



CHESAPEAKE FOREST
Proposed FY2006
ANNUAL WORK PLAN



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CHESAPEAKE FOREST ANNUAL WORK PLAN SUMMARY

This document summarizes the proposed activities that will occur on the Chesapeake Forest during the 2006 fiscal year. The fiscal year runs from July 1, 2005 to June 30, 2006. The following proposed activities are the results of a multi-agency effort. The multi-agency approach has ensured that all aspects of these lands have been addressed within the development of this plan.

Plan Activities

Network with Maryland DNR agencies:

- Wildlife & Heritage – Identify and develop restoration projects, report and map potential Ecological Significant Areas (ESA) as found during fieldwork, release programs for game and non-game species. Mapping will be done with Global Positioning Systems (GPS). Participates on the Inter-Disciplinary Team (ID Team) and assists in the development of a forest monitoring program.
- Natural Resource Police – Enforcement of natural resource laws on the forest.
- Resource Planning – Provides assistance in the development of plans, facilitates meetings with various management groups, develops Geographic Information System (GIS) maps for public review, conducts deed research and boundary recovery. Participates on the ID Team.
- Maryland Conservation Corps (MCC) – Assists in painting boundary lines, installing gates and trash removal.
- State Forest & Park Service – Participates on the ID Team.
- Chesapeake & Coastal Watershed Service – Develops watershed improvement projects, assists in the development of a forest monitoring programs and participates on the ID Team.

Network with other agencies:

- Vision Forestry, LLC – Designs and implements management activities on the gifted half of the forest. Participates on the ID Team.
- Sustainable Forestry Initiative – Provides third party forest certification.
- Forest Stewardship Council – Provides third party forest certification.
- The Conservation Fund – Provides guidance in the development of management activities on the forest.

- The Chesapeake Bay Foundation – Identifies sites for future water quality improvement projects.
- National Wild Turkey Federation – Establishes and maintains handicap-hunting opportunities within the forest and provides funding for habitat protection and restoration.
- US Fish & Wildlife Service – Assists in prescribed burns for Delmarva Fox Squirrel (DFS) habitat.
- AmeriCorps* National Civilian Community Corps – Assists in boundary line marking, gate installations, trash pick up, restoration projects, etc.

Network with Universities and Colleges:

- Salisbury University – Conducts species monitoring, a vegetative cross sectional study, and water quality improvement studies.
- Virginia Polytechnical Institute and State University – Conducts loblolly pine growth and yield studies.
- University of Georgia – Studies wood properties of loblolly pine growing on similar soils throughout the southeast region.

Maintenance:

- Open 13,918 acres for public hunting opportunities on 15 individual complexes.

Each of the 15 complexes requires a significant amount of work to prepare the land for public use. Boundaries need to be painted yellow (as per DNR policy), roads need to be brushed open, gates need to be installed and locked, trash needs to be removed and parking areas need to be established.

All of the exterior boundaries will be marked with a 4” wide yellow band facing private property and a 4” yellow circle facing State property. Additionally, a small white sign will be installed every 100’ indicating the Chesapeake Forest boundary line and the newly designated public hunting area. Two long-term contractual employees provided jointly by the Forest Service (FS) and the Wildlife & Heritage Service (WHS) will complete the boundary line work.

All interior roads within each complex will be brush hogged where possible by the FS and the WHS. Many of the roads have grown shut and require special heavy equipment to remove the larger trees. The Chesapeake Forest has partnered with the Blackwater National Wildlife Refuge who has such equipment. Brushing of these roads will improve access for the public and help to maintain firebreaks for communities at risk from wildfire.

Gates and trash removal will be completed with the assistance of the National Civilian Conservation Corps (NCCC). For the past two years, the Chesapeake Forest has been awarded a grant, which provides a 10 – 12 person NCCC crew to assist in forest management activities.

Areas suitable for public parking already exist. However, the areas identified require some light to moderate improvements. The FS and the WHS will brush hog the parking areas and add gravel as needed. Most of the existing areas identified are adjacent to the entrance of access roads and are approximately 25’ wide by 50’ long. Heavy equipment (such as a bulldozer) will not be used for the establishment of the public parking areas.

Table 1 illustrates the proposed maintenance required to open 13,918 acres for public hunting for the 2005 / 2006 hunting season.

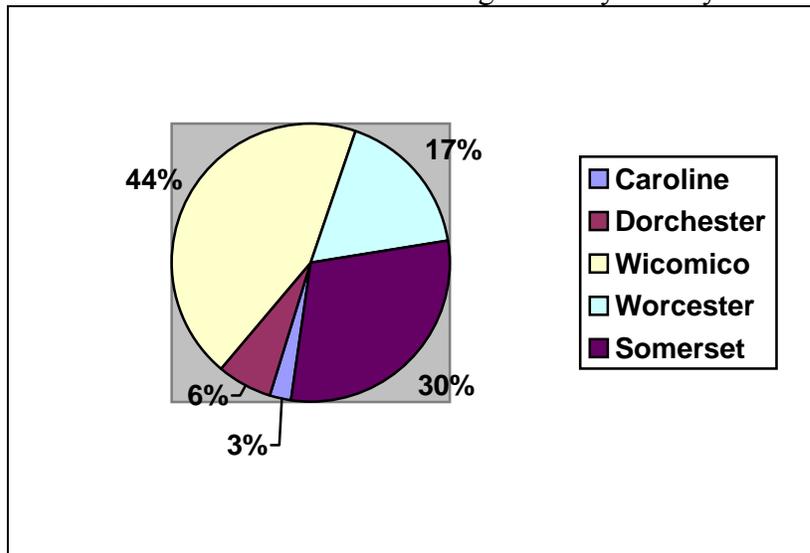
Table 1. Overview of Maintenance requirements for Public Hunting areas

Activity	Amount
1.) Repaint & Post Boundary Lines	130.8 Miles
2.) Brush & Clear Roads	54.6 Miles
3.) Install Farm Style Gates	80
4.) Trash Removal	~20 Tons
5.) Improve Parking Areas	26
6.) Remove Tree Stands	~300

Recreation:

- Open up an additional 13,918 acres for public hunting and other recreational activities.

Chart 1. Additional Public Hunting Areas by County



- Develop additional Resource Based Recreational (RBR) opportunities on the forest. This may include hunting, horseback riding; water trails, hiking trails, bird watching opportunities, etc.
- Design and develop a handicap hunting trail on the forest.
- Design and develop a water trail with a brochure to include an overnight remote camping site.

