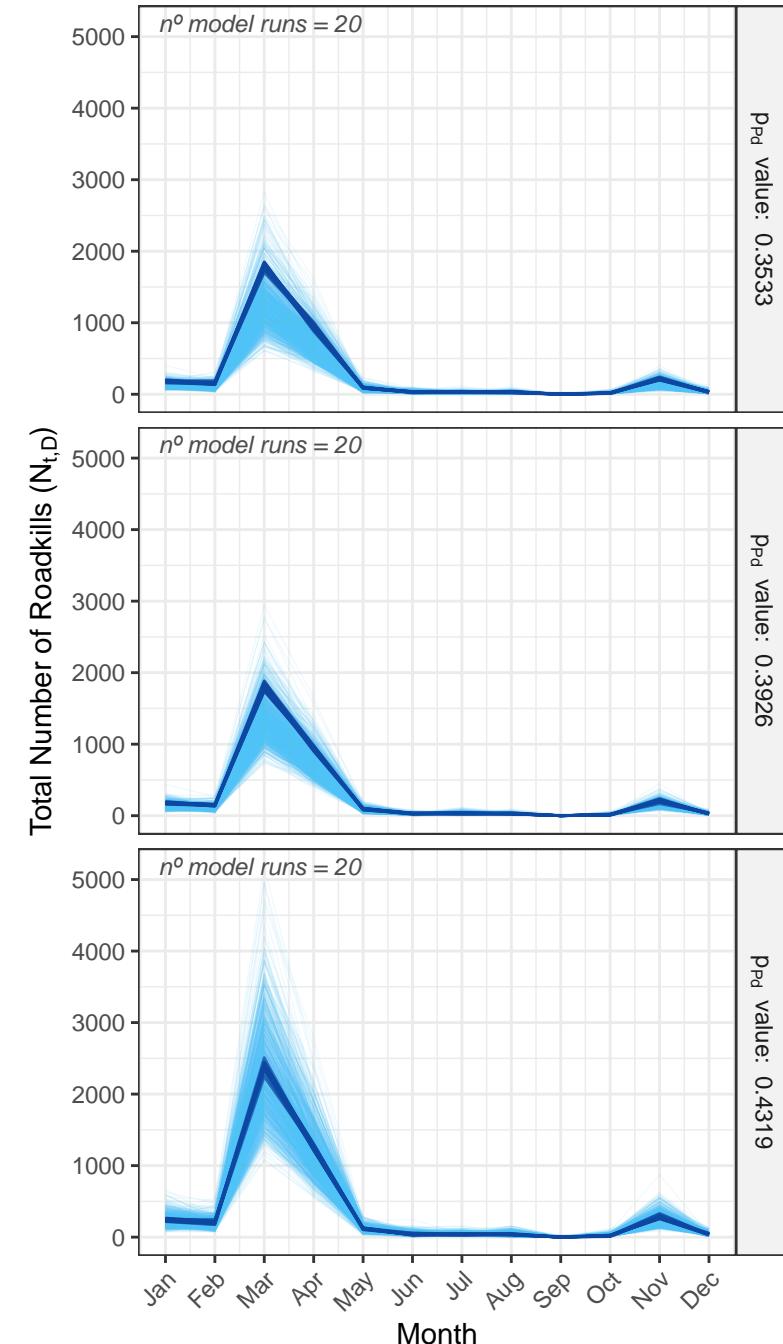
Light Blue Bands: 50 posterior samples per sim | Dark Lines: True Simulated Values



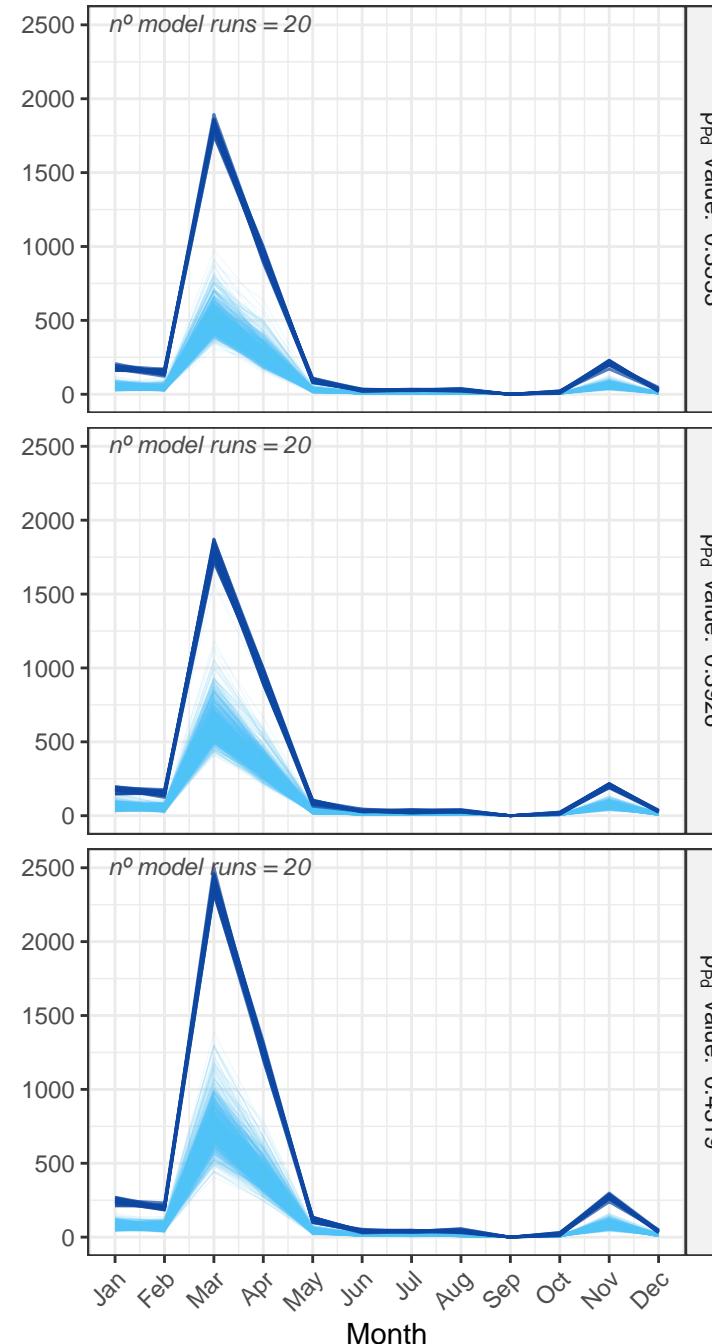
Amphibians: Posterior Estimation Overlap per Simulation Scenario

Light Blue Bands: 50 posterior samples per sim | Dark Lines: True Simulated Values

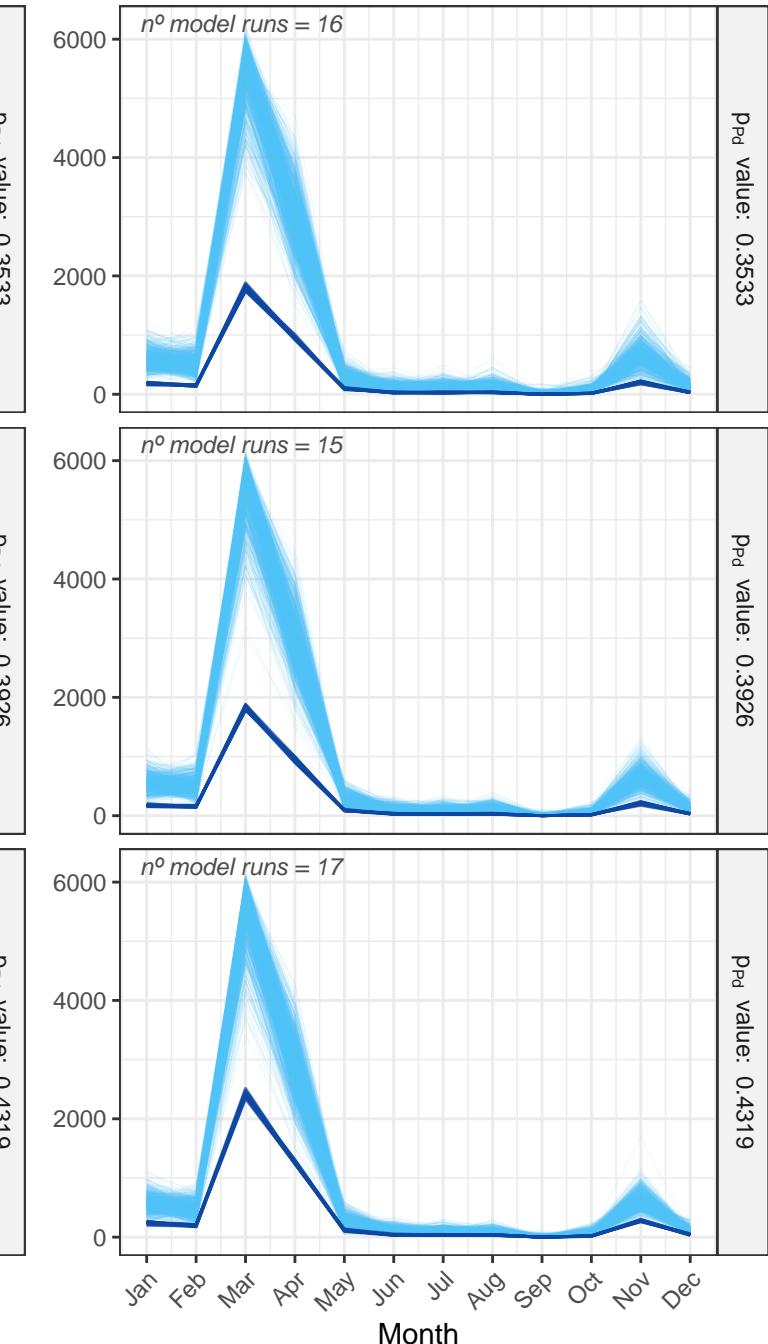
Prior: Accurate prior



Prior: Inaccurate prior



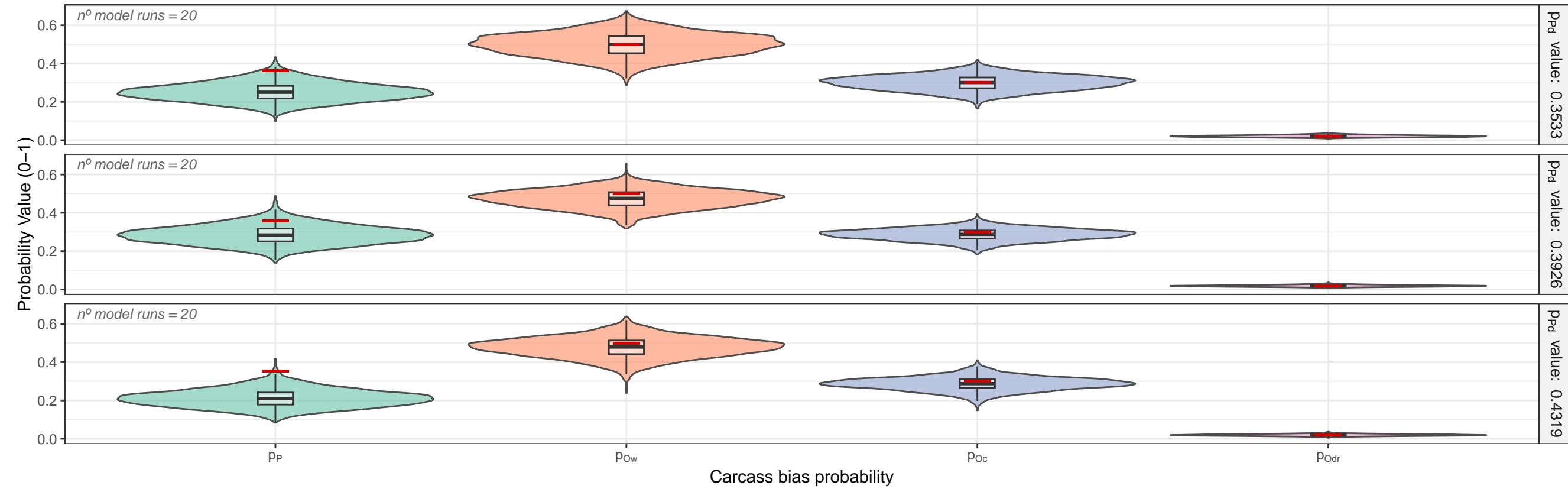
Prior: Uninformative prior



Amphibians – Complete carcass bias probabilities recovery across simulation scenarios

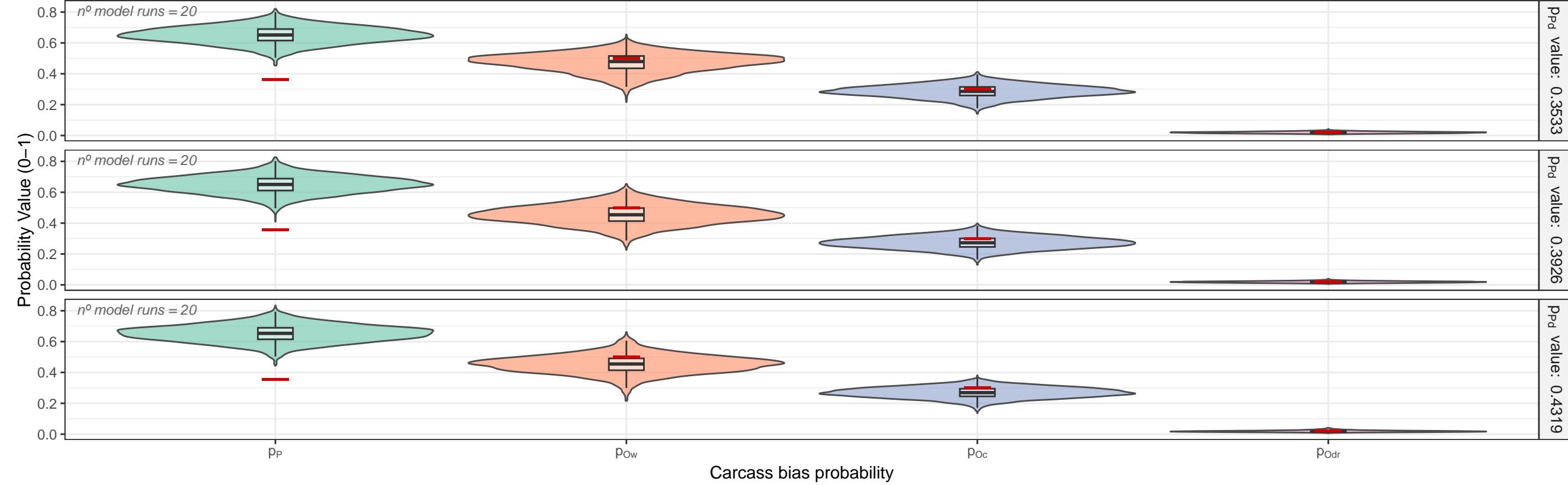
Amphibians – Scenario Matrix for Prior: Accurate prior

Violin plots indicate posterior distribution | Red dash (–) indicates True Simulated Values



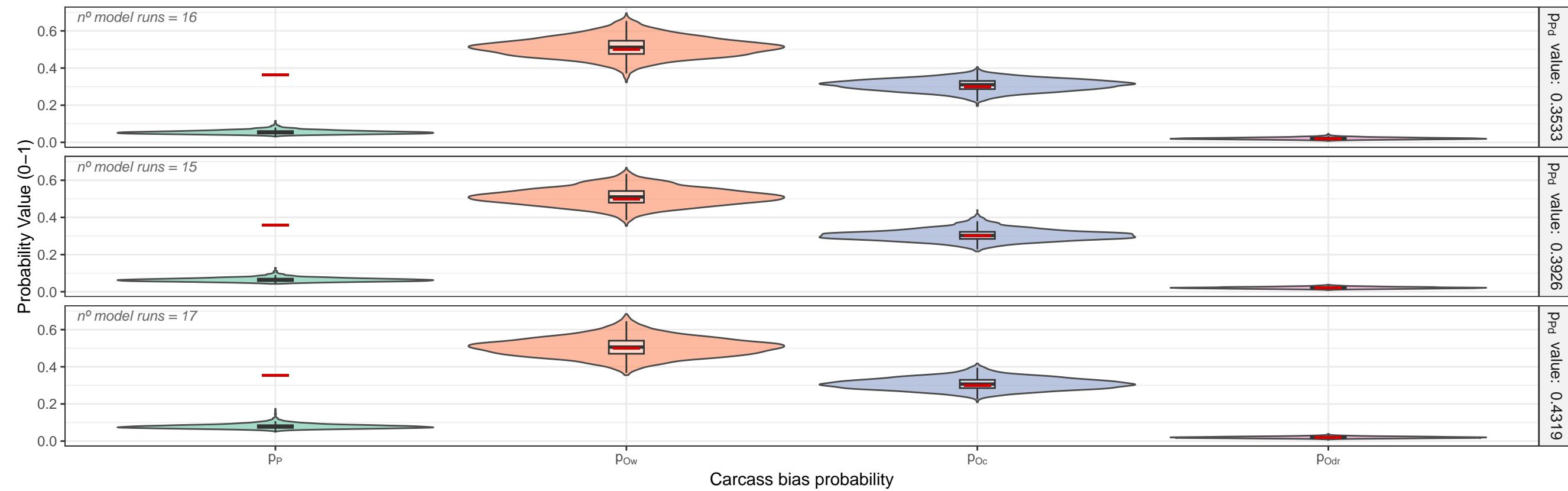
Amphibians – Scenario Matrix for Prior: Inaccurate prior

Violin plots indicate posterior distribution | Red dash (–) indicates True Simulated Values



Amphibians – Scenario Matrix for Prior: Uninformative prior

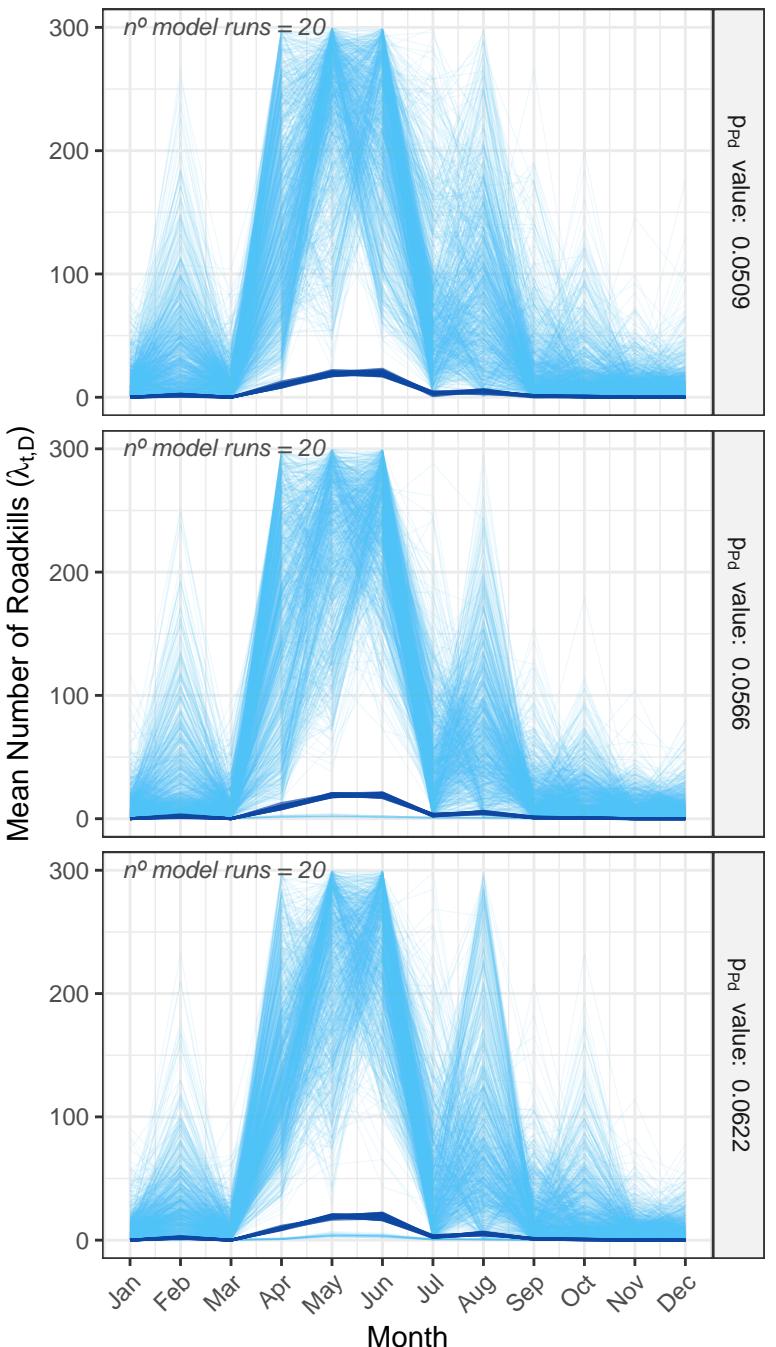
Violin plots indicate posterior distribution | Red dash (–) indicates True Simulated Values



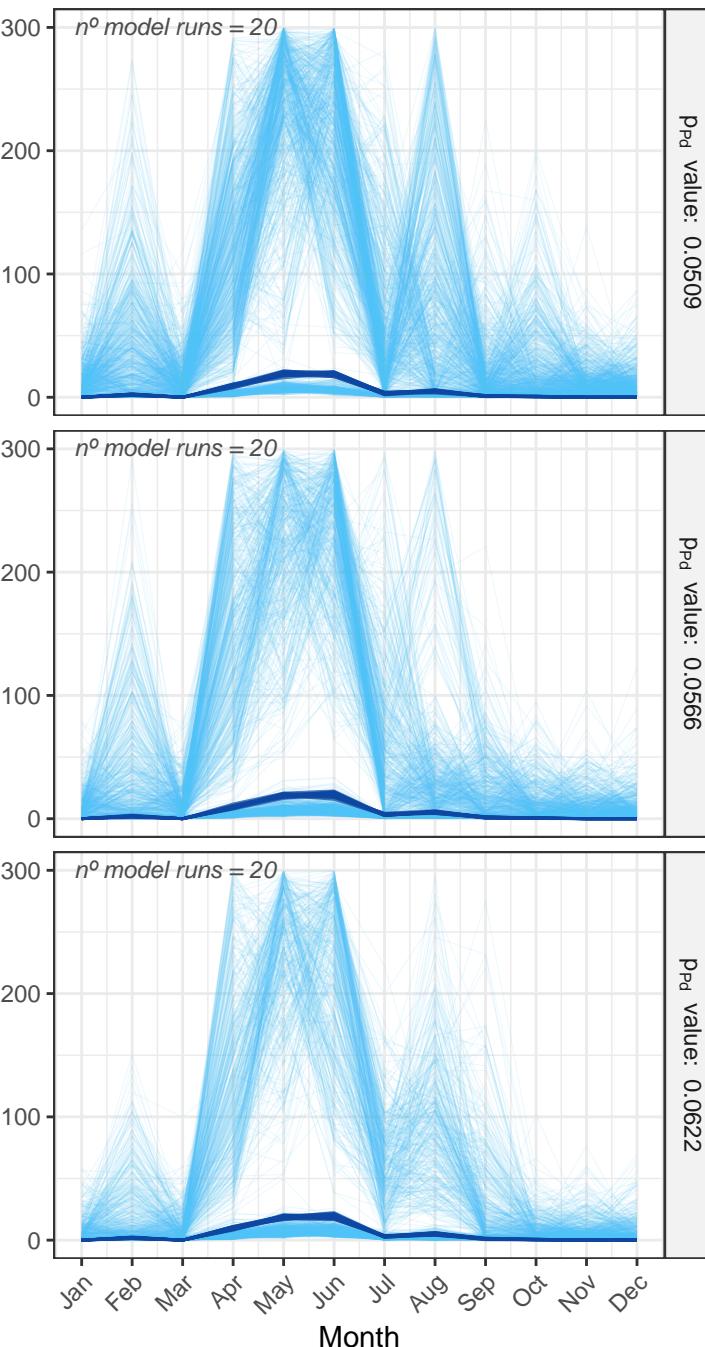
Reptiles G1: Posterior Estimation Overlap per Simulation Scenario

Light Blue Bands: 50 posterior samples per sim | Dark Lines: True Simulated Values

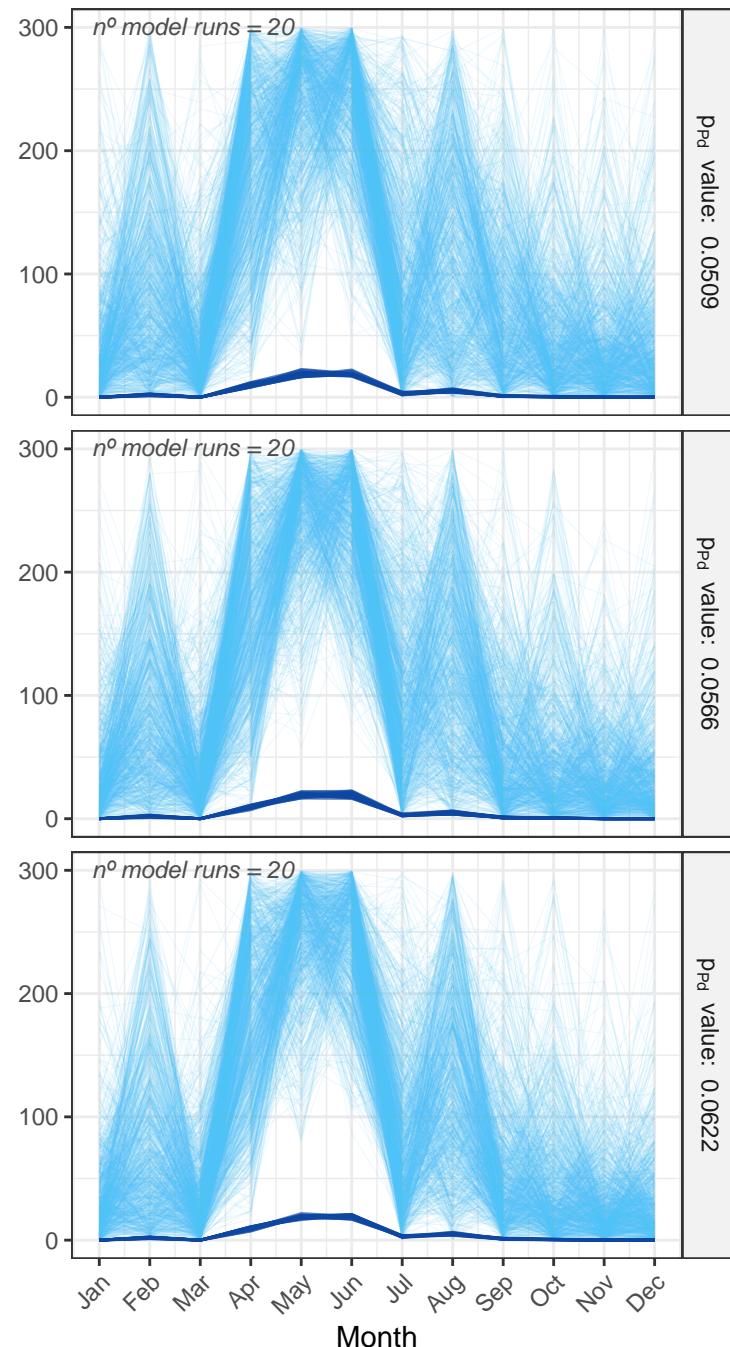
Prior: Accurate prior



Prior: Inaccurate prior



Prior: Uninformative prior



p_D value: 0.0509

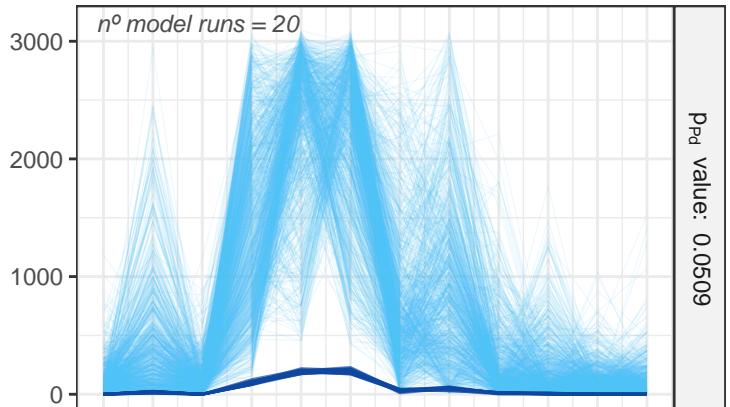
p_D value: 0.0566

p_D value: 0.0622

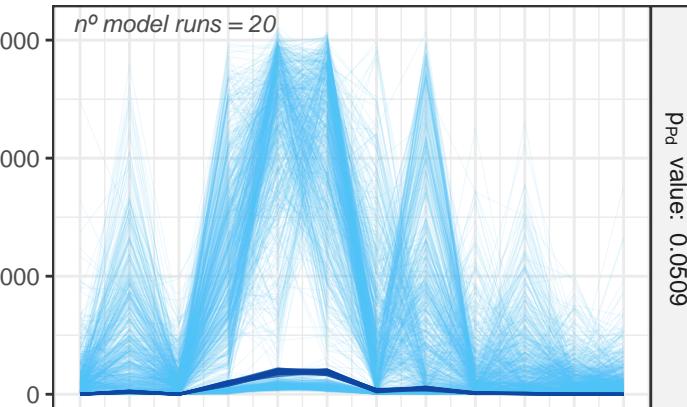
Reptiles G1: Posterior Estimation Overlap per Simulation Scenario

Light Blue Bands: 50 posterior samples per sim | Dark Lines: True Simulated Values

