



USGA® COURSE CONSULTING SERVICE

Site Visit Report

Walloon Lake Country Club Petoskey, Michigan

Visit Date: June 11, 2024

Present:

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USGAGreenSection

Executive Summary

It was a pleasure to visit Walloon Lake Country Club for the first time to conduct a Course Consulting Service visit. While touring the golf course, our discussions focused on the following topics.

- **Putting greens.** Overall, the putting greens were in excellent condition on the day of the visit. We reviewed the cultural management program, collected data using the GS3 smart golf ball and a shear strength tester, seedhead control, contamination of unwanted grasses in the collars and roll-out areas, and the challenges and risks that come with managing putting greens with high populations of annual bluegrass in a northern climate.

Visual inspection of the root zone did not reveal any concerns with elevated organic matter levels, and we collected samples from No. 1, No. 2, and No. 7 as part of a USGA-funded research project to quantify organic matter levels in the top portion of the root zone. The putting greens we collected data from revealed that the playing surfaces are performing at a high level. This is a direct reflection of a sound agronomic program being in place.

Ups and downs in the weather this year made it challenging to control annual bluegrass seedheads. It was reviewed how the timing of applications could be adjusted for improved seedhead control. Kentucky bluegrass and perennial ryegrass contamination in the collars and roll-out areas can impact ball lies and course appearance. Unfortunately, there is not a selective herbicide to remove these unwanted grasses from these playing surfaces.

Annual bluegrass can certainly produce a high-quality playing surface, but the reality is it has poor heat tolerance, drought tolerance, and disease resistance, as well as is more prone to winter injury when compared to creeping bentgrass. Options such as resurfacing and rebuilding putting greens and applying certain plant growth regulators and selective herbicides were reviewed as solutions for increasing creeping bentgrass populations.

- **Fairways and tees.** Our discussions around the fairways and tees focused on perennial ryegrass and Kentucky bluegrass contamination, divot recovery, the stability of No. 16 fairway, and adding a forward tee on No. 9. Similar to any golf course that sees a decent number of rounds, divots were observed on the fairways and tees. Overall, there were no concerns with divot recovery, but it was reviewed how adding Chewings fescue seed to the divot mix would function as a nurse grass and help promote recovery.

A sample collected from the middle of No. 16 fairway reveals how the rootzone appears to be a narrowly graded sand with round particles that could be contributing to the stability concerns. Having a soil physical analysis performed would confirm the soil's physical properties to determine if using the sand injection process to incorporate a coarser and more angular sand would improve stability.

The current forward tee on No. 9 creates a challenging hole for golfers playing from this tee. On the other side of the forced carry at the beginning of the fairway, there is space for adding a new forward tee, but this is the type of course project that requires the input of a golf course architect.

- **Fine fescue areas and rough.** The fine fescue areas that have been added throughout the golf course create a contrast with the fine cut playing surfaces and the maintained rough as well as add texture to the golf course. Overall, weed control in these areas was excellent on the day of the visit and our discussions around these areas focused on managing density.

Investing in a flail mower, such as the [Wiedenmann® Super 600](#), would make it possible to mow these areas more aggressively to reduce the density and collect clippings.

Another major focus of our discussions around fine fescue areas were the edges along the meadow between No. 12 and No. 16. The density of trees along the edges makes it challenging for herbicide applications to be made as well as the terrain is rough, making it difficult to mow. Reducing the tree population as well as regrading is necessary so these areas can be seeded and properly maintained.

Our discussions around the maintained rough focused on controlling creeping bentgrass encroachment and concentrated traffic in pinch points. Using the herbicide mesotrione can help suppress creeping bentgrass in isolated areas, so more desirable turfgrass species can be seeded into the rough. When it comes to concentrated traffic like areas behind No. 6 tee, adjusting the mowing line for the fine fescue area would make it possible to distribute traffic over a larger area.

- **Master plan.** While touring the golf course, a number of topics came up that would typically be included in a golf course master plan as well as require the expertise of a golf course architect. These topics included, rebuilding putting greens to establish an improved variety of creeping bentgrass as well as soften contours, adding a forward tee on No. 18, establishing ornamental plantings behind No. 5 putting green, and establishing a tree philosophy. Additionally, the life cycle of the irrigation system was reviewed and considering its age, beginning the planning process for replacing the irrigation system would fall into a master plan. Developing a master plan is recommended so changes are made to the golf course without impacting its integrity as well as helps ensure funds are spent wisely and efficiently.

