

Tool 19

Project Investigation Field Sheets

This tool contains a variety of field sheets designed to aid watershed planning by collecting more information on the feasibility of potential restoration sites and developing a workable concept design to narrow down project choices to a manageable level. The following field sheets are available here, and more information and guidance for completing each of the field forms are available in the references below:

- Retrofit Reconnaissance Inventory (see CWP, 2006, in press)
- Stream Repair Investigation (see Schueler and Brown, 2004)
- Urban Reforestation Site Assessment (see Cappiella *et al.*, 2005)
- Discharge Prevention Investigations (see Brown *et al.*, 2004)
- Contiguous Forest Assessment (see CWP, 2002a)
- Rare, Threatened, and Endangered Species Assessment (see CWP, 2002a)

Also included are links to Additional Sensitive Area Assessments

Retrofit Reconnaissance Inventory Data Sheet

1. **Subwatershed:** _____ **Site Number:** _____ **Site Name:** _____

2. **Location (Coordinates):** (Latitude: _____ Longitude: _____)

Location (Coordinates) _____

From County ADC/Locator Map

Indicated by coordinates and quadrants on the map pages (e.g., H3 NW)

Street Name _____

Subdivision or Business Name _____

Notes:

3. **Describe existing site conditions, including drainage structures/patterns**

- Existing Facility **Type** _____
- Unmanaged Existing Development
- Site Identified during stream assessment (e.g., USA, RSAT, RBP)

4. **Property Ownership (public or private):** _____

5. **Date of Preliminary Survey:** _____

6. **Surveyors:** _____

7. **Photo Roll and Picture #: Roll #:** _____ **Photo #:** _____

Retrofit Reconnaissance Inventory Data Sheet

8. Drainage Area: _____

9. Describe drainage area land use:

10. Approximate Imperviousness (%): _____

11. Retrofit Volume Computations (i.e., target and available storage):

WQ_v Cp_v Q_p

12. Describe elements of potential retrofit:

On-line retrofit Off-line retrofit

Retrofit Reconnaissance Inventory Data Sheet

13. Adjacent Land Use (possible conflicts):

14. Conflicts with Existing Utilities:

15. Construction and Maintenance Access:

16. Wetlands Present? **Yes** **No** **Maybe**

If yes, describe:

17. Forested Area or Other Sensitive Areas Present? **Yes** **No**

If yes, describe:

