

Land Cover and Environmental Planning Report for:
Silver Woods

Beaver Dam Road, Ocean View, DE

July 31, 2012



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Development History

Silver Woods is a mixed use planned community located on the south side of Beaver Dam Road between Parker House and Central Avenues. Phase 1 is currently under construction and consists of 29 single family residential lots on public water and sewer. Approximately 20 homes are constructed or under construction at this time. Additionally all utilities and storm water management facilities have been constructed for Phase 1 and a sanitary sewer pump station for the entire site have been constructed.



Figure 1: Site Location

The original development plan for this property was recorded in Sussex County as Starlight Woods in 1986 and consisted of 353 single family residential lots on 124 acres. This plan called for developing the entire parcel with lots covering the entire property.



Figure 2: Original Subdivision Plan

Subsequent plans for the property have sought to cluster the development and preserve as many lots as possible while preserving a portion of the natural resources on the site. In 2007 a plan was submitted that depicted 186 townhomes and 188 single family lots as well as the preservation of approximately 30 acres of forested area.



Figure 3: 2007 Plan

Further studies of the property following the 2007 plan submittal and a new commitment to green building and green development led to new site design concepts in order to further cluster development, provide needed commercial services and assisted living facilities as well as provide additional conservation and enhancement opportunities. The newest concept, which is still under development, is being pursued with a plan to certify the site as a Certified Green Site under the National Green Building Standard, as such; great care has been taken to layout the subdivision with the assistance of a planner, landscape architect, civil engineer and environmental scientist.

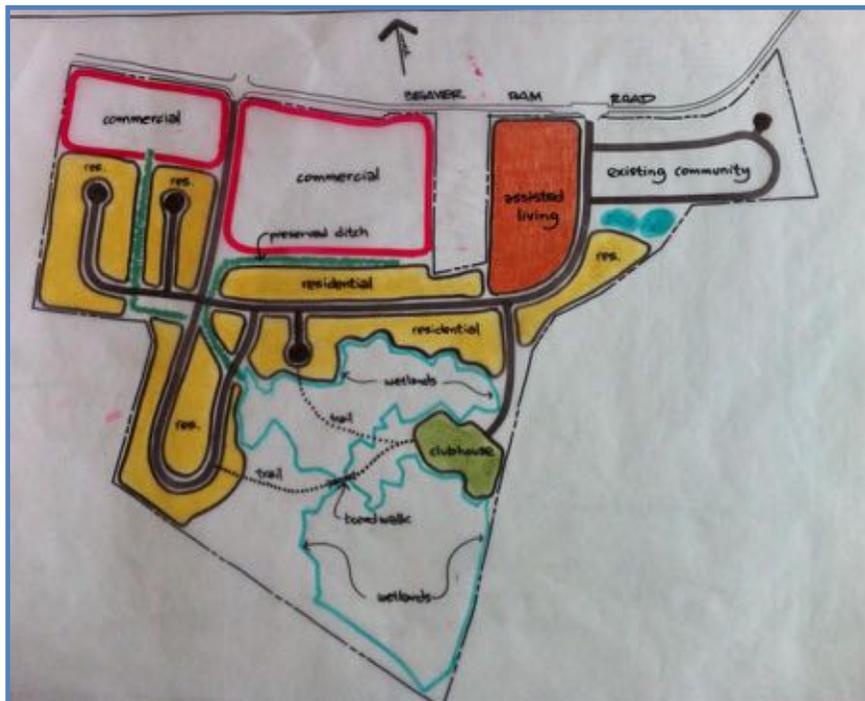


Figure 4: Latest Concept Plan

Concept Plan Rationale

General

The plan has been laid out in order to preserve natural drainage patterns and minimize the amount of site grading in order to minimize environmental disturbances. Good planning principles have been employed to make sure that the site is a model green community.

Commercial Development

Good planning principles almost always position the commercial development along the frontage road in order to minimize traffic in the residential areas and to provide visibility for the commercial facilities. A study of the markets, population and spending for the vicinity of the site have revealed that various commercial enterprises are needed in the area. Additionally, green site design promotes the placement of commercial in close vicinity to residential clusters in order to minimize trip length and promote alternate means of accessing the commercial facilities, including foot traffic, bicycle traffic, local shuttles as well as automobiles. Since most commercial facilities in the area are located along Route 26, which is often jammed with tourist traffic, this commercial facility will provide an alternative for local residents and reduce carbon emissions.

