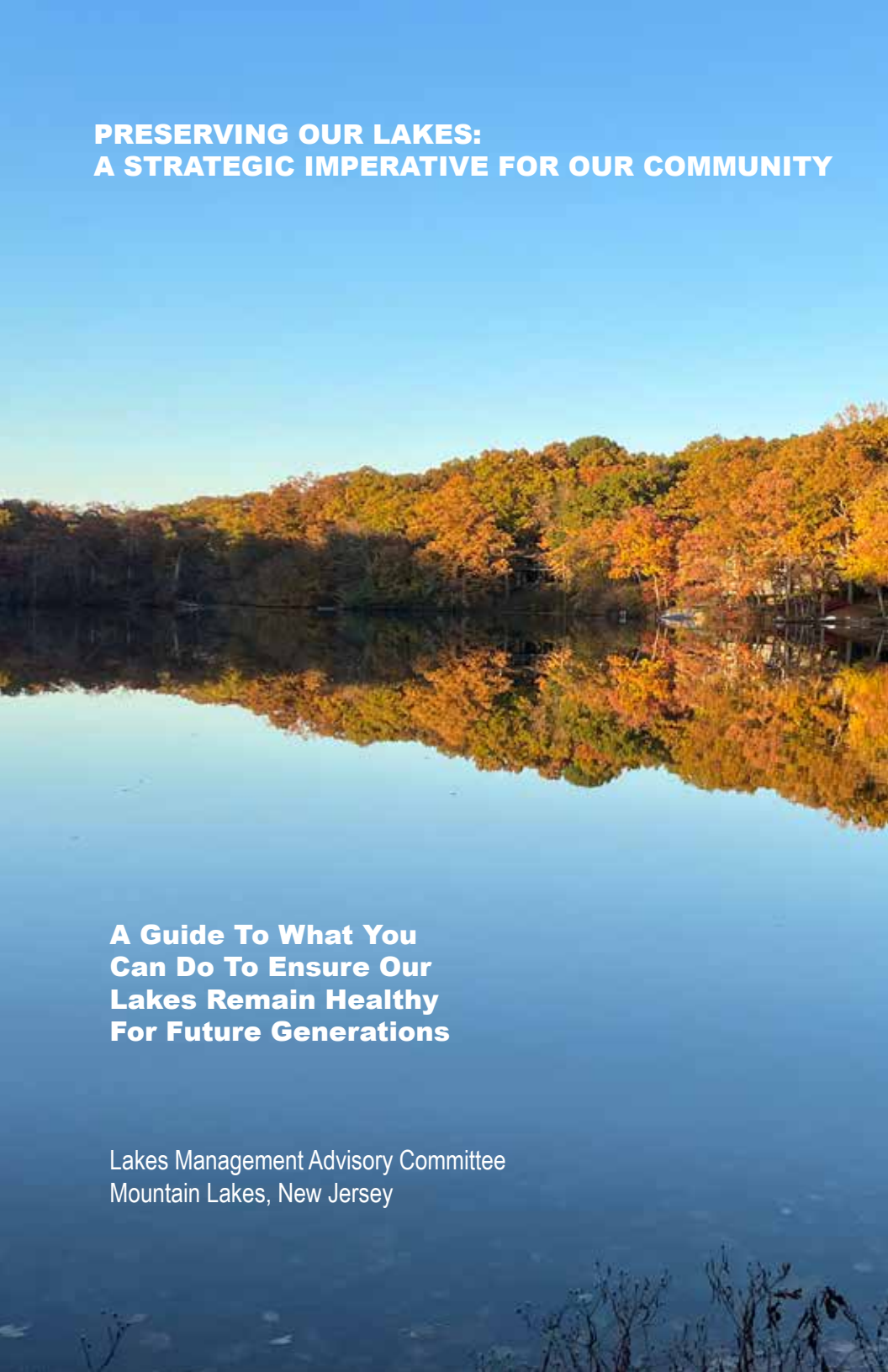




PRESERVING OUR LAKES: A STRATEGIC IMPERATIVE FOR OUR COMMUNITY

A Guide To What You Can Do To Ensure Our Lakes Remain Healthy For Future Generations

Lakes Management Advisory Committee
Mountain Lakes, New Jersey



Our lakes are an important resource to protect and keep healthy.

