Mini Model Constraints Breakdown:

September 2022

Attempt 1

**Total Acreage**

* 167N\_2021\_NMGT + 167N\_2021\_THNB + 167N\_2025\_NMGT + 167N\_2025\_THNB + 167N\_2030\_NMGT + 167N\_2030\_THNB + 167N\_2050\_NMGT + 167N\_2050\_THNB + 167S\_2021\_NMGT + 167S\_2021\_THNB + 167S\_2025\_NMGT + 167S\_2025\_THNB + 167S\_2030\_NMGT + 167S\_2030\_THNB + 167S\_2050\_NMGT + 167S\_2050\_THNB + 505\_2021\_ASV + 505\_2021\_NMGT + 505\_2021\_THNB + 505\_2025\_ASV + 505\_2025\_NMGT + 505\_2025\_THNB + 505\_2030\_ASV + 505\_2030\_NMGT + 505\_2030\_THNB + 505\_2050\_ASV + 505\_2050\_NMGT + 505\_2050\_THNB + 608\_2021\_AWR + 608\_2021\_NMGT + 608\_2025\_AWR + 608\_2025\_NMGT + 608\_2030\_AWR + 608\_2030\_NMGT + 608\_2050\_AWR + 608\_2050\_NMGT + 999\_2021\_AWR + 999\_2021\_CAR + 999\_2021\_NAR + 999\_2021\_NMGT + 999\_2021\_SAR + 999\_2025\_AWR + 999\_2025\_CAR + 999\_2025\_NAR + 999\_2025\_NMGT + 999\_2025\_SAR + 999\_2030\_AWR + 999\_2030\_CAR + 999\_2030\_NAR + 999\_2030\_NMGT + 999\_2030\_SAR + 999\_2050\_AWR + 999\_2050\_CAR + 999\_2050\_NAR + 999\_2050\_NMGT + 999\_2050\_SAR == + 1318480.0

**Yearly Acreages:**

* 2021Acreage
  + 167N\_2021\_NMGT + 167N\_2021\_THNB + 167S\_2021\_NMGT + 167S\_2021\_THNB + 505\_2021\_ASV + 505\_2021\_NMGT + 505\_2021\_THNB + 608\_2021\_AWR + 608\_2021\_NMGT + 999\_2021\_AWR + 999\_2021\_CAR + 999\_2021\_NAR + 999\_2021\_NMGT + 999\_2021\_SAR == + 329620.0
* 2025Acreage
  + 167N\_2025\_NMGT + 167N\_2025\_THNB + 167S\_2025\_NMGT + 167S\_2025\_THNB + 505\_2025\_ASV + 505\_2025\_NMGT + 505\_2025\_THNB + 608\_2025\_AWR + 608\_2025\_NMGT + 999\_2025\_AWR + 999\_2025\_CAR + 999\_2025\_NAR + 999\_2025\_NMGT + 999\_2025\_SAR == + 329620.0
* 2030Acreage
  + 167N\_2030\_NMGT + 167N\_2030\_THNB + 167S\_2030\_NMGT + 167S\_2030\_THNB + 505\_2030\_ASV + 505\_2030\_NMGT + 505\_2030\_THNB + 608\_2030\_AWR + 608\_2030\_NMGT + 999\_2030\_AWR + 999\_2030\_CAR + 999\_2030\_NAR + 999\_2030\_NMGT + 999\_2030\_SAR == + 329620.0
* 2050Acreage
  + 167N\_2050\_NMGT + 167N\_2050\_THNB + 167S\_2050\_NMGT + 167S\_2050\_THNB + 505\_2050\_ASV + 505\_2050\_NMGT + 505\_2050\_THNB + 608\_2050\_AWR + 608\_2050\_NMGT + 999\_2050\_AWR + 999\_2050\_CAR + 999\_2050\_NAR + 999\_2050\_NMGT + 999\_2050\_SAR == + 329620.0

**Forest Type Acreages:**

* 505Acreage
  + 505\_2021\_ASV + 505\_2021\_NMGT + 505\_2021\_THNB + 505\_2025\_ASV + 505\_2025\_NMGT + 505\_2025\_THNB + 505\_2030\_ASV + 505\_2030\_NMGT + 505\_2030\_THNB + 505\_2050\_ASV + 505\_2050\_NMGT + 505\_2050\_THNB == + 25994.0
* 167NAcreage
  + 167N\_2021\_NMGT + 167N\_2021\_THNB + 167N\_2025\_NMGT + 167N\_2025\_THNB + 167N\_2030\_NMGT + 167N\_2030\_THNB + 167N\_2050\_NMGT + 167N\_2050\_THNB == + 137679.0
* 167SAcreage
  + 167S\_2021\_NMGT + 167S\_2021\_THNB + 167S\_2025\_NMGT + 167S\_2025\_THNB + 167S\_2030\_NMGT + 167S\_2030\_THNB + 167S\_2050\_NMGT + 167S\_2050\_THNB == + 122092.0
* 608Acreage
  + 608\_2021\_AWR + 608\_2021\_NMGT + 608\_2025\_AWR + 608\_2025\_NMGT + 608\_2030\_AWR + 608\_2030\_NMGT + 608\_2050\_AWR + 608\_2050\_NMGT == + 40786.0
* 999Acreage
  + 999\_2021\_CAR + 999\_2021\_NAR + 999\_2021\_NMGT + 999\_2021\_SAR + 999\_2025\_CAR + 999\_2025\_NAR + 999\_2025\_NMGT + 999\_2025\_SAR + 999\_2030\_CAR + 999\_2030\_NAR + 999\_2030\_NMGT + 999\_2030\_SAR + 999\_2050\_CAR + 999\_2050\_NAR + 999\_2050\_NMGT + 999\_2050\_SAR == + 3069.0