Special Projects:

- Update and maintain forest information in a GIS database.
- Obtain & maintain dual forest certification from the Forest Stewardship Council (FSC) and the Sustainable Forest Initiative (SFI)
- Conduct information and educational opportunities on the forest.
- Inventory and protect historic sites (i.e. cemeteries, old home sites, Native American Indian sites) using GPS and GIS technology.

Silvicultural Activity Overview

Table 2 summarizes, the proposed silvicultural activities for the 2006 annual work plan on approximately 3,996 acres (7%) of the CF.

Table 2. 2006 Silvicultural Activity Overview.

Activity	Acres
1. Final Harvest	209
2. Selection Harvest	0
3. Commercial Thin #1	1011
4. Commercial Thin #2	1382
5. Pre-commercial Thinning	24
6. Mechanical Site Preparation	593
7. Planting	593
8. Watershed Improvement Project	30
9. Aerial release, natural stands	77
10. Mid-rotation vegetation control	0
11. Fertilization	0
12. Prescribed Fire	0
13. Restoration Projects	2
14. Grass Control	0
Total acres affected*	3,998

* Total acres affected are not the sum of all acres to be treated since many acres are scheduled for multiple activities (e.g. site preparation, planting and grass control or spray-fertilize). Efforts promote natural regeneration should also reduce the acres affected. In addition, several tracts will have significant buffers, which will also reduce the harvest acreage accordingly. The current Geographic Information System (GIS) database is not accurate enough to give a precise acreage. However, the system will be continually updated by using Global Positioning Systems (GPS) to map new stand boundaries as stand prescriptions are carried out in the field.

The following is a list of definitions of proposed management activities that will occur on the Chesapeake Forest.

Final Harvest – A final harvest prescription shifts the management attention to the next generation of trees. The goal for each stand is to match the harvesting technique to the site conditions in order to achieve successful regeneration. These sites will often, but not always, be regeneration harvests. The first choice is to encourage natural regeneration if the seed source is available and the pine component is healthy. If natural regeneration is well established in the understory, the harvest type may be a shelterwood or modified shelterwood cutting. Each harvest prescription will be determined in the field on a site-by-site basis.

Selection Harvest – This includes the removal of single trees and groups of trees within a given stand. This method will be used to distribute age classes and to adjust species composition within a given stand.

Improvement Harvest – This type of harvest is designed to remove less desirable trees of any species from a stand. The goal is very site-specific, and will depend on the condition of the site and existing stand. Each harvest will be guided by specific prescriptions that are noted in the field and forest plan.

Riparian Buffer Zone Establishment – Riparian buffer zones are vegetated areas adjacent to or influenced by a perennial or intermittent bodies of water. These buffers are established and managed to protect aquatic, wetland, shoreline, and/or terrestrial environments. Boundaries of riparian buffer zones will be marked, surveyed (GPS) and mapped (GIS). Selective harvesting and/or thinnings may occur in these areas to encourage a mixed hardwood-pine composition.

Prescribed Fire – Prescribed fires are set deliberately, under proper supervision and weather conditions, to achieve a specific management goal such as enhancing wildlife habitat, encouraging fire-dependent plant species, reducing fuel loads that feed wildfires, and preparing sites for planting.

Pre-Commercial Thinning – Pre-commercial thinning is the removal of trees to reduce over crowded conditions within a stand. This type of thinning concentrates growth on more desirable trees. This treatment is usually done on stands 5 to 10 years of age. The number of trees retained will depend on growth and condition of the stand.

First Commercial Thinning – This will occur on plantations at age 12-20 years old to facilitate forest health and promote development of larger trees over a shorter amount of time. This is accomplished in plantations by removing every 5th row of trees and selectively thinning between rows. In naturally regenerated stands, thinning corridors will be established every 50 feet and the stand will be selectively thinned along both sides of the corridor. Approximately 30-35% of the total stand volume will be removed in this process.

Second Commercial Thinning - Usually performed on stands 20-28 years old. The objective is to lengthen the rotation age of the stand and produce larger trees. In some cases, this technique is used to improve habitat for the Delmarva Fox Squirrel (DFS) and Forest Interior Dwelling Species (FIDS). Approximately 30-35% of the total stand volume will be removed in this process.

Reforestation – Reforestation reestablishes forest cover either naturally or artificially, and is usually accompanied by some kind of site preparation during the same fiscal year. The nature of the site preparation will be determined by field examination. It is almost always followed, in the same fiscal year, with grass control in the form of chemicals (hand-applied by ground crews). Site conditions will dictate application rates, etc., in each case.

Aerial Release Spraying - An aerial spraying is used to reduce hardwood competition in slower growing young pine stands or to eliminate exotic species. This will generally be done on natural stands that have had a pre-commercial thinning to encourage the desired pine stand. Prior field examination and exact boundary locations will be established in each case. All forms of aerial spraying are based on precision GPS mapping and accompanied by on-board flight GPS controls. GPS-generated maps shows each pass of the aircraft and are provided by the contractor to demonstrate precision application. No aerial applications are allowed over riparian or wetland areas or forest buffers.

Ground Spraying – A ground application is used to discourage unwanted hardwood competition in the understory. This treatment is typically done a year or two after a successful thinning to open up the understory and reduce competition for the dominant trees. Each stand will be evaluated for application rates, etc., as well as locations to protect desired hardwood species or islands within a stand.

Fertilization – Fertilizers are nutrients applied to the site to increase tree growth by overcoming nutrient deficiencies in the soil. Soil tests are taken prior to application to guide formulation and application rates as required by the Nutrient Management Plan. These nutrients are typically urea-based and are applied on the ground during thinning operations. To reduce the opportunity for nutrient input into nearby waters, fertilizers are not applied in riparian forest buffers.

**Locations & Descriptions
Of
Silvicultural Activities**

Description of 2006 Activities – Dorchester County

Complex D08-2

Nicholls Tract (4208):

A first thinning proposed for stand 1 (63.8 acres). This stand, established in 1991 will be thinned to a residual basal area of approximately 60-70 sq. ft./acre

W.T. Willis Tract (4258)

First thinnings are proposed on both stand 3 (64 acres) and stand 4 (18.9 acres). These stands were established in 1984 and 1987 respectively. These stands will be thinned to a residual basal area of approximately 60-70 sq. ft./acre. Because this tract is in a Delmarva Fox Squirrel area, wherever present, oaks will be favored over pines during the selection process. Prescribed fire should be considered in future work plans to further promote the oak component of this stand.

