

Ohio Hills Adaptive Silviculture for Climate Change Sitewide Goals and Objectives:

With links to state and federal plans

1. Manage for a compositionally and structurally diverse sustainable oak ecosystem (State Plan 1¹).
 - Emphasize oak regeneration where seedlings are most competitive on Dry-Oak and Dry-Mesic landtypes.
 - Preserve overstory oaks where oak regeneration is unlikely in Bottomlands and mesic sites (State Plan 1.3).
 - Use all available silvicultural strategies and fire in management (Wayne 6.1.1², Wayne 6.2).
 - Establish multi-age/cohort stands to promote structural diversity (State Plan 3.1, Wayne 4.3).
 - Use forest management to emulate natural range of variability in disturbance to promote heterogeneous stand conditions at landscape scale.
 - At the landscape-scale, manage for diverse forest successional stages to encourage heterogeneous habitat types of forest-dependent wildlife (State Plan 3, Wayne 4.1, Wayne 4.4).
 - Increase the area of early-successional forest habitat (age class <20 years old) (State Plan 3.2).
 - Maintain and promote mature forest types for wildlife species, such as cerulean warbler and Kentucky warbler, that are low-level disturbance specialists (Assessment³).
2. Consider visual aesthetics where timber harvesting is recommended (State Plan).
3. Support Ohio's timber industry by promoting important commercial species such as white oak (Assessment).
4. Mitigate risks of invasive species establishment or spread.
 - Establish monitoring for invasive insects such as spongy moth, hemlock woolly adelgid, and Asian longhorn beetle, (State Plan. Wayne 7).
5. Sustain and promote organismal and functional diversity (Wayne 4.1, Wayne, 6.1, State Plan 2.2, State Plan 3.1, State Plan 3.4).
 - Ensure forest management activities promote organismal diversity from understory (herbaceous plants) to canopy (tree species).
 - Protect state and federally recognized threatened and endangered species, including timber rattlesnake and *Myotis spp.* bats.
6. Protect known or discovered archaeological resources.
7. Employ all applicable water quality best management practices during timber harvest.
8. Support and provide recreational opportunities, hunting and wildlife watching, through diversifying forest age and structure (e.g., early-successional habitat for hunting) (Strategy 2.3.1⁴).
9. Support demonstration and science delivery.
 - Demonstrate sustainable forest management under climate change (State Plan 2.2).
 - Provide demonstration stands and support outreach.
 - Support long-term research (Strategy 1.1.3).
 - Establish monitoring for future forest health threats (Strategy 5.1.2).

¹ Ohio Department of Natural Resources Division of Forestry Forest Management Plan for State Forests 2021-2031

² [Wayne NF 2006 Land and Resource Management Plan \(2006 Forest Plan\)](#)

³ ["Assessment" Ohio's Statewide Forest Action Plan: Forest Resource Assessment](#)

⁴ ["Strategy" Ohio's Statewide Forest Action Plan: Forest Resource Strategy](#)

Ohio Hills Adaptive Silviculture for Climate Change Inventory Summary:

The Ohio Hills ASCC study is located within southeastern Ohio's Interagency Forestry Team's Collaborative Oak Management Region. Forty-one stands were considered for this study and a total of 17 stands (23 – 115 acres in size) distributed within Vinton Furnace State Experimental Forest (VFEF) and Zaleski State Forest (ZF) were selected as prospective research stands for this experiment. The process for identifying the final selection included locating stands with similar stocking, basal area, and merchantable medial diameter across the heterogeneous landscape. The prospective area is 610 acres (247 ha) in size. Forests range from dry to mesic and predominant tree species include White Oak, Black Oak, Chestnut Oak, Red Maple, Yellow Poplar, and Sugar Maple. The prospective stands include a mixture of ridgetop (17%), SW upper hillslope (21%) and SW lower hillslope (12%) habitats, collectively referring to the Dry-Oak Ecological LandType of the region (51% of the total prospective area). The Dry-Mesic LandType occupies 30% of the prospective area, including 18% NE upper hillslopes and 12% NE lower hillslopes. The remaining 20% of the area is of the Bottomland LandType. We combined ODNR Division of Forestry [SILVAH](#) inventories with SILVAH inventories collected in January – March 2021. The following includes data from 156 plots.

