







Beaverdam Creek and Clemson Waterfowl Management Areas

Wetlands Management Review





Acknowledgements

The South Carolina Department of Natural Resources (SCDNR) is grateful for the candid, professional feedback from three experienced waterfowl practitioners: Frank Nelson, Jonathan Patrick, and Houston Havens, who spent many hours reviewing management plans and conducting onsite reviews with the South Carolina Department of Natural Resources' staff. The visiting wetlands review team extends its appreciation to Wildlife Biologist Bob Miller and his team.

Wetlands Management Review Team

Frank Nelson

Frank has worked with the Missouri Department of Conservation for the past twenty-one years. In his current role, he serves as Wetlands Coordinator to support the management of fifteen intensively managed waterfowl areas and specializes in leveraging technology and research to improve habitats.



Jonathan Patrick

Jonathan is the Wildlife Education Center Programs Director for the South Carolina Waterfowl Association. He is responsible for the management of more than eight hundred acres of upland waterfowl impoundments and brings expertise in managing agricultural crops for waterfowl.



Houston Havens

As the Waterfowl Program Coordinator for the Mississippi Department of Wildlife, Fisheries and Parks, Houston works with private landowners and staff to oversee a variety of projects to improve waterfowl habitat, including large-scale impoundment improvements and identifying habitat management deficiencies.

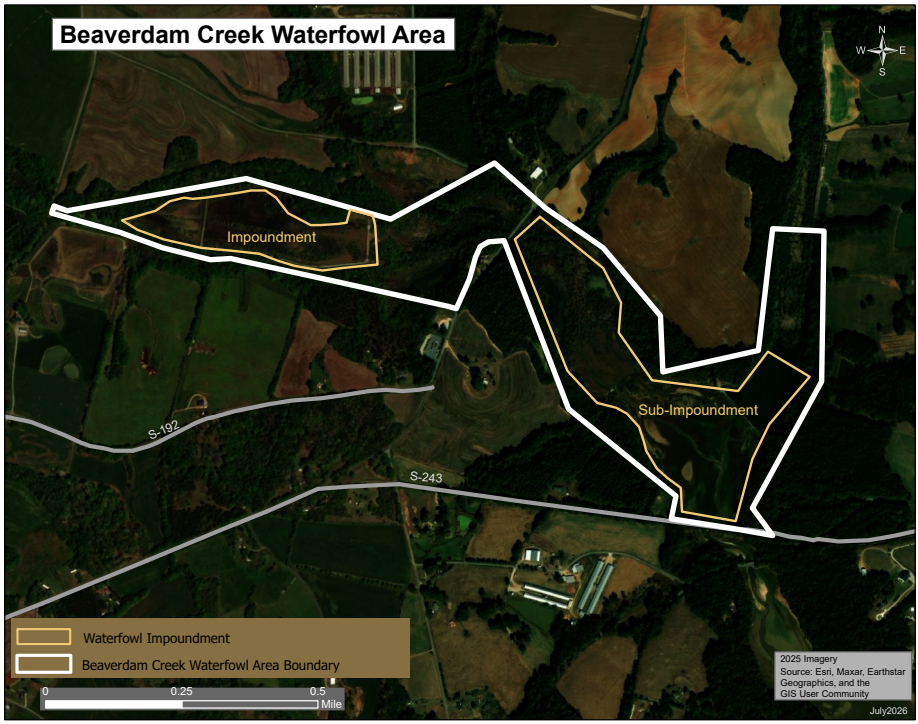




South Carolina is located on the southern extent of the Atlantic Flyway. Migratory waterfowl counts are highly weather-dependent.