A second thinning is proposed for stand 7 (71.3 acres). This stand established in 1973 was thinned in 1998 and will be thinned to a residual basal are of approximately 80 sq. ft. per acre. Similarly to the first thinnings, preference should be given to oaks, where present, during the selection process. Prescribed fire should be considered in future work plans to further promote the oak component of this stand.

Descriptions of 2006 Activities – Wicomico County

Complex W03-2

Phillips Farewell Tract (3564)

This is a portion of a stand that was cutover by the previous owners. There are areas here that have sufficient pine regeneration and in need of a pre-commercial thinning.

There are other areas where hardwoods persist. A pre-commercial thinning is proposed where appropriate. In the hardwood areas a prescribed fire is proposed in order to promote desirable hardwood species.

Aughty Naughty Tract (3534)

First thinnings are proposed for stand 9 (5 acres), established 1987, and stand 13 (56.9 acres), established 1991. These stands will be thinned to a residual basal area of approximately 60-70 sq. ft. per acre.

Wright #2 Tract (7114)

A first thinning is proposed for stand 1 (26.6 acres), established 1991. This stand will be thinned to a residual basal area of approximately 60-70 sq. ft. acre.

Owens Creek and the associated headwater ditch bisect the thinning on the Aughty-Naughty and the Wright #2 tracts. A 300-foot buffer will protect the creek. No harvesting will occur in the first 25 feet. The balance of this buffer will be thinned to lower basal areas in order to promote hardwood regeneration and a future mature mixed pine hardwood buffer.

Shaeffer Tract (7140)

A first thinning is proposed for stand 2 (20.8 acres), established in 1987. This stand will be thinned to a residual basal area of approximately 60-70 sq. ft. per acre.

This entire complex is in a Delmarva Fox Squirrel area and thinnings will be conducted to promote the hardwood (oak) component of the stand wherever possible.

Complex W14-2

Helmick Tract (3517)

A second thinning is proposed for stand 3 (106.5 acres), established in 1971 and thinned a first time in 1999. The stand will be thinned to a basal area of no less than 80 sq. ft. per acre. The first thinning in this stand was heavy in places and only suppressed, crooked, etc. trees need be removed in these areas.

Freeny Tract (3532)

A second thinning is proposed for stand 2 (56.5 acres), established in 1971 and thinned a first time in 1999. This stand will thinned similarly to the Helmick tract to a residual basal area of no less than 80 sq. ft. per acre.

Complex W22-2

Jones Tract (3583)

A second thinning is proposed for stand 2 (54.4 acres), established in 1982 and thinned a first time in 1998. This stand will be thinned to a residual basal area of 80 sq. ft per acre.

Wilson Tract (3587)

A second thinning is proposed for stand 5 (35.9 acres), established in 1982 and thinned a first time in 1998. This stand will be thinned to a residual basal area of 80 sq. ft. per acre.

This complex is situated in a Delmarva Fox Squirrel area and thinning will be conducted to promote the hardwood (oak) component of the stand wherever possible.

Complex W23-2

Greenhill Tract (7102)

A large portion of stand 6 (115.2 acres) was scheduled for a final harvest in the 2005 work plan. Plans are to complete this final harvest during the summer of 2004. As this plan was created before the SFI-FSC certification audit, plans are now to break this block up into several smaller (less than 40 acre blocks), and perform a first thinning on areas in between the final harvest areas. Plans should be included in the 2006 plan for regeneration of the final harvest areas of approximately 80 acres. Areas should be inspected for natural regeneration in the spring of 2005. If there is not sufficient natural regeneration which is unlikely do to the age (15) and timing (summer) of the harvest, site should be considered for a control burn followed by a planting in the spring of 2006. Because this is a Delmarva Fox Squirrel area both pines and hardwoods should be planted as the site conditions dictate.

Austin Tract (7107)

Portions of stand 7 (78.2 acres) and stand 15 (21 acres) were scheduled for harvest during the summer of 2003. Work began in 2003 with plans to complete these final harvests during the summer of 2004. Similar to the Greenhill complex the larger planned clearcut areas have been broken up into final harvest areas and thinned areas in an effort to reduce clearcut size to less than 40 acres. Upon completion of the final harvest areas an experimental site preparation operation will be implemented. This will entail using a bulldozer and root rake to rake the site in a direction perpendicular to the old windrows in an effort to spread the topsoil and organic matter back across the site. The site will then be planted with a combination of loblolly pines and hardwoods as site conditions dictate.

Hillyer Tract (7119)

A second thinning is proposed for stand 2 (22.7 acres) established in 1975 and thinned a first time in 1998. This stand will be thinned down to a residual basal area of approximately 80 sq. ft per acre. Because this is a Delmarva Fox Squirrel area, the thinning will be conducted to promote the hardwood (oak) component of the stand wherever possible.

Complex W27-2

Cox Tract (7139)

A backpack select herbicide release is proposed for both stand 1 (24.1 acres of natural regenerated loblolly pine in 2002) and stand 2 (a 1.7 acre Atlantic White cedar plantation planted in 2003). When the Atlantic White cedar were planted in 2003, some small wet areas in stand 1

were also planted with Bald cypress, a tree very sensitive to herbicides, thus the backpack release proposal. In this manner, undesirable hardwoods can be controlled and desirable oaks and bald cypress can be protected and promoted. This backpack release is an experiment to create mixed stands of desirable hardwoods and pines as specified in the Sustainable Forest Management Plan. Blanket applications from the air, even at very low rates, may not achieve the desired results. While more costly from an application standpoint, herbicide use should be greatly reduced and targeted specifically to less desirable species.

Complex W37-2

Farlow Tract #3555

Stand 2 (10.8 acres) and a portion of stand 5 (24.8 acres) were scheduled for a final harvest in a previous work plan, and scheduled to be completed during the summer of 2004. The harvested stand should be inspected for natural regeneration during the spring of 2005. If regeneration is not acceptable, plans should be to site prepare and plant with loblolly pines in 2006. This tract is in a general management area.

Complex W44-2

Gillis Tract (3565)

A second thinning is proposed for stand 3 (73.5 acres), established in 1981 and thinned a first time in 1999. The stand should be thinned down to a residual basal area of approximately 80 sq. ft. per acre. A second thinning is also planned for stand 2 (12 acres). This stand is already quite thin in places. Harvesting in this stand will be limited to an "improvement" harvest, which will remove only the very suppressed, crooked, diseased, etc. trees.

