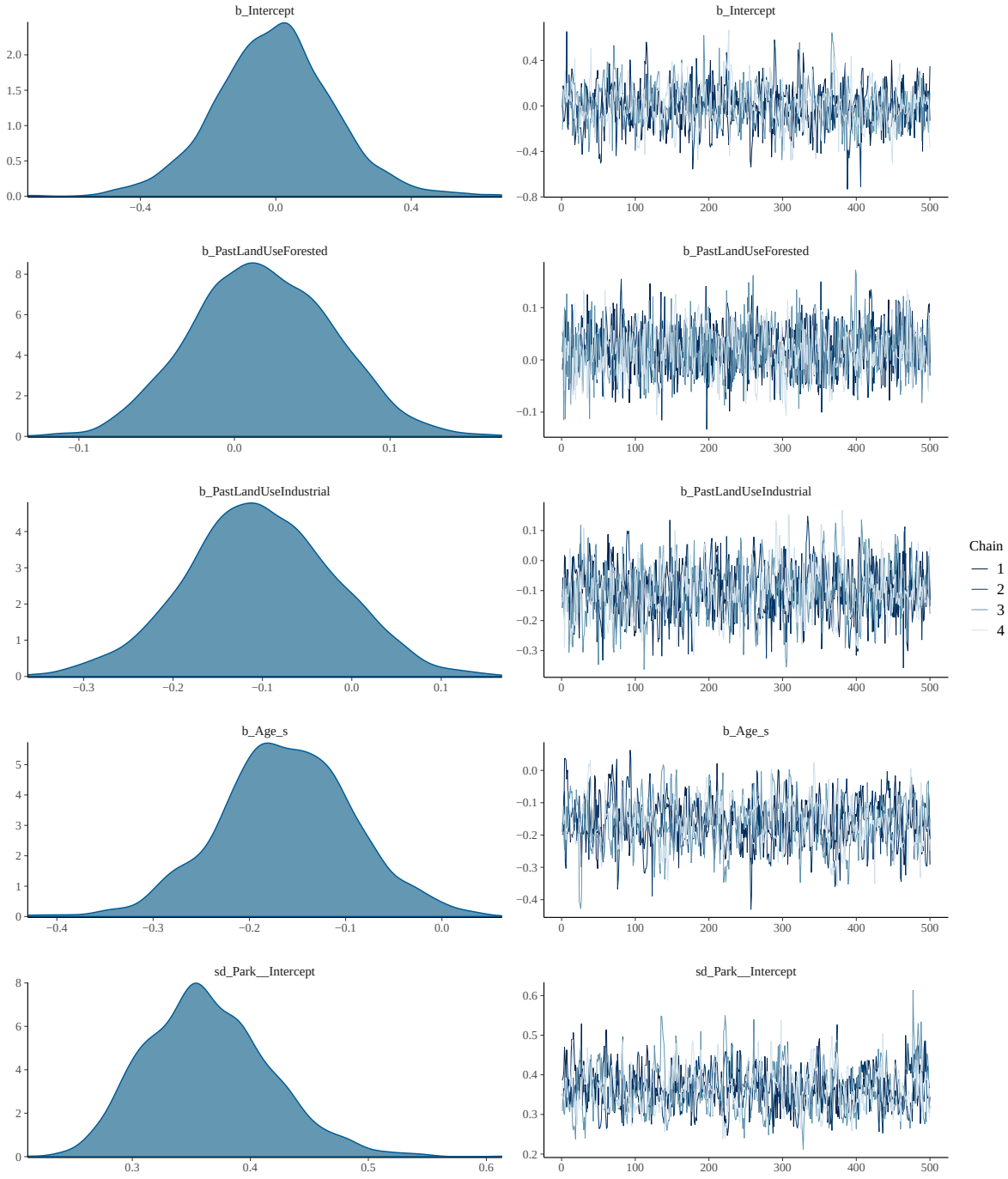
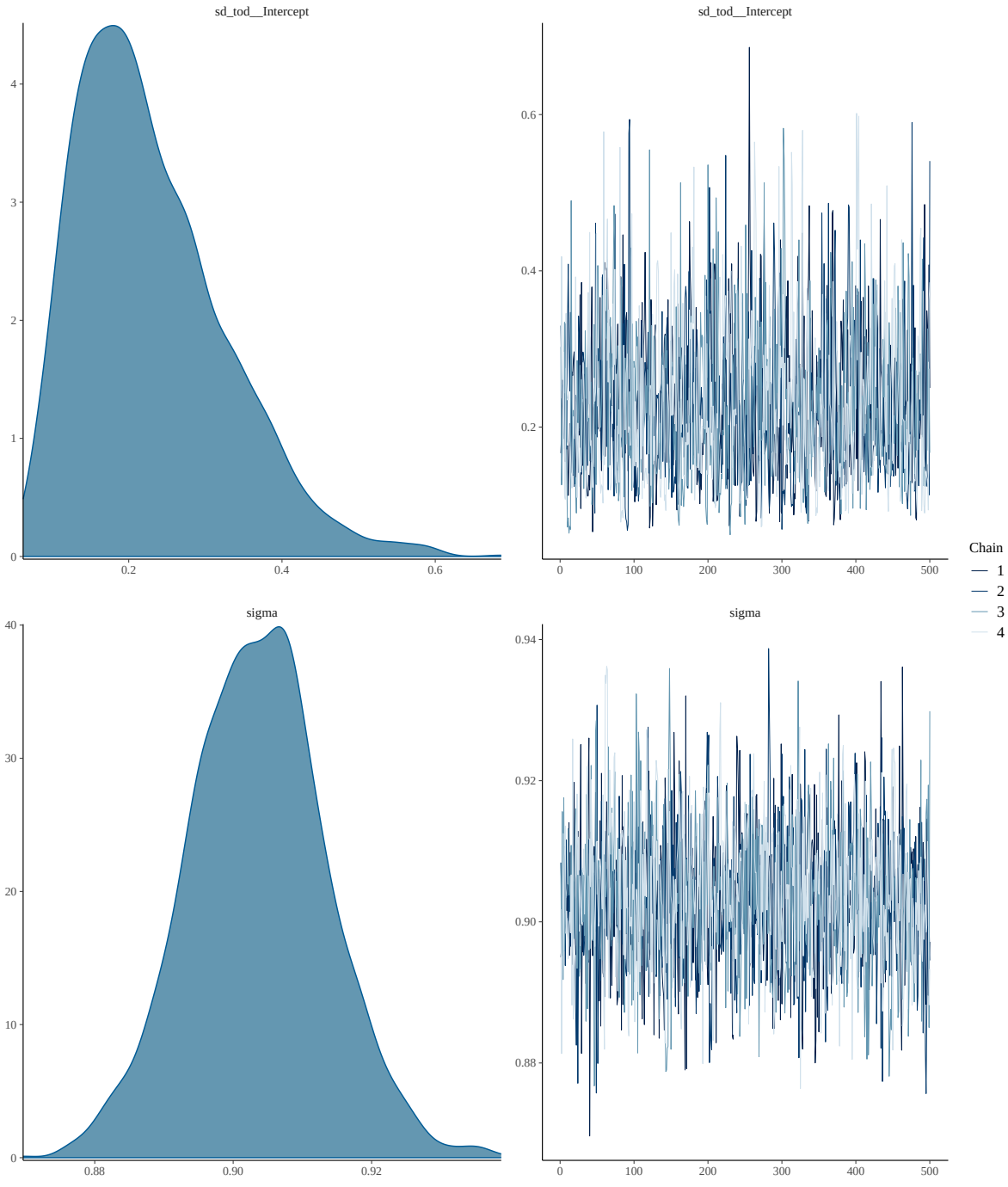
Model Diagnostic Plots

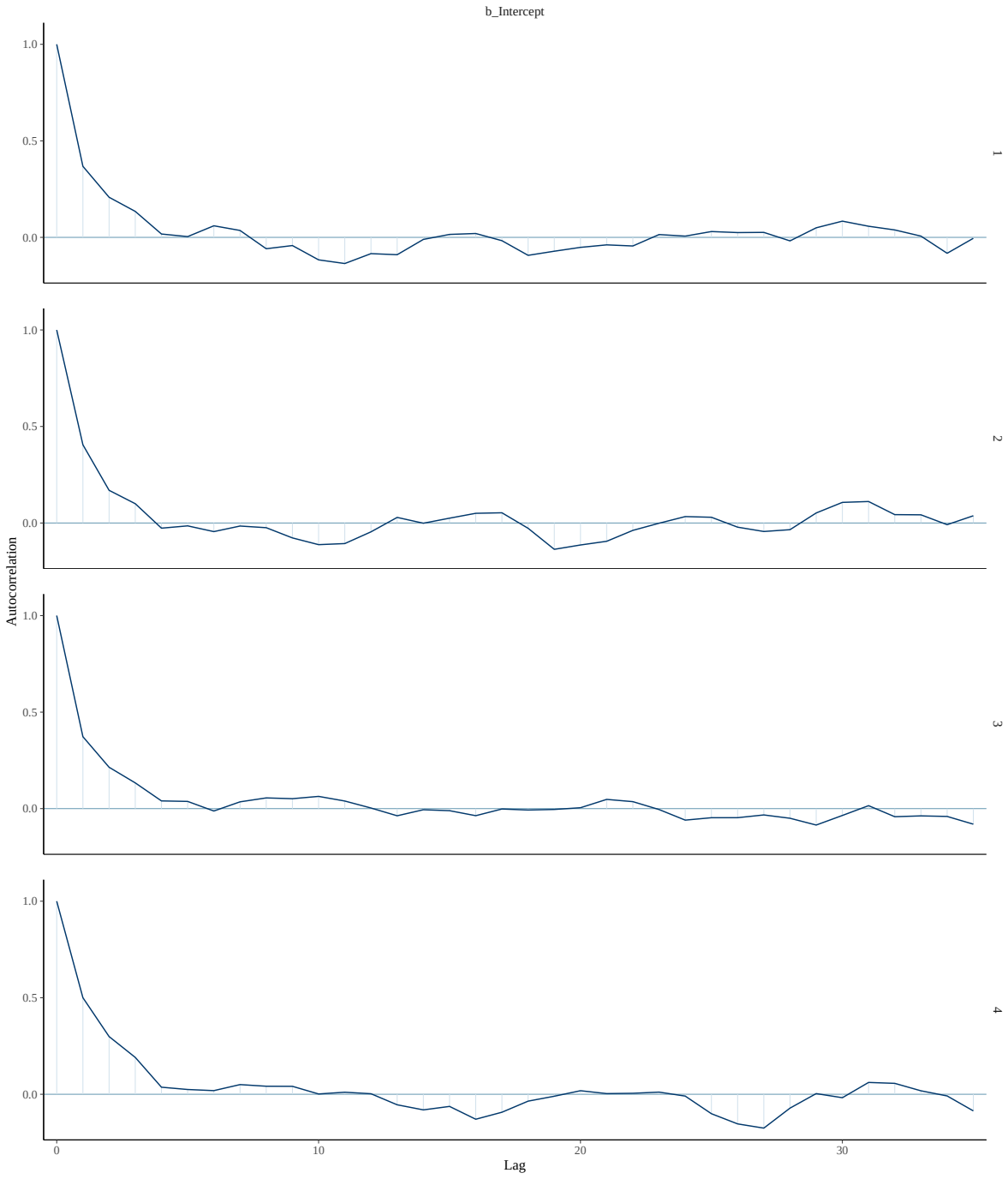
These model diagnostic plots assess whether the chains of our models are converged and well mixed, and if the model is well specified and has an adequate fit.

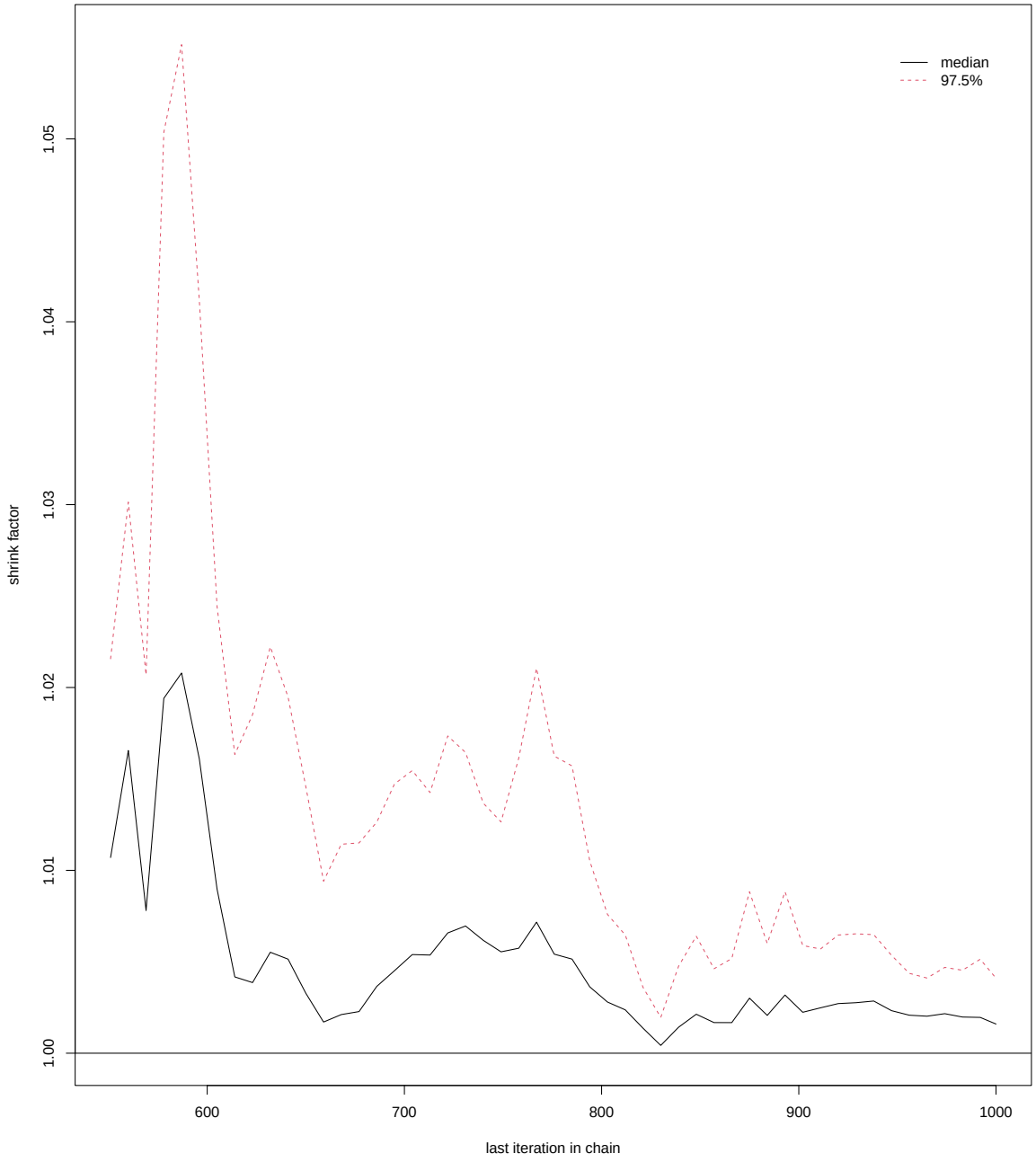
The first plot of the series shows trace plots for each of our parameters, where we want to see stationary and well-mixed chains. The second plot shows an autocorrelation plot by chain and parameter. We want our autocorrelation to quickly drop to zero with increasing lag. Thirdly, the Gelman plot indicates if the chains converge, where we want the value to decrease by the end of runtime. Finally, we have the posterior predictive check where we want the black line to be within/close to the blue lines, to indicate that our model is adequately generative.

