



**PUD Floating Zone Application and
PUD Concept Plan Application**

Prepared For

Southfields of Elkton Capital Development
c/o Stonewall Capital
117 E. Main Street
Elkton, Maryland 21921

Prepared By

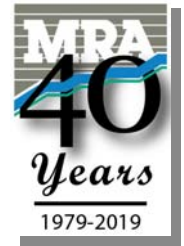
Morris & Ritchie Associates, Inc. (Planners & Engineers)
Baker, Thomey & Emrey (Land Use Council)
Eco-Science Professionals, Inc. (Environmental Scientists)
Vortex Environmental, Inc. (Environmental Scientists)

Date

December 9, 2019

MORRIS & RITCHIE ASSOCIATES, INC.

Architects | Planners | Urban Designers | Landscape Architects | Engineers | Surveyors



December 9, 2019

Mr. David Wiseman
Chair, Elkton Planning Commission

Ms. Jeanne Minner
Planning Director
Town of Elkton
100 Railroad Avenue
Elkton, Maryland 21921

RE: Southfields – PUD Floating Zone and Concept Plan Application

Dear Chairman Wiseman and Planning Director Minner:

On behalf of Southfields of Elkton Capital Development (c/o Stonewall Capital) and the entire Southfields team, we are pleased to submit this report and the accompanying plan set as our formal application for PUD Floating Zone and Concept Plan approval. Our team has worked diligently to address all of the requirements stipulated in Article XI of Elkton's zoning code. We look forward to working with you, the staff, consultants, Planning Commission and Mayor and Commissioners on perfecting this incredible opportunity for Elkton – an exemplary Live/Work/Play master planned community.

Throughout our work we have kept the objectives for Planned Unit Developments in mind to ensure we are exceeding the town's expectations. These include:

- a. To provide a more attractive and varied environment than would be possible through the strict application of existing zoning district requirements.
- b. To encourage the conservation of natural features, preservation of open space and critical and sensitive areas, and protection from natural hazards.
- c. To provide for efficient use of public facilities.
- d. To encourage a more intimate, efficient and aesthetic use of open space.
- e. To encourage developers to use a more creative approach in the development of land.
- f. To encourage variety in the physical development pattern of residential areas.
- g. To enhance the neighborhood character and create a pedestrian oriented environment within each PUD.
- h. To allow greater intensity and density developments while promoting a more desirable living environment through the use of site and building design standards.
- i. To encourage and preserve opportunities for energy-efficient development and redevelopment.
- j. To promote attractive and functional environments for non-residential uses that are compatible with surrounding land use.
- k. To encourage non-residential uses that serve primarily the region.

I. To properly address how a large size Planned Unit Development is created and built-out to ensure cohesiveness in design and planning and encourage efficiency when the development of a large number of dwelling units (in excess of 50 acres) is proposed. We believe the master plan that we have developed does, indeed, exceed these requirements.

This report is organized to address the requirements of the PUD Floating Zoning Application first, then the PUD Concept Plan requirements (from Appendix A) next. When a requirement is addressed by the plan set, we will identify the appropriate pages.

Finally, we thank you for the time and commitment you have already put forth in crafting and approving the PUD zoning code. We look forward to a similar collaborative effort as we now move thru the detailed application process.

Respectfully

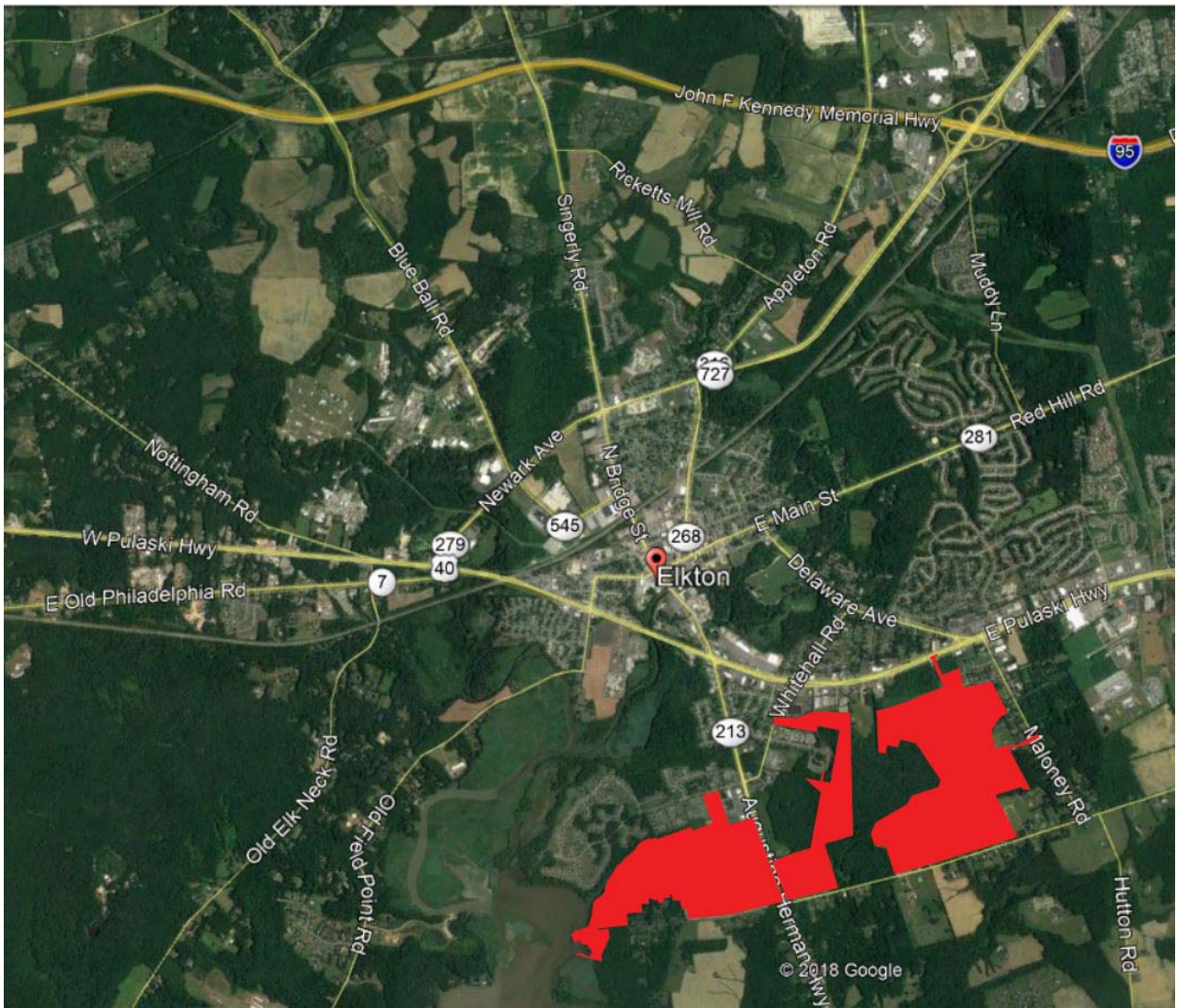
Morris and Ritchie Associates, Inc.

A handwritten signature in dark ink, appearing to read 'SD Davis', with a stylized flourish at the end.

Sean D. Davis, RLA
Principal

General PUD Floating Zone Requirements

1. Article XI. 17. a. 1. – General Location.



2. Article XI. 17. a. 2. – Phasing Diagram

Attached as Exhibit A is a General Land Use Plan for Southfields. The proposed phasing for the development includes:

- Phase I – Parcels D (multi-family apartments and rental townhomes), F, H, and I. Approval Process 12/2019 – 8/2020. Begin Construction 9/2020.
- Phase II – Parcels D (senior apartments), E, and G. Approval Process 8/2020 – 4/2021. Begin Construction 5/2021.
- Phase III – Parcel C. Approval Process 12/2020 – 8/2021. Begin Construction 9/2021.
- Phase IV – Parcels A, B, and C1. Approval Process 8/2020 – 8/2022. Begin Construction 9/2022.

3. Article XI. 17. a. 3. – Land Use Percentages

The table below identifies the permitted and proposed densities/floor area ratios for each parcel from Exhibit A. These include:

Parcel	Acreage	Permitted Density	Proposed Density
A*	+/- 7.7	0.35 FAR = 117,394 sq.ft.	20,000 sq.ft.
B*	+/- 9.0	17.5 du/ac = 157 homes	140 multi-family condominiums
C	+/- 46.8	6.25 du/ac = 292 homes	152 Single Family Detached Homes
C1*	+/- 9.1	6.25 du/ac = 56 homes	33 Single Family Detached Homes
D	+/- 32.7	17.5 du/ac = 572 homes	256 multi-family apartments 75 rental townhomes 200 senior multi-family apartments
E	+/- 20.4	0.35 FAR = 311,018 sq.ft.	4 restaurants (30,000 sq.ft.) 125 room hotel 1 gas/convenience store
F**	+/- 54.0	6.25 du/ac = 337 homes	Commercial Sports Complex
G	+/- 3.6	0.35 FAR = 54,885 sq.ft.	20,000 sq.ft. Day Care (including outdoor play space)
H	+/- 49.6	6.25 du/ac = 310 homes	167 Single Family Detached Homes
I	+/- 229.4	0.40 FAR = 3,997,065 sq.ft.	3,029,760 sq.ft.

* Indicates Parcels that will require a Chesapeake Bay Critical Area Growth Allocation to achieve the Permitted and Proposed Density. A formal request has been made by the applicant to the Town to initiate the Growth Allocation process with the Town, County, and State.

** The underlying zoning for Parcel F is R3. The permitted uses include residential which is illustrated for density purposes only.

Note 1 – The applicant reserves the right to increase the total number of single family homes in Parcels C, C1, and H by 15% during the Preliminary and Final plan approval process without having to return to the PUD Concept plan approval stage.

Note 2 – The applicant reserves the right to increase the total square footage of retail, and total number of hotel rooms by 15% during the Preliminary and Final plan approval process without having to return to the PUD Concept plan approval process.

4. Article XI. 17. a. 4. – Proposed Open Space

Attached as Exhibit B is a General Open Space plan for the entire community. This identifies most, but not all of the open space and recreation areas of the community. Smaller, more neighborhood or parcel oriented open and recreation spaces will add to this total amenity acreage. Most of the open spaces on Exhibit B (with the exception of Parcel F) are natural preservation areas. All open and recreation space is intended to be privately owned (fee simple ownership such as the sports complex or amenities within the multi-family apartment parcel, property owners association for the light industrial warehousing, or homeowners association for the single family neighborhoods).

5. Article XI. 17. a. 5. – Provision of Utilities

Southfields will be served by public water and sewer. The exact connections to the existing systems is still being evaluated by the applicant and the Town. As existing water and sewer are adjacent to, or within close proximity to the site from adjacent neighborhoods, Route 213, and Route 40, the applicant does not anticipate any problems with serving the development. A public water tower and sewer pump station will be located on site to augment the public utility services. As requested by the Town, attached as Exhibit C is the latest sewer and water capacity analysis.

6. Article XI. 17. a. 6. – Expected Town Responsibilities

At this time, the only anticipated Town responsibilities include future maintenance of on-site sewer, water, and roadways that will be dedicated to the Town as part of the site plan/subdivision approval process.

7. Article XI. 17. a. 7. – Cost Revenue Analysis

Attached as Exhibit D is a Cost Revenue analysis for Southfields prepared by Real Property Research Group. This report describes the net fiscal benefit to the Town and County, taking into consideration the cost for all municipal services.

8. Article XI. 17. a. 8. – Application Fees

The applicable review fees have been submitted concurrently with this report and accompany plans.

PUD Concept Plan Requirements

Article XI allows an applicant to submit a Concept Plan with the PUD Floating Zone application for approval. Southfields of Elkton Capital Development has chosen to file both applications simultaneously. This section of the report covers elements of Article XI that are somewhat distinct from the enumerated Floating Zone application requirements described above. This section will also cover those requirements in Appendix A that are not shown on the accompanying plan set. These include:

1. Article XI.3 – Minimum Area for a PUD

Southfields meets the requirements for a Large PUD as the property is under single ownership, over 100 acres of contiguous land (not separated by more than ¼ of a mile) and no more than two noncontiguous parcels.

2. Article XI.4 – Permitted Uses

The proposed uses, as illustrated on the Conceptual Site Plan and described in this report, comply with Article X. The applicant will file a Special Exception application to permit “Storage of goods not related to sale or use of those goods on the same lot where they are stored, warehousing; all storage within completely enclosed structures” (uses 10.200 and 10.210) while proceeding thru the PUD approval process so that the Special Exception hearing can take place as quickly as possible after the Planning Commission and the Mayor and Commissioners approve the PUD Floating Zone Application and the Planning Commission approves the PUD Concept Plan in accordance with Article XI.17. It is essential to the applicant that the Special Exception be determined as quickly as possible after the PUD is approved so as to ensure this critical use can be constructed.

3. Article XI.10 – Signage

Attached as Exhibit E is the proposed Comprehensive Signage Plan for Southfields. This plan covers all freestanding signs proposed throughout the community. Building mounted signs shall comply with Article XVI. If, in the course of the development a subsequent owner or tenant would like to modify and vary from those shown on Exhibit E, or Article XVI, they will be permitted to pursue such variances without having to return to the PUD Concept plan approval process.

4. Article XI. 11 – Modifications

Attached as Exhibit F is the proposed Modifications to Standards proposed as part of this PUD application. The proposed modifications are:

- a. Minor in relation to the existing ordinances,
- b. An environmental benefit to the Town and Community by providing either more community wide open space or less impervious surfaces,
- c. In keeping with numerous other requirements in like situated Towns and Counties throughout Maryland,
- d. Not based on special conditions or circumstances that are unique to the property, but rather based on industry trends of what the consumer wants,
- e. Not the result of the applicant's actions, were not self-imposed or self-created, but rather based on market demands, and
- f. If strict enforcement of the existing standards are applied there will be a greater impact to the natural environment and therefore contrary to the public's benefit.

5. Article XI.13 and 14 – Residential Requirements

In accordance with Article XI.13, the proposed plan includes five different types of housing (single family detached fee simple homes, multifamily condominiums, multifamily rental apartments, rental townhomes, and senior multifamily apartments). In addition, 58% of the total site is devoted to open space and residential uses and 67% of the total 1023 homes are single family detached dwellings, condominiums, and/or senior housing units.

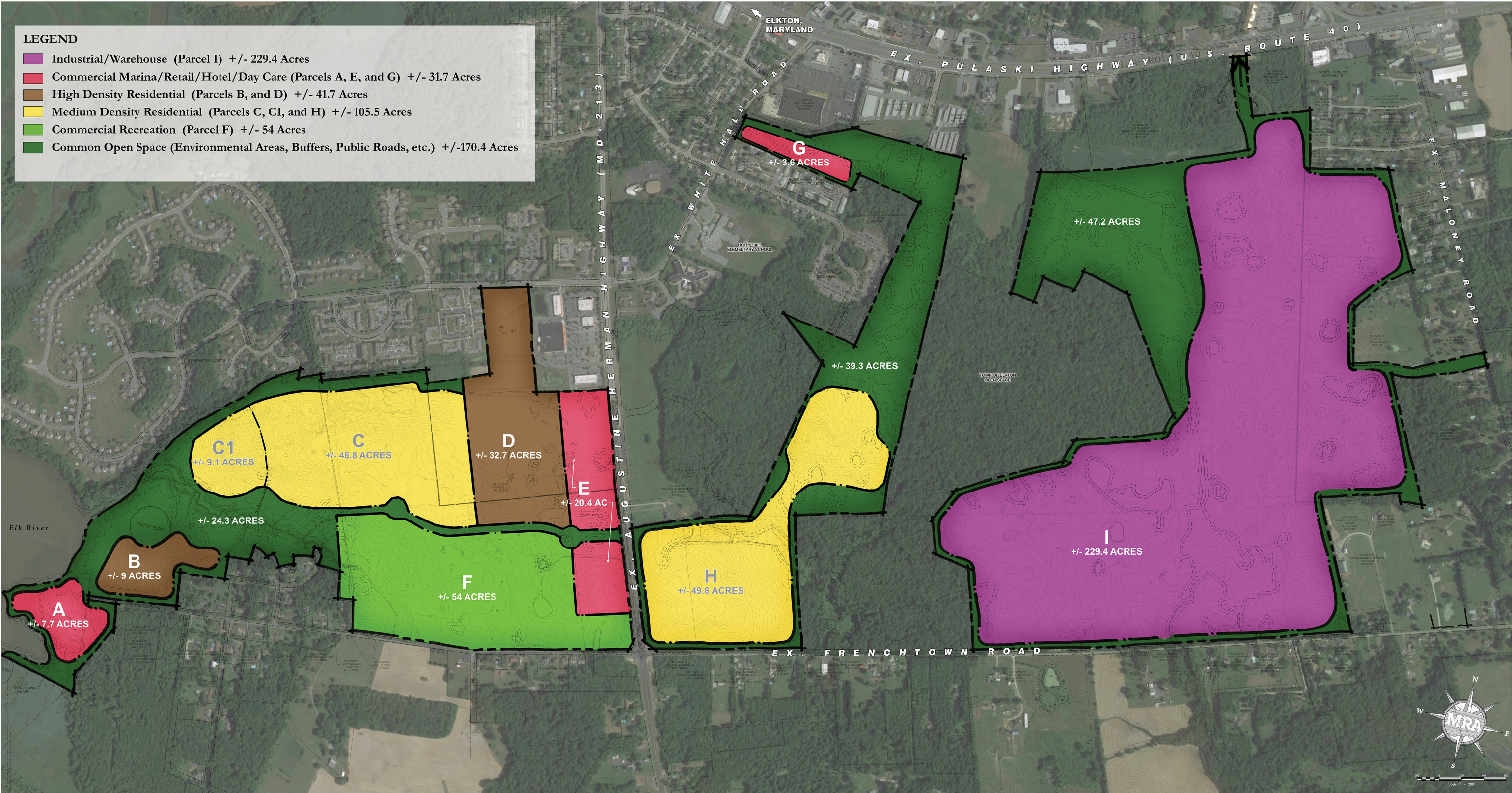
6. Article XI.15 – Common Open Space

As illustrated on Exhibit B, General open Space, a total of 308.1 acres of active and passive open space has been provided throughout Southfields. This equates to 48% of the total site, well in excess of the required 25%.

In addition to the total open space requirements, either .02 acres or 30% of the required open space, whichever is greater, must be parks and recreation areas. It was the applicants understanding during the drafting of the PUD ordinance that the 30% requirement was to be removed and only the .02 acres per home was to be required. The basis for this understanding was the argument that over 260 acres of the site will be dedicated to non-residential commercial and industrial/warehousing uses which do not require recreation space. This 260 acres equates to 19.5 acres of recreation space ($260 \times .25 \times .30$). Regardless, the site meets either requirement by providing over 57 acres of parks and recreation space. This includes the Sports Park (Parcel F), the amenity centers for the multifamily apartments, rental townhomes, senior apartments (Parcel D) and community amenity areas in Parcels C, C1, and H.

Appendix A Requirements

All of the requirements outlined in Appendix A are covered either in this report or on the accompanying plan set. Exhibit G includes all of the Forest Stand Delineation reports for the property.



LEGEND

- Open Space (Environmental Areas, Buffers)
- Active Recreation Open Space (Public park, Private clubhouse amenities)



MORRIS & RITCHIE ASSOCIATES, INC.

Architects | Planners | Urban Designers | Landscape Architects | Engineers | Surveyors

**MEMORANDUM**

Date:	December 6, 2019	Project No.:	20523 x01
Re:	Water and Sewer Projections	Project Name:	Southfields
From:	Amy DiPietro		
To:	File	Enclosures:	With Via: Email,

- Sewage Flow Projection
** based on MRA 11/11/19 Concept Plan and Ray Jackson 11/13/19 (email)*

Average Flow, Q_AParcel A

Marina:	50 slips x 30 GPD/boat slip ("DNREC WW Design Guidelines")	<u>= 1,500 GPD</u>
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Parcel B

Condos:	140 units x 250 GPD/unit	<u>= 35,000 GPD</u>
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Parcel C

Single Family Detached:	224 units x 250 GPD/units	<u>= 56,000 GPD</u>
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Parcel D

Townhouses:	75 units x 250 GPD/units	= 18,750 GPD
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Apartments:	256 units x 250 GPD/unit	= 64,000 GPD
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SUBTOTAL	<u><u>82,750 GPD</u></u>
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Parcel E

Hotel:	125 rooms x 120 GPD/room	= 15,000 GPD
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Restaurant:	(2) 7,500 sf, assume 320 seats ea. 640 seats x 25 GPD/seat	= 16,000 GPD
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Gas/Convenience:	5,500 sf x 0.18 GPD/sf (AA Co. "Commercial Mix")	= 990 GPD
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SUBTOTAL	<u><u>31,990 GPD</u></u>
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Parcel F

Sports Complex:

One building, assume 20 toilets and 20 sinks, 2 utility sinks
for food prep

20 toilets x 35 GPD/toilet = 700 GPD

20 sinks x 15 GPD/sink = 300 GPD

2 utility sinks x 50 GPD/utility sink = 100 GPD

SUBTOTAL = 1,100 GPD

Parcel G

Senior Housing:

200 units x 1.5 person/unit x 125 GPD/pp
(town uses 250 GPD for all residential)

= 37,500 GPD

Parcel H

Single Family

Detached:

159 units x 250 GPD/unit

= 39,750 GPD

Parcel J

Daycare Center:

Assume 20,000 sf, per previous MRA design
Assume 100 children and 20 staff (5 children/staff)

100 children x 10 GPD/child = 1,000 GPD

20 staff x 15 GPD/staff = 300 GPD

(per DNREC WW Design Guidelines) SUBTOTAL = 1,300 GPD

Total

* Parcel I not included, private PS's to Route 40 sewer

* $Q_i = Q_A / 3$

Parcel	Q_A (GPD)	Q_i (GPD)
A	1,500	500
B	35,000	11,667
C	56,000	18,667
D	82,750	27,583
E	31,990	10,663
F	1,100	367
G	37,500	12,500
H	39,750	13,250
J	1,300	433

Total $Q_A = 286,890$ GPD
 $Q_p = 3.2 (Q_A)^{5/6} = 3.2 (286,890)^{5/6} = 1,130,436$ GPD (The equation provided in MDE guidelines uses MGD for Q_A and Q_p . Please double check this calculation.)
Total $Q_i = 95,630$ GPD $Q_D = Q_p + Q_i = 1,130,436 + 95,630 = 1,226,066$ GPD....use 1,226,100 GPD

Parcel I

* per MDE Design Guidelines, Warehouse $Q_A = 0.03$ GPD/sf

* Building sf acquired from MRA CAD file "20528_PL-COND-ALT-3" dated 11/5/19

Building 1

(starting from north)

$$\begin{aligned}
 Q_A &= 865,260 \text{ sf} \times 0.03 \text{ GPD/sf} && = 25,958 \text{ GPD} \\
 Q_P &= Q_A \times 4 = 25,958 \text{ GPD} \times 4 && = 103,832 \text{ GPD} \\
 Q_i &= Q_A / 3 = 25,958 \text{ GPD} / 3 && = 8,653 \text{ GPD} \\
 Q_D &= Q_P + Q_i = 103,832 + 8,653 && = 112,485 \text{ GPD} \\
 &&& = 78.1 \text{ GPM} \\
 &&& \text{Use 80 GPM}
 \end{aligned}$$

* Pump selection in 80 – 85 GPM range

Building 2

$$\begin{aligned}
 Q_A &= 1,199,700 \text{ sf} \times 0.03 \text{ GPD/sf} && = 35,991 \text{ GPD} \\
 Q_P &= Q_A \times 4 = 35,991 \text{ GPD} \times 4 && = 143,964 \text{ GPD} \\
 Q_i &= Q_A / 3 = 35,991 \text{ GPD} / 3 && = 11,997 \text{ GPD} \\
 Q_D &= Q_P + Q_i = 143,964 + 11,997 && = 155,961 \text{ GPD} \\
 &&& = 108.3 \text{ GPM} \\
 &&& \text{Use 110 GPM}
 \end{aligned}$$

* Pump selection in 110 – 115 GPM range

Building 3

$$\begin{aligned}
 Q_A &= 964,800 \text{ sf} \times 0.03 \text{ GPD/sf} && = 28,944 \text{ GPD} \\
 Q_P &= Q_A \times 4 = 28,944 \text{ GPD} \times 4 && = 115,776 \text{ GPD} \\
 Q_i &= Q_A / 3 = 28,944 \text{ GPD} / 3 && = 9,648 \text{ GPD} \\
 Q_D &= Q_P + Q_i = 115,776 + 9,648 && = 125,424 \text{ GPD} \\
 &&& = 87.1 \text{ GPM} \\
 &&& \text{Use 90 GPM}
 \end{aligned}$$

* Pump selection in 90 – 95 GPM range



REAL PROPERTY **RESEARCH** GROUP
ATLANTA ■ WASHINGTON/BALTIMORE

Community Impact Analysis

Southfields of Elkton Planned Development

Elkton, Cecil County, Maryland

Prepared for:
Stonewall Capital

December 2019



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SUMMARY

Real Property Research Group, Inc. has been engaged by Stonewall Capital to complete a community impact analysis of a mixed-use planned development known as the Southfields of Elkton Planned Development, a 630-acre mixed use project near Frenchtown Road and Route 213 in Elkton Maryland. Stonewall Capital is the developer and sponsor of the project. The project, which represents a total capital investment of \$602.6 million (including construction estimates for all components), involves a partnership with multiple developers, builders, financial partners, and operators.

The planned development is analyzed according to the multiple proposed components including multifamily rental, residential for-sale, light industrial, retail, neighborhood service, and recreational uses.

Based on our analysis, we have reached the following conclusions (Table 1):

- As proposed, the Southfields of Elkton Planned Development will span approximately 630 acres of land in southern Elkton, Cecil County, Maryland. Planned uses include over 1,100 residential units (rental and for-sale), up to 315,000 square feet of commercial space, a 125-room hotel, a 50-acre sports complex, a marina, and a 250-acre light industrial (logistic, ecommerce, light industrial) park. Based on estimates of planned uses, construction budgets, and project parameters provided by the developer, the IMPLAN input-output model estimates total economic impact during the construction phase to be \$697.5 million in total output, 5,057 new jobs, and a \$373.3 million increase to value added, of which \$278.5 million relates to the increase in employee compensation.
- Following completion of all proposed components, the Southfields of Elkton Planned Development is expected to have an ongoing estimated contribution of \$126.3 million in direct economic output to the Cecil County economy. Total output, including direct, indirect, and induced impacts are estimated to be \$234.4 million. The total impact to employment is estimated to be 2,512 jobs and the total impact to value added is \$134.8 million, of which \$97.5 million is attributable to employee compensation.
- The total construction period gross contribution is estimated at \$9.76 million to Cecil County tax revenue and \$2.2 million to tax revenue for the Town of Elkton. The total ongoing operation period gross contribution is estimated at \$5.6 million to Cecil County tax revenue and \$2.4 million to tax revenue for the Town of Elkton.

We hope that you find this analysis helpful and we look forward to your comments.



Ethan Reed
Senior Analyst



Robert M. Lefenfeld
Founding Principal

Table 1 Summary of Community Impacts

Project Overview - Southfields of Elkton	
Geography	
Location	Town of Elkton, Cecil County , Maryland
Site Status pre-development	Vacant, unimproved
Project Description	
Asset Class	Mixed-Use Development (residential, commercial, light industrial, hospitality, recreation uses)
Development Type	New Construction
Schedule	2020-2026
Lead Developer	Stonewall Capital
Project Size	630 acres
Total Estimated Development Cost	\$602.6M
Economic Impacts	
Construction Period (One Time)	
Economic Output	\$697.5M
Employment Impact	5,057
Employee Wages	\$278.5M
Operating Period (Annual Average)	
Economic Output	\$234.4M
Employment Impact	2,512
Employee Wages	\$97.5M
Fiscal Impacts	
Construction Period	
Cecil County Revenue Impact	\$9,758,378
Elkton Revenue Impact	\$2,232,010
Operating Period (Annual Average)	
Cecil County Revenue Impact	\$5,603,970
Elkton Revenue Impact	\$2,400,441

Sources: RPRG, Inc.; IMPLAN Cecil County, Elkton, MD 2017, Stonewall Capital



I. INTRODUCTION

A. Assignment

Stonewall Capital (Client) has engaged Real Property Research Group, Inc. to complete a community impact analysis involving the development and construction of the Southfields of Elkton Planned Development, a mixed-use planned development located in southern Elkton, Cecil County, Maryland. It is expected that the Client will use this report in discussions with local planning commissions regarding the subject development.

Stonewall Capital is the developer and sponsor of the project. The project, which represents a total capital investment of \$602.6 million, will be developed over a six-year period from 2020 to 2026 including residential, light industrial/distribution (logistic, ecommerce, light industrial), retail/commercial, hospitality, and community/recreational uses.

The report is divided into six sections. Following this introduction, Section 2 provides an overview of the subject project. Section 3 summarizes the local and regional context and examines the demographic characteristics of the neighborhood and region. Section 4 measures the direct, indirect, and induced economic contributions of the subject project on the regional economy. Section 5 calculates the fiscal contributions of the project on local government jurisdictions. Section 6 summarizes the project's projected impacts and contributions. Reference is made to the statement of Underlying Assumptions and Limiting Conditions attached as Appendix I and incorporated in this report.

II. PROJECT DESCRIPTION

A. Southfields at Elkton Overview

The subject site is located within a southern portion of Elkton, Cecil County, Maryland (Figure 1). The subject development includes ten parcels/components planned for residential, commercial, light industrial, hospitality, or recreation uses as well as substantial common open space.

Overall, the Southfields of Elkton Planned Development will span approximately 630 acres of land at or near the intersection of MD-213 and Frenchtown Road (Figure 2). Planned uses include over 1,100 residential units (rental and for-sale), up to 315,000 square feet of commercial space, a 125-room hotel, a 50-acre sports complex, a marina, and a 250-acre light industrial (logistic, ecommerce, light industrial) park.

Figure 1 View of Subject Site



Figure 2 Southfield of Elkton Land Use Plan



B. Project Planned Uses, Development Budget and Operational Assumptions

For the purposes of this analysis, certain assumptions and estimates are needed regarding planned uses including type, size, budget, and operational activity of the various planned components of the subject development. These estimates were provided by the development team, and RPRG supplemented some information with research on industry averages. The total aggregate development/construction cost for all components of the Southfields of Elkton Planned Development is projected at \$602.6 million (Table 2) which includes the development/construction of all components with construction commencements ranging from 2020 to 2023 and completions from 2021 to 2026.

Operation period activity include projected gross sales for non-residential components and aggregate household incomes for residential components.¹ Further explanation of operation-period analysis methodology is provided in later sections of this report.

Table 2 Project Estimated Budget (Construction and Ongoing)

Parcel	Planned Use	Description	Construction Budget	Est. Construction Year	Est. Annual Gross Revenue/Income	Est. Employees	Est. Operations Year 1
J	Light Industrial/Logistics/Commerce	Three 1MSF cross dock distribution centers	\$325,000,000	2020-2025	N/A	1,250	2022-2025
I	Commercial	Day Care Center	\$2,500,000	2021	\$2,000,000	N/A	2021
H	Phase 1 Residential - Single-Family	159 single-family homes	\$23,400,000	2020-2022	\$13,836,078	N/A	2021-2022
E-1	Retail	Two restaurants	\$15,500,000	2021-2023	\$4,200,000	N/A	2022-2023
E-2	Retail	Convenience Store	\$5,000,000	2021-2023	\$3,800,000	N/A	2023
E-3	Hotel	125-Room Hotel	\$17,000,000	2021-2023	\$6,589,000	N/A	2023
D	Multifamily	331-Unit Townhome and Apartment	\$61,000,000	2021-2024	\$17,753,025	N/A	2024
F	Sports Complex	Indoor/Outdoor Sports Complex	\$26,000,000	2021-2023	\$6,200,000	40	2023
G	Senior Multifamily	200 Rental Units 55+	\$15,000,000	2021-2022	\$9,595,297	N/A	2022
C	Phase 2 Residential - Single-Family	Approx. 196 Single-Family Homes	\$32,700,000	2022-2026	\$17,055,794	N/A	2023-2026
B	Senior Condos	Approx 140 condo units 55+	\$22,500,000	2023-2026	\$9,997,326	N/A	2026
A-1	Marina	75-slip Marina	\$30,000,000	2023-2026	\$1,400,000	N/A	2026
A-2	Retail	Two restaurants	\$7,000,000	2023-2026	\$2,800,000	N/A	2025-2026
A-3	Multifamily	100-unit apartment	\$20,000,000	2023-2026	\$5,363,452	N/A	2026
Total			\$602,600,000		\$100,589,972		

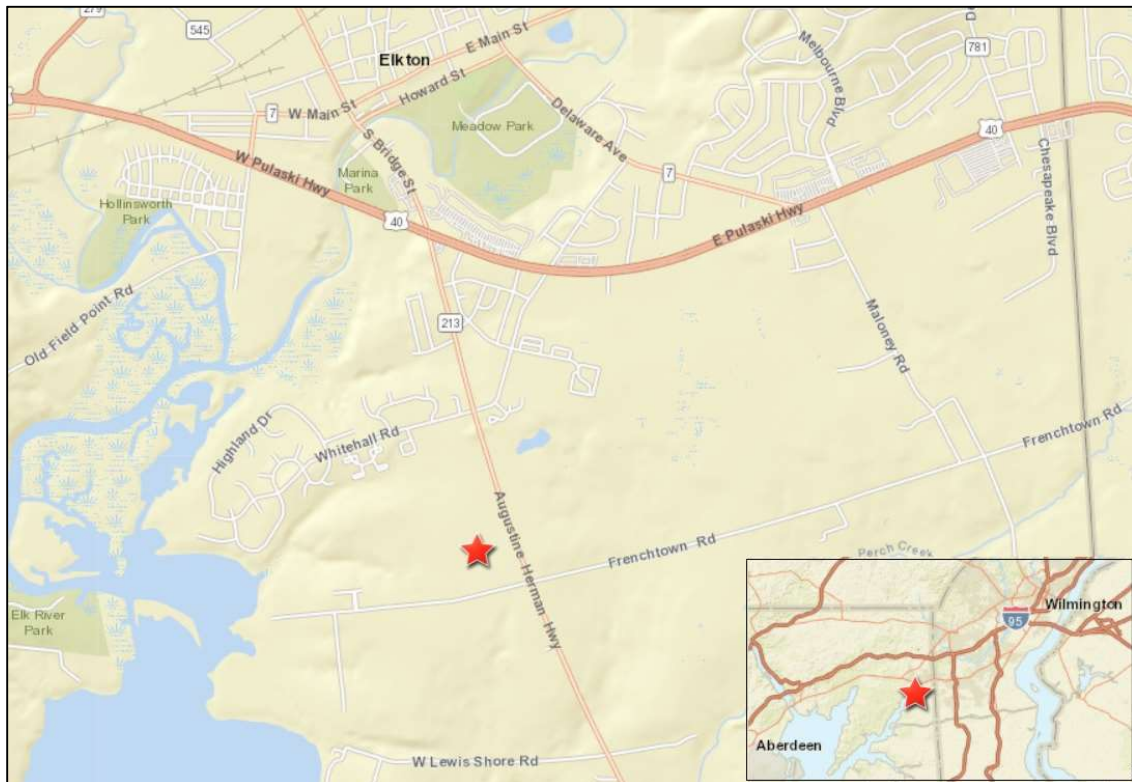
Source: Stonewall Capital, RPRG, Inc. industry research

III. LOCAL AND REGIONAL CONTEXT

A. Site and Neighborhood Description

The subject site is located across multiple parcels throughout southern Elkton, generally near the intersection of MD-213/Augustine Herman Highway and Frenchtown Road in Elkton, Cecil County, Maryland. The site is approximately two miles south of Elkton's downtown area (Map 1). The site is also approximately two miles west of the Maryland-Delaware border.

Map 1 Site Location within the Remington Neighborhood



The subject site is located in an emerging area of Elkton near primary employment and retail centers, transportation thoroughfares, and residential uses. Most single-family homes are concentrated along nearby thoroughfares such as MD-213 and Frenchtown Road, though single-family subdivisions are located west and northwest of the site. Further north of the site beyond agricultural fields is a retail center on White Hall Road containing a Redner's Warehouse grocery store, a bank, restaurants and other small retailers. Additional residential uses near this retail center include single-family detached and attached homes (townhomes) as well as multi-family rental communities (Villas at Whitehall and Springford Gardens Apartments) and an assisted living facility and nursing home. Villas at Whitehall is an affordable senior rental community, while Springford Gardens is an affordable general occupancy rental property.

Within an exurban location in the southern portion of Elkton, the subject site is surrounded by agricultural uses, forested lands, and low-density residential uses. Land uses are similarly rural/exurban travelling east, west, and south of the site, with some small commercial uses scattered along MD-213 to the south. About one mile north of the site, development patterns become more

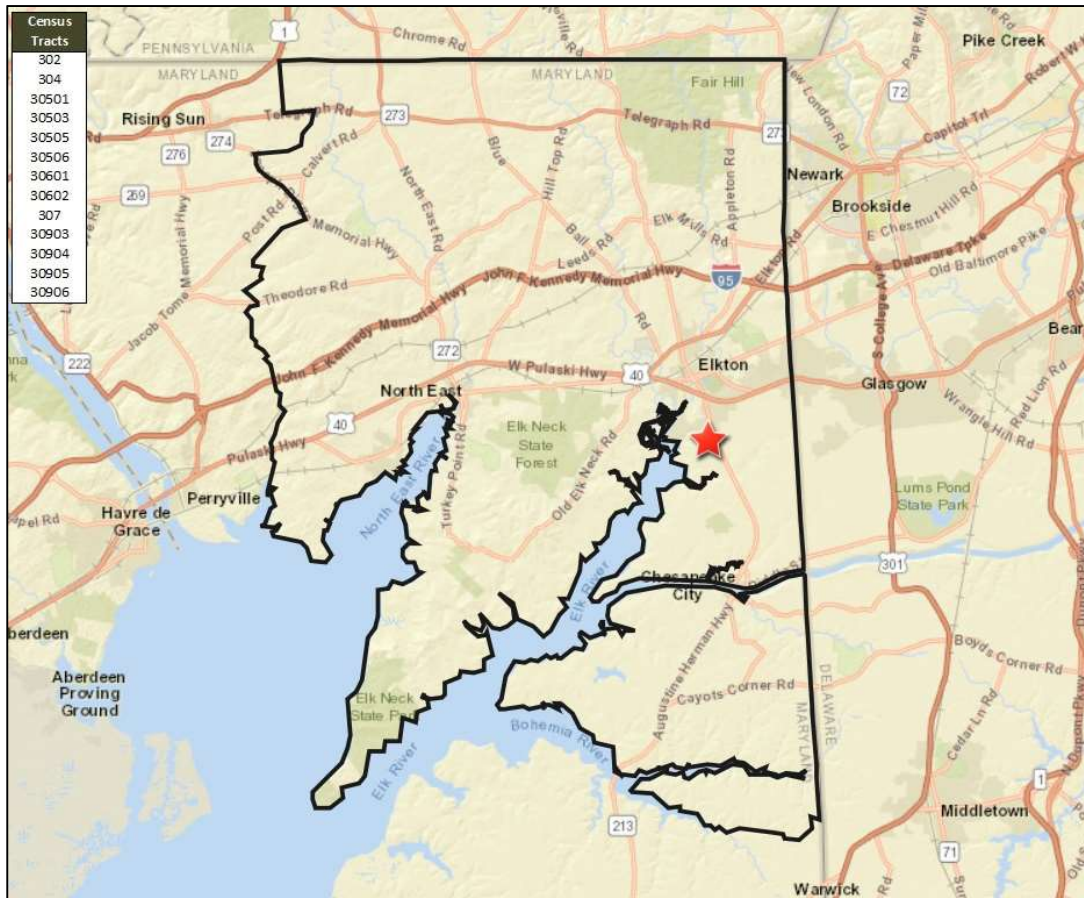
dense and characteristically suburban, with a large concentration of retailers, service providers, single-family residences (both detached and townhomes) and other uses concentrated along the US-40 corridor. Retail concentrations along US-40 include standalone establishments and several small shopping centers.

Elkton's core neighborhoods are located further north of US-40, approximately two miles north of the subject site. As the county seat and primary population center of eastern Cecil County, Elkton is an important employment and commerce center in the region and contains a variety of land uses including government and professional offices, schools, parks, medical services, and a small concentration of boutique shops and restaurants along Main Street. Residential uses within and immediately around Elkton's town center mostly consist of older single-family detached homes, but townhouse subdivisions and several multi-family rental communities also have a presence in the town.

Cecil County's convenient access to Interstate-95 and strategic position between and near the major metropolitan areas of Philadelphia, Wilmington, Baltimore, and Washington D.C. has fostered a notable concentration of logistical nodes, including distribution centers for Amazon, Medline, Restoration Hardware, IKEA, and GE Appliances. Lidl, the German grocery chain, has also begun hiring for its new distribution center in Perryville, while Smithfield Foods announced the development of its own new distribution center in April 2019. Additionally, Great Wolf Lodge recently announced plans for a new \$200 million resort in Perryville that will include a hotel, water park, shops, and other entertainment areas.

B. Demographic Context

To estimate potential households for residential components of the subject development, RPRG derived a residential market area, referred to as the Southfields Market Area of Cecil County. For comparative purposes, the demographic characteristics of the Southfields Market Area, which RPRG defines as the 13 census tracts illustrated in Map 2 are measured against the demographic characteristics of a Tri-County Region consisting of Cecil County, Harford County, and Kent County. The tracts that compose the Southfields Market Area are also referred to as the primary market area or simply as the market area in this report.

Map 2 Southfields Market Area

The Southfields Market Area's population and household base grew steadily from 2000 to 2010, recording net growth of 10,194 people (17.3 percent) and 3,857 households (18.1 percent) between Census counts (Table 3). Annual rates of growth during the period were 1.6 percent for population and 1.7 percent for households. During the same period, the region's population grew by 13.1 percent and its household base grew by 14.1 percent. The region's annual growth rates were 1.2 percent for population and 1.3 percent for households.

Growth rates in the market area slowed from 2010 to 2019 with annual net growth of 0.5 percent for population and households. The market area's total net growth over the past nine years was 3,164 people and 1,203 households. The region's rate of growth also slowed relative to the past decade, with annual growth of 0.5 percent for both population and households.

Esri projects the market area's growth rates to accelerate over the next five years to 1.0 percent per year among population and households. The market area is projected to reach 75,905 people and 27,725 households by 2024, with annual growth of 265 households.

Table 3 Population and Household Projections

	Tri-County Region				
Population	Count	Total Change		Annual Change	
		#	%	#	%
2000	323,738				
2010	366,131	42,393	13.1%	4,239	1.2%
2019	384,135	18,004	4.9%	2,000	0.5%
2024	394,654	10,519	2.7%	2,104	0.5%
		Total Change		Annual Change	
Households	Count	#	%	#	%
2000	118,556				
2010	135,250	16,694	14.1%	1,669	1.3%
2019	142,015	6,765	5.0%	752	0.5%
2024	145,900	3,885	2.7%	777	0.5%

Southfields Market Area					
Count	Total Change		Annual Change		
	#	%	#	%	
58,984					
69,178	10,194	17.3%	1,019	1.6%	
72,342	3,164	4.6%	352	0.5%	
75,905	3,563	4.9%	713	1.0%	
		Total Change		Annual Change	
Count	#	%	#	%	
21,342					
25,199	3,857	18.1%	386	1.7%	
26,402	1,203	4.8%	134	0.5%	
27,725	1,323	5.0%	265	1.0%	

Source: 2000 Census; 2010 Census; Esri; and Real Property Research Group, Inc.

