



COURSE CONSULTING SERVICE

Onsite Visit Report

Beaver Meadow Golf Course Concord, New Hampshire

Visit Date: October 23, 2019

Present:

Mr. Bernard “Sid” Chase, Golf Course Manager
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United States Golf Association

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The USGA Green Section develops and disseminates sustainable management practices that produce better playing conditions for better golf.

Executive Summary

It was great to visit Beaver Meadow Golf Course for a Tree Evaluation visit on October 23, 2019. The purpose of this visit was to evaluate the trees on the golf course and discuss their impact on turf health and playability.

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General Observations

As a whole, the golf course is heavily wooded but there are more trees and poor growing environments on the back nine than there are on the front nine. It appears as though the golf course was under-cleared from the very beginning. The overabundance of trees is negatively impacting turf health in many areas and is making the golf course extremely challenging, especially for high handicap players. As such, a significant amount of tree removal is required throughout the property to improve turf health and playability.

In most areas, trees are severely overplanted so it will be difficult to find any specimen trees that could properly develop, but every effort should be given to select specimen hardwood species to remain where possible. The idea of the selective tree removal program is not to clear cut the entire property, but to remove trees that are negatively impacting turf health and encroaching on playing corridors. Additionally, species of trees that are poorly suited for golf course use should be removed. The second nine will require larger land-clearing equipment to efficiently remove necessary trees while Holes 3 – 9 will require more selective removal and a much lower quantity of trees to be removed to make a significant positive impact. The north-south orientation of many of the holes is increasing the negative effects of the trees on holes that are oriented in this direction (i.e., 1, 2, 5, 6, 10, 11, 13, 15, 16, 17 and 18).



The red areas outline the large areas where a significant amount of tree removal is required to improve growing environments.

Tree Evaluation Criteria

During our tour of the golf course. We evaluated the trees on the golf course based on the following criteria:

1. **Growing environments.** The environment that turf grows in is the most influential factor on turf health and reliability, bar none.
 - Trees that produce shade, particularly morning shade during the summer months should be removed. Sunlight is required for turf to produce energy. Without adequate sunlight turf will not be able to survive, especially in high traffic areas. Morning sunlight is most critical during the summer months because the turf can more efficiently utilize sunlight during the cool morning temperatures. However, afternoon sunlight is critical during the winter months to reduce the likelihood for winter injury. Ideally, all fine turf areas would receive full sunlight all day during the entire year.
 - Trees can restrict air movement which can result in turf decline during periods of hot and wet conditions during the summer months. Providing unrestricted air movement across fine turf areas will improve turf health and reliability during periods of challenging weather and will expedite the drying process following heavy rain events.
 - Trees produce roots that outcompete turf for water and nutrients. When trees are grown too close to fine turf areas, the surface roots will negatively impact turf health.
 - When trees are placed in high traffic areas, turf thinning often results because the trees act as obstacles which concentrates traffic to areas around the tree. The stress from concentrated traffic is in addition to the surface roots outcompeting the turf for water and nutrients.
2. **Playability.** Trees that are encroaching on playing corridors, have aggressive surface rooting and trees that serve as double hazards should be removed.
3. **Potential for opening vistas across the property.** In many instances a fantastic view across the rolling topography could be revealed if poor quality trees were removed.
4. **Trees that are located in areas that impact high handicap players more so than low handicap players should be removed.** The tree at the dogleg on the left side of Hole 9 is a great example.
5. **Tree health.** Any tree that is unhealthy should be removed to reduce the likelihood for branches or the entire tree falling unexpectedly.
6. **Species selection.** Trees that are poorly suited for golf course use should be removed throughout the property. Species such as white pine, spruce, birch and dogwood are examples of species of trees that are poorly suited for golf course use. These species are inherently flawed with one or more of the following characteristics:
 - Surface rooting, soft, brittle and weak branching, rapid growth, low branching habit, dense shade, or heavy production of debris, such as fruit and seeds that must be cleaned.

Remediation

1. **In all areas where trees are removed the site will need to be remediated to restore playability and desirable aesthetics.**

- The ideal process for restoring each area will depend upon its location. Areas that are deemed “in-play” will require the stumps to be ground, the surface to be leveled and a suitable soil to be spread over the surface prior to seeding back to primary rough. Fortunately, the pond left of Hole 14 is going to be dredged so this will produce some material that can be used to cap areas that need to be reestablished following tree removal.
- Areas that are deemed “out-of-play”, such as the left of 17 tee should have the stumps ground, but the area can either remain as an unmanaged forest site, or can be hydroseeded to produce a high grass area similar to what is currently located behind 15 green.

