**Supplemental Information**

**Tables**

Table S1:

|  |  |
| --- | --- |
| **Number of size classes** | **Deterministic lambda estimate** |
| 5 | 1.01745 |
| 10 | 1.0098 |
| 20 | 1.024082 |
| 30 | 1.026804 |
| 40 | 1.026783 |
| 45 | 1.026646 |
| 50 | 1.026603 |
| 55 | 1.026465 |
| 60 | 1.026708 |
| 65 | 1.026238 |
| 70 | 1.026189 |
| 75 | 1.026128 |
| 80 | 1.025979 |
| 90 | 1.025937 |
| 100 | 1.025775 |

Table S2: Gelman-Rubin Statistics for erbr\_JAGSmodBest\_c3t10s30b10\_noYRE\_20230420.rds

Point est. Upper C.I.

grwth\_intercept 1.01 1.05

grwth\_RosCoef 1.00 1.00

grwth\_TempFallCoef 1.00 1.01

grwth\_TempSummerCoef 1.01 1.05

grwth\_TempWinterCoef 1.00 1.00

grwth\_PptFallCoef 1.00 1.01

grwth\_PptSummerCoef 1.00 1.01

grwth\_PptWinterCoef 1.00 1.01

grwthvar\_intercept 1.00 1.00

grwthvar\_RosCoef 1.00 1.00

surv\_intercept 1.01 1.02

surv\_RosCoef 1.00 1.00

surv\_PptWinterCoef 1.00 1.01

surv\_TempFallCoef 1.00 1.01

surv\_TempSummerCoef 1.01 1.02

surv\_TempWinterCoef 1.00 1.00

reproyesno\_intercept 1.02 1.06

reproyesno\_RosCoef 1.00 1.00

reproyesno\_PptFallCoef 1.00 1.00

reproyesno\_PptSummerCoef 1.00 1.00

reproyesno\_TempFallCoef 1.01 1.03

reproyesno\_TempSummerCoef 1.00 1.01

reproyesno\_TempWinterCoef 1.00 1.01

repro\_intercept 1.02 1.07

repro\_RosCoef 1.00 1.00

repro\_PptFallCoef 1.03 1.10

repro\_PptSummerCoef 1.02 1.07

repro\_TempWinterCoef 1.01 1.03

repro\_TempFallCoef 1.02 1.08

repro\_TempSummerCoef 1.06 1.20

newplt\_intercept 1.00 1.00

Multivariate psrf

1.06

Median estimates for erbr\_JAGSmodBest\_c3t10s30b10\_noYRE\_20230420.rds

Lower95 Median Upper95

grwth\_intercept -7.42923e-02 0.843750500 1.875120000

grwth\_RosCoef 7.21833e-01 0.748661000 0.774960000

grwth\_TempFallCoef -1.42189e-01 -0.095329100 -0.050223400

grwth\_TempSummerCoef -4.54884e-03 0.052770950 0.102879000

grwth\_TempWinterCoef -6.57659e-02 -0.023970050 0.016783900

grwth\_PptFallCoef -2.35904e-03 -0.001073345 0.000123586

grwth\_PptSummerCoef -3.87444e-04 0.000167723 0.000725839

grwth\_PptWinterCoef 4.59256e-03 0.006007120 0.007446100

grwthvar\_intercept 8.72395e-01 1.144950000 1.421390000

grwthvar\_RosCoef -1.23158e-02 0.087034250 0.186198000

surv\_intercept -1.45877e[+01 -8.428785000](https://dialpad.com/launch/?phone=%2B01%20-8.428785000%20&type=web) -2.848170000

surv\_RosCoef 3.88181e-01 0.545309000 0.705051000

surv\_PptWinterCoef 2.82526e-02 0.037333750 0.046806100

surv\_TempFallCoef -4.85562e-01 -0.138639500 0.231601000

surv\_TempSummerCoef 2.97336e-01 0.539424500 0.792573000

surv\_TempWinterCoef 1.32272e-01 0.399727000 0.675929000

reproyesno\_intercept -6.57355e[+00 -3.300305000](https://dialpad.com/launch/?phone=%2B00%20-3.300305000%20&type=web) -0.173030000

reproyesno\_RosCoef 1.21632e[+00 1.360285000](https://dialpad.com/launch/?phone=%2B00%20%201.360285000%20&type=web)  1.513480000