Why This Matters?

Our lakes are more than natural beauty—they are foundational to our community's identity and economy. Alongside our excellent public schools, our lakes are a primary driver of quality of life and property values. They are facing a slow-motion crisis, filling in at a rate that threatens their long-term viability.

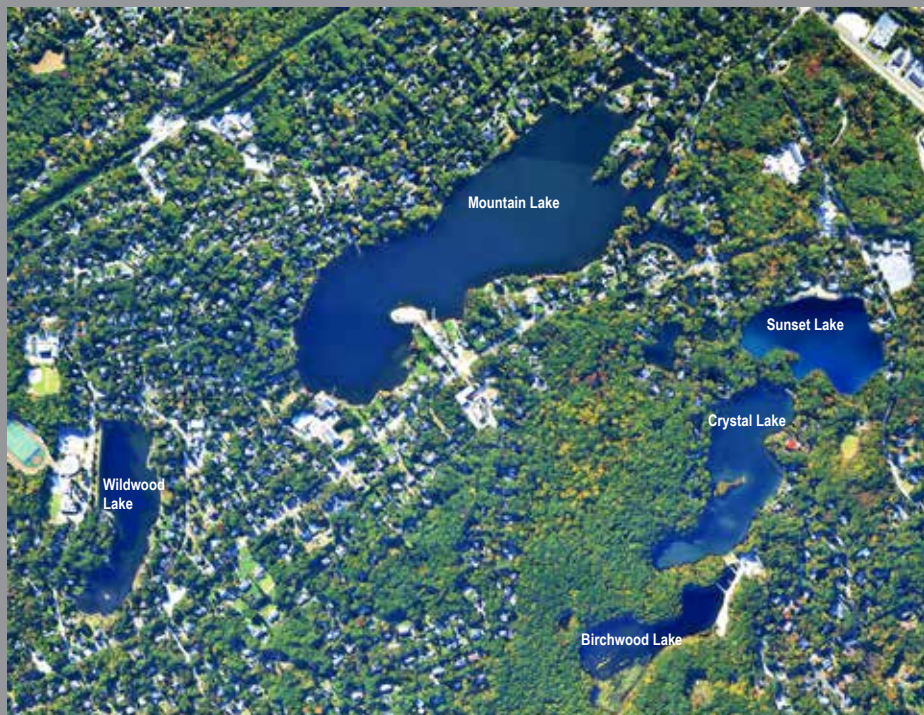
The centerpiece of our community is the chain of nine lakes that winds through it. These beautiful bodies of water provide us all with recreation and pleasure year-round. Swimming, boating, picnicking, fishing, skating and hiking always have been enjoyed by our residents.

We are not the only creatures to enjoy the lakes. Birds, fish, turtles, snakes and frogs are just some of the animals which make our lakes their home. They feed, nest and live either in or near the water. These inhabitants are an integral part of our lakes and enhance the pleasure we derive.

The quality of the water and the depth of each lake affect us as well as resident wildlife. Without clean, healthy lakes, aquatic recreation is unpleasant and aquatic life is difficult or impossible to sustain.

We hope that the information which follows will educate the residents of Mountain Lakes about the history of our lakes, what is being done to preserve them, and what we residents can do to promote and sustain this effort.

The Lakes Management Committee 2025



The Formation of Our Lakes

The Borough of Mountain Lakes was built on swampy woodlands. In the late 1800s, the Fox Lakes Ice Company dammed portions of these wetlands to create Birchwood, Crystal and Sunset Lakes. Then, in 1910, Herbert J. Hapgood began developing the planned community of Mountain lakes and formed six further lakes.

