

Data Submitted (UTC 11): 8/23/2022 4:00:00 AM

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Comments: Many environmental organizations urge the Forest Service to adopt a definition of "mature and old-growth" that includes all forests and trees older than 80 years. As an ESA-certified ecologist and Maryland-certified Forest Professional with extensive experience in Eastern U.S. forests, my experience is that 80 years is a reasonable number, at least for Eastern deciduous and mixed forest. I have found that forests of this age and older tend to be more structurally and species diverse in flora and fauna. Forest structure is especially important for birds, which have species-specific nesting and feeding habits. And cavity nesters require old trees or snags.

The attached paper, "Defining the Minimum Age of a Mature Forest in Either Legislation or Regulation" (Kerr 2020), urges the use of culmination of mean annual increment (CMAI) to define tree maturity. The mean CMAI of mid and late-successional tree species from this paper is 84 years (+/-25), which rounds to 80 years.

The 1998 Tyrrell et al. report (<https://www.fs.usda.gov/treearch/pubs/10261>), which collated a lot of stand data, is also an excellent resource. Since it is a FS product, I assume you're familiar with it. :)

Old growth forest (as opposed to mature forest) is especially rare and deserves special protection. Indicators include a predominance of canopy trees that are old, large (depending on growing conditions), and late successional; evidence of tree gap dynamics; fallen logs in advanced stages of decomposition; the presence of snags; multiple layers; undisturbed soils; pit and mound structure; a diverse understory; an abundance of lichens and fungi; and an absence of signs of human disturbance. These features depend on numerous factors, including forest type, climate, soils, topography, and disturbance history. In difficult growing conditions, an old-growth community might not meet typical standards. For example, rocky soils, exposed ridge tops, dry, sandy soils, shale barrens, river scours, or maritime or saline conditions may retard forest growth, favor certain species, and affect ecosystem structure and functions.

Finally, I urge the consideration of mature forest-dependent wildlife as indicators of forest maturity. For example, old and mature forest supports some species rarely found in younger forest, such as barred owl, red-shouldered hawk, Acadian flycatcher, Blackburnian warbler, and brown creeper. A study of breeding birds in Pennsylvania (Haney and Schaadt, 1996) found both a higher density of individuals, and a greater number of species, in old growth as compared to younger or managed forest. This was especially true for neotropical migrants. I have found this to be true in Maryland also (e.g., Weber et al., 2008).

Citations:

Haney, J.C., and C.P. Schaadt. 1996. Functional roles of eastern old growth in promoting forest biodiversity. P. 76-88 in *Eastern Old Growth Forests: Prospects for Rediscovery and Recovery*, M.B. Davis (ed.) Island Press, Washington D.C. 383 pp.

Tyrrell, Lucy E.; Nowacki, Gregory J.; Buckley, David S.; Nauertz, Elizabeth A.; Niese, Jeffrey N.; Rollinger, Jeanette L.; Crow, Thomas S.; Zasada, John C. 1998. Information about old growth for selected forest type groups in the eastern United States. General Technical Report NC-197. St. Paul, MN: U.S. Dept. of Agriculture, Forest Service, North Central Forest Experiment Station.

Weber, T., P. Blank, and A. Sloan. 2008. Field validation of a conservation network on the eastern shore of Maryland, USA, using breeding birds as bio-indicators. *Environmental Management* 41:538-550.

ATTACHMENT: Defining the Minimum Age of a Mature Forest in Either Legislation or Regulation, by Andy Kerr,

The Larch Company, December 21, 2020