reproyesno\_PptFallCoef 2.75796e-03 0.008874885 0.014925500

reproyesno\_PptSummerCoef 3.47825e-03 0.005689330 0.007973630

reproyesno\_TempFallCoef -7.70728e-01 -0.545922000 -0.323246000

reproyesno\_TempSummerCoef -9.91380e-03 0.233489000 0.483893000

reproyesno\_TempWinterCoef 5.39519e-01 0.713779500 0.882506000

repro\_intercept -1.95336e[+00 -0.498982500](https://dialpad.com/launch/?phone=%2B00%20-0.498982500%20&type=web)  0.972216000

repro\_RosCoef 8.47602e-01 0.921045000 0.993841000

repro\_PptFallCoef -5.21182e-03 -0.002477605 0.000221268

repro\_PptSummerCoef 2.56346e-03 0.003423800 0.004293720

repro\_TempWinterCoef 1.94176e-01 0.271084500 0.346437000

repro\_TempFallCoef -3.50796e-01 -0.258463500 -0.167466000

repro\_TempSummerCoef 4.71452e-02 0.157685500 0.276879000

newplt\_intercept -5.62393e[+00 -5.160815000](https://dialpad.com/launch/?phone=%2B00%20-5.160815000%20&type=web) -4.687630000

Gelman-Rubin Statistics for erbr\_JAGSmod\_c3t10s30b10\_noYRE\_4to13\_210616.rds

grwth\_intercept 1.03 1.09

grwth\_RosCoef 1.00 1.00

grwth\_TempFallCoef 1.02 1.05

grwth\_TempSummerCoef 1.02 1.05

grwth\_TempWinterCoef 1.00 1.01

grwth\_PptFallCoef 1.01 1.03

grwth\_PptSummerCoef 1.01 1.02

grwth\_PptWinterCoef 1.02 1.05

grwthvar\_intercept 1.00 1.00

grwthvar\_RosCoef 1.00 1.00

surv\_intercept 1.00 1.01

surv\_RosCoef 1.00 1.00

surv\_PptWinterCoef 1.00 1.00

surv\_TempFallCoef 1.00 1.00

surv\_TempSummerCoef 1.01 1.02

surv\_TempWinterCoef 1.00 1.00

reproyesno\_intercept 1.00 1.00

reproyesno\_RosCoef 1.00 1.00

reproyesno\_PptFallCoef 1.01 1.02

reproyesno\_PptSummerCoef 1.00 1.01

reproyesno\_TempFallCoef 1.01 1.03

reproyesno\_TempSummerCoef 1.02 1.04

reproyesno\_TempWinterCoef 1.00 1.00

repro\_intercept 1.01 1.02

repro\_RosCoef 1.00 1.00

repro\_PptFallCoef 1.01 1.03

repro\_PptSummerCoef 1.01 1.02

repro\_TempWinterCoef 1.00 1.01

repro\_TempFallCoef 1.01 1.02

repro\_TempSummerCoef 1.02 1.05

newplt\_intercept 1.00 1.00

Multivariate psrf

1.03

Median estimates for erbr\_JAGSmod\_c3t10s30b10\_noYRE\_4to13\_210616.rds

Lower95 Median Upper95

grwth\_intercept 2.38384e[+00 3.686035000](dialpad://%2B00%20%20%203.686035000) 4.99655e+00

grwth\_RosCoef 7.17010e-01 0.748216000 7.79026e-01

grwth\_TempFallCoef -1.60326e-01 -0.096336950 -3.39090e-02

grwth\_TempSummerCoef -2.02679e-01 -0.128576000 -5.45719e-02

grwth\_TempWinterCoef -9.81390e-02 -0.053582250 -8.96023e-03

grwth\_PptFallCoef 2.10234e-03 0.004399125 6.63443e-03

grwth\_PptSummerCoef -1.99774e-03 -0.001190505 -3.67647e-04

grwth\_PptWinterCoef -9.42707e-04 0.001285130 3.64144e-03

grwthvar\_intercept 7.85886e-01 1.082670000 1.37482e+00

grwthvar\_RosCoef 4.70904e-02 0.153978000 2.59223e-01

surv\_intercept -2.76582e[+01 -20.138700000](dialpad://%2B01%20-20.138700000) -1.22948e+01

