Forest Valuation
Project work 3

Name:
Student No.:

1. Based on the transition matrix model (Cao et al. 2016, p. 58-60), predict forest dynamics at the stand level for 50 years.
2. Define the timing of forest succession up to the climax community.
3. Estimate the stand DBH and BA when it reaches a stable ecosystem.
4. Compute the mortality rate (self-thinning rate) during the succession.
5. Processing the data of 40 pine stands (Cao et al. 2016, p.57) with a diameter size class 10 cm, calculate number of trees N_i (trees/size class), mean diameter D_i, and basal area BA_i for each size class.
6. Using the matrix model (example 4.2), predict 20 years growth for the pine forests (suppose 40 plots as a whole forest), computer mean DBH and BA at forest level.
7. Based on the whole stand model (example 4.1), predict 20 years growth for the 40 pine stands, respectively. Then, summarize to forest level, calculate forest level D and BA.
8. Compare and analyze the matrix model and the whole stand model, in terms of growth predictions, statistic bias, and the underlying reasons.

1. 根据例 4.2 转移概率矩阵模型（实验指导书 58-60 页），预测 50 年间的林分动态变化。
2. 判断顶级群落恢复需要的时间。
3. 计算达到顶级群落时林分的平均胸径 D 和林分断面积 BA。
4. 计算演替阶段的枯损率。
5. 对例 4.1 数据按 10cm 径阶整理（40 块油松样地，实验指导书表 4.1，第 57 页），计算各径阶的株数 N_i，平均胸径 D_i，和平均断面积 BA_i。
6. 基于例 4.2 矩阵模型，预测 20 年后这 40 块油松所代表的油松林总体森林水平的平均胸径 D (cm/ha)，以及断面积 BA (m^2/ha)。
7. 基于例 4.1 全林模型，分别计算预测这 40 块样地林分的 20 年生长。汇总计算总体森林水平的 D 和 BA。
8. 比较分析矩阵模型和全林模型在生长预测上的异同。