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Supplementary material

Prey consumption estimates for salmon sharks

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Table S1. Prior and hyperprior distributions of the von Bertalanffy growth function parameters

Parameters are L_∞, maximum length; *K*, energy loss or growth; *m* unit-less values introduced for mathematical convenience; t_o, theoretical age at which length is zero; and σ, the standard deviation of length-at-age for all individuals in the model. A hyperprior is a prior distribution on a parameter of a prior distribution

Priors	Hyperpriors	
L_∞ ~Normal(μ_{Linf}, σ^2_{Linf})	μ_{Linf} ~Normal(270, 10)	σ^2_{Linf} ~Normal(15, 5)
K ~gamma(α, β)	α ~Gamma(2, 2)	β ~Gamma(2, 2)
m ~β(γ, δ)	γ ~Gamma(7.5, 4)	δ ~Gamma(9, 4)
t_o ~normal(-10, 5)		
σ ~uniform(1E-3, 200)		

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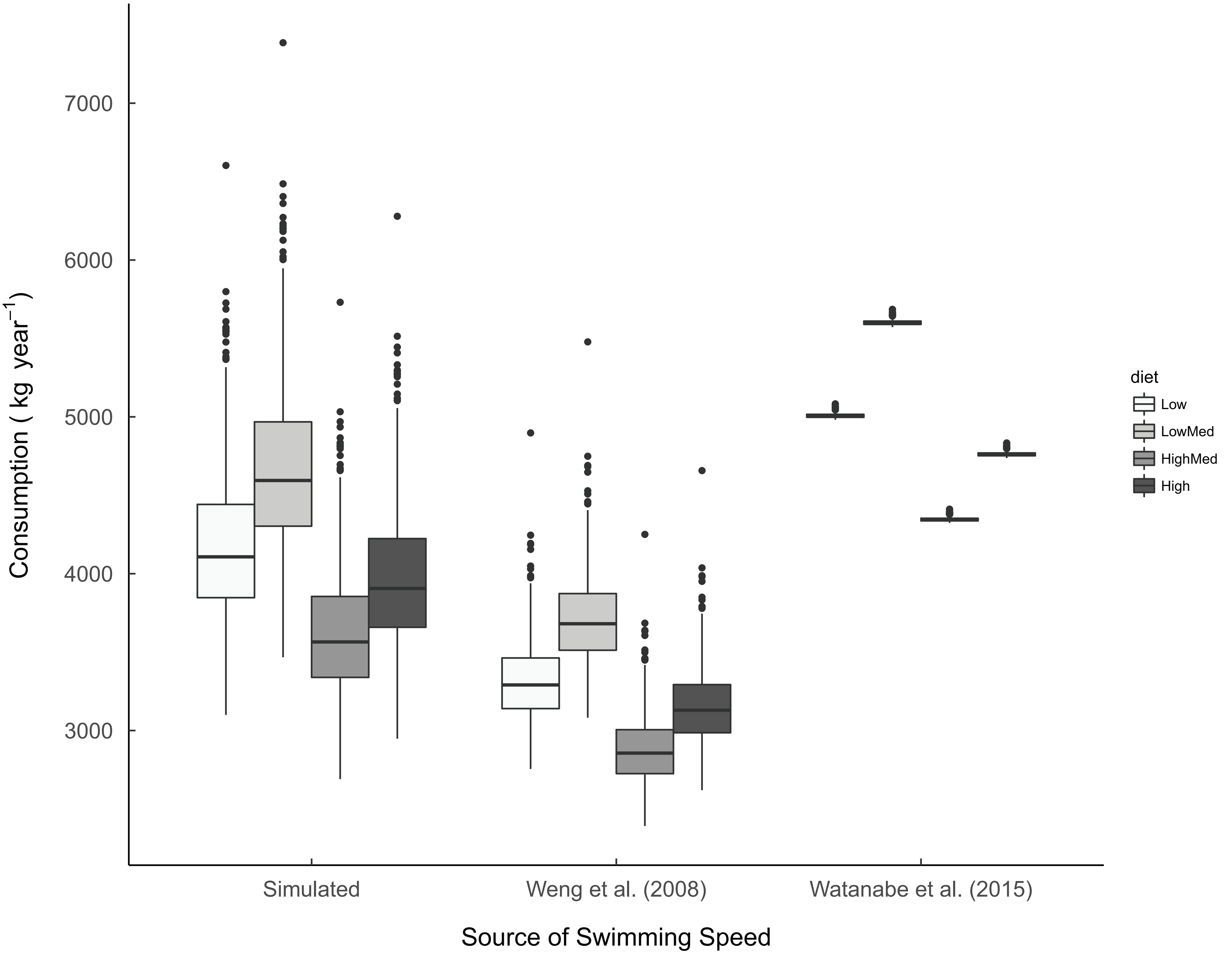
Fig. S1. An examination of the sensitivity of per capita prey consumption estimates of adult salmon sharks in kilograms of prey consumed per year to the specification of swimming speed in the mass balance model. From left to right are estimates using a swimming speed drawn from a normal distribution with the mean and standard deviation of the combined input speeds, next are estimates using only the speed range reported by Weng *et al*. (2008) and then the cruising speed measured by Watanabe *et al*. (2015). From left to right for each source of swimming speed are the 'low', 'low medium', 'high medium', and 'high' proportion of Pacific salmon diet scenarios (Table 4). Estimates that included variability are represented as box and whisker plots. The bold centre line of each box plot is the median whereas the lower and upper hinges are the 25th and 75th percentiles respectively. The whiskers extend 1.5 times the distance between the first and third quartiles, and any estimates beyond that range are plotted individually as points. (See following page.)



