

ACTION STEPS

Through this project, the LRCOG has worked to address the goals set out in the *Introduction*. These goals reflect the ideas and concerns that have been expressed by a large and varied group of stakeholders in the last several years. Many of the ideas and concerns, as we have established in the review of historical documents, have been expressed since the 1940s. These goals were accepted by the Town as the guideposts for our efforts.

Our work reflected in this report, sought to better understand those concerns and ideas and, where possible, to bring forward a response based on the science and historical evidence that exists regarding the Lake and its water quality. Our work in this effort can be used to build the framework for a Lake Management Plan that is needed to strategically manage the Lake into the future. To review, these goals included the following:

1. Delineate the actors and roles of authority with the Lake.
2. Identify the contributors to Lake water quality and quantity.
3. Review the work/studies already undertaken on the Lake and identify future needs for study.
4. Review and consolidate the concerns and ideas regarding the Lake that have been expressed in public forums and reports.
5. Propose for the Town of White Lake its role in developing and successfully implementing a Lake Management Plan.
6. Identify the stakeholders which are important for the coordinated management of the Lake going forward.

Considering the above, we were able to develop a series of *Action Steps* that would have a beneficial impact on the future Lake water quality going forward. Findings related to each of these seven goals are summarized below. Recommended *Action Steps* are included under each goal.

Goal 1: Delineate actors and roles of authority with the Lake.

There are two actors with authority roles regarding the Lake and its future health – the State and the Town of White Lake.

State of North Carolina

Several pieces of legislation have been enacted by the North Carolina General Assembly (NCGA) over time which impact the lake. The most significant include in the following:

- **“An Act to Secure to The People of the State of North Carolina the Use of the Lakes of Bladen, Columbus and Cumberland Counties”**. This 1911 Act specifically made White Lake a public trust which, “shall never be sold or conveyed to any person, firm, or corporation, but shall always be and remain the property of the State of North Carolina for the use and benefit of all people of the State”.
- **Chapter 165 of the Session Laws of 1929** reduced the threshold of acres from 500 to 50 and added the specification that “all lakes now belonging to the State...should be administered as provided for other recreational areas owned by the State.” This legislation further clarified the role of the State as the ‘owner’ of the Lake for purposes of the public trust.
- This tenet of state ownership was most recently clarified in 1990 when the State Attorney General’s Office was asked to render an opinion on matters related to the state lakes. That opinion establishes that the lake is a public asset for use by the general public.

“In the case of those lakes explicitly designated under North Carolina laws as ‘state lakes’, the State is charged with managing those properties as a public trust resource, including the prevention of unlawful, private encroachment on attendant public rights. [T]he DPR has broad regulatory authority over state lakes as a public trust resource. Consequently, government regulations reasonably related to resource protection authority will be valid. Such regulations could (with) validity restrict boating on state lakes, including a complete ban on the use of motorboats under appropriate circumstances”.

There are three (3) State agencies involved in the management of White Lake. These are:

- North Carolina Department of Parks and Recreation (DPR)
- North Carolina Department of Environmental Quality (DEQ)
- North Carolina Wildlife Resources Commission (WRC)

Of these three, the DPR and DEQ have the most relevant impact to lake issues being discussed in this study. One way to separate the enforcement area of these two Departments is that DEQ is interested in issues *below* the water surface and DPR is interested in issues *on and above* the water surface. The WRC is interested specifically in wildlife and aquatic species.

Town of White Lake

The Town of White Lake was chartered in 1951. As a municipal entity in North Carolina, the Town has broad powers over many aspects related to the governance of their jurisdiction including the operation and maintenance of the town's infrastructure including water and sewer, management of land use and development within its jurisdiction, and provision of law enforcement and fire protection, among others. The Town has no legal authority to enforce ordinances or laws involving the lake below the high water mark. The Town must seek approval from the appropriate state agency to undertake any activity involving the lake.

The Town does, however, have a significant impact on the lake especially as it relates to water quality and clarity. The town's footprint on the land surrounding the lake is significant. The amount and density of development around the Lake has intensified significantly. Action Steps regarding land use are included under Goal #5.

The Town of White Lake also has the ability through a simple real estate purchase or, if necessary, through eminent domain, to acquire land for a public purpose. As noted in this study, control of the land along the perimeter of the Lake is now all in private hands. Also as noted in this study, the major outlet for the Lake is on privately owned land.

Action Step: The State of North Carolina and the Town of White Lake should work collaboratively on future management of the Lake.

