Steelhead Overshoot Update

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The beta matrix

	mouth to BON	BON to MCN	MCN to ICH or PRA	PRA to RIS	ICH to LGR	Deschutes River	John Day River	Tucannon River	Yakima River	loss
mouth to BON	0	1	0	0	0	0	0	0	0	1
BON to MCN	1	0	1	0	0	1	1	0	0	1
MCN to ICH or PRA	0	1	0	1	1	0	0	0	1	1
PRA to RIS	0	0	1	0	0	0	0	0	0	1
ICH to LGR	0	0	1	0	0	0	0	1	0	1
Deschutes River	0	1	0	0	0	0	0	0	0	1
John Day River	0	1	0	0	0	0	0	0	0	1
Tucannon River	0	0	0	0	1	0	0	0	0	1
Yakima River	0	0	1	0	0	0	0	0	0	1
loss	0	0	0	0	0	0	0	0	0	0

No covariate model

For each movement probability:

Every β_0 = 1.

Numerator:

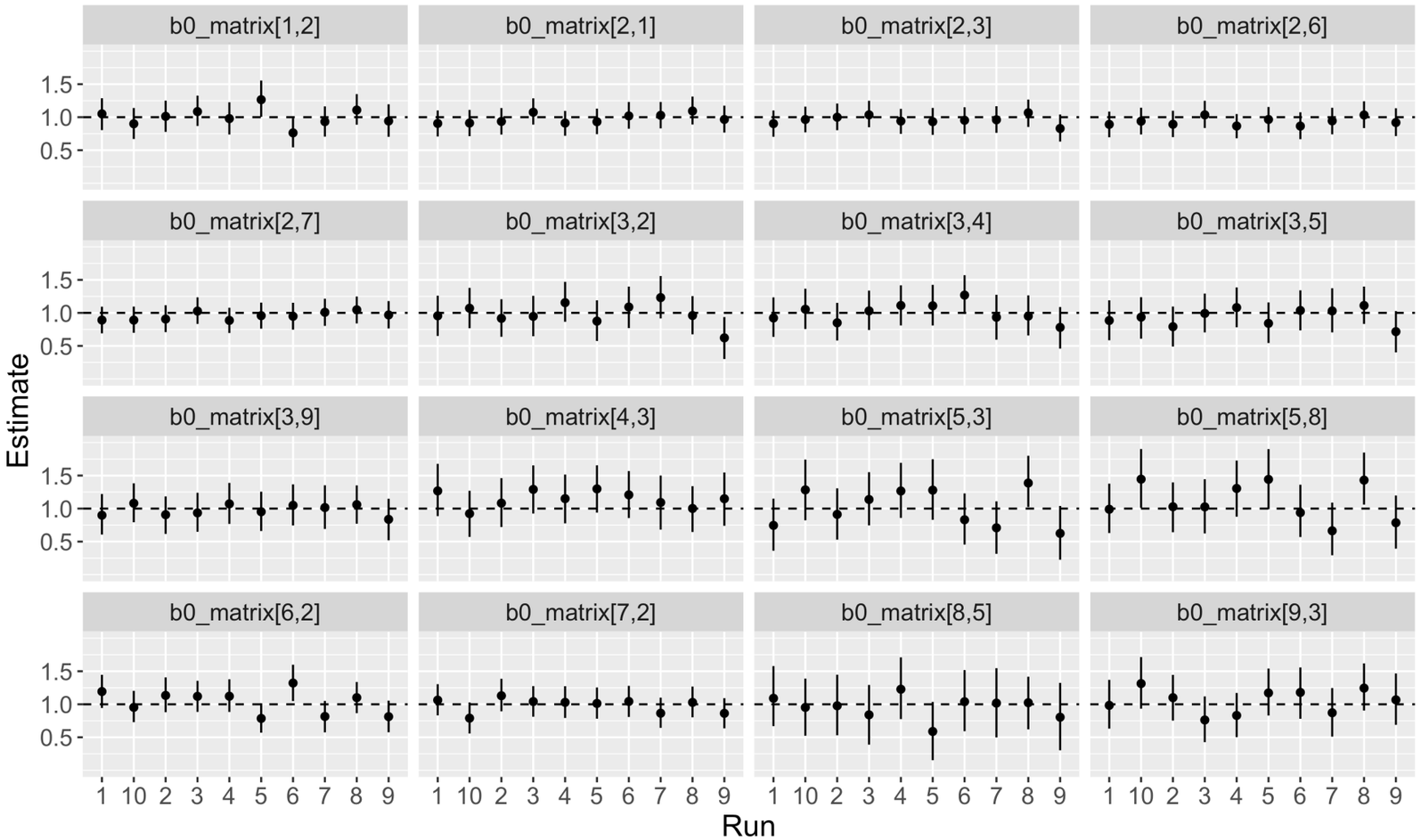
$$\psi_{BM-JDR} = \exp(\beta_{0,BM-JDR})$$

