FG model

Inference for Bugs model at "ssm\_lynx3.bug", fit using jags,

3 chains, each with 1500000 iterations (first 750000 discarded), n.thin = 750

n.sims = 3000 iterations saved

mu.vect sd.vect 2.5% 25% 50% 75% 97.5% Rhat n.eff

HR1 0.226 0.061 0.117 0.182 0.222 0.268 0.348 1.085 28

HR2 0.635 0.138 0.402 0.543 0.623 0.720 0.935 1.036 62

HR3 4.025 1.819 1.179 2.826 3.772 4.944 8.470 1.008 600

N.est[1] 2.485 0.991 1.293 1.636 2.142 3.244 4.643 1.397 9

N.est[2] 3.315 0.928 2.135 2.546 3.091 4.021 5.315 1.250 12

N.est[3] 4.398 0.820 3.034 3.812 4.249 4.907 6.179 1.122 21

N.est[4] 4.358 0.811 2.882 3.757 4.328 4.914 6.015 1.047 74

N.est[5] 4.880 0.801 3.207 4.342 4.857 5.404 6.574 1.055 110

N.est[6] 5.903 0.744 4.612 5.386 5.847 6.368 7.516 1.019 220

N.est[7] 5.643 0.951 4.048 4.962 5.534 6.249 7.682 1.002 1100

N.est[8] 4.166 0.690 2.963 3.679 4.126 4.613 5.654 1.021 110

N.est[9] 3.871 0.722 2.519 3.371 3.832 4.316 5.367 1.012 180

N.est[10] 5.052 0.894 3.415 4.430 4.994 5.623 6.899 1.012 180

N.est[11] 5.330 0.780 3.862 4.816 5.287 5.800 6.999 1.001 3000

N.est[12] 6.016 0.806 4.535 5.475 5.968 6.513 7.700 1.003 710

N.est[13] 5.433 0.740 4.046 4.937 5.383 5.902 7.008 1.001 3000

N.est[14] 5.383 0.871 3.879 4.764 5.321 5.923 7.243 1.012 210

N.est[15] 5.147 0.714 3.835 4.666 5.102 5.599 6.620 1.006 370

N.est[16] 4.564 0.693 3.297 4.078 4.536 5.000 6.022 1.001 3000

N.est[17] 4.778 0.918 3.007 4.154 4.770 5.380 6.615 1.009 240

N.est[18] 6.177 1.199 4.025 5.261 6.142 7.053 8.559 1.034 67

N.est[19] 5.549 0.914 3.920 4.933 5.493 6.133 7.449 1.005 490

N.est[20] 5.841 1.109 3.905 5.041 5.781 6.597 8.100 1.034 63

N.est[21] 4.846 0.829 3.308 4.265 4.824 5.402 6.473 1.030 73

N.est[22] 4.855 0.801 3.351 4.329 4.825 5.345 6.511 1.007 320

N.est[23] 5.691 0.847 4.105 5.133 5.704 6.227 7.428 1.001 3000

N.est[24] 6.153 1.035 4.113 5.479 6.142 6.832 8.231 1.004 550

N.est[25] 5.910 1.167 3.713 5.120 5.864 6.665 8.290 1.011 180

N.est[26] 6.265 2.194 2.254 4.795 6.169 7.596 11.010 1.009 580

N.pred[1] 7.280 3.633 1.426 4.924 6.893 9.187 15.444 1.010 2000

N.pred[2] 6.352 3.479 0.678 4.079 6.016 8.198 13.984 1.011 990

N.pred[3] 5.441 3.323 0.409 3.163 5.088 7.211 12.842 1.012 520

X.est[1] 7.456 3.899 3.109 4.331 6.295 9.971 16.377 1.318 10

X.est[2] 9.790 3.811 5.032 6.667 9.088 12.041 18.483 1.227 13

X.est[3] 12.789 3.559 8.369 9.961 11.861 14.832 21.222 1.157 17

X.est[4] 12.677 3.480 7.023 10.344 11.994 14.460 20.703 1.094 30

X.est[5] 14.199 3.601 7.869 11.719 13.897 16.308 22.250 1.082 36

X.est[6] 17.035 3.321 11.722 14.723 16.576 18.959 24.733 1.054 41

X.est[7] 16.333 3.901 10.259 13.517 15.811 18.605 25.015 1.034 74

X.est[8] 12.127 3.231 7.356 9.851 11.590 13.830 19.943 1.064 36

X.est[9] 11.338 3.386 6.058 8.924 10.860 13.239 19.251 1.045 50

X.est[10] 14.684 3.804 8.348 12.004 14.412 16.923 23.424 1.021 100

X.est[11] 15.492 3.769 9.544 12.846 15.057 17.634 24.305 1.028 79

X.est[12] 17.442 3.909 11.350 14.693 16.988 19.526 26.557 1.034 65