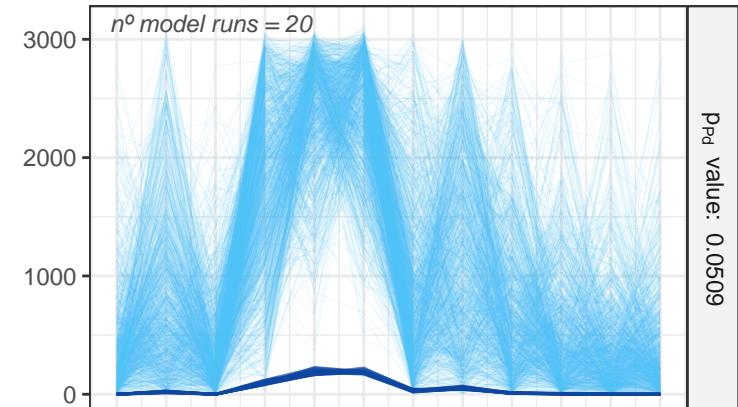
Prior: Accurate prior



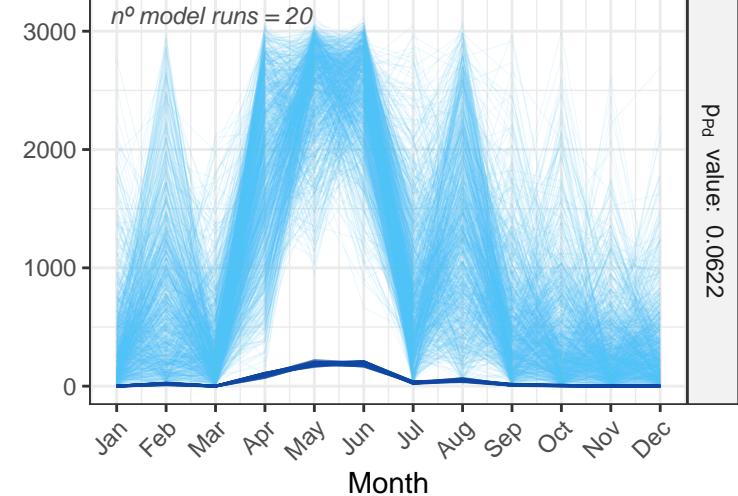
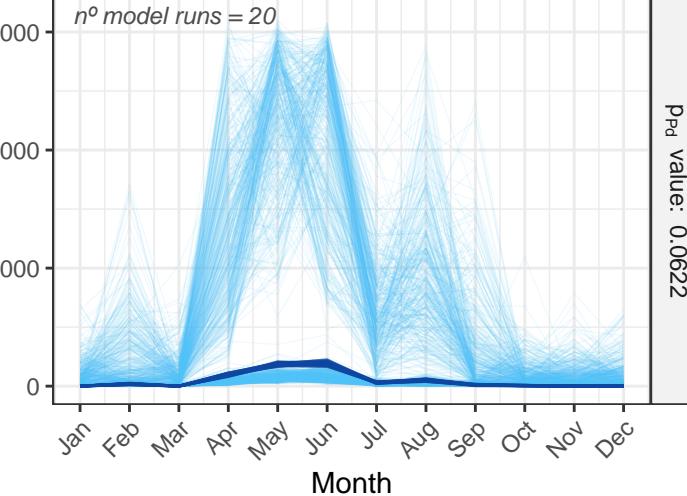
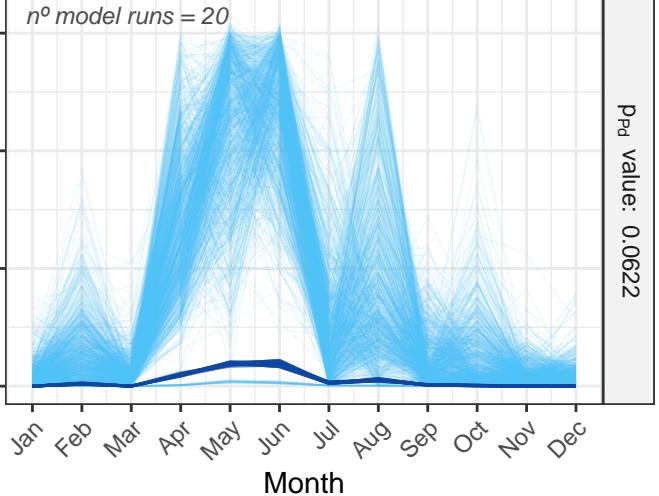
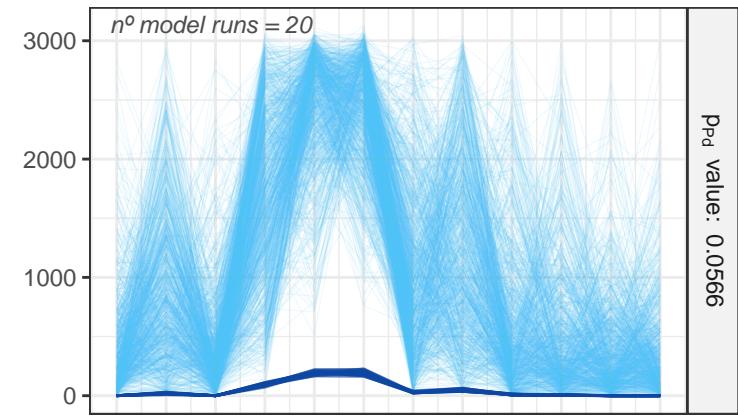
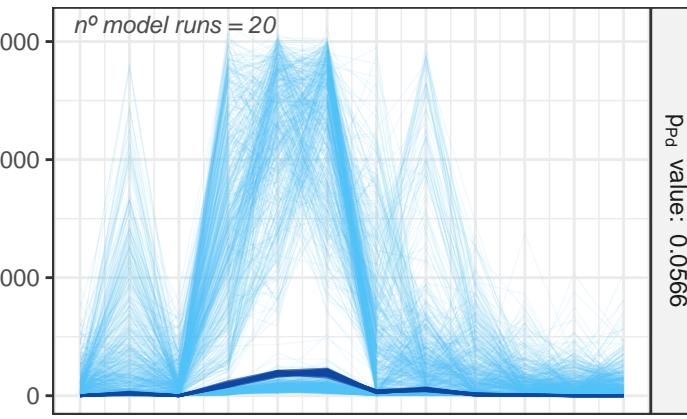
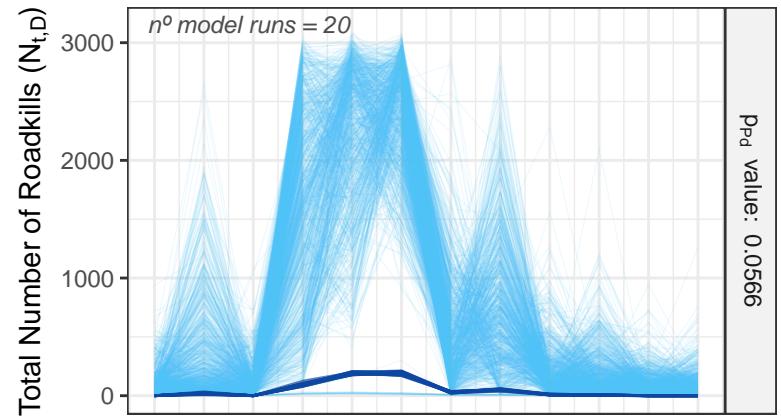
Prior: Inaccurate prior



Prior: Uninformative prior



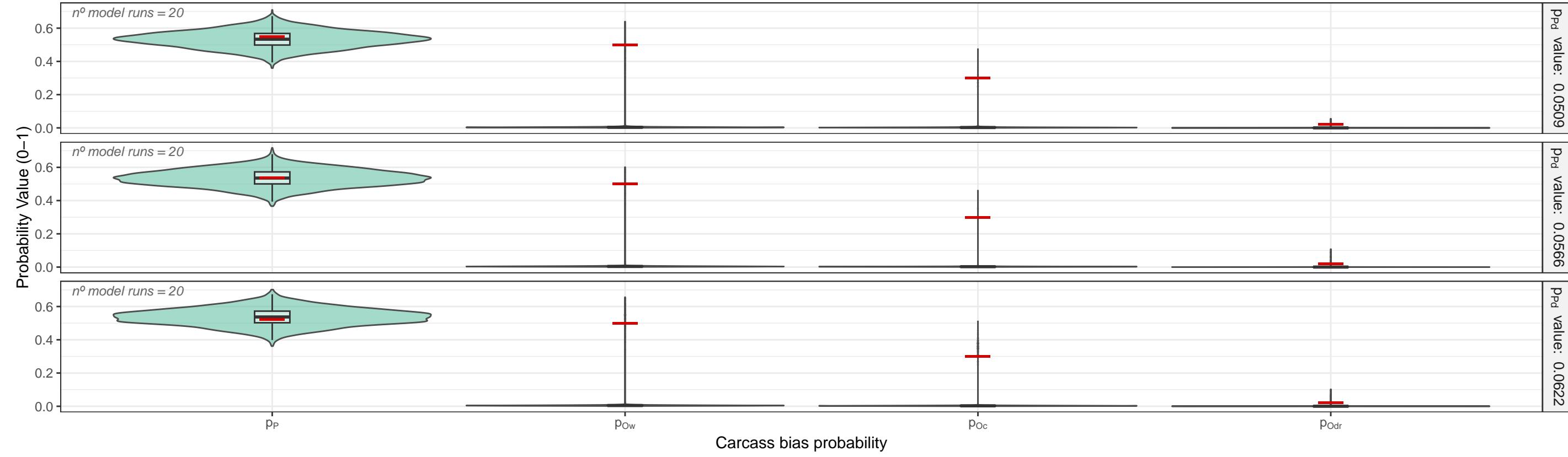
Total Number of Roadkills ($N_{t,D}$)



Reptiles G1 – Complete carcass bias probabilities recovery across simulation scenarios

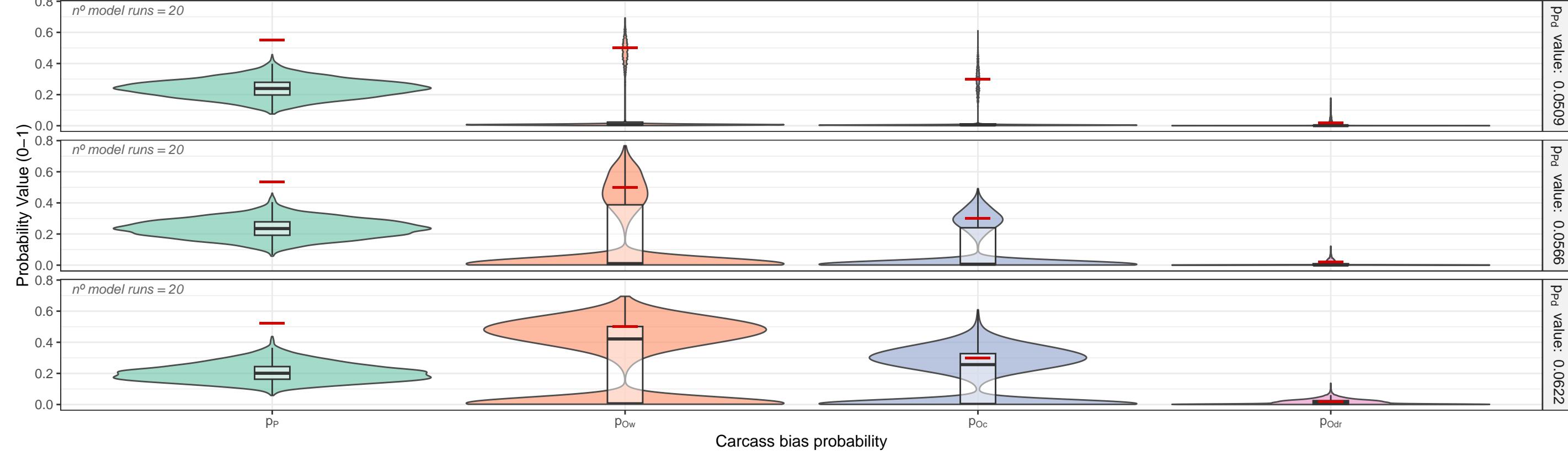
Reptiles G1 – Scenario Matrix for Prior: Accurate prior

Violin plots indicate posterior distribution | Red dash (–) indicates True Simulated Values



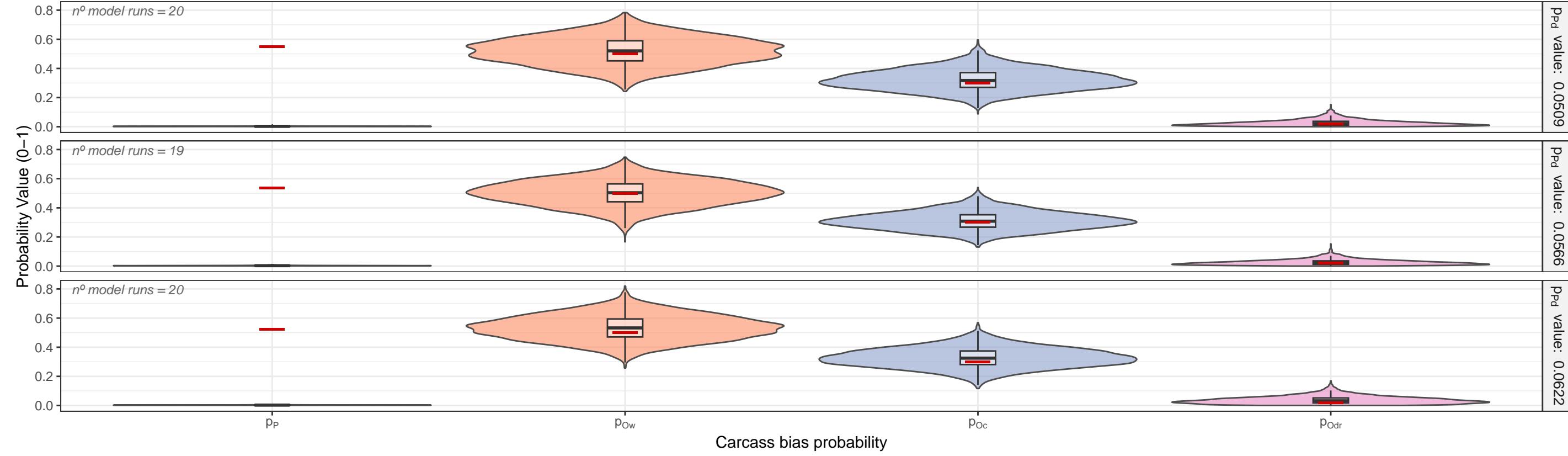
Reptiles G1 – Scenario Matrix for Prior: Inaccurate prior

Violin plots indicate posterior distribution | Red dash (–) indicates True Simulated Values



Reptiles G1 – Scenario Matrix for Prior: Uninformative prior

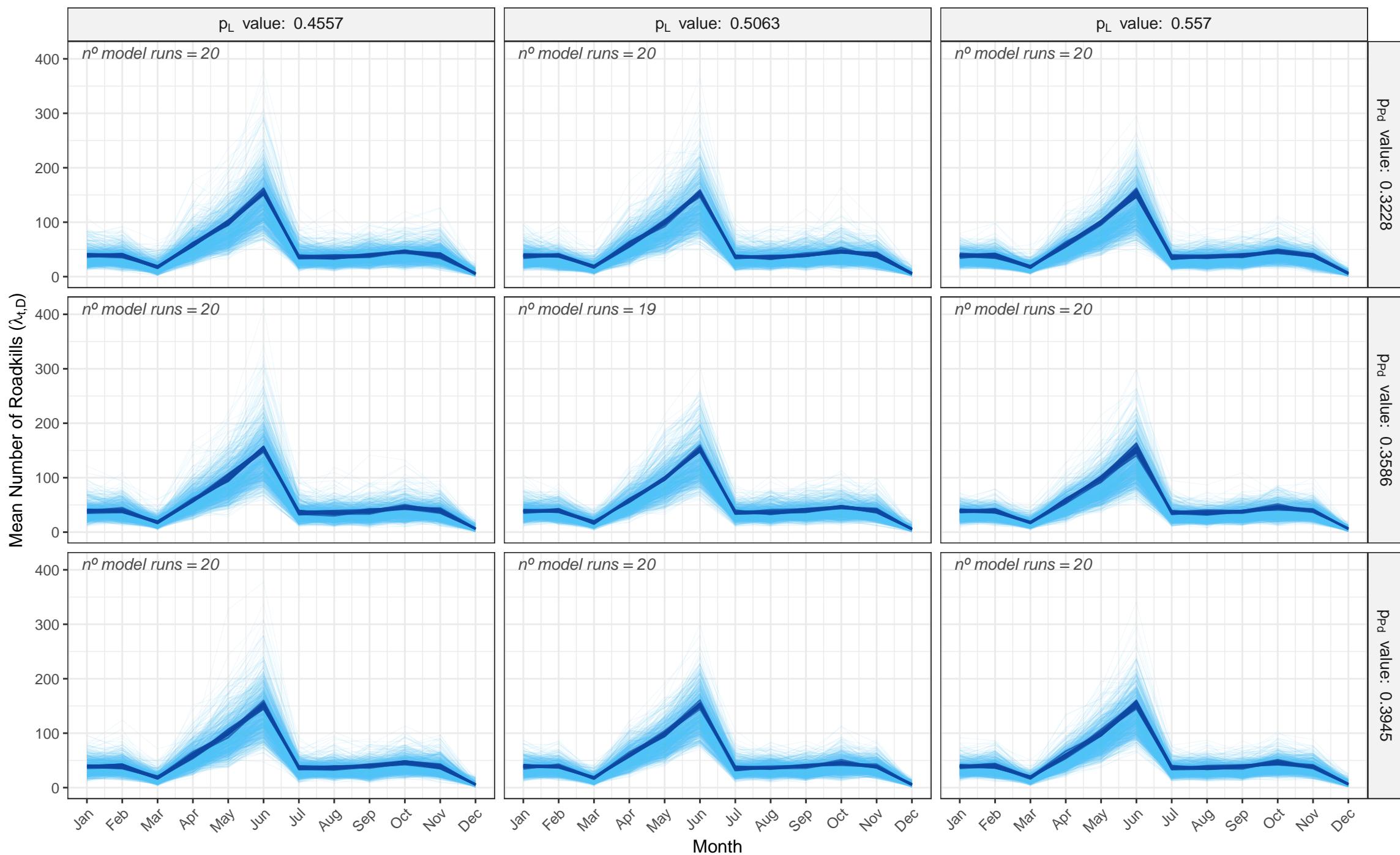
Violin plots indicate posterior distribution | Red dash (–) indicates True Simulated Values



Birds Bats G1: Posterior Estimation Overlap per Simulation Scenario

Prior: Accurate prior

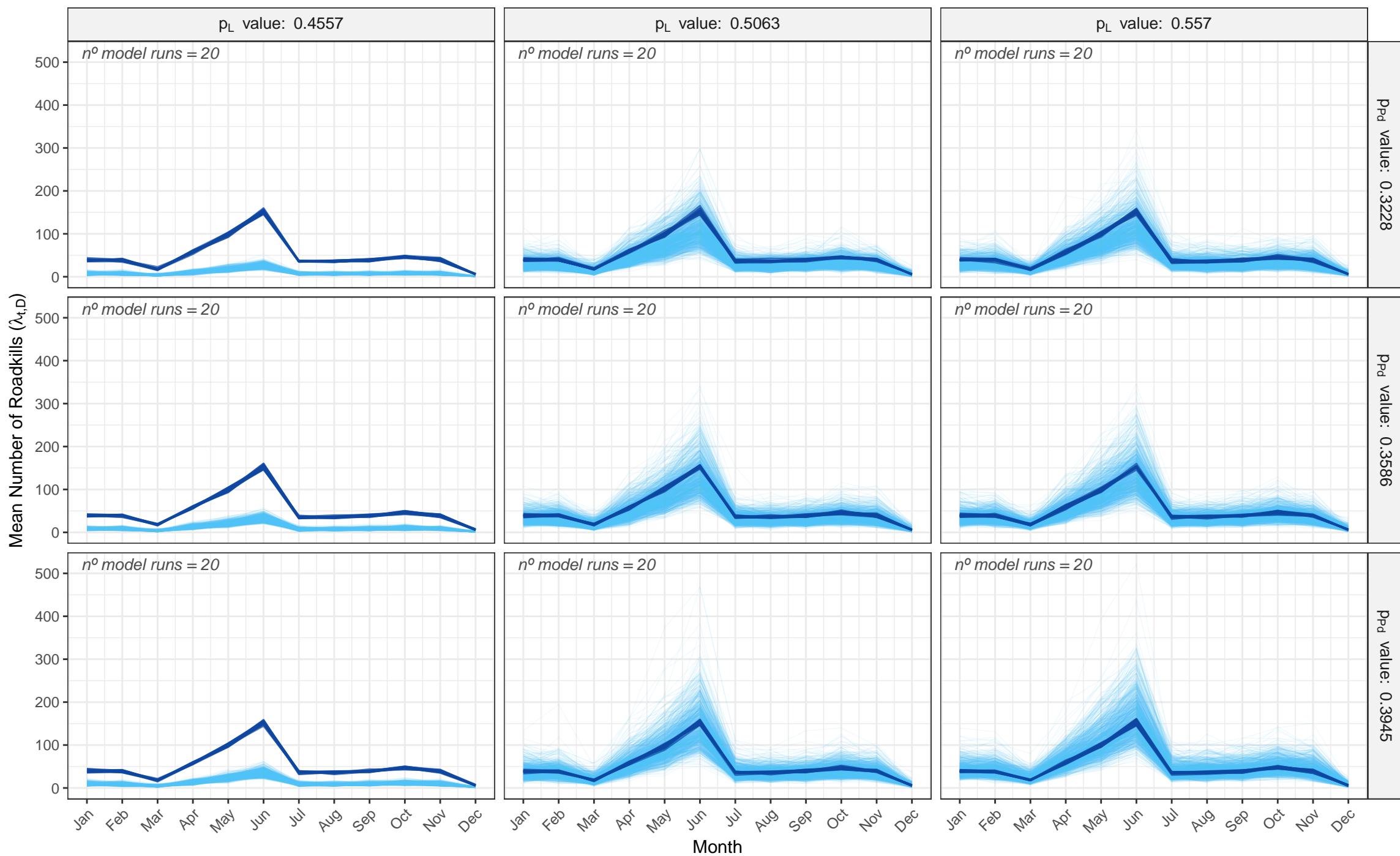
Light Blue Bands: 50 posterior samples per sim | Dark Lines: True Simulated Values



Birds Bats G1: Posterior Estimation Overlap per Simulation Scenario

Prior: Inaccurate prior

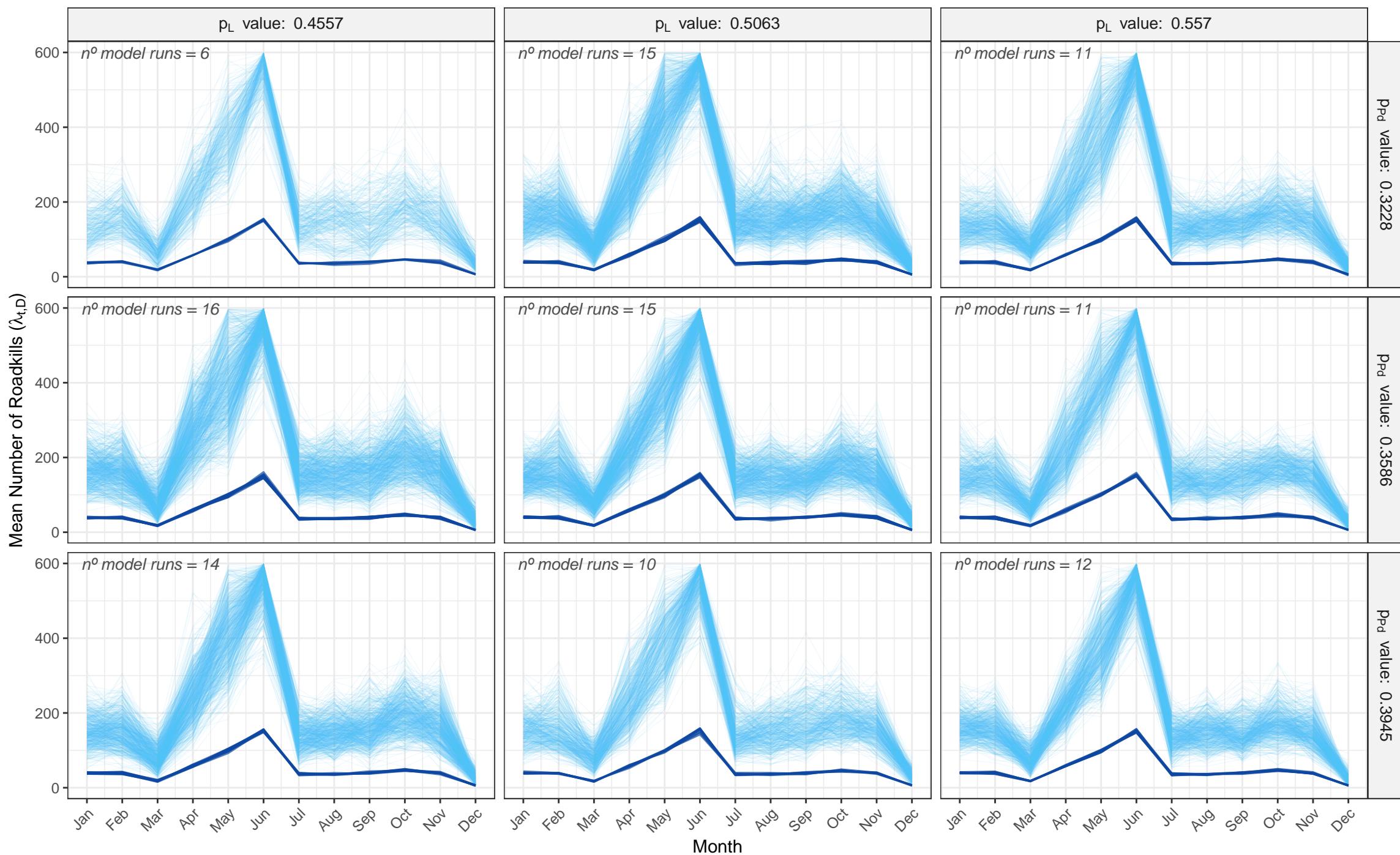
Light Blue Bands: 50 posterior samples per sim | Dark Lines: True Simulated Values



Birds Bats G1: Posterior Estimation Overlap per Simulation Scenario

Prior: Uninformative prior

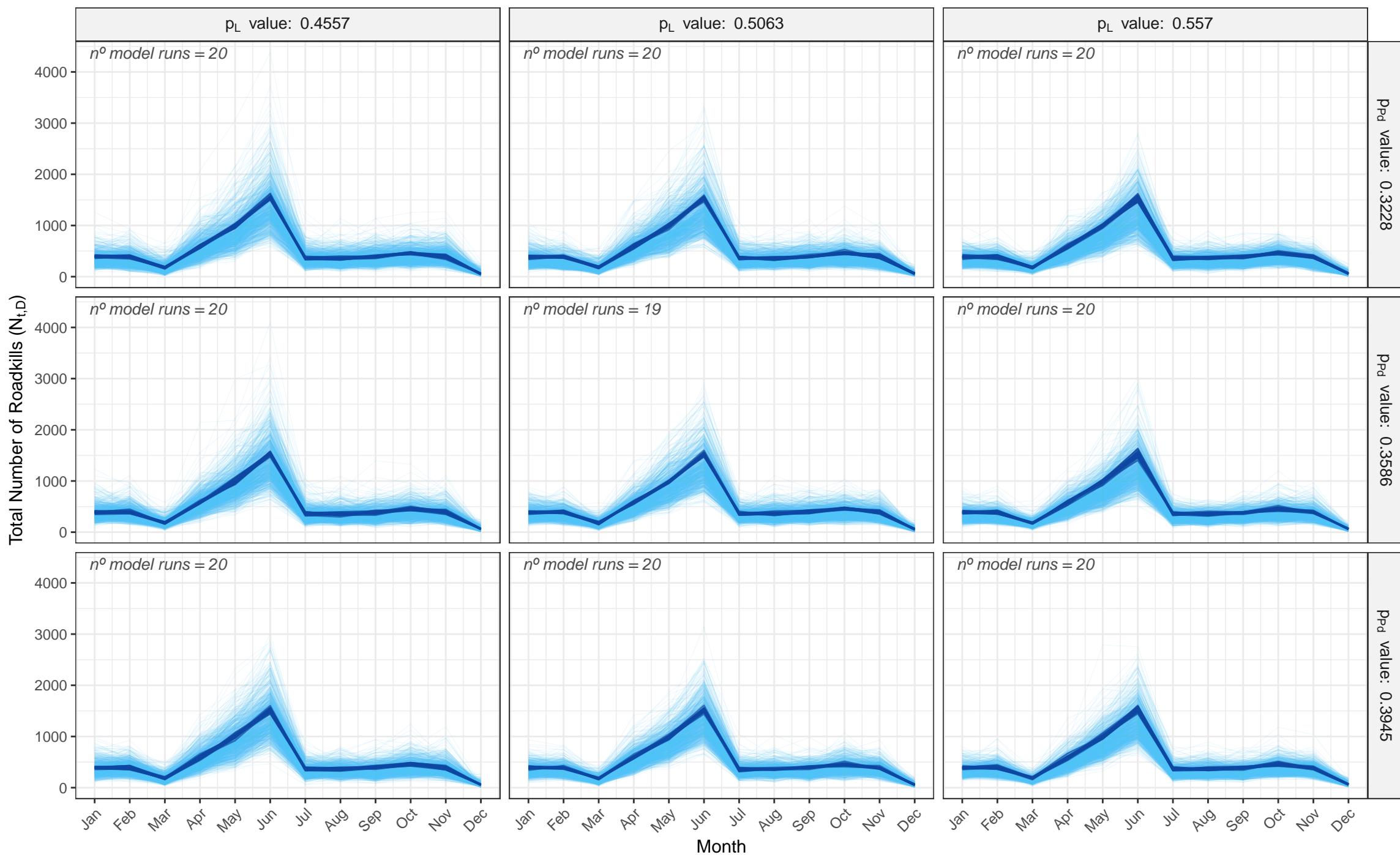
Light Blue Bands: 50 posterior samples per sim | Dark Lines: True Simulated Values