Denominator:

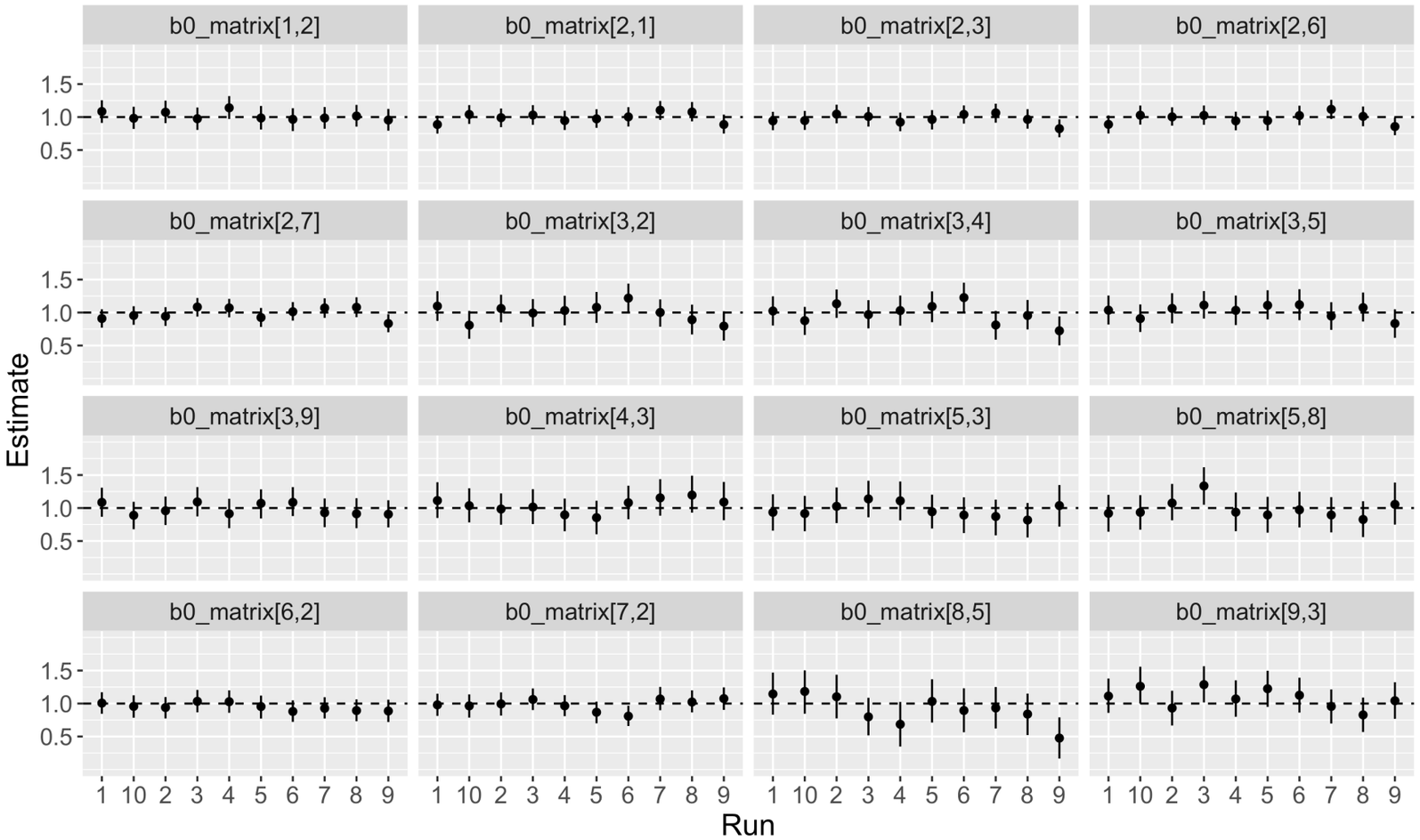
$$1 + \psi_{BM-JDR} + \psi_{BM-DES} + \psi_{BM-MIP} + \psi_{BM-MB}$$

