All fire return intervals (years) and percentage of high versus low mortality fires. Note, the FRIs as used in RMLands are point-level (not stand-level) return intervals. Our goal is to best describe the Yuba River watershed and its fire regimes, not necessarily to represent California or the Sierra Nevada as a whole.

Process for deriving “original values”: For each state in a given BPS model, I noted the given FRI for replacement, mixed, and surface fire. Replacement fire was assigned to high mortality. Surface fire was assigned to low mortality. Mixed fires were assigned to high or low mortality based on the outcome stated in the BPS model. For example, if a mixed severity fire reset a patch to Class A (Early Development), it was designated a high mortality fire. If a mixed severity fire resulted in no change or a change from closed to open, it was designated a low mortality fire. From these FRI values I derived a probability of fire in each category. In addition, the estimated proportion of land area in a given stage provided in the BPS model was taken into account. Fire probabilities for a given condition class were multiplied by proportion of land area to generate a relative probability. These relative probabilities were then summed and converted to an FRI. In this way I recalculated all FRIs for high mortality, low mortality, and all fires, similar to the chart found on the last page of a given BPS model. Thus we did incorporate the mixed severity regime as described in LandFire.

The new values given below are either my estimates of a new FRI number suggested after a reviewer gave a qualitative correction of an FRI (e.g. “this value should be higher”) or are the actual values suggested by a reviewer. Please note that just because a given landcover type has been changed once does not mean it cannot be revised again (especially in those cases where I have provided the estimate, as I am not an expert on Sierra Nevada FRI). The BPS values are intended to be a jumping-off point, not necessarily the final word. We have noticed that in general high mortality fire return intervals seem low, so special attention should perhaps be given to them.

The ultramafic cover types merit special consideration, as I originally included values corresponding to ultramafic BPS models that seemed appropriate. However, when they are compared side by side with non-ultramafic versions of the same cover type, some of the FRIs seem too different (or not different enough!). I also used the same ultramafic estimates across a few cover types (for example MHW and DFTO), which might be okay as a starting point, but they should probably be adjusted.

Because FRI is essential for model parameterization we would like to get final recommendations on these values soon. We will then go forward with the final values and run the model.

Please do not hesitate to contact me if you have any questions!

NOTES

LPN-ASP, RFR-ASP, SMC-ASP: Several modifications made to the BPS model 610 that was the basis for these models. First, an additional stage was added to represent the condition in which low mortality burns an older conifer stand, opening it up enough for previously overtopped aspen stands to resprout. But, the conifers present are still the dominant component of the stand. The same FRI for high mortality was used for this condition, and a longer FRI for low mortality as compared to the LDC condition was input. Another change to the BPS model is that for the Mid Development – Aspen with Conifer condition (see pertinent descriptions), based on reviewer feedback, we reduced the likelihood of low mortality fire and increased the likelihood of high mortality fire. As part of this final review, we note that these models all have the same FRI values, but these should probably be adjusted so that they make sense in the context of their non-aspen counterparts (i.e. SMC-ASP should not be wildly different from SMC-M).

SCN-ASP, YPN-ASP: These FRIs were changed to be based on the eastside “stable” aspen BPS model rather than the westside model. Since these numbers are relatively new they were not included in the original description of SCN and YPN for reviewers to look at. The return intervals calculated from the BPS model are a little surprising but perhaps these numbers are reasonable for Sierra Nevada aspen.

CMM: Per reviewer request, combined Late Development Closed and Late Development Open. FRIs for the two stages were averaged to make the composite stage.

LSG/SAGE: Reviewer seemed to imply that SAGE should burn more frequently than LSG, at least for any fire metric, but I was not sure how to implement this suggestion (increase SAGE or decrease LSG).