The following report details the observations and recommendations that were made as we toured the golf course.

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Putting Greens

Observations and Recommendations

1. Cultural management program

- The cultural management program consists of performing weekly vertical mowing and top dressing, injecting sand using the DryJect® process, and performing solid deep tine aeration to a depth between 8 and 10 inches.
- Additionally, samples were collected as part of a USGA-funded research project to standardize how samples are collected and processed to measure organic matter. The data from these samples will make it possible to benchmark organic matter levels, and when future samples are collected, trends in organic matter level fluctuations can be monitored to determine if any fine-tuning needs to be made to the cultural management program.



A consistent sand cap has developed over the years from cultural management practices being performed. One thing to note is the difference in rooting when samples were collected from creeping bentgrass (left) and annual bluegrass (right). This highlights one of the differences between these grasses and one of the reasons creeping bentgrass is able to better withstand extreme weather conditions better than annual bluegrass.

- Based on visual inspection as well as overall putting green performance, no major adjustments need to be made to the cultural management practices that are being performed. The structure of the cultural management program makes it possible to continue to build a sand cap on top of the heavy soil that was used to construct the original nine greens. As an ideal root zone accumulates, this is beneficial for both turf health and playability.
- With DryJect being recently added to the cultural management program, it was discussed how the [STEC Equipment VGR TopChanger](#) would be an option for performing the sand injection process in-house. While purchasing a piece of equipment such as this requires a significant investment, in the long run, it is possible that savings could be realized considering the cost of the DryJect process.
- It was also discussed how performing the DryJect twice in the fall would make it possible to incorporate additional sand into the root zone. If the funds are available, this would be beneficial, especially on the nine original putting greens.

2. Surface performance metrics

- We had the opportunity to use the GS3 smart golf ball to measure putting green speed, trueness, smoothness, and firmness. The data we collected on the day of the visit aligns with data that has been collected at other golf courses where putting green surfaces are performing at a high level. Generally speaking, when smoothness is measured below 4 and trueness below 1, this indicates that well-struck putts will track on their intended line.

The smoothness and trueness data we collected on the day of the visit aligns with data that has been collected at other golf courses where putting greens are performing at a high level. Surface management practices that are being performed are maximizing the performance of the putting greens and there is certainly no need to make any major changes.

The screenshot shows a mobile app interface titled 'Roll Test' for 'Green 11'. It includes a table of putting data with columns for Green Speed, Trueness, and Smoothness. Below the table is a 'Rolling Metrics' section with checkboxes for Green Speed, Trueness, and Smoothness, and a 'Done' button. At the bottom is a navigation bar with icons for Home, Map, Add New, Calendar, and More.

Green Speed	Trueness	Smoothness	
14'0"	0.55	2.19	×
13'5"	0.64	1.65	×
13'0"	0.64	2.16	×
8'4"	0.76	2.54	×
8'5"	0.69	1.88	×
8'7"	0.66	1.61	×

Green Speed	Trueness	Smoothness
11'0"	0.66	2.00

Additionally, a putting green speed of eleven feet is suitable for the putting greens at Walloon Lake Country Club due to the contouring of many of the putting greens, such as No. 7 and No. 8.

- The surface strength of multiple putting greens was also measured when we toured the golf course. Data collected on the day of the visit shows that strong putting green surfaces are being maintained. When a putting green surface is measured above 15 Newton meters, this indicates a strong surface, which translates to being able to deliver firm conditions that golfers desire.

3. Seedhead control

- Similar to many golf courses, annual bluegrass seedhead control was a challenge this year. This is due to the ups and downs there were experience with the weather throughout the spring.
- Research that was conducted at Virginia Tech University shows that making an application of the plant growth regulator ethephon in the late fall or early winter results in improved seedhead control.
 - ◆ Rather than making this application to all the putting greens, testing this change to the seedhead control program on one putting green is recommended to evaluate its effectiveness.

4. Collar and roll-out contamination

- Similar to many older golf courses, contamination of unwanted grasses, such as Kentucky bluegrass and perennial ryegrass, has occurred in the collars and roll-out areas. It is likely that over time, these grasses have migrated from the rough, and it is possible that perennial ryegrass was used to fill divots at one time in the past. Also, it appears that many of the roll-out areas were created by simply lowering the mowing height of the turf in the rough, and this

is another reason these grasses are present. Unfortunately, there is no selective herbicide that can be applied to suppress these grasses.