Action Step: The land area at the location of the Lake outlet is now privately owned. An easement between this outlet location on the lake, the outfall ditch to NC Hwy 53, and the roadway necessary to access the outlet should be secured by a public entity. The Town should step forward to acquire land control for the outlet and the necessary easement.

Action Step: The Department of Parks and Recreation should continue in its role to manage the area around the Lake outlet.

Goal #2: Identify the contributors to lake water quality and quantity.

Review of the data and reports, including three years of level monitoring, reveals that there are a number of factors which contribute to the overall health of the Lake. These include:

- Rainfall – it is the major contributor to lake level in the Lake.
- Groundwater – second to rainfall is also a contributor to the water level in the Lake. There is no surface water flow into the Lake
- Shallow Depth of the Lake - White Lake is a very shallow Carolina Bay Lake. The average depth is 6.2 feet and the maximum depth is 9.6 feet. The surface area and shallowness of the lake make it susceptible to heating up and losing water through evaporation, particularly during the summer which is, also, the highest point of activity on the lake. This shallowness makes the Lake sediments particularly susceptible to being stirred.
- Presence of Nutrients in Rainwater – White Lake nitrogen levels were historically very low, and it ranked lowest among the Bay Lakes in Total Nitrogen levels in 1974. This has changed dramatically since the 1970s. Atmospheric deposition of Nitrogen has been shown by the EPA creating a “hotspot” centered on the Coastal Plain of North Carolina. The significant challenge with Nitrogen is that it can be readily utilized by phytoplankton, so big rain events can provide the equivalent of “liquid fertilizer” to the Lake and create the opportunity for algae blooms. Phytoplankton are small to very small algae that float in the water column and are not visible to the naked eye. When fueled, they become dense and can cause the water to look green, red, or brown
- Presence of Phosphorus in Lake Sediments - The monitoring of Phosphorus levels in the Lake reveals that the topmost layer of sediments (those closest to the water) consistently carry the highest levels of Phosphorous. While the vegetation rooted in the sediment survives on this nutrient, Phosphorus when stirred up enters the water column and becomes another source of fuel for the phytoplankton in the water. Phytoplankton are small to very small algae that float in the water column and are not visible to the naked eye. Algal blooms occur when environmental conditions allow exponential growth of phytoplankton.

- Increased Development and Density of Development – This study documents the increase in development around the Lake. The density of that development – very small lots and limited setbacks for lake-related development – has also increased. With this has also come an increase in impervious surfaces such as asphalt roads and concrete drives and pathways. When rain events occur, or when humans hose off those surfaces, the water and sediments move to the Lake which is the lowest point. The absence of stormwater controls in White Lake contributes to the challenges of maintaining healthy water quality in the lake.

Action Step: As White Lake and the other Bay Lakes are state-owned resources, under the management authority of State Parks, it is imperative that monitoring and management of all the lakes be coordinated and fully supported financially for the long term. All the Bay lakes have unique attributes, and as a group, they have national significance.

Action Step: Continue monitoring the Lake level at set intervals.

Action Step: Continue to support and enhance the groundwater model that has been developed for the Lake.

Action Step: Continue the lake water quality monitoring for factors such as pH, nutrients, ammonia and nitrogen levels, toxins and bacteria. Establish a cooperative program with DPR and DEQ to share information and coordinate remediation efforts.

Action Step: Implement a stormwater ordinance to better control and mitigate discharges into the lake. Explore an alternate method of disposing of stormwater.

Action Step: Implement stronger land use controls such as reducing development densities on lots, increasing the amount of setback from the lake, and reducing the amount of impervious surface area around the lake.

Action Step: Continue to improve the integrity of the wastewater collection system to eliminate as much exfiltration of wastewater into the groundwater as possible.

Action Step: Monitor for the introduction of invasive species into the lake. Establish and encourage the use of boat washing stations for nonresident boats entering the lake.

Action Step: Consider obtaining conservation easements for establishing some open space areas around the lake.

Action Step: Reduce the level of recreational boat traffic by instituting a recreational capacity plan which would recognize the detrimental effects of too many watercraft utilizing the lake at one time.

Goal #3: Consolidation of Concerns and Ideas.

