

Greenbelt City Council Work Session

Forest Preserve Health Assessment

**Monday
August 31, 2015
8:00 p.m.**

**Council Room
Greenbelt Municipal Building**

**CITY OF GREENBELT, MARYLAND
MEMORANDUM**

TO: Michael P. McLaughlin, City Manager *MPM*
FROM: Celia W. Craze, Planning and Community Development Director
DATE: August 25, 2015
SUBJECT: Recommendation for selection of consultant to perform professional services for the Greenbelt Forest Preserve forest health assessment

Background:

In November 2014, the City Council directed staff to proceed with actions necessary for the city to contract with a professional forest biologist/ecologist to prepare a forest health assessment of the Greenbelt Forest Preserve.

Staff drafted a Request for Proposals (RFP) to secure such services. The RFP was reviewed by the Forest Preserve Advisory Board (FPAB) at the February 2015 and March 2015 meetings. Significant edits were made to the original RFP at the suggestion of the FPAB, and a final version of the RFP was approved by consent at the March 2015 meeting. The RFP was sent to the City Council on April 22, 2015.

Staff requested suggestions from the FPAB of professionals to whom the RFP should be distributed. FPAB members submitted five names to staff, all of which were forwarded the RFP. To further create a distribution list, staff researched other firms with experience developing forest health assessments as well as firms found through an internet search for forest ecologist and forest biologist. Finally, staff consulted with the Maryland Department of Natural Resources directory of Forest Conservation Act¹ approved providers, selecting those with expertise in the development of forest conservation plans. In addition, the Maryland Department of Natural Resources listing of registered foresters was consulted. A total of 145 RFP's were mailed or emailed on April 22. The RFP was also posted on the city webpage.

Response:

The city received five (5) responses to the RFP. In staff's experience, five proposals is a good response. The companies/firms submitting RFP's were as follows:

- Environmental Systems Analysis, Inc. (ESA)

¹ This is a list of companies and individuals approved to provide services under the Maryland Forest Conservation Act. While this list may include foresters, inclusion in the list does not indicate that the provider is self-identified as a forester.

- A. Morton Thomas and Associates, Inc. (AMT)
- CPJ Associates with J. Cook Consultants and Coastal Resources, Inc.
- PostModern-LA
- KCI Technologies, Inc.

Staff reviewed all proposals, and found only the PostModern-LA proposal to be non-responsive. The remaining four responses outlined a comprehensive work program which followed the requested services as spelled out in the RFP.

Cost proposals were then reviewed. Costs for the proposed work were quoted as follows:

• CPJ Associates	\$184,485
• PostModern-LA	\$133,645
• KCI Technologies, Inc.	\$ 56,364
• ESA	\$ 31,800
• A. Morton Thomas (AMT)	\$ 28,450

While no budget had been established, staff was working with an estimate of \$25,000 for the project. Based on the proposed costs, staff proceeded with detailed review and consideration of the ESA and AMT proposals.

Content of proposals:

Both the ESA and the AMT proposals addressed the requirements of the RFP. It is staff's assessment that either firm is able to provide the required services and that the proposals reflect an understanding of the scope and purpose of the forest health assessment. Some specific observations about the individual proposals follow:

ESA

- Conducted a field investigation of the preserve in advance of preparation of the response. Made several initial observations about tree stands, stream channels, wetlands, non-native species, etc...
- Will perform natural resources inventory and forest stand delineation using protocols established by the Maryland Department of Natural Resources (DNR).
- Using infrared motion detector cameras will perform a wildlife inventory.
- Proposes aquatic sampling of benthic macro invertebrates and fish with later laboratory testing.
- Includes water chemistry sampling.
- Plans thorough assessment of abiotic impacts, which will include a soils inventory.
- Discusses comprehensive trails management plan to address trail construction, maintenance and abandonment.

- Technically detailed.

A. Morton Thomas (AMT)

- Describes expertise in forest ecology.
- References DNR Forest Stewardship Plan, Management and Maintenance Guidelines, and Chapter 12 of the Greenbelt City Code.
- Technically detailed. Includes examples of sample studies and procedures.
- Will develop a list of primary wildlife habitat according to major forest communities.
- Specifies abiotic factors to be evaluated.
- Thorough discussion of impact of adjacent land uses.
- Specific maps to be created listed.
- Emphasizes community input into project.
- Discusses issues which will inform development of recommendations.

Professional qualifications:

There has been a great deal of discussion regarding the professional qualifications of the selected consultant. The Management and Maintenance Guidelines use the terms forester, forest ecologist/biologist and horticulturalist to describe the professional qualifications of an individual/firm selected to perform the forest health assessment. None of these terms are defined in the guidelines.

The RFP requests “qualified individuals and/or firms” while the Council action stated forest biologist/ecologist.

The challenge is that these terms are not defined, and that the individual definitions being brought during recent discussions are not necessarily consistent with descriptions found in internet searches.

In most of the RFPs, the specific qualifications of the sought after consultant is stated in a broad fashion. This allows decisions on the qualifications of a firm to be decided on specific educational, professional and practical experience and training. This was staff’s assumption in drafting the RFP.

Most of the debate regarding professional qualifications focuses on the suitability of a **forester** to perform the required services. It has been suggested that the perspective of a forester is that of consumption of forest resources (i.e. timbering, logging, harvesting), and therefore unsuitable to perform a forest health assessment. Staff disagrees with this opinion although it is somewhat irrelevant to this discussion because neither ESA nor AMT describe their services and project personnel as foresters.

It should not be predetermined simply by the term forester (even though this is recognized in the Management and Maintenance Guidelines as an appropriate related field) that an individual's experience and expertise is skewed toward resource consumption. Instead, the term forester should be viewed as an appropriately related profession suitable for providing services under the RFP if the training, education, approach and experience of the individual or firm reflect expertise in those disciplines appropriate for a forest health assessment consultant.

Regarding the related experience of the specific staff associated with the ESA and AMT proposals, both companies include personnel with backgrounds suitable for the requested services. A summary of the ESA and AMT project personnel background is as follows:

ESA

- Ecologist/botanist
- Environmental scientist/aquatic ecologist
- Environmental scientist/botanist

AMT

- Project manager (experience biology & landscape architecture)
- Senior arborist/natural resource specialist/horticulturalist
- Landscape ecologist
- Ecologist/natural resources planner
- Environmental scientist
- Water quality and stream assessment associate

Neither of these companies mentions forestry as a related field or area of expertise. Both firms indicate they have experienced personnel in areas of ecology, biology, environmental science, and aquatic science. Further, AMT specifically describes itself as having “*Expertise in **forest ecology**, measurement and interpretation of forest types, evaluation of individual tree and forest stand health, identification of wildlife and critical habitat, and recognition of other physical conditions, relationships and activities that impact forest ecosystems*”.

It is staff's assessment that both ESA and AMT employ personnel with the necessary training and experience to perform the duties outlined in the RFP.

Related experience:

Both ESA and AMT have extensive experience conducting environmental studies. Specific demonstrated areas of experience are:

ESA

- Preparation of invasive species management plans
- Invasive plant management, wetland delineation and Rare Threatened Endangered (RTE) studies
- Community forest assessment with recommendations
- Natural resources management plan
- RTE survey
- Wildlife studies
- Forest stand delineation
- Integrated natural resources management plan for wildlife management
- Natural resources inventory

A Morton Thomas

- Forest assessment and stream restoration
- Environmental assessment
- Resource management
- Design/ site selection based on environmental analysis
- Stream restoration
- RTE survey
- Wetland boundary survey
- Tree and forest inventory and evaluation
- Forest conservation planning
- Tree protection planning
- Stream stabilization
- Tree conservation plan
- Natural resource evaluation
- Survey and classification of streams and forests
- Ecological master planning for wildlife sanctuary
- Invasive species management
- Fish passage planning
- Watershed investigation
- Geomorphic assessment
- Stream monitoring

Both firms have extensive relevant experience in every area of study defined in the RFP. While neither firm has developed a “forest health assessment” per se, staff was unable to locate any forest health assessments prepared for other jurisdictions that would be analogous to the study the city seeks. Accordingly, we need to look at the aggregate experience of a firm to determine if there is the appropriate knowledge base to complete the forest health assessment.

Based on the overall experience of both ESA and AMT, it is staff's conclusion that sufficient expertise exists for both these firms to be considered for selection to undertake the forest health assessment.

Forest Preserve Advisory Board response:

Staff initially forwarded the ESA and AMT proposals to FPAB for their review and comment. Subsequently staff provided the proposals of CPJ Associates, Postmodern-LA and KCI Technologies to the FPAB. FPAB was asked to return comments, questions and recommendations (if any) by July 31, 2015. Comments and questions were ultimately received from eight (8) of the nine (9) board members. All FPAB comments are attached to this memorandum.

The FPAB discussed this item at its meeting of August 20, 2015, and decided to forward its comments to Council without a recommendation.

In the course of email discussions between board members, several expressed concern with projects, unrelated to the city, done by ESA. While the city has been pleased with past work by ESA, the board's objections are strong.

FPAB member comments addressed the content of the proposals, and the degree to which the proposal addressed the requirements set forth in the RFP. Also noted by three board members was the emphasis on the public role in the project, which AMT includes in their proposal. AMT also commented on the Management and Maintenance Guidelines as well as City Code as it relates to the forest preserve. Members felt that these elements of the AMT proposal set it apart from the ESA proposal.

Three members of the FPAB do not support awarding a contract to any of the firms. Objections include absence of citizen input into the process and the argument that the firms are not qualified to perform the required services.

Staff recommendation:

It is staff's assessment that both the ESA and AMT proposals are responsive to the RFP and provide sufficient detail, include appropriately trained project personnel, and present reasonable costs to justify a recommendation to hire either firm.

The city has recent past experience working with ESA on the Greenhill underpass stream channel stabilization project. In addition, ESA is employed as the city's environmental consultant on the Greenbelt Station project. We have always found their work to be excellent and the firm is well qualified to do the work.

The city worked with A. Morton Thomas over 25 years ago when they prepared the topographic plan for the Roosevelt Center, but this work is unrelated in scope and required experience to the forest health assessment. Therefore, staff does not consider AMT to be a firm with which we have relevant past experience.

A. Morton Thomas' cost proposal is \$28,450 compared to the ESA's cost of \$31,800.

It is staff's recommendation that the City Council accept the proposal of A. Morton Thomas and Associates, Inc. (AMT) to provide professional services associated with the development of a forest preserve forest health assessment, as set forth in their proposal dated June 12, 2015 at a cost of \$28,450.

Staff finds that the AMT proposal outlines the required services, includes appropriately trained and experienced staff, and has the relevant professional experience necessary to undertake and complete the study. Staff further finds that the AMT proposal recognizes the importance of public participation in this process which is critical to the project.

Should Council direct, staff will prepare a Resolution for Negotiated Purchase to be presented for first reading at the September 15, 2015 City Council meeting.

Attachments:

Request for Proposal
A Morton Thomas and Associates, Inc. proposal
ESA proposal
Summary of FPAB comments

CITY OF GREENBELT, MARYLAND
REQUEST FOR PROPOSALS
FOREST HEALTH ASSESSMENT
GREENBELT FOREST PRESERVE
CONTRACT NO. 2015– 01

The City of Greenbelt is seeking proposals from qualified individuals and/or firms to conduct a Forest Health Assessment of the Greenbelt Forest Preserve, and to prepare a report with findings and recommendations for management activities.

BACKGROUND

Greenbelt, Maryland is one of three “green” towns planned and constructed under the administration of President Franklin D. Roosevelt. The plan for Greenbelt incorporated visionary planning concepts from around the world, resulting in a community that demonstrates excellence in design, as well as reflecting progressive cultural and social themes.

One of the major design elements of the three green towns¹ is the green belt of forest that surrounds the towns. Parts of the original Greenbelt green belt remain in the wooded areas south of the Baltimore-Washington Parkway, west in the Greenbelt Park, and north and east in the Beltsville Agricultural Research Center and the Goddard Space Flight Center.

Since 1953, sale of the undeveloped areas of Greenbelt from the federal government to private developers began a trend of suburban residential growth in areas that were part of the green belt. Over time, as development pressure threatened the privately owned remaining lands of the green belt, the Greenbelt City Council initiated acquisition of the privately owned green belt. Over 200 acres of private land was acquired through purchase, donation and transfer, giving the City of Greenbelt control over the most intact remaining area of the green belt.

In order to provide for the permanent protection of the green belt as a forested, undisturbed area, the Greenbelt City Council created the Forest Preserve program. In 2003, the areas of the green belt acquired by the city were designated as part of the Greenbelt Forest Preserve. These areas are referenced as the North Preserve and the South Preserve

¹ The other green towns are Greenhills, Ohio and Greendale, Wisconsin. A fourth green town, Greenbrook, New Jersey, was never built.

The purpose of the Greenbelt Forest Preserve is "... to protect, manage, and administer ...designated areas for the present and future use and enjoyment of the citizens of Greenbelt by protecting them from the impacts of a growing population, expanding growth, and growing mechanization, thus preserving these lands as an enduring natural resource". Guidelines for the management and maintenance of the forest preserve were adopted in 2007. The City Council also appointed the Forest Preserve Advisory Board to advise the council on matters impacting the forest preserve.

The philosophy and purpose of the Greenbelt Forest Preserve program is critical to any forest health assessment to be prepared pursuant to this RFP. Respondents are directed to Chapter 12 of the Greenbelt City Code, and the Forest Preserve Management and Maintenance Guidelines for context in the preparation of a proposal for services. (Insert hyperlinks)

LOCATION and DESCRIPTION

The north and south preserves shall be referenced as the "Study Area".

The North Preserve is that area held in ownership by the City of Greenbelt and located north of Northway, west of the Baltimore-Washington Parkway, south of the corporate city limits, and east of Ridge Road, comprised of legal parcels described as Map 27, Grid A2, Parcel 10, consisting of 102.5869 acres; Map 27, Grid B2, Parcel 17, consisting of 13.90 acres; Map 27, Grid A1, Parcel 19, consisting of 24.3363 acres; Map 27, Grid B3, Parcel 20, consisting of 4.079 acres; and Map 27, Grid A3, Parcel 12, consisting of 10.6427 acres; shown as Area A on Attachment 1.

The South Preserve is that area held in ownership by the City of Greenbelt and located south of Northway, west of the Baltimore-Washington Parkway, and east of Ridge Road, comprised of legal parcels described as Map 27, Grid A3, Parcel 6, consisting of 20.4667 acres; Map 27, Grid A3, Parcel 7, consisting of 17.1919 acres; Map 27, Grid A3, Parcel 8, consisting of 11.8707 acres; Map 27, Grid A4, Parcel 9, consisting of 11.8707 acres; Map 27, Grid A4, Parcel 11, consisting of 9.34 acres; and Map 27, Grid A4, Parcel 21, consisting of 10.1552 acres; shown as Areas B, C, D and E on Attachment 1.

SCOPE OF SERVICES

The selected consultant(s) will conduct a comprehensive forest health and ecosystem assessment of the Greenbelt Forest Preserve, North and South preserves.

The scope of the study will include the following elements:

- I. Forest composition and health– Assessment of forest and ecosystem health and quality, to include: (structure, plant communities, rare plants, overall species composition, and invasive species)

- a. Forest composition and successional stage
 - i. Categorization of ecological systems or plant community associations using hierarchical system such as the National Vegetation Classification System or Nature Serve's Ecological Classification Units.
 - b. Forest areas damaged/disturbed by biotic factors
 - i. Survey of non-native vegetation, including description of location and areas, and descriptions of vegetation and relative threat to forest health
 - ii. Total acres (by cause and community type) of forest affected by damaging agents
- II. Wildlife inventory, dynamics and habitat –Analysis of terrestrial and aquatic species communities' interrelationships with each other and their habitats and how those interrelationships have been affected by human disturbance.
 - a. Inventory and description of forest dependent animal species, including species of conservation need
 - b. Inventory and description of aquatic animal species, including species of conservation need
 - c. Listing of primary wildlife habitat types (based on plant community analysis in I.a., above) used by each animal species found in the inventory
- III. Abiotic factors impacting forest health – To include:
 - a. Number and location of sites where deposited waste is a problem
 - b. Fire rating
 - c. Number and location of identified hazardous and environmental problem sites
 - d. Number and location of sites exhibiting forest health problems that can be attributed to adjacent land use and activities (runoff, erosion, groundwater contamination)
 - e. Number and location of sites with significant ongoing soil erosion and compaction
 - f. Number and location of sites contributing to degradation of water quality
 - g. Condition of streams, stream banks and buffers
 - h. Soils survey
- IV. Impact of adjacent land use and development on forest health
- V. Findings and conclusions of survey
- VI. Proposed goals for future health of forest preserve
- VII. Recommendations per IV and V

VIII. Recommended revisions to forest preserve article (city code chapter 12) and Forest Preserve Management and Maintenance Guidelines

IX. Final report

OUTLINE OF SERVICES

- I. Meet with project staff to review project scope and schedule
- II. Review relevant documentation, guidelines, codes, studies, etc..., including the 2014 Department of Natural Resources survey
- III. Conduct historic analysis of the study area
- IV. Outline of planned studies
- V. Review of City Code chapter 12 and Forest Preserve Management and Maintenance Guidelines
- VI. Briefing of project staff of preliminary findings of study
- VII. Briefing of project staff on preliminary recommendations of study
- VIII. Preliminary final report and recommendations
- IX. Maps, plans, photographs and other graphic detail as required
- X. Final Draft Plan
- XI. Final Adopted Plan

Services shall also include up to three (3) meetings with Greenbelt City Council; two (2) meetings with advisory board(s); unlimited meetings with project staff.

DELIVERABLES

- I. Final approved plan (3 printed copies)
- II. Final approved plan – electronic copy
- III. Maps, plans, photographs and other graphic exhibits as may be included or referenced in the study (3 printed copies and electronic copy)
- IV. Consultation Services for Planning and Implementation of strategies
 - a. Meet with City Council, City Staff, FPAB and community to assist in developing a short term (e.g. 1-5 years) and long term (e.g. 10 – 15 years) plan for any strategies recommended.
- V. Education & Training
 - a. Recommend options for community education and training in the implementation (as appropriate) for forest preserve management strategies and practices.

QUALIFICATIONS

The respondent or respondent team shall contain individuals with appropriate and adequate background and experience to undertake the required services and deliver the required studies, reports, goals and recommendations.

CONTENT OF RESPONSE

The respondent shall submit three (3) copies of the response. The response shall include the following, at a minimum:

- I. Proposed scope of services
- II. Names of project team/firms (please indicate principal contact)
- III. Resumes of project team
- IV. Qualification statement of project firm(s)
- V. List of relevant, former projects of similar scope
- VI. List of references
- VII. Proposed schedule – include phasing if recommended
- VIII. Proposed fees for services

SELECTION OF CONTRACTOR

The contractor will be evaluate in terms of:

- I. Professional qualifications necessary for satisfactory performance of required services;
- II. Specialized experience and technical competence in the type of work required;
- III. Capacity to accomplish the work in the required time;
- IV. Past performance on contracts in terms of cost, quality of work, and compliance with performance schedules;
- V. Location in the general geographical area of the project and knowledge of the locality of the project;
- VI. Demonstrated competence in the areas off forest health assessment, ecosystem assessment, and knowledge of applicable management practices.

Proposals shall be evaluated based on relevant experience, project staffing, proximity to the site, understand of the project, and proposed cost.

CONTACT INFORMATION

Proposals shall be delivered by 4 p.m. on June 12, 2015 to the following:

City of Greenbelt
15 Crescent Road, Suite 200
Greenbelt, MD 20770
Attn.: Celia Craze

ccraze@greenbeltmd.gov

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NTS



Request for Proposals for:
Forest Health Assessment
Greenbelt Forest Preserve
Contract No. 2015-01



A. Morton Thomas and Associates, Inc.
Consulting Engineers

June 12, 2015 at 4:00 pm

City of Greenbelt
15 Crescent Road, Suite 200
Greenbelt, Maryland 20770



June 12, 2015

Ms. Celia Craze
City of Greenbelt
15 Crescent Road, Suite 200
Greenbelt, Maryland 20770

Re: Request for Proposals
Forest Health Assessment of the Greenbelt Forest Preserve
AMT File No.: P15-0517

Dear Ms. Craze:

A. Morton Thomas and Associates, Inc. (AMT) is pleased to submit three (3) copies of our qualifications to conduct a Forest Health Assessment of the Greenbelt Forest Preserve.

AMT is a multidisciplinary firm with a staff of more than 430 professionals and 14 offices throughout the Mid-Atlantic region. AMT is a well-established firm that has provided engineering, forest conservation, and environmental assessment services for the past 60 years to municipal and other government clients. Our firm has the technical skill and ability to provide professional services in the areas of forest health, wildlife and ecosystem assessments. We have worked extensively with agencies and municipalities in and around the City of Greenbelt, including for the Federal Highway Administration for forest conservation services at Greenbelt Park. Through this experience we have accumulated an extensive understanding of natural systems in Greenbelt, Prince George's County, and similar geographic areas.

We have assisted clients with gaining a detailed, comprehensive understanding of their forest and natural resources to assist in long term planning and stewardship goals. We are well-suited to provide the same professional services to the City and have the firm resources to fulfill all requirements needed to successfully complete this project on time.

We thank you for this opportunity to present our qualifications and look forward to the next stage in your selection process.

Sincerely,

A. Morton Thomas and Associates, Inc.

A handwritten signature in blue ink, appearing to read "Greg Osband".

Greg Osband, RLA, ISA
Project Manager
gosband@amtengineering.com

A handwritten signature in blue ink, appearing to read "Max Kantzer".

Max Kantzer, PE, LEED AP
Principal
mkantzer@amtengineering.com

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- Maryland DNR Forest Associations

PROPOSED SCOPE OF SERVICES

Project Understanding

The City of Greenbelt is seeking a Forest Health Assessment of the North and South preserves of the Greenbelt Forest Preserve in order to obtain a more detailed, comprehensive understanding of the forest and the resources contained within. This information will provide the City with a basis for decision-making and long term stewardship of the forest as a complete ecosystem.

The health of the Greenbelt Forest Preserve depends upon an intricate web of relationships between living organisms and the surrounding environment. The health assessment our team performs will provide a detailed description of the forest's vegetation and wildlife, as well as other biotic and abiotic factors that influence it. A better understanding of existing conditions and the natural dynamics at play will allow the City to identify and prioritize those actions that will promote the forest's long-term vitality and maximize the benefits it provides to the community. Forests can be managed for multiple uses: forest (vegetation), soil protection, runoff reduction, pollutant removal (both air and water), stream buffers, habitat diversity, wildlife, corridors and edges for movement of wildlife, recreation, and aesthetics. Dynamic ecosystems provide cover and food, diversity, stability and resilience.

We have reviewed the Outline of Services and Deliverables on page four (4) in the Request for Proposals (RFP). The AMT team acknowledges and affirms their appropriateness for this effort. We are committed to preparing a Forest Health Assessment that includes a report of our findings and recommendations, description of methodology, project documentation, photographs and other graphic exhibits, and strategies for planning, implementation, education, training, and practices for managing the Greenbelt Forest Preserve.

AMT uses a project approach based on partnering with the City of Greenbelt, the City's Project Manager and staff, and the community. We will encourage active participation of the entire project team and welcome dialogue with and input from other interested parties. This helps us deliver a final product with the most appropriate and useful information, and promotes community buy-in.

AMT has demonstrated expertise in forest ecology, measurement and interpretation of forest types, evaluation of individual tree and forest stand health, identification of wildlife and critical habitat, and recognition of other physical conditions, relationships and activities that impact forest ecosystems. We have completed an overview of the site, as well as the Greenbelt City Code Chapter 12, the 2007 Forest Preserve Management and Maintenance Guidelines, and the 2013 Maryland Department of Natural Resources (DNR) Forest Stewardship Plan and the needs described in the RFP. From this information, we have tailored our methodology to efficiently address items that we expect to be most useful to the City. The information collected and analyzed during the inventory phase will be used in the development of maps, reports, findings, and recommendations to support wise forest stewardship decisions and management strategies.

Forest Composition and Health

Forest Composition and Successional Stage

The scope provided by the City asks for characterization of the forest using a hierarchical system. We can provide this using the National Vegetation Classification System, or we can classify the forest associations in accordance with what DNR developed and uses for Maryland forests. However, determining the forest association is only one step toward understanding the forest. Forest Associations make distinctions at a regional geographic level, but are not detailed enough

to describe site specific conditions. Descriptions of three forest associations we would most likely encounter in the Forest Preserve, are provided in the Appendix of this proposal.