X.est[13] 15.772 3.657 10.126 13.187 15.259 17.812 24.391 1.036 59

X.est[14] 15.627 3.859 9.748 12.811 15.100 17.892 24.657 1.017 120

X.est[15] 14.926 3.442 9.956 12.450 14.338 16.791 23.302 1.051 46

X.est[16] 13.297 3.438 8.073 10.887 12.794 15.124 21.281 1.033 67

X.est[17] 13.927 3.953 7.520 11.146 13.471 16.218 23.024 1.018 130

X.est[18] 17.885 4.626 10.298 14.633 17.327 20.611 28.031 1.021 110

X.est[19] 16.131 4.101 9.609 13.271 15.602 18.503 25.240 1.028 81

X.est[20] 16.941 4.437 9.645 13.824 16.489 19.541 26.769 1.022 100

X.est[21] 14.136 3.911 8.373 11.361 13.530 16.303 23.044 1.068 34

X.est[22] 14.181 3.920 7.989 11.430 13.675 16.399 23.424 1.044 53

X.est[23] 16.557 4.134 10.002 13.667 16.031 18.816 26.113 1.028 79

X.est[24] 17.866 4.513 10.523 14.689 17.413 20.304 28.152 1.017 120

X.est[25] 17.181 4.800 9.519 13.744 16.506 19.894 28.153 1.043 51

X.est[26] 18.186 7.101 5.746 13.282 17.661 22.631 33.377 1.019 120

beta 0.356 0.064 0.237 0.311 0.356 0.406 0.470 1.053 44

lam 1.305 0.341 0.642 1.113 1.276 1.474 2.076 1.012 550

lambda[1] 1.413 0.268 0.911 1.220 1.404 1.563 1.965 1.291 11

lambda[2] 1.378 0.250 0.922 1.193 1.360 1.573 1.841 1.160 18

lambda[3] 1.522 0.278 1.077 1.312 1.486 1.705 2.133 1.194 15

lambda[4] 1.539 0.290 1.097 1.326 1.499 1.710 2.220 1.049 53

lambda[5] 1.467 0.338 1.040 1.249 1.404 1.590 2.339 1.083 53

lambda[6] 1.537 0.325 1.076 1.300 1.479 1.712 2.366 1.039 60

lambda[7] 1.136 0.290 0.592 0.936 1.140 1.310 1.743 1.034 300

lambda[8] 1.288 0.259 0.807 1.124 1.266 1.428 1.884 1.020 160

lambda[9] 1.481 0.328 0.990 1.248 1.417 1.655 2.304 1.045 52

lambda[10] 1.167 0.230 0.731 1.018 1.168 1.301 1.657 1.016 210

lambda[11] 1.331 0.244 0.936 1.171 1.302 1.457 1.894 1.004 760

lambda[12] 1.212 0.227 0.825 1.065 1.192 1.334 1.718 1.010 330

lambda[13] 1.377 0.281 0.937 1.188 1.328 1.528 2.028 1.029 82

lambda[14] 1.136 0.237 0.685 0.977 1.142 1.278 1.626 1.023 150

lambda[15] 1.403 0.296 0.938 1.199 1.347 1.572 2.121 1.024 100

lambda[16] 1.397 0.277 0.958 1.206 1.351 1.549 2.067 1.028 80

lambda[17] 1.313 0.233 0.917 1.160 1.284 1.445 1.828 1.010 230

lambda[18] 1.050 0.219 0.653 0.887 1.049 1.197 1.503 1.017 130

lambda[19] 1.232 0.248 0.805 1.078 1.208 1.363 1.788 1.022 110

lambda[20] 0.921 0.240 0.511 0.734 0.914 1.102 1.376 1.064 38

lambda[21] 1.331 0.284 0.885 1.147 1.276 1.485 2.001 1.034 76

lambda[22] 1.293 0.239 0.894 1.139 1.263 1.422 1.843 1.014 180

lambda[23] 1.256 0.223 0.868 1.112 1.238 1.385 1.751 1.008 350

lambda[24] 1.043 0.233 0.620 0.878 1.045 1.193 1.520 1.022 120

lambda[25] 1.297 0.354 0.600 1.109 1.272 1.468 2.096 1.016 480

mean.lambda 1.300 0.105 1.133 1.223 1.286 1.367 1.533 1.084 29

sigma2.obs 2.000 1.127 0.407 1.202 1.813 2.531 4.918 1.091 29

sigma2.proc 0.109 0.104 0.003 0.038 0.081 0.146 0.367 1.123 24

deviance 83.188 13.078 49.039 76.559 84.996 92.015 103.296 1.144 25

For each parameter, n.eff is a crude measure of effective sample size,

and Rhat is the potential scale reduction factor (at convergence, Rhat=1).