surv\_RosCoef 5.18658e-01 0.717388500 9.13013e-01

surv\_PptWinterCoef 4.53594e-02 0.057587250 6.93530e-02

surv\_TempFallCoef 1.43751e-01 0.558188000 9.94106e-01

surv\_TempSummerCoef 2.75202e-01 0.551976000 8.49012e-01

surv\_TempWinterCoef 4.81048e-01 0.829582500 1.19797e+00

reproyesno\_intercept -1.03071e[+01 -6.889915000](dialpad://%2B01%20%20-6.889915000) -3.38689e+00

reproyesno\_RosCoef 1.25586e[+00 1.416590000](dialpad://%2B00%20%20%201.416590000) 1.58688e+00

reproyesno\_PptFallCoef 7.61357e-03 0.015342000 2.29076e-02

reproyesno\_PptSummerCoef 3.07318e-03 0.005593840 8.04352e-03

reproyesno\_TempFallCoef -4.38119e-01 -0.167314000 8.61913e-02

reproyesno\_TempSummerCoef -1.81364e-01 0.081477550 3.44822e-01

reproyesno\_TempWinterCoef 6.69555e-01 0.859279000 1.05126e+00

repro\_intercept -2.57762e[+00 -1.014270000](dialpad://%2B00%20%20-1.014270000) 6.03159e-01

repro\_RosCoef 8.58563e-01 0.938705000 1.01638e+00

repro\_PptFallCoef -9.42123e-03 -0.005950125 -2.49825e-03

repro\_PptSummerCoef 3.10044e-03 0.004072475 5.01865e-03

repro\_TempWinterCoef 1.32069e-01 0.217302500 3.02716e-01

repro\_TempFallCoef -3.93131e-01 -0.279075500 -1.66185e-01

repro\_TempSummerCoef 1.06302e-01 0.228934500 3.62725e-01

newplt\_intercept -5.34903e[+00 -4.840310000](dialpad://%2B00%20%20-4.840310000) -4.29084e+00

Gelman-Rubin Statistics for erbr\_JAGSmod\_c3t10s30b10\_noYRE\_4to13odd\_210621.rds