Loblolly/Shortleaf Pine Found primarily on the Coastal Plain in Maryland on moist and poorly drained soils. At higher elevations on the Coastal Plain, it is found on drier soils and often on abandoned farmland. About 12% of Maryland's forests are loblolly-shortleaf pine. The proportion of these two species varies; however, loblolly pine usually dominates. Herbaceous plants are usually sparse because little light reaches the forest floor.	depends on amounts of precipitation, and how water drains through soils.	Atlantic/Appalachian Hardwoods Found on north- and east-facing slopes of the Appalachian Plateau Province in Maryland. This association occupies cooler moister sites. It is not commonly found further east. However, some small pockets occur in coves in western Montgomery County.
Loblolly Pine/Hardwood Found on the Coastal Plain Province. It represents a transition from forests dominated by pines to forests dominated by oaks and other hardwoods. Loblolly pine is a minor but important component, representing about 20% of the composition. Hardwood species reflect the amount of soil moisture on the site.	Northern Hardwoods Found primarily in the western provinces of the State. It occurs on a variety of soil and moisture conditions.	Hemlock/Northern Hardwoods Found throughout the Appalachian Plateau Province in western Maryland. It occupies cooler moister sites. Small pockets of hemlock/northern hardwoods may be found in coves in western Montgomery County.
Oak/Hickory About 60% of Maryland's forests are oak-hickory forest associations and they are found across the State. The proportions of each species vary greatly. Species makeup	Oak/Northern Hardwoods Found throughout the Appalachian Mountains in Maryland. It is commonly found on warmer, drier sites on south- and west-facing slopes in the Blue Ridge and Appalachian Plateau Provinces. The proportion of these species varies greatly.	Atlantic/Oak/Gum/Cypress Found along the Chesapeake Bay and the lower western and eastern shore areas of the Coastal Plain. These forests are characterized by wet soils. Often, these sites are flooded during most of the growing season.
	Virginia Pine/Oak Found throughout Maryland but most commonly on the Piedmont Plateau and the Coastal Plain. Primarily, it occurs on old fields and other well-drained sites. It represents a transition from areas with almost pure Virginia pine to oaks and other hardwoods that tolerate shady conditions.	White Pine/Northern Hardwoods Found throughout central and western Maryland. Generally, it is not found on the Coastal Plain. The understory in this forest association is sparse.

Summary of Maryland Forest Associations as adopted by Maryland Department of Natural Resources

The AMT team uses forest inventory protocols that provide a wealth of information about each forest stand. We expect this to add significantly to the 2013 DNR Woodland Inventory and be more useful for the City's purposes. The Woodland Inventory is, understandably, more geared to an owner who is cultivating the forest to produce and extract forest products.

In order to provide more specific data about forest health we also propose the following methodology: AMT ecologists and arborists will perform an inventory of existing forest conditions using an approach derived from Natural Resources Inventory and Forest Stand Delineation (NRI/FSD) methodologies used in Maryland. Data gathering and mapping will be expanded to include the additional information described below and in the wildlife and abiotic sections. The inventory will include qualitative data and standardized quantitative data about each forest stand as well as narrative descriptions of each forest stand.

- **Gather and Review Available Data** - Prior to performing field inventories we will collect and review available information about the site, and overlay the mappable data on a preliminary set of plans. Sources will include meetings with project staff, the Forest Preserve Advisory Board and others who might have relevant information about the forest. Other sources will include the 2013 DNR Forest Stewardship Plan, Forest Preserve Management and Maintenance Guidelines, and Chapter 12 of the Greenbelt City Code. AMT will also use historic records and available GIS data such as PGAtlas and Maryland's Environmental Resource and Land Information Network (MERLIN) to show other site information such as topography, soils types, steep slopes, erodibility, streams, wetlands, hydrogeologic features / hydraulically adjacent slopes, hazardous materials, regulated areas such as wetlands and stream buffers, Wetlands of Special State Concern, records of Rare, Threatened and Endangered Species, etc.
- **Field Investigations** – Preliminary mapping and remote sensing (e.g. aerial and color infrared photography) will guide us in identifying and locating forest stands for further study. The AMT team will conduct field investigations to verify preliminary mapping, observe and record qualitative information about each forest type the team encounters, and prepare individual forest stand data sheets from random 1/10 acre sample plots in each forest stand. We will photograph each forest type and other landscape features and note their locations. While on site,

will also note information about wildlife and abiotic influences that affect the composition and health of each stand.

Forest Areas Damaged or Disturbed by Biotic Factors

Where not otherwise noted in the forest stand data sheets, we will identify non-native or invasive species that pose a threat to forest health. Our forest stand maps will note their location and size, affected or potentially affected forest areas, and the severity of damage that has already occurred or may be anticipated. We will also note any diseases or pest infestations that have caused significant damage or mortality or reduced the health of the forest, and whether they threaten to spread to other trees or parts of the forest.

Water Resources

Because of the importance of streams and wetlands in forest ecosystems, we also propose to verify the location of mapped streams and wetlands. We will identify perennial and intermittent streams and ephemeral drainage channels, stream order, stream condition and quality of riparian buffers. We also expect to encounter wetlands and other hydrologic features such as springs, seeps, vernal pools, etc. that will not show up during the available data gathering phase. Although we will not prepare a formal wetlands and Waters of the US delineation and report, or request a jurisdictional determination by Maryland Department of the Environment (MDE), we will identify, describe and photograph these features and show their approximate locations. We will also note any evidence or effects of human activity, land disturbance, beaver activity, or other factors related to stream and water quality.

Analysis, Ranking, and Summaries

In addition to a report, including data sheets, descriptions, photographs, and commentary about our forest observations, AMT will prepare plans that show forest stand locations, types, and sizes. Other notable features recorded might include "wolf trees" (an indicator of forest succession), trees $\geq 75\%$ dbh of the County champion, Forest Interior Dwelling Species (FIDS) habitat, damage from windstorms, etc. We will map the stand locations

and analyze the forest stand data: Dominant / Codominant species, Forest Association, successional stage, basal area in s.f. per acre, size class of dominant species, percent of canopy closure; number of tree species, common understory species, percent of understory cover 3' to 20' tall, number of understory species 3' to 20' tall, common herbaceous species, common herbaceous & woody plant cover 0' to 3' tall, list of major invasive plant species & percent of cover, number of

Part A: Composition and Structure	
1. Percent canopy closure	
70-100%	3
40-69%	2
10-39%	1
0-9%	0
2. Number of shrubs under 20' tall	
15 or more	3
10-14	2
5-9	1
0-4	0
3. # of tree species 5" DBH and greater	
6 or more	3
4-5	2
2-3	1
0-1	0
4. Size class of dominant trees	
Greater than 20"	3
6-19.9"	2
3-5.9"	1
Less than 3"	0
5. Percent herbaceous and shrub cover under 3'	
75-100%	3
25-74%	2
5-24%	1
0-4%	0
6. Stocking level (BA)	
>120	3
50-120	2
<50	1
7. Other features	
	2
	1
Composition and Structure	
TOTAL	0

Part B: Condition	
1. Invasive species coverage	
Herbaceous	
<1	3
1-5	2
>5	1
Understory	
<1	3
1-5	2
>5	1
Canopy	
<1	3
1-5	2
>5	1
2. Percent of damage from insect & disease or storm damage	
0-10	3
11-20	2
21-30	1
31+	0
3. Percent of downed dead woody material present	
51-100%	3
15-50%	2
5-14%	1
0-4%	0
4. Average number of standing dead trees/tenth acre plot	
0-1	3
2	2
3-5	1
5 or more	0
5. Other features	
	2
	1
Condition	
TOTAL	

Part C: Location				
Priority 1	20	Stand	Location Rating	
Priority 2	15	1		
Priority 3	10	2		
		3		
		4		

Part D: Stand Function						
Stand	Water Quality Protection	Visual Screening	Wildlife Habitat	Energy Conservation	Personal Woodlot	Other Function
1						
2						
3						
4						

Summary Table - Forest Analysis and Priorities						
	Part A	Part B	Part C			
Stand	Structure (Out of 20)	Condition (Out of 20)	Location (Out of 20)	Total (Out of 60)	Priority for Preservation (H, M or L)	Priority for Restoration (H, M or L)
1						
2						
3						

Sample Forest Structure Rating Method

standing dead trees ≥ 6 " dbh, and a summary Forest Structure Rating Score. On the right side of the previous page is an example of the information we will provide about existing forest composition, health, function, and priorities.

Wildlife Inventory, Dynamics and Habitat

Forest Dependent Animal Species

AMT biologists will conduct a qualitative inventory of forest dependent animal species throughout each forest area. The inventory will consist of specific agency coordination, a review of readily available literature/data and a qualitative field inventory exercise.

- *Agency Coordination* – AMT will coordinate with DNR to identify any records of general forest species diversity including, but not limited to, forest interior dwelling species (FIDS), other avian species, mammals, reptiles, and species in need of conservation. We anticipate that we will evaluate and discuss information about the prevalence of white-tailed deer populations. For species of conservation need, AMT will mail a formal letter to DNR explaining the project and our request for known species and locations. If species of conservation need are identified by DNR or any other agency, AMT will report these findings to the City. Based on a review of the DNR Forest Stewardship Plan for the area, at least one (1) species of concern has been identified.
- *Readily Available Literature Review* – AMT will review and compile data from existing literature including, but not limited to, the Second Atlas of the Breeding Birds of Maryland and the District of Columbia 2002-2006, 2013 DNR Forest Stewardship Plan, additional DNR literature resources (general wildlife identification data, white-tailed deer population info, etc.), and discussions with other ecological professionals including DNR wildlife biologists. We will also canvass City staff and the community about knowledge they might have about the presence of any forest dependent or aquatic animal species.
- *Inventory Exercise* - The inventory exercise, in combination with the results of the agency coordination, literature review and AMT's forest characteristics analysis (Structure, Condition, Location, Function, etc.) will be conducted to best identify which species are either present or likely to be present. The inventory field exercise conducted by AMT biologists will consist of a cruise of the forest communities and will include identification of those species or evidence of various species encountered (e.g. scat, actual sightings, and signs of herbivory). No formal quantitative surveys will be conducted for any specific species (for example FIDS). A descriptive report will be developed explaining the results of the inventory, including a description of key forest animal species groups (mammals, birds, reptiles) and will highlight any species in need of conservation as well as those species that may pose a threat to the diversity of the forest ecosystem.

Aquatic Animal Species

AMT will conduct a qualitative inventory of aquatic animal species throughout each forest area. The inventory will consist of agency coordination, a review of readily available literature/data and a qualitative field inventory exercise.

- *Agency Coordination* – AMT will coordinate with DNR to identify any records of general aquatic species diversity including but not limited to fish, reptiles and amphibians and species in need of conservation. For species of conservation need, AMT will mail a formal letter to DNR explaining the project and our request for known species and locations. If any species of conservation need are identified by MD DNR or any other agency, AMT will report the findings to the City.

- *Readily Available Literature Review*—The AMT team will also review existing literature including but not limited to relevant Maryland Biological Stream Surveys (MBSS), Prince George's County, City of Greenbelt, DNR literature resources, and discussions with other ecological professionals including DNR fisheries biologists.
- *Inventory Exercise* - The inventory exercise will focus on those areas within the forest communities that maintain aquatic resources including vernal pools, wetlands, floodplains and waterways (streams). Based on the results of the agency coordination and literature review, the inventory exercise will be conducted to best identify which species are either present or most likely present. The inventory field exercise conducted by AMT biologists will also include identification of those species or evidence of various species encountered during the field visit. No formal quantitative surveys will be conducted for any specific species (for example fish). A descriptive report will be developed explaining the results of the inventory, including a description of key aquatic animal species groups (fish, reptiles, amphibians) and will highlight any species in need of conservation and any that may pose a threat to the diversity of the forest ecosystem.

Listing of Primary Wildlife Habitat Types

AMT will develop a listing of primary wildlife habitat types for each of the major forest communities (e.g. edge species habitat, FIDS habitat, forest types such as oak complex-mesic forest). In general, the listings will largely reflect the primary or dominant plant community and composition that serves as the basis for wildlife habitat and critical life cycle requirements (shelter, food, and nesting). Specific key criteria that will be used to categorize each wildlife habitat type will focus on the following factors:

- Geographical distribution
- Physical setting
- Landscape
- Community structure
- Community composition
- Community succession
- Stand dynamics
- Anthropogenic effects
- Future trends and influences

The inter-relationship between each wildlife type, largely based on plant community structure and composition, will be described in the report. Specific attention will be made to natural successional changes as well as anthropogenic effects and what potential wildlife management efforts may be required to ensure greater forest wildlife diversity in the future.

Abiotic Factors Impacting Forest Health

Any discussion of forest and wildlife assessments must include consideration of many overlapping influences, including abiotic factors. In the previous sections discussed above, we have noted many pertinent abiotic factors that we will include in our inventories. Dynamic relationships between forest vegetation, wildlife, habitat, climatological, historical and physical landscape features have a direct bearing on forest ecosystems. These factors will be included in our composite maps of the forest stands and wildlife habitat.

Specific abiotic elements that we inventory will include the following:

- *Deposited Waste* – We will note the number and location of specific sites with accumulations of deposited waste. The general presence or absence of waste will be noted as part of the forest stand delineations and overall site mapping.
- *Fire Rating* – Typically, mixed broadleaf and coniferous, deciduous and evergreen forests don't have distinct overall characteristics that distinguish them in the way that might be seen in western, drier climates (e.g. susceptibility to crown fire, ground fire, brush fire, etc.) However, we will note the number and location of sites where excessive amounts of yard waste or brush have been deposited, or locations close to roadways and other sites where ignition sources are most likely to start a fire within the forest.
- *Hazardous and Environmental Problem Sites* – We will note the number and location of any sites with readily observable indications of hazardous waste or other environmental contaminants. If the City desires, we can also search environmental databases and records of any sites within the vicinity, and prepare a catalog and maps of any recorded sites. However, we will not prepare a Phase I Environmental Site Assessment as prescribed in ASTM E1527-13 or perform any subsurface explorations. If at a later time the City feels this is necessary we will provide a separate scope and fee for performing this work.
- *Sites Where Forest Health is Directly Attributable to Adjacent Land Use and Activities* – In the Washington Metropolitan Area, even the most "pristine" sites are affected by human activities. For this task we will note the number and location of specific sites where we observe a direct link between the land use or other activities that adversely affect forest health.
- *Soil Erosion and Compaction* – As part of our forest stand delineation we will note and comment on soil erosion and compaction and they will be one determinant used to give a Forest Structure Rating Score to each forest stand. In addition, in this task we will note the number and location of any sites where significant soil erosion and compaction is a problem that might warrant specific remedial measures.
- *Degradation of Water Quality* – As with soil erosion and compaction, there are numerous sources that additively contribute substantially to water quality degradation. For this task we will note the number and location of any sites where we observe a direct link between the site and degradation of water quality.
- *Condition of Streams, Stream Banks and Buffers, and Soils Survey* – As discussed in our methodology for the inventory of Forest Condition and Health, we will field identify, describe and locate significant hydrologic features, including this that don't appear in the available site data. Part of this inventory will be to perform a qualitative evaluation of the condition of streams, stream banks, and riparian buffers. We will also note incised streams and streams that are not connected to their historic floodplains. Likewise, we will use soil mapping and reports obtained from the Natural Resources Conservation Service Web Soil Survey as part of our preliminary mapping for the forest inventory.

Impact of Adjacent Land Use and Development on Forest Health

AMT's Forest Health Assessment will include a narrative discussion of the impacts that human land use and development have on adjacent forest resources. Common impacts include: runoff containing excessive amounts of fertilizers, pesticides, oils, heavy metals, sediment, bacteria from pet feces, trash and other foreign matter; air pollution generated by gasoline-powered lawn equipment, automobiles, and open-air burning; noise pollution; dumping of solid waste and yard clippings;

local climatological changes (heat island effect); as well as global climate change. Some of the greatest impacts on our forests come from wildlife predation by domestic and feral cats and dogs, damage to vegetation and trails caused by excessive foot traffic, mountain bikes, or ATV's, erosion resulting from poor trail location and construction, fires set by humans, and clearing of adjacent trees for new development, which has extensive long-term negative effects on ecosystem dynamics of adjacent woodlands.

In addition to a general discussion of the impacts and ways to manage or mitigate them, **AMT's detailed mapping will show specific locations where these impacts are most likely to occur.** We will also discuss the effects of these land uses and activities, their relative significance to overall forest health, and the extent of damage already caused by or anticipated from these factors.

Findings and Conclusions of Survey

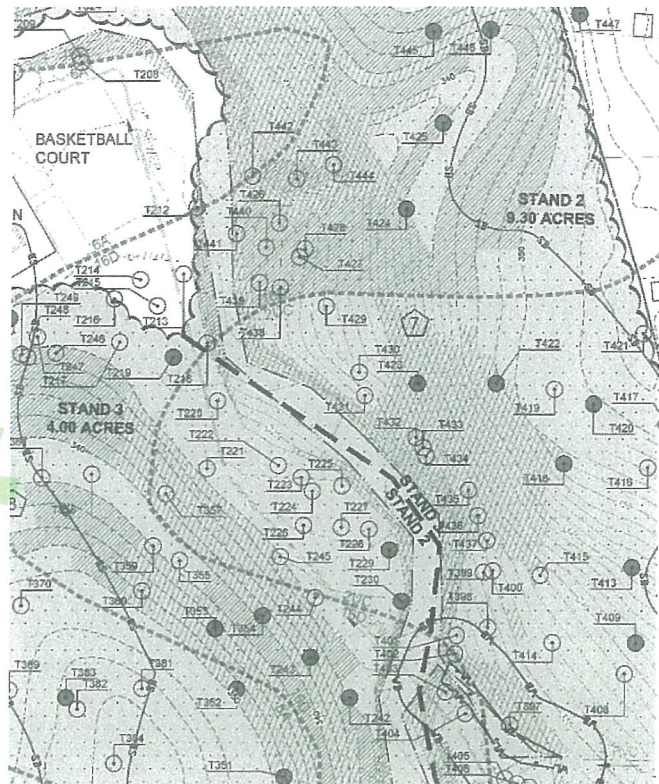
Starting with the initial kickoff meeting and throughout the process of data assembly, field inventory, review, and analysis the AMT team will share its progress, observations

and preliminary findings or recommendations with our partners at the City, including the Project Manager, staff, Forest Preserve Advisory Board Members, and the community. **We will promote participation and dialogue throughout the study.** This may include City participants who may wish to accompany us during some of our field investigations. With the City's approval, we will also invite MD DNR staff to join us in the field.

We will use the information gathered through these meetings and during our field investigations to update our preliminary mapping. AMT ecologists and planners will combine the information gathered in the Forest, Wildlife and Abiotic Inventories with our other mapping of physical features of the site and nearby areas. We will also **assemble a narrative report that summarizes the data we gathered, our observations, and preliminary recommendations for management and maintenance of the forest.**

Forest conditions depicted in the mapping will include:

- Forest stands and physical landscape features (e.g. soil types, topography, steep slopes, heavily eroded or disturbed sites)
- Streams, wetlands, hydraulically adjacent slopes, and environmental buffers
- Locations of invasives and their priority for removal
- Locations of trash and garbage and their priority for removal
- Potential FIDS habitat, defined as contiguous forest at least 50 acres in size with at least 10 acres of interior forest ≤ 300 feet from the nearest forest edge, or riparian corridors ≤ 300 feet wide and larger than 50 acres,
- Sites with highest potential for diversity
- Sites with highest potential for habitat
- Sites with highest Forest Structure Value



Sample NRI/FSD Plan

The mapping and preliminary report will provide a basis for the findings and conclusions of the Forest Health Assessment and related recommendations, guidelines, and strategies for managing the Forest Preserve. After review and comments we will prepare a final report and plans showing the major features of the Forest Preserve and information about specific locations identified during the Forest Health Assessment. Supplemental appendices will include data sheets, photographs, records, information obtained from literature and other sources, meeting minutes, and comments or correspondence received from the community and from meetings with project staff, advisory boards, and the City Council.

Proposed Goals for Future Health of Forest Preserve

In collaboration with City Staff, Forest Preserve Advisory Board Members, and the community, the AMT team will discuss which forest values are most important to the City. The Forest Preserve is susceptible to a variety of stresses, and there is competition between various user desires, needs and attitudes about this natural resource. The AMT team will bring to this effort its years of experience and in-depth knowledge of forest conditions and alternative management approaches. We will suggest various goals and objectives, discussing the pros and cons of each, and the associated opportunities and constraints that may affect outcomes.

As their starting point, the goals proposed for future health of the Forest Preserve will be guided by the standards and intent expressed in Chapter 12 of the Greenbelt City Code, by the Forest Preserve Management and Maintenance Guidelines, and by other statements of policy from the City. A central question will be whether the City, after reviewing the mapping from our inventory and our preliminary recommendations, wants to consider any policy modifications and whether the community will support this. We will identify the challenges and potential opportunities presented by the Forest Preserve's natural resources, and develop a list of actions and management priorities for review and approval by the City. After discussion, comments and direction from the City, AMT will develop a final list of goals for the Forest Preserve.

Recommendations

The recommendations that AMT develops are dependent upon the forest conditions we encounter and the policies and goals of the City for the Forest Preserve.

One simple truth about forests in urban or urbanizing areas is that they are not "pristine". They rarely contain "old growth". Instead, they reflect the impact of different land uses and outside influences over the years. They may have been cleared for timber, farmed, grazed, planted with trees or left to naturally regenerate and develop through different levels of succession. They may have been damaged by wind or ice storms, fire, or disease. Soils may be eroded or compacted in some areas. In others, legacy sediments from upland farms may have accumulated in the valleys, adversely affecting streams and aquatic habitat.

The following are a few examples of the basis for and types of recommendations we might develop:

- **Preservation of Current Conditions vs. Active Management of Forest Resources** – Although, as phrased, this topic appears to be about two very different approaches, the reality is that these approaches exist on a continuum. There may be a spectrum of issues to be weighed and choices to be made when considering the best form of forest stewardship.

For example, wildlife habitat diversity increases when there are more forest edges. "Soft" edges are higher in value than "hard" edges (see 2013 DNR Forest Stewardship Plan). One of the goals may be better protection of wildlife, which can be achieved through improved edge conditions. The City could plant smaller trees and shrubs

at some locations along these edges. This would also help to control invasive species that are frequently found along disturbed forest edges by reducing the amount of sunlight that reaches them. Another benefit would be improved screening and buffering between adjacent uses such as the Baltimore-Washington Parkway.

Nevertheless, there may be some who oppose this action. They may not like the aesthetic changes or worry about undesirable species that might occupy the edge habitat. This can also be a slippery slope. Where do you draw the line between acceptable and unacceptable amounts and types of activities? The City Code and the Maintenance and Management Guidelines tend to favor keeping such practices to a minimum.

Almost any alteration has some effect on ecological relationships and on constantly evolving ecosystem dynamics. This may be seen by some as a good thing and by others as a dangerous practice. Promoting edge habitat may compete with the desire to maintain and increase Forest Interior Dwelling Species (FIDS) habitat.

The point is that there are many tradeoffs and few clear choices when recommending which goals to set and how to achieve them.

- **Impacts of Stormwater Runoff** – Stormwater runoff is one of the leading causes of stream and aquatic habitat physical degradation and decreased water quality. Increased rates of runoff and erosion lead to headcutting (erosion), undercutting of stream banks and damage to riparian forest and habitat. Evaluating stormwater and stream problems and designing practices for improved stormwater management is one of AMT's specialties. We expect to observe areas where stormwater runoff has adversely affected forest natural resources. One of the challenges will be deciding whether any actions to address this should be allowed within the Forest Preserve and, if so, to what extent? The AMT team can provide extensive information about options and suggest guidelines for selecting those that offer the greatest cost to benefit ratio. On the other hand, one can make strong counterarguments to allow nature to "run its course". Again, current policy and guidelines lean strongly toward the latter.

These are just a few of the many considerations involved in any recommendations that AMT might offer. **Developing a set of management and maintenance guidelines that sensitively and carefully promote increased stability, diversity, and quality of ecosystem services the forest provides the City is a key objective of our proposed services.**

Recommended Revisions to Forest Preserve Article

The AMT team has extensive experience with forest conservation laws and regulations throughout Maryland. Clients such as Montgomery College, M-NCPPC Prince George's and Montgomery Counties, the City of Rockville, and many other public sector clients have sought our expertise and advice on implementation and enforcement of these regulations and the anticipated results of different approaches. We have closely examined different codes and regulations and discussed interpretations and alternatives with our clients, their legal counsel and environmental staff.