DIC info (using the rule, pD = var(deviance)/2)

pD = 77.8 and DIC = 161.0

DIC is an estimate of expected predictive error (lower deviance is better).

FG model shiny

Inference for Bugs model at "ssm\_lynx1.bug", fit using jags,

3 chains, each with 1500000 iterations (first 750000 discarded), n.thin = 2

n.sims = 1125000 iterations saved

mu.vect sd.vect 2.5% 25% 50% 75% 97.5% Rhat n.eff

HR1 0.251 0.053 0.163 0.214 0.244 0.283 0.368 1.480 8

HR2 0.591 0.115 0.397 0.513 0.576 0.660 0.846 1.528 8

HR3 3.778 1.665 1.147 2.651 3.568 4.643 7.704 1.068 76

N.est[1] 2.857 1.036 1.241 1.812 3.102 3.603 4.656 3.372 4

N.est[2] 3.755 1.150 2.075 2.496 3.930 4.623 5.979 3.354 4

N.est[3] 4.776 0.922 3.359 3.867 4.895 5.464 6.495 3.174 4

N.est[4] 4.615 0.900 3.156 3.865 4.513 5.305 6.447 1.773 6

N.est[5] 5.195 0.732 3.804 4.673 5.135 5.685 6.703 1.076 32

N.est[6] 6.229 0.689 4.940 5.766 6.194 6.658 7.667 1.183 15

N.est[7] 5.659 0.821 4.210 5.129 5.571 6.090 7.585 1.139 25

N.est[8] 4.187 0.691 2.904 3.726 4.166 4.615 5.659 1.105 27

N.est[9] 3.868 0.720 2.525 3.397 3.841 4.311 5.371 1.090 32

N.est[10] 5.038 0.927 3.376 4.409 4.984 5.613 6.993 1.050 76

N.est[11] 5.449 0.810 3.964 4.912 5.402 5.933 7.192 1.039 65

N.est[12] 6.128 0.803 4.651 5.586 6.088 6.630 7.827 1.008 2400

N.est[13] 5.586 0.746 4.235 5.085 5.540 6.037 7.199 1.042 60

N.est[14] 5.416 0.865 3.914 4.812 5.336 5.955 7.293 1.036 79

N.est[15] 5.333 0.705 4.093 4.845 5.284 5.763 6.863 1.140 19

N.est[16] 4.520 0.724 3.272 4.014 4.462 4.959 6.106 1.002 1600

N.est[17] 4.557 0.951 2.872 3.869 4.516 5.188 6.523 1.096 26

N.est[18] 5.998 1.243 3.851 5.051 5.944 6.881 8.477 1.273 11

N.est[19] 5.464 0.962 3.753 4.784 5.417 6.080 7.489 1.031 73

N.est[20] 5.695 1.152 3.705 4.839 5.618 6.482 8.068 1.169 16

N.est[21] 4.911 0.846 3.376 4.320 4.882 5.455 6.676 1.217 14

N.est[22] 4.798 0.838 3.245 4.231 4.765 5.323 6.558 1.020 110

N.est[23] 5.652 0.907 3.940 5.043 5.628 6.229 7.519 1.004 580

N.est[24] 6.092 1.088 3.991 5.361 6.083 6.812 8.259 1.044 52

N.est[25] 6.011 1.289 3.643 5.133 5.944 6.828 8.714 1.078 31

N.est[26] 6.341 2.291 2.184 4.784 6.225 7.748 11.220 1.052 95

N.pred[1] 7.397 3.755 1.331 4.861 6.987 9.374 16.089 1.056 180

N.pred[2] 6.270 3.587 0.477 3.803 5.864 8.176 14.569 1.050 140

N.pred[3] 5.171 3.402 0.437 2.744 4.746 6.990 13.085 1.040 120

X.est[1] 6.791 2.592 2.862 4.049 6.936 8.674 11.527 3.095 4

X.est[2] 8.920 2.899 4.990 5.693 9.144 11.041 14.545 2.946 4

X.est[3] 11.335 2.451 7.273 9.383 11.401 13.117 16.171 2.530 4

X.est[4] 10.942 2.336 7.321 9.007 10.709 12.625 15.694 1.681 6

X.est[5] 12.293 1.902 9.198 10.861 12.120 13.517 16.369 1.093 27

X.est[6] 14.744 1.900 11.568 13.321 14.656 15.990 18.744 1.177 16