BM-loss = 1 - Σ (all other movements)

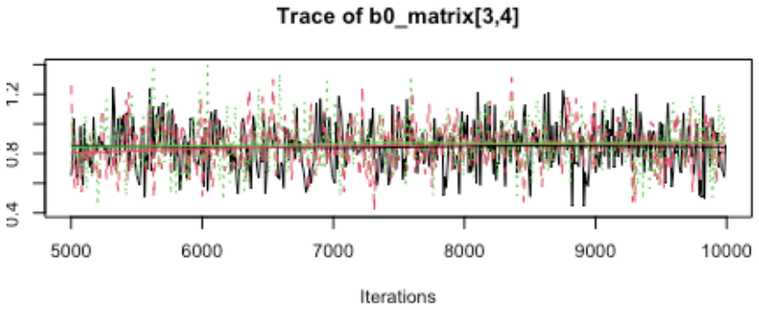
Results - no covariates, 600 fish

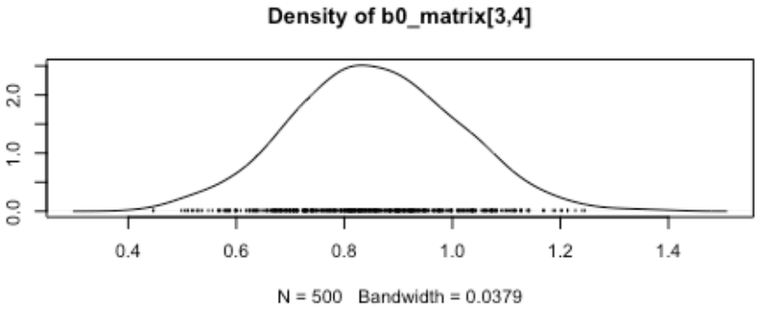


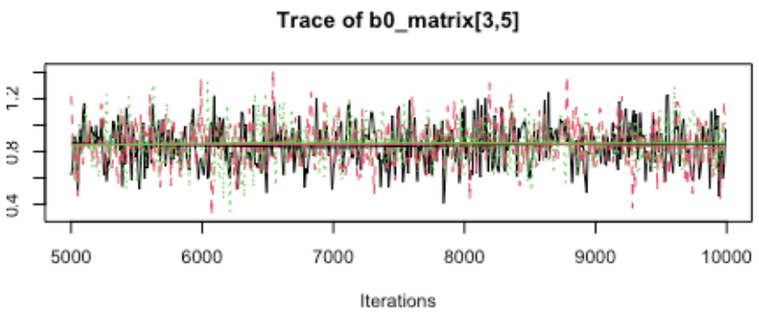
Results - no covariates, 1200 fish

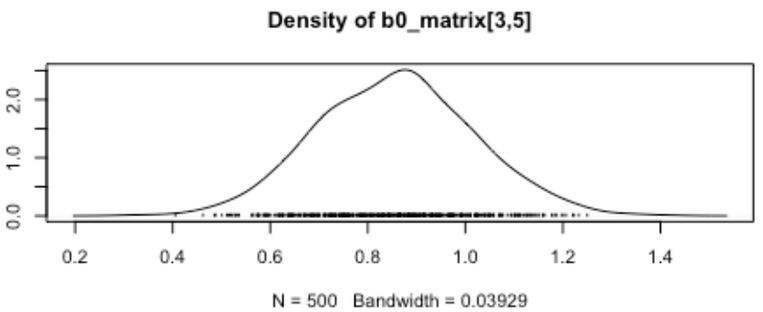


Traceplots look good









Covariates - attempting to include temperature, flow, rear, and origin

All covariates model

For each movement probability:

Numerator:

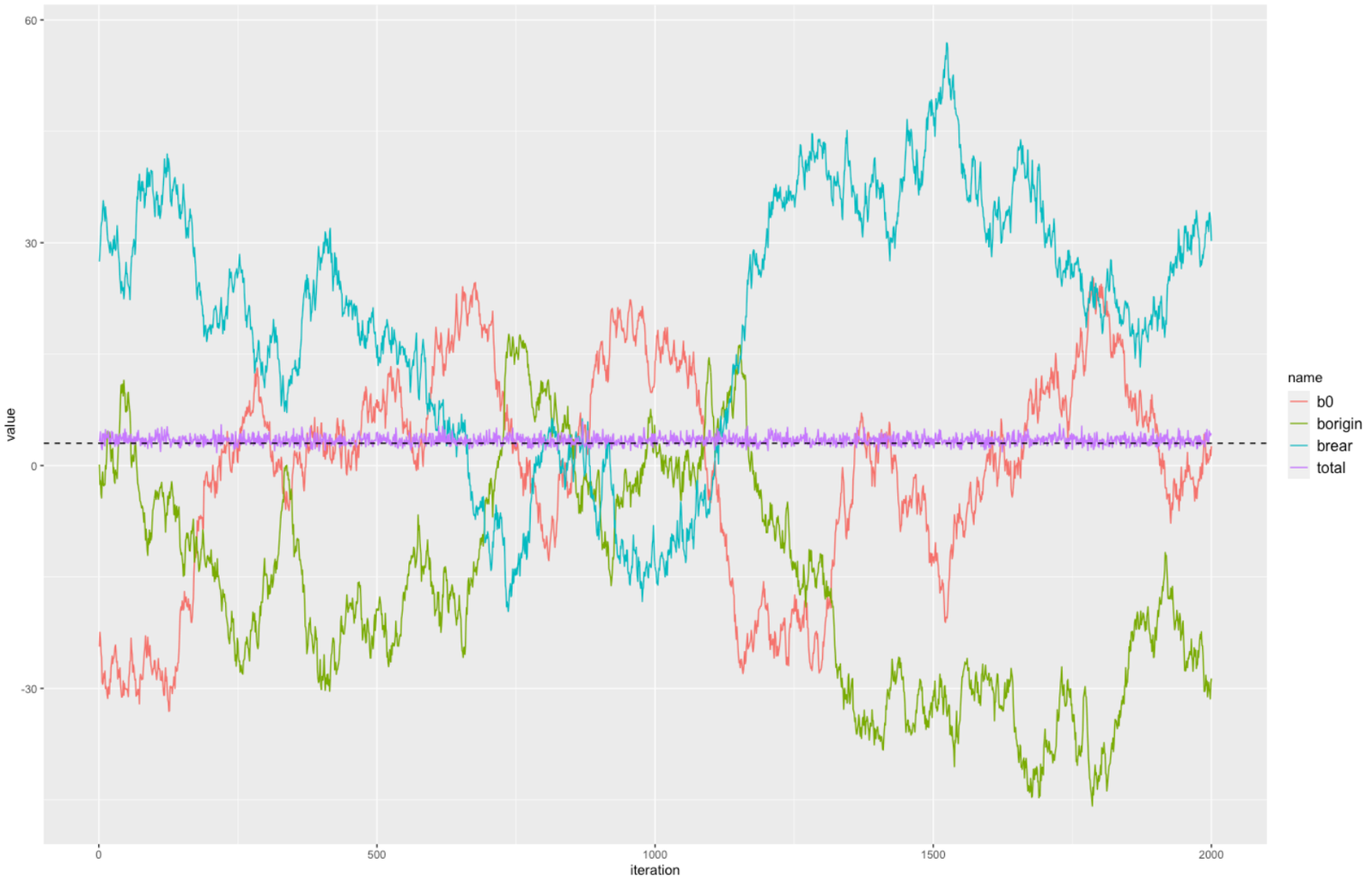
$$\psi_{BM-JDR} = \exp(\beta_{0,BM-JDR} + \beta_{temp,BM-JDR} * temp + \beta_{flow,BM-JDR} * flow + \beta_{rear,BM-JDR}[rear] + \beta_{origin,BM-JDR}[origin])$$