- Options that can be used to control these grasses would require that a non-selective herbicide either be used to spot-treat areas where encroachment has occurred or another option would be to apply a non-selective herbicide to eliminate all the grasses in the roll-out areas and collars and then seed with an improved variety of creeping bentgrass to create a monostand of turf.



Unfortunately, there is no herbicide that can be used to eliminate the unwanted grasses from the rollout areas, approaches and collars. Either spot treating with a nonselective herbicide or eliminating all the turf and establishing creeping bentgrass would be necessary.

- A possible solution that could be explored before using non-selective herbicides to remove these grasses is to slightly raise the mowing height of the triplex mower used to mow these areas. Both the fairway mowers and the collar and roll-out area mowers are set at the same height, but it is possible that the collar, approach, and roll-out area mower is cutting at a slightly lower height in these areas. Kentucky bluegrass and perennial ryegrass are both present in the fairways, but they do not appear to have the same impact on playability, and it is possible that these mowers are mowing slightly higher even though the mowers used for the fairways are set at the same height as the collar, approach, and roll-out area mower.

5. Annual bluegrass challenges

- Overall, high-quality playing conditions are being delivered on the putting greens, but the reality is there are high risks that come with managing putting greens with high populations of annual bluegrass. This grass has poor heat and drought tolerance and is susceptible to many different diseases.
- Additionally, there is a high risk of winter injury or winter kill occurring when high populations of annual bluegrass are present on putting green surfaces at golf courses located in a northern climate. For example, annual bluegrass can only survive approximately 30 days under ice cover as well as it is highly susceptible to crown hydration, which can occur when significant temperature fluctuations occur during the late winter or early spring.
- Given the likelihood of severe winter conditions being experienced, having creeping bentgrass surfaces is ideal because this grass is better suited to withstand temperature extremes as well as this grass has improved heat tolerance, drought resistance, and disease resistance when compared to annual bluegrass. In an ideal situation, a decision would be made to either resurface the putting greens with creeping bentgrass or rebuild the putting greens and establish creeping bentgrass.
- If the resurfacing option were put into action, it would be necessary to install sand channel drainage in the nine original putting greens as well as perform tree removal around putting

greens such as No. 9 to improve the growing environments. The rebuilding option would create an opportunity to soften the contours of many of the putting greens so additional hole locations could be used when setting up the golf course. Rebuilding the putting greens would require working with a golf course architect to ensure the integrity of the golf course is protected. One way to look at converting the putting greens to creeping bentgrass is this is an insurance policy for the most important asset on the golf course.

- Whether or not interseeding could be performed to increase the populations of creeping bentgrass was reviewed but it should be noted how research performed at Iowa State University shows that an interseeding program results in marginal success at best.
- It was also discussed whether the herbicide PoaCure® could be used to suppress annual bluegrass and increase creeping bentgrass populations, but given the amount of annual bluegrass, this herbicide should not be applied. It would be possible to evaluate the plant growth regulator Cutless® but given the annual bluegrass populations in some putting greens, the suppression caused by this plant growth regulator could result in unacceptable conditions.

6. No. 16

- No. 16 green is located in a challenging growing environment. Tree removals have been completed and tree canopies have been raised to improve air circulation, but unfortunately cannot be performed along the left side of the hole to increase how much direct sunlight reaches this putting green. One option we reviewed for improving this putting greens growing environment is moving the putting green to the right. This is certainly an adjustment that could be made to improve the growing environment, but considering the impact it would have on the golf course, this type of course adjustment should not be made without a golf course architect being involved.

Fairways and Tees

Observations and Recommendations

1. Divot recovery

- Overall, we did not observe any concerns with divot recovery on the fairways or tees. The agronomic team is keeping pace with filling divots on a routine schedule, and golfers observing divots are just part of the game, especially when a golf course sees the bulk of its rounds played in a short time frame.
- One strategy we reviewed for improving the rate of divot recovery is using Chewings fescue seed in the divot mix. This grass germinates quickly and will function as a nurse grass to promote faster recovery, and eventually, the turf from the edge of the divot crowds out the Chewings fescue, and there is no risk of a Chewings fescue contamination issue occurring.

2. No. 16 fairway

- While visiting No. 16 fairway, Mr. Pulaski noted that there are some concerns with the stability of this fairway. Given the steepness of the slope of the fairway, it appears that some wash boarding has occurred. This is when the mower bounces slightly while mowing up the steep slope.