The types of commercial uses have been thought out for a portion of the commercial facility and a further refined concept for this area has been developed for preliminary planning purposes.

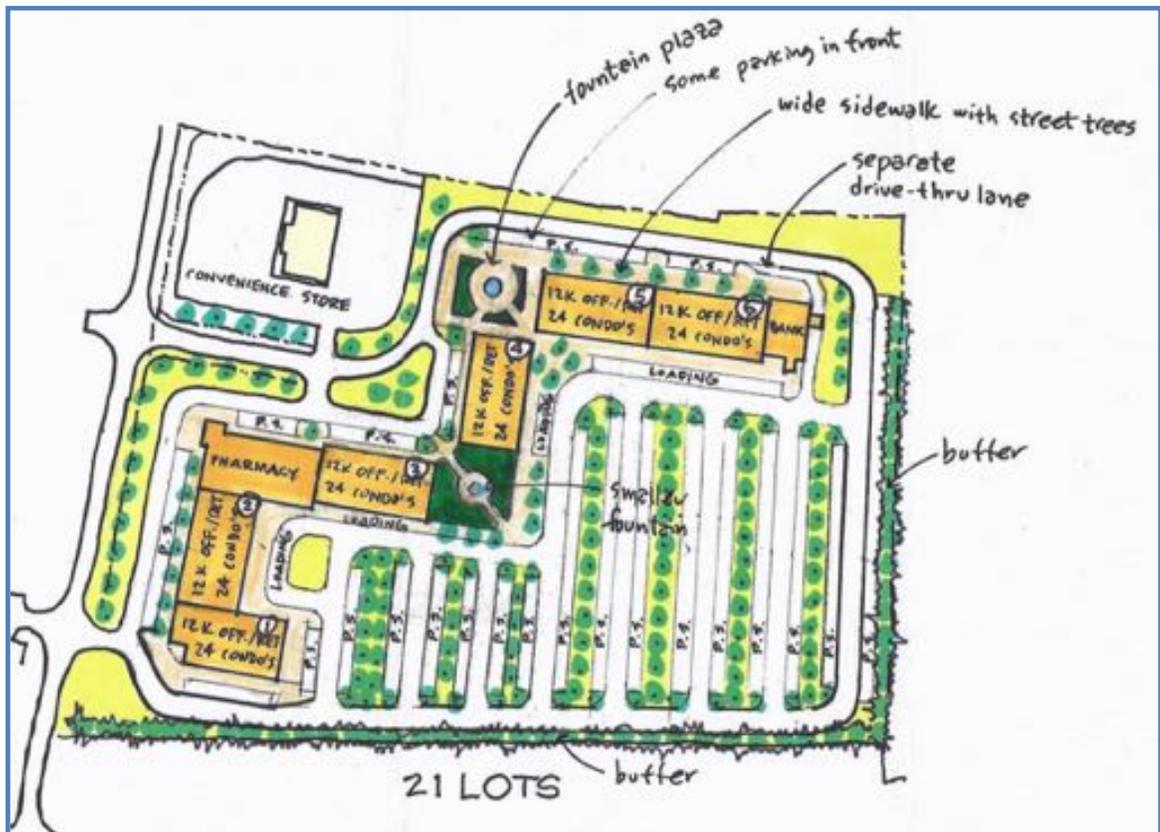


Figure 5: Preliminary Concept

Some of the highlights of this design include:

- A pharmacy in a corner position with a town clock tower
- A streetscape that includes wide sidewalks, outdoor seating and street trees
- A prominent fountain plaza with good visibility from Beaver Dam Road
- Some parking in front of stores but more pedestrian friendly layout encourages remote parking and walking or biking and walking with no vehicle needed for community residents
- The main parking field (required) is hidden by the buildings and landscaping and will be heavily landscaped
- A smaller fountain plaza on the interior and adjacent to the stores and parking
- The stores are all two sided, meaning that there are no backs or fronts and both sides will be attractive

Assisted Living

Various assisted living providers have been consulted regarding the size and placement of the much needed facility in this area. Two options were provided by various providers with the majority preferring the current proposed location along Beaver Dam Road, for many of the same reasons as the placement of the commercial facility.