Birds Bats G1: Posterior Estimation Overlap per Simulation Scenario

Prior: Accurate prior

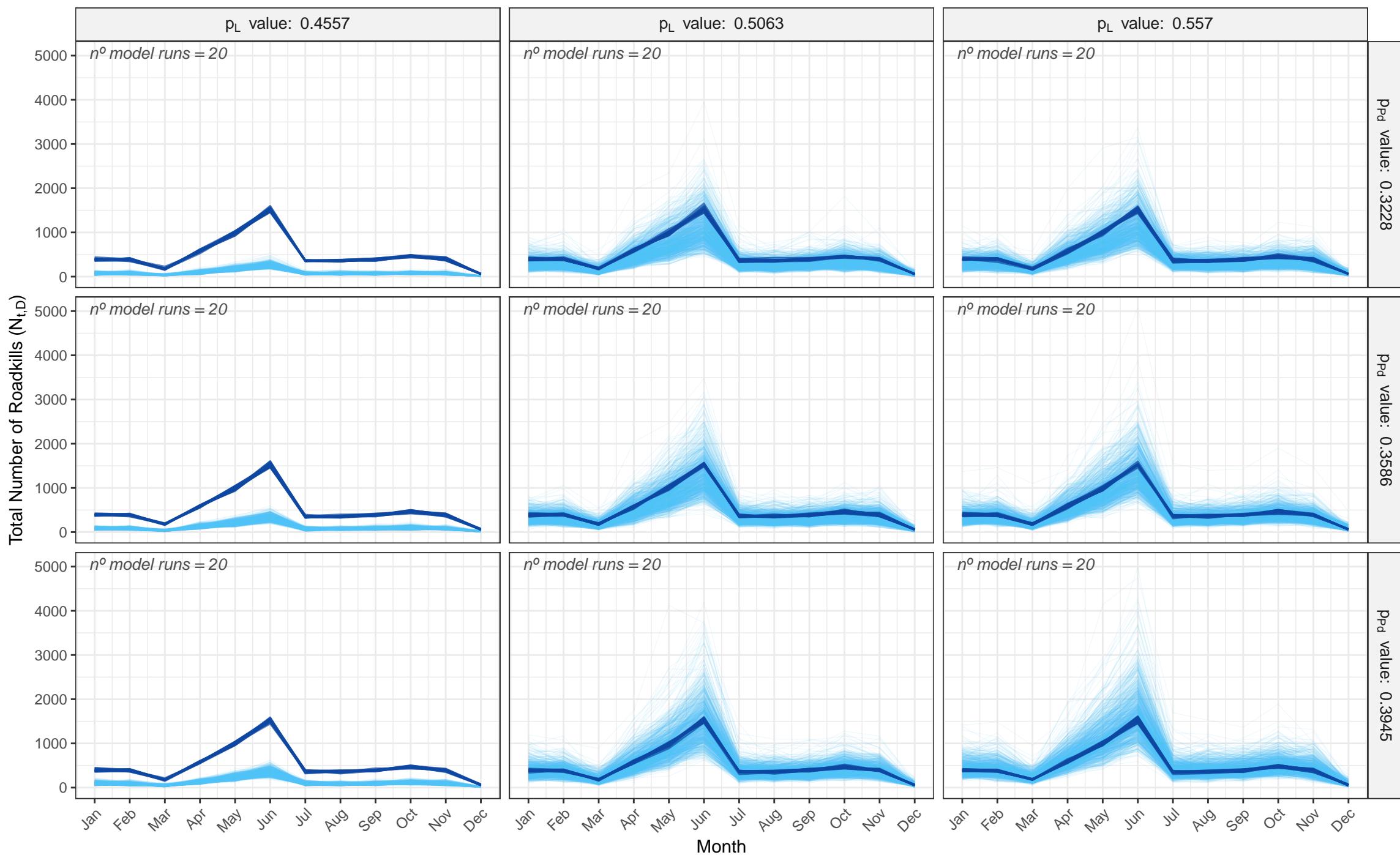
Light Blue Bands: 50 posterior samples per sim | Dark Lines: True Simulated Values



Birds Bats G1: Posterior Estimation Overlap per Simulation Scenario

Prior: Inaccurate prior

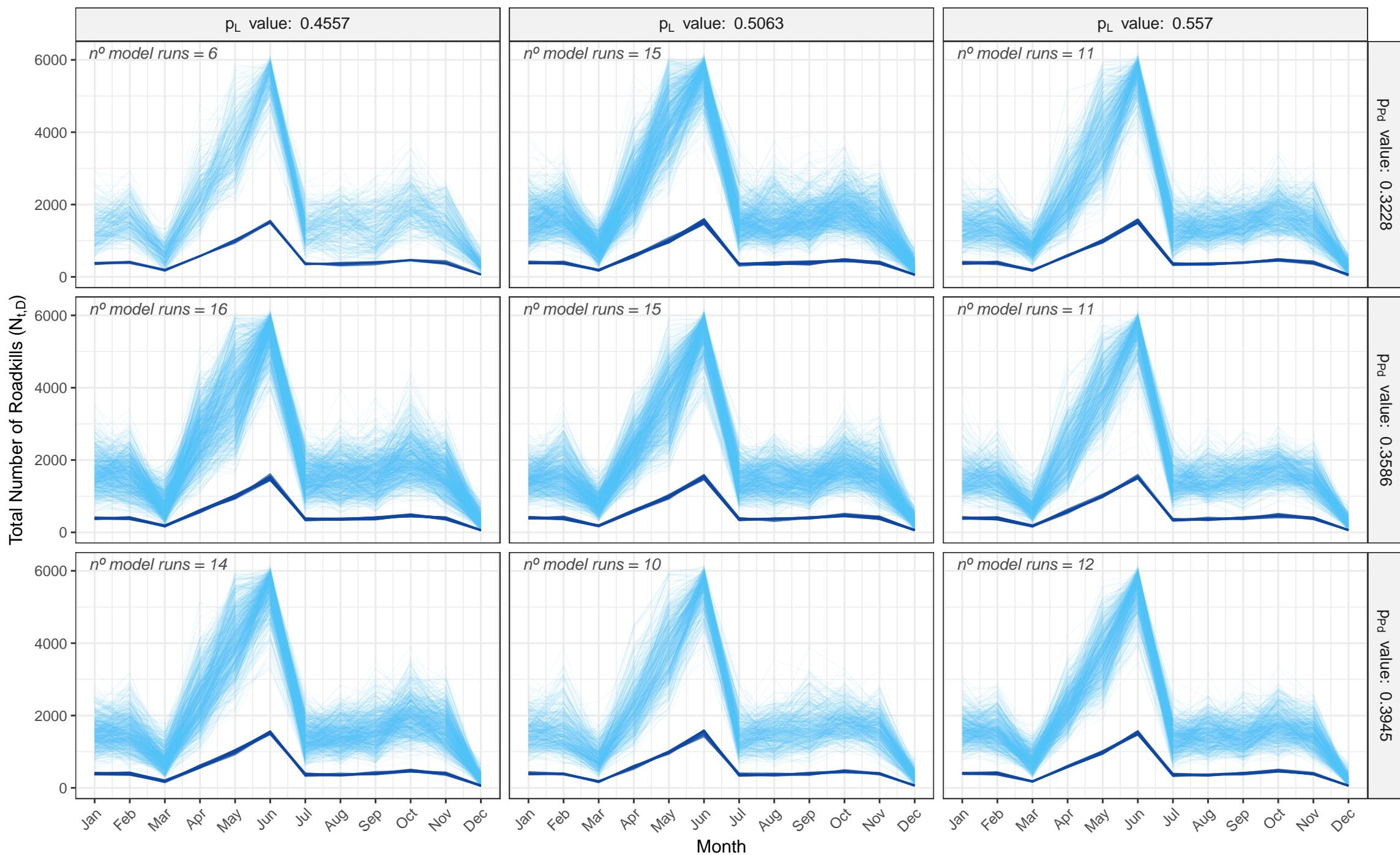
Light Blue Bands: 50 posterior samples per sim | Dark Lines: True Simulated Values



Birds Bats G1: Posterior Estimation Overlap per Simulation Scenario

Prior: Uninformative prior

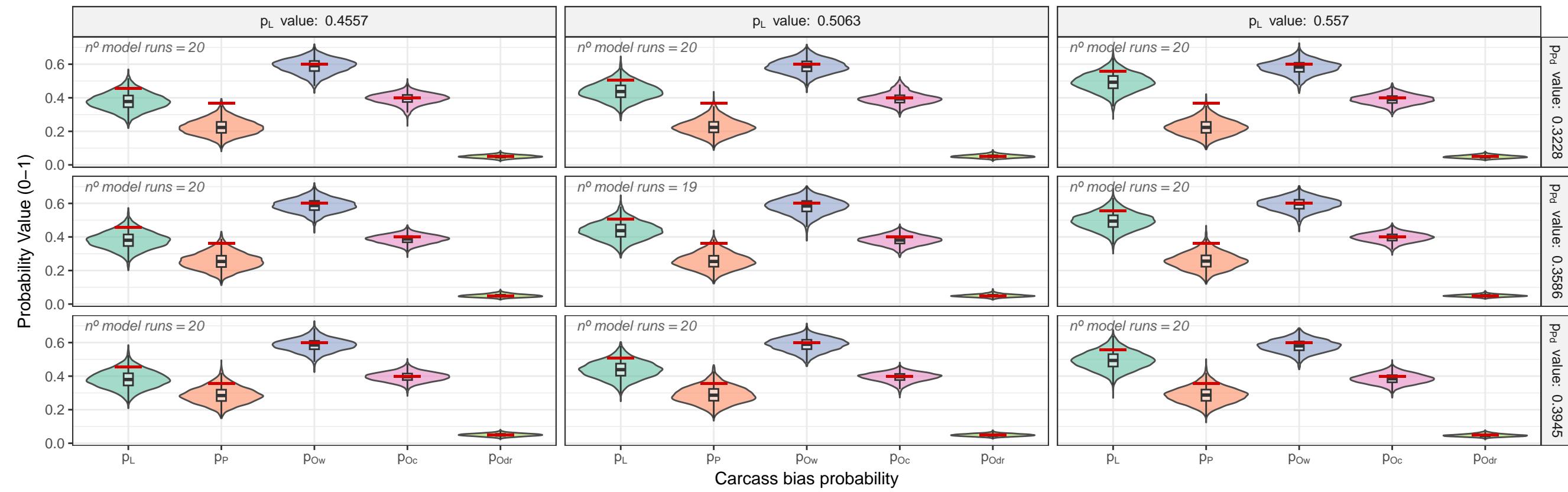
Light Blue Bands: 50 posterior samples per sim | Dark Lines: True Simulated Values



Birds Bats G1 – Complete carcass bias probabilities recovery across simulation scenarios

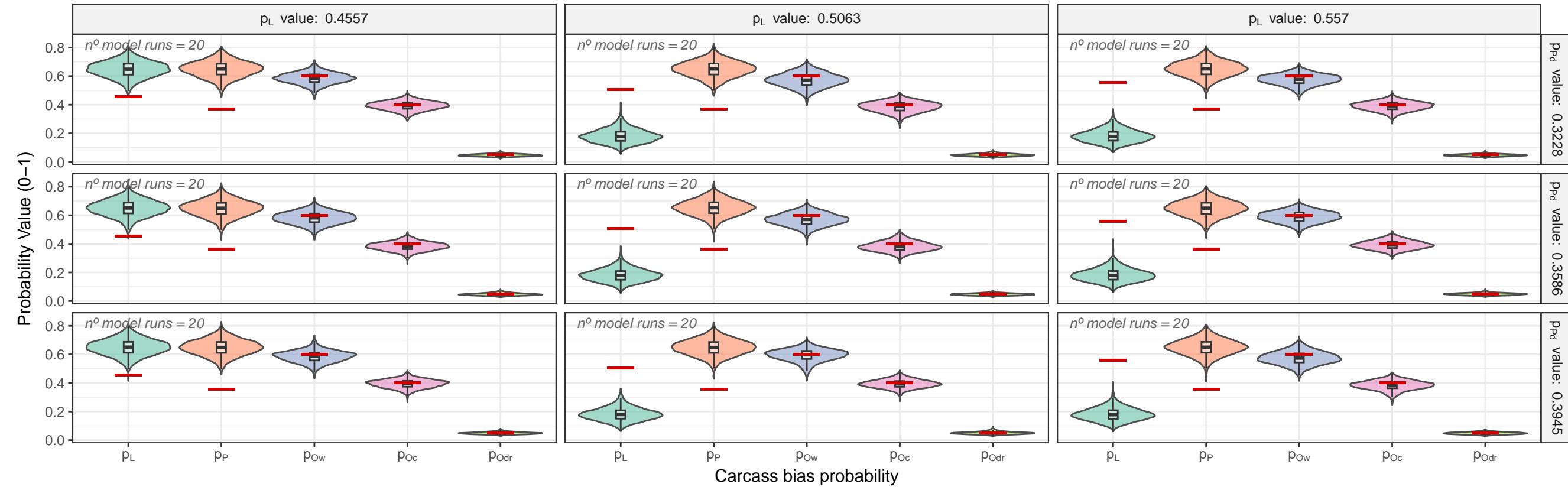
Birds Bats G1 – Scenario Matrix for Prior: Accurate prior

Violin plots indicate posterior distribution | Red dash (–) indicates True Simulated Values



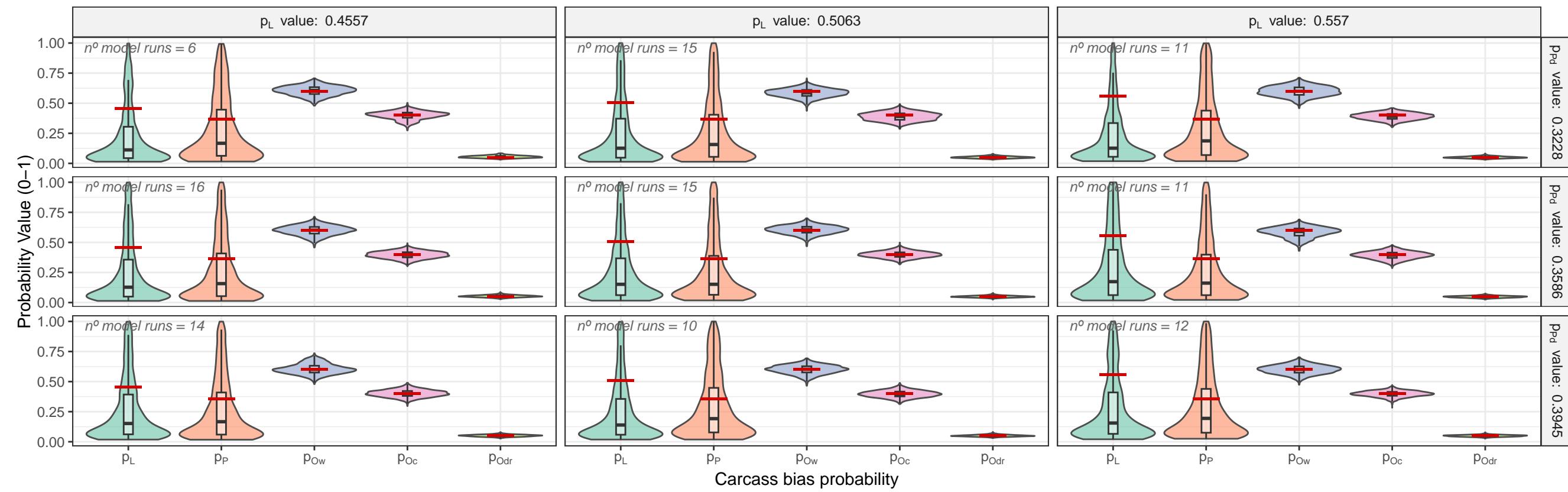
Birds Bats G1 – Scenario Matrix for Prior: Inaccurate prior

Violin plots indicate posterior distribution | Red dash (–) indicates True Simulated Values



Birds Bats G1 – Scenario Matrix for Prior: Uninformative prior

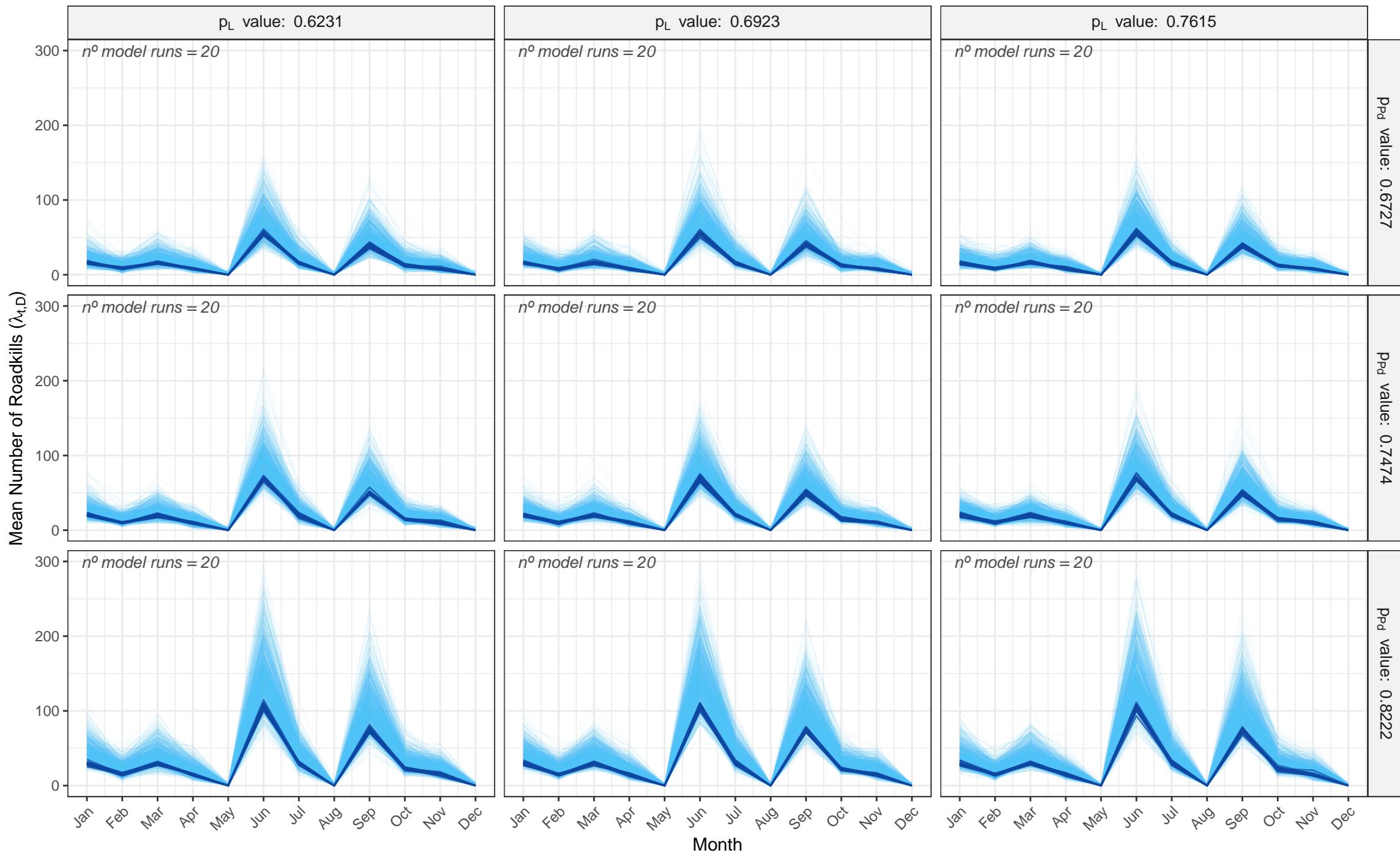
Violin plots indicate posterior distribution | Red dash (–) indicates True Simulated Values



Birds G2: Posterior Estimation Overlap per Simulation Scenario

Prior: Accurate prior

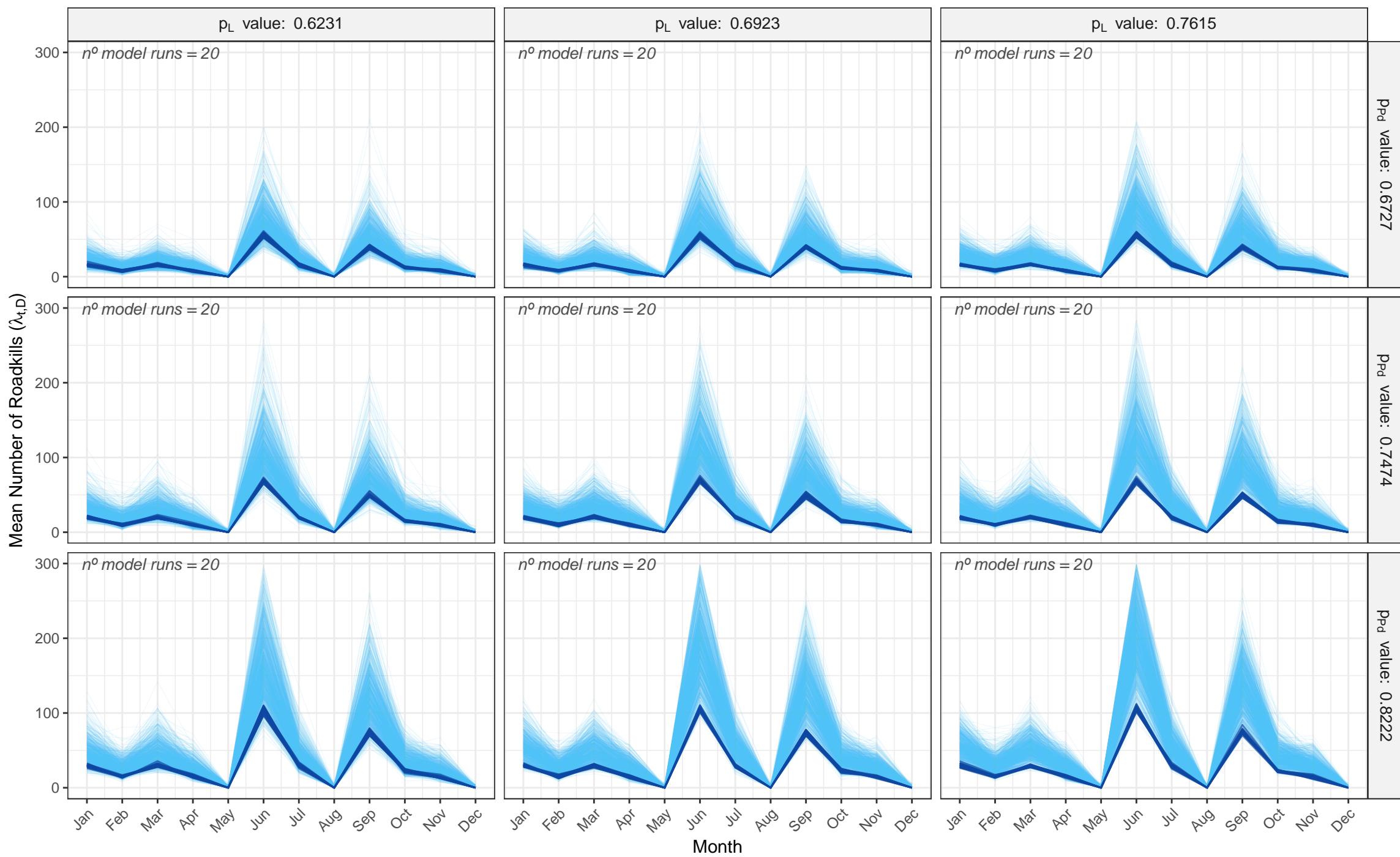
Light Blue Bands: 50 posterior samples per sim | Dark Lines: True Simulated Values



Birds G2: Posterior Estimation Overlap per Simulation Scenario

Prior: Inaccurate prior

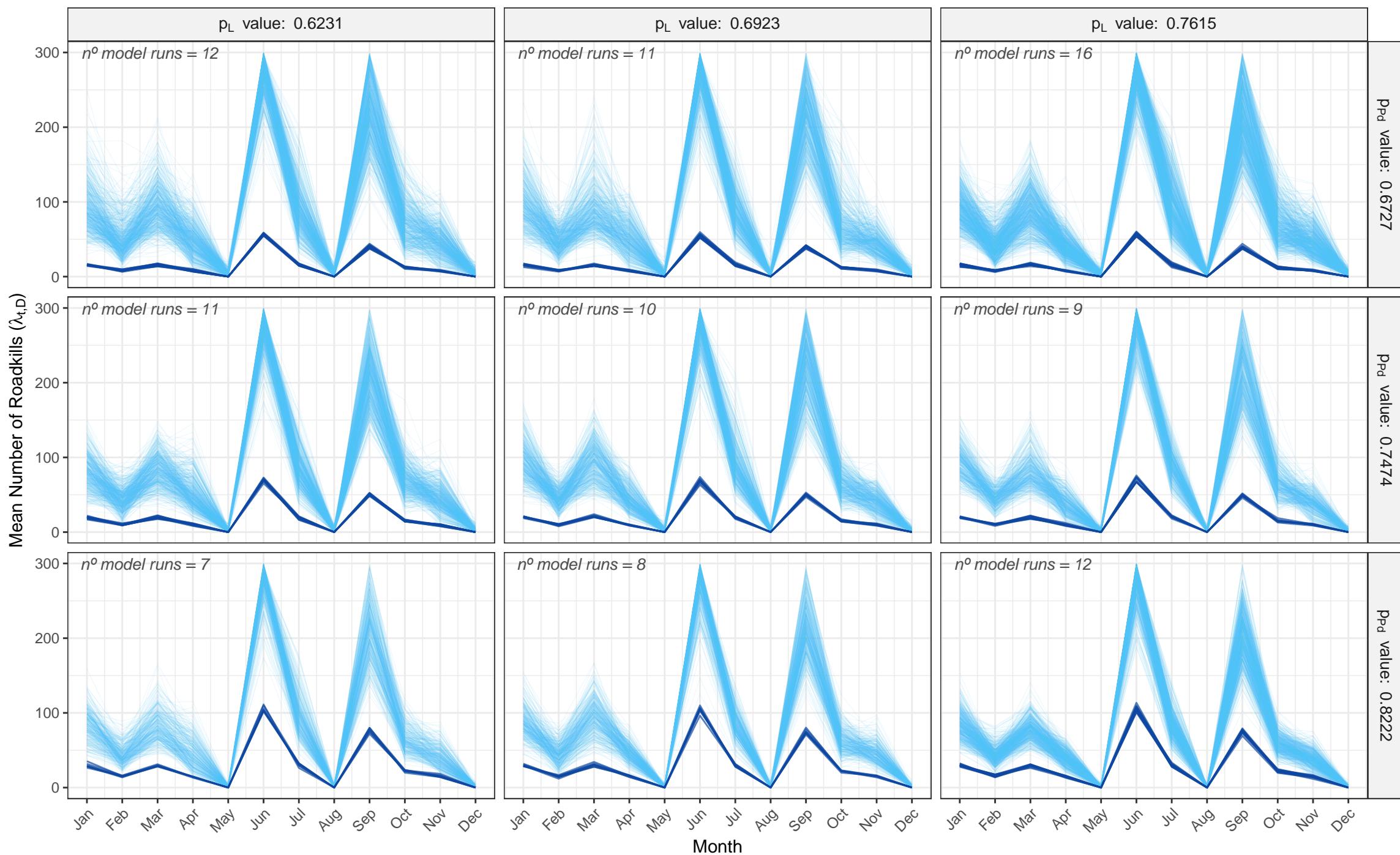
Light Blue Bands: 50 posterior samples per sim | Dark Lines: True Simulated Values



Birds G2: Posterior Estimation Overlap per Simulation Scenario

Prior: Uninformative prior

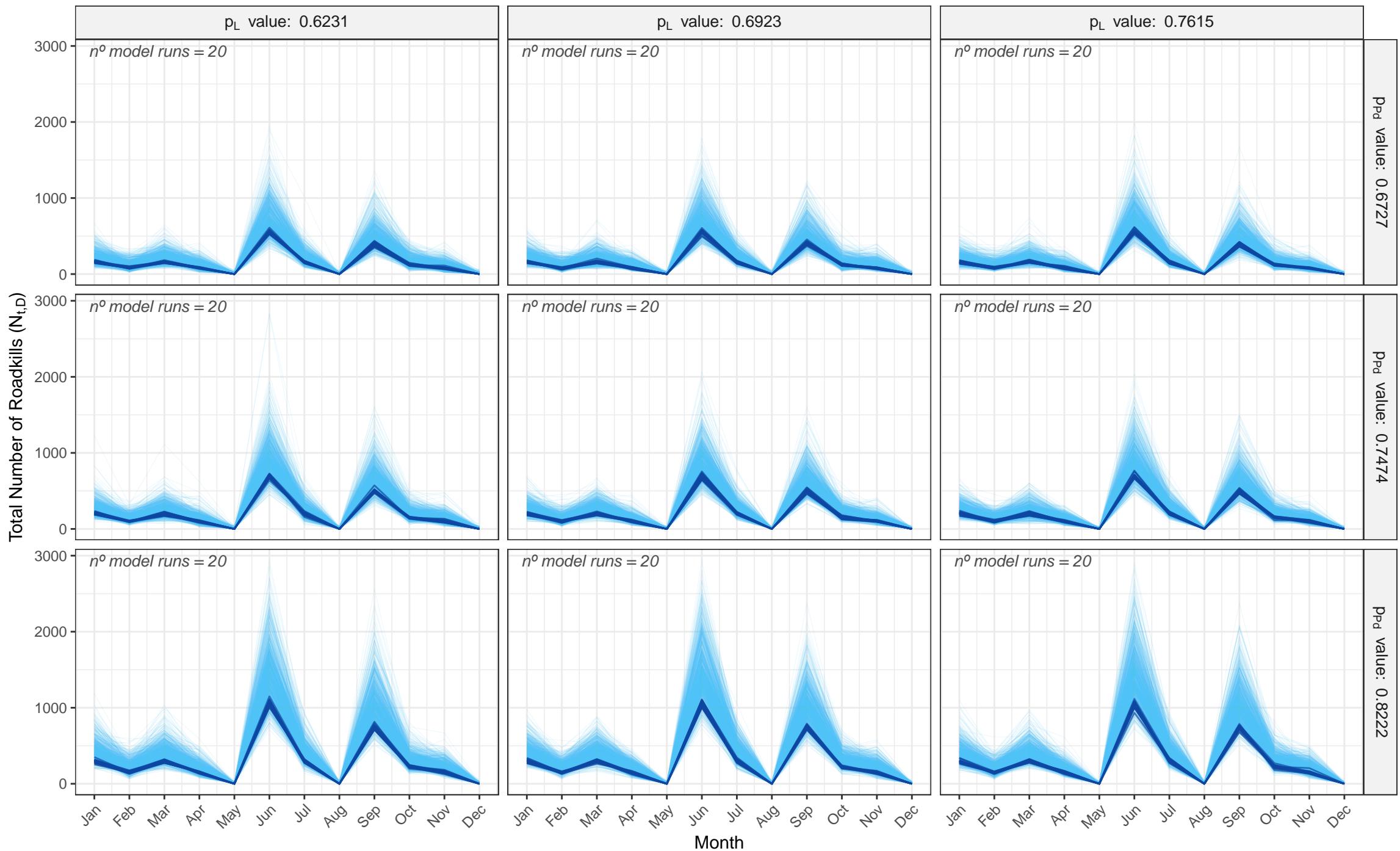
Light Blue Bands: 50 posterior samples per sim | Dark Lines: True Simulated Values