OCFW: Changed model to include four condition classes rather than three, but this did not really change the FRIs/proportions. I used the same FRIs for the Late condition as for the Mid Closed condition.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **High Mortality** | | | **Low Mortality** | | | **Any Mortality** | | |  | **High Percent** | | | **Low Percent** | | |
| **Landcover Type** |  | **Original Value** | **New Value** | **Reason for Change** | **Original Value** | **New Value** | **Reason for Change** | **Original Value** | **New Value** | **Reason for Change** |  | **Original Value** | **New Value** | **Reason for Change** | **Original Value** | **New Value** | **Reason for Change** |
| **CMM** |  | 226 | 223 | Consequence of combining LDO and LDC to LD. | 114 | 56 | Consequence of combining LDO and LDC to LD. | 76 | 45 | Consequence of combining LDO and LDC to LD. |  | 34 | 20 | Consequence of combining LDO and LDC to LD. | 66 | 80 | Consequence of combining LDO and LDC to LD. |
| **DFTO** |  | 75 | 65 | Per Becky, based on median between BPS, Skinnner&Chang | 8 |  |  | 8 | 30 | Per Hugh. Becky suggested 16 |  | 10 | 18 | Per Hugh | 90 | 82 | Per Hugh |
| **DFTO-U** |  | 87 | 90 | Consequence of reducing ultramafic model from 4 classes to 3 to fit primary DFTO model. | 17 | 19 | Consequence of reducing ultramafic model from 4 classes to 3 to fit primary DFTO model. | 14 | 40 | Per Hugh  Becky suggested 32.  Was 16: Consequence of reducing ultramafic model from 4 classes to 3 to fit primary DFTO model. |  | 16 | 17 | Consequence of reducing ultramafic model from 4 classes to 3 to fit primary DFTO model. | 84 | 83 | Consequence of reducing ultramafic model from 4 classes to 3 to fit primary DFTO model. |
| **LPN** |  | 122 | 180 | Becky: should fall between SCN and WWP. | 50 | 120 | Becky: should fall between SCN and WWP. | 36 |  |  |  | 29 |  |  | 71 |  |  |
| **LPN-ASP** |  | 94 | 92 | Modified BPS extensively (see notes below table) | 58 | 91 | Modified BPS extensively (see notes below table) | 36 | 46 | Modified BPS extensively (see notes below table) |  | 38 | 50 | Modified BPS extensively (see notes below table) | 62 | 50 | Modified BPS extensively (see notes below table) |
| **LSG** |  | 226 |  |  | 140 |  |  | 86 |  |  |  | 38 |  |  | 62 |  |  |
| **MHW** |  | 75 |  |  | 8 |  |  | 8 |  |  |  | 10 |  |  | 90 |  |  |
| **MHW-U** |  | 87 | 90 | Consequence of reducing ultramafic model from 4 classes to 3 to fit primary MHW model. | 17 | 19 | Consequence of reducing ultramafic model from 4 classes to 3 to fit primary MHW model. | 14 | 16 | Consequence of reducing ultramafic model from 4 classes to 3 to fit primary MHW model. |  | 16 | 17 | Consequence of reducing ultramafic model from 4 classes to 3 to fit primary MHW model. | 84 | 83 | Consequence of reducing ultramafic model from 4 classes to 3 to fit primary MHW model. |
| **MRIP** |  | 77 | 85 | Reverted to original BPS. | 53 | 114 | Reverted to original BPS | 31 | 49 | Reverted to original BPS |  | 41 | 57 | Reverted to original BPS. | 59 | 43 | Reverted to original BPS. |
| **OAK** |  | 122 |  |  | 10 |  |  | 9 | 12 | Per Becky |  | 15 |  |  | 85 |  |  |
| **OCFW** |  | 55 |  |  | 9 |  |  | 8 |  |  |  | 13 |  |  | 87 |  |  |
| **OCFW-U** |  | 53 | 70 | Estimate due to SMC comment that ultramafic sites should have longer FRIs. Assumed it would apply to OCFW as well. | 11 | 19 | Estimate due to SMC comment that ultramafic sites should have longer FRIs. Assumed it would apply to OCFW as well. | 9 | 15 | Estimate due to SMC comment that ultramafic sites should have longer FRIs. Assumed it would apply to OCFW as well. |  | 17 | 22 | Estimate due to SMC comment that ultramafic sites should have longer FRIs. Assumed it would apply to OCFW as well. | 83 | 78 | Estimate due to SMC comment that ultramafic sites should have longer FRIs. Assumed it would apply to OCFW as well. |
| **RFR-M** |  | 139 | 209 | Estimate due to reviewer comment that red fir in general should have longer FRIs, and high mortality in particular was too frequent. So I assumed a systematic underestimate of high mortality fire in the BPS model. | 32 | 50 | Estimate due to reviewer comment that red fir in general should have longer FRIs. | 26 | 40 | Estimate due to reviewer comment that red fir in general should have longer FRIs,. |  | 19 | 20 | Per Hugh – RFRM has higher value here than RFRX | 81 | 80 | See left |
