

# Ecological Solutions

Michael Van Clef, Ph.D.



*Consulting Services for the Conservation Community*

## White-tailed Deer Management Services

Ecological Solutions can provide a variety of deer management services including:

- ✓ **Measuring forest health to determine current conditions and set future goals**
  - Ecological Solutions has developed a simple but scientifically rigorous protocol to monitor deer impacts on forests. These protocols have been implemented at over thirty locations by fifteen organizations across New Jersey. See Appendices A and B for details.
  - Perform Distance Sampling protocols to provide deer population estimates
- ✓ **Initiating and managing formal site-based Deer Management Programs**
  - Ecological Solutions has direct experience designing and implementing Deer Management Programs designed to foster forest health. See Appendix C for an example of program rules utilized by a current client.
- ✓ **Communicating with neighboring land owners to coordinate hunting efforts**
  - Ecological Solutions has facilitated communication between stewards of open space and neighboring private or public land owners to encourage mutually beneficial strategies.
- ✓ **Exploring implementation of special Division of Fish & Wildlife options**
  - Programs include Community-Based Deer Management, Agricultural Depredation Permits or the Deer Management Assistance Program.
  - Ecological Solutions has experience with state programs and can work with Division of Fish & Wildlife staff to determine their applicability at particular sites and/or municipalities.
- ✓ **Assist with development of a municipal Deer Task Force**
  - A Deer Task Force can facilitate large-scale deer management objectives aimed at protecting human health (e.g., reduction of Lyme Disease or Deer-Vehicle Collisions), minimizing economic losses (e.g., agricultural losses and damage to landscaping) and improving health of forest ecosystems.
  - Ecological Solutions is currently working with the newly created Hopewell Valley Deer Task Force and has encouraged other municipalities to develop their own programs that incorporate many of the strategies described above.

**Method Name:** Sentinel Seedlings

**Concept:** An experimental approach to measure the effectiveness of deer management programs and investigate potential for natural regeneration of trees and shrubs. The method involves planting red oak seedlings within upland forest habitat and measuring the percentage of browsed individuals after six months. [Note: Red oak is ubiquitous in upland forests of Northern New Jersey. Green ash should be utilized in wetland forests.]

**Rationale:** Experimental planting is a simple technique to determine current deer browse intensity that reduces 'ecological noise' involved with measuring browse impacts on existing woody plants. Factors that are controlled and/or accounted for within the methodology include: 1) difficulty in locating a statistically valid quantity of naturally occurring woody seedlings (e.g., little or no existing natural woody vegetation below the browse line), 2) lack of natural regeneration following initiation of deer management programs caused by other factors (e.g., recovery lag time caused by various factors such as temporally low seed production, drought conditions that kill seedlings, or continuing impacts of low deer densities when little browse is available), 3) previous browse damage that complicates interpretation of browse levels in the time period of interest (e.g., ambiguity in separating new browse from old browse), and 4) clumped or sparse distribution of natural seedlings (e.g., adequate sampling of an entire area of interest is not possible).

**Methods:**

Materials –

1. Red Oak seedlings (1' to 3' tall only) - 10 per plot x \_\_\_\_ plots = \_\_\_\_ seedlings. [Note: Bare root seedlings are available from the New Jersey Forest Tree Nursery in Jackson, New Jersey. However, seedlings are usually only shipped in spring. Seedlings are sold in packs of 100. Prices are \$38/pack (1-4 packs), \$30/pack (5-24 packs), and \$20/pack (25-75 packs). An alternative source for all planting is Croshaw Nursery in Columbus, New Jersey. They have 18"+ seedlings for \$0.98/seedling (25-199 seedlings), \$0.94/seedling (300-499 seedlings), and \$0.60/seedling (>500 seedlings).] [Note: I will usually be purchasing seedlings for other organizations, so we could coordinate to achieve a bulk purchase discount.]
2. Meter stick
3. Flagging Tape (enough to mark mature trees surrounding each plot and to mark each seedling)
4. Pin Flags (enough to mark the four corners of each plot)
5. Seedling planting spade / tree bar (or other planting aide)
6. Compass (to determine north-south orientation of each plot)
7. GPS Unit (to determine the location of each plot)
8. Data sheets (see attached)

Procedures –

*Timing* - Seedlings should be planted while dormant in December. The recording of browse should be performed six months after planting (June). [Note: This timing is associated with the suspected maximum feeding season (i.e., winter through late spring) on woody plants by white-tailed deer. The timing also reduces the possibility of seedling death (and therefore lack of palatability) due to growing season events such as drought, insect herbivory, pathogen attack, etc. Finally, it allows for recording

## Appendix A. New Jersey Forest Health Monitoring System Protocols

seedling survival over winter in relation to the intensity of browse (i.e. If the seedling is alive, then they it will have sprouted by June).]

