

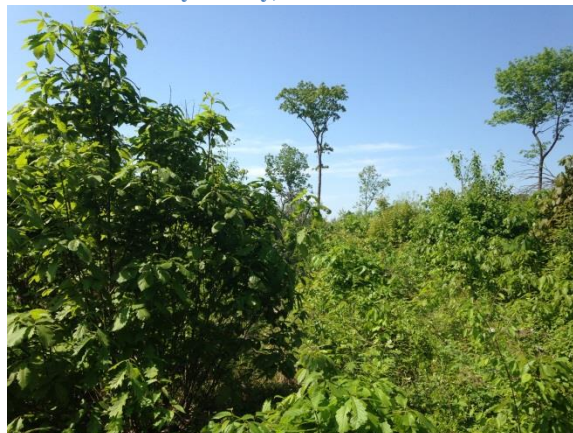
## **New Jersey Forests, Forestry and Your Water**

Clean water – the basis of human health – is a critical societal concern. Forests are the source of nearly two-thirds of water in the lower 48 states. Forests serve as a “living sponge” to capture, store, and then slowly release precipitation as well as trapping and transforming the chemicals and nutrient deposits from rain or runoff. Trees are used as a solution for pollution problems, particularly on farms where forest buffers can protect streams from fertilizers and pesticides, and in developed areas where tree canopy helps to reduce storm water runoff.

Prior to the Forestry movement in the United States, the “timber barons” of the late 19<sup>th</sup> and early 20<sup>th</sup> centuries literally went from coast-to-coast harvesting indiscriminately from sensitive areas in watersheds, causing serious degradation of stream and lake quality, including water supplies to many towns and cities. Problems associated with these practices included sedimentation, excessive amounts of nutrients in the water, and increases in water temperature. Massive fish kills were common. Wildfires, which frequently followed, further added to water quality problems.



**Before Forestry: Cut-over and burned-over forest, ~25 years after harvest, Colorado, 1915 (photo courtesy of the Forest History Society)**



**After Forestry: Successful regrowth, 2 years after harvest, Sussex County, 2016 (photo courtesy of Steven Kalleser)**



**After Forestry: A forest managed under sound forestry principles for 80 years, Warren County, NJ, 2010 (photo courtesy of Charles Newlon)**

Most water quality problems associated with timber harvesting were caused by poorly designed and constructed access roads and their inadequate closure, improper stream crossings, excessive exposure of bare soil, and inadequate stream buffers.

In the late 1800’s Forestry took hold in America, both from the grassroots concern of citizens about their water as well as the influx of professional foresters from Europe. Forestry is a vital component in the greater Conservation movement that says that forests are critically important to human welfare. Those forests must be carefully, thoughtfully stewarded to make sure that they produce what we need: clean water, abundant wildlife and biodiversity, aesthetics, quality recreational opportunities, clean air, improved property values, energy conservation, and – yes – a sustainable wood supply as an alternative to forest-destroying fossil fuels extraction and mineral extraction. Forestry is focused on managing forests for those societal values, of which water quality is at the top of the list.

Sustainable forest management\* practices that

*\* We define sustainable forest management as being conducted in accordance with a forest management plan approved by the DEP State Forester, utilizing recognized silvicultural systems, and following DEP-approved Best Management Practices.*

addressed the failings of the past became prevalent as Forestry became a profession in the early 1900's. Cut-and-run harvesting was replaced with techniques that sought to mimic natural

disturbances. Decades of research and forest practice have resulted in standards that protect against adverse impacts on water supplies. These standards, which are called "Best Management Practices" (BMP's), include all aspects of sustainable forest management, from site preparation and reforestation, to vine and brush control and thinnings and prescribed fire, to very detailed standards for tree harvesting operations.

Embedded within those standards are protections for wetlands (including vernal ponds), streams and other open waters, floodplains, and threatened and endangered species, as well as erosion control practices. Foresters implement BMP's that minimize soil and litter layer disturbance, facilitate rapid regeneration of trees, and control overland flow of water to minimize negative water quality effects.

In New Jersey, the massive landscape-level clearing of forests are long over; never to return. Sustainable forest management in and around wetlands, open water, and floodplains is strictly regulated by the DEP State Forestry Service. Adherence to state BMP's is mandatory. The professional foresters who serve New Jersey's forest lands are well trained in all aspects of BMP's, and collectively have many decades of experience in implementation. These BMP's have helped to protect streams and riparian zones and therefore helped to balance the activities needed to perpetuate dynamic, disturbance-dependent forest ecosystems with our concerns for good water quality and sustainable water flow.



A rare great blue heron in flight over a pond within a managed forest, Warren County, NJ (photo courtesy of William Kalleser)



A Category 1 trout stream within a Wildlife Management Area managed under a Forest Stewardship Plan, Sussex County, NJ (photo courtesy of William Kalleser)

But why manage a forest? Certain aspects of water quality may fluctuate dramatically in an unmanaged forest over a long-term, while water yield and quality will remain stable in a forest managed in

adherence to BMP's. This is because managed forests are periodically thinned to improve residual tree health. Unmanaged stands have a tendency to develop high levels of relative density. This situation may increase the probability of large-scale windthrow, or increased mortality from damaging agents.

Such "overstocked" forests have a minimal amount of sunlight reaching the forest floor. Thus, few young trees would be available in the event of a severe windthrow or insect infestation. Given such a catastrophe, effects on water quality would be the same as if the area had been harvested indiscriminately. In an unmanaged forest, the potential exists – depending on the damaging agent – to have a complete loss of a watershed forest. In a managed forest with diverse, young trees, losses could be limited to certain areas. In the event of loss, the young trees that are present will ameliorate some of the negative water quality effects. Such resilience of forests will become more important, given scenarios for climate change.

Managing dynamic, disturbance-dependent forests for water quality and other social values across ownerships in the most densely populated state is complex. We can always do better. That's why we need careful monitoring, continued research and ongoing public involvement. If we do nothing, the capacity of our forests to protect and sustain itself and our water supply will continue to erode.

*For other information, useful links and downloads, or to contact us, please visit the NJ Division of the Allegheny SAF on the web at [www.njforests.org/protecting-water-quality](http://www.njforests.org/protecting-water-quality).*