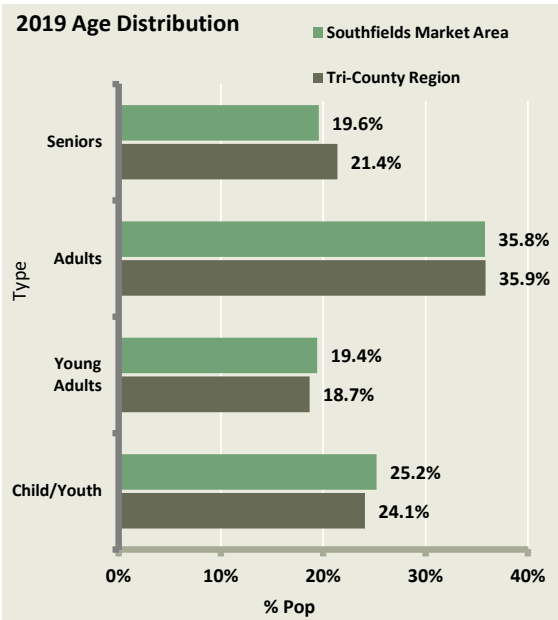
C. Demographic Characteristics

The median age of the population in the market area is 38 years compared to 40 years in the region (Table 4). Adults age 35-61 comprise the largest percentage of each area's population at approximately 36 percent in both the market area and the region. Roughly 25 percent of the market area's population is under the age of 20 compared to 24.1 percent in the region. The 19.6 percent of the market area's population age 62+ is slightly less than the regional senior population percentage of 21.4 percent. A similar 19.4 percent of the market area's population is Young Adults between the ages of 20 and 34 years compared to 18.7 percent of the regional population.

Table 4 Age Distribution

2019 Age Distribution	Tri-County Region		Southfields Market Area	
	#	%	#	%
Children/Youth	91,779	24.1%	18,239	25.2%
Under 5 years	21,091	5.5%	4,394	6.1%
5-9 years	22,600	5.9%	4,614	6.4%
10-14 years	24,519	6.4%	4,850	6.7%
15-19 years	23,569	6.2%	4,381	6.1%
Young Adults	71,141	18.7%	14,048	19.4%
20-24 years	21,567	5.7%	4,129	5.7%
25-34 years	49,574	13.0%	9,919	13.7%
Adults	136,692	35.9%	25,904	35.8%
35-44 years	46,221	12.1%	9,033	12.5%
45-54 years	51,956	13.6%	9,841	13.6%
55-61 years	38,514	10.1%	7,030	9.7%
Seniors	81,468	21.4%	14,151	19.6%
62-64 years	16,506	4.3%	3,013	4.2%
65-74 years	39,184	10.3%	7,076	9.8%
75-84 years	18,582	4.9%	2,979	4.1%
85 and older	7,196	1.9%	1,083	1.5%
TOTAL	381,080	100%	72,342	100%
Median Age	40		38	

Source: Esri; RPRG, Inc.

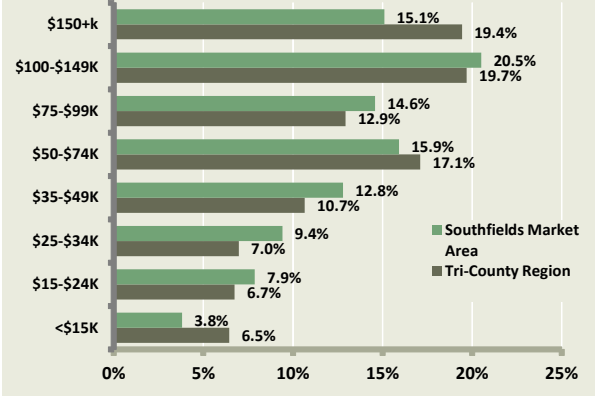


The Southfields Market Area 2019 median income of \$75,330 is \$3,650 or 4.6 percent lower than the region's median of \$78,980 (Table 5). Nearly 13 percent of market area households earn \$35,000 to \$49,999, while 15.9 percent earn \$50,000 to \$74,999, and approximately half (50.2 percent) earn \$75,000 or more, including 35.6 percent of households that earn \$100,000 or more.

Table 5 Household Income

Estimated 2019 Household Income		Tri-County Region		Southfields Market Area	
		#	%	#	%
less than \$15,000		9,264	6.5%	1,006	3.8%
\$15,000 \$24,999		9,686	6.7%	2,078	7.9%
\$25,000 \$34,999		10,032	7.0%	2,484	9.4%
\$35,000 \$49,999		15,302	10.7%	3,379	12.8%
\$50,000 \$74,999		24,556	17.1%	4,203	15.9%
\$75,000 \$99,999		18,576	12.9%	3,850	14.6%
\$100,000 \$149,999		28,276	19.7%	5,414	20.5%
\$150,000 Over		27,904	19.4%	3,988	15.1%
Total		143,595	100%	26,402	100%
Median Income		\$78,980		\$75,330	

Source: Esri; Real Property Research Group, Inc.

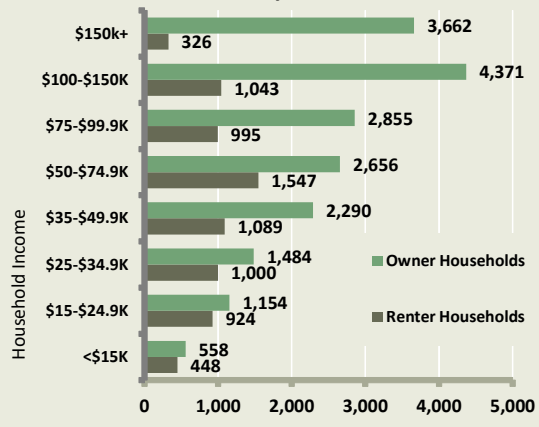
2019 Household Income

Based on the relationship between owner and renter incomes as recorded in the 2013-2017 American Community Survey, the breakdown of tenure, and household estimates, RPRG estimates that the 2019 median income of renter households in the market area is \$53,635, compared to an owner median of \$87,019 (Table 6). The market area has a significant base of middle- and upper-income renters, with over half (53.1 percent) of all renter households in the market area earning at least \$50,000, including almost one-third (32.1 percent) with incomes of \$75,000 or more.

Table 6 Household Income by Tenure

Estimated 2019 HH Income		Renter Households		Owner Households	
		#	%	#	%
Southfields Market Area					
less than \$15,000		448	6.1%	558	2.9%
\$15,000 \$24,999		924	12.5%	1,154	6.1%
\$25,000 \$34,999		1,000	13.6%	1,484	7.8%
\$35,000 \$49,999		1,089	14.8%	2,290	12.0%
\$50,000 \$74,999		1,547	21.0%	2,656	14.0%
\$75,000 \$99,999		995	13.5%	2,855	15.0%
\$100,000 \$149,999		1,043	14.1%	4,371	23.0%
\$150,000 over		326	4.4%	3,662	19.2%
Total		7,371	100%	19,031	100%
Median Income		\$53,635		\$87,019	

Source: American Community Survey 2013-2017 Estimates, RPRG, Inc.

2019 Household Income by Tenure

IV. ECONOMIC IMPACTS

A. Methodology

To estimate the impact of a new investment or a change in a region's economy, economists use input-output models based on sets of regional multipliers. The multiplier approach stems from decades of research into the functioning of regional economies. As demand for the output of one industry in a region increases (a direct impact), that industry will increase its demand for raw materials, parts, transportation, and utilities supplied by other industries in the region (indirect impacts). This increased demand from both the direct and indirect impacts also increases demand for labor, and therefore increases employment and employment compensation. Increased employee compensation also increases household consumption, further increasing demand for industry output in the region (induced impacts). Input-output models are used to estimate this interaction between regional firms and consumers to predict the overall change in a regional economy that results from a single economic event, such as the construction of a new development, a new firm moving to a region, or a military base closing.

IMPLAN, an econometric model used for this impact analysis, was originally developed by the US Department of Agriculture. Data and updated software is now available through IMPLAN Group, LLC. For any change in the final demand of a given industrial sector in an economy, IMPLAN provides the necessary calculations and data to estimate the direct, indirect and induced impacts to economic output, employment and value-added. Value-added impacts include: (1) employee compensation (including payroll and benefits); (2) proprietary income (payments received by self-employed individuals as income); (3) other property type income (rents, royalties and dividends); and (4) indirect business taxes (excise taxes, property taxes, fees, licenses, and sales taxes paid by businesses, but not taxes on profit or income).

Impacts from a real estate or infrastructure investment such as the Southfields of Elkton Planned Development project come in two stages: (1) during the predevelopment / construction period and (2) after build-out, and during the operations or occupation period. The two impacts are determined separately because the construction impacts occur once and are considered to be temporary impacts. After build out, the production/operating activities of the development users and residents are considered permanent and ongoing impacts. Combined, the impact analysis of a real estate/infrastructure investment provides a long term view of the economic value the development brings to a community.

For purposes of this analysis, the regional economy is considered to be Cecil County, Maryland. We later analyze fiscal impacts to the Town of Elkton.

B. Economic Impact During Construction Period

Impacts associated with the construction phase of the Southfields of Elkton Planned Development project include both the increase in demand for construction, but also the increase in demand for machinery, equipment, and professional services such as engineering and architecture. The construction/development budget for the project as shown in Table 2 identifies various uses of funds for the construction of the project. Table 7 restates the project budget showing the total amount for each development component with an allocation to primary construction economic sectors to be used in this analysis. We note that for each component, beyond the primary construction sector, RPRG further segmented additional economic sectors such as including architectural, engineering, and related services; environmental and technical consulting services; legal services; water, sewage, and other systems; financial investment activities; and local government enterprises. These sectors were estimated based on a model developed by RPRG to estimate ratios of common construction activities among various IMPLAN sectors.²

RPRG used estimated percentages for regional spending based on regional purchase coefficients built into the IMPLAN model for each economic sector. Each development component was entered with an event year associated with the estimated year of completion as provided by the developer. All impact amounts are stated in 2019 constant dollars.

Table 7 Project Construction Budget and IMPLAN Construction Sectors

Parcel	Description	Budgeted Amt	Construction Year	Construction IMPLAN Sector Description (not including additional sectors for various hard and soft costs/activities)
A-1	Marina	\$30,000,000	2023-2026	Construction of other new non-residential structures
A-2	Retail	\$7,000,000	2023-2026	Construction of new commercial structures
A-3	Multifamily	\$20,000,000	2023-2026	Construction of new multifamily residential structures
B	Senior Condos	\$22,500,000	2023-2026	Construction of new multifamily residential structures
C	Phase 2 Residential - Single-Family	\$32,700,000	2022-2026	Construction of new single-family residential structures
D	Multifamily	\$61,000,000	2021-2024	Construction of new multifamily residential structures
E-1	Retail	\$15,500,000	2021-2023	Construction of new commercial structures
E-2	Retail	\$5,000,000	2021-2023	Construction of new commercial structures
E-3	Hotel	\$17,000,000	2021-2023	Construction of new commercial structures
F	Sports Complex	\$26,000,000	2021-2023	Construction of other new non-residential structures
G	Senior Multifamily	\$15,000,000	2021-2022	Construction of new multifamily residential structures
H	Phase 1 Residential - Single-Family	\$23,400,000	2020-2022	Construction of new single-family residential structures
I	Commercial	\$2,500,000	2021	Construction of new commercial structures
J	Light Industrial/ Logistics/Commerce	\$325,000,000	2020-2025	Construction of new commercial structures
TOTAL PROJECT		\$602,600,000	2020-2026	

Sources: RPRG; IMPLAN Cecil County, MD 2017, and Stonewall Capital

Table 8 summarizes the overall construction period economic impacts that result from the construction activity associated with the Southfields of Elkton Planned Development project as well as for soft costs such as architecture and engineering fees and legal fees. After adjusting for regional/non-regional spending and inflation, the \$602.6 million overall project budget results in a total direct impact to the Cecil County economy of \$558.2 million in 2019 dollars. The total economic impact during the construction phase of the project on the county's economy, including direct, indirect and induced impacts, is estimated to be \$697.5 million in total output, 5,057 new jobs, and a \$373.3 million increase to value added, of which \$278.5 million relates to the increase in employee compensation. As these impacts relate to the construction period only, these impacts are temporary and will occur throughout the construction period as expenditures are made.

Table 8 Construction Period Economic Impact

	Construction Period Impacts
Direct Impact - Total Output (\$000s)	\$558,219
Total Economic Impact	
Total Output (\$000s)	\$697,534
Total Employment (All Jobs)	5,057
Total Value Added (\$000s)	\$373,296
Total Employee Compensation (\$000s)	\$278,526

NOTE: 2019 Dollars

Sources: RPRG; IMPLAN Cecil County, MD 2017

Table 9 breaks out the impact to total output during the construction period. Of the total \$697.5 million of total impact to industry output for the construction of the Southfields of Elkton Planned

Development, \$558.2 million is considered direct impact, \$60.7 million is the indirect impact and \$78.6 million is the induced impact.

Table 9 Construction Period Impact on Industry Output

	Construction Period Impacts
Impact on Industry Output (\$000s)	
Direct Impact on Output	\$558,219
Indirect Impact on Output	\$60,736
Induced Impact on Output	\$78,579
Total Industry Output (\$000s)	\$697,534

NOTE: 2019 Dollars

Sources: RPRG; IMPLAN Cecil County, MD 2017

Table 10 shows the direct, indirect and induced impacts to value added in Cecil County resulting from the construction of Southfields of Elkton Planned Development project. The economic definition of value added is the difference between the final price of a product and the cost of the intermediate goods used to produce the product. Typically, value added includes payments to employees for labor, business taxes paid to governments, and payments to investors in the form of interest, dividends or profits. The IMPLAN model has estimated that the total impact to value added as a result of the construction of Southfields of Elkton Planned Development is \$373.3 million. Of this total impact to value added, \$293.2 million is direct impact, \$34.2 million is indirect, and \$45.8 million is the induced impact.

Table 10 Construction Period Impact on Value Added

	Construction Period Impacts
Impact on Value Added (\$000s)	
Direct Impact on Value Added	\$293,243
Indirect Impact on Value Added	\$34,243
Induced Impact on Value Added	\$45,811
Total Impact on Value Added (\$000s)	\$373,296

NOTE: 2019 Dollars

Sources: RPRG; IMPLAN Cecil County, MD 2017

One component of value added is employment compensation. Table 11 identifies the direct, indirect, and induced impacts to total employment compensation during the construction period of the subject project. As discussed above, the employment compensation impact as estimated by the IMPLAN model includes the value of wages and benefits, including health insurance and contributions to retirement. The construction of the Southfields of Elkton Planned Development has a total impact to employee wages of \$278.5 million, which includes direct impact to employee wages of \$235.1 million, an indirect impact of \$21.2 million, and an induced impact of \$22.2 million.

Table 11 Construction Period Impact on Employment Compensation

	Construction Period Impacts
Impact on Employment Compensation (\$000s)	
Direct Impact on Emp Compensation	\$235,132
Indirect Impact on Emp Compensation	\$21,163
Induced Impact on Emp Compensation	\$22,230
Total Emp Compensation (\$000s)	\$278,526

NOTE: 2019 Dollars

Sources: RPRG; IMPLAN Cecil County, MD 2017

Table 12 identifies the direct, indirect, and induced impacts to total employment in Cecil County resulting from the construction of the Southfields of Elkton Planned Development. The IMPLAN model estimates the impacts to total employment, including both full-time and part-time jobs. The construction activity associated with the Southfields of Elkton Planned Development results in an estimated 5,057 jobs over the length of the construction period. Of those jobs, 3,951 are directly related to the construction project, 488 jobs are indirectly related, and 618 jobs are induced.

Table 12 Construction Period Impact on Employment

	Construction Period Impacts
Impact on Employment (All Jobs)	
Direct Impact on Employment	3,951
Indirect Impact on Employment	488
Induced Impact on Employment	618
Total Employment (All Jobs)	5,057

Sources: RPRG; IMPLAN Cecil County, MD 2017

All of the construction period impacts identified above are temporary by nature and end once the construction is completed. The construction period for the project potentially extends throughout 2026. The impacts are also not experienced all at once, but rather are experienced as construction expenditures are incurred.

C. Economic Impacts During Operations

In economic activity studies, researchers are asked to identify the economic impact of a specific event, project or policy. When the event, project, or policy brings a new industry to a region or results in an overall increase in industry or consumer spending, the new economic activity generated by the event, project or policy is said to impact the local economy. The new economic activity adds to the existing economic activity in the region. For example, the construction activity associated with the subject Southfields of Elkton Planned Development project represents new demand for construction work that otherwise would not occur but for the investment being made in the project. Often the event, project or policy in question does not necessarily represent new economic activity. In the case of the subject, many components of the new Southfields of Elkton Development will create new service, trade, technical, and operational positions that will produce new employee wages and new derivative income in the local economy. As a result, at least portions of the economic output generated at the subject development would be considered a new impact to the Cecil County economy. If it were not

for the Southfields at Elkton Development at least some of the planned components may not be constructed or operated (at least within the study timeframe) with subsequent increased employment, household expenditures, and local expenditures at the various facilities.

On the other hand, it is not clear that economic activity for some components would not have occurred regardless of the subject project. The future residents of the residential components may or may not be new to the county, which would differentiate their aggregate impact on the local economy. Only the economic contributions through increased household spending of households new to the county could be unequivocally considered new economic activity. It is unknown how many of the future resident households would be drawn from outside of the local jurisdiction by the project. As a conservative approach, this analysis will measure how the operations of the project – from commercial sales to the outputs of tenant business to the household spending of project residents – contribute to the local economy, rather than how they add to, or impact it.

Operating period contributions are expressed on an annual basis and, unlike construction period impacts that occur only once, are ongoing as long as the expenditures continue to be made. Economic activity is measured on the basis of industry output, or the value of the production necessary to address the demand for the subject activity. The value of production is equal to the total cost of the production plus any profit.

In order to gauge the overall operating period economic contributions of the subject Southfields of Elkton Planned Development, it is necessary to consider the contributions from the various planned development components for the project. Table 13 outlines the planned development components and the operational assumptions used as inputs in the IMPLAN model to estimate the economic contributions resulting from the subject's various planned components.

Table 13 Estimated Operations Inputs

Parcel	Description	Est. Annual Gross Revenue/ Income	Est. Employees	Operation Year 1	Construction IMPLAN Sector Description
A-1	Marina	\$1,400,000	N/A	2026	Other amusement and recreation industries
A-2	Retail	\$2,800,000	N/A	2026	Full-service restaurants
A-3	Multifamily	\$5,363,452	N/A	2026	Household Income (\$50k-\$70k)
B	Senior Condos	\$9,997,326	N/A	2026	Household Income (\$70k-\$100k)
C	Phase 2 Residential - Single-Family	\$17,055,794	N/A	2026	Household Income (\$70k-\$100k)
D	Multifamily	\$17,753,025	N/A	2024	Household Income (\$50k-\$70k)
E-1	Retail	\$4,200,000	N/A	2023	Full-service restaurants
E-2	Retail	\$3,800,000	N/A	2023	Retail - Gasoline stores
E-3	Hotel	\$6,589,000	N/A	2023	Hotels and motels, including casino hotels
F	Sports Complex	\$6,200,000	40	2023	Fitness and recreational sports centers
G	Senior Multifamily	\$9,595,297	N/A	2022	Household Income (\$40k-\$50k)
H	Phase 1 Residential - Single-Family	\$13,836,078	N/A	2022	Household Income (\$70k-\$100k)
I	Commercial	\$2,000,000	N/A	2021	Child day care services
J	Light Industrial/ Logistics/Commerce	N/A	1,250	2025	Warehousing and storage

Sources: RPRG; IMPLAN Cecil County, MD 2017, and Stonewall Capital

RESIDENT SPENDING

The residential categories of economic activity associated with the Southfields of Elkton Planned Development project relate to household spending by future residents of the project's rental apartment units, condos, and single-family homes. To test the contribution of household spending from the project's residents, we first needed to determine a reasonable estimate of aggregate household income for all residents in the development. As project details are not yet finalized, we apply median household incomes³ to each proposed residential component, adjusted for tenure (renter or owner) and age (general occupancy or senior 55+). As shown in Table 14, the estimated

aggregate annual household income of future Southfields of Elkton residents assuming 95 percent occupancy of rental communities is approximately \$71.96 million. This \$71.96 million of household income is included in the analysis of the project's operating period contributions to the county's economy. This estimate is considered conservative as many households residing in the subject development will likely have incomes exceeding the area median income.

Table 14 Estimated Aggregate Household Income

Unit Type	Unit Count	Median HH income	Aggregate Income	Year
General Occupancy Multifamily Rental	331	\$53,635	\$17,753,025	2024
Mixed-Use General Occupancy Rental	100	\$53,635	\$5,363,452	2026
Senior (55+) Multifamily Rental	200	\$47,976	\$9,595,297	2022
Rental Gross Potential Aggregate Income			\$32,711,774	
Less: Vacancy at 5%			(\$1,635,589)	
Rental Effective Potential Aggregate Income			\$31,076,185	2022-2026
Senior (55+) Condo	140	\$71,409	\$9,997,326	2026
Single-Family For Sale (Phase 1)	159	\$87,019	\$13,836,078	2022
Single-Family For Sale (Phase 2)	196	\$87,019	\$17,055,794	2026
Combined Residential Aggregate Income			\$71,965,384	2022-2026

Source: Stonewall Capital, Esri, ACS, RPRG, Inc.

Table 15 summarizes the overall annual contributions to the Cecil County economy that are expected to result from the operations of the Southfields at Elkton Planned Development at stabilization. The project is expected to have an estimated annual contribution of \$142.9 million in direct economic output to the Cecil County economy. Total output, including direct, indirect and indirect impacts are estimated to be \$234.4 million annually. The total impact to employment is estimated to be 2,512 jobs and the total impact to value added is \$134.8 million annually, of which \$97.5 million is attributable to employee compensation.

Table 15 Operating Period Contributions

	Project Total
Direct Contributions - Total Output (\$000s)	\$142,894
Total Economic Impact	
Total Output (\$000s)	\$234,400
Total Employment (All Jobs)	2,512
Total Value Added (\$000s)	\$134,801
Total Employee Compensation (\$000s)	\$97,503

NOTE: 2019 Dollars

Sources: RPRG, Inc.; IMPLAN Cecil County, MD 2017

Table 16 breaks out the project's total impact on industry output during operations. The operation of all proposed components of the Southfields of Elkton Development project is expected to contribute \$234.4 million of output to the county economy annually, of which \$142.9 million is direct output, while \$31.2 million is indirect output and \$60.3 million is induced output.

Table 16 Operating Period Contributions to Economic Output

	Project Total
Contributions to Industry Output	
Direct Contributions to Output	\$142,894
Indirect Contributions to Output	\$31,184
Induced Contributions to Output	\$60,322
Total Industry Output (\$000s)	\$234,400

NOTE: 2019 Dollars

Sources: RPRG, Inc.; IMPLAN Cecil County, MD 2017

Table 17 highlights the project's \$134.8 million contribution to value added. Value-added impacts include: (1) employee compensation (including payroll and benefits); (2) proprietary income (payments received by self-employed individuals as income); (3) other property type income (rents, royalties and dividends); and (4) indirect business taxes (excise taxes, property taxes, fees, licenses, and sales taxes paid by businesses, but not taxes on profit or income). The direct contribution to value added is \$82.5 million, while indirect impact to value added is \$17.4 million and induced impact to value added is \$34.9 million.

Table 17 Operating Period Contributions to Value Added

	Project Total
Impacts to Value Added (\$000s)	
Direct Impact to Value Added	\$82,508
Indirect Impact to Value Added	\$17,409
Induced Impact to Value Added	\$34,883
Total Value Added (\$000s)	\$134,801

NOTE: 2019 Dollars

Sources: RPRG, Inc.; IMPLAN Cecil County, MD 2017

As part of value added, Table 18 identifies the direct, indirect and induced impacts to total employee wages expected during the operations within the entire Southfields of Elkton Development project. Figures below reflect employees of all commercial, light industrial, and recreational components of the planned development as well as any on-site employees at the planned multifamily communities. Total contributions to employee wages are projected at \$97.5 million, of which \$69.4 million is direct, \$11.1 million is indirect and \$17.1 million is induced.

Table 18 Operating Period Contributions to Employment Compensation

	Project Total
Impacts to Employment Compensation (\$000s)	
Direct Impacts to Emp Compensation	\$69,371
Indirect Impacts to Emp Compensation	\$11,079
Induced Impacts to Emp Compensation	\$17,053
Total Emp Compensation (\$000s)	\$97,503

NOTE: 2019 Dollars

Sources: RPRG, Inc.; IMPLAN Cecil County, MD 2017

Table 19 identifies the direct, indirect and induced contributions to total employment that are expected during the operations of all components of the Southfields of Elkton Planned Development. On an annual basis, the subject's operations are projected to support 2,512 total jobs; 1,736 direct, 300 indirect, and 475 induced.

Table 19 Operating Period Contributions to Employment

	Project Total
Impact on Employment (All Jobs)	
Direct Impact on Employment	1,736
Indirect Impact on Employment	300
Induced Impact on Employment	475
Total Employment (All Jobs)	2,512

Sources: RPRG, Inc.; IMPLAN Cecil County, MD 2017

V. FISCAL IMPACTS

A. Methodology

The direct, indirect and induced economic impacts, or contributions, of the construction and operations of the new Southfields of Elkton Planned Development, as quantified in the previous section, will contribute to the finances of the relevant taxing jurisdictions, Town of Elkton and Cecil County.

The fiscal impact analysis involves estimating the extent to which the subject project will affect local government revenues and expenditures. The analysis includes estimating payments made between the project and the local government, such as property taxes. In addition, the analysis estimates any tax revenue, such as income or sales taxes, which can be applied to the economic impacts computed in Section IV of this report.

The final component of the fiscal impact analysis estimates the impact of the project on miscellaneous revenue and expenditures of local government, such as parking violations and excise taxes, which cannot be directly attributed to the project, but are assumed to be affected by the economic activity supported by the project. These estimated impacts to local taxes revenue are generated as part of the IMPLAN model.^{iv} IMPLAN refers to all estimated contributions to local government revenues as “impacts” and includes contributions by the project’s direct, indirect, and induced economic impacts.

B. Fiscal Analysis

Local taxes are typically the largest source of revenue for a local municipality. Impacts to tax revenues generated by the IMPLAN for Cecil County are outlined in Table 20, and impacts to tax revenues for the Town of Elkton are outlined in Table 21.^v Tax impacts are estimated for both the construction period and the ongoing operation period. The total construction period gross contribution is estimated at \$9.76 million to Cecil County tax revenue, and the total ongoing operation period gross contribution is estimated at \$5.6 million to Cecil County tax revenue.

Table 20 Tax Impacts, Cecil County

Cecil County Construction Period Tax Impact		Cecil County Ongoing Operation Period Tax Impact	
County Tax Description	Total	County Tax Description	Total
Social Insurance Tax- Employee Contribution	\$0	Social Insurance Tax- Employee Contribution	\$0
Social Insurance Tax- Employer Contribution	\$0	Social Insurance Tax- Employer Contribution	\$0
TOPI: Sales Tax	\$47,195	TOPI: Sales Tax	\$25,830
TOPI: Property Tax	\$6,971,936	TOPI: Property Tax	\$4,197,378
TOPI: Motor Vehicle License	\$0	TOPI: Motor Vehicle License	\$0
TOPI: Other Taxes	\$465,207	TOPI: Other Taxes	\$330,995
TOPI: Special Assessments	\$5,170	TOPI: Special Assessments	\$2,829
Corporate Profits Tax	\$0	Corporate Profits Tax	\$0
Personal Tax: Income Tax	\$2,208,815	Personal Tax: Income Tax	\$1,026,952
Personal Tax: Motor Vehicle License	\$0	Personal Tax: Motor Vehicle License	\$0
Personal Tax: Property Tax	\$60,055	Personal Tax: Property Tax	\$19,986
Personal Tax: Other Tax	\$0	Personal Tax: Other Tax	\$0
Subtotal	\$9,758,378	Subtotal	\$5,603,970

Sources: RPRG, Inc.; IMPLAN Cecil County, Elkton, MD 2017

The total construction period gross contribution to tax revenue for the Town of Elkton is estimated at \$2.2 million, and the total ongoing operation period gross contribution is estimated at \$2.4 million to tax revenue for the Town of Elkton.^{vi}

Table 21 Tax Impacts, Elkton

Elkton Construction Period Tax Impact		Elkton Ongoing Operation Period Tax Impact	
Town Tax Description	Total	Town Tax Description	Total
Social Insurance Tax- Employee Contribution	\$0	Social Insurance Tax- Employee Contribution	\$0
Social Insurance Tax- Employer Contribution	\$0	Social Insurance Tax- Employer Contribution	Sumvalue
TOPI: Sales Tax	\$187,144	TOPI: Sales Tax	\$0
TOPI: Property Tax	\$1,551,393	TOPI: Property Tax	\$0
TOPI: Motor Vehicle License	\$0	TOPI: Motor Vehicle License	\$253,530
TOPI: Other Taxes	\$152,220	TOPI: Other Taxes	\$2,046,806
TOPI: Special Assessments	\$26	TOPI: Special Assessments	\$0
Corporate Profits Tax	\$0	Corporate Profits Tax	\$98,576
Personal Tax: Income Tax	\$0	Personal Tax: Income Tax	\$1,530
Personal Tax: Motor Vehicle License	\$0	Personal Tax: Motor Vehicle License	\$0
Personal Tax: Property Tax	\$16,666	Personal Tax: Property Tax	\$0
Personal Tax: Other Tax/Fees	\$324,561	Personal Tax: Other Tax/Fees	\$0
Subtotal	\$2,232,010	Subtotal	\$2,400,441

Sources: RPRG, Inc.; IMPLAN Cecil County, Elkton, MD 2017

RPRG reviewed the Cecil County and the Town of Elkton Approved Annual Budgets for FY 2020. Cecil County has a FY 2020 General Fund operating budget of \$202.8 million. According to IMPLAN estimates, the Southfields of Elkton Planned Development will contribute a 4.8 percent increase in countywide general fund revenue during the construction period and a 2.8 percent increase in countywide revenue during ongoing operations. The Town of Elkton has a FY 2020 General Fund operating budget of \$17.2 million. According to IMPLAN estimates, the Southfields of Elkton Planned Development will contribute a 13 percent increase in Town general fund revenue during the construction period and a 14 percent increase in Town revenue during ongoing operations.

A fundamental assumption of this analysis is that demand for government services (and government revenue sources) have constant returns to scale. This means that if the quantities of units of government demand (such as the number of residents or the number of businesses) changes, government revenue and expenditures will change on a pro-rata basis. To estimate this, government expenditures are attributed to residents or to residents and businesses. As neither budget itemizes revenues in a manner allowing for allocation of every line item to residents or businesses, it is impossible to accurately estimate the pro-rata increase in expenditures per additional job or resident. However, we recognize that incremental expenditures will balance at least a small portion of the increased revenues generated by the project.

The fiscal impacts of the Southfields of Elkton Planned Development on the Town of Elkton and Cecil County include both direct and indirect impacts. Direct fiscal impacts include payments made between the project and/or users and the local government jurisdictions. Direct fiscal impacts consist of the revenue and expenditures per job/resident applied to total direct employment contributions. Indirect fiscal impacts include the revenue and expenditures per job applied to the total indirect and induced employment contributions.

Additional fiscal impacts to local governments also come in the form of elevated property values and subsequent property taxes from the properties surrounding a new development. Studies have shown that new mixed-use development typically has a positive impact on surrounding property values; this additional potential increase in tax revenue is acknowledged but estimating this additional fiscal contribution is beyond the scope of this study.

VI. SUMMARY OF COMMUNITY IMPACTS

As proposed, the Southfields of Elkton Planned Development will span approximately 630 acres of land in southern Elkton, Cecil County, Maryland. Planned uses include over 1,100 residential units (rental and for-sale), up to 315,000 square feet of commercial space, a 125-room hotel, a 50-acre sports complex, a marina, and a 250-acre light industrial (logistic, ecommerce, light industrial) park. Based on estimates of planned uses, construction budgets, and project parameters provided by the developer, the IMPLAN input-output model estimates total economic impact during the construction phase to be \$697.5 million in total output, 5,057 new jobs, and a \$373.3 million increase to value added, of which \$278.5 million relates to the increase in employee compensation (Table 22).

Following completion of all proposed components, the Southfields of Elkton Planned Development is expected to have an ongoing estimated contribution of \$126.3 million in direct economic output to the Cecil County economy. Total output, including direct, indirect, and induced impacts are estimated to be \$234.4 million. The total impact to employment is estimated to be 2,512 jobs and the total impact to value added is \$134.8 million, of which \$97.5 million is attributable to employee compensation.

The total construction period gross contribution is estimated at \$9.76 million to Cecil County tax revenue and \$2.2 million to tax revenue for the Town of Elkton. The total ongoing operation period gross contribution is estimated at \$5.6 million to Cecil County tax revenue and \$2.4 million to tax revenue for the Town of Elkton.

Table 22 Summary of Community Impacts

Project Overview - Southfields of Elkton	
Geography	
Location	Town of Elkton, Cecil County , Maryland
Site Status pre-development	Vacant, unimproved
Project Description	
Asset Class	Mixed-Use Development (residential, commercial, light industrial, hospitality, recreation uses)
Development Type	New Construction
Schedule	2020-2026
Lead Developer	Stonewall Capital
Project Size	630 acres
Total Estimated Development Cost	\$602.6M
Economic Impacts	
Construction Period (One Time)	
Economic Output	\$697.5M
Employment Impact	5,057
Employee Wages	\$278.5M
Operating Period (Annual Average)	
Economic Output	\$234.4M
Employment Impact	2,512
Employee Wages	\$97.5M
Fiscal Impacts	
Construction Period	
Cecil County Revenue Impact	\$9,758,378
Elkton Revenue Impact	\$2,232,010
Operating Period (Annual Average)	
Cecil County Revenue Impact	\$5,603,970
Elkton Revenue Impact	\$2,400,441

Sources: RPRG, Inc.; IMPLAN Cecil County, Elkton, MD 2017, Stonewall Capital

APPENDIX 1 UNDERLYING ASSUMPTIONS AND LIMITING CONDITIONS

In conducting the analysis, we will make the following assumptions, except as otherwise noted in our report:

1. There are no zoning, building, safety, environmental or other federal, state or local laws, regulations or codes which would prohibit or impair the development, marketing or operation of the subject project in the manner contemplated in our report, and the subject project will be developed, marketed and operated in compliance with all applicable laws, regulations and codes.
2. No material changes will occur in (a) any federal, state or local law, regulation or code (including, without limitation, the Internal Revenue Code) affecting the subject project, or (b) any federal, state or local grant, financing or other program which is to be utilized in connection with the subject project.
3. The local, national and international economies will not deteriorate, and there will be no significant changes in interest rates or in rates of inflation or deflation.
4. The subject project will be served by adequate transportation, utilities and governmental facilities.
5. The subject project will not be subjected to any war, energy crisis, embargo, strike, earthquake, flood, fire or other casualty or act of God.
6. The subject project will be on the market at the time and with the product anticipated in our report, and at the price position specified in our report.
7. The subject project will be developed, marketed and operated in a highly professional manner.
8. No projects will be developed which will be in competition with the subject project, except as set forth in our report.
9. There are neither existing judgments nor any pending or threatened litigation, which could hinder the development, marketing or operation of the subject project.

The conclusions reached in a community impact analysis are inherently subjective and there can be no assurance that the estimates made or assumptions employed in preparing this report will in fact be realized or that other methods or assumptions might not be appropriate. The analyst relied on statements of the project sponsor and other third parties with respect to the subject project. RPRG made attempts to verify the truthfulness or accuracy of such statements whenever possible. The conclusions expressed in this report are as of the date of this report, and an analysis conducted as of another date may require different conclusions. The actual results achieved will depend on a variety of factors including the performance of management, the impact of changes in general and local economic conditions, and the absence of material changes in the regulatory or competitive environment.



The analysis will be subject to the following limiting conditions, except as otherwise noted in our report:

1. The analysis contained in this report necessarily incorporates numerous estimates and assumptions with respect to planned development components, business activity, residential absorption, general and local business and economic conditions, the absence of material changes in the competitive environment and other matters. Some estimates or assumptions, however, inevitably will not materialize, and unanticipated events and circumstances may occur; therefore, actual results achieved during the period covered by our analysis will vary from our estimates and the variations may be material.
2. Our absorption estimates are based on the assumption that the product recommendations set forth in our report will be followed without material deviation.
3. All estimates of future dollar amounts are based on the current value of the dollar, with allowance for inflation or deflation as included and calculated by the IMPLAN model.
4. We have no responsibility for considerations requiring expertise in other fields. Such considerations include, but are not limited to, legal matters, environmental matters, architectural matters, geologic considerations, such as soils and seismic stability, and civil, mechanical, electrical, structural and other engineering matters.
5. Information, estimates and opinions contained in or referred to in our report, which we have obtained from sources outside of this office, are assumed to be reliable and have not been independently verified.
6. The conclusions and recommendations in our report are subject to these Underlying Assumptions and Limiting Conditions and to any additional assumptions or conditions set forth in the body of our report.

APPENDIX 2 ANALYST RESUMES

TAD SCEPANIAK **Managing Principal**

Tad Scepianiak assumed the role of Real Property Research Group's Managing Principal in November 2017 following more than 15 years with the firm. Tad has extensive experience conducting market feasibility studies on a wide range of residential and mixed-use developments for developers, lenders, and government entities. Tad directs the firm's research and production of feasibility studies including large-scale housing assessments to detailed reports for a specific project on a specific site. He has extensive experience analyzing affordable rental communities developed under the Low Income Housing Tax Credit (LIHTC) program and market-rate apartments developed under the HUD 221(d)(4) program and conventional financing. Tad is the key contact for research contracts many state housing finance agencies, including several that commission market studies for LIHTC applications.

Tad is National Chair of the National Council of Housing Market Analysts (NCHMA) and previously served as Vice Chair and Co-Chair of Standards Committee. He has taken a lead role in the development of the organization's Standard Definitions and Recommended Market Study Content, and he has authored and co-authored white papers on market areas, derivation of market rents, and selection of comparable properties. Tad is also a founding member of the Atlanta chapter of the Lambda Alpha Land Economics Society.

Areas of Concentration:

- Low Income Tax Credit Rental Housing: Mr. Scepianiak has worked extensively with the Low Income Tax Credit program throughout the United States, with special emphasis on the Southeast and Mid-Atlantic regions.
- Senior Housing: Mr. Scepianiak has conducted feasibility analysis for a variety of senior oriented rental housing. The majority of this work has been under the Low Income Tax Credit program; however his experience includes assisted living facilities and market rate senior rental communities.
- Market Rate Rental Housing: Mr. Scepianiak has conducted various projects for developers of market rate rental housing. The studies produced for these developers are generally used to determine the rental housing needs of a specific submarket and to obtain financing.
- Public Housing Authority Consultation: Tad has worked with Housing Authorities throughout the United States to document trends rental and for sale housing market trends to better understand redevelopment opportunities. He has completed studies examining development opportunities for housing authorities through the Choice Neighborhood Initiative or other programs in Florida, Georgia, North Carolina, South Carolina, Texas, and Tennessee.

Education:

Bachelor of Science – Marketing; Berry College – Rome, Georgia

ROBERT M. LEFENFELD
Founding Principal

Mr. Lefenfeld, Founding Principal of the firm, with over 30 years of experience in the field of residential market research. Before founding Real Property Research Group in 2001, Bob served as an officer of research subsidiaries of Reznick Fedder & Silverman and Legg Mason. Between 1998 and 2001, Bob was Managing Director of RF&S Realty Advisors, conducting residential market studies throughout the United States. From 1987 to 1995, Bob served as Senior Vice President of Legg Mason Realty Group, managing the firm's consulting practice and serving as publisher of a Mid-Atlantic residential data service, Housing Market Profiles. Prior to joining Legg Mason, Bob spent ten years with the Baltimore Metropolitan Council as a housing economist. Bob also served as Research Director for Regency Homes between 1995 and 1998, analyzing markets throughout the Eastern United States and evaluating the company's active building operation.

Bob provides input and guidance for the completion of the firm's research and analysis products. He combines extensive experience in the real estate industry with capabilities in database development and information management. Over the years, he has developed a series of information products and proprietary databases serving real estate professionals.

Bob has lectured and written extensively about residential real estate market analysis. Bob has created and teaches the market study module for the MBA HUD Underwriting course and has served as an adjunct professor for the Graduate Programs in Real Estate Development, School of Architecture, Planning and Preservation, University of Maryland College Park. He is the past National Chair of the National Council of Housing Market Analysts (NCHMA) and currently chairs its FHA Committee.

Areas of Concentration:

- Strategic Assessments: Mr. Lefenfeld has conducted numerous corridor analyses throughout the United States to assist building and real estate companies in evaluating development opportunities. Such analyses document demographic, economic, competitive, and proposed development activity by submarket and discuss opportunities for development.
- Feasibility Analysis: Mr. Lefenfeld has conducted feasibility studies for various types of residential developments for builders and developers. Subjects for these analyses have included for-sale single-family and townhouse developments, age-restricted rental and for-sale developments, large multi-product PUDs, urban renovations and continuing care facilities for the elderly.
- Information Products: Bob has developed a series of proprietary databases to assist clients in monitoring growth trends. Subjects of these databases have included for sale housing, pipeline information, and rental communities.

Education:

Master of Urban and Regional Planning; The George Washington University.
Bachelor of Arts - Political Science; Northeastern University.

ETHAN REED
Senior Analyst

Ethan Reed joined RPRG in 2016 where he focuses on rental market studies and economic analyses for development projects. Throughout his extensive career, Ethan has served the residential and commercial real estate industry including advising lenders, developers, homebuilders, investors, nonprofit organizations and government agencies through market and property analysis, economic analysis, site selection and marketing strategy.

Prior to joining RPRG, Ethan served as Senior Research Manager with CoStar Group, leading market research & analysis efforts as well as developing new research and analysis products & services for the commercial real estate industry. Ethan's additional experience includes directing regional research and marketing efforts for CBRE as well as providing valuation, analysis and advisory services for commercial and residential clients throughout Texas.

Areas of Concentration:

- Economic and Community Impact: Ethan conducts community development and economic impact analyses to illustrate the impacts of development projects including those that utilize federal, state, and local tax credits. Components of these reports include employment projections, local and regional economic impacts, and fiscal impacts on local governments.
- Low Income Housing Tax Credits: Ethan prepares rental market studies for submission to lenders and state agencies for nine percent and four percent Low Income Housing Tax Credit allocations.
- FHA Section 221(d)(4): Ethan prepares comprehensive feasibility studies for submission to HUD regional offices as part of a lender's application for Section 221(d)(4) mortgage insurance. These reports strictly adhere to HUD's Multifamily Accelerated Processing (MAP) guidelines for market studies
- Market and Product Advisory Analysis: Ethan provides detailed analysis of existing markets, product and pricing recommendations, and targeted marketing suggestions for developers and land owners in the preliminary stages of development.
- Commercial Feasibility: Ethan conducts feasibility analyses of proposed commercial and industrial uses in the context of the existing marketplace.