*Sample Size* - In past studies, I have calculated the total number of plots required by dividing the entire area of interest by 25 (i.e., 1 plot for each 25 acres). This number can be reduced if sampling of large areas is required. Conversely, if the area of interest is small, than plot density can be increased. [Note: Minimum sample size is 10 plots to account for natural variability].

*Plot Placement Rules* - To remove edge effects when testing forest areas, plots should be at least 25 meters from non-forest habitat (e.g., structures/disturbances including homes, roads, open fields, etc.). Unless specifically part of the experimental design, plots should not be located in large canopy gaps (i.e., canopy coverage less than 30% over an area greater than  $\frac{1}{4}$  acre). Other areas that should be avoided include rock outcrops/areas too rocky to plant seedlings, early successional forest types (e.g., stem exclusion/pole phase, successional/dense red cedar woodlands), and other areas where seedlings are usually not found. If a pre-selected plot location (see below) does not meet the above criteria, then a new point should be randomly selected. [Note: Do not non-randomly shift the plot location to a more suitable nearby area away from the original grid point.]

*Plot Location Selection* - Each plot location should be chosen *randomly* on the established statewide 100 meter x 100 meter grid (see attached GIS shapefile). Random selection is achieved by systematic assignment of identification numbers to each grid point within the area of interest. Generally, one would 'clip' the statewide grid to the shape of the area of interest before assigning grid identification numbers (this is a simple operation within ArcMap). Plot selection is achieved by using a random numbers table or similar resources (see [www.random.org](http://www.random.org)) to select the number of plots desired from the full number of possible plots within the area of interest. [Note: If desired, sample plots can be 'stratified' by sub-areas within the entire area of interest. This would be beneficial wherever there is a special interest in assuring measurements at various locations (e.g., two distinct habitat types, areas near and distant to parking access, etc.).] [Note: The spacing of plot locations on the grid maintains independence of plots (i.e., two plots cannot be simultaneously considered during a single browse event). The 100 meter spacing also aids sample placement across the landscape and avoids potential placement bias (e.g., plot locations in known areas of high or low deer activity).]

*Seedling Plot Design* - Plant 10 seedlings in two parallel rows of 5 with 1 meter between adjacent seedlings. The long edge of plots should face North-South. Flagging tape should be placed in several trees surrounding the plot and pin flags should be placed in the four plot corners to assist with relocation. Flagging tape should be tied to the base of each seedling to assist with their relocation.

*Browse Data Collection* - Immediately upon planting seedlings within a plot, the number of intact end bud clusters should be counted on each seedling (end buds in oak species generally consist of a cluster of three or more buds at the terminus of a stem). [Note: Branches may break in the process of transporting and planting seedlings. An initial end bud cluster count allows clear interpretation of browse at the end of the experiment. Seedlings without end bud clusters should not be used in the experiment.] Final end bud cluster counts are performed after six months of exposure to deer browse. [Note: Although browse in forest habitat is usually associated with deer, a variety of other animals may browse woody seedlings. However, removal by deer is associated with a noticeably jagged/torn stem. Removal by rabbits and rodents are associated with a clean, angled stem cut (approximately 45°).]