Any recommendations that AMT might make would, first and foremost, be determined by the policies and management and maintenance guidelines the City chooses to adopt. Our review of applicable portions of Chapter 12 of the City Code and any recommendations we might have will be informed by our extensive experience with forest regulations.

Below we provide a couple of examples of questions of interpretation or sections of the Code that might prevent the City from taking actions that it might otherwise decide are appropriate and necessary.

1. The first example is at Section 12-156. Prohibited Activities, paragraph (d). In sum, it prohibits construction of any temporary or permanent structures. Period (emphasis added). This appears to contradict paragraph (c), which authorizes “bridges, ... or other manmade structures ...” as provided in the management and maintenance guidelines. Furthermore, the definition of “structures” in paragraph (d) is unclear. It is conceivable that someone might challenge installation of a pole and sign. Is a bench considered a structure? An interpretive or educational panel? A blind for observing wildlife? These might enhance the recreational and educational benefits of the forest, but it is unclear which, if any, would be allowed.
2. Within the same section, paragraph (d), bars any action “to alter or modify the natural course or any water ...” This appears to prohibit actions such as remediation of stormwater damage, a topic discussed in the previous section. It could be interpreted as prohibiting even corrective action to address trail erosion. Should the City decide it wishes to adopt certain recommendations, guidelines, practices or strategies that come out of this project, or if the City merely wishes to have greater flexibility or less uncertainty about what it can and cannot do, it might wish to revise certain parts of the Code.
3. The current Forest Preserve Management and Maintenance Guidelines state that the Americans with Disabilities Act (ADA) does not dictate standards for recreation trails. Recent changes to ADA law and regulations prescribe standards for outdoor developed areas, rendering this statement obsolete. The City may wish to take a more proactive approach to assuring barrier free access that is consistent with the new regulations. AMT has been providing consultation and design services to many government entities for modifying existing conditions or making improvements that will bring their facilities into compliance with ADA standards. The AMT team is well versed in the new standards. Some of this is described in the May 2014 Guidance for Outdoor Developed Areas published by the United States Access Board.

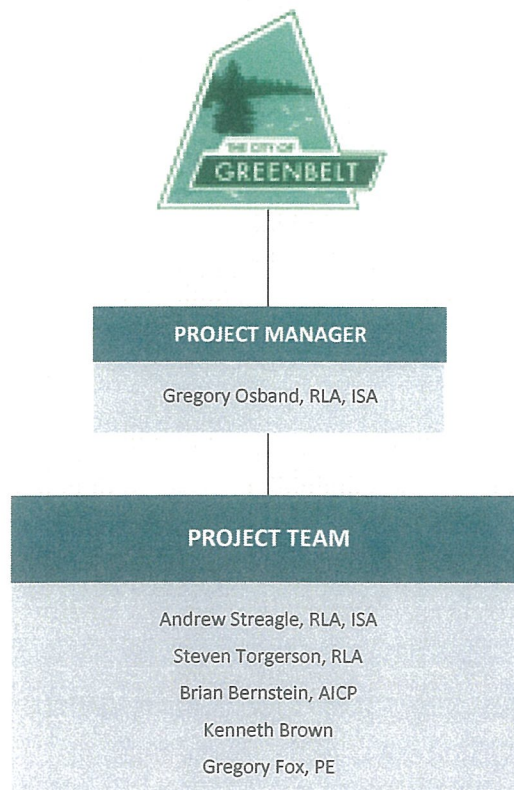
PROJECT TEAM

AMT is a multidisciplinary firm with a staff of more than 430 professionals. Our staff includes, ecologists, arborists, landscape architects, planners, environmental specialists, and engineers. Key personnel for this project have demonstrated experience in forest health and ecosystem assessments, and expert knowledge of management practices. AMT offers the City a team devoted to serving the needs of this project.

This project will be led by Gregory Osband, RLA, ISA who will also be the principal contact. Mr. Osband is a registered landscape architect and certified arborist with more than 35 years of experience. As a landscape architect, he understands the dynamic and constantly changing nature of the landscape and of human interactions with the natural environment. He worked as a biologist and planner for the Costa Rican National Parks Service, where he focused on new reserves and ecotourism. He wrote a position paper for creation of the Amistad International Biosphere Reserve located in Costa Rica and Panama. His additional experience includes designing the master plan for a new National Park in the Netherlands, and extensive forestry and arborist experience, including research in urban forest management.

Other key staff have extensive experience providing forestry services. Andrew Streagle, RLA, ISA, MNR has performed dozens of Natural Resource Inventory / Forest Stand Delineations (NRI/FSD), wetland delineations, Forest Conservation Plans, and arborist evaluations, and designed details for forest preservation and remedial practices. In 2013 he also received a Master's in Natural Resources degree from Virginia Polytechnic Institute and State University. Steven Torgerson, RLA, has similar forest assessment and management experience. Prior to joining AMT, he worked for the US Forest Service, planning and designing venues for the Salt Lake City Winter Olympics. Later he worked for the National Park Service as the cultural resources landscape architect at Yosemite National Park.

Our team's structure is shown in the organizational chart below. Resumes of key staff are included on the following pages.



Gregory Osband, RLA, ISA

PROJECT MANAGER

Mr. Osband is a registered landscape architect and certified arborist with more than 35 years of expertise in environmental stewardship, urban forestry, planning and design. His skills include wetland delineation, tree and habitat evaluation, natural resource inventory/forest stand delineation (NRI/FSD), forest conservation plans (FCP), bioengineering, landscape preservation, restoration, design, and construction. Mr. Osband focused his graduate research and thesis on "Urban Forest Management". He has a thorough knowledge of Forest Conservation Laws, zoning, and environmental regulations. He has prepared comprehensive evaluations, mapping and recommendations for forest and habitat resource stewardship and directed curative and enhancement operations. Mr. Osband routinely participates in public outreach, provides expert testimony, and permitting with local, state, and federal agencies.

His relevant experience includes:

Greenbelt Park Forest Conservation – Greenbelt, MD: Forest assessment and environmental permitting for a Federal Highway Administration (FHWA) road rehabilitation and stream restoration project at the 950+ acre Greenbelt Park. Prepared Natural Resource Inventory and Forest Conservation Plans, screened site for rare, threatened, and endangered species, prepared tree protection plans and obtained variances for removal of specimen trees.

Blossom Point Environmental Assessment - Charles County, MD: Prepared Environmental Assessment (EA) and resource management plans for construction of a new satellite tracking facility, on a site with more than 1000 acres of forest and the largest protected estuary of its kind along the Potomac River. Documented high levels of environmental diversity, FIDS habitat, bald eagle nesting sites and other critical habitats. Delineated over 6 miles of wetland boundaries, including tidal and non-tidal submerged, emergent, scrub-shrub, palustrine and forested wetlands. Developed plan for altering and managing forest and meadow habitat to maintain Line of Sight. Supporting documentation for a Finding of No Significant Impact (FONSI) included site and environmental stewardship plans, wetland and floodplain permitting, and protection of.

Oxbow Nature Preserve Scenic Overlook - Anne Arundel County, MD: Environmental assessment and design for visitor access to this outstanding environmental preservation area. Determined the optimum trail route and overlook location based on forest stand, root, and soil conditions, and potentially hazardous trees. Coordinated extensively with the community, The Nature Conservancy, and agencies. Developed special design and construction details to maintain animal crossings, protect tree roots, prevent soil compaction and erosion, reduce equipment requirements, and prevent introduction of invasive species.

Animal Shelter / Laytonia Park - Montgomery County, MD: Environmental evaluations and planning to determine the optimal site locations for facilities and activities. Prepared NRI/FSD and FCPs, including management and reforestation plans to protect adjacent Wetlands of Special State Concern, minimize impervious areas and design stormwater management practices to meet stringent Upper Rock Creek Special Protection Area requirements.

Green Branch Regional Park Master Plan (M-NCPPC) – Bowie, MD: Site assessment, planning and design for a new regional park. Included review of available records, stream and wetland delineation, forest and habitat inventories and forest preservation. Site minimizes ground disturbance, maintains the historic hedgerows, and preserves forest, streams and wetlands on the site

Montgomery College Master Plans and Site Improvements – Montgomery County, MD: Environmental assessments, planning and design for master plans of all three campuses. Reviewed forest conservation regulations for three jurisdictions and made recommendations for the future forest conservation requirements and stewardship of sensitive resources.

Upper Marlboro Revitalization Plan - Prince George's County, MD: Master plan for revitalizing mixed use area adjacent to downtown Upper Marlboro. Most of the study area lies within the 100 year flood plain. The plan proposes recapturing an overlooked area of stunning natural resources with a linked network of public spaces, pedestrian routes and prime development sites linked to the historic town center.

POSITION
Associate

EDUCATION
MLA, 1984, Landscape Architecture,
Harvard Graduate School of Design

BA, *cum laude*, 1979, Biology, Harvard

REGISTRATIONS
Registered Landscape Architect: MD
(#721), DE, NC and PA

Certified Landscape Architect: VA
(#001369)

ISA Certified Arborist (#MA-4950A)

Green Roof Professional

YEARS EXPERIENCE
Total: 34
With AMT: 9

Andrew Streagle, RLA, ISA, MNR

SENIOR ARBORIST / NATURAL RESOURCE SPECIALIST

Mr. Streagle is a registered landscape architect and certified arborist with more than 12 years of experience. He has completed numerous tree surveys, invasive species removal specifications, and forest vegetation assessments. He is thoroughly familiar with Roadside Tree Law, Forest Conservation Laws, zoning, and environmental regulations, and has extensive forest stand delineation, and forest conservation experience. He also has experience working in and around the City of Greenbelt.

His project experience includes:

Greenbelt Park Forest Conservation – Prince George’s County, MD: Lead Landscape Architect for tree assessment and environmental/forest permitting services for the Federal Highway Administration (FHWA) at Greenbelt Park. The project entails road rehabilitation and stream restoration work at the 950+ acre site in Greenbelt, Maryland. Mr. Streagle assessed the condition, size, species and health of significant trees; acquired a variance for the removal of a specimen tree; executed Natural Resource Inventory and Forest Conservation Plans for DNR review; and contacted DNR regarding rare, threatened, and endangered species. He also prepared tree protection plans.

Montgomery College (Multiple Campuses) – Montgomery County, MD: Lead Arborist/Landscape Architect for design team providing forest conservation research and information for the 2006-2016 Facility Master Plan Update for the Germantown, Rockville, and Takoma Park/Silver Spring Campuses. Mr. Streagle reviewed existing forest conservation and environmental feature information, researched current forest conservation standards and requirements for three separate jurisdictions, provided recommendations for the future forest conservation requirements, and stewardship of sensitive resources. Provided environmental evaluations, arborist, planning, and landscape architecture services for various site/building improvements. Also provided tree protection measure design and construction administration. Mr. Streagle wrote a natural resources stewardship plan for the 224-acre Germantown campus for his master’s degree capstone project. The stewardship plan covers invasive plant control, deer management, forest regeneration and harvest, and meadow establishment and management.

Blossom Point Facility – Charles County, MD: Lead Landscape Architect/Environmental Professional for delineation of approximately six miles of wetland boundaries and assessment of environmental conditions on this US Navy/US Army facility. Mr. Streagle evaluated potential sites for impacts and suitability for proposed facility expansion. Prepared construction documents that limited disturbance of sensitive environmental features. Mr. Streagle prepared detailed forest clearing and management plan for the site. The site includes a high level of environmental diversity, including tidal and non-tidal wetlands, and varied forest associations.

Pyles Drive Streambank Stabilization – Prince George’s County, MD: Lead Landscape Architect for preparation of NRI/FSD, restoration planting design, tree and forest inventory and evaluation, forest conservation planning, and tree protection measure design for protected forest and specimen trees beside to the stream and on adjacent surround steep slopes. Created a forest bank with reforestation for additional credit for future County use. AMT also provided a preliminary stream study and stream stabilization design for 1,200 LF of highly eroded banks, which included various stabilization techniques including cross vanes, log vanes, imbricated riprap walls and buffer restoration. Buffer restoration included selection and planting design of appropriate native tree and shrub species, as well as selection and design of native seed mixes to aide in site stabilization.

Yorkville Road – Brandywine, MD: Lead Landscape Architect for Tree Conservation Plan (TCP) for this unique site located in a residential neighborhood. The site’s steep slopes experienced major settling and significant erosion and became unfit for housing. DER acquired the land and now uses it for mitigation credit for the agency’s other off-site projects. Provided tree assessment services, including health, species, size, and location. Also provided a tree/shrub list for afforestation, protection measures, and invasive species removal specifications.

POSITION

Sr. Landscape Architect

EDUCATION

MNR, 2013, Natural Resources, Virginia Polytechnic Institute and State University

BLA, 2003, Landscape Architecture, Pennsylvania State University

REGISTRATIONS

Registered/Certified Landscape Architect: MD, DE, NC and VA

ISA Certified Arborist (#MA-4682A)

PLANET Certified Landscape Technician – Exterior

Certified Professional Horticulturist: MD

YEARS EXPERIENCE

Total: 12

With Firm: 8

Steven Torgerson, RLA

LANDSCAPE ECOLOGIST

Steven Torgerson is a registered landscape architect with 15 years of experience providing environmental and landscape ecologist services for public agencies across the Mid-Atlantic and Western Regions. Mr. Torgerson developed his skills and understanding of landscape ecology while working as a landscape architect for the USDA Forest Service, National Park Service and completing his master's degree with a focus on watershed planning. Recent projects in the Mid-Atlantic include environmental planning, wetland delineation, tree evaluation, natural resource inventory/forest stand delineation (NRI/FSD), forest conservation plans (FCP), and landscape restoration design and construction, for various public and private facilities. His relevant experience includes:

MD 4/Suitland Parkway - Prince George's County, MD: Lead Landscape Architect/Ecologist for a new road alignment and interchange that includes Suitland Parkway on National Park Service Lands. Created detailed inventories and prepared Environmental Assessment documentation including coordination with the National Park Service, Maryland Department of Environment, and Maryland Department of Environmental Resources. Identified wetland resources; floodplains; rare, threatened and endangered species; archaeological and historic resources; and forest impacts. Managed the preparation of the forest economic tree value assessment for the construction site and a mitigation site. Developed mitigation measures for impacts to the site.

Blossom Point Environmental Assessment - Charles County, MD: Prepared Environmental Assessment (EA) and resource management plans for construction of a new satellite tracking facility, on a site with more than 1000 acres of forest and the largest protected estuary of its kind along the Potomac River. Documented high levels of environmental diversity, FIDS habitat, bald eagle nesting sites and other critical habitats. Delineated over 6 miles of wetland boundaries, including tidal and non-tidal submerged, emergent, scrub-shrub, palustrine and forested wetlands. Developed plan for altering and managing forest and meadow habitat to maintain Line of Sight. Supporting documentation for a Finding of No Significant Impact (FONSI) included site and environmental stewardship plans, wetland and floodplain permitting, and protection of.

Upper Marlboro Revitalization Plan - Prince George's County, MD: Master plan for revitalizing mixed use area adjacent to downtown Upper Marlboro. Most of the study area lies within the 100 year flood plain. The plan proposes recapturing an overlooked area of stunning natural resources with a linked network of public spaces, pedestrian routes and prime development sites linked to the historic town center.

Pegg Road Extended - St. Mary's County, MD: Lead Landscape Architect/ Ecologist for a new alternative road alignments and solutions to minimize environmental impacts for a proposed new roadway corridor (2.3 miles). Created detailed inventories and prepared Environmental Assessment documentation for alignment alternatives, including significant wetland resources; floodplains; rare, threatened and endangered species; archaeological and historic resources; and forest impacts. Prepared public presentation graphics for the proposed solutions. Participated in public outreach meetings and discussions.

Environmental Services for Potomac Bi-County Water Tunnel - Montgomery County, MD: Landscape Ecologist for the Preparation of site plans, access routes, environmental protection and restoration plans for shaft and tunnel construction / staging areas in Montgomery County park land. Impacts included construction and fill in floodplains and wetlands, wetland and stream restoration, stream crossings, steep slopes, forest disturbance, reforestation and site restoration plans. The project included extensive public outreach, coordination and permitting for County, State and Federal agencies.

Green Branch Regional Park Master Plan (M-NCPPC) - Bowie, MD: Site assessment, planning and design for a new regional park. Included review of available records, stream and wetland delineation, forest and habitat inventories and forest preservation. Site minimizes ground disturbance, maintains the historic hedgerows, and preserves forest, streams and wetlands on the site.

POSITION
Design Associate

EDUCATION
MLA, 2005, Landscape Architecture,
Pennsylvania State University

BLA, 1999, Landscape Architecture, Utah
State University

REGISTRATIONS
Registered/Certified Landscape
Architect: MD (#3520), DE, NC, TN, UT
and VA

YEARS EXPERIENCE
Total: 15
With AMT: 8

Brian Bernstein, AICP

SENIOR ECOLOGIST / NATURAL RESOURCES PLANNER

Mr. Bernstein is a Senior Ecologist with AMT and has over 26 years' experience providing technical and managerial oversight for environmental assessment and planning projects throughout the Mid-Atlantic States. He has successfully managed numerous projects for clients such as the US Army Corps of Engineers, Maryland State Highway Administration, Maryland Transportation Authority, Maryland Department of Natural Resources, Maryland Transit Administration, U.S. Department of Agriculture, the National Park Service, and numerous Maryland counties and municipalities. Mr. Bernstein's technical expertise includes conducting numerous ecological and biological assessments, non-tidal and tidal wetland studies and delineations, forest delineations and conservation plans, wetland and stream restoration/mitigation design and construction, and permitting.

His relevant experience includes:

Intercounty Connector Project (SHA) – Montgomery and Prince George's County, MD:

Served as Natural Environmental Deputy for the transportation project. Responsibilities included natural resources studies (forest stand delineations, wetland delineations, stream assessments, reforestation opportunities) for the project. Responsible for managing, delineating and ranking the forest communities throughout the study area. Conducted a ranking system for each forest community based on several ecological functions including overall diversity, maturity and size.

Long Green Valley Rural Legacy Plan - Baltimore County, MD: Environmental Planner for the research and development of the Rural Legacy Area and Plan for the Long Green Valley Conservancy in coordination with Baltimore County Government. Evaluated natural resources within the area as part of long-term preservation goals. Coordinated with the County in determining whether area goals complied with the County Master Plan and future County and State plans. Developed a forest community analysis based on GIS and groundtruthing to identify opportunities to link forest cover as part of larger state Green Infrastructure program. Identified key areas within the rural legacy area to create wider and new forest buffers to increase forest cover and wildlife connectivity.

Monongahela National Forest Stream Classification Project (US Forest Service) - West Virginia: Field Ecologist that assisted in the survey and classification of 182 miles of streams and adjacent forest cover. The project involved the survey of the physical and biological conditions of each forested stream system and recommending trout stream habitat improvements. A key element to the project was the evaluation and development of recommendations to improve adjacent forest cover.

Powder Mill Road Reconstruction Environmental Assessment and Environmental Mitigation (US Department of Agriculture) - Prince George's County, MD: Manager/Technical Lead for wetland and forest stand delineations, reforestation and mitigation design, and EA documentation for 2.5 miles of roadway reconstruction. In addition, the project involved a botanical survey for rare plants including *Carex bullata* and *Amelanchier obovalis*. Coordinated with numerous agencies on potential impacts to RTEs.

Forest Delineation/ Large Tree Survey Services (MD State Highway Administration) – Statewide, MD: Ecologist with the Environmental Programs Division that performed numerous forest stand delineations and large tree surveys as part of natural resource assessments for projects throughout the state of Maryland. For each project, forest over was delineated to determine the forest classification. In addition, major species composition and size data was collected. Large trees with a DBH greater than 30 Inches were identified, recorded and surveyed.

Audrey Carroll Wildlife Sanctuary (Audubon Society of Central Maryland) – Mt. Airy, MD: Ecologist for an ecological restoration master plan for the sanctuary. Key elements were assessment of existing forest cover and wetland systems. Property consists of numerous native forest stands as well as many invasive tree species (e.g., *Ailanthus*). Master plan identified key forest resources for protection as well as management plan to control invasive species.

POSITION Associate

EDUCATION

MS, 1994, Biology and Environmental Studies, Johns Hopkins University

BS, 1990, Biology, Towson University

REGISTRATIONS

American Institute of Certified Planners (#015074)

Maryland Tree Expert (#0467)

MD DNR Qualified Professional

YEARS EXPERIENCE

Total: 26

With AMT: <1

Kenneth Brown

SENIOR ENVIRONMENTAL SCIENTIST

Mr. Brown is a Senior Environmental Scientist with more than 25 years of experience in the public, private, and non-profit sectors in the areas of water resources, forest resources, land use, and regulatory permitting. He has extensive knowledge of forest assessment; stream and wetland restoration; local, state, and federal regulatory programs; and the evaluation of the environmental, economic, and social aspects of proposed activities and practices. Mr. Brown is skilled in the use of various computer software for design and modeling and has published guidance manuals on urban stream restoration and watershed assessments. His relevant experience includes:

Greenbelt Park Wetland Delineation (FHWW/NPS) - Prince George's County, MD: Project Manager/Senior Environmental Scientist responsible for wetland/waters of the U.S. delineation, stream assessment, and wetland functional analysis. The project supported an environmental assessment to analyze the potential impacts of proposed road improvements and culvert replacement along a three-mile corridor within Greenbelt Park.

I-95 Express Toll Lanes Section 100 Environmental Permitting Support and Design Management, Maryland Transportation Authority (MDTA) - Baltimore County, MD: Senior Environmental Scientist responsible for environmental permitting and compliance associated with improvements to I-95 from just south of the I-95/I-895 interchange in northeast Baltimore to north of MD 43 in White Marsh (Section 100). Services include: reviewing designs for compliance with Section 404 permit conditions, providing guidance to designers regarding permit compliance, including design information needed to document compliance with permit conditions and avoidance and minimization of impacts; managing overall coordination with the U.S. Army Corps of Engineers and the Maryland Department of the Environment – Nontidal Wetlands and Waterways Division on Section 404 permit-related issues, including project updates, design reviews and approvals, permit modifications, and compensatory mitigation; and managing project compliance with the Maryland Reforestation Law, including preparation, review, and submittal of Reforestation Review requests and forest impact plates to the Maryland Department of Natural Resources.

White Marsh Run Conservation Site - Stream Restoration and Fish Passage Project, I-95 Express Toll Lanes Section 100, 404/401 Compensatory Mitigation Project- Maryland Transportation Authority (MDTA) - Baltimore County, MD: Project Manager/Senior Environmental Scientist responsible for design specifications and design revisions as the designers representative for the construction of the White Marsh Run Stream Restoration and Fish Passage Project. The project involved construction of 1,250 feet of riffle grade controls to provide fish passage at on White Marsh Run past US 40 and an additional 1,200 feet of stream restoration to stabilize severely eroded sections of the stream. Project also required the development of forest conservation plans and forest conservation easements for the 184-acre White Marsh Run Conservation site. The project served as the primary 404/401 stream mitigation project for the I-95 Express Toll lanes project.

Stream and Sewer Infrastructure Assessment Project (DC Water) – Washington, DC: Environmental Project Manager in support of the DC Water Sewer Management Program's stream and sewer infrastructure assessments. Provided technical assistance in locating and mapping sewer infrastructure and assessing stream conditions to support prioritization of infrastructure stabilization and management along stream corridors.

Stream Restoration Design and Forest Conservation, Cabin Branch Development - Montgomery County, MD: Project Manager/Senior Environmental Scientist responsible for wetland/waters of the U.S. delineation, Section 404/401 permitting, forest conservation planning, and stream restoration design for a 500+ acre mixed use development project within one of Montgomery County, MD's Special Protection Area (SPA) watersheds.

MD 4/Suitland Parkway - National Park Service (NPS) Forest and Tree Value Study – (MDSHA) Prince George's County, MD: This study provided a monetary value based on existing forest quality on a property proposed to be exchanged for National Park Service lands to be disturbed due to the construction of the MD 4/Suitland Parkway Interchange. Using methods outlined in the *Guide for Plant Appraisal (9th edition)* published by the International Society of Arboriculture, this study helped demonstrate the higher value of the trees on the land to be exchanged in comparison with the value of the trees to be removed due to construction of the interchange.