Education:

Master of Business Administration; Liberty University

Bachelor of Science – Business Administration; University of Texas at Dallas

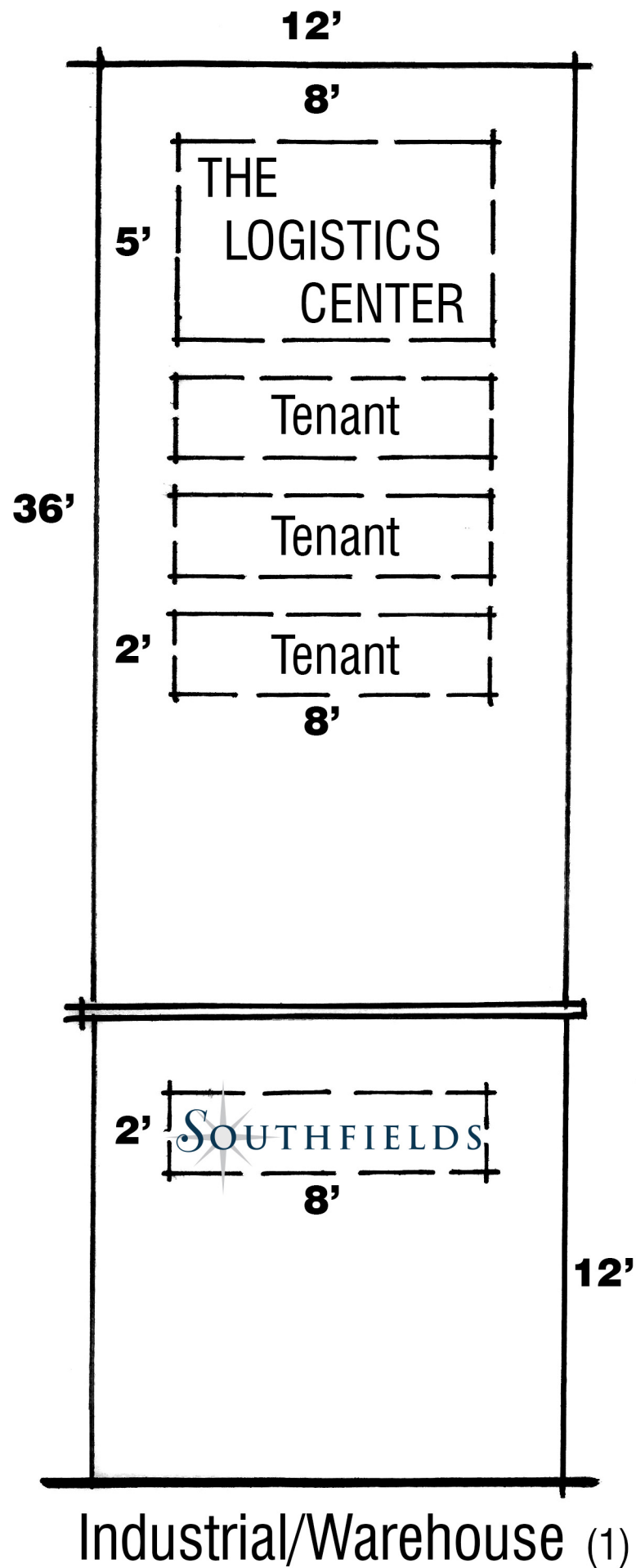
APPENDIX 3 ENDNOTES

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- ¹ Projected annual gross sales estimated based on data on average sales for typical/similar businesses provide by trade associations and service providers including STR Host Data, CSP Daily, Dockwa, and Toast. Sports Complex estimated annual sales provided by SSC Consulting, and Light Industrial Park operation period input based on projected employees provided by Trammell Crow.
- ² Based on previous experience performing economic impact analyses for residential and commercial development projects, RPRG has derived typical ratios of supplementary activities and sectors related to residential and commercial construction. The total construction budget provided by the developer was segmented based on these ratios and included in the IMPLAN model.
- ³ Based on data provided by Esri, a demographic data provider, as well as the U.S. Census Bureau's American Community Survey data
- ^{iv} IMPLAN Tax Impact Methodology: In principle, the tax impact report captures all tax revenue in the study area across all levels of government that exist in that study area for the specific industries and institutions affected by an event or group of events. The underlying data that support the tax impact report, however, do not embody that much detail. For example, IMPLAN does not have systematic reports of state government tax revenue by county; IMPLAN has same-year state government tax revenue by state and must allocate that to counties based on proxy information (we do have county-level data for some states, and use this to build a model for the allocation process). Also, IMPLAN obtains detailed TOPI data by geography (even for each city within a county), but does not have any industry detail about the specific TOPI line item. A third note: for the data by city, we often must aggregate that to the county level, so that a model of two cities in the same county will have the same implied effective tax rates. In other words, city-specific data will be used, but averaged across all cities within a county. Please note that all line items are controlled to nationwide, current-year controls estimated by the Bureau of Economic Analysis (BEA) in the National Income and Product Accounts (NIPAs) with no industry resolution and two level-of-government distinctions, Federal and State & Local. For example, the NIPAs might give a value of \$15 billion in State & Local income tax in 2017, which would be reflected in the 2017 IMPLAN data. Industrial and geographic resolution are reported at their maxima and nest more aggregate levels. For example, if IMPLAN has raw data on property tax at the county level, that implies we also have state-level data.
- ^v TOPI is typically one of the largest categories in IMPLAN's Tax Impact Analysis; TOPI refers to Taxes On Production & Imports and includes all payments to governments other than payroll and end of year income/profit taxes. TOPI includes excise, sales, and property taxes, fees and fines, and licenses and permits. The sector that collects the sales taxes (retail, lodging, restaurants, etc.) turns the collected money over to government through their TOPI.
- ^{vi} Operation period assumptions include estimated annual operating budget for all proposed components, estimated number of employees at the industrial and recreational components, and 150 percent of area median income for proposed households to more accurately estimate residential contributions.

LEGEND

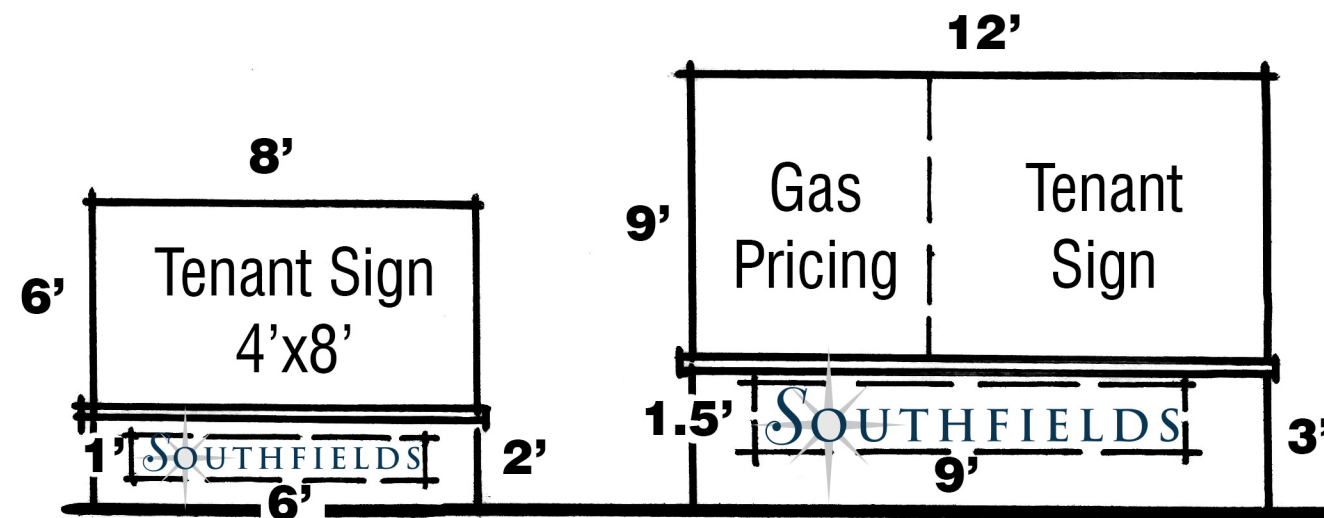
- Industrial / Warehouse Sign (1)
- Retail Pad Site Signs (7)
- Retail Gas Convenience Sign (1)
- Sports Complex Sign (1)
- Residential Neighborhood Signs (5 pairs)





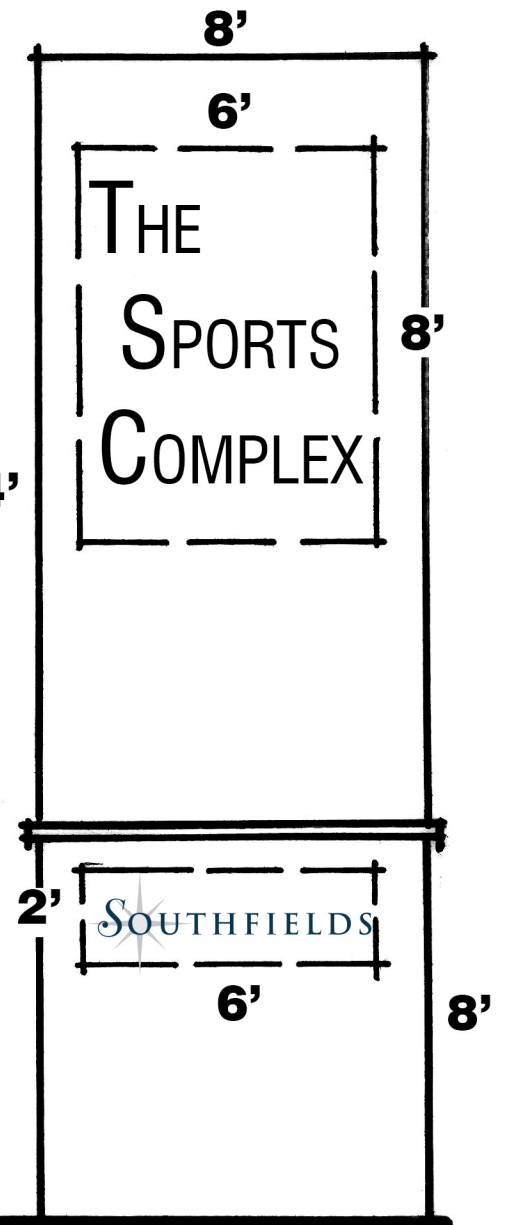
GENERAL NOTES

1. All signs shall have a solid brick base that shall be one third the height of the sign wall.
2. All masonry bases that front onto Route 213 shall be the same material, color and size.
3. The remaining materials for the sign can be masonry, stucco (or similar approved material), or metal.
4. All materials shall be durable and maintenance free in accordance with Article XVI.
5. All letters on a sign can be pinned on or durable plastic panels (that may incorporate a corporate identity/logo).
6. Signs may be internally illuminated, ground mounted illuminated, or halo-lite letters.

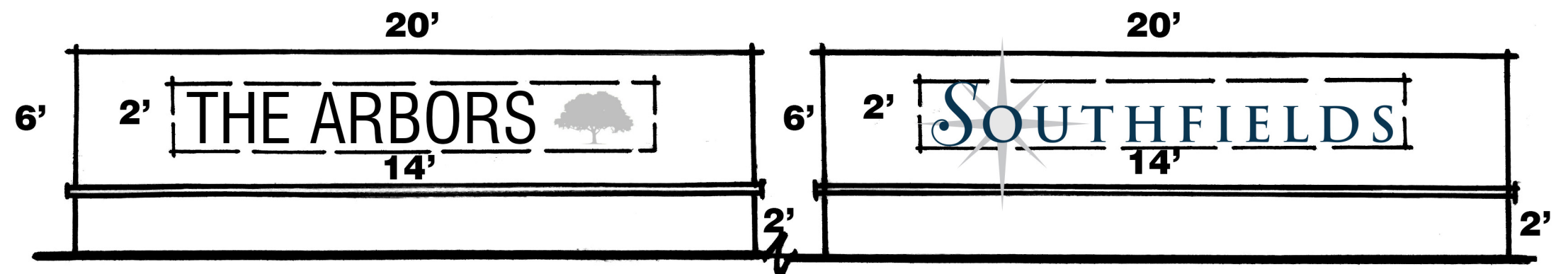


Retail Pad Signs (7)

Gas Convenience Sign (1)



Sports Complex (1)



Residential Neighborhood Signs (5 Pairs)

EXHIBIT F

Section 9. Schedule of Zone Regulations

	Minimum Lot Criteria					Minimum Yard Requirements (feet)			Max. Height	Lot Coverage	Density/ Intensity	Min. Open Space	Min. Tract Size
Districts	Area (sq.ft.)	Per Du. (sq.ft.)	Width (feet)	Depth (feet)	Road Frontage (feet)	Front	Side	Rear	(feet)	Max % [1]	Max FAR or dus/ac	OSR	(acres)
RP*													
resource protection [2]	21,000	21,000	100	150	60	50	25	50	25		2		
R-1													
single-family detached	10,000	10,000	80	120	40	30	10	50	35	50%	3	10%	
R-2													
single-family detached	8,000	8,000	60	100	40	25	10	40	35	60%	5	10%	
duplex	16,000	8,000	120	100	40	25	10	40	35	60%	5	10%	
R-3													
single-family detached	6,000	6,000	50	90	40 30	20	5	40 25	35 40	60%	5	10%	
duplex	12,000	6,000	100	100	40	20	5	40	35	60%	5	10%	
townhouse	2,200	2,200	20	110	20	15	0[3][4]	30	40	65%	10	20%	2 ac.
apartments/condos	87,120	1,700			200	50	50[5]	50[5]	40 60	65%	14	30%	2 ac.

USE	OFF-STREET PARKING REQUIREMENT
Auditorium	1.0 space per 6 permanent seats
Automobile Dealership	1.0 space per 300 sq. ft. GFA enclosed sales plus 1.0 space per 2,000 sq. ft. of open display area, plus 2.0 spaces per service bay
Bar	1.0 space per 2 seats
Beauty Parlor	3.0 spaces per operator chair
Bed and Breakfast	1.0 space per guest room plus 2.0 spaces per owner's unit
Bowling Alley	4.0 spaces per alley
Bank	4.0 spaces per every 1,000 sq. ft. GFA
Car Wash, attended	10 spaces per washing lane
Car Wash, unattended	4 spaces per wash bay
Church/Synagogue	1.0 space per 3 seats
Convenience Store	1.0 spaces per every 250 sq. ft GFA
Day Care Center	1.0 space per 7 children, plus 1.0 space per staff person
Equipment Sales/Service Shop/Wholesale	2.0 spaces per every 1,000 sq. ft. GFA, plus 1.0 space per every 300 sq. ft. GFA over 1,000 sq. ft.
Express Delivery Service	1.0 space per two employees on maximum shift, plus 1.0 space per each vehicle maintained in the premises
Fast Food Restaurant	1.0 space per 4 seats, plus 1.0 space per 2 employees on maximum shift.
With or Without Drive-Through Facilities	With drive-through facility, add 8 stacking spaces for the drive-through window
Fiduciary Institutions	1.0 space per 300 sq. ft. GFA
Funeral Homes	1.0 space per 4 permanent seats, or 1.0 space per 30 sq. ft. GFA
Furniture Stores	1.0 space per 500 sq. ft. GFA, plus 1.0 space per employee on maximum shift
Garage/Auto Body Shop	1.0 space per 300 sq. ft GFA plus 1.0 space per employee
Golf Course	6.0 per hole
Group Homes	1.0 space per staff person, plus 1.0 space per 2 occupants
Health Club	10 spaces per every 1,000 sq. ft. GFA, plus 1.0 space per every 2 employees.
Hospital	1.0 space per 250 ft. GFA (amended effective July 22, 2008)
Hotel/Motel	1.0 space per room, plus 1.0 space per employee on maximum work shift, plus 1.0 space per each 200 sq. ft. GFA of commercial floor area contained therein
Industrial	1.0 space per 800 sq. ft. GFA 0.35 spaces/1,000 GFA for logistic/warehousing/distribution centers.
Laundromat/Dry Cleaners	1.0 per machine, minimum of 5.0 spaces
Library	1.0 space per 300 sq. ft. GFA
Manufacturing/Warehouse	1.0 space per 800 sq. ft. GFA or 1.5 spaces per each employees on a maximum work shift, plus 1.0 space per each truck or vehicle used in connection therewith, whichever is greater 0.35 spaces/1,000 GFA for logistic/warehousing/distribution centers
Medical Center	1.0 space per 250 sq. ft. GFA
Miniature Golf	1.0 space per hole
Nightclub	1.0 space per 2 seats

(10) percent if Class I racks for fifty (50) percent of the total of number employees and residential units are provided.

Section 4. Parking Space Dimensions

1. Subject to Subsections 2. and 3., each parking space shall contain a rectangular area at least eighteen (18) feet long and nine (9) feet wide. Lines demarcating parking spaces may be drawn at various angles in relation to curbs or aisles, so long as the parking spaces so created contain within them the rectangular area required by this section.
2. Wherever parking areas consist of spaces set aside for parallel parking, the dimensions of such parking spaces shall be not less than twenty-three (23) feet by nine (9) feet.
3. Each handicapped parking space shall meet the requirements of the Americans with Disabilities Act. (See Section 12 of this Part also.)

Section 5. Required Widths of Parking area Aisles and Driveways

1. Parking area aisle widths shall conform to the following table, which varies the width requirement according to the angle of parking.

Aisle Width	Parking Angle				
	0°	30°	45°	60°	90°
One-Way Traffic	15	15	16	18	24
Two-Way Traffic	22	22	22	23	24

2. Driveways shall be not less than 10 feet or exceed 15 feet in width for one-way traffic and not less than 18 feet or exceed 30 feet in width for two-way traffic, except that 10-foot-wide driveways are permissible for two-way traffic when (a) the driveway is not longer than 50 feet, (b) it provides access to not more than 6 spaces, and (c) sufficient turning space is provided so that vehicles need not back into a public street.

Section 6. General Design Requirements

1. Unless no other practicable alternative is available vehicle accommodation areas shall be designed so that, without resorting to extraordinary movements, vehicles may exit such areas without backing onto a public street. This requirement does not apply to parking areas consisting of driveways that serve one or two dwelling units, although backing onto arterial streets is discouraged.
2. Vehicle accommodation areas of all development shall be designed so that sanitation, emergency, and other public service vehicles can serve such developments without the necessity of backing unreasonable distances or making other dangerous or hazardous turning movements.
3. Every vehicle accommodation area shall be designed so that vehicles cannot extend beyond the perimeter of such area onto adjacent properties or public rights-of-way. Such areas shall also be designed so that vehicles do not extend over sidewalks or tend to bump against or damage any wall, vegetation, or other obstruction. In a residential zone, the driveway should be a minimum

of either twenty feet by twenty feet (20' x 20'), or ten feet by forty feet (10' x 40'). Garages cannot be counted as parking space. **For rental townhomes, the driveway minimum should be 20' deep x 17' wide to accommodate 2 parking spaces.**

4. Circulation areas shall be designed so that vehicles can proceed safely without posing a danger to pedestrians or other vehicles and without interfering with parking areas.
5. Any lighting used to illuminate off-street parking areas shall be arranged so as to reflect away from any adjoining residential zone or uses and any public or private right-of-way.
6. A "sight triangle" shall be observed within a triangle formed by the intersection of the street lines and points on the street line twenty-five (25) feet from the intersection at all street intersection or intersections of driveways with streets.
7. All parking areas shall be drained so as to dispose of all surface water within the parking area without carrying the said water accumulation over a public sidewalk.
8. No required off-street parking space in any residential zone shall be located within any required front yard or side street side yard area except that parking in driveways for two (2) spaces is permitted.
9. Additional parking in residential zones: Provided the above parking (Subsection 8) has been met, additional parking shall be permitted in the required front yards or side street side yard, provided the following setback requirements are met:

<u>Zone</u>	<u>Front Yard Setback</u>	Side Street
		<u>Side Yard Setback</u>
RP	15'	8'
R-1	15'	8'
R-2	10'	4'

10. The percentage of coverage of permitted parking areas and driveways in any residential zone shall not exceed fifty (50) percent of the total required front yard or side street side yard.
11. For uses located in all zoning districts other than the TC District, off-street parking facilities may be located within the required front yard of any commercial, office/residential, or industrial zone, but shall not be nearer than fifty (50) feet to any residential district.
12. Special access, surface, and location requirements for garages, parking lots, automobile service stations, and vehicle sales lots:
 - a. No building, structure or premises shall be used, erected, or altered which is intended or designed to be used as a community garage, an automobile repair shop, a service station, or a parking lot or structure as the principal use on a property, which has an entrance or exit for vehicles in the same block front and within two hundred (200) feet of the property boundary of any school, public playground, church, hospital, public library, convalescent, nursing, or rest home, orphanage, and no such entrance or exit, except for a community garage, shall be located within twenty (20) feet of any residential zone; nor shall any structure used for an automobile repair shop or service station or any part of a parking lot or structure be located within one hundred (100) feet of any property boundary line of any of the aforesaid public or institutional uses. "Parking lot" or



Vortex Environmental, Inc.

ENVIRONMENTAL CONSULTANTS

December 9, 2019

Ms. Jeanne D. Minner, AICP
Town of Elkton Planning Department
100 Railroad Avenue
P.O. Box 157
Elkton, MD 21922-0157

RE: BRIDGEWELL COURTS SUBDIVISION; TOWN OF ELKTON, THIRD ELECTION DISTRICT, CECIL COUNTY, MARYLAND

Dear Jeanne:

Vortex Environmental, Inc. would like to request a time extension on the Forest Stand Delineation (FSD) for the 67.36-acre Bridgewell Courts Subdivision located along Whitehall Road in the Town of Elkton, Third Election District, Cecil County, Maryland. The original FSD was prepared by Vortex Environmental, Inc. in 2004 and submitted to the Town of Elkton for review and approval.

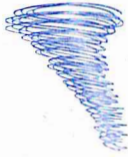
Vortex Environmental, Inc. would like to request an extension of this Forest Stand Delineation (FSD) for the property. A recent field inspection on the property was conducted on June 14, 2019 and no significant changes or alterations were observed within the forest stands and/or forest boundaries on the 67.36 property. Since there were no significant alterations to the property, it is the opinion of Vortex Environmental, Inc. that the information provided in the previous FSD is still valid and accurate.

If there are any questions regarding this project, please feel free to contact me.

Sincerely,

VORTEX ENVIRONMENTAL, INC.

Bradly J. Gochnauer
President



Vortex Environmental, Inc.

ENVIRONMENTAL CONSULTANTS

December 9, 2019

Ms. Jeanne D. Minner, AICP
Town of Elkton Planning Department
100 Railroad Avenue
P.O. Box 157
Elkton, MD 21922-0157

**RE: HEUSTER PROPERTY; TOWN OF ELKTON, THIRD ELECTION DISTRICT,
CECIL COUNTY, MARYLAND**

Dear Jeanne:

Vortex Environmental, Inc. would like to request a time extension on the Forest Stand Delineation (FSD) for the 54.953-acre Heuster Property located along Maloney Road in the Town of Elkton, Third Election District, Cecil County, Maryland. The original FSD was prepared by Vortex Environmental, Inc. in 2007 and submitted to the Town of Elkton for review and approval.

Vortex Environmental, Inc. would like to request an extension of this Forest Stand Delineation (FSD) for the property. A recent field inspection on the property was conducted on June 14, 2019 and no significant changes or alterations were observed within the forest stands and/or forest boundaries on the 54.953 property. Since there were no significant alterations to the property, it is the opinion of Vortex Environmental, Inc. that the information provided in the previous FSD is still valid and accurate.

If there are any questions regarding this project, please feel free to contact me.

Sincerely,

VORTEX ENVIRONMENTAL, INC.

Bradly J. Gochnauer
President

**FOREST STAND DELINEATION
ON THE 67.36 ACRE
BRIDGEWELL COURTS
SUBDIVISION**

Town of Elkton, Third Election District
Cecil County, Maryland

Prepared for:
Southside, LLC.
755 West Pulaski Highway
Elkton, MD 21921

Prepared by:
Vortex Environmental
313 West Liberty Street, Suite 126
Lancaster, PA 17603
(717) 509-3934 FAX (717) 509-2789

January 28, 2004

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APPENDIX A

Field sampling data sheets, forest structure data sheets, forest structure analysis, and forest stand summary sheets.

APPENDIX B

Forest Stand Delineation map prepared at a scale of 1 inch = 200 feet.

APPENDIX C

Maryland Natural Heritage Correspondence.

INTRODUCTION

This report identifies and describes "forest stands" (see Regulatory Definitions) on the 67.36 acre Bridgewell Courts Subdivision, Town of Elkton, Third Election District, Cecil County, Maryland. Based on January 22, 2004 field investigations, 66.4 acres of forest, comprised of four distinct forest stands, occurring on the Bridgewell Courts Subdivision are subject to regulations under the Maryland Forest Conservation Act. The procedures described in the Town of Elkton Forest Conservation Ordinance were used to conduct the Forest Stand Delineation.

These findings are based on review of background information and field investigations. The background information included topography, aerial photography, and the Cecil County Soil Survey. Field investigations were conducted on January 22, 2004. This report generally characterizes the study area and describes the methodology used to determine the location and structure of the forest stand. Locations of the stand and sampling plots are indicated on the Forest Stand Delineation Map presented in Appendix B.

LOCATION

The Bridgewell Courts Subdivision is located within the Town of Elkton, Cecil County, east of Whitehall Road, south of its intersection with East Pulaski Highway (Route 40). The subdivision is located adjacent to the Elk Chase Apartment complex (Figure 1). The project consists of 67.36 acres, which is dominated by forested lands. A small area of mowed lawn was observed in the northwestern corner of the property and a portion of a maintained stormwater basin was observed along the northern border.

The Bridgewell Courts Subdivision is bounded to the north by Walmart and other commercial properties, to the south by forested lands, to the east by forested lands and a golf driving range, and to the west by Whitehall Road, the Elk Chase Apartment complex, and The Woods (a proposed residential development). The maximum dimensions of the site are approximately 2000 feet east to west and 3250 feet north to south; it encompasses a total of 67.36 acres (Figure 2).

BACKGROUND INFORMATION

HYDROLOGY and TOPOGRAPHY

The topography of the site forms supporting hydrology to an unnamed tributary of the Perch Creek. Water from the site drains to numerous non-tidal wetlands that are scattered throughout the site. These wetlands drain to the eastern property boundary, and eventually into an unnamed intermittent tributary of Perch Creek. The maximum elevation is approximately 75 feet National Geodetic Vertical Datum (NGVD) along the western border of the site; the minimum elevation is approximately 50 feet NGVD along the eastern border where the non-tidal wetlands drain off-site.



Legend:

Property Boundary - - - - -

Scale 1" = 2,000'



0 2000

Figure 1: Site Location Map for the Bridgewell Courts Subdivision
Cecil County ADC
Map 13, D-11, 8th Edition
Town of Elkton, 3rd Election District, Cecil County, Maryland

Vortex Environmental

SOILS

Three soil series including five soil types (Elkton silt loam, EmA; Keyport loam, KeA and KeB2; Keyport silt loam, KpA; and Matapeake silt loam, MnB2) occur on the Bridgewell Courts Subdivision according to the Cecil County Soil Survey (Figure 3). The Elkton soil series is hydric according to the Hydric Soils of the United States and the "Hydric Soils of the State of Maryland". No steep slopes (>25%) or highly erodible soils (>15% with K values > .35) were observed on the property.

VEGETATION

A background data search was submitted to the Maryland Natural Heritage Program on January 26, 2004 (Appendix C). The Maryland Natural Heritage Program, operated in conjunction with the Maryland Department of Natural Resources, is a site specific information system which describes significant natural resources of Maryland. It includes data descriptive of plant and animal species of special concern, exemplary natural communities, and unique geological features.

The results of the background search have not been received. The results will be forwarded to the Elkton Building and Planning Office upon receipt. No threatened, endangered, or rare plant or animal species were observed during the field investigation.

FIELD INVESTIGATIONS

METHODS

The procedures described in the Forest Conservation Technical Manual were used to delineate the forest stands. A site investigation was performed on January 22, 2004. A Preliminary Forest Stand Delineation Map (Scale 1" = 50') and soils map were used as base maps during our field investigations. An initial reconnaissance-level survey was performed to analyze general site conditions, environmental features, and the location of forest stands. Forest structure analysis data (Tables D-1 through D-3) was obtained and recorded for each stand and is presented in Appendix A. Locations of sampling plots are presented in Appendix B.

Sampling intensity for the forest structure analysis was calculated at an intensity of approximately one sample plot per four acres of forest with a minimum of one sample plot per forest stand. This lower sampling intensity was utilized due to the large amount of forest, and similar characteristics within each stand. Sampling plot locations were chosen at random in the office and were drawn on the preliminary forest stand

delineation map prior to conducting field investigations. All sample plot locations were identified in the field with white and blue striped flagging. All sampling was conducted using methodologies approved by the Town of Elkton Building and Planning Office. All



0 1320

**Figure 3: Soil Map for the Bridgewell Courts Subdivision
Soil Survey for Cecil County
Sheet 24, 1973
Town of Elkton, 3rd Election District, Cecil County, Maryland**

Vortex Environmental

forest stand information was obtained from a 1/10 acre plot using the fixed plot sampling method which involves the establishment of a 1/10 acre plot and direct measurement of forest stand information within that fixed plot. Basal area for each sampling plot was obtained using the variable plot sampling method using a Cruz-all angle gauge to count all trees with a basal factor 10.

The vegetation was identified in the field with the aid of The Flora of West Virginia, Newcomb's Wildflower Guide, The Tree Identification Book, The Shrub Identification Book, and The Textbook of Dendrology.

STAND CONDITIONS

Stand conditions are based on field investigations conducted on January 22, 2004. The vegetation on the Bridgewell Courts Subdivision was characterized by species composition and divided into stands. Four (4) forest stands were identified on the site, and are characterized below.

Forest Stand I – River Birch / Sycamore; 23.3 acres

Forest Stand I consisted of a river birch/ sycamore association (best available match to the Maryland SAF cover type). This stand was observed in the south-central portion and northwest corner of the site. This stand is a fairly young stand of mixed deciduous trees and the understory is dominated by invasive shrub species (sampling plots 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, and 1.7). This forest stand was dominated by tulip poplar, red maple, and sweet gum (size class 10-17.9"). The associated species included sassafras, white oak, pin oak, pine, black cherry, willow oak, american beech, osage orange, and river birch. The shrub and herbaceous layer vegetation was dominated by japanese honeysuckle, multiflora rose, greenbriar, spicebush, field garlic, and ground pine. This stand contained several isolated non-tidal wetlands, but for the most part was dominated by uplands. No specimen trees were observed in Forest Stand I.

The stand has a good forest structure value (7.6), but due to the presence of the non-tidal wetlands and greater than 100 acres of contiguous forest the stand receives a Priority 1 (high) rating.

Forest Stand II – Basket Oak / Loblolly Pine; 1.9 acre

Forest Stand II consisted of a basket oak / loblolly pine association (best available match to the Maryland SAF cover type). This stand was observed in the west-central portion of the site. This stand is mature stand of pines, with encroaching hardwood species (sampling plot 2.1). This forest stand was dominated by mature pine trees (size class 18-29.9"). The associated species included red maple and sweet gum. The shrub layer vegetation was dominated by greenbriar, highbush blueberry, and american beech saplings. This stand contained one isolated non-tidal wetland, but for the most part was dominated by uplands. No specimen trees were observed in Forest Stand II.

The stand has a good forest structure value (8), but due to the presence of the non-tidal wetlands and greater than 100 acres of contiguous forest the stand receives a Priority 1 (high) rating.

Forest Stand III – Willow Oak / Loblolly Pine; 36.0 acres

Forest Stand III consisted of a willow oak/ loblolly pine association (best available match to the Maryland SAF cover type). This stand was scattered throughout the site, and consists mainly of non-tidal wetlands. This stand is a mature stand of mixed deciduous trees; the stand has very good species diversity (sampling plots 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, and 3.8). This forest stand was dominated by willow oak, swamp white oak, sweet gum, and red maple (size class 18-29.9"). The associated species included white oak, pin oak, pine, american beech, tulip poplar, black cherry, and river birch. The dense shrub and herbaceous layer vegetation was dominated by japanese honeysuckle, multiflora rose, greenbrier, spicebush, poison ivy, and ground pine. This stand is dominated by non-tidal wetlands. Numerous specimen trees were observed in Forest Stand III.

The stand has a good forest structure value (9.1), but due to the presence of the non-tidal wetlands, specimen trees, and greater than 100 acres of contiguous forest the stand receives a Priority 1 (high) rating.

Forest Stand IV – Tulip Poplar; 5.2 acres

Forest Stand IV consisted of a tulip poplar association (best available match to the Maryland SAF cover type). This stand was observed in the north-central portion of the site. This stand is a mature stand of mixed deciduous trees, the stand has good species diversity and age structure (sampling plot 4.1 and 4.2). This forest stand was dominated by american beech and red oak (size class 18-29.9"). The associated species included tulip poplar, willow oak, red maple, sassafras, and sweet gum. The sparse shrub and herbaceous layer vegetation was dominated by american beech saplings and ground pine. This stand contained several isolated non-tidal wetlands, but for the most part was dominated by uplands. Numerous specimen trees were observed in Forest Stand IV.

The stand has a good forest structure value (9.5), but due to the presence of the non-tidal wetlands, specimen trees, and greater than 100 acres of contiguous forest the stand receives a Priority 1 (high) rating.

ENVIRONMENTAL FEATURES

The Bridgewell Courts Subdivision was evaluated for the presence or absence of environmental features such as specimen trees (> 30" dbh), hydric soils, non-tidal wetlands, perennial and intermittent streams and their buffers, critical habitats, steep

slopes or highly erodible soils, cultural features, historic sites, and adjacent land uses. Numerous specimen trees (>30" dbh) were observed in Forest Stands III and IV. The vast majority of these two stands and the specimen trees will be preserved by forest retention or non-tidal wetland buffers. Because of this the exact location of each specimen tree is not shown on the FSD. The location of all specimen trees within or immediately adjacent to the proposed development envelope will be obtained and included in the Preliminary Forest Conservation Plan for the subdivision. Hydric soils were observed within the non-tidal wetlands that are scattered throughout the site. A Jurisdictional Determination has been obtained for the project site. No intermittent or perennial watercourses were observed on the project site. The project site does not contain any existing structures, cultural features, critical habitats, or historic sites. No steep slopes and highly erodible soils were observed on the project site.

The adjacent land uses to the site include forested lands, proposed residential subdivisions, an apartment complex, and commercial properties.

CONCLUSION

The enclosed forest stand delineation map indicates the location of forest stands and environmental features on the 67.36 acre Bridgewell Courts Subdivision. Our determinations were based on background and field investigations of environmental features and species composition of the forest community. We conclude that four forest stands consisting of 66.4 acres exist on the Bridgewell Courts Subdivision.

REGULATORY DEFINITIONS

Forests are defined by the Maryland Department of Natural Resources (MD DNR) (Chapter 255, Laws of Maryland, 1991) as "a biological community dominated by trees and other woody plants covering a land area of 10,000 square feet or greater. Forest included (1) areas that have at least 100 trees per acre with at least 50% of those having a two inch or greater diameter at 4.5 feet above ground and larger, and (2) forest areas that have been cut but not cleared. Forest does not include orchards".

Forest Stands are defined by the Maryland Department of Natural Resources (MD DNR) (Chapter 255, Laws of Maryland, 1991) as "a contiguous group of trees sufficiently uniform in species composition, arrangement of age classes, and condition to be a distinguishable, homogeneous unit".

Forest Stand Delineations are defined by the Maryland Department of Natural Resources (MD DNR) (Chapter 255, Laws of Maryland, 1991) as "the methodology for evaluating the existing natural features and vegetation on a site proposed for development, taking into account the environmental elements that shape or influence the structure or makeup of a plant community".

Intermittent Streams are defined by the Maryland Department of Natural Resources (MD DNR) (Chapter 255, Laws of Maryland, 1991) as "a stream in which surface water is absent during a portion of the year as shown on the most recent 7.5 minute topographic quadrangle published by the United States Geological Survey as confirmed by field verification".

Perennial Streams are defined by the Maryland Department of Natural Resources (MD DNR) (Chapter 255, Laws of Maryland, 1991) as "a stream containing surface water throughout an average rainfall year, as shown on the most recent 7.5 minute topographic quadrangle published by the United States Geological Survey as confirmed by field verification".

REFERENCES

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APPENDIX A

Field sampling data sheets, forest structure data sheet, forest structure analysis, and forest stand summary sheets.

APPENDIX B

Forest Stand Delineation map prepared at a scale of 1 inch = 200 feet.

APPENDIX C

Maryland Natural Heritage Correspondence.

Table D-4 : Forest Stand Summary Sheet

Property Name: Bridgewell Courts

Prepared by: BJG
Date: 1/22/04

Stand Variable	Stand # 1 Acreage 23.3 acres	Stand # 2 Acreage 1.9 acres
Forest Association (SAF cover type)	River Birch - Sycamore Association	Basket Oak-Loblolly Pine Association
Size class of dominant trees	10" - 17.9" dbh	18" - 29.9" dbh
Number of Trees/acre	291	370
Number of tree species/plot	5	3
Basal area	93	170
Number of dead trees/acre	0.3	1
List of common understory species	Japanese Honeysuckle Multi-stem Rose Greenbrier, Field Gostic Spicebush, Ground Pine	Greenbrier, Highbush Blueberry American Beach Spigelia
Number of shrubs 1/100 acre plot	2.2	1.2
% Canopy coverage	—	—
% Herbaceous cover	—	—
% Downed woody material	34 %	20 %
% Exotic or invasive species	66 %	40 %
Forest Structure Value	7.6 (Good Structure)	8 (Good Structure)
Comments	Young Mixed Deciduous Forest, Upland	Mature Pine Stand with scattered younger deciduous trees

Table D-4 : Forest Stand Summary Sheet

Property Name: Bridgewell Courts

Prepared by: BJG

Date: 1/22/04

Stand Variable	Stand # Acreage 3 36.0 acres	Stand # Acreage 4 5.2 acres
Forest Association (SAF cover type)	Willow Oak - Catochy Pine Association	Tulip Poplar Association
Size class of dominant trees	18" - 29.9" dbh	18 - 29.9" dbh
Number of Trees/acre	284	250
Number of tree species/plot	5	5
Basal area	110	160
Number of dead trees/acre	0.9	1.5
List of common understory species	Ground Pine, Spicebush Highbush Blueberry, Greenhick Poison Ivy, Japanese Honeygale Multi-Peta Rose	Ground Pine American Beech Springs
Number of shrubs 1/100 acre plot	2.3	0.7
% Canopy coverage	—	—
% Herbaceous cover	—	—
% Downed woody material	30%	30%
% Exotic or Invasive species	30%	0%
Forest Structure Value	9.1 (Good Structure)	9.5 (Good Structure)
Comments	Mature Deciduous Forest, Low-lying and dominated by non-tidal wetlands	Mature Deciduous Forest, mainly uplands

Table D-1: Field Sampling Data Sheet

Property Name: Bridgeview Courts Prepared by: BTC
 Stand # 1 Plot # 1 Date: 1/22/04

Basal Area <u>90</u>	Size Class of Trees Within the Sample Plot $\frac{1}{10}$				
Tree Species (note dominant and co-dominant species)	Number of Trees 2-5.9" dbh	Number of Trees 6-9.9" dbh	Number of Trees 10-17.9" dbh	Number of Trees 18-29.9" dbh	Number of Trees >30" dbh
Sassafras	II				
Sweet Gum	II	II	II		
Red Maple	III	II	I		
White Oak				II	
Tulip Poplar	III	III		I	
Pine Oak				I	
Pine		II			
Number of Trees per size class <u>(300)</u>	14	9	3	4	
List of understory species	Japanese Honeygum, Greenbrier, Spicebush				
Comments (to include): HISTORICAL/CULTURAL FEATURES THREATENED/ENDANGERED SPECIES SPECIMEN TREES <div style="text-align: center; margin-top: 20px;"> Upland Mixed Deciduous Forest, fairly young stand </div>					

Table D-3: Forest Structure Data Sheet

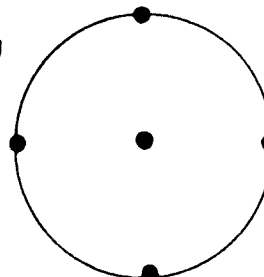
Property : Bridgwell Courts Prepared by: BJG
 Stand #: 1 Plot #: 1 Date: 1/22/04

Forest Structure Variable	sample point 1	sample point 2	sample point 3	sample point 4	sample point 5	% yes
Canopy coverage						
herbaceous ground cover						
downed woody debris	N	N	N	Y	N	20%
invasive plant cover	Y	N	Y	Y	Y	80%
number of shrub species (1/100 acre)	3	1	0	1	2	(1.7)

0 Dead

Forest Structure Sampling Method:

1/10 acre plot,
5 sample points



Forest Structure Analysis

1.1

The following parameters will be measured and evaluated at each site according to Figure D-2. Each parameter at each sample site will be given a value of 3,2,1, or 0. Three represents the most valuable structure and, the least valuable. Upon completion of the sampling, the person preparing the FSD will calculate the forest structure value for each stand. This analysis along with the other forest stand data will be used to determine the retention potential of the stand.

To determine the total habitat value use the following scale:

Range of total habitat numbers from samples taken April - October:

15-21	Priority forest structure
7-14	Good forest structure
0-6	Poor forest structure

In the winter and late fall, from November - March, only numbers 1,3,4,5,7, can be measured. During that time, the range of total habitat numbers will be:

11-15	Priority forest structure
6-10	Good structure
0-5	Poor forest structure

1. Percent Canopy Closure of trees with a DBH greater than 7"

70% - 100 %	3
40% - 69%	2
10% - 39%	1
0% - 9%	0

5. Size Class of Dominant Trees

Greater than 20"	3
7" - 19.9"	2
3" - 6.9"	1
Less than 3"	0

2. Number of Understory Shrubs 1/100 acre

6 or more	3
4 - 5	2
2 - 4	1
0 - 1	0

6. Percent of Understory Herbaceous Coverage

75% - 100%	3
25% - 74%	2
5% - 24%	1
0% - 4%	0

3. Number of Dead Trees/tenth acre plot¹

3 or more	3
2	2
1	1
0	0

7. Number of Tree Species with a DBH greater than 7"/plot¹

6 or more	3
4 - 5	2
2 - 4	1
0 - 1	0

4. Percent of Dead and Downed Woody Material Present

15% - 100%	3
5% - 14%	2
0 - 1	1
0	0

¹ Data included in Forest Stand Summary Sheet (See Table D-4).

Table D-1: Field Sampling Data Sheet

Property Name: Bridgewell Courts
 Stand # 1

Plot # 2

Prepared by: BTG
 Date: 1/22/04

Basal Area <u>110</u>	Size Class of Trees Within the Sample Plot $\frac{1}{4}$				
Tree Species (note dominant and co-dominant species)	Number of Trees 2-5.9" dbh	Number of Trees 6-9.9" dbh	Number of Trees 10-17.9" dbh	Number of Trees 18-29.9" dbh	Number of Trees >30" dbh
Tulip Poplar		11	11 11	111	
Sweet Gum	1111	11 11	11		
Red Maple	111	1			
Black Cherry	11	1			
Number of Trees per size class <u>(350)</u>	9	11	12	3	
List of understory species	Japanese Honeysuckle, Multiflora Rose				
Comments (to include): HISTORICAL/CULTURAL FEATURES THREATENED/ENDANGERED SPECIES SPECIMEN TREES					

Table D-3: Forest Structure Data Sheet

Property : Bridgwell Courts

Prepared by: BJG

Stand #: 1

Plot #: 2

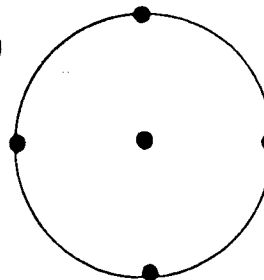
Date: 1/22/04

Forest Structure Variable	sample point 1	sample point 2	sample point 3	sample point 4	sample point 5	% yes
Canopy coverage						
herbaceous ground cover						
downed woody debris	N	N	N	N	N	0
invasive plant cover	Y	Y	N	Y	Y	80%
number of shrub species (1/100 acre)	2	1	3	2	1	(1.8)

0 Dead

Forest Structure Sampling Method:

1/10 acre plot,
5 sample points



Forest Structure Analysis

(1.2)

The following parameters will be measured and evaluated at each site according to Figure D-2. Each parameter at each sample site will be given a value of 3,2,1, or 0. Three represents the most valuable structure and, the least valuable. Upon completion of the sampling, the person preparing the FSD will calculate the forest structure value for each stand. This analysis along with the other forest stand data will be used to determine the retention potential of the stand.