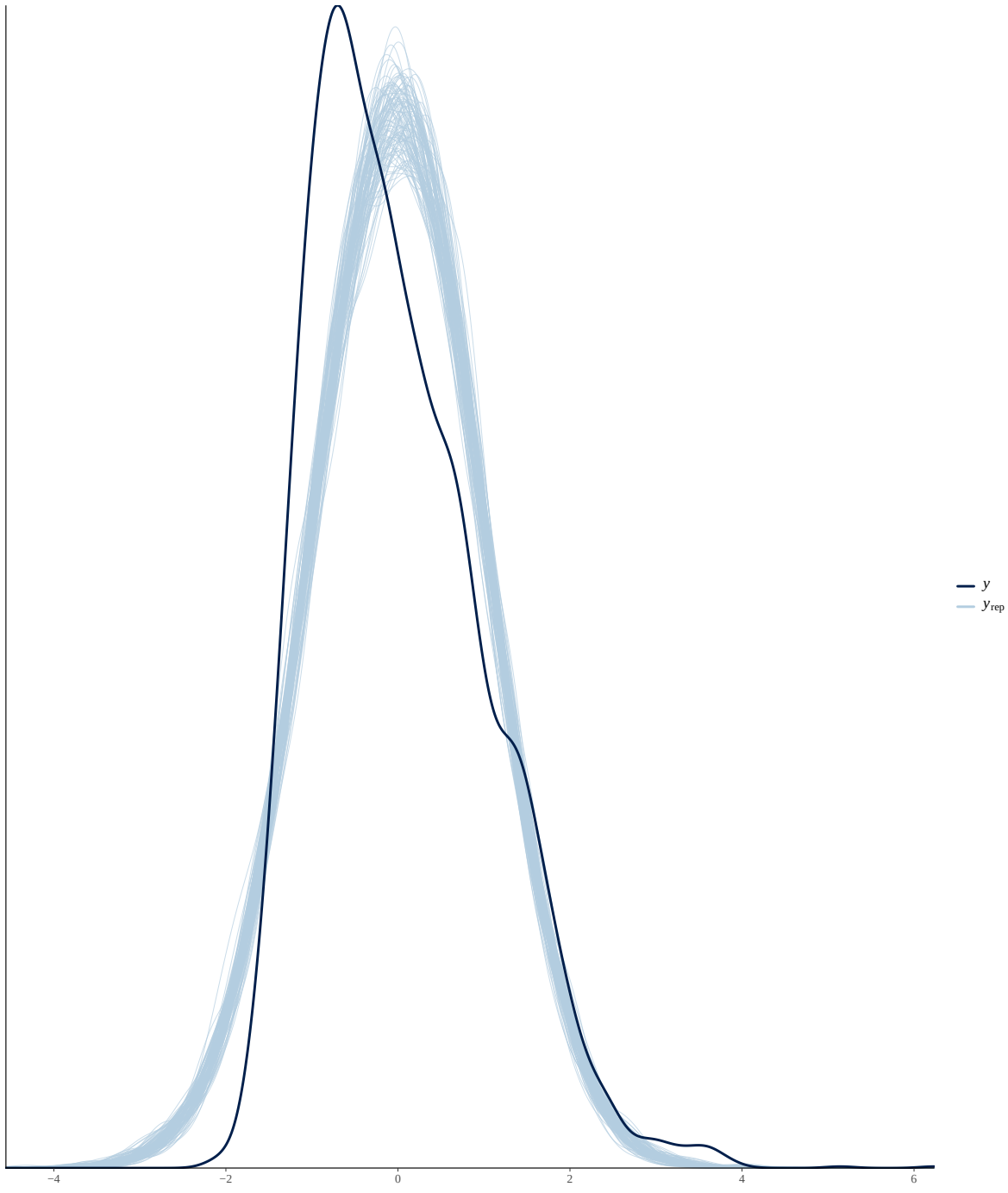
Model 1: Total Effect of Past Land-Use on Temperature



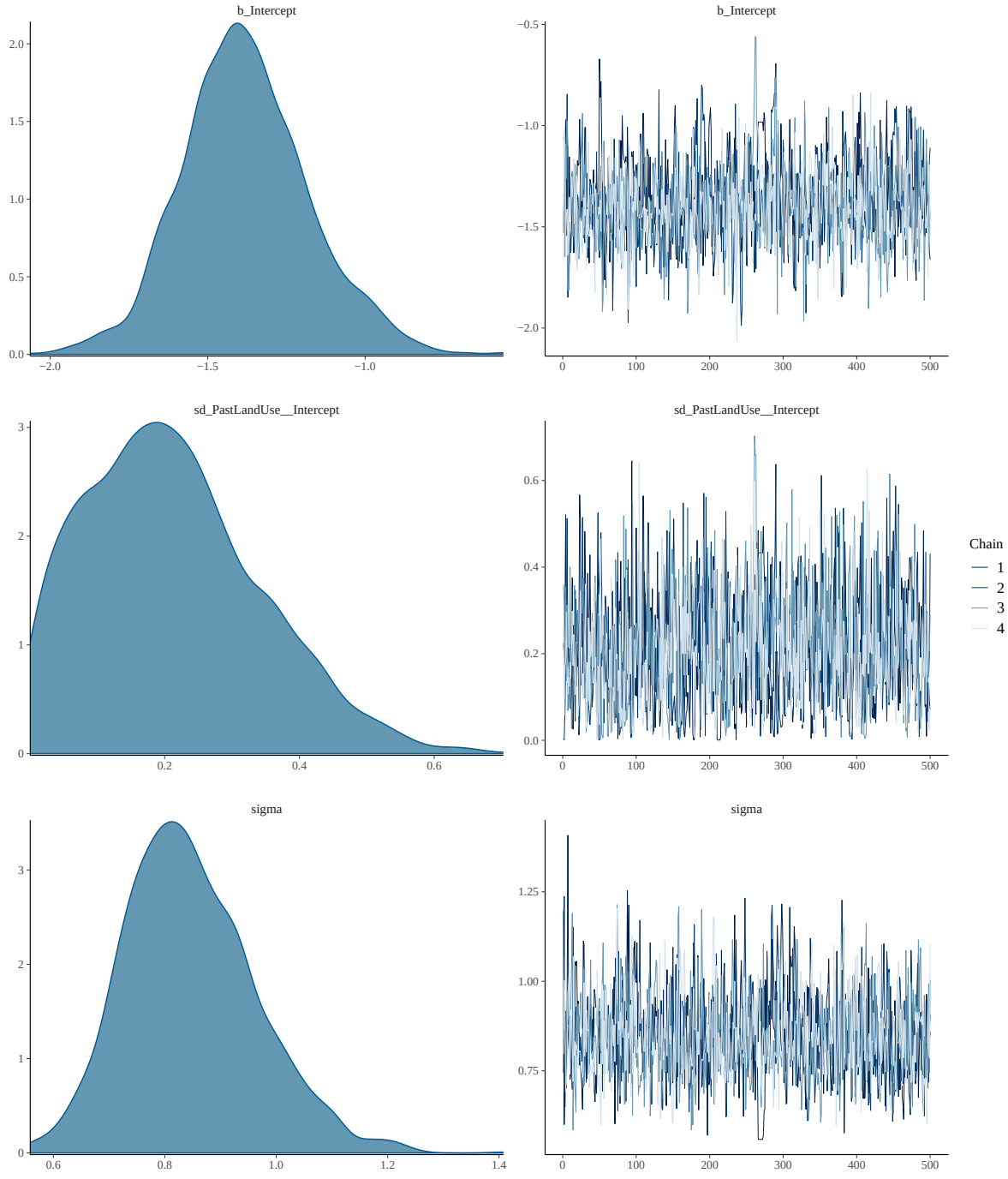

sd_tod__Intercept
sd_tod__Intercept
sigma
sigma
Chain
1
2
3
4

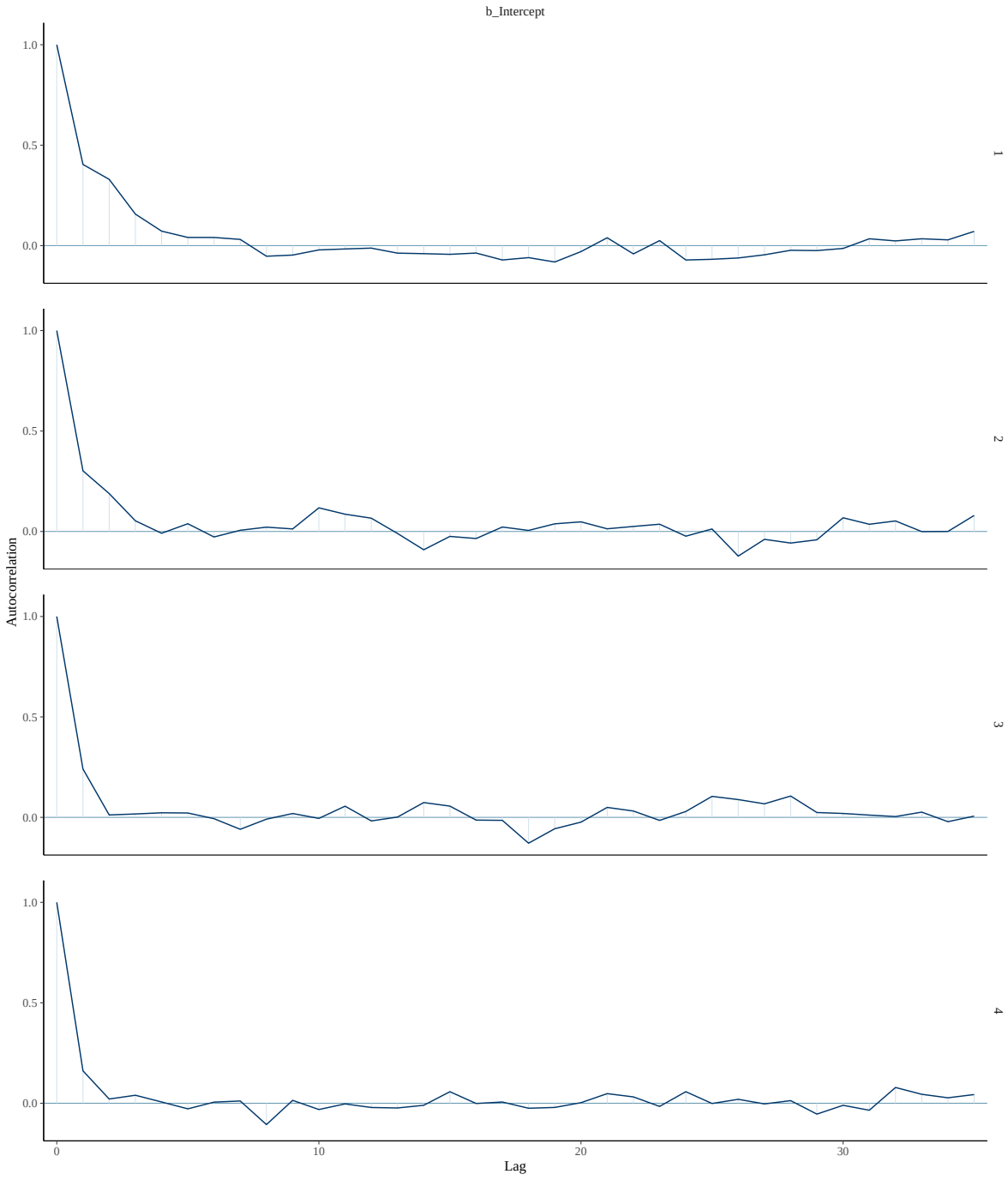

b_Intercept
Autocorrelation
Lag
1.0
0.5
0.0
0
10
20
30
1
2
3
4

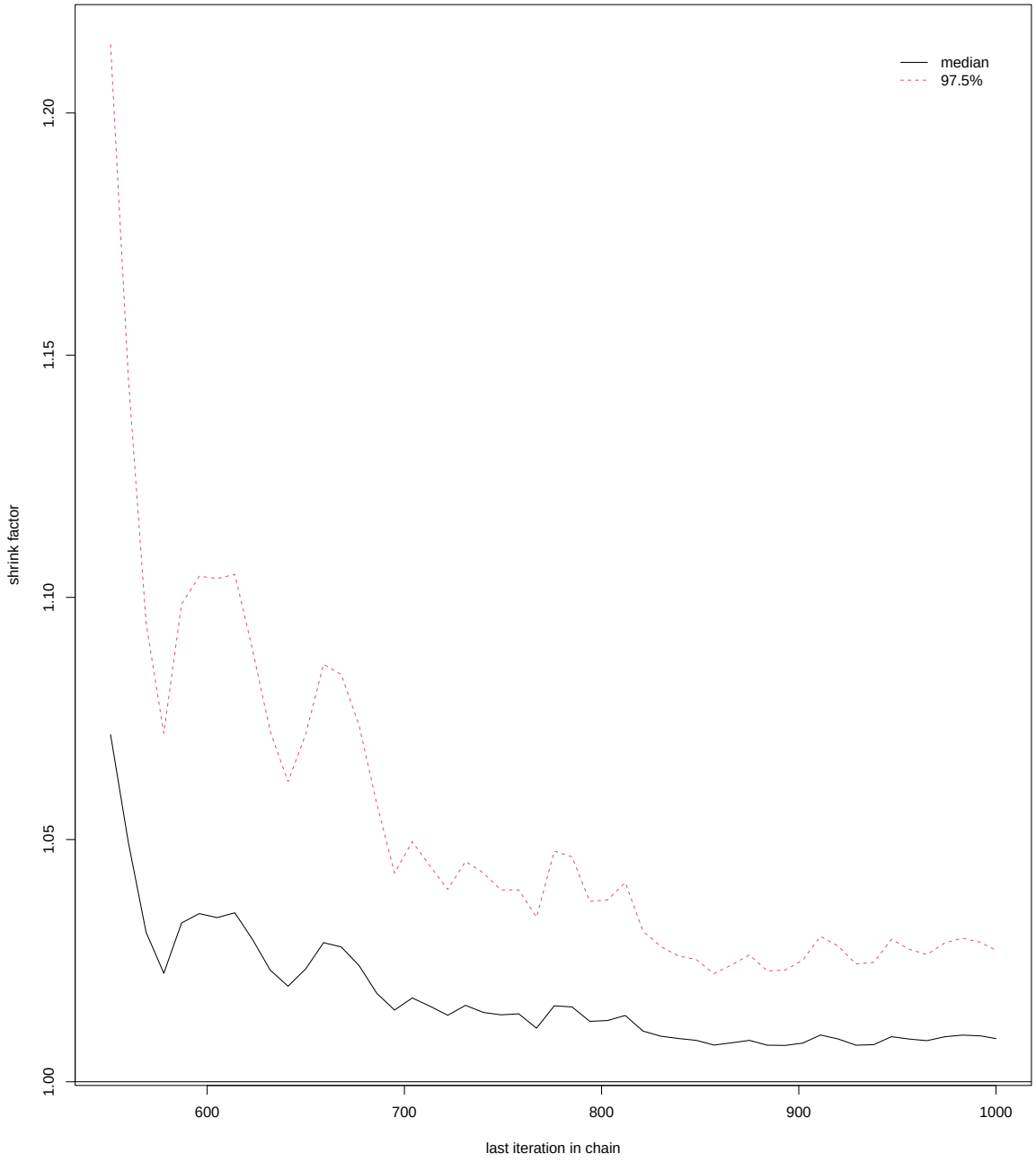

median
97.5%
shrink factor
1.00
1.01
1.02
1.03
1.04
1.05
600
700
800
900
1000
last iteration in chain