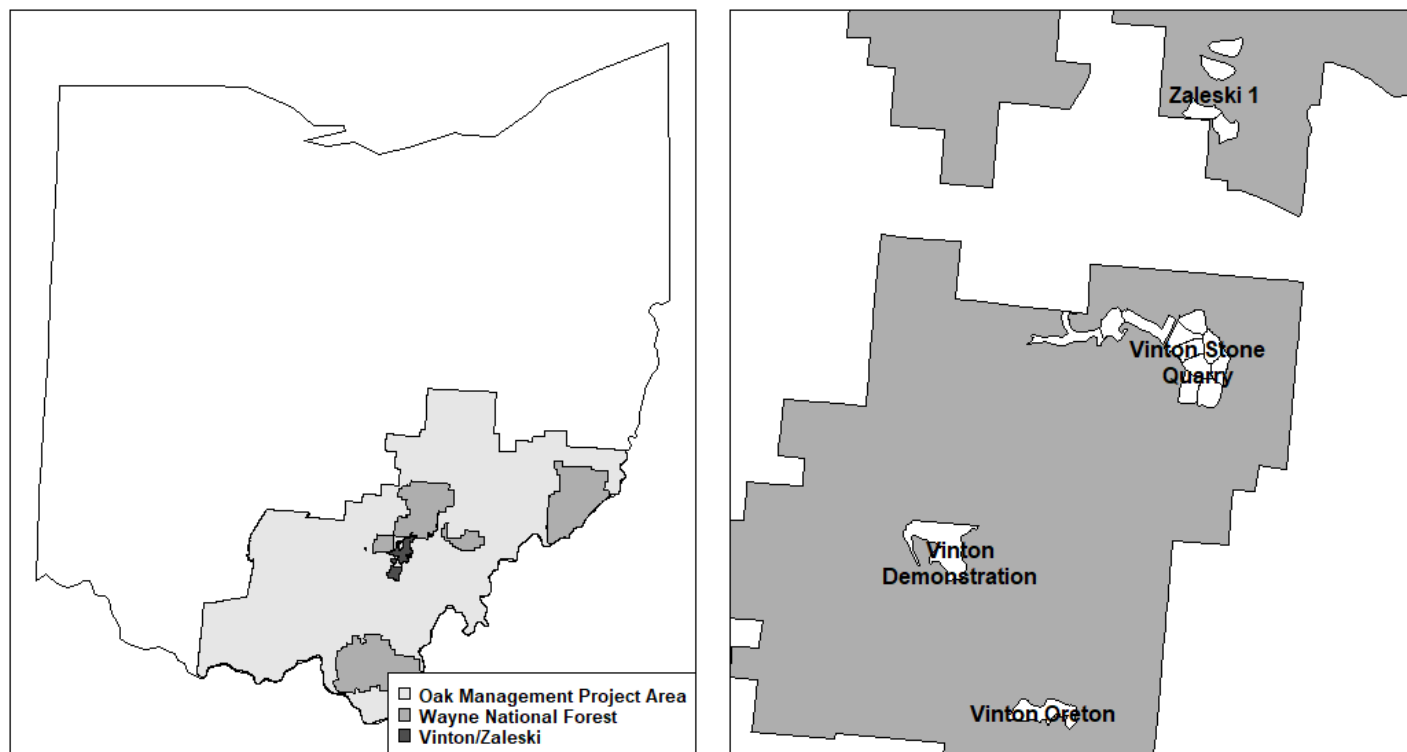


Figure 1. Locations of 17 experimental research stands (23-115 acres in size) among VFEF and ZF.