To determine the total habitat value use the following scale:

Range of total habitat numbers from samples taken April - October:

15-21	Priority forest structure
7-14	Good forest structure
0-6	Poor forest structure

In the winter and late fall, from November - March, only numbers 1,3,4,5,7, can be measured. During that time, the range of total habitat numbers will be:

11-15	Priority forest structure
6-10	Good structure
0-5	Poor forest structure

<p>1. Percent Canopy Closure of trees with a DBH greater than 7"</p> <table> <tr> <td>70% - 100 %</td> <td>3</td> </tr> <tr> <td>40% - 69%</td> <td>2</td> </tr> <tr> <td>10% - 39%</td> <td>1</td> </tr> <tr> <td>0% - 9%</td> <td>0</td> </tr> </table>	70% - 100 %	3	40% - 69%	2	10% - 39%	1	0% - 9%	0	<p>5. Size Class of Dominant Trees¹</p> <table> <tr> <td>Greater than 20"</td> <td>3</td> </tr> <tr> <td>7" - 19.9"</td> <td>2</td> </tr> <tr> <td>3" - 6.9"</td> <td>1</td> </tr> <tr> <td>Less than 3"</td> <td>0</td> </tr> </table>	Greater than 20"	3	7" - 19.9"	2	3" - 6.9"	1	Less than 3"	0
70% - 100 %	3																
40% - 69%	2																
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Greater than 20"	3																
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<p>2. Number of Understory Shrubs 1/100 acre</p> <table> <tr> <td>6 or more</td> <td>3</td> </tr> <tr> <td>4 - 5</td> <td>2</td> </tr> <tr> <td>2 - 4</td> <td>1</td> </tr> <tr> <td>0 - 1</td> <td>0</td> </tr> </table>	6 or more	3	4 - 5	2	2 - 4	1	0 - 1	0	<p>6. Percent of Understory Herbaceous Coverage</p> <table> <tr> <td>75% - 100%</td> <td>3</td> </tr> <tr> <td>25% - 74%</td> <td>2</td> </tr> <tr> <td>5% - 24%</td> <td>1</td> </tr> <tr> <td>0% - 4%</td> <td>0</td> </tr> </table>	75% - 100%	3	25% - 74%	2	5% - 24%	1	0% - 4%	0
6 or more	3																
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<p>3. Number of Dead Trees/tenth acre plot¹</p> <table> <tr> <td>3 or more</td> <td>3</td> </tr> <tr> <td>2</td> <td>2</td> </tr> <tr> <td>1</td> <td>1</td> </tr> <tr> <td>0</td> <td>0</td> </tr> </table>	3 or more	3	2	2	1	1	0	0	<p>7. Number of Tree Species with a DBH greater than 7"/plot¹</p> <table> <tr> <td>6 or more</td> <td>3</td> </tr> <tr> <td>4 - 5</td> <td>2</td> </tr> <tr> <td>2 - 4</td> <td>1</td> </tr> <tr> <td>0 - 1</td> <td>0</td> </tr> </table>	6 or more	3	4 - 5	2	2 - 4	1	0 - 1	0
3 or more	3																
2	2																
1	1																
0	0																
6 or more	3																
4 - 5	2																
2 - 4	1																
0 - 1	0																
<p>4. Percent of Dead and Downed Woody Material Present</p> <table> <tr> <td>15% - 100%</td> <td>3</td> </tr> <tr> <td>5" - 14"</td> <td>2</td> </tr> <tr> <td>0 - 1</td> <td>1</td> </tr> <tr> <td>0</td> <td>0</td> </tr> </table>	15% - 100%	3	5" - 14"	2	0 - 1	1	0	0									
15% - 100%	3																
5" - 14"	2																
0 - 1	1																
0	0																

¹ Data included in Forest Stand Summary Sheet (See Table D-4).

Table D-1: Field Sampling Data Sheet

Property Name: Bridgman's Carts Prepared by: BTG
 Stand # 1 Plot # 3 Date: 1/22/04

Basal Area <u>100</u>	Size Class of Trees Within the Sample Plot $\frac{1}{10}$				
Tree Species (note dominant and co-dominant species)	Number of Trees 2-5.9" dbh	Number of Trees 6-9.9" dbh	Number of Trees 10-17.9" dbh	Number of Trees 18-29.9" dbh	Number of Trees >30" dbh
Red Maple					
Tulip Poplar	I	II			
Sweet Gum	III	III	I	II	
Black Cherry			III	II	
Number of Trees per size class <u>360</u>	9	19	4	4	
List of understory species	Japanese Honeyuckle, Multiflora Rose, Field Garlic Spicebush, Greenbrier				
Comments (to include): HISTORICAL/CULTURAL FEATURES THREATENED/ENDANGERED SPECIES SPECIMEN TREES <div style="margin-left: 150px;">Young Mixed Deciduous Forest</div>					

Table D-3: Forest Structure Data Sheet

Property : Bridgwell Courts
Stand #: 1

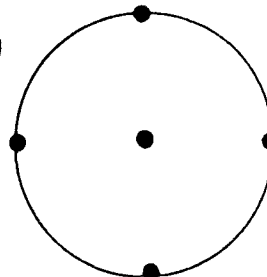
Prepared by: DTG
Date: 1/22/04

Forest Structure Variable	sample point 1	sample point 2	sample point 3	sample point 4	sample point 5	% yes
Canopy coverage						
herbaceous ground cover						
downed woody debris	Y	N	Y	N	N	40%
invasive plant cover	Y	Y	Y	N	Y	80%
number of shrub species (1/100 acre)	3	3	2	1	2	(2,2)

0 Dead

Forest Structure Sampling Method:

1/10 acre plot,
5 sample points



Forest Structure Analysis

1.3

The following parameters will be measured and evaluated at each site according to Figure D-2. Each parameter at each sample site will be given a value of 3,2,1, or 0. Three represents the most valuable structure and, the least valuable. Upon completion of the sampling, the person preparing the FSD will calculate the forest structure value for each stand. This analysis along with the other forest stand data will be used to determine the retention potential of the stand.

To determine the total habitat value use the following scale:

Range of total habitat numbers from samples taken April - October:

15-21	Priority forest structure
7-14	Good forest structure
0-6	Poor forest structure

In the winter and late fall, from November - March, only numbers 1,3,4,5,7, can be measured. During that time, the range of total habitat numbers will be:

11-15	Priority forest structure
6-10	Good structure
0-5	Poor forest structure

1. Percent Canopy Closure of trees with a DBH greater than 7"		5. Size Class of Dominant Trees ¹	
70% - 100 %	3	Greater than 20"	3
40% - 69%	2	7" - 19.9"	2
10% - 39%	1	3" - 6.9"	1
0% - 9%	0	Less than 3"	0
2. Number of Understory Shrubs 1/100 acre		6. Percent of Understory Herbaceous Coverage	
6 or more	3	75% - 100%	3
4 - 5	2	25% - 74%	2
2 - 4	1	5% - 24%	1
0 - 1	0	0% - 4%	0
3. Number of Dead Trees/tenth acre plot ¹		7. Number of Tree Species with a DBH greater than 7"/plot ¹	
3 or more	3	6 or more	3
2	2	4 - 5	2
1	1	2 - 4	1
0	0	0 - 1	0
4. Percent of Dead and Downed Woody Material Present			
15% - 100%	3		
5" - 14"	2		
0 - 1	1		
0	0		

¹ Data included in Forest Stand Summary Sheet (See Table D-4).

Table D-1: Field Sampling Data Sheet

Property Name: Bridgewell Courts Prepared by: BTB
 Stand # 1 Plot # 4 Date: 1/22/04

Basal Area <u>90</u>	Size Class of Trees Within the Sample Plot $\frac{1}{10}$				
Tree Species (note dominant and co-dominant species)	Number of Trees 2-5.9" dbh	Number of Trees 6-9.9" dbh	Number of Trees 10-17.9" dbh	Number of Trees 18-29.9" dbh	Number of Trees >30" dbh
<u>American Beech</u>	<u>11</u>	<u>1</u>			
<u>Sweet Gum</u>	<u>1111</u>	<u>1111</u>	<u>111</u>	<u>1</u>	
<u>Tulip Poplar</u>	<u>111</u>	<u>11</u>			
<u>Red Maple</u>	<u>1</u>	<u>1111</u>	<u>1</u>	<u>1</u>	
Number of Trees per size class <u>(280)</u>	<u>10</u>	<u>12</u>	<u>4</u>	<u>2</u>	
List of understory species	<u>Ground Pine, Spicebush, Highbush Blueberry</u>				
Comments (to include): HISTORICAL/CULTURAL FEATURES THREATENED/ENDANGERED SPECIES SPECIMEN TREES					

Table D-3: Forest Structure Data Sheet

Property : Bridgwell County

Prepared by: BSG

Stand #: 1

Plot #: 4

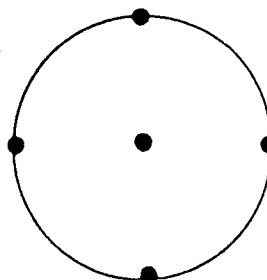
Date: 1/22/04

Forest Structure Variable	sample point 1	sample point 2	sample point 3	sample point 4	sample point 5	% yes
Canopy coverage						
herbaceous ground cover						
downed woody debris	N	Y	N	Y	Y	60%
invasive plant cover	N	N	Y	N	N	20%
number of shrub species (1/100 acre)	0	3	2	0	1	(12)

0 Dead

Forest Structure Sampling Method:

1/10 acre plot,
5 sample points



Forest Structure Analysis

14

The following parameters will be measured and evaluated at each site according to Figure D-2. Each parameter at each sample site will be given a value of 3,2,1, or 0. Three represents the most valuable structure and, the least valuable. Upon completion of the sampling, the person preparing the FSD will calculate the forest structure value for each stand. This analysis along with the other forest stand data will be used to determine the retention potential of the stand.

To determine the total habitat value use the following scale:

Range of total habitat numbers from samples taken April - October:

15-21	Priority forest structure
7-14	Good forest structure
0-6	Poor forest structure

In the winter and late fall, from November - March, only numbers 1,3,4,5,7, can be measured. During that time, the range of total habitat numbers will be:

11-15	Priority forest structure
6-10	Good structure
0-5	Poor forest structure

1. Percent Canopy Closure of trees with a DBH greater than 7"

70% - 100 %	3
40% - 69%	2
10% - 39%	1
0% - 9%	0

5. Size Class of Dominant Trees

Greater than 20"	3
7" - 19.9"	2
3" - 6.9"	1
Less than 3"	0

2. Number of Understory Shrubs 1/100 acre

6 or more	3
4 - 5	2
2 - 4	1
0 - 1	0

6. Percent of Understory Herbaceous Coverage

75% - 100%	3
25% - 74%	2
5% - 24%	1
0% - 4%	0

3. Number of Dead Trees/tenth acre plot

3 or more	3
2	2
1	1
0	0

7. Number of Tree Species with a DBH greater than 7"/plot

6 or more	3
4 - 5	2
2 - 4	1
0 - 1	0

4. Percent of Dead and Downed Woody Material Present

15% - 100%	3
5" - 14"	2
0 - 1	1
0	0

1 Data included in Forest Stand Summary Sheet (See Table D-4).

Table D-1: Field Sampling Data Sheet

Property Name: Bridgwell Courts
 Stand # 1 Plot # 5

Prepared by: BSG
 Date: 1/22/04

Basal Area <u>80</u>	Size Class of Trees Within the Sample Plot $\frac{1}{10}$				
Tree Species (note dominant and co-dominant species)	Number of Trees 2-5.9" dbh	Number of Trees 6-9.9" dbh	Number of Trees 10-17.9" dbh	Number of Trees 18-29.9" dbh	Number of Trees >30" dbh
<u>Sweet Gum</u>	<u>11</u>	<u>11</u>	<u>1</u>		
<u>Pink Poplar</u>	<u>1</u>	<u>1</u>			
<u>Red Maple</u>	<u>111</u>	<u>111 111</u>	<u>1111</u>	<u>1</u>	
Number of Trees per size class <u>240</u>	<u>6</u>	<u>13</u>	<u>5</u>	<u>1</u>	
List of understory species	<u>Multiflora Rose, Japanese Honeyuckle, Field Garlic</u>				
Comments (to include): HISTORICAL/CULTURAL FEATURES THREATENED/ENDANGERED SPECIES SPECIMEN TREES					

Table D-3: Forest Structure Data Sheet

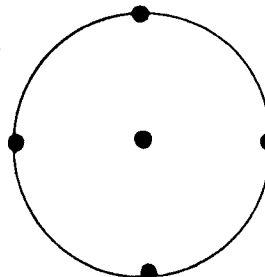
Property : Bridgwell Court Prepared by: BTG
 Stand #: 1 Plot #: 5 Date: 1/22/04

Forest Structure Variable	sample point 1	sample point 2	sample point 3	sample point 4	sample point 5	% yes
Canopy coverage						
herbaceous ground cover						
downed woody debris	Y	N	Y	N	N	40%
invasive plant cover	N	Y	Y	N	Y	60%
number of shrub species (1/100 acre)	1	0	3	1	2	1.7

0 dead

Forest Structure Sampling Method:

1/10 acre plot,
5 sample points



Forest Structure Analysis

1.5

The following parameters will be measured and evaluated at each site according to Figure D-2. Each parameter at each sample site will be given a value of 3, 2, 1, or 0. Three represents the most valuable structure and, the least valuable. Upon completion of the sampling, the person preparing the FSD will calculate the forest structure value for each stand. This analysis along with the other forest stand data will be used to determine the retention potential of the stand.

To determine the total habitat value use the following scale:

Range of total habitat numbers from samples taken April - October:

15-21	Priority forest structure
7-14	Good forest structure
0-6	Poor forest structure

In the winter and late fall, from November - March, only numbers 1, 3, 4, 5, 7, can be measured. During that time, the range of total habitat numbers will be:

11-15	Priority forest structure
6-10	Good structure
0-5	Poor forest structure

1. Percent Canopy Closure of trees with a DBH greater than 7"

70% - 100 %	3
40% - 69%	2
10% - 39%	1
0% - 9%	0

5. Size Class of Dominant Trees¹

Greater than 20"	3
7" - 19.9"	2
3" - 6.9"	1
Less than 3"	0

2. Number of Understory Shrubs 1/100 acre

6 or more	3
4 - 5	2
2 - 4	1
0 - 1	0

6. Percent of Understory Herbaceous Coverage

75% - 100%	3
25% - 74%	2
5% - 24%	1
0% - 4%	0

3. Number of Dead Trees/tenth acre plot¹

3 or more	3
2	2
1	1
0	0

7. Number of Tree Species with a DBH greater than 7"/plot¹

6 or more	3
4 - 5	2
2 - 4	1
0 - 1	0

4. Percent of Dead and Downed Woody Material Present

15% - 100%	3
5" - 14"	2
0 - 1	1
0	0

¹ Data included in Forest Stand Summary Sheet (See Table D-4).

Table D-1: Field Sampling Data Sheet

Property Name: Bridgeville Courts Prepared by: SSG
 Stand # 1 Plot # 6 Date: 1/22/07

Basal Area <u>100</u>	Size Class of Trees Within the Sample Plot $\frac{1}{10}$				
Tree Species (note dominant and co-dominant species)	Number of Trees 2-5.9" dbh	Number of Trees 6-9.9" dbh	Number of Trees 10-17.9" dbh	Number of Trees 18-29.9" dbh	Number of Trees >30" dbh
Sweet Gum	11 11	1 1	11	1	
Red Maple	11				
Pin Oak		1			
American Beech	11		1		
Willow Oak				1	
Pine			11		
Number of Trees per size class <u>(280)</u>	11	7	5	2	
List of understory species	Ground Pine, Greenbrier, Highbush Shrubbery				
Comments (to include): HISTORICAL/CULTURAL FEATURES THREATENED/ENDANGERED SPECIES SPECIMEN TREES					

Table D-3: Forest Structure Data Sheet

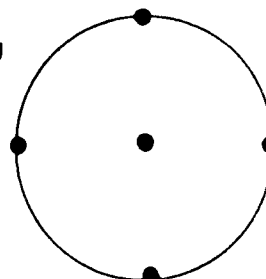
Property : Bridgewell County Prepared by: BTG
 Stand #: 1 Plot #: 6 Date: 1/22/04

Forest Structure Variable	sample point 1	sample point 2	sample point 3	sample point 4	sample point 5	% yes
Canopy coverage						
herbaceous ground cover						
downed woody debris	Y	N	Y	N	Y	60%
invasive plant cover	N	Y	N	Y	Y	60%
number of shrub species (1/100 acre)	3	2	4	4	5	(3.6)

2 Dead

Forest Structure Sampling Method:

1/10 acre plot,
5 sample points



Forest Structure Analysis

The following parameters will be measured and evaluated at each site according to Figure D-2. Each parameter at each sample site will be given a value of 3, 2, 1, or 0. Three represents the most valuable structure and, the least valuable. Upon completion of the sampling, the person preparing the FSD will calculate the forest structure value for each stand. This analysis along with the other forest stand data will be used to determine the retention potential of the stand.

To determine the total habitat value use the following scale:

Range of total habitat numbers from samples taken April - October:

15-21	Priority forest structure
7-14	Good forest structure
0-6	Poor forest structure

In the winter and late fall, from November - March, only numbers 1, 3, 4, 5, 7, can be measured. During that time, the range of total habitat numbers will be:

11-15	Priority forest structure
6-10	Good structure
0-5	Poor forest structure

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70% - 100 %	3																
40% - 69%	2																
10% - 39%	1																
0% - 9%	0																
Greater than 20"	3																
7" - 19.9"	2																
3" - 6.9"	1																
Less than 3"	0																
<p>2. Number of Understory Shrubs 1/100 acre</p> <table> <tr> <td>6 or more</td><td>3</td></tr> <tr> <td>4 - 5</td><td>2</td></tr> <tr> <td>2 - 4</td><td>1</td></tr> <tr> <td>0 - 1</td><td>0</td></tr> </table>	6 or more	3	4 - 5	2	2 - 4	1	0 - 1	0	<p>6. Percent of Understory Herbaceous Coverage</p> <table> <tr> <td>75% - 100%</td><td>3</td></tr> <tr> <td>25% - 74%</td><td>2</td></tr> <tr> <td>5% - 24%</td><td>1</td></tr> <tr> <td>0% - 4%</td><td>0</td></tr> </table>	75% - 100%	3	25% - 74%	2	5% - 24%	1	0% - 4%	0
6 or more	3																
4 - 5	2																
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0 - 1	0																
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25% - 74%	2																
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3 or more	3																
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15% - 100%	3																
5" - 14"	2																
0 - 1	1																
0	0																

¹ Data included in Forest Stand Summary Sheet (See Table D-4).

Table D-1: Field Sampling Data Sheet

Property Name: Bridgwell Courts
 Stand # 1 Plot # 7

Prepared by: BSG
 Date: 1/22/04

Basal Area <u>80</u>	Size Class of Trees Within the Sample Plot $\frac{1}{10}$				
Tree Species (note dominant and co-dominant species)	Number of Trees 2-5.9" dbh	Number of Trees 6-9.9" dbh	Number of Trees 10-17.9" dbh	Number of Trees 18-29.9" dbh	Number of Trees >30" dbh
Red Maple	III 1	II 11	III		
Sweet Gum	1				
Osage Orange	11				
River Birch	1	1			
Number of Trees per size class <u>(230)</u>	10	8	5		
List of understory species	Spicebush, Multiflora Rose, Field Garlic, Japanese Honeyuckle				
Comments (to include): HISTORICAL/CULTURAL FEATURES THREATENED/ENDANGERED SPECIES SPECIMEN TREES					

Table D-3: Forest Structure Data Sheet

Property : Bridgewater County

Prepared by: GTG

Stand #: 1

Plot #: 7

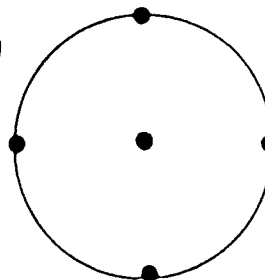
Date: 1/22/04

Forest Structure Variable	sample point 1	sample point 2	sample point 3	sample point 4	sample point 5	% yes
Canopy coverage						
herbaceous ground cover						
downed woody debris	Y	N	N	N	N	20%
invasive plant cover	Y	Y	Y	N	Y	80%
number of shrub species (1/100 acre)	3	4	2	4	5	(3.6)

0 Dead

Forest Structure Sampling Method:

1/10 acre plot.
5 sample points



Forest Structure Analysis

17

The following parameters will be measured and evaluated at each site according to Figure D-2. Each parameter at each sample site will be given a value of 3, 2, 1, or 0. Three represents the most valuable structure and, the least valuable. Upon completion of the sampling, the person preparing the FSD will calculate the forest structure value for each stand. This analysis along with the other forest stand data will be used to determine the retention potential of the stand.

To determine the total habitat value use the following scale:

Range of total habitat numbers from samples taken April - October:

15-21	Priority forest structure
7-14	Good forest structure
0-6	Poor forest structure

In the winter and late fall, from November - March, only numbers 1, 3, 4, 5, 7, can be measured. During that time, the range of total habitat numbers will be:

11-15	Priority forest structure
6-10	Good structure
0-5	Poor forest structure

1. Percent Canopy Closure of trees with a DBH greater than 7"	5. Size Class of Dominant Trees
70% - 100 %	Greater than 20" 3
40% - 69%	7" - 19.9" 2
10% - 39%	3" - 6.9" 1
0% - 9%	Less than 3" 0
2. Number of Understory Shrubs 1/100 acre	6. Percent of Understory Herbaceous Coverage
6 or more	75% - 100% 3
4 - 5	25% - 74% 2
2 - 4	5% - 24% 1
0 - 1	0% - 4% 0
3. Number of Dead Trees/tenth acre plot ¹	7. Number of Tree Species with a DBH greater than 7"/plot ¹
3 or more	6 or more 3
2	4 - 5 2
1	2 - 4 1
0	0 - 1 0
4. Percent of Dead and Downed Woody Material Present	
15% - 100%	3
5" - 14"	2
0 - 1	1
0	0

¹ Data included in Forest Stand Summary Sheet (See Table D-4).

Table D-1: Field Sampling Data Sheet

Property Name: Bridgeview Courts
 Stand # 2

Plot # 1

Prepared by: ASG
 Date: 11/22/04

Basal Area <u>170</u>	Size Class of Trees Within the Sample Plot $\frac{1}{10}$				
Tree Species (note dominant and co-dominant species)	Number of Trees 2-5.9" dbh	Number of Trees 6-9.9" dbh	Number of Trees 10-17.9" dbh	Number of Trees 18-29.9" dbh	Number of Trees >30" dbh
Pine			### ## 11	### 1	
Red Maple	III	II	II		
Sweet Gum	III	### III			
Number of Trees per size class <u>(370)</u>	7	10	14	6	
List of understory species	Greenbriar, Highbush Blueberry, American Beech Saplings				
Comments (to include): HISTORICAL/CULTURAL FEATURES THREATENED/ENDANGERED SPECIES SPECIMEN TREES <div style="margin-left: 100px;"> Mature Pine stand with some younger mixed deciduous species encroaching. </div>					

Table D-3: Forest Structure Data Sheet

Property : Bridgwell Court

Prepared by: BJG

Stand #: 2

Plot #: 1

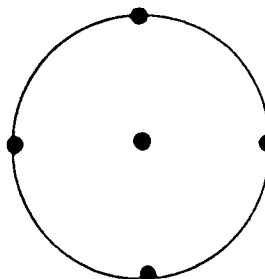
Date: 11/22/04

Forest Structure Variable	sample point 1	sample point 2	sample point 3	sample point 4	sample point 5	% yes
Canopy coverage						
herbaceous ground cover						
downed woody debris	Y	N	N	N	N	20%
invasive plant cover	Y	Y	N	N	N	40%
number of shrub species (1/100 acre)	1	2	2	0	1	(1.2)

1 Dead

Forest Structure Sampling Method:

1/10 acre plot,
5 sample points



Forest Structure Analysis

2.1

The following parameters will be measured and evaluated at each site according to Figure D-2. Each parameter at each sample site will be given a value of 3, 2, 1, or 0. Three represents the most valuable structure and, the least valuable. Upon completion of the sampling, the person preparing the FSD will calculate the forest structure value for each stand. This analysis along with the other forest stand data will be used to determine the retention potential of the stand.

To determine the total habitat value use the following scale:

Range of total habitat numbers from samples taken April - October:

15-21	Priority forest structure
7-14	Good forest structure
0-6	Poor forest structure

In the winter and late fall, from November - March, only numbers 1, 3, 4, 5, 7, can be measured. During that time, the range of total habitat numbers will be:

11-15	Priority forest structure
6-10	Good structure
0-5	Poor forest structure

1. Percent Canopy Closure
of trees with a DBH greater
than 7"

70% - 100 %	3
40% - 69%	2
10% - 39%	1
0% - 9%	0

5. Size Class of Dominant Trees¹

Greater than 20"	3
7" - 19.9"	2
3" - 6.9"	1
Less than 3"	0

2. Number of Understory Shrubs 1/100 acre

6 or more	3
4 - 5	2
2 - 4	1
0 - 1	0

6. Percent of Understory Herbaceous Coverage

75% - 100%	3
25% - 74%	2
5% - 24%	1
0% - 4%	0

3. Number of Dead Trees/tenth acre plot¹

3 or more	3
2	2
1	1
0	0

7. Number of Tree Species with a DBH
greater than 7"/plot¹

6 or more	3
4 - 5	2
2 - 4	1
0 - 1	0

4. Percent of Dead and Downed Woody
Material Present

15% - 100%	3
5" - 14"	2
0 - 1	1
0	0

¹ Data included in Forest Stand Summary Sheet (See Table D-4).

Table D-1: Field Sampling Data Sheet

Property Name: Bridgwell Courts Prepared by: WJC
 Stand # 3 Plot # 1 Date: 1/22/04

Basal Area <u>120</u>	Size Class of Trees Within the Sample Plot $\frac{1}{10}$				
Tree Species (note dominant and co-dominant species)	Number of Trees 2-5.9" dbh	Number of Trees 6-9.9" dbh	Number of Trees 10-17.9" dbh	Number of Trees 18-29.9" dbh	Number of Trees >30" dbh
Red Maple		1	1		
Sweet Gum		### 11	###	11	
Willow Oak				11	
Number of Trees per size class <u>(180)</u>	0	8	6	4	
List of understory species	Ground Pine, Greenbrier, Highbush Dogberry, Spicebush				
Comments (to include): <div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> HISTORICAL/CULTURAL FEATURES THREATENED/ENDANGERED SPECIES SPECIMEN TREES </div> <div style="width: 65%;"> <p style="font-size: 1.2em;">Low-lying Mixed Deciduous Forest</p> <p style="font-size: 1.2em;">Dominated by Non-Tidal Wetlands</p> <p style="font-size: 1.2em;">Numerous Specimen Trees</p> </div> </div>					

Table D-3: Forest Structure Data Sheet

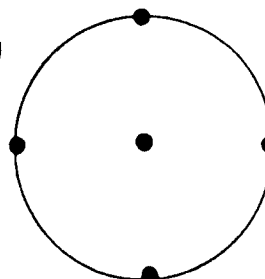
Property : Bridgewell Courts Prepared by: DTG
 Stand #: 3 Plot #: 1 Date: 1/22/04

Forest Structure Variable	sample point 1	sample point 2	sample point 3	sample point 4	sample point 5	% yes
Canopy coverage						
herbaceous ground cover						
downed woody debris	Y	Y	N	Y	N	60%
invasive plant cover	Y	N	Y	N	N	40%
number of shrub species (1/100 acre)	1	2	1	3	2	(1.8)

0 Dead

Forest Structure Sampling Method:

1/10 acre plot,
5 sample points



Forest Structure Analysis

(3.1)

The following parameters will be measured and evaluated at each site according to Figure D-2. Each parameter at each sample site will be given a value of 3,2,1, or 0. Three represents the most valuable structure and, the least valuable. Upon completion of the sampling, the person preparing the FSD will calculate the forest structure value for each stand. This analysis along with the other forest stand data will be used to determine the retention potential of the stand.

To determine the total habitat value use the following scale:

Range of total habitat numbers from samples taken April - October:

15-21	Priority forest structure
7-14	Good forest structure
0-6	Poor forest structure

In the winter and late fall, from November - March, only numbers 1,3,4,5,7, can be measured. During that time, the range of total habitat numbers will be:

11-15	Priority forest structure
(7) 6-10	Good structure
0-5	Poor forest structure

1. Percent Canopy Closure of trees with a DBH greater than 7"

70% - 100 %	3
40% - 69%	2
10% - 39%	1
0% - 9%	0

5. Size Class of Dominant Trees¹

Greater than 20"	3
7" - 19.9"	(2)
3" - 6.9"	1
Less than 3"	0

2. Number of Understory Shrubs 1/100 acre

6 or more	3
4 - 5	2
2 - 4	(1)
0 - 1	0

8. Percent of Understory Herbaceous Coverage

75% - 100%	3
25% - 74%	2
5% - 24%	1
0% - 4%	0

3. Number of Dead Trees/tenth acre plot¹

3 or more	3
2	2
1	1
0	(0)

7. Number of Tree Species with a DBH greater than 7"/plot¹

6 or more	3
4 - 5	2
2 - 4	(1)
0 - 1	0

4. Percent of Dead and Downed Woody Material Present

15% - 100%	(3)
5" - 14"	2
0 - 1	1
0	0

¹ Data included in Forest Stand Summary Sheet (See Table D-4).

Table D-1: Field Sampling Data Sheet

Property Name: Bridgwell Court
 Stand # 3 Plot # 2

Prepared by: BTG
 Date: 1/22/04

Basal Area <u>120</u>	Size Class of Trees Within the Sample Plot $\frac{1}{10}$				
Tree Species (note dominant and co-dominant species)	Number of Trees 2-5.9" dbh	Number of Trees 6-9.9" dbh	Number of Trees 10-17.9" dbh	Number of Trees 18-29.9" dbh	Number of Trees >30" dbh
Sweet Gum	II	III	III	I	
Red Maple	III				
Pin Oak			I		
Willow Oak				III	II
American Beech	III	I			
Tulip Poplar	III				
Number of Trees per size class <u>(300)</u>	II	6	6	5	2
List of understory species	Greenbriar, Highbush Blueberry, Spicebush				
Comments (to include): HISTORICAL/CULTURAL FEATURES THREATENED/ENDANGERED SPECIES SPECIMEN TREES					

Table D-3: Forest Structure Data Sheet

Property : Bridgwell Courts

Prepared by: DJG

Stand #: 3

Plot #: 2

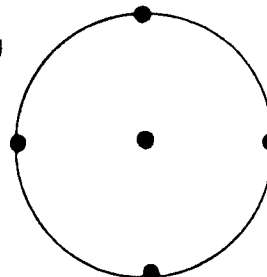
Date: 1/22/04

Forest Structure Variable	sample point 1	sample point 2	sample point 3	sample point 4	sample point 5	% yes
Canopy coverage						
herbaceous ground cover						
downed woody debris	N	Y	N	N	N	20%
invasive plant cover	Y	N	Y	N	N	40%
number of shrub species (1/100 acre)	1	0	3	2	3	(1.4)

1 Dead

Forest Structure Sampling Method:

1/10 acre plot.
5 sample points



Forest Structure Analysis

3.2

The following parameters will be measured and evaluated at each site according to Figure D-2. Each parameter at each sample site will be given a value of 3,2,1, or 0. Three represents the most valuable structure and, the least valuable. Upon completion of the sampling, the person preparing the FSD will calculate the forest structure value for each stand. This analysis along with the other forest stand data will be used to determine the retention potential of the stand.

To determine the total habitat value use the following scale:

Range of total habitat numbers from samples taken April - October:

15-21	Priority forest structure
7-14	Good forest structure
0-6	Poor forest structure

In the winter and late fall, from November - March, only numbers 1,3,4,5,7, can be measured. During that time, the range of total habitat numbers will be:

11-15	Priority forest structure
6-10	Good structure
0-5	Poor forest structure

1. Percent Canopy Closure of trees with a DBH greater than 7"

70% - 100 %	3
40% - 69%	2
10% - 39%	1
0% - 9%	0

5. Size Class of Dominant Trees¹

Greater than 20"	3
7" - 19.9"	2
3" - 6.9"	1
Less than 3"	0

2. Number of Understory Shrubs 1/100 acre

6 or more	3
4 - 5	2
2 - 4	1
0 - 1	0

6. Percent of Understory Herbaceous Coverage

75% - 100%	3
25% - 74%	2
5% - 24%	1
0% - 4%	0

3. Number of Dead Trees/tenth acre plot¹

3 or more	3
2	2
1	1
0	0

7. Number of Tree Species with a DBH greater than 7"/plot¹

6 or more	3
4 - 5	2
2 - 4	1
0 - 1	0

4. Percent of Dead and Downed Woody Material Present

15% - 100%	3
5% - 14%	2
0 - 1	1
0	0

¹ Data included in Forest Stand Summary Sheet (See Table D-4).

Table D-1: Field Sampling Data Sheet

Property Name: Bridgeville Courts
 Stand # 3 Plot # 3

Prepared by: BSK
 Date: 1/22/04

Basal Area <u>110</u>	Size Class of Trees Within the Sample Plot $\frac{1}{10}$				
Tree Species (note dominant and co-dominant species)	Number of Trees 2-5.9" dbh	Number of Trees 6-9.9" dbh	Number of Trees 10-17.9" dbh	Number of Trees 18-29.9" dbh	Number of Trees >30" dbh
Sweet Gum	III	III	I	II	I
Pin Oak			I		
Red Maple	III	II	II		
Swamp White Oak				II	
Willow Oak	I		II		
Number of Trees per size class <u>(240)</u>	8	5	6	4	1
List of understory species	Highbush Blueberry				
Comments (to include): HISTORICAL/CULTURAL FEATURES THREATENED/ENDANGERED SPECIES SPECIMEN TREES					

Table D-3: Forest Structure Data Sheet

Property : Bridgwell County

Prepared by: BJG

Stand #: 3

Plot #: 3

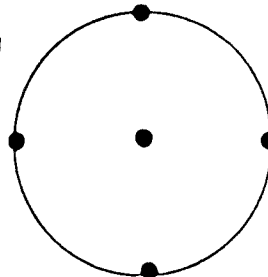
Date: 1/22/04

Forest Structure Variable	sample point 1	sample point 2	sample point 3	sample point 4	sample point 5	% yes
Canopy coverage						
herbaceous ground cover						
downed woody debris	N	N	N	Y	N	20%
invasive plant cover	N	N	N	N	N	0%
number of shrub species (1/100 acre)	3	5	5	2	4	3.8

2 Dead

Forest Structure Sampling Method:

1/10 acre plot,
5 sample points



Forest Structure Analysis

33

The following parameters will be measured and evaluated at each site according to Figure D-2. Each parameter at each sample site will be given a value of 3,2,1, or 0. Three represents the most valuable structure and, the least valuable. Upon completion of the sampling, the person preparing the FSD will calculate the forest structure value for each stand. This analysis along with the other forest stand data will be used to determine the retention potential of the stand.

To determine the total habitat value use the following scale:

Range of total habitat numbers from samples taken April - October:

15-21	Priority forest structure
7-14	Good forest structure
0-6	Poor forest structure

In the winter and late fall, from November - March, only numbers 1,3,4,5,7, can be measured. During that time, the range of total habitat numbers will be:

(ii) 11-15	Priority forest structure
6-10	Good structure
0-5	Poor forest structure

1. Percent Canopy Closure of trees with a DBH greater than 7"

70% - 100 %	3
40% - 69%	2
10% - 39%	1
0% - 9%	0

5. Size Class of Dominant Trees₁

Greater than 20"	(3)
7" - 19.9"	2
3" - 6.9"	1
Less than 3"	0

2. Number of Understory Shrubs 1/100 acre

6 or more	3
4 - 5	2
2 - 4	(1)
0 - 1	0

6. Percent of Understory Herbaceous Coverage

75% - 100%	3
25% - 74%	2
5% - 24%	1
0% - 4%	0

3. Number of Dead Trees/tenth acre plot¹

3 or more	3
2	(2)
1	1
0	0

7. Number of Tree Species with a DBH greater than 7"/plot¹

6 or more	3
4 - 5	(2)
2 - 4	1
0 - 1	0

4. Percent of Dead and Downed Woody Material Present

15% - 100%	(3)
5" - 14"	2
0 - 1	1
0	0

¹ Data included in Forest Stand Summary Sheet (See Table D-4).

Table D-1: Field Sampling Data Sheet

Property Name: Bridgwell Courts
 Stand # 3

Plot # 4

Prepared by: BJG
 Date: 1/22/04

Basal Area <u>130</u>	Size Class of Trees Within the Sample Plot $\frac{1}{10}$				
Tree Species (note dominant and co-dominant species)	Number of Trees 2-5.9" dbh	Number of Trees 6-9.9" dbh	Number of Trees 10-17.9" dbh	Number of Trees 18-29.9" dbh	Number of Trees >30" dbh
Sweet Gum		 1			
Red Maple				1	
Willow Oak			1		1
Swamp White Oak				1	
Number of Trees per size class 260	9	9	5	2	1
List of understory species	High Bush Blueberry, Greenbrier				
Comments (to include): HISTORICAL/CULTURAL FEATURES THREATENED/ENDANGERED SPECIES SPECIMEN TREES					

Table D-3: Forest Structure Data Sheet

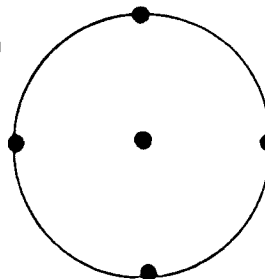
Property : Bridgwell County Prepared by: BTG
 Stand #: 3 Plot #: 4 Date: 1/22/04

Forest Structure Variable	sample point 1	sample point 2	sample point 3	sample point 4	sample point 5	% yes
Canopy coverage						
herbaceous ground cover						
downed woody debris	N	N	Y	Y	N	40%
invasive plant cover	N	N	N	N	N	0%
number of shrub species (1/100 acre)	3	5	3	4	2	(3.4)

2 Dead

Forest Structure Sampling Method:

1/10 acre plot,
5 sample points



Forest Structure Analysis

3.4

The following parameters will be measured and evaluated at each site according to Figure D-2. Each parameter at each sample site will be given a value of 3,2,1, or 0. Three represents the most valuable structure and, the least valuable. Upon completion of the sampling, the person preparing the FSD will calculate the forest structure value for each stand. This analysis along with the other forest stand data will be used to determine the retention potential of the stand.

To determine the total habitat value use the following scale:

Range of total habitat numbers from samples taken April - October:

15-21	Priority forest structure
7-14	Good forest structure
0-6	Poor forest structure

In the winter and late fall, from November - March, only numbers 1,3,4,5,7, can be measured. During that time, the range of total habitat numbers will be:

11-15	Priority forest structure
6-10	Good structure
0-5	Poor forest structure

1. Percent Canopy Closure of trees with a DBH greater than 7"

70% - 100 %	3
40% - 69%	2
10% - 39%	1
0% - 9%	0

5. Size Class of Dominant Trees

Greater than 20"	3
7" - 19.9"	2
3" - 6.9"	1
Less than 3"	0

2. Number of Understory Shrubs 1/100 acre

6 or more	3
4 - 5	2
2 - 4	1
0 - 1	0

6. Percent of Understory Herbaceous Coverage

75% - 100%	3
25% - 74%	2
5% - 24%	1
0% - 4%	0

3. Number of Dead Trees/tenth acre plot

3 or more	3
2	2
1	1
0	0

7. Number of Tree Species with a DBH greater than 7"/plot

6 or more	3
4 - 5	2
2 - 4	1
0 - 1	0

4. Percent of Dead and Downed Woody Material Present

15% - 100%	3
5" - 14"	2
0 - 1	1
0	0

1 Data included in Forest Stand Summary Sheet (See Table D-4).

Table D-1: Field Sampling Data Sheet

Property Name: Bridgeport Cove
 Stand # 3 Plot # 5

Prepared by: BSG
 Date: 1/22/04

Basal Area <u>110</u>	Size Class of Trees Within the Sample Plot $\frac{1}{10}$				
Tree Species (note dominant and co-dominant species)	Number of Trees 2-5.9" dbh	Number of Trees 6-9.9" dbh	Number of Trees 10-17.9" dbh	Number of Trees 18-29.9" dbh	Number of Trees >30" dbh
Sweet Gum	III	III 1	II		
Red Maple	III II	III III	II		
Willow Oak		I	II	II	
American Beech	II				
Swamp White Oak			I		
Number of Trees per size class 360	12	15	7	2	
List of understory species	Highbush Blueberry, Ground Pine, Greenbrier				
Comments (to include): HISTORICAL/CULTURAL FEATURES THREATENED/ENDANGERED SPECIES SPECIMEN TREES					

Table D-3: Forest Structure Data Sheet

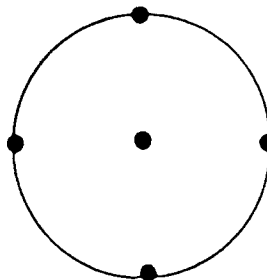
Property : Bridgwell Court Prepared by: BJG
 Stand #: 3 Plot #: 5 Date: 1/22/04

Forest Structure Variable	sample point 1	sample point 2	sample point 3	sample point 4	sample point 5	% yes
Canopy coverage						
herbaceous ground cover						
downed woody debris	Y	N	N	N	N	20%
invasive plant cover	N	N	N	N	N	0%
number of shrub species (1/100 acre)	2	3	0	0	2	(17)

0 Dead

Forest Structure Sampling Method:

1/10 acre plot,
5 sample points



Forest Structure Analysis

3.5

The following parameters will be measured and evaluated at each site according to Figure D-2. Each parameter at each sample site will be given a value of 3, 2, 1, or 0. Three represents the most valuable structure and, the least valuable. Upon completion of the sampling, the person preparing the FSD will calculate the forest structure value for each stand. This analysis along with the other forest stand data will be used to determine the retention potential of the stand.

To determine the total habitat value use the following scale:

Range of total habitat numbers from samples taken April - October:

15-21	Priority forest structure
7-14	Good forest structure
0-6	Poor forest structure

In the winter and late fall, from November - March, only numbers 1, 3, 4, 5, 7, can be measured. During that time, the range of total habitat numbers will be:

11-15	Priority forest structure
6-10	Good structure
0-5	Poor forest structure

1. Percent Canopy Closure of trees with a DBH greater than 7"

70% - 100 %	3
40% - 69%	2
10% - 39%	1
0% - 9%	0

5. Size Class of Dominant Trees¹

Greater than 20"	3
7" - 19.9"	2
3" - 6.9"	1
Less than 3"	0

2. Number of Understory Shrubs 1/100 acre

6 or more	3
4 - 5	2
2 - 4	1
0 - 1	0

6. Percent of Understory Herbaceous Coverage

75% - 100%	3
25% - 74%	2
5% - 24%	1
0% - 4%	0

3. Number of Dead Trees/tenth acre plot¹

3 or more	3
2	2
1	1
0	0

7. Number of Tree Species with a DBH greater than 7"/plot¹

6 or more	3
4 - 5	2
2 - 4	1
0 - 1	0

4. Percent of Dead and Downed Woody Material Present

15% - 100%	3
5" - 14"	2
0 - 1	1
0	0

¹ Data included in Forest Stand Summary Sheet (See Table D-4).

Table D-1: Field Sampling Data Sheet

Property Name: Bridgwell Courts
 Stand # 3

Plot # 6

Prepared by: BTG
 Date: 1/22/04

Basal Area <u>100</u>	Size Class of Trees Within the Sample Plot $\frac{1}{10}$				
Tree Species (note dominant and co-dominant species)	Number of Trees 2-5.9" dbh	Number of Trees 6-9.9" dbh	Number of Trees 10-17.9" dbh	Number of Trees 18-29.9" dbh	Number of Trees >30" dbh
Sweet Gum	III		I		
Red Maple	II	III			
Willow Oak			I	I	
Swamp White Oak	III	II		III	
American Beech	II		I	I	
Pine Oak	I	I			
Number of Trees per size class <u>(280)</u>	12	7	4	5	
List of understory species	Greensward, Highbush Blueberry, Spicebush				
Comments (to include): HISTORICAL/CULTURAL FEATURES THREATENED/ENDANGERED SPECIES SPECIMEN TREES					

Table D-3: Forest Structure Data Sheet

Property : Bridgwell Coasts

Prepared by: DJG

Stand #: 3

Plot #: 6

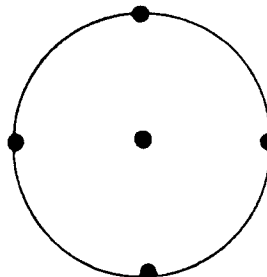
Date: 1/22/04

Forest Structure Variable	sample point 1	sample point 2	sample point 3	sample point 4	sample point 5	% yes
Canopy coverage						
herbaceous ground cover						
downed woody debris	Y	N	Y	N	N	40%
invasive plant cover	N	N	Y	N	N	20%
number of shrub species (1/100 acre)	2	3	4	1	1	(2.2)

0 Dead

Forest Structure Sampling Method:

1/10 acre plot,
5 sample points



Forest Structure Analysis

3.6

The following parameters will be measured and evaluated at each site according to Figure D-2. Each parameter at each sample site will be given a value of 3, 2, 1, or 0. Three represents the most valuable structure and, the least valuable. Upon completion of the sampling, the person preparing the FSD will calculate the forest structure value for each stand. This analysis along with the other forest stand data will be used to determine the retention potential of the stand.