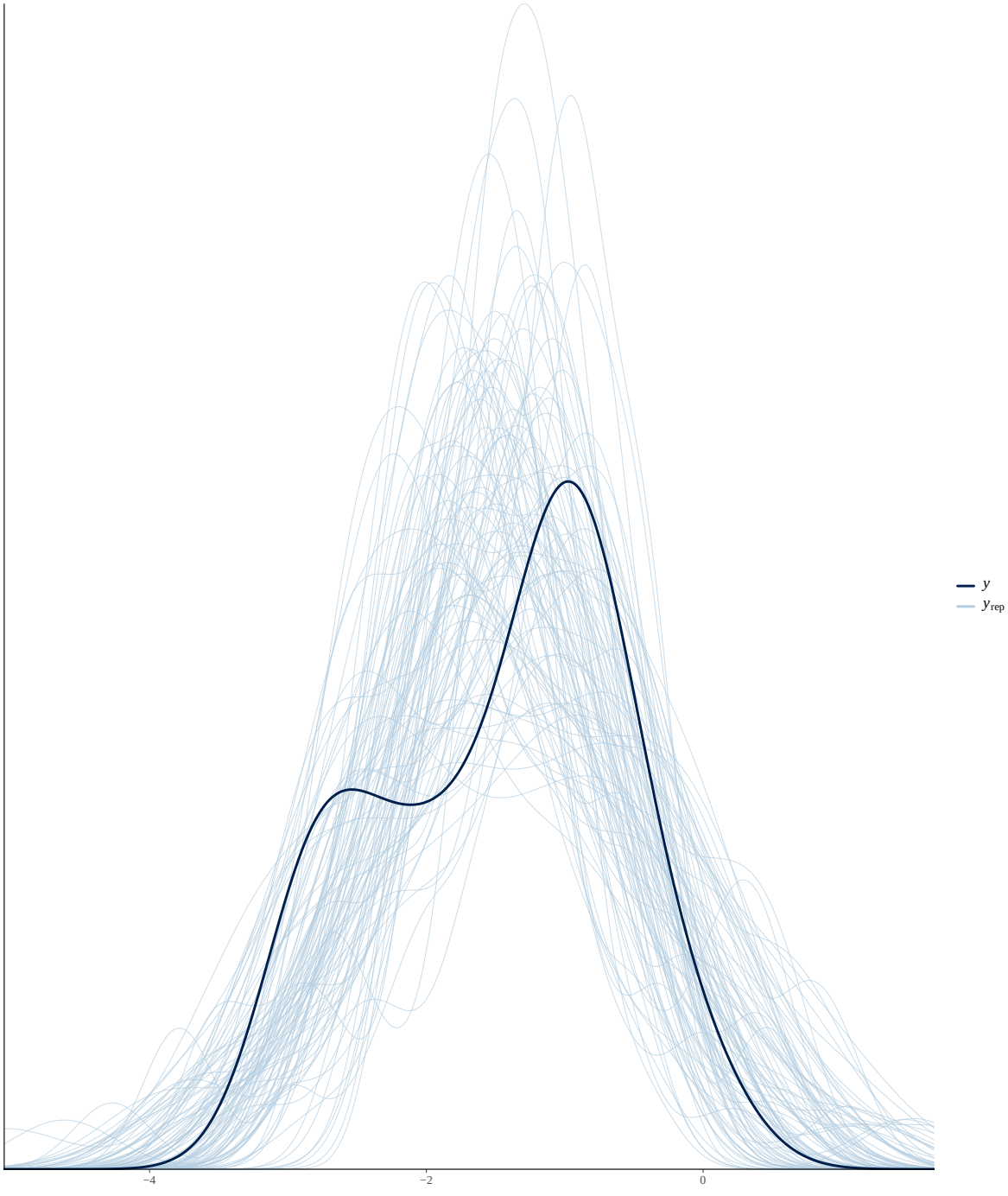

y
y_rep
−4
−2
0
2
4
6

Model 2a: Direct Effect of Past Land-Use on Large Tree (>= 5 cm DBH) Density

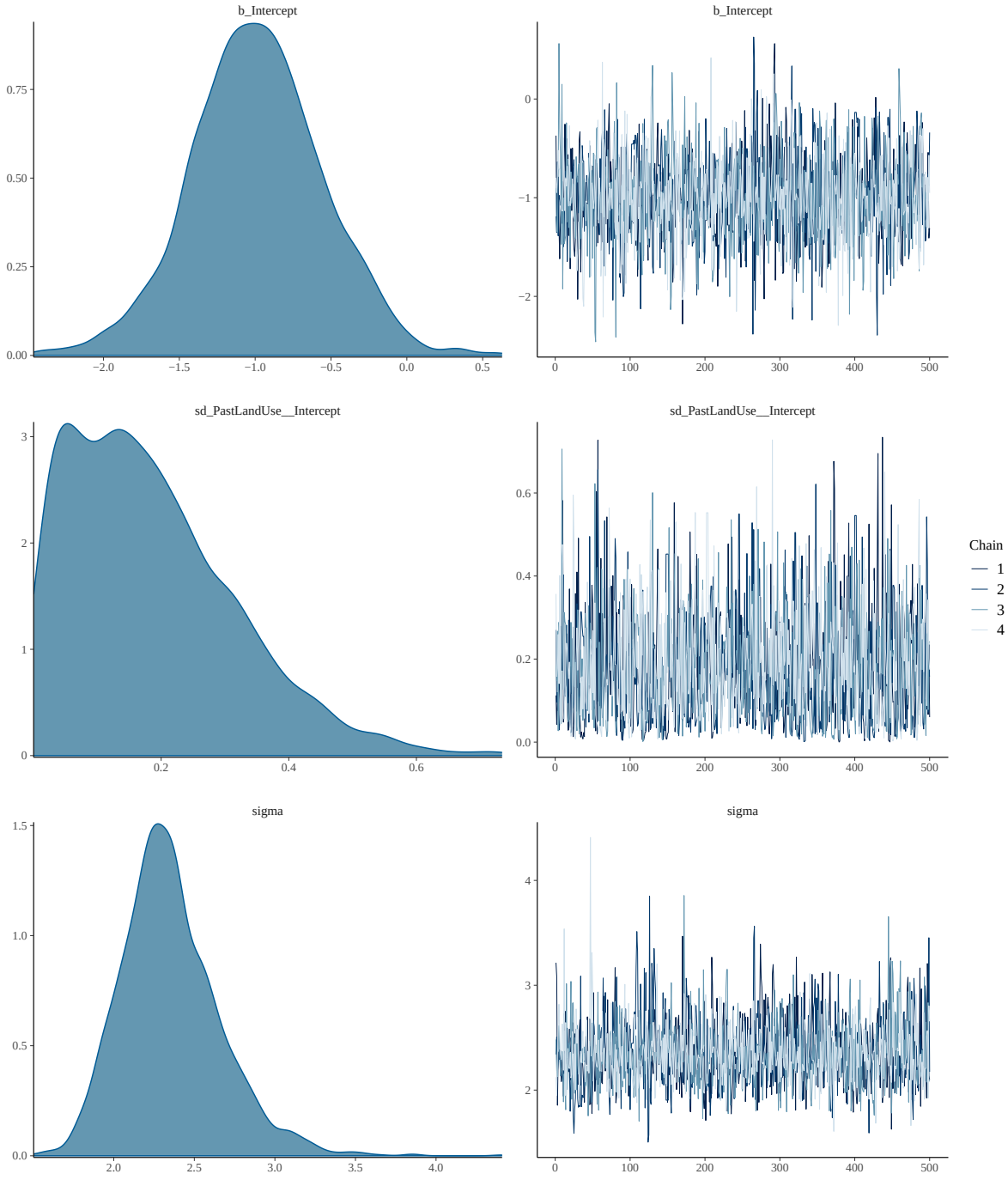


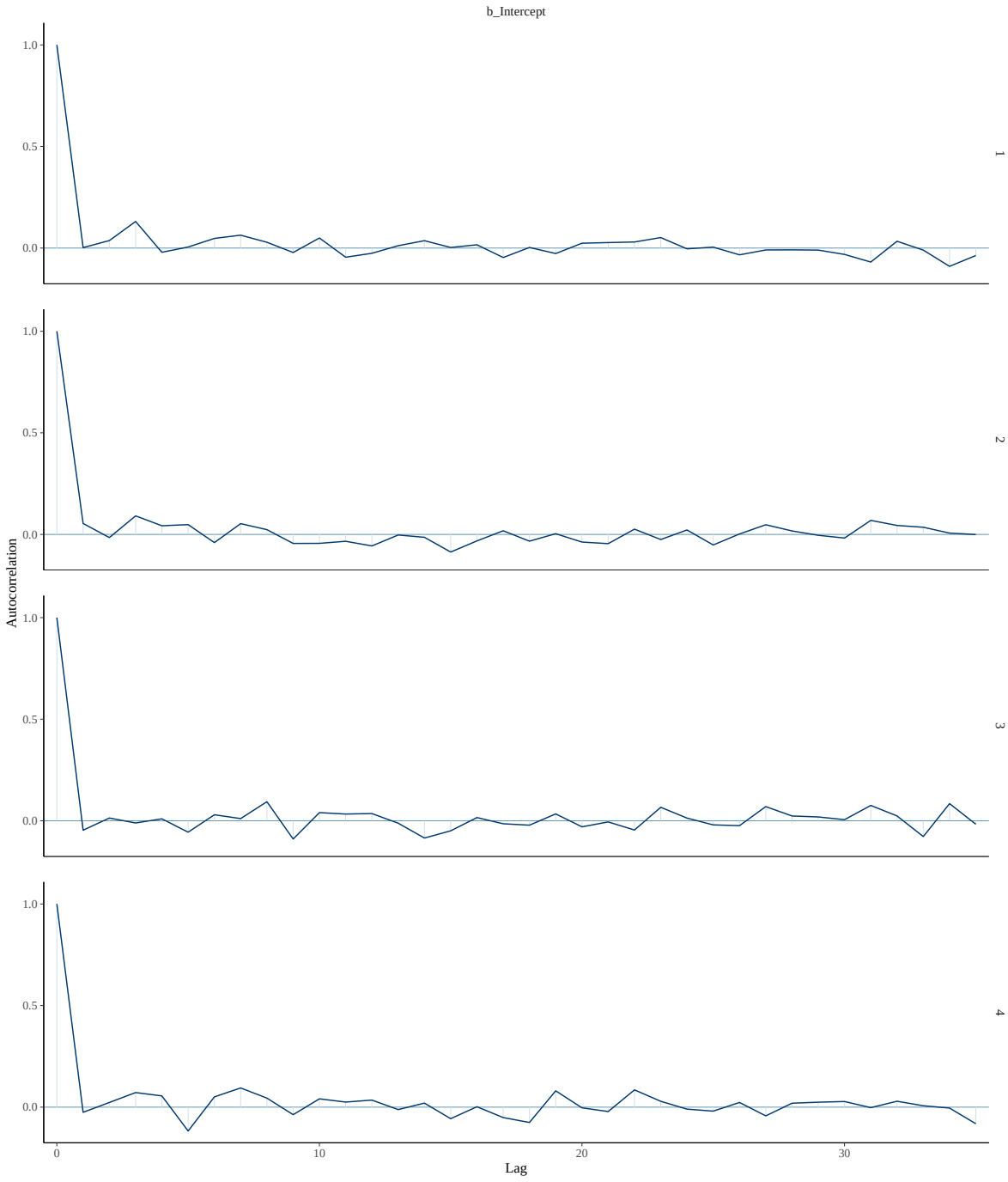

b_Intercept
Autocorrelation
1.0
0.5
0.0
1
2
3
4
0
10
20
30
Lag

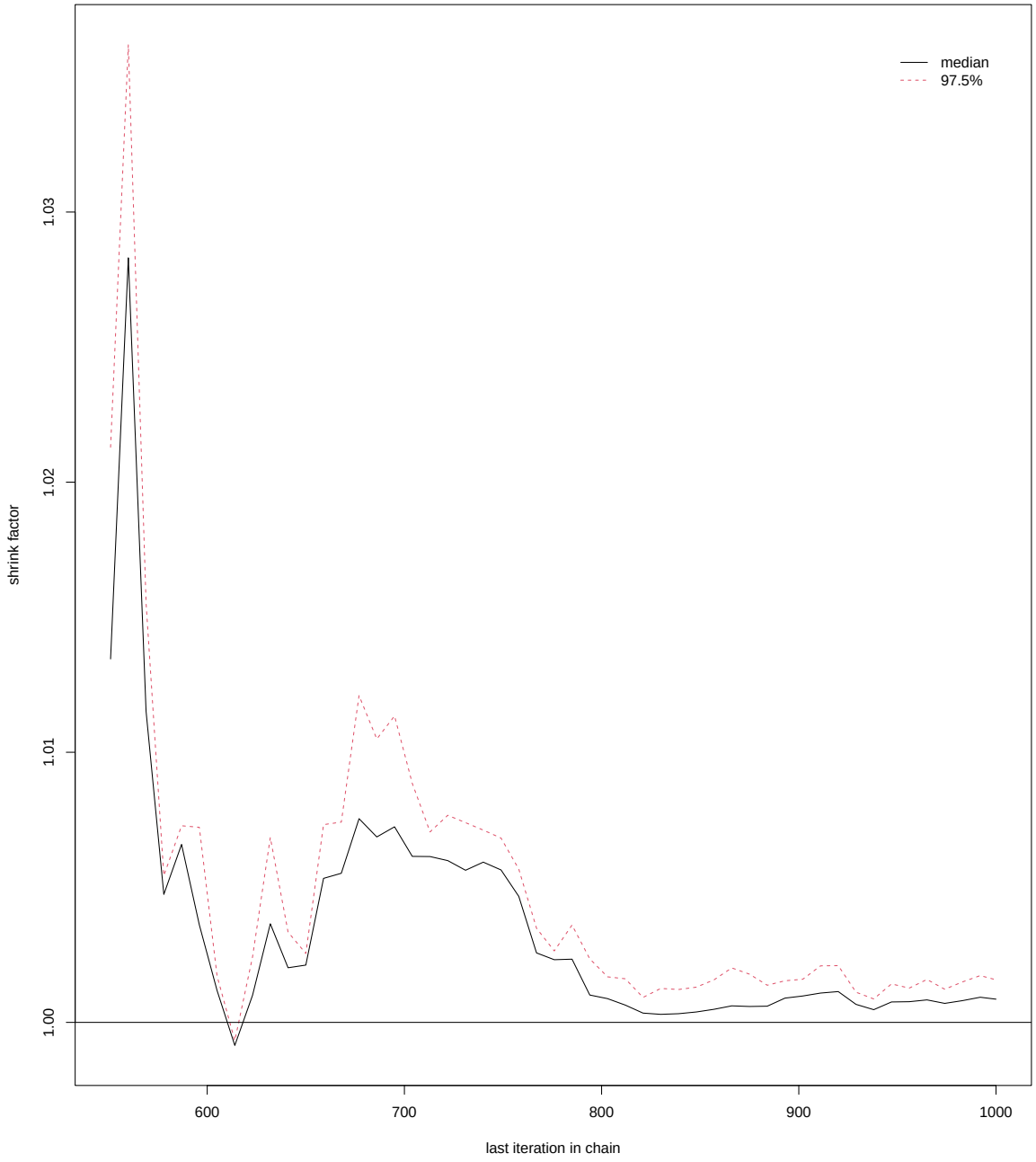

median
97.5%
shrink factor
1.00
1.05
1.10
1.15
1.20
600
700
800
900
1000
last iteration in chain