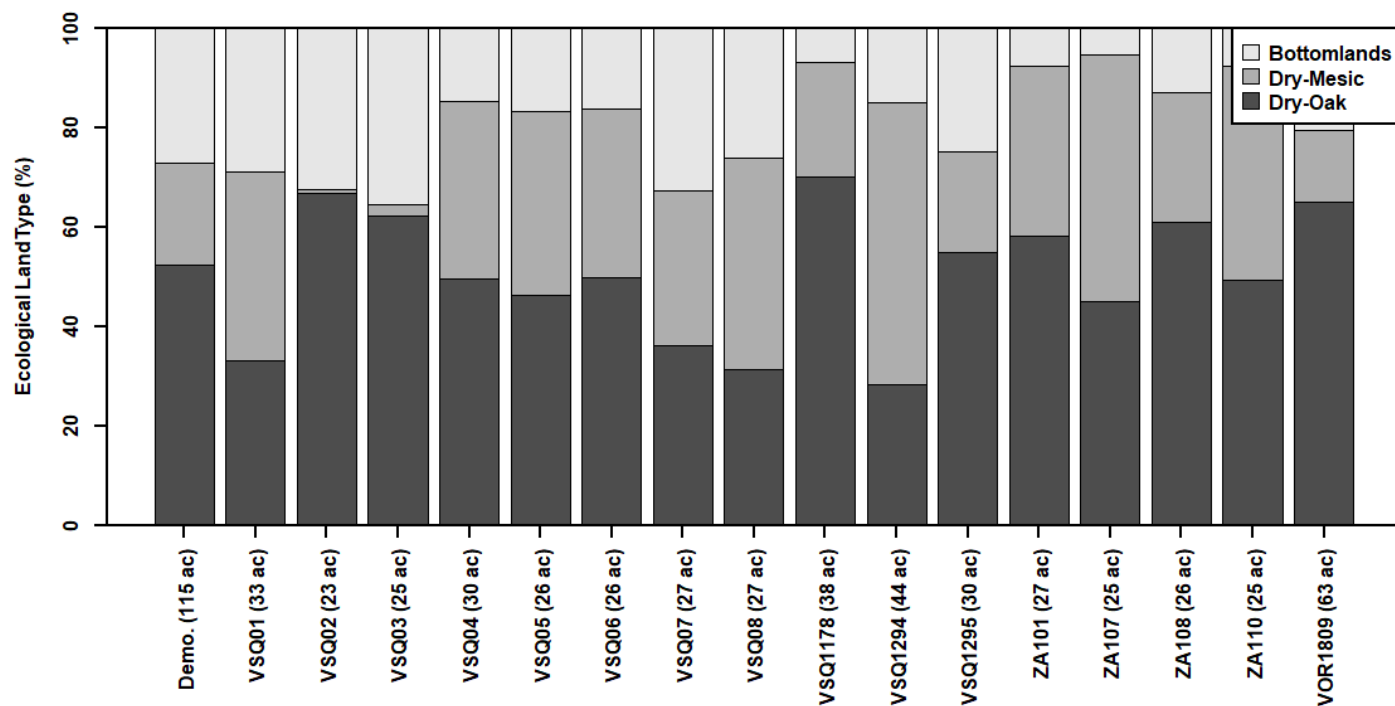


Figure 2. Percent Ecological LandType of prospective research stands.