Birds G2: Posterior Estimation Overlap per Simulation Scenario

Prior: Accurate prior

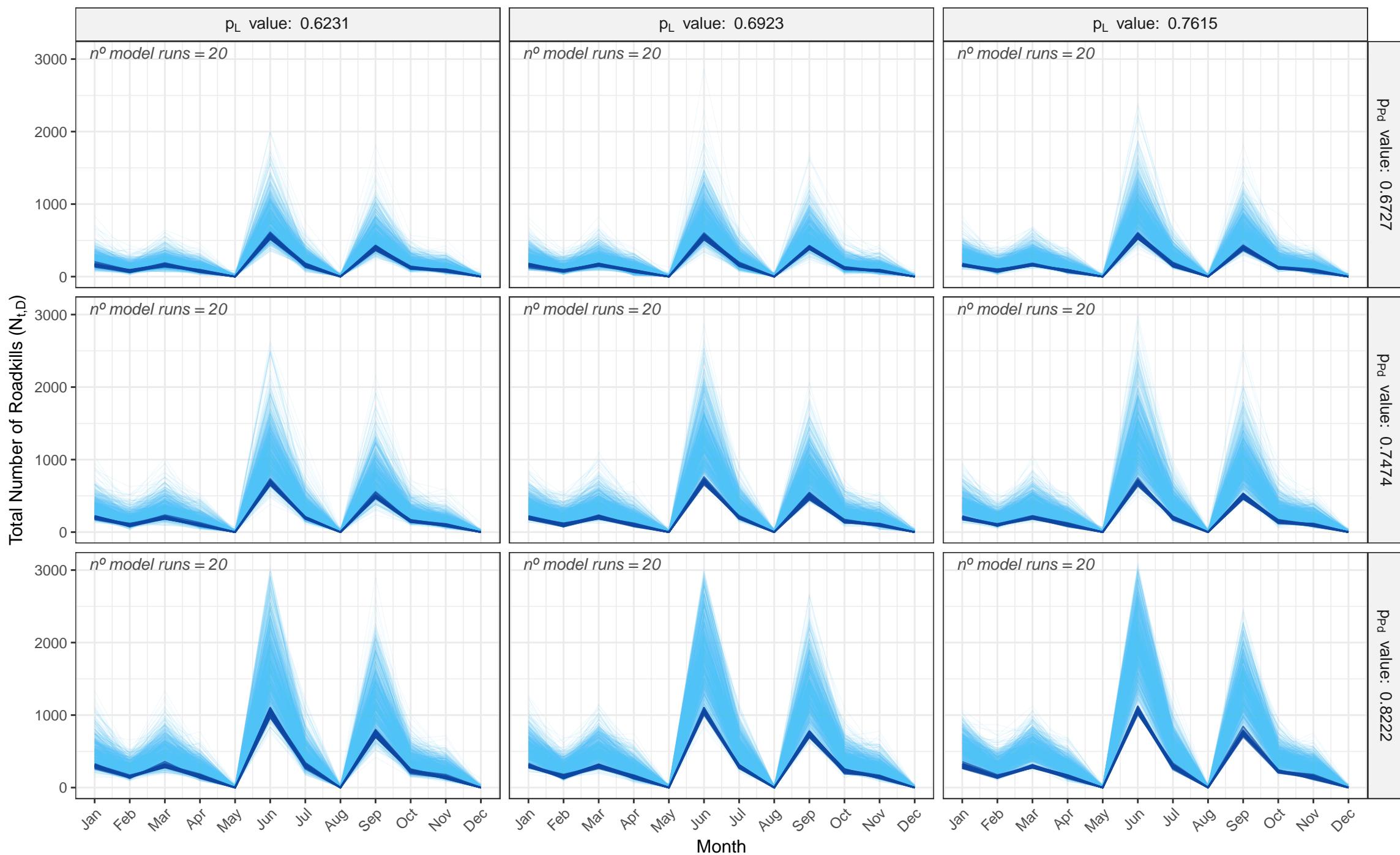
Light Blue Bands: 50 posterior samples per sim | Dark Lines: True Simulated Values



Birds G2: Posterior Estimation Overlap per Simulation Scenario

Prior: Inaccurate prior

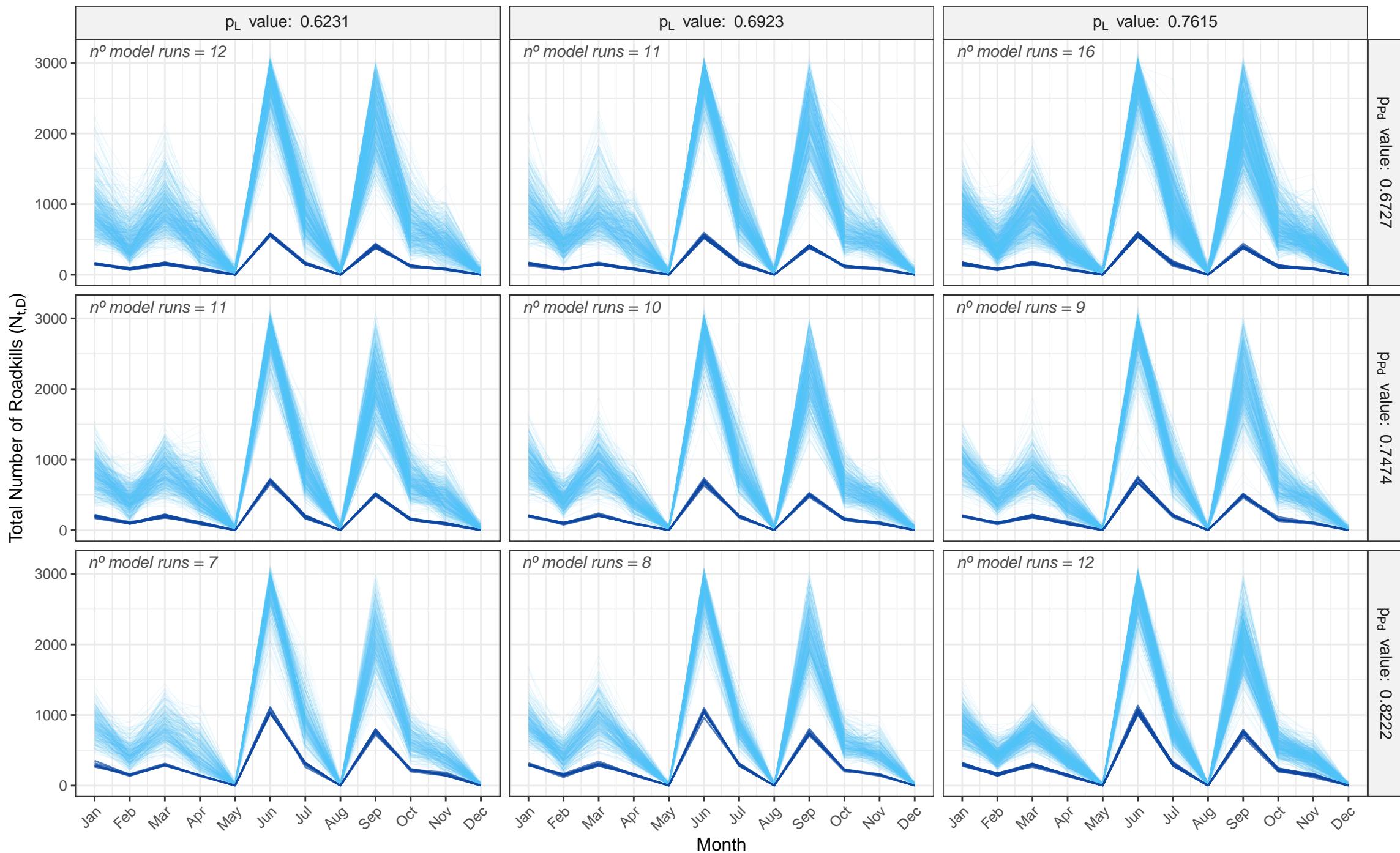
Light Blue Bands: 50 posterior samples per sim | Dark Lines: True Simulated Values



Birds G2: Posterior Estimation Overlap per Simulation Scenario

Prior: Uninformative prior

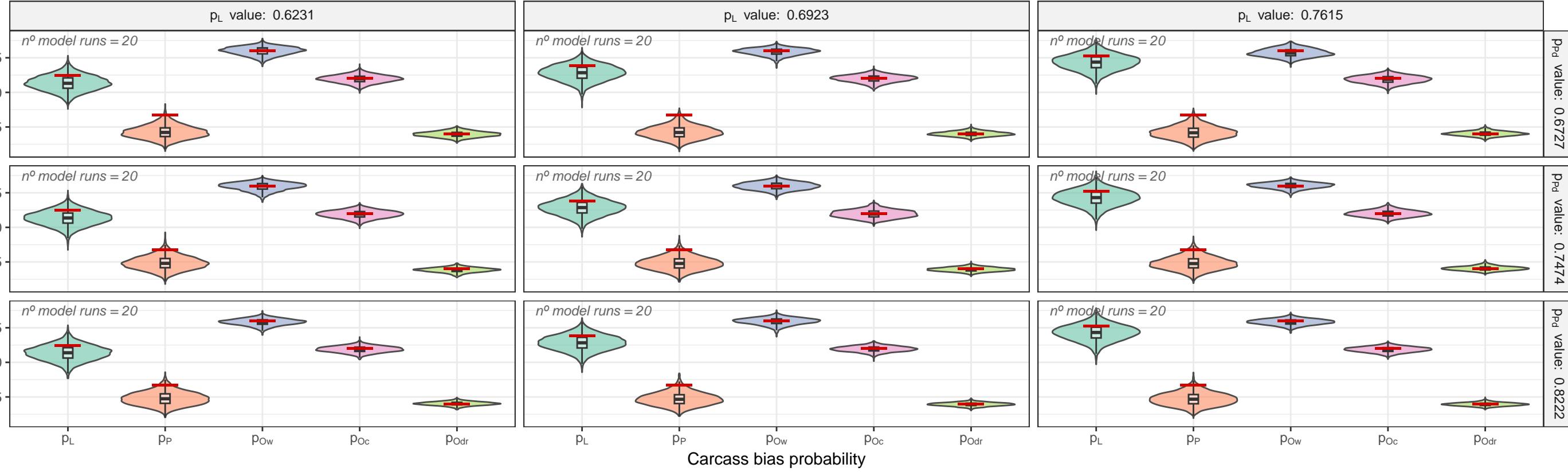
Light Blue Bands: 50 posterior samples per sim | Dark Lines: True Simulated Values



Birds G2 – Complete carcass bias probabilities recovery across simulation scenarios

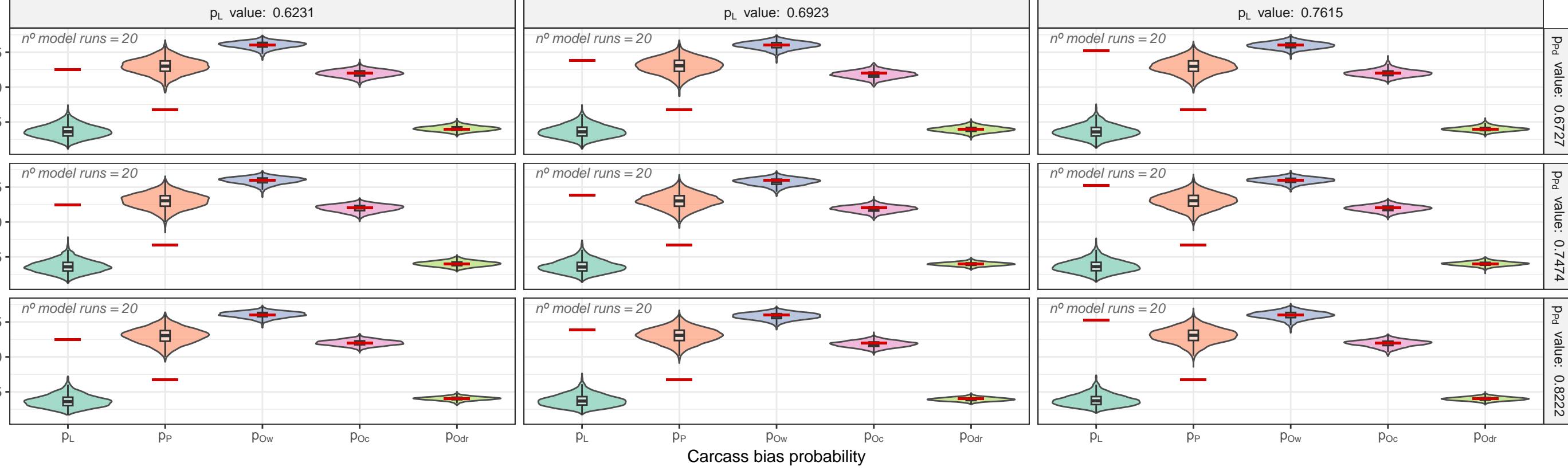
Birds G2 – Scenario Matrix for Prior: Accurate prior

Violin plots indicate posterior distribution | Red dash (–) indicates True Simulated Values



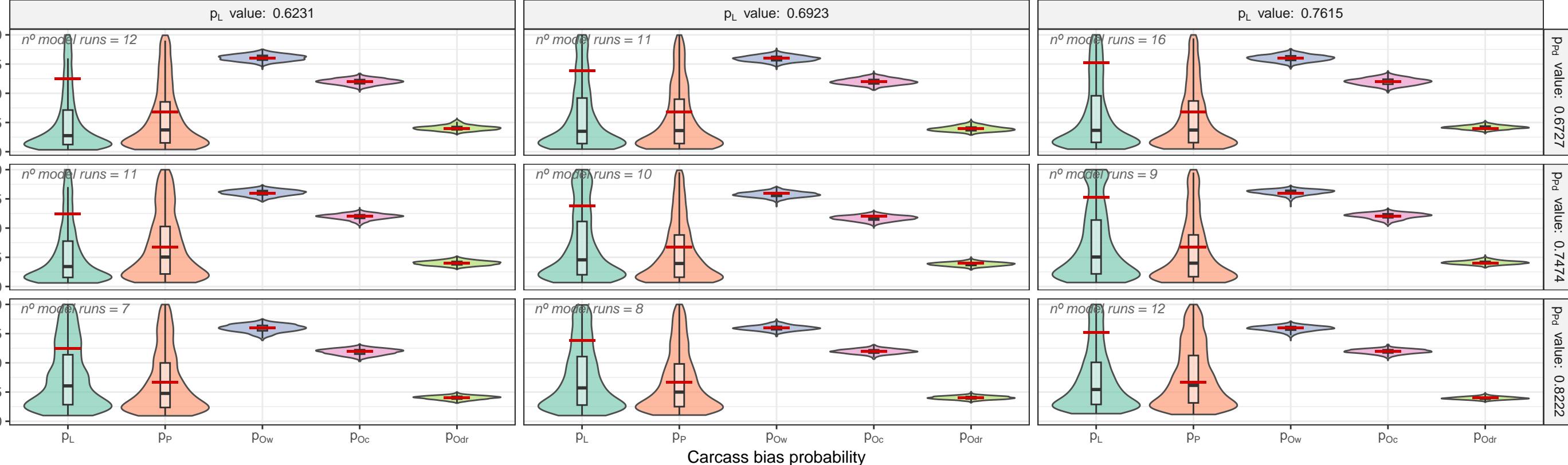
Birds G2 – Scenario Matrix for Prior: Inaccurate prior

Violin plots indicate posterior distribution | Red dash (–) indicates True Simulated Values



Birds G2 – Scenario Matrix for Prior: Uninformative prior

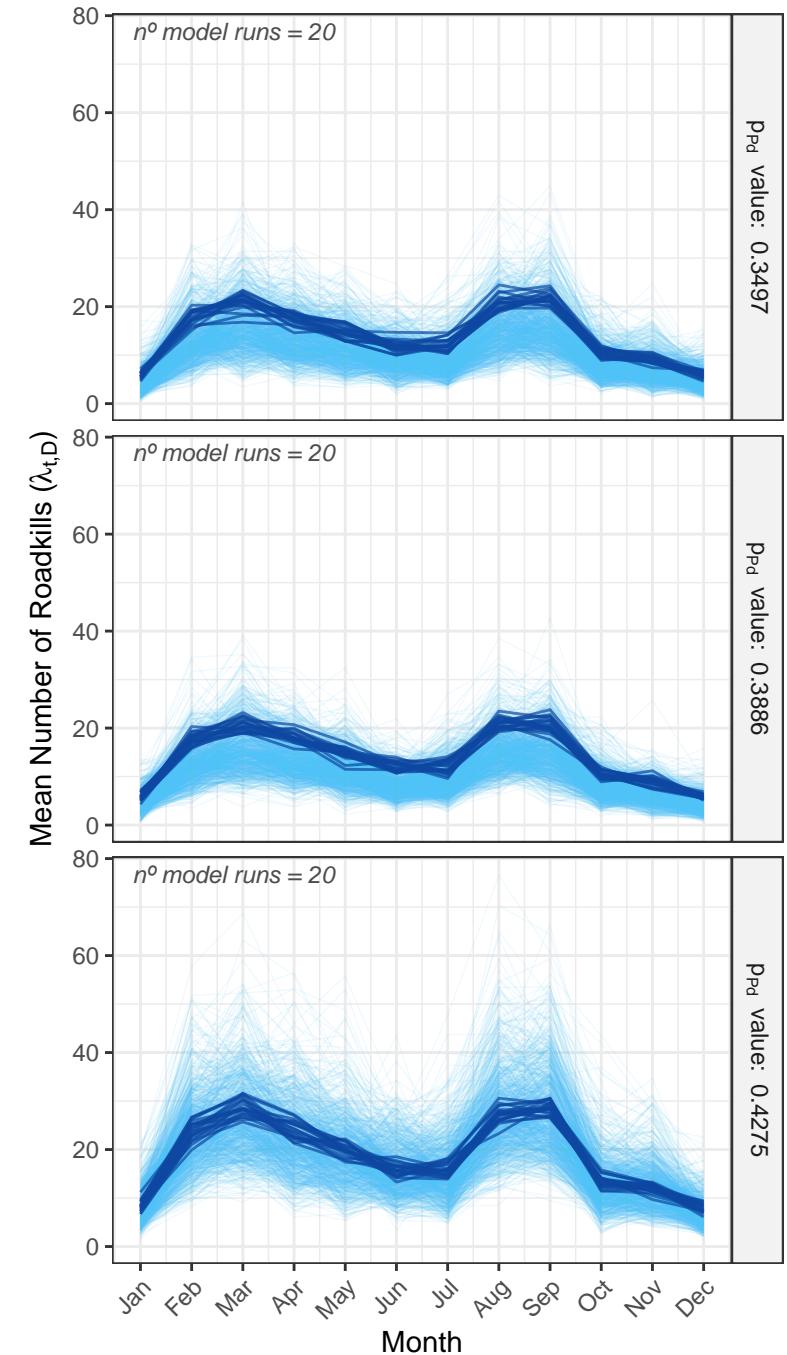
Violin plots indicate posterior distribution | Red dash (–) indicates True Simulated Values



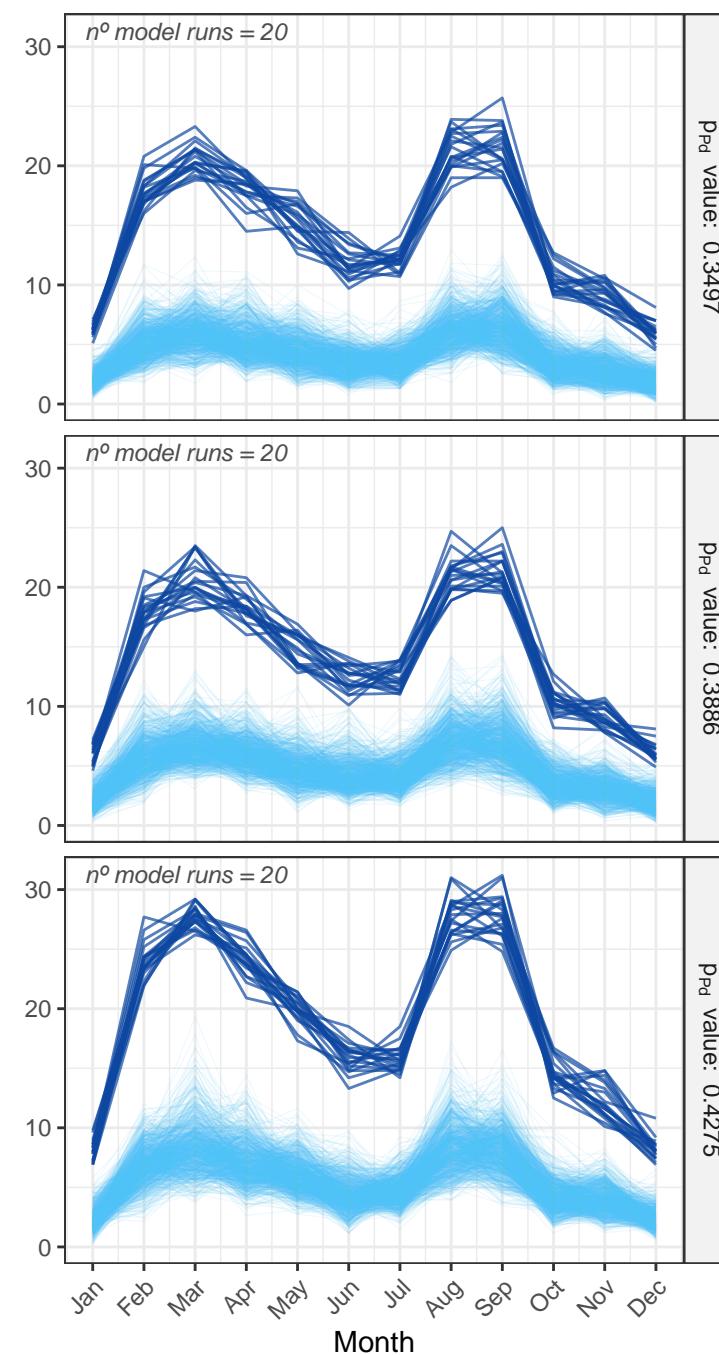
Mammals G1: Posterior Estimation Overlap per Simulation Scenario

Light Blue Bands: 50 posterior samples per sim | Dark Lines: True Simulated Values

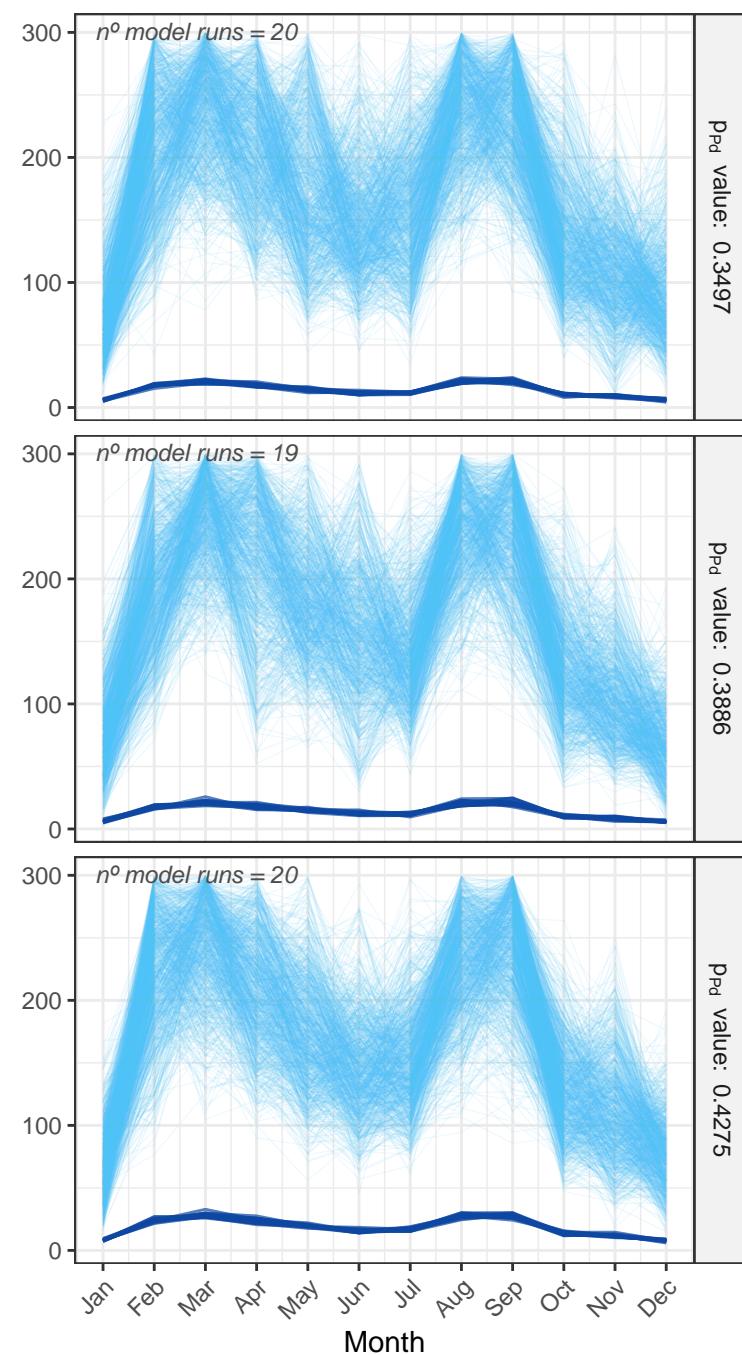
Prior: Accurate prior



Prior: Inaccurate prior



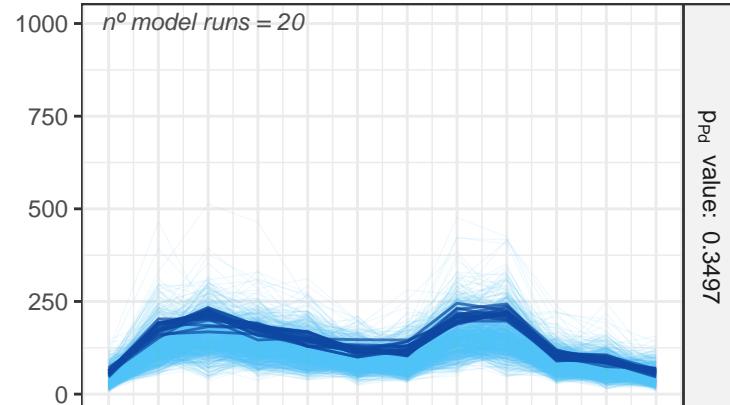
Prior: Uninformative prior



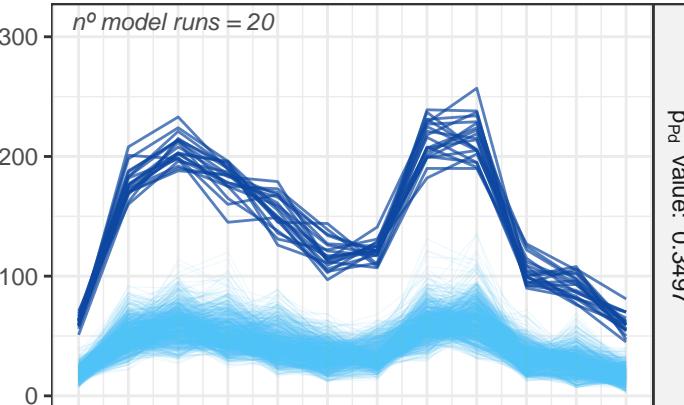
Mammals G1: Posterior Estimation Overlap per Simulation Scenario

Light Blue Bands: 50 posterior samples per sim | Dark Lines: True Simulated Values