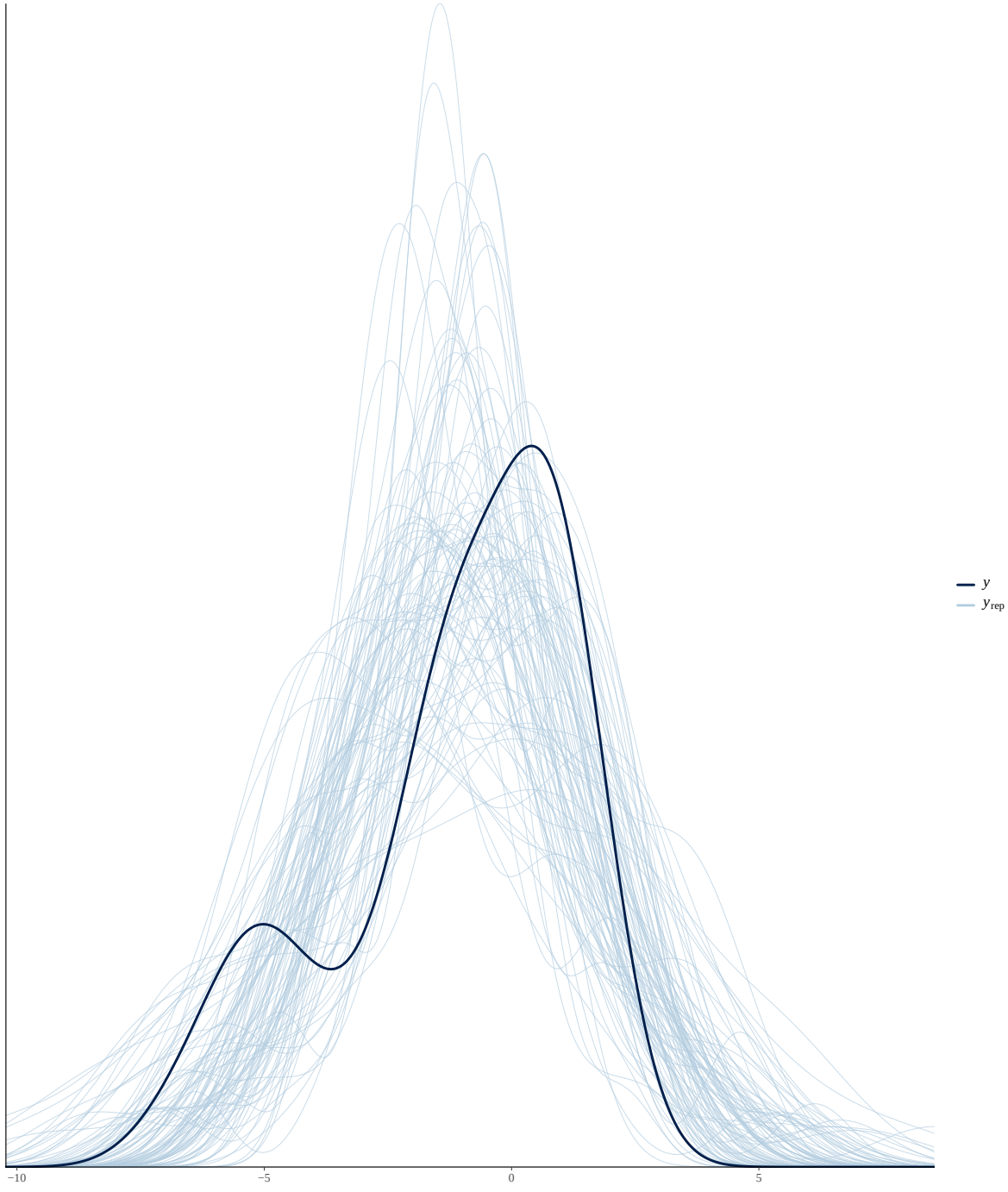

y
y rep
−4
−2
0

Model 2b: Direct Effect of Past Land-Use on Small Tree (< 5 cm DBH) Density

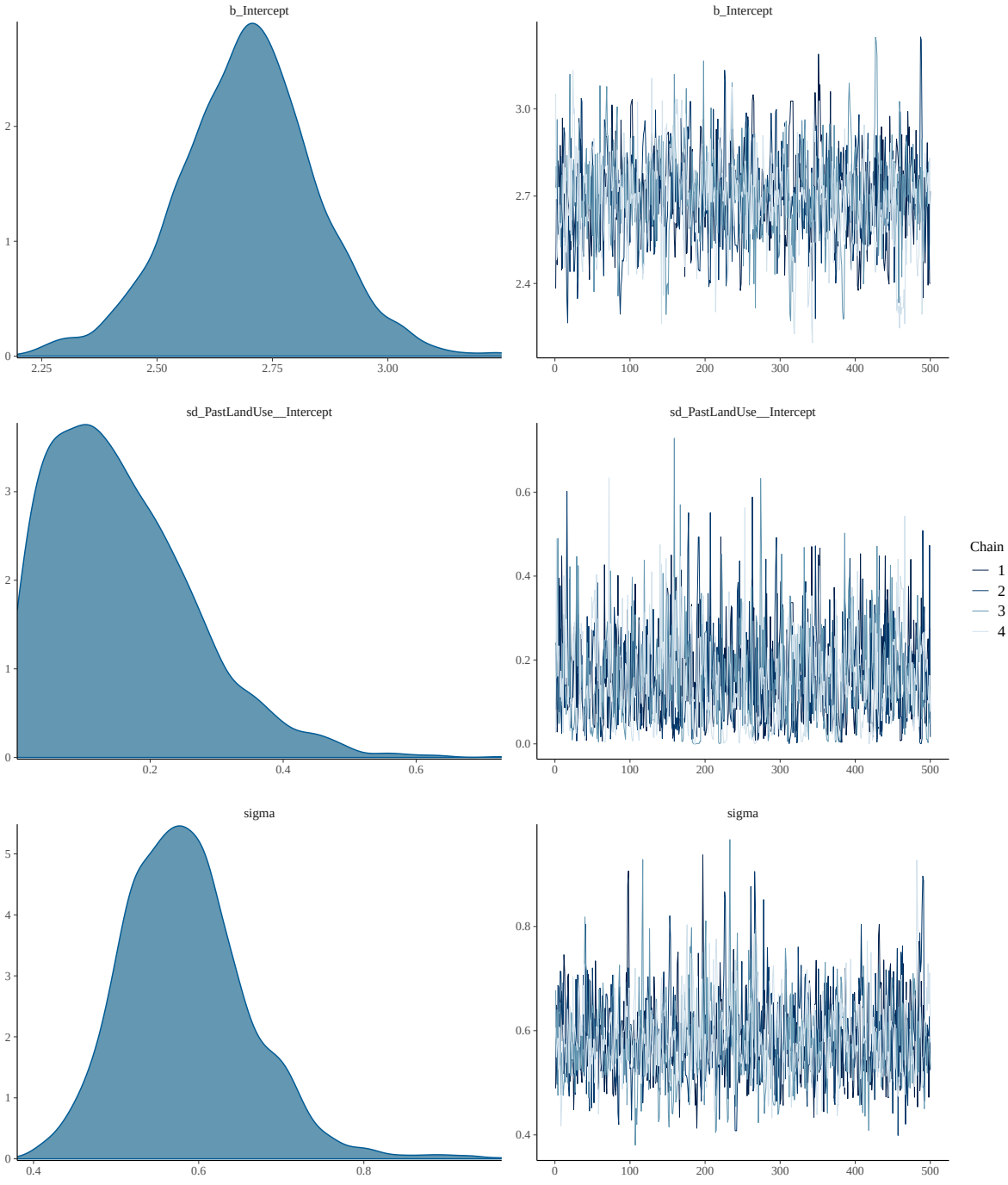


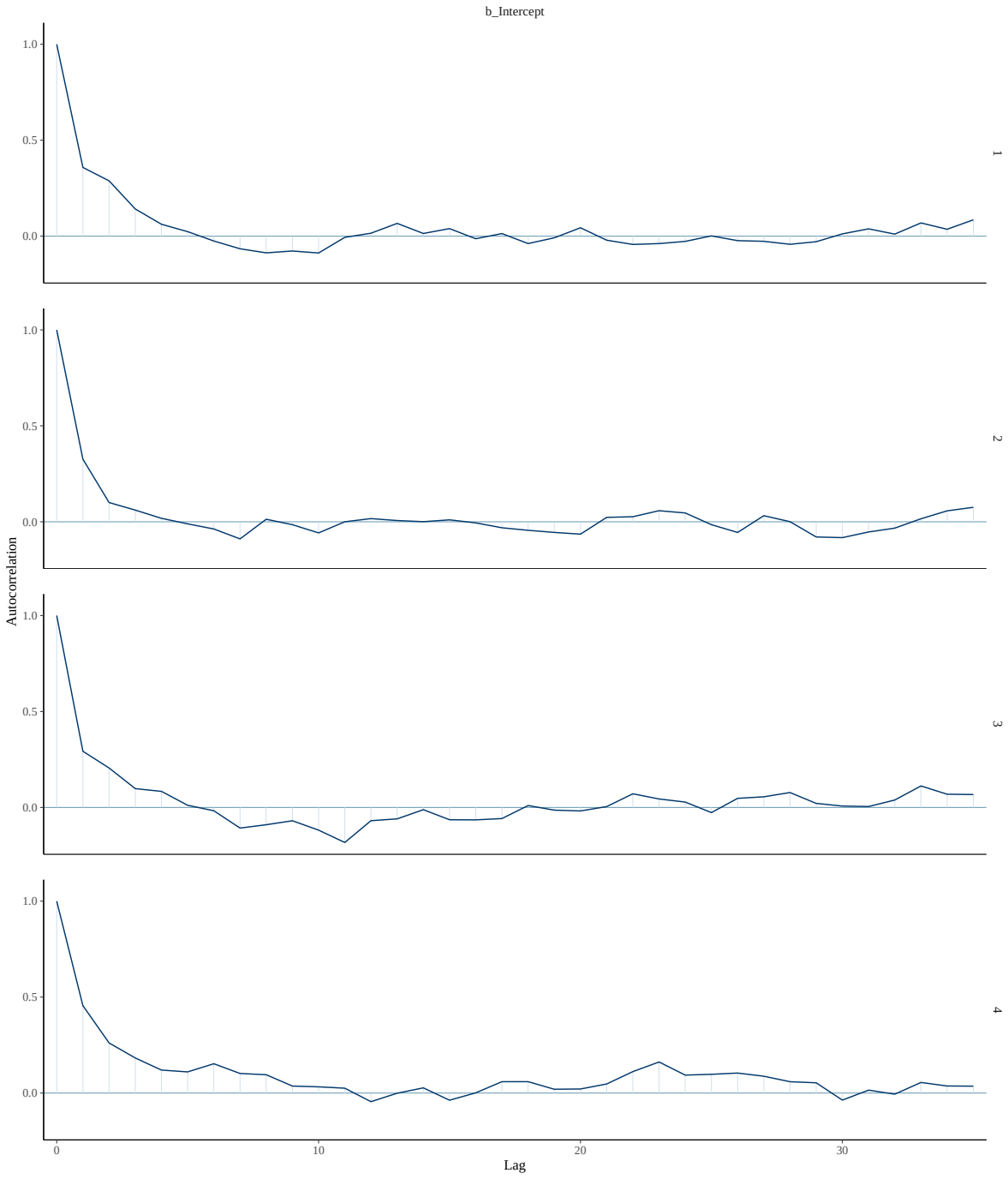

b_Intercept
Autocorrelation
Lag
1.0
0.5
0.0
0
10
20
30
1
2
3
4

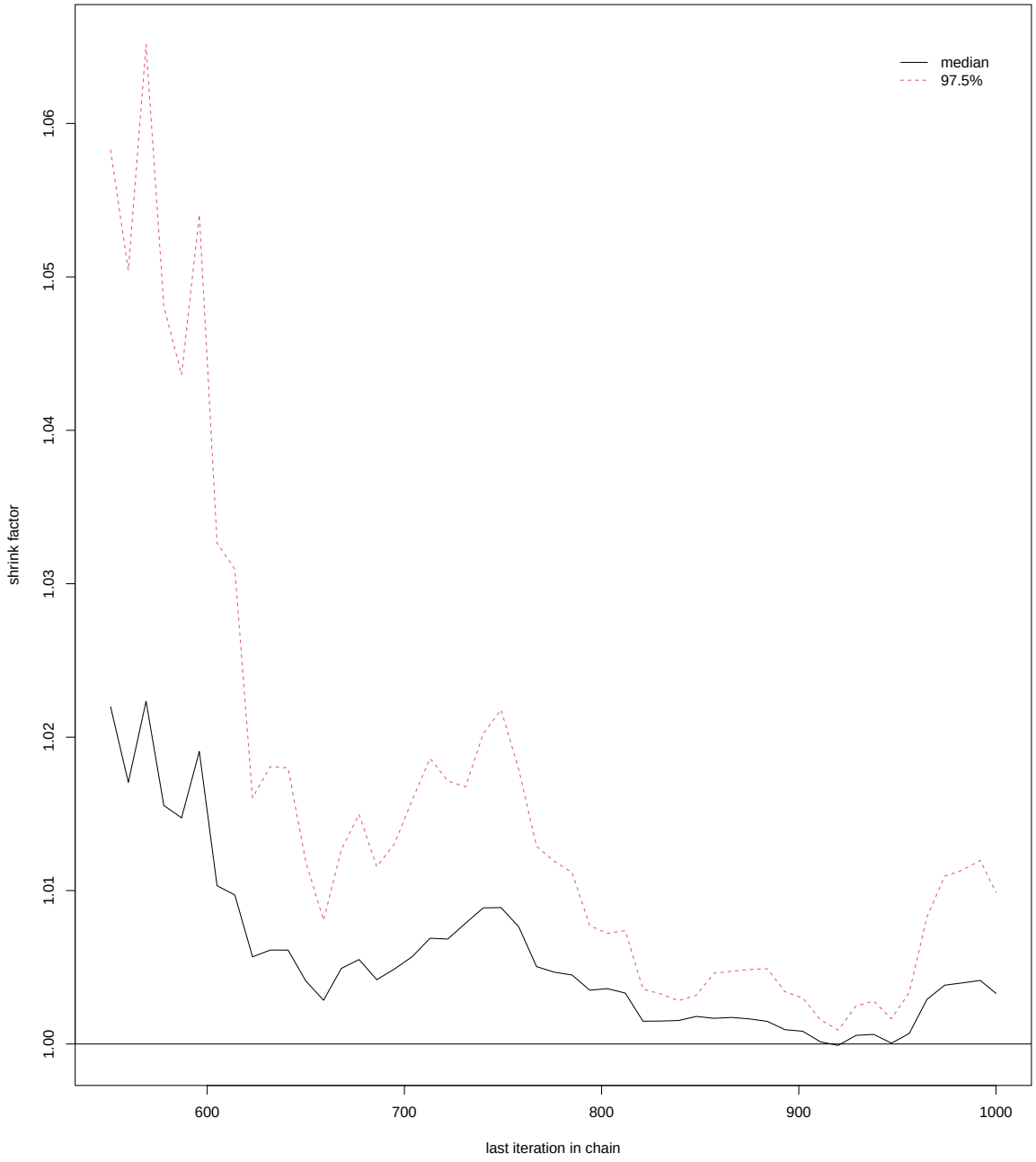

median
97.5%
shrink factor
1.00
1.01
1.02
1.03
600
700
800
900
1000
last iteration in chain