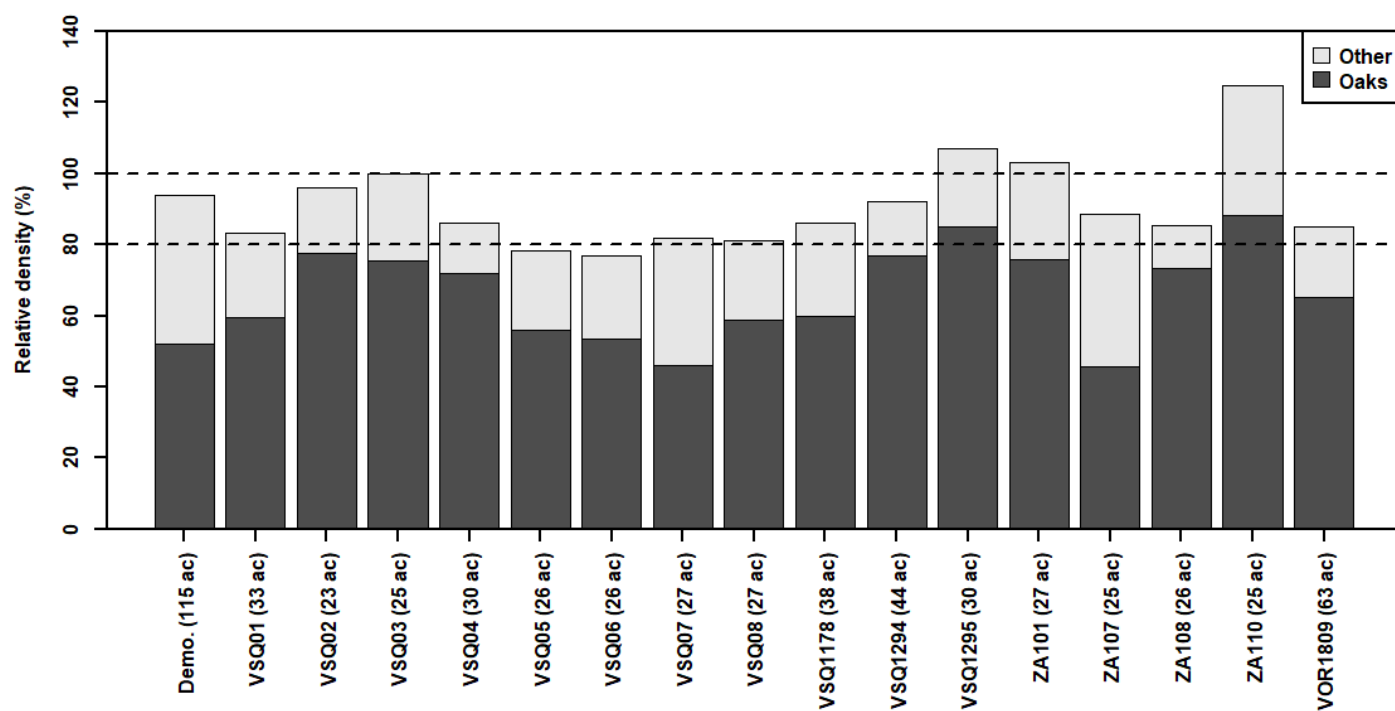


Figure 3. Relative density (Stout et al., 1987) of oaks and other species among the prospective research stands.