Complex W54-2

Carey Tract (3579)

A second thinning is proposed for stand 1 (18.1 acres) a natural stand and stand 2 (54.3 acres) a plantation both established in 1978, and thinned a first time in 1998. All of this acreage will not need a second thinning as the previous owners experimented with a low basal area first thinning on a portion of this tract with the intention that it would not need a second thinning. CAUTION, should be taken around the old cemetery site on this tract. A 50-foot no harvest buffer will be left to protect the cemetery.

Complex W58-2

Laws Tract (7168)

A first thinning is proposed for stand 1 (28.6 acres) established in 1988. This stand will be thinned down to a residual basal area of approximately 60-70 sq. ft. per acre.

Descriptions of 2006 Activities – Worcester County

Complex WR02-2

Littleton-Fooks Tract (3760)

First thinnings are proposed for stand 4 (49 acres) established 1989, stand 6 (18.4 acres), established in 1988, and stand 8 (92 acres), established in 1991. These stands will be thinned to a residual basal area of 60-70 sq. ft. per acre. A 100' buffer will protect water flowing through ditches. No harvesting will occur in the first 50', the balance of the buffer will be thinned to lower basal areas in order to promote the hardwoods and a future mixed pine hardwood stand.

Final harvests in portions of stands 2, 3, 5, & 8 totaling 106 acres should be completed during 2004. The variety of ages and species makeup of these stands will guide the regeneration decisions here. All areas should be inspected after the spring of 2005 for natural regeneration. Where natural regeneration is not acceptable, light mechanical or aerial release should be considered followed by planting in the spring of 2006. In this general management area, loblolly pines will be planted wherever the site allows.

Complex WR04-2

Littleton Tract (3762)

A first thinning is planned for stand 2 (54.1 acres), established in 1991. The stand will be thinned to a residual basal area of 60-70 sq. ft. per acre. There is a large tax ditch (Timmonstown Branch), which runs along the south side of this tract just "upstream" of the Jones Brothers Tract watershed improvement project. On the east side of Timmonstown branch there is already a large hardwood swamp, which buffers the tax ditch. A 100' buffer will protect water flowing through the ditch on the west side of Timmonstown Road.

Complex WR07-2

Bradford Tract (3708)

These proposed harvests, a combination of second thinnings on stands 2 (32.9 acres) and 5 (18 acres) and final harvests in another portion of stand 2 (7.2 acres) and stand 3 a mature pine stand. This entire harvest area will be approached as a variable retention harvest with the two clearcut patches and varying degrees of spacing on the balance of the select cut area resulting in a variety of structure and species mix. This area is wet and opportunities for intensive levels of forest management limited. This harvest will be the beginning of the conversion of primarily even aged pine stand to uneven aged mixed stand. Harvests should be followed by prescribed fire in future work plans.

Complex WR39-2

W.T. Byrd (3717)

A second thinning is planned for a portion of stand 10 (11 acres), established in 1975 and thinned a first time in 1998. The stand will be thinned to a basal area of approximately 80 sq. ft. per acre.

Complex WR40-2

Dunn Swamp (3716):

A final harvest is planned for a portion of stand 12 (31.7 acres). This entire 250+ acre portion of the Dunn Swamp tract (east of Dunn Swamp Road) is all relatively uniform in age and past prescriptions. This harvest was selected in an effort to break up this large uniform pine stand with a clearcut that is under the FSC maximum size of 40 acres. In order to comply with the 40-acre clearcut size restriction, we must look at many such large uniform areas and begin creating smaller management parcels.

Payne Tract (3725)

Most of this tract was harvested in the early spring of 2003. No natural pine regeneration was evident in the bigger portion of this tract (22 acres) so it was straight planted with loblolly pines in the spring of 2004. Harvesting in the narrow area fronting Old Virginia Road was not completed until early 2004 and was left to inspect for natural regeneration after the 04-growing season. An aerial release is proposed for at least the 22-acre portion of this clearcut area. This is a general management area where pine is preferable. No spraying will occur in the ditch buffer on the western edge of the tract or the hardwood habitat retention area along the northern edge of this harvest.

Description of 2006 Activities – Somerset County

Complex S02-2

Kemp Tract (4859):

Final harvests are proposed for two separate blocks of stand 3 (95.1 acres) established in 1989. As a result of Heritage field inspections for the 2004 work plan a new ESA was designated (Eden Swamp & Powerline) where 5 state threatened plant species and one state endangered/globally rare plant species were found. These plants were found primarily in the powerline and pine stands adjacent to the powerline.

Summer control burns following these harvests are also proposed, followed by monitoring for natural regeneration and presence of threatened and endangered plant species. In areas where no natural regeneration and/or establishment of threatened plant community exist, these areas should be reforested with a combination of native pine and hardwood species depending upon site conditions.

A 300-foot buffer will protect Barkley Branch to the north. No harvesting will occur in the first 50 feet. The balance of the buffer will be thinned to lower basal areas, favoring hardwoods in an effort to create a mature mixed pine hardwood buffer in the future. No heavy equipment or landing zones will be used in the powerline due to the presence of a rare plant species.

Complex S04-2

English Tract (4870)

An aerial release is proposed for stand 6 (22 acres) established in 2003.

Complex S11-2

Earl Smith Tract (4827):

A second thinning is proposed for stand 1 (34.9 acres) established in 1981 and thinned a first time in 1997. This stand will be thinned to a residual basal area of approximately 80 sq. ft. per acre.

Pinto Tract (4896):

A second thinning is proposed for stand 3 (32.4 acres) established in 1981 and thinned a first time in 1997. This stand will be thinned to a residual basal area of approximately 80 sq. ft. per acre.

Both the Earl Smith and Pinto tract proposals adjoin a tax ditch, which will be protected by a 100-foot buffer. Thinning will occur in this buffer where hardwoods will be favored with the intent of creating a mature mixed pine hardwood buffer in the future.

Peters Tract (4854):

A first thinning is proposed for stand 4 (10.6 acres) established in 1981. This stand will be thinned to a residual basal area of approximately 60-70 sq. ft. acre. The riparian buffer will be

300' and managed for a mixture of hardwood and pine. The first 50' of this buffer will be a no-cut zone.

Complex S12-2

Green Polk Tract (5423):

Proposed site preparation and regeneration is proposed for stand 3 (47.2 acres). This stand is on the 2005 plan for final harvest but not yet harvested as of preparation of this work plan. The goal, as for all of the Chesapeake Forest, is for natural regeneration if possible. This stand is a young stand and seed production will be minimal. Upon completion of the harvest a standard decision process should take place. Inspect for natural regeneration the year following the harvest (2006). If needed, additional regeneration decisions should be made at that time. Burning (if there is enough fuel), followed by planting, or just straight planting would be the preferred recommendation if no natural regeneration is present.