Each lake was created by the construction of an earthen dam. Each dam has an outlet, or spillway, to enable water level control. All dams need periodic maintenance or reinforcement. Most of ours have been upgraded significantly since their initial construction.

The major source of water for all the lakes is rainfall. Rainwater enters the lakes via storm drains and surface runoff. The drainage area is called a watershed. It is defined by the slope of the land, which in turn determines the path that a drop of rain follows along the land's surface.

In Mountain Lakes, rain (storm water runoff) is collected in storm sewers that empty into the lakes as well as into a myriad of small streams, some of which also feed the lakes. Other streams run out of the lakes generally toward Parsippany, into the Whippany River and eventually into the Passaic River. The watershed for the borough's lake chain is approximately 800 acres and is completely within Borough borders. This means that the watershed—the water itself and the sediments, nutrients and other chemicals carried by that water—is impacted by no other community. In addition, since Mountain Lakes is primarily a residential community, toxic runoff into the lakes from businesses enterprises is of minimal concern. The residents of Mountain Lakes have a unique opportunity to control the quality of our own lakes.

The nine lakes in the Borough form a chain, with water flowing from the lake with the highest elevation, Birchwood, down to each lake in succession. Birchwood Lake, located at the northwestern border of Mountain Lakes, is the only lake not fed by storm sewers.

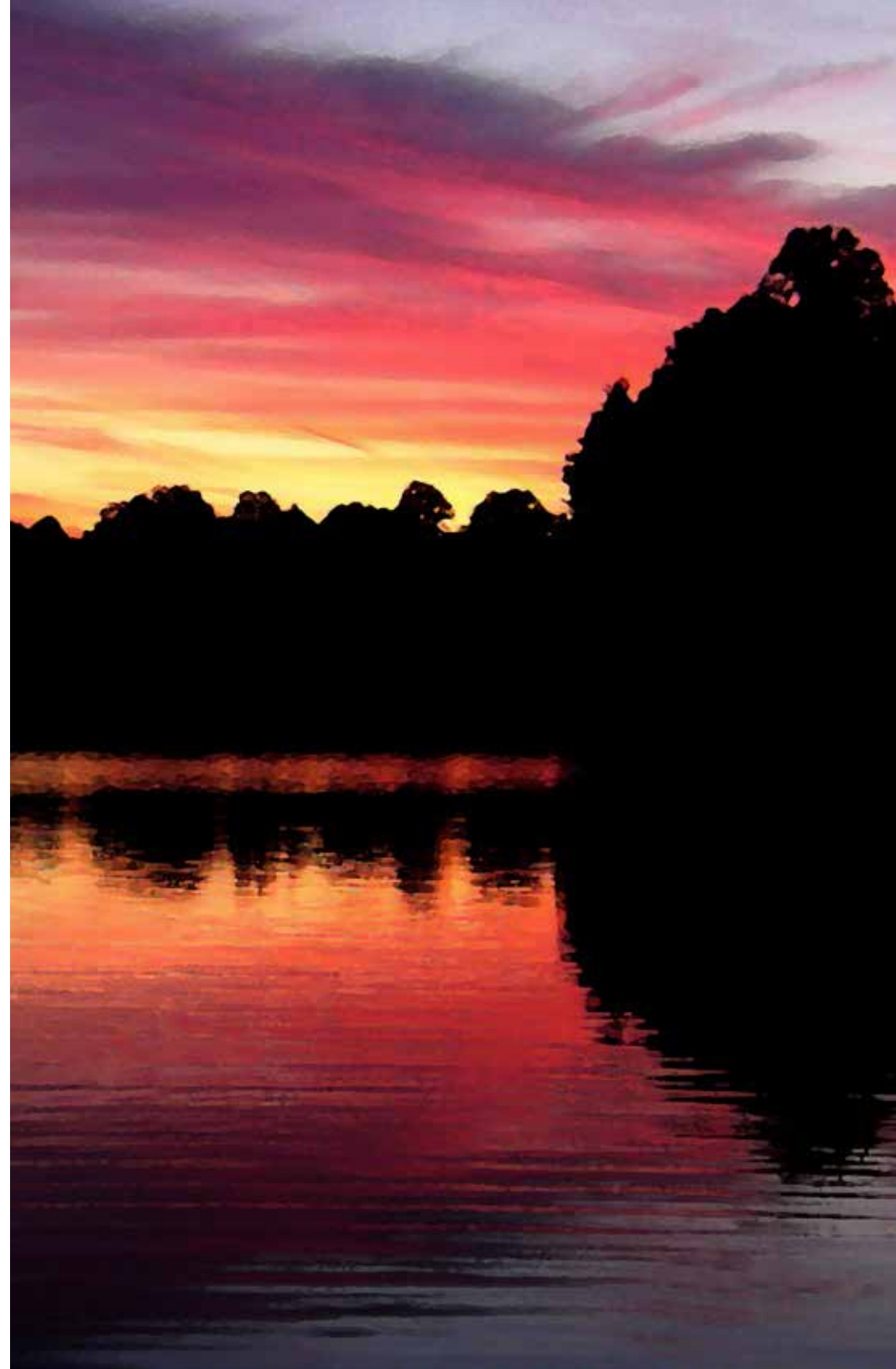
The Formation of Our Lakes (Continued)