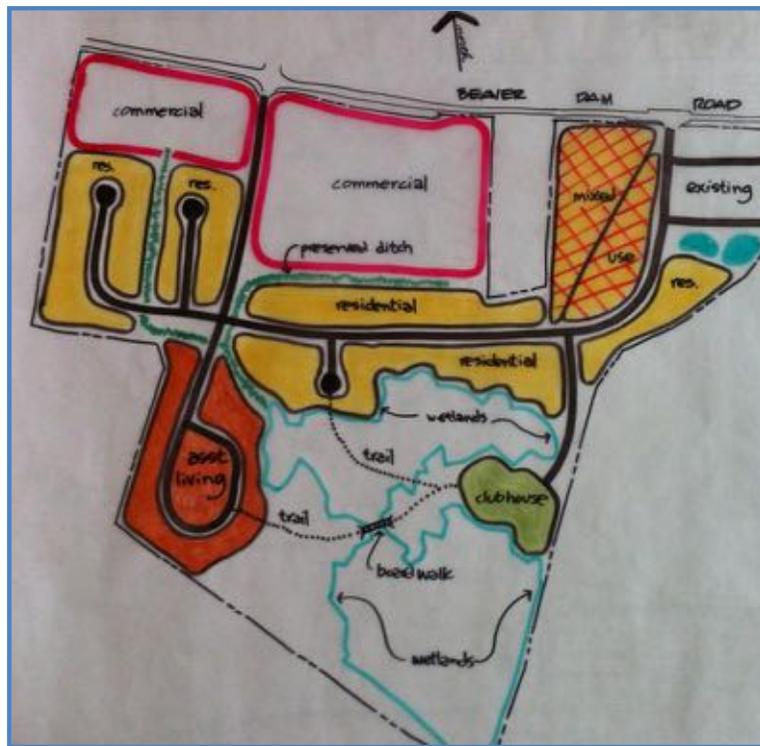


Figure 6: Alternative Assisted Living Concept (not preferred)

The alternative design provides a more serene setting adjacent to the preserved woodlands but also subjects the residential areas to additional traffic from deliveries and visitors to the facility. This location also does not provide the visibility that most providers prefer for the facility.

The current preferred concept, with the assisted living facility along Beaver Dam Road isolates the facility between Thornton Drive and Beaver Dam Road and allows for extensive landscaping buffers to screen it from the existing Phase 1 community and the proposed residential community and puts the facility in line with the proposed commercial facilities.

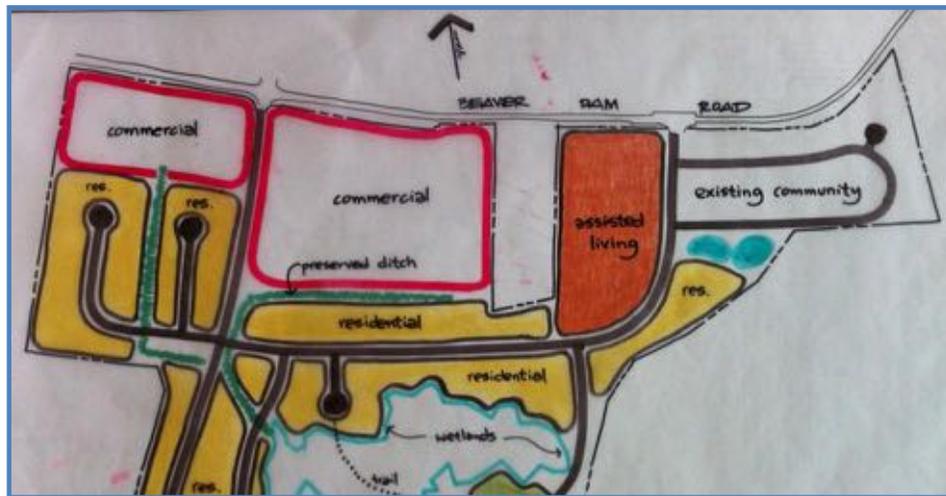


Figure 7: Preferred Assisted Living Location

Residential

The proposed residential lots occupy the remainder of the developed portion of the site and completely surround the woodland resources proposed for preservation. Since this residential development has the least impact, it is appropriate to surround the preserved woodland and habitat areas with this type of development. The residential portion of the development will be buffered from the other uses through landscaped buffers and green storm water management practices. Additionally, a green designed community facility will be placed adjacent to the preservation area and act as a trailhead, educational facility and community gathering place. The focus for this area will be environmental preservation education through displays and signage.