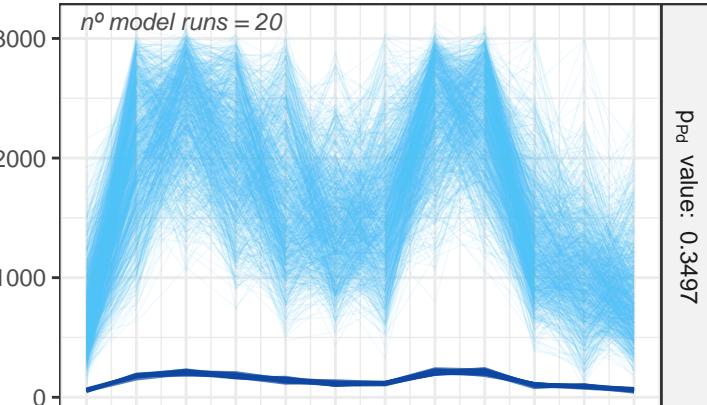
Prior: Accurate prior



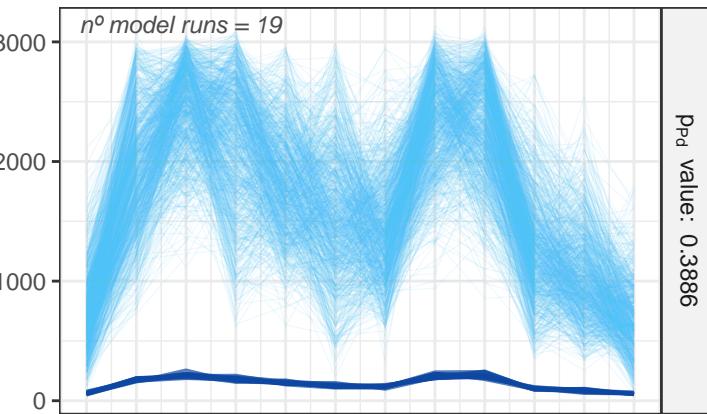
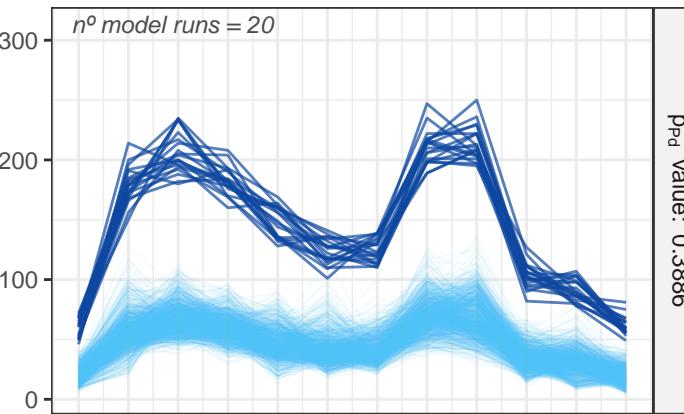
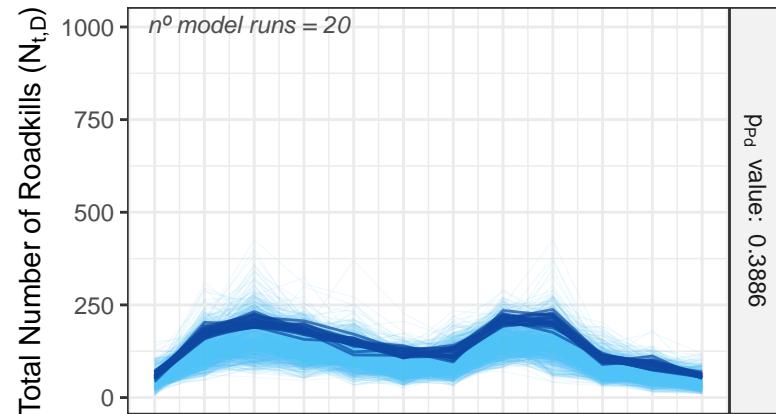
Prior: Inaccurate prior



Prior: Uninformative prior

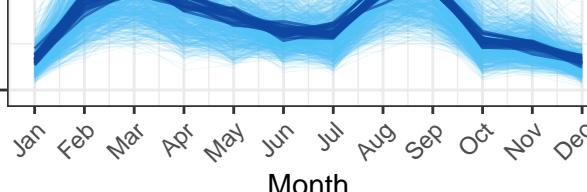


Total Number of Roadkills ($N_{t,D}$)



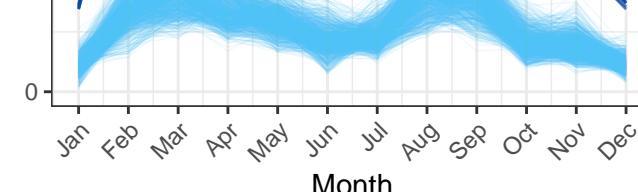
n^o model runs = 20

p_{pd} value: 0.4275



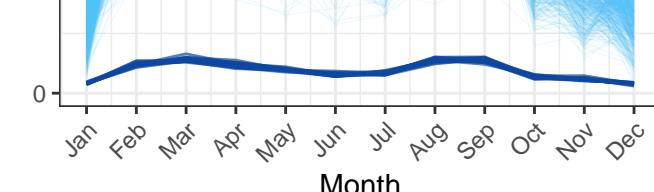
n^o model runs = 20

p_{pd} value: 0.4275



n^o model runs = 20

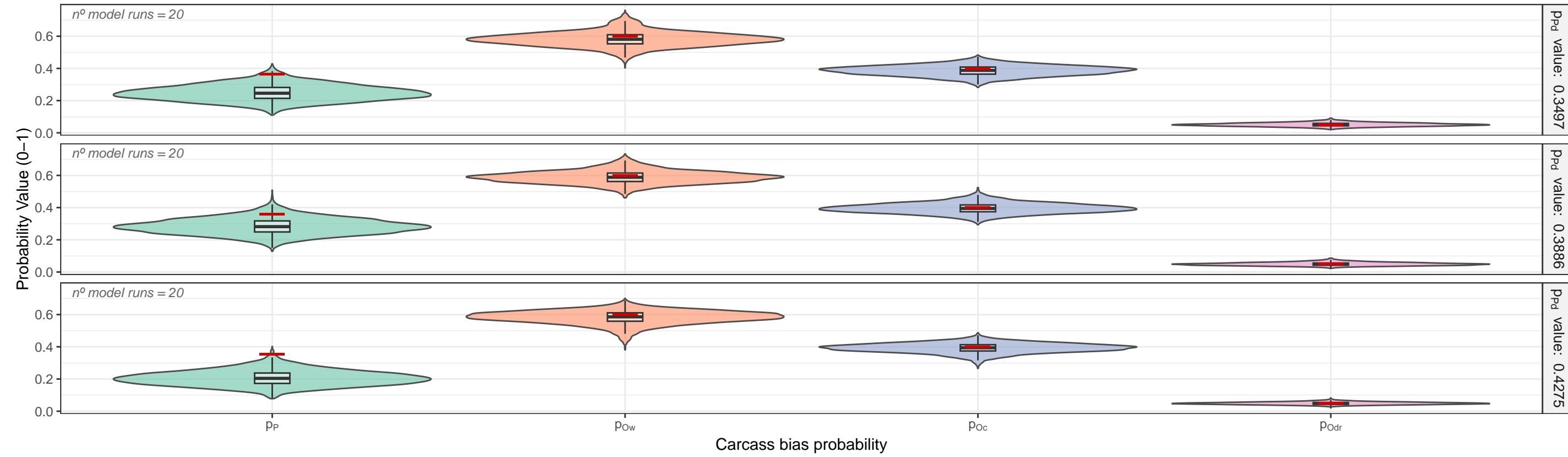
p_{pd} value: 0.4275



Mammals G1 – Complete carcass bias probabilities recovery across simulation scenarios

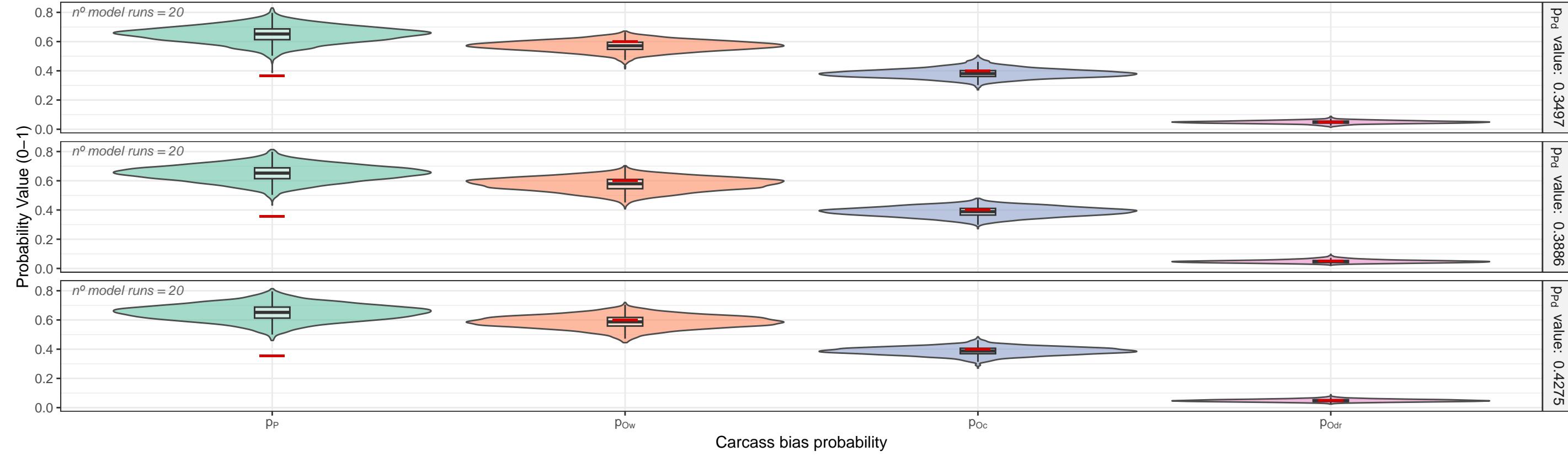
Mammals G1 – Scenario Matrix for Prior: Accurate prior

Violin plots indicate posterior distribution | Red dash (–) indicates True Simulated Values



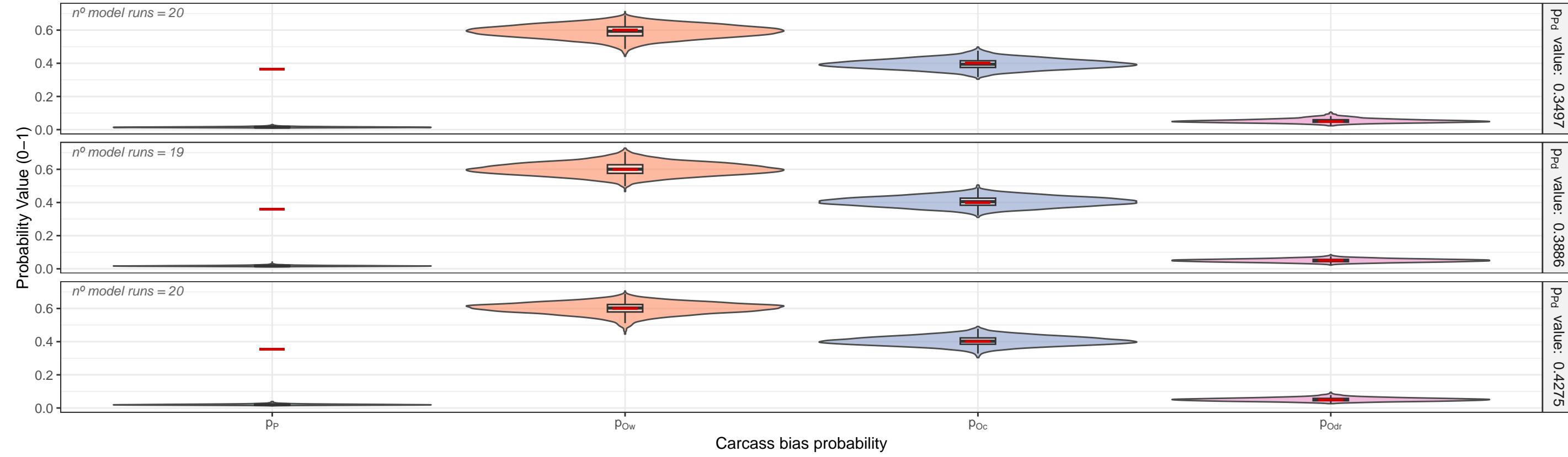
Mammals G1 – Scenario Matrix for Prior: Inaccurate prior

Violin plots indicate posterior distribution | Red dash (–) indicates True Simulated Values



Mammals G1 – Scenario Matrix for Prior: Uninformative prior

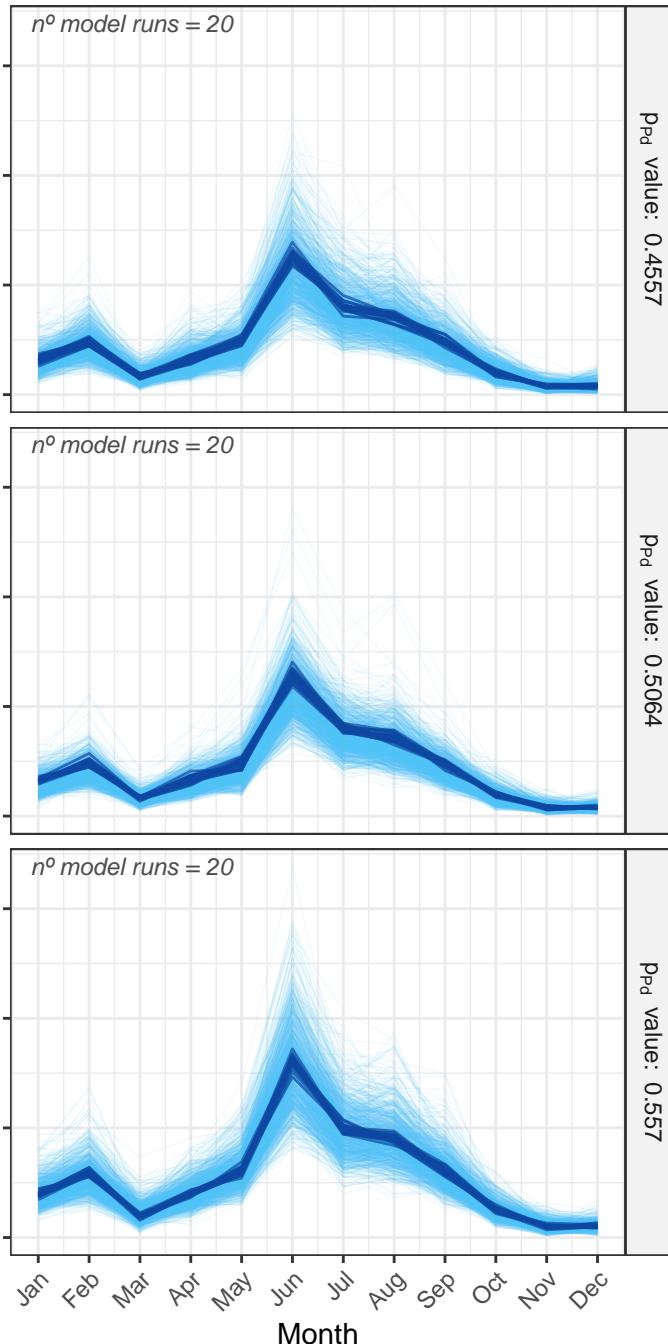
Violin plots indicate posterior distribution | Red dash (–) indicates True Simulated Values



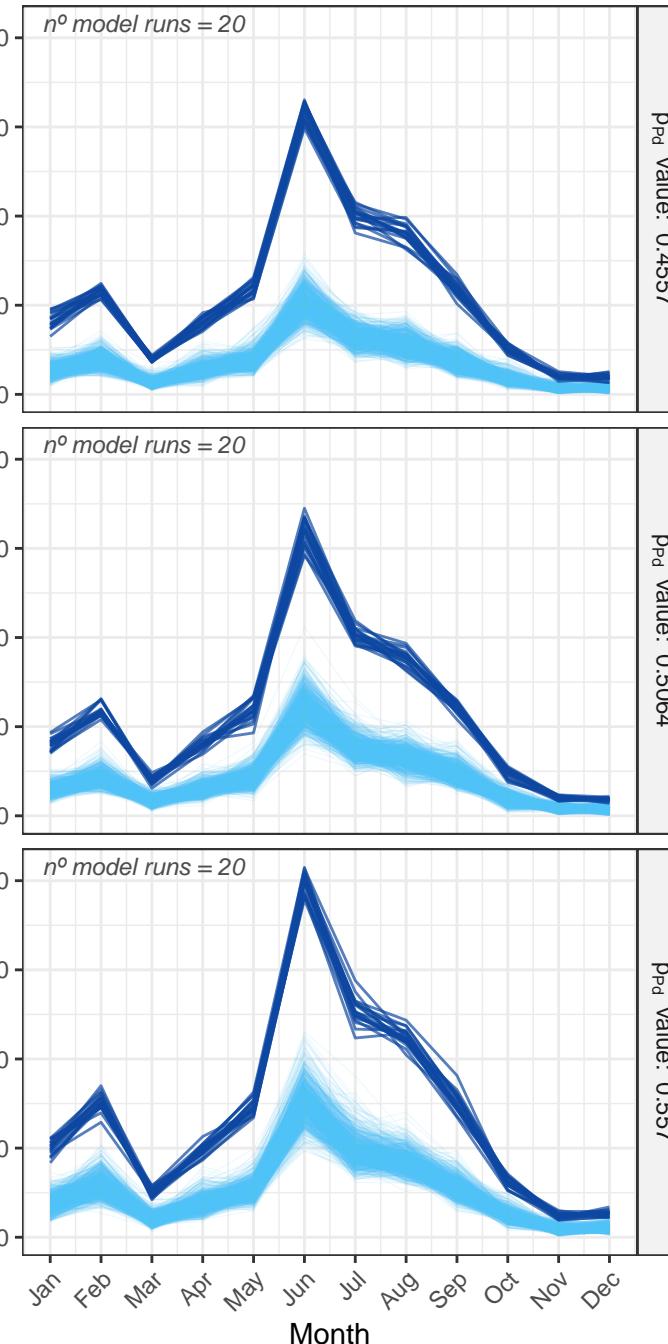
Mammals G2: Posterior Estimation Overlap per Simulation Scenario

Light Blue Bands: 50 posterior samples per sim | Dark Lines: True Simulated Values

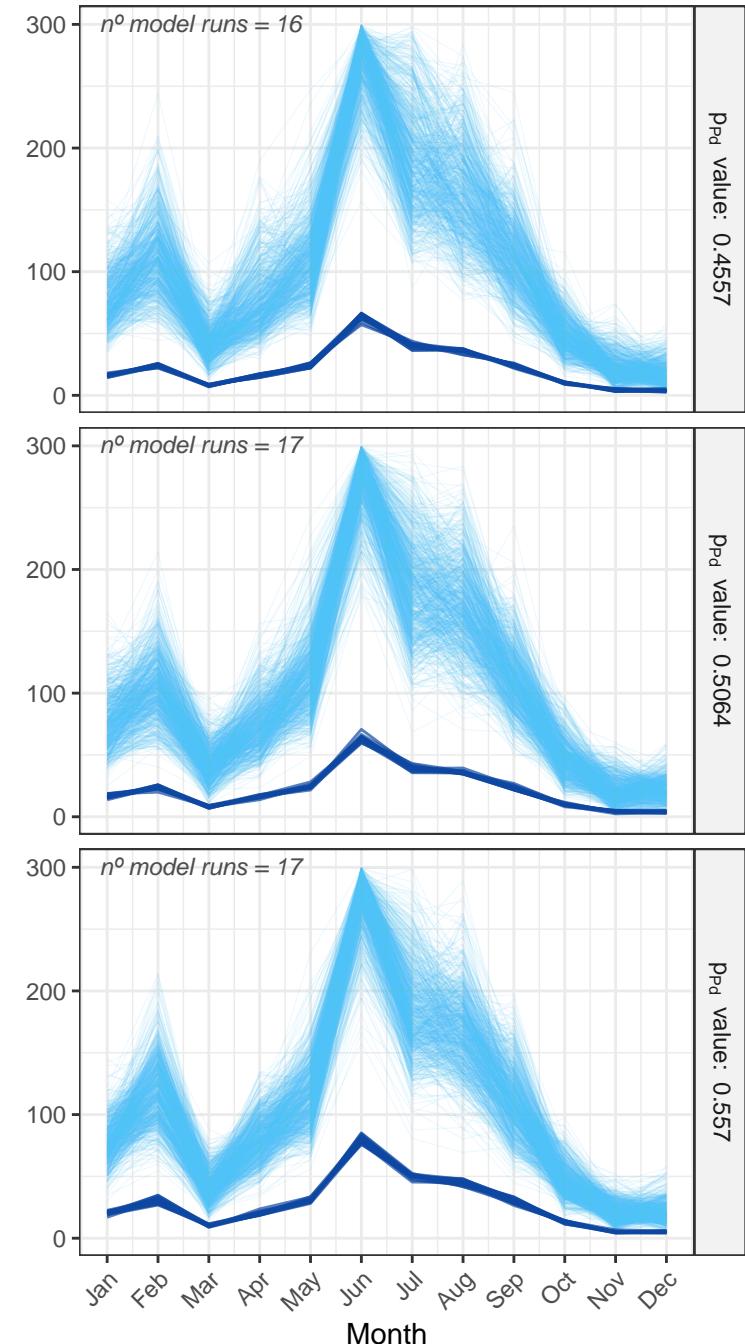
Prior: Accurate prior



Prior: Inaccurate prior



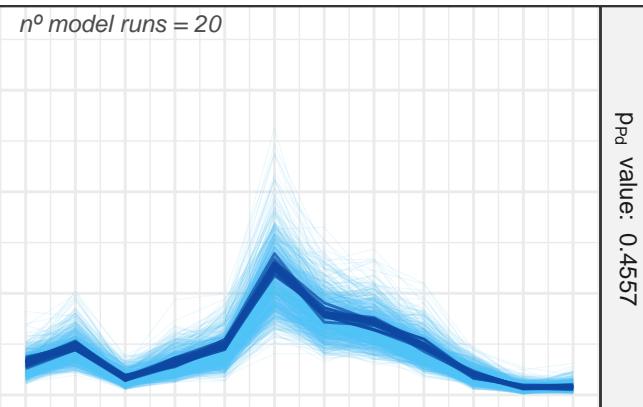
Prior: Uninformative prior



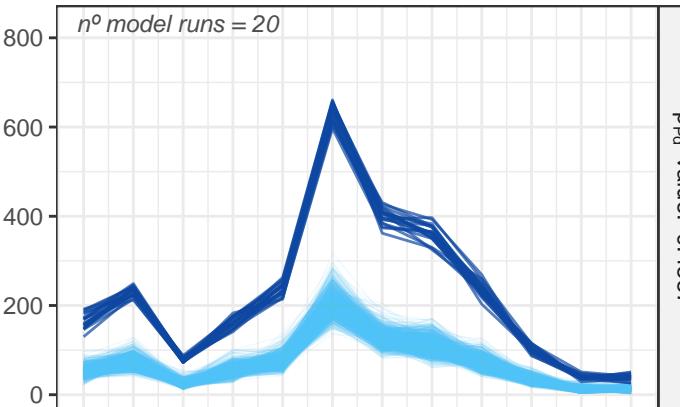
Mammals G2: Posterior Estimation Overlap per Simulation Scenario

Light Blue Bands: 50 posterior samples per sim | Dark Lines: True Simulated Values

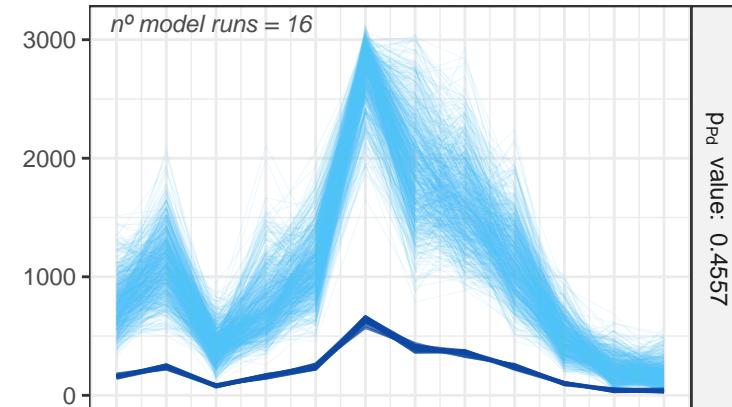
Prior: Accurate prior



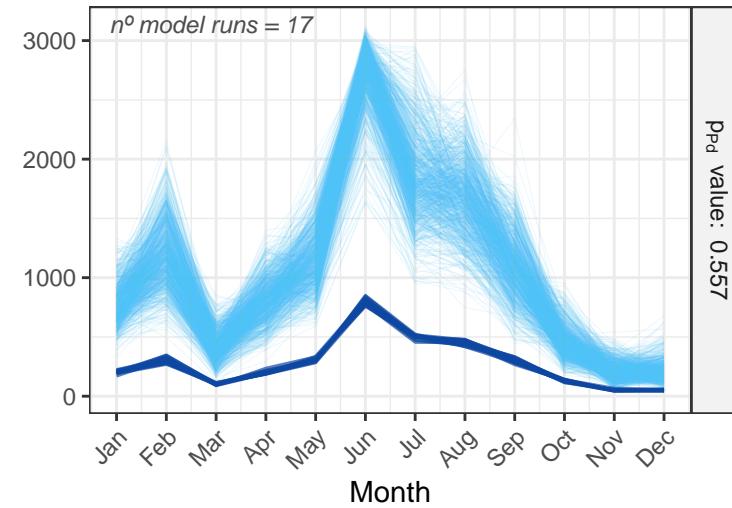
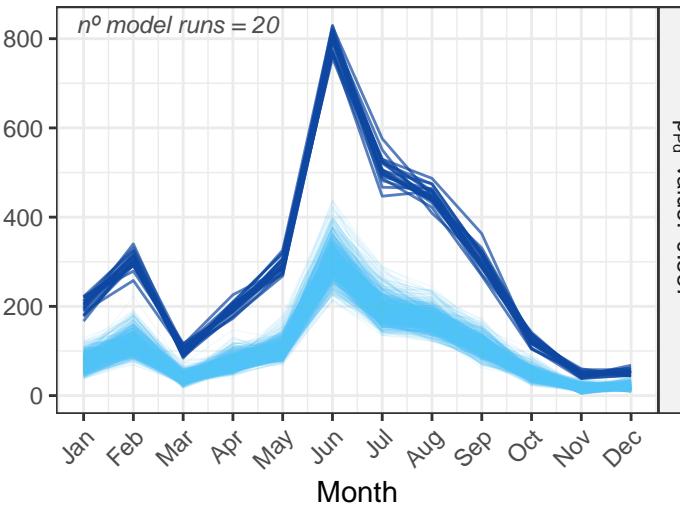
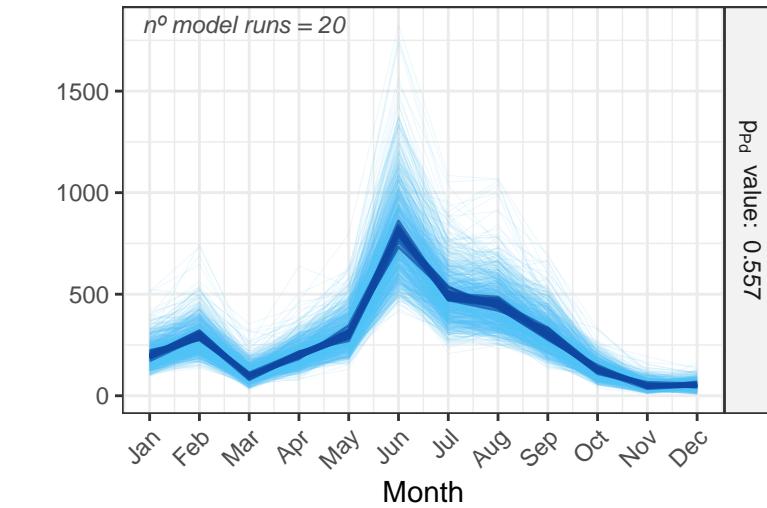
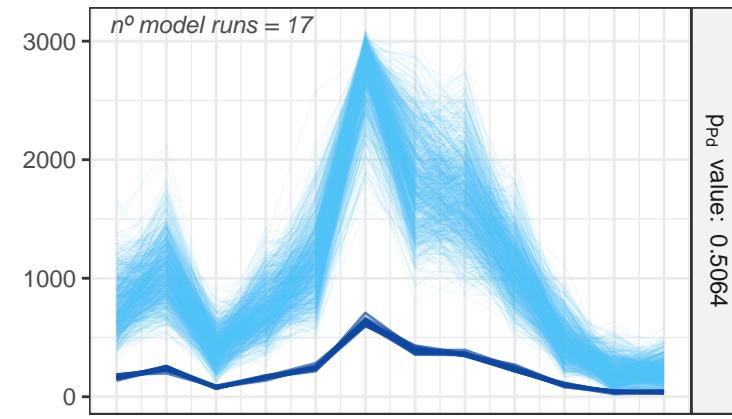
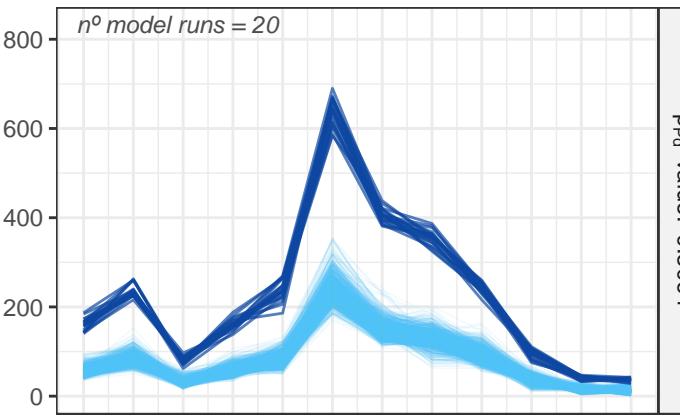
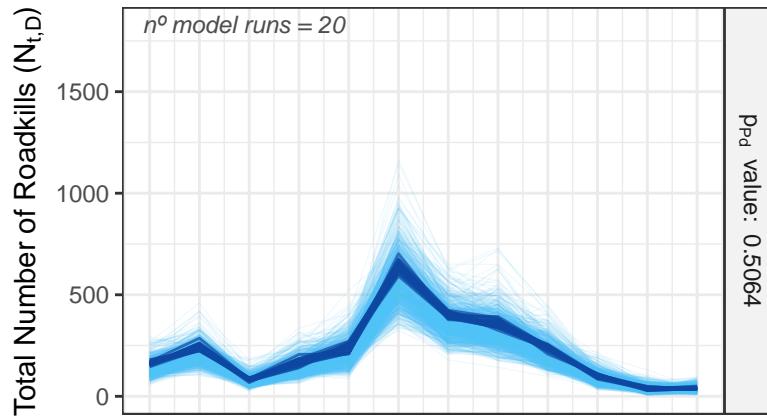
Prior: Inaccurate prior



Prior: Uninformative prior



Total Number of Roadkills ($N_{t,D}$)