POSITION

Project Manager/Environmental Scientist

EDUCATION

BS, 1986, Biophysical Environmental Science, Northland College

REGISTRATIONS

MD DNR Qualified Professional

YEARS EXPERIENCE

Total: 25

With AMT: <1

Gregory Fox, PE

WATER QUALITY AND STREAM ASSESSMENT

Mr. Fox has 15 years of management and technical experience in water resources engineering for stream projects and ecosystem assessments. This includes watershed assessment, water quality BMP monitoring, storm drain design, culvert design, hydrologic and hydraulic modeling (H&H), hydrogeomorphological assessment, natural channel (NCD), Legacy Sediment Removal (LSR), floodplain reconnection, alluvial and threshold channel design, hydrologic and hydraulic modeling, environmental permitting, urban BMP design, floodplain studies, storm drain outfall stabilization retrofit design, planting and reforestation, and erosion/sediment control. He has assessed over 100 miles of stream and designed restorations for several miles of stream. Mr. Fox is knowledgeable in programs and techniques that include TR-20, TR-55, HEC-RAS, XP-SWMM, HEC-HMS, HEC-21, Rapid Stream Assessment Technique, Benthic Analysis, HY-8 Culvert Analysis, TVHG, ArcMap, and GIS Hydro.

On-Call Stream Restorations – Prince George’s County, MD: Project Engineer for urban stream stabilization and restoration of eroded reaches. Projects included watershed investigation, geomorphic assessment, H&H, adaptive urban NCD, riparian buffer restoration and permit approval from MDE, USACE and Prince George's County. Also responsible for supervising contractor during construction of in-stream structures.

Upper Gwynns Falls Small Watershed Action Plan – Baltimore County, MD: Managed and prepared the Small Watershed Action Plan for the area V, Baltimore County watershed for NPDES compliance. The project includes the inspection of over 50 stormwater management facilities under the MS4 permit and ranked each facility and area for possible water quality enhancement by government and community action. Assessed over 200 neighborhoods, institutional properties, commercial areas, and hotspots. The action plan includes a SWAP report designed to meet the Chesapeake Bay TMDL requirements and the goals and objectives of the community. Developed the Characterization Report and Action Plan utilizing GIS to collect, analyze and present the factors in the watershed that affect water quality to identify the best project locations to reduce TMDL in the watershed. Organized the steering committee and gave presentations at all stakeholder meetings.

Whitemarsh Run Monitoring – Baltimore County, MD: Project Manager for this stream monitoring task for compliance with MDE permitting requirements for construction of new roadway. Monitored the impacts of new highway bridge and culvert construction on the stability of Whitemarsh Run and two tributaries. Included physical stream stability assessments, water quality assessment, habitat and macroinvertebrate assessments, photo documentation, and watershed analysis. Prepared quarterly monitoring reports and time trend analyses to determine the stability of the streams during construction.

MD 43 BMP Monitoring – Baltimore County, MD: Project Manager for BMP and stream monitoring task. Monitored the effectiveness of the erosion and sediment control measures being used to protect two streams that cross the new highway. Four BMPs being used as sediment basins during construction were monitored for TSS and turbidity to determine the basin’s efficiency in removing sediment as well as the impact that sediment has to the receiving waters. Determined the sampling locations, performed weekly site inspections, watershed analysis, and data collection during storm events using a combination of bulk sampling and automated samplers located at the BMP outfalls and receiving streams. Worked with the University of Maryland and SHA to monitor the effectiveness of adding polymer flocculants and using skimmers to increase the amount of sediment removed from the basins prior to discharge into streams.

MS4 Water Resources Engineering Term Contract – Montgomery County, MD: Stream Project Manager. Tasks include stream restoration projects on 8,000 LF of Great Seneca Creek tributaries, a 1,600 LF Cabin John Creek tributary and 10,000 LF of Rock Creek tributaries. Reaches were assessed using geomorphic/geofluvial analysis methods including BANCS (BEHI/NBS) to quantify sediment removal potential, H&H practices include calibration of GIS-Hydro, TR-20, geomorphic and HEC-RAS modeling. The designs follow NCD, bioengineering and LSR methodologies to reconnect the floodplain to stabilize and increase the water quality in the channel. Responsible for concept development, design computations, construction documents, scheduling, cost estimating, permitting, public meeting presentations, agency coordination and TMDL credit documentation.

POSITION

Associate

EDUCATION

BS, 2000, Civil Engineering, Virginia Polytechnic Institute and State University

Rosgen Levels I-IV (2004-2011)

REGISTRATIONS

Professional Engineer: MD (#31177), DC, DE, NC, TN and VA

SHA E/S Control Designers Blue Card (#D06-016)

MDE Green Card for E/S Control (#28559)

SHA Yellow Card for E/S Control (#06-505)

YEARS EXPERIENCE

Total: 15

With AMT: 8

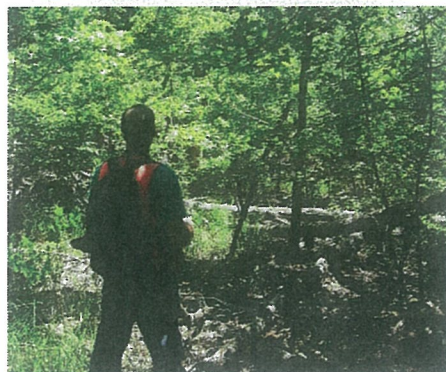


Oxbow Nature Preserve

Anne Arundel County, Maryland

AMT provided environmental assessments, planning, and design for improved visitor access, including ADA accessible trails, boardwalk and an overlook for bird watching and environmental education at the Oxbow Nature Preserve. AMT worked in conjunction with the Russett Community Association, Anne Arundel County Parks and Recreation Department, MD DNR, The Nature Conservancy, Southern Maryland Resource Conservation & Development, and MDE to develop designs that minimize environmental impacts to the sites sensitive natural resources. All elements are ADA compliant and utilize vandal (and beaver) resistant materials. The platform is large enough to accommodate up to 30 people and includes a rain shelter and interpretive panels that provide environmental learning opportunities.

Our team determined the optimum trail route and overlook location based on forest stand, root, and soil conditions, as well as identification of potentially hazardous trees. We prepared unique trail details to protect trees and avoid damaging roots, prevent soil compaction and erosion, provide for passage of small fauna such as salamanders and box turtles, and maintain existing drainage patterns. Using helical piers for the viewing platform eliminated the need for construction equipment to be operated on the high, steep slopes adjacent to the Oxbow. We also prepared strict performance specifications to prevent introduction of alien species, foreign materials, or other inadvertent environmental damage.



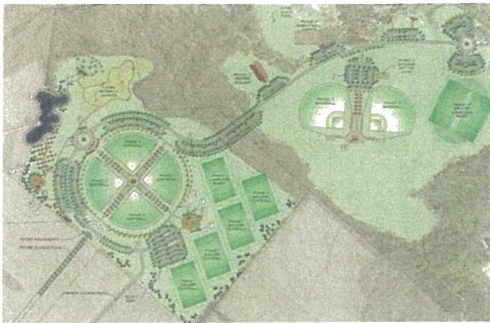
Blossom Point Facility

Charles County, Maryland

AMT organized and led field investigation teams delineating over six (6) miles of non-tidal and tidal wetland boundaries and assessed environmental and forest resource conditions on an approximately 800-acre US Army/US Navy owned property in Charles County, Maryland as part of need to expand satellite facility operations. AMT worked safely and efficiently on this secure property, a portion of which included a live ordinance range. Throughout the study area, AMT assessed an area of environmental diversity, ranging from tidal and non-tidal submerged, emergent and scrub-shrub wetlands, to palustrine and inland forested wetlands and varied forest associations. A variety of species exist on the site, including multiple bald eagle nesting sites.

AMT worked closely with NAVFAC, NASA, and the US Army to minimize the need to mitigate wetland, forest, and bald eagle nesting site impacts by developing a creative and agency approved wetland preservation plan and selective forest clearing plan associated with the line-of-sight (LOS) clearance zone required for the project. Instead of wetland clearing, AMT designated selective canopy tree clearing areas and developed tree removal

specifications within and adjacent to wetland systems that impeded on the required LOS for the new facility.



Green Branch Regional Park Master Plan

Bowie, Maryland

AMT provided site analysis, master planning and design services for new recreational facilities and infrastructure for a regional, multi-phase park and sports complex. Environmental design services included review of available records and data, stream and wetland delineation, forest and habitat inventories and forest preservation.

The site layout is tailored to fit the existing landscape, minimizes ground disturbance, maintains the historic hedgerows, and preserves forest, streams and wetlands on the site. The design successfully integrates stormwater management into the overall design by using small and localized areas to capture runoff from adjacent parking lots and other impervious areas. A trail system weaves along the western side of the property and through the butterfly garden/wet meadow complex and stormwater treatment areas.



Montgomery College (Multiple Campuses)

Rockville, Takoma Park, and Germantown, Maryland

AMT has provided environmental evaluations, arborist, planning, and landscape architecture services for various site/building improvements and Master Plan updates for multiple campuses for Montgomery College. These have included reviewing forest conservation regulatory compliance for three separate jurisdictions, inventorying and updating existing forest and tree condition evaluations and mapping, and providing recommendations for the future forest conservation requirements and stewardship of sensitive resources. During construction projects, AMT has designed tree protection and remediation measures, worked with the stakeholders and adjacent residents, coordinated with utilities, and provided construction administration, observation and inspection services.



Yorkville Road Off-Site Bank Mitigation

Prince George's County, Maryland

The Prince George's Department of Environmental Resources hired AMT to execute a Tree Conservation Plan (TCP) for this unique site. Located in a residential neighborhood, the site's steep slopes recently experienced major settling and significant erosion. As the site is unfit for housing, DER acquired the land and now uses it for mitigation credit for the agency's other off-site projects. AMT provided tree assessment services, including health, species, size, and location. AMT also provided a tree/shrub list for afforestation, protection measures, invasive species removal, and the

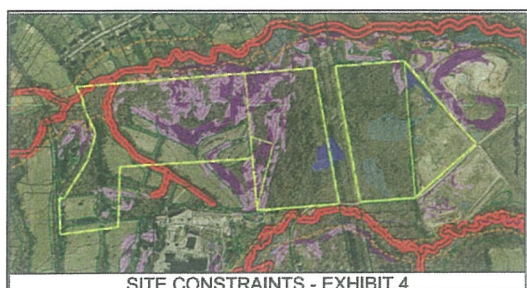
execution of a TCP that was reviewed and approved by Prince George's County Environmental Planning Section.



Montgomery Animal Shelter

Montgomery County, Maryland

AMT provided comprehensive site planning, civil engineering and landscape architecture design services for the Animal Services and Adoption Center. AMT, in conjunction with the architect, prepared numerous site concept and planning studies to identify the ideal location for the new facility, based on location of existing sensitive environmental features such as forest, stream and wetlands of special state concern. AMT evaluated the composition and health of existing forests and specimen trees across the site. Extensive coordination was required between the end users, County staff and the Maryland National Capital Park and Planning Commission to finalize the building location, site setbacks, visitor and staff parking requirements, vehicular access location and maximum impervious area allowed on the site.



Public Safety Training Complex

Prince George's County, Maryland

AMT provided site feasibility and planning services for a central facility for local state and Federal public safety agencies. Evaluated local master plans and county-wide infrastructure, needs assessment and programming for future facilities. Conducted site reconnaissance to identify potential archaeological, historical, or environmental features that might affect the development of the site including rare, threatened or endangered species; wetlands; floodplains; steep slopes; forests; streams; and stream buffers. Test fit various site plans on a 160 acre site and an adjacent landfill, developed alternatives in work sessions with stakeholders and presented preferred options to agencies and County Executive.



Upper Marlboro Revitalization Plan

Prince George's County, Maryland

AMT collaborated with The Design Collective, Inc. to prepare a vision for transforming this largely industrial and mixed use area adjacent to downtown Upper Marlboro. AMT's primary assignment was to assess the environmental constraints and opportunities, participate in public forums, and author the environmental planning section of the report. The plan proposes recapturing the extraordinary natural resources hidden in the center of the study area, to serve as a community and recreational hub, with a linked network of public spaces, pedestrian routes and prime development sites linked to the historic town center.

The assessment included field inventories of forests and wetlands, review of environmental records, including Rare, Threatened and Endangered

Species, and evaluation of floodplain and other regulatory guidelines. Recommended resource management, reforestation and wetlands enhancement to restore and improve ecosystem services. Challenging conditions (100 year flood plain, sensitive environments, historic and cultural resources) that hindered development required “outside the box” thinking to turn liabilities into valuable assets to promote redevelopment.



Woodland Conservation Bank at Spice Creek

Brandywine, Maryland

The Spice Creek property is a 157.03 acre site, owned by the Maryland-National Capital Park and Planning Commission (M-NCPPC). M-NCPPC leases parts of the property to neighboring farmers and previously leased to a tree nursery operation. The Prince George’s County Department of Environmental Resources (DER) intends to shift the use the abandoned nursery fields to a forest conservation bank that can be used to satisfy forest conservation requirements by off-site DER projects. DER hired AMT to complete Natural Resource Inventory/Forest Stand Delineation and Tree Conservation Plan for county review.

The property is bounded on the east by the Patuxent River, Spice Creek and a large wetland complex to the north, forests to the west, and agricultural lands to the south. As part of the permitting process, AMT spent multiple days in the field collecting data on tree species, wetlands and stream delineation. The beautiful Spice Creek site includes incredibly steep slopes, several wetlands, a complex network of streams, multiple forest stands, and an amazing diversity of well-established native species (canopy and understory). The NRI/FSD is approved and the TCP process is underway. Because a portion of the parcel is within the Chesapeake Bay Critical Area, the Spice Creek project is rightly subject to a more critical review process than conventional NRI/FSDs and TCPs (“Conservation Plan”). As part of the TCP/Conservation Plan, AMT and DER are coordinating on the best options for manage non-native and invasive species (*Acer platanoides*, *Pyrus calleryana*). These species were originally planted in the nursery fields but now threaten the diverse forests that surround the former nursery fields.



Pyles Drive Streambank Stabilization

Prince George’s County, Maryland

AMT provided NRI/FSD, tree and forest inventory and evaluation, forest conservation planning, and tree protection measure design for protected forest and specimen trees beside to the stream and on adjacent surround steep slopes. We created a forest bank with reforestation for additional credit for future County use. AMT also provided a preliminary stream study and stream stabilization design for 1,200 LF of highly eroded banks, that included various stabilization techniques including cross vanes, log vanes, imbricated riprap (IRR) walls and buffer restoration. The buffer restoration

included selection and planting design of appropriate native tree and shrub species, as well as selection and design of native seed mixes to aide in site stabilization.



Henson Creek Connector Trail and Pedestrian Bridge

Prince George's County, Maryland

AMT is providing environmental analysis, design and permitting for the Henson Creek Connector Trail and Pedestrian Bridge. The purpose of this project is to provide a trail to connect the 56 acre Tucker Road Athletic Complex with the new 15-acre Southern Regional Tech Rec Complex on Bock Road. The connection traverses sensitive upland and riparian forest, streams, wetlands, and archaeological sites, and includes construction of about 1,500 feet of 8 feet wide asphalt hiker/biker trail and a 130 feet pedestrian bridge across Henson Creek.

The work includes topographic surveys, NRI/FSD, TCPII, wetland delineations, trail alignment, grading, storm drainage, stormwater management, erosion and sediment control and structural design of abutments for a pre-engineered truss bridge. Special details and careful trail alignment protect valuable forest and habitat and avoid disturbance of archaeological sites. AMT is providing analysis of the floodplain, hydraulic analysis of Henson Creek, and coordinating plan review and permitting with DPWT, DER, Environmental Planning, Soils Conservation Service, WSSC and MDE.

REFERENCES

The list of references below are former and current clients for whom our firm has or is currently providing similar services.

Prince George's County Department of Environmental Planning

Ms. Kim Finch – Planner Coordinator

14741 Gov. Oden Bowie Drive

Upper Marlboro, MD 20772

(301) 952-3506

Kim.Finch@ppd.mncppc.org

Russett Community Association (Oxbow Nature Preserve)

Mr. Tim Reyburn - Director

14440 Cherry Lane Court, Suite #212

Laurel, Maryland 20707-4946

(301) 206-3036

treyburn@ticoscen.com

City of Rockville Department of Recreation and Parks

Ms. Elise Polydoroff - Assistant City Forester

14625 Rothgeb Drive

Rockville, Maryland 20850-5312

(240) 314-8710

EPolydoroff@rockvillemd.gov

Montgomery College Capital Planning, Design & Construction

Ms. Sandra Filippi - Campus Planner

40 West Gude Drive, Suite 200

Rockville, Maryland 20850-1166

(240) 567-7362

Sandra.Filippi@montgomerycollege.edu

M-NCPPC Montgomery County Department of Parks

Park Development Division

Mr. Colter Burkes - Urban Forester

9500 Brunett Avenue

Silver Spring, Maryland 20901

(301) 495-2469

Colter.Burkes@montgomeryparks.org

PROPOSED SCHEDULE

TASK/DELIVERABLE	DATE OF COMPLETION
Notice to Proceed	July 15, 2015
Inventory, Preliminary Findings and Report (Nine Weeks)	September 15, 2015
Develop Goals & Recommendations (Six Weeks)	November 1, 2015
Final Report (Three Weeks)	November 22, 2015

PROPOSED FEES

FEE BY TASK	
Task	Amount
I – V: Inventory, Mapping, Meetings*, Preliminary Findings and Report	\$17,750.00
VI – VIII: Meetings*, Goals, Recommendations, Planning and Implementation	\$7,000.00
IX: Final Report, including education and training recommendations	\$2,500.00
TOTAL	\$27,250.00
Option 1: Review and Summary of Environmental Databases and Land Records (HAZMAT)	\$1,200.00
TOTAL – Including Option 1	\$28,450.00

** Includes up to three (3) meetings with City Council; two (2) meetings with advisory boards, and six (6) meetings with project staff. If additional meetings are needed AMT will prepare a scope and fee for additional services, or provide them on an hourly basis at our standard rates.*

MARYLAND DNR FOREST ASSOCIATIONS

Oak-Hickory Forest Association

About 60% of Maryland's forests are oak-hickory forest associations, and they are found across the State. The proportions of each species vary greatly. Species makeup depends on amounts of precipitation, and how water drains through soils.

The oak-hickory forest association can be maintained if large oak and hickory seedlings are present prior to any natural or planned disturbance to the overstory. If only small openings or no openings are created in the canopy, this association will gradually convert to northern hardwoods. If larger openings are created or the overstory is completely removed within a short period of time, this association will gradually convert to Allegheny or Appalachian hardwoods.

Characteristic tree species include:

Northern red oak, black oak, scarlet oak, white oak, chestnut oak, and all hickories.

Associated tree species include:

Yellow-poplar, red maple, blackgum, persimmon, black walnut, butternut, pitch pine, sweetgum, black locust, dogwood, and sassafras.

Understory plants include:

Dogwood, sassafras, sourwood, serviceberry, eastern redbud, American hornbeam, eastern hophornbeam, witch-hazel, hazelnut, blueberry, viburnum, spicebush, mountain-laurel, rhododendron, wild grape, Virginia creeper, green brier, and poison-ivy.

Herbaceous plants include:

Tick trefoil, Solomon's seal, may apple, dittany, trillium, black snakeroot, pussy's-toes, wild ginger, bellwort, aster, cinquefoil, and goldenrod.



Virginia Pine-Oak Forest Association

The Virginia pine-oak forest association is found throughout Maryland. It is most commonly found on the Piedmont Plateau and the Coastal Plain. Primarily, it occurs on old fields and other well-drained sites. It represents a transition from areas with almost pure Virginia pine to oaks and other hardwoods that tolerate shady conditions.

Without disturbance or with partial removal of the overstory, this community will gradually convert to an oak-hickory forest association. The Virginia pine-oak forest association can be maintained if oak regeneration is established before the entire overstory is removed naturally or by a planned treatment.

Characteristic tree species include:

Virginia pine, northern and southern red oak, scarlet oak, black oak, chestnut oak, white oak, post oak, and blackjack oak.

Associated tree species include

Shortleaf pine, pitch pine, Table-Mountain pine, yellow-poplar, blackgum, red maple, persimmon, winged elm, hickory, and sourwood.

Understory plants include:

Dogwood, eastern redbud, sumac, blackberry, poison-ivy, Virginia creeper, green brier, and honeysuckle.

Herbaceous plants include:

May apple, tick trefoil, broomsedge, and pipsissewa.



White Pine/Northern Hardwoods Forest Association

The white pine/northern hardwoods forest association can be found throughout central and western Maryland. Generally, it is not found on the Coastal Plain. The understory in this forest association is sparse.

Natural or planned disturbances that create openings in the canopy larger than about one-half acre will maintain this forest association. If openings are not created, white pine/northern hardwoods will gradually convert to northern hardwoods, oak-hickory, or oak/northern hardwoods.

Characteristic tree species include:

White pine, sugar maple, red maple, American beech, and yellow birch.

Associated tree species include:

Sweet birch, gray birch, black cherry, white ash, yellow-poplar, basswood, cucumber tree, aspen, eastern hemlock, pin cherry, striped maple, white oak, northern red oak, balsam fir, white spruce, northern white-cedar, hickory, shortleaf pine, and pitch pine.

Understory plants on the Allegheny Plateau and Mountains include:

Striped maple, American beech, rhododendron, viburnum, witch-hazel, eastern hophornbeam, witch hobble, and winterberry.

Understory plants in the Appalachian Mountains include:

Blueberry, huckleberry, azalea, teaberry, mountain-laurel, blackberry, green brier, and Virginia creeper.



Request for Proposal, Contract 2015-01
City of Greenbelt, MD
Forest Health Assessment
Greenbelt Forest Preserve



June 12, 2015

Prepared For:

City of Greenbelt
15 Crescent Road, Suite 200
Greenbelt, MD 20770

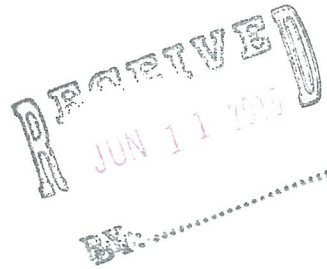
Prepared By:

Environmental Systems Analysis, Inc.
162 West Street
Annapolis, MD 21401





esa



6/12/15

Ms. Celia Craze
City of Greenbelt
15 Crescent Road, Suite 200
Greenbelt, MD 20770

Re: *Response to Request for Proposal*
 Contract No. 2015-01
 Forest Health Assessment, Greenbelt Forest Preserve

Ms. Celia Craze:

Enclosed with this cover letter are three bound copies of an Environmental Systems Analysis, Inc. (ESA), technical and cost proposal response to *City of Greenbelt, Request for Proposal, Contract Number 2015-01, Forest Health Assessment, Greenbelt Forest Preserve*.

We understand that the proposal response is due on June 12, 2015, and we made a point to configure our proposal per your identified *Content of Response*. As you read through the ESA response, please call, e-mail or write, if you should have any questions, as I can be reached at 410-267-0495 x-203 or mburchick@esatoday.com.

Thank you for your consideration.

Sincerely,

Mark Burchick

Mark Burchick
Principal, Senior Environmental Scientist

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To better prepare writing the response to this RFP, I briefly walked a portion of the North Woods Tract on May 24, 2015. I followed a trail network, attempting to go toward the northeast portion of the site to observe the stream channel and wetlands. I did note a skunk cabbage spring seep (PFO/EM1B) and the riverine intermittent (R4) stream channel with associated pocket wetlands (PFO1A). Along the way I took a few notes on species observed, which includes the following:

Trees: Black Cherry, Black Gum, Catalpa, Eastern Red Cedar, Green Ash, Mockernut Hickory, Mulberry, Northern Red Oak, Red Maple, Sassafras, Sweet Gum, Sycamore, Tulip Poplar, Virginia Pine, White Oak and Willow Oak.

Shrubs: American Holly, American Strawberry Bush, Arrowwood Viburnum, Elderberry, Flowering Dogwood, Highbush Blueberry, Ironwood, Spicebush and Winterberry.

Forbs: Agrimony, Cleavers, Curled Dock, Cursed Buttercup, Enchanters Nightshade, False Solomon Seal, Honewort, Indian Cucumber Root, Jack-in-the-Pulpit, Jewelweed, Partridgeberry, Pokeweed, Running Ground Cedar, Skunk Cabbage, Tall Meadow Rue, True Solomon Seal, Violet spp., Wild Strawberry, Wild Yam and Wood Lily.

Vines: Allegheny Blackberry, Catbriar, Common Greenbriar, Poison Ivy and Virginia Creeper.

Grass/Sedge/Rush: Deertongue, Fox Sedge, Strap Sedge, Virginia White Grass and Wood Reed Grass.

Ferns: Christmas Fern, Lady Fern, New York Fern and Sensitive Fern.

Non-Native Species: Asiatic Barberry, Asiatic Bittersweet, Bush Honeysuckle, Garlic Mustard, Japanese Honeysuckle, Lamb's Ear, Microstegium, Multiflora Rose, Phragmites, Porcelainberry, Privet, Tall Fescue, Tree-of-Heaven, Wineberry and Winged Euonymus.