To determine the total habitat value use the following scale:

Range of total habitat numbers from samples taken April - October:

15-21	Priority forest structure
7-14	Good forest structure
0-6	Poor forest structure

In the winter and late fall, from November - March, only numbers 1, 3, 4, 5, 7, can be measured. During that time, the range of total habitat numbers will be:

11-15	Priority forest structure
6-10	Good structure
0-5	Poor forest structure

1. Percent Canopy Closure of trees with a DBH greater than 7"	5. Size Class of Dominant Trees
70% - 100 %	Greater than 20" 3
40% - 69%	7" - 19.9" 2
10% - 39%	3" - 6.9" 1
0% - 9%	Less than 3" 0
2. Number of Understory Shrubs 1/100 acre	6. Percent of Understory Herbaceous Coverage
6 or more	75% - 100% 3
4 - 5	25% - 74% 2
2 - 4	5% - 24% 1
0 - 1	0% - 4% 0
3. Number of Dead Trees/tenth acre plot ¹	7. Number of Tree Species with a DBH greater than 7"/plot ¹
3 or more	6 or more 3
2	4 - 5 2
1	2 - 4 1
0	0 - 1 0
4. Percent of Dead and Downed Woody Material Present	
15% - 100%	3
5" - 14"	2
0 - 1	1
0	0

¹ Data included in Forest Stand Summary Sheet (See Table D-4).

Table D-1: Field Sampling Data Sheet

Property Name: Bridgwell Courts
 Stand # 3 Plot # 7

Prepared by: BSG
 Date: 11/22/04

Basal Area <u>110</u>	Size Class of Trees Within the Sample Plot $\frac{1}{10}$				
Tree Species (note dominant and co-dominant species)	Number of Trees 2-5.9" dbh	Number of Trees 6-9.9" dbh	Number of Trees 10-17.9" dbh	Number of Trees 18-29.9" dbh	Number of Trees >30" dbh
Red Maple	11	11	11	1	
Sweet Gum	11	11	111	111	
Tulip Poplar		1		1	
American Beech	1				
Black Cherry		1			
Number of Trees per size class <u>(330)</u>	6	14	7	6	
List of understory species	Spicebush, Japanese Amurhelle, Multiflora Rose Greenbrier				
Comments (to include): HISTORICAL/CULTURAL FEATURES THREATENED/ENDANGERED SPECIES SPECIMEN TREES					

Table D-3: Forest Structure Data Sheet

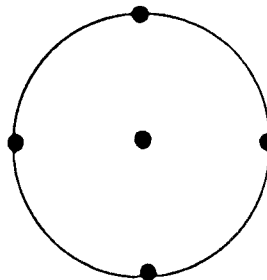
Property : Bridgwell Courts Prepared by: BTG
 Stand #: 3 Plot #: 7 Date: 1/22/04

Forest Structure Variable	sample point 1	sample point 2	sample point 3	sample point 4	sample point 5	% yes
Canopy coverage						
herbaceous ground cover						
downed woody debris	Y	N	N	N	N	20%
invasive plant cover	Y	Y	N	Y	Y	80%
number of shrub species (1/100 acre)	3	2	1	3	4	(2.6)

2 Dead

Forest Structure Sampling Method:

1/10 acre plot,
5 sample points



Forest Structure Analysis

3.7

The following parameters will be measured and evaluated at each site according to Figure D-2. Each parameter at each sample site will be given a value of 3, 2, 1, or 0. Three represents the most valuable structure and, the least valuable. Upon completion of the sampling, the person preparing the FSD will calculate the forest structure value for each stand. This analysis along with the other forest stand data will be used to determine the retention potential of the stand.

To determine the total habitat value use the following scale:

Range of total habitat numbers from samples taken April - October:

15-21	Priority forest structure
7-14	Good forest structure
0-6	Poor forest structure

In the winter and late fall, from November - March, only numbers 1, 3, 4, 5, 7, can be measured. During that time, the range of total habitat numbers will be:

11-15	Priority forest structure
6-10	Good structure
0-5	Poor forest structure

1. Percent Canopy Closure of trees with a DBH greater than 7"	5. Size Class of Dominant Trees
70% - 100% 3	Greater than 20" 3
40% - 69% 2	7" - 19.9" 2
10% - 39% 1	3" - 6.9" 1
0% - 9% 0	Less than 3" 0
2. Number of Understory Shrubs 1/100 acre	6. Percent of Understory Herbaceous Coverage
6 or more 3	75% - 100% 3
4 - 5 2	25% - 74% 2
2 - 4 1	5% - 24% 1
0 - 1 0	0% - 4% 0
3. Number of Dead Trees/tenth acre plot ¹	7. Number of Tree Species with a DBH greater than 7"/plot ¹
3 or more 3	6 or more 3
2 2	4 - 5 2
1 1	2 - 4 1
0 0	0 - 1 0
4. Percent of Dead and Downed Woody Material Present	
15% - 100% 3	
5" - 14" 2	
0 - 1 1	
0 0	

¹ Data included in Forest Stand Summary Sheet (See Table D-4).

Table D-1: Field Sampling Data Sheet

Property Name: Bridgwell Courts
 Stand # 3 Plot # 8

Prepared by: BJG
 Date: 1/22/04

Basal Area <u>80</u>	Size Class of Trees Within the Sample Plot $\frac{1}{40}$				
Tree Species (note dominant and co-dominant species)	Number of Trees 2-5.9" dbh	Number of Trees 6-9.9" dbh	Number of Trees 10-17.9" dbh	Number of Trees 18-29.9" dbh	Number of Trees >30" dbh
Sweet Gum					
Red Maple					
River Birch					
Pin Oak					
Number of Trees per size class	16	12	4		
List of understory species	Spiraea, Highbush Blueberry, Poison Ivy				
Comments (to include): HISTORICAL/CULTURAL FEATURES THREATENED/ENDANGERED SPECIES SPECIMEN TREES					

Table D-3: Forest Structure Data Sheet

Property : Bridgwell Courts

Prepared by: BJG

Stand #: 3

Plot #: 8

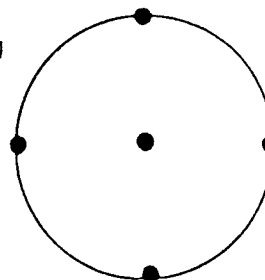
Date: 1/22/04

Forest Structure Variable	sample point 1	sample point 2	sample point 3	sample point 4	sample point 5	% yes
Canopy coverage						
herbaceous ground cover						
downed woody debris	N	N	N	Y	N	20%
invasive plant cover	N	Y	N	Y	Y	60%
number of shrub species (1/100 acre)	0	2	3	2	2	(1.8)

0 Dead

Forest Structure Sampling Method:

1/10 acre plot,
5 sample points



Forest Structure Analysis

3.8

The following parameters will be measured and evaluated at each site according to Figure D-2. Each parameter at each sample site will be given a value of 3,2,1, or 0. Three represents the most valuable structure and, the least valuable. Upon completion of the sampling, the person preparing the FSD will calculate the forest structure value for each stand. This analysis along with the other forest stand data will be used to determine the retention potential of the stand.

To determine the total habitat value use the following scale:

Range of total habitat numbers from samples taken April - October:

15-21	Priority forest structure
7-14	Good forest structure
0-6	Poor forest structure

In the winter and late fall, from November - March, only numbers 1,3,4,5,7, can be measured. During that time, the range of total habitat numbers will be:

11-15	Priority forest structure
6-10	Good structure
0-5	Poor forest structure

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15% - 100%	3																
5" - 14"	2																
0 - 1	1																
0	0																

¹ Data included in Forest Stand Summary Sheet (See Table D-4).

Table D-1: Field Sampling Data Sheet

Property Name: Bridgewell Courts
 Stand # 4

Plot # 1

Prepared by: DTG
 Date: 1/22/04

Basal Area <u>180</u>	Size Class of Trees Within the Sample Plot $\frac{1}{10}$				
Tree Species (note dominant and co-dominant species)	Number of Trees 2-5.9" dbh	Number of Trees 6-9.9" dbh	Number of Trees 10-17.9" dbh	Number of Trees 18-29.9" dbh	Number of Trees >30" dbh
American Beech	11	11 11	11	11	
Red Oak			1	1	1
Sweet Gum	1	1	1		
Willow Oak				1	1
Sassafras	1				
Red Maple			11		
Number of Trees per size class 260	4	9	6	5	2
List of understory species	Ground Pine, American Beech Saplings				
Comments (to include): HISTORICAL/CULTURAL FEATURES THREATENED/ENDANGERED SPECIES SPECIMEN TREES <div style="text-align: center; margin-top: 20px;"> Native Mixed Deciduous Forest Stand Numerous specimen trees </div>					

Table D-3: Forest Structure Data Sheet

Property : Bridgewater County

Prepared by: DJG

Stand #: 4

Plot #: 1

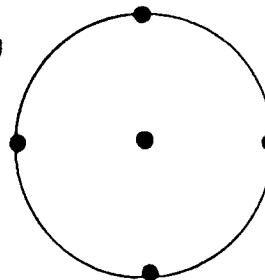
Date: 1/22/04

Forest Structure Variable	sample point 1	sample point 2	sample point 3	sample point 4	sample point 5	% yes
Canopy coverage						
herbaceous ground cover						
downed woody debris	Y	N	Y	N	N	40%
invasive plant cover	N	N	N	N	N	0%
number of shrub species (1/100 acre)	0	0	0	3	1	(0.8)

2 Dead

Forest Structure Sampling Method:

1/10 acre plot.
5 sample points



Forest Structure Analysis

4.1

The following parameters will be measured and evaluated at each site according to Figure D-2. Each parameter at each sample site will be given a value of 3, 2, 1, or 0. Three represents the most valuable structure and, the least valuable. Upon completion of the sampling, the person preparing the FSD will calculate the forest structure value for each stand. This analysis along with the other forest stand data will be used to determine the retention potential of the stand.

To determine the total habitat value use the following scale:

Range of total habitat numbers from samples taken April - October:

15-21	Priority forest structure
7-14	Good forest structure
0-6	Poor forest structure

In the winter and late fall, from November - March, only numbers 1, 3, 4, 5, 7, can be measured. During that time, the range of total habitat numbers will be:

11-15	Priority forest structure
6-10	Good structure
0-5	Poor forest structure

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15% - 100%	3																
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0 - 1	1																
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¹ Data included in Forest Stand Summary Sheet (See Table D-4).

Table D-1: Field Sampling Data Sheet

Property Name: Bridgewell Courts
 Stand # 4

Plot # 2

Prepared by: BJG
 Date: 1/22/04

Basal Area <u>140</u>	Size Class of Trees Within the Sample Plot $\frac{1}{10}$				
Tree Species (note dominant and co-dominant species)	Number of Trees 2-5.9" dbh	Number of Trees 6-9.9" dbh	Number of Trees 10-17.9" dbh	Number of Trees 18-29.9" dbh	Number of Trees >30" dbh
American Beech					
Red Oak					
Tulip Poplar					
Red Maple					
Number of Trees per size class <u>(240)</u>	8	9	1	5	1
List of understory species	American Beech Saplings				
Comments (to include): HISTORICAL/CULTURAL FEATURES THREATENED/ENDANGERED SPECIES SPECIMEN TREES					

Table D-3: Forest Structure Data Sheet

Property : Bridgwell Courts
Stand #: 4

Plot #: 2

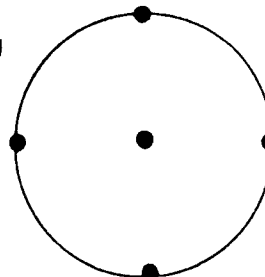
Prepared by: BSG
Date: 1/22/04

Forest Structure Variable	sample point 1	sample point 2	sample point 3	sample point 4	sample point 5	% yes
Canopy coverage						
herbaceous ground cover						
downed woody debris	N	Y	N	N	N	20%
invasive plant cover	N	N	N	N	N	0%
number of shrub species (1/100 acre)	0	1	0	1	1	0.6

1 Dead

Forest Structure Sampling Method:

1/10 acre plot,
5 sample points



Forest Structure Analysis

4.2

The following parameters will be measured and evaluated at each site according to Figure D-2. Each parameter at each sample site will be given a value of 3, 2, 1, or 0. Three represents the most valuable structure and, the least valuable. Upon completion of the sampling, the person preparing the FSD will calculate the forest structure value for each stand. This analysis along with the other forest stand data will be used to determine the retention potential of the stand.

To determine the total habitat value use the following scale:

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⑨ 6-10	Good structure
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¹ Data included in Forest Stand Summary Sheet (See Table D-4).



Vortex Environmental

P.O. Box 176 • Strasburg, PA 17579 • (717) 687-4227 • Fax: (717) 687-4247 • E-mail: vortex@epix.net

January 26, 2004

Ms. Lori Byrne, E-1
Forest, Wildlife, and Heritage Service
Maryland Department of Natural Resources
Tawes State Office Building
580 Taylor Avenue
Annapolis, Maryland 21401

**RE: REMLE, INC. TRACT – TOWNHOUSE SUBDIVISION, TOWN OF ELKTON,
THIRD ELECTION DISTRICT, CECIL COUNTY, MARYLAND.**

Dear Ms. Byrne:

Vortex Environmental requests a specific search of the current Maryland Natural Heritage Program locational data fields for the REMLE, Inc. Tract – Townhouse Subdivision, Town of Elkton, 3rd Election District, Cecil County, Maryland. The site is located east of Whitehall Road, south of its intersection with Pulaski Highway (Route 40).

Enclosed you will find a USGS map (Elkton, MD-DEL) which identifies the approximately 60 acre tract. The site is dominated by mixed deciduous forest and forested non-tidal wetlands. A townhouse subdivision is proposed for the site. Environmental investigations of the site, including a non-tidal wetland investigation and forest stand delineation were conducted in January of 2004. Your prompt attention to this matter is greatly appreciated.

Sincerely,

Vortex Environmental

Bradly J. Gochnauer
Environmental Scientist

enclosure

**FOREST STAND DELINEATION
ON THE
HEUSTER PROPERTY**

Town of Elkton, 3rd Election District
Cecil County, Maryland

Prepared for:
Southside, LLC.
755 West Pulaski Highway
Elkton, MD 21921

Prepared by:
Vortex Environmental, Inc.
313 West Liberty Street, Suite 226
Lancaster, PA 1754.9533
(717) 509-3934 FAX (717) 509-2789

May 21, 2007

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Figure 3. Soils Map	4

APPENDIX A

Field sampling data sheets, forest structure data sheets, forest structure analysis, and forest stand summary sheets

APPENDIX B

Forest Stand Delineation Plan prepared at a scale of 1 inch = 150 feet

APPENDIX C

Maryland Natural Heritage Correspondence

INTRODUCTION

This report identifies and describes "forest stands" (see Regulatory Definitions) on the 54.953-acre Heuster Property, located in the Town of Elkton, 3rd Election District, Cecil County, Maryland. Based on the May 12 and 16, 2007, field investigations, 29.41 acres of forest, comprised of 4 distinct forest stands, occurring on the Heuster Property are subject to regulations under the Maryland Forest Conservation Act. The procedures described in the Town of Elkton Forest Conservation Regulations and Maryland Forest Conservation Manual were used to delineate the forest stands. These findings are based on review of background information and field investigations. The background information included topography, aerial photography, and the Cecil County Soil Survey. Field investigations were conducted by Bradley J. Gochner and Thomas M. Lugar on May 12 and 16, 2007, respectively. This report generally characterizes the project site and describes the methodology used to determine the location and structure of the forest stands. Locations of the stand and sampling plots are indicated on the Forest Stand Delineation Map presented in Appendix B.

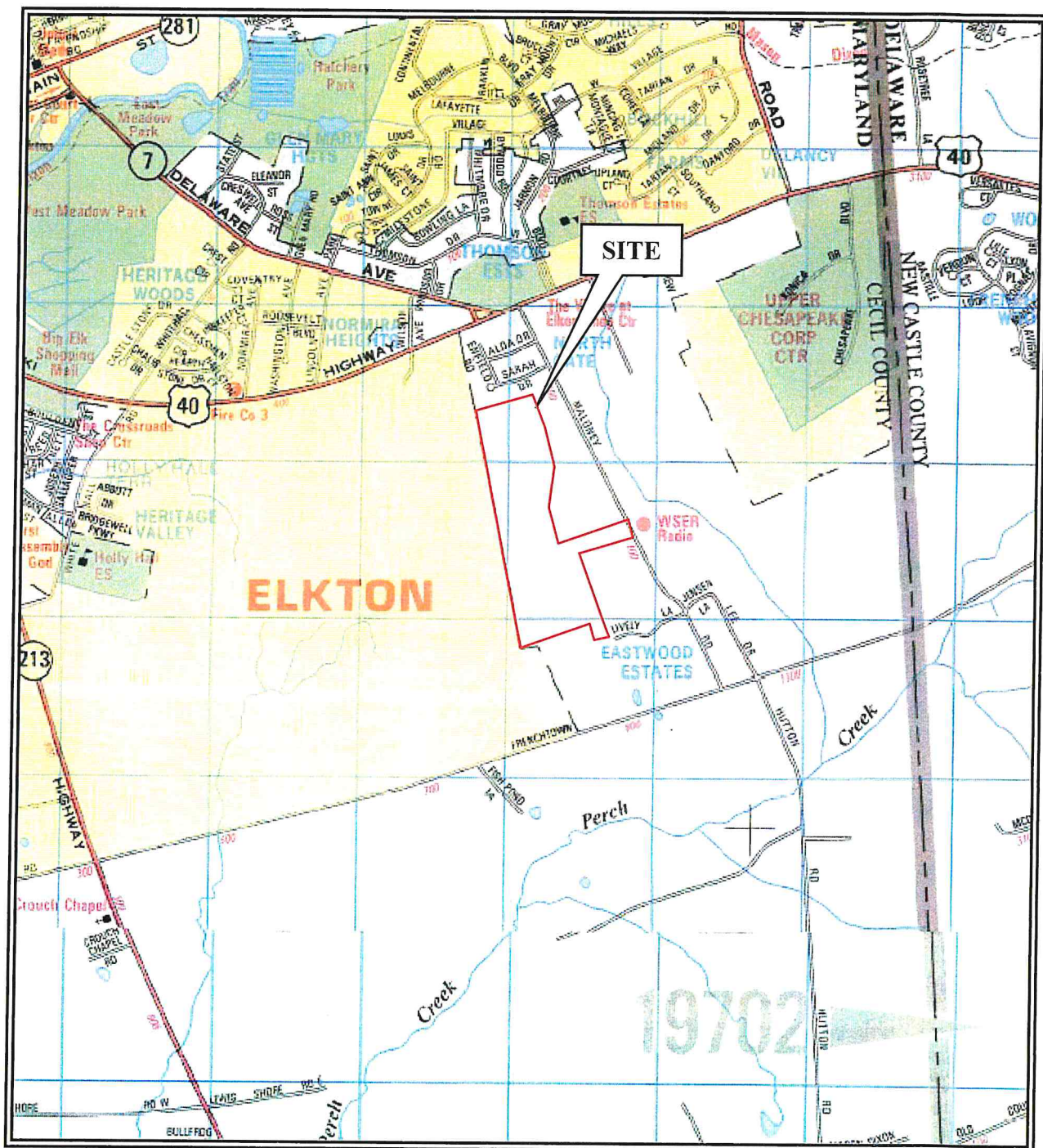
LOCATION

The Heuster Property is located in the Town of Elkton, 3rd Election District, Cecil County, Maryland. The project site is located west of Maloney Road, south its intersection with Sarah Drive (Figure 1). The project site is bounded to the north by residential properties and a farmette, to the south by agricultural land and a large residential property, to the west by agricultural land, and to the east by pasture and residential properties (Figure 2). The project site encompasses a total of 54.953 acres. The property consists of mixed deciduous forest, old field, scrub-shrub, and mowed turf lawn. There is an existing barn in the central portion of the site. There are also two unoccupied mobile homes in the central and southern portions of the site. An existing driveway provides access to the central portion of the site from Maloney Road.

BACKGROUND INFORMATION

HYDROLOGY and TOPOGRAPHY

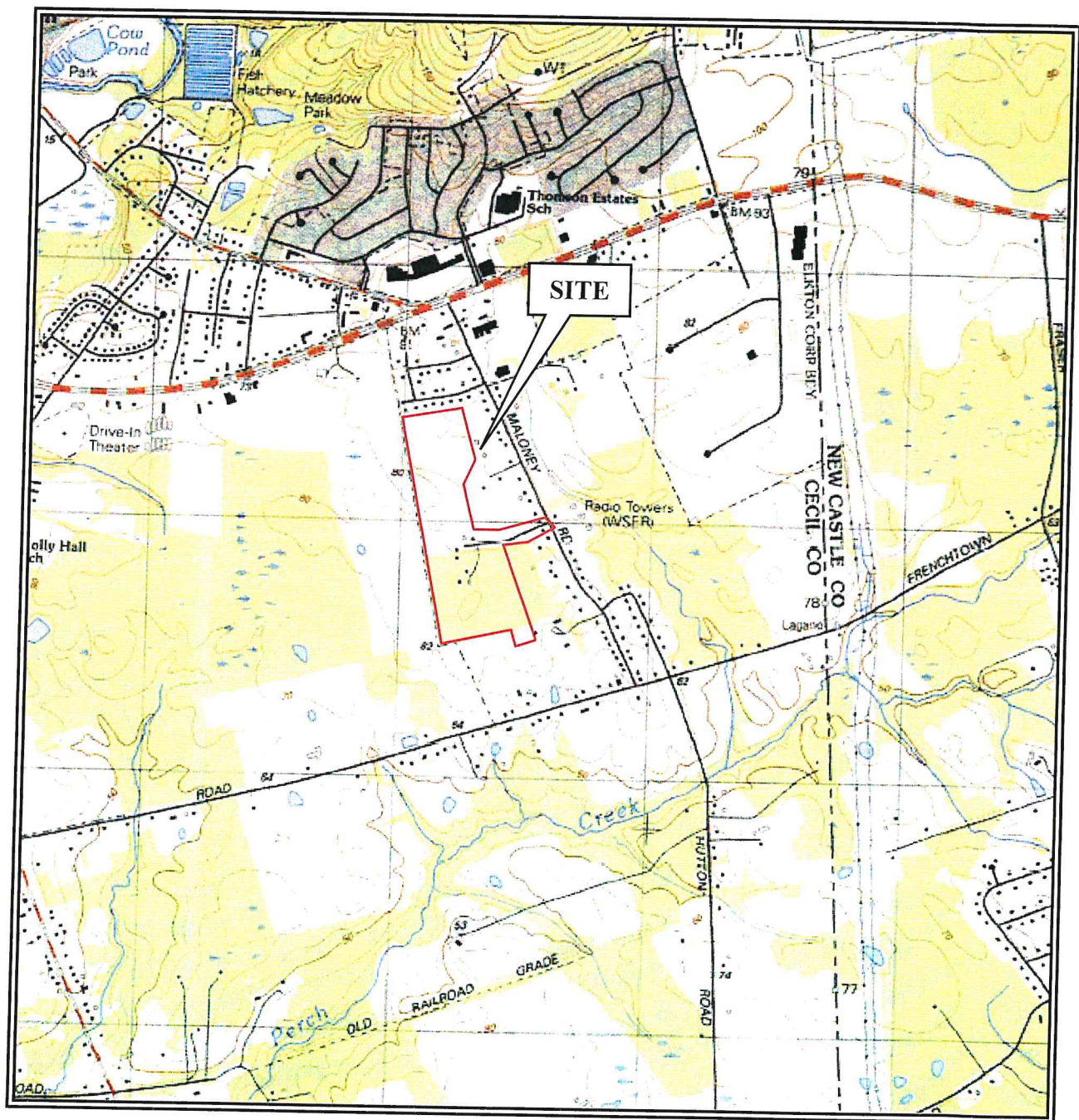
The topography of the site slopes is relatively level. The elevation averages between 70 and 80 feet above mean sea level throughout the site. Hydrology from site is conveyed via overland sheet flow to the eastern and southern boundaries of the site, and off-site. Wetland hydrology was observed within ten isolated non-tidal wetland areas located throughout the site. A wetland delineation was not conducted by Vortex Environmental, Inc. on the property, the location of the non-tidal wetland areas shown on the FSD (Appendix B) was provided by others.



Legend:
Property Boundary ———

Scale 1" = 2,000'

Figure 1: Site Location Map for the Heuster Property
Cecil County ADC Map
Map Sheets 13 & 18
Town of Elkton, Third Election District, Cecil County, Maryland



Legend:
Property Boundary ———

Scale 1"=2,000'

Figure 2: USGS Map for the Heuster Property
Elkton, MD-DE- 7.5 minute USGS Quadrangle Sheet
1992
Town of Elkton, Third Election District, Cecil County, Maryland

SOILS

Four soil series including five soil types (Elkton silt loam, EmA; Matapeake silt loam, MnB2; Sassafras sandy loam, SaB2; and Woodstown silt loam, WsA and WsB2) occur on Heuster Property according to the Cecil County Soil Survey (Figure 3). The Elkton silt loam is hydric according to the Hydric Soils of the United States and the "Hydric Soils of Cecil County".

Hydric soils were observed within the nine non-tidal wetlands located scattered the project site during the field investigations. The location of the non-tidal wetland areas on the FSD (Appendix B) was provided by others.

VEGETATION

A background data search was submitted to the Maryland Natural Heritage Program for the Heuster Property on May 3, 2007. The Maryland Natural Heritage Program, operated in conjunction with the Maryland Department of Natural Resources, is a site specific information system, which describes significant natural resources of Maryland. It includes data descriptive of plant and animal species of special concern, exemplary natural communities, and unique geological features. The response letter has not yet been received. The letter will be forwarded to the Town of Elkton Building and Planning Office upon receipt.

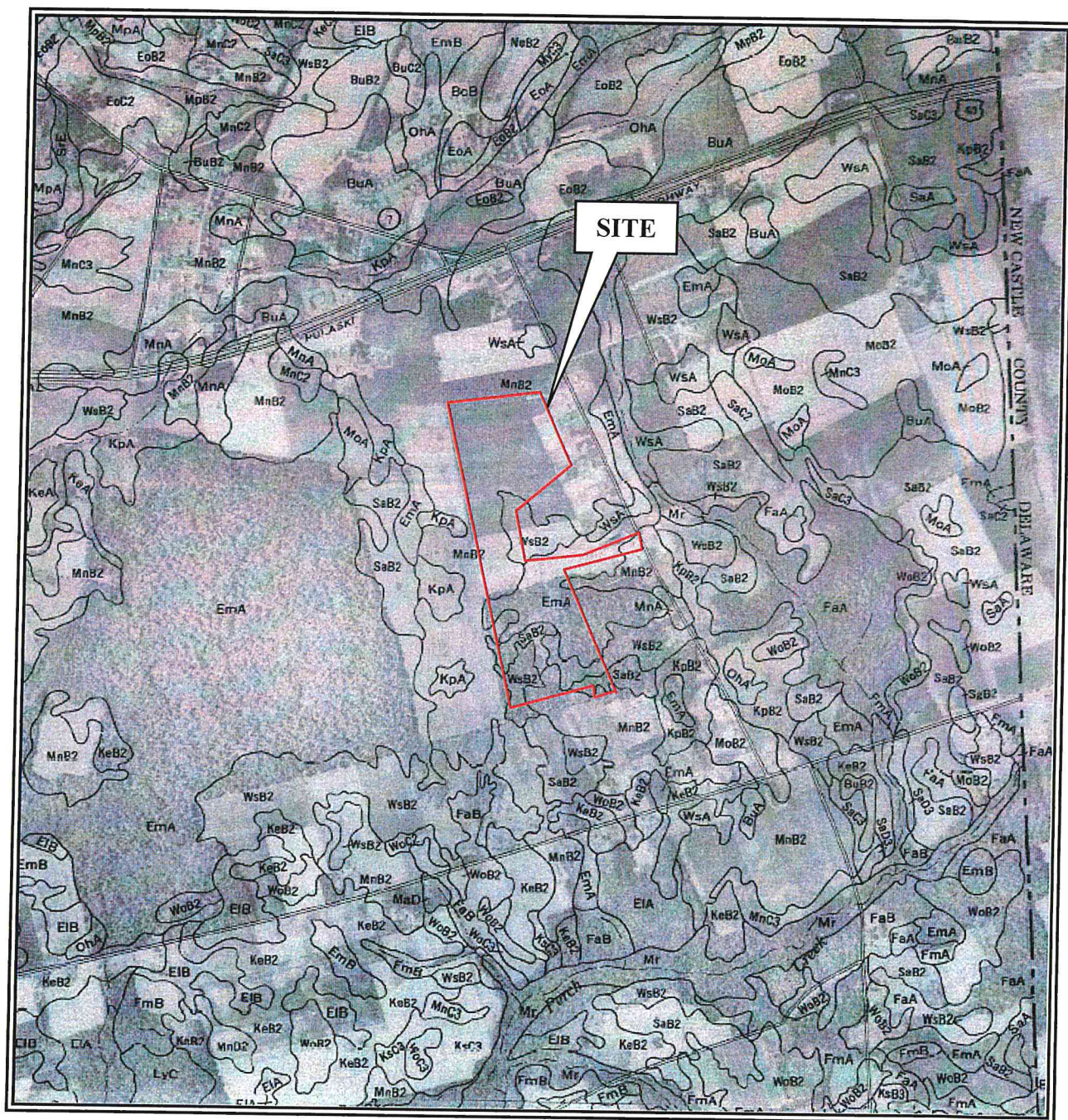
No rare, threatened, and/or endangered plants were observed on the site during our field investigation.

FIELD INVESTIGATIONS

METHODS

The procedures described in the Forest Conservation Technical Manual were used to delineate the forest stands. Site investigations were performed on May 12 and 16, 2007, respectively. A sketch plan and soils map was used as base maps during our field investigations. An initial reconnaissance-level survey was performed to analyze general site conditions, environmental features, and the location of forest stands. Forest structure analysis data (Tables D-1 through D-3) was obtained and recorded for each stand and is presented in Appendix A. Locations of sampling plots are presented in Appendix B.

Sampling intensity for the forest structure analysis was calculated at an intensity of approximately one sample plot per four acres of forest with a minimum of one sample plot per forest stand. Sampling plot locations were chosen at random in the office and were drawn on the preliminary forest stand delineation map prior to conducting field investigations. All sample plot locations were identified in the field with white and blue striped flagging. All sampling was conducted using methodologies approved by the Town of Elkton Office of Building and Planning. All forest stand information was obtained from a 1/10 acre plot using the fixed plot sampling method which involves the establishment of a 1/10 acre plot and direct measurement of forest stand information within that fixed plot. Basal area for each sampling plot was obtained using the variable plot sampling method using a Cruz-all angle gauge to count all trees with a basal factor 10.



Legend:
Property Boundary ———

Scale 1" = 1,320'

Figure 3: Soil Map for the Heuster Property
Soil Survey for Cecil County
Sheets 24 & 29, 1973
Town of Elkton, Third Election District, Cecil County, Maryland

The vegetation was identified in the field with the aid of The Flora of West Virginia, Newcomb's Wildflower Guide, The Tree Identification Book, The Shrub Identification Book, and The Textbook of Dendrology.

STAND CONDITIONS

Stand conditions are based on field investigations conducted on May 12 and 16, 2007, respectively. The vegetation on Heuster Property was characterized by species composition and divided into stands. Four forest stands were identified on the site, and are characterized below.

Forest Stand 1 – River Birch-Sycamore Association; totaling 5.31 acres

Forest Stand 1A/1B consisted of a River Birch-Sycamore association (best available SAF Forest Association cover type match). This forest stand was located in the southern portion of the site (Sampling Plots 1.1 and 1.2). This is a younger forest stand with an understory dominated by native and invasive herb, shrub and vine. Three specimen trees were observed within Stand 1A, a 32.5" pin oak, a 37" pin oak, and a 31" willow oak. Two specimen trees were observed within the southern portion of Stand 1B, a 32" southern red oak, and a 30" pin oak. No steep slopes were observed within this stand. Two non-tidal wetlands dominated Stand 1A, and two isolated, forested wetlands were observed within Stand 1B. The canopy was dominated by red maple (dominate size class – 6-10" DBH). The additional tree species included sweet gum, river birch, American beech, black gum, sassafras, and American sycamore. The understory consisted of May-apple, arrowwood, Virginia creeper, Japanese honeysuckle, and spicebush. The stand has an average forest structure value of 14 which corresponds to a good forest structure rating. Due to the presence of the non-tidal forested wetlands and their associated buffers, this stand receives a priority (PA-1) rating for forest conservation.

Forest Stand 2 – Tulip-Poplar Association; totaling 11.77 acres

Forest Stand 2 consisted of a Tulip-Poplar association (best available SAF Forest Association cover type match). This forest stand was located in the western portion of the site, including the forest adjacent to the western boundary of the central and northern portions of the site, (Sampling Plots 2.1-2.4). Eight specimen trees were observed within this stand, a 43" black cherry, a 32" pin oak, a 30" pin oak, a 33.75" black cherry, a 36.75" willow oak, a 30.5" willow oak, a 40" black cherry, and a 44" southern red oak. A portion of a non-tidal forested wetland and its associated buffer was observed in the northwestern portion of this stand near the western boundary of the site. A portion of the buffer of a forested, non-tidal wetland was observed in the southwestern portion of this stand. No steep slopes were observed within this stand. This is a mature upland forest stand with an understory dominated by native and invasive herb, shrub, sapling, and vine species. The canopy was dominated by sweet gum and black cherry (dominate size class – 10-17.99" DBH). The additional tree species included red maple, black gum, flowering dogwood, southern red oak, Virginia pine, and sassafras. The understory consisted of cleavers, Virginia creeper, Japanese honeysuckle, greenbriar, Allegheny blackberry, multiflora rose, arrowwood, spicebush, beech saplings, cherry saplings, and hickory saplings. The stand has an average forest structure value of 12.75 which corresponds to a good forest structure rating. Due to the presence of the non-tidal wetlands and numerous specimen trees, this stand receives a priority rating (PA-1) for conservation.

Forest Stand 3 – Tulip Poplar Association; totaling 2.16 acres

Forest Stand 3 consisted of a Tulip Poplar association (best available SAF Forest Association cover type match). This forest stand was observed in the northern portion of the site between two scrub-shrub areas. No specimen trees were observed within this stand. No steep slopes were observed within this stand. A portion of a non-tidal wetland and its associated buffer were observed within the southwestern portion of this stand. This is a mature upland forest stand with an understory dominated by native and invasive herb, shrub, and vine species. The canopy was dominated by osage-orange (dominate size class – 6-10" DBH). The additional tree species was black cherry. The understory consisted of garlic mustard, grasses, Indian strawberry, field garlic, Japanese honeysuckle, and greenbriar. This stand has an average forest structure value of 10 which corresponds to a good forest structure rating. Due to the presence of the non-tidal wetland and its associated buffer, this stand receives a priority (PA-1) rating for forest conservation.

Forest Stand 4 – Tulip-Poplar Association; totaling 10.21 acres

Forest Stand 4 consisted of a Tulip-Poplar association (best available SAF Forest Association cover type match). This forest stand was observed in the southeastern portion of the site (Sampling Plots 4.1-4.3). There were no specimen trees observed within this forest stand. A non-tidal wetland and its associated buffer were observed within the southwestern portion of this stand. Portions of two non-tidal wetlands and their associated buffers were observed in the northern portion of this stand. No steep slopes were observed within this stand. This is a mature forest stand dominated by native and invasive herb, shrub, vine, and sapling species. The canopy was dominated by white oak and pignut hickory (dominate size class – 18-29.9" DBH). The additional tree species included sweet gum, tulip-poplar, sweet birch, shagbark hickory, black gum, sassafras, red maple, flowering dogwood, and sweet cherry. The understory consisted of May-apple, sedge, hay-scented fern, ivy, Japanese honeysuckle, poison ivy, multiflora rose, Allegheny blackberry, high-bush blueberry, oak seedlings, sweet gum saplings, black cherry saplings, red maple saplings, hickory saplings, and American holly. This forest stand extends off-site to the east. The stand has an average forest structure value of 13 which corresponds to a good forest structure rating. Due to the presence of the non-tidal wetlands, this stand receives a priority (PA-1) rating for forest conservation.

ENVIRONMENTAL FEATURES

The Heuster Property was evaluated for the presence or absence of environmental features such as specimen trees, hydric soils, non-tidal wetlands, perennial and intermittent streams and their buffers, critical habitats, steep slopes or steep erodible soils, cultural features, historic sites, and adjacent land uses.

Three specimen trees (a 32.5 inch pin oak, a 37 inch pin oak, and a 31 inch willow oak) were observed within Stand 1A. Two specimen trees (a 32-inch southern red oak and a 30 inch pin oak) were observed within Stand 1B. Eight specimen trees (a 43inch black cherry, a 32 inch pin oak, a 30 inch pin oak, a 33.75 inch black cherry, a 36.75 inch willow oak, a 30.5 inch willow oak, a 40 inch black cherry, and a 44 inch southern red oak) were observed within Stand 2. Hydric soils and non-tidal wetlands were observed throughout the site. No watercourses were observed on the site.

No steep slopes greater than 25 percent or steep erodible soils greater than 15 percent with a K-value greater than 0.35 were observed on the site. The adjacent land uses to the site include residential properties, agricultural land, pasture, a farmette, mixed deciduous forest, and a local road.

CONCLUSION

The enclosed forest stand delineation map indicates the location of forest stands and environmental features on the 54.953-acre Heuster Property. Our determinations were based on background and field investigations of environmental features and species composition of the forest community. We conclude that four (4) forest stands consisting of 29.41 acres exist on the project site.

REGULATORY DEFINITIONS

Forests are defined by the Maryland Department of Natural Resources (MD DNR) (Chapter 255, Laws of Maryland, 1991) as "a biological community dominated by trees and other woody plants covering a land area of 10,000 square feet or greater. Forest included (1) areas that have at least 100 trees per acre with at least 50% of those having a two inch or greater diameter at 4.5 feet above ground and larger, and (2) forest areas that have been cut but not cleared. Forest does not include orchards".

Forest Stands are defined by the Maryland Department of Natural Resources (MD DNR) (Chapter 255, Laws of Maryland, 1991) as "a contiguous group of trees sufficiently uniform in species composition, arrangement of age classes, and condition to be a distinguishable, homogeneous unit".

Forest Stand Delineations are defined by the Maryland Department of Natural Resources (MD DNR) (Chapter 255, Laws of Maryland, 1991) as "the methodology for evaluating the existing natural features and vegetation on a site proposed for development, taking into account the environmental elements that shape or influence the structure or makeup of a plant community".

Intermittent Streams are defined by the Maryland Department of Natural Resources (MD DNR) (Chapter 255, Laws of Maryland, 1991) as "a stream in which surface water is absent during a portion of the year as shown on the most recent 7.5 minute topographic quadrangle published by the United States Geological Survey as confirmed by field verification".

Perennial Streams are defined by the Maryland Department of Natural Resources (MD DNR) (Chapter 255, Laws of Maryland, 1991) as "a stream containing surface water throughout an average rainfall year, as shown on the most recent 7.5 minute topographic quadrangle published by the United States Geological Survey as confirmed by field verification".

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- USGS (U.S. Geological Survey). Elkton, MD-DE 7.5-minute topographic USGS quadrangle. Department of Interior, Washington, DC. 1992. Scale: 1 inch = 2000 feet.

APPENDIX A

Field sampling data sheets, forest structure data sheets, forest structure analysis, and forest stand summary sheets

Table D-1: Field Sampling Data Sheet

Property Name: HEUSTER
 Stand # 1 Plot # 1

Prepared by: TOM LOUGHEE
 Date: 5/11/07

	Size Class of Trees Within the Sample Plot				
Tree Species (note dominant and co-dominant species)	Number of Trees 2-6" dbh	Number of Trees 6-10" dbh	Number of Trees 11-17" dbh	Number of Trees 18-29" dbh	Number of Trees >30" dbh
SWEET GUM	1				
RED BEECH	1	1			
RED MAPLE	HH HH	III	1		
AM. BEECH	1				
Number of Trees per size class	14	4	1		
List of understory species	MAY APPLE ARROWWOOD				
Basal Area	120				
Number of Dead Trees per plot	1				
Comments	YOUNG LOW-CYCLING MIXED DECIDUOUS FOREST IN CENTRAL PORTION OF SITE				

Table D-3: Forest Structure Data Sheet

Property : HEUSTER

Prepared by: TOM LUGAR

Stand #: 1

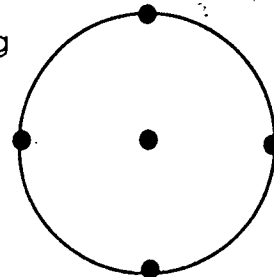
Plot #: 1

Date: 5/11/07

Forest Structure Variable	sample point 1	sample point 2	sample point 3	sample point 4	sample point 5	% yes
Canopy coverage	85%	80%	80%	85%	80%	82%
herbaceous ground cover	Y	Y	N	Y	Y	80%
downed woody debris	Y	N	N	N	Y	40%
invasive plant cover	N	N	N	N	N	0%
number of shrub species (1/100 acre)	0	0	0	0	1	0.2

Forest Structure Sampling Method:

1/10 acre plot,
5 sample points



1.1

Forest Structure Analysis

The following parameters will be measured and evaluated at each site according to Figure D-2. Each parameter at each sample site will be given a value of 3,2,1, or 0. Three represents the most valuable structure and , the least valuable. Upon completion of the sampling, the person preparing the FSD will caculate the forest structure value for each stand. This analysis along with the other forest stand data will be used to determine the retention potential of the stand.

To determine the total habitat value use the following scale:

Range of total habitat numbers from samples taken April - October:

15-21	Priority forest structure
7-14	Good forest structure
0-6	Poor forest structure

In the winter and late fall, from November - March, only numbers 1,3,4,5,7, can be measured. During that time, the range of total habitat numbers will be:

11-15	Priority forest structure
6-10	Good structure
0-5	Poor forest structure

1. Percent Canopy Closure
of trees with a DBH greater
than 7"

70% - 100 %
40% - 69%
10% - 39%
0% - 9%

3
2
1
0

5. Size Class of Dominant Trees₁

Greater than 20"
7" - 19.9"
3" - 6.9"
Less than 3"

3
2
1
0

2. Number of Understory Shrubs 1/100 acre

6 or more
4 - 5
2 - 4
0 - 1

3
2
1
0

6. Percent of Understory Herbaceous Coverage

75% - 100%
25% - 74%
5% - 24%
0% - 4%

3
2
1
0

3. Number of Dead Trees/tenth acre plot¹

3 or more
2
1
0

3
2
1
0

7. Number of Tree Species with a DBH
greater than 7"/plot¹

6 or more
4 - 5
2 - 4
0 - 1

3
2
1
0

4. Percent of Dead and Downed Woody
Material Present

15% - 100%
5" - 14"
0 - 1
0

3
2
1
0

13

¹ Data included in Forest Stand Summary Sheet (See Table D-4).

Table D-1: Field Sampling Data Sheet

Property Name: HEUSTER
Stand # 1 Plot # 2

Prepared by: TOM LOGAN
Date: 5/16/07

	Size Class of Trees Within the Sample Plot				
Tree Species (note dominant and co-dominant species)	Number of Trees 2-6" dbh	Number of Trees 6-10" dbh	Number of Trees 11-17" dbh	Number of Trees 18-29" dbh	Number of Trees >30" dbh
RED MAPLE	111	11			
SWEET GUM	1	1			
BLACK GUM		1			
RIVER BIRCH		1			
SASSAPARILLA	1				
AM. SYCAMORE	1				
Number of Trees per size class	6	5			
List of understory species	ARROWWOOD JAP. MONY SUCKLE VA. CREEPER SPICEBUSH				
Basal Area	100				
Number of Dead Trees per plot	2				
Comments	LOW LYING MIXED DECIDUOUS FOREST IN SOUTHERN PORTION OF SITE				

Table D-3: Forest Structure Data Sheet

Property : HEUSTER

Prepared by: TOM LUGAR

Stand #: 1

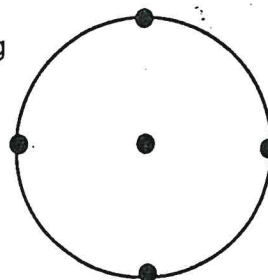
Plot #: 2

Date: 5/14/07

Forest Structure Variable	sample point 1	sample point 2	sample point 3	sample point 4	sample point 5	% yes
Canopy coverage	75%	65%	85%	65%	80%	74%
herbaceous ground cover	Y	Y	Y	Y	Y	100%
downed woody debris	Y	N	Y	N	N	40%
invasive plant cover	Y	Y	Y	Y	Y	100%
number of shrub species (1/100 acre)	3	3	1	2	5	(2.4)

Forest Structure Sampling Method:

1/10 acre plot,
5 sample points



1.2

Forest Structure Analysis

The following parameters will be measured and evaluated at each site according to Figure D-2. Each parameter at each sample site will be given a value of 3,2,1, or 0. Three represents the most valuable structure and , the least valuable. Upon completion of the sampling, the person preparing the FSD will caculate the forest structure value for each stand. This analysis along with the other forest stand data will be used to determine the retention potential of the stand.