Rainfall and underwater springs keep it filled. Now a 13-acre lake, Birchwood is surrounded entirely by borough-owned parkland. It has an average depth of 5 feet and a maximum depth of 14 feet, possibly with deeper holes.

The water from this lake flows through an earthen dam (located adjacent to the parking lot) down a hillside into Crystal Lake. This 19-acre lake is the deepest in the chain, with an average depth of 8 feet and a maximum depth of 14 feet. The shoreline combines Borough land with private properties. Crystal's water flows through a dam adjacent to Sunset Road, down a spillway (an outlet to prevent flooding) to Sunset Lake.

Sunset Lakes is 14 acres in area with an average depth of 4 feet and maximum depth of 8 feet. It has two outlets: one feeds a wetland behind the municipal building before reaching Mountain Lake; the other feeds two connected ponds, Shadow Lake and Olive Lake. The small ponds are 3 acres combined. Each has an average depth of 4 feet. Shadow and Olive flow into the next lake in the chain, Cove Lake, known also as Propagation Pool. This 1-acre lake, too, has an average depth of 4 feet. A conduit takes this water beneath the Boulevard to a 2.5-acre lake called Grunden's Pond or Reservoir Lake. This has an average depth of 3 feet with maximum depth 6 feet.

Water then flows into the eighth and largest lake in the chain, Mountain Lake. Mountain Lake has an area of 75 acres and an average depth of 7 feet and maximum of 10 feet. It also has two outlets: the dam at the Bird Sanctuary on Lake Drive near Morris Avenue; and the Canal which connects to Wildwood Lake. The Canal can flow in either direction depending on the relative water levels of the two lakes. Wildwood Lake is the final lake in the chain. It has an area of 16 acres and an average depth of 5 feet. The major outlet at Wildwood is the dam located on Glen Road. The water flows into a conduit under Wildwood School, becomes a brook and passes beneath Morris Avenue and the railroad tracks before eventually flowing into Lake Intervale in Parsippany.



Our Lakes - A Living System

Although our lakes are man-made, they function as natural ecosystems, providing habitats for a variety of water-dependent plants and animals. These habitats include the wetlands, the shoreline, open water and lake bottom. The animals and plants interact and depend on each other and their surroundings to survive.