18. Other factors that may increase cost or affect feasibility:

19. Additional Notes and/or Sketch Information:
(Include key existing features and proposed design)

20. Site Candidate for Further Investigation: Yes No

Feasibility	High	5	4	3	2	1	Low
Benefits	High	5	4	3	2	1	Low

Stream Repair Investigation Form

PROJECT: _____		DATE: ____/____/____		ASSESSED BY: _____	
SUBWATERSHED: _____			PHOTO ID (Camera-Pic#): _____ # _____		
USA RCH ID:	START LAT _____ ° _____ ' _____" LONG _____ ° _____ ' _____" LMK _____		CONCEPT NO:		
	END LAT _____ ° _____ ' _____" LONG _____ ° _____ ' _____" LMK _____				
INDEX OF USA FORMS		AVERAGE REACH DIMENSIONS (from RCH)			
OT: _____	TR: _____	BANK OF CONCERN <input type="checkbox"/> LT <input type="checkbox"/> RT <input type="checkbox"/> Both		Avg bankfull height _____ft	
ER: _____	SC: _____	Length LT _____ft RT _____ft		Avg bottom width _____ft	
IB: _____	CM: _____	Avg Bank Ht LT _____ft RT _____ft		Avg top width _____ft	
UT: _____	RCH: _____	Avg Bank Angle LT _____° RT _____°		Avg wetted width _____ft	
Land ownership <input type="checkbox"/> Public <input type="checkbox"/> Private <input type="checkbox"/> Don't Know <input type="checkbox"/> Other:					
Available riparian corridor <input type="checkbox"/> ≤25 ft <input type="checkbox"/> 26 - 50 ft <input type="checkbox"/> 51-75ft <input type="checkbox"/> 76-100ft <input type="checkbox"/> >100ft					
CORRIDOR VEGETATION		<input type="checkbox"/> Mature wooded <input type="checkbox"/> Scrub/shrub <input type="checkbox"/> Grass or turf <input type="checkbox"/> Other:			
Degradation severity	Adjusted channel: Grade and width fairly stable, with relatively isolated of bank erosion; and poor instream habitat conditions.		Past downcutting evident, active stream widening, banks actively eroding at a moderate rate.		Active Downcutting: Tall unstable banks on both sides of the stream eroding at a fast rate; erosion contributing significant sediment loads to stream.
	5 4 3 2 1				
Upstream/Downstream condition	Upstream and downstream reaches assessed as good or fair.		Either upstream or downstream reach assessed as poor with other assessed as fair/good.		Both upstream and downstream reaches assessed as poor.
	5 4 3 2 1				
Construction access to stream	Good: Open area in public ownership, sufficient room to stockpile materials, easy stream channel access for heavy equipment using existing roads or trails.		Fair: Forested or developed area adjacent to stream. Access requires tree removal or impact to landscaped areas. Stockpile areas small or distant from stream.		Difficult: Must cross wetland, steep slope, or other sensitive areas to access stream, Minimal stockpile areas and/or located a great distance from stream section. Specialized heavy equipment required
	5 4 3 2 1				
Infrastructure constraints	Sewers or other infrastructure are not present in the project reach corridor		Sewers, other utilities or structures are present in the project reach corridor any may constrain project design		Presence of sewers and other infrastructure will greatly impact project design and may require expensive relocation.
	5 4 3 2 1				
Restoration Outcome Potential	Repair expected to restore stable, vegetated streambanks using mostly soft stabilization practices, reconnect floodplain, and significantly improve habitat		Repair expected to restore streambank stability with a mix of rigid and soft streambank stabilization practices, and moderately improve stream habitat conditions		Restoration will structurally maintain stable streambanks using predominately hard streambank protection practices, maintain existing sediment transport regime, little habitat improvement
	5 4 3 2 1				
Upstream land use	Older (30-40+ yrs), well-established neighborhoods or commercial areas. Little or no new development expected		A mix of older (30-40+ yrs) development and newer (<10-20 yrs) development. Some new development or redevelopment possible		Most of subwatershed has developed in last ten years, and significant future development is possible
	5 4 3 2 1				
Upstream retrofit potential	Upstream retrofits expected to significantly reduce stormwater flows to project reach		Upstream stormwater retrofits expected to produce only marginal reductions in stormwater flows and pollutant loads		No upstream retrofit opportunities exist, existing hydrology will not be improved
	5 4 3 2 1				
Scope of planned stream repair	Comprehensive: major change in planform, grade, or cross-section of channel, many practices		Moderate: Combination of individual stream repair practices, but only minor changes in channel dimensions		Simple: use of a few stream repair practices to address a problem at a defined point
	5 4 3 2 1				

Concept Sketch: Plan View of stream with approximate locations of stream repair practices

PROPOSED STREAM REPAIR PRACTICES

- A. Rigid Bank stabilization
_____ linear feet
- B. Soft bank stabilization
_____ linear feet
- C. Flow deflection
_____ # of structures
- D. Grade control
_____ # of structures
- E. Habitat structures
_____ # of structures
- F. Flow diversion
_____ # of structures
- G. Fish passage
_____ # of structures
- H. Comprehensive
_____ linear feet
- I. Other:

Comments on Project Design (include any special supplemental design studies or permits needed)

Planning Level Cost Estimate



Urban Reforestation Site Assessment (URSA)

1. General Site Information

Location:

Property owner:

Current landuse:

2. Climate

USDA plant hardiness zone:

Sunlight exposure:

- Full sun (6 hours or more of direct sun per day)
- Part sun or filtered light (< 6 hours per day)
- Shade (< 3 hours of direct sun per day)

Micro-climate features (check if present):

- High wind exposure
- Re-reflected heat load
- Other:

3. Topography

Steep slopes

Are any slopes > 15% present in the proposed planting area? Y/N

If Yes, estimate slope:

Low-lying areas

Are any low-lying areas present in the proposed planting area? Y/N

Notes:

4. Vegetation

Regional forest association (or dominant species from reference site):

Current vegetative cover (check all that apply):

- Mowed turf
- Other herbaceous
- None
- Trees or shrubs

Note species to be preserved:

Are invasive plants/noxious weeds present? Y/N

If Yes, note species and % coverage at site

Adjacent vegetative cover:

Is forest present? Y/N

If Yes, note dominant species:

Are invasive plants/noxious weeds present? Y/N

If Yes, note species and % coverage at site

5. Soils

Texture:

- Clay
- Loam
- Sand

Drainage:

- Poor (< 1" per hour)
- Moderate (1" - 6" per hour)
- Excessive (> 6" per hour)

Compaction:

- None
- Moderate
- Severe

pH:

- Acid (5.0 – 6.8)
- Neutral (6.8 – 7.2)
- Alkaline (7.2 – 8.0)

Other soil features (check if present and describe):

- Active or severe soil erosion
- Potential soil contamination
- Debris and rubble in soil
- Recent construction or other soil disturbance
- Other:

Soil Quality

List results of soil tests if applicable (e.g., levels of phosphorus, salt, or organic matter in the soil). Describe any visual indicators of soil quality.

6. Hydrology

Site hydrology:

- Upland
- Riparian

Note: For riparian planting sites where planting is proposed on both stream banks, fill this section out for each bank individually

Stormwater runoff to planting site (check all that apply):

- Bypasses site in pipe
- Upslope drainage area outfalls to site
Note diameter of pipe outfall:
- Open channel directs flow across or around the site
- Shallow concentrated flow (e.g., evidence includes rills, gullies, sediment deposits)
- Sheetflow
- Unknown

Contributing flow length:

Slope: _____%

Length: _____ft

Dominant cover type:

- Impervious
- Pervious

Floodplain connection (riparian areas only):

Are levees present? Y/N

Bank height: _____ft

Depth to water table (optional): _____ft

Stream order: _____

Notes or Sketch:

7. Potential Planting Conflicts

Space limitations (check if present, and note height of overhead wires, signs and lighting):

- Overhead wires: _____ft
- Pavement
- Buildings
- Signs: _____ft
- Lighting: _____ft
- Sewer and drainage pipes
- Underground utilities
- Other:

Other limiting factors (check if present and describe below):

- Trash dumping/debris
Note type of trash, volume (estimated pickup truck loads), and source if known:

- Deer, beaver or other animal impacts
- Mowing conflict (e.g., site is mowed regularly)
- Wetland present
- Insect infestation or disease
- Heavy pedestrian traffic
- Other:

Notes:

Local Ordinance Setbacks

Check local ordinances and note any required setbacks from these features.

8. Planting and Maintenance Logistics

Site access (check if present):

- Delivery access for planting materials
- Temporary storage areas for soils, mulch, etc.
- Heavy equipment access
- Volunteer parking
- Nearby facilities for volunteers

Party responsible for maintenance (if known):

Water source (check all that apply):

- Rainfall only
- Storm water runoff
- Hose hook-up nearby
Note distance from hook-up to planting area (ft):
- Irrigation system in place
- Overbank flow from river or stream
- Fire hydrant nearby
- Other:

9. Site Sketch

Sketch the site below and include the following features at a minimum:

- Property boundary, landmark features (e.g., roads, streams) and adjacent land use/cover
- Boundary and approximate dimensions of proposed planting area
- Variations in sun exposure, microclimate and topography within planting area
- Current vegetative cover, and location of trees to be preserved and invasive species
- Location and results of soils samples (if variable)
- Flow paths to planting area and contributing flow length
- Above or below ground space limitations (e.g., utilities, buildings)
- Other limiting factors (e.g., trash dumping, pedestrian paths)
- Water source and access points
- Scale and north arrow