Month

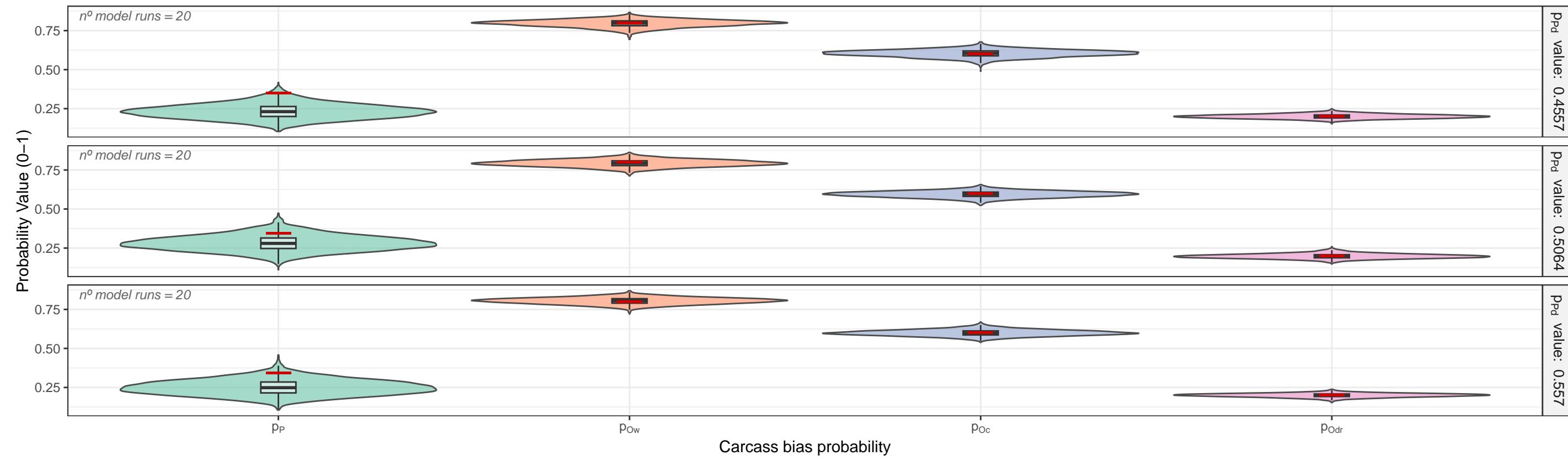
Month

Month

Mammals G2 – Complete carcass bias probabilities recovery across simulation scenarios

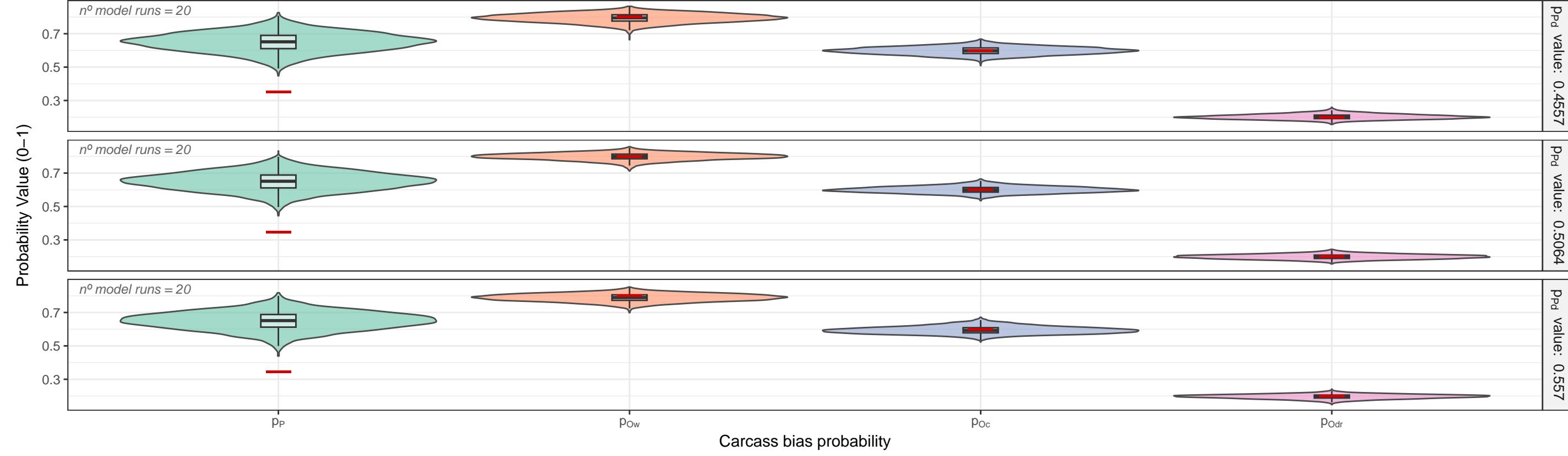
Mammals G2 – Scenario Matrix for Prior: Accurate prior

Violin plots indicate posterior distribution | Red dash (–) indicates True Simulated Values



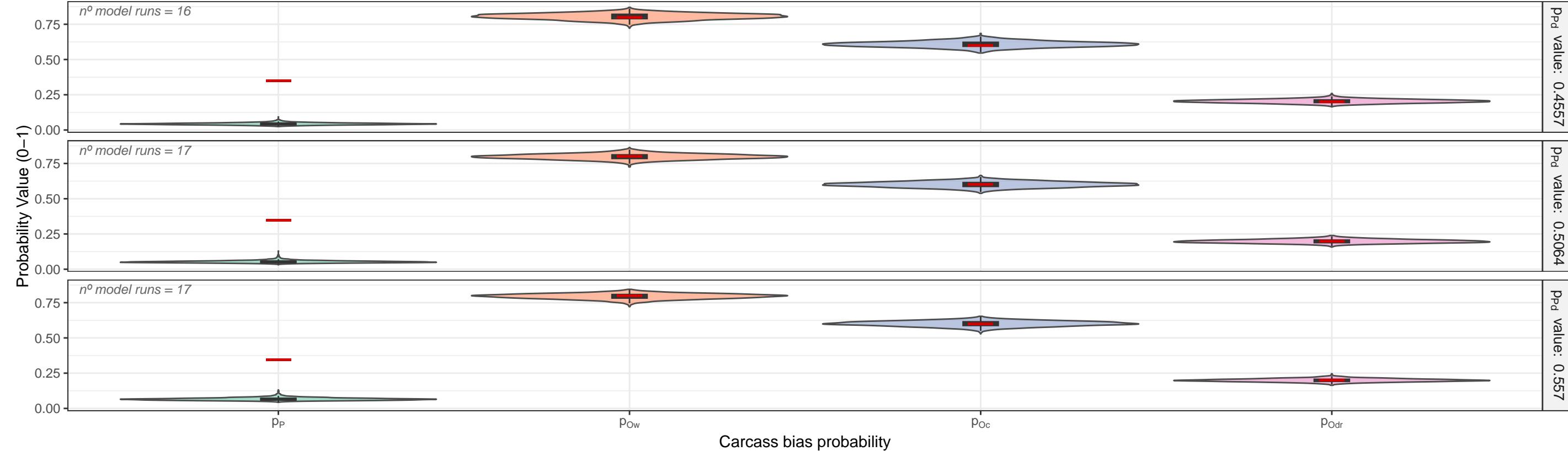
Mammals G2 – Scenario Matrix for Prior: Inaccurate prior

Violin plots indicate posterior distribution | Red dash (–) indicates True Simulated Values



Mammals G2 – Scenario Matrix for Prior: Uninformative prior

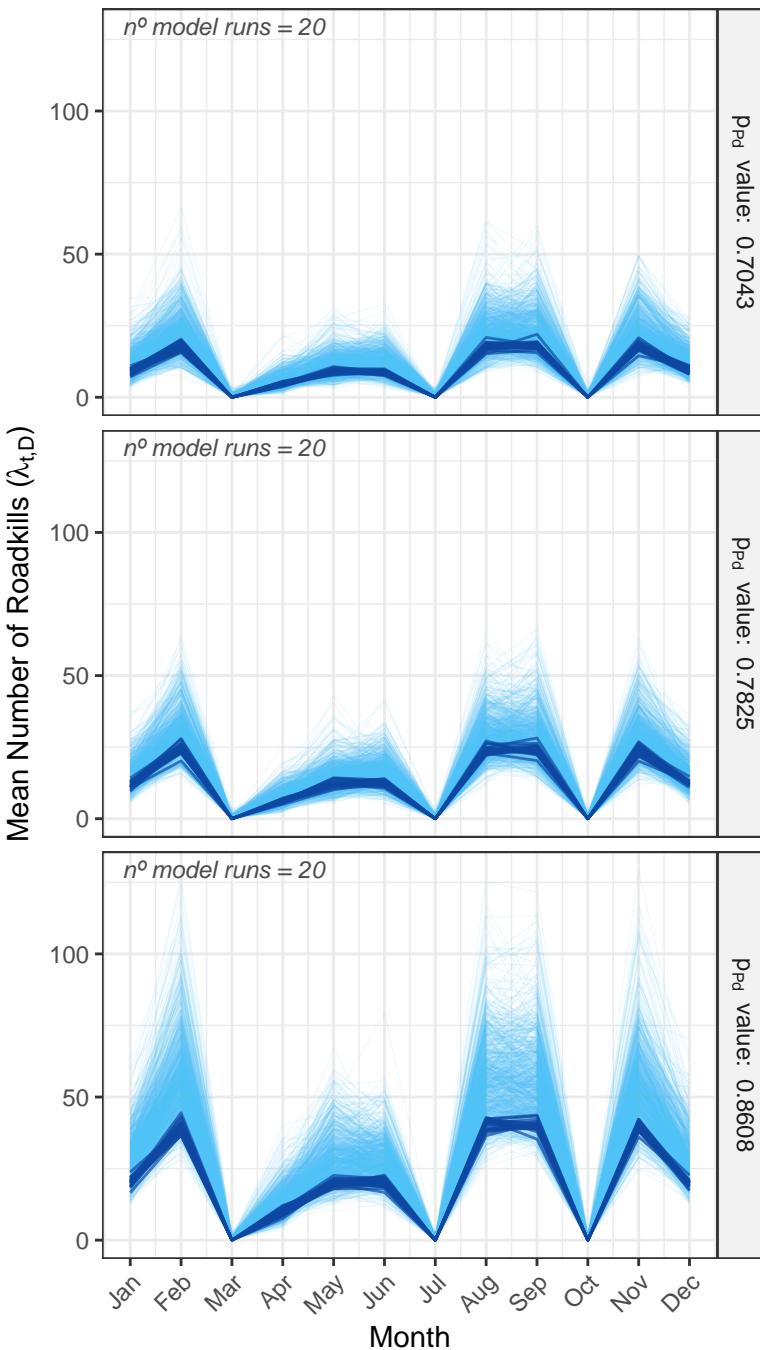
Violin plots indicate posterior distribution | Red dash (–) indicates True Simulated Values



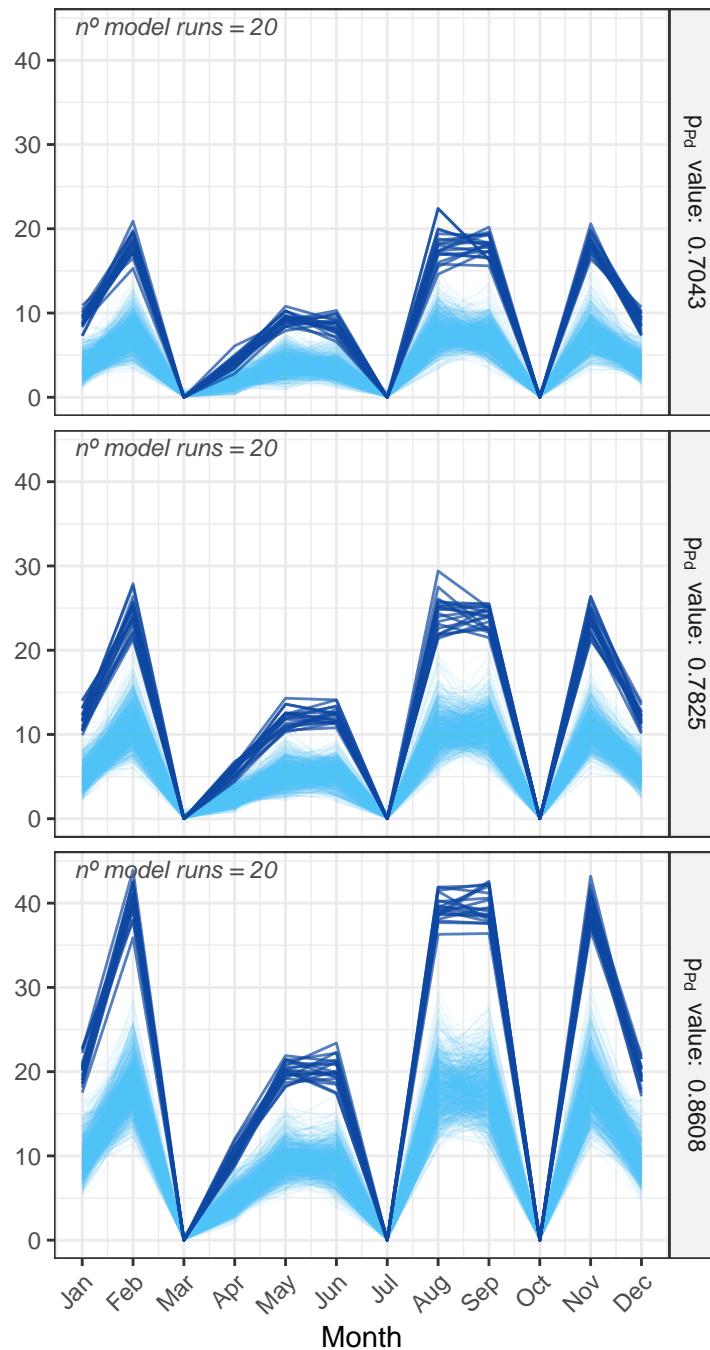
Mammals G3: Posterior Estimation Overlap per Simulation Scenario

Light Blue Bands: 50 posterior samples per sim | Dark Lines: True Simulated Values

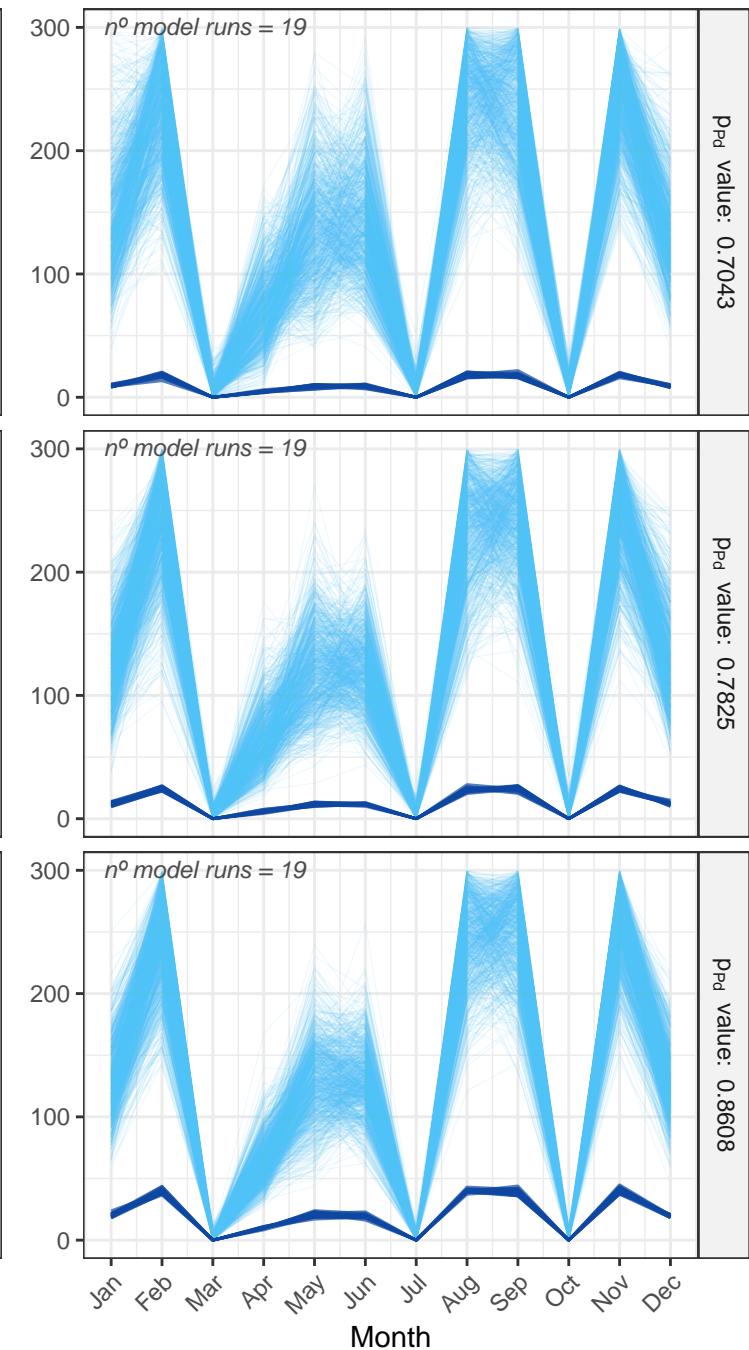
Prior: Accurate prior



Prior: Inaccurate prior



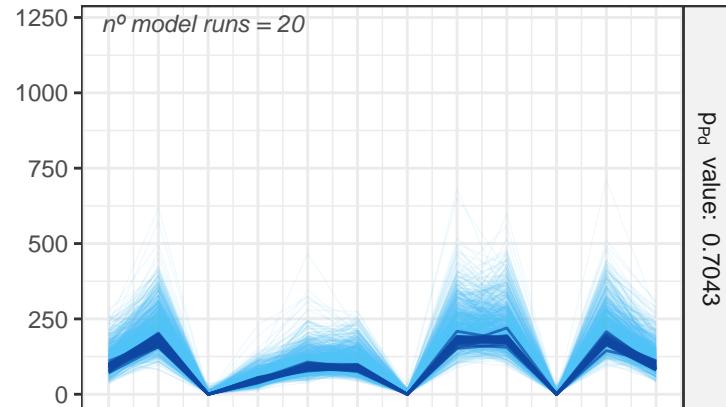
Prior: Uninformative prior



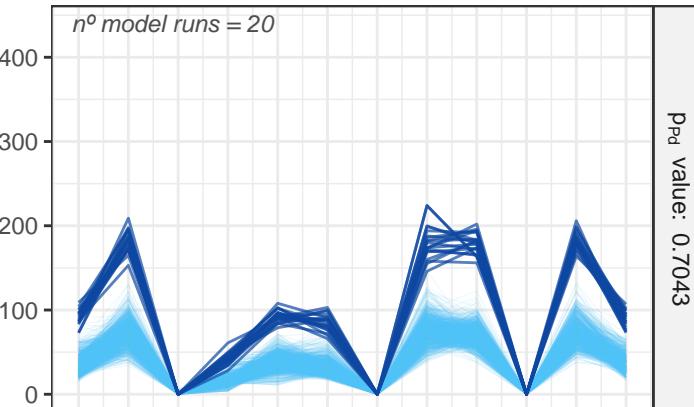
Mammals G3: Posterior Estimation Overlap per Simulation Scenario

Light Blue Bands: 50 posterior samples per sim | Dark Lines: True Simulated Values

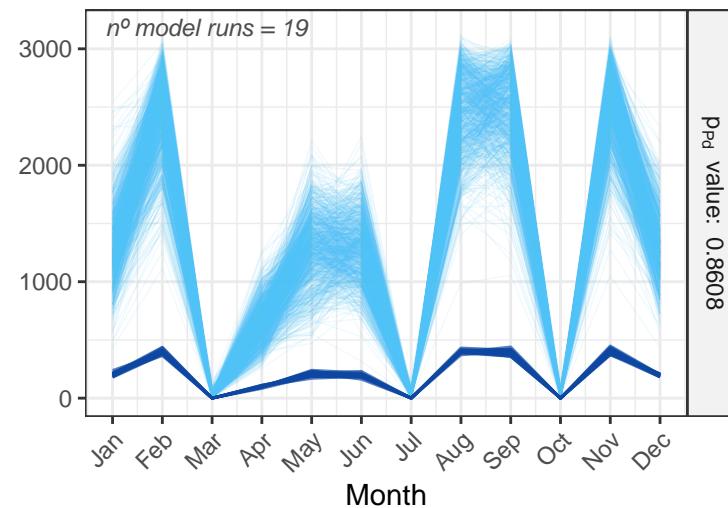
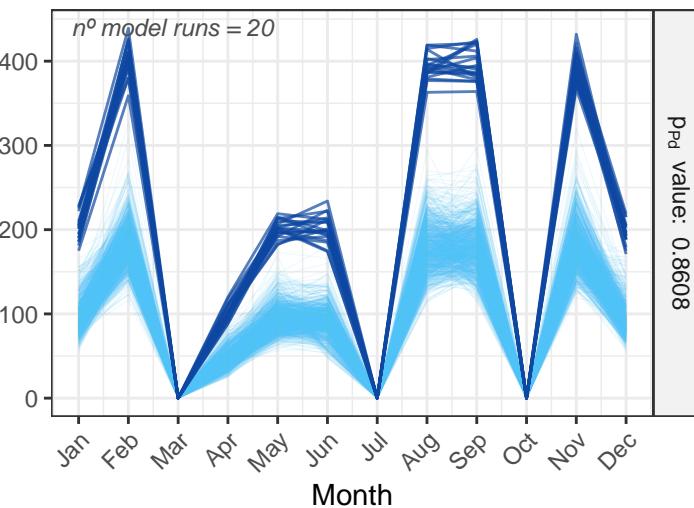
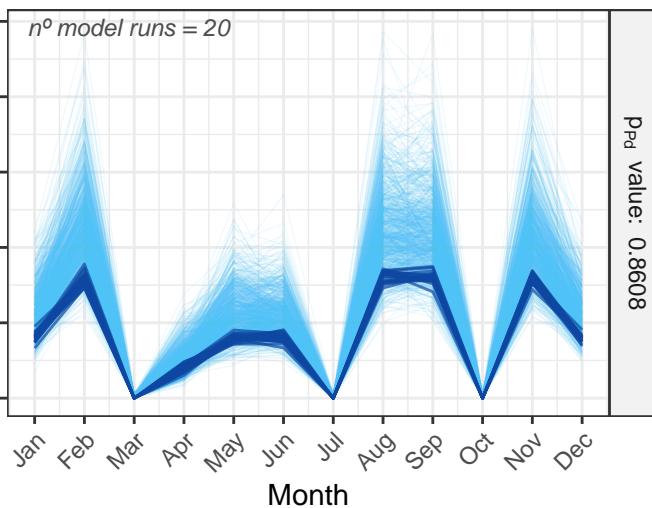
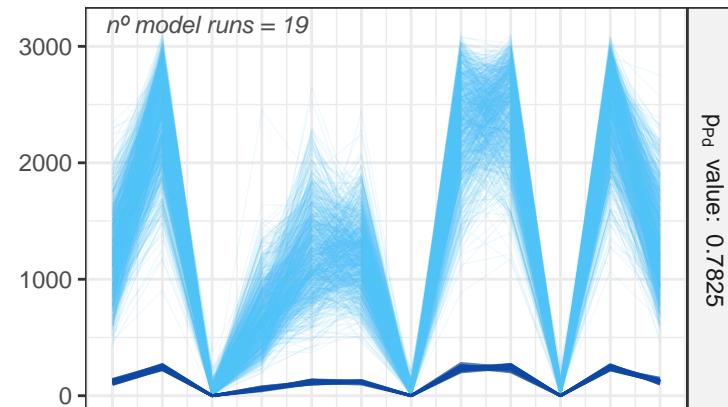
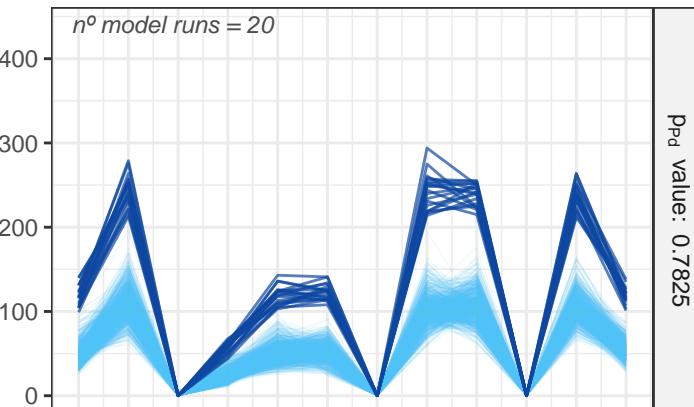
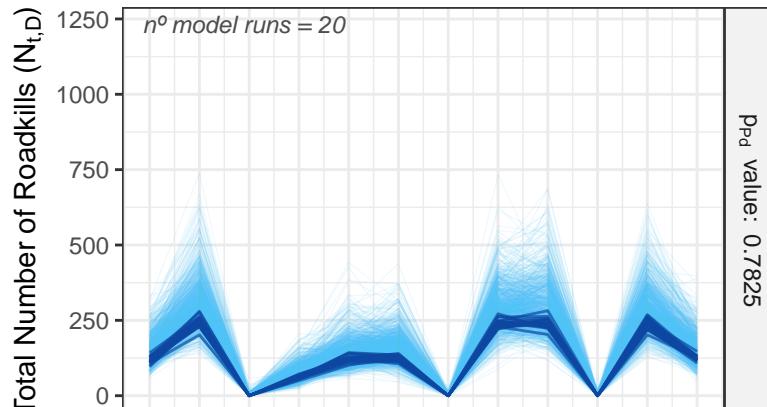
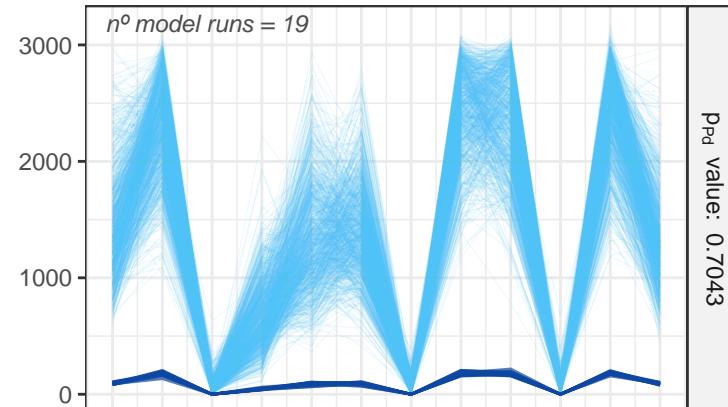
Prior: Accurate prior



Prior: Inaccurate prior



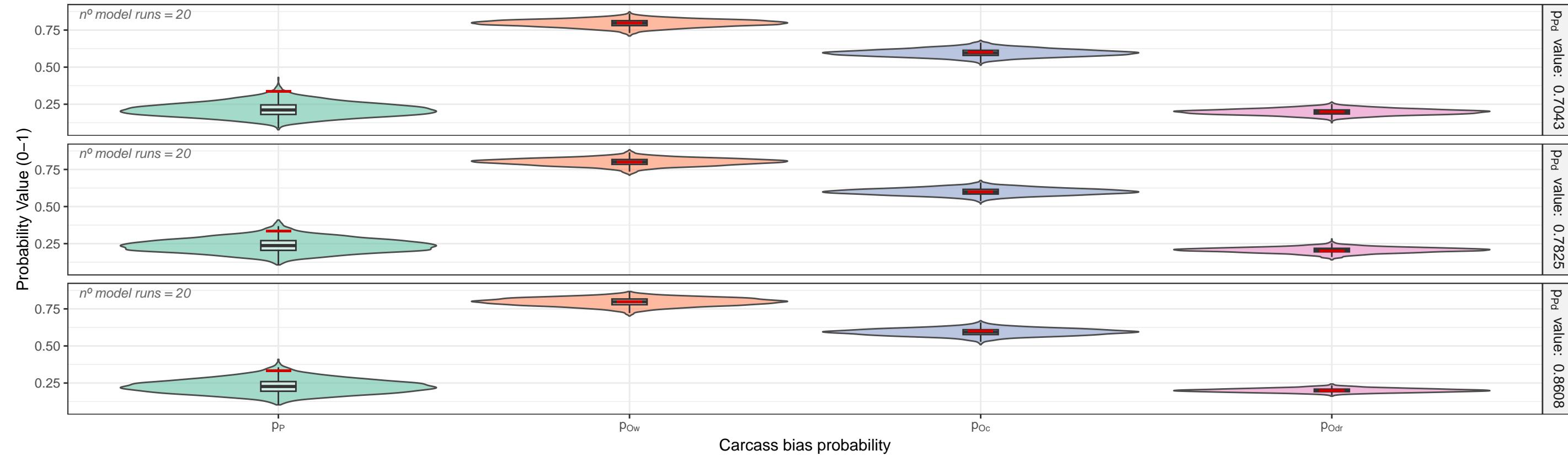
Prior: Uninformative prior



Mammals G3 – Complete carcass bias probabilities recovery across simulation scenarios

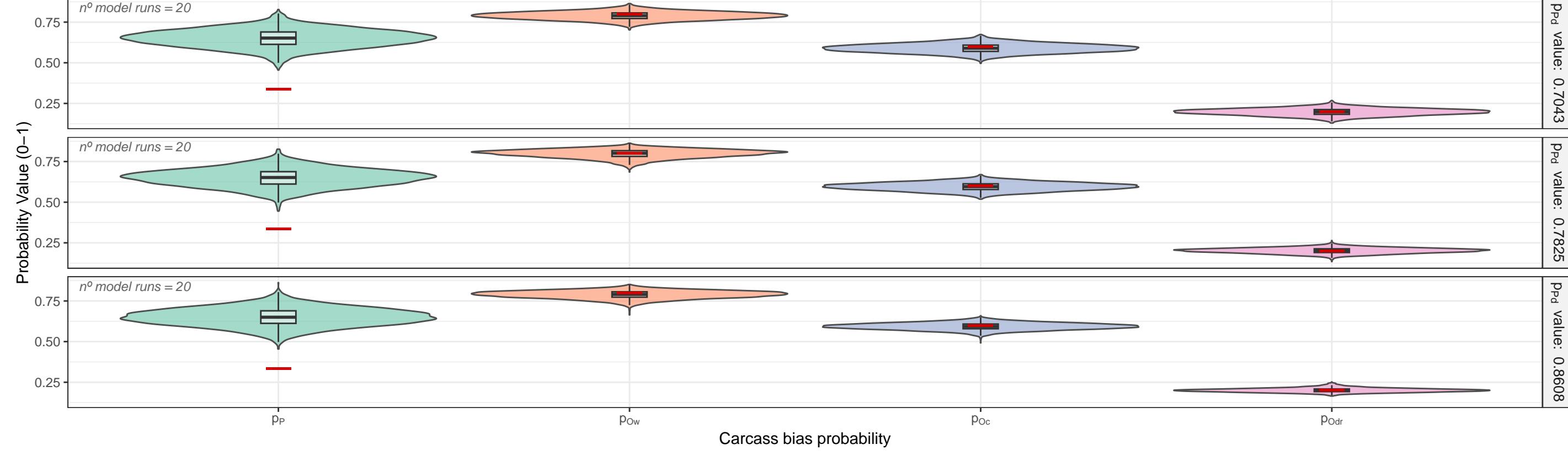
Mammals G3 – Scenario Matrix for Prior: Accurate prior