To determine the total habitat value use the following scale:

Range of total habitat numbers from samples taken April - October:

15-21	Priority forest structure
7-14	Good forest structure
0-6	Poor forest structure

In the winter and late fall, from November - March, only numbers 1,3,4,5,7, can be measured. During that time, the range of total habitat numbers will be:

11-15	Priority forest structure
6-10	Good structure
0-5	Poor forest structure

1. Percent Canopy Closure
of trees with a DBH greater
than 7"

70% - 100 %	3
40% - 69%	2
10% - 39%	1
0% - 9%	0

5. Size Class of Dominant Trees¹

Greater than 20"	3
7" - 19.9"	2
3" - 6.9"	1
Less than 3"	0

2. Number of Understory Shrubs 1/100 acre

6 or more	3
4 - 5	2
2 - 4	1
0 - 1	0

6. Percent of Understory Herbaceous Coverage

75% - 100%	3
25% - 74%	2
5% - 24%	1
0% - 4%	0

3. Number of Dead Trees/tenth acre plot¹

3 or more	3
2	2
1	1
0	0

7. Number of Tree Species with a DBH
greater than 7"/plot¹

6 or more	3
4 - 5	2
2 - 4	1
0 - 1	0

4. Percent of Dead and Downed Woody
Material Present

15% - 100%	3
5" - 14"	2
0 - 1	1
0	0

15

¹ Data included in Forest Stand Summary Sheet (See Table D-4).

Table D-1: Field Sampling Data Sheet

Property Name: HEUSTER
Stand # 2 Plot # 1

Prepared by: TDM
Date: 5/11/07 LUGAR

	Size Class of Trees Within the Sample Plot				
Tree Species (note dominant and co-dominant species)	Number of Trees 2-6" dbh	Number of Trees 6-10" dbh	Number of Trees 11-17" dbh	Number of Trees 18-29" dbh	Number of Trees >30" dbh
RED MAPLE	1			1	
SWEET GUM	1		III		
BLACK GUM	III				
Number of Trees per size class	5		3	1	
List of understory species	VA UNILIFERA CHERRY SAPLINGS JAP. HONEYSUCKLE ARNICA MULTIFLORA ROSE				
Basal Area	110				
Number of Dead Trees per plot	Ø				
Comments	CENTRAL PORTION OF SITE				

Table D-3: Forest Structure Data Sheet

Property : HEUSTER

Prepared by: TOM LUGAR

Stand #: 2

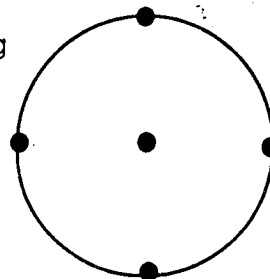
Plot #: 1

Date: 5/11/07

Forest Structure Variable	sample point 1	sample point 2	sample point 3	sample point 4	sample point 5	% yes
Canopy coverage	60%	70%	80%	70%	65%	69%
herbaceous ground cover	Y	Y	Y	Y	Y	100%
downed woody debris	Y	N	Y	Y	N	60%
invasive plant cover	Y	Y	Y	Y	Y	100%
number of shrub species (1/100 acre)	5	3	4	4	5	(4.2)

Forest Structure Sampling Method:

1/10 acre plot,
5 sample points



2.1

Forest Structure Analysis

The following parameters will be measured and evaluated at each site according to Figure D-2. Each parameter at each sample site will be given a value of 3,2,1, or 0. Three represents the most valuable structure and, the least valuable. Upon completion of the sampling, the person preparing the FSD will calculate the forest structure value for each stand. This analysis along with the other forest stand data will be used to determine the retention potential of the stand.

To determine the total habitat value use the following scale:

Range of total habitat numbers from samples taken April - October:

13	15-21	Priority forest structure
	<u>7-14</u>	<u>Good forest structure</u>
	0-6	Poor forest structure

In the winter and late fall, from November - March, only numbers 1,3,4,5,7, can be measured. During that time, the range of total habitat numbers will be:

11-15	Priority forest structure
6-10	Good structure
0-5	Poor forest structure

1. Percent Canopy Closure of trees with a DBH greater than 7"

70% - 100 %	3
40% - 69%	<u>2</u>
10% - 39%	1
0% - 9%	0

5. Size Class of Dominant Trees¹

Greater than 20"	3
7" - 19.9"	<u>2</u>
3" - 6.9"	1
Less than 3"	0

2. Number of Understory Shrubs 1/100 acre

6 or more	3
4 - 5	<u>2</u>
2 - 4	1
0 - 1	0

6. Percent of Understory Herbaceous Coverage

75% - 100%	<u>3</u>
25% - 74%	2
5% - 24%	1
0% - 4%	0

3. Number of Dead Trees/tenth acre plot¹

3 or more	3
2	2
1	<u>1</u>
0	<u>0</u>

7. Number of Tree Species with a DBH greater than 7"/plot¹

6 or more	3
4 - 5	2
2 - 4	<u>1</u>
0 - 1	0

4. Percent of Dead and Downed Woody Material Present

15% - 100%	<u>3</u>
5" - 14"	2
0 - 1	1
0	0

13

¹ Data included in Forest Stand Summary Sheet (See Table D-4).

Table D-1: Field Sampling Data Sheet

Property Name: HEUSTER
 Stand # 2 Plot # 2

Prepared by: TOM LOGAN
 Date: 5/16/07

	Size Class of Trees Within the Sample Plot				
Tree Species (note dominant and co-dominant species)	Number of Trees 2-6" dbh	Number of Trees 6-10" dbh	Number of Trees 11-17" dbh	Number of Trees 18-29" dbh	Number of Trees >30" dbh
<u>FLOWERING DOGWOOD</u>	<u>11</u>				
<u>S. RED OAK</u>			<u>1</u>		
<u>SWEET GUM</u>		<u>1</u>	<u>11</u>	<u>1</u>	
<u>RED MAPLE</u>	<u>11</u>				
Number of Trees per size class <u>(9)</u>	<u>4</u>	<u>1</u>	<u>3</u>	<u>1</u>	
List of understory species	<u>HICKORY SEEDLINGS VA CREEPER</u> <u>BLACK CHERRY SAPLINGS JAP. NONNET SUCKLE</u> <u>MULTIFLORA ROSE</u>				
Basal Area	<u>120</u>				
Number of Dead Trees per plot	<u>1</u>				
Comments	<u>MATURE MIXED DECIDUOUS FOREST IN THE WESTERN PORTION OF THE SITE</u>				

Table D-3: Forest Structure Data Sheet

Property : HEUSTER

Prepared by: TOM LUGAR

Stand #: 2

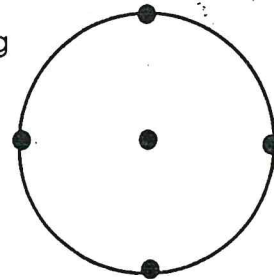
Plot #: 2

Date: 5/16/07

Forest Structure Variable	sample point 1	sample point 2	sample point 3	sample point 4	sample point 5	% yes
Canopy coverage	80%	80%	75%	70%	75%	76%
herbaceous ground cover	Y	Y	Y	Y	Y	100%
downed woody debris	N	N	N	N	Y	20%
invasive plant cover	Y	Y	Y	Y	Y	100%
number of shrub species (1/100 acre)	3	5	4	4	4	4.0

Forest Structure Sampling Method:

1/10 acre plot,
5 sample points



2.2

Forest Structure Analysis

The following parameters will be measured and evaluated at each site according to Figure D-2. Each parameter at each sample site will be given a value of 3, 2, 1, or 0. Three represents the most valuable structure and , the least valuable. Upon completion of the sampling, the person preparing the FSD will calculate the forest structure value for each stand. This analysis along with the other forest stand data will be used to determine the retention potential of the stand.

To determine the total habitat value use the following scale:

Range of total habitat numbers from samples taken April - October:

15	15-21	Priority forest structure
	7-14	Good forest structure
	0-6	Poor forest structure

In the winter and late fall, from November - March, only numbers 1, 3, 4, 5, 7, can be measured. During that time, the range of total habitat numbers will be:

11-15	Priority forest structure
6-10	Good structure
0-5	Poor forest structure

1. Percent Canopy Closure of trees with a DBH greater than 7"

70% - 100 %	3
40% - 69%	2
10% - 39%	1
0% - 9%	0

5. Size Class of Dominant Trees¹

Greater than 20"	3
7" - 19.9"	2
3" - 6.9"	1
Less than 3"	0

2. Number of Understory Shrubs 1/100 acre

6 or more	3
4 - 5	2
2 - 4	1
0 - 1	0

6. Percent of Understory Herbaceous Coverage

75% - 100%	3
25% - 74%	2
5% - 24%	1
0% - 4%	0

3. Number of Dead Trees/tenth acre plot¹

3 or more	3
2	2
1	1
0	0

7. Number of Tree Species with a DBH greater than 7"/plot¹

6 or more	3
4 - 5	2
2 - 4	1
0 - 1	0

4. Percent of Dead and Downed Woody Material Present

15% - 100%	3
5" - 14"	2
0 - 1	1
0	0

15

¹ Data included in Forest Stand Summary Sheet (See Table D-4).

Table D-1: Field Sampling Data Sheet

Property Name: HEUSTER
Stand # 2 Plot # 3

Prepared by:
Date: 5/16/07

	Size Class of Trees Within the Sample Plot				
Tree Species (note dominant and co-dominant species)	Number of Trees 2-6" dbh	Number of Trees 6-10" dbh	Number of Trees 11-17" dbh	Number of Trees 18-29" dbh	Number of Trees >30" dbh
<u>RED MAPLE</u>	<u>11</u>				
<u>V. PINE</u>	<u>1</u>	<u>111</u>	<u>1</u>		
<u>FLOWERING DOGWOOD</u>	<u>111</u>				
<u>WEET GUM</u>	<u>1</u>		<u>11</u>		
Number of Trees per size class <u>(13)</u>	<u>7</u>	<u>3</u>	<u>3</u>		
List of understory species	<u>CLEAVES</u> <u>SPICEBUSH</u> <u>V.A. CREEPER</u> <u>JAP. HONEY SUCKLE</u> <u>ARROWWOOD</u> <u>BEECH SAPLINGS</u>				
Basal Area	<u>170</u>				
Number of Dead Trees per plot	<u>Ø</u>				
Comments	<u>MATURE MIXED DECIDUOUS FOREST IN</u> <u>THE SOUTHWESTERN PORTION OF THE SITE</u>				

Table D-3: Forest Structure Data Sheet

Property : HEUSTER

Stand #: 2

Plot #: 3

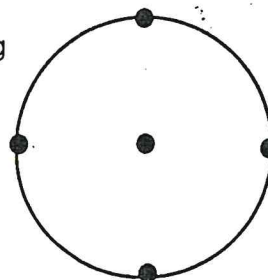
Prepared by: TOM LUGAR

Date: 5/16/07

Forest Structure Variable	sample point 1	sample point 2	sample point 3	sample point 4	sample point 5	% yes
Canopy coverage	70%	75%	75%	75%	75%	74%
herbaceous ground cover	Y	Y	Y	Y	Y	100%
downed woody debris	N	Y	N	N	N	20%
invasive plant cover	Y	Y	Y	Y	Y	100%
number of shrub species (1/100 acre)	1	3	2	4	3	(2.8)

Forest Structure Sampling Method:

1/10 acre plot,
5 sample points



2.3

Forest Structure Analysis

The following parameters will be measured and evaluated at each site according to Figure D-2. Each parameter at each sample site will be given a value of 3,2,1, or 0. Three represents the most valuable structure and , the least valuable. Upon completion of the sampling, the person preparing the FSD will calculate the forest structure value for each stand. This analysis along with the other forest stand data will be used to determine the retention potential of the stand.

To determine the total habitat value use the following scale:

Range of total habitat numbers from samples taken April - October:

13	15-21	Priority forest structure
	7-14	Good forest structure
	0-6	Poor forest structure

In the winter and late fall, from November - March, only numbers 1,3,4,5,7, can be measured. During that time, the range of total habitat numbers will be:

11-15	Priority forest structure
6-10	Good structure
0-5	Poor forest structure

1.	Percent Canopy Closure of trees with a DBH greater than 7"		5.	Size Class of Dominant Trees ¹	
	70% - 100 %	3		Greater than 20"	3
	40% - 69%	2		7" - 19.9"	2
	10% - 39%	1		3" - 6.9"	1
	0% - 9%	0		Less than 3"	0
2.	Number of Understory Shrubs 1/100 acre		6.	Percent of Understory Herbaceous Coverage	
	6 or more	3		75% - 100%	3
	4 - 5	2		25% - 74%	2
	2 - 4	1		5% - 24%	1
	0 - 1	0		0% - 4%	0
3.	Number of Dead Trees/tenth acre plot ¹		7.	Number of Tree Species with a DBH greater than 7"/plot ¹	
	3 or more	3		6 or more	3
	2	2		4 - 5	2
	1	1		2 - 4	1
	0	0		0 - 1	0
4.	Percent of Dead and Downed Woody Material Present				
	15% - 100%	3			
	5" - 14"	2			
	0 - 1	1			
	0	0			

13

¹ Data included in Forest Stand Summary Sheet (See Table D-4).

Table D-1: Field Sampling Data Sheet

Property Name: HEUSTER

Stand # 2

Plot # 4

Prepared by: TOM LUGAR

Date: 5/16/07

	Size Class of Trees Within the Sample Plot				
Tree Species (note dominant and co-dominant species)	Number of Trees 2-6" dbh	Number of Trees 6-10" dbh	Number of Trees 11-17" dbh	Number of Trees 18-29" dbh	Number of Trees >30" dbh
<u>BLACK CHERRY</u>		<u>11</u>	<u>11</u>		
<u>SASSAPARILLA</u>	<u>HHHH</u>	<u>11</u>			
Number of Trees per size class <u>(20)</u>	<u>14</u>	<u>4</u>	<u>2</u>		
List of understory species	<u>GREEN BOLT</u> <u>ALLEGHENY</u> <u>BLACKBERRY</u> <u>JAP. HONEYSUCKLER</u>				
Basal Area	<u>90</u>				
Number of Dead Trees per plot	<u>1</u>				
Comments	<u>MIXED DECIDUOUS FOREST STRIP ADJ. TO WESTERN BOUNDARY</u>				

Table D-3: Forest Structure Data Sheet

Property : HEUSTER

Prepared by: TOM LUGAR

Stand #: 2

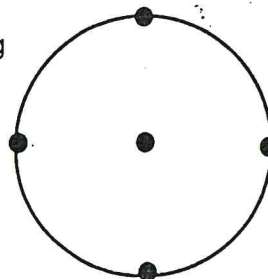
Plot #: 4

Date: 5/16/07

Forest Structure Variable	sample point 1	sample point 2	sample point 3	sample point 4	sample point 5	% yes
Canopy coverage	50%	60%	65%	65%	70%	62%
herbaceous ground cover	Y	Y	Y	Y	Y	100%
downed woody debris	N	N	N	N	N	0%
invasive plant cover	Y	Y	Y	Y	Y	100%
number of shrub species (1/100 acre)	1	2	2	1	2	(1.6)

Forest Structure Sampling Method:

1/10 acre plot,
5 sample points



2.4

Forest Structure Analysis

The following parameters will be measured and evaluated at each site according to Figure D-2. Each parameter at each sample site will be given a value of 3,2,1, or 0. Three represents the most valuable structure and , the least valuable. Upon completion of the sampling, the person preparing the FSD will caculate the forest structure value for each stand. This analysis along with the other forest stand data will be used to determine the retention potential of the stand.

To determine the total habitat value use the following scale:

Range of total habitat numbers from samples taken April - October:

15-21	Priority forest structure
<u>7-14</u>	Good forest structure
0-6	Poor forest structure

In the winter and late fall, from November - March, only numbers 1,3,4,5,7, can be measured. During that time, the range of total habitat numbers will be:

11-15	Priority forest structure
6-10	Good structure
0-5	Poor forest structure

1.	Percent Canopy Closure of trees with a DBH greater than 7"		5.	Size Class of Dominant Trees ₁	
	70% - 100 %	3		Greater than 20"	3
	40% - 69%	2		7" - 19.9"	2
	10% - 39%	1		3" - 6.9"	1
	0% - 9%	0		Less than 3"	0
2.	Number of Understory Shrubs 1/100 acre		6.	Percent of Understory Herbaceous Coverage	
	6 or more	3		75% - 100%	3
	4 - 5	2		25% - 74%	2
	2 - 4	1		5% - 24%	1
	0 - 1	0		0% - 4%	0
3.	Number of Dead Trees/tenth acre plot ¹		7.	Number of Tree Species with a DBH greater than 7"/plot ¹	
	3 or more	3		6 or more	3
	2	2		4 - 5	2
	1	1		2 - 4	1
	0	0		0 - 1	0
4.	Percent of Dead and Downed Woody Material Present				
	15% - 100%	3			
	5" - 14"	2			
	0 - 1	1			
	0	0			

10

¹ Data included in Forest Stand Summary Sheet (See Table D-4).

Table D-1: Field Sampling Data Sheet

Property Name: HEUSTER
Stand # 3 Plot # 1

Prepared by: 5/16/07
Date: 5/16/07

	Size Class of Trees Within the Sample Plot				
Tree Species (note dominant and co-dominant species)	Number of Trees 2-6" dbh	Number of Trees 6-10" dbh	Number of Trees 11-17" dbh	Number of Trees 18-29" dbh	Number of Trees >30" dbh
BLACK CHERRY	1		1		
OSAGE-ORANGE	1	HHH	10	11	
Number of Trees per size class	(9) 2	5	3	2	
List of understory species	GARLIC MUSTARD GRASSES JAP HONEYSUCKLE GREENBRIAR FIELD INDIAN STRAWBERRY GARLIC				
Basal Area	90				
Number of Dead Trees per plot	0				
Comments	MATURE MIXED DECIDUOUS FOREST ADJ. TO NORTHERN BOUNDARY				

Table D-3: Forest Structure Data Sheet

Property : HEUSTER

Stand #: 3

Plot #: 1

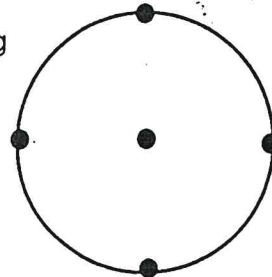
Prepared by: TOM LUGAR

Date: 5/16/07

Forest Structure Variable	sample point 1	sample point 2	sample point 3	sample point 4	sample point 5	% yes
Canopy coverage	90%	75%	80%	65%	75%	77%
herbaceous ground cover	Y	Y	Y	Y	Y	100%
downed woody debris	N	N	N	N	N	0%
invasive plant cover	Y	Y	Y	Y	Y	100%
number of shrub species (1/100 acre)	1	0	0	0	0	0.2

Forest Structure Sampling Method:

1/10 acre plot,
5 sample points



3.1

Forest Structure Analysis

The following parameters will be measured and evaluated at each site according to Figure D-2. Each parameter at each sample site will be given a value of 3,2,1, or 0. Three represents the most valuable structure and , the least valuable. Upon completion of the sampling, the person preparing the FSD will caculate the forest structure value for each stand. This analysis along with the other forest stand data will be used to determine the retention potential of the stand.

To determine the total habitat value use the following scale:

Range of total habitat numbers from samples taken April - October:

15-21	Priority forest structure
7-14	Good forest structure
0-6	Poor forest structure

In the winter and late fall, from November - March, only numbers 1,3,4,5,7, can be measured. During that time, the range of total habitat numbers will be:

11-15	Priority forest structure
6-10	Good structure
0-5	Poor forest structure

1. Percent Canopy Closure
of trees with a DBH greater
than 7"

70% - 100 %
40% - 69%
10% - 39%
0% - 9%

3
2
1
0

5. Size Class of Dominant Trees¹

Greater than 20"
7" - 19.9"
3" - 6.9"
Less than 3"

3
2
1
0

2. Number of Understory Shrubs 1/100 acre

6 or more
4 - 5
2 - 4
0 - 1

3
2
1
0

6. Percent of Understory Herbaceous Coverage

75% - 100%
25% - 74%
5% - 24%
0% - 4%

3
2
1
0

3. Number of Dead Trees/tenth acre plot¹

3 or more
2
1
0

3
2
1
0

7. Number of Tree Species with a DBH
greater than 7"/plot¹

6 or more
4 - 5
2 - 4
0 - 1

3
2
1
0

4. Percent of Dead and Downed Woody
Material Present

15% - 100%
5" - 14"
0 - 1
0

3
2
1
0

10

¹ Data included in Forest Stand Summary Sheet (See Table D-4).

Table D-1: Field Sampling Data Sheet

Property Name: HEUSTER
Stand # 4 Plot # 3

Prepared by: TOM LUGER
Date: 5/16/07

	Size Class of Trees Within the Sample Plot				
Tree Species (note dominant and co-dominant species)	Number of Trees 2-6" dbh	Number of Trees 6-10" dbh	Number of Trees 11-17" dbh	Number of Trees 18-29" dbh	Number of Trees >30" dbh
WHITE OAK			1	1	
BLACK GUM			1		
RED MAPLE		1	1		
FLOWERING DOGWOOD	1				
SWEETCHERRY	1				
Number of Trees per size class	2	1	3	1	
List of understory species	POISON IVY BLACK CHERRY SAPLINGS AM. HOLLY HICKORY SAPLINGS HAY-SCENTED FERN ALLBERRY BLACKBERRY				
Basal Area	90				
Number of Dead Trees per plot	0				
Comments	MATURE MIXED DECIDUOUS FOREST IN THE EASTERN PORTION OF THE SITE				

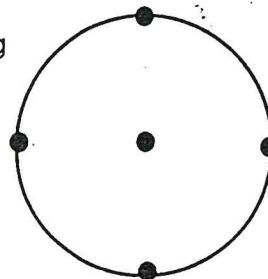
Table D-3: Forest Structure Data Sheet

Property : HEVSTER Prepared by: TOM LUGAR
 Stand #: 4 Plot #: 3 Date: 5/16/07

Forest Structure Variable	sample point 1	sample point 2	sample point 3	sample point 4	sample point 5	% yes
Canopy coverage	75%	80%	70%	85%	80%	78%
herbaceous ground cover	Y	Y	Y	Y	Y	100%
downed woody debris	Y	N	N	N	N	20%
invasive plant cover	N	N	N	N	N	0%
number of shrub species (1/100 acre)	1	1	3	3	6	1.6

Forest Structure Sampling Method:

1/10 acre plot,
5 sample points



4.3

Forest Structure Analysis

The following parameters will be measured and evaluated at each site according to Figure D-2. Each parameter at each sample site will be given a value of 3,2,1, or 0. Three represents the most valuable structure and , the least valuable. Upon completion of the sampling, the person preparing the FSD will calculate the forest structure value for each stand. This analysis along with the other forest stand data will be used to determine the retention potential of the stand.

To determine the total habitat value use the following scale:

Range of total habitat numbers from samples taken April - October:

13	15-21	Priority forest structure
	7-14	Good forest structure
	0-6	Poor forest structure

In the winter and late fall, from November - March, only numbers 1,3,4,5,7, can be measured. During that time, the range of total habitat numbers will be:

11-15	Priority forest structure
6-10	Good structure
0-5	Poor forest structure

1.	Percent Canopy Closure of trees with a DBH greater than 7"		5.	Size Class of Dominant Trees ¹	
	70% - 100 %	3		Greater than 20"	3
	40% - 69%	2		7" - 19.9"	2
	10% - 39%	1		3" - 6.9"	1
	0% - 9%	0		Less than 3"	0
2.	Number of Understory Shrubs 1/100 acre		6.	Percent of Understory Herbaceous Coverage	
	6 or more	3		75% - 100%	3
	4 - 5	2		25% - 74%	2
	2 - 4	1		5% - 24%	1
	0 - 1	0		0% - 4%	0
3.	Number of Dead Trees/tenth acre plot ¹		7.	Number of Tree Species with a DBH greater than 7"/plot ¹	
	3 or more	3		6 or more	3
	2	2		4 - 5	2
	1	1		2 - 4	1
	0	0		0 - 1	0
4.	Percent of Dead and Downed Woody Material Present				
	15% - 100%	3			
	5" - 14"	2			
	0 - 1	1			
	0	0			

13

¹ Data included in Forest Stand Summary Sheet (See Table D-4).

Table D-1: Field Sampling Data Sheet

Property Name: HEUSTER
Stand # 4 Plot # 1

Prepared by: TOM LOGAN
Date: 5/16/07

	Size Class of Trees Within the Sample Plot				
Tree Species (note dominant and co-dominant species)	Number of Trees 2-6" dbh	Number of Trees 6-10" dbh	Number of Trees 11-17" dbh	Number of Trees 18-29" dbh	Number of Trees >30" dbh
<u>PIGNOT HICKORY</u>	<u>111</u>		<u>1111</u>		
<u>WHITE OAK</u>				<u>11</u>	
<u>SWEET GUM</u>	<u>1</u>		<u>1</u>		
Number of Trees per size class <u>(11)</u>	<u>4</u>		<u>5</u>	<u>2</u>	
List of understory species	<u>RED MAPLE SAPLINGS SEDGE JAP. HORNETSUCKLE</u> <u>MAY-APPLE BLACK CHERRY SAPLINGS</u> ^{N. Y.} <u>MULTIFLORA ROSE</u>				
Basal Area	<u>120</u>				
Number of Dead Trees per plot	<u>0</u>				
Comments	<u>MATURE MIXED DECIDUOUS FOREST IN THE SOUTH-CENTRAL PORTION OF THE SITE</u>				

Table D-3: Forest Structure Data Sheet

Property : HEUSTER

Prepared by: TOM LUGAR

Stand #: 4

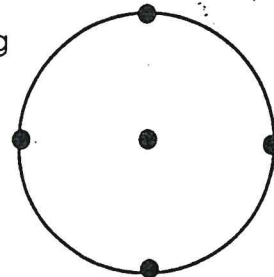
Plot #: 1

Date: 5/16/07

Forest Structure Variable	sample point 1	sample point 2	sample point 3	sample point 4	sample point 5	% yes
Canopy coverage	80%	80%	75%	85%	65%	77%
herbaceous ground cover	Y	Y	Y	Y	Y	100%
downed woody debris	N	N	N	N	Y	20%
invasive plant cover	Y	N	N	N	Y	40%
number of shrub species (1/100 acre)	1	0	5	0	5	(2.2)

Forest Structure Sampling Method:

1/10 acre plot,
5 sample points



4.1

Forest Structure Analysis

The following parameters will be measured and evaluated at each site according to Figure D-2. Each parameter at each sample site will be given a value of 3,2,1, or 0. Three represents the most valuable structure and , the least valuable. Upon completion of the sampling, the person preparing the FSD will calculate the forest structure value for each stand. This analysis along with the other forest stand data will be used to determine the retention potential of the stand.

To determine the total habitat value use the following scale:

Range of total habitat numbers from samples taken April - October:

15-21	Priority forest structure
7-14	Good forest structure
0-6	Poor forest structure

In the winter and late fall, from November - March, only numbers 1,3,4,5,7, can be measured. During that time, the range of total habitat numbers will be:

11-15	Priority forest structure
6-10	Good structure
0-5	Poor forest structure

1. Percent Canopy Closure of trees with a DBH greater than 7"

70% - 100 %	3
40% - 69%	2
10% - 39%	1
0% - 9%	0

5. Size Class of Dominant Trees¹

Greater than 20"	3
7" - 19.9"	2
3" - 6.9"	1
Less than 3"	0

2. Number of Understory Shrubs 1/100 acre

6 or more	3
4 - 5	2
2 - 4	1
0 - 1	0

6. Percent of Understory Herbaceous Coverage

75% - 100%	3
25% - 74%	2
5% - 24%	1
0% - 4%	0

3. Number of Dead Trees/tenth acre plot¹

3 or more	3
2	2
1	1
0	0

7. Number of Tree Species with a DBH greater than 7"/plot¹

6 or more	3
4 - 5	2
2 - 4	1
0 - 1	0

4. Percent of Dead and Downed Woody Material Present

15% - 100%	3
5" - 14"	2
0 - 1	1
0	0

14

¹ Data included in Forest Stand Summary Sheet (See Table D-4).

Table D-1: Field Sampling Data Sheet

Property Name: HEUSTER
Stand # 4 Plot # 2

Prepared by: TOM LOGAN
Date: 5/16/07

	Size Class of Trees Within the Sample Plot				
Tree Species (note dominant and co-dominant species)	Number of Trees 2-6" dbh	Number of Trees 6-10" dbh	Number of Trees 11-17" dbh	Number of Trees 18-29" dbh	Number of Trees >30" dbh
TULIP-POPLAR					
PIGNUT HICKORY				1	
SWEET BIRCH					
SWEET GUM	1				
SHAGBARK HICKORY	1				
WHITE OAK			1		
BLACK GUM					
SASSAPARILLA	11				
Number of Trees per size class	22		1	1	
List of understory species	SWEET GUM SAPLINGS HIGH-BUSH BLUEBERRY OAK SEEDLINGS POISON IVY				
Basal Area	90				
Number of Dead Trees per plot	0				
Comments	YOUNGER MIXED DECIDUOUS FOREST IN THE SOUTHEASTERN PORTION OF THE SITE				

Table D-3: Forest Structure Data Sheet

Property : HEUSTER

Prepared by: TOM LUGAR

Stand #: 4

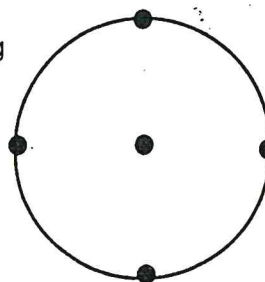
Plot #: 2

Date: 5/16/07

Forest Structure Variable	sample point 1	sample point 2	sample point 3	sample point 4	sample point 5	% yes
Canopy coverage	90%	85%	90%	70%	85%	84%
herbaceous ground cover	N	Y	Y	Y	N	60%
downed woody debris	Y	N	N	N	N	20%
invasive plant cover	N	Y	N	Y	N	40%
number of shrub species (1/100 acre)	0	2	3	1	3	(1.4)

Forest Structure Sampling Method:

1/10 acre plot,
5 sample points



4.2

Forest Structure Analysis

The following parameters will be measured and evaluated at each site according to Figure D-2. Each parameter at each sample site will be given a value of 3,2,1, or 0. Three represents the most valuable structure and , the least valuable. Upon completion of the sampling, the person preparing the FSD will caculate the forest structure value for each stand. This analysis along with the other forest stand data will be used to determine the retention potential of the stand.

To determine the total habitat value use the following scale:

Range of total habitat numbers from samples taken April - October:

12	15-21	Priority forest structure
	7-14	Good forest structure
	0-6	Poor forest structure

In the winter and late fall, from November - March, only numbers 1,3,4,5,7, can be measured. During that time, the range of total habitat numbers will be:

11-15	Priority forest structure
6-10	Good structure
0-5	Poor forest structure

1. Percent Canopy Closure of trees with a DBH greater than 7"

70% - 100 %	3
40% - 69%	2
10% - 39%	1
0% - 9%	0

5. Size Class of Dominant Trees¹

Greater than 20"	3
7" - 19.9"	2
3" - 6.9"	1
Less than 3"	0

2. Number of Understory Shrubs 1/100 acre

6 or more	3
4 - 5	2
2 - 4	1
0 - 1	0

6. Percent of Understory Herbaceous Coverage

75% - 100%	3
25% - 74%	2
5% - 24%	1
0% - 4%	0

3. Number of Dead Trees/tenth acre plot¹

3 or more	3
2	2
1	1
0	0

7. Number of Tree Species with a DBH greater than 7"/plot¹

6 or more	3
4 - 5	2
2 - 4	1
0 - 1	0

4. Percent of Dead and Downed Woody Material Present

15% - 100%	3
5" - 14"	2
0 - 1	1
0	0

12

¹ Data included in Forest Stand Summary Sheet (See Table D-4).

Table D-4 : Forest Stand Summary Sheet

Property Name: HEUSTER

Prepared by: ^{Tom} LUGAR
Date: 5/21/07

Stand Variable	Stand # 1 Acreage 5.31 Ac.	Stand # 2 Acreage 11.77 Ac.
Forest Association (SAF cover type)	RIVER BIRCH-SYCAMORE	TULIP-POPLAR
Size class of dominant trees	6-10 " DBH	10-17.4" DBH
Number of Trees/acre	150	127.5
Number of tree species/plot	5	3.25
Basal area	110	122.5
Number of dead trees/acre	3	2
List of common understory species	MAY-APPLE ARROWWOOD VA. CREEPER JAP. HONEYSUCKLE	VA. CREEPER JAP. HONEYSUCKLE HICKORY SAPLINGS
Number of shrubs 1/100 acre plot	1.3	3.15
% Canopy coverage	78%	70.25%
% Herbaceous cover	90%	100%
% Downed woody material	40%	25%
% Exotic or invasive species	50%	100%
Forest Structure Value	14- GOOD	12.75- GOOD
Comments	LOW LYING YOUNGER MIXED DECIDUOUS FOREST	MATURE MIXED DECIDUOUS FOREST

Table D-4 : Forest Stand Summary Sheet

Property Name: HEUSTER

Prepared by: ^{Tom} LUGAR
Date: 5/21/07

Stand Variable	Stand # 3 Acreage 2.16 Ac.	Stand # 4 Acreage 10.21 Ac.
Forest Association (SAF cover type)	TULIP-POPLAR	TULIP-POPLAR
Size class of dominant trees	6-10" DBH	18-29.9" DBH
Number of Trees/acre	90	140
Number of tree species/plot	2	5.33
Basal area	90	100
Number of dead trees/acre	Ø	Ø
List of common understory species	GARLIC MUSTARD JAP. HONEYSUCKLE GRAISES INDIAN STRAWBERRY	BLACK CHERRY SAPLINGS POISON IVY JAP. HONEYSUCKLE HAY-SCENTED FERN
Number of shrubs 1/100 acre plot	0.2	1.73
% Canopy coverage	77%	74.67%
% Herbaceous cover	100%	86.67%
% Downed woody material	0%	20%
% Exotic or invasive species	100%	26.67%
Forest Structure Value	10 - GOOD	13 - GOOD
Comments	MATURE FOREST BE- TWEENTWOSCRUB-SHRUB AREAS	MATURE MIXED DECIDUOUS FOREST IN THE SOUTHERN PORTION OF THE SITE

APPENDIX B

Forest Stand Delineation Plan prepared at a scale of 1 inch = **150** feet

APPENDIX C

Maryland Natural Heritage Correspondence



Martin O'Malley, Governor
Anthony G. Brown, Lt. Governor
John R. Griffin, Secretary
Eric Schwaab, Deputy Secretary

June 15, 2007

Thomas M. Lugar
Vortex Environmental
313 West Liberty St.
Suite 226
Lancaster, PA 17603

RE: Environmental Review for Heuster Property, west of Maloney Road and south of intersection with Sarah Drive, Town of Elkton, Third Election District, Cecil County, MD.

Dear Mr. Lugar:

The Wildlife and Heritage Service has determined that there are no State or Federal records for rare, threatened or endangered species within the boundaries of the project site as delineated. As a result, we have no specific comments or requirements pertaining to protection measures at this time. This statement should not be interpreted however as meaning that rare, threatened or endangered species are not in fact present. If appropriate habitat is available, certain species could be present without documentation because adequate surveys have not been conducted.

Thank you for allowing us the opportunity to review this project. If you should have any further questions regarding this information, please contact me at (410) 260-8573.

Sincerely,

Lori A. Byrne,
Environmental Review Coordinator
Wildlife and Heritage Service
MD Dept. of Natural Resources

ER# 2007.1116



SOUTHFIELDS- **SAMOST PROPERTY**

NATURAL RESOURCES INVENTORY & FOREST STAND DELINEATION REPORT

prepared for:

**Southfields of Elkton Capital Development
c/o Stonewall Capital
1206 Sparks Road
Sparks, Maryland 21152**

prepared by:

**Eco-Science Professionals, Inc.
P.O. Box 5006
Glen Arm, Maryland 21057
(410) 683-7840**

December 6, 2019

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I. INTRODUCTION

Eco-Science Professionals, Inc. was contracted by Stonewall Development to perform Forest Stand Delineation for the Samost property. The project site encompasses approximately 244.1 acres of land located off of Frenchtown Road in the Elkton section of Cecil County, Maryland. This study was done to identify and assess the regulated natural resources which would impact site development. The property is part of the larger Southfields community project.

II. NATURAL RESOURCE INVENTORY NARRATIVE

The subject property is located off of Frenchtown Road in the Elkton section of Cecil County, Maryland. The subject property is shown on County tax map 320 as parcel 2371. The general land use in the vicinity of the site is characterized by medium density residential and commercial development.

The site is located within the Coastal Plain physiographic province of Maryland. In Cecil County, which ranges from nearly level to gently rolling topography with unconsolidated bedrock.

The Samost Property is a large, oddly shaped parcel that is primarily utilized for agriculture. The property contains one active homesite that is located along Frenchtown Road. This residential use area includes a home, lawn and a small pond. The active use area for the home is about one acre and is surrounded by forest.

A second home and barnyard was also located along Frenchtown Road, west of the existing home, but these improvements have been removed and the area is abandoned. Foundations remain and evidence of past uses are present. Some trash and dumping has also occurred in this area. This area occupies roughly 2.3 acres.

The majority of the site, approximately 142 acres is maintained for crop production. A 56+/- acre field is situated along the Frenchtown Road frontage. This rectangular field area includes the former farmyard area that is now overgrown. A hedgerow is present along a stream channel that cuts across the eastern corner of the field and several isolated wetlands are present within the field. An approximately 86 acre field complex is located along the eastern edge of the property. This field extends from Frenchtown Road the northern end of the site, near Pulaski Highway. The farming activity extends offsite in the northwestern corner of the property. The

overall field area includes a hedgerows and a few small, isolated wooded pockets. Several isolated wetland pockets are present within the field. A narrow field connection allows vehicle and equipment access between the two field areas. connection is present between the At the time of our field review the fields were mowed close but appeared to have last produced soybeans.

The balance of the site is dominated by a mixed oak-tulip poplar community. The canopy composition varies but is generally made up of tulip poplar, American beech, white oak, willow oak, and sweet gum. The forest contains a mix of upland and wetland habitats with the tree canopy reflecting this conditions. The wetland/upland limits are a mosaic pattern and several of the canopy and understory species occur in both areas so the general nature of the forest does not change across the site. The biggest difference in the forest type is based on age with younger forest occurring behind the homesite along Frenchtown Road and an slightly older stand occurring in the western end of the site. Specimen trees are scattered throughout the stand, even in the younger communities.

As noted, wetlands are present on the property. These wetlands occur as isolated pockets in the farm field and as isolated and contiguous wetlands within the forest. The isolated pockets in the farmed field vary from being farmed wetlands to wooded pockets within the field. In the farmed wetlands the vegetation varies. The outer edges of the wetlands have been successfully planted with crops during the summer season. The interior of these wetlands appears to retain more water and is not conducive to crop production. These areas are dominated by wetland grasses with some woolgrass and soft rush being noted. Most of the vegetation in these areas was mowed at the time of our field review. Areas that have not been farmed have retained their wooded character. These areas are dominated by red maple, sweet gum and willow oak. Some of these wetland pockets have experienced dumping of debris and other items. Vine growth is heavy in this isolated pockets. Shrub growth in the wetlands include summersweet and spicebush. Multiflora rose is common in adjacent uplands and extending into only temporarily saturated areas

A large contiguous wetland system is present in the forest in southern end of the site. This wetland system is drained by a stream channel that crosses through the crop field and also included the farm pond located just west of the existing home. The wetlands is primarily forested but portions of the wetland extend into the adjacent farm fields. In the forest the canopy made up of sweet gum, red maple, willow oak. The headwater of this system contains diverse branching and numerous seeps. Summersweet, spicebush, highbush blueberry, cinnamon fern, false nettle, skunk cabbage, sensitive fern and jewelweed were noted in the wetlands. Black willow were noted around the pond.

Within the forest several isolated wetland pockets are present. These depressions appear to support ponding in the winter and early season and were dry during our late fall field review. Sweet gum, willow oak, black gum and red maple are common in these areas. Summersweet is dense in the shrub layer of these wetlands.

A large wetland system is also located in the northern end of the forest, adjacent to and extending into the farm fields. This wetland system is broad and shallow with a very irregular edge. An intermittent drainage channel is present along the northern edge of the wetland. This drainage channel may have been excavated historically to improve farming in the adjacent fields. The drainage channel connects to the an offsite stream providing a connection to this wetland complex. The canopy of this wetland is dominated by sweet gum and willow oak with red maple, black gum and pin oak being notable. Summer sweet and spicebush are common within the wetlands. A small portion of the wetland extends into the crop fields near the wetlands eastern most extent. In this area young red maple, sweet gum , black willow and sycamore have colonized the field. Cinnamon fern, false nettle, sensitive fern and jewelweed were noted in patches throughout the wetlands. Herbaceous cover is not uniform or well established in the wetlands.

A third contiguous wetland is present along the southwestern edge of the site. This wetland extends into the farm field from the forest and extends westerly offsite. This wetland is ultimately connected to an unnamed stream system. Onsite the mature forested portion of the site is dominated by sweet gum, red maple and willow oak. Colonization within the field includes young red maple and sweet gum.

The nontidal wetlands and tributaries on the property are classified as Use I waters. The streams are all within the Upper Elk River watershed (02130603).

The forest on the property is noted to be potential Forest Interior Habitat on the DNR Living Resources tab on the MD Merlin Website.

The Web Soil Survey shows the following soils on the project site:

CsA	Crosiadore silt loam, 0 to 2 percent slopes
CsB	Crosiadore silt loam, 2 to 5 percent slopes
EmA	Elkton silt loam, 0 to 2 percent slopes
HbB	Hambrook sandy loam, 2 to 5 percent slopes
HbC	Hambrook sandy loam, 5 to 10 percent slopes
KpB	Keyport silt loam, 2 to 5 percent slopes
McA	Marshyhope loam, 0 to 2 percent slopes
MkB	Matapeake silt loam, 2 to 5 percent slopes
MkC	Matapeake silt loam, 5 to 10 percent slopes
MpB	Matapeake-Urban land complex, 0 to 5 percent slopes
MtaA	Mattapex silt loam, 0 to 2 percent slopes, northern coastal plain
MtaB	Mattapex silt loam, 2 to 5 percent slopes, northern coastal plain
MuB	Mattapex-Urban land complex, 0 to 5 percent slopes
NsA	Nassawango silt loam, 0 to 2 percent slopes
NsB	Nassawango silt loam, 2 to 5 percent slopes
OtA	Othello silt loams, 0 to 2 percent slopes, northern coastal plain

VnaB Urban land-Nassawango complex, 0 to 5 percent slopes
WdaB Woodstown sandy loam, 2 to 5 percent slopes, Northern Coastal Plain

The non-urban series of the Crosiadore, Elkton, Hambrook, Keyport, Marshyhope Matapeake, Mattapex Nassawango Othello and Woodstown soils are all considered Farmland of Statewide importance or prime farmland.

Crosiadore, Elkton and Othello soils are mapped as hydric soils or have notable hydric inclusions.

III. FOREST STAND DELINEATION

Methods

The forest stand delineation for the subject property was performed November, 2019. The requirements outlined in Section 1 of the State of Maryland Forest Conservation Act and in the *Town of Elkton Forest Conservation Ordinance* were used to delineate and report the characteristics of the existing forest resources on the property.

Forest Stand Narratives

One forest stand type, with two variant areas, is present on the property. The forest limits, which encompasses 98.8 +/- acres of the site have been mapped on the Forest Stand Delineation Plan. The Forest Stand Summary Sheet and data sheets can be found in appendix section of this report. Below find a description of the forest stand present on this project site.

Stand F-1

The forest on the site is all within a mixed oak/tulip poplar community. The stand occurs on gentle to moderate slopes and includes both upland and wetland habitats. The forest occurs primarily along the edge of a large stand and is generally impacted by the edge effect along its outer boundary.