grwth\_intercept 2.00 3.64

grwth\_RosCoef 1.00 1.00

grwth\_TempFallCoef 2.18 3.80

grwth\_TempSummerCoef 2.75 5.25

grwth\_TempWinterCoef 1.83 3.09

grwth\_PptFallCoef 2.27 4.21

grwth\_PptSummerCoef 1.30 1.82

grwth\_PptWinterCoef 2.52 4.45

grwthvar\_intercept 1.02 1.08

grwthvar\_RosCoef 1.00 1.00

surv\_intercept 1.89 3.51

surv\_RosCoef 1.00 1.00

surv\_PptWinterCoef 3.55 12.55

surv\_TempFallCoef 2.42 5.11

surv\_TempSummerCoef 3.14 7.13

surv\_TempWinterCoef 3.66 12.50

reproyesno\_intercept 1.09 1.28

reproyesno\_RosCoef 1.00 1.00

reproyesno\_PptFallCoef 1.30 1.87

reproyesno\_PptSummerCoef 1.34 1.99

reproyesno\_TempFallCoef 1.25 1.73

reproyesno\_TempSummerCoef 1.34 2.01

reproyesno\_TempWinterCoef 1.20 1.58

repro\_intercept 1.02 1.05

repro\_RosCoef 1.00 1.01

repro\_PptFallCoef 1.18 1.58

repro\_PptSummerCoef 1.19 1.61

repro\_TempWinterCoef 1.13 1.40

repro\_TempFallCoef 1.18 1.55

repro\_TempSummerCoef 1.18 1.61

newplt\_intercept 1.04 1.12

Multivariate psrf

3.35

Median estimates for erbr\_JAGSmod\_c3t10s30b10\_noYRE\_4to13odd\_210621.rds

Lower95 Median Upper95

grwth\_intercept -4.99993000 -3.181855000 0.23196500

grwth\_RosCoef 0.79968000 0.832045500 0.86386700

grwth\_TempFallCoef -0.07543170 0.296181000 0.77601100

grwth\_TempSummerCoef -0.41127400 0.198085500 0.52522100

grwth\_TempWinterCoef -1.99999000 -1.533310000 -0.84399400

grwth\_PptFallCoef -0.04730890 -0.024616200 0.01068180

grwth\_PptSummerCoef 0.00594593 0.010862350 0.01640280

grwth\_PptWinterCoef -0.03152390 -0.014743200 -0.00174802

grwthvar\_intercept 0.19961600 0.554612500 0.89111700

grwthvar\_RosCoef 0.17093500 0.279001500 0.39567200

surv\_intercept -16.52380000 22.495400000 64.06650000

surv\_RosCoef 0.36473900 0.573345000 0.78353300

surv\_PptWinterCoef -0.16748300 0.023830850 0.23875000

surv\_TempFallCoef -0.55829300 0.770802500 1.90393000

surv\_TempSummerCoef -5.63845000 -1.820265000 0.29250000

surv\_TempWinterCoef -4.07730000 2.652170000 16.49650000

reproyesno\_intercept -24.77520000 -2.206320000 23.11230000

reproyesno\_RosCoef 1.27369000 1.533710000 1.78375000

reproyesno\_PptFallCoef 0.01314020 0.064230450 0.10920400

reproyesno\_PptSummerCoef -0.03279130 -0.014097150 0.00885686

reproyesno\_TempFallCoef -1.00093000 0.174141000 1.30486000

reproyesno\_TempSummerCoef -2.15181000 -0.680826500 0.98069400

reproyesno\_TempWinterCoef -0.21030500 0.370015500 0.94439500

repro\_intercept -4.99997000 -2.576325000 3.35182000

repro\_RosCoef 0.78112100 0.884290500 0.99393500

repro\_PptFallCoef -0.01319930 0.012403750 0.04290570

repro\_PptSummerCoef -0.01591300 -0.002547535 0.00845185

repro\_TempWinterCoef -0.21405500 0.133760500 0.42990600

repro\_TempFallCoef -0.71966400 -0.141277000 0.61731700

repro\_TempSummerCoef -0.56780600 0.113766500 0.68064900

newplt\_intercept -6.32002000 -5.119935000 -3.65204000

[Convergence of even and odd datasets is bad (and also 9-13 and 4-8 datasets). Often multimodal and sometimes the prior bounds appear (based on trace plots) to truncate the distributions. I used the same priors, starting values, etc. for all datasets.]

Gelman-Rubin Statistics for erbr\_JAGSmod\_c3t10s30b10\_noYRE\_9to13\_210623.rds

grwth\_intercept 1.17 1.55

grwth\_RosCoef 1.00 1.00

grwth\_TempFallCoef 3.39 7.81

grwth\_TempSummerCoef 3.05 6.83

grwth\_TempWinterCoef 1.10 1.31

grwth\_PptFallCoef 1.62 2.55

grwth\_PptSummerCoef 1.14 1.41

grwth\_PptWinterCoef 1.06 1.19

grwthvar\_intercept 1.00 1.00

grwthvar\_RosCoef 1.00 1.00

surv\_intercept 5.72 10.94

surv\_RosCoef 1.02 1.09

surv\_PptWinterCoef 2.80 5.68

surv\_TempFallCoef 3.34 6.54

surv\_TempSummerCoef 4.82 9.73

surv\_TempWinterCoef 4.80 9.64

reproyesno\_intercept 3.90 7.70

reproyesno\_RosCoef 1.00 1.01

reproyesno\_PptFallCoef 4.39 8.70

reproyesno\_PptSummerCoef 2.94 5.85

reproyesno\_TempFallCoef 4.46 8.78

reproyesno\_TempSummerCoef 4.09 8.27

reproyesno\_TempWinterCoef 3.65 7.10

repro\_intercept 1.18 1.51

repro\_RosCoef 1.00 1.01

repro\_PptFallCoef 2.98 5.59

repro\_PptSummerCoef 2.68 4.81

repro\_TempWinterCoef 1.03 1.10

repro\_TempFallCoef 2.97 5.65

repro\_TempSummerCoef 2.96 5.48

newplt\_intercept 1.00 1.00

Multivariate psrf

8.83

Median estimates for erbr\_JAGSmod\_c3t10s30b10\_noYRE\_9to13\_210623.rds

Lower95 Median Upper95

grwth\_intercept -4.54729000 -0.056293300 4.9039800

grwth\_RosCoef 0.62141000 0.682875500 0.7424190

grwth\_TempFallCoef -1.30158000 -0.108303000 0.6272850

grwth\_TempSummerCoef -0.65674400 0.038964150 1.2500900

grwth\_TempWinterCoef -2.00000000 -0.535470500 1.8302200

grwth\_PptFallCoef -0.03024240 0.000563512 0.0345038

grwth\_PptSummerCoef -0.00391388 0.009514275 0.0277116

grwth\_PptWinterCoef -0.04938190 -0.008579920 0.0688524

grwthvar\_intercept 0.51480000 0.968999500 1.4154900

grwthvar\_RosCoef -0.10140400 0.066250900 0.2360910

surv\_intercept -91.38790000 -6.204875[000 109.4590](https://dialpad.com/launch/?phone=000%20109.4590)000