## Appendix A. New Jersey Forest Health Monitoring System Protocols

*Data Analysis* - The proportion of seedlings receiving browse can be analyzed using Goodness-of-Fit statistics. Results can be compared against a pre-determined benchmark or pre- and post-implementation of a deer management program. If this methodology is used in multiple locations, then results can be compared with each other to statistically determine differences in deer browse between locations based upon a variety of potential factors (e.g., habitat types, deer management strategies, etc.). In addition, a simple review of the spatial pattern of browse should be performed. This can be accomplished by visual assessment of an aerial map depicting plot locations that are labeled with their respective percentages of seedlings browsed. [Note: Previous implementation of this protocol has shown that seedling browse is related to deer density (site 1: 90 deer per square mile = 50% browsed, site 2: 20 deer per square mile = 15% browsed). Neither of these sites had significant natural regeneration, which suggests that experimentally measured browse of 15% is not conducive to regeneration of trees and shrubs. At this time, I can only suggest that measured browse should be below 15%. To provide some guidance, I would assume that experimental seedling browse levels less than 10% would be related to improving advance regeneration and overall forest health.]

---

**Method Name:** Forest Secchi

**Concept:** A measurement of existing shrub and sapling cover in forest habitat. The method involves measuring the amount of a white board that is visually obstructed when viewed from a pre-determined point located 10 meters away.

**Rationale:** This method is a very rapid assessment of existing forest conditions and acts as an index of forest health. It is meant to complement the Sentinel Seedling study above that provides 'instantaneous measurements'. Interpretation of this method is unambiguous and can be used to determine the success of a mature deer management program (ideally, baseline data should be taken prior to initiation of a deer management program). Although this method is slower to show the benefits of a deer management program (see Sentinel Seedling rationale above), it directly measures a natural response of the forest to reduced deer densities and represents that ultimate desired condition (i.e., dense understory cover).

**Methods:**

Materials –

1. One meter square white foam board (should be able to be folded in half to facilitate movements through forest habitat)
2. Black tape (placed every 0.25m to create an evenly-spaced 16-cell grid on the white board)
3. Densiometer
4. 'Guide Post' – 1.4m tall (see text below)
5. Plot locations are the same as used above (materials included flagging tape, compass, GPS unit, measuring tape)
6. Data Sheets (see attached)

Procedures –

Forest Secchi measurements should be conducted at the same locations used for the Sentinel Seedling experiment. Measurements should be repeated every 2-4 years after collecting baseline data.

## Appendix A. New Jersey Forest Health Monitoring System Protocols

*Timing* – Sampling of existing woody vegetation can occur at any time during the growing season. To minimize data collection time when using the Sentinel Seedling experiment, measurements should be performed in June. [Note: In past experience, the most time consuming part of both techniques is travel time between plots. Data collection time for both techniques is minimal.]

*Sample Size* – See Sentinel Seedling above.

*Plot Placement Rules* – See Sentinel Seedling above.

*Plot Location Selection* – See Sentinel Seedling above. The same plots used in the Sentinel Seedling study should be used for the Forest Secchi measurements.

*Data Collection* – A 1-m<sup>2</sup> white foam board should be evenly divided into a 16-cell grid using black tape. The number of obstructed cells (partially or completely) should be recorded at a distance of 10 meters from the center point of the plot. Cover of native and non-native species should be recorded separately. For each point, four readings should be taken at the following compass bearings: NE, SE, SW, NW (readings should not be taken directly N-S so that any impacts on vegetation coincident with seedling planting does not alter measurements). The white board should be held 40 centimeters (1.31 feet) above the ground (top of board will then be 1.4 meters or 4.59 feet above ground). [Note: In past experience, deer begin to ‘notice’ woody vegetation greater than six inches tall. Therefore, sites with a history of high deer densities tend to have very low cover of woody plants taller than the lowest height of the board (i.e., 40 centimeters). The maximum typical height of deer browse damage does not exceed 1.4 meters.] [Note: The construction of a 1.4 meter post with Velcro strips at 0.4 and 1.4 meters (enough to hold the board - with matching Velcro strips - at the desired height) significantly increases the speed and accuracy of measurements. Ideally, a densiometer should be used to measure forest canopy coverage at each sampling point because shrub and tree sapling density can be impacted by shade (i.e., growth rates are lower under dense canopy coverage). [Note: Additional data collection, if resources permit, could include a list of woody species within plots, canopy species composition, herbaceous cover and species list, etc. Though not essential to data interpretation, this additional data could provide valuable information toward understanding the complexities of forest recovery upon implementation of an effective deer management program.]