Denominator:

$$1 + \psi_{BM-JDR} + \psi_{BM-DES} + \psi_{BM-MIP} + \psi_{BM-MB}$$

BM-loss = 1 - Σ (all other movements)

Identifiability issue with rear/origin



Multinomial logit - 3 intercept terms

For each movement probability:

Numerator:

$$\psi_{BM-JDR} = \exp(\beta_{\mathbf{0,BM-JDR}} + \beta_{temp,BM-JDR} * temp + \beta_{flow,BM-JDR} * flow + \beta_{\mathbf{rear,BM-JDR}}[\mathbf{rear}] + \beta_{\mathbf{origin,BM-JDR}}[\mathbf{origin}])$$

Denominator:

$$1 + \psi_{BM-JDR} + \psi_{BM-DES} + \psi_{BM-MIP} + \psi_{BM-MB}$$

BM-loss = 1 - Σ (all other movements)

Potential solution: Different intercept for each origin + rear combination?

$\beta_{0,TUC,W}$

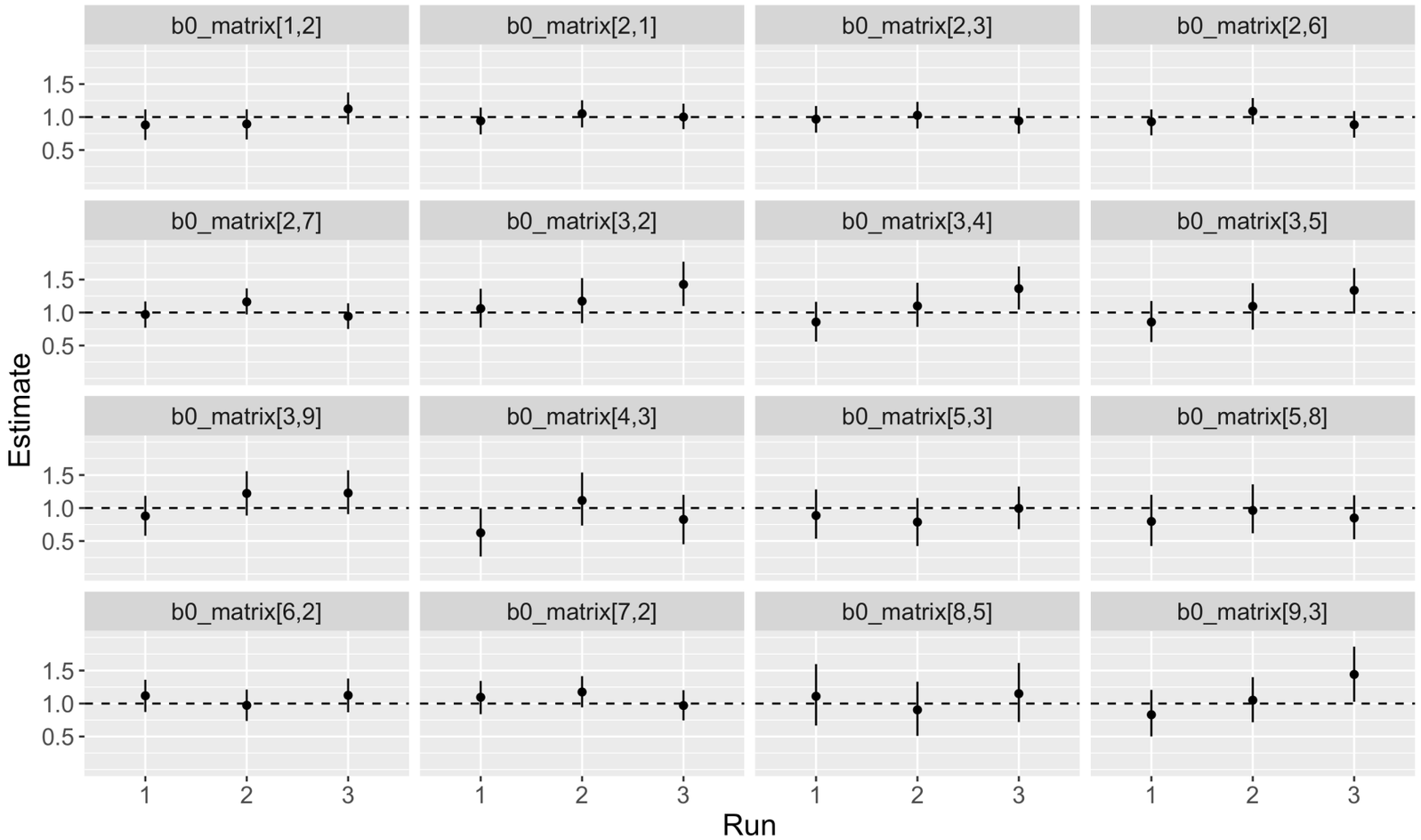
$\beta_{0,TUC,H}$

$\beta_{0,JDR,W}$

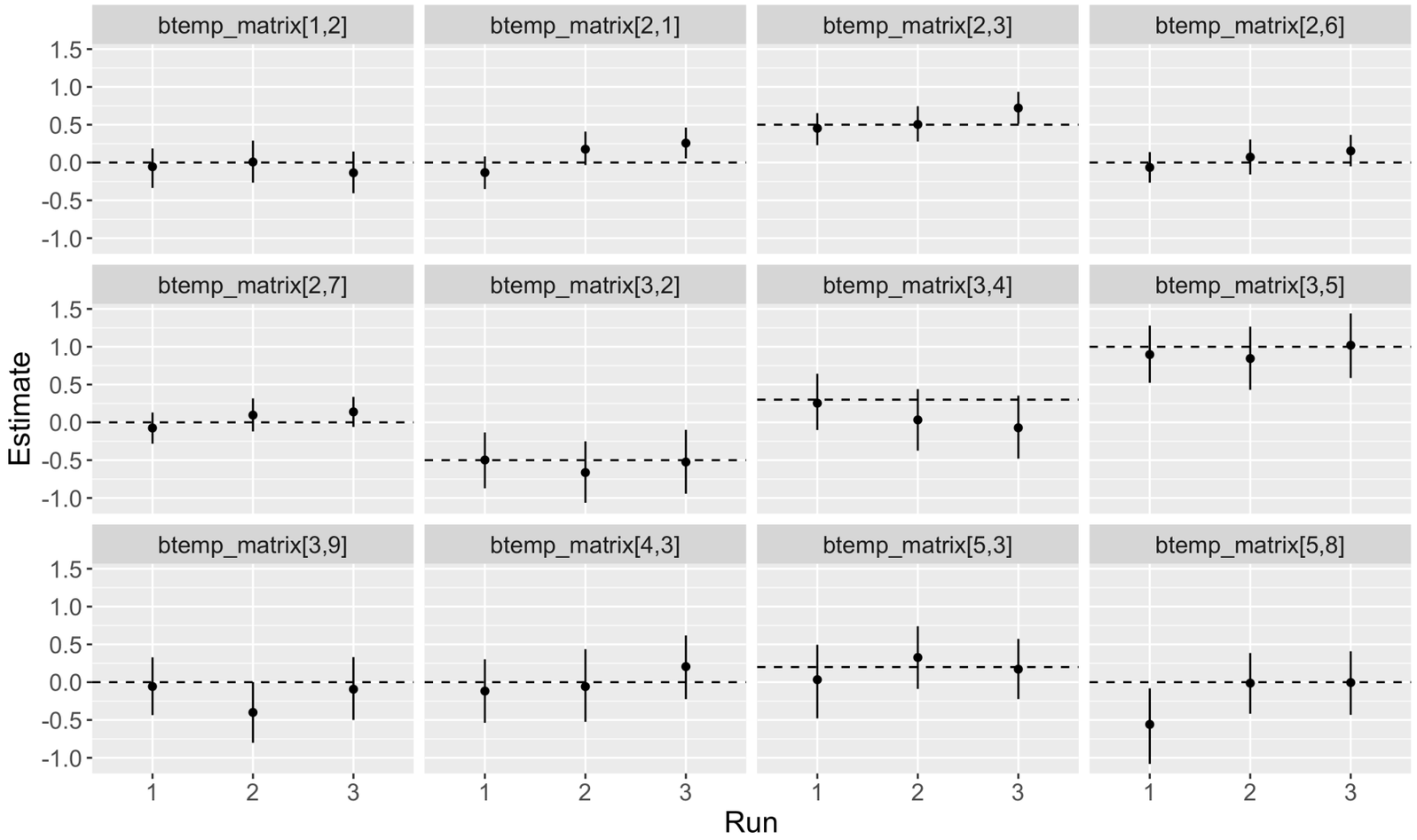
etc.

