PROPERTY PLANNING COMMON ELEMENTS

COMPONENTS OF MASTER PLANS

HABITATS AND THEIR MANAGEMENT

Single-tree Selection

Description

Single-tree selection is a method to regenerate and maintain uneven-aged stands by removing some trees at regular intervals. An uneven-aged stand structure is maintained by periodically regenerating new age classes while manipulating the overstory structure to facilitate continual development of quality growing stock. Stand regeneration is achieved by periodically manipulating the overstory and understory to create conditions favorable for establishment and survival of desired tree species. Generally, most regeneration is of seed origin, although a component can be vegetative.

Individual trees of various size and age classes are periodically removed to provide space for regeneration and promote growth of remaining trees. To recruit and release regeneration, trees are removed singly and in small groups, creating canopy gaps <0.1 acre in size. Each regeneration opening (canopy gap) covers an area equivalent to the crown spread of one to several large trees. The spacing of regeneration gaps is irregular, based on the location of large harvested trees and small groups of undesirable trees (risk, vigor, quality, species). Residual stand stocking is regulated by age or size class and generally maintained at a specified level to promote development of quality boles (timber) and fully utilize the site. Regeneration cuts, thinning, and harvesting usually occur simultaneously.

Characteristics

- Uneven-aged

- Seed origin

- Overstory never completely removed – periodic removal of individuals and groups of overstory trees create gaps to recruit new overstory trees and regeneration

- Overstory provides seed source and modifies understory conditions to favor reproduction, competition, and growth of certain species

- Favors regeneration and maintenance of shade-tolerant species

- Method allows for variations in regeneration and structure (e.g., age class, composition, density) over space and time

- Regeneration cuts (gap creation), thinning, and harvesting usually occur simultaneously

Considerations

General considerations in the application of the single-tree selection method are:

- Site evaluation (suitable to meet nutrient-moisture needs of species)

- Stand composition, size and age class structure, condition, and health
- Potential seed and sprout sources – competition, condition, health
- Advanced regeneration
- Regeneration requirements (moisture, nutrients, light, heat) of desired species
- Competitive abilities of desired species, and potential competition among species
- Seedbed requirements
- Competition control
- Overstory impacts on understory light and heat levels
- Gap management:
  - Smaller gaps favor shade-tolerant species
  - Previous gaps needing expansion to release established regeneration
  - Number of new gaps to release advanced regeneration or establish new regeneration
  - Crown size and expected crown closure rates
- Crop tree management
- Order of removal of overstory trees for gap creation, thinning, and harvest – generally the most vigorous crop trees are retained and less vigorous and diseased trees are removed
- Cutting cycle and allowable cut
- Protection of residual stems, crowns, root systems, and advanced regeneration from logging damage

Advantages

- Permanent forest with multiple age classes – overstory not completely removed
- Maintenance of permanent overstory allows treatment adjustments and modification if problems arise or objectives are not initially achieved
- Relatively continuous full site occupancy
- Local, known seed source
- Reproduction generally certain
- System favors shade-tolerant species
- In general, little need for site preparation or competition control
- Periodic improvement of stand quality through judicious tending
- Maximizes growth and quality for some species (e.g., sugar maple)
- Can grow large, high-quality trees – facilitates high levels of sawtimber production
- Periodic income can be relatively frequent (sustained yield)

Disadvantages

- Requires technical skill and the need to monitor stand conditions
- Application techniques are not well developed for every species
- Not a good system to regenerate and manage shade-intolerant or mid-tolerant species
- Species diversity can be difficult to establish or maintain
- May require timing to seed crop for some species
- Careful logging practices required to protect overstory and advanced regeneration; some damage is unavoidable
- Frequent re-entry increases frequency of site disturbance
- Frequent re-entry requires a more extensive and permanent network of access roads and skid trails
- For any given entry, income is less than for complete overstory removal
- Added time and cost for timber sale establishment
- Logging costs are relatively high to remove scattered sawtimber trees