CENTRAL HARDWOOD NOTES

Assessing Regeneration Potential

When a regeneration harvest cut is planned for even-aged stands or it is time to make another cut in uneven-aged stands, the first thing to do is assess the regeneration potential. Regeneration potential is the likelihood of being successful in reproducing desired species. You need an assessment to be reasonably sure that regeneration and management objectives can be met. In even-aged stands, an assessment will help determine which regeneration method to use. In uneven-aged stands it will help determine where to locate groups, which species are reproducing, and how the reproduction is growing.

An assessment answers the following questions:

1. What is the site quality?

   Is it suitable for the species desired or which other species will grow well on the site? (See Notes 4.01 The Importance of Site Quality, 4.02 Measuring Site *Qualify in the Central Hardwood Region,* and 4.03 *Forest Site Classification in the Interior Uplands.)* Site quality is also important because advance oak regeneration must be larger and/or more numerous on good sites than on poor sites to become established in the new stand or in openings.

2. What is the source of the reproduction of the species desired?

   Primary resources are seed, advance reproduction, stump or root sprouts or a combination of these sources. *(See* Note 3.01 *Principles of Natural Regeneration)*

3. If the source is advance reproduction, is the advance reproduction adequate to replace the current stand?

   Answering this question requires making an inventory that includes size, numbers, and distribution of the advance reproduction. In general, large advance reproduction stems of any species will grow faster and compete better than small stems. So, the larger an advance reproduction stem, the higher its potential to become dominant or codominant in the new stand.

4. How many sprouts can be expected from stumps of cut overstory trees of the desired species?

   An inventory by broad diameter classes and species must be made to answer this question. Except for some oaks, information is not available on stump sprouting frequency for important central hardwoods. Stumps of small or

young trees generally sprout more frequently than stumps from large or old trees. You can use this general relationship to get a rough estimate of the number of sprouts to expect.

5. If advance reproduction plus stump sprouting are not adequate, are new seedlings needed, and if so, are the desired species present in the overstory?

   If there are a few yellow-poplar and/or white ash overstory trees, you can expect new seedlings of these species to be present in the reproduction, especially on good sites. These seedlings will come from seed stored in the fitter, but there is no way to accurately estimate how many seedlings will result. In the eastern part of the central hardwoods area, numbers of new seedlings in experimental cuts have ranged from about 1,000 to more than 10,000 per acre for yellow-poplar and from about 300 to 2,000 per acre for white ash. While not all of these seedlings will survive and grow well enough to become part of the dominant stand, regeneration of desirable species is not a problem in mixed hardwoods.

6. How severe is the competition from unwanted species likely to be?

   We do not have techniques to estimate competition severity. However, when surveys show that advance reproduction plus stump sprouts of the desired species are adequate, and/or where yellow-poplar seedlings are expected, the desired species will be able to compete successfully if the regeneration method recommendations are followed (see Notes 2.05 Silvicultural Systems for Oak-*Hickory and Oak-Pine, 2.06 Silvicultural Systems for Bottom/and Hardwoods,* and *2.07 Silvicultural Systems for Harvesting Mixed Hardwood Stands).* Where new seedlings of oak or pine are needed, existing understories that contain largely unwanted species must be controlled. Follow the recommendations for the regeneration method that will be used.

If your assessment indicates there will be enough natural reproduction of desired species, the stand can be harvested. If there will be insufficient natural regeneration, the final harvest must be delayed until natural regeneration is adequate. There may be opportunities to supplement the natural regeneration with planted seedlings *(see* Note *3.05 Seeding and Planting Hardwoods).* The major considerations in evaluating regeneration potential for planted seedlings are choosing the right species for the site, the appropriate size seedlings to plant, seed source, and competition control.

Note 3.03 outlines *How to Assess the Oak Regeneration Potential in the Missouri Ozarks.* A similar procedure by Marquis et *al.* exists for hardwood stands in the Alleghenies. Both are complex and you should use them only with professional help or training. The Carvell publication listed in the References suggests ways to assess regeneration potential and leaves the choice up to the user.

For other areas definitive data for adequate amounts of the different kinds of reproduction are not generally available. Your best source for these kinds of recommendations are from local or regional silviculturists.

References

Catvell, K.L. 1988. Field guide for analyzing hardwood stand regeneration. In: Guidelines for regenerating Appalachian hardwood stands; 1988 May 24-26; Morgantown, WV. SAF-38-03. Morgantown, WV: West Virginia University: 148-155.

Marquis, D.A.; Ernst, R.L.; Stout, S.L. 1984. Prescribing silvicultural treatments in hardwood stands of the Alleghenies. Gen. Tech. Rep. NE-96. Broomall, PA: U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station. 90 p.

Sander, I.L.; Johnson, P.S.; Rogers, Robert. 1984. Evaluating oak advance reproduction in the Missouri Ozarks. Res. Pap. NC-251. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 16 p.

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