Hole-by-Hole Recommendations

Hole Number 1

1. **Remove the three trees on the right side of the teeing ground.** These trees are blocking morning sunlight to the tee and the third tree is beginning to encroach on playing corridors.
2. **Significantly thin the grove of pine trees on the right side of the fairway.** These trees are blocking morning sunlight to the fairway. During spring and fall months the fairway does not receive sunlight until noon.
 - Additionally, the grove of trees on the left side of Hole 1 is blocking morning sunlight to the fairway on Hole 18. This grove of trees should be thinned significantly.
 - On both sides of the hole, select six – 10 trees on each side to remain and remove all others. Creating channels through the trees will provide sunlight and unrestricted air movement to the fairways.
3. **Remove the oak tree to the right side of the putting green.** This tree is blocking morning sunlight during the summer months and produces a large amount of debris that collects in the recently renovated greenside bunkers.

Hole Number 2

1. **Remove the trees to the left of the teeing ground.** These trees are located very close to the teeing ground and are blocking morning sunlight to the tee. Additionally, trees located this close to the cart path will increase the likelihood for cart path damage from surface rooting.
2. **Significantly thin the grove of pines on the left side of the fairway, similar to what was discussed on the left and right side of Hole 1.** These trees are all blocking morning sunlight to the fairway on Hole 2.
 - Removing these trees will also increase air movement through this portion of the golf course which will expedite the drying process on these fairways.
3. **Remove the declining maple tree on the left side of the putting green.** This tree is in decline and is located very close to the bunker which will be renovated sometime in the near future.

Hole Number 3

1. **Push the tree line back on the left side of the teeing ground to improve morning sunlight penetration to the tee.** Additionally, these trees are located very close to the cart path and their roots will eventually compromise the cart path system when it is repaved with asphalt.

Hole Number 4

1. **Remove the three small trees on the left side of the fairway approximately 50 yards short of the putting green.** These trees are blocking a view to the green from the fairway.
2. **All of the pines on the right side of the fairway should be removed eventually.** Planting desirable species such as oak or maple before these trees are removed would be a good idea to establish a desirable species before the pines decline or are removed.
3. **Approximately 200 yards from the green there are three maples and three dogwoods.** Remove the dogwood trees and the middle maple tree.
 - Dogwood is an undesirable species for use on the golf course due to its low branching habit. Removing the dogwoods and the middle maple will allow the remaining two maples to properly develop.



Hole 4: Remove the trees on the left side of the hole blocking a view of green from the fairway. Also, remove the dogwoods and middle maple on the right side of the hole.

Hole Number 5

1. **The white pines between the fairways on Holes 4 and 5 are also blocking morning sunlight to the fairway on Hole 5.** Not surprisingly, the turf on the right side of the fairway was thin near the white pines. Removing these trees will improve turf health and density.
2. **Remove the grove of pine trees to the left side of the putting green.** These trees are beginning to encroach on playing corridors and are blocking morning sunlight to the teeing ground, fairway and putting green on Hole 6.
3. **Remove the two pines to the right side of the putting green.** These trees are blocking morning sunlight to the putting green.

Hole Number 6

1. **Remove most of the pines behind the teeing ground.** These trees are blocking sunlight penetration during the spring and fall months to the back portion of the tee. A grove of trees can remain to provide separation between Holes 5 and 6 but the trees that remain should be the trees that are closest to 5 fairway.

2. **Remove the three pine trees adjacent to the teeing ground.** These trees on the left side of the tee are located extremely close to the tee and surface roots are certainly growing well into the teeing ground. Surface roots compete with turf for water and nutrients and compromise turf health.
 - Additionally, pine trees have a weak branching habit and these trees are growing directly above the teeing ground. Removing these trees will eliminate the chance of branches falling onto the tee.
3. **Remove all of the trees between 5 green and 6 green.** As stated above, these trees are blocking sunlight to 6 fairway, tee, and green.
4. **Remove the pine tree directly behind the putting green.** This tree is located extremely close to the green and undoubtedly has surface roots growing into the putting green.



The red areas outline the large areas where a significant amount of tree removal is required to improve growing environments on Holes 4 - 8.

Hole Number 7

1. **All of the white pines on the left side of the fairway should eventually be removed and more desirable deciduous species such as oak or maple should be replanted in this area.**

- This project would be best performed in phases where the first six or seven pines are removed, and one or two desirable species are planted and then the second half of the pines are removed five years later and replanted with 1 or 2 deciduous trees.