*Data Analysis* – See Sentinel Seedling above. Additional analyses could include comparisons of native and non-native cover related to current browse measured via the Sentinel Seedlings. Unfortunately, there are no absolute thresholds to compare measured values. However, it is known that healthy forests have dense shrub layers. Therefore, an estimated threshold of approximately 70% mean woody cover has been tentatively adopted.

Appendix B. New Jersey Forest Health Monitoring System Data

Figure 1. Tabular Data Summary Through 2009

Site Name	Site Manager	Municipality	County	# of plots	Site Acreage (Total)	Planted Species	Planting Date*	Ending Date*	Days Exposed	Plots Discovered (%)	% Seedlings Browsed*			Woody Understory Cover			Canopy Cover
											Deer Browse	Other Browse	Total Browse	Native Cover	Non - Native Cover	Total Cover	
Aphawa	NJCF	West Milford Twp	Passaic	19	570	red oak	8-Dec-06	29-Jun-07	201	100	33	3	36	24	4	24	93
Arena	FoHVOS	Hopewell Twp	Mercer	9	27	red oak	14-Dec-07	20-Jun-08	186	100	58	0	58	2	0	2	95
Baldpate Mountain	Mercer County et al.	Hopewell Twp	Mercer	38	1222	red oak	28-Dec-07	1-Jul-08	183	97	59	7	66	22	64	78	87
Blair Creek	TNC	Stillwater Twp	Sussex	20	480	red oak	22-Nov-04	26-May-05	184	60	14	0	14				
Deerpath	NJAS	Bethlehem Twp	Hunterdon	10	198	red oak	7-Dec-06	17-May-07	160	80	37	0	37	27	25	52	69
Duke Farms	Duke Farms	Hillsborough Twp	Somerset	20	353	red oak	6-Dec-07	11-Jun-08	185	100	65	1	66	10	10	12	95
Eames	FoHVOS	Hopewell Twp	Mercer	10	76	red oak	26-Dec-07	24-Jun-08	178	100	81	2	83	10	22	27	91
Elks	FoHVOS	Hopewell Twp	Mercer	10	46	green ash	3-Dec-06	26-Jun-07	203	100	82	0	82	10	11	20	98
Gomez	Hopewell Twp	Hopewell Twp	Mercer	10	59	red oak	26-Dec-07	25-Jun-08	179	100	74	0	74	12	54	62	82
Great Swamp NWR - Upland	USFWS	Chatham / Harding / Long Hill	Morris	10	9400	red oak	27-Dec-07	30-Jun-08	183	100	65	6	65	36	16	50	98
Great Swamp NWR - Wetland	USFWS	Chatham / Harding / Long Hill	Morris	29	9400	green ash	25-Dec-07	30-Jun-08	185	100	66	1	66	52	10	61	96
Heritage	FoHVOS	Hopewell Twp	Mercer	10	66	green ash	23-Dec-08	16-Jun-09	173	90	25	0	25	39	9	40	92
Johnsonburg	TNC	Frelinghuysen Twp	Warren	20	520	red oak	29-Nov-04	21-May-05	172	100	49	0	49				
Lawrence & Stephens	FoHVOS, D&R Greenway	Hopewell Twp	Mercer	9	107	green ash	26-Dec-07	24-Jun-08	178	100	77	0	77	42	15	47	98
Mercer Park NW	Mercer County	Hopewell Twp	Mercer	14	786	green ash	27-Dec-08	18-Jun-09	171	93	48	2	50	25	4	29	92
Nayfield	FoHVOS	Hopewell Twp	Mercer	10	57	green ash	4-Dec-06	26-Jun-07	202	100	62	1	63	20	20	38	99
Old Farm	NJAS	Independence Twp	Warren	10	151	red oak	1-Dec-06	18-Jun-07	197	90	62	0	62	13	0	14	83
Newhouse Easement	FoHVOS	Hopewell Twp	Mercer	10	214	red oak	18-Dec-08	15-Jun-09	177	100	70	1	71	15	49	59	96
NJDWSC	NJDWSC	Ringwood Boro, Wanaque Boro	Passaic	40	6842	red oak	3-Jan-09	9-Jul-09	186	99	46	1	47	30	5	33	92

