 Define/articulate the Issue/Problem (focus the effort)

* explicit purpose – Discover what happens to stock of mature trees over time
* Reference Behavior Pattern (RBP) –
  + Initial Mature Trees: 100
  + Initial Immature Trees: 100
  + Flow from immature to mature trees: immature/20
  + Years to maturity: 20
  + Harvest & replace: 5%
* diagram

1. Build an initial model. What happens to your stock of mature trees over time? Does this make sense?

The stock stays level at 100, harvest and replant are at 5/year. My stock of mature trees stays level. This makes sense, as the rate of harvest allows for the rate of maturity to equal the rate of planting given the delay.

1. What will happen if you decide at year 5 to begin harvesting 10% of the mature trees (and plant saplings at this higher rate as well)?

Year 5: 10% harvest & replace

At year 5, my harvest ratio starts to increase to 5.05 at year 6, then drops and levels by year 40 at 5.025 trees.

My stock of mature trees falls to nothing by year 60.

My stock of immature trees goes converse to 100.5 by year 60.

1. Now, explore strategies for preserving the stand and maintaining stability, e.g., different policies for planting saplings and/or different maturation time constants,

My solution: Replant = Harvest+STEP(0.001,5)

At this rate, my stock of mature trees drops to 99.5 over a 50 year period, then rebounds to 100 by year 1000. My rate of replanting climbs from 5 to 5.05 over 20 years, drops to 5.027 by year 75, and rebounds to 5.05 by year 1000. Immature trees stock climbs from 100 to 100.5 over the same 20 Years, then climbs steadily to 101 by year 1000.