Violin plots indicate posterior distribution | Red dash (–) indicates True Simulated Values



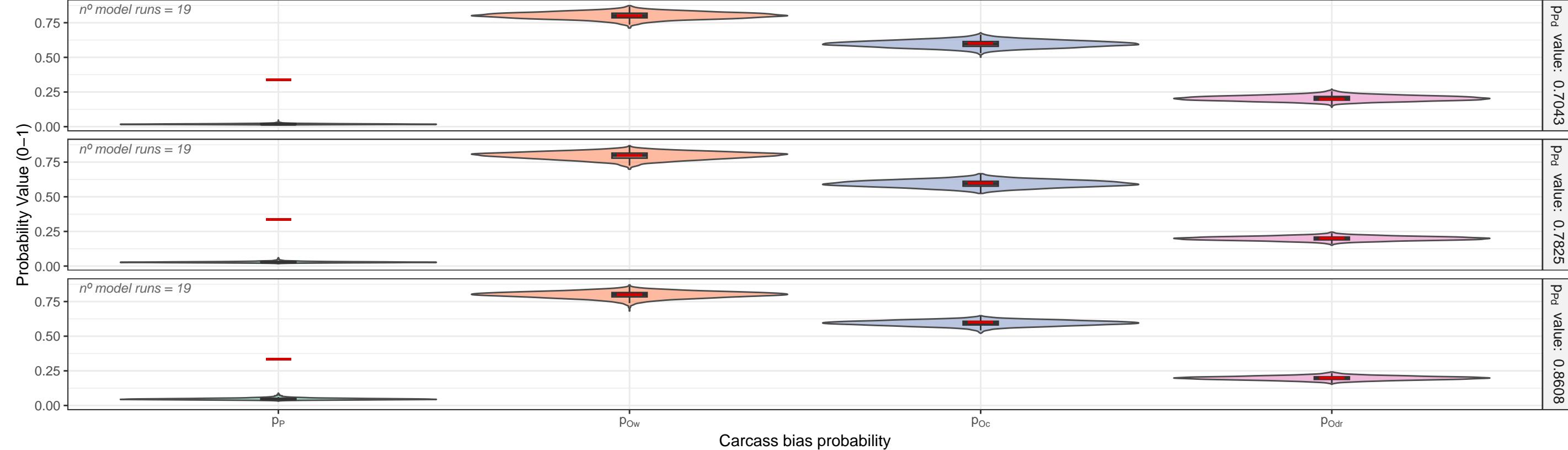
Mammals G3 – Scenario Matrix for Prior: Inaccurate prior

Violin plots indicate posterior distribution | Red dash (–) indicates True Simulated Values



Mammals G3 – Scenario Matrix for Prior: Uninformative prior

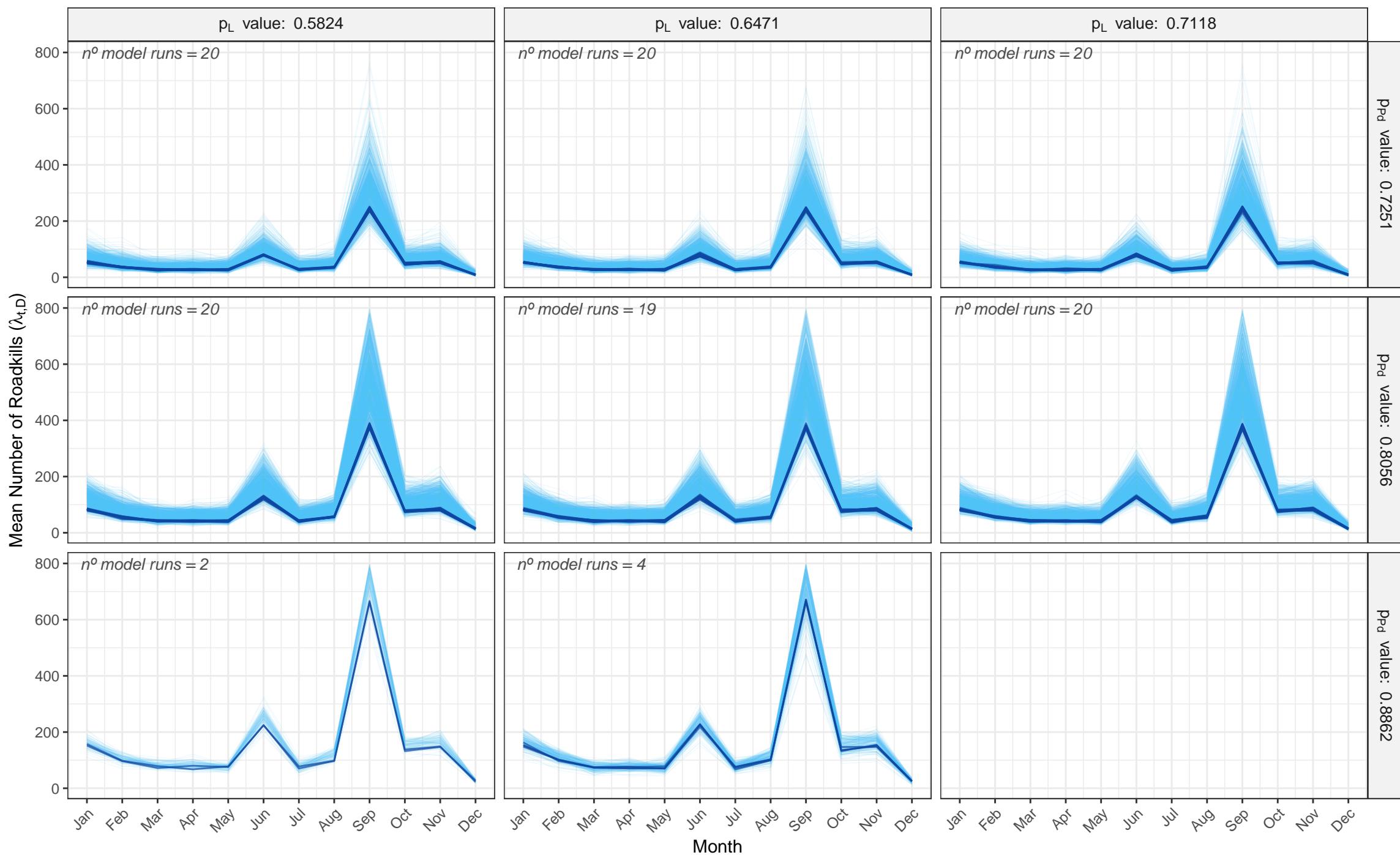
Violin plots indicate posterior distribution | Red dash (–) indicates True Simulated Values



Mammals G4: Posterior Estimation Overlap per Simulation Scenario

Prior: Accurate prior

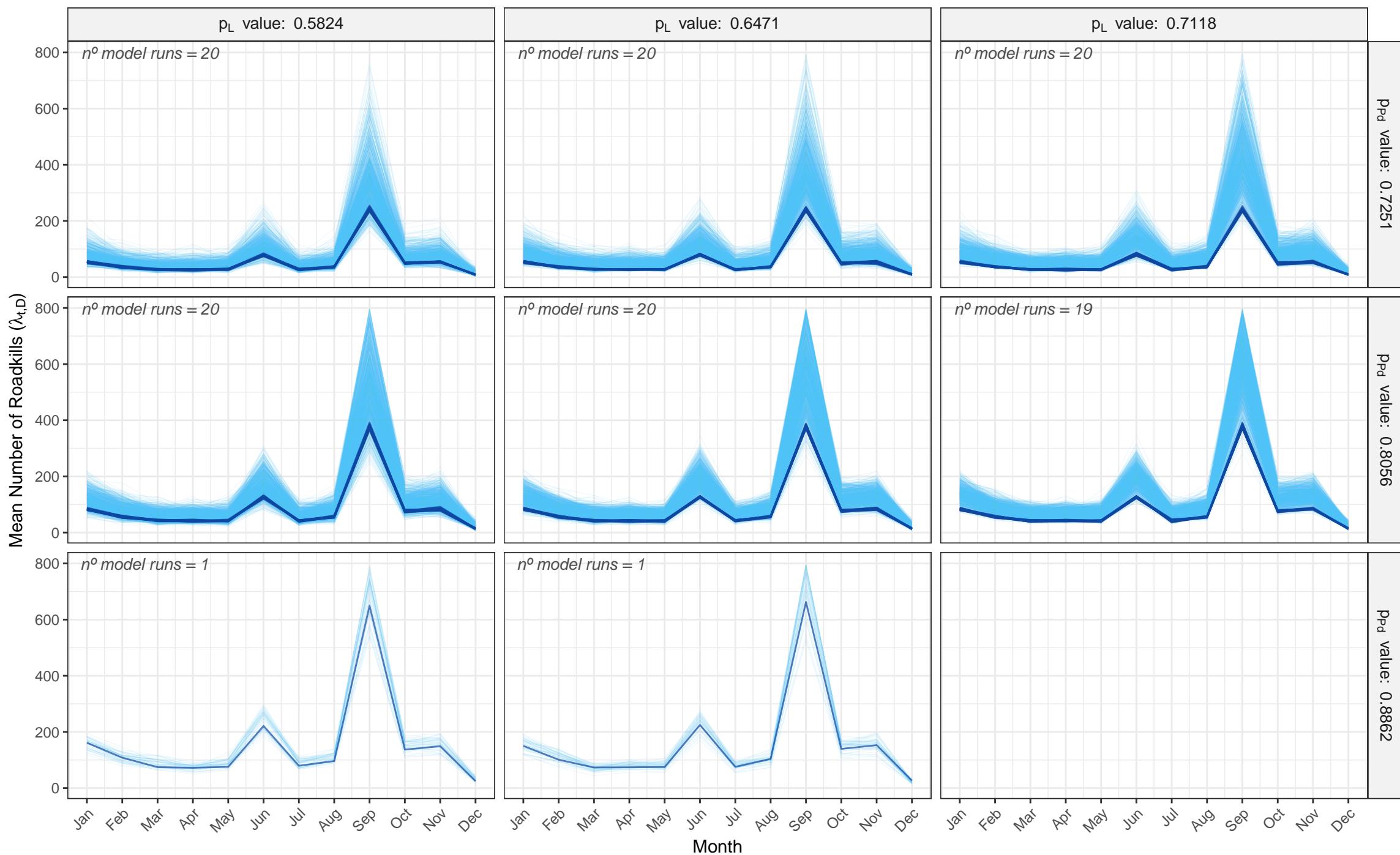
Light Blue Bands: 50 posterior samples per sim | Dark Lines: True Simulated Values



Mammals G4: Posterior Estimation Overlap per Simulation Scenario

Prior: Inaccurate prior

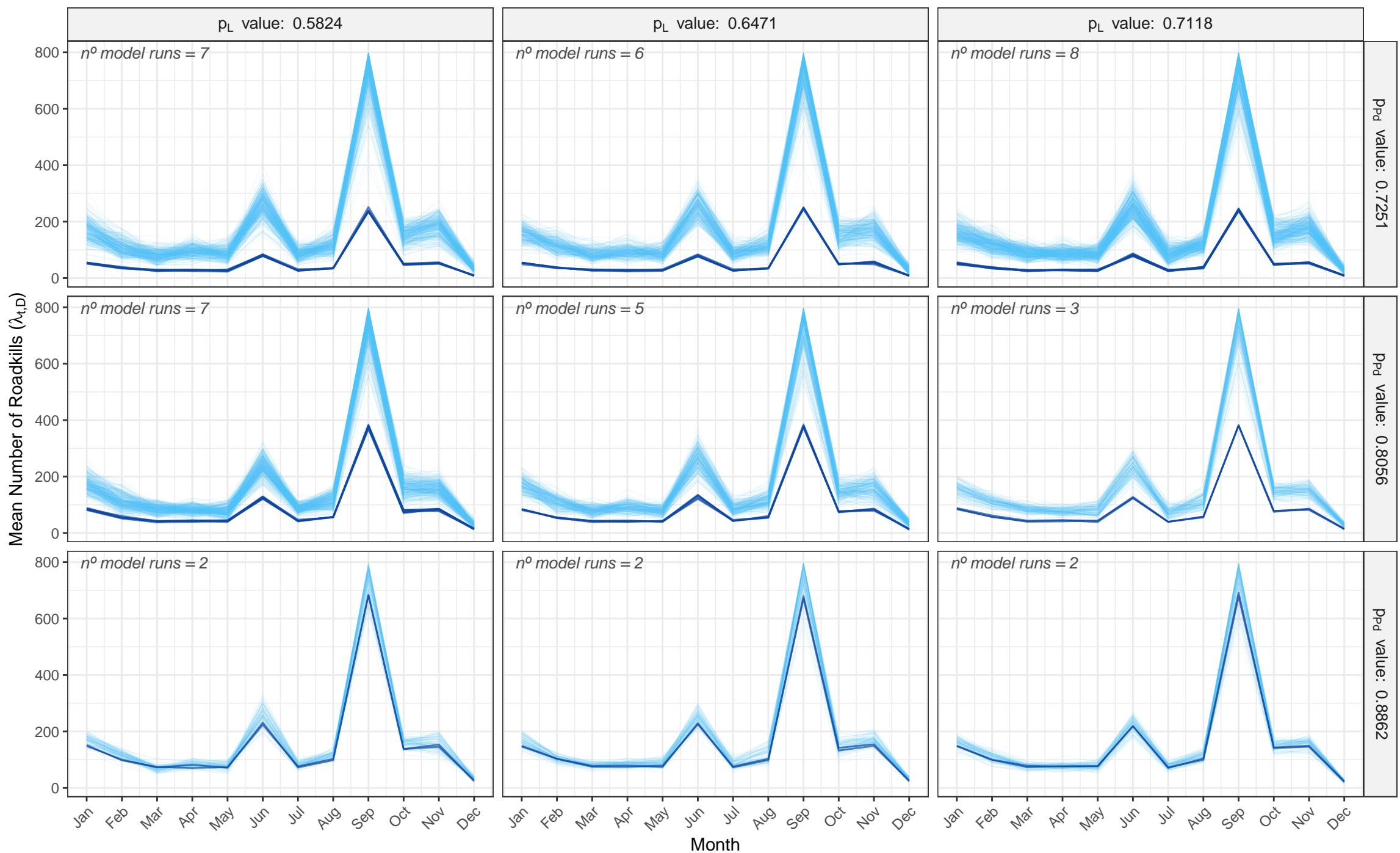
Light Blue Bands: 50 posterior samples per sim | Dark Lines: True Simulated Values



Mammals G4: Posterior Estimation Overlap per Simulation Scenario

Prior: Uninformative prior

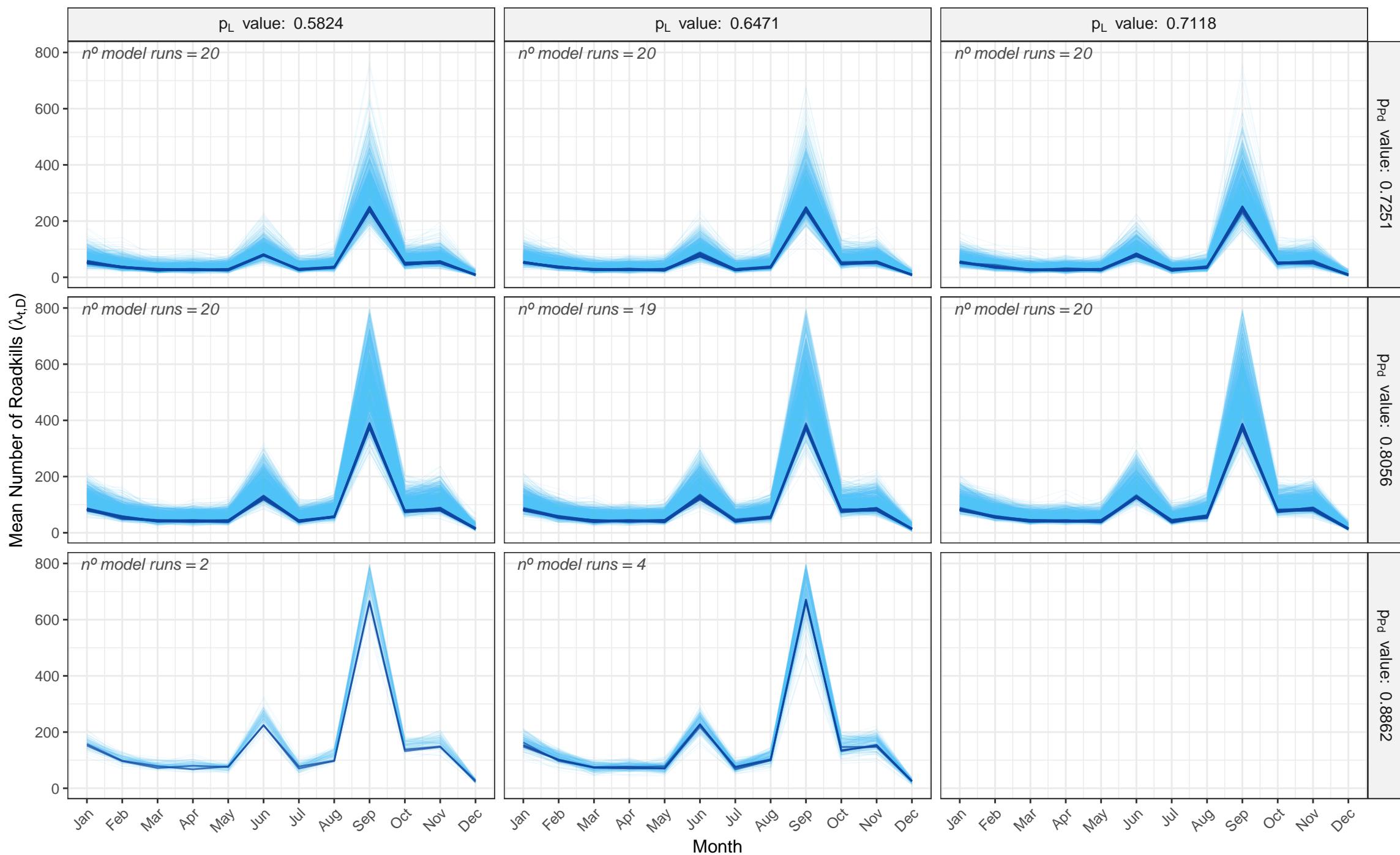
Light Blue Bands: 50 posterior samples per sim | Dark Lines: True Simulated Values



Mammals G4: Posterior Estimation Overlap per Simulation Scenario

Prior: Accurate prior

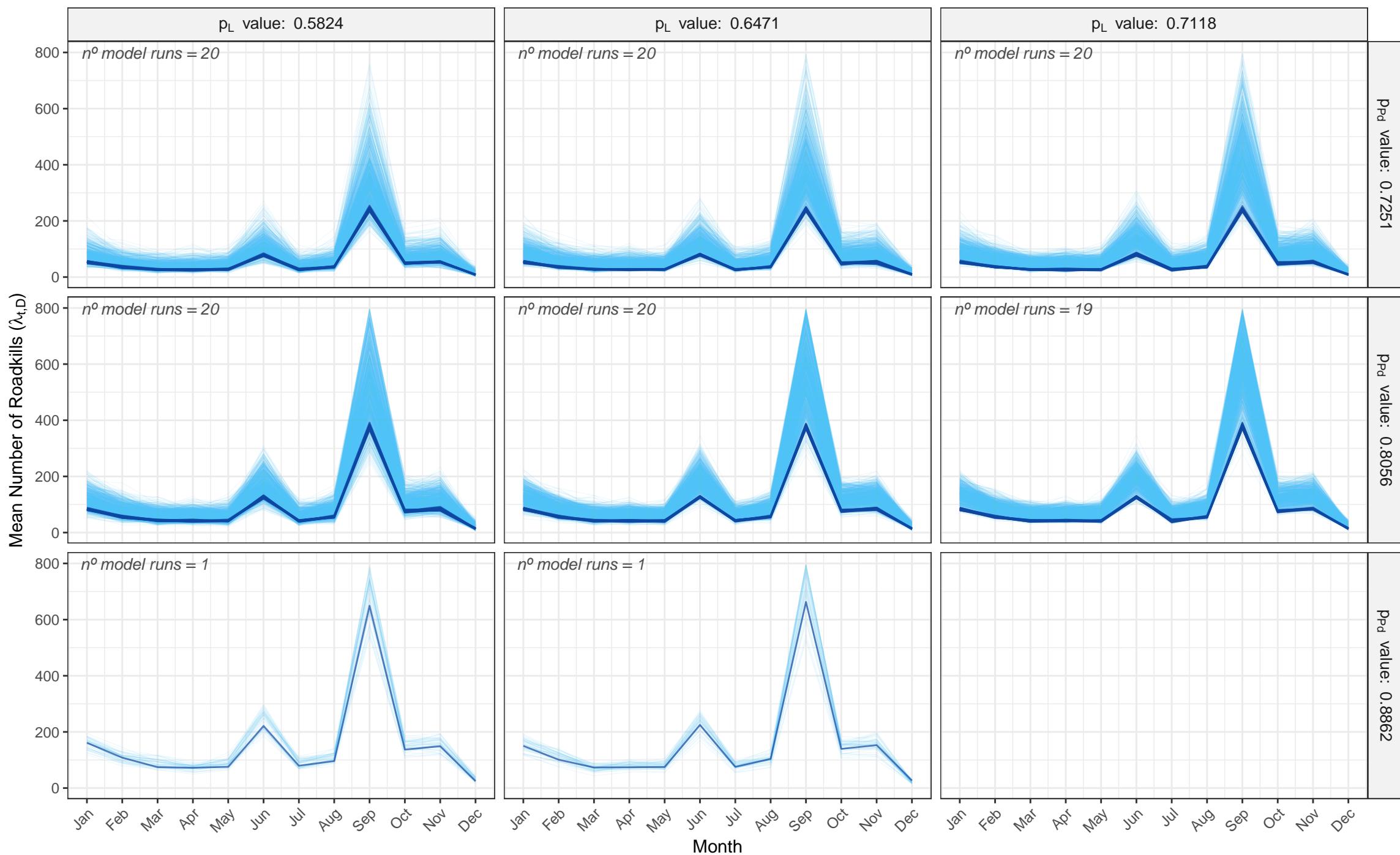
Light Blue Bands: 50 posterior samples per sim | Dark Lines: True Simulated Values



Mammals G4: Posterior Estimation Overlap per Simulation Scenario

Prior: Inaccurate prior

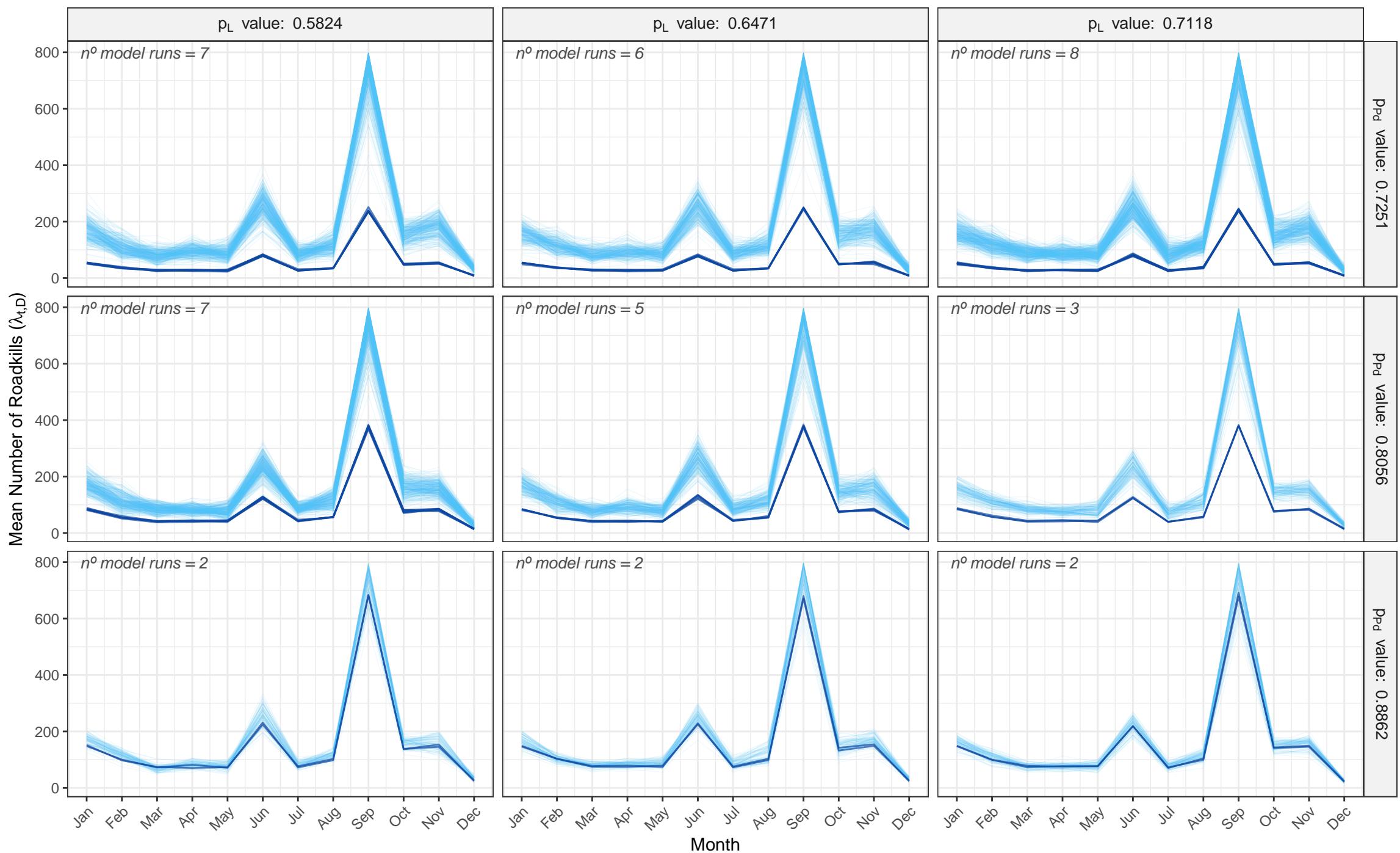
Light Blue Bands: 50 posterior samples per sim | Dark Lines: True Simulated Values



Mammals G4: Posterior Estimation Overlap per Simulation Scenario

Prior: Uninformative prior

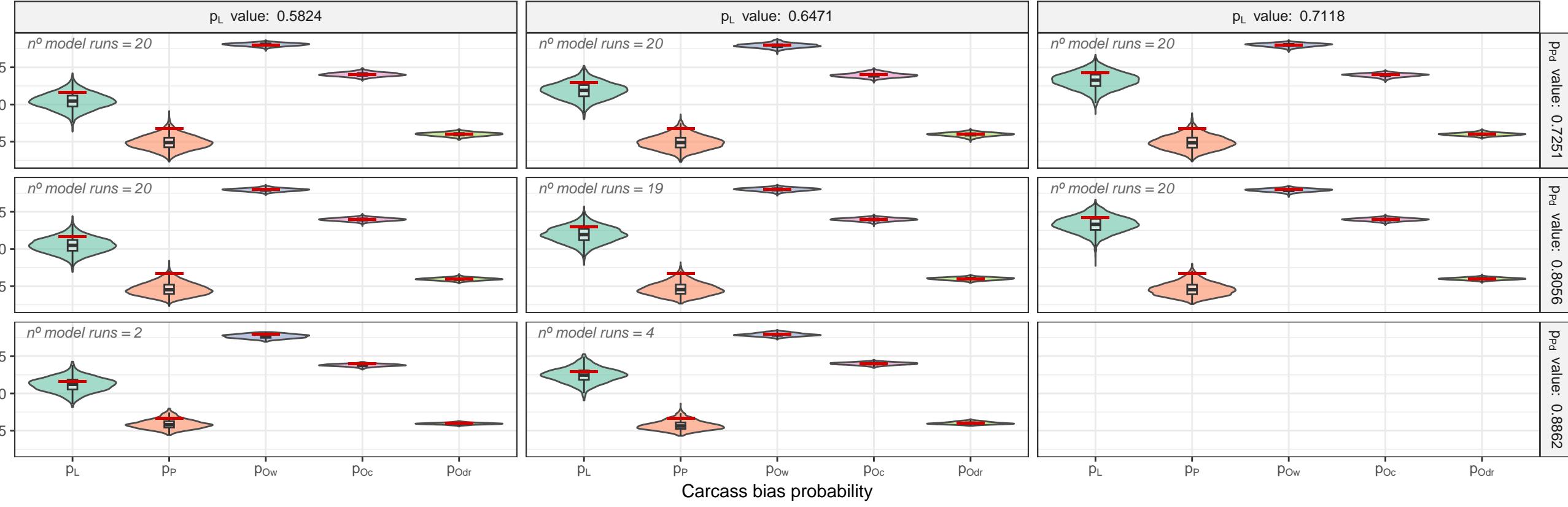
Light Blue Bands: 50 posterior samples per sim | Dark Lines: True Simulated Values



Mammals G4 – Complete carcass bias probabilities recovery across simulation scenarios