A variety of stakeholders have been present for discussions and report presentations regarding the Lake in the last several years. Review of those reports, minutes and notes, newspaper accounts, etc. reveal that these stakeholders have extremely diverse views on the future of the Lake. These stakeholders have included:

- The State of NC represented by State Agencies
- The Town of White Lake represented by the elected Board of Commissioners
- Scientific Community (regulatory, educational and private)
- Property Owners
- Vacationers
- Other Interested Parties

We conclude that it is challenging to consolidate these views and ideas because they are so varied. We also conclude that management of the Lake for good water quality going forward is essential. We observe that without the Lake and all that it brings to the Town of White Lake, the region, and the State, loss of this natural resource would be economically and environmentally catastrophic.

Action Step: Encourage a science-based approach to the management of lake water quality.

Action Step: Continue to recognize and invite stakeholders to participate in the process of developing a full Lake Management Plan.

Goal #4: Stakeholders are needed for coordinated, future management of the Lake and its water quality.

Going forward, the main ingredient for any successful outcome will require the Stakeholders to work together for a defined common purpose. Going forward without solid cooperation will not bring the desired outcome of a healthy and vibrant lake.

Action Step: Continue to recognize and invite stakeholders to participate in the process of developing a full Lake Management Plan.

Goal #5: Define a role for the Town of White Lake.

As outlined in Goal #2 above, there are many factors that impact the lake level and lake water quality. We conclude that there is not one action which could be taken in absence of others that will create the opportunity for the desired outcome of a healthy and vibrant lake. There are also factors which influence the lake that are within control of the Town and those which are not. Of those within the Town's control, we recommend the following:

Action Step: Be the convener of the stakeholders in managing the Lake.

Action Step: Make use of the tools that are at the Town's disposal for protecting the lake:

- Amend the zoning ordinance to include stronger land use controls particularly for the area around the lake perimeter.
- Enact a Stormwater Ordinance.

Goal #6: Identify future study needs.

During the course of this effort, we identified several areas where additional study would be useful. Several have already been mentioned in other Goals.

Action Step: Additional stormwater studies of the Lake perimeter are needed to identify the major contributors /causes of stormwater runoff into the Lake. This

could significantly contribute to a refinement needed to develop and enact a Stormwater Management Plan and regulations for the Town of White Lake.

Action Step: Extensive monitoring would be necessary to learn more about the factors affecting surficial aquifer levels and especially to try and quantify the extent to which each factor impacts amounts of groundwater flowing into or out of White Lake. Plans for a study meant to attempt that are outlined in the appendix and incorporate much more of a vertical component to assessing hydraulic gradients than past studies have, with monitoring wells that are deeper, farther from the lake (and nearer to blueberry farms), and also within the lake bottom. Ideally, monitoring would have started before the current program to repair/replace portions of the Town's sewer system had begun to better gauge the effect of those improvements. But there will at least be somewhat of a pre-repairs baseline from the numerous studies done to date.

Further studies can hopefully be done as a cooperative effort with owner/operators of the nearby blueberry farms, north and east of White Lake. If information sharing could be arranged and approvals/access established for conducting monitoring activities on farm properties, far more could be learned about possible impacts to Lake White from the ponds, ditches, and pumping wells at the higher elevations. Study plans in the appendix could proceed without that, but it is recommended that the Town explore possibilities for conducting a study as a cooperative effort before proceeding with another extensive one.

CONCLUSION

White Lake is a small, but complex water body. As a result of its location in the Southern Coastal Plain, the shallow depth, the presence of nutrients in rainfall and in lake sediments, intense development along its perimeter, the Lake is susceptible to algae blooms and discoloration. As a result of development over time, the lake perimeter has grown intensively and this growth is dense and includes significant impervious surfaces.

Understanding of the environment that is active in and around the Lake is critical to its long-term survival. It is clear that human impacts are influencing the lake water quality. The quantity of water in the lake is set by statute and, therefore, is influenced only by the natural occurrence of rain events and other water inputs into the lake, including stormwater runoff.

The ownership and management of the Lake has also been set by statute. White Lake is a part of the state-owned lake system. State agencies, including the Departments of Parks and Recreation, Environmental Quality and the NC Wildlife Commission have been charged with various management responsibilities. The other major actor in the survival of the Lake into the future is the Town of White Lake.

In this report, we have made several recommendations, couched as “Action Steps” for the Town and other stakeholders to consider. Our goal is to bring forward for consideration by the Town and the State, in particular, but also by other identified stakeholders, the need to work together in managing this precious natural and economic resource.

We trust that this report will serve as a guide to developing a Management Plan for the Lake. It is both a precious natural resource and an economic driver for the region. The Lake deserves our best efforts.

