

Principles to consider for good silviculture

Approach: I have written a draft that is organized as a “tree”. It starts with a general philosophical approach to all landscapes with trees (think tree trunk), then progresses down the large branches of a part of the tree concerning native forests of uplands, and terminates with the specifics of Southern New England (a part of the outer branches associated with upland forests).

A. OVERARCHING GENERAL PHILOSOPHY for all managed landscapes natural or human dominated – industrial, agricultural or urban.

1. Good silviculture is applied forest ecology – and from my perspective it means “thinking like a forest”. It is a suite of techniques (a tool kit) that are applied for the protection, restoration, and cultivation of forests and trees for any of the social values that forests and trees may have. The techniques are used to achieve social goals (drivers). However, the techniques are governed (guided) by the ecology of the forest. The ecology must therefore be recognized as a set of constraints of what you can and can not do to achieve the desired social values.
2. Good silviculture is applied at the stand scale (defined by site, species composition, competition and age class). Stands are arranged in ways to insure compatibility of different social values either within a stand or across stands. Social values, and the spatial and temporal scales that they are managed for, are governed by ecological constraints of the stand AND larger spatial ecosystem level processes (usually hydrological).

My perspective:

Never throw any part of the “toolkit” out through regulation. Cook book regulations and silvicultural systems have no place other than the dumpster. There is a use for every manipulation or technique in silviculture depending upon the unique circumstance of the site and social value desired.

B. GENERAL CONSIDERATIONS FOR UPLAND NATURAL FOREST SYSTEMS which are usually on marginal lands, and where social benefits are multiple and are not dominated by any.

1. Across the landscape, and the stands composed within, it is wise to maintain the full assemblage of species compositions, age class distributions, and site ecologies/disturbance types represented within the region.
2. Across a landscape, stands need to be allocated to passive and active management regimes based on ecological constraints (usually relating to unique ecology, hydrology and soil sensitivity, operability). Consider this a dynamic allocation process over time – passive uses can become active and active can become passive.
3. For the majority of stands it is wise to insure the ability to regenerate the full complement of species that should be represented on the site. Maintain the diversity of the regeneration niche.

My perspective:

- i) Social values change much more rapidly than trees grow – the manager needs to be able to accommodate such changes with a diverse “forest stock portfolio”
- ii) Maintaining a diverse portfolio in species composition and regeneration guilds at the stand level, and in age-class distributions and competition at the landscape scale, will maximize resiliency (and redundancy) to ecological and human impacts (acute – hurricanes, tornadoes, floods; chronic – diseases, insects, invasives, pollutants, overbrowsing).

C. ECOLOGICAL CONSIDERATIONS FOR SOUTHERN NEW ENGLAND

1. Autecology - the oak-maple-coniferous forest is relatively shade intolerant, driven largely by episodic disturbance regimes of human and natural origin. Most species in these forests are maladapted to lethal, but adapted to release disturbance processes that are driven by initial floristics.
2. The stand dynamics paradigm is a useful concept to use for understanding the competitive and facilitative interactions of species mixtures.
3. Stand initiation is the most critical period to insure establishment and release of most of the shade intolerant/intermediate tree species that rely upon advance regeneration
4. The stem exclusion stage is the most fragile stage of stand development

D. SILVICULTURAL PRINCIPLES FOR MANAGING SOUTHERN NEW ENGLAND

1. Regeneration: The majority of stands should be treated by various kinds of shelter-wood which change in structure, and timing with topographic position. In more extensive stands patch/group selection can be applied.
2. Stand dynamics: Cleaning (stem exclusion) and Crown thinings/Crop Tree (post stem exclusion) are the most compatible stand level treatments to accelerate developmental process, structure, and size class distribution
3. Regeneration caution: A minority of stands/sites can be managed for specific social values that may simplify stand composition (structure/age) – seed tree, clearcut, single-tree selection, coppice, plantations.
4. Stand dynamics caution: A minority of stands can be managed for specific social values that may simplify stand composition (structure/age) – weeding and liberation release; low, selection, and mechanical thinnings; fire; various intensive site prep treatments.