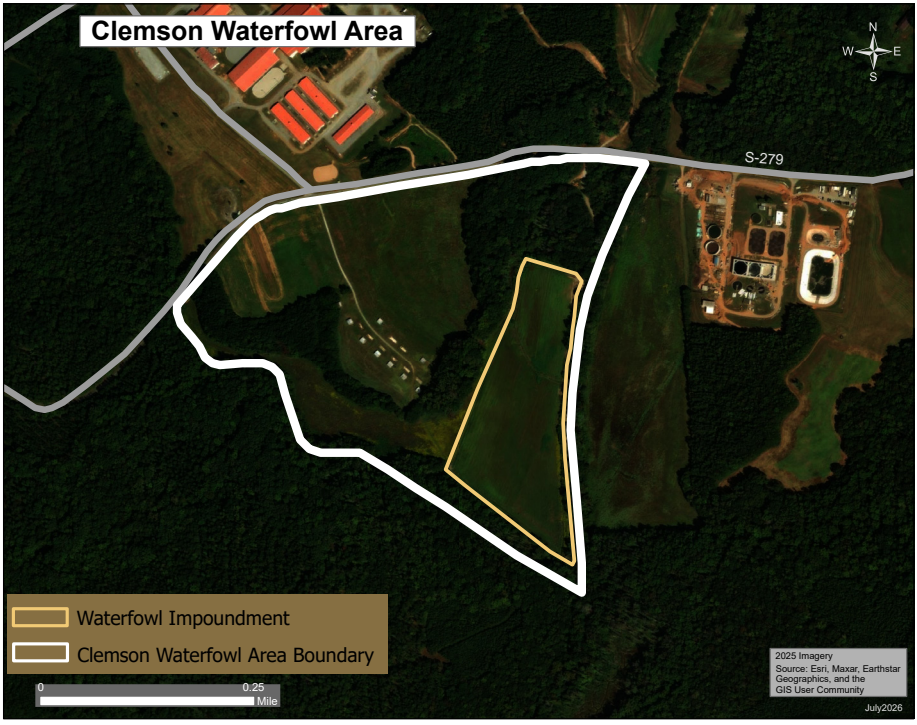
Property Overview

Beaverdam Creek and Clemson Waterfowl Management Areas are Category One lottery hunt sites located near Clemson, South Carolina.



Beaverdam Creek Waterfowl Management Area : Beaverdam is located near Lake Hartwell, on property owned by the United States Army Corps of Engineers and managed by SCDNR. The site consists of approximately thirty acres of agricultural fields and mixed bottomland habitat. Little Beaverdam Creek flows along the property's southern border. A system of dikes, water control structures, and pumps allows for water management. Siltation from flash flood events is a significant issue for this property.

Clemson Waterfowl Management Area: The Clemson waterfowl area is located on property owned by Clemson University and has been managed by SCDNR since 1990. Eighteen Mile Creek flows along the property's eastern boundary. The Garrison Arena—an extensive complex including barns, arenas, an expo center, RV hook-ups, and outdoor show rings, adjoins the property to the north. The College of Veterinary Medicine is under construction nearby, and an adjacent wastewater treatment plant is doubling in size. The property totals twenty acres, some of which is planted in the summer and flooded in the late fall to provide waterfowl hunting. An earthen dike along Eighteen Mile Creek, a flashboard riser system, and an emergency spillway provide for water level management. Over the past several decades, as the region continues to develop, this property has experienced a significant increase in flash floods that challenge effective management, most notably reducing the opportunity for planted crops. Areas that were previously productive cropland are now frequently flooded. Additionally, flooding is depositing massive amounts of sand and debris on and across the dike into the impoundment. This siltation has increased over time as more of the surrounding area at higher elevations has continued to be developed.



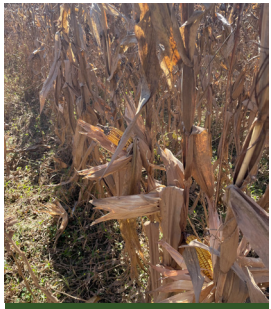
TARGET WATERFOWL PLANT SPECIES



Smartweed



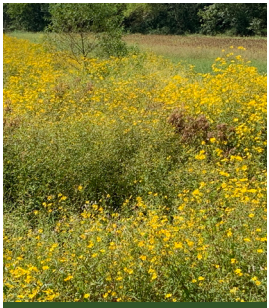
Millet



Corn



Sorghum Sundangrass



Bidens



"Wood ducks, mallards, and American green-winged teal comprise 71 percent of the harvest on Beaverdam and Clemson Waterfowl Areas from 2015 to 2025."