OUTFALL RECONNAISSANCE INVENTORY/ SAMPLE COLLECTION FIELD SHEET

Section 1: Background Data

Subwatershed:		Outfall ID:	
Today's date:		Time (Military):	
Investigators:		Form completed by:	
Temperature (°F):	Rainfall (in.):	Last 24 hours:	Last 48 hours:
Latitude:	Longitude:	GPS Unit:	GPS LMK #:
Camera:		Photo #s:	
Land Use in Drainage Area (Check all that apply):			
<input type="checkbox"/> Industrial		<input type="checkbox"/> Open Space	
<input type="checkbox"/> Ultra-Urban Residential		<input type="checkbox"/> Institutional	
<input type="checkbox"/> Suburban Residential		Other: _____	
<input type="checkbox"/> Commercial		Known Industries: _____	
Notes (e.g., origin of outfall, if known):			

Section 2: Outfall Description

LOCATION	MATERIAL	SHAPE	DIMENSIONS (IN.)	SUBMERGED
<input type="checkbox"/> Closed Pipe	<input type="checkbox"/> RCP <input type="checkbox"/> CMP <input type="checkbox"/> PVC <input type="checkbox"/> HDPE <input type="checkbox"/> Steel <input type="checkbox"/> Other: _____	<input type="checkbox"/> Circular <input type="checkbox"/> Single <input type="checkbox"/> Elliptical <input type="checkbox"/> Double <input type="checkbox"/> Box <input type="checkbox"/> Triple <input type="checkbox"/> Other: _____ <input type="checkbox"/> Other: _____	Diameter/Dimensions: _____	In Water: <input type="checkbox"/> No <input type="checkbox"/> Partially <input type="checkbox"/> Fully With Sediment: <input type="checkbox"/> No <input type="checkbox"/> Partially <input type="checkbox"/> Fully
<input type="checkbox"/> Open drainage	<input type="checkbox"/> Concrete <input type="checkbox"/> Earthen <input type="checkbox"/> rip-rap <input type="checkbox"/> Other: _____	<input type="checkbox"/> Trapezoid <input type="checkbox"/> Parabolic <input type="checkbox"/> Other: _____	Depth: _____ Top Width: _____ Bottom Width: _____	
<input type="checkbox"/> In-Stream	(applicable when collecting samples)			
Flow Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <i>If No, Skip to Section 5</i>			
Flow Description (If present)	<input type="checkbox"/> Trickle <input type="checkbox"/> Moderate <input type="checkbox"/> Substantial			

Section 3: Quantitative Characterization

FIELD DATA FOR FLOWING OUTFALLS					
PARAMETER	RESULT	UNIT	EQUIPMENT		
<input type="checkbox"/> Flow #1	Volume		Liter	Bottle	
	Time to fill		Sec		
<input type="checkbox"/> Flow #2	Flow depth		In	Tape measure	
	Flow width	____' ____"	Ft, In	Tape measure	
	Measured length	____' ____"	Ft, In	Tape measure	
	Time of travel		S	Stop watch	
Temperature		°F	Thermometer		
pH		pH Units	Test strip/Probe		
Ammonia		mg/L	Test strip		

Outfall Reconnaissance Inventory Field Sheet

Section 4: Physical Indicators for Flowing Outfalls Only

Are Any Physical Indicators Present in the flow? Yes No (If No, Skip to Section 5)