surv\_RosCoef 0.31354900 0.594161000 0.8839100

surv\_PptWinterCoef -0.16793200 -0.026354850 0.0838820

surv\_TempFallCoef -5.95370000 -1.318230000 0.8943010

surv\_TempSummerCoef -4.34841000 1.820110000 7.0419900

surv\_TempWinterCoef -10.17660000 -1.148355000 8.1789500

reproyesno\_intercept -98.65160000 -51.559600000 -20.1937000

reproyesno\_RosCoef 0.90405900 1.150315000 1.4021500

reproyesno\_PptFallCoef -0.01494110 0.045566400 0.1736500

reproyesno\_PptSummerCoef -0.01744490 0.025946250 0.0532531

reproyesno\_TempFallCoef -1.38839000 2.378460000 9.6232300

reproyesno\_TempSummerCoef -3.32533000 0.409561000 2.2064600

reproyesno\_TempWinterCoef -3.85621000 -1.466840000 0.1622930

repro\_intercept -4.99999000 -1.028795000 4.2970600

repro\_RosCoef 0.69459400 0.821537000 0.9488990

repro\_PptFallCoef -0.05683360 -0.005664220 0.0278443

repro\_PptSummerCoef -0.01103080 0.007718985 0.0401378

repro\_TempWinterCoef -0.12131700 0.226197000 0.5850440

repro\_TempFallCoef -3.12895000 -0.712352500 0.9291770

repro\_TempSummerCoef -0.68966700 0.494329000 2.4875200

newplt\_intercept -7.33373000 -5.986710000 -4.6348300

Gelman-Rubin Statistics for erbr\_JAGSmod\_c3t10s30b10\_noYRE\_4to8\_210701.rds

grwth\_intercept 1.22 1.67

grwth\_RosCoef 1.00 1.00

grwth\_TempFallCoef 10.62 21.54

grwth\_TempSummerCoef 13.55 27.32

grwth\_TempWinterCoef 6.20 26.32

grwth\_PptFallCoef 1.13 1.18

grwth\_PptSummerCoef 1.44 2.89

grwth\_PptWinterCoef 1.19 1.21

grwthvar\_intercept 1.00 1.00

grwthvar\_RosCoef 1.00 1.00

surv\_intercept 3.79 8.33

surv\_RosCoef 1.00 1.00

surv\_PptWinterCoef 3.78 8.28

surv\_TempFallCoef 1.79 2.94

surv\_TempSummerCoef 3.74 8.18

surv\_TempWinterCoef 2.35 4.20

reproyesno\_intercept 2.48 4.49

reproyesno\_RosCoef 1.00 1.00

reproyesno\_PptFallCoef 2.60 4.76

reproyesno\_PptSummerCoef 2.56 4.66

reproyesno\_TempFallCoef 2.60 4.77

reproyesno\_TempSummerCoef 2.60 4.77

reproyesno\_TempWinterCoef 2.59 4.73

repro\_intercept 1.20 1.56

repro\_RosCoef 1.00 1.01

repro\_PptFallCoef 1.22 1.62

repro\_PptSummerCoef 1.22 1.60

repro\_TempWinterCoef 1.22 1.61

repro\_TempFallCoef 1.23 1.63

repro\_TempSummerCoef 1.21 1.59

newplt\_intercept 1.00 1.00

Multivariate psrf

9.78

Median estimates for erbr\_JAGSmod\_c3t10s30b10\_noYRE\_4to8\_210701.rds

Lower95 Median Upper95

grwth\_intercept -4.99994e[+00 -1.532600000](https://dialpad.com/launch/?phone=%2B00%20-1.532600000%20)  3.53504000

