Thinning

Why Thin?

- **Select the best tree species.**
- Reduce insect and disease vulnerability:
  - Increase individual tree vigor,
  - Diversify tree species.
- Improve forest genetics.

Why Thin?

- Enhance non-timber values:
  - E.g., Allowing more light into understory may stimulate desirable understory plants and wildlife they depend on.
- Decrease fire hazard

When to Thin

- Begin thinning early (10-20 year old trees).
- Thin before crown ratio is less than 40%.
- Make subsequent thinnings as competition recurs (when the crowns of adjacent trees begin to touch.)
- Thinning intervals commonly range from 10 to 25 years.

Desired Spacing after Thinning?

- Distance left between trees varies, depending on trees' size; and objectives
  - Usually 12 - 15 feet on saplings
  - Up to 50 feet on older trees
  - Space trees wider for more understory plants?

Leave Trees:
After meeting spacing needs, which trees will . . .

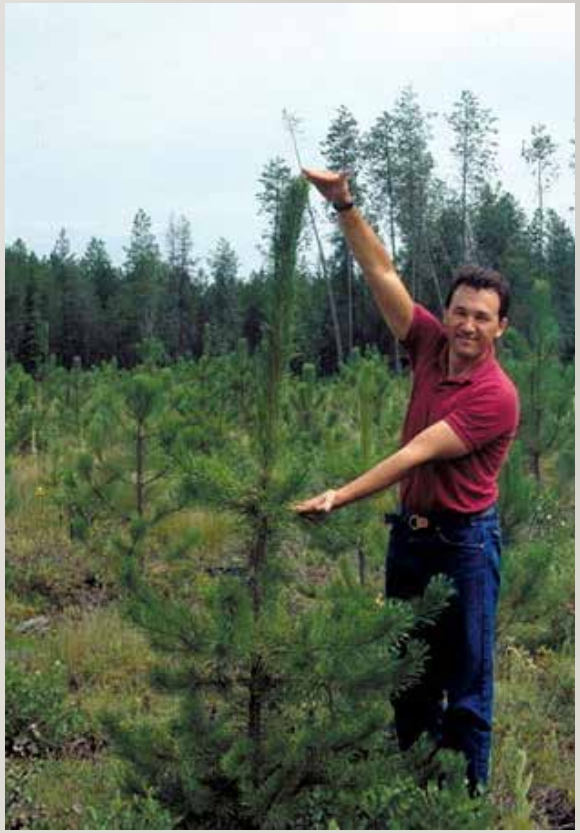
- Resist insect and disease problems (e.g., species)?
- Pass on desirable qualities to naturally regenerated tree seedlings, enhancing forest genetics?
- Produce higher value trees in the next harvest (e.g., form, growth rate).
- Support wildlife or other objectives (e.g., snags)

Species:
Which are best adapted to the site, over long term?

- Stay within range of species well adapted to site.
- Preferentially cut shade tolerant trees (particularly on drier sites).
- Within range of species adapted to site, leave or plant under-represented species (e.g., white pine).

Species:
Which are most desirable for different management goals?

- Highest commercial value (how long will you grow them)?
- Highest wildlife value?
- Aesthetic value?



Growth and Form

- Leave Trees Matter!
  - Most of our forests are even–aged because of regeneration after stand-replacing fires
  - Cutting everything over a certain diameter - leaving the smaller trees, is dysgenic (degrades stand genetics)
- Favor dominant trees (tallest trees dominating canopy rather than poorer competitors lower in the canopy)
- Favor good height growth (e.g., pointy tops, longer distance between branch whorls).

Growth and Form

- Favor trees with at least a 40% crown ratio.
- Remove trees with forked or broken tops, or ramicorn branches (forks break out, very heritable)
- Favor trees with abundant, full needles, with good color and length for their species
- Disfavor trees with, crook, sweep, excessive taper

Insects/Disease

- Tree killer #1: Root Diseases:
  - Favor larch or pines, which survive root diseases best
- Tree killer #2: Bark Beetles:
  - Reduce stocking, favor most drought-tolerant species for site
- Leaving the best species for the site, adequately spaced, is best insurance for healthy forests.
  - Sustainable species reference point: What is the most shade tolerant tree species in stand understory? (often the worst species to favor)