This stand adjoins Manokin Creek. The harvest will leave a 150-foot buffer to protect the creek. No site preparation will occur within this buffer.

Complex S16-2

Howard Price (4829):

A final harvest is proposed for a 35.4-acre portion of stand 1 established in 1968. There is a significant amount of natural pine regeneration in the understory of this pine stand. Efforts will be made to protect as much of this natural regeneration as possible during the harvest. (See *Habitat Retention Guidelines*)

Complex S19-2

Hayman Tract (4895):

A first thinning is proposed for stand 2 (23.1 acres) established in 1991. This stand will be thinned to a residual basal area of approximately 60-70 sq. ft. acre. This stand joins Taylor Branch, which will be protected by a 150' buffer. There will be no harvesting in the first 25 feet. The balance of this buffer will be thinned to lower basal areas favoring hardwoods wherever possible with the intent of creating a mature mixed pine hardwood buffer in the future.

Peterman Tract (5401):

A first thinning is proposed for stand 2 (19.5 acres) established in 1991. This stand will be thinned to a residual basal area of approximately 60-70 sq. ft. per acre. This stand is bisected by a blue line ditch, which will be protected by a 150' buffer on either side. There will be no harvesting in the first 25 feet. The balance of this buffer will be thinned to a lower basal area favoring hardwoods wherever possible (which will help supplement/compliment surrounding HQ FIDS management/planning on surrounding lands) with the intent of creating a mature mixed pine hardwood buffer in the future.

Complex S21-2

Wilford Tract (4809):

A first thinning is proposed for stand 5 (15 acres), a natural loblolly pine stand established in 1970. Because this is late in the rotation to perform a first thinning, with no potential second thinnings in the future, this stand will be thinned to a basal area of approximately

80 sq. ft./acre leaving what is expected to be the best final crop trees. Because this is in a Delmarva Fox Squirrel area, wherever present, oaks will be favored over pines during the selection process.

A second thinning is proposed for stand 1 (45 acres), established in 1979 and thinned a first time in 1998. This stand will be thinned to a basal area of approximately 80 sq. ft/acre favoring oaks wherever present.

E.Mace Smith Jr. (4852):

A second thinning is proposed for stand 2 (20 acres) established in 1977 and thinned a first time in 1998. This stand will be thinned to a residual basal area of approximately 80 sq. ft per acre favoring oaks wherever present.

All of the thinnings in this complex should be considered for prescribed fire in future workplans to further promote the oak component of these stands.

Complex S30-2

Bob Hamlet (4844)

Final Harvest on portions of stand 1 (14.2 acres) and stand 6 (35.7 acres) was completed during 2004. The goal, as for all of the Chesapeake Forest, is for natural regeneration if possible. This harvested stand was a young stand and seed production was minimal. Inspect for natural regeneration in spring of 2005. If needed, additional regeneration decisions should be made at that time. Burning in the summer of 2005 and straight planting of native pines and or hardwoods the following spring would be the desirable prescription. This is a Delmarva Fox Squirrel area so serious consideration shall be given to hardwood regeneration as site conditions dictate.

Complex S31-2

Peach Blossom Tract (5417):

A first thinning is proposed for stand 1 (48.9 acres) established in 1987. This stand will be thinned to a residual basal area of 60-70 square feet. Because this is a Delmarva Fox Squirrel area, oaks will be favored as much as possible during the selection process. This stand also adjoins Back Creek, which will be protected by a 300' buffer. There will be no harvesting in the first 25 feet. The balance of this buffer will be thinned to a lower basal area favoring (protected) hardwoods wherever possible with the intent of creating a mature mixed pine hardwood buffer in the future.

Complex S36-2

Amos Hooks Tract (4876):

Second thinnings are proposed for both stand 3 (30.9 acres) and stand 4 (63.3 acres). These stands were established in 1980 and 1981 respectively. Both stands were thinned a first time in 1998. These stands will be thinned to a residual basal area of approximately 80 sq. ft. per acre. Stand 3 adjoins Marumsc Creek, which will be protected by a 300' buffer. No harvesting will occur within the first 25' of the creek. The balance of the buffer will be thinned to lower basal areas in an effort to promote hardwoods within this buffer area.

Hooks #2 Tract (4845):

Second thinnings are proposed for both stand 1 (51.3 acres) and stand 2 (47 acres). These stands were established in 81 and 80 respectfully. Both stands were thinned a first time in 1998. These stands will be thinned to a residual basal area of approximately 80 sq. ft. per acre.

Strickland Tract (5443):

A second thinning is proposed for stand 5 (50.6 acres), which is a natural loblolly pine stand that was established in 1981 and thinned a first time in 1998. The stand will be thinned to a residual basal area of approximately 80 sq. ft. per acre.

Martin Tract (4801):

A second thinning is proposed for stand 1 (31.8 acres) established in 1975 and thinned a first time in 1996. The stand will be thinned to a residual basal area of approximately 80 sq. ft. per acre

This entire complex is in a Delmarva Fox Squirrel Area. All thinning will be conducted to promote the hardwood (oak) component of these stands wherever possible.

Complex S38-2

Somers Tract (5420):

First thinnings are proposed for stand 1 (40.3 acres) established in 1991, stand 2 (31.3 acres) a natural pine stand established in 1984, and stand 4 (45.5 acres) established in 1990. These stands will be thinned to a residual basal area of approximately 60-70 sq. ft. per acre.

Haislip Hooks Tract (5408):

A first thinning is proposed for stand 1 (106.1 acres) established in 1991. This stand will be thinned to a residual basal area of approximately 60-70 sq. ft. per acre.

Both tracts in this complex are in a Delmarva Fox Squirrel area. Thinning will be conducted to promote the hardwood (oak) of these stands wherever possible.

Complex S40-2

Cullen Tract (5432):

In an effort to improve the age class distribution problem across the Chesapeake Forest, a final harvest is proposed for a portion of stand 3 (36.8 acres), a young stand established in 1987. (See *Habitat Retention Guidelines*)

The goal, as for all of the Chesapeake Forest, is for natural regeneration if possible. This stand is a young stand and seed production will be minimal. Upon completion of the harvest a standard decision process should take place. Inspect for natural regeneration the year following the harvest (2006). If needed, additional regeneration decisions should be made at that time. Burning if there is enough fuel, followed by planting, or just straight planting (native pine or hardwoods as site conditions dictate) would be preferred recommendation if no natural regeneration is present.