Appendix B. New Jersey Forest Health Monitoring System Data

Figure 1. Tabular Data Summary Through 2009 (continued)

Site Name	Site Manager	Municipality	County	# of plots	Site Acreage (Total)	Planted Species	Planting Date*	Ending Date*	Days Exposed	Plots Discovered (%)	% Seedlings Browsed*			Woody Understory Cover			
											Deer Browse	Other Browse	Total Browse	Native Cover	Non - Native Cover	Total Cover	Canopy Cover
Northern Stony Brook - Upland	D&R Greenway	Hopewell Twp / East Amwell Twp	Mercer / Hunterdon	4	298	red oak	18-Dec-08	17-Jun-09	179	75	23	0	23	55	16	63	99
Northern Stony Brook - Wetland	D&R Greenway	Hopewell Twp / East Amwell Twp	Mercer / Hunterdon	8	298	green ash	18-Dec-08	17-Jun-09	179	100	33	3	35	29	37	59	99
Plainsboro	NJAS	Plainsboro Twp	Middlesex	11	600	red oak	11-Dec-06	22-Jun-07	191	100	64	0	64	12	0	12	85
Pochuck	NJAS	Vernon Twp	Sussex	10	221	red oak	19-Dec-06	20-Jul-07	211	100	38	0	38	23	12	35	72
Preston Easement	FoHVOS	Hopewell Twp	Mercer	10	76	red oak	18-Dec-08	15-Jun-09	177	100	62	10	72	6	25	29	97
SBMWA	SBMWA	Hopewell Twp	Mercer	30	807	red oak	14-Dec-07	16-Jun-08	182	100	63	11	74	28	37	58	94
Scherman - Hoffman	NJAS	Bernards Twp	Morris	20	276	red oak	18-Nov-04	24-May-05	186	95	44	0	44				
Schiff 2006	Schiff	Mendahm Twp	Morris	15	340	red oak	10-Dec-06	30-Jun-07	200	100	57	2	59	6	30	33	95
Schiff 2008	Schiff	Mendahm Twp	Morris	17	512	red oak	4-Jan-09	28-Jun-09	174	100	75	3	78	7	46	53	98
Skyview	FoHVOS	Hopewell Twp	Mercer	10	79	green ash	23-Dec-08	16-Jun-09	173	100	57	8	65	13	60	67	90
South Mountain	Essex County	Maplewood / Millburn / South Orange	Essex	40	2047	red oak	22-Dec-07	24-Jun-08	182	100	82	1	82	10	4	13	95
Sparta Mountain	NJAS	Sparta Twp	Sussex	9	349	red oak	14-Dec-07	18-Jun-08	184	100	48	0	48	31	30	31	80
Tiger Brook / MacGregor	Chester Township	Chester Township	Morris	15	430	red oak	29-Dec-08	22-Jun-09	173	100	67	1	67	19	27	44	93
Thompson	FoHVOS	Hopewell Twp	Mercer	10	57	green ash	3-Dec-06	6-Jul-07	213	100	70	11	81	13	70	80	84
<b>AVERAGES<sup>T</sup></b>				<b>15</b>	<b>1224</b>				<b>186</b>	<b>98</b>	<b>59</b>	<b>3</b>	<b>61</b>	<b>21</b>	<b>24</b>	<b>40</b>	<b>92</b>