| **RFR-X** |  | 130 | 300 | Per Hugh – made longer than RFR-M | 36 |  |  | 28 | 30 |  |  | 21 | 15 | See above | 78 | 85 | See left |
| **RFR-U** |  | 50 | 300 | Maritza –UM value should be comparable to nonUM values for cover type. | 11 | 70 | See High Mort FRI explanation. | 9 | 50 | See High Mort FRI explanation. |  | 18 |  |  | 82 |  |  |
| **RFR-ASP** |  | 94 | 190 | Per Becky suggestion to have number close to RFRM. Maritza decided to make the FRI slightly shorter than RFRM.  Prev 92: Modified BPS extensively (see notes below table) | 58 | 75 | Per Becky  Prev 91: Modified BPS extensively (see notes below table) | 36 | 46 | Modified BPS extensively (see notes below table) |  | 38 | 50 | Modified BPS extensively (see notes below table) | 62 | 50 | Modified BPS extensively (see notes below table) |
| **SAGE** |  | 124 |  |  | 1000 |  |  | 110 | 42 | Per Hugh |  | 89 |  |  | 11 |  |  |
| **SCN** |  | 500 | 350 | Per Becky | 923 | 500 | Per Becky  Prev 160: (Maritza) Changed after talking with Becky. | 324 | 250 | Changed after talking with Becky. Hugh had same number. |  | 65 |  |  | 35 |  |  |
| **SCN-ASP** |  | 92 | 325 | Per Becky suggestion to make value similar to SCN FRI.  Prev 38: Using Aspen model that does not have a LDC state analogous to SCN’s LDC. Per reviewer comment that SCN-ASP likely to be “stable” aspen. Used BPS model 110 but reduced classes to 3 from 4. | 91 | 450 | Per Becky suggestion to make value similar to SCN FRI.  Prev 111: Same reason as high mortality. | 46 | 225 | Per Becky suggestion to make value similar to SCN FRI.  Prev 29: Same reason as high mortality. |  | 50 | 74 | Same reason as high mortality. | 50 | 26 | Same reason as high mortality. |
| **SMC-M** |  | 106 | 150 | Estimate in response to reviewer request to make interval “higher.” | 20 | 15 | Estimate in response to review request to make interval “lower.” | 17 |  |  |  | 16 | 15 | Changed by reviewer. | 84 | 85 | Changed by reviewer. |
| **SMC-X** |  | 97 | 180 | Estimate in response to reviewer request to make interval “much higher.” | 13 |  |  | 12 |  |  |  | 12 | 8 | Changed by reviewer. | 88 | 92 | Changed by reviewer. |
| **SMC-U** |  | 53 | 250 | Estimate in response to reviewer request to make interval “much longer than non-ultramafic types. | 11 | 40 |  | 9 | 30 | Changed in response to reviewer comment that correct range was 20-40 years. |  | 17 | 5 | Changed by reviewer. | 83 | 95 | Changed by reviewer. |
| **SMC-ASP** |  | 94 | 92 | Modified BPS extensively (see notes below table) | 58 | 40 | Per Becky (closer to SMCM)  Prev 91: Modified BPS extensively (see notes below table) | 36 | 20 | Changed in response to reviewer request to make interval “less”. |  | 38 | 50 | Modified BPS extensively (see notes below table) | 62 | 50 | Modified BPS extensively (see notes below table) |
| **WWP** |  | 133 |  |  | 28 |  |  | 23 |  |  |  | 17 |  |  | 83 |  |  |
| **YPN** |  | 121 | 200 | Per Hugh – prev was “much too short”.  Prev: 100 - Estimate in response to reviewer comment that 121 years was too long for stand-replacing fire. | 10 |  |  | 9 |  |  |  | 29 | 5 | Per Hugh | 71 | 95 | Per Hugh |
| **YPN-ASP** |  | 92 | 38 | Using “stable” aspen model originally envisioned as basis for eastside aspen. Used BPS model 110 but reduced classes to 3 from 4. | 91 | 111 | Same reason as high mortality. | 46 | 18 | Per Hugh  Prev 29: Same reason as high mortality. |  | 50 | 12 | Per Hugh.  Prev 74: Same reason as high mortality. | 50 | 88 | Per Hugh  Prev 26: Same reason as high mortality. |

Landcover Type

* CMM – Curl-leaf Mountain Mahogany
* DFTO – Doug Fir-Tanoak
* LPN – Lodgepole Pine
* LSG – Black and Low Sagebrush
* MHW – Montane Hardwood
* MRIP – Montane Riparian
* OAK – Blue Oak-Foothill Pine Woodland
* OCFW – Oak-Conifer Forest and Woodland
* RFR – Red Fir
* SAGE – Big Sagebrush
* SCN – Subalpine Conifer
* SMC – Sierran Mixed Conifer
* WWP – Western White Pine
* YPN – Yellow Pine

Modifiers

* M – Mesic
* X – Xeric
* U – Ultramafic
* ASP – Aspen