First thinnings are proposed for the balance of stand 3 (8.3 acres) and all of stand 2 (73.1 acres) established in 1988.

Complex S41-2

Banks Tract (4866)

Second thinnings are proposed for stand 1 (2.4 acres), stand 2 (6 acres) and stand 3 (29.8 acres). The stands were established in 1945, 1971 & 1979 respectfully and all were thinned in 1998. A crop tree harvest will be conducted in stand 1, a small mature stand that is too small for a final harvest. The best crop trees will be selected and competing trees will be harvested. Stands 2 & 3 will be thinned to a residual basal area of approximately 80 sq. ft per acre.

Complex S52-2

Paul's Corner #1 Tract (5444)

First thinnings are proposed for both stand 1 (19.1 acres) and stand 2 (3.1 acres), which were established in 1989. These stands will be thinned to a residual basal area of approximately 60-70 sq. ft per acre.

Harold Johnson Tract (4878)

A first thinning is proposed for stand 1 (24.7 acres) established in 1987. The stand will be thinned to a residual basal area of approximately 60-70 sq. ft. per acre.

Paul's Corner #3 Tract (5446):

A first thinning is proposed for stand 1 (11.5 acres) established in 1983. The stand will be thinned to a residual basal area of approximately 60-70 sq. ft. per acre.

Complex S54-2

Jesse Johnson Tract (4879)

A second thinning is proposed for stand 1 (42.4 acres) established in 1972 and thinned a first time in 1998. A first thinning is proposed for stand 2 (21.5 acres) a natural stand established in 1978. The stand will be thinned to a residual basal area of approximately 60-70 sq. ft per acre.

Complex S55-2

Haislip Marumsco Tract (5403)

Second thinnings are proposed for stand 7 (137.8 acres) and stand 10 (45.9 acres) These stands were both established in 1981 and thinned a first time in 1998. The stands will be thinned to a residual basal area of approximately 80 sq. ft. per acre.

Regeneration is planned for a portion of stand 5 (63.2 acres). This stand on the 2005 for final harvest has yet to be harvested though some of the area has been burned in an effort to prepare a seed bed for natural regeneration. The stand will be inspected for a potential shelterwood harvest during the summer of 2004 rather than a clearcut as proposed in the 2005 work plan. Natural regeneration can then be evaluated and compared in a burned and unburned area.

Wilson Tract (4806)

Second thinnings are proposed for stand 1(17.1 acres) established in 1982, stand 3 (72.4 acres) established 1981, and stand 4 (68.7 acres) established in 1984. All stands were thinned a

first time in 1998. These stands will be thinned to a residual basal area of approximately 80 sq. ft. per acre.

There is at least one known Bald Eagles Nest in this complex. Appropriate buffers and seasonal restrictions will be adhered to for all harvest operations.

**Locations & Descriptions
Of
Watershed Improvement Projects**

PROPOSED WETLAND RESTORATION

AT

DUNN SWAMP

BACKGROUND

The Dunn Swamp (Tract # 3716) is a combined 1,275-acre parcel located in Worcester County approximately 3 miles southwest of Pocomoke City. The site is bisected by an existing ditch, which drains agricultural fields on the tract. The origin of the ditch is located on site with the existing Ag fields. The ditch runs south to north and drains to Pitts Creek, which eventually drains to Pocomoke Sound. After exiting the existing Ag fields, the ditch runs approximately 500 feet through a mature riparian forest.

This site is one of the few-farmed tracts within the Chesapeake Forest Land complex. There is approximately 88 acres currently in agriculture at the site. The area, which appears to be most appropriate for wetland restoration, is about 15 - 20 acres of the existing agricultural field. The soils at the site consist mostly of Fallsington, Pocomoke, Woodstown and Fort Mott soil series (ref. Worcester County Soil Survey, 1973). The Fallsington and Pocomoke soil series is considered to be a hydric soils. This means that these soils are generally somewhat poorly or are very poorly drained. The Fallsington and Pocomoke soil series occupy approximately 80% of the area being investigated for wetland restoration.

The specific area of interest for wetland restoration is the area on either side of the existing Ag ditch. The ditch runs approximately 800 linear feet from the southern boundary of the proposed wetland restoration area to the northern boundary of the site. The soils adjacent to the stream/ditch consist primarily of Fallsington sandy loam. The soil and typical landscape is described as follows:

“The Fallsington series consists of level, or nearly level, poorly drained soils on upland flats and at the base of gentle slopes. These soils formed in old, moderately coarse textured material that contains moderate amounts of silt and clay and is underlain by coarse-textured material. The native trees are loblolly pine, pond pine, water-tolerant oaks, sweetgum, sourgum and red maple. The understory in wooded areas is holly, sweetbay and briar... Good sites for excavated ponds are on these soils. The high water table severely limits these soils for many non-farm purposes.”

CHARACTERISTICS OF ADJACENT LAND USE

The manmade ditch drains most of the area in agricultural production as well as surround-forested areas. The watershed area appears to be divided evenly between forested and agricultural land. Approximately 88 acres is currently in agricultural

production. Water draining from agricultural lands to the proposed restoration site would be intercepted and impounded in the proposed wetland restoration area. This would provide additional water quality benefits in terms of sequestering nutrients, sediments, etc.

RESTORATION GOALS

The goal of this restoration project would be to restore the forested wetland that likely existed prior to the farming activities. This would effectively reduce the flow of water leaving the site and provide opportunities for water quality improvements as well as ground water recharge. In addition it may be feasible design the project to incorporate white cedar as part of the wetland forest restoration. This project is an excellent opportunity to improve habitat and water quality by:

- Capturing agricultural run-off and routing it through forested wetlands
- Allowing more residence time for storm and flood flows;
- Providing nutrient uptake and storage of sediments in the floodplain; and
- Enhancing the habitat value adjacent to the existing unnamed tributary.

RESTORATION PROPOSAL

It is the intent, at this preliminary stage, to do the following:

1. Establish low-level berms adjacent to the forested area on the north side of the Ag field.
2. Plugging the existing ditch; and
3. Sculpt areas within the restoration site to provide for native forest communities.

The practices outlined above would serve to capture surface runoff from rain events as well as impede the existing flow of water off-site via the ditch. Plugging the ditch and building a low-level berm would allow the existing run-off to braid its way through the restoration area and provide the hydrology for wetland forest communities. The proposed wetland restoration area is approximately 15 - 20 acres.

PROJECT BENEFITS

By impeding the conveyance of run-off and ground water, we can increase retention of storm flows and thereby increase the uptake and sequestration of nutrients and sediments. In addition, on-site habitat conditions can be improved restoring the native wetland forest community, which provide habitat for a host of important wetland dependant species.