Sweet gum and American beech occurred in most of the sample points taken and are common throughout the stand. Sweet gum are present in both understory and canopy with a high presence in the canopy. American beech are also common in both strata but tend to be most common in the understory. Willow oak, white oak and pin oak are common in the canopy with tulip poplar also being notable, particularly in drier pockets. Red maple, black gum and pignut hickory are also common in the understory of the stand. The hickory is more restricted to upland habitats while the maple and gum are common throughout.

Typically the canopy is created by trees in the 12-20" dbh size range, with scattered specimen trees also being present. The stand does include two notable variant areas where the canopy trees are slightly younger or older than average. The wetland forest along the southern edge of the site contains a smaller stand. This area includes sweet gum, willow and pin oak, red maple and black gum that are generally in the 6-12" dbh size range. Some larger trees are present in this area but the general trend here is toward slightly smaller trees. The size of the trees may be a factor of age or a factor of poorer growing conditions due to soils.

A slightly older than average portion of the stand is located in a small area in the western portion of the forest, just north of the farm field. In this area specimen tulip poplar are very common in the canopy. This canopy area would be best described as being in the 26-36" dbh range. The overall area of this older area is not substantial enough to be considered a distinct stand. The associate oaks, sweet gum, and American beech are typical of the balance of the forest community.

The canopy closure is approximately 90 percent throughout the stand. The average age of the stand is estimate to be 60-80, based on the typical canopy tree size. The presence of numerous specimen trees suggests that some element of the forest may be older.

The shrub layer of the stand is variable based on proximity to the edge of the stand and presence of seasonal wetlands. Along the outer edges the shrub and vine community is well established with bush honeysuckle, multiflora rose, spicebush, and greenbrier all being common. In and around wetland pockets summersweet is present in dense colonies. Some Japanese barberry, highbush blueberry and arrowwood were also noted. Japanese honeysuckle, poison ivy and Oriental bittersweet are also common. .

The herb layer of the stand is minimal. Japanese honeysuckle is common toward the edges of the stand. Christmas fern and partridgeberry are scattered throughout and cinnamon fern, sensitive fern and jewelweed are notable in the wetlands.

The overall condition of this stand is good. The stand has good species diversity and canopy development. The limited native shrub and herb layers reduce the overall habitat value. . Invasive species colonization, primary Japanese/bush honeysuckle and bittersweet, is very high in localized areas. If this continued to spread it will detract more from the stands overall condition.

Some dead standing and storm damaged trees were noted in the stand. Downed woody is common in some areas of the stand. Some storm damage was noted in the stand.

The stand appears to be used routinely for hunting and passive recreation.

This stand is connected to offsite forest resources. The overall forest community is mapped as potentially providing forest interior habitat but the portion of the stand within the

study area is heavily impacted by edge effect. The overall, on and offsite, forest does meet the minimum standard for interior habitat. Further investigation would be required to determine that actual level of usage by forest interior breeding birds.

The stand scores a 11 out of 21 on the structure analysis indicating good structure.

Portions of the stand occurring within wetland, streams and their buffers are considered a high priority for retention. Portions of the stand outside these areas would be considered a moderate priority for preservation.

Specimen Trees

The Cecil County Forest Conservation Program defines specimen trees as "trees having a diameter measured at 4.5 feet above the ground of 30 inches or more, or trees having 75 percent or more of the diameter of the current state or Cecil County champion tree of that species. Sixty five specimen trees are present on the site. The location, type, size and condition of the trees is shown on the accompanying plan.

V. AUTHORSHIP

This wetland study was performed by John Canoles and Henry Leskinen. Messrs. Canoles and Leskinen have extensive experience in natural resources assessments and inventories. Mr. Canoles received his B.S. in Natural Sciences with an Environmental Conservation Concentration from Towson State University in Towson, Maryland. Mr. Leskinen received his B.S. in Biological Sciences from St. Marys College of Maryland in St. Marys City, Maryland. Messrs Canoles and Leskinen have each received their Provisional Wetland Certification from the U.S. Army Corps of Engineers, Baltimore District (See Appendix A).

VI. LITERATURE CITED

Cowardin, Lewis et.al. *Classification of Wetlands and Deepwater Habitats of the United States*. U.S. Dept. of Interior, Fish and Wildlife Service, Washington, D.C. FWS/OBS-79/31. December, 1979.

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Maryland Department of Natural Resources. 1991. *Forestry Conservation Act 1991 - Technical Training Workshop*.

Town of Elkton. 1993 *Forest Conservation Ordinance*.

U.S. Department of Agriculture, Soil Conservation Service. *Soil Survey for Cecil County, Maryland*. July 1968.

Web Soil Survey. 2019. Specific site search

APPENDIX A

Certification Forms



William Donald Schaefer
Governor

Maryland Department Of Natural Resources

Public Lands and Forestry
Tawes State Office Building
580 Taylor Avenue
Annapolis, MD 21401

Torrey C. Brown, M.D.
Secretary

January 12, 1993

Mr. John Canoles
Eco-Science Professionals, Inc.
P.O. Box 5006
Glen Arm, MD 21057

Dear Mr. Canoles,

We of the Maryland Department of Natural Resources have reviewed your application for qualified professional status for the purpose of developing Forest Stand Delineations and Forest Conservation Plans. We are happy to inform you that our review found you met the requirements of COMAR 08.19.06.01 for this status. Your name will be included on a list of qualified professionals to be sent to jurisdictions with power to review Forest Stand Delineations and Forest Conservation Plans.

Participation by professionals like you is key to successful implementation of the Forest Conservation Act. Thank you for submitting your application.

Sincerely,

Eric Schwaab
Director, Forestry Programs

c:\letters\qualpro.apr

Telephone: _____
DNR TTY for the Deaf: 410-974-3683

Ⓢ

Eco-Science Professionals, Inc.



DEPARTMENT OF THE ARMY
BALTIMORE DISTRICT, U.S. ARMY CORPS OF ENGINEERS
P.O. BOX 1715
BALTIMORE, MD 21203-1715

U.S. ARMY CORPS OF ENGINEERS

CERTIFIES THAT

JOHN PRESTON CANOLES

CERTIFICATE NUMBER: WDGP93MD0610044B

has successfully demonstrated
to the U.S. Army Corps of Engineers, Baltimore District,
sufficient understanding of, and the capability to
perform satisfactory wetland delineations consistent with, the
Corps 1987 Wetland Delineation Manual and supplemental guidance.
This verifies that wetland delineations performed by the
certified wetland delineator named above will receive expedited
consideration and acceptance by the certifying district, for
purposes of the Corps' final determination of wetland
jurisdiction pursuant to Section 404 of the Clean Water Act.

Donald W. Roeseke
Donald W. Roeseke
Chief, Regulatory Branch
Baltimore District

August 19, 1993
Date

*This is a provisional certification for the purposes of the
demonstration phase of the Corps Wetland Delineator Certification
Program

APPENDIX B

Forest Stand Data Sheets/Checklist

SUBMITTAL REQUIREMENTS

1. Site Vicinity Map

- ☒ location of the project site and surrounding area within one square mile
- ☒ major roads
- ☒ political boundaries
- ☒ north arrow
- ☒ adjacent land uses
- ☒ forested areas
- ☒ minimum scale of 1" = 2000' (1:24,000)

2. Forest Stand Delineation Map

- ☒ property boundaries (tax maps, plats, or surveyed boundaries)
- ☒ north arrow
- ☒ title, date, revisions, scale, and legend
- ☒ certification by Qualified Professional or stamp of a Maryland licensed L.A. or Forester
- ☒ topographic contours and interval (USGS 7 1/2 minute quad or spot elevations)
- ☒ steep slopes greater than 25% (on areas greater than or equal to 10,000 square feet)
- ☒ 100-year flood plain (watersheds of 400 acres or larger or Class III streams)
- ☒ intermittent and perennial streams (USGS 7 1/2 minute quadrangle or SCS Soil Surveys)
- ☒ stream buffers (50-foot width)
- ☒ soil classifications (SCS Soil Surveys) indicating soils with:
 - ☒ structural limitations
 - ☒ hydric properties
 - ☒ K value greater than 0.35 on slopes greater than or equal to 15%
- ☒ non-tidal or tidal wetlands and buffers (National Wetlands Inventory 1:24,000 or Maryland Water Resources Administration)
- ☒ Critical Habitat Areas
- ☒ forested areas and unforested areas including tree lines extending off-site
- ☒ priority afforestation areas
- ☒ priority retention areas
- ☒ field sampling locations
- ☒ proposed limits of disturbance

☒ location description and size of forest stands
☒ location of trees or stands which have trees that are:

- ☒ rare, threatened, and endangered species of plants (Maryland Natural Heritage Program)
- ☒ part of an historic site or associated with an historic structure
- ☒ designated by the Maryland Department of Natural Resources or local authority as a champion tree for that species
- ☒ specimen trees of 30" dbh or greater (some local jurisdictions may vary)
- ☒ trees with at least 75% of the diameter of the state champion tree of that species

3. Forest Stand Analysis

- ☒ site description
- ☒ methodology
- ☒ summary for each stand, describing:
 - ☒ stand composition
 - ☒ stand structure
 - ☒ stand condition
 - ☒ retention potential relating to proposed development or
 - ☒ specific management recommendations
 - ☒ stand function
 - ☒ water quality benefits
 - ☒ specific wildlife habitat value
 - ☒ other land use objectives, including recreation, timber management, etc.
- ☒ recommendations for specific areas such as specimen trees
- ☒ field sampling data sheets if required
- ☒ property name, name of person collecting data, date data was collected
- ☒ complete data for each sample plot
- ☒ forest stand summary sheets
- ☒ include the name of the property, location, name of the person preparing the summary, and the date it was prepared
- ☒ summary for each forest stand

4. Application

- ☒ completed information including signature (COMAR 08.19.04.02)

Source: DNR

Full FSD Checklist

Figure
2.1.9

Forest Stand Field Data Summary Sheet

Property Name: Southfields Samost

Prepared by: ESPI
Date: 10/19

Stand Variable	Stand Number		
	1	2	
Acreage of Stand	98.8		
Forest Association (SAF cover type)	mixed oak / poplar		
Average size class of dominant trees	12-20		
Average # of trees/acre	80		
Number of tree species per acre	7		
Basal area/acre	110		
Average # of dead trees/acre	3		
Forest Structure Value	11		

Common understory species: American beech, black gum, light hickory
American holly, black cherry

Comments: Limited invasive species, notable edge effect

Forest Structure Analysis(Reprinted from the MD Forest Conservation Manual)

The following parameters will be measured and evaluated at each site according to the techniques for forest structure data collection described previously. Each parameter at each sample site will be given a value of 3, 2, 1, or 0. Three represents the most valuable structure and 0, the least valuable. Upon completion of the sampling, the person preparing the FSD will calculate the forest structure value for each stand. This analysis, along with the other forest stand data will be used to determine the retention potential and priority level of the stand.

To determine the total habitat value use the following scale¹:

Range of total habitat numbers from samples taken April - October:

15-21	Priority for forest structure
7-14	Good forest structure
0-6	Poor forest structure

In the winter and late fall, from November - March, only numbers 1,3,4,5,7 can be measured. During that time, the range of total habitat numbers will be:

11-15	Priority forest structure
6-10	Good forest structure
0-5	Poor forest structure

1. Percent Canopy Closure of trees with a DBH greater than 7"

70%-100%	3
40%-69%	2
10%-39%	1
0%-9%	0

2. Number of Understory Shrubs 1/100 acre

6 or more	3
4-5	2
2-3	1
0-1	0

3. Number of Dead Trees/tenth acre plot²

3 or more	3
2	2
1	1
0	0

4. Percent of Dead and Downed Woody Material Present

15%-100%	3
5%-14%	2
1%-4%	1
0	0

5. Size Class of Dominant Trees²

Greater than 20"	3
7"-19.9"	2
3"-6.9"	1
Less than 3"	0

6. Percent of Understory Herbaceous Coverage

75%-100%	3
25%-74%	2
5%-24%	1
0%-4%	0

7. Number of Tree Species with a DBH greater than 7"/plot²

6 or more	3
4-5	2
2-3	1
0-1	0

¹ Round values in 1-7 to the nearest whole number.

² Data included in the Forest Stand Field Data Summary Sheet.

11

Figure B-1 Forest Sampling Data Worksheet

Property: Sanost Prepared By: EST
Stand #: 1 Plot #: 1 Plot Size: 1/10 Date: 10/19

Basal Area in Square Feet per Acre:		Size Class of Trees > 20' Height within Sample Plot														
Tree Species	Number of Trees 2-5.9" dbh			Number of Trees 6-11.9" dbh			Number of Trees 12-19.9" dbh			Number of Trees 20-29.9" dbh			Number of Trees > 30" dbh			Total
	Dom.	CoD	Other	Dom.	CoD	Other	Dom.	CoD	Other	Dom.	CoD	Other	Dom.	CoD	Other	
Spr. gum	1			2			1									4
P. Oak						1										1
Red maple			9													9
Willow oak			1													1
black gum			1													1
Total Number of Trees per Size Class	10			3			1									18
Number & Size of Standing Dead Trees																
List of Common Understory Species 3'-20':							Percent of Canopy Closure					Percent of Invasive Cover per Plot (All Layers):		Plot Successional Stage:		
MTF 206/406 small area hess- oaks black haw							C	N	E	S	W	Total	80		early	
							Y	Y	Y	Y	Y					
List of Herbaceous Species 0'-3':							Percent of Understory Cover 3'-20'					List of Major Invasive Species per Plot (All Layers):				
Orion Grass J. honeysuckle							C	N	E	S	W					
							Y	Y	N	Y	N					
							Percent of Herbaceous Cover 0'-3'					J. honeysuckle R. oaks multiflora rose				
							C	N	E	S	W					
							Y	Y	Y	N	Y					
Comments																
MTF rose heavy outside sample point Younger pocket in the stand																
Sheet ___ of ___																

Source: DNR

Figure B-1 Forest Sampling Data Worksheet

Property: Senost Prepared By: ESL
Stand #: 1 Plot #: 3 Plot Size: 4.0 Date: 10/19

Basal Area in Square Feet per Acre: <u>40</u>		Size Class of Trees > 20' Height within Sample Plot														
Tree Species	Number of Trees 2-5.9" dbh			Number of Trees 6-11.9" dbh			Number of Trees 12-19.9" dbh			Number of Trees 20-29.9" dbh			Number of Trees > 30" dbh			
Crown Position	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Total
<u>Sw. Gum</u>	<u>3</u>			<u>1</u>			<u>1</u>									<u>5</u>
<u>T. poplar</u>							<u>1</u>									<u>1</u>
<u>Beech</u>			<u>2</u>													<u>2</u>
<u>Black gum</u>			<u>2</u>													<u>2</u>
Total Number of Trees per Size Class	<u>7</u>			<u>1</u>			<u>2</u>									<u>10</u>
Number & Size of Standing Dead Trees																
List of Common Understory Species 3'-20': <u>Young beech</u> <u>highbush blueberry</u> <u>Greenbrier 20%</u> <u>summersweet</u> <u>burglark</u>				Percent of Canopy Closure						Percent of Invasive Cover per Plot (All Layers):			Plot Successional Stage:			
				C	N	E	S	W	Total							
				<u>Y</u>	<u>Y</u>	<u>Y</u>	<u>Y</u>	<u>Y</u>								
				Percent of Understory Cover 3'-20'												
				C	N	E	S	W	Total							
				<u>Y</u>	<u>N</u>	<u>Y</u>	<u>Y</u>	<u>N</u>								
List of Herbaceous Species 0'-3': <u>Jayces haysuckle</u>				Percent of Herbaceous Cover 0'-3'						List of Major Invasive Species per Plot (All Layers):						
				C	N	E	S	W	Total							
				<u>N</u>	<u>N</u>	<u>Y</u>	<u>Y</u>	<u>N</u>					<u>Jay. haysuckle</u>			
Comments <u>old canopy with young understory</u>																
Sheet ___ of ___																

Source: DNR

Figure B-1 Forest Sampling Data Worksheet

Property: Samost Prepared By: ESPI
Stand #: 1 Plot #: 2 Plot Size: 1/10 Date: 10/19

Basal Area in Square Feet per Acre:		Size Class of Trees > 20' Height within Sample Plot														
Tree Species	Number of Trees 2-5.9" dbh			Number of Trees 6-11.9" dbh			Number of Trees 12-19.9" dbh			Number of Trees 20-29.9" dbh			Number of Trees > 30" dbh			Total
	Dom.	CoD	Other	Dom.	CoD	Other	Dom.	CoD	Other	Dom.	CoD	Other	Dom.	CoD	Other	
Sweet Gum	2		3	2			1									6
Red maple			5		1											6
black Gum			1													1
White pine			3													3
T. poplar			1													1
Total Number of Trees per Size Class	13			3			1									17
Number & Size of Standing Dead Trees																
List of Common Understory Species 3'-20': multiflora rose blackberry Greenbush Rum. olive yang dentatum				Percent of Canopy Closure						Percent of Invasive Cover per Plot (All Layers): 40%			Plot Successional Stage:			
				C	N	E	S	W	Total							
				N	Y	Y	Y	Y								
				Percent of Understory Cover 3'-20'												
				C	N	E	S	W	Total							
				Y	Y	N	N	Y								
List of Herbaceous Species 0'-3': J. longicaulis				Percent of Herbaceous Cover 0'-3'									List of Major Invasive Species per Plot (All Layers): multiflora rose J. longicaulis Olive			
				C	N	E	S	W	Total							
				Y	Y	Y	Y	N								
Comments: Several dead sweet gum poison ivy common on trees																
Sheet ____ of ____																

Source: DNR

Figure B-1 Forest Sampling Data Worksheet

Property: Samost Prepared By: ESM
Stand #: 1 Plot #: 4 Plot Size: 1/10 Date: 10/19

Basal Area in Square Feet per Acre: <u>110</u>	Size Class of Trees > 20' Height within Sample Plot															
Tree Species	Number of Trees 2-5.9" dbh			Number of Trees 6-11.9" dbh			Number of Trees 12-19.9" dbh			Number of Trees 20-29.9" dbh			Number of Trees > 30" dbh			
Crown Position	Dom.	CoD	Other	Dom.	CoD	Other	Dom.	CoD	Other	Dom.	CoD	Other	Dom.	CoD	Other	Total
<u>White</u>							<u>2</u>									<u>2</u>
<u>Beech</u>		<u>2</u>					<u>3</u>	<u>1</u>								<u>3</u>
<u>Su. gum</u>					<u>2</u>											<u>2</u>
<u>bl. gum</u>					<u>1</u>											<u>1</u>
Total Number of Trees per Size Class	<u>2</u>			<u>3</u>			<u>3</u>									<u>8</u>
Number & Size of Standing Dead Trees																
List of Common Understory Species 3'-20': <u>Clethra</u> <u>Young beech</u> <u>Holly</u>							Percent of Canopy Closure						Percent of Invasive Cover per Plot (All Layers): <u>5%</u>		Plot Successional Stage: <u>mature</u>	
							C	N	E	S	W	Total				
							<u>Y</u>	<u>Y</u>	<u>Y</u>	<u>Y</u>	<u>Y</u>					
							Percent of Understory Cover 3'-20'									
							C	N	E	S	W	Total				
							<u>Y</u>	<u>Y</u>	<u>Y</u>	<u>Y</u>	<u>Y</u>					
List of Herbaceous Species 0'-3': <u> </u>							Percent of Herbaceous Cover 0'-3'						List of Major Invasive Species per Plot (All Layers): <u>Eucalyptus</u>			
							C	N	E	S	W	Total				
							<u>N</u>	<u>N</u>	<u>N</u>	<u>N</u>	<u>N</u>					
Comments <u>Several poplar just outside sample</u>																
Sheet <u> </u> of <u> </u>																
Source: DNR																

Figure B-1 Forest Sampling Data Worksheet

Property: Samost Prepared By: ESPE
Stand #: 1 Plot #: 5 Plot Size: 1/10 Date: 10/19

Basal Area in Square Feet per Acre:		Size Class of Trees > 20' Height within Sample Plot														
Tree Species	Number of Trees 2-5.9" dbh			Number of Trees 6-11.9" dbh			Number of Trees 12-19.9" dbh			Number of Trees 20-29.9" dbh			Number of Trees > 30" dbh			
Crown Position	Dom.	CoD	Other	Dom.	CoD	Other	Dom.	CoD	Other	Dom.	CoD	Other	Dom.	CoD	Other	Total
Willow oak								1								1
Rd maple								2								1
White oak				1												1
sw gum		5						2								7
beech				1												1
Total Number of Trees per Size Class	5			2			3			4						10
Number & Size of Standing Dead Trees																
List of Common Understory Species 3'-20':							Percent of Canopy Closure						Percent of Invasive Cover per Plot (All Layers):		Plot Successional Stage:	
Young willow oak 20 C. lathraea 20 Young beech 10							C	N	E	S	W	Total	5		mature	
							Y	Y	Y	Y	Y					
							Percent of Understory Cover 3'-20'									
List of Herbaceous Species 0'-3': Club moss - Grandpa Creeping Euponymus							C	N	E	S	W	Total	List of Major Invasive Species per Plot (All Layers): Creeping Euponymus Jap. honeysuckle			
							Y	Y	X	Y	Y					
							Percent of Herbaceous Cover 0'-3'									
							C	N	E	S	W	Total				
							Y	N	N	Y	N					
Comments																
Sheet ___ of ___																

Source: DNR

Figure B-1 Forest Sampling Data Worksheet

Property: Semost Prepared By: ESPI
Stand #: 1 Plot #: 6 Plot Size: 1/10 Date: 10/19

Basal Area in Square Feet per Acre: <u>60</u>	Size Class of Trees > 20' Height within Sample Plot															
Tree Species	Number of Trees 2-5.9" dbh			Number of Trees 6-11.9" dbh			Number of Trees 12-19.9" dbh			Number of Trees 20-29.9" dbh			Number of Trees > 30" dbh			Total
Crown Position	Dom.	CoD	Other	Dom.	CoD	Other	Dom.	CoD	Other	Dom.	CoD	Other	Dom.	CoD	Other	
<u>Poplar</u>													<u>1</u>			<u>1</u>
<u>White Oak</u>								<u>1</u>								<u>1</u>
<u>Beech</u>			<u>1</u>		<u>1</u>			<u>1</u>								<u>3</u>
<u>S. Gum</u>			<u>1</u>			<u>1</u>			<u>1</u>							<u>3</u>
<u>Pignut Hike</u>						<u>1</u>			<u>1</u>							<u>2</u>
<u>Black Gum</u>			<u>1</u>													<u>1</u>
Total Number of Trees per Size Class	<u>3</u>			<u>3</u>			<u>4</u>			<u>1</u>						<u>11</u>
Number & Size of Standing Dead Trees																
List of Common Understory Species 3'-20': <u>Clethra</u> <u>Young beech</u>				Percent of Canopy Closure						Percent of Invasive Cover per Plot (All Layers): <u>—</u>			Plot Successional Stage: <u>mature</u>			
				C	N	E	S	W	Total							
				<u>Y</u>	<u>Y</u>	<u>Y</u>	<u>Y</u>	<u>Y</u>								
				Percent of Understory Cover 3'-20'												
				C	N	E	S	W	Total							
				<u>N</u>	<u>N</u>	<u>Y</u>	<u>Y</u>	<u>Y</u>								
List of Herbaceous Species 0'-3': <u>Crows foot</u>				Percent of Herbaceous Cover 0'-3'						List of Major Invasive Species per Plot (All Layers): <u>—</u>						
				C	N	E	S	W	Total							
				<u>N</u>	<u>Y</u>	<u>Y</u>	<u>N</u>	<u>Y</u>								
Comments																
Sheet ___ of ___																

Source: DNR

Figure B-1 Forest Sampling Data Worksheet

Property: Scout Prepared By: ESPI
Stand #: 1 Plot #: 7 Plot Size: 1/10 Date: 10/19

Basal Area in Square Feet per Acre:		Size Class of Trees > 20' Height within Sample Plot														
Tree Species	Number of Trees 2-5.9" dbh			Number of Trees 6-11.9" dbh			Number of Trees 12-19.9" dbh			Number of Trees 20-29.9" dbh			Number of Trees > 30" dbh			Total
	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	
Red maple			2			1			4							7
Sweet gum			2													2
Willow oak						1										1
Total Number of Trees per Size Class	4			2			4									10
Number & Size of Standing Dead Trees																
List of Common Understory Species 3'-20':						Percent of Canopy Closure						Percent of Invasive Cover per Plot (All Layers):		Plot Successional Stage:		
highbush blueberry Young sweet gum Young oak Greenbrier						C	N	E	S	W	Total	7 < 5% midstructure				
						Y	Y	Y	Y	Y						
List of Herbaceous Species 0'-3': Wood reed Japanese hollyhock						Percent of Understory Cover 3'-20'						List of Major Invasive Species per Plot (All Layers): Japanese hollyhock				
						C	N	E	S	W	Total					
						Percent of Herbaceous Cover 0'-3'										
						C	N	E	S	W	Total					
						Y	Y	N	Y	Y						
						Y	Y	N	Y	Y						
Comments																
Sheet ____ of ____																

Source: DNR

Figure B-1 Forest Sampling Data Worksheet

Property: Senest Prepared By: ESPI
Stand #: 1 Plot #: 8 Plot Size: 1/4 Date: 10/19

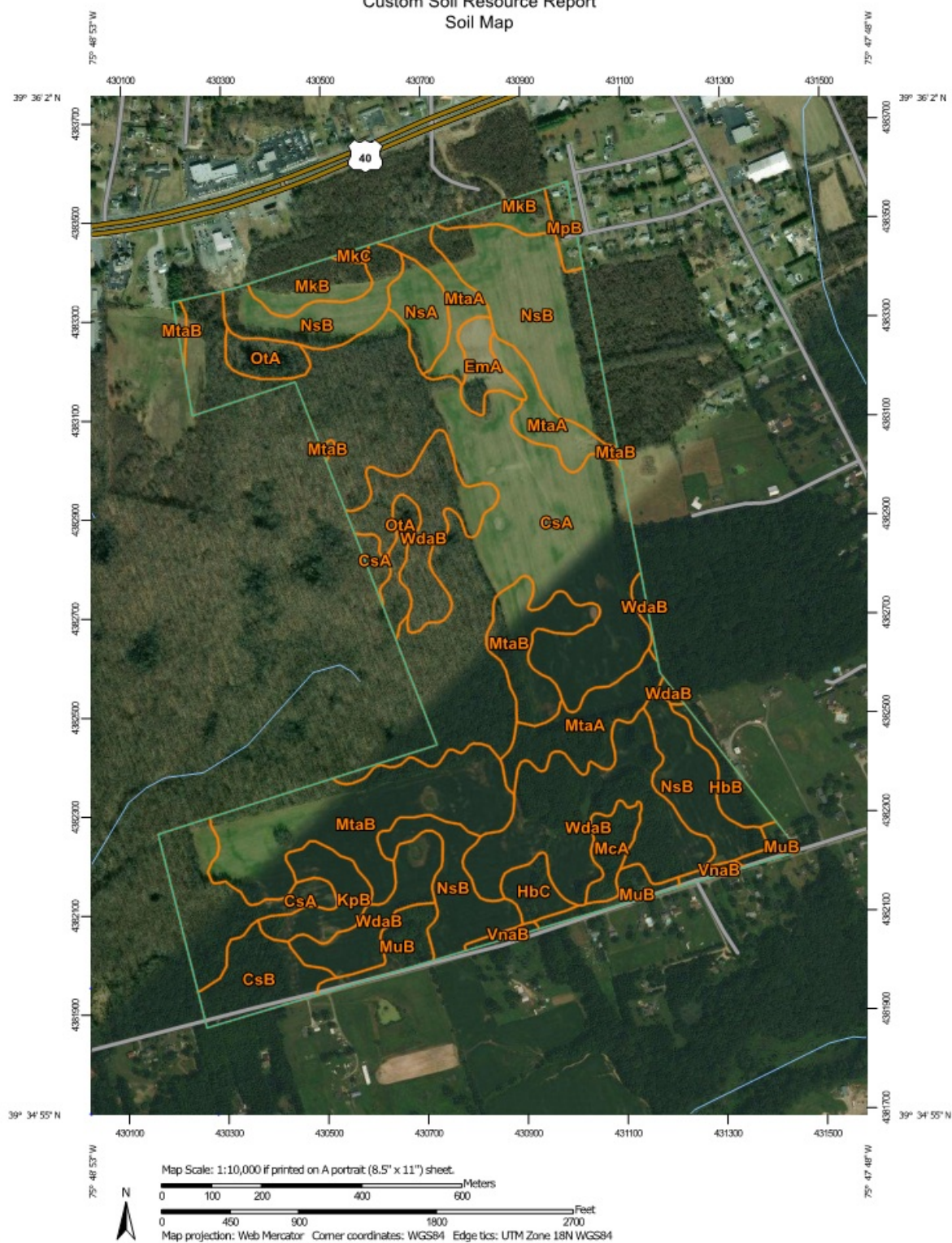
Basal Area in Square Feet per Acre:		Size Class of Trees > 20' Height within Sample Plot															
Tree Species	Number of Trees 2-5.9" dbh			Number of Trees 6-11.9" dbh			Number of Trees 12-19.9" dbh			Number of Trees 20-29.9" dbh			Number of Trees > 30" dbh			Total	
	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other		
T. Poplar									1			1		2		4	
blackg					1											1	
Whiteck								1			1					2	
Red maple			2					1								3	
Total Number of Trees per Size Class	2			1			3			2			2			10	
Number & Size of Standing Dead Trees																	
List of Common Understory Species 3'-20': Am. beech Am. Holly				Percent of Canopy Closure						Percent of Invasive Cover per Plot (All Layers): 5		Plot Successional Stage: mature					
				C	N	E	S	W	Total								
				Y	Y	Y	Y	Y	100								
List of Herbaceous Species 0'-3': Japanese haysuckle				Percent of Understory Cover 3'-20'						List of Major Invasive Species per Plot (All Layers): Japanese haysuckle							
				C	N	E	S	W	Total								
				Y	N	N	N	Y	40								
				Percent of Herbaceous Cover 0'-3'													
				C	N	E	S	W	Total								
				Y	N	N	N	N	20								
Comments older pocket in stand																	
Sheet ____ of ____																	

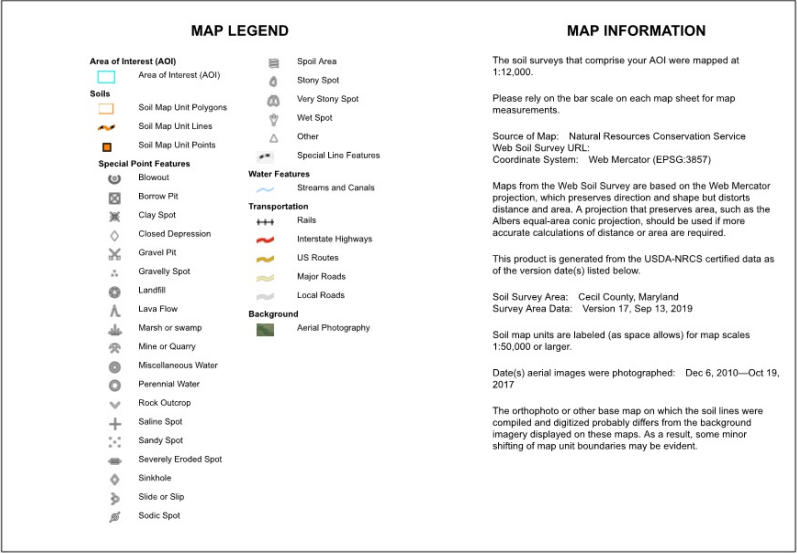
Source: DNR

APPENDIX C

Site Soil Data, NWI Mapping, & FIDS Mapping

Custom Soil Resource Report Soil Map





Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
CsA	Crosiadore silt loam, 0 to 2 percent slopes	84.9	31.6%
CsB	Crosiadore silt loam, 2 to 5 percent slopes	7.2	2.7%
EmA	Elkton silt loam, 0 to 2 percent slopes	3.3	1.2%
HbB	Hambrook sandy loam, 2 to 5 percent slopes	3.0	1.1%
HbC	Hambrook sandy loam, 5 to 10 percent slopes	2.8	1.0%
KpB	Keyport silt loam, 2 to 5 percent slopes	5.6	2.1%
McA	Marshyhope loam, 0 to 2 percent slopes	3.2	1.2%
MkB	Matapeake silt loam, 2 to 5 percent slopes	7.1	2.7%
MkC	Matapeake silt loam, 5 to 10 percent slopes	0.3	0.1%
MpB	Matapeake-Urban land complex, 0 to 5 percent slopes	1.9	0.7%
MtaA	Mattapex silt loam, 0 to 2 percent slopes, northern coastal plain	17.4	6.5%
MtaB	Mattapex silt loam, 2 to 5 percent slopes, northern coastal plain	31.6	11.7%
MuB	Mattapex-Urban land complex, 0 to 5 percent slopes	6.9	2.6%
NsA	Nassawango silt loam, 0 to 2 percent slopes	4.4	1.6%
NsB	Nassawango silt loam, 2 to 5 percent slopes	42.0	15.6%
OtA	Othello silt loams, 0 to 2 percent slopes, northern coastal plain	5.7	2.1%
VnaB	Urban land-Nassawango complex, 0 to 5 percent slopes	1.2	0.5%
WdaB	Woodstown sandy loam, 2 to 5 percent slopes, Northern Coastal Plain	40.3	15.0%
Totals for Area of Interest		268.8	100.0%

Report—Forestland Productivity

Forestland Productivity—Cecil County, Maryland				
Map unit symbol and soil name	Potential productivity			Trees to manage
	Common trees	Site Index	Volume of wood fiber	
			<i>Cu ft/ac/yr</i>	
CsA—Crosiadore silt loam, 0 to 2 percent slopes				
Crosiadore	Blackgum	65	67.00	Cherrybark oak, Loblolly pine, White oak, Willow oak
	Loblolly pine	85	120.00	
	Red maple	70	43.00	
	Southern red oak	80	65.00	
	Swamp chestnut oak	70	50.00	
	Sweetgum	85	93.00	
	White oak	75	47.00	
	Willow oak	80	74.00	
	Yellow-poplar	75	68.00	
CsB—Crosiadore silt loam, 2 to 5 percent slopes				
Crosiadore	Blackgum	65	67.00	Cherrybark oak, Loblolly pine, White oak, Willow oak
	Loblolly pine	85	120.00	
	Red maple	70	43.00	
	Southern red oak	80	65.00	
	Swamp chestnut oak	70	50.00	
	Sweetgum	85	93.00	
	White oak	75	47.00	
	Willow oak	80	74.00	
	Yellow-poplar	75	68.00	

Forestland Productivity—Cecil County, Maryland				
Map unit symbol and soil name	Potential productivity			Trees to manage
	Common trees	Site Index	Volume of wood fiber	
			<i>Cu ft/ac/yr</i>	
EmA—Elkton silt loam, 0 to 2 percent slopes				
Elkton, undrained	Blackgum	70	75.00	Cherrybark oak, Loblolly pine, Swamp chestnut oak, Water oak, Willow oak
	Loblolly pine	80	110.00	
	Red maple	70	43.00	
	Southern red oak	70	50.00	
	Swamp chestnut oak	75	57.00	
	Sweetgum	80	79.00	
	White oak	75	47.00	
	Willow oak	75	62.00	
Elkton, drained	—	—	—	Cherrybark oak, Loblolly pine, White oak, Willow oak
HbB—Hambrook sandy loam, 2 to 5 percent slopes				
Hambrook	Loblolly pine	80	110.00	Eastern white pine, Loblolly pine, Northern red oak, Southern red oak, White oak, Yellow-poplar
	Northern red oak	90	85.00	
	Red maple	75	47.00	
	Southern red oak	90	85.00	
	Sweetgum	80	79.00	
	White oak	85	65.00	
	Yellow-poplar	90	90.00	
HbC—Hambrook sandy loam, 5 to 10 percent slopes				
Hambrook	Loblolly pine	80	110.00	Eastern white pine, Loblolly pine, Northern red oak, Southern red oak, White oak, Yellow-poplar
	Northern red oak	90	85.00	
	Red maple	75	47.00	
	Southern red oak	90	85.00	
	Sweetgum	80	79.00	
	White oak	85	65.00	
	Yellow-poplar	90	90.00	

Forestland Productivity—Cecil County, Maryland				
Map unit symbol and soil name	Potential productivity			Trees to manage
	Common trees	Site Index	Volume of wood fiber	
			<i>Cu ft/ac/yr</i>	
KpB—Keyport silt loam, 2 to 5 percent slopes				
Keyport	Loblolly pine	70	101.00	Loblolly pine, Northern red oak, Southern red oak, White oak, Yellow-poplar
	Northern red oak	80	62.00	
	Red maple	70	43.00	
	Southern red oak	70	50.00	
	Swamp chestnut oak	75	57.00	
	Sweetgum	85	93.00	
	White oak	75	47.00	
	Willow oak	80	74.00	
	Yellow-poplar	75	68.00	
McA—Marshyhope loam, 0 to 2 percent slopes				
Marshyhope	Blackgum	70	75.00	Loblolly pine, Northern red oak, Southern red oak, White oak, Yellow-poplar
	Loblolly pine	85	120.00	
	Red maple	70	43.00	
	Southern red oak	80	65.00	
	Swamp chestnut oak	70	50.00	
	Sweetgum	85	93.00	
	White oak	75	47.00	
	Yellow-poplar	75	68.00	
MkB—Matapeake silt loam, 2 to 5 percent slopes				
Matapeake	Loblolly pine	85	120.00	Eastern white pine, Loblolly pine, Northern red oak, Southern red oak, White oak, Yellow-poplar
	Northern red oak	85	75.00	
	Red maple	75	47.00	
	Southern red oak	90	85.00	
	Sweetgum	85	93.00	
	White oak	85	65.00	
	Yellow-poplar	85	81.00	

Forestland Productivity—Cecil County, Maryland				
Map unit symbol and soil name	Potential productivity			Trees to manage
	Common trees	Site Index	Volume of wood fiber	
			<i>Cu ft/ac/yr</i>	
MkC—Matapeake silt loam, 5 to 10 percent slopes				
Matapeake	Loblolly pine	85	120.00	Eastern white pine, Loblolly pine, Northern red oak, Southern red oak, White oak, Yellow-poplar
	Northern red oak	85	75.00	
	Red maple	75	47.00	
	Southern red oak	90	85.00	
	Sweetgum	85	93.00	
	White oak	85	65.00	
	Yellow-poplar	85	81.00	
MpB—Matapeake-Urban land complex, 0 to 5 percent slopes				
Matapeake	Loblolly pine	85	120.00	Eastern white pine, Loblolly pine, Northern red oak, Southern red oak, White oak, Yellow-poplar
	Northern red oak	85	75.00	
	Red maple	75	47.00	
	Southern red oak	90	85.00	
	Sweetgum	85	93.00	
	White oak	85	65.00	
	Yellow-poplar	85	81.00	
Urban land	—	—	—	—
MtaA—Mattapex silt loam, 0 to 2 percent slopes, northern coastal plain				
Mattapex	Loblolly pine	85	120.00	Loblolly pine, Northern red oak, Southern red oak, White oak, Yellow-poplar
	Northern red oak	80	62.00	
	Red maple	75	47.00	
	Southern red oak	85	75.00	
	Sweetgum	90	106.00	
	White oak	80	55.00	
	Yellow-poplar	80	74.00	

Forestland Productivity—Cecil County, Maryland				
Map unit symbol and soil name	Potential productivity			Trees to manage
	Common trees	Site Index	Volume of wood fiber	
			<i>Cu ft/ac/yr</i>	
MtaB—Mattapex silt loam, 2 to 5 percent slopes, northern coastal plain				
Mattapex	Loblolly pine	85	120.00	Loblolly pine, Northern red oak, Southern red oak, White oak, Yellow-poplar
	Northern red oak	80	62.00	
	Red maple	75	47.00	
	Southern red oak	85	75.00	
	Sweetgum	90	106.00	
	White oak	80	55.00	
	Yellow-poplar	80	74.00	
MuB—Mattapex-Urban land complex, 0 to 5 percent slopes				
Mattapex	Loblolly pine	85	120.00	Loblolly pine, Northern red oak, Southern red oak, White oak, Yellow-poplar
	Northern red oak	80	62.00	
	Red maple	75	47.00	
	Southern red oak	85	75.00	
	Sweetgum	90	106.00	
	White oak	80	55.00	
	Yellow-poplar	80	74.00	
Urban land	—	—	—	—
NsA—Nassawango silt loam, 0 to 2 percent slopes				
Nassawango	Loblolly pine	85	120.00	Eastern white pine, Loblolly pine, Northern red oak, Southern red oak, White oak, Yellow-poplar
	Northern red oak	85	75.00	
	Red maple	75	47.00	
	Southern red oak	90	85.00	
	Sweetgum	85	93.00	
	White oak	85	65.00	
	Yellow-poplar	80	74.00	

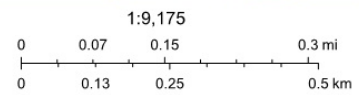
Forestland Productivity—Cecil County, Maryland				
Map unit symbol and soil name	Potential productivity			Trees to manage
	Common trees	Site Index	Volume of wood fiber	
			<i>Cu ft/ac/yr</i>	
NsB—Nassawango silt loam, 2 to 5 percent slopes				
Nassawango	Loblolly pine	85	120.00	Eastern white pine, Loblolly pine, Northern red oak, Southern red oak, White oak, Yellow-poplar
	Northern red oak	85	75.00	
	Red maple	75	47.00	
	Southern red oak	90	85.00	
	Sweetgum	85	93.00	
	White oak	85	65.00	
	Yellow-poplar	80	74.00	
OTA—Othello silt loams, 0 to 2 percent slopes, northern coastal plain				
Othello, drained	—	—	—	Cherrybark oak, Loblolly pine, White oak, Willow oak
Othello, undrained	Blackgum	70	75.00	Cherrybark oak, Loblolly pine, Swamp chestnut oak, Water oak, Willow oak
	Loblolly pine	90	129.00	
	Red maple	70	43.00	
	Southern red oak	70	50.00	
	Swamp chestnut oak	75	57.00	
	Sweetgum	80	79.00	
	White oak	75	47.00	
	Willow oak	75	62.00	
VnaB—Urban land-Nassawango complex, 0 to 5 percent slopes				
Urban land	—	—	—	—
Nassawango	Loblolly pine	85	120.00	Eastern white pine, Loblolly pine, Northern red oak, Southern red oak, White oak, Yellow-poplar
	Northern red oak	85	75.00	
	Red maple	75	47.00	
	Southern red oak	90	85.00	
	Sweetgum	85	93.00	
	White oak	85	65.00	
	Yellow-poplar	80	74.00	

Forestland Productivity—Cecil County, Maryland				
Map unit symbol and soil name	Potential productivity			Trees to manage
	Common trees	Site Index	Volume of wood fiber	
			<i>Cu ft/ac/yr</i>	
WdaB—Woodstown sandy loam, 2 to 5 percent slopes, Northern Coastal Plain				
Woodstown	Loblolly pine	80	110.00	Loblolly pine, Northern red oak, Southern red oak, White oak, Yellow-poplar
	Northern red oak	80	62.00	
	Red maple	75	47.00	
	Southern red oak	85	75.00	
	Sweetgum	90	106.00	
	White oak	80	55.00	
	Yellow-poplar	85	81.00	

FIDS MAPPING



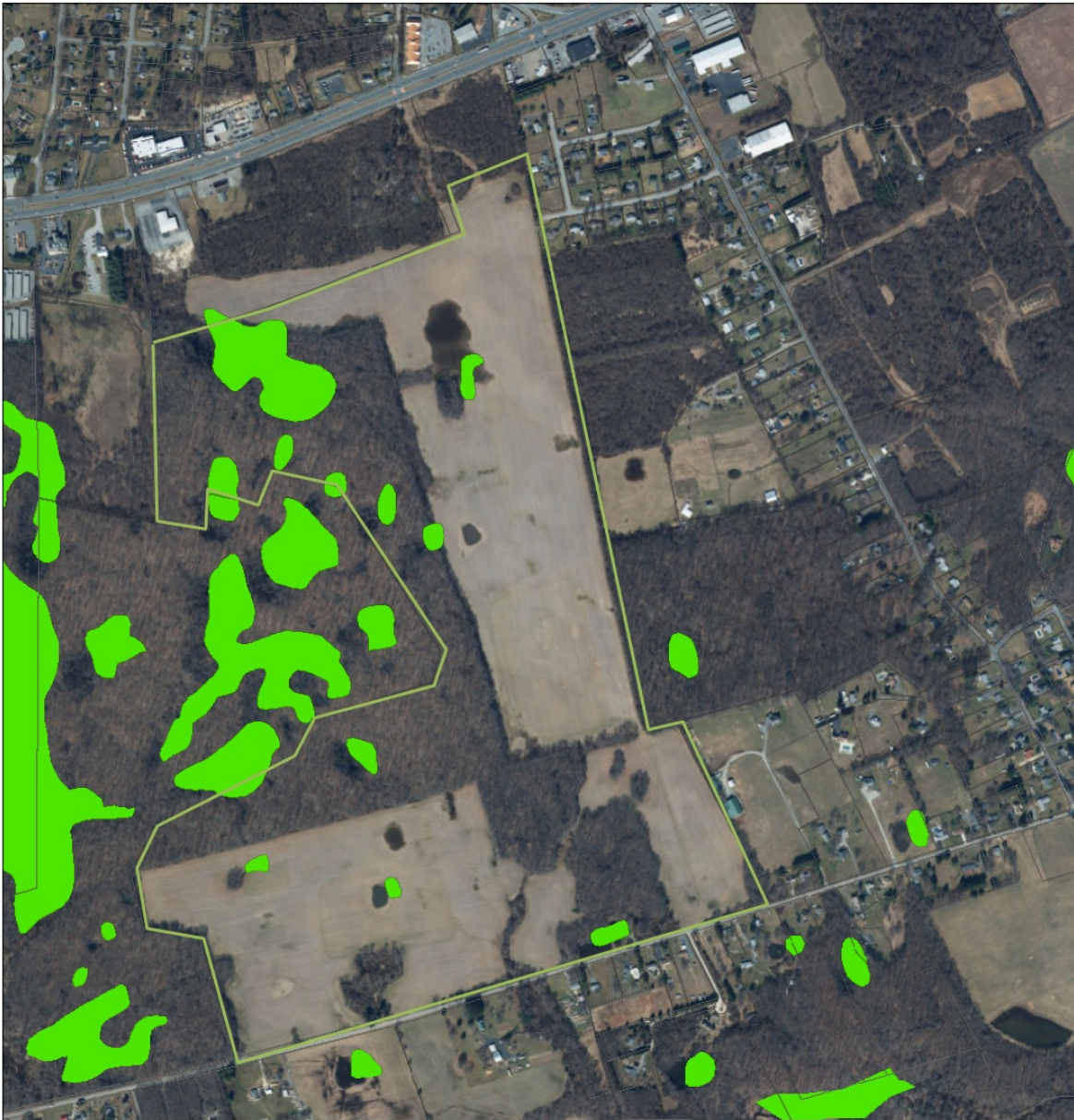
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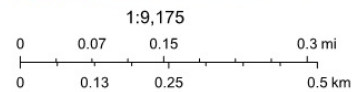
MD IMAP, MDP, SDAT, MD IMAP, DNR, Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap

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NWI MAPPING



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MD iMAP, MDP, SDAT, MD iMAP, DNR, USFW, Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap

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APPENDIX D

Forest Stand Delineation Plan



SOUTHFIELDS- VANDEVELDE PROPERTY

NATURAL RESOURCES INVENTORY, FOREST STAND DELINEATION, AND CRITICAL AREA FINDINGS REPORT

prepared for:

**Southfields of Elkton Capital Development
c/o Stonewall Capital
1206 Sparks Road
Sparks, Maryland 21152**

prepared by:

**Eco-Science Professionals, Inc.
P.O. Box 5006
Glen Arm, Maryland 21057
(410) 683-7840**

December 6, 2019

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I. INTRODUCTION

Eco-Science Professionals, Inc. was contracted by Stonewall Development to perform Forest Stand Delineation for the VandeVelde property. The project site encompasses approximately 68.1 acres of land located off of Frenchtown Road in the Elkton section of Cecil County, Maryland. This study was done to identify and assess the regulated natural resources which would impact site development. The property is part of the larger Southfields community project.