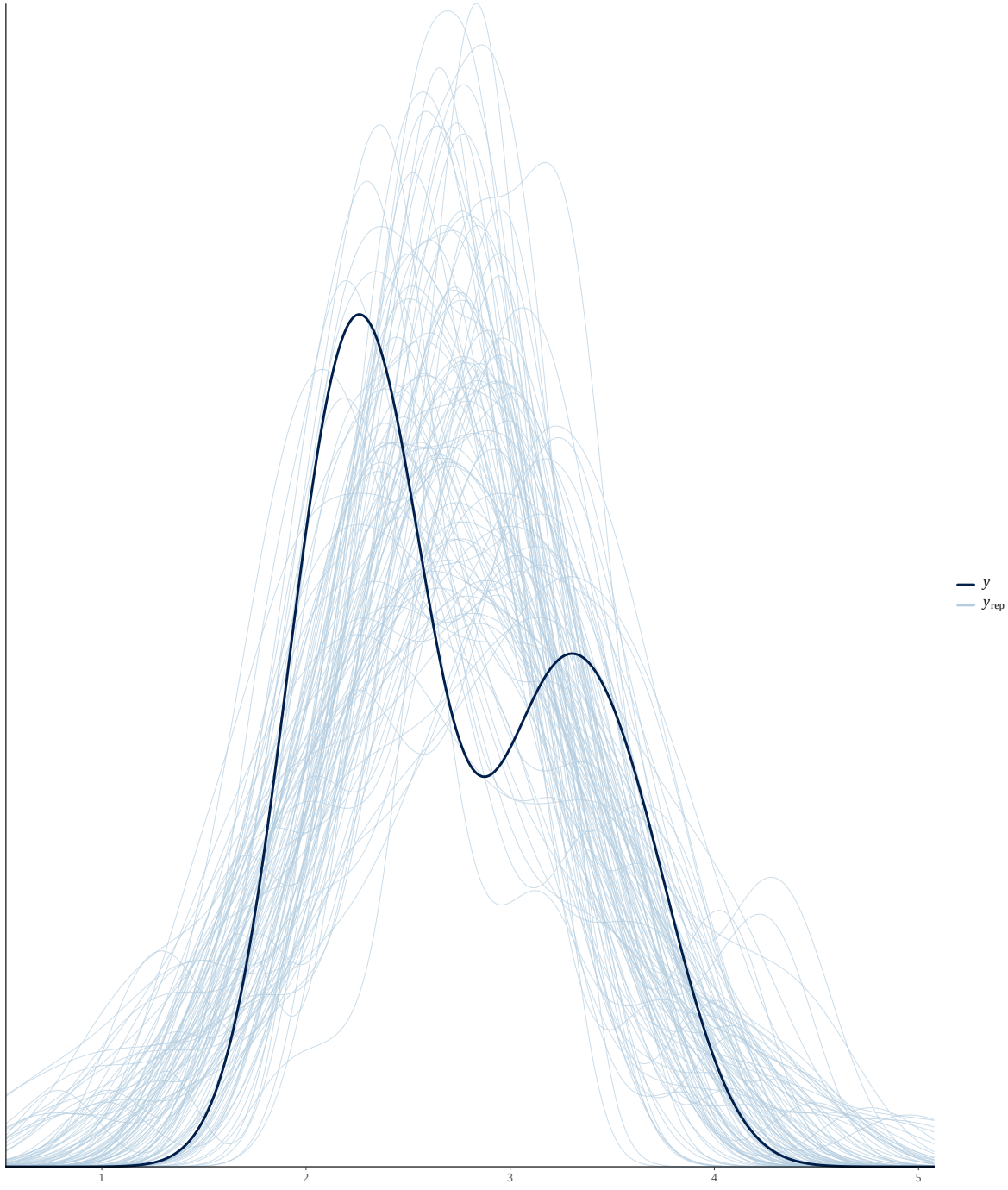

y
y_rep
−10
−5
0
5

Model 3a: Direct Effect of Past Land-Use on Large Tree (>= 5 cm DBH) Density

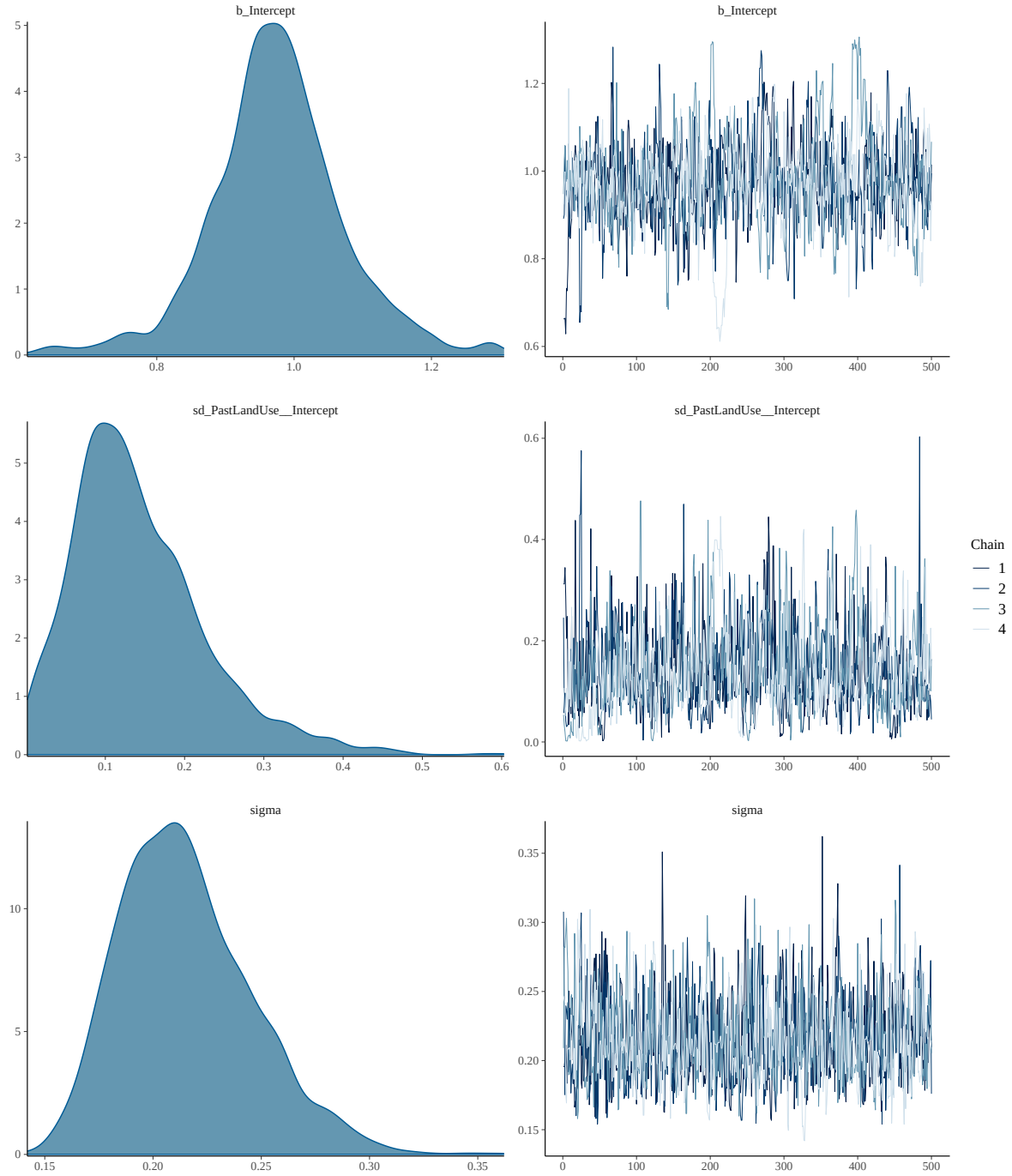


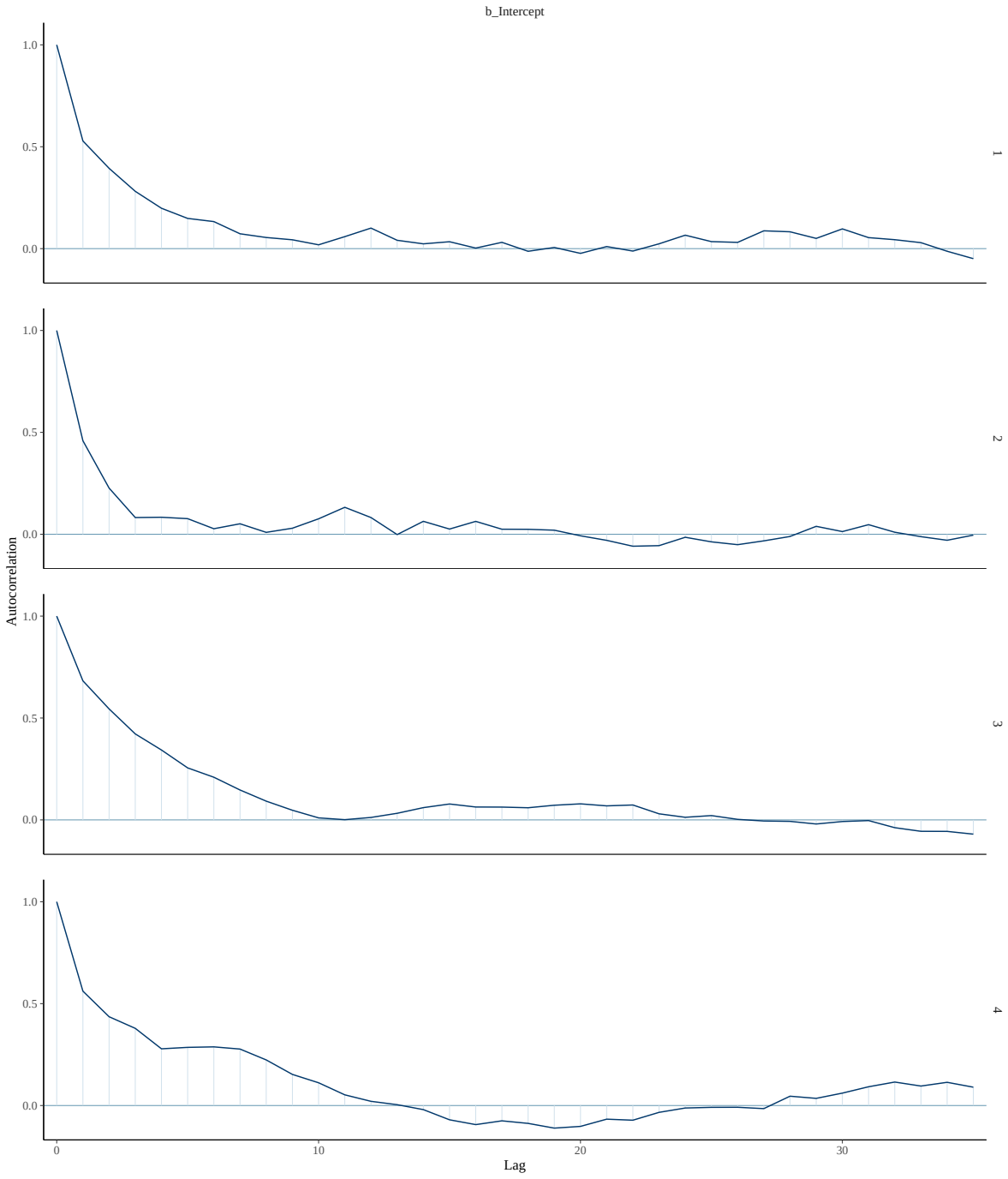

b_Intercept
Autocorrelation
Lag
1.0
0.5
0.0
0
10
20
30
1
2
3
4

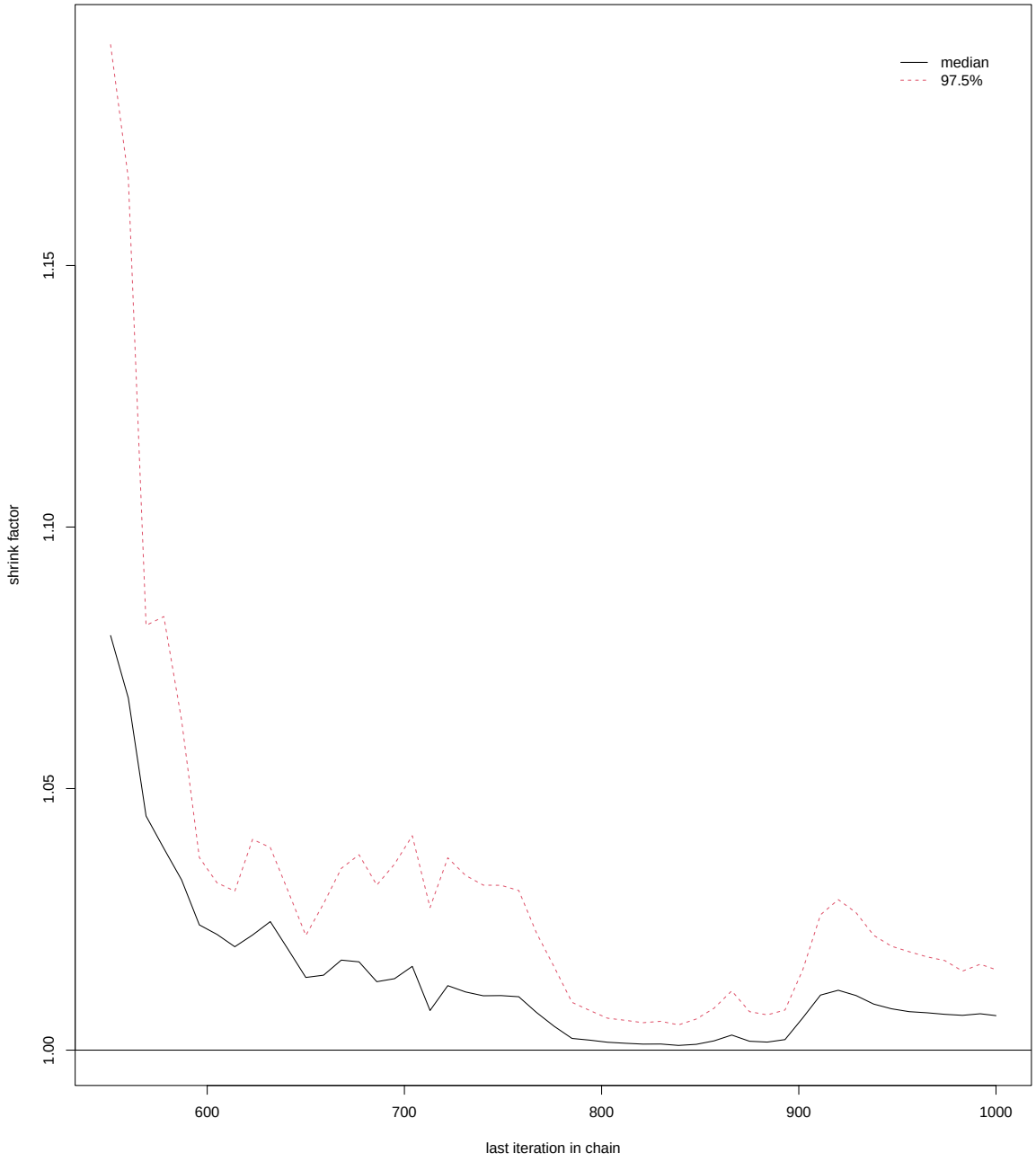

median
97.5%
shrink factor
1.00
1.01
1.02
1.03
1.04
1.05
1.06
600
700
800
900
1000
last iteration in chain