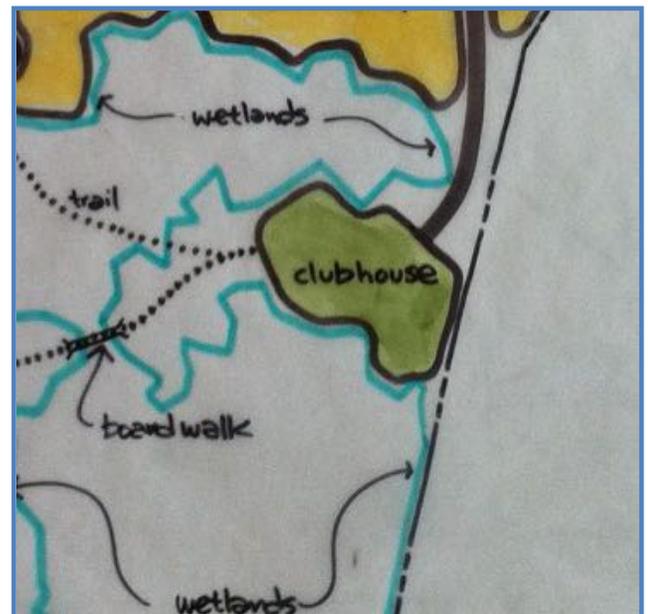


Figure 8: Community Center Location

Current Site Conditions

All of the concept plans described above have been developed using the analysis of the Land Cover types and values as described in this section of the report. These areas have been extensively studied in order to minimize environmental impacts and maximize environmental restoration opportunities.

A majority of the site is covered with woody vegetation of various ages and levels of disturbance. All of the areas of the site have been disturbed by the actions of man at some time history of the parcel. Aerial photographs dating back to 1937 have been consulted along with various public maps and on site studies.

Natural History

The native forests of Sussex County Delaware are Oak and Hickory climax communities. Most of Sussex County was covered by this forest type prior to European settlement which began in the 1600s. The timber was heavily exploited by the settlers for ship building, charcoal making, settlement (log cabins and forts) and farming operations. Sawmills were constructed on most streams and rough boards were cut and shipped back to Europe in trade for needed supplies.

Oaks were later used to make railroad ties and then softwoods that repopulated these cleared areas were used for boxes, crates and baskets until the 1950s when plastics started to take the place of wood in these applications.

Delaware continues to supply approximately 14 million board feet of timber annually with about 50% comprised of softwoods and 50% mixed hardwoods.

Site History

Historical USGS Maps and Available Aerial Photographs were reviewed in order to determine past uses of the Subject Property and surrounding areas as described below:

1918 USGS Quadrangle – A residence is indicated along Beaver Dam Road in the approximate location of the current Thornton Drive. Additional residences appear along Beaver Dam, Parker House and Central Avenues all of which existed in 1918.



1937 Aerial Photograph from Delaware DataMIL – The Subject Property is wooded on the southern portion and appears to be in active agricultural use on the northern portion along Beaver Dam Road. A possible residence appears on the site just west of the current location of Thornton Drive. A large portion of the wooded area appears to have been in past agricultural use and in various stages of re-vegetation. The woodland area on the southwestern portion of the property appears to be older than the other forested areas. Surrounding land uses all appear to be agriculture and forest with several individual home sites.



1948 USGS Quadrangle – A residence is indicated along Beaver Dam Road and the southern portion of the Subject Property is indicated as woodlands with a narrow clearing on the southeastern portion of the site.



1952 Aerial Photograph from EDR – No significant changes were observed from previous data sources.



1954 USGS Quadrangle – Additional structures are indicated on the northwestern portion of the Subject Property and the drainage patterns are more clearly indicated showing a stream or ditch that flows under Beaver Dam Road and South through the site to Beaver Dam Ditch. The structures appear to be long and narrow and the shape of current chicken rearing houses. Similar structures are indicated north of Beaver Dam Road in the same general location.



1954 Aerial Photograph from Delaware DataMIL - No significant changes were observed from previous data sources.



1955 Aerial Photograph from EDR - No significant changes were observed from previous data sources.



1960 Aerial Photograph from EDR – A ponded area appears just southwest of the apparent structure just west of the current Thornton Drive which appears to correspond to a low area in the woodlands in that general area of the site.