2. Remove all the white pines around the putting green complex on Hole 7.

- The white pines on the left side of the green are destroying the cart path with aggressive surface rooting and the pine tree on the right side of the green is producing shade on the green. Fall and winter shade on the putting green are increasing the risk for winter injury on the green.

Hole Number 8

1. Remove the seven trees behind and to the left of the putting green close to the road.

These trees are blocking afternoon sunlight during late fall, early spring and winter. Removing these trees will improve turf health as it heads into winter and provide more sunlight to the green in the spring, which will expedite recovery if winter injury does occur.

- Keeping the pines between the putting green on Hole 6 and the road will provide separation between Hole 6 and the road. Removing the trees closer to the road will have no impact on separation between the golf course and the road.

Hole Number 9

1. Remove all of the pines between Holes 8 and 9. The pines near Number 9 tee are blocking morning sunlight to the teeing grounds. Not surprisingly, turf density on these tees was thin. If desired, a deciduous tree can be replanted between the tees on Number 9 and the fairway at Number 8. However, do not overplant in this area. No more than one tree should be replanted.

- The azaleas on the right side of the blue tee should be removed. These are restricting air movement and require maintenance to maintain an acceptable appearance.

2. Push the tree line on the left side of the hole back 15 – 20 yards. The trees on the left side of this hole are beginning to encroach on playing corridors.

- The trees directly adjacent to the left side of the blue and white tees should be pushed back as well. These trees are beginning to grow over the teeing ground.
- The large white oak tree behind and to the left of the blue tee should be removed. It is growing over the top of the tee. If this tree is not on your property, it may be worth communicating with the neighbor to see if they would allow you to remove this tree.

3. Remove the oak tree that is defining the dogleg on this hole. This tree is impacting high handicap players. A tee shot that is hit to the middle of the fairway, approximately 120 – 150 yards from the green is being penalized by this tree. Conversely, a low handicap player can easily hit a more lofted club over this tree.

- A better long-term solution to defining the dogleg and penalizing low handicap players that are attempting to cut the corner would be to construct a bunker or develop a high grass rough area on the left side of this hole.

The tree on the left side of Hole 9 should be removed. A high handicap player is severely penalized from the middle of the fairway. A low handicap player will be able to hit it past the tree if desired or over the tree if a shorter shot is played from the tee.



Hole Number 10

1. **Remove all of the pines between 10 tee and 18 green.** These trees are blocking morning sunlight to the teeing ground on Hole 10.
2. **Significantly thin the grove of trees between 10 fairway and 18 fairway.** These trees are all blocking morning sunlight to 18 fairway and are negatively impacting turf health.
 - Selecting a handful of the most desirable species and removing all other trees would be an ideal program for this area.
 - The entire right side of this hole needs to be significantly thinned all the way down to the putting green. The trees on the right side of the putting green are blocking morning sunlight to the green.
 - There is a significant amount of tree removal required on the right side of Hole 10. Once all of the poor quality trees are removed, this would be a good area to plant two or three desirable species. Again, select six – 10 desirable species to remain and remove all other trees. After the area is cleared a few desirable species can be replanted in key areas if desired.