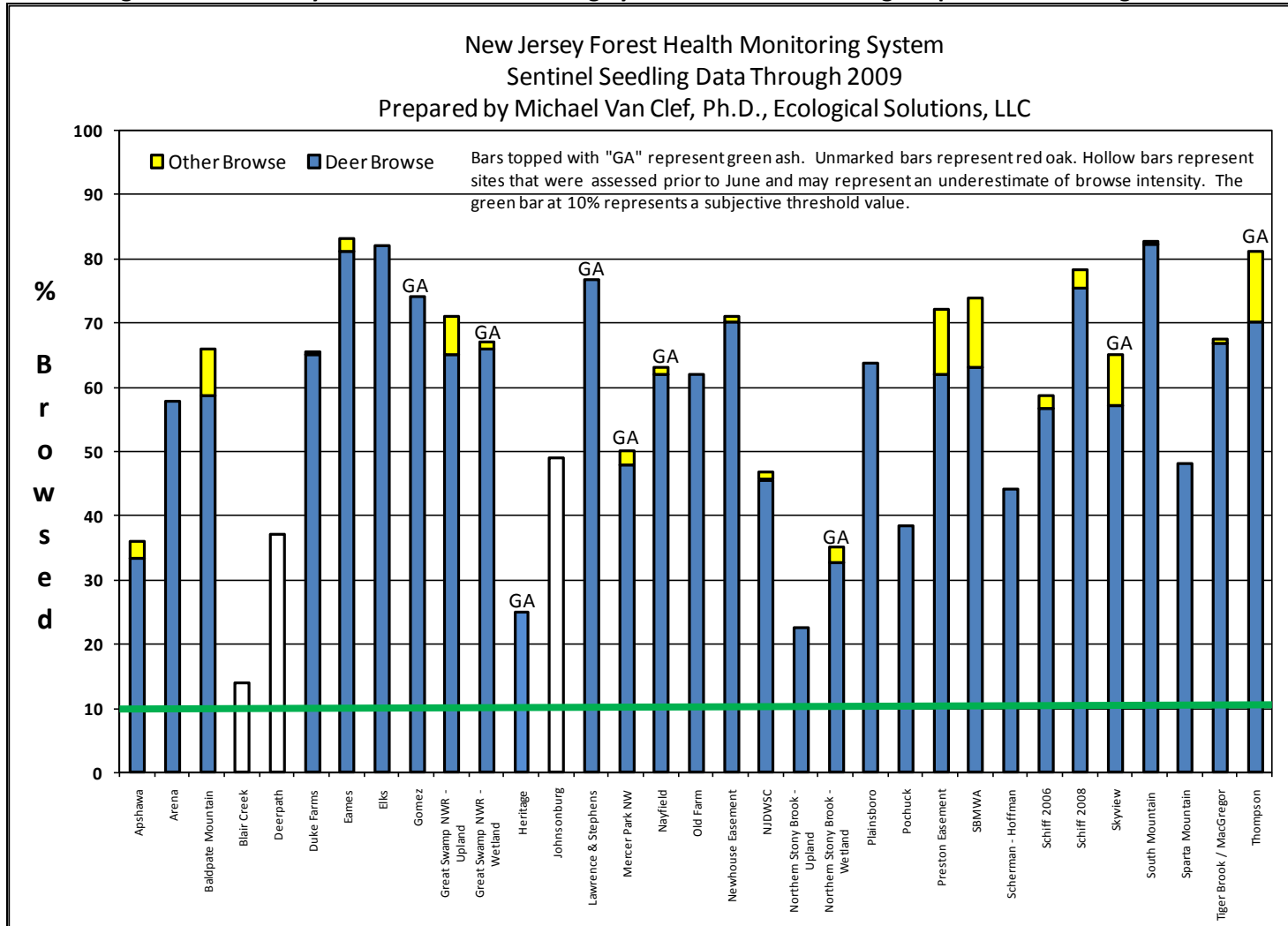
N/A denotes that measurements were not recorded.

\*The average date is presented for sites that required more than one day for planting and/or browse data collection.

<sup>T</sup>Seedling browse measurements taken prior to June are not included in the average because experience has shown that significant browse occurs post leaf out, which makes May measurements biased toward lower browse percentages.