INDICATOR	CHECK if Present	DESCRIPTION	RELATIVE SEVERITY INDEX (1-3)		
Odor	<input type="checkbox"/>	<input type="checkbox"/> Sewage <input type="checkbox"/> Rancid/sour <input type="checkbox"/> Petroleum/gas <input type="checkbox"/> Sulfide <input type="checkbox"/> Other:	<input type="checkbox"/> 1 – Faint	<input type="checkbox"/> 2 – Easily detected	<input type="checkbox"/> 3 – Noticeable from a distance
Color	<input type="checkbox"/>	<input type="checkbox"/> Clear <input type="checkbox"/> Brown <input type="checkbox"/> Gray <input type="checkbox"/> Yellow <input type="checkbox"/> Green <input type="checkbox"/> Orange <input type="checkbox"/> Red <input type="checkbox"/> Other:	<input type="checkbox"/> 1 – Faint colors in sample bottle	<input type="checkbox"/> 2 – Clearly visible in sample bottle	<input type="checkbox"/> 3 – Clearly visible in outfall flow
Turbidity	<input type="checkbox"/>	See severity	<input type="checkbox"/> 1 – Slight cloudiness	<input type="checkbox"/> 2 – Cloudy	<input type="checkbox"/> 3 – Opaque
Floatables -Does Not Include Trash!!	<input type="checkbox"/>	<input type="checkbox"/> Sewage (Toilet Paper, etc.) <input type="checkbox"/> Suds <input type="checkbox"/> Petroleum (oil sheen) <input type="checkbox"/> Other:	<input type="checkbox"/> 1 – Few/slight; origin not obvious	<input type="checkbox"/> 2 – Some; indications of origin (e.g., possible suds or oil sheen)	<input type="checkbox"/> 3 – Some; origin clear (e.g., obvious oil sheen, suds, or floating sanitary materials)

Section 5: Physical Indicators for Both Flowing and Non-Flowing Outfalls

Are physical indicators that are not related to flow present? Yes No (If No, Skip to Section 6)

INDICATOR	CHECK if Present	DESCRIPTION	COMMENTS
Outfall Damage	<input type="checkbox"/>	<input type="checkbox"/> Spalling, Cracking or Chipping <input type="checkbox"/> Peeling Paint <input type="checkbox"/> Corrosion	
Deposits/Stains	<input type="checkbox"/>	<input type="checkbox"/> Oily <input type="checkbox"/> Flow Line <input type="checkbox"/> Paint <input type="checkbox"/> Other:	
Abnormal Vegetation	<input type="checkbox"/>	<input type="checkbox"/> Excessive <input type="checkbox"/> Inhibited	
Poor pool quality	<input type="checkbox"/>	<input type="checkbox"/> Odors <input type="checkbox"/> Colors <input type="checkbox"/> Floatables <input type="checkbox"/> Oil Sheen <input type="checkbox"/> Suds <input type="checkbox"/> Excessive Algae <input type="checkbox"/> Other:	
Pipe benthic growth	<input type="checkbox"/>	<input type="checkbox"/> Brown <input type="checkbox"/> Orange <input type="checkbox"/> Green <input type="checkbox"/> Other:	

Section 6: Overall Outfall Characterization

Unlikely
 Potential (presence of two or more indicators)
 Suspect (one or more indicators with a severity of 3)
 Obvious

Section 7: Data Collection

1. Sample for the lab?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
2. If yes, collected from:	<input type="checkbox"/> Flow	<input type="checkbox"/> Pool
3. Intermittent flow trap set?	<input type="checkbox"/> Yes	<input type="checkbox"/> No If Yes, type: <input type="checkbox"/> OBM <input type="checkbox"/> Caulk dam

Section 8: Any Non-Illicit Discharge Concerns (e.g., trash or needed infrastructure repairs)?

**UPLAND CONTIGUOUS FOREST
FIELD DATA SHEET**

PROJECT		LOCATION	
STATION #		INVESTIGATORS	
LATITUDE		LONGITUDE	
FORM COMPLETED BY		PICTURE #	
DATE _____ TIME _____ AM PM		WEATHER	
ECOREGION/ FOREST ASSOCIATION			
# OF TREES IN PRISM & DBH	Number	DBH	
DOMINANT TREE SPECIES			
SPECIMEN OR RARE SPECIES	Rank (1-5) 5 being highest Describe		
DENSIOMETER READING (# of squares >3/4 filled/total # squares)	North ____/24 = ____%	South ____/24 = ____%	East ____/24 = ____%
	West ____/24 = ____%		
	Average of above readings = ____%		
WETLAND?	Soils Y N	Hydrology Y N	Plants Y N
UNDERSTORY CHARACTERIZATION	Dense, Medium, Sparse Dominant species:		
HABITAT COMPLEXITY	Canopy, Mid Canopy, Understory 3 present 2 present 1 present		
FORBES (herbaceous cover)	Dense, Medium, Sparse		
EVIDENCE OF DISRUPTION AND EXTENT (%)	Natural (ie. storm, disease, deer browsing)		Anthropogenic (ie. clearing, dirt road, timber harvesting , trash)
	Extent (% site coverage)		Extent (% site coverage)
INVASIVES	Species	Dense, Medium, Sparse	Extent (% site coverage)
SIZE OF TRACT	Acres		
WATERSHED FEATURES	Predominant Surrounding Landuse	Local Watershed NPS Pollution	
	<input type="checkbox"/> Forest <input type="checkbox"/> Commercial <input type="checkbox"/> Field/Pasture <input type="checkbox"/> Industrial <input type="checkbox"/> Agricultural <input type="checkbox"/> Residential <input type="checkbox"/> Other _____	<input type="checkbox"/> No evidence <input type="checkbox"/> Some potential sources <input type="checkbox"/> Obvious sources	

