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FINAL DRAFT

Cranberry Lake Water Level Management Plan

A Collaborative Effort by the

New Jersey Department of Environmental Protection

Robin Madden, State Parks, Forests & Historic Sites – Assistant Commissioner’s Office

Joshua Osowski, State Parks, Forests & Historic Sites – State Park Service

Laura Franek, State Parks, Forests & Historic Sites – State Park Service

Lisa Barno, Fish & Wildlife – Species and Habitat Conservation

Shawn Crouse, Fish & Wildlife – Freshwater Fisheries

Ross Shramko, Fish & Wildlife – Freshwater Fisheries

Victor Poretti, Water Resource Management – Freshwater & Biological Monitoring (with support by Johannus Franken)

And

Community Members of the Cranberry Lake Water Level Planning Committee

Brian Church

John Garrity

Michelle Lloyd

Patricia Miller

Michael Walsh

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Purpose of Plan

The Cranberry Lake Water Level Management Plan (Plan) guides the scheduling of drawdowns of Cranberry Lake located in Byram Township, Sussex County, New Jersey to balance the varying interests of visitors and residents on the lake.

The State of New Jersey, Department of Environmental Protection is the managing authority of Cranberry Lake. The title of ownership to the dam impounding the waters known as Cranberry Lake and the control of the sluice gates controlling the impounded waters is owned by the State of New Jersey. The property and rights were vested initially in trust to the Morris Canal and Banking Company. The property and rights vested in trust included Lake Hopatcong, Lake Musconetcong, Bear Pond at Saxton Falls and Cranberry Lake (NJSA Title 13:12-1 -29). The passage of 14 canal acts from February 28, 1923 through March 13, 1925 continued the lakes as part of the Morris Canal and Banking Company. Its charter and rights were later deeded to the State of New Jersey. The Acts placed the administration and management of the Company and its properties under the Board of Conservation and Economic Development, which later became the Department of Environmental Protection.

Cranberry Lake is a man-made (circa 1830) 193-acre lake located in Byram Township, Sussex County. As with most New Jersey lakes, the lake is shallow, with a maximum depth of 15 ft. It lies within the Musconetcong River Watershed. The shoreline is a mix of private lakefront property owners and Allamuchy Mountain State Park. There is a public boat ramp and small public parking area. The lake is designated as FW2 Trout Maintenance Category 1 as it can support trout year-round. Water flow from the lake is extremely important to maintaining aquatic life in the river. These flows are especially critical during the summer months, when hot, dry weather results in natural increases in water temperatures. The Department recognizes that during summer months, outlet flows from Cranberry Lake is minimal to non-existent naturally and typically the dam gates are not opened.

Goals and Objectives

The Goals of this plan are as follows:

- To ensure the safety of, and to maximize the recreational and existing commercial opportunities at Cranberry Lake, and to provide opportunity for improvements and repairs to shoreline structures through a scheduled Water Level Management Plan, while
- Providing for the protection of the aquatic ecosystem located within and downstream of the lake

The Objective of this plan is as follows:

- To establish a set of management and operational guidelines for manipulation of the lake's water level to meet the established goals.
- To establish a set of easily understood management and operational guidelines for the manipulation of the Cranberry Lake water control structure to maintain a lake elevation as near as possible to 6 feet in Cranberry Lake conditions permitting and except during scheduled drawdown periods.

Disclaimer: At no time does this plan restrict the ability of the Department of Environmental Protection to exercise best professional judgement in response to unusual or unforeseen circumstances as necessary to minimize property damage or the threat to human safety in the Cranberry Lake Watershed.

Planning Considerations

Cranberry Lake Dam

Cranberry Lake is in the Delaware River Basin within the State of New Jersey, County of Sussex, Byram Township, in Block 383 Lot 2. The dam, constructed in 1927, is 18 ft. high and 1,000 feet long. It is designated a high-hazard dam in that failure of the dam may result in probable loss of life and/or extensive property damage.

The mid-level outlet consists of a sluice gate located on the spillway and discharges directly into the concrete stilling basin.

The low-level outlet consists of a 12-inch diameter cast iron pipe located in the dam to the right of the spillway and discharges directly into a pool at the toe of the transition area and downstream toe area. The outlet is operated via a valve located within a concrete chamber at the right-side downstream toe area.

Under the Dam Safety Rules, the Cranberry Lake Dam must be inspected by a Licensed Professional Engineer every two years (N.J.A.C. 7:20). Based on the 2020 inspection, the dam is in fair condition. The Department will continue to address concerns as needed.

Resource Management Considerations

The Department's Fish & Wildlife (FW) notes that both the fishery in Cranberry Lake and the watershed downstream are important natural resources and management of them requires balancing the needs of both. FW annually stocks Cranberry Lake, with Northern

Pike and monitors the existing fishery within the lake. Supplemental stockings of Largemouth Bass and Sunfish species are stocked when surveys on the lake indicate a need for supplemental stockings.

Fish & Wildlife's regulations governing water lowering in impoundments (N.J.A.C. 7:25-6.25) require that north of I-195 lake lowering must be completed by November 1 to protect hibernating turtles and amphibians.