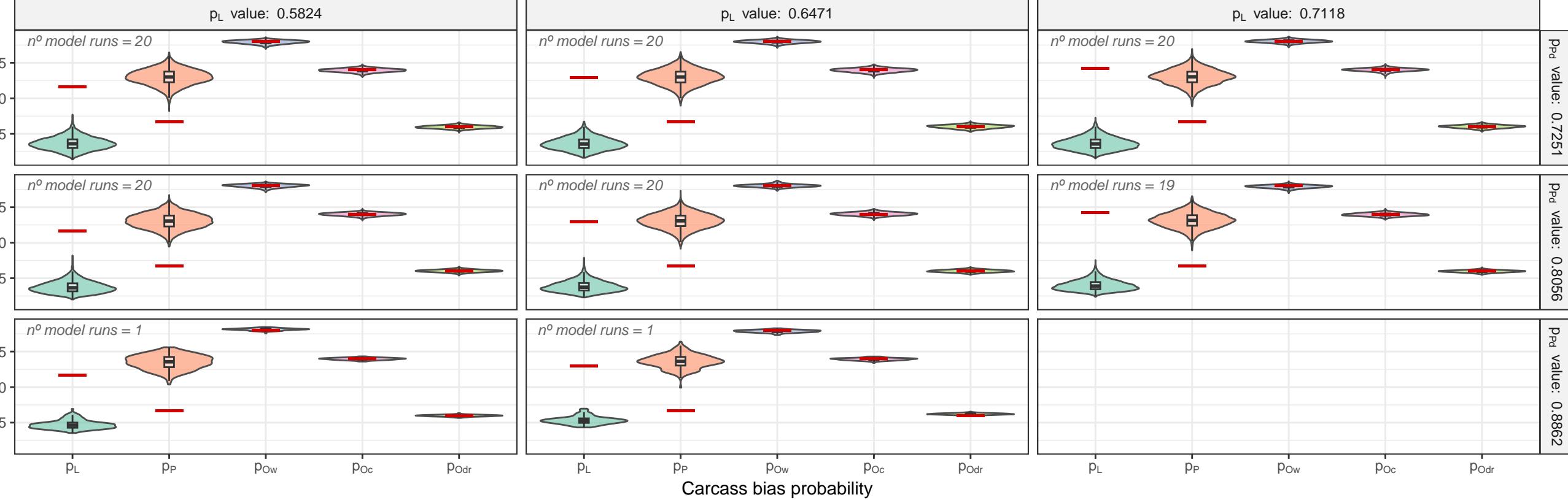
Mammals G4 – Scenario Matrix for Prior: Accurate prior

Violin plots indicate posterior distribution | Red dash (–) indicates True Simulated Values



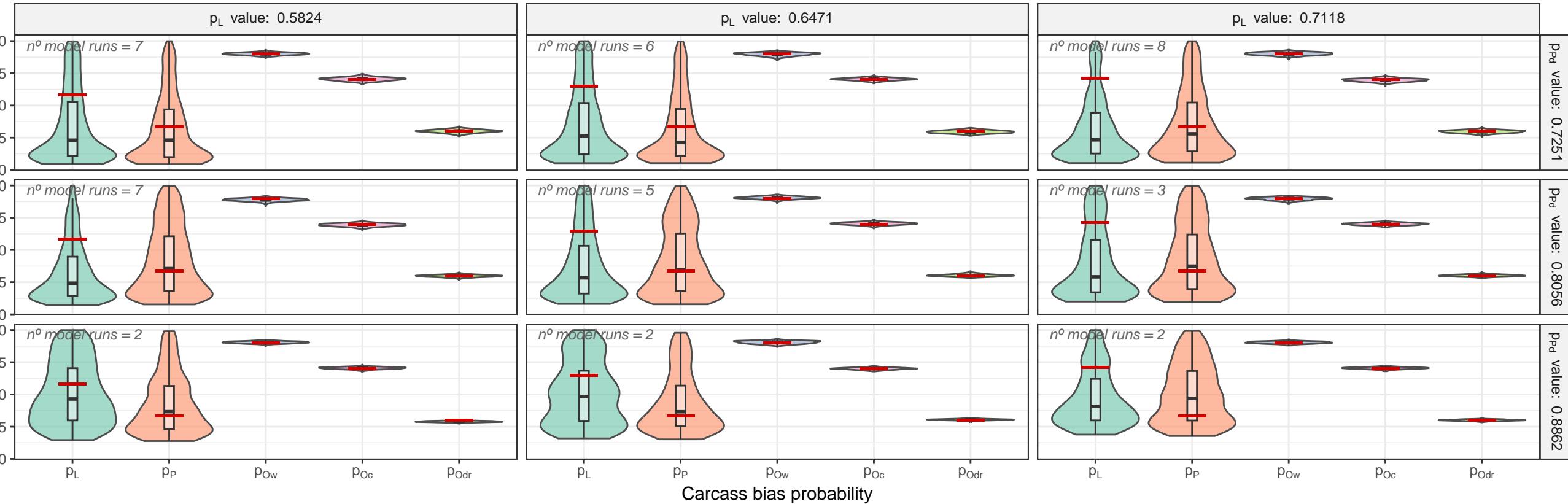
Mammals G4 – Scenario Matrix for Prior: Inaccurate prior

Violin plots indicate posterior distribution | Red dash (–) indicates True Simulated Values



Mammals G4 – Scenario Matrix for Prior: Uninformative prior

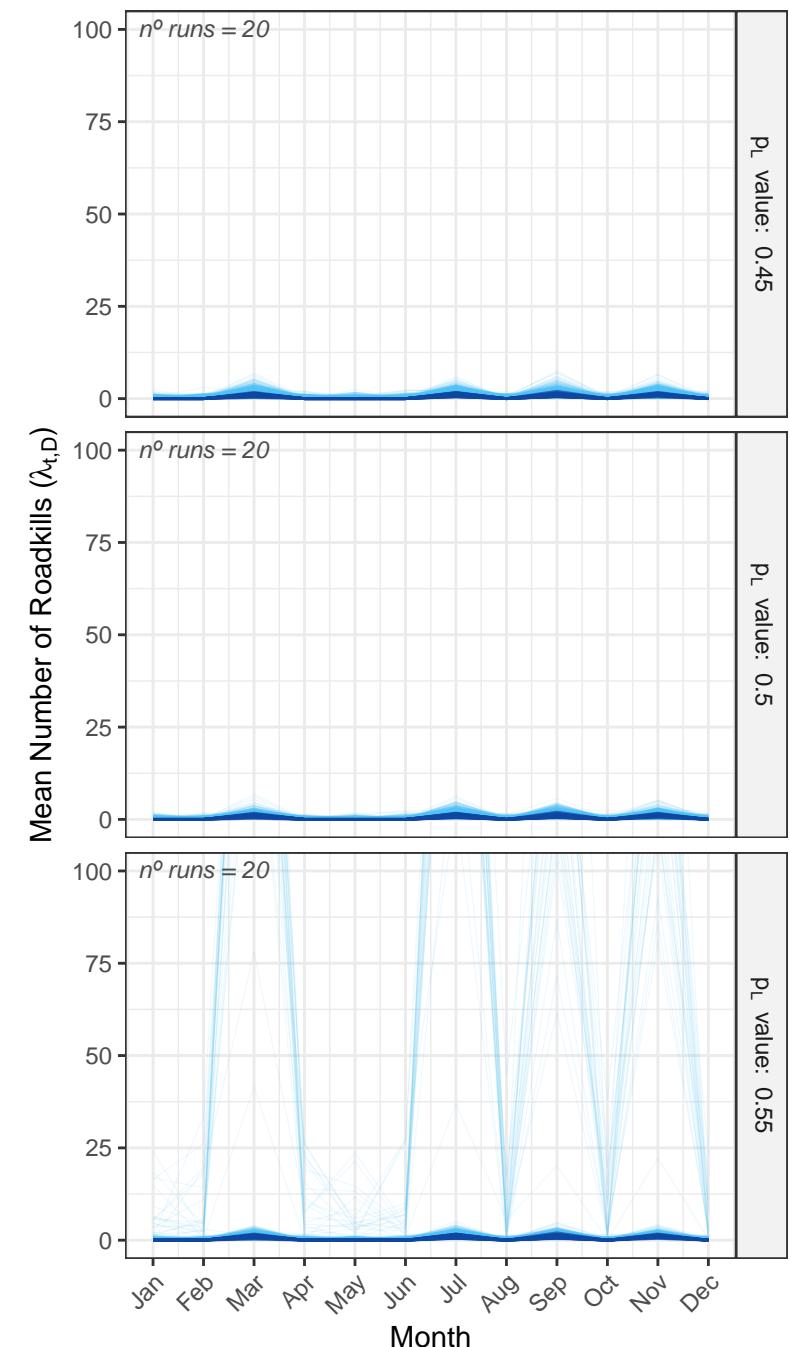
Violin plots indicate posterior distribution | Red dash (–) indicates True Simulated Values



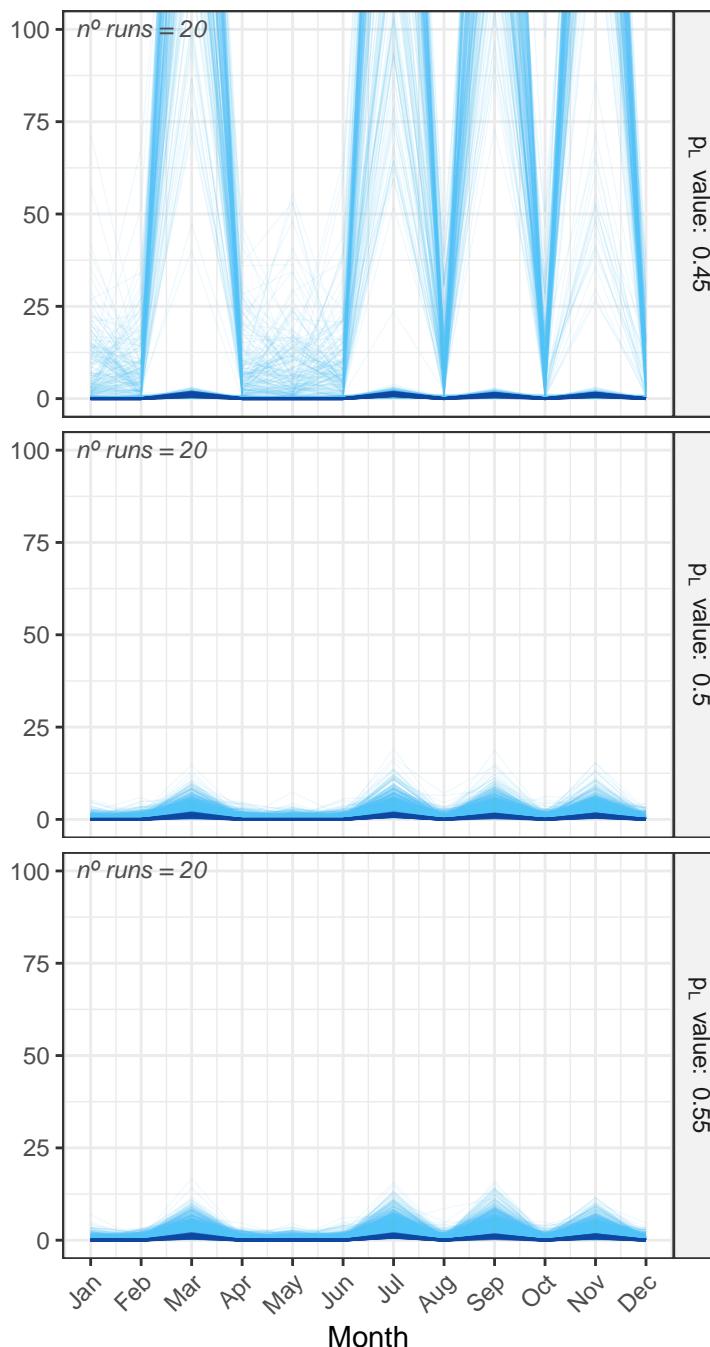
Mammals G5: Posterior Estimation Overlap per Simulation Scenario

Light Blue Bands: 50 posterior samples per sim | Dark Lines: True Simulated Values

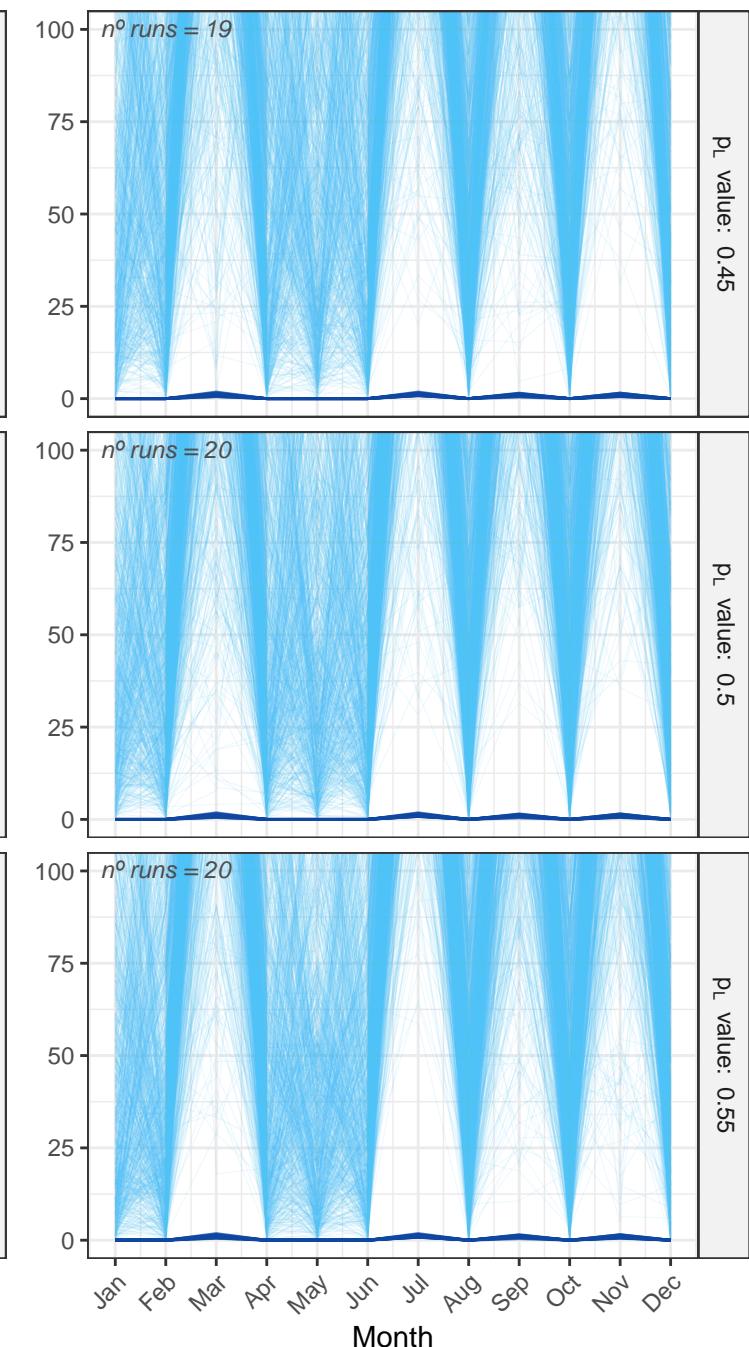
Prior: Accurate prior



Prior: Inaccurate prior



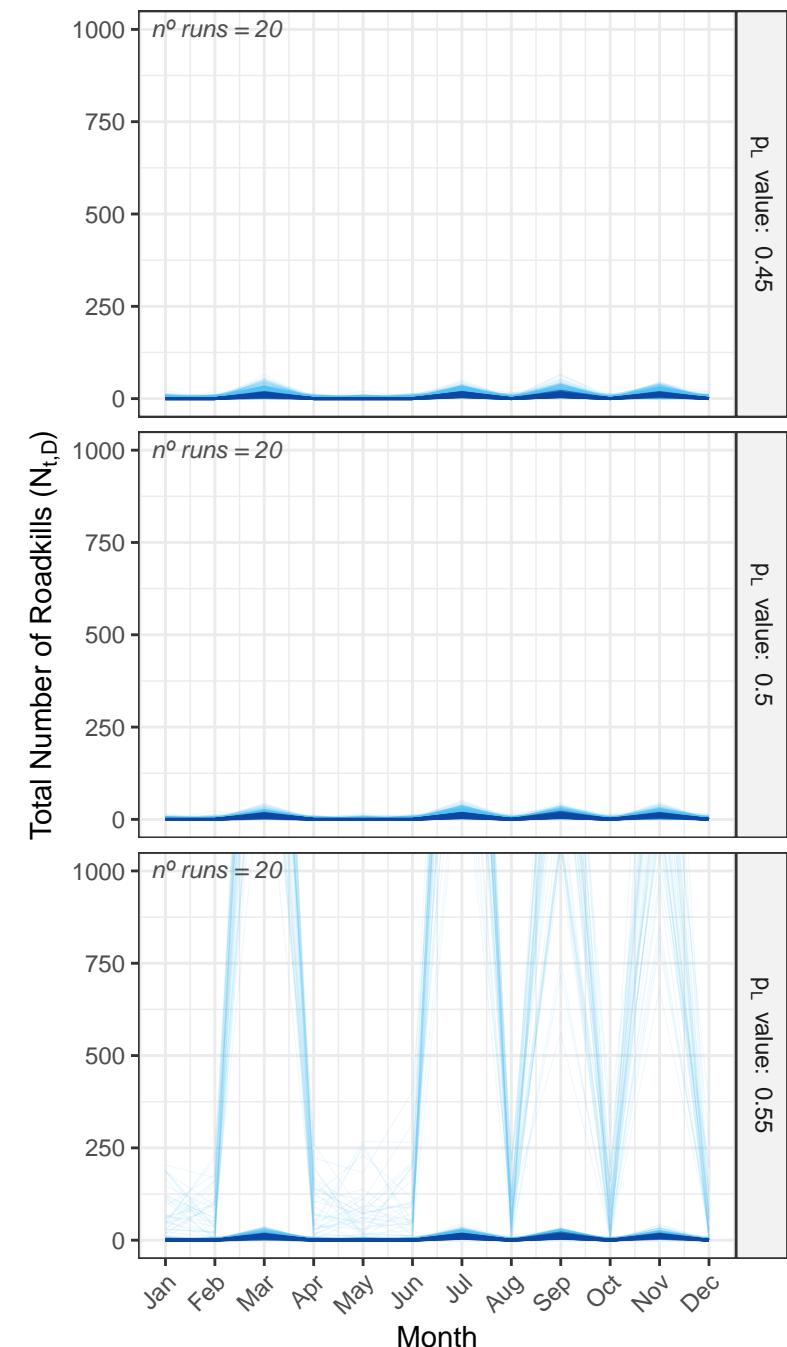
Prior: Uninformative prior



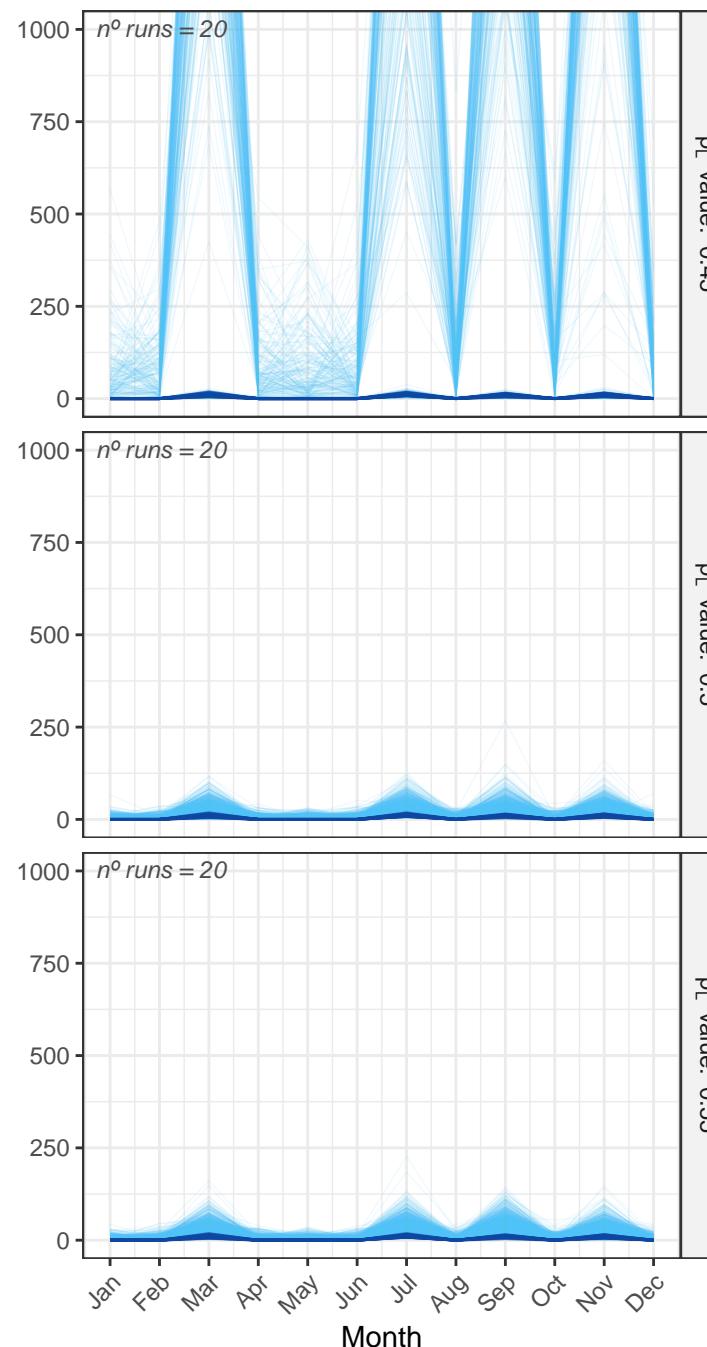
Mammals G5: Posterior Estimation Overlap per Simulation Scenario

Light Blue Bands: 50 posterior samples per sim | Dark Lines: True Simulated Values

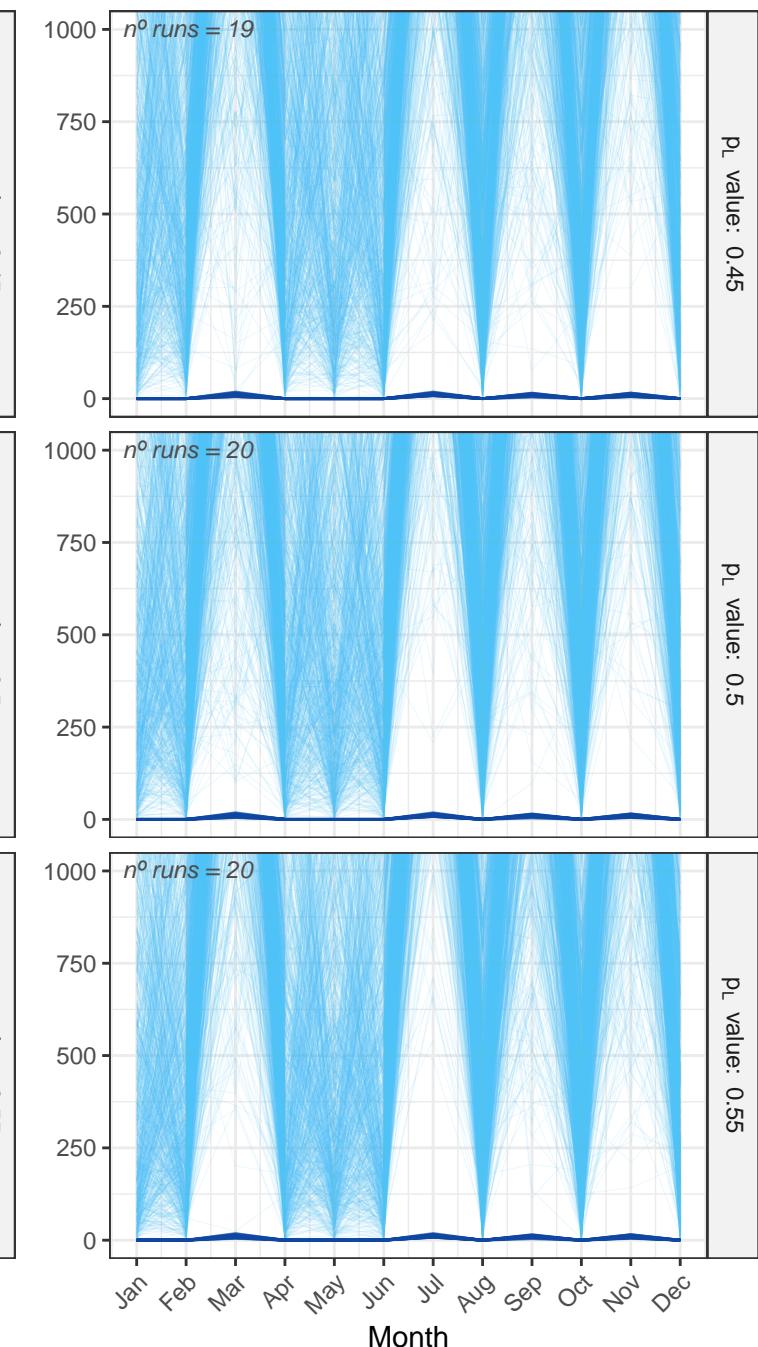
Prior: Accurate prior



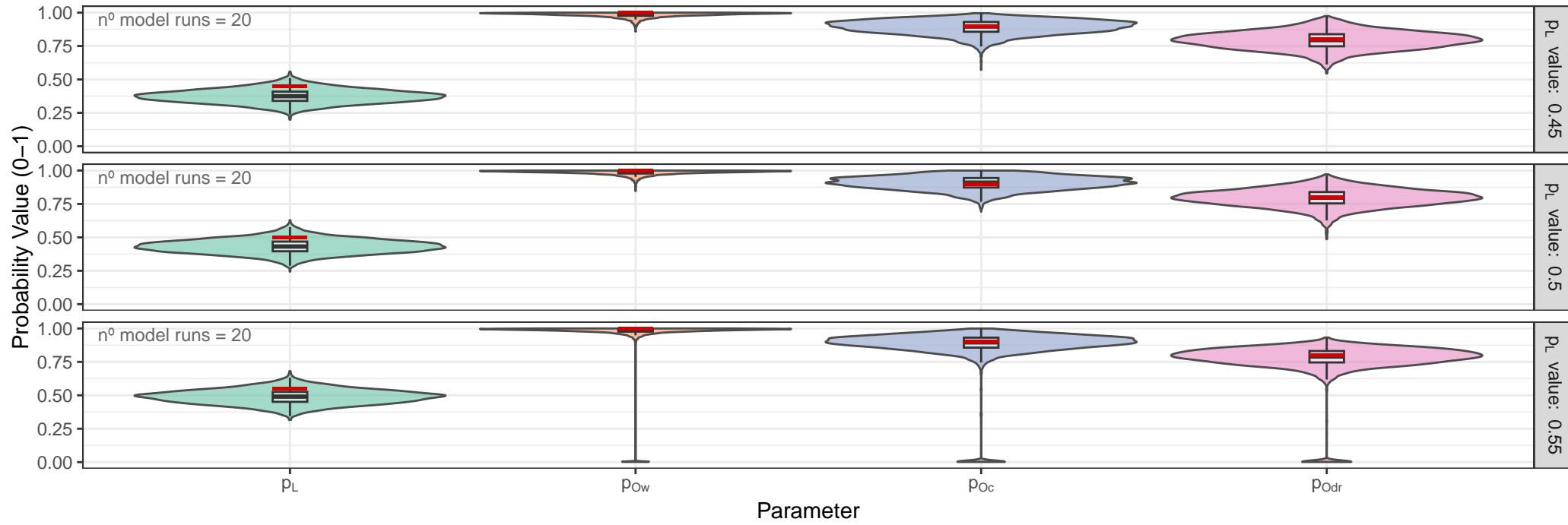
Prior: Inaccurate prior



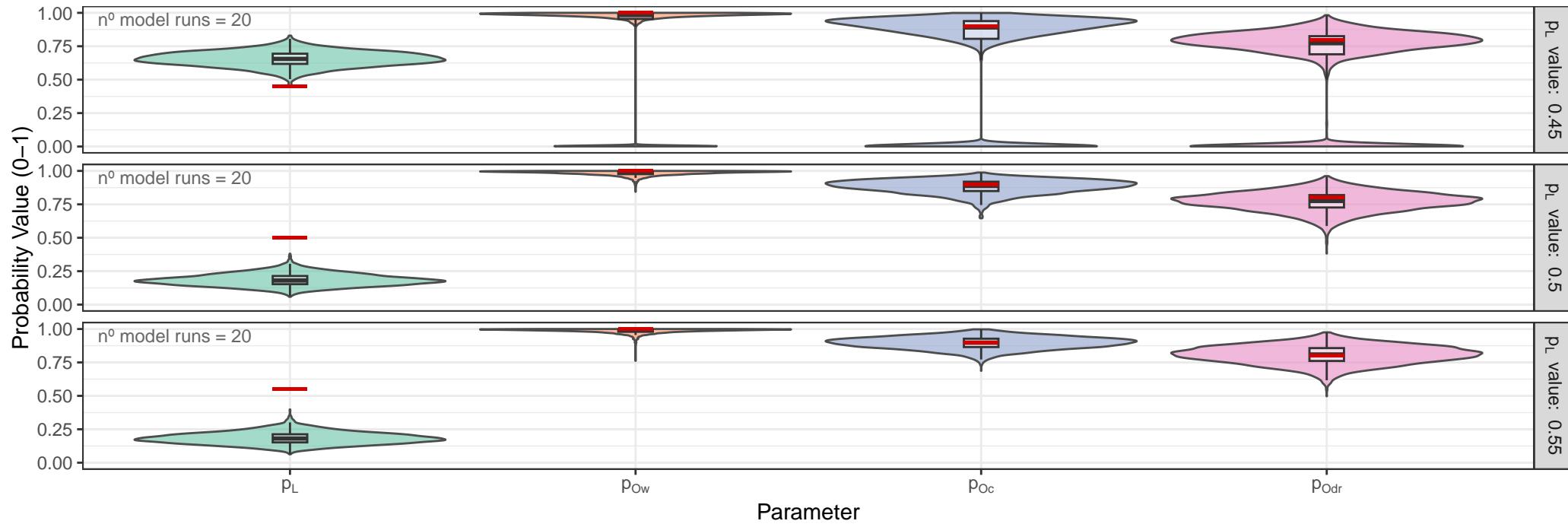
Prior: Uninformative prior



Mammals G5 – Prior: Accurate prior



Mammals G5 – Prior: Inaccurate prior



Mammals G5 – Prior: Uninformative prior