grwth\_RosCoef 7.82274e-01 0.820158000 0.85834900

grwth\_TempFallCoef -1.78775e[+00 0.231399000](https://dialpad.com/launch/?phone=%2B00%20%200.231399000%20)  1.19249000

grwth\_TempSummerCoef -8.40089e-01 -0.223322000 1.61547000

grwth\_TempWinterCoef -1.99912e[+00 0.216200000](https://dialpad.com/launch/?phone=%2B00%20%200.216200000%20)  1.76616000

grwth\_PptFallCoef -9.48612e-02 0.008104480 0.07133080

grwth\_PptSummerCoef -2.97430e-02 -0.001325530 0.04199700

grwth\_PptWinterCoef -6.62719e-03 0.011358200 0.04787640

grwthvar\_intercept 1.04218e[+00 1.570245000](https://dialpad.com/launch/?phone=%2B00%20%201.570245000%20)  2.09664000

grwthvar\_RosCoef 1.52233e-02 0.201317000 0.37807300

surv\_intercept -2.27233e[+01 42.347100000](https://dialpad.com/launch/?phone=%2B01%2042.347100000%20) 137.48800000

surv\_RosCoef 6.98963e-01 1.010835000 1.34974000

surv\_PptWinterCoef -2.48909e-01 -0.064732500 0.05897840

surv\_TempFallCoef -5.05574e-01 0.345675000 1.24102000

surv\_TempSummerCoef -7.30915e[+00 -2.544060000](https://dialpad.com/launch/?phone=%2B00%20-2.544060000%20)  0.60009600

surv\_TempWinterCoef 5.51450e-01 1.710365000 3.09658000

reproyesno\_intercept -3.81420e[+00 11.546900000](https://dialpad.com/launch/?phone=%2B00%2011.546900000%20)  37.62000000

reproyesno\_RosCoef 1.49289e[+00 1.736995000](https://dialpad.com/launch/?phone=%2B00%20%201.736995000%20)  1.98901000

reproyesno\_PptFallCoef -1.87274e-01 -0.052517600 0.01517080

reproyesno\_PptSummerCoef 3.85725e-03 0.015605000 0.03516290

reproyesno\_TempFallCoef -5.99208e[+00 -2.095785000](https://dialpad.com/launch/?phone=%2B00%20-2.095785000%20)  -0.19431900

reproyesno\_TempSummerCoef -3.31771e-01 1.044070000 3.54625000

reproyesno\_TempWinterCoef -3.48341e[+00 -0.554974000](https://dialpad.com/launch/?phone=%2B00%20-0.554974000%20)  1.04684000

repro\_intercept -2.25978e[+00 2.465275000](https://dialpad.com/launch/?phone=%2B00%20%202.465275000%20)  4.99997000

repro\_RosCoef 8.94200e-01 0.989540000 1.08552000

repro\_PptFallCoef -2.92064e-02 -0.009764735 0.01650660

repro\_PptSummerCoef 2.29162e-05 0.004052940 0.00741791

repro\_TempWinterCoef -2.79132e-01 0.179051500 0.75699300

repro\_TempFallCoef -8.39215e-01 -0.281716500 0.46492800

repro\_TempSummerCoef -4.87459e-01 0.026999100 0.49716800

newplt\_intercept -5.01039e[+00 -4.384375000](https://dialpad.com/launch/?phone=%2B00%20-4.384375000%20)  -3.64821000