Covariates: temperature only - 600 fish

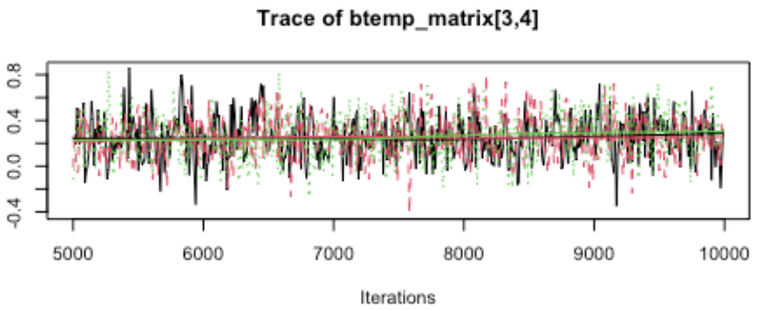
Intercepts (b0) are still being recovered

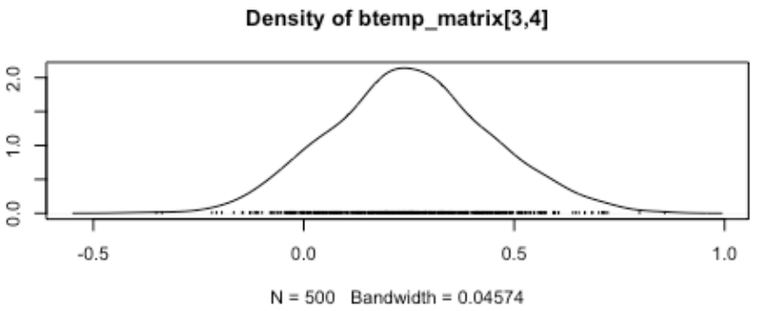


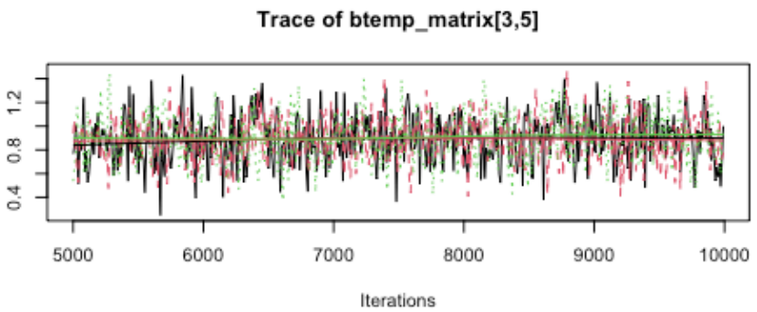
Some temperature betas are being recovered

