**Set of models prepared using glmmTMB during analysis**

**Model 1**

Density ij (of a particular stage of *A. spicatum*) = a + (1|Plot)

**Model 2**

Density ij (of a particular stage of *A. spicatum*) = a + b(Population) (1|Plot)

**Model 3**

Density ij (of a particular stage of *A. spicatum*) = a + b(Population)+ c1Herb coverij+ (1|Plot)

**Model 4**

Density ij (of a particular stage of *A. spicatum*) = a + b(Population)+ c1Herb coverij+ c2 Shrub cover ij+ (1|Plot)

**Model 5**

Density ij (of a particular stage of *A. spicatum*) = a) + b(Population)+ c1Herb cover ij + c2 Shrub cover ij +  c3Harvesting ij+ (1|Plot)

**Model 6**

Density ij (of a particular stage of *A. spicatum*) = a + b(Population)+ c1Herb cover ij + c2Harvesting ij+ (1|Plot)

**Model 7**

Density ij (of a particular stage of *A. spicatum*) = a + b(Population)+ c1 Shrub cover ij+ c2Harvesting ij  j+ (1|Plot)

**Model 8**

Density ij (of a particular stage of *A. spicatum*) = a + b(Population) + c1 RRI + (1|Plot)

**Model 9**

Density ij (of a particular stage of *A. spicatum*) = a + b(Population) + c1Harvesting + (1|Plot)

**Model10**

Density ij (of a particular stage of *A. spicatum*) = a + b(Population) + c1Herb\_cover ij + c2 Shrub cover ij + c3 Harvesting ij  + c4RRI ij + (1|Plot)

**Model 11**

Density ij (of a particular stage of *A. spicatum*) = a + b(Population) + c1Harvesting ij  + c2RRI ij + (1|Plot)

**Model12**

Density ij (of a particular stage of *A. spicatum*) = a + (1|Plot) + b(Population) + c1Herb\_cover ij + c2RRI ij

**Model13**

Density ij (of a particular stage of *A. spicatum*) = a + b(Population) + c1Shrub\_cover ij + c2RRI ij + (1|Plot)

**Model14**

Density ij (of a particular stage of *A. spicatum*) = a + b(Population) + c1Herb\_cover ij + c2Harvesting ij + c3RRI ij + (1|Plot)

**Model15**

Density ij (of a particular stage of *A. spicatum*) = a + b(Population) + c1Shrub\_cover ij + c2Harvesting ij + c3RRI ij + (1|Plot)

**Model16**

Density ij (of a particular stage of *A. spicatum*) = a + b(Population) + + c1RRI ij +c2Herb\_cover ij + c3 Shrub cover ij + c4 Harvesting ij  + c5Trampling ij + c6 Animal drooping ij+  c7 Fire ij  + (1|Plot)

**Model17**

Density ij (of a particular stage of *A. spicatum*) = a + b(Population) + c1 Harvesting ij  + c2Trampling ij + c3 Animal drooping ij+  c4 Fire ij  + (1|Plot)

**Model18**

Density ij (of a particular stage of *A. spicatum*) = a + b(Population) + c1 Harvesting ij  + c2Trampling ij + c3 Animal drooping ij+  c4 Fire ij  + c6 Herb ij  + (1|Plot)

**Model19**

Density ij (of a particular stage of *A. spicatum*) = a + b(Population) + c1Herb\_cover ij  + c2 Harvesting ij  + c3Trampling ij + c4 Animal drooping ijj + (1|Plot)

**Model20**

Density ij (of a particular stage of *A. spicatum*) = a + b(Population) + c1Herb\_cover ij + c2 Harvesting ij  + c3Trampling ij + (1|Plot)

**Model21**

Density ij (of a particular stage of *A. spicatum*) = a + b(Population) + c1Harvesting ij  + c2Trampling ij + (1|Plot)

**Model22**

Density ij (of a particular stage of *A. spicatum*) = a + b(Population) + c1Fire ij + c2 Harvesting ij  + c3Trampling ij + (1|Plot)

**Model23**

Density ij (of a particular stage of *A. spicatum*) = a + b(Population) + c1Animal drooping ij + c2 Trampling ij + c3 Fire ij  + (1|Plot)

**Model24**

Density ij (of a particular stage of *A. spicatum*) = a + b(Population) + c1Animal drooping ij + c2 Fire ij + (1|Plot)

**Model25**

Density ij (of a particular stage of *A. spicatum*) = a + b(Population) + c1Trampling ij + c2 Fire+ (1|Plot)

**Model26**

Density ij (of a particular stage of *A. spicatum*) = a + b(Population) + c1Harvesting ij  + c2Fireij + (1|Plot)

Where, a, b(Population) and c1…c13 are fixed model parameters, i=1…66 is the plot (random effect) and j=1…5 is the sub-plot. Population has three categories (subalpine, lower alpine and alpine). Density is expressed as the number of individuals in a given stage category counted within a 1 m2 sub-plot.