**Locations & Descriptions
Of
Ecologically Significant Area (ESA)
Restoration Project**

Centennial Ponds Ecologically Significant Area Restoration Plan

The Centennial Ponds Ecologically Significant Area (ESA) is located in Dorchester County west of the town of Reids Grove and is dissected by Centennial Road. This ESA contains 362.58 acres of Chesapeake Forest including parts of stand 1, 2, 4, and 5 of tract 4256 and a the majority of tract 4260. Stand 3 of tract 4256 is located completely outside of the ESA. These tracts were previously managed by Chesapeake Forest Products Corporation to maximize pulpwood production of loblolly pine (*Pinus taeda*) by such silvicultural practices as windrow creation, bedding, wetland ditching, chemical hardwood control, fertilizing, planting of a loblolly pine monoculture and extensive road construction. Though these practices have had a severe effect on the landscape, hydrology, and the natural flora and fauna of the ESA, 7 rare species tracked by the Maryland Heritage Program are present (Table 1).

The boundary of the Centennial Ponds ESA (Map 1) is the result of a landscape-level conservation effort aimed to protect rare communities as well as the rare species found within them. This ESA contains 14 Delmarva bays of varying quality and vegetative composition, and a large complex of low wet woods of varying seasonal inundation, connected by a series of upland forests that have been converted to loblolly pine plantations. The ESA boundary was delineated based on various criteria associated with rare species habitat, the potential for managing for that habitat, and for the future expansion of rare species populations. These criteria included soil type, wetland type, wetland buffers, amphibian “life zones” and the actual location of rare species populations.

This plan is an outline and justification for the management practices that will be utilized at the Centennial Ponds ESA in FY2006. The plan focuses on two main areas of restoration. The first pertains to the hydrology of the site and the second to vegetation management within the Delmarva bays.

Delmarva Bay and Hydrologic Restoration

Delmarva bays, or Carolina bays, are elliptical-shaped, centripetally-drained, seasonally saturated depressional wetlands (Sharitz and Gibbons 1982, Sipple and Klockner 1984). There are three main types of bays based on dominant vegetation type: herbaceous (or glade), shrub swamp, and forested. Forested bays are the most common while herbaceous bays are least common (Sipple and Klockner 1984). The majority of rare threatened and endangered plants and animals that are found in Delmarva bays occur in the herbaceous type. Carolina bays are found on the Atlantic Coastal Plain of the eastern U. S. from southern New Jersey to northern Florida, ranging in size typically, from <10 meters in length to > 8 kilometers (Sharitz and Gibbons 1982). Bays on the Delmarva Peninsula are typically <10 meters to 1 km in length (Stolt and Rabenhorst 1987). Herbaceous vegetative composition and amphibian use of Delmarva bays may change seasonally and annually based on a number of ecological factors, the principal being hydroperiod. The seasonal hydroperiod and open-canopy of these bays has made

them an especially important habitat for rare plants, and the lack of predatory fish has also made these bays significant breeding habitat for common and rare amphibians.

The restoration of the sites natural hydrologic regime will have a profound effect on both the Delmarva Bays and the forest the Bays are nested within. Restoring the natural hydrologic regime is essential to ensure the long-term viability of the rare species at the site. All six of the rare species found here require early successional wetland habitats. Though the majority of the site (57%) is mapped as wetlands on the Maryland Wetlands maps, the silvicultural practices that have taken place have altered the hydrology, by ditching and bedding suggesting that the site was once more than 57% wetlands.

In the northeast portion of the ESA is a Delmarva Bay complex composed of what appear to be 12 small bays (Map 2). Many of these bays are hydrologically connected by surface water. These bays do not contain the normal plant zonation or topographical relief associated with Delmarva Bays. There may be two reasons for this. Either the disturbance by forestry practices that has occurred on site have so severely altered the surrounding landscape and the bays themselves that these features are no longer identifiable, or they are not typical Delmarva Bays. A separate Delmarva Bay restoration plan may be developed after the initial processes of the hydrological restoration have been completed, if these restoration practices have shed light on the bays' size, shape or number.

The Centennial Ponds ESA contains a number of large ditches that parallel the main logging roads. The amount of water in these ditches varies by the time of year and at the point where you measure the depth along the ditch. The deepest ditch was 12 feet in depth and contained approximately 3 feet of water in March of 2004. Another ditch draining the most water contained approximately 4 feet of water, also in March 2004. These ditches were designed to drain the wetlands on site to create/improve the available habitat for loblolly pine. This in turn impacted the habitat and populations of the associated wetland species.

Typical forestry site preparation practices such as bedding and windrow construction have allowed for the dense establishment of Loblolly pine (*Pinus taeda*) within many of the wetlands. The density of loblolly pine within these wetlands is far greater than the density of trees that would have been established through natural succession, if any would be present at all. In addition to bedding, many of the wetland has had windrows constructed through them. The windrows that are present may be acting to impound water and actually increase the water level in specific areas.

Goal: The goal of this restoration plan is to return a more natural hydrologic regime to the site in an attempt to restore the ecological conditions necessary for the existence and long term viability of the rare species present.

Objective: There are 2 main objectives for restoring the hydrology at the Centennial Ponds site.

1. Restore the sites natural hydrologic regime of the Delmarva Bays;
2. Restore the natural hardwood community that has been replaced in favor of the Loblolly pine plantation;
3. Increase the habitat and population size available for the state-tracked species.

Methods: The restoration of the sites natural hydrologic regime will be a difficult and labor-intensive task. The restoration will be a multi-staged process of removing trees to restore and increase the open to semi-open canopy wetlands, and to allow the natural mixed hardwood forest that should be found here to return. The bays will have to be managed to limit and control woody plant succession. Manual woody plant control should be conducted, as needed, i.e. when succession dictates. Future management at the site will be dependent on the effects of the hydrologic restoration.

Step 1. Manually remove the woody plants within and surrounding the bays. Trees within the basin of and surrounding the bays will be managed by common woody management techniques such as cutting, girdling, chemical treatment (“cut and paint” or “hack and squirt” application of glyphosate). There are many young invasive tree species growing in the basins of and around the bays, primarily Loblolly Pine. Removing these species will help restore the natural hydrologic regime by decreasing evapotranspiration (ET) while expanding available habitat for the Carpenter Frog and herbaceous plants. Cut trees can be stacked and burned.