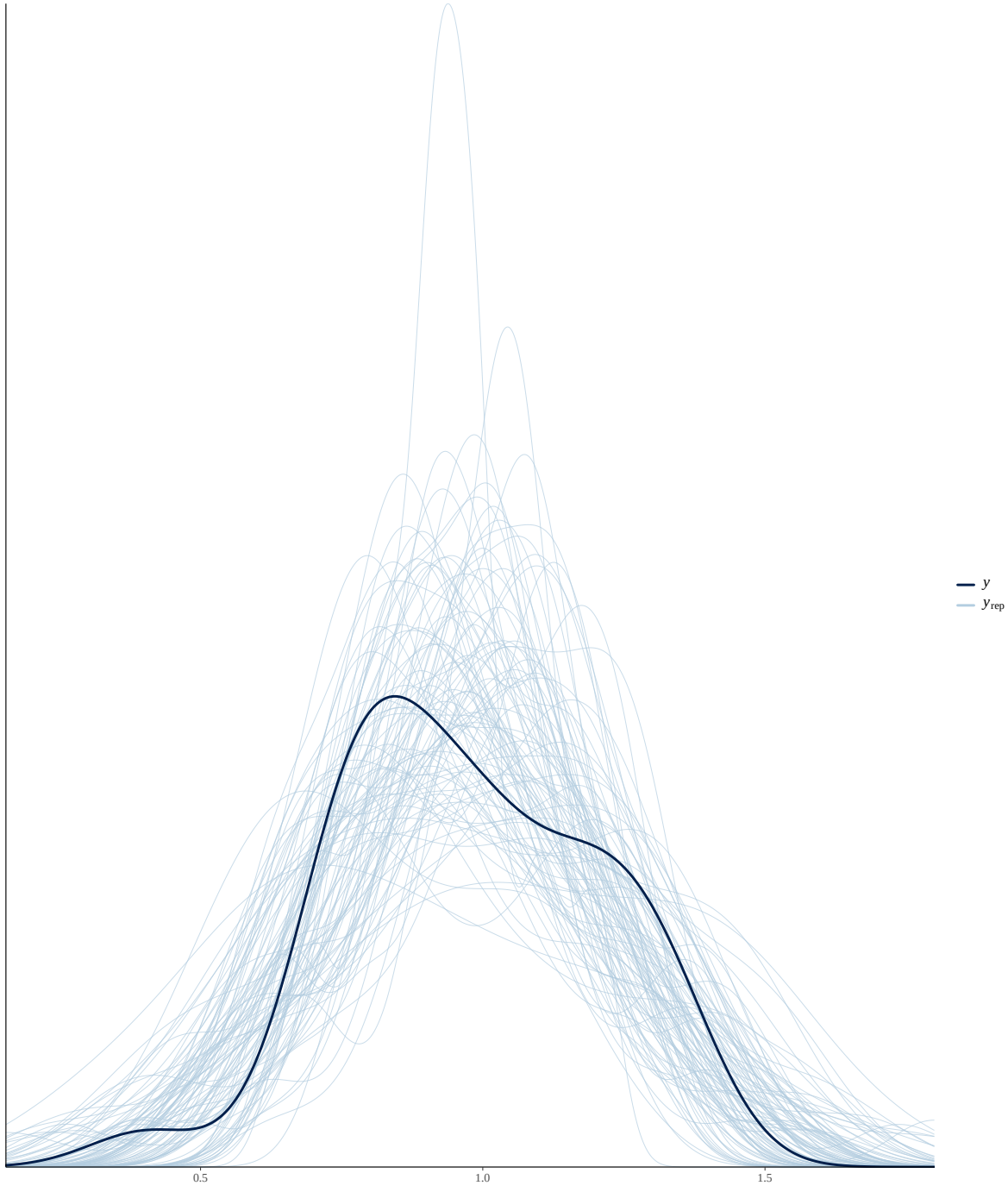

y
y rep
1
2
3
4
5

Model 3b: Direct Effect of Past Land-Use on Small Tree (< 5 cm DBH) Density

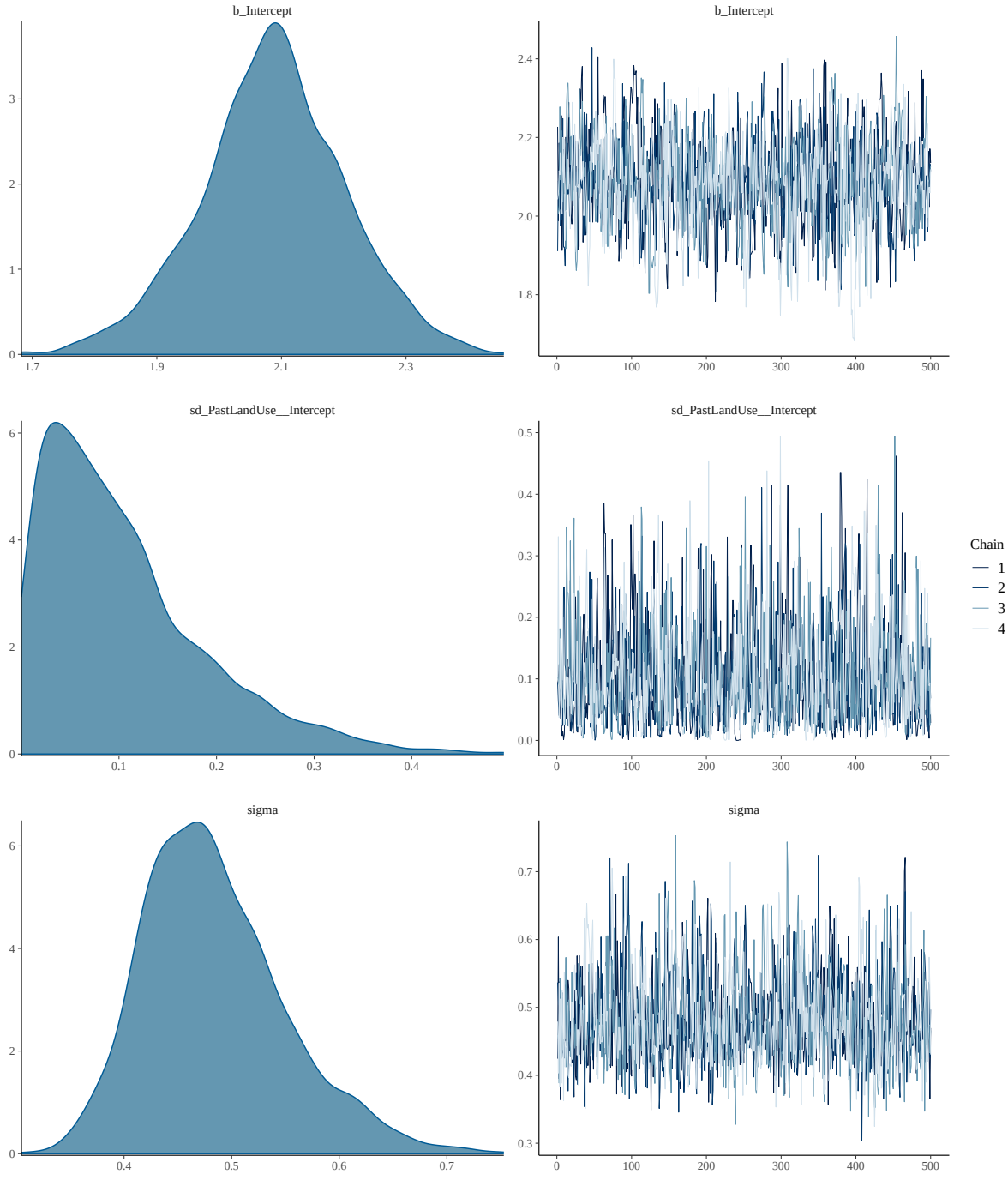


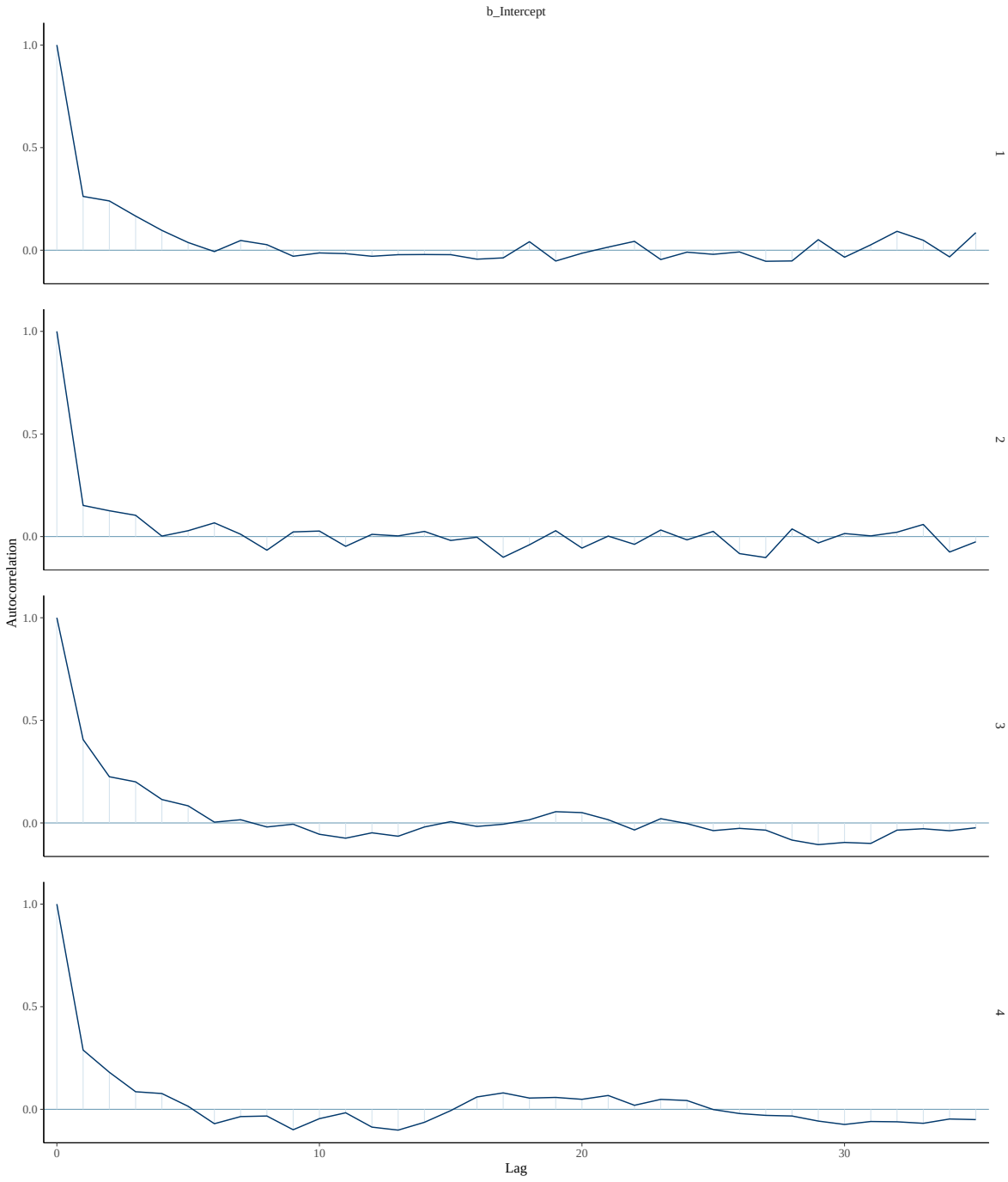

b_Intercept
Autocorrelation
Lag
1.0
0.5
0.0
0
10
20
30
1
2
3
4

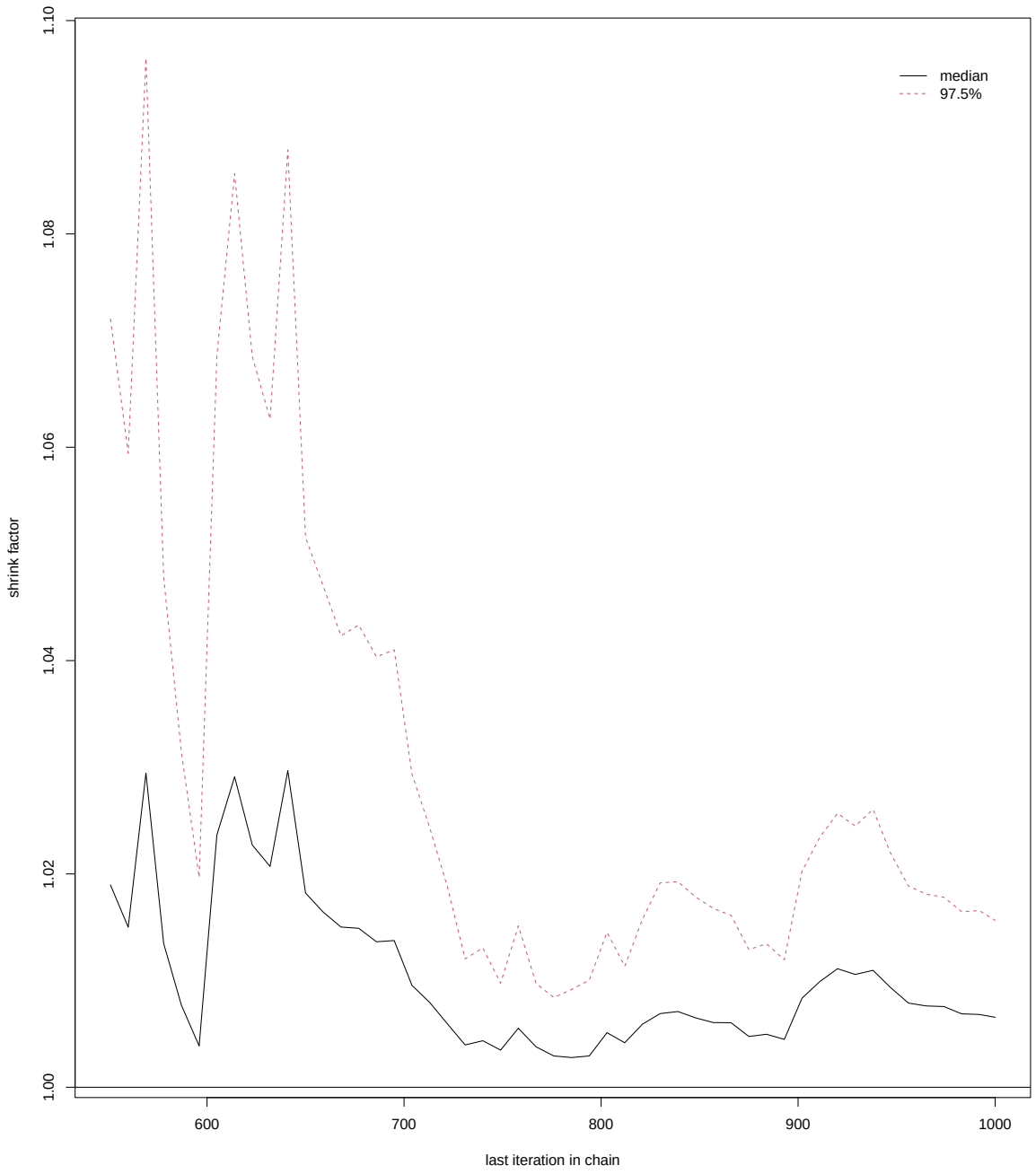

median
97.5%
shrink factor
1.00
1.05
1.10
1.15
600
700
800
900
1000
last iteration in chain

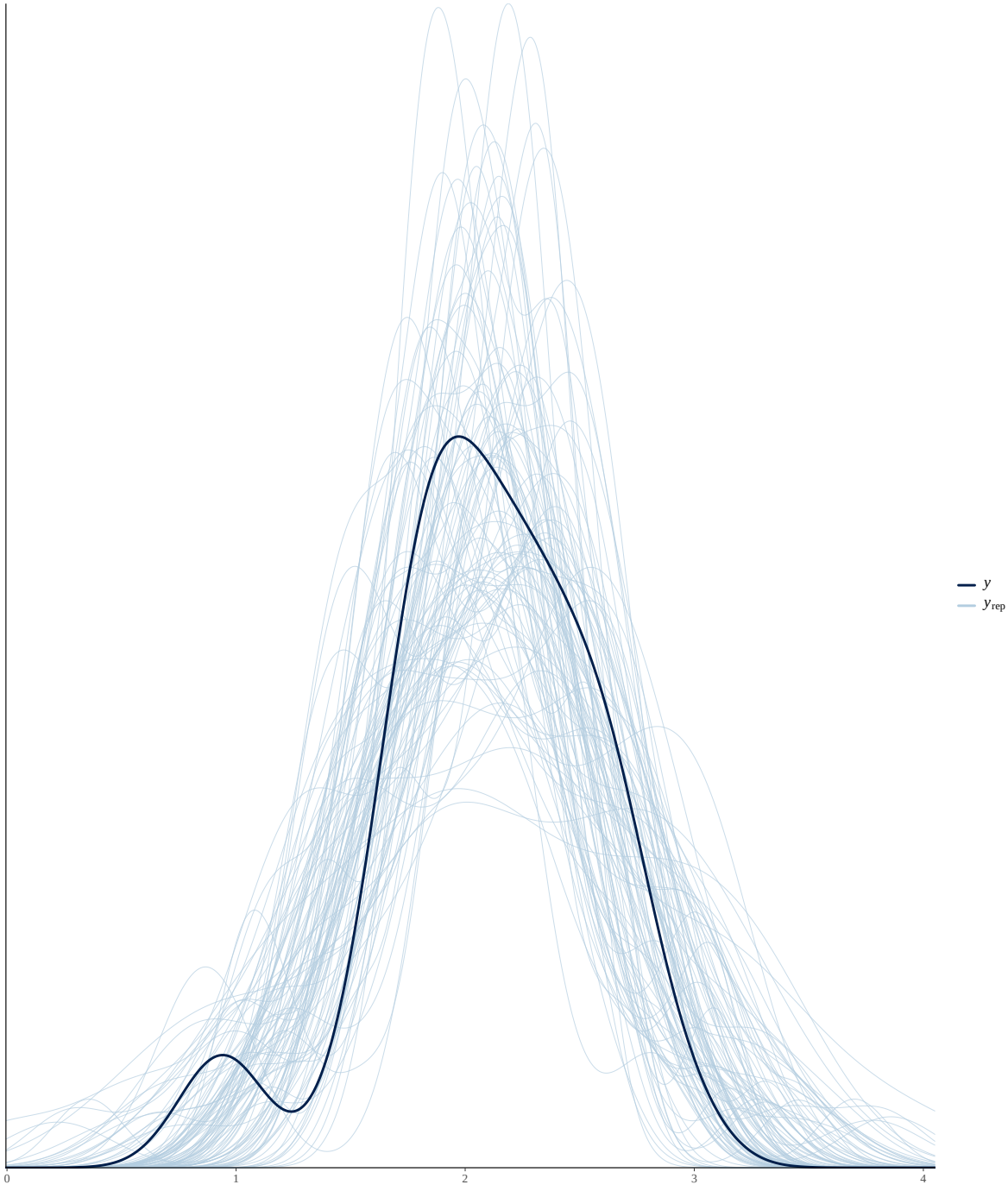

y
y_rep
0.5
1.0
1.5

Model 4: Direct Effect of Past Land-Use on Large Tree (>= 5 cm DBH) Species Richness