**Afforestation:**

* 999\_2025\_CAR + 999\_2025\_NAR + 999\_2025\_SAR <= + 3069.0
* AffCont30\_25\_CAR
  + 999\_2030\_CAR == 999\_2025\_CAR + 0.0
* AffCont30\_25\_NAR
  + 999\_2030\_NAR == 999\_2025\_NAR + 0.0
* AffCont30\_25\_SAR
  + 999\_2030\_SAR == 999\_2025\_SAR + 0.0
* AffCont50\_30\_CAR
  + 999\_2050\_CAR == 999\_2030\_CAR + 0.0
* AffCont50\_30\_NAR
  + 999\_2050\_NAR == 999\_2030\_NAR + 0.0
* AffCont50\_30\_SAR
  + 999\_2050\_SAR == 999\_2030\_SAR + 0.0

**No Management:**

* NoMgmt\_2021
  + 167N\_2021\_NMGT + 167S\_2021\_NMGT + 505\_2021\_NMGT + 608\_2021\_NMGT + 999\_2021\_NMGT <= + 329620.0
* NoMgmt\_2025
  + 167N\_2025\_NMGT + 167S\_2025\_NMGT + 505\_2025\_NMGT + 608\_2025\_NMGT + 999\_2025\_NMGT <= + 329620.0
* NoMgmt\_2030
  + 167N\_2030\_NMGT + 167S\_2030\_NMGT + 505\_2030\_NMGT + 608\_2030\_NMGT + 999\_2030\_NMGT <= + 329620.0
* NoMgmt\_2050
  + 167N\_2050\_NMGT + 167S\_2050\_NMGT + 505\_2050\_NMGT + 608\_2050\_NMGT + 999\_2050\_NMGT <= + 329620.0

**Ash Salvage:**

* 505\_2025\_ASV + 505\_2030\_ASV + 505\_2050\_ASV <= + 20797.0

**Thinning:**

* ThinTotal
  + 167N\_2021\_THNB + 167S\_2021\_THNB + 505\_2021\_THNB == + 246251.0
* Thin167N\_2021
  + 167N\_2021\_THNB <= + 5197.0
* Thin167S\_2021
  + 167S\_2021\_THNB <= + 127759.0
* Thin505\_2021
  + 505\_2021\_THNB <= + 113295.0

**AWC:**

* TotalCedar
  + 608\_2021\_AWR + 608\_2025\_AWR + 608\_2030\_AWR + 608\_2050\_AWR + 999\_2021\_AWR + 999\_2025\_AWR + 999\_2030\_AWR + 999\_2050\_AWR <= + 40535.0
* AWRConvert2021
  + 608\_2021\_AWR + 999\_2021\_AWR <= + 1000.0
* AWRConvert\_2025
  + 608\_2025\_AWR + 999\_2025\_AWR <= + 4000.0
* AWRConvert\_2030
  + 608\_2030\_AWR + 999\_2030\_AWR <= + 5000.0
* AWRConvert\_2050
  + 608\_2050\_AWR + 999\_2050\_AWR <= + 20000.0

Attempt 2:

Fixed the Thinning constraints so that the correct forest types match the proper acreages. It still resulted in an error.

**Thinning:**

* ThinTotal
  + 167N\_2021\_THNB + 167S\_2021\_THNB + 505\_2021\_THNB == + 246251.0
* Thin505\_2021
  + 505N\_2021\_THNB <= + 5197.0
* Thin167N\_2021
  + 167N\_2021\_THNB <= + 127759.0
* Thin167S\_2021
  + 167S\_2021\_THNB <= + 113295.0

Attempt 3:

Took all of the forest type acreages and split them by year. Essentially the acreages from Attempt 1 were divided by 4 to accomplish this. It worked in the CMAI run, so I figured why not, but it still resulted in an error. I think that there may be something weird going on the with 999/Afforestation constraints because they both have 3069 on the right side (but 999 constraint is == and afforestation constraint is <=).

Attempt 4:

This isn’t a real attempt. I realized that on our final CMAI run we were using the full private lands acreage for 505 and not the stewardship acreage. It’s been fixed in the CMAI runs (Run 8 is now the final working run!), and I’m fixing those numbers in this attempt as well. There’s obviously still an error.