- A sample collected from this fairway revealed how visually the root zone appears to be narrowly graded as well as consists of a large number of round particles. Having a soil physical analysis performed on samples collected from the middle of the fairway is recommended to determine if this visual assessment is correct. Provided a physical analysis confirms this, it would be worth exploring how a more widely graded and angular sand could be incorporated into the root zone to help improve stability.

3. No. 9 forward tee

- The current forward tee requires that golfers playing from this tee play over a forced carry. This makes this hole extremely challenging and has even been converted to a par-5. Given the total distance as well as the slope of the fairway, playing this hole as a par-5 is still a challenge from the forward tee. There is an area at the beginning of the fairway where a forward tee could be added so golfers do not have to negotiate this forced carry. This is an example of another course improvement project that requires the expertise of a golf course architect.

Fine Fescue Areas and Rough

Observations and Recommendations

1. Density management

- One challenge that is often experienced when managing fine fescue areas on a golf course where heavy soils are present is overall density. This is because heavier soils retain nutrients and moisture that increase turf density. Investing in a [Wiedenmann® Super 600](#) would make it possible to mechanically thin fine fescue areas. An added benefit of investing in a piece of equipment such as this is that it can be used to clean up leaves in the fall as well as other debris on the golf course.



Being able to mow the fine fescue areas more aggressively with a flail mower would make it possible to reduce density in the fine fescue areas.

- It should be noted that all the fine fescue areas are not the same because they were established using different methods. The fine fescue area to the right of No. 10 as well as the Meadow between No. 12 and No. 17, was established from fine fescue seed.
- However, the fine fescue area between No. 5 and No. 15 was established by suspending mowing of the existing rough. As a result, there are a number of different grasses present in this area, which has an additional impact on overall density. Fortunately, this area is located well out of play. In areas such as this, it would be worth testing the herbicides Fusilade® and sethoxydim to evaluate how they can be used to selectively control unwanted grasses and

transition to primarily fine fescue. It should be noted how some interseeding of fine fescue may be necessary.

2. No. 12, No. 16, and No. 17 meadow

- The edges along the meadow on No. 12 and No. 17 were reviewed. Turf density in these areas is impacted by the tree population as well as it is extremely challenging to manage these areas because of the density of the trees. Reducing the tree population and regrading the edges of the meadow on both No. 12 and No. 17 is recommended so maintenance can be performed.
- Tree spacing should be such that the agronomic team can maneuver a sprayer through this area so herbicides can be applied to manage weed encroachment. Additionally, smoothing the terrain will make it possible to mow this area as well as navigate a sprayer more easily. It must be noted that it will take time for these areas to mature, and generally speaking, this can take three years.

3. Creeping bentgrass encroachment

- Creeping bentgrass encroachment in the maintained rough on No. 4 and No. 7 were reviewed. It was discussed how plans are in place to interseed more desirable grasses in these areas. In addition to performing interseeding, treating these areas with the herbicide mesotrione is recommended to suppress creeping bentgrass, which helps with being able to establish more desirable grass species.
- Making three applications of the herbicide mesotrione will be necessary, and seeding can be performed after these applications are made.

4. No. 5 tee surrounds

- The design of No. 5 tee is such that most carts travel behind the tee and along the left side. There is little space between the back of the tee in the fine fescue area for carts to travel, and this results in traffic being concentrated. Pushing the fine fescue line back is recommended so a larger area is created for traffic to be dispersed as carts travel from behind the tee to the left side.

Master Plan

Observations and Recommendations

1. Working with a golf course architect

- Having a formal relationship in place with a golf course architect is recommended because many of the changes that are being considered for the golf course require the expertise of an architect. This would include everything from potentially rebuilding the putting greens to whether or not ornamental plantings should be performed behind No. 5 putting green. Having a master plan in place that is developed by working with a golf course architect will ensure the integrity of the golf course is protected for future generations of members.

2. Rebuilding or resurfacing putting greens

- The risk associated with having high populations of annual bluegrass on putting greens was already reviewed earlier in this report. Resurfacing or rebuilding putting greens is a major undertaking for any golf course and would require shutting down for a portion of the golf

season for this work to be completed. Whether or not a project such as this could be completed in phases was reviewed, but in reality, all this work should be completed at one time to put all the playing surfaces on the same maturation schedule as well as to avoid construction fatigue and feeling like the golf course is constantly under construction.