Wildlife Observations: Crayfish Mounds, Pileated Woodpecker (forest interior - FID), Wood Thrush (forest interior - FID) and Phantom Crane fly.



I. Proposed Scope of Services

The proposed scope of services that are requested within the request for proposal (RFP) include that a comprehensive forest health and ecosystem assessment be performed at the Greenbelt Forest Preserve, described as the "study area" in the RFP. This study area includes Area A (151-acres, known as the North Preserve) and Areas B, C, D and E (69-acres, known as the South Preserve).

The scope asks for specific elements, which we identify in italics, then with a technical approach response provided, as to how Environmental Systems Analysis, Inc. (ESA) will perform each task.

I. Forest Composition and Health.

To determine forest composition and health, ESA will perform a natural resources inventory (NRI) and forest stand delineation (FSD) using protocols identified in the Maryland Department of Natural Resources, *State Forest Conservation Technical Manual*, Third Edition, 1997. The *Manual* describes a random plotless technique to qualify and quantify forest structure. The random plotless technique is the standard protocol of the USDA Forest Service and USDI National Park Service when developing Integrated Natural Resources Management Plans. ESA utilizes the plotless technique because of the enhanced quality (thoroughness) of data that is collected using the protocol.

The strategy requires approximately one data station per five-acres of homogeneous forest and ESA will analyze a minimum of 40 data stations within the approximate 220-acres of the forested North and South Preserve. Each plot will be GPS field-located and mapped using ESA's Trimble GEO-XH GPS survey unit with sub-meter accuracy and Pathfinder software, compatible with CAD. The strategy of establishing a baseline will allow future studies a basis of comparison for the purpose of trend analysis.

ESA will prepare a base CAD drawing that includes color aerial photography, then with an overlay of topography and the boundaries of Areas A, B, C, D and E, which will constitute the base map. Working from the base, ESA will then overlay forty proposed forest data plots, for use as we perform our formal natural resource inventory and forest stand delineation.

The ESA study protocol will involve the delineation of forest cover and their acreage within the preserve boundaries. The forest stands will be based on species composition, density, size, condition, and age of the stand. The dominant, co-dominant and associate tree species for each stand will be identified and tabulated to indicate their relative frequencies and average tree diameter class along with descriptions of each tree stand including the identification of the understory and herbaceous species.

The forest stands will be characterized by studying the results of variable point sampling, typically averaging 80-feet across in pole-stocked or larger timber. Variable point sampling refers to a method in which sample trees are selected with a probability proportional to their basal areas, (i.e. large trees with large basal areas have higher probabilities of selection than smaller trees). Basal area is defined as a measurement of the cross-sectional area of a tree trunk at breast height. Basal area of a forest stand is the sum of the basal areas of the individual trees. Furthermore, since basal area is highly correlated with tree volume, variable point sampling is a very efficient method for estimating frequency of occurrence and volume.

At each sample point location, trees that fall within the sample area are tallied and measured. This data

is used to estimate the number of trees per acre, per each one-inch diameter class. In addition, the condition of the overstory trees in each vegetation type is evaluated and the understory and ground cover species identified. Information included in the sample point data collection includes percent canopy closure and tree species observed including relative dominance, percent and species of shrubs, percent and species of forest floor covered by herbaceous plants, percent of forest floor covered by downed woody debris, and the presence or absence of exotic or invasive species.

Both within and between the sample plots, ESA will prepare a list of all species observed. Plant species, which are listed as uncommon, watchlist, rare, threatened, endangered, or in need of conservation will be identified.

Interpretation of the field data will allow us to make judgments as to the forest composition, structure, condition and function, and to develop management recommendations for each stand. The FSD map is prepared and includes the natural resources inventory - soil types, steep slopes, wetlands, buffer setbacks, and other natural features and constraints. The NRI/FSD maps will be included with narratives, as part of the larger comprehensive report. Completed data sheets will be included and a forest stand summary is also included as part the narrative report, entitled *Results of Study*, and *Stand Summary Table*. Both the report and maps will include forest types qualified by the *Classification of Vegetation Communities of Maryland: A Subset of the International Classification of Ecological Communities, Terrestrial Vegetation of the United States* (Maryland Department of Natural Resources, Natural Heritage Program).

II. Wildlife Inventory, Dynamics and Habitat.

ESA will perform a wildlife inventory throughout the 220-acre, North and South Preserve. The inventory will be accomplished by documenting species observed while performing forestry studies and through direct evidence such as scat, song/calls, footprints, active dens and the like.

ESA owns ten high quality Reconyx Hyperfire HC500 infrared motion detector trail cameras. The cameras are capable of silently capturing both day and night time photos, with each photo documenting the time, date and temperature at the time each photo is taken. All cameras are enclosed in tamper-proof metal boxes and can be secured to trees using cable locks. Each camera station will include interpretive signage and a station identification number that is visible in each photo. The location of each station will be plotted onto mapping.

Cameras will be installed in natural areas including forests, woodlots, meadows, riparian stream corridors, and wetland edges. We will make a point to evaluate movement corridors and pinch points along wetlands, fence lines, road and trail crossings, culverts, ecotones of forest and meadow edge, water and woodland edge, observable wildlife trails, dens and den trees. Cameras will be calibrated, by taking reference photos, manipulating the cameras (wedges and screws) to obtain the best possible heights and directions for each shot.

Each baited camera station will include kernel corn, corn cob, sunflower seed, peanuts and occasional roadkill (as available). Certain animals will be attracted to the bait stations. The combination of visits, urine, scat and overall interest has a tendency to attract other animals. All animals require fresh drinking water, and it will be important to locate some cameras near the stream, as this will be part of a daily movement for wildlife. It will be our hope to capture in digital photography common species such

as deer, raccoon, squirrel, fox, chipmunk, groundhog, opossum, rabbit and others. The cameras may also document feral cats or dogs, and unusual sightings such as rats, otter, turkey, beaver, coyote, mink, weasel or escaped farm animals.

Aquatic sampling of benthic macroinvertebrates and fishes will follow the *MBSS Sampling Manual: Field Protocols* (MD DNR, 2014). Monitoring of benthic macroinvertebrates can be conducted from June 1 through September 30. Each monitoring station will consist of a 75 meter reach. The upstream (75 meter) and downstream (0 meter) boundaries will be marked and tree tags will be placed at these locations. The GPS coordinates for the midpoint of the reach will be obtained, using a GPS unit that provides sub-meter accuracy. Photographs, facing upstream and downstream, will be taken at the midpoint of the reach and of any unique conditions. An equipment inventory and functionality test will be performed prior to initiating field data collection. All data will be entered onto MBSS field datasheets, as provided in the *MBSS Sampling Manual* and entered into MS Excel. Field crews will consist of qualified and Maryland Biological Stream Survey (MBSS) certified staff and will include a Principal Investigator and a Field Research Assistant. The following provides a description of the monitoring to be conducted:

Benthic Macroinvertebrates - Benthic macroinvertebrate sampling will follow the *MBSS Sampling Manual: Field Protocols* (MD DNR, 2014). The percentage of each habitat, including riffles, rootwads, woody debris, leaf packs, macrophytes, and undercut banks will be determined in order to weight the sample according to the habitat type within the 75 meter reach. Sampling will be conducted moving from downstream to upstream to minimize disturbance to the benthic macroinvertebrate community. The 540 micron mesh D-net will be placed flush within the riffle ensuring macroinvertebrates cannot pass between the net and stream channel bottom. Rocks immediately upstream of the net will be rubbed by hand to remove macroinvertebrates. Smaller substrate will be displaced by foot and allowed to flow through the net. The D-net will also be used to dislodge organisms from non-riffle habitats using a jabbing/sweeping motion. This procedure will be repeated until a total of 20 ft² of substrate has been sampled. The amount of each habitat type sampled will be documented. The sample will be emptied into a 540 micron mesh sieve bucket and fine sediment will be removed. Large debris, including leaves, sticks, and stones will be examined in the sieve bucket for macroinvertebrates and discarded. Macroinvertebrates remaining on the net will be removed and added to the sample. The sample will be transferred to a pre-labeled bucket and preserved with 95% ethanol. A chain-of-custody form, as provided in the *MBSS Sampling Manual* will be completed and samples will be hand delivered to MD DNR benthic laboratory, located in Annapolis, for identification.

Benthic macroinvertebrate processing and identification will be completed by MD DNR certified taxonomists at the MD DNR laboratory and follow the *MBSS Laboratory Methods for Benthic Macroinvertebrate Processing and Taxonomy* (MD DNR, 2000). The sample will be spread evenly over a subsampling tray that is divided into one hundred square grids that are 5 centimeters by 5 centimeters each. 120 macroinvertebrates will be picked and identified to genus from randomly chosen squares on the grid. The number of grids needed to acquire the 120 macroinvertebrate sub-sample will be documented. The number of macroinvertebrates within the entire sample will be documented if 120 organisms cannot be obtained.

Fish - ESA will work with a certified subcontractor to conduct fish sampling using the *MBSS Sampling Manual: Field Protocols* (MD DNR, 2014). Block nets will be installed at the upstream and downstream reach limits to prevent the escape of fish. Rocks and stakes will be used to anchor the nets. All nets

(block and dip) will have a mesh size equal to or less than ¼ inch. Double pass electro-fishing will be employed. The time in seconds that each unit electro-fishes will be recorded. Sampling begins downstream and is performed from bank to bank. Based on information provided by MBSS, the width of the stream is approximately 12 meters and will require four anodes. All netted fish will be placed into buckets, weighed in aggregate, identified to species, and counted. Game fish will also be measured. Any species that cannot be positively identified will be preserved and identified in the laboratory. Any rare, threatened, and endangered species will be photographed, as long as the photograph will not cause harm to the fish.

Physical Habitat Assessment - ESA will conduct the Maryland Physical Habitat Index (MPHI) assessment using the spring index period forms, according to the *MBSS Sampling Manual: Field Protocols* (MD DNR, 2014). Parameters include trash rating, remoteness, riparian buffer width, adjacent land cover, riparian vegetation, buffer breaks, buffer break types, channelization, land use, stream gradient, and road culvert descriptors. The ESA will conduct the Maryland Physical Habitat Index (MPHI) assessment using the summer index period forms, according to the *MBSS Sampling Manual: Field Protocols* (MD DNR, 2014). Parameters include bank erosion, bar formation and substrate, stream character, woody debris, and flow. The MBSS Stream Habitat Assessment Guidance Sheet will also be completed for each station and parameters evaluated are: instream habitat, epifaunal substrate, velocity/depth diversity, pool/glide/eddy quality, riffle/run quality, embeddedness, shading, and trash rating. These parameters will be scored according to a rating of optimal (20-16), sub-optimal (15-11), marginal (10-6), or poor (5-0). In addition, embeddedness and shading will be evaluated and given a percentage.

Water Chemistry Sampling and Analysis - All water chemistry sampling will follow the *MBSS Sampling Manual* and will be conducted at the upstream limit of the station in order to avoid any disturbance created by field crews. Grab water quality samples, including pH, acid neutralizing capacity, sulfate, nitrite, nitrate, ammonia, total nitrogen (dissolved and particulate), ortho-phosphate, total phosphorus (dissolved and particulate), chloride, conductivity, and dissolved organic carbon will be collected during the spring and analyzed by the University of Maryland Center for Environmental Science, Appalachian Laboratory, using MBSS protocols. In-situ measurements, including dissolved oxygen, pH, specific conductance and temperature will be obtained using an YSI multi-parameter probe. Turbidity will be measured using a Hach turbidimeter. QA/QC protocols, such as calibrating equipment prior to sampling and maintaining a log book that documents calibrations and any equipment problems will be followed.

Data Analysis and Reports - Results will be provided in MS Excel and analyzed using metrics for coastal plain streams, as provided in *MBSS New Biological Indicators to Better Assess the Condition of Maryland Streams* (Southerland et. al, 2005). The following benthic index of biological integrity (BIBI) metrics for coastal plain streams will be used: number of taxa, number of EPT taxa, number of Ephemeroptera taxa, number of intolerant urban taxa, percent Ephemeroptera taxa, number of scrapers taxa, and percent climbers taxa. An overall rating of very poor (1.0 - 1.9), poor (2.0 - 2.9), fair (3.0 - 3.9) and good (4.0 - 4.9) will be applied to the monitoring station. The following fish index of biological integrity (BIFI) metrics for coastal plain streams will be used: number of native species, number of benthic fish species, number of intolerant species, percent abundance of dominant species, percent of tolerant species, and biomass per square meter.

III. Abiotic Factors Impacting Forest Health.

Through the time spent in the field doing forestry, wildlife and fisheries surveys, the ESA field team will

be cognizant to observe for and document various natural resource threats, concerns and hazards including property encroachment, illegal dumping, point source pollutants, exposed utilities, soil erosion and other issues that could be deleterious to the natural resources of the study area. The condition of the stream, stream banks and buffers will be addressed during the inventory of aquatic animal species. A soil survey overlay of the project site will be incorporated into the natural resource inventory mapping at the beginning of the project, as we make our base mapping. Soil types help us refine forest stand types, especially the mapped locations of hydric (wetland) and hydric inclusion (streams) soils.

IV. Impact of Adjacent Land Use and Development on Forest Health.

Fortunately, much of the watershed within the study area is stable and built-out, and has been for quite a while. It is assumed that not much more impervious cover will be introduced within the watershed, and which should allow stream channels to eventually reach repose through ecological time. The assumption is that the adjacent BARC will continue with agricultural research, the B&W Parkway will not expand, Old Greenbelt housing will remain in-situ, and that areas of higher density and institutional use south of the Parkway and along Greenbelt Road are zoned in a manner that not much more land development is being proposed that might affect the North and South Preserves.

During the kick-off and orientation process, ESA would like to meet with the City Planner to discuss adjacent land use issues and development. Based on these conversations, ESA will be in a better position to address concerns within our report of management recommendations.

V. Findings and Conclusions of Survey.

Upon completion of field work, ESA will prepare a draft and final report, which will provide a baseline inventory of forest and wildlife, and also document findings and conclusions of the survey based on our best professional judgment, having prepared numerous integrated natural resources management plans for large scale, public and private natural area land managers.

VI. Proposed Goals for Future Health of Forest Preserve.

We are aware that the proposed deliverables will help guide City Council, the Forest Preserve Advisory Board and other stakeholders with adherence and prioritization of the *Forest Preserve Management and Maintenance Guidelines*. Working with the *Guidelines* document, ESA will propose goals to promote overall stewardship of the Preserve.

VII. Recommendations.

A recommendations section will be included in the deliverable report, which will include identification of natural resource threats, concerns and hazards, and then methodologies to address prioritized issues through possible future studies and/or work orders.

It was obvious from our one, very brief visit to the North Preserve that a comprehensive trails plan may be in order, which should include consistency of trail construction, maintenance and abandonment methodologies. The North Preserve includes core forested interior with a high degree of area-to-edge ratio. This forest interior should be documented and possibly protected in a manner to minimize the encroachment of trails and identify buffers for sensitive habitat and/or locations of rare, threatened

and/or endangered plant or animal species or natural community types such as skunk cabbage seeps.

To increase overall advocacy of the goals of the stewardship plan (*Forest Preserve Management and Maintenance Guidelines*), the combination of this study and others may allow for a more formal opportunity to provide outdoor education and natural history interpretation of the Preserve natural resources.

Another important element of a natural resources management plan in our region includes the ability to monitor for whitetail deer herbivory pressure and natural regeneration capabilities, so that deer do not compromise forest vegetation, especially forb cover/diversity. Invasive plant management is also an important management issue. For clients on a limited budget, we may advise to apply management resources for only the most invasive of plant species and/or perform suppression/eradication activities primarily within the core preserves and interior trails, rather than along forest edges.

II. Names of Project Team

The project team is made up of the staff of Environmental Systems Analysis, Inc. (ESA). ESA has been in business since 1989 (26-years), and is a small, privately owned company represented by a professional staff of multi-disciplinary natural resource scientists and support personnel.

The Greenbelt Forest Health Assessment project will be managed by Mark Burchick, and assisted by Leslie Wood Mummert and Amy Hennessey, who together, will perform all of the field survey work. Once field work is completed, additional ESA staff, including landscape architect will prepare CAD graphics and mapping.

Mr. Mark Burchick was born and raised at 20 Woodland Way (Woodland Hills), in Greenbelt, and has a brother that still lives at that address. The Burchick's were a founding family of Greenbelt, with Mr. Michael Burchick building his Woodland Way home. Mr. Michael and Myrna Burchick are buried at the Greenbelt Cemetery on Ivy Lane.

III. Resumes of Project Team

Mark Burchick - Project Manager, Senior Ecologist/Botanist

Mr. Burchick went to the University of Maryland, College Park for his undergraduate curriculum and received a BS in Natural Resources Management (Agricultural Engineering). He has an MS in Natural Resources Management and Systems Ecology, with class work from the University of California at Davis, Colorado State, Clemson University and Texas A&M. He also has a Master's Certificate from the U. S. Department of Agriculture in Natural History Field Studies.

Mr. Burchick was a U. S. Park Ranger with the Department of Interior, National Park Service for 13-years and is an 18-year principal of ESA, a natural resources and ecological restoration firm located in Annapolis, Maryland, having 37-years of direct natural resources management experience. Mr. Burchick, an expert botanist, specializes in wetland delineation, natural resource inventory, forest stand delineation, rare plant surveys, wildlife and fisheries studies and implementation of integrated natural resource management plans.

Mr. Burchick was a member of the MD Department of Natural Resources task force for the development of the *State Forest Conservation Technical Manual*, in compliance with the Maryland Forest Conservation Act. He wrote and edited significant portions of the *Manual* related to forest stand delineation field methods of ecology and stand prioritization for retention, and then went on to provide Community College instruction curriculum for the State certification process of qualified professionals.

Mr. Burchick is currently responsible for the management of multi-disciplinary natural resource scientists, support personnel and projects, providing environmental, natural resource management and ecological restoration services to civil engineering, legal, governmental and land development clients.

Specific to the City of Greenbelt, Forest Health Assessment solicitation, Mr. Burchick participated in the field work and publication of the *Annotated List of Flora of the Beltsville Agricultural Research Center, Beltsville, Maryland, USDA-Agricultural Research Service Publication-155*, May 2000. A goodly portion of the plant species and forest types as documented in the *Flora* are likely consistent with the abutting Greenbelt North and South Preserve.

Leslie Wood Mummert - Senior Environmental Scientist/Botanist

Ms. Wood Mummert has BS in Biology from Duke University and a MS in Botany and Field Naturalist Program from the University of Vermont. Leslie has been a senior natural resources management scientist/botanist with ESA for the last 13-years and has a total of 19-years of direct experience as a natural resources scientist. Her experience includes assessing forests for forest health, wildlife habitat, rare plants and invasive plants; forest stand delineations and forest conservation plans; developing natural area management plans and invasive species management plans; writing environmental assessments; conducting wetland delineations and wetland functional assessments; designing and monitoring wetland creation/restoration areas; assessing and designing living shoreline projects; and all aspects of project management. The following projects represent an overview of Ms. Wood Mummert's experience:

NAVFAC Washington Regional Invasive Species Management - Mrs. Wood Mummert **supervises implementation of invasive species management plans at multiple Navy bases in the Washington DC region.** The treatment focuses on multiple species: tree-of-heaven, English ivy, winter creeper, periwinkle, bush honeysuckle, mile-a-minute, Japanese knotweed, Canada thistle, autumn olive, barberry, Bradford pear, garlic mustard, Japanese honeysuckle, multiflora rose, porcelainberry, wineberry, paulownia, *Phragmites* and others. Treatment includes foliar spray, cut and wick application of herbicide, mowing and prescribed fire.

NSF Carderock Invasive Plant Management, Wetland Delineation and RTE Studies Montgomery County, MD - Ms. Wood Mummert assessed natural areas on 187 acre campus for invasive plant species and prepared management plan with GIS mapping. She conducted wetland delineation using US Army Corps of Engineers (USACE) Wetland Delineation Manual and Eastern Mountain and Piedmont Supplement protocols and conducted rare plant field study at Naval Support Facility Carderock. Rare plant survey included extensive list of potential species but focused on previously found *Cyperus lancastricensis* and *Sagittaria graminea*. She wrote wetland delineation report and led Jurisdictional Determination field visit. Prepared Rare, Threatened and Endangered Vegetation Survey report.

Bay Ridge Community Forest, Forest Assessment, Anne Arundel County, MD - Ms. Wood Mummert used Maryland's Natural Resource Inventory and Forest Stand Delineation methodology to document the vegetative species of the community forest, observed wildlife and installed wildlife cameras, surveyed the soils type and conditions within the forest and wrote a forest assessment report with recommendations. Recommendations included adopting a deer management strategy and an invasive species management strategy, and conducting a formal vegetation study of the deer enclosures.

Old Colchester Park -Vegetation Classification and Non-Native Invasive Plant Assessment, Fairfax County, VA - Ms. Wood Mummert conducted an analysis of the park's vegetation using the Virginia Department of Conservation/Virginia Natural Heritage Program (DCR/VANHP) Vegetation Classification Protocol, the Park Authority Non-Native Invasive Assessment and Prioritization (NNIAP) Protocol, and a carrying capacity/user impact methodology. The report included site specific management recommendations based on unique natural communities, deer management and invasive species management.

Laurel Hill Park - Natural Resource Management Plan and Treeless Areas Management Plan, Fairfax County, VA - Ms. Wood Mummert mapped vegetation communities as defined by Virginia Department of Conservation and Recreation's *The Natural Communities of Virginia: Classification of Ecological Community Groups Version 2.2* (DCR 2006) and developed natural resources management recommendations for seven Land Bays within FCPA's 1200-acre Laurel Hill Park. She conducted data plot sampling to classify and quantify the vegetation community and worked with ESA's GIS Specialist to create GIS-based maps of the vegetation communities. She identified forest data gaps, research and monitoring needs and developed management recommendations for each vegetation community.

Severn School Forest Assessment and Living Classroom Master and Restoration Plans, Anne Arundel County, MD - Ms. Wood Mummert assessed the school's forest and developed a restoration plan and master plan to turn the site into a living classroom. The site needed extensive non-native invasive species management, including replanting with native shrubs. The master plan included a low ropes challenge course, an outdoor classroom gathering area, a theater, rain gardens, vistas of the Severn River, canoes/kayak storage and trails. Each of these elements offers numerous learning opportunities for students in a variety of subjects while also allowing them to enjoy the outdoors and participate more fully in their own education.

Elklick Woodlands Natural Area Preserve, Natural Resources Management Plan, Fairfax County, VA - Ms. Wood Mummert assessed the preserve and prepared the background field work necessary for documenting natural resource threats, concerns and hazards for the 226-acre Elklick Preserve, a Virginia Natural Area Preserve. She developed management recommendations regarding trails, NNIs and known RTEs. Management concerns identified included boundary identification, perimeter "edge" management, hydrology, internal trail system, invasive species management, access to the site, use limitations, general resources needed and monitoring and research needs.

Preserve at Piscataway Wetland Permitting and Forest Natural Regeneration Monitoring, Prince George's County, MD - Ms. Wood Mummert was responsible to work with MDE to obtain a wetland impact permit for 878-acre project. She negotiated with MDE's Science Services Administration for approval because of MDE Tier II Anti-degradation Policy and with Maryland Department of Natural Resources (MD DNR) because of rare fish species present in receiving waters. She submitted wetland application and supplemental information; coordinated with engineer on submittals; prepared for and

attended public hearing; provided agencies with stream buffer conservation easement plans and special condition to monitor sewer installation in response to RTE and Tier II concerns. Annually, she monitors forest natural regeneration areas and downstream water quality in response to wetland permit conditions.

State Highway Administration Stream Restoration/Wetland Mitigation/Reforestation Design at Seneca Creek Project A (SCA), Montgomery County, MD - Ms. Wood Mummert designed wetland mitigation plans of over 16 acres of forested and herbaceous wetland creation and enhancement. Identified existing vegetation; determined seasonal groundwater levels; identified drainage areas; drafted grading plans; identified impacts to existing wetlands; developed planting schedules and landscape plans; researched rare plants; wrote site evaluation reports; assisted on cost estimate; wrote special provisions; coordinated with ICC representative; and conducted quality control reviews.

Amy Hennessey - Senior Environmental Scientist/Aquatic Ecologist

Ms. Hennessey has a **BS in Biology** from the University of Maryland, College Park and an **MS in Environmental Science** from Johns Hopkins University. Amy has extensive training in geomorphology, hydrology, river/stream assessment and monitoring and has been the lead aquatic scientist for ESA for the last 14-years.