1963 Aerial Photograph from EDR – Three ponded areas appear on the northeastern portion of the site and a ponded area appears in the woods in the central portion of the site. There are a variety of ponded areas visible on nearby properties which indicate that this photo was taken at a time of significant rainfall.



1972 USGS Quadrangle – An additional structure is indicated along Beaver Dam Road that appears to correspond to either the Taylor or Cooper Property and another long narrow building appears on the western portion of the site along Beaver Dam Road. The road system and several buildings are indicated in Plantation Park to the east of the Subject Property.



1973 Aerial Photograph from EDR - No significant changes were observed from previous data sources.





1977 Aerial Photograph from EDR – Additional sections of Plantation Park appear to be under construction south of the Subject Property.



1980 Aerial Photograph from EDR - No significant changes were observed from previous data sources.



1981 USGS Quadrangle – The structure just west of the existing Thornton Drive appears to be gone at this time. Two driveways appear on the property along Beaver Dam Road that appear to be associated with the Cooper and Taylor Properties.



1984 USGS Quadrangle - Additional structures appear along Beaver Dam Road on the northern portion of the property. Two of the long narrow buildings on the northwestern portion of the property appear to be gone or converted to smaller structures. The indicated drainage patterns have changed with the elimination of the main ditch through the property. The area with the two new driveways is labeled as a trailer park as is Plantation Park to the south.



1989 Aerial Photograph from EDR – The roads from the previously recorded plan of Starlight Woods appear to have been cleared on the Subject Property. An area of ground disturbance appears just west of the current Thornton Drive and appears to have a large ponded area associated with it.



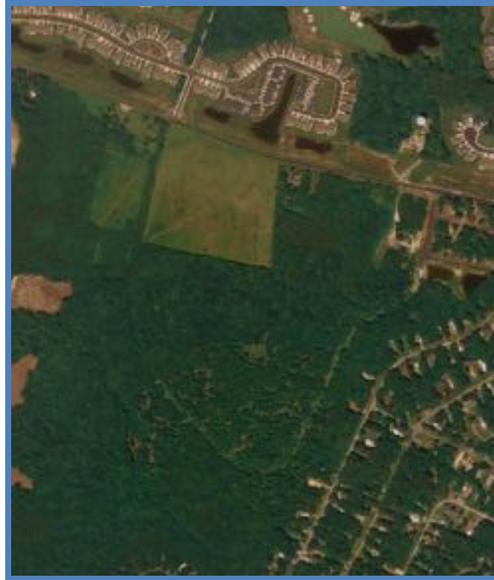
1991 USGS Quadrangle – A portion of the Starlight Woods Road system is depicted this map.



1999 Aerial Photograph from EDR – The disturbed area just west of the current Thornton Drive, that was previously disturbed, appears to be a trailer park.



2006 Aerial Photograph from EDR – The trailer park appears to be gone and woody vegetation colonizing the area. Thornton Drive and Brenda Lane in Phase 1 appear to be constructed as well as the two storm water management ponds. All of the structures that previously existed on the site, with the exception of the Cooper home appear to be gone from the site. The development site to the west of the property (Forest Landing) appears to be under construction.



Current Land Cover and Descriptions

Using the historical information above and a site investigation, a land cover map was created to describe the resources present on the site.



Old Field transitioning to Scrub/Shrub

This is the red area on the map above, this area was previously farmed in row crops, contained chicken houses and a residential building and based on discussions with people familiar with that area also was operated as a hog farm at some time in the past. This area was in agricultural use since at least 1937 and as late as the 1999 aerial photograph and appears to be abandoned in the 2006 aerial photograph.



The area is currently dominated by a mix of herbaceous, shrub and saplings, namely:

- Autumn Olive – *Eleagnus umbellata*, listed by USDA as an invasive species that crowds out native species. Native to Asia.
- Red Maple – *Acer rubrum*, A common pioneer species. Native.
- Sweetgum – *Liquidambar styraciflua*, a common pioneer species. Native.
- Black Cherry – *Prunus serotina*, A common pioneer species that can be weedy or invasive. Native.
- Panic Grass – *Panicum* spp., A native widespread grass.
- Queen Anne’s Lace – *Daucus carota*, Native to Europe and naturalized in North America.
- Goldenrods – *Solidago* spp., A weed of waste areas growing from a woody rhizome. Native.
- Asters – *Aster* spp., A weed of waste areas. Native.
- Multiflora Rose – *Rosa multiflora*, Invasive weed from Asia, introduced for soil stabilization.
- Pokeweed – *Phytolacca Americana*, perennial weed found in disturbed areas. Native.