Explanation of Contiguous Forest Field Data Sheet

Representative or random sites should be chosen for the Contiguous Forest Assessment. Enough points should be chosen to provide a good representative characterization of the land under consideration for protection. General guidance is to sample at least 2 points for less than 100 acres of forest, and at least 4 points for up to 1000 acres of forest.

PROJECT: Project name. Typically refers to the watershed being studied

LOCATION: Station location description (i.e. 100 meters NE of the corner of Rt. 5 and Boon Drive).

STATION #: A unique station identifier. Usually refers the subwatershed being studied (e.g., Scotts Level subwatershed Site #1 might be called SL-1).

INVESTIGATORS: Initials of investigators assessing the site (useful if clarification of the data sheet is needed).

LATITUDE/ LONGITUDE: Use a GPS unit to determine the latitude and longitude of the specific location. If you do not have a GPS unit, an estimate of the location should be made using aerial/orthophoto maps.

PICTURE NUMBERS: Roll and photo numbers for any pictures taken at the site.

FORM COMPLETED BY: Initials of investigator completing the form (often necessary for deciphering hand writing).

WEATHER: Describe the current weather (e.g, sunny, rainy, snowing).

DATE: Day, month and year the survey was completed.

TIME _____ **AM PM:** Time the survey was completed.

ECOREGION/ Forest Classification: By pre-identifying the eco-region and forest association, the investigator will have an idea of what to expect and what issues may be facing that region. Ecoregion information is available at www.natureserve.org

OF TREES IN PRISM and DBH: Number of trees in Prism refers to a 10 Basal Area Factor (BAF) Prism which is used to select out the larger trees at a given site. The size of the trees is quantified by DBH, or Diameter at Breast Height.

DOMINANT TREE SPECIES PRESENT: Common and/or scientific name of dominant tree species present. Be as specific as possible (i.e. chinquapin oak, loblolly pine).

SPECIMEN OR RARE SPECIES: Give each site a rank from 1 to 5 (5 being the highest) based on the presence, age, height, location, and health of rare or specimen species present. For example, the presence of old growth trees, rare plant species, or habitat for an endangered species would constitute a high score of 5. Large mature trees and good quality forest would constitute a score of 3 or 4. A site with only 1 specimen tree might receive a rank of 2, while a site with young trees and no rare species would score a 1. The ranking system may vary and should be pre-determined.

DENSIOMETER READING: A spherical densiometer is used to measure the density of the forest canopy. In other words, you are quantifying how much of the sky above you is blocked by trees. To use a densiometer correctly it must be held level about 12-18" in front of you. When looking into the densiometer you can see the trees above you and grid marks on the densiometer mirror. Count and record the number of grid squares that are more than $\frac{3}{4}$ filled with tree images as well as the total number of squares to calculate the percent coverage. A densiometer reading should be taken at each of the four compass directions. Take the average of the four readings to get a canopy density % for the site. If the canopy density is greater than 50%, the canopy is closed. If the density is less than 50%,

the canopy is open. Densiometers are available through forestry supply companies. As there may be some variation between types, follow manufacturers instructions.