Each habitat has physical, biological and chemical characteristics. An imbalance in any of these can have an adverse effect on the entire ecosystem. Life in a lake ecosystem requires five essential elements:

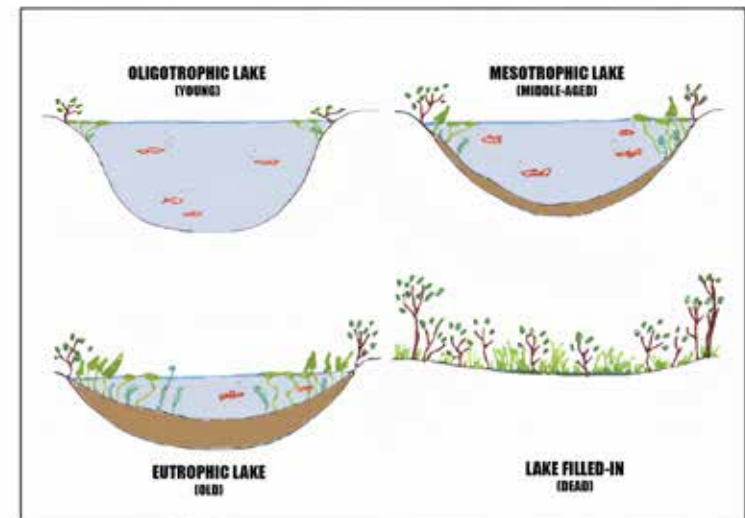
Sunlight / Oxygen / Water / Nutrients / Depth

In a process called photosynthesis, plants use the energy from sunlight to convert nutrients into living matter. During photosynthesis, aquatic plants produce oxygen in the lakes. The lakes can obtain additional oxygen through wind action that aerates the lake water. Water, the universal solvent, contains many dissolved elements, including the nutrients nitrogen and phosphorus that plants need to grow.

All lakes have a limited lifespan. As lakes age, they fill in. Our man-made lakes, now well into their second century, exhibit characteristics of middle (Mesotrophic) and old age (Eutrophic). Lakes are said to be 'young' if they are filling in very slowly and their characteristics have not changed much since the lake was formed. A lake is considered 'old' if it is filling in much more quickly, so an 'old' lake will be very different than when it first was formed. The natural process of succession in which a lake fills in with sediment and gets shallower continues as a lake changes to a pond, pond to marsh, marsh to meadow, and meadow to dry land. Because our lakes are man-made, relatively small and shallow, they are aging more quickly than do larger, deeper natural lakes.

Our lakes are filling in due to the direct inflow of sediment, leaves, sand, and rocks and to eutrophication—excess accumulation of nutrients promoting overabundant growth of algae and other aquatic plants. Like people, plants need nutrients, but too much of a good thing becomes a problem. As these overabundant masses of plants die, they sink to the bottom, consuming valuable dissolved oxygen as they decompose, adversely impacting other aquatic plants and wildlife which need that oxygen, potentially leading to dead zones.

The key to slowing the aging process of our lakes is to reduce the sediment and nutrient load that washes off our community's land surfaces, everywhere. While nutrients, such as nitrogen and phosphorus, occur naturally, much of the excess nutrient load in our lakes comes from human activities and sources—fertilizers, wastewater, automobile exhaust, animal waste. This provides us with tangible opportunities to slow the process of eutrophication of our community's lakes. Further, tangible opportunities exist to reduce the direct inflow of leaves, sand, and rocks.



Our lakes are currently in the Mesotrophic / Eutrophic stages. The degree of sedimentation varies with each body of water.



Current Assessment of Our Lakes

As you swim, boat or fish, the lakes usually look beautiful and healthy. Unfortunately, their condition is not as good as it may appear. Some lakes are close to a tipping point, where major restorative action will be required.

Our water bodies are shallow and sensitive to ecosystem changes. Since their formation, all have been adversely affected by the result of excess sediment and nutrient loads, perhaps also by changes in patterns of temperature and rainfall. Compared to 25 years ago, we see a diminished population of fish and other beneficial wildlife that live in or near our waters. Without proper lake intervention, the aging and destruction of our water bodies likely will accelerate. Future generations will not have the opportunity to enjoy them as have past generations. In as few as 20 years, without intervention, the shallowest of the lakes may not be useable for recreation.