7000
6000
5000
4000
3000
Consumption (kg year^{-1})
Simulated
Weng et al. (2008)
Watanabe et al. (2015)
Source of Swimming Speed
diet
Low
LowMed
HighMed
High

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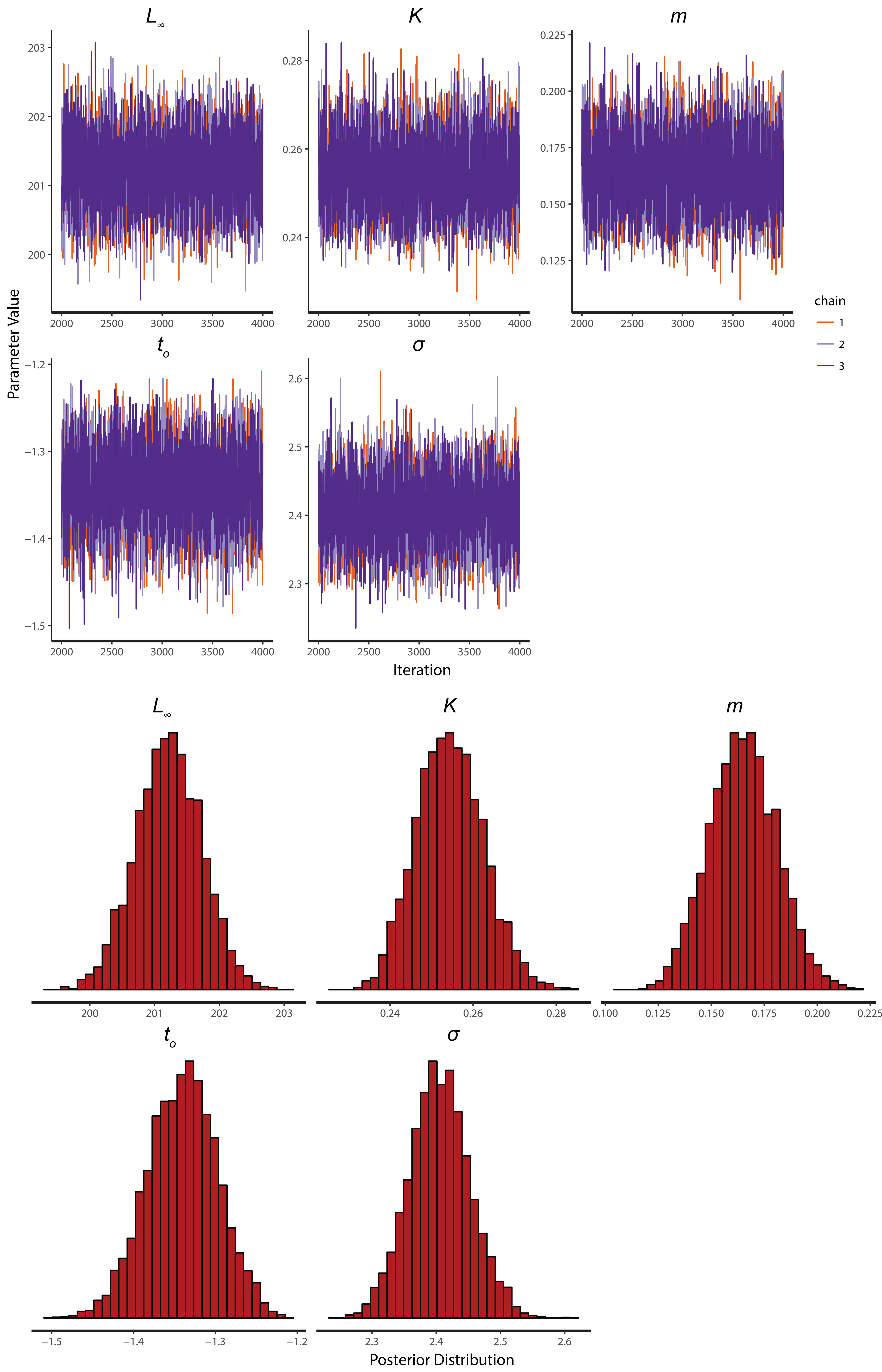
Fig. S2. (top panel) Trace plots of von Bertalanffy growth curve parameters estimated for salmon sharks using a hierarchical Bayesian model. (bottom panel) Histograms of selections from the posterior distributions of von Bertalanffy growth curve parameters estimated for salmon sharks using a hierarchical Bayesian model. Together, the homogeneity of trace plots and unimodal histograms were used as a proxy of convergence of the growth model. (See following page.)



L_∞
K
m
t_o
σ
Parameter Value
Iteration
chain
1
2
3
2000
2500
3000
3500
4000
200
201
202
203
0.24
0.26
0.28
0.100
0.125
0.150
0.175
0.200
0.225
−1.5
−1.4
−1.3
−1.2
2.3
2.4
2.5
2.6
Posterior Distribution

References

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