**Total Acreage**

* 167N\_2021\_NMGT + 167N\_2021\_THNB + 167N\_2025\_NMGT + 167N\_2025\_THNB + 167N\_2030\_NMGT + 167N\_2030\_THNB + 167N\_2050\_NMGT + 167N\_2050\_THNB + 167S\_2021\_NMGT + 167S\_2021\_THNB + 167S\_2025\_NMGT + 167S\_2025\_THNB + 167S\_2030\_NMGT + 167S\_2030\_THNB + 167S\_2050\_NMGT + 167S\_2050\_THNB + 505\_2021\_ASV + 505\_2021\_NMGT + 505\_2021\_THNB + 505\_2025\_ASV + 505\_2025\_NMGT + 505\_2025\_THNB + 505\_2030\_ASV + 505\_2030\_NMGT + 505\_2030\_THNB + 505\_2050\_ASV + 505\_2050\_NMGT + 505\_2050\_THNB + 608\_2021\_AWR + 608\_2021\_NMGT + 608\_2025\_AWR + 608\_2025\_NMGT + 608\_2030\_AWR + 608\_2030\_NMGT + 608\_2050\_AWR + 608\_2050\_NMGT + 999\_2021\_AWR + 999\_2021\_CAR + 999\_2021\_NAR + 999\_2021\_NMGT + 999\_2021\_SAR + 999\_2025\_AWR + 999\_2025\_CAR + 999\_2025\_NAR + 999\_2025\_NMGT + 999\_2025\_SAR + 999\_2030\_AWR + 999\_2030\_CAR + 999\_2030\_NAR + 999\_2030\_NMGT + 999\_2030\_SAR + 999\_2050\_AWR + 999\_2050\_CAR + 999\_2050\_NAR + 999\_2050\_NMGT + 999\_2050\_SAR == + 1240564

**Yearly Acreages:**

* 2021Acreage
  + 167N\_2021\_NMGT + 167N\_2021\_THNB + 167S\_2021\_NMGT + 167S\_2021\_THNB + 505\_2021\_ASV + 505\_2021\_NMGT + 505\_2021\_THNB + 608\_2021\_AWR + 608\_2021\_NMGT + 999\_2021\_AWR + 999\_2021\_CAR + 999\_2021\_NAR + 999\_2021\_NMGT + 999\_2021\_SAR == + 310141
* 2025Acreage
  + 167N\_2025\_NMGT + 167N\_2025\_THNB + 167S\_2025\_NMGT + 167S\_2025\_THNB + 505\_2025\_ASV + 505\_2025\_NMGT + 505\_2025\_THNB + 608\_2025\_AWR + 608\_2025\_NMGT + 999\_2025\_AWR + 999\_2025\_CAR + 999\_2025\_NAR + 999\_2025\_NMGT + 999\_2025\_SAR == + 310141
* 2030Acreage
  + 167N\_2030\_NMGT + 167N\_2030\_THNB + 167S\_2030\_NMGT + 167S\_2030\_THNB + 505\_2030\_ASV + 505\_2030\_NMGT + 505\_2030\_THNB + 608\_2030\_AWR + 608\_2030\_NMGT + 999\_2030\_AWR + 999\_2030\_CAR + 999\_2030\_NAR + 999\_2030\_NMGT + 999\_2030\_SAR == + 310141
* 2050Acreage
  + 167N\_2050\_NMGT + 167N\_2050\_THNB + 167S\_2050\_NMGT + 167S\_2050\_THNB + 505\_2050\_ASV + 505\_2050\_NMGT + 505\_2050\_THNB + 608\_2050\_AWR + 608\_2050\_NMGT + 999\_2050\_AWR + 999\_2050\_CAR + 999\_2050\_NAR + 999\_2050\_NMGT + 999\_2050\_SAR == + 310141

**Forest Type Acreages:**

* 505Acreage
  + 505\_2021\_ASV + 505\_2021\_NMGT + 505\_2021\_THNB + 505\_2025\_ASV + 505\_2025\_NMGT + 505\_2025\_THNB + 505\_2030\_ASV + 505\_2030\_NMGT + 505\_2030\_THNB + 505\_2050\_ASV + 505\_2050\_NMGT + 505\_2050\_THNB == + 6515

**No Management:**

* NoMgmt\_2021
  + 167N\_2021\_NMGT + 167S\_2021\_NMGT + 505\_2021\_NMGT + 608\_2021\_NMGT + 999\_2021\_NMGT <= + 310141
* NoMgmt\_2025
  + 167N\_2025\_NMGT + 167S\_2025\_NMGT + 505\_2025\_NMGT + 608\_2025\_NMGT + 999\_2025\_NMGT <= + 310141
* NoMgmt\_2030
  + 167N\_2030\_NMGT + 167S\_2030\_NMGT + 505\_2030\_NMGT + 608\_2030\_NMGT + 999\_2030\_NMGT <= + 310141
* NoMgmt\_2050
  + 167N\_2050\_NMGT + 167S\_2050\_NMGT + 505\_2050\_NMGT + 608\_2050\_NMGT + 999\_2050\_NMGT <= + 310141

**Ash Salvage:**

* 505\_2025\_ASV + 505\_2030\_ASV + 505\_2050\_ASV <= + 6515