Appendix B. New Jersey Forest Health Monitoring System Data

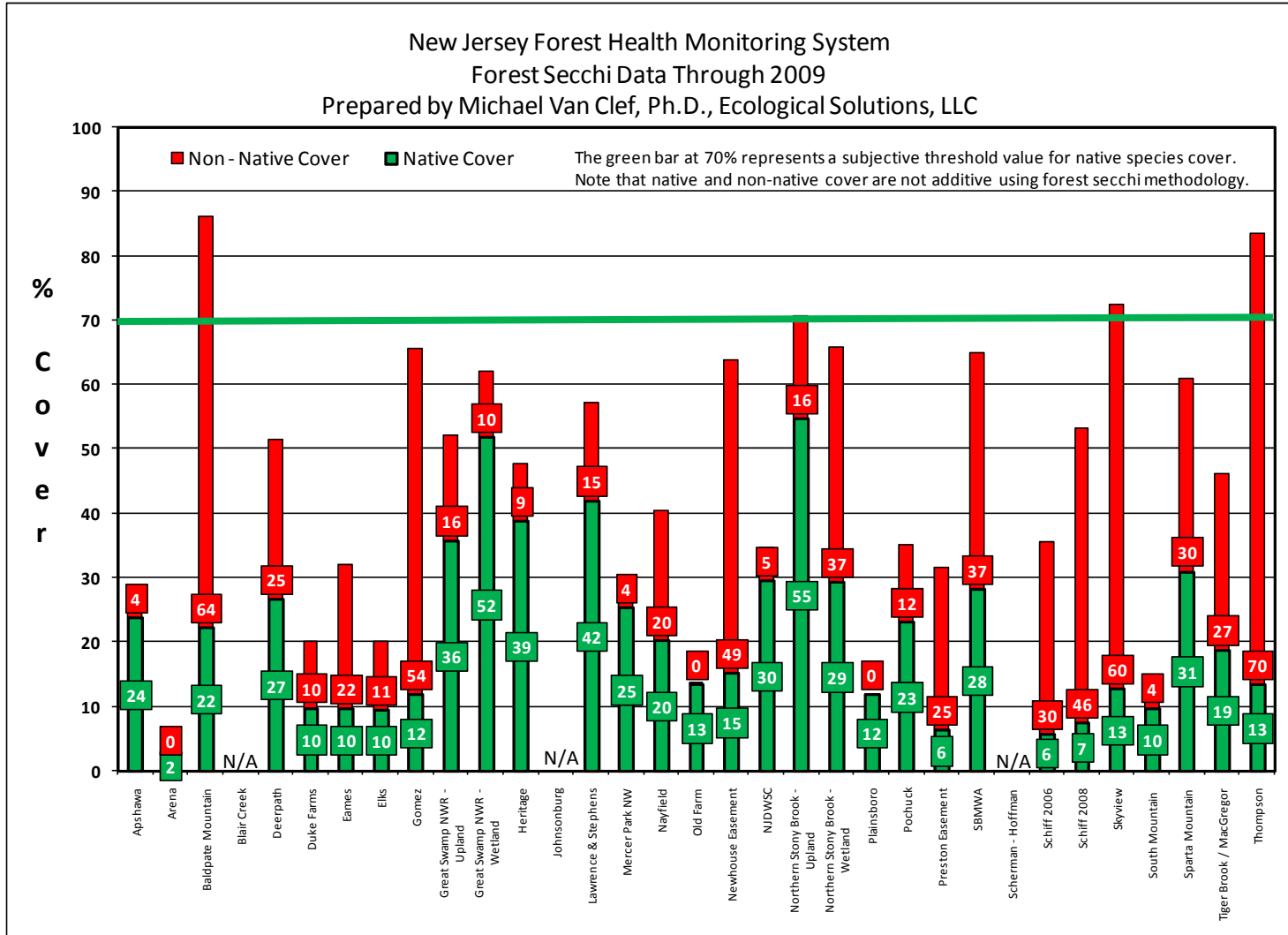
Figure 2. New Jersey Forest Health Monitoring System – Sentinel Seedling Graphed Data Through 2009





Appendix B. New Jersey Forest Health Monitoring System Data

Figure 3. New Jersey Forest Health Monitoring System – Forest Secchi Graphed Data Through 2009



## Appendix C. Example Deer Management Program Rules

### Introduction

The *Sample Land Trust (SLT)* Deer Management Program (DMP) is intended to improve ecosystem health through a reduction of the white-tailed deer population. *SLT* welcomes hunters who understand and honor their legal and ethical responsibilities as hunters to help us meet our conservation goals.

We require that DMP participants hunt safely and humanely, with respect for and courtesy toward both human and non-human life. Hunting privileges are non-exclusive and *SLT* and their guests retain the right to use the Preserve for all lawful purposes. Activities of *SLT* take precedence over DMP participant rights to hunt on the Preserve and participants shall comply with any reasonable restrictions specified by *SLT* in order to accommodate such activities.

