Redline mapping, as practiced by the Home Owner’s Loan Corporation (HOLC) in the 1930s, has been criticized for evident racial discrimination in addition to financial risk assessment. Modern urban tree canopy cover has been demonstrably lower in historically redlined zones of four US cities already. This project focused on Indianapolis, IN, where a HOLC map was developed in 1937. Analysis using a geographic information system (GIS) was conducted to detect evidence of an ecological legacy of redlining. Using this method, evidence of relatively high-intensity development, low greenspace and forest cover, and disproportionately high incidences of brownfield sites, Superfund sites, industrial waste sites, and Interstate highways were detected in historically redlined zones in Indianapolis. While opportunities for further and more detailed research are considered, the method employed here should be developed such that it is replicable for other cities with redlining histories in Indiana and other surrounding states with comparable spatial datasets.