Trees in this area average between 3 and 6 inch diameter at breast height which is consistent with the approximated age based on aerial photographs.





This area is proposed to be developed as a commercial center along Beaver Dam Road and mixed use commercial and residential to the south. These are more dense development types and are appropriate for this disturbed land area.

Old Field

This is the area with no color overlay on the map above, this area was previously farmed in row crops. This area was in agricultural use since at least 1937 and as late as the 2006 aerial photograph and appears to have been abandoned between 2006 and 2012.



The area is currently dominated by a mix of herbaceous and shrubs similar to the area above but younger, namely:

- Autumn Olive – *Eleagnus umbellata*, listed by USDA as an invasive species that crowds out native species. Native to Asia.
- Red Maple – *Acer rubrum*, A common pioneer species. Native.
- Sweetgum – *Liquidambar styraciflua*, A common pioneer species. Native.
- Black Cherry – *Prunus serotina*, A common pioneer species that can be weedy or invasive. Native.
- Loblolly Pine – *Pinus taeda*, A fast growing pine that grows in sandy acid soils. Native.
- Panic Grass – *Panicum* spp., A native widespread grass.
- Goldenrods – *Solidago* spp., A weed of waste areas growing from a woody rhizome. Native.
- Asters – *Aster* spp., A weed of waste areas. Native.
- Multiflora Rose – *Rosa multiflora*, Invasive weed from Asia, introduced for soil stabilization.

Trees in this area average 1 inch diameter at breast height which is consistent with the approximated age based on aerial photographs.



This area is proposed to be developed as a commercial center along Beaver Dam Road. These are more dense development types and are appropriate for this disturbed land area.

Young Woodlands

This is the bright green area on the map above, this area was previously farmed in row crops and a portion along Beaver Dam Road was previously developed as a trailer park. This area was in agricultural use since at least 1937 and as late as the 1980 aerial photograph, it appears to have been developed as a trailer park in 1981 and was abandoned around 1999 the remainder appears to have been abandoned around 1980. Field evidence indicates that this area was also affected by a forest fire at some time in the recent past.



The area still shows signs of disturbance with old fill piles, old asphalt piles and utility posts where the trailer park previously existed. It is currently classified as a young woodland dominated by a mix of herbaceous, shrub and saplings, namely:

- Tulip Poplar – *Liriodendron tulipifera*, This is a straight, fast growing native tree .
- Red Maple – *Acer rubrum*, A common pioneer species. Native.
- Sweetgum – *Liquidambar styraciflua*, a common pioneer species. Native.
- Loblolly Pine – *Pinus taeda*, A fast growing pine that grows in sandy acid soils. Native. Seedlings only.
- Willow Oak – *Quercus phellos*, A common medium sized oak that grows in wet areas and areas with poor drainage. Native. Seedlings only.
- Multiflora Rose – *Rosa multiflora*, Invasive weed from Asia, introduced for soil stabilization.
- Pokeweed – *Phytolacca Americana*, perennial weed found in disturbed areas. Native.
- Virginia Creeper – *Parthenocissus quinquefolia*, A woody vine. Native.
- Japanese Knotweed – *Polygonum cuspidatum*, An invasive weed from Asia, listed as one of the world's 100 worst invasive species.
- Common Reed – *Phragmites australis* – Invasive species from Europe that grows vigorously and is difficult to eradicate.
- Japanese Honeysuckle, *Lonicera japonica*, A weedy vine from Asia that can be invasive.

Trees in this area average between 6 and 8 inch diameter at breast height which is consistent with the approximated age based on aerial photographs.





This area is proposed to be developed as an assisted living center along Beaver Dam Road and 44 single family residential lots the south. The more densely developed assisted living facility is proposed in the most heavily disturbed portion of this land cover type. The invasive species will be addressed through the development of these areas in order to reduce the chance that they will spread to areas proposed for preservation.