Planning Committee

Cranberry Lake is an important recreational and ecological resource, it is essential to consider a balanced view of all interests when creating a water level management plan that may impact both recreation and natural resources of the lake. To provide transparency that all interests were represented, the Department formed an advisory Water Level Management Plan committee to provide recommendations in developing the plan in 2022. The individuals and organizations included community residents, members of the Cranberry Lake Community Club, Byram Township liaison and Department representatives from State Parks, Forests & Historic Sites, Fish & Wildlife, and the Bureau of Freshwater and Biological Monitoring.

The advisory committee determined the following reasons for a lake lowering:

- Lake and dam maintenance
- Aquatic vegetation control
- Private property maintenance

The advisory committee discussed how lowering the lake may impact: recreation, economics, harmful algal blooms, downstream impacts, natural resources, and aquatic vegetation control. As discussed,

- **Recreation:** As lake lowerings typically occur late fall through the winter months, lowering the lake has the most significant impact on winter recreation, especially in areas where the lake is more shallow. Residents who live near these shallow areas may not be able to access the ice due to unfrozen/spring fed muddy areas. Lowering the lake can also shorten the boating season for larger boats that need deeper water. This again impacts residents who live near the more shallow areas of the lake.
- **Economic:** Though there are some businesses around the lake, the economic impacts of lowering the lake are considered minimal.
- **Harmful Algal Blooms:** The academic literature does not find many direct links between the lowering of lakes and an increased risk of harmful algal blooms (HABs). Mainly as most lake lowerings are done in the late fall through the winter months. One study suggests that if a drawdown causes sediment in the lake to become suspended in the water column these nutrients could spur algae growth, leading to a bloom. It is unknown if this is an issue at Cranberry Lake, but to date there have been no harmful algal

blooms or indications of forming HABs.

- **Downstream Impacts:** In some of the Department managed Lakes, The Department is required to maintain a minimum flow of water to ensure that downstream waterways have adequate water. When refilling, water flow out of the dam must be maintained. The water flow must be continuous and sufficient in quantity to prevent the destruction of downstream aquatic biota. For example, an outlet pipe may not be closed completely when refilling so that continuous, adequate flow downstream is maintained. Downstream impacts are minimal at Cranberry Lake due to the short distance between the dam and the unnamed stream the lake outlet flows into. The outlet stream is also backwatered by the unnamed stream under low flow conditions.
- **Natural Resources:** Lowering the lake does impact aquatic biota and natural resources. Also, if a lake is lowered too much, it can negatively impact oxygen levels and lead to fish kills. Fish & Wildlife restricts the timing, duration, and extent of lowerings to minimize impacts. This includes timing the lowering for animals that hibernate in the lake can acclimate to the reduced lake level before hibernation sets in.
- **Aquatic Vegetation Control:** For a winter lake lowering to aid in control of aquatic vegetation, the exposed lakebed must freeze the roots of the plants. If the winter temperature does not get low enough, or if snow cover insulates the exposed lakebed, then roots will not freeze. As a result, in some years of lake lowering it will aid in reducing aquatic vegetation while other years it does not. One concern is when native aquatic vegetation is reduced by a drawdown it may be replaced by invasive aquatic vegetation, which can cause greater impacts. It should also be noted that a healthy lake needs aquatic plants to provide habitat for fish and other animals, assist with oxygen levels under ice, and uptake nutrients in the water that could feed harmful algal blooms.

Drawdown Schedule: 20-year Plan

The primary benefits for lowering the lake are property owner maintenance and shore clean up activities. While there may be some weed control benefits in ideal climate conditions, this is not the primary reason. The Bureau of Freshwater & Biological Monitoring has agreed to do a water quality sample during the growing season following a 4-foot drawdown as resources allow. They will also monitor water quality before and after a drawdown as staff and resources allow. Currently, the Department does not believe a comprehensive study on weed control benefits is merited, as there are many studies already published on weed control and lake lowerings, if funding is identified for such a study, the Department may consider a scientific assessment of drawdowns at Cranberry Lake.

A drawdown of four feet (48 inches) shall begin in 2023-24 and continue every four (4) years thereafter [but not to conflict with the 5' drawdown of Lake Hopatcong

unless directed beyond the 2023-24 drawdown of Cranberry Lake].

The full drawdown is to begin on or about the 2nd week of October. The refill will begin once ice has softened sufficiently to reduce the concern over damage.

If a drought warning is declared by the Commissioner of the Department of Environmental Protection, or a water supply emergency is declared by the Governor, the Assistant Commissioner of State Parks, Forests & Historic Sites shall consult with the Assistant Commissioner of Water Resource Management to determine whether a departure from the Cranberry Lake Water Level Management Plan is warranted. This could affect the drawdown schedule.

Any deviation from the Water Level Management Plan shall be communicated via the communications plan contained in this document.

Schedule of Water Lowering Events

The scheduled four-year, four-foot drawdown provides an opportunity for property owners to schedule and perform significant maintenance to in-water structures or debris clean-up as is permitted according to state, county, and local ordinances.