- If the putting greens were resurfaced or rebuilt, establishing the playing surfaces from seed is recommended. There are a number of challenges that come with sodding putting greens. This not to say sodding putting greens cannot be done, but when looking at seeding or sodding, seeding is the preferred option.

3. Trees

- Trees can certainly be a feature of a golf course, but they, without a doubt, have an impact on turf health and playability. Additionally, a large number of older trees are distributed throughout the golf course, and when trees are approaching the end of their life cycle, having a tree philosophy in place is recommended to gradually remove aging and undesirable trees and create a transition to the tree population that will persist for future generations of members.
- We did not have the time to take a deep dive into the entire tree population, but we did discuss a number of situations where trees are having an impact on turf health and playability as well as how there are multiple groupings of trees where reducing the tree population would be best for turf health as well as tree health. An example of this would be the trees located along the edge of the meadow on both No. 12 and No. 17.
- Another component of a tree philosophy that is put in place should be creating sight lines to the lake from multiple holes on the golf course. This is a unique feature of the property, and any views that can be created would elevate the golf experience. By performing strategic tree removals along the right side of No. 12 and the right side of No. 17, views of the lake could be revealed from multiple locations on No. 17.



Thinning the tree population along the right side of No. 12 and No. 17 would further reveal views of the lake. Specifically, the group of trees highlighted by the red X should be removed so the lake is more visible.

- Along the left side of the carry rough on No. 3, three oak trees that are planted close together impact turf health in the rough. Removing all three of these oak trees as well as performing select tree removal along the left side of the hole to properly space trees is recommended.
- The cedar trees located along the right side and behind No. 9 putting green have a major impact on the growing environment created for this playing surface. Considering all these trees are approximately the same age, back planting with specimen hardwood trees is

recommended so a transition can be created to remove these trees. Trees should not be planted in any areas where they will restrict sunlight as they mature.

- The maple trees located between the cart path in the back of No. 11 green are located too close to this playing surface. Generally speaking, trees should not be located between a cart path and a fairway, tee, or putting green. In locations where a cart path is not present, trees should not be located within 40 feet of these playing surfaces. Removing the three maple trees from behind No. 11 putting green is recommended to improve turf health in the rough. Considering the cedar trees that are located behind these maple trees, this will not have a dramatic impact on this hole.
- Along the right side of No. 13 green and approach, several white pine trees and four locust trees have an impact on turf health where carts exit the fairway and in the rough surrounds. Removing all the white pine trees and all the locust trees is recommended to improve turf health in the rough. Given the dense tree plantings that exist in the conservancy behind this green complex, this will not have a dramatic impact on the overall appearance of this hole.
- It was reviewed how the tree line along the left side of No. 17 could be pushed back approximately 60 feet because this is part of the golf course property. It would be necessary to have this area surveyed to determine exactly where the property line is located. Pushing the tree line back as far as possible is recommended so the amount of direct sunlight that reaches the left side of the fairway and the rough is increased. This will have a major impact on turf health and the overall playability along the left side of this hole.



Pushing the tree line back along the left of No. 17 would result in more direct sunlight reaching the entire left side of the hole. This would not have a major impact on the appearance of the hole because there would still be a wood line along the hole.

- The USGA Green Section offers a [Course Consulting Service Tree Evaluation](#) where the entire tree population is evaluated based on turf health and impact on playability. If there is interest in learning how this type of visit would be structured for Walloon Lake Country Club, I would be happy to setup a call to review how it would be structured.

4. Irrigation system

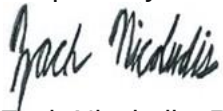
- Generally speaking, a PVC irrigation system has a life cycle between 20 and 25 years. Given the current age of the irrigation system, beginning the planning process for replacing this infrastructure is recommended. Working with an irrigation consultant to develop an irrigation design as well as a timeline will make it possible to determine when this investment is made and ensure the proper funds are in place for this project.

Summary

Overall, the agronomic program is doing an excellent job of maximizing turf health and playability. It cannot be overstated how important it is for a master plan to be developed for where investments are made in the golf course to upgrade the playing surfaces and infrastructure as well as protect the integrity of the golf course. Working with the golf course architect will ensure that proper adjustments are made to any of the playing surfaces where investments are made.

Thank you for your time and continued support of the USGA Green Section. I look forward to working with your facility in the future. If there are any questions regarding this report's contents, please feel free to contact me at znicoludis@usga.org or on my cell phone at (412) 215-6488.

Respectfully submitted,



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USGA Green Section

Turfgrass and Environmental Research

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