

BIODIVERSITY - YOUNG GROWTH

Goal: Maintain ecosystems capable of supporting the full range of native and desired non-native species and ecological processes. Maintain a mix of representative habitats at different spatial and temporal scales. Provide for the continuation of timber uses and resources by the timber industry and Alaska residents.

Objective: Manage young growth to improve habitat for wildlife and commercial timber products. Review standards and guidelines for applicability to young growth stands.

Background: Even-aged management of timber lands significantly alters habitat suitability for wildlife species. The suitability of that habitat changes over time as natural restocking occurs. Near term, post harvest, many clearcut areas provide increased forage and cover for wildlife. However, as a dense, even-aged overstory becomes established and outcompetes understory species for resources, habitat suitability for wildlife is drastically decreased. A priority of the 2008 Tongass Land Management Plan is to use established silvicultural methods to manage young growth stands to increase future timber harvest potential and improve stand characteristics for the benefit of wildlife

Biodiversity Question 2: Following young-growth treatments, is the change in understory vegetation providing improved habitat for key old-growth associated species?

Evaluation Criteria

The effect of young-growth treatments on understory vegetation and habitat for key old-growth associated species will be determined by assessing the acres of treatment in young-growth stands and reviewing literature and research findings for young-growth treatment effects to understory vegetation.

The following describes research projects that occurred in fiscal year 2009.

TWYGS - The Forest Service's Pacific Northwest Research Station designed and is monitoring and evaluating a Tongass-wide young-growth study (TWYGS) to assess the response of understory plants, overstory trees, and slash loading to several silvicultural treatments. Treatments that began in 2002 were completed by 2006 and included altering stand composition by artificially regenerating stands with red alder, pruning treatments, and precommercial thinning to various densities. Responses to treatments will be assessed at five year intervals after initial treatment. The study is intended to last a minimum of 20 to 30 years to assess long-term responses to treatments (McClellan 2007).

POW Commercial Thinning—The Pacific Northwest Research Station designed and will be monitoring this 3 replicate test of mechanized thinning in older young growth stands on Prince of Wales Island. The primary objective of this study is to evaluate the feasibility and effects of commercial thinning in even-aged western hemlock-Sitka spruce stands in southeast Alaska. Short-term findings will address logging feasibility,

harvesting costs, product yields, harvest-related tree damage, and soil disturbance. Longer-term findings will address effects on understory plant diversity and abundance, deer forage availability, light availability, forest structure, stand growth and yield, and post-harvest tree damage.

Monitoring Results

Of the 5.64 million acres of productive forest land on the Tongass, 4.95 million acres or 88 percent are old growth and are referred to as productive old growth (POG). The remaining 0.69 million acres are young-growth forest. Young growth is forest growth that has regenerated naturally or has been planted after some disturbance (e.g. clearcut harvest, serious fire, catastrophic windthrow, or insect attack) to the previous forest growth. About 0.45 million acres of the young growth is a result of timber harvest and the remainder is a result of natural processes (e.g., wind, fire, glacial retreat) (USDA 2008c, p. 3-134).

Based on information provided in the Forest Service Activity Tracking System (FACTS) database, an estimated 192,567 acres of young growth stands were thinned since fiscal year 1964. Approximately 18,074 acres of this was thinned for wildlife or riparian habitat restoration. In the past 10 fiscal years, 62,004 acres of young growth were thinned. In fiscal year 2009, approximately 6,491 acres of young growth were thinned. An estimated eight percent (536 acres) was specifically for wildlife or riparian habitat restoration.