Ms. Hennessey has 17 years of direct experience in physical, chemical, and biological monitoring and statistical assessment of streams, particularly urban streams. She has training in Rosgen Levels I through IV and uses the four methods described in *Recommendations of the Expert Panel to Define Removal Rates for Individual Stream Restoration Projects* (Schueler and Stack et al. 2014) to determine TMDL credits. Amy has over 10 years of experience in developing stream restoration and step pool storm conveyance (SPSC) system design plans, including site selection, alternative site analysis, geomorphic assessment, hydrologic and hydraulic modeling, plan development, and local, federal, and state permitting, development of monitoring plans, and monitoring to determine changes over time and functional uplift. She is certified by the MD DNR's Maryland Biological Stream Survey (MBSS) to conduct spring benthic macro invertebrate sampling and physical habitat using the methods of the *Maryland Biological Stream Survey Round Four Sampling Manual* (DNR, 2015).

Amy conducts physical habitat assessments using DNR's MBSS methods (DNR, 2014) and EPA's *Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates, and Fish Second Edition* (Barbour et al., 1999). She uses metrics for the Coastal Plain Region, as outlined in *A Physical Habitat Index for Freshwater Wadeable Streams in Maryland (Final Report)* (Paul et al., 2003) and EPA's RBPs for low-gradient streams. Amy has experience in conducting stream assessments using Metropolitan Washington Council of Government's Rapid Stream Assessment Technique (RSAT) and Stream Corridor Assessment Survey (MDNR 2001). Recently, Amy has conducted targeted site biological monitoring for Anne Arundel County using methods described in *Quality Assurance Project Plan for Anne Arundel County Biological Monitoring and Assessment Program* (Anne Arundel County, 2011). In addition, she is managing the development of Anne Arundel County's TMDL plan for nine approved TMDLs for bacteria, and is familiar with the Sawmill and Furnace Creek watersheds.

IV. Qualifications Statement

ESA is amply qualified to perform the Greenbelt Forest Preserve, Forest Health Assessment. ESA provides environmental, land planning, natural resource management and ecological restoration services to our land development, engineering, legal and governmental clients.

ESA is located in Annapolis, Maryland, and has an extensive list of projects performed throughout Maryland, Washington DC and Virginia. Being a hands-on applied ecology company, we offer a range of environmental consulting, assessment, planning, design, permitting, compliance, monitoring and oversight services, with an emphasis on wetlands, forestry, water resources and stream restoration.

The field of natural resources management and restoration ecology is a dynamic science. Through continuous education, research, observation, field monitoring and construction oversight our management techniques are refined and improved on a continual basis.

Regulatory compliance throughout the land planning and development process represents the emphasis of our work effort. ESA provides comprehensive services regarding the delineation of nontidal, tidal, prior converted and farmed wetlands. This effort involves wetland functional analysis, jurisdictional determinations, pre-application meetings, permit processing, mitigation design, public hearings, construction oversight or design/build, performance monitoring and reauthorizations.

We also provides forestry compliance services that include forest stand delineation, natural resource inventory, specimen tree surveys, forest conservation planting plans, implementation and monitoring.

ESA is a regional leader in watershed, stream assessment and restoration. Our services include fluvial geomorphology studies, bioengineering design and construction oversight. ESA has prepared numerous pond, lake and stormwater facility retrofit plans, which involve the latest in 'best management practice,' (BMP) and 'limited impact development' (LID) techniques.

Other services include the use of various field methods of ecology to measure, monitor and assess natural resource issues. ESA performs environmental surveys, rare, threatened and endangered species identification and management plans, invasive/nuisance species management, timber stand improvements, conservation easement and buffer management plans, park management, tidal Critical Areas Commission studies (CAC), wildlife, and Phase 1 hazardous waste studies.

V. List of Relevant Projects of a Similar Scope

Rare, Threatened and Endangered Species Survey

Naval Research Laboratory (NRL), Midway Research Center (MRC), Stafford County, VA

Delivery Order N00173-15-F-0228, Contract #GS-10F-0115K

At present, from February through August 2015, Mark Burchick and Leslie Wood Mummert are performing a rare, threatened and endangered species survey at the 162-acre NRL-MRC. The work to date has included a VMRC listing of known RTE species on-site and nearby of similar habitat, a bald eagle survey and 14-days of field work to collect a comprehensive list of all vegetation observed, and which has generated a list of 270 plant species thus far. Three rare plant species aggregates have been mapped and the study area forests have been classified as *Piedmont/Coastal Plain Oak-Beech/Heath*

Forests, Acidic Oak- Hickory Forests, Oak/Heath Forests and Mesic Mixed Hardwood Forests through The Natural Communities of Virginia: Ecological Groups and Community Types, VA DVR, Division of Natural Heritage, Technical Report 12-04, February 2012. Ancillary to the field work, ESA has prepared an extensive list of mammals, birds, amphibians and reptiles observed.

Deliverables for the project will include chapters of the NRL-MRC, Integrated Natural Resources management Plan (INRMP) regarding a baseline vegetation analysis, forest stand prioritization based on community structure and the presence of RTE species and non-native invasive plant management.

**Naval Engineering Command (NAVFAC) Natural Resources Management
Contract #N40080-12-D-0350, Delivery Orders #001 through #024, Various Locations**

ESA is the prime contractor for a five-year (2011 - 2015) contract to provide natural resources, integrated natural resources management plan (INRMP) and implementation for NAVFAC facilities consisting of the Navy Yard, U.S. Naval Academy, Patuxent Naval Air Station, Webster Field, Naval Observatory, Dahlgren, Carderock, Indian Head, Blossom Point, Bethesda National Naval Medical Center, Joint Base Anacostia-Bolling, Quantico, Naval Research Laboratory, Suitland and others.

The multi-million dollar contract involves the management of sub-contractors and includes:

- Management suppression activities for non-native invasive plant species, using chemical (herbicides), biological (grazing goats), mechanical (forestry mowers) and prescribed burns.
- Wildlife studies for bats, birds, butterflies and other pollinators, small mammals, fisheries, deer, spring seep amphipods and amphibians and reptiles.
- Nontidal and tidal wetland delineation and forest stand delineation.
- Development of integrated natural resources management plans (INRMP's) and plan updates.
- Rare, threatened and endangered plant and animal species surveys.
- Design-build of meadows, wetlands, shoreline erosion control and stream channel restoration.
- Bird/Animal Aircraft Strike Hazard (BASH), Bird-Avoidance Model (BAM) habitat manipulations.

One of the highlights of ESA studies included the first-ever documentation of all coves, marshes, islands and streams of the fresh-tidal Mattawoman and Chicamuxen Creeks at Indian Head, Mainside and Stump Neck (Potomac River), in Charles County, MD. The study classified several fresh-tidal natural communities, ecological groups and community types, as well as rare plant populations and submerged aquatic vegetation.

**Fort George G. Meade Study for Fauna and Wildlife Populations, Wildlife Management Services
Anne Arundel County, MD**

Through AECOM Sub-Contract #AEC2-001-SUB-01, ESA performed a two-year study (2013-2014) at U.S. Army Garrison Fort George G. Meade in Anne Arundel County. The study included writing and implementing the Department of Public Works, Environmental Division, integrated natural resources management plan (INRMP) for wildlife management.

The two-year study included:

- A baseline wildlife survey of the 5,067-acre Garrison was performed, using 48 Reconyx Hyperfire

HC500 motion detector infrared wildlife camera stations, through an eight-week period during the spring breeding period.

- A ground-based FLIR deer population survey was performed, documenting 152 deer per square mile on-base. Developed management recommendations to reduce herd densities through culling operations.
- An extensive breeding amphibian study was performed at numerous wetland and vernal pool sites, including cover boards to document dozens of species, which were photo verified and provided to the Maryland Amphibian and Reptile Atlas (MARA).
- A fisheries inventory and lake management plan was performed for Lake Burba, an 8-acre, in-stream pond and focal point amenity. A combination of electro-shocking and seine-netting determined the species matrix, and stocking recommendations were made.
- A small mammal trapping program was implemented with multiple 100-foot line transects installed using both Sherman collapsible and pitfall traps, for species such as mole, vole, shrew, mouse and rat. Post-trapping allowed ESA to develop rotational meadow management plans to promote old-field meadows and habitat diversification.
- The Middle Patuxent River that flows through the Garrison is a strong-hold for the endangered glassy darter. ESA compiled all research performed to date and wrote the management plan that will be carried into the future regarding habitat protection for this species of concern. ESA also prepared the management plan for the northern long-eared bat and a blue heron rookery that occurs on-base.

Vegetation Classification and Non-Native Invasive Plant Assessment
Old Colchester Preserve and Park, Natural Resources Management Plan
Deer Management Studies and Services
Fairfax County Park Authority, Fairfax County, VA

Throughout 2011 and 2012 ESA performed a detailed natural resources inventory, forest stand delineation and rare plant survey of Old Colchester Preserve and Park. The tract of forested land for the park was recently acquired by the Fairfax County Park Authority, and includes 140-acres of waterfront property on the fresh-tidal Occoquan Creek at the mouth of Belmont Bay. The specific deliverables for the project included habitat, vegetation community, non-native invasives assessment and carrying capacity mapping, and overall assessment of natural resource threats, concerns and hazards of the newly acquired land. Through the process of ground-truthing, ESA documented 11 vegetation community types including:

- Tidal freshwater aquatic bed
- Tidal freshwater marsh
- Herbaceous nontidal wetland
- Coastal plain floodplain swamp
- Coastal plain depression swamp
- Coastal plain acidic seepage swamp
- Forested nontidal wetland
- Coastal plain floodplain forest
- Northern coastal plain mesic mixed hardwood forest
- Acidic oak-hickory forest
- Early seral pine-hardwood forest

With the assistance from the VA DCR Natural Heritage Program, ESA documented the depression swamp as being a state rare natural community and also documented state rare vegetation species. Our report documented a series of management recommendations and topics necessary to be addressed within a natural resource management plan.

Concurrent with the vegetation classification, also during 2011 and 2012, ESA assisted Lardner/Klein Architects (LKA), with the field research and development of the Old Colchester Preserve and Park, natural resources management plan. ESA participation included field work to provide chapters on human activity, carrying capacity analysis, sensitive natural (water and vegetation) resources, deer management, non-native invasive species, site natural history themes and interpretation, conceptual trail alignment and mapping. The overabundance of deer and the inordinate pressure of deer browse on natural community structure have been identified as a significant threat to Fairfax County parks.

In 2013, ESA was awarded a FCPA contract along with Patriot Land and Wildlife Management to provide 5-years (2013 through 2017) of on-call deer management related services. To date, ESA has installed deer exclosure fencing at three park locations and prepared the year-1 baseline reports. The methodology employed for reading vertical and horizontal vegetation within the exclosures and in adjacent control plots, is known as the NPS Browse Impact Protocol.

Laurel Hill Park, Natural Resources Management Plan Fairfax County Park Authority, Fairfax County, VA

ESA participated in two contracts from 2003 through to 2012 to assist in the development of the 1,000-acre Laurel Hill Park (Lorton landfill and environs) master plan for the natural resources management office of the Fairfax County Park Authority (FCPA). The first contract was through EDAW, and ESA's responsibilities included performing natural resources inventory, forest stand delineation, tidal and nontidal wetland delineation, determination of resource protection area (RPA) and resource management area (RMA) boundaries and Federal/State endangered plant survey for small-whorled pogonia, known to occur in the immediate vicinity of Laurel Hill. The highlight of the contract was to expand on the forest stand delineation to formally classify all forest types to their Virginia DCR, *Natural Communities of Virginia: Ecological Groups and Community Types*. A second highlight was to prepare a barn owl habitat management plan, as barn owl nesting was documented through our field work.

The second portion of the contract was through Lardner/Klein Architects (LKA), whereby ESA provided field studies and reports in support of the FCPA Laurel Hill, Natural Resource Management Plan. Laurel Hill Park is regionally known for their meadows, thickets and old-field conditions. Working with LKA, ESA prepared the FCPA *Treeless Area Technical Manual* and design/built a 10-acre demonstration meadow at the Laurel Hill Golf Club. The demonstration included a field trip for County natural resource personnel and Society of Range Managers to observe and calibrate drill seeders and hydro-seeding for meadow establishment.

U.S. Secret Service, James J. Rowley Training Facility Campus Master Plan Environmental Studies, Beltsville, Prince George's County

Working through an EDAW sub-contract, ESA supplied all manner of environmental support for the Secret Service facility master plan. From 2009 through 2011, ESA performed natural resource amenity versus constraints mapping, natural resource inventory, forest stand delineation, specimen tree survey,

wetland delineation, jurisdictional determination, wetland permitting, rare, threatened and endangered plant species survey for the 481-acre complex. ESA provided guidance and plans for a master plan trail network, lake and fisheries, deer and invasives plant management.

**National Security Agency, Cyber-Security Center
Site Plan Environmental Studies, Anne Arundel County, MD**

Working as a sub-contractor to Wiley/Wilson (USACE Contract W912-DR-10-0018, Delivery Order #027), ESA performed environmental studies from 2009 through to 2013, for the Fort Meade Golf Course transfer to NSA, which allows for the construction of their Cyber-Security Center. Work on the former 242-acre golf course included a natural resource inventory, forest stand delineation, specimen tree survey, forest conservation plan and wetland delineation.

**National Geospatial Intelligence Agency
Master Plan Environmental Studies, Montgomery County, MD**

Working through Wiley/Wilson, from 2011 through 2013, ESA was responsible in performing a natural resource inventory, forest stand delineation, specimen tree survey, forest conservation plan, wetland delineation and wetland permitting for the Intelligence Campus, and which included all of the incumbent County, State and Federal approvals, authorizations and permits.

**Prince Frederick Wastewater Treatment Plant
Forest Management Plan, Calvert County, MD**

Working with Prince Frederick government and Ching Tien, PhD of the Maryland Department of the Environment during 2009 and 2010, ESA prepared a long-term research management plan to study the uptake efficiencies of nitrogen within forested, effluent (gray water) irrigation spray fields. The focus of the plan was to document planting, management and harvesting of trees to enhance nitrogen removal. Seven forest stand types were documented on the 200-acre forested site, distinctive primarily by seral age of each stand, stocking size, stand composition, and stand occurrence as it relates to topography. Data collected for each stand included:

- Aerial extent in acres
- Estimated trees per acre
- Average diameter
- Basal area per acre
- Stand formation type
- Dominant indicator species
- Dominant species per acre
- Dominant species mean diameter
- Dominant percent frequency of occurrence
- Approximate age of the stand
- Proposed cutting cycle

Working with MDE and analytics developed to date, we were able to determine that the wastewater treatment plant has a 60-day capacity for treatment, with an uptake capability of 195-pounds of nitrogen per acre, per year, at a rate of 2-inches of spray per week.

Our final recommendations to be implemented included that on-site forests will be clear-cut and stabilized with native grasses and brought back on-line, in 5-acre blocks, through a 30-year rotation. We have documented that younger trees acquire, assimilate and transform 70% more nitrogen than older, slower growing trees. Each forest block of a 5-year age difference (5, 10, 15, 20, 25 and 30-year old stands), will allow MDE to monitor the long term nitrogen uptake and determine the best ways to perform rotation harvests and at what age forest blocks perform the best. It is hoped that this forest management study will provide state of the science, best management practice (BMP) strategies for municipal effluent treatment.

During the performance of the ESA forestry studies, a rare, threatened and endangered (RTE) species survey was performed, so that the County would not be held liable for an intentional/incidental taking of RTE species.

VI. List of References

Charles Smith, FCPA Natural Resources Manager, 703-324-8555, Charles.Smith@fairfaxcounty.gov
Fairfax County Park Authority, 12055 Government Center Parkway, Suite 936, Fairfax, VA 22035

(Vegetation Classification and Non-Native Invasive Plant Assessment, Old Colchester Preserve and Park, Natural Resources Management Plan, Deer Management Studies and Services, Fairfax County Park Authority, Fairfax County, VA., Laurel Hill Park, Natural Resources Management Plan, Fairfax County Park Authority, Fairfax County, VA)

John Houchins, Fort Meade Natural Resources Manager, 301-677-9372, john.w.houchins2.civ@mail.mil
U.S. Army Garrison Fort Meade, 2212 Chisholm Avenue, Suite 5115, Fort Meade, MD 20755

(Fort George G. Meade Study for Fauna and Wildlife Populations, Wildlife Management Services, Anne Arundel County, MD)

Seth Berry, NSF Indian Head, Natural Resources Manager, 301-774-2273, seth.m.berry@navy.mil
Naval Support Facility Indian Head, 3972 Ward Road, Suite 101, Indian Head, MD 20640

(Naval Engineering Command – NAVFAC, Natural Resources Management, Contract #N40080-12-D-0350, Delivery Orders #001 through #024, Various Locations)

Terri Hruby, Assistant Director of Planning, 301-345-5417, thruby@greenbeltmd.gov
City of Greenbelt, Planning & Community Development, 15 Crescent Road, Greenbelt, MD 20770

(Watershed Study, Buddy Attick Lake Park Resident Goose Management Plan, Greenhill Stream Restoration, Jara Mitigation Site Search)

VII. Proposed Schedule

- Once awarded the contract, ESA will generate the necessary base mapping of the project site.
- ESA will request a formal *Environmental Review* from the MD DNR Natural Heritage Program for any RTE plant or animal species known to occur on-site or nearby of similar habitat.
- Kick-off meeting - project orientation between ESA staff and City of Greenbelt staff and/or stakeholders, and including other meetings with City Council and Advisory Board.

- Four full days of forestry field work (40 data stations at 10 stations per day).
- Two full days to set-up, calibrate/test, bait and take down wildlife cameras (10 cameras running for one-week each, at a total of twenty locations within the North and South Preserve).
- Two full days of fisheries seining and inventory of aquatic animal species.
- Data interpretation, writing draft final and final report with appendices to include tables, photographs and maps.

The required field work and deliverables will require an approximate three month period of work, with two months to perform the field work, and a one-month period to generate the written deliverables. The field work will be performed upon notification to proceed, during the 2015 growing season, through the months of June, July and August, then with the report and mapping submitted shortly thereafter during August or September.

The timing of this project will not allow for the determination of highly ephemeral early spring wildflowers that may have completed their above-ground life cycle prior to commencement of field work. The timing of this project may not necessarily allow for the investigation of rare, threatened and/or endangered species that may be identified through the MD DNR Natural Heritage environmental review process. Species identified through the formal review process will require a phenology evaluation to determine the best times of year to look for these species based on diagnostics, such as flower, fruit, inflorescence and/or seed-set.

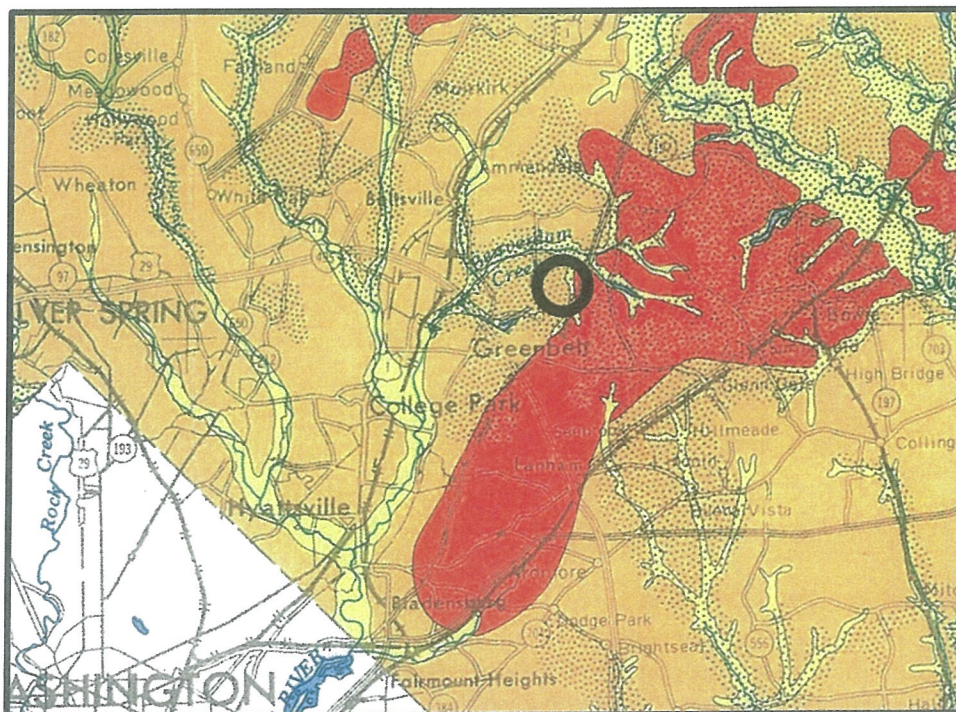
VIII. Proposed Fees for Services

Map Preparation	\$520
MD DNR Environmental Review Request	\$280
Kick-off Meeting - Project Orientation	\$1,000
Forestry Data Collection	\$8,100
Wildlife Survey	\$3,120
Fisheries Survey	\$2,560
Draft Report/Maps	\$8,720
Final Report/Map	\$3,000
Meetings (City Council, Advisory Board, Project Staff)	\$4,000
Reimbursables (mileage, Xerox, bait, supplies)	\$500
Total	\$31,800

As you perform your evaluation of our technical and cost proposal, please call or e-mail if you should have any questions. Please contact Mark Burchick at 410-267-0495 x-203 (office), 301-775-4388 (cell) or mburchick@esatoday.com. Thank you for your consideration.



Above: The approximate 220-acre forest assessment study area is more or less bounded by the Beltsville Agricultural Research Center (BARC) to the north, Baltimore Washington Parkway to the east and south, and Ridge Road and Greenbelt Homes Incorporated (GHI) housing along the west. All of the property eventually drains toward the north and east, developing unnamed tributaries that flow to Beaver Dam Creek, a tributary of Indian Creek (Anacostia watershed). **Below:** The majority of the study area occurs in the mapped/classified Tulip Poplar Forest Association. Areas of second order and larger stream valleys and floodplains comprise the coastal plain River Birch-Sycamore Forest Association and the northeast most portion of the study area along the B&W Parkway envelopes the depauperate soil Chestnut Oak-Post-Oak-Blackjack Oak Forest Association (Brush, Lenk & Smith). These generalized forest types are refined through ground-truthing, using the MD DNR, Natural Heritage Program, Classification of Vegetation Communities of Maryland.





The following two photos are examples of the Reconyx motion detector, infrared, wildlife trail cameras used by ESA. These cameras will photograph anything that walks through an invisible beam, taking a burst of five-photographs over thirty-seconds, and then one per five minutes thereafter if the animal remains standing in the radius of the beam. Each wildlife station has a card with a station number, as each station is GPS field located onto mapping. Each station is baited with food and remains operation for a one-week period. Stations are typically located near water, as all animals must drink, and/or along wildlife trails, ecotone edges, den sites and openings/clearings in the forest. In the photo above, a whitetail deer drinks from a vernal pool along the Little Patuxent River. In the photo below, a predator fox captures a young prey groundhog. This particular study site has both red and gray fox. As adults, all red fox will have a white-tipped tail for the last inch or more. A gray fox will have a solid colored tail. Both species may have color coat phases that may make them seasonally difficult to distinguish, but the red will always have a white-tipped tail.



Forest Preserve Advisory Board

Opinions of members on bids to conduct an assessment of Forest Preserve health. Two bids reviewed are from AMT (A. Morton Thomas and Associates) and ESA (Environmental Systems Analysis) were evaluated by members of the Forest Preserve Advisory Board and forwarded by e-mail to Greenbelt Planning Director Celia Craze in July and August 2015. Four members are urging the City Council to accept one of the two bids, with the AMT bid being a clear favorite. Three members oppose accepting either bid, and wish to send out a second solicitation for proposals.

In favor: Susan Gregersen, Damien Ossi, Donna Hoffmeister, Willis Witter.

Opposed: Bob Snyder, Donna Almquist, Yoni Seigel.

Opinions not yet submitted: Valerie Elliott, Joe Murray

FPAB Vice Chair Susan Gregersen wrote on August 11:

Comments on Forest Preserve Health Assessment Proposals

From: Susan Gregersen, Vice Chair, Forest Preserve Advisory Board (FPAB).

As a member of the task force appointed by the City Council in 2003 to develop the Forest Preserve Management and Maintenance Guidelines (M & M Guidelines), and as an original member of the Forest Preserve Advisory Board (FPAB), I am glad that the Greenbelt City Council has approved moving forward with a professional assessment of the Forest Preserve. Many FPAB members, past and present, have looked forward to this opportunity for years. Following are my comments on proposals I reviewed, that were submitted in response to the *Request for Proposals, Forest Health Assessment, Greenbelt Forest Preserve, Contract No. 2015-01* (RFP).