WETLAND: Are there wetlands present? This can be difficult to determine since the time of year and amount of recent rainfall can greatly influence your findings. Knowledgeable personnel and wetland identification guides may be necessary to help determine if wetlands are present.

Soils: Are the soils hydric? Y/N

Hydrology: Is there standing water? Y/N

Plants: Are there wetland plants? Y/N

UNDERSTORY CHARACTERIZATION: Understory refers to the trees located entirely below the general level of the canopy that receive little or no sunlight from above or the sides. Indicate if understory is dense, medium, or sparse and identify the dominant species.

HABITAT COMPLEXITY: Circle the number of different habitats (canopy, mid-canopy, and understory/shrubs) present: 3 present 2 present 1 present.

FORBES: Forb are herbaceous groundcover, including vegetation such as ferns. Indicate if forbes are dense, medium, or sparse.

EVIDENCE OF DISRUPTION AND EXTENT: Describe any evidence of disruption, indicate whether the disruption is natural or anthropogenic and identify the extent (%) of the site affected.

INVASIVE SPECIES: (non-native plants) Invasive species can overrun native species due to lack of natural predators, and often create a monoculture. Identify and describe the type, density (dense, medium, sparse) and extent (% site coverage) of any invasive species present.

SIZE OF TRACT: (acres) Estimate the size of the tract based on topographical maps or GIS data layers.

WATERSHED FEATURES: Identify the predominant surrounding land use and indicate if evidence of local watershed nonpoint source pollution exists. Nonpoint source pollution (NPS) is pollution that cannot be connected to one specific source such as an industrial sewage treatment plant. Examples of NPS pollution may include runoff from golf courses, commercial development, or residential lawns containing fertilizers, pesticides, sediment, metals and other pollutants.

Glossary

Basal Area – The cross-sectional area of a tree at breast height (4.5 feet above ground). The basal area of all trees in a given area represents forest stand density and is measured in square feet per acre.

Biltmore Stick – A measurement tool resembling a yard stick that is used to estimate the diameter and height of a tree.

Caliper – Tree diameter measured at 2 inches above the root collar.

Canopy – The level of the tallest trees overhanging branches that result in the limitation of sunlight reaching lower levels.

Champion Tree – The largest tree of its species within the United States, the state, county or municipality as determined by the state or local Natural Resources Department or similar agency.

Contiguous Forest – Forested land without significant breaks due to roads, power lines or other clearings.

Critical Habitat Area – A critical habitat for all endangered species and its surrounding protection area.

Densiometer – A monitoring tool used to determine the amount of canopy coverage.

Dominant Trees – Trees with crowns extending above the general level of the crown cover and receiving full sunlight from above and partly from the side; typically larger than the average trees in the stand.

Forest Stand Delineation – A methodology for evaluating the existing natural features and vegetation on a site proposed for development, taking into account the environmental elements that shape or influence the structure or makeup of a plant community.

Forest Structure – A measure of vertical and horizontal structural diversity within a stand, which is related to stand age and habitat.

Natural Regeneration – The natural establishment of trees and other vegetation.

Prism – A piece of precisely angled glass used in large forested areas for estimating basal areas, volumes or number of trees per unit area.

Specimen Tree – Trees having a diameter measured at breast height (4.5 feet above the ground) of 30 inches or more, or trees having 75% or more of the diameter of the current state champion tree of that species.

Understory Trees – Trees with crowns entirely below the general level of the canopy receiving little or no sunlight from above or the sides.

**RARE AND THREATENED SPECIES
FIELD DATA SHEET**

PROJECT:	LOCATION
STATION # TRACT#	STORET #
LAT _____ LONG _____	INVESTIGATORS
FORM COMPLETED BY	Picture #s
DATE _____	Weather
TIME _____ AM PM	

