Suburban Lawns and Ecological Productivity

Supporting citations for the claim that conventional turfgrass lawns are significantly lower in biological and ecological productivity than more diverse landscapes.

Biodiversity & Ecological Homogenization

1. Groffman et al. (2016) — Landscape and Urban Planning

A study comparing residential lawns at NSF Long-Term Ecological Research sites across six U.S. cities (Phoenix, Baltimore, Minneapolis-St. Paul, Miami, Boston, and Los Angeles) found that plant communities in residential lawns had more in common with each other than with their unmanaged regional counterparts — representing a continental-scale ecological homogenization. Turfgrasses dominated all sites regardless of local climate or native vegetation type.

Summary coverage: phys.org/news/2018-07-decline-biodiversity-suburban-ecosystems.html

2. Burghardt, Tallamy & Shriver (2009)

Demonstrated that native animal diversity is generally correlated with native vegetation diversity — meaning monoculture turfgrass lawns, which eliminate native plant diversity, correspondingly impoverish native fauna. Cited widely in urban ecology literature as a foundational link between plant and animal biodiversity in residential landscapes.

Referenced in: University of Florida IFAS Extension — Florida's Biodiversity: The Impact of Turfgrass Lawns

3. Ignatieva et al. (2020) — Land (MDPI), "Lawns in Cities: From a Globalised Urban Green Space Phenomenon to Sustainable Nature-Based Solutions"

Reviews the global proliferation of conventional lawns and documents their disservices including greenhouse gas emissions, groundwater pollution, overuse of water, herbicide application, and — centrally — low biodiversity value. Proposes nature-based alternatives including urban meadows and native grasslands as ecologically superior replacements.

DOI: https://www.mdpi.com/2073-445X/9/3/73

4. Breuste et al. (2025) — Diversity (MDPI), "Rethinking Urban Lawns: Rewilding and Other Nature-Based Alternatives"

A recent (2025) peer-reviewed review drawing on case studies from ten Eurasian cities. States explicitly that conventional, intensively maintained lawns are criticized for their "low biodiversity value and high resource demands," and evaluates strategies for transforming lawns into ecologically and socially resilient landscapes using species-rich meadows and semi-natural grasslands.

DOI: https://doi.org/10.3390/d17120830

Native Plant Replacement & Pollinator Support

5. Wild Ones (2025) — "What is a Pollinator Lawn?"

Synthesizes research showing that conventional turfgrass lawns function as "ecological dead zones." Cites that approximately 2% of the lower 48 U.S. states — nearly 40 million acres — is covered by lawns, making turfgrass the single largest irrigated crop in the country. Documents that converting as little as 10–20% of lawn area to native planting beds can significantly improve ecological function.

wildones.org/what-is-a-pollinator-lawn/

6. University of Florida IFAS — "Florida's Biodiversity: The Impact of Turfgrass Lawns and Non-native Ornamental Plants"

Documents two pathways by which conventional turfgrass landscaping reduces biodiversity: (1) directly limiting native species diversity within turfgrass-dominated areas, and (2) altering surrounding natural habitats in ways that exclude native plants and animals. Concludes that the negatives of non-native plant-dominated landscapes far outweigh any positives for wildlife.

wec.ifas.ufl.edu — IFAS Extension

Note on Carbon: A More Complex Picture

One common counterargument is that turfgrass sequesters significant soil carbon. The research here is genuinely mixed and worth acknowledging:

7. Qian & Follett (2002) / Review in Plants (MDPI, 2022) — Carbon Sequestration in Turfgrass-Soil Systems

Turfgrass systems can function as net carbon sinks with soil organic carbon stocks comparable to some natural systems. However, intensive management (fertilizers, mowing, irrigation) produces offsetting emissions of N_2O and fossil CO_2. Critically, studies showing lawns outperforming native prairies in carbon storage typically require substantial water and chemical inputs — inputs that native, climate-adapted landscapes do not require at all.

https://www.mdpi.com/2223-7747/11/19/2478

The strongest and most consistent evidence supports the biodiversity and ecological function argument. The carbon question requires contextual care. For habitat support, pollinator health, food web integrity, and species richness, native and diverse plantings outperform conventional turfgrass lawns substantially and across many independent lines of research.