NCASI

Forestry Program Research Highlights

2025

IMPACT. SCIENCE. SOLUTIONS.

High-Level Research Summaries For Key Issues

ISSUES COVERED

Trends in Forest Gain/Loss	Biodiversity	Forest and Water	Forest Carbon

Forest Gain/Loss – Southeastern U.S.

- Harvesting rates in the southeastern U.S. have slightly declined and there continues to be a surplus of growth compared to harvest (NCASI 2022[1]).
- The southeastern U.S. continues to grow far more timber than is harvested. Annual growth amounts to 681.6 million green tons, while harvest totals 390.8 million tons (USDA 2022[2]).
- It is important to understand that the primary driver of forest loss in the southeastern U.S. is conversion due to urbanization (Olson 2020[3]).

Biodiversity – Southeastern U.S.

- Research has demonstrated that active forest management within managed pine landscapes contributes to conservation of biological diversity (e.g., Loehle et al. 2006[4]; Miller et al. 2009[5]; Verschuyl et al. 2011[6]; Iglay et al. 2012[7], 2014[8], 2018[9]; King and Schlossbert 2014[10]; Bender et al. 2015[11]; Demarais et al. 2017[12]; Parrish et al. 2017[13]; Levy et al. 2025[14]).
- Different species require different forest conditions; therefore, there is no one set of forest management recommendations that will benefit all species in a single stand (e.g., Guldin et al. 2007[15]; Favorito et al. 2023[16]).
- At the landscape scale, forest management can provide a changing needs throughout the year (e.g., Edwards et al. 2004[17]; Miller and Conner 2005[18]; Brooks 2009[19]; Bender et al. 2015[20]; Homyack et al. 2016[21]; Guzy et al. 2019a[22], 2019b[23]; Perea et al. 2025[24]).

Water from Forests and Best Management Practices (BMPs)

- State and private forests contribute 370 billion m^3 yr^{-1} to the surface water supply with approximately 55 million people in the southeastern US deriving some portion of their drinking water from private forests (Liu et al. 2020[25]).
- Forestry BMPs, when properly applied, are highly effective at reducing erosion and the potential for sediment delivery to waterbodies in the southeastern US (Cristan et al. 2016[26]; Fielding et al. 2022[27]; Hawks et al. 2022[28]; Hawks et al. 2023[29]).
- Application of forestry BMPs coupled with state monitoring programs and participation in forest certification programs, that require routine third-party audits, provide assurance to federal and state agencies that BMPs protect aquatic resources and species (Warrington et al. 2017[30]; Schilling et al. 2021[31]).

Forest Carbon

- Forests remove CO_2 from the atmosphere and store it in live trees, dead wood, and harvested wood products; therefore, sustainably managed forests play a key role in mitigating effects of climate change (Nabuurs et al. 2007[32]).
- While it is true that mature and old growth forests store more C than younger forests, younger forests sequester C at a much faster rate (Gray et al. 2016[33]).
- Forest growth trajectories show more rapid growth at young ages than at older ones, therefore maximizing C storage can be best achieved at harvest rotations near the culmination of mean annual increment (peak of average annual growth; Diaz et al. 2018[34]).
- While reduced harvest levels may lead to an increase in forest C stocks, it may also lead to increased use of substitute products that are accompanied by much higher emissions from production and use (Churkina et al. 2020[35]; NCASI 2020[36]).

CONCEPT CONNECTIONS

- Younger forests sequester carbon at a faster rate than older forests and are important for diversity of wildlife species, including some in decline.
- Active forest management, including implementing BMPs, at a landscape scale, maintains a diversity of forest and cover types and conditions to support biodiversity, water quality, and carbon sequestration and storage.
- Economic return on forests encourages maintaining ecosystem services and sustainable wood fiber.

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