X.est[7] 13.395 2.130 9.819 11.954 13.190 14.569 18.399 1.087 38

X.est[8] 9.932 1.862 6.517 8.665 9.843 11.097 13.878 1.100 29

X.est[9] 9.178 1.917 5.732 7.877 9.089 10.350 13.241 1.089 33

X.est[10] 11.925 2.296 7.727 10.397 11.827 13.350 16.718 1.037 110

X.est[11] 12.917 2.193 8.928 11.403 12.815 14.271 17.583 1.044 61

X.est[12] 14.511 2.153 10.538 13.062 14.391 15.832 19.119 1.011 480

X.est[13] 13.233 2.028 9.677 11.826 13.100 14.469 17.614 1.048 55

X.est[14] 12.822 2.217 8.987 11.297 12.628 14.151 17.712 1.021 130

X.est[15] 12.630 1.905 9.308 11.298 12.496 13.802 16.761 1.133 21

X.est[16] 10.711 1.924 7.451 9.356 10.523 11.871 14.981 1.002 1400

X.est[17] 10.794 2.394 6.605 9.076 10.649 12.332 15.879 1.069 34

X.est[18] 14.187 3.031 8.968 11.926 14.034 16.221 20.498 1.222 13

X.est[19] 12.940 2.468 8.647 11.198 12.754 14.482 18.272 1.017 120

X.est[20] 13.476 2.844 8.538 11.417 13.291 15.318 19.515 1.131 20

X.est[21] 11.651 2.272 7.636 10.026 11.537 13.116 16.436 1.192 15

X.est[22] 11.381 2.237 7.373 9.829 11.247 12.784 16.143 1.024 93

X.est[23] 13.392 2.396 9.010 11.756 13.273 14.900 18.442 1.004 670

X.est[24] 14.429 2.784 9.177 12.546 14.358 16.220 20.148 1.032 71

X.est[25] 14.260 3.328 8.348 11.933 14.033 16.363 21.362 1.081 30

X.est[26] 15.039 5.563 5.017 11.212 14.728 18.495 26.882 1.054 82

beta 0.425 0.032 0.363 0.400 0.425 0.451 0.480 1.014 180

lam 1.343 0.352 0.667 1.151 1.314 1.516 2.140 1.114 88

lambda[1] 1.364 0.212 1.050 1.239 1.333 1.424 1.929 1.478 8

lambda[2] 1.333 0.238 0.914 1.152 1.323 1.479 1.799 1.811 6

lambda[3] 1.593 0.394 1.074 1.322 1.472 1.744 2.574 2.008 5

lambda[4] 1.640 0.381 1.079 1.349 1.550 1.901 2.546 1.775 6

lambda[5] 1.459 0.208 1.132 1.312 1.434 1.572 1.935 1.008 410

lambda[6] 1.580 0.323 1.118 1.348 1.505 1.771 2.377 1.647 7

lambda[7] 1.234 0.286 0.690 1.062 1.249 1.397 1.812 1.348 11

lambda[8] 1.371 0.278 0.910 1.196 1.332 1.504 2.042 1.063 140

lambda[9] 1.503 0.315 1.030 1.285 1.443 1.666 2.282 1.308 11

lambda[10] 1.219 0.256 0.759 1.057 1.222 1.359 1.732 1.142 26

lambda[11] 1.362 0.235 0.949 1.214 1.335 1.489 1.900 1.062 69

lambda[12] 1.292 0.235 0.874 1.143 1.275 1.418 1.823 1.043 220

lambda[13] 1.429 0.285 0.979 1.241 1.379 1.575 2.124 1.177 19

lambda[14] 1.202 0.236 0.757 1.045 1.209 1.346 1.686 1.199 17

lambda[15] 1.456 0.305 0.993 1.251 1.397 1.609 2.197 1.228 15

lambda[16] 1.437 0.294 0.973 1.243 1.386 1.589 2.140 1.166 19

lambda[17] 1.338 0.239 0.922 1.185 1.310 1.468 1.883 1.052 60

lambda[18] 1.102 0.232 0.669 0.936 1.106 1.258 1.565 1.184 16

lambda[19] 1.260 0.250 0.817 1.101 1.242 1.392 1.831 1.066 49

lambda[20] 0.976 0.258 0.522 0.774 0.979 1.173 1.454 1.465 8

lambda[21] 1.368 0.302 0.897 1.175 1.313 1.511 2.113 1.198 17