Older Woodlands Previously Disturbed

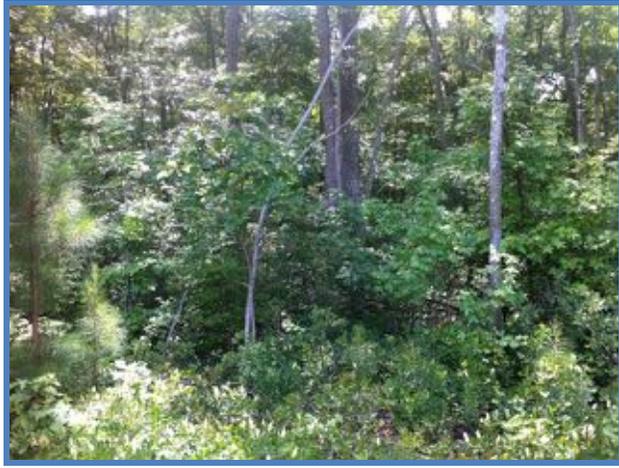
This is the olive green area on the map above, this area appeared wooded on the 1937 aerial photograph but with selective clearing and some small clear-cut areas that appear to be re-vegetating in 1954. This area appears disturbed again in 1989 with the cutting of roads consistent with the Starlight Woods road network.

These cleared areas are still visible and are re-vegetating with a look similar to the scrub/shrub areas described above. The uncut woodlands contain older trees but the prior clearing has created an edge effect in these areas and eliminated forest interior habitat. This land cover includes Phase 1 of Silver Woods. The older forest contains:



- Tulip Poplar – *Liriodendron tulipifera*, This is a straight, fast growing native tree .
- Red Maple – *Acer rubrum*, A common pioneer species. Native.
- Sweetgum – *Liquidambar styraciflua*, a common pioneer species. Native.
- Loblolly Pine – *Pinus taeda*, A fast growing pine that grows in sandy acid soils. Native. Seedlings only.
- Willow Oak – *Quercus phellos*, A common medium sized oak that grows in wet areas and areas with poor drainage. Native. Seedlings only.
- Southern Red Oak – *Quercus falcata*, A native oak that occasionally hybridizes with other oak species.
- White Oak – *Quercus alba*, A long-lived native oak that can become quite massive, has been known to live up to 600 years.
- Swamp White Oak – *Quercus michauxii*, A native lowland oak, sometimes considered a variety of Chestnut Oak (*Q. prinus*).
- Summersweet – *Clethra alnifolia*, A native flowering shrub that prefers moist, acid soils.
- Sassafras – *Sassafras albidum*, A native, medium sized tree that prefers rich, well-drained soil. Usually colonizes forest gaps and clearings.
- American Holly – *Ilex opaca*, A native, medium sized, understory tree. The berries are poisonous to humans but important for birds.

Trees in this area average between 8 and 20 inch diameter at breast height which is consistent with the approximated age based on aerial photographs.



The clearings contain:

- Red Maple - *Acer rubrum*, A common pioneer species. Native.
- Sweetgum – *Liquidambar styraciflua*, a common pioneer species. Native.
- Multiflora Rose – *Rosa multiflora*, Invasive weed from Asia, introduced for soil stabilization.
- Virginia Creeper – *Parthenocissus quinquefolia*, A woody vine. Native.
- Blackberry – *Rubus* spp., A native shrub (canes) that tends to grow in clearings and old fields.
- Pokeweed – *Phytolacca Americana*, perennial weed found in disturbed areas. Native.
- Japanese Honeysuckle, *Lonicera japonica*, A weedy vine from Asia that can be invasive.

Trees in this area 1 inch diameter at breast height which is consistent with the approximated age based on aerial photographs.



This area is proposed to be developed as 30 single family residential lots and a clubhouse in Phase 2. This less intense development type allows for potential conservation on the rear of lots and in the clubhouse area. Additionally, the proposed plan calls for the preservation of a large portion of this land cover type (approximately 40 acres) and the enhancement and management to improve this resource.