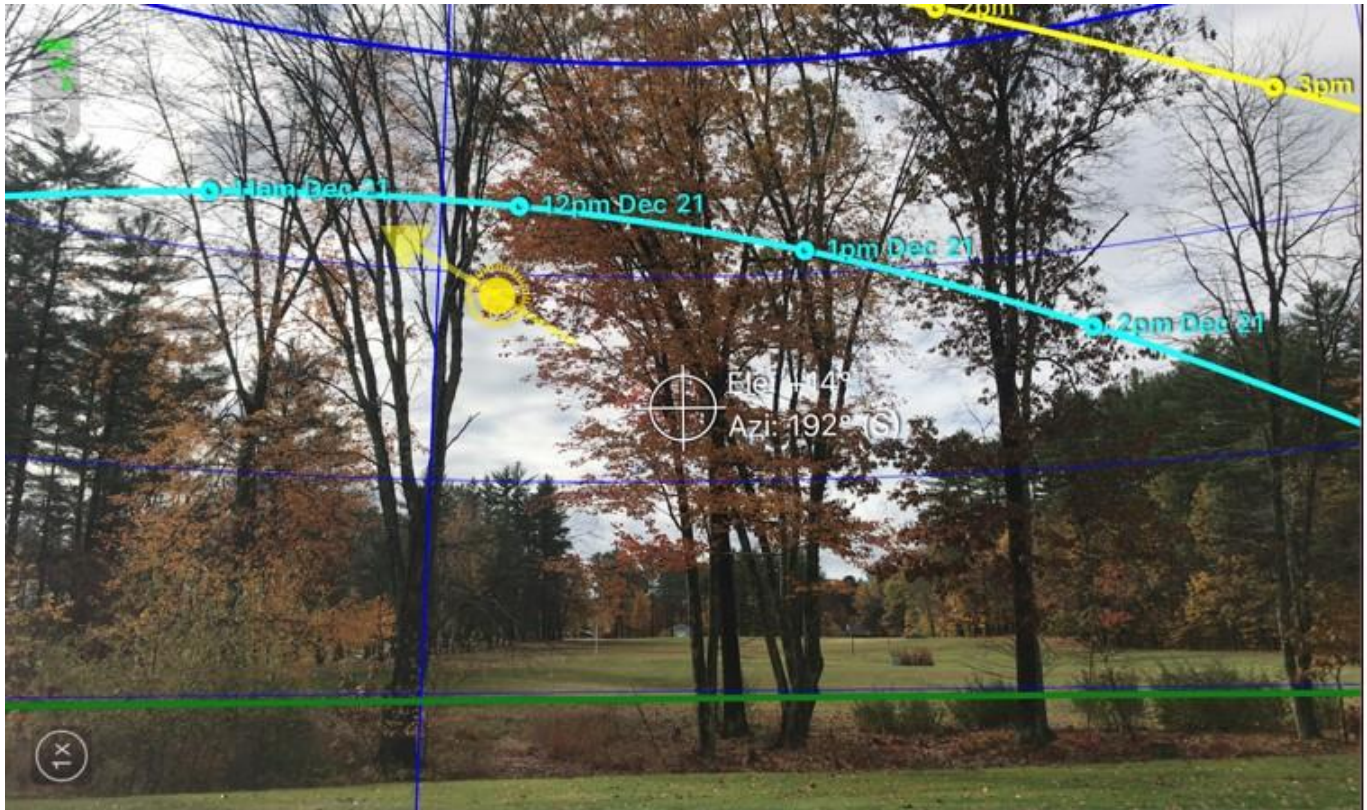
Hole Number 11

1. **The teeing ground on hole Number 11 is one of the worst growing environments I have ever seen.** All of the trees on the left side of the tee are blocking morning sunlight and the trees on the right side and behind the tee are overhanging the teeing ground.
 - Left of the tee, push this tree line back 20 – 30 yards to improve morning sunlight penetration to the tee.
 - On the right side of the tee, any tree that is overhanging the teeing ground should be removed.



Number 11 tee was recently sodded but this sod will not last long due to limited sunlight. Push the tree line on the left back 20 -30 yards and remove any trees on the right that are overhanging the tee.

2. **Remove all of the pine trees on the left side of the golf hole.** These trees are all blocking morning sunlight to the fairway. As a result, turf health and density on the fairway is poor.
 - Once all of the trees on the left side of the fairway are removed, a deciduous tree such as a white oak or sugar maple could be replanted approximately 100 yards from the green.
3. **Remove the white pines on the right side of the hole.** A desirable species could be replanted in this area if desired.
4. **Remove the Bradford pear on the right side of the fairway and replant with a desirable species, such as an oak or maple.**
5. **Remove all of the trees to the left of and behind the putting green on Hole 11.**
 - The trees to the left of the putting green are blocking morning sunlight penetration to the green during the summer months. The trees behind the putting green are blocking sunlight penetration to the putting green during the fall, winter and spring months. As a result, this putting green will be one of the last to begin growing in the spring and will be at a greater risk for winter injury.
 - ◆ Replant five – six desirable deciduous trees behind this putting green to separate the driving range from the putting green.



The light blue line shows the sun's path during the winter solstice. The back of 11 green receives no sunlight during the winter months. Remove the trees behind this green.

Hole Number 12

1. **Remove the birch tree on the right side of the putting green.** This tree is blocking morning sunlight to the green and is in decline.

Hole Number 13

1. **Remove the two tallest trees directly behind the teeing ground and the three tallest trees behind of and to the right of the teeing ground.** Removing these five trees will provide an additional two – three hours of sunlight to the tees during most of the playing season.
2. **Remove the trees on the right side of the golf hole.** Select a couple of desirable deciduous trees to remain and clear all of the other trees. The trees on the right side of this golf hole are producing shade on the newly renovated tee and the putting green.