II. NATURAL RESOURCE INVENTORY NARRATIVE

The subject property is located off of Frenchtown Road in the Elkton section of Cecil County, Maryland. The subject property is shown on County tax map 323 as parcel 79. The general land use in the vicinity of the site is characterized by medium density residential and commercial development.

The site is located within the Coastal Plain physiographic province of Maryland. In Cecil County, which ranges from nearly level to gently rolling topography with unconsolidated bedrock.

The Van de Velde property has water frontage on the Elk River. The portion of the property along the waterfront and within 1000 feet of the tidal waters, approximately 48 acres, is within the Critical Area. The site is mapped as a Resource Conservation Area within the Critical Area. The remaining 20 acres is outside the Critical Area. Portions of the site outside the Critical Area are subject to the Forest Conservation Act requirements.

The western end of the subject property has road frontage along Frenchtown Road, the eastern end of the site abuts the Lynnhaven Acres community. Several actual and paper streets of the Lynn Haven Acres community also provide access to the subject property.

The subject property is entirely forested with no active disturbances being noted. Use of the property for hunting and other recreational opportunities was observed. Some minor encroachment from adjacent properties may also be occurring.

The forest on the site is dominated by a mixed oak-tulip poplar community. The canopy composition varies but is generally made up of tulip poplar, white oak, and sweet gum. Some evidence of past logging was noted, especially in the western half of the site within the Critical

Area. In the critical area the community is dominated by tulip poplar, sweet gum and American beech. Poplar maintains a higher percent in the upper elevations with maple and sweet gum being prevalent on the lower terrace. Less common associates include chestnut oak, white oak, hickory and black cherry. The canopy is generally in the 14-22" dbh range. A few larger oaks and silver maple were noted in the stand. Tire ruts, the uniform age of the trees and the smaller general size of the dominant trees across the southwestern portion of the site suggest this area was logged. The shrub community is generally dense with young American holly, mixing with bush honeysuckle, spicebush, highbush blueberry greenbrier and summersweet.

Shrub development in the stand is variable with dense shrub colonization along the edges of the stand and only limited shrubs present toward the interior. Bush honeysuckle and multiflora rose are common along the outer edges of the community. Green brier, Japanese honeysuckle, poison ivy and Oriental bittersweet are also notable.

A perennial tributary stream channel is present along the northern edge of the site. This stream originates offsite and flows through a well defined, though meandering, stream valley. A second stream system originates along the eastern property boundary as a headwater wetland that drains into a deeply incised stream valley that flows along the rear of the Lynnhaven Acres community and then cuts across the middle of the subject property. This system does have some contributing wetlands along its length. These wetlands are typically forested with a canopy made up of sweet gum, red maple, willow oak and red oak. The headwater of this system contains diverse branching and numerous seeps. Summersweet, spicebush, highbush blueberry, cinnamon fern, false nettle, skunk cabbage, sensitive fern and jewelweed were noted in the wetlands.

Tidal wetlands are present along the Elk Creek frontage and at the confluence of the tributary streams. These areas are dominated by common reed but does support some other native vegetative species. Cattails, willow, maple, bulrush, woolgrass and winterberry were noted.

The tidal waters of the Elk River are classified as Use II waters. The nontidal tributaries on the property are classified as Use I waters. The streams are all within the Upper Elk River watershed (02130603).

The forest on the property is noted to be potential Forest Interior Habitat on the DNR Living Resources tab on the MD Merlin Website. In addition, the waterfront along Elk River is identified as a possible waterfowl staging area.

Three headstones were found to be present in the western edge of the site. These stones are located on a slight but discernible point along the slopes overlooking the waterfront. A large, 39" dbh white oak, flagged in the field as specimen tree 66, is present in this area.

The Web Soil Survey shows the following soils on the project site:

AnA Annemessex loam, 0 to 2 percent slopes
AnB Annemessex loam, 2 to 5 percent slopes
CfB Christiana-Sassafras-Urban land complex, 0 to 5 percent slopes
EnB Elsinboro silt loam, 3 to 8 percent slopes
KpA Keyport silt loam, 0 to 2 percent slopes
KpC Keyport silt loam, 5 to 10 percent slopes
McA Marshyhope loam, 0 to 2 percent slopes
RmB Russett-Christian-Hambrook complex, 0 to 5 percent slopes
RmC Russett-Christian-Hambrook complex, 5 to 10 percent slopes
RmD Russett-Christian-Hambrook complex, 10 to 15 percent slopes
RxB Russett-Christian-Urban land complex, 0 to 5 percent slopes
WdaB Woodstown sandy loam, 2 to 5 percent slopes, Northern Coastal Plain
Za Zekiah sandy loam, frequently flooded

Annemessex, Elsinboro, Keyport, Marshyhope soils are all considered Farmland of Statewide importance. Zekiah sandy loamy is mapped as a hydric soil.

III. FOREST STAND DELINEATION

Methods

The forest stand delineation for the subject property was performed November, 2019. The requirements outlined in Section 1 of the State of Maryland Forest Conservation Act and in the *Town of Elkton Forest Conservation Ordinance* were used to delineate and report the characteristics of the existing forest resources on the property.

Forest Stand Narratives

One forest stand type is present within 20 acre portion of the property that is subject to the Forest Conservation Act requirements. The forest limits, which encompass 20 +/- acres of the site outside the Critical Area have been mapped on the Forest Stand Delineation Plan. The Forest Stand Summary Sheet and data sheets can be found in appendix section of this report. Below find a description of the forest stand present on this project site.

Stand F-1

Stand F-1 is a mature mixed oak/tulip poplar community. The stand occurs on gentle to moderate slopes and includes both upland and wetland habitats. The eastern edge of the stand

abuts an existing cropfield. To the north and west the stand is adjacent to offsite and/or Critical Area forest. The Lynnhaven Acres community and Frenchtown Road are present along the southern edge of the stand.

Tulip poplar and American beech are common in all sample points across the stand. Poplar is the dominant canopy tree and beech is common in the understory. Canopy associates include sweet gum, red maple, and willow oak in the wetland and stream bottoms and white oak and southern red oak in the uplands. Overall the canopy is created by trees in the 20-30" dbh size range, with scattered specimen trees also being present. The canopy closure is approximately 90 percent throughout the stand.

The understory of the stand is dominated by young American beech. Red maple, black gum, black cherry, pignut hickory and tulip poplar are also common in this strata. The shrub layer of the stand is variable based on proximity to the edge of the stand. Along the outer edges the shrub and vine community is well established with bush honeysuckle, multiflora rose, spicebush, and greenbrier. Some Japanese barberry, highbush blueberry and arrowwood were also noted. Japanese honeysuckle, poison ivy and Oriental bittersweet are also common. Creeping Euonymus is present throughout the stand but has not become invasive.

In the interior portions of the stand the shrub layer is minimal with scattered high bush blueberry, arrowwood and spicebush being more notable.

The herb layer of the stand is minimal. Japanese honeysuckle is common toward the edges of the stand. Christmas fern and partridgeberry are scattered throughout and cinnamon fern and sensitive fern are notable in the wetlands. False nettle, skunk cabbage and jewelweed was also observed in the wetland areas

The estimated age of Stand F-1 is 60-80 years old. The stand occupies approximately 20 +/- acres of the net tract area of the site. Additional forest is present within the Critical Area.

The overall condition of this stand is good. The stand has good species diversity and canopy development. The limited native shrub and herb layers reduce the overall habitat value. . Invasive species colonization, primary Japanese/bush honeysuckle and bittersweet, is very high in localized areas. If this continued to spread it will detract more from the stands overall condition.

Some dead standing and storm damaged trees were noted in the stand. Downed woody debris was variable within the stand. In general woody debris was limited but some areas do have evidence of storm damage where downed trees are notable.

The stand appears to be used routinely for hunting and passive recreation.

This stand is connected to other on and offsite forest resources. The overall forest

community is mapped as potentially providing forest interior habitat but the portion of the stand within the study area is heavily impacted by edge effect. This forest does provide edge buffer to the adjacent Critical Area forest. The overall stand meets the minimum standard for interior habitat. Further investigation would be required to determine that actual level of usage by forest interior breeding birds.

The stand scores a 11 out of 21 on the structure analysis indicating good structure.

Portions of the stand occurring within wetland, streams and their buffers are considered a high priority for retention. Portions of the stand outside these areas would be considered a moderate priority for preservation.

Specimen Trees

The Cecil County Forest Conservation Program defines specimen trees as "trees having a diameter measured at 4.5 feet above the ground of 30 inches or more, or trees having 75 percent or more of the diameter of the current state or Cecil County champion tree of that species. Seventy-two specimen trees are present on the entire site. The location, type, size and condition of the trees is shown on the accompanying plan. Several of these trees occur within the Critical Area. Specimen trees are not specifically regulated in the Critical Area.

V. AUTHORSHIP

This wetland study was performed by John Canoles and Henry Leskinen. Messrs. Canoles and Leskinen have extensive experience in natural resources assessments and inventories. Mr. Canoles received his B.S. in Natural Sciences with an Environmental Conservation Concentration from Towson State University in Towson, Maryland. Mr. Leskinen received his B.S. in Biological Sciences from St. Marys College of Maryland in St. Marys City, Maryland. Messrs Canoles and Leskinen have each received their Provisional Wetland Certification from the U.S. Army Corps of Engineers, Baltimore District (See Appendix A).

VI. LITERATURE CITED

Cowardin, Lewis et.al. *Classification of Wetlands and Deepwater Habitats of the United States*. U.S. Dept. of Interior, Fish and Wildlife Service, Washington, D.C. FWS/OBS-79/31. December, 1979.

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APPENDIX A

Certification Forms



William Donald Schaefer
Governor

Maryland Department Of Natural Resources

Public Lands and Forestry
Tawes State Office Building
580 Taylor Avenue
Annapolis, MD 21401

Torrey C. Brown, M.D.
Secretary

January 12, 1993

Mr. John Canoles
Eco-Science Professionals, Inc.
P.O. Box 5006
Glen Arm, MD 21057

Dear Mr. Canoles,

We of the Maryland Department of Natural Resources have reviewed your application for qualified professional status for the purpose of developing Forest Stand Delineations and Forest Conservation Plans. We are happy to inform you that our review found you met the requirements of COMAR 08.19.06.01 for this status. Your name will be included on a list of qualified professionals to be sent to jurisdictions with power to review Forest Stand Delineations and Forest Conservation Plans.

Participation by professionals like you is key to successful implementation of the Forest Conservation Act. Thank you for submitting your application.

Sincerely,

Eric Schwaab
Director, Forestry Programs

c:\letters\qualpro.apr

Telephone: _____
DNR TTY for the Deaf: 410-974-3683

Ⓢ

Eco-Science Professionals, Inc.



DEPARTMENT OF THE ARMY
BALTIMORE DISTRICT, U.S. ARMY CORPS OF ENGINEERS
P.O. BOX 1715
BALTIMORE, MD 21203-1715

U.S. ARMY CORPS OF ENGINEERS

CERTIFIES THAT

JOHN PRESTON CANOLES

CERTIFICATE NUMBER: WDGP93MD0610044B

has successfully demonstrated
to the U.S. Army Corps of Engineers, Baltimore District,
sufficient understanding of, and the capability to
perform satisfactory wetland delineations consistent with, the
Corps 1987 Wetland Delineation Manual and supplemental guidance.
This verifies that wetland delineations performed by the
certified wetland delineator named above will receive expedited
consideration and acceptance by the certifying district, for
purposes of the Corps' final determination of wetland
jurisdiction pursuant to Section 404 of the Clean Water Act.

Donald W. Roeseke
Donald W. Roeseke
Chief, Regulatory Branch
Baltimore District

August 19, 1993
Date

*This is a provisional certification for the purposes of the
demonstration phase of the Corps Wetland Delineator Certification
Program

APPENDIX B

Forest Stand Data Sheets/Checklist

SUBMITTAL REQUIREMENTS

1. Site Vicinity Map

- ☒ location of the project site and surrounding area within one square mile
- ☒ major roads
- ☒ political boundaries
- ☒ north arrow
- ☒ adjacent land uses
- ☒ forested areas
- ☒ minimum scale of 1" = 2000' (1:24,000)

2. Forest Stand Delineation Map

- ☒ property boundaries (tax maps, plats, or surveyed boundaries)
- ☒ north arrow
- ☒ title, date, revisions, scale, and legend
- ☒ certification by Qualified Professional or stamp of a Maryland licensed L.A. or Forester
- ☒ topographic contours and interval (USGS 7 1/2 minute quad or spot elevations)
- ☒ steep slopes greater than 25% (on areas greater than or equal to 10,000 square feet)
- ☒ 100-year flood plain (watersheds of 400 acres or larger or Class III streams)
- ☒ intermittent and perennial streams (USGS 7 1/2 minute quadrangle or SCS Soil Surveys)
- ☒ stream buffers (50-foot width)
- ☒ soil classifications (SCS Soil Surveys) indicating soils with:
 - ☒ structural limitations
 - ☒ hydric properties
 - ☒ K value greater than 0.35 on slopes greater than or equal to 15%
- ☒ non-tidal or tidal wetlands and buffers (National Wetlands Inventory 1:24,000 or Maryland Water Resources Administration)
- ☒ Critical Habitat Areas
- ☒ forested areas and unforested areas including tree lines extending off-site
- ☒ priority afforestation areas
- ☒ priority retention areas
- ☒ field sampling locations
- ☒ proposed limits of disturbance

- ☒ location description and size of forest stands
- ☒ location of trees or stands which have trees that are:
 - ☒ rare, threatened, and endangered species of plants (Maryland Natural Heritage Program)
 - ☒ part of an historic site or associated with an historic structure
 - ☒ designated by the Maryland Department of Natural Resources or local authority as a champion tree for that species
 - ☒ specimen trees of 30" dbh or greater (some local jurisdictions may vary)
 - ☒ trees with at least 75% of the diameter of the state champion tree of that species

3. Forest Stand Analysis

- ☒ site description
- ☒ methodology
- ☒ summary for each stand, describing:
 - ☒ stand composition
 - ☒ stand structure
 - ☒ stand condition
 - ☒ retention potential relating to proposed development or
 - ☒ specific management recommendations
 - ☒ stand function
 - ☒ water quality benefits
 - ☒ specific wildlife habitat value
 - ☒ other land use objectives, including recreation, timber management, etc.
- ☒ recommendations for specific areas such as specimen trees
- ☒ field sampling data sheets if required
- ☒ property name, name of person collecting data, date data was collected
- ☒ complete data for each sample plot
- ☒ forest stand summary sheets
- ☒ include the name of the property, location, name of the person preparing the summary, and the date it was prepared
- ☒ summary for each forest stand

4. Application

- ☒ completed information including signature (COMAR 08.19.04.02)

Source: DNR

Full FSD Checklist

Figure
2.1.9

Forest Stand Field Data Summary Sheet

Property Name: Van de Velde

Prepared by: ESPE

Date: 11/18/16

Stand Variable	Stand Number		
	1	2	
Acreage of Stand	20.0 +/-		
Forest Association (SAF cover type)	Oak/poplar		
Average size class of dominant trees	20-30		
Average # of trees/acre	80		
Number of tree species per acre	7		
Basal area/acre	80		
Average # of dead trees/acre	4		
Forest Structure Value	11		

Common understory species: American beech, American Holly, black gum
black cherry.

Comments: _____

Forest Structure Analysis(Reprinted from the MD Forest Conservation Manual)

The following parameters will be measured and evaluated at each site according to the techniques for forest structure data collection described previously. Each parameter at each sample site will be given a value of 3, 2, 1, or 0. Three represents the most valuable structure and 0, the least valuable. Upon completion of the sampling, the person preparing the FSD will calculate the forest structure value for each stand. This analysis, along with the other forest stand data will be used to determine the retention potential and priority level of the stand.

To determine the total habitat value use the following scale¹:

Range of total habitat numbers from samples taken April - October:

15-21	Priority for forest structure
7-14	Good forest structure
0-6	Poor forest structure

In the winter and late fall, from November - March, only numbers 1,3,4,5,7 can be measured. During that time, the range of total habitat numbers will be:

11-15	Priority forest structure
6-10	Good forest structure
0-5	Poor forest structure

1. Percent Canopy Closure of trees with a DBH greater than 7"

70%-100%	3
40%-69%	2
10%-39%	1
0%-9%	0

5. Size Class of Dominant Trees²

Greater than 20"	3
7"-19.9"	2
3"-6.9"	1
Less than 3"	0

2. Number of Understory Shrubs 1/100 acre

6 or more	3
4-5	2
2-3	1
0-1	0

6. Percent of Understory Herbaceous Coverage

75%-100%	3
25%-74%	2
5%-24%	1
0%-4%	0

3. Number of Dead Trees/tenth acre plot²

3 or more	3
2	2
1	1
0	0

7. Number of Tree Species with a DBH greater than 7"/plot²

6 or more	3
4-5	2
2-3	1
0-1	0

4. Percent of Dead and Downed Woody Material Present

15%-100%	3
5%-14%	2
1%-4%	1
0	0

11/9

¹ Round values in 1-7 to the nearest whole number.

² Data included in the Forest Stand Field Data Summary Sheet.

Figure B-1 Forest Sampling Data Worksheet

Property: Van de Velde Prepared By: ETPI
Stand #: F1 Plot #: 1 Plot Size: 1/10 Date: 11/11/19

Basal Area in Square Feet per Acre: <u>80</u>		Size Class of Trees > 20' Height within Sample Plot														
Tree Species	Number of Trees 2-5.9" dbh			Number of Trees 6-11.9" dbh			Number of Trees 12-19.9" dbh			Number of Trees 20-29.9" dbh			Number of Trees > 30" dbh			
Crown Position	Dom.	CoD	Other	Dom.	CoD	Other	Dom.	CoD	Other	Dom.	CoD	Other	Dom.	CoD	Other	Total
<u>Paper</u>	<u>1</u>			<u>1</u>			<u>1</u>			<u>3</u>						
<u>beech</u>	<u>2</u>			<u>2</u>			<u>1</u>									
Total Number of Trees per Size Class	<u>3</u>			<u>3</u>			<u>2</u>			<u>3</u>						<u>11</u>
Number & Size of Standing Dead Trees																
List of Common Understory Species 3'-20': <u>beech</u>							Percent of Canopy Closure					Percent of Invasive Cover per Plot (All Layers):		Plot Successional Stage:		
							C	N	E	S	W	Total				
							<u>Y</u>	<u>Y</u>	<u>Y</u>	<u>Y</u>	<u>Y</u>	<u>100</u>	<u>56</u>		<u>mature</u>	
							Percent of Understory Cover 3'-20'									
							C	N	E	S	W	Total				
							<u>N</u>	<u>N</u>	<u>Y</u>	<u>N</u>	<u>Y</u>	<u>40</u>				
List of Herbaceous Species 0'-3': <u>x-mas fern - 5%</u> <u>NY Fern - 13</u>							Percent of Herbaceous Cover 0'-3'					List of Major Invasive Species per Plot (All Layers): <u>barberry</u>				
							C	N	E	S	W	Total				
							<u>H</u>	<u>H</u>	<u>Y</u>	<u>Y</u>	<u>H</u>	<u>40</u>				
Comments <u>Sapling beech, Am Lilly</u> <u>some Greenbrow noted</u>																
Sheet ___ of ___																

Source: DNR

Figure B-1 Forest Sampling Data Worksheet

Property: Van de Velde Prepared By: ESPI
Stand #: _____ Plot #: 2 Plot Size: 1/10 Date: 11/6/19

Basal Area in Square Feet per Acre: <u>70</u>		Size Class of Trees > 20' Height within Sample Plot															
Tree Species <u>70</u>	Number of Trees 2-5.9" dbh			Number of Trees 6-11.9" dbh			Number of Trees 12-19.9" dbh			Number of Trees 20-29.9" dbh			Number of Trees > 30" dbh				
Crown Position	Dom.	CoD	Other	Dom.	CoD	Other	Dom.	CoD	Other	Dom.	CoD	Other	Dom.	CoD	Other	Total	
<u>P. plan</u>													1				
<u>R. maple</u>						1											
<u>beech</u>								2			1						
<u>Sl. oak</u>																	
<u>Sw. Gum</u>								2									
Total Number of Trees per Size Class				1			4			2						7	
Number & Size of Standing Dead Trees																	
List of Common Understory Species 3'-20': <u>beech</u> <u>spicebush</u> <u>10%</u> <u>Red maple</u> <u>bush haws</u> <u>5%</u>				Percent of Canopy Closure						Percent of Invasive Cover per Plot (All Layers): <u>5%</u>			Plot Successional Stage:				
				C	N	E	S	W	Total								
				Y	Y	Y	Y	Y	100								
				Percent of Understory Cover 3'-20'													
				C	N	E	S	W	Total								
				N	Y	Y	Y	Y	80								
List of Herbaceous Species 0'-3': <u>Common Fern</u>				Percent of Herbaceous Cover 0'-3'									List of Major Invasive Species per Plot (All Layers): <u>bush haws</u> <u>J. hays</u> <u>C. Evonymus</u>				
				C	N	E	S	W	Total								
				N	Y	N	N	N	20								
Comments: <u>more bush haws & J. hays & green fern toward outer edge of forest</u> <u>poison ivy common on trees</u>																	
Sheet ____ of ____																	

Source: DNR

Figure B-1 Forest Sampling Data Worksheet

Property: Van de Velde Prepared By: ESRE
Stand #: _____ Plot #: 3 Plot Size: 1/10 Date: 11/11/15

Basal Area in Square Feet per Acre: <u>90</u>		Size Class of Trees > 20' Height within Sample Plot														
Tree Species	Number of Trees 2-5.9" dbh			Number of Trees 6-11.9" dbh			Number of Trees 12-19.9" dbh			Number of Trees 20-29.9" dbh			Number of Trees > 30" dbh			
Crown Position	Dom.	CoD	Other	Dom.	CoD	Other	Dom.	CoD	Other	Dom.	CoD	Other	Dom.	CoD	Other	Total
<u>Poplar</u>	<u>3</u>			<u>2</u>			<u>3</u>									
<u>beech</u>					<u>1</u>											
<u>R. maple</u>			<u>1</u>													
Total Number of Trees per Size Class	<u>4</u>			<u>3</u>			<u>3</u>									<u>10</u>
Number & Size of Standing Dead Trees																
List of Common Understory Species 3'-20':							Percent of Canopy Closure						Percent of Invasive Cover per Plot (All Layers):		Plot Successional Stage:	
<u>Spicebush 70%</u> <u>holly</u>							C	N	E	S	W	Total	<u>30%</u>		<u>mid mature</u>	
							<u>Y</u>	<u>Y</u>	<u>Y</u>	<u>Y</u>	<u>Y</u>	<u>100</u>				
List of Herbaceous Species 0'-3':							Percent of Understory Cover 3'-20'						List of Major Invasive Species per Plot (All Layers):			
<u>J. haysuckle 30%</u> <u>Union grass 5%</u>							C	N	E	S	W	Total				
							<u>Y</u>	<u>Y</u>	<u>Y</u>	<u>Y</u>	<u>Y</u>	<u>100</u>				
							Percent of Herbaceous Cover 0'-3'									
							C	N	E	S	W	Total				
							<u>Y</u>	<u>N</u>	<u>N</u>	<u>N</u>	<u>Y</u>	<u>40</u>				
Comments: <u>multiflora rose noted outside sample</u>																
Sheet ____ of ____																

Source: DNR

Figure B-1 Forest Sampling Data Worksheet

Property: Van de Velde Prepared By: ESR
Stand #: _____ Plot #: 4 Plot Size: 1/10 Date: 11/11/15

Basal Area in Square Feet per Acre: <u>70</u>		Size Class of Trees > 20' Height within Sample Plot															
Tree Species	Number of Trees 2-5.9" dbh			Number of Trees 6-11.9" dbh			Number of Trees 12-19.9" dbh			Number of Trees 20-29.9" dbh			Number of Trees > 30" dbh			Total	
	Crown Position	Dom.	CoD	Other	Dom.	CoD	Other	Dom.	CoD	Other	Dom.	CoD	Other	Dom.	CoD		Other
<u>Poplar</u>	<u>2</u>							<u>1</u>	<u>3</u>		<u>1</u>						
<u>Hack Cherry</u>			<u>1</u>						<u>1</u>								
<u>beech</u>																	
Total Number of Trees per Size Class		<u>3</u>							<u>2</u>		<u>1</u>						<u>6</u>
Number & Size of Standing Dead Trees																	
List of Common Understory Species 3'-20': <u>Multiflora rose 10%</u> <u>sp. cedar 5%</u> <u>prunet 20%</u> <u>beech saplings</u>				Percent of Canopy Closure						Percent of Invasive Cover per Plot (All Layers): <u>20%</u>		Plot Successional Stage: <u>m.d. mature</u>					
				C	N	E	S	W	Total								
				<u>Y</u>	<u>Y</u>	<u>Y</u>	<u>Y</u>	<u>Y</u>	<u>100</u>								
				Percent of Understory Cover 3'-20'													
				C	N	E	S	W	Total								
				<u>Y</u>	<u>Y</u>	<u>Y</u>	<u>Y</u>	<u>Y</u>	<u>100</u>								
List of Herbaceous Species 0'-3': <u>foxglove</u> <u>Jap. honeysuckle</u>				Percent of Herbaceous Cover 0'-3'						List of Major Invasive Species per Plot (All Layers): <u>Multiflora rose</u> <u>Jap. honeysuckle</u>							
				C	N	E	S	W	Total								
				<u>Y</u>	<u>N</u>	<u>N</u>	<u>Y</u>	<u>Y</u>	<u>60</u>								
Comments																	
Sheet ____ of ____																	

Source: DNR

Figure B-1 Forest Sampling Data Worksheet

Property: Van de Velde Prepared By: ESPE

Stand #: _____ Plot #: 5 Plot Size: 1/10 Date: 11/11/19

Basal Area in Square Feet per Acre: <u>8</u>		Size Class of Trees > 20' Height within Sample Plot														
Tree Species	Number of Trees 2-5.9" dbh			Number of Trees 6-11.9" dbh			Number of Trees 12-19.9" dbh			Number of Trees 20-29.9" dbh			Number of Trees > 30" dbh			
Crown Position	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Total
<u>Poplar</u>							<u>4</u>									
<u>beech</u>	<u>2</u>						<u>4</u>									
<u>Red Maple</u>			<u>2</u>			<u>1</u>										
Total Number of Trees per Size Class	<u>4</u>			<u>1</u>			<u>8</u>									<u>139</u>
Number & Size of Standing Dead Trees																
List of Common Understory Species 3'-20': <u>Young birch</u>							Percent of Canopy Closure						Percent of Invasive Cover per Plot (All Layers): <u>—</u>		Plot Successional Stage: <u>midstage</u>	
							C	N	E	S	W	Total				
							<u>4</u>	<u>4</u>	<u>4</u>	<u>N</u>	<u>4</u>	<u>100</u>				
							Percent of Understory Cover 3'-20'									
							C	N	E	S	W	Total				
							<u>4</u>	<u>N</u>	<u>N</u>	<u>N</u>	<u>N</u>	<u>20</u>				
List of Herbaceous Species 0'-3': <u>—</u>							Percent of Herbaceous Cover 0'-3'									
							C	N	E	S	W	Total				
							<u>N</u>	<u>N</u>	<u>N</u>	<u>H</u>	<u>N</u>	<u>0</u>				
List of Major Invasive Species per Plot (All Layers): <u>—</u>																
Comments <u>heavy leaf litter, no shrubs</u> <u>downed sticks & branches</u>																
Sheet ____ of ____																

Source: DNR

APPENDIX C

Site Soil Data, NWI & Living Resources Mapping

Custom Soil Resource Report Soil Map



Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
AnA	Annemessex loam, 0 to 2 percent slopes	2.2	1.9%
AnB	Annemessex loam, 2 to 5 percent slopes	10.1	8.9%
CfB	Christiana-Sassafras-Urban land complex, 0 to 5 percent slopes	0.5	0.4%
EnB	Elsinboro silt loam, 3 to 8 percent slopes	1.8	1.5%
KpA	Keyport silt loam, 0 to 2 percent slopes	0.0	0.0%
KpC	Keyport silt loam, 5 to 10 percent slopes	9.9	8.7%
McA	Marshyhope loam, 0 to 2 percent slopes	1.5	1.3%
RmB	Russett-Christiana-Hambrook complex, 0 to 5 percent slopes	14.2	12.5%
RmC	Russett-Christiana-Hambrook complex, 5 to 10 percent slopes	22.4	19.7%
RmD	Russett-Christiana-Hambrook complex, 10 to 15 percent slopes	28.7	25.3%
RxB	Russett-Christiana-Urban land complex, 0 to 5 percent slopes	16.0	14.1%
W	Water	2.6	2.3%
WdaB	Woodstown sandy loam, 2 to 5 percent slopes, Northern Coastal Plain	0.1	0.1%
Za	Zekiah sandy loam, frequently flooded	3.7	3.2%
Totals for Area of Interest		113.4	100.0%

Report—Forestland Productivity

Forestland Productivity—Cecil County, Maryland				
Map unit symbol and soil name	Potential productivity			Trees to manage
	Common trees	Site Index	Volume of wood fiber	
			<i>Cu ft/ac/yr</i>	
AnA—Annemessex loam, 0 to 2 percent slopes				
Annemessex	Sweetgum	85	—	Loblolly pine, Sweetgum, Water oak, White oak
	Water oak	90	—	
	Willow oak	90	—	
AnB—Annemessex loam, 2 to 5 percent slopes				
Annemessex	Sweetgum	85	—	Loblolly pine, Sweetgum, Water oak, White oak
	Water oak	90	—	
	Willow oak	90	—	
CfB—Christiana-Sassafras-Urban land complex, 0 to 5 percent slopes				
Christiana	Sweetgum	75	72.00	Loblolly pine, Northern red oak, Yellow-poplar
	Virginia pine	70	114.00	
	White oak	70	57.00	
Sassafras	Loblolly pine	80	110.00	Eastern white pine, Loblolly pine, Northern red oak, Southern red oak, White oak, Yellow-poplar
	Northern red oak	90	85.00	
	Red maple	75	47.00	
	Southern red oak	90	85.00	
	Sweetgum	85	93.00	
	White oak	85	65.00	
	Yellow-poplar	90	90.00	
Urban land	—	—	—	—

Forestland Productivity—Cecil County, Maryland				
Map unit symbol and soil name	Potential productivity			Trees to manage
	Common trees	Site Index	Volume of wood fiber	
			<i>Cu ft/ac/yr</i>	
EnB—Elsinboro silt loam, 3 to 8 percent slopes				
Elsinboro	Hickory	80	60.00	Eastern white pine, Northern red oak, Yellow-poplar
	Northern red oak	80	57.00	
	Yellow-poplar	90	86.00	
KpA—Keyport silt loam, 0 to 2 percent slopes				
Keyport	Loblolly pine	70	101.00	Loblolly pine, Northern red oak, Southern red oak, White oak, Yellow-poplar
	Northern red oak	80	62.00	
	Red maple	70	43.00	
	Southern red oak	70	50.00	
	Swamp chestnut oak	75	57.00	
	Sweetgum	85	93.00	
	White oak	75	47.00	
	Willow oak	80	74.00	
	Yellow-poplar	75	68.00	
KpC—Keyport silt loam, 5 to 10 percent slopes				
Keyport	Loblolly pine	70	101.00	Loblolly pine, Northern red oak, Southern red oak, White oak, Yellow-poplar
	Northern red oak	80	62.00	
	Red maple	70	43.00	
	Southern red oak	70	50.00	
	Swamp chestnut oak	75	57.00	
	Sweetgum	85	93.00	
	White oak	75	47.00	
	Willow oak	80	74.00	
	Yellow-poplar	75	68.00	
McA—Marshyhope loam, 0 to 2 percent slopes				
Marshyhope	Blackgum	70	75.00	Loblolly pine, Northern red oak, Southern red oak, White oak, Yellow-poplar
	Loblolly pine	85	120.00	
	Red maple	70	43.00	
	Southern red oak	80	65.00	
	Swamp chestnut oak	70	50.00	
	Sweetgum	85	93.00	
	White oak	75	47.00	
	Yellow-poplar	75	68.00	

Forestland Productivity—Cecil County, Maryland				
Map unit symbol and soil name	Potential productivity			Trees to manage
	Common trees	Site Index	Volume of wood fiber	
			<i>Cu ft/ac/yr</i>	
RmB—Russett-Christiana-Hambrook complex, 0 to 5 percent slopes				
Russett	Loblolly pine	90	129.00	Eastern white pine, Loblolly pine, Sweetgum, Yellow-poplar
	Northern red oak	80	57.00	
	Sweetgum	90	100.00	
	Yellow-poplar	90	86.00	
Christiana	Sweetgum	75	72.00	Loblolly pine, Northern red oak, Yellow-poplar
	Virginia pine	70	114.00	
	White oak	70	57.00	
Hambrook	Loblolly pine	80	110.00	Eastern white pine, Loblolly pine, Northern red oak, Southern red oak, White oak, Yellow-poplar
	Northern red oak	90	85.00	
	Red maple	75	47.00	
	Southern red oak	90	85.00	
	Sweetgum	80	79.00	
	White oak	85	65.00	
	Yellow-poplar	90	90.00	
RmC—Russett-Christiana-Hambrook complex, 5 to 10 percent slopes				
Russett	Loblolly pine	90	129.00	Eastern white pine, Loblolly pine, Sweetgum, Yellow-poplar
	Northern red oak	80	57.00	
	Sweetgum	90	100.00	
	Yellow-poplar	90	86.00	
Christiana	Sweetgum	75	72.00	Loblolly pine, Northern red oak, Yellow-poplar
	Virginia pine	70	114.00	
	White oak	70	57.00	
Hambrook	Loblolly pine	80	110.00	Eastern white pine, Loblolly pine, Northern red oak, Southern red oak, White oak, Yellow-poplar
	Northern red oak	90	85.00	
	Red maple	75	47.00	
	Southern red oak	90	85.00	
	Sweetgum	80	79.00	
	White oak	85	65.00	
	Yellow-poplar	90	90.00	

Forestland Productivity—Cecil County, Maryland				
Map unit symbol and soil name	Potential productivity			Trees to manage
	Common trees	Site Index	Volume of wood fiber	
			<i>Cu ft/ac/yr</i>	
RmD—Russett-Christiana-Hambrook complex, 10 to 15 percent slopes				
Russett	Loblolly pine	90	129.00	Eastern white pine, Loblolly pine, Sweetgum, Yellow-poplar
	Northern red oak	80	57.00	
	Sweetgum	90	100.00	
	Yellow-poplar	90	86.00	
Christiana	Sweetgum	75	72.00	Loblolly pine, Northern red oak, Yellow-poplar
	Virginia pine	70	114.00	
	White oak	70	57.00	
Hambrook	Loblolly pine	80	110.00	Eastern white pine, Loblolly pine, Northern red oak, Southern red oak, White oak, Yellow-poplar
	Northern red oak	90	85.00	
	Red maple	75	47.00	
	Southern red oak	90	85.00	
	Sweetgum	80	79.00	
	White oak	85	65.00	
	Yellow-poplar	90	90.00	
RxB—Russett-Christiana-Urban land complex, 0 to 5 percent slopes				
Russett	Loblolly pine	90	129.00	Eastern white pine, Loblolly pine, Sweetgum, Yellow-poplar
	Northern red oak	80	57.00	
	Sweetgum	90	100.00	
	Yellow-poplar	90	86.00	
Christiana	Sweetgum	75	72.00	Loblolly pine, Northern red oak, Yellow-poplar
	Virginia pine	70	114.00	
	White oak	70	57.00	
Urban land	—	—	—	—
W—Water				
Water	—	—	—	—

NWI/CA Mapping



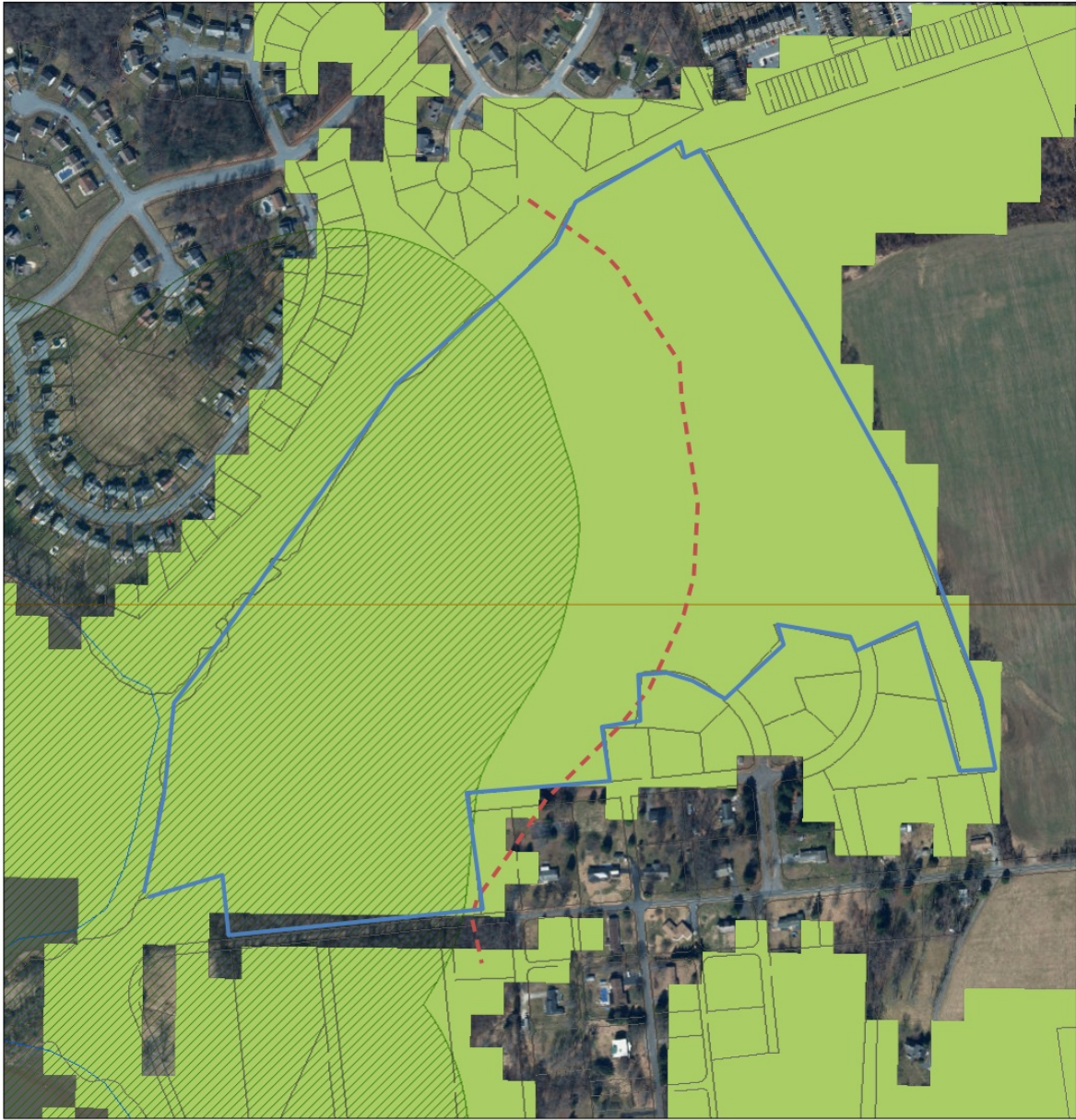
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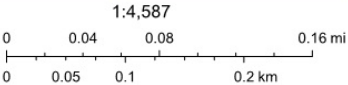
MD iMAP, MDP, SDAT, MD iMAP, DNR, USFW. Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap

Web AppBuilder for ArcGIS
Cecil County, Esri, HERE, Garmin, INCREMENT P, USGS, EPA, USDA | MD iMAP | MD iMAP, DoIT | MD iMAP, USDA | MD iMAP, USGS | MD iMAP, COMMERCE, DHCD, MDP, MHT, MDOT, MDOT SHA, USDOT,

Living Resources/CA Mapping



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MD iMAP, MDP, SDAT, MD iMAP, DNR, Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap

Cecil County, Esri, HERE, Garmin, INCREMENT P, USGS, EPA, USDA | MD iMAP | MD iMAP, DoIT | MD iMAP, USDA | MD iMAP, USGS | MD iMAP, COMMERCE, DHCD, MDP, MHT, MDOT, MDOT SHA, USDOT, Web AppBuilder for ArcGIS

APPENDIX D

Forest Stand Delineation Plan