Project Overview

In September 2025, SCDNR engaged a third-party facilitator and a team of three external wetland experts with public and private sector experience to conduct a thorough review of wetland management practices. The team was tasked with evaluating the following five areas:

1. Evaluate the **existing management plan** for gaps or misplaced goals.
2. Evaluate **infrastructure** (dikes, water control structures).
3. Evaluate the selection and success of **planted crops**.
4. Evaluate and make recommendations on **mitigating disturbance**.
5. Evaluate current **water management** regimes and issues.

During two meetings (one web-based teleconference and a classroom session/ field tour), the team reviewed all aspects of the properties' wetland management programs and documentation, including:

- **Waterfowl Management Area Management Plan**
- **Maps**
- **Water management data**
- **Equipment and staffing**
- **Budget**
- **Waterfowl harvest data**



Key Takeaways

The wetlands review team is impressed by the tenacity and innovation of the SCDNR staff in addressing management challenges driven by weather systems and off-site impacts.

ONE:
EXISTING MANAGEMENT PLANS

Current management plans for each site are consistent with best practices in managing upland sites. The plans establish windows for water management (flooding and drawdown), planting and maintenance, and consider the impacts of unpredictable weather events.





CLEMSON: The review team commends SCDNR for adequate staffing, budget, and equipment to implement the plan, and notes that the size of the property, as well as the severe impacts of flooding and siltation from Eighteen Mile Creek, significantly limit SCDNR's ability to effectively manage the site as a waterfowl impoundment. The 2024 installation of fencing to protect the site from wild hogs was a positive step.



Staff are encouraged to adapt the management plan to site conditions, utilizing crops as a tool for plant succession management, rather than an emphasis that dictates the timing of drawdowns to achieve annual outcomes. Encouraging moist soil plants, such as annual smartweeds, millet, sprangletop, and sedges, may provide waterfowl forage in areas that have proven difficult for crop establishment, as moist soil management is able to withstand wetter conditions. Additionally, the transition to moist soil management would support student learning. The review team identified several beneficial moist soil plants on site in areas that were too wet for agricultural planting, noting that conditions and seed sources currently exist to produce natural waterfowl foods within the wetlands.

Noting the small size of the property, the review team encourages SCDNR to reduce the number of blinds from three to two and to set clear expectations for hunters via the website to improve the quality of the hunt.

Several factors limit or may be reducing the waterfowl concentration and activity in this area. Acknowledging the benefits of wetland management, not only for wintering waterfowl but for other wetland species year-round, helps justify the agency's investment and management of the site, while also providing a broader array of social and ecological benefits.

BEAVERDAM CREEK: The review team notes the natural cover of this property, including strips of trees, as a significant benefit and commends staff for embracing the challenges presented by the persistently wet conditions on some portions of this site. Staff are encouraged to remain vigilant in the treatment of woody vegetation such as willows within the impoundment, which can lessen the attractiveness of the site to waterfowl and create management challenges in the long term if they continue to spread and dominate the wetlands. This site is very vulnerable to flash floods, as evidenced by the excessive deposition of sand and debris in ditches and around pumps.



“If the property is going to be wet, rather than fight reality, embrace it and change your management expectations and actions. Moist soil plants provide seeds and bugs that supply birds with proteins and amino acids beneficial for molting, along with carbohydrates for energy.” — Frank Nelson

TWO:
INFRASTRUCTURE

Staff have been actively maintaining dikes, emergency spillways, and water control structures on both sites; however, the existing infrastructure is becoming increasingly inadequate with intensifying storm patterns. One-hundred-year storms are now occurring four to five times per year.

CLEMSON: SCDNR has experienced staff and equipment in place to maintain the current infrastructure; however, frequent flash floods are pushing water over and through the existing dike and into the impoundment, causing ongoing maintenance challenges and a lack of longevity for any solution designed to control massive water flows. After the workshop, a closer look at Digital Elevation Models showed that a protection levee on the east side of Eighteen Mile Creek had been added, which could deflect more flow and sediment onto Clemson and the west side of the channel. With ongoing development upstream, the hydrology and sediment dynamics within the watershed are likely changing and contributing to the problem for these low-lying floodplains. To underscore the scale of the issue, thirty to forty tons of sand per year are deposited into the impoundment by storm events. This sand is removed from the impoundment by the Army Corps of Engineers and used to renourish beaches on Lake Hartwelll.