Background

Section Twelve (Forest Health) of the Forest Preserve M & M Guidelines states:

p. 56, paragraph 3: "These guidelines have already touched on some issues that are relevant in determining the health of the forest community, such as invasive species, runoff and erosion, and catastrophic events. Many other indicators of the health of a forested area require the expertise of a forester* (emphasis added) to identify, evaluate, and recommend treatment."

Also, p. 58, paragraph 3: "There is no single measurement which can summarize the health of a forest. . . However, in order to make informed decisions regarding the physical health of the Forest Preserves (sic), it is important to have a baseline assessment of current conditions."

Finally, p. 58, last paragraph: "The long term vitality of the Forest Preserves (sic) can only be projected if the current health of these wooded areas is understood. Obtaining such an evaluation from an appropriately trained forest biologist/ecologist or horticulturist (emphasis added) would give the City an invaluable tool to further define and refine maintenance activities necessary to protect the Forest Preserves for current and future generations of Greenbelters."

Clearly, the intent of this section of the guidelines was to recommend, when the City of Greenbelt could find monies in the budget, engaging the services of professionals qualified to perform an assessment of the Forest Preserve. The companies that responded to the RFP are qualified to perform such as assessment, and have several types of environmental professionals on their staffs, including individuals with educational backgrounds in ecology, horticulture, forestry, and other environmental disciplines. Otherwise, the companies would not have responded to the RFP.

Comments on Proposals: I reviewed all five proposals submitted in response to the RFP. It was immediately obvious that three of the proposals were financially beyond the City's means. So, I focused on the proposals submitted by Environmental Systems Analysis, Inc. (ESA), and A. Morton Thomas and Associates, Inc. (AMT). I realize that

other FPAB members also closely reviewed these two proposals, and have made some comments on them. Of these two proposals, I prefer AMT's.

AMT has worked on several projects in the Greenbelt area, including at Greenbelt (federal) Park. I feel that this is an advantage for the company to have knowledge of environmental conditions (many not so good) in our immediate area. On page 1 of its proposal, AMT states that their project approach is based on "partnering with the City of Greenbelt . . . and the community . . . (and) will encourage active participation of the entire project team and welcome dialogue with and input from other interested parties." This approach, as we all are aware, will be extremely important in Greenbelt.

Also on page 1, AMT states its expertise in forest ecology, measurement and interpretation of forest types (and) . . . identification of wildlife and critical habitat." AMT performed an "overview" of the Forest Preserve, the Greenbelt City Code Chapter 12, the M & M Guidelines, and the DNR report in preparation for their submittal. The various sections of AMT's proposal respond well to the requirements set out in the RFP. These efforts indicate to me that AMT is serious about doing a thorough and good job on the assessment, should they be awarded the contract.

I liked the section (starting on page 5) entitled "Abiotic Factors Impacting Forest Health," wherein a bullet list of abiotic elements AMT will inventory is discussed, including deposited waste, fire rating, hazardous and environmental problem sites, degradation of water quality, etc. We concerned Greenbelters really have no clear idea of how these factors are impacting our Forest Preserve—it will be interesting to know more about these issues, and what could be done to mitigate these problems.

In the section entitled "Impact of Adjacent Land Use and Development on Forest Health" (pages 6 and 7), AMT states it will "include a narrative discussion of the impacts that human land use and developments have on adjacent forest resources." . . . (and that) "AMT's detailed mapping will show specific locations where these impacts are most likely to occur." As development in and around Greenbelt continues to infringe on wooded areas, this information will be a good baseline by which to measure future environmental threats to the Forest Preserve.

Also on page 7, in the section entitled "Findings and Conclusions of Survey," AMT states: "Starting with the initial kickoff meeting and throughout the process of data assemble, field inventory, review, and analysis the AMT team will share it progress, observations and preliminary findings or recommendations with our partners at the City, including the Project Manager, staff, Forest Preserve Advisory Board Members, and the community. We will promote participation and dialogue throughout the study." This sounds like a great approach to me, and I will look forward to our participation in this assessment, whichever company is awarded the contract.

In the "Recommendations" section of their proposal (pages 8 and 9), AMT discusses the complexity of urban forest realities. In the first paragraph of that section, "Preservation of Current Conditions vs. Active Management of Forest Resources," AMT notes that "these approaches exist on a continuum " . . . and that many issues may have to be weighed, and "choices to be made when considering the best form of forest stewardship." When a final report is issued, the City and concerned community members (including FPAB) will need to work together to make choices, based on recommendations from the assessment, about how to best care for and manage the Forest Preserve. At least then, we will have more information to work with than we do now. AMT also acknowledges the fact that the City Code and M & M Guidelines proscribe aggressive interference with the Forest Preserve.

In the final section of the AMT proposal, "Recommended Revisions to Forest Preserve Article," I am encouraged that AMT has "extensive experience with forest conservation laws and regulations throughout Maryland." However, I believe that Greenbelt should be extremely careful about making changes to the City Code Forest Preserve Article, and the M & M Guidelines. I would not want to see the use of pesticides and herbicides in the Forest Preserve. Nor would I want to see extensive trail maintenance, or major alterations made to the Preserve areas.

After all, the Greenbelt Forest Preserve is not another park in our city's ample selection of recreation areas. We should try to work hard to assure that the Preserve remains a preserved wooded area for its own sake, as well as for the Greenbelt community. This forest health assessment will be a first step in Greenbelt's continuing stewardship of the Forest Preserve.

*I consulted some internet resources when reviewing the proposals and reading through all the e-mail communications from FPAB members. I found the following definition of forester:

A forester is a person who practices forestry; the science, art and profession of managing forests. Foresters engage in a broad range of activities including . . . ecological restoration and management of protected areas. Foresters manage forests and provide a variety of objectives including . . . conservation, outdoor recreation, and aesthetics. Emerging management practices include managing forestlands for biodiversity, carbon sequestration, and air quality.

Some notable foresters through the years:

Geoffrey Chaucer (1343-1400) – Author of *The Canterbury Tales*

John Muir (1838-1914) – “Father of the National Parks”

Gifford Pinchot (1865-1946) - First Chief of the U.S. Forest Service; coined the term *conservation ethic* as applied to natural resources

FPAB member Damien Ossi wrote on July 31: see also email dated 7/24,

"Overall, I prefer the AMT proposal. AMT displayed a greater understanding of the preserve and a closer reading of the RFP by including reflections on the impacts of disparate forest uses and varying management goals. The AMT proposal shows a greater understanding of the overall reason for the existence of the preserve, the value of the preserve that is independent of human use or human benefit, the value that it has to humans, and the investment of the community in the preserve. AMT's proposal displays sensitivity to the community and the conflicts that may arise with any proposed management actions."

-- Damien Ossi. Forest Preserve Advisory Board, July 31, 2015.

Mr. Ossi wrote again on Aug. 1

Both AMT and ESA have staff who are qualified to do the surveys required in the RFP. None of them are foresters.

I know that the RFP went to the MD DNR Community Ecologist, Jason Harrison, in DNR's Natural Heritage Service, and to Matthew Sarver of Sarver Ecological on my recommendation. Are they the only two ecologists? Didn't it go to a few others that were recommended by FPAB members?

Matt Sarver emailed me in June to say that he was too busy to write a proposal, but that he wished he could. I did not personally hear back from Jason.

The RFP was created with the advice, input and approval of the FPAB. I think the broad range of prices offered by the five proposals is indicative of how broad and expansive it is.

FPAB member Donna Hoffmeister wrote on Aug. 2 see full email from 8/2

AMT:

- References the RFP well
- Appears to have the needed experience, knowledge and resources (project lead is a certified arborist with local and international experience; one support staff is a certified arborist while the rest are ecologists).
- Appears to have a realistic understanding of the challenges of a forest health wildlife and ecosystem assessment in Greenbelt; it hopes "to ensure a greater forest wildlife diversity in the future," (p. 5) while acknowledging that "preservation exists on a continuum" (p. 8) "with few clear choices" (p. 9). It proposes interfacing with the city before its final report to learn what position on that continuum the city finds appropriate (p. 8).
- Correlates its proposal with the code, guidelines and DNR Report; e.g., it acknowledges the limitations of the DNR Report and proposes a broader inventory (p. 2); it detects contradictions in the City Code and will attempt to find out from DNR what endangered species it detected.

- Emphasizes community involvement, education and training; indeed it specifies 2 meetings with FPAB (p. 7).
- The proposal itself demonstrates good communication skills, which portends good communication with us later on.
- The schedule of 5 months appears to correlate with city expectations.
- It mentions ADA [Americans with Disabilities Act] regulations (p. 10) which the city needs to discuss.

ESA Pro

- Took the time to visit the North Woods.
- Although it is a smaller company than AMT, it also appears to have the needed experience, resources and qualified staff and willingness to use information already available.
- It takes into consideration that the city may have limited funds for dealing with invasive species (p. 6).
- Its 10 baited camera stations is intriguing and not part of the AMT proposal.

ESA Contra

- Does not reference the code, guidelines or DNR Report; by mentioning the “comprehensive trails plan” (p. 5) it suggests a shallow understanding of Greenbelt for someone who grew up here.
- Its macroinvertebrate sampling may infringe on local sensitivities, although its study of forest streams might be fruitful.
- It mentions spring and summer monitoring (p. 3) while also precluding work in spring (p. 16); otherwise its 3 months of projected work correlates with city expectations.
- It underestimates Greenbelt’s concerns about adjacent land use, when it states that BARC, BWI Parkway and GHI Housing will “remain in-situ” (p. 5).
- It mentions meeting with City Council and Advisory Board but does not stress community interaction as much as AMT does.

FPAB member Willis Witter wrote on July 18 See also email dated 8/1

Either [AMT or ESA] could be made workable.

However, I feel the AMT proposal is a better fit with a mindset of community involvement, which will be needed to maintain the preserve for future generations. The turnout of perhaps two dozen people at the recent trash-collection event demonstrates that citizens of Greenbelt are more than willing to devote time and effort to caring for the preserve.

Note the statement on the AMT proposal, page 7: “We will promote participation and dialogue throughout the study. This may include city participants who may wish to accompany us during some of our field investigations.” Although not immediately obvious, this could well be the most significant statement in the entire AMT proposal.

I find nothing comparable with ESA.

Also, AMT made a commendable effort to study details in the City Code, the Forest Preserve Management and Maintenance Guidelines and data collected in the earlier study by the Maryland Department of Natural Resources.

For example, on page 8, AMT addresses the issue of “Preservation of Current Conditions vs. Active Management of Forest Resources.”

It continues: “Although, as phrased, this topic appears to be about two very different approaches, the reality is that these approaches exist on a continuum. There may be a spectrum of issues to be weighed and choices to be made when considering the best form of forest stewardship.”

AMT also noted some of the obstacles to forest management. For example, on page 10, it cites a portion of the City Code, Section 12, which bars any action "to alter or modify the natural course of any water" in the preserve. Presumably this means storm water, the same water that continues to carve a ladder of exposed tree roots in a popular Northway entrance to Area A of the preserve.

The major shortcoming of the ESA proposal is that one sees little, if any, effort to address limits imposed by the City Code and Preserve Guidelines.

For example, page 5 of the ESA report says: "Working with the Guidelines document, ESA will propose goals to promote overall stewardship of the Preserve." Exactly two sentences later the ESA proposal says: "It was obvious from our one, very brief visit to the North Preserve that a comprehensive trails plan may be in order, which should include consistency of trail construction, maintenance and abandonment methodologies."

Since the Guidelines prohibit trail maintenance for public recreation, one questions whether ESA studied the City Code and Guidelines before drafting its proposal.

Nor did ESA appear to scrutinize data collected in the DNR report.

Does the city want to spend its money on 40 data stations to analyze species composition, density, size, condition, dominant, co-dominant, associated tree species to calculate relative frequencies, average tree diameter, etc. (ESA page 1)? This looks a lot like data already provided in the DNR report.

Likewise, people are certain to object to ESA's plan to collect benthic macroinvertebrates (small animals such as worms) and preserving the tiny creatures in alcohol, to be identified at a DNR lab in Annapolis?

Keep in mind, the City Code and Guidelines appear to limit management of the preserve to removal of invasives and trash, and possibly steps to mitigate erosion. These modest activities, if implemented, could go a long way toward improving the health of the preserve while strengthening the emotional bond between Greenbelt's citizens and their Preserve.

In short, the map overlays to be produced by either ESA or AMT would provide invaluable information for all three permitted activities.

However, the AMT proposal appears far more in line with what the city is seeking.

Willis Witter wrote again on Aug. 7

As for ESA, I and others on the FPAB don't trust this company, albeit for differing reasons. In my case, I am upset that ESA made no effort to understand limits imposed by the Guidelines and City Code on management and maintenance activities that could be permitted in the Preserve. On the other hand, AMT went to great lengths to study both documents in meticulous detail before drafting its proposal. It also invited volunteers from Greenbelt to participate in its field work. In their respective proposals, I give AMT a grade of "A" and ESA a grade of "D-minus."

Willis Wrote again on August 10:

As for re-opening the entire RFP process, this strikes me as a less than reasonable request. Members of the FPAB had an opportunity to weigh in. Celia [Craze] incorporated our suggestions. There was a consensus on the FPAB that the RFP was good to go. I realize some members are disappointed with the response. If the Council wishes to re-open the entire RFP process, it is their prerogative. I am reluctant to keep the issue bottled up in the FPAB. Invasive species continue to make inroads and a continuation of the city's de facto policy of zero maintenance and zero management poses an unacceptable risk to the preserve.

FPAB member Donna Almquist wrote on July 31 ✓

City Council, FPAB, Ms. Craze, Mr. McLaughlin,

I am not comfortable providing feedback on the RFP proposals. In my opinion the process is flawed as evidenced by the low number of proposals received (5) relative to the number of solicitations sent (over 120). I would like to have seen the city encourage the public to participate early in the process. The RFP was sent to only two forest biologists/ecologists; the rest were sent to the DNR list of Forest Conservation Act (FCA) Service Providers (these providers have forester related training/experience). In doing so the city has ignored the guidance provided by council and found in the Forest Preserve Management and Maintenance Guidelines document.

According to the draft minutes of the November 24 council meeting, Rodney Roberts moved that council proceed on contracting with a professional forest biologist/ecologist to provide an assessment of the Forest Preserve; Mayor Jordan requested staff seek out a professional forest biologist/ecologist with the necessary skill set and types of qualifications necessary; and a member of the public, Jude Maul, an ecologist himself recommended that the RFP be widely distributed, also cautioning that many groups license ecologists. The Forest Preserve Management and Maintenance Guidelines document includes a provision for a forest biologist/ecologist to provide the assessment.

I believe the RFP was too stringently written thereby eliminating candidates that may have been good choices. The RFP should have been advertised in appropriate trade and scientific journals. A forester does not have the appropriate background to provide the Forest Preserve health assessment.

I advise council to stop the process before an award is made.

Donna Almquist

Donna Almquist wrote again on Aug. 5

... My main point is that the overwhelming majority of individuals or firms that were sent solicitations were from the Maryland DNR list of FCA Service Providers. Ms. Craze did not at first provide this information to the Board. Had I not asked for this information the Board would not have known about the 120 solicitations sent to the FCA Service Providers. The type of professionals in this group include foresters, landscape architects, or others with degrees in natural resource management, landscape planning, etc. This kind of professional is not a good fit.

Third, I compared the first draft with the final version of the RFP and did not see a lot of input from Board members. I noticed under Wildlife inventory the word "description" was added. I also noticed under "deliverables" that Consultation Services language and Education & Training language was added. This is a small amount of input in relation to the content of the RFP, which was predominately written by Ms. Craze. I spent a lot of time putting together two pages of recommendations and not one was included in the RFP. Also, the RFP was not voted on by the Board. A report should have been sent to council regarding the Board's opinion (likes, dislikes, concerns, etc.). We as members of the Board were asked to forward our comments to Ms. Craze. We are not Ms. Craze's working group, we advise the council. The council is supposed to represent the community and the Board should reach out to the community to capture their input. ...

Donna Almquist wrote, also on July 29 ✓

Council, Mr. McLaughlin, Ms. Craze,

I agree with Bob Snyder. I request that council ask Michael McLaughlin to direct Celia Craze to extend the RFP comment period for FPAB members until after the August 20 FPAB meeting. Although all of Bob Snyder's reasons for requesting additional time are important, I think giving the public an opportunity to be informed is the most

important. The public deserves the opportunity to come and listen to FPAB member's comments, ask questions and give input. This is a very important issue for the community. We have an obligation to provide the public with an opportunity to provide input. The August 20 FPAB meeting should be advertised in the News Review with this topic as the only item on the agenda. This way the public will be fully aware that this important topic is under discussion.

Donna Almquist

FPAB member Bob Snyder Wrote on July 3

see also emails dated 7/23,
7/26, 7/26, 7/26, 7/28

Ms. Craze:

I have several concerns per your request for comments you present to us:

- 1.) The tone of your email emphasize cost/price as priority over appropriateness or suitability of an organization to do the FP assessment.
- 2.) Also you seem to be impressed with whether you are familiar with these firms and whether they have done work in Greenbelt previously. This should not be a major factor in determining whether a firm or organization is qualified or suited to do a FP assessment based on the requirements called for in our cities M&M Guidelines. No where in our cities Forest Preserve Management & Maintenance Guidelines do I see any reference to selection of an organization to do a FP assessment being based on city staff's familiarity with an organization or prior contracted work.
- 3.) As FPAB member Donna Almquist stated, we have an interest in knowing who the other 3 organizations are that provided a proposal to the RFP. Cost should not be a factor in dismissing them before we have any knowledge of what their proposal is. How do we know if their approach and manner of conducting a FP assessment isn't more in accord with the FP M&M Guidelines and the unique requirements in evaluating a less disturbed forested preserve?
- 4.) In reading through the AMT firm's experience (and references), resumes, prior projects and approach, they (all male staff) appear to be experienced in (focused on) landscape architecture, civil engineering with respect to the landscaping of highways, nature and recreation projects, stream and erosion control projects and other 'park-like' projects. I don't consider them experienced or suitable in any manner in assessing our cities Forest Preserve.
- 5.) Compared to AMT, the ESA firm proposes more appropriate study, inventory, reporting of our FP's natural resources (flora, fauna, hydrology, topography, etc..) and they reference human impact and our cities M&M guidelines and its requirements and recommendations. Though ESA may be more appropriate than AMT in assessing our FP, we owe it to the citizens of Greenbelt to be informed about the other 3 firms' proposals and their approach & suitability to the FP assessment.

Bob Snyder

Bob Snyder wrote on Aug. 1

> I agree with Donna Almquist. The FP assessment should be postponed to allow for Greenbelt citizens input. And Council should direct city staff to re-submit the Forest Preserve assessment RFP to a suitable list of candidate organizations. The RFP should never have been sent to organizations other than those that have a forest ecologist and environmental perspective.

>

> As I opined in an earlier email the 5 firms that submitted interest are NOT suitable. They are engineering and/or landscape architecture firms with a forest management perspective, judging from their submitted documents and

projects experience, and their firms websites.

Bob Snyder wrote again on Aug. 10

The public needs time to understand the impact on the FP of having only these two unsuitable firms (ESA, AMT) being considered for the assessment. This point has already been made by several of us.

In terms of the FPAB - We have not heard at all from JM, SG, and VE has not provided her opinion on these firms. She has only asked or made a few procedural points.

The public needed to know how the RFP was written and distributed.[there are ways to write RFPs that give the impression that only certain type firms would be considered].

Some of us are suspect that only 5 replied when over 125 firms or org.s were contacted.

Some think there should have been one or two additional months allowed for firms/org.s to consider and send in their proposals/interest in the project.

There should have been more opportunities (at FPAB mtgs. or work sessions, even Council mtgs.) this spring/summer for the public to have input BEFORE the RFP was sent out.

Bob Snyder Aug. 10 email

FPAB member Yoni Siegel wrote on July 30

I don't think any of these companies are appropriate to perform a health assessment of the FP based on their qualifications and past experience. The FP Guidelines call for a forest ecologist/biologist to perform the FP health assessment and feel that the right audience needs to be targeted. We don't need another DNR/forester perspective.

I agree with Donna Almquist that we should devote the next FPAB meeting entirely to this issue and advertise it in the News Review, giving citizens an opportunity to provide input.

Yoni

----- Original Message -----

From: "Damien Ossi"

/illis Witter"
na Almquist"

7-24-15

in"
h"

Subject: Re: Greenbelt Forest Preserve assessment (ESA & AMT)

I have not had the chance to review these proposals yet, but I wanted to respond to a few points that have come up.

First off, I am not a fan of ESA. They were involved in the greenwashing of a project in the District that leveled 45 acres of good wildlife habitat to make way for a Costco. But I do have an issue with statements that Yoni and Bob have made about that company's use of herbicides in the Greenhill restoration project. If that project involved excessive application of herbicides, the deaths of non-target organisms, and the use of non-regulated poisons, then there should have been consequences for ESA as the state and local levels.

Can Bob or Yoni or anyone else give us more information? Was ESA the applicator, or did they use a sub-contractor? Was the apparent violation of the herbicide applicators licence reported to the city and/or Maryland Department of Agriculture? What plants were targeted with this application? What plants and animals were poisoned? What was the poison? Was it an herbicide, insecticide or other pesticide? How many and what species of animals and non-target plants were killed? Where was that documented?

I do invasive plant management as a large part of my job. I use herbicides to manage invasive plants. I am certified to apply herbicides in the the District. I use the principles of integrated pest management, where chemicals are the last option. I follow the rules on the herbicide's label (the label is the law and must be followed). I have read numerous papers about the toxicity of herbicides to animals, papers that involved both laboratory and field experiments. I have attempted several times in the past to present this information to the board, only to be told that the information, my explanations, and the documentation was too technical.

I think it is inappropriate in this review to accuse ESA of violations of state and federal law without documentation or proof. I oppose using the mention of herbicides in any proposals as a criteria for rejection of that proposal.

I strongly oppose an outright ban on the use of herbicides to manage invasive plants in the Preserve without a scientific and independent review of the perceived impacts of their use or non-use. The guidelines do not ban their use now and should not be amended to ban them.

Damien

On Thursday, July 23, 2015 2:45 PM, "
<ROBERTLSNYDER@

et"

FPAB & City Council:

The ESA and AMT (RFP) proposals are NOT suitable for assessing Greenbelt's Forest Preserve (FP) for a number of reasons. I list these below. I will look more closely at the other three firms (KCI, CPJ, Post Mod.) within a few days and send my opinion in a later email.

I put more importance into the first few pages of their proposals (cover letter and proposed scope of services) as these give a clue as to their philosophy, experience and how they would approach the task of assessing the health of our Forest Preserve and whether they are qualified with respect to the provision in our FP M&M Guidelines which call for an evaluation of the FP "...health by a forest biologist/ecologist." (p. 58, sect. Forest Health, M&M Guidelines).

ESA:

The ESA (RFP) states on their page 1 that they will "perform inventory and forest stand delineation using MD's DNR protocols established in their 1997 technical manual." ESA also refers to a forester's perspective several times: "...management recommendations for forest stands."(p.2) They also refer to one of their employees experienced in using "...foliar spray treatment."

The references (prior projects) ESA provides all deal with the design & management of grounds or the adjacent environment of government facilities, such as, the NSA & Ft. Meade; US Secret Service grounds; Naval facilities; a Fairfax, VA county park; and Calvert County water treatment plant. I don't consider these types of projects to be relevant to assessing the health and ecosystem of our Forest Preserve.

In addition, ESA worked with GHI and the City about 13 years ago on a stream (Greenhill, Hillside Rds.) restoration project that involved excessive spraying of chemicals and herbicides which resulted in the poisoning of flora & fauna in the adjacent wooded areas at this location.

AMT:

Likewise, the AMT refers to depending on and coordinating with the DNR report/survey for much of its work:

On page 4 they state: "AMT will coordinate with the DNR...". On page 1 they refer to developing a forest stewardship and management plan based on the 2013 DNR report. Also on page 1 AMT states, "...preparing a forest preserve assessment that includes... managing the Greenbelt Forest Preserve."

AMT seems to think that the RFP is all about Greenbelt desiring to have a forest management plan developed and provided. I see more language in their cover letter and 'scope of services' that refer to 'management' along the lines of the DNR than I see about the ecological/biological health of our FP ecosystem.