SOURCES and REFERENCES

Sources for Sections on History, Legislation, Authority, and Planning

Attachment 1: Lake Management Strategic Plan – Scope of Work LRCOG.

Attachment 2: NC General Assembly, Session Laws 1828-29, Chapter 6.

Attachment 3 NC General Assembly, Session Laws 1911, Chapter 8.

Attachment 4: NC General Assembly, Session Laws 1920, Chapter 165.

Attachment 5: NC General Assembly, Session Laws 2009 – 150, Consolidated Charter for Town of White Lake.

Attachment 6: White Lake State Park General Management Plan 1996, NCDENR Division of Parks and Recreation.

Attachment 7: General Statutes of North Carolina 143-215 (and others), DEQ authority.

Attachment 8: NC General Assembly, Session Laws 1971, Chapter 570, Ditches around White Lake.

Attachment 9: NC General Assembly, Session Laws 1973, Chapter 252, amend to allow Town of White Lake to repair water and sewer pipes around lake.

Copies of the documents listed above are found in the Sources and References Notebook.

Sources for Section on Groundwater Supply for the Lake

***** Indicates that copies of this sourced material is found in the Sources and References Notebook.***

**Study Plan and Costs to Further Evaluate Groundwater Flows, Consolvo 2022

**Campbell, B.G. and Coes, A.L., 2010, Groundwater availability in the Atlantic Coastal Plain of North and South Carolina: U.S. Geological Survey professional paper 1773.

ES Engineering Services, P.A., 2022, map titled: Phase-2 Proposed Sanitary Sewer Improvements, accessed via the White Lake Watch website (viewed 9/14/22): (<https://whitelakewatch.com/white-lake-sewer-projects>)

**Frey, D.G., 1940, Morphometry and hydrography of some natural lakes of the North Carolina Coastal Plain: the bay lake as a morphometric type. Journal of the Elisha Mitchell Scientific Society, volume 65, no. 1.

GMA (Groundwater Management Associates, Inc.) and Wooten (the Wooten Company), 2003, Water Resources Plan, prepared for the Lumber River Council of Governments and the Southern Coastal Plain Ground Water Advisory Council.

**Heath, R.C., 1983, Basic ground-water hydrology: U.S. Geological Survey Water-Supply Paper 2220.

**NC DWR, 2017 White Lake water quality investigation, White Lake, Bladen County (Cape Fear Basin). North Carolina Department of Environmental Quality, Division of Water Resources.

NC DWR, 2021, Local Water Supply Plan for White Lake, accessed online:
<https://www.ncwater.org/WUDC/app/LWSP/>

NC DWR, Groundwater level database, <https://www.ncwater.org/?page=343>

NC DWR, Hydrogeological framework database, <https://www.ncwater.org/?page=348>

**Shank, C. and Zamora, P., 2019, Influence of groundwater flows and nutrient inputs on White Lake water quality.

**Winner, M.D., Jr., and Coble, R.W., 1996, Hydrogeologic framework of the North Carolina Coastal Plain Aquifer System: U.S. Geological Survey professional paper 1404-I.

**Weems, R.E., Lewis, W.C., Murray, J.H., Queen, D.B., Grey, J.B., and DeJong, B.D., 2011, Detailed sections from auger holes in the Elizabethtown 1: 100,000-scale quadrangle, North Carolina: U.S. Geological Survey Open-File Report 2011-1115.

**Wells, B.W. and Boyce, S.G., 1953, Carolina bays: additional data on their origin, age and history. Journal of the Elisha Mitchell Scientific Society, volume 65, no. 1.

**Winter, T.C., Judson, W.H., Franke, O.L., Alley, W.M., 1999, Ground water and surface water a single resource: U.S. Geological Survey Circular 1139.