Rare or Threatened Species			
Extent of Population <i>(if known)</i>			
Evidence of Potential Threats to Population			
Co-occurrence of other RTE species			
Wetland?	Soils	Hydrology	Plants
RPA Protection?			
HABITAT COMPLEXITY	Canopy, Mid Canopy, Understory 3 present 2 present 1 present		
FORBES	Dense, Medium, Sparse		
Evidence of Disruption and Extent (%)	Natural (ie. storm)	Anthropogenic (ie. clearing, dirt road, timber harvesting)	Disease
Presence of Invasives			
WATERSHED FEATURES	Predominant Surrounding Landuse <input type="checkbox"/> Forest <input type="checkbox"/> Commercial <input type="checkbox"/> Field/Pasture <input type="checkbox"/> Industrial <input type="checkbox"/> Agricultural <input type="checkbox"/> Residential <input type="checkbox"/> Other _____	Local Watershed NPS Pollution <input type="checkbox"/> No evidence <input type="checkbox"/> Some potential sources <input type="checkbox"/> Obvious sources	

Notes or Sketch on Back

Table 1: Links for Additional Sensitive Areas Assessments

Type of Assessment	Link to Assessment Method
Wetland Delineation	<p>U.S. Army Corps of Engineers Wetland Delineation Manual http://www.sqj.usace.army.mil/permit/documents/87manual.pdf</p>
Functional Wetland Assessment	<p>Methods for Evaluating Wetland Condition www.epa.gov/waterscience/criteria/wetlands/</p> <p>A Hydrogeomorphic Classification for Wetlands http://el.erdc.usace.army.mil/emrrp/emris/EMRIS_PDF/wrpde4.pdf</p> <p>Review of Rapid Methods for Assessing Wetland Condition http://www.epa.gov/owow/wetlands/monitor/RapidMethodReview.pdf</p> <p>The Process of Selecting a Wetland Assessment Procedure: Steps and Considerations http://el.erdc.usace.army.mil/emrrp/emris/emrshelp6/the_process_of_selecting_a_wetland_assessment_procedure_steps_and_considerations.htm</p> <p>North Carolina Coastal Region Evaluation of Wetland Significance http://www.nccoastalmanagement.net/Wetlands/NCCREWSDOC.pdf</p> <p>Wetland Rapid Assessment Procedure http://www.sfwmd.gov/org/reg/nrm/wrap99.pdf</p> <p>Field Identification of Potential Freshwater Wetland Restoration Sites http://www.woonasquatucket.org/documents/ID&Nomination.pdf</p> <p>Spatial Wetland Assessment for Management and Planning http://www.csc.noaa.gov/lcr/text/swamp.html</p>
Vegetative Community Survey	<p>USGS-NPS Vegetation Mapping Program http://biology.usgs.gov/npsveg/fieldmethods/index.html</p> <p>Habitat Evaluation Procedures handbook http://policy.fws.gov/ESMindex.html</p> <p>Soil Quality Test Kit Handbook http://soils.usda.gov/sqi/files/KitGuideComplete.pdf</p>
Rare, Threatened and Endangered Species	<p>New York State Natural Heritage Program Rare Plant Field Techniques http://www.dec.state.ny.us/website/dfwmr/heritage/fieldtech.htm</p> <p>Wyoming Natural Diversity Database Plant Species of Concern Survey Form http://uwadmnweb.uwyo.edu/wyndd/Data/plant_survey_form.pdf</p> <p>Minnesota County Biological Survey Rare Plant Survey http://www.dnr.state.mn.us/ecological_services/mcbs/procedures_plants.html</p> <p>Minnesota County Biological Survey Rare Animal Survey http://www.dnr.state.mn.us/ecological_services/mcbs/procedures_animals.html</p>
Forest Stand Delineation/Tree Inventory	<p>USDA Forest Service Volunteer Training Manual (street tree inventory) www.umass.edu/urbantree/volmanual.pdf</p> <p>Urban Forest Health Monitoring Draft Field Manual www.fs.fed.us/ne/syracuse/Tools/UFHMonitoring.htm</p> <p>Trees Approved Technical Manual (Montgomery County, MD) www.mc-mncppc.org/environment/forest/trees/detail_trees.pdf</p> <p>Maryland Green Infrastructure Assessment</p>

	http://dnrweb.dnr.state.md.us/download/bays/gia_doc.pdf
--	---