USDA Forest Service
U.S. DEPARTMENT OF AGRICULTURE

Northern Research Station

Rooted in Research

ISSUE 33 | JUNE 2024

Impacts of 1930s Redlining Practices on Urban Tree Cover Persist Today

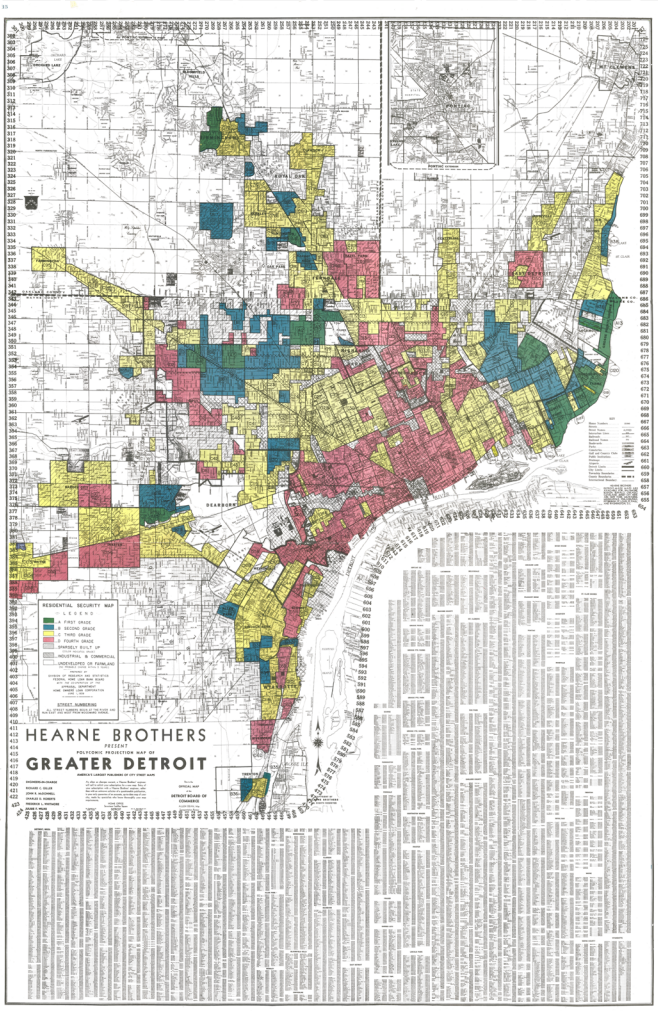
Between 1935 and 1940, the government-sponsored Home Owners' Loan Corporation assigned grades to neighborhoods in hundreds of U.S. cities. The grades supposedly reflected real estate risk and mortgage security and were based in part on recent sales histories and a neighborhood's proximity to various industries. Significantly, residents' race, religion, class, and ethnicity were also considered. The system had four color classes: green (considered the best), blue, yellow, and red.

According to David Nowak, emeritus research forester with the U.S. Department of Agriculture, Forest Service, Northern Research Station, redlined areas tended to include homeowners who were considered at high risk of defaulting on their mortgages. They included immigrants, people with low incomes, non-whites, and members of certain religions. The maps that were drawn, Nowak says, "reflected the racism and other inherent biases of the people who drew them."

Redlining had real-life consequences for millions of families. It created and enforced housing segregation in cities along racial, religious, and income lines. People deemed high risk were restricted to living only in redlined neighborhoods. Properties in those neighborhoods were appraised at lower values because of the location. The system also made it difficult—and sometimes impossible—for non-whites to obtain financing for a mortgage, even in a redlined neighborhood, and prevented many people from becoming homeowners.

KEY MANAGEMENT CONSIDERATIONS

- Formerly redlined urban neighborhoods in the United States still have less tree cover, more impervious ground cover like buildings and pavement, and fewer benefits associated with a natural environment than non-redlined neighborhoods.
- Part of the disparity in tree cover may relate to how redlined neighborhoods were selected. These neighborhoods were often already densely developed areas and had high impervious cover, which limited space for trees both then and now.
- Formerly redlined areas are often densely developed and have little remaining open space, so increasing tree cover may require building green roofs or removing impervious surfaces like roads, buildings, and parking lots to create more space for trees.



A 1939 map of Detroit shows grades assigned to neighborhoods and reflects the prejudices in real estate and housing policy between 1935 and 1940. City Survey Files, 1935-1940/National Archives.

A Study on Redlining and Tree Cover

Redlining affected a neighborhood's tree cover. Nowak and coauthors Alexis Ellis and Eric Greenfield traced the legacy of redlining by examining the tree cover in all redlined areas in U.S. cities. They used geographic information from official 1935 and 1940 maps, data from the 2010 U.S. Census, national tree and impervious cover maps, and i-Tree, which uses satellite and other data to estimate ecosystem services and benefits provided by trees. The authors identified neighborhoods that had been classified as green, blue, yellow, and red and applied data on tree cover and impervious surfaces such as roads, buildings, and parking lots.

The authors found that the grades assigned in the 1930s have had a lasting effect. Neighborhoods that were classified green (the highest rating) now have more than 40 percent tree cover and about 30 percent impervious cover; neighborhoods that were classified red now have about 21 percent tree cover and 53 percent impervious cover. The result over time is that people living in redlined areas have had reduced access to the environmental benefits associated with tree cover—lower summer temperatures, lower energy use in buildings, less air pollution, less water runoff, and more carbon storage—than residents who have lived in other neighborhoods.

The authors also estimated the economic effects of reduced tree cover using the i-Tree application, which puts dollar values on services like stormwater storage and energy savings for buildings that are shaded by trees in summer. They calculated that if formerly redlined areas had had the same percentage of tree cover as formerly green areas today, U.S. cities and residents would have conservatively received $308 million more each year in environmental benefits and services.

A tree-lined city neighborhood. Licensed photo by John/Adobe Stock.

Not all differences in today's urban tree cover found were caused by redlining. Redlined areas already had higher population densities and more impervious surfaces at the time the maps were drawn, and these differences have persisted over time. Even if tree planting were increased today in formerly redlined areas, tree cover would still be lower than in formerly green, blue, or yellow areas because less greenspace is available.

Countering Tree Cover Inequities over Time

The challenge for today's planners, urban foresters, and policy makers is to use this information as they make planning choices about tree cover. In newly developing areas, leaving ample greenspace can allow for greater tree cover and support the healthy growth and development of individual trees. In already developed areas, it is more challenging to increase greenspace and tree cover. The authors suggest that city policies could be directed to help offset disparities in environmental services, but Nowak acknowledges that "increasing tree cover in some areas will be difficult without removing impervious surfaces. If you want to create a park or large greenspace area in an area that's highly impervious, you could remove parking lots or possibly remove buildings." Planting on rooftops might be possible, but "it's hard to retrofit trees into highly impervious areas," Nowak says. "Going forward, we can design our cities with more parks and greenspace instead of densely packed buildings and other impervious surfaces and thus have a more nature-friendly design."

PROJECT LEADS

David Nowak is an emeritus research forester with the Northern Research Station.

FURTHER READING

Locke, Dexter H.; Hall, Billy; Grove, J. Morgan; Pickett, Steward T.A.; Ogden, Laura A.; Aoki, Carissa; Boone, Christopher G.; O'Neil-Dunne, Jarlath P.M. 2021. Residential housing segregation and urban tree canopy in 37 US Cities. npj Urban Sustainability. 1(1): 15. https://doi.org/10.1038/s42949-021-00022-0.

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