Older Woodlands Recently Disturbed

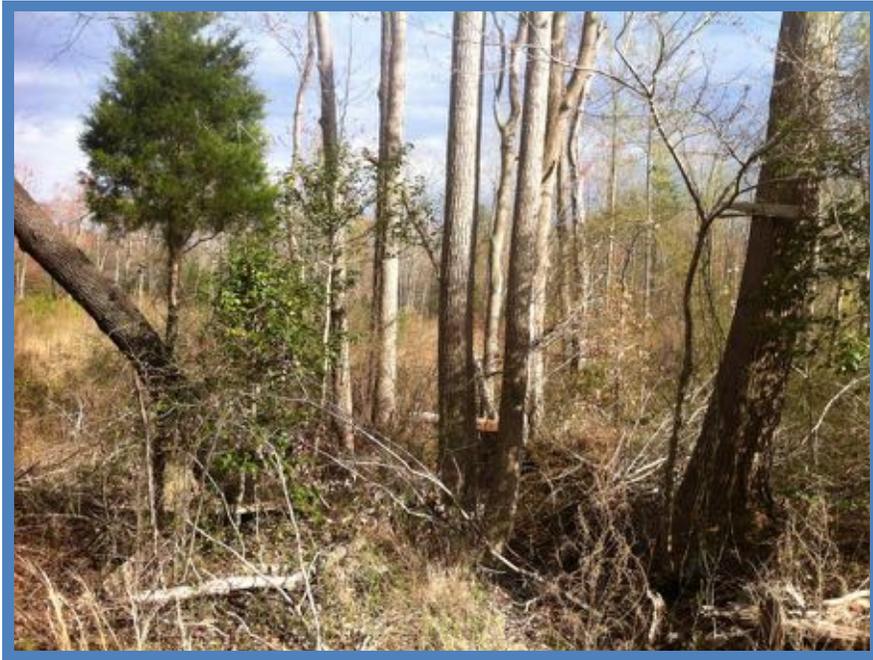
This is the green area on the map above, this area appeared wooded on the 1937 aerial photograph with extensive clearing occurring just offsite since 2006. The clearing appears to be associated with the adjacent development to the southwest. This has created a small island with edge effects to the south, west and east of this forest area.



This forest contains:

- Tulip Poplar – *Liriodendron tulipifera*, This is a straight, fast growing native tree.
- Pignut Hickory -
- Loblolly Pine – *Pinus taeda*, A fast growing pine that grows in sandy acid soils. Native.
- Willow Oak – *Quercus phellos*, A common medium sized oak that grows in wet areas and areas with poor drainage. Native.
- Southern Red Oak – *Quercus falcata*, A native oak that occasionally hybridizes with other oak species.
- White Oak – *Quercus alba*, A long-lived native oak that can become quite massive, has been known to live up to 600 years.
- Swamp White Oak – *Quercus michauxii*, A native lowland oak, sometimes considered a variety of Chestnut Oak (*Q. prinus*).
- Summersweet – *Clethra alnifolia*, A native flowering shrub that prefers moist, acid soils.
- Sassafras – *Sassafras albidum*, A native, medium sized tree that prefers rich, well-drained soil. Usually colonizes forest gaps and clearings.
- American Holly – *Ilex opaca*, A native, medium sized, understory tree. The berries are poisonous to humans but important for birds.

Trees in this area average between 12 and 30 inch diameter at breast height which is consistent with the approximated age based on aerial photographs.





This area is proposed to be developed as 31 single family residential lots. Many of these lots will be larger and larger trees will be located and prioritized for preservation on the rear of lots. Additionally, the proposed plan calls for the preservation of a portion of this land cover type (approximately 3 acres) and the enhancement and management to improve this resource.

Preservation and Enhancement Measures

Construction Signage and Fencing

All forest areas and individual trees identified for preservation will be protected during construction through signage and fencing. Additionally, contractors will be subject to developer imposed fines if the forest protection guidelines are compromised during construction. Once a final development plan is approved, a forest protection plan will be developed identifying specific measures for specific areas of the site.



Permanent Signage

Permanent educational signs will be placed along trails, at the clubhouse and the rear of lots adjacent to preservation areas. Language for these signs will be developed in conjunction with the Town of Ocean View in order to educate homeowners and identify preservation areas.



Forest Management Plan

A forest management plan will be developed in order to assist the open space managers in maintaining a healthy forest ecosystem. Initial enhancement measures will be identified in the management plan as well as inspection procedures and corrective actions.

Summary

Silver Woods, Phase 2, has been planned to minimize environmental impacts. A team of professionals has been employed to plan the site in accordance with the National Green Building Standard. Great care has been taken to site different development types in appropriate areas both from a proper planning standpoint and with sensitivity to the existing natural environment.

The current plan is a far cry from the initial approved Starlight Woods plan in which all of the natural resources on the site would have been eliminated. It is even a vast improvement over the revised plan with townhomes and single family homes.

The current plan provides much needed services, clusters development on previously disturbed areas and provides for the preservation and enhancement of the most important natural resources on the site.