The majority of the rare species located on site are located in two bays closest to Centennial Road, in the northwest corner of the ESA. To expand these populations an experimental portion of the bay complex, the 4 bays in closest proximity to the rare species, will have all loblolly pines and windrows removed between them (Map 2).

Step 2. An experimental removal of a windrow located within the bay complex. Removing windrows that divide the bay complex is intended to help restore the natural hydrology, dimensions, and open canopy of the bay. Before any removal of windrows is attempted a study regarding the use of these windrows by herpetofauna will be conducted. If it is determined that these windrows are significant to herpetofauna, and it is advised by a team of ecologists not to remove the windrows, this step will be reconsidered.

Step 3. Ditch filling/plugging. A number of large ditches parallel the logging roads at the site. The amount of water located in the ditches varies between a few inches to 4+ feet in depth. These ditches will be plugged or filled to negate the draining of the associated wetlands and restore the natural hydrologic regime at the site. The increase in water table may be enough to cause mass loblolly mortality within the associated wetlands and allow for the natural regeneration of the hardwood component. If the mortality of the loblollies is not high enough to alter the composition of the stands, manual removal may be reconsidered at a site-wide scale.

Restoration Success: Successful restoration of the hydrology at Centennial Ponds will mean that the majority of the loblolly pine has been replaced by swamp forest, the rare species population will have expanded into the newly available adjacent habitat and the long-term viability of these populations have been secured. Continuous management in the form of woody plant management to combat succession may have to be conducted. Additionally, new species of native herbaceous plants may be discovered in the Delmarva bays due to the restored natural hydrology.

Table 1:

Species	Common Name	G-Rank	S-Rank	Protection Status
<i>Eleocharis melanocarpa</i>	Black-fruited spikerush	G4	S1	Endangered
<i>Hypericum denticulatum</i>	Coppery St. john's-wort	G5	S1	Endangered
<i>Lobelia canbyi</i>	Canby's lobelia	G4	S2	Threatened
<i>Rana virgatipes</i>	Carpenter Frog	G5	S2	In Need of Conservation
<i>Rhynchospora cephalantha</i>	Capitate beakrush	G5	S1	Endangered
<i>Rhynchospora harperi</i>	Harper's beakrush	G4?	S1	Threatened
<i>Sabatia difformis</i>	Lance-leaved Sabatia	G4G5	S1	Endangered

Monitoring



Chesapeake Forest
Continuous Forest Inventory
Field Inventory Report

By:

Deidra Brace
Project Supervisor
October 2004



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The first Continuous Forest Inventory (CFI) was conducted, during the summer of 2004, on Chesapeake Forest. The forest consists of 59,170 acres spread through out five counties of the lower eastern shore of Maryland. Two hundred and ten permanent plots were established using a computer-generated randomization. The plots were 1/10 acre (37.2 foot radius) in size and all five-inch dbh (diameter at breast height) or greater trees were measured. The information recorded at each plot included species, dbh, merchantable height, tree class, percent cull, damage, crown ratio, and crown class. Stand characteristics were also determined using size class, site index, land use, forest type, disturbance factor, distance to road, and physical limitations. Herpetological, ornithological, and botanical surveys were also completed in conjunction with the forest survey. A total of fourteen resource professionals were hired to conduct the inventory; three ornithologists, two herpetologist, two botanist, six foresters, and a project supervisor. Education backgrounds ranged from college students to individuals holding master degrees. The forestry portion of the inventory took ten weeks, ornithological survey eight weeks, herpetological and botanical surveys took twenty weeks.

There were a total of five thousand one hundred fourteen trees measured with an average of twenty-four trees per plot. A total of thirty different tree species measured (Appendix A) with the majority of trees measured being Loblolly Pine. DBH for the trees ranged from five to forty inches (Appendix B), with the majority of the trees measured falling into the smaller dbh classes of five to ten inches (poletimber class). Forty-seven percent of the plots landed in the poletimber class (Appendix F). The predominant forest types are mostly Loblolly pine, Loblolly pine-Hardwood and Plantation (Appendix G). Eighty percent of the plots fell within the these dominant forest

types. The land use is mostly classified as general (Appendix H). Tree class was also measured (Appendix D). Seventy-six percent of the trees measured were categorized as acceptable. An acceptable tree is a tree that has the potential of being merchantable.

Three percent of the trees surveyed were categorized as a dead/ snag tree.

Site index was measured on each plot. Sixty-eight percent of the plots had a site index of fifty-six to seventy-four (Appendix E). Site index is a species-specific measure of actual or potential forest productivity (site quality) expressed in terms of the average height of trees included in a specified stand component at a specified base age.

The total cost of the field inventory was \$98,109. Eighty percent of the total budget was spent on salaries (Appendix C). Eight percent was spent on housing and furniture. Six percent of the budget was used to purchase equipment, which included field data recorders, GPS units and various technical tools.

Accuracy of plot placement in the field was the greatest challenge. Extreme variations were noticed between where plots actually are and where they were supposed to be. The degree of error ranged from two feet to over two thousand feet. This problem was due primarily to human error in the field. Another contributing factor was that the initial maps indicated that the distances were in feet when they were actually in meters. This was a simple projection error. The ornithologists discovered this problem within the first two weeks, and it was corrected. Another contributing factor was inaccurate map interpretation and a lack of determination to conquer the dense vegetation by field crews. There were twenty-three plots that were established over one thousand or more feet from their intended location. There were forty-eight plots located one hundred feet or less away from their intended location. Plots that were located within one hundred feet if

their intended location were considered to be within the expected level of accuracy since the GPS units were accurate to fifty feet and crews were pacing through thick underbrush.

Several of the forestry crew members offered suggestions on how to improve future projects (Appendix I). As project supervisor, I have also mentioned several suggestions (Appendix J).

Projected Annual Budget

CHESAPEAKE FOREST FY 06 PROJECTED BUDGET

<i>Cost of Management</i>	
<i>(*Costs will vary from year to year)</i>	
State CF Salaries & Contract Management	\$ 300,000
Land Operation	\$ 400,000
Inventory & Monitoring Program	\$ 70,000
Sustainable Forest Certification	\$ 15,000
Watershed Improvement & Other Restoration Projects	\$ 80,000
County Payment (15% of revenues)	\$ 160,000
Fixed Cost (ditch drainage payments to counties)	\$ 8,000
TOTAL COST	\$1,033,000

<i>Operating Revenues & State Funding</i>	
Forest Product Sale Revenues	\$ 750,000
Hunt Club Revenues	\$ 350,000
State Funding	\$ 100,000
TOTAL REVENUES & FUNDING	\$1,200,000