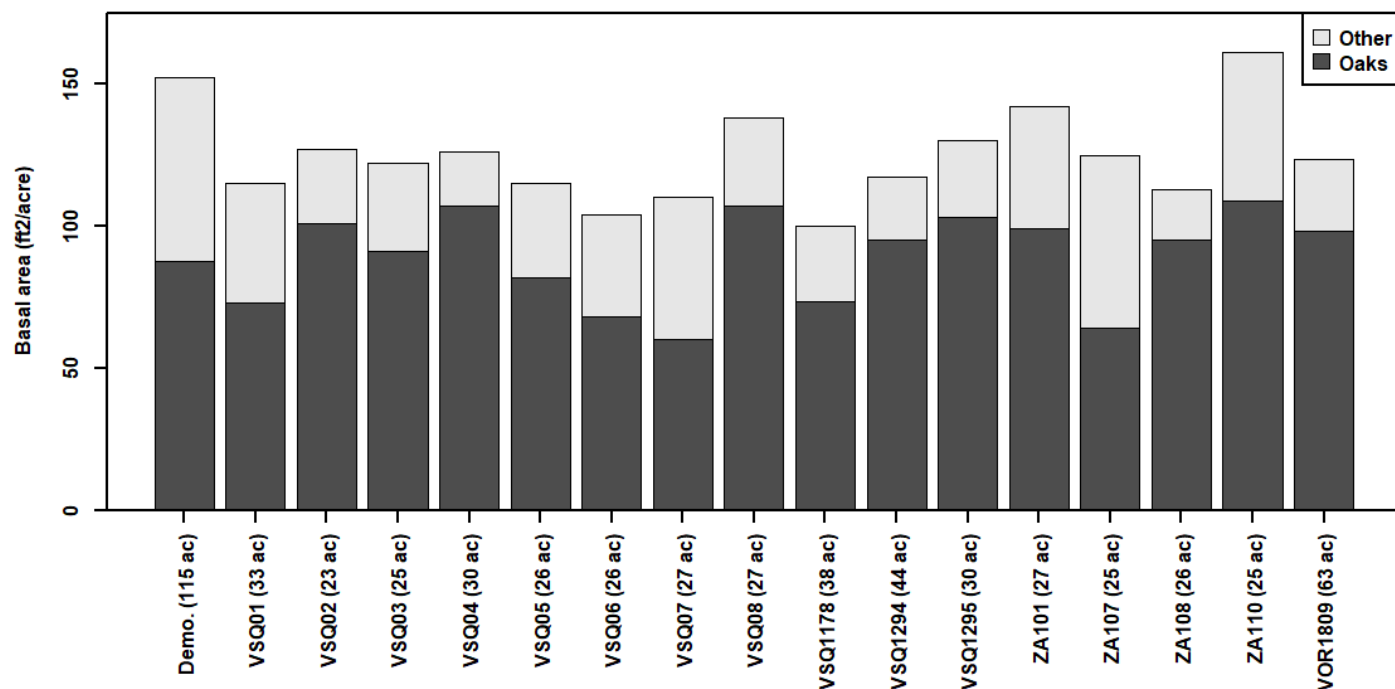


Figure 4. Basal area (ft²/acre) of oaks and other species among the prospective research stands.

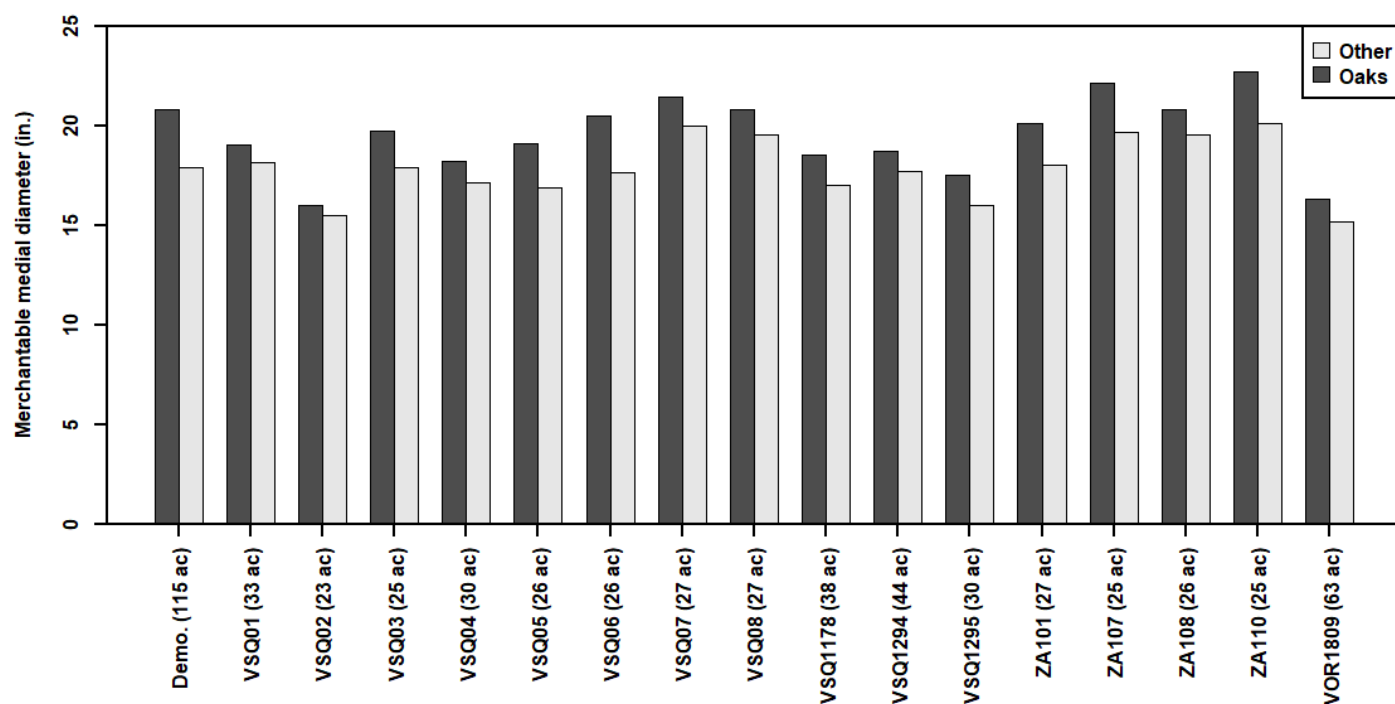


Figure 5. Merchantable medial diameter (in.) of oaks and other species among the prospective research stands.

Literature cited:

Stout, S.L., Marquis, D.A., Ernst, R.L., 1987. A relative density measure for mixed-species stands: tree-area ratios are more accurate than stocking charts. *J. For.* 85, 45–47. <https://doi.org/10.1093/jof/85.7.45>