Year	Maximum Scheduled Drawdown*	Elevation (gauge elevation)
2023-2024	48"	4 ft
2027-2028	48"	4 ft
2031-2032	48"	4 ft
2035-2036	48"	4 ft
2039-2040	48"	4 ft
2043-2044	48"	4 ft

*Normal pool elevation is 6 feet – Primary spillway elevation is 771.4 feet.

Overview of Procedures for Drawdown

1. On or before August 1st of each year scheduled for a drawdown, the Park Superintendent will submit a Water Lowering Application to Fish & Wildlife as required by N.J.S.A 25:5-29. Upon issuance of the permit, the Water Lowering permit will be provided to the New Jersey State Park Service.
2. The drawdown will commence approximately on the second week of October and the reduced elevation will be maintained to the extent feasible for the

duration of the drawdown. A slow refill may be required to avoid dock damage due to heavy ice formations on the lake surface.

3. A drawdown approval will always be dependent upon water supply conditions. The State Park Service will consult with the Department's Division of Water Supply and the North Jersey District Water Supply Commission for guidance on water supply conditions.
4. If a drought warning or drought emergency is declared by the Commissioner of the New Jersey Department of Environmental Protection, or if the Governor declares a water releases emergency, the Divisions of Water Supply and Water Allocation will guide the required water transfers and any necessary deviations from the drawdown schedule. Any deviations to scheduled drawdowns that result will be relayed in accordance with the Communication Strategy outlined in the plan.
5. The following will be the procedures for the 4-foot drawdown:
 - a. The maximum depth of the drawdown is set at four (4) feet below the spillway elevation.
 - b. Rate of Water Release: When lowering, water must be released slowly at a rate that will prevent the stranding of fish in off-channel pools within the lake basin and avoids flushing fish downstream. The release rate must be controlled such that there is no overbank flow of the primary downstream channel. If bottom waters are released, a slow rate of release will minimize the undesirable release and transport of silt, detritus, and debris downstream.
 - c. An effort will be made to maintain the four (4) foot lake level reduction when it has been reached, to allow for maximum weed exposure during periods of freezing.
 - d. The lake refilling process will begin once the condition of the ice has softened sufficiently to reduce the risk of ice damage.
 - e. The following will be monitored during the drawdown:
 - i. South of the Cranberry Lake Community Club's clubhouse
 - ii. South Shore Road
 - f. Refill Procedures
 - i. Beginning March 1st, the Hopatcong State Park Superintendent, shall monitor ice conditions at several locations around the lake. Recommended ice monitoring locations are:
 1. South of the Cranberry Lake Community Club's clubhouse
 2. End of Laurel Cove
 3. End of Cabin Springs Cove
 4. End of Weaver House Cove
 5. South Shore Road
 - 6.

When, in the opinion of the State Park Superintendent, spring thaw has softened the ice

on the lake to avoid ice damage to private property, generally when the ice is less than 4 inches thick (typically around March 15th), the gates on the Cranberry Lake Dam shall be closed and the lake shall be allowed to fill to the spillway crest elevation of 6 feet.

Communication Strategy

To ensure effective communication between the Department, the local community, and other lake users regarding the water level on Cranberry Lake, the following guidelines should be followed:

1. Communication from Department to the local community.
 - a. The following topics will be shared via Hopatcong State Park webpage and social media, though this list is not exhaustive:
 - i. Water level adjustments,
 - ii. Dates and important information regarding the 4-year drawdown.
 - iii. Drought information impacting water level management.
 - iv. Ice-out/refill procedures.
 - b. Communication List
 - i. Cranberry Lake Community Club
 - ii. Township of Byram
 - iii. General Public (update Park website and social media)
 - iv. Jefferson Lake Camp
2. Communication from the local community and lake users to Department
 - a. To communicate with the Department about issues regarding Cranberry Lake Water Level Management.
 - i. Emergency: Call 1-877-WARN-DEP
 - ii. Other issues: Contact the Hopatcong State Park Superintendent at 973-398-7010 or HopatcongStatePark@dep.nj.gov.

Plan Review and Revision

The plan will be updated as necessary. Reasons for an update may include changes to water management policy due to new emerging science or research, feedback from the public or to address environmental issues due to climate change.

Future updates will include input and/or consultation with local constituents, this may include, the current community members of the Cranberry Lake Water Level Planning Committee, other members of the public and Cranberry Lake Community Club, and/or the Township of Byram.

The following procedures are recommended when revising the Cranberry Lake Water Level Management Plan

1. The Department will reestablish an advisory committee to review the Plan.
2. The committee will create a draft of the revised Plan.
3. The draft plan will be submitted to the Assistant Commissioner of State

Parks, Forests & Historic Sites.

4. The Assistant Commissioner will determine if the changes warrant a public process to receive feedback on the proposed changes.
5. The Department will examine the feedback and determine whether to formally accept the changes to the Plan.
6. If the changes are accepted, the State Park Service will share the results via the Communication Strategy described in the plan.