The current infrastructure is adequate to seasonally fluctuate the water levels to support moist soil management. The team recognizes the interest of hunters to see planted crops. Protecting the site by investing in a flood protection levee for such a small area that receives a lot of water all at once is likely not a wise investment. Staff are encouraged to document rainfall and creek levels to guide decisions about future investments. Looking for opportunities to encourage backwater flooding at the location of the current spillway, as opposed to headwater flooding on the north side, would likely minimize the degree of sedimentation. Both sides of Eighteen Mile Creek should be considered with any future flood resiliency solution.

BEAVERDAM CREEK: Despite frequent, significant rain events, the dikes on Beaverdam Creek Waterfowl Management Area are in good condition, and limited sediment was seen inside the impoundment. However, sediment deposited in the creek bed and along the banks of the creek, as well as the shallow depth of the creek, has rendered one pump system useless and significantly reduced the effectiveness of other pumps. Further, water levels in Lake Hartwell impact the ability to move water off this site. Staff should explore ways to document and, if possible, quantify sedimentation and water flow issues during and after rainfall events, and use this data to assist with making future infrastructure investments.



THREE:
PLANTED CROPS

Crop success is directly correlated to the timing and amount of rainfall. Staff noted concerns about the ability to dry sites adequately to plant crops at a desirable time and loss of crops due to mid-season flooding. While corn is often viewed as a desirable crop, it is a non-water-tolerant crop selection and vulnerable to loss in a late-season flood. As such, staff have had challenges getting these two sites dry enough to plant and maintain dryness for a successful crop. Often, the best producing crop areas are the higher elevations, which may not flood at normal winter water levels. The review team encourages staff to respect site limitations and to either pursue other crops that can tolerate wetter sites or consider moist soil management.



Sorghum sudan can serve as a visual screen in addition to a food source.

CLEMSON: Approximately twenty acres are cultivated with waterfowl desirable crops, such as a combination of corn, chiwapa millet, and sorghum-sudangrass hybrid. Fields are plowed, planted, fertilized, and sprayed with herbicides as needed. When crops mature, they are left standing and flooded closer to the waterfowl hunting season. Due to the presence of moist soil plants, food is not a limiting factor on this site. Staff should consider crops as a tool to set back succession and provide a visual break.

BEAVERDAM CREEK: Approximately eight to ten acres are cultivated on the site with waterfowl desirable crops. Fields are plowed, planted, fertilized, and sprayed



"Planted crops should never cover 100 percent of an area to be flooded. Growing natural vegetation in strips or pockets allows managers the flexibility to mow or disk openings prior to flooding without violating federal waterfowl baiting laws. These areas show open water to attract waterfowl early in the season." — Houston Havens

with herbicides as needed. Annual crops consist of a combination of chiwapa millet and sorghum-sudangrass. When crops mature, they are left standing and flooded closer to the waterfowl hunting season. The abundance of natural grasses and seeds provide forage that augments crops.

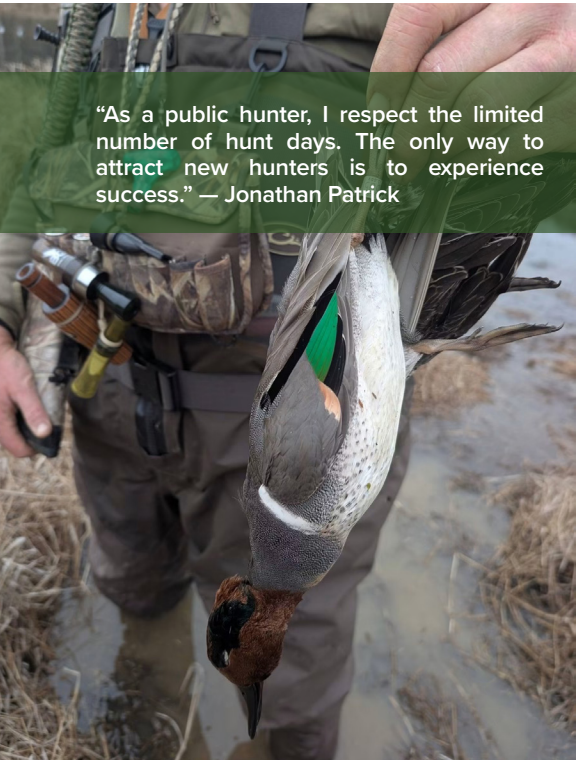
Staff have adjusted expectations and actions in recent years and have been managing more for moist soil plants and using agriculture as a tool to periodically set back succession. The visiting team supports this approach and notes that this may result in cultivating only higher elevation areas and/or delaying planting in low areas until the soil dries. The goal of these planted crops is to provide hunter cover or a visual break. The team notes that crop yield in this scenario is secondary. Additionally, using agriculture as a tool provides cross-seasonal benefits of high moist soil production the following growing season and a subsequent reduction of perennials or invasive species in the footprint of the food plot.