Gelman-Rubin Statistics for erbr\_JAGSmodComplx\_c3t10s30b10\_noYRE\_210827.rds

grwth\_intercept 1.01 1.04

grwth\_RosCoef 1.00 1.00

grwth\_TempFallCoef 1.01 1.04

grwth\_TempSummerCoef 1.01 1.04

grwth\_TempWinterCoef 1.00 1.00

grwth\_PptFallCoef 1.01 1.02

grwth\_PptSummerCoef 1.00 1.01

grwth\_PptWinterCoef 1.00 1.02

grwthvar\_intercept 1.00 1.00

grwthvar\_RosCoef 1.00 1.00

surv\_intercept 1.04 1.13

surv\_RosCoef 1.00 1.00

surv\_PptWinterCoef 1.02 1.07

surv\_TempFallCoef 1.04 1.15

surv\_TempSummerCoef 1.01 1.02

surv\_TempWinterCoef 1.00 1.00

surv\_PptSummerCoef 1.00 1.01

reproyesno\_intercept 1.03 1.09

reproyesno\_RosCoef 1.00 1.00

reproyesno\_PptFallCoef 1.00 1.01

reproyesno\_PptSummerCoef 1.01 1.02

reproyesno\_TempFallCoef 1.01 1.02

reproyesno\_TempSummerCoef 1.02 1.06

reproyesno\_TempWinterCoef 1.00 1.00

reproyesno\_PptWinterCoef 1.02 1.06

repro\_intercept 1.04 1.12

repro\_RosCoef 1.00 1.00

repro\_PptFallCoef 1.02 1.05

repro\_PptSummerCoef 1.02 1.06

repro\_TempWinterCoef 1.01 1.03

repro\_TempFallCoef 1.03 1.10

repro\_TempSummerCoef 1.03 1.11

repro\_PptWinterCoef 1.03 1.11

newplt\_intercept 1.00 1.00

Multivariate psrf

1.07

Median estimates for erbr\_ JAGSmodComplx\_c3t10s30b10\_noYRE\_210827.rds

Lower95 Median Upper95

grwth\_intercept 1.69360e[+00 3.077850](https://dialpad.com/launch/?phone=%2B00%20%203.077850)e[+00 4.48565](https://dialpad.com/launch/?phone=%2B00%20%204.48565)e+00

grwth\_RosCoef 7.31645e-01 7.584630e-01 7.86431e-01

grwth\_TempFallCoef -1.49269e-01 -1.009730e-01 -4.96602e-02

grwth\_TempSummerCoef -1.66162e-01 -9.362325e-02 -9.30802e-03

grwth\_TempWinterCoef -8.80737e-02 -4.775385e-02 -8.43039e-03

grwth\_PptFallCoef 1.51154e-03 3.390295e-03 5.27045e-03

grwth\_PptSummerCoef -1.41326e-03 -7.944835e-04 -1.75994e-04

grwth\_PptWinterCoef 2.95964e-04 2.198425e-03 4.18768e-03

grwthvar\_intercept 8.58136e-01 1.143770e[+00 1.43253](https://dialpad.com/launch/?phone=%2B00%20%201.43253)e+00

grwthvar\_RosCoef 1.14807e-02 1.125755e-01 2.17448e-01

surv\_intercept -1.95592e[+01 -1.234120](https://dialpad.com/launch/?phone=%2B01%20-1.234120)e[+01 -4.84731](https://dialpad.com/launch/?phone=%2B01%20-4.84731)e+00

surv\_RosCoef 3.94822e-01 5.613175e-01 7.24955e-01

surv\_PptWinterCoef 3.38098e-02 4.504745e-02 5.68031e-02

surv\_TempFallCoef -3.21845e-01 1.173265e-01 5.58538e-01

surv\_TempSummerCoef 3.11178e-01 5.629890e-01 8.22910e-01

surv\_TempWinterCoef 3.05513e-01 6.220440e-01 9.52024e-01

surv\_PptSummerCoef -8.00641e-03 -4.269260e-03 -3.90111e-04

reproyesno\_intercept -9.64922e[+00 -3.382440](https://dialpad.com/launch/?phone=%2B00%20-3.382440)e[+00 2.14736](https://dialpad.com/launch/?phone=%2B00%20%202.14736)e+00

reproyesno\_RosCoef 1.20268e[+00 1.350920](https://dialpad.com/launch/?phone=%2B00%20%201.350920)e[+00 1.51075](https://dialpad.com/launch/?phone=%2B00%20%201.51075)e+00

reproyesno\_PptFallCoef 2.66480e-03 9.017115e-03 1.53805e-02

reproyesno\_PptSummerCoef 3.77721e-03 6.109935e-03 8.42681e-03

reproyesno\_TempFallCoef -8.24529e-01 -5.478910e-01 -2.78358e-01

reproyesno\_TempSummerCoef -4.28686e-02 2.337670e-01 5.26502e-01

reproyesno\_TempWinterCoef 4.90192e-01 6.763885e-01 8.66317e-01

reproyesno\_PptWinterCoef -9.78181e-03 -2.580840e-04 9.23359e-03

repro\_intercept -7.47820e-01 1.930335e[+00 4.87414](https://dialpad.com/launch/?phone=%2B00%20%204.87414)e+00