Sources for Section on Water Quality

**** Indicates that copies of this sourced material is found in the Sources and References Notebook**

- Beachler, M.M. and D.F. Hill. 2003. Stirring up trouble? Resuspension of bottom sediments by recreational watercraft. *Lake and Reservoir Management*, 19(1): 15-25. <https://doi.org/10.1080/07438140309353985>
- Dolulil, M.T. and K. Teubner. 2000. Cyanobacterial dominance in lakes. *Hydrobiologia* 438: 1-12.
- Elser, J.J., T. Andersen, J.S. Baron, A. Bergström, M. Jansson, M. Kyle, K.R. Nydick, L. Steger, and D.O. Hessen. 2009. Shifts in lake N:P stoichiometry and nutrient limitation driven by atmospheric nitrogen deposition. *Science* 326: 835-837
- Fay, E.M., A. Gunderson, and A. Anderson. 2022. Numerical study of the impact of wake surfing on inland bodies of water. *Journal of Water Resource and Protection*, 14: 238-272. <https://doi.org/10.4236/jwarp.2022.143012>
- **Frey, D.G. 1948. North Carolina's Bay Lakes. *Wildlife in North Carolina*, May 1948. P. 10-17.
- Havens, K.E., H.W. Paerl, E.J. Philips, M. Zhu, J.R. Beaver, and A. Srifa. 2016. Extreme weather events and climate variability provide a lens into how shallow lakes may respond to climate change. *Water* 8: 229. <https://doi.org/10.3390/w8060229>
- Hoverson, D. and P. McGinley. 2007. Waves, wind, watercraft, and lake clarity: a study of sediment resuspension in Clark Lake. Center for Watershed Science and Education, University of Wisconsin-Stevens Point. 43 p.
- Keller, D. 2017. Low-speed boating...managing the wave. *LakeLine*, a publication of the North American Lake Management Society. 37(3): 10-11.
- Lauritsen, D., J. Holz, T. Barrow, and S. Brattebo. 2019. A tale of two lakes: sediment phosphorus comparisons between two shallow Bay Lakes in the NC Coastal Plain. North American Lake Management Society International Symposium, November 11-15, 2019, Burlington VT.
- Lee, D.R. 1977. A device for measuring seepage flux in lakes and estuaries. *Limnology and Oceanography* 22(1): 140-147.
- LIMNOSCIENCES. 2020. White Lake, Bladen County, NC Lake Monitoring Results 2020. May 2021.
- LIMNOSCIENCES. 2021. White Lake, Bladen County, NC Lake Monitoring Results 2021. June 2022.
- Marr, J., A. Riesgraf, W. Herb, M. Lueker, J. Kozarek, and K. Hill. 2022. A field study of maximum wave height, total wave energy, and maximum wave power produced by four recreational boats on a freshwater lake. University of Minnesota St. Anthony

Falls Laboratory, Healthy Waters Initiative SAFL Project Report No. 600,
Minneapolis, Minnesota. 120 p.

- Morris, D.P. and W.M. Lewis, Jr. 1988. Phytoplankton nutrient limitation in Colorado mountain lakes. *Freshwater Biology* 20: 315-327.
- North Carolina State University. 2019. 2019 White Lake aquatic vegetation survey. NCSU Extension, Aquatic Weed Program.
- North Carolina State University. 2020. 2020 White Lake aquatic vegetation survey. NCSU Extension, Aquatic Weed Program.
- North Carolina State University. 2021. 2020 White Lake aquatic vegetation survey. NCSU Extension, Aquatic Weed Program.
- Paerl, H.W. 2014. Mitigating harmful cyanobacterial blooms in a human- and climatically-impacted world. *Life* 4: 988-1012; <https://doi:10.3390/life4040988>
- Paerl, H.W. and T.G. Otten. 2013. Harmful cyanobacterial blooms: causes, consequences, and controls. *Microbial Ecology* 65(4): 995-1010
<https://doi:10.1007/s00248-012-0159-y>
- Pardo, L.H., M.J. Robin-Abbot, C.T. Driscoll (eds.). 2011. Assessment of nitrogen deposition effects and empirical critical loads of nitrogen for ecoregions of the United States. Gen. Tech. Rep. NRS-80. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 291 p.
<https://doi.org/10.2737/NRS-GTR-80>
- Smol, J.P. 2009. Under the radar: long-term perspectives on ecological changes in lakes. *Proc. R. Soc. B* 286: 20190834.
- Tebo, L.B. Jr. 1961. Inventory of fish population in lentic waters. Report of Projects F-5-R and F-6-R, NC Wildlife Resources Commission. 313 p.
- Wehr, J.D. and R.G. Sheath. 2003. *Freshwater Algae of North America*. New York: Academic Press. 918 p.
- **Weiss, C.M. and E.J. Kuenzler. 1976. The trophic state of North Carolina lakes. University of North Carolina Water Resources Research Institute Report UNC-WRRI-76-119. 224 p.