Research is being conducted to assess changes to stand structure, including understory vegetation, as a result of different thinning methods. Final results have not been completed for the TWYGS and Commercial Thinning Study projects. A review of existing research shows that young-growth stands vary in their value to wildlife but can potentially contribute more, in terms of structure and function, through active stand management. After clearcut harvesting, rapid establishment and regeneration of conifers, shrubs and herbaceous plants are expected. For the first 15-25 years after clearcutting, these young-growth stands provide a greater understory plant biomass than old-growth stands. However, an increase in snow accumulation due to reduced cover makes them less useful during the winter for some species habitat. After 20-30 years, the forest canopy closes and enters the stem exclusion stage (Alaback 1982). Canopy closure can last up to 100 years or longer and eliminates most understory herbs and shrubs (Alaback 1982). The stands that develop after clearcutting are even-aged and lack understory diversity. Thinning is a tool used to manage young growth stands to accelerate growth and develop a mature forest structure. Young-growth stands can be treated through release, pre-commercial thinning, and commercial thinning to concentrate growth in fewer, larger trees (USDA 2008c, p. 3-138). Thinning reduces the standing stock of trees to a level that encourages better growing conditions through increased light and reduced competition for light, growing space and nutrients within the stand. This benefits wildlife by diversifying the structure and increasing the understory vegetation of the residual stand.

Active young-growth management has the potential to benefit many species. Benefits to both marten and goshawk occur through an increase in small mammal populations and by speeding the succession of older young-growth stand toward old-growth condition. Red squirrels and red-backed voles, major prey items of these species, benefit from more open forests with abundant understory vegetation. Key features of old-growth forest, including large, mature trees, multiple canopy layers, standing snags, down woody debris, and a diverse and abundant herb layer. These features can be maintained or created by retaining structures and organisms at the time of regeneration harvest of old-growth forest and through active management of young, even-aged stands. Thinning of young-growth stands has beneficial impacts to black-tailed deer by opening up the forest and promoting the growth of understory vegetation (USDA 2008, p. 3-255; Hanley 1996, 2005). Due to the lack of light penetrating the understory, deer forage availability is at its lowest when stands are in the stem exclusion phase. Lack of available light causes a decline in lower tree limbs and results in understory plant mortality. Activities such as thinning, girdling, or pruning open the forest canopy and result in increased understory biomass. Therefore, thinning leads to an increase in the amount of forage available for deer.

There are still many uncertainties related to appropriate young-growth treatment designs, specific beneficial effects of such treatments, and implications for deer. The Tongass National Forest, in collaboration with the Pacific Northwest Research Station, is conducting the Tongass-Wide Young Growth Study (TWYGS) to address many of these uncertainties. TWYGS is the most extensive and intensive study of young-growth ever conducted in Southeast Alaska. The study is designed to evaluate the potential benefits of treating pre-commercial stands to increase wildlife habitat and for wood production. Initial results indicate that the potential for restoring diverse and abundant understory plant communities through the active management of young stands is promising (*Young-growth Management*, presented at the Tongass Conservation Strategy Review Workshop 2006). Other potential approaches to even-aged management are also being assessed including thinning of older, “commercial” aged young-growth stands (Deal 2001, Deal and Tappeiner 2002, Deal et al. 2002), the role of red alder (*Alnus rubra*) in the reforestation of harvested areas to expedite the production of large-diameter conifers (Deal 1997, Deal et al. 2004, Hanley et al. 2006), and the initial use of alternatives to clearcutting (McClellan et al. 2000).

Evaluation of Results

New information does not support any changes to the Forest Plan at this time. The management of young growth appears to produce positive benefits to wildlife by shortening the stem-exclusion phase of stand development when tree crowns are crowded and forage availability is at its lowest. Young growth treatment methods can be considered for use to extend the period that understory forage is available for species such as deer, increase habitat for certain prey species, or promote conditions that mimic old-growth stand characteristics at a faster rate than would occur without treatment (USDA 2008c, p. 3-138).

Action Plans

- Continue to review the results of young growth research.
- Develop a strategy to identify what key old-growth associated species should be addressed and how key habitat components should be monitored.
- Review project level monitoring that is occurring and assess if there is a way to apply the results of this information forest-wide.
- Assess if TWYGS results can be used to assess habitat relations for key species (i.e. small mammals).

Citations

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