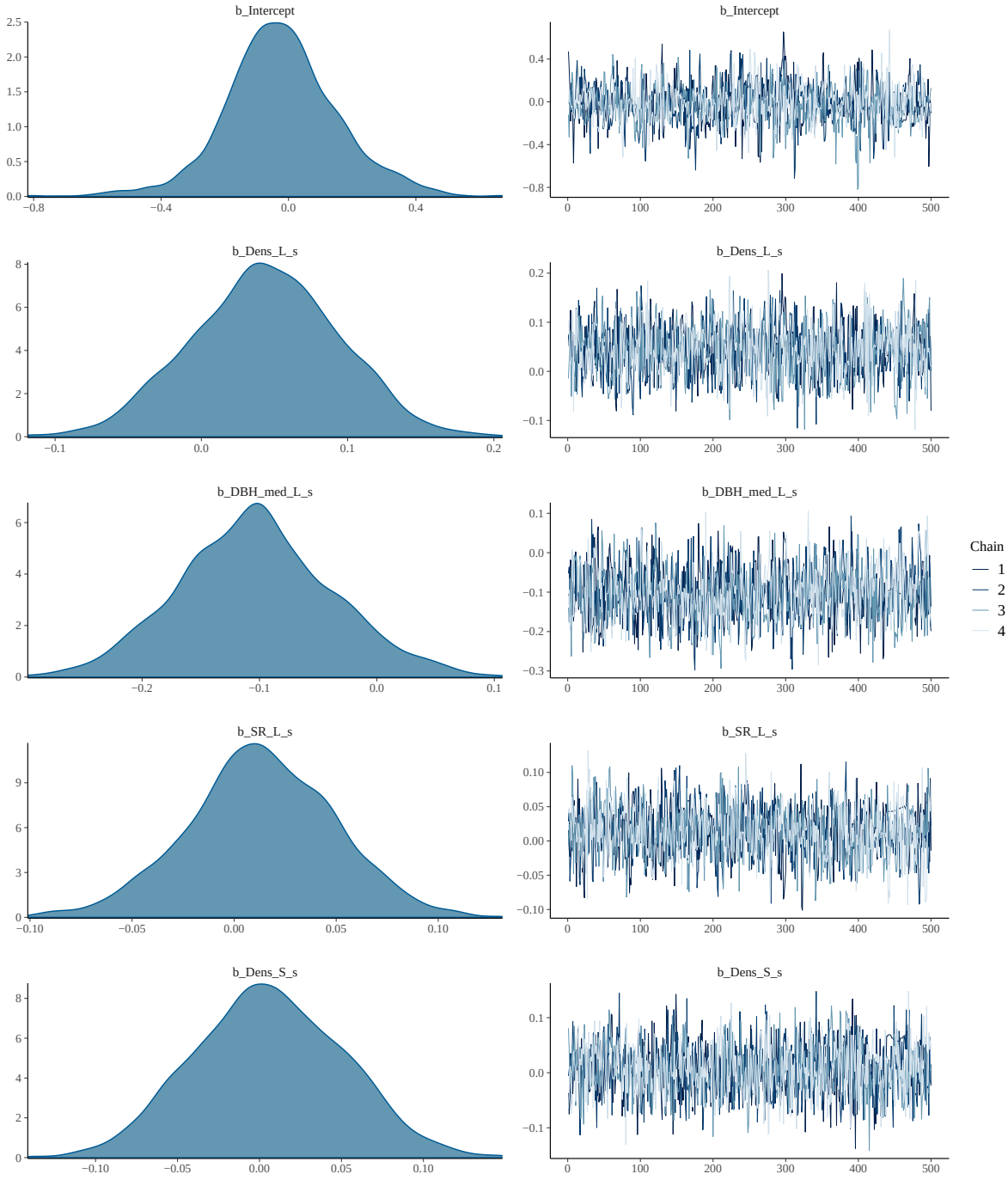


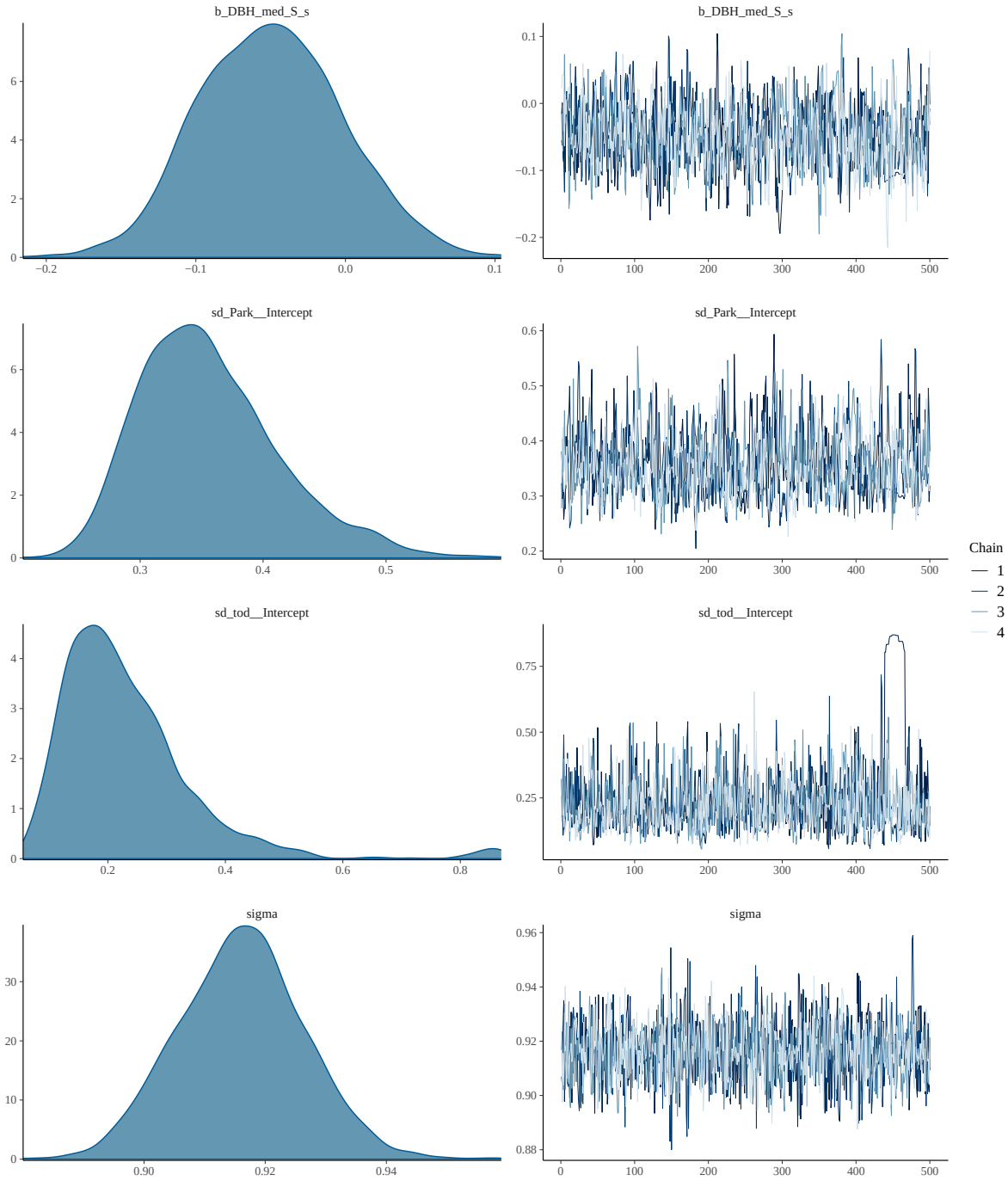

b_Intercept
Autocorrelation
Lag
1.0
0.5
0.0
0
10
20
30
1
2
3
4

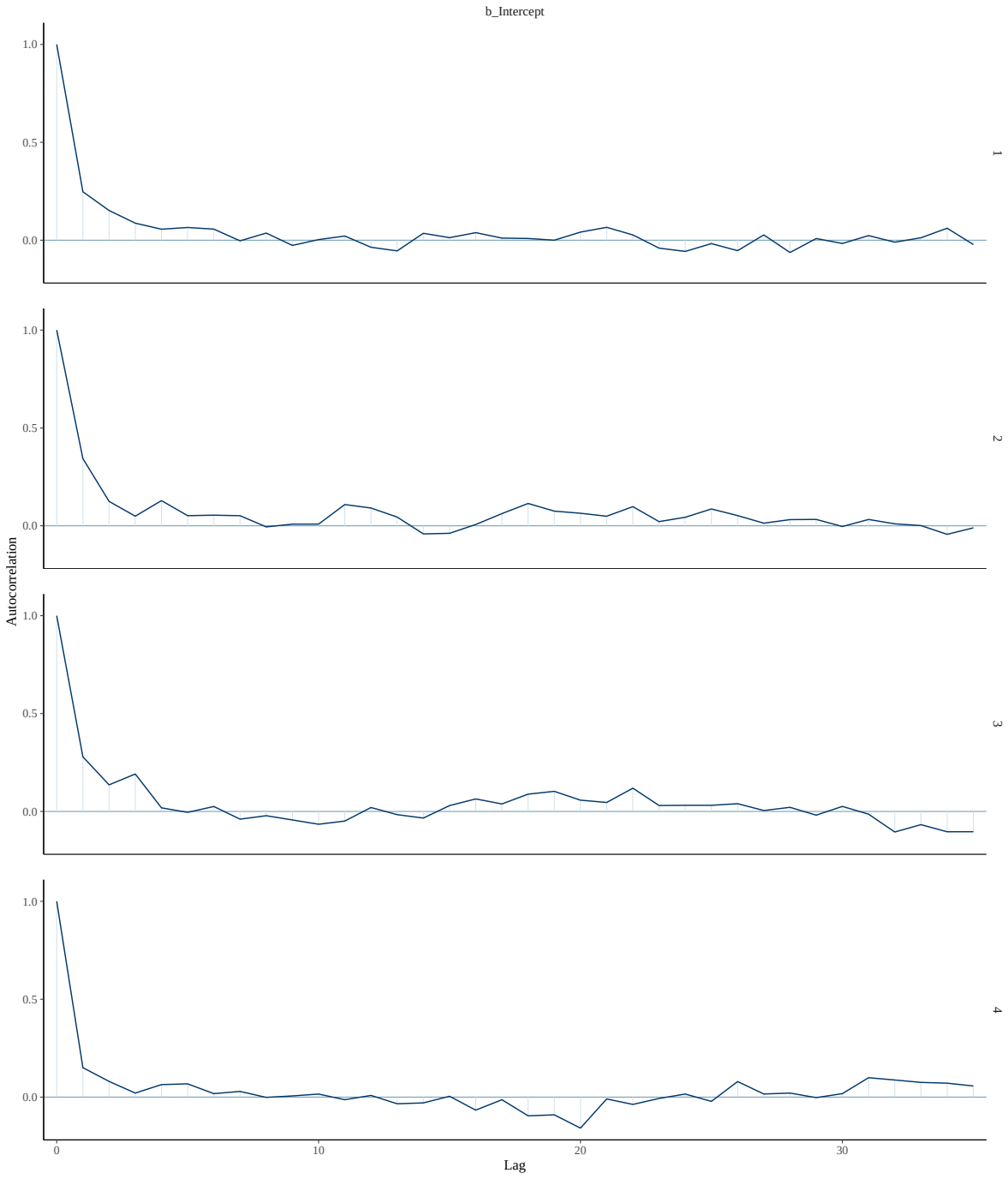

median
97.5%
shrink factor
last iteration in chain
1.00
1.02
1.04
1.06
1.08
1.10
600
700
800
900
1000

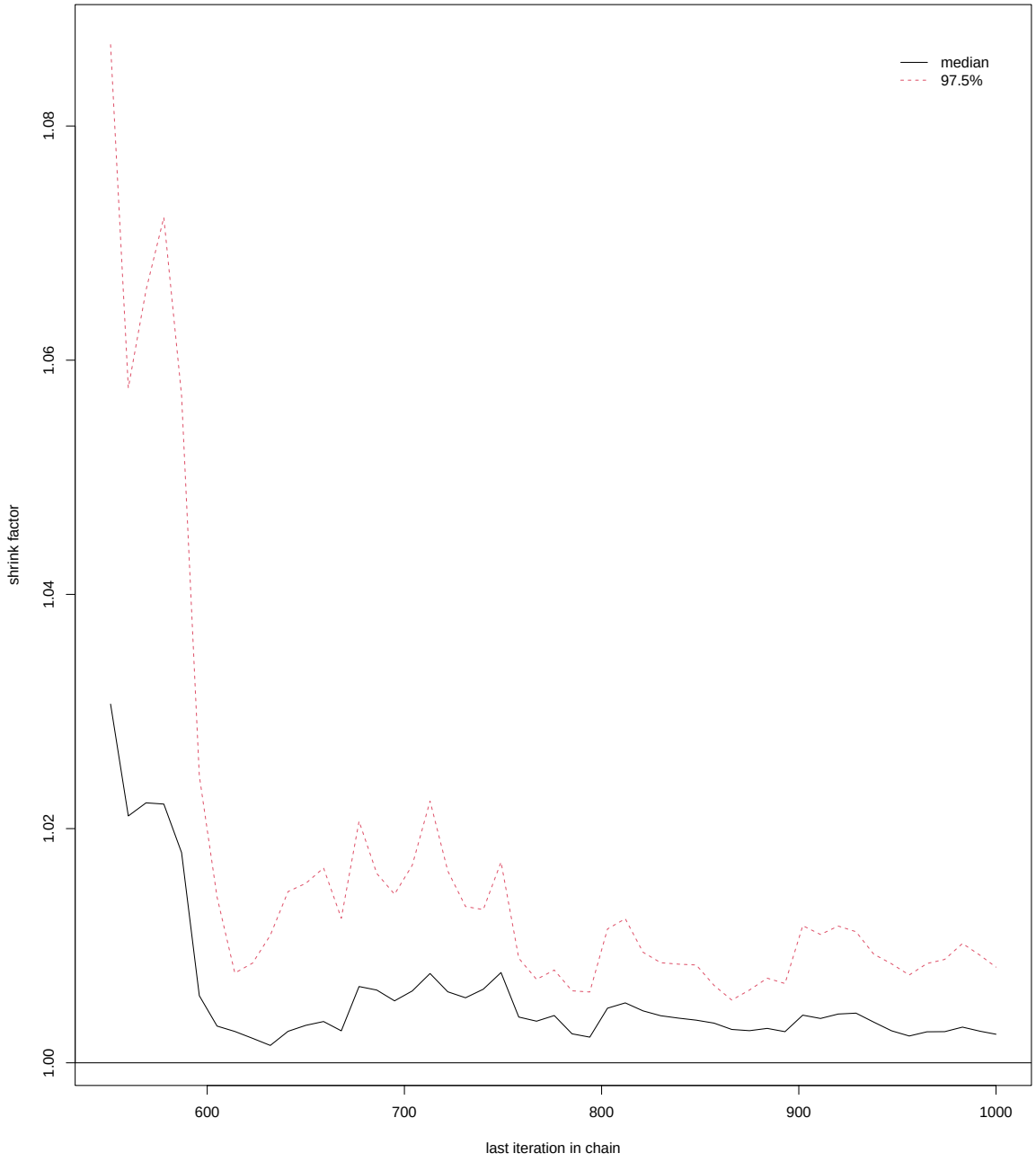

y
y_rep
0
1
2
3
4

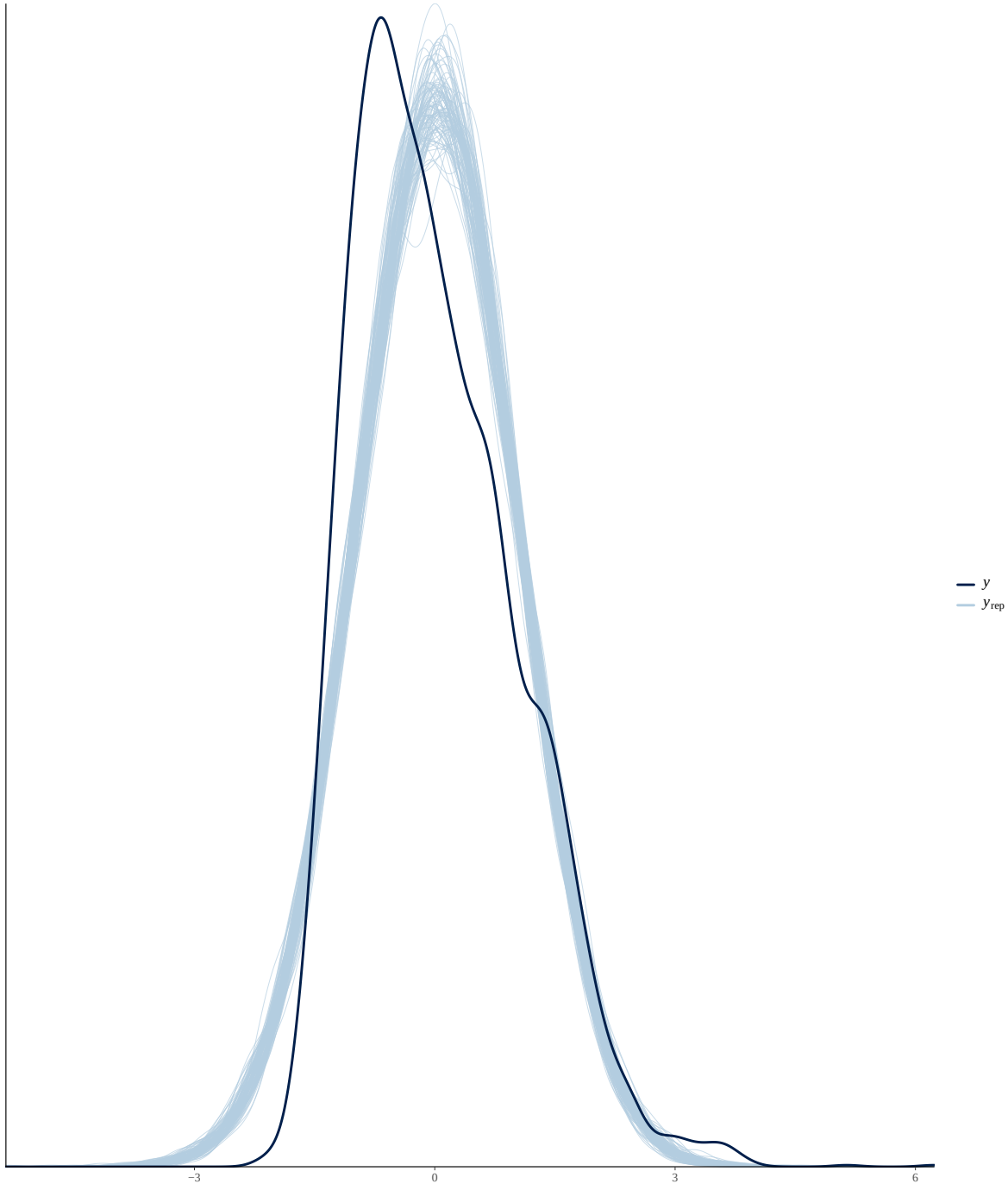
Model 5: Direct Effect of Forest Composition on Temperature




b_DBH_med_S_s
b_DBH_med_S_s
sd_Park__Intercept
sd_Park__Intercept
sd_tod__Intercept
sd_tod__Intercept
sigma
sigma
Chain
1
2
3
4


b_Intercept
Autocorrelation
Lag
1.0
0.5
0.0
0
10
20
30
1
2
3
4


median
97.5%
shrink factor
1.00
1.02
1.04
1.06
1.08
600
700
800
900
1000
last iteration in chain


y
y_rep
−3
0
3
6