



Brookhaven  
National Laboratory

# 2023 Site Environmental Report

VOLUME 1



The cover for this year's Site Environmental Report features an image of a pinecone from a pitch pine (*Pinus rigida*) tree which is the predominant pine species in Long Island's Central Pine Barrens. Our pine barrens represent one of only three known Atlantic coastal pine barrens ecosystems in the world. These ecosystems are disturbance-dependent which means their existence relies on the actions of a physical force, agent, or process that causes a pronounced change in an ecosystem—e.g., fires, drought, wind events. Pine barrens have evolved over thousands of years in the presence of frequent fires. As a result, plant and animal species of the pine barrens have become adapted to conditions created by periodic fires. For example, pitch pine seeds germinate and grow best on mineral soil in full sunlight, conditions created when fire burns off surface litter and removes competing vegetation.

The image on the inside cover depicts a prescribed fire being implemented at Brookhaven National Laboratory (BNL). Prescribed burns are fires set intentionally in a designated area or unit and set under a specific set of weather and fuel conditions called a prescription. Fires are ignited, monitored, and controlled by individuals specifically trained in the use of fire for management as well as fire suppression.

In the absence of any forest management and aggressive fire suppression over the last 75-100 years, our forests have become overcrowded and extremely unhealthy. Just like in your garden, when you plant vegetation too close together the plants are forced to compete for resources (e.g., light, water, nutrients) resulting in stressed plants that are more likely to be negatively impacted by pests and pathogens. The same is occurring in our forests. Without active management to thin out the forest, trees become stressed and more susceptible to other stressors like the southern pine beetle (*Dendroctonus frontalis*) which has killed enormous swaths of pitch pine trees throughout Long Island.

In addition, without fire to periodically clear out material in the forest understory, there has been a large buildup of wildland fuels. New York State (NYS) has identified the Central Pine Barrens Region of Long Island as having not only the greatest amount of wildland/urban interface in the state, but also as being its most fire-prone area. Under the right conditions, this fuel buildup could lead to the ignition of a catastrophic wildfire, which would not only adversely impact the existing ecology but endanger structures and human life.

This is why prescribed fire is being implemented at the Laboratory. It mimics a naturally occurring process that serves to protect the Laboratory and surrounding communities from wildfires by reducing fuels, helps promote the fire-adapted species endemic to this rare ecosystem, increases biodiversity, and improves overall forest health resilience. The Environmental Protection Division (EPD) conducts prescribed burns with the assistance of BNL Fire Rescue and multiple partner agencies such as the New York State Department of Environmental Conservation (NYSDEC), the Long Island Central Pine Barrens Commission, and the U.S. Fish and Wildlife Service (FWS).

The Brookhaven National Laboratory Site Environmental Report is a public document that is distributed to various U.S. Department of Energy sites, local libraries, and local regulators and stakeholders. The report is available to the general public on the internet at <https://www.bnl.gov/esh/env/ser/>.

To obtain a copy of the report, please write or call:

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