Two of the lakes, Birchwood and Wildwood, are in particular need of remediation. Twenty-five years ago, these were robust ecosystems that supported a diversity of wildlife and strong fish habitats and populations. Today, they are shallower, with a resulting far smaller volume of water and greatly diminished fish and wildlife populations. Bathymetric mapping suggests a nearly 50% reduction in the water volume of Birchwood Lake in the approximately ten years leading up to 2023.

Sunset Lake has undergone significant recent change due to a New Jersey state requirement to rebuild its dam. The Lake was drained and the fish stock relocated to Mountain Lake in 2023 to facilitate the dam work. Following completion in early 2024, snow melt and rain water gradually have restored the lake level. There is need to reintroduce fish stock to restore the ecosystem. This is anticipated to begin in 2026.

Crystal and Mountain Lakes remain relatively healthy yet continue to age. They naturally will deteriorate without proper stewardship.

Assessment (Continued)

The Borough of Mountain Lakes continues to retain the services of a lake management company to test and treat our water bodies to keep them as healthy as possible for our residents and our resident wildlife. Importantly, the Borough Council, with support of the Lakes Management Committee, is embarking upon a research and long-term strategic planning process with a specialist vendor. This undertaking is expected to take 1-2 years. In the meantime, community members, from young children to our eldest residents, can become responsible and active stewards. Actions and extra care today will mean less extensive and less costly restoration in the future.

Our lakes make the community of Mountain lakes a cherished place to live and raise families. Reversing the adverse, possibly unnoticed trends in the health of our lakes calls for community-wide involvement. Stewardship at the resident level and research, planning and investment on the part of the Borough Council with support from Borough committees and commissions, offer the potential to preserve these gems for future families to enjoy and for future aquatic plants and wildlife to thrive. This should be our legacy.



What you can do now!

Lakefront residents:

- Keep loose leaves and lawn clippings away from our lakes.*
- Make sure your lawn crew does not use phosphorus fertilizers and weed killers on your lawns. Also, they have to be instructed to not blow leaves and lawn clippings into the water. This is your responsibility as a homeowner*
- Try to keep geese off your lawns. Call the Borough if you need assistance with geese.
- Lakeside residents should not alter their lakefront. This means no added sand or gravel to lake edges to create a private beach or swimming area.*
- Construction sites must be controlled to minimize erosion to the lakes.*
- Consider building or planting a natural barrier of shrubs or grasses near the lakes edges. This gives wildlife, such as frogs, turtles and birds a natural place to live and breed. It will also stop leaves and cut grasses from blowing into the lakes.

Non-lakefront residents:

Our lakes are man-made and rainwater feeds maintains our lake levels. Everything you do throughout the town impacts our lakes.

-Do not use fertilizers with phosphorus. There is an ordinance that prohibits the use of fertilizers containing more than 0.5% phosphorus on lawns. You are responsible for checking with your lawn care service to make sure they follow the letter of the law. Make sure your service is licensed by the Borough and uses phosphate free fertilizers. This is critical to the lakes health and will prevent algae outbreaks and weed growth.*

-Do not pour chemicals, solvents or cleaning materials down the towns storm drain system . Everything leads to the lakes and these chemicals will end up in our lake water.*

-Clean up pet feces and droppings and dispose of properly. We have seen more and more dog waste in the edge of the woods and near walkways. This waste is very high in nutrients and contributes to lake algae and weed issues. Also, leaving it in a tied bag on the side of the road is as bad as leaving it untouched. Be responsible! *

*Please note that there are town ordinances that have substantial fines for violations.

Sources:

- Bathymetric Mapping Projects 2012, 2023 (Solitude Lake Management, DPK Consulting)
- Biodiversity Study of Mountain Lakes Water Bodies, Wayne Roth, 2024
- NH Lakes - Life of a lake graphic
- Know Your Lakes, Mountain Lakes League of Women Voters, 2002
- Lakes Management Advisory Committee Borough Council Presentation Feb 26, 2024
- USGS.gov