repro\_RosCoef 8.66751e-01 9.411700e-01 1.01843e+00

repro\_PptFallCoef -6.14286e-03 -3.315400e-03 -5.91584e-04

repro\_PptSummerCoef 2.16014e-03 3.095500e-03 4.04701e-03

repro\_TempWinterCoef 1.07334e-01 2.048690e-01 3.02086e-01

repro\_TempFallCoef -4.78028e-01 -3.408920e-01 -2.01699e-01

repro\_TempSummerCoef -1.03180e-02 1.145695e-01 2.33934e-01

repro\_PptWinterCoef -1.02789e-02 -5.300280e-03 -8.62831e-05

newplt\_intercept -5.68874e[+00 -5.198160](https://dialpad.com/launch/?phone=%2B00%20-5.198160)e[+00 -4.65639](https://dialpad.com/launch/?phone=%2B00%20-4.65639)e+00

**Figures**

**A comparison of different seasons

Description automatically generated with medium confidence**

Figure S1: Winter precipitation (total), summer precipitation (total), and winter temperature (mean daily mean) from 1991-2022. Red points represent climate during the study period (2004-2022).

A)

A collage of graphs and diagrams

Description automatically generated

B)

A collage of graphs and diagrams

Description automatically generated

C)

A collage of graphs and diagrams

Description automatically generated

D)

A collage of graphs and diagrams

Description automatically generated

E)

A collage of graphs and diagrams

Description automatically generated

F)

A collage of graphs and diagrams

Description automatically generated

G)

A collage of graphs and diagrams

Description automatically generated

H)

A collage of different graphs

Description automatically generated

Figure S2: Trace plot and empirical cumulative distribution function (ECDF) for each chain, posterior distribution, and autocorrelation for the A) intercept, B) plant size, and C) fall temperature, D) summer temperature, E) winter temperature, F) fall precipitation, G) summer precipitation, and H) winter precipitation parameters from the mean growth model.

A)

B)

Figure S3: Trace plot and empirical cumulative distribution function (ECDF) for each chain, posterior distribution, and autocorrelation for the A) intercept, and B) plant size parameters from the variance in growth model.

A)

B)

C)

D)

E)

F)

Figure S4: Trace plot and empirical cumulative distribution function (ECDF) for each chain, posterior distribution, and autocorrelation for the A) intercept, B) plant size, C) winter precipitation, D) fall temperature, E) summer temperature, and F) winter temperature parameters from the probability of survival model.

A)

B)

C)

D)

E)

F)

G)

Figure S5: Trace plot and empirical cumulative distribution function (ECDF) for each chain, posterior distribution, and autocorrelation for the A) intercept, B) plant size, C) fall precipitation, D) summer precipitation, E) fall temperature, F) summer temperature, and G) winter temperature parameters from the probability of reproducing model.

A)

B)

C)

D)

E)

F)

G)

Figure S6: Trace plot and empirical cumulative distribution function (ECDF) for each chain, posterior distribution, and autocorrelation for the A) intercept, B) plant size, C) fall precipitation, D) summer precipitation, E) winter temperature, F) fall temperature, and G) summer temperature parameters from the amount of reproduction model.

A collage of graphs and diagrams

Description automatically generated

Figure S7: Trace plot and empirical cumulative distribution function (ECDF) for each chain, posterior distribution, and autocorrelation for the intercept parameter from the number of new young plants model.

A graph of numbers and dots

Description automatically generated

Figure S8: Relationship between annual deterministic lambda and number of individuals per transect and year.

[Analysis of Deviance Table (Type II Wald chisquare tests). Response: MEAN

Chisq Df Pr(>Chisq)

numIndivs 0.6616 1 0.416]

*A graph of a number of numbers

Description automatically generated with medium confidence*

Figure S9 Annual deterministic population growth rate as a function of climate from 1990-2020. Top) Total summer (April-July) precipitation. Middle) Total winter (December -March) precipitation. Bottom) Mean winter (December -March) daily mean temperature. Variation within each climate-year represents parameter uncertainty (n=1000). Black lines represent fits from linear models; Top) adjusted R2=0.003, P<2.2e-16, Middle) adjusted R2=0.02, P<2.2e-16, Bottom) adjusted R2=0.001, P=2.28e-9.

A graph of a plant size

Description automatically generated

Figure S11: Estimated stable stage distribution (number of individuals in each size class) based on a population size of 150 after averaging all year-transect-parameter matrices.