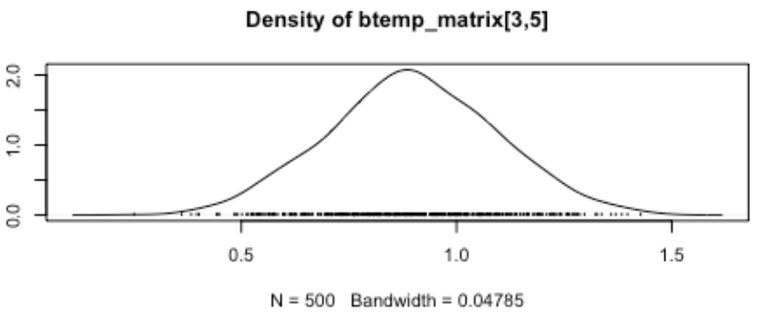


These btemp have nice traceplots

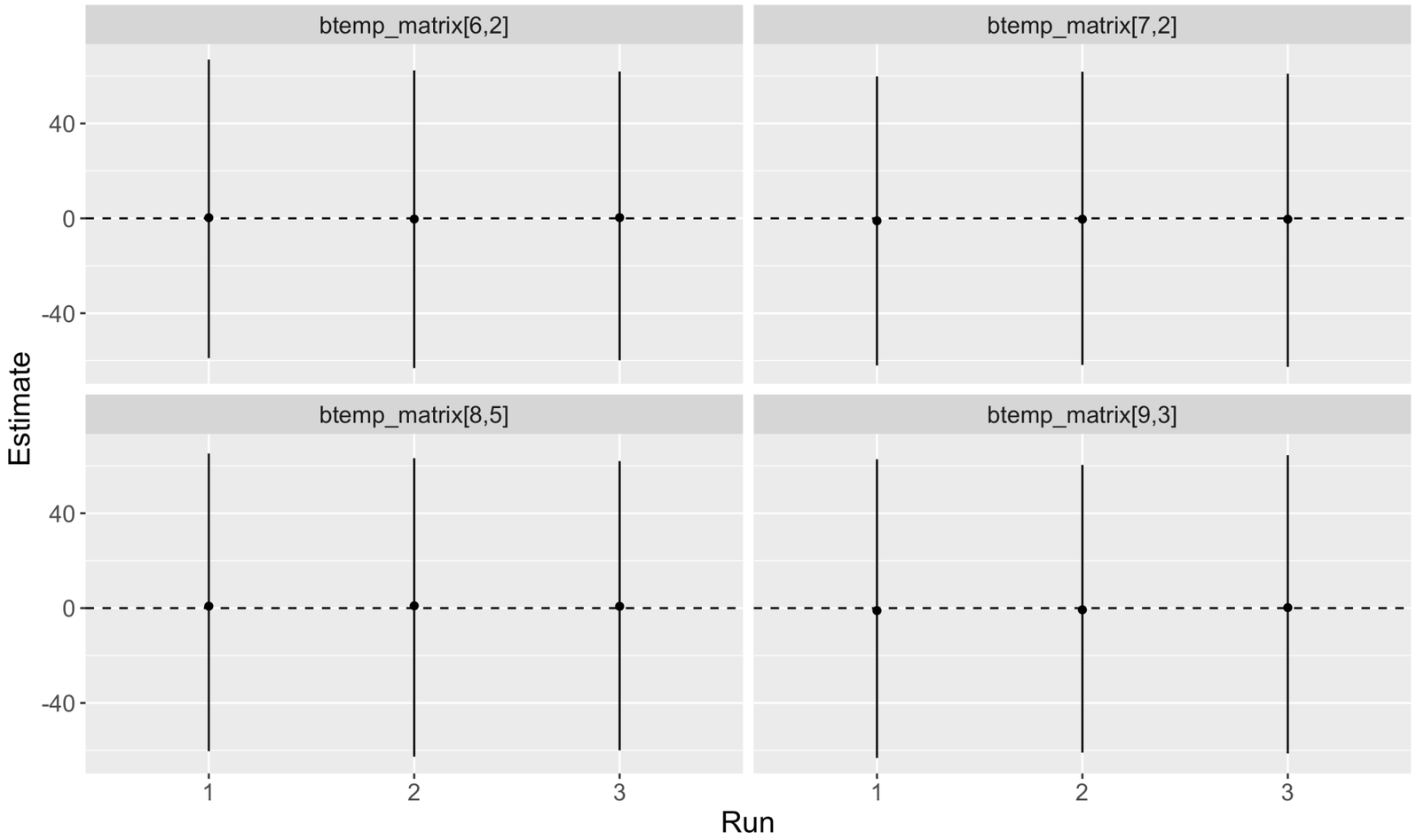








Some temperature betas are not being recovered



Traceplots indicate that these are not being informed by the data?