Remove the trees right of Hole 13. The effects of shade and concentrated traffic are shown in this photo.



Hole Number 14

1. **Remove all of the trees to the left side of the teeing ground.** These trees are blocking critical morning sunlight to the tee.
 - One or two desirable deciduous trees could be planted on the left side of the teeing ground but should be planted 20 – 30 yards away from the tee.
2. **Push the tree line directly behind the putting green back 40 – 50 yards.** The trees directly behind this putting green are blocking sunlight to the green during the winter months.
 - The trees to the left of the green are blocking some morning sunlight during the summer months, but they are doing a great job of screening the power lines. If a few trees of value are removed during harvest that is okay, but overall, these trees should remain to screen out the power lines.

Hole Number 15

1. **Push the tree line back on the left side of the teeing ground approximately 15 – 20 yards.** All of these trees are blocking morning sunlight to the teeing ground. Not surprisingly, turf health and density on the teeing ground was poor.
 - Continue along the left side of the golf hole down the entire length of the hole pushing the tree line back approximately 10 – 15 yards. The trees on the left side of the golf hole are all blocking morning sunlight to the fairway.

Dense shade from the trees left of 15 tee are the primary cause for turf loss in this area.



2. Significantly thin the grove of trees on the right side of the golf hole.

- Keep the three largest oak trees on the right side of the tee on Hole 15. These trees will provide separation between Holes 15 and 16.
- Significantly thin the population of trees between Hole 15 and 16. Select approximately six trees to remain and remove all other trees. The same type of removal should be performed here as is performed between Holes 1 and 2, and 1 and 18.

Hole Number 16

- 1. Remove the grouping of trees behind 16 green.** Removing these trees will expose a great view from 14 fairway down 16.
- 2. Remove six or seven trees on the left side of the putting green that are blocking a view from 16 green to 17 green.**

Remove the trees left of 17 tee and between 16 green and 17 tee, as shown in this image.



Hole Number 17

- 1. Remove all of the trees directly to the left of the teeing ground.** These trees are all blocking morning sunlight to the teeing ground during all times of the year.
 - There is a drainage outlet on the left side of the cart path near the tee. Tree removal should extend from the drain towards 16 green. The area of removal should also extend from the drainage outlet towards the 150-yard marker in 16 fairway. This area is outlined in the aerial image on page 3 of this report.
- 2. Push the tree line back on the right side of the teeing ground to remove any trees that are overhanging the tee.**
- 3. The tree line that extends from the left side of 17 green down towards 18 green should be severely thinned.** The trees left of 17 green are blocking morning sunlight to the putting green and as the tree line extends down 18, the trees began to shade 18 tee and 18 fairway. Removing most of these trees will improve sunlight penetration to fine turf areas and improve airflow through this portion of the golf course.
 - This is another area where most trees should be removed between fairways and selective planting can be performed once most of the trees are removed.

Summary

The golf course is heavily wooded and unfortunately poor growing environments are the primary cause of turf loss on several teeing grounds and fairways. Additionally, some trees that are blocking afternoon sunlight to putting greens during the winter months are increasing the risk for winter injury and also delaying recovery following winter injury. Removing trees that are negatively impacting growing environments around putting greens, tees and fairways (in that order) will improve turf health and reliability in the most important areas on the golf course. In many cases a significant amount of trees need to be removed to make a noticeable impact on growing environments. While these changes may seem significant in the beginning, it will allow more desirable species to be replanted in ideal locations

and in appropriate quantities to allow desirable species to properly develop and flourish in the future without negatively impacting turf health or playability.

I hope this report proves useful and if I can be of further assistance at any time or if you have any questions regarding anything in this report, please do not hesitate to contact me.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Paul Jacobs" with a stylized flourish at the end.

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Additional Considerations

The USGA appreciates your support of the Course Consulting Service. Please visit the [Course Care](#) section of usga.org to access regional updates that detail agronomist observations across the region. Also, please visit the [Water Resource Center](#) to learn about golf's use of water and how your facility can help conserve and protect our most important natural resource.

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As a not-for-profit agency that is free from commercial connections, the USGA Course Consulting Service is dedicated to providing impartial, expert guidance on decisions that can affect the playing quality, operational efficiency and sustainability of your course.

First started in 1953, the USGA Course Consulting Service permits individual facilities to reap the benefits of on-site visits by highly skilled USGA agronomists located in Green Section offices throughout the country.



For questions regarding this report or any other aspect of the USGA Course Consulting Service, please do not hesitate to contact our office.