On page 18 of their document (Firm experience) they list 7 clients, of which three of these are highway depts. (MD, VA, and Federal H. Admin.). Landscaping and design work along highways is hardly applicable project experience for assessing a forest preserve. Their other projects highlighted: (stream bank restoration/stabilization; engineering and architectural landscape services for an animal shelter, a Montgomery college facility, and a Bowie park and recreation center) are projects of little relevance to assessing the ecological health of our FP.

Lastly, note the slogan on the AMT letterhead: Consulting engineers

We do not need and should not utilize landscape architecture and engineering firms to assess our Forest Preserve. Our FP M&M Guidelines call for a FP evaluation/assessment by a professional

biologist/ecologist.

- Bob Snyder

Celia Craze

From: Willis Witter
Sent: Sunday, July 26, 2015 8:38 PM
To:
Cc:

angel;

Subject:

Celia and others,

It may be worth considering that the only "management and maintenance" in the preserve that is clearly allowed by the Guidelines and City Code involves trash removal and invasive control. Arguably the Guidelines would also permit efforts to manage erosion, but the City Code forbids diversion of water (ie. erosion control).

I wrote earlier that I like the AMT proposal for two reasons: (1) AMT gave careful consideration to limitations in the Guidelines and City Code and (2) AMT expressed a willingness to directly involve volunteers in their work.

I continue to support the AMT proposal for these reasons and hope the city decides to hire AMT to complete its study.

However, reservations expressed by other FPAB members have me questioning whether any measures to manage the preserve are possible in a reasonable period of time. As the city considers an all-encompassing assessment of the Forest Preserve's health, could we also solicit qualified NGOs (such as Cheers, the Anacostia Watershed Society and dozens of others) to simply map invasives in the preserve,

Maintaining an "Undisturbed" forest is the underlying principle behind the Guidelines. I believe invasives represent a disturbance that is both serious and immediate. At present the City Council has banned city staff from authorizing any invasive management efforts. Using the Guidelines as a rubric, I would have to give the city a failing grade -- at present -- for its management of the preserve. This need not be a final grade. If the FPAB could procure a map of invasives, present it to the City Council, the ban would probably be lifted. At the very least, the rest of the preserve should be protected from English Ivy emanating from the compost pile at the end of Northway, before it reaches Blueberry Hill.

Willis

From: "ROBERTLSNYDER08"
To:

7-26-15

Its my understanding there are several residents who live on Hillside Rd. adjacent to where the work was performed by ESA (and/or their sub-contractor) willing to testify and provide evidence of the adverse effects of their (ESA) work at the appropriate time & place (public forum or City Council meeting) when the FP assessment topic comes up.

Bob

Celia Craze

From:

ROBERT SNYDER

Sent:

To:

7-26-15

Cc:

ens;

Subject:

Greenbelt FP assessment: 3 additional firms: CPJ; KCI; Post Modern LA

FPAB & City Council:

The additional three firms that replied to the Greenbelt Forest Preserve assessment (RFP) are also NOT suitable to perform this service. These firms are primarily landscape architecture and engineering firms with very limited (or NO) experience in assessing a relatively undisturbed forested ecosystem such as our city's Forest Preserve.

CPJ (Charles P. Johnson & Associates):

Their letterhead states they are "Engineers, Planners, Surveyors and Landscape Architects".

CPJ's qualifications statement states: "(We) provide a wide range of services including...surveying, planning, design, construction management, engineering..."

Several of their recent projects they reference were: stream restoration, storm water management projects, pond creation, tree plantings, landscape and garden design. These are worthy projects but NOT relevant to a FP health assessment.

CPJ provides an estimated breakdown (in percentages) of work involvement (effort) of their 5 personnel needed for the four work phase categories. They are a Project Mgr., Project Engineer, Landscape Architect, Forester and a Biologist.

In all categories they place more emphasis on the involvement of a Forester than the Biologist:

Project Approach/Desktop analysis: Forester: 32% Biologist: 5%

Field Assessment: Forester: 39% Biologist: 15%

Preliminary Reporting: Forester: 30% Biologist: 8%

Mtgs. & Public Outreach: Forester: 26% Biologist: 6%

We already have obtained a forester's perspective of our FP from the DNR.

KCI:

KCI is KCI Technologies, Inc.(and engineering firm). They appear quite similar to AMT and ESA.

Their website says KCI stands for: Knowledge, Creativity, Innovation.

Their site states: We provide Construction, Engineering, Environmental, Resource Mgmt., Facilities, Transportation, Communication and Infrastructure services. We are a "multi-disciplined engineering firm".

Page 16 of their proposal states: "...our staff are engineers, planners, construction managers, scientists, arborists, surveyors, landscape architects, DNR qualified professionals."

POST MODERN Landscape Architects (PMLA):

PMLA are Landscape Architects specializing in LA, garden design, and exterior site/space planning and design. They list on their web site the many projects and clients that primarily include upscale residential homes, public and state facilities and institutions.

PMLA's three partners (Mr. Post, Mr. Irre, Mr. Ryder) list their science degrees:

Mr. Post, ASLA, lists himself as a certified arborist.

Mr. Irre has a Biology degree and lists that he is also a "wetland and soils scientist with exp. in habitat assessment and plant species identification."

Mr. Ryder lists himself as a "scientist with exp. in ecology, environmental science, forest conservation."

Though PMLA's credentials/qualifications seem more relevant than the other 4 engineering and landscape arch. firms, one wonders if they are suited to assessing our FP health, since their previous work listed is involved with landscape architecture and site/space & garden planning/design.

As with AMT & ESA, it seems these 3 other firms also get the impression from our RFP that Greenbelt is seeking a forest management plan for our city's Forest Preserve, thus the interest from these 5 engineering and landscape arch. firms. The language used in the RFP that was sent out gives these interested firms the impression that this is what Greenbelt is looking for, rather than simply assessing the health and condition of our FP which would include assessing invasives.

- R. Snyder

Celia Craze

From: Judith Davis
Sent: Tuesday, July 28, 2015 3:41 PM
To: Council; Michael McLaughlin; Celia Craze
Subject: Fw: Greenbelt Forest Preserve assessment (ESA & AMT)

As Council has probably seen from many forwarded emails concerning the Forest Preserve assessment proposal, the FPAB is sharply divided on this issue and its members have many opinions on who should be awarded the contract or of doing an assessment at all. I talked with Valerie Elliott Sunday about this and asked if the FPAB is going to come to some agreement. She felt it wouldn't; that what will be done is to forward all the comments to Council for Council to decide without a report from FPAB as to a suggested choice. At least, that's the plan for now. The FPAB is not meeting in August.

J

From: Terri Hruby
Sent: Monday, July 27, 2015 11:38 AM
To: Celia Craze
Cc: don
joer
Heri...
Subject: FW: Greenbelt Forest Preserve assessment (ESA & AMT)

Celia,
As the project manager on the Greenhill Stream Restoration project, I want to clarify that there was no herbicide use associated with this project. Also another point to note, ESA was not the contractor who performed the work on this project, but rather it designed/engineered the project and assisted the City in construction management.

Terri

Begin forwarded message:

From: Damien Ossi <
Date: July 24, 2015 at 8:03:09 AM EDT

!>

is

From: ROBERTLSNYDER@

Sent: Tuesday, July 28, 2015 5:09 PM

To: Emm

ney

Roberts;

Cc: Valer

Susan Gr

Subject: Extend comments deadline until Aug. 20th FPAB meeting

City Council, City Manager, and FPAB:

The July 7th email from Ms. Craze to the FPAB states that she would like comments on the proposals from 5 firms that have responded to the city's RFP for assessing the health of the Forest Preserve (FP) by the end of July.

Some members of FPAB have replied with comments. Some FPAB members have not replied. I believe FPAB members should have more time for this task.

I am proposing that FPAB have until the next FPAB meeting, August 20th as a deadline to forward comments and opinions on this RFP process. This extra time will allow for all FPAB members to review and then send in their comments. FPAB needs to hear from all members on this topic. Its possible that some FPAB members have been committed to family and out of town summer activities and this additional extension of time is needed.

Since FPAB does not meet in July it would be important to the process for us to contrast and compare our opinions on the 5 firms during the 'in person' meeting (Aug. 20th) thus avoiding discussing through emails. If you recall at one of our FPAB meetings last winter, it was the consensus to not rely on discussion and FPAB business via email. The public deserves to hear what FPAB has to say about this most important issue, and have the additional time to ask questions about the assessment.

At the Nov. 24th City Council meeting the Mayor and Council members expressed the importance of the selection process for the FP assessment to be open, transparent and allow for adequate time for the community to have input into the process. Council agreed that the FP assessment be done by a "professional forest biologist/ecologist" (Nov. 24th Council minutes).

In the best interest of the Greenbelt community, the Forest Preserve and all FPAB members, I ask that the comment period for the 5 RFP proposals be extended to the August 29th FPAB meeting. The topic of the meeting should be listed in the Greenbelt News Review so members of the community will be fully informed in case they would like to attend and offer input. This was the process for the AK issue as well as the 'community gardens' issue over the previous several years. We should expect a similar process of openness, transparency, and public input.

Thank you.
Bob Snyder

Celia Craze

From: Michael McLaughlin
Sent: Wednesday, July 29, 2015 4:11 PM
To: Damien Ossi; Emmett Jordan
Cc: Valerie Elliott; Celia Craze; Cindy Murray
Subject: RE: Extend comments deadline until Aug. 20th FPAB meeting

Mr. Ossi,

Typically an RFP is drafted, publicized and responses reviewed by staff. A briefing and review will be conducted with the appropriate advisory board depending on the project. Then a staff recommendation along with a report from the advisory board, if the board wishes to do so, will be forwarded to/placed on the agenda of the Council for decision. City Council is aware that the RFP was prepared and that it was reviewed by the Forest Preserve Advisory Board. They are also aware that it was advertised and responses received. Council members are interested in this work proceeding.

Ms. Craze has asked for comments from Board members to inform her recommendation on the matter to the City Council. There can also be discussion of the responses at the August Board meeting since Council will not be considering the RFP responses until one of its September meetings.

Mike

Michael McLaughlin
City Manager
City of Greenbelt
301-474-8000

From: Damien Ossi [
Sent: Wednesday, July 29, 2015 2:00 PM
To: Emmett Jordan; Michael McLaughlin
Cc: Valerie Elliott; Celia Craze
Subject: Re: Extend comments deadline until Aug. 20th FPAB meeting

Mayor Jordan and Mr. McLaughlin,

In response to Bob and Donna's emails of yesterday and today, I have a few questions, and comments:

Do other advisory boards demand similar oversight powers on staff and projects? Does the city's standard procedure for selection of contractors typically include this amount of board input and the amount of public input that is being demanded by Bob and Donna A.?

I have not had the time to properly review the proposals yet, but I am aware of projects that both companies have worked on. Either would be adequate if not perfect for the job, but I think that Willis has raised some excellent points that contrast the two proposals.

Celia Craze

From: Valerie Elliott
Sent: Wednesday, July 29, 2015 11:22 PM
To: Donna Almquist
Cc: ROBERTLSNYD; Emmett Jordan; Edward Putens; Konrad Herling; Judith Davis; Le...; Silke Pope; Rodney Roberts; Michael McLaughlin; Celia Craze; Yoni Siegel; Donna Hoffmeister; Damien Ossi; Willis Witter; Susan Gregersen; Joseph Murray
Subject: Re: Extend comments deadline until Aug. 20th FPAB meeting

Fellow FPAB members,

As of today, most FPAB members have submitted comments regarding the RFP bids. I would like to thank all members who have spent so much time considering this issue, researching it and submitting your opinions, concerns and recommendations. I suggest that FPAB continue to offer input as individual members and not wait until our August 20 meeting. If FPAB sees a need to discuss the RFP bids at the August meeting, we can add it to the agenda.

It is my understanding that city will continue to accept input for the Forest Preserve Assessment RFP bids from both FPAB and citizens until a decision is made by City Council.

A good time for citizen input would be at the City Council meeting when council members officially receive the RFP bids package to consider.

The best time for FPAB to give input is now and until the end of July. During August, the Dept. of Planning and Community Development will be organizing, researching and analyzing the RFP bids in order to prepare the package for City Council to review and make a decision. The City Council is expecting to receive this package at the September meeting, so the sooner FPAB members submit their comments, the more the Planning and Community Development office can act on them and take them into consideration.

Thanks,
Valerie

On Wed, Jul 29, 2015 at 12:58 PM, Donna Almquist <

e:

Council, Mr. McLaughlin, Ms. Craze,

I agree with Bob Snyder. I request that council ask Michael McLaughlin to direct Celia Craze to extend the RFP comment period for FPAB members until after the August 20 FPAB meeting. Although all of Bob Snyder's reasons for requesting additional time are important, I think giving the public an opportunity to be informed is the most important. The public deserves the opportunity to come and listen to FPAB member's comments, ask questions and give input. This is a very important issue for the community. We have an obligation to provide the public with an opportunity to provide input. The August 20 FPAB meeting should be advertised in the News Review with this topic as the only item on the agenda. This way the public will be fully aware that this important topic is under discussion.

Donna Almquist

Assessment of two proposals for a forest health assessment of the Greenbelt Forest Preserve

Both AMT and ESA present thorough, detailed plans that address all aspects of the RFP.

Both companies include a list of employees that have experience with all aspects of the RFP. Both submitted a variety of recent projects that include work similar to that required in the RFP. Both propose the use of the MD DNR Natural Resources Inventory/Forest Stand Delineation protocols, but offer two different methods.

I note differences in each section of the two proposals that match sections of the RFP:

AMT

- Project understanding
 - includes acknowledgement of multiple potential management goals
 - includes overview of code, guidelines, DNR report and other resources used in the proposal
- Forest Composition and Health
 - very detailed plan to sample plant community structure and health
 - plot-based sampling by stand type;
 - 0.1 acre plots; number of plots not specified
 - sampling plan includes sampling canopy, sub canopy, shrub and herbaceous layers, and inventory of invasive plant species.
 - Proposal includes a full list of data that will be collected in its plant community plots, and proposal included examples of datasheets.
 - Plan to assess non-native invasive species and pest or disease infestations in the preserve.
 - Identify stream, wetland, and vernal pool features, and note condition
- Wildlife
 - Literature and data reviews (DNR, Breeding Bird Atlas, etc)
 - Qualitative inventory
 - during forest composition plot surveys
 - separate cruise of forest
- Aquatic wildlife
 - Literature and data reviews (DNR, Breeding Bird Atlas, etc)
 - Qualitative inventory
 - Based on literature review to find expected species or sign of expected species
- Wildlife habitat types
 - Proposal includes a section on wildlife habitat types based on plant community composition and five other criteria
- Abiotic forest health factors

- Proposal notes methods to assess seven abiotic forest health factors.
- Adjacent land use impacts
 - Proposal indicates a number of adjacent land use impacts that will be called out on maps in the final report.
- Findings and conclusions
 - Share progress with city and community
 - Promote participation and dialogue
 - Report
 - Narrative
 - Eight mapped factors
 - Preliminary recommendations
- Proposed goals for future health of preserve
 - Discuss goals and objectives of forest management plan
 - Discuss forest values important to city
 - Competition between user desires/attitudes
 - Identify challenges and opportunities
 - Develop plan with actions and priorities for review
 - Final list of goals and actions after review by city/community
- Code/Policy Recommendations
 - Presents a review of potential conflicts between code and guidelines as they exist today.
 - Forest edge management
 - Invasive species management
 - Conflicts in code about ability to manage stormwater runoff/erosion control

ESA

- Forest Composition and Health
 - plan to sample plant communities
 - random plotless technique, 40 random locations; Variable point sampling
 - Variable point sampling is a method to determine basal area or tree size/density to estimate board-feet of timber per acre. I'm not sure what value this would have for managing the forest preserve.
- Wildlife
 - Qualitative assessment to be performed during forest assessment
 - presents detailed plan to sample wildlife with baited camera traps
- Aquatic wildlife
 - presents a very intensive plan to sample aquatic invertebrates.
 - MBSS protocols
 - Macroinvertebrate and fish sampling
 - Physical habitat
 - Water chemistry

- Wildlife habitat types
 - Proposal does not call out classification of wildlife habitat types other than as presented in the above inventories
- Abiotic forest health factors
 - Proposal notes how abiotic forest health factors will be addressed during other inventories
- Adjacent land use impacts
 - Proposal notes desire to discuss with city concerns
- Findings and conclusions
 - Draft and final reports based on professional judgment
- Proposed goals for future health of preserve
 - –
- Code/Policy Recommendations
 - Trails plan to protect forest interior and sensitive wetlands
 - Possible deer herbivory study
 - Invasive plant management

Overall, I prefer the AMT proposal.

AMT displayed a greater understanding of the preserve and a closer reading of the RFP by including reflections on the impacts of disparate forest uses and varying management goals. The AMT proposal shows a greater understanding of the overall reason for the existence of the preserve, the value of the preserve that is independent of human use or human benefit, the value that it has to humans, and the investment of the community in the preserve. AMT's proposal displays sensitivity to the community and the conflicts that may arise with any proposed management actions.

Damien Ossi
 Forest Preserve Advisory Board
 July 31, 2015

Celia Craze

From: Damien Ossi <[REDACTED]>
Sent: Saturday, August 01, 2015 11:58 AM
To:

>m>

Willis Witter; Susan Gregersen;
ray; Donna Hoffmeister; Rodney Roberts;
Leta Mach; Konrad Herling; Judith Davis;

Subject: Re: Forest Health Assessment

I disagree.

Both AMT and ESA have staff who are qualified to do the surveys required in the RFP. None of them are foresters.

I know that the RFP went to the MD DNR Community Ecologist, Jason Harrison, in DNR's Natural Heritage Service, and to Matthew Sarver of Sarver Ecological on my recommendation. Are they the only two ecologists? Didn't it go to a few others that were recommended by FPAB members?

Matt Sarver emailed me in June to say that he was too busy to write a proposal, but that he wished he could. I did not personally hear back from Jason.

The RFP was created with the advice, input and approval of the FPAB. I think the broad range of prices offered by the five proposals is indicative of how broad and expansive it is.

Damien

Sent from Yahoo Mail on Android

***** Your email has been scanned by Trend Micro ScanMail *****
From: "Donna Almquist" <[REDACTED]>
Date: Fri, Jul 31, 2015 at 11:50 PM
Subject: Forest Health Assessment

City Council, FPAB, Ms. Craze, Mr. McLaughlin,

I am not comfortable providing feedback on the RFP proposals. In my opinion the process is flawed as evidenced by the low number of proposals received (5) relative to the number of solicitations sent (over 120). I would like to have seen the city encourage the public to participate early in the process. The RFP was sent to only two forest biologists/ecologists; the rest were sent to the DNR list of Forest Conservation Act (FCA) Service Providers (these providers have forester related training/experience). In doing so the city has ignored the guidance provided by council and found in the Forest Preserve Management and Maintenance Guidelines document.

According to the draft minutes of the November 24 council meeting, Rodney Roberts moved that council proceed on contracting with a professional forest biologist/ecologist to provide an assessment of the Forest Preserve; Mayor Jordan requested staff seek out a professional forest biologist/ecologist with the necessary

Celia Craze

From: Damien Ossi
Sent: Saturday, August 01, 2015 12:03 PM
To: Donna Almquist; Valerie Elliott; Yoni Siegel; Willis Witter; Susan Gregersen; ROBERTLSNYDE; Donna Hoffmeister; Rodney Roberts; Silke Pope; Emmett Jordan; Edward Putens; Leta Mach; Konrad Herling; Judith Davis; Celia Craze; Michael McLaughlin
Subject: Re: Forest Health Assessment

I forgot, I had also sent the RFP to Rod Simmons, who is on the board of the MD Native Plant Society. He wrote the monograph about the forest plant communities of the upper Anacostia watershed in the journal *Marilandica* that I handed out at an FPAB meeting.

He was unable to write a proposal.

Damien

Sent from Yahoo Mail on Android

From: "Donna Almquist" <_____
Date: Fri, Jul 31, 2015 at 11:50 PM
Subject: Forest Health Assessment

City Council, FPAB, Ms. Craze, Mr. McLaughlin,

I am not comfortable providing feedback on the RFP proposals. In my opinion the process is flawed as evidenced by the low number of proposals received (5) relative to the number of solicitations sent (over 120). I would like to have seen the city encourage the public to participate early in the process. The RFP was sent to only two forest biologists/ecologists; the rest were sent to the DNR list of Forest Conservation Act (FCA) Service Providers (these providers have forester related training/experience). In doing so the city has ignored the guidance provided by council and found in the Forest Preserve Management and Maintenance Guidelines document.

According to the draft minutes of the November 24 council meeting, Rodney Roberts moved that council proceed on contracting with a professional forest biologist/ecologist to provide an assessment of the Forest Preserve; Mayor Jordan requested staff seek out a professional forest biologist/ecologist with the necessary skill set and types of qualifications necessary; and a member of the public, Jude Maul, an ecologist himself recommended that the RFP be widely distributed, also cautioning that many groups license ecologists. The Forest Preserve Management and Maintenance Guidelines document includes a provision for a forest biologist/ecologist to provide the assessment.

I believe the RFP was too stringently written thereby eliminating candidates that may have been good choices. The RFP should have been advertised in appropriate trade and scientific journals. A forester does not have the appropriate background to provide the Forest Preserve health assessment.

I advise council to stop the process before an award is made.

Donna Almquist

Celia Craze

From: Willis Witter
Sent: Saturday, August 01, 2015 5:47 PM
To: Damien Ossi
Cc: Donna Hoffmeister; Joseph Murray; Celia Craze; Susan Gregersen; Yoni Siegel; Robert Snyder; Valerie Elliott; Rodney Roberts; Judith Davis; Donna Almquist
Subject: Forest Assessment proposal

Damien,

Thank you for your input on the two proposals under consideration for a forest assessment. Because your conclusion appeared at the end of a long attachment (to a long email string), it is worth repeating for emphasis.

"Overall, I prefer the AMT proposal. AMT displayed a greater understanding of the preserve and a closer reading of the RFP by including reflections on the impacts of disparate forest uses and varying management goals. The AMT proposal shows a greater understanding of the overall reason for the existence of the preserve, the value of the preserve that is independent of human use or human benefit, the value that it has to humans, and the investment of the community in the preserve. AMT's proposal displays sensitivity to the community and the conflicts that may arise with any proposed management actions."

-- Damien Ossi. Forest Preserve Advisory Board, July 31, 2015.

None of the opinions expressed thus far can match the brevity and wisdom contained in this single paragraph.

Thank you again,

Willis

Celia Craze

From: Donna Hoffmeister
Sent: Sunday, August 02, 2015 8:41 AM
To: Willis Witter; ROBERTL; Susan Gregersen; Donna Almquist; Damien Ossi; Joseph Murray; Yoni Siegel; Valerie Elliott; Celia Craze
Subject: Forest Health Assessment
Attachments: Forest Health Assessments Proposals.docx

I hope the city finds our comments useful in making a decision. Further discussion at our August meeting would prevent an assessment starting in a timely fashion and would not add more information than we have already provided.

Both companies appear qualified but AMT is the better match with Greenbelt. My comments are attached and below.

--Donna

AMT

- References the RFP well
- Appears to have the needed experience, knowledge and resources (project lead is a certified arborist with local and international experience; one support staff is a certified arborist while the rest are ecologists).
- Appears to have a realistic understanding of the challenges of a forest health wildlife and ecosystem assessment in Greenbelt; it hopes "to ensure a greater forest wildlife diversity in the future," (p. 5) while acknowledging that "preservation exists on a continuum" (p. 8) "with few clear choices" (p. 9). It proposes interfacing with the city before its final report to learn what position on that continuum the city finds appropriate (p. 8).
- Correlates its proposal with the code, guidelines and DNR Report; e.g., it acknowledges the limitations of the DNR Report and proposes a broader inventory (p. 2); it detects contradictions in the City Code and will attempt to find out from DNR what endangered species it detected.
- Emphasizes community involvement, education and training; indeed it specifies 2 meetings with FPAB (p. 7).
- The proposal itself demonstrates good communication skills, which portends good communication with us later on.
- The schedule of 5 months appears to correlate with city expectations.
- It mentions ADA regulations (p. 10) which the city needs to discuss.

ESA Pro

- Took the time to visit the North Woods.
- Although it is a smaller company than AMT, it also appears to have the needed experience, resources and qualified staff and willingness to use information already available.
- It takes into consideration that the city may have limited funds for dealing with invasive species (p. 6).
- Its 10 baited camera stations is intriguing and not part of the AMT proposal.

ESA Contra

- Does not reference the code, guidelines or DNR Report; by mentioning the "comprehensive trails plan" (p. 5) it suggests a shallow understanding of Greenbelt for someone who grew up here.