FOUR:
MITIGATING DISTURBANCE

As Category One waterfowl sites, both Clemson and Beaverdam Creek minimize disturbance by limiting access from November 1 until February 8. The properties are hunted one day per week during the season. During the remainder of the week, disturbance is limited to minimal staff site visits.

CLEMSON: The Clemson Waterfowl Management Area's small size makes the site particularly vulnerable to off-site impacts of disturbance. Low-lying beaver complexes that are further downstream do provide some spatial refuge close by. However, walk-in hunting can disturb these birds in these locations. Additionally, these locations have been impacted by sedimentation and are therefore degraded and less valuable as waterfowl habitat. The proximity to campus and small size make this site accessible for many other uses (birdwatching, hiking, field instruction) that may have negative impacts on waterfowl usage. For minimal impact on waterfowl, the review team recommends continuing to limit non-hunting uses to the off-season.



"As a public hunter, I respect the limited number of hunt days. The only way to attract new hunters is to experience success." — Jonathan Patrick

Outside of waterfowl hunting season, by embracing the frequency of flooding and available water, this site would likely be used by a range of waterbirds and other wetland-dependent species, making it a great opportunity for wildlife viewing or learning. Planting a mix of bottomland trees, including mast-producing species in the open area immediately west of the impoundment, known as the "neck," or coordinating management of Clemson Waterfowl Management Area with the property east of Eighteen Mile Creek, could provide a wider riparian corridor, benefiting aquatic life in the stream and

forest species moving along the stream corridor.

BEAVERDAM CREEK: Disturbance at Beaverdam Creek is minimal thanks to the management plan and aligned management interests on adjoining properties. The plan prescribes a balance of passive and intensive management, allowing for sanctuary. An upstream beaver complex provides additional refuge for pair bonding. Remote areas like beaver wetlands and scrub-shrub wetlands should be monitored periodically to understand waterfowl use (if any) and to decide if treatment is necessary. Aerial applications of herbicides with drones or other methods could be beneficial for maintaining open pockets of water. Staff are encouraged to continue work with birders and anglers to find ways to support non-hunting uses without impacting waterfowl during the fall hunting season.



FIVE:
WATER MANAGEMENT

CLEMSON: The review team commends staff for working tirelessly to develop new solutions for managing water on this site. For this site to be effectively managed, landscape-scale watershed planning to include Clemson University, the Army Corps of Engineers, and others, is needed. The challenges that SCDNR is experiencing with flooding and sedimentation are likely prevalent within the Eighteen Mile Creek watershed. This setting, in proximity to the University, provides students who will be moving into the natural resource workforce the potential for greater interaction between SCDNR and Clemson University. This could occur on multiple levels and serve as an outdoor classroom, understanding wetland management and challenges, and monitoring wetland species over time.

BEAVERDAM CREEK: Managing water on Beaverdam Creek is significantly impacted by the unpredictable water levels on Lake Hartwell. Despite the challenges, the review team encourages staff to strive for consistency in managing water levels, particularly in the spring. Continually fluctuating levels increase woody vegetation that can be difficult to control. Staff are encouraged to continue seeking ways to make water management more efficient and effective, including controlling the pump remotely and/or adding a second pump.



Conclusion

Clemson and Beaverdam Creek Waterfowl Management Areas are managed by experienced, committed staff who are dedicated to the goal of providing quality habitat for migrating and resident waterfowl and a diversity of other species. We encourage staff and leadership to continue to evaluate the management goals based on weather and user data, ongoing changes within the landscape, the desires of the property owners, and adjust the habitat management to achieve those goals.





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