lambda[22] 1.322 0.249 0.898 1.164 1.292 1.452 1.901 1.063 54

lambda[23] 1.293 0.239 0.867 1.142 1.272 1.420 1.833 1.057 73

lambda[24] 1.086 0.248 0.610 0.911 1.100 1.257 1.559 1.202 15

lambda[25] 1.342 0.352 0.664 1.151 1.313 1.514 2.143 1.116 89

mean.lambda 1.342 0.100 1.195 1.272 1.323 1.396 1.583 1.502 8

sigma2.obs 2.350 1.293 0.538 1.414 2.151 3.028 5.438 1.728 6

sigma2.proc 0.114 0.109 0.004 0.037 0.078 0.161 0.397 1.589 7

deviance 87.400 12.835 57.105 80.076 90.105 96.679 106.017 2.074 5

For each parameter, n.eff is a crude measure of effective sample size,

and Rhat is the potential scale reduction factor (at convergence, Rhat=1).

DIC info (using the rule, pD = var(deviance)/2)

pD = 39.8 and DIC = 127.2

DIC is an estimate of expected predictive error (lower deviance is better).

FG only Shiny (Inits differ)

mu.vect sd.vect 2.5% 25% 50% 75% 97.5%

N.est[26] 6.341 2.291 2.184 4.784 6.225 7.748 11.220 1.052 95

N.pred[1] 7.397 3.755 1.331 4.861 6.987 9.374 16.089 1.056 180

N.pred[2] 6.270 3.587 0.477 3.803 5.864 8.176 14.569 1.050 140

N.pred[3] 5.171 3.402 0.437 2.744 4.746 6.990 13.085 1.040 120

(6.341-2)\*1.34

FG shiny (inits same)

mu.vect sd.vect 2.5% 25% 50% 75% 97.5%

N.est[26] 6.278 2.242 2.282 4.738 6.141 7.650 11.093 1.001 14000

N.pred[1] 7.246 3.577 1.509 4.777 6.840 9.198 15.475 1.001 5700

N.pred[2] 6.132 3.429 0.614 3.734 5.726 8.007 14.040 1.001 9000

N.pred[3] 5.043 3.263 0.426 2.690 4.617 6.830 12.645 1.001 11000

FG only

mu.vect sd.vect 2.5% 25% 50% 75% 97.5%

N.est[26] 6.265 2.194 2.254 4.795 6.169 7.596 11.010 1.009 580

N.pred[1] 7.280 3.633 1.426 4.924 6.893 9.187 15.444 1.010 2000

N.pred[2] 6.352 3.479 0.678 4.079 6.016 8.198 13.984 1.011 990

N.pred[3] 5.441 3.323 0.409 3.163 5.088 7.211 12.842 1.012 520

N.est[26] 6.27 2.65 4.06 4.92 7.64 8.59 10.48

N.pred[1] 7.69 0

N.pred[2] 6.82 2

N.pred[3] 5.99 4

N.pred[4] 5.54 5

> round(pred.T[2],2)

[1] 2.65

> round(pred.T[,2],2)

[1] 11.71 4.06 NA NA 9.52 NA NA

> round(pred.T[2,],2)

l\_95 l\_75 l\_50 Median u\_50 u\_75 u\_95

2.65 4.06 4.92 6.27 7.64 8.59 10.48

P.less\_targ mean sd

0.27 6.33 2.02

> round(pred.T2\_1[2,],2)

l\_95 l\_75 l\_50 Median u\_50 u\_75 u\_95

2.45 4.62 5.71 7.69 9.96 11.50 14.80

P.less\_targ

0.16

> round(pred.T2\_2[2,],2)

l\_95 l\_75 l\_50 Median u\_50 u\_75 u\_95

1.86 3.85 4.93 6.82 9.04 10.54 13.71

P.less\_targ

0.26

> round(pred.T2\_3[2,],2)

l\_95 l\_75 l\_50 Median u\_50 u\_75 u\_95

1.20 3.07 4.17 5.99 8.13 9.63 12.69

P.less\_targ

0.36

> round(pred.T2\_4[2,],2)

l\_95 l\_75 l\_50 Median u\_50 u\_75 u\_95

0.86 2.68 3.79 5.54 7.67 9.17 12.12

P.less\_targ

0.41

FG model run per region

6.35

Using the same initial values

Number of iterations: 1500000

Number of chains: 3

Burn in: 750000

Thinning: 2