Attachments to Water Quality Section

- WQ 1. Monitoring Lake Level Variability at White Lake
- WQ 2. Historical Records on Lake Levels
- WQ 3. White Lake Springs: Flow Rates Variable
- WQ 4. "What the pH Happened?" NC Division of Water Resources Special Study, 2015

- WQ 5. Historical and Recent pH Ranges in the Bay Lakes, 1947-2020
- WQ 6. Nutrient Comparisons Over Time, 1974-2022
- WQ 7. Assessing the Relative Importance of White Lake's Nutrient Sources, 2019 Report to LRCOG
- WQ 8. The Influence of Atmospheric Deposition of Nitrogen in a Shallow Seepage Lake in the NC Coastal Plain
- WQ 9. Sediment Phosphorus Comparisons Between Two Shallow Bay Lakes (White Lake and Lake Waccamaw)
- WQ 10. Algae and Aquatic Vegetation in White Lake
- WQ 11. White Lake Phytoplankton, and Comparisons with Singletary Lake
- WQ 12. Letter from NCDEQ to the Town of White Lake on future lake treatments - 2019

All of the above documents are found in the Sources and references Notebook.

Other Documents Reviewed for this Report

***** Indicates that copies of this sourced material is found in the Sources and References Notebook.***

**Frey, D.G. 1949. Morphometry and hydrography of some natural lakes of the North Carolina Coastal Plain: The Bay Lake as a morphometric type. D. G. Frey, Journal of the Elisha Mitchell Scientific Society., 1949

**Carolina Bays in Relation to the North Carolina Coastal Plain, D. G. Frey, Journal of the Elisha Mitchell Scientific Society, 1950

**Evidence of Recent Enlargement of the "Bay" Lakes of North Carolina, David Frey, Ecology Magazine 1954

**The Quaternary Evolution of Herdon Bay, a Carolina Bay on the Coastal Plain of North Carolina; Implications for Paleoclimate and Oriented Lake Genesis, C. Moore, et al., 2016

**Bay Lake Hydrology: Surface Water and Groundwater, Mike O'Driscoll, PowerPoint, Professor, East Carolina University 2018

**The Trophic State of North Carolina Lakes, C.M. Weiss and E.M. Lemon, Water Resources Research Institute of the University of North Carolina, 1993

**North Carolina Department of Environmental Quality. 2017a. 2017 White Lake Monitoring Report. White Lake, Bladen County, NC. November 2017. NC Department of Environmental Quality Division of Water Resources, Water Sciences Section.

**North Carolina Department of Environmental Quality. 2017b. Phytoplankton Assemblages in White Lake, Bladen County, 2017. November 2017. NC Department of Environmental Quality Division of Water Resources, Water Sciences Section.

**North Carolina Department of Environmental Quality. 2019. 2018 White Lake Monitoring Report. White Lake, Bladen County, NC. September 2019. NC Department of Environmental Quality Division of Water Resources, Water Sciences Section.

Hydrological Investigation of White Lake, North Carolina Department of Natural Resources and Community Development, 1982.

**Influence of Groundwater Flows and Nutrient Inputs on White Lake Water Quality, Final Report to the Town of White Lake, Dr. C. Shank and Dr. P. Zamora, 2019

**Groundwater Availability in the Atlantic Coastal Plain of North and South Carolina, B. G. Campbell and A. L. Coes, US Geological Survey, 2010

**Carolina Bays: Additional data on Their Origin and History, B. W. Wells and Steve Boyce, 1953

**Surficial Geologic Map of Elizabethtown 2011, USGS paper, Weems and Lewis, 2011

**System Wide Plan for North Carolina State Parks, NC Division of State Parks, NC Department of Natural and Cultural Resources, 2018

**White Lake Hydrogeology Study, C. R. Edgerton, Hydrologic Engineer, NC State Highway Commission, 1969

**White Lake General Management Plan. NC State Parks, 1996

White Lake Development Study, Division of Community Assistance, NC Department of Natural Resources and Community Development, 1963

Addendum – Additional Reference Material

The following are additional materials referred to in this study. They represent archived correspondence and reports from the North Carolina State Archives. Copies of these documents are found in the Sources and References Notebook.

- Archived correspondence and reports related to White Lake involving town officials, residents, and state agencies concerning lake conditions, lake water quality and watercraft during the time frame of 1950 to 1965.
- Archived correspondence and reports related to White Lake involving town officials, residents, and state agencies concerning lake water quality from 1950 to 2018.

- Archived policies, reports, and correspondence related to State Parks from 1940 to 1971.