### Application Process

All individuals legally eligible to hunt in New Jersey are eligible to participate in the DMP. An announcement for the DMP was made in the (Insert name of local newspaper) and the NJ State Federation of Sportsmen's Clubs newsletter. Applications for participation in the DMP will be accepted on a first-come-first serve basis. Individual or group applications will be accepted. If requests for participation in the DMP exceed availability, then applicants will be placed on a waiting list. Individuals on the waiting list will be contacted if existing participants voluntarily leave the DMP or are disqualified from participation by not meeting program standards.

An application form can be downloaded from [www.SLT.org](http://www.SLT.org) and submitted via e-mail to Land Trust DMP Leader (**xxxx@slt.org**) or mailed to Land Trust DMP Leader, Sample Land Trust, PO Box 111, Anywhere, NJ 11111. Applicants may call xxx-xxx-xxxx with any questions.

### Hunting Rules

**There will be zero tolerance for violations of the following rules and program requirements. Any violations will result in immediate and permanent suspension of hunting privileges on all *SLT* preserves.**

**1) All state hunting and game laws and regulations must be followed.** Please refer to the current Hunting Issue of the New Jersey Fish and Wildlife Digest available from the New Jersey Department of Environmental Protection, Division of Fish and Wildlife, 501 E. State Street, P.O. Box 400, Trenton, NJ 08625-0400. State hunting regulations may be downloaded at <http://www.state.nj.us/dep/fgw/hunting.htm> or from [www.NJFishandWildlife.com](http://www.NJFishandWildlife.com).

**2) No species other than white-tailed deer may be hunted on *SLT* Preserves.** Trapping or snaring of any animals is prohibited.

**3) Participants are required to provide proof of excess liability insurance in the amount of \$1,000,000.** Free insurance is provided to members of the New Jersey State Federation of Sportsmen's Clubs (currently there is a \$35 per year club membership fee, but other providers of insurance are acceptable).

## Appendix C. Example Deer Management Program Rules

**4) Individual participants will be charged \$75 per year for membership in the DMP. For group applicants, the maximum fee will be equal to \$75 per 10 acres of Preserve area.** Fees will be used solely for stewardship functions associated with the Preserves. In addition, each individual Participant must commit to 10 hours per year toward stewardship activities at the Preserves. For group applicants, the stewardship requirement is equivalent to 1 hour per acre of Preserve area regardless of the number of individuals in the group. Basic tasks will include trail maintenance, litter removal and patrol of the preserve. Additional activities may include invasive species control, gate installation, wildlife observations or other stewardship-related tasks.

### **Harvest Requirements and Reporting**

**5) Participants must harvest a minimum of two antlerless deer per year.** If hunters meet this minimum standard and do not violate any hunting rules, then they will be allowed to continue participation in the DMP in the following year. If minimum harvest standards are not met, then participants will be removed from the DMP and placed on a waiting list with priority given to hunters that have not yet participated in the DMP. Annual harvest minimums may be amended annually based upon measurements of forest health performed by *SLT*.

If more than two antlerless deer are harvested by a Participant, then the DMP membership fee will be refunded to assist with meat processing costs. In addition, *SLT* is willing to work with Participants to donate meat to local food banks.

**Note: If a group of hunters jointly applied for participation, then the expected antlerless harvest is 1 deer per 5 acres of Preserve area. As an example, 14 antlerless deer would have to be harvested on a 70 acre Preserve. This goal is considered a total goal for the entire group.**

**6) All Participants must report harvest data.** Participants should report basic harvest data to *SLT* via phone or e-mail. Data should include antler status, weapon used (bow, firearm type) and estimated deer weight. Participants shall report to *SLT* the metal possession seal number of all deer harvested from the Preserve. At the end of the hunting season, *SLT* will request data from the Division of Fish & Wildlife's Deer Project to confirm the antler status of deer harvested at the Preserves.

### **Access and Available Hunting Days / Areas**

**7) Participants will be allowed to hunt on the Preserve for a total of 45 days per year (Note: 45 days may or may not be sufficient to manage deer at particular locations).** DMP participants will select specific dates at the start of each hunting season after reviewing all available dates outlined in the current F&W Digest - Hunting and Trapping Issue (Zone 12 and 41 – Regulation Set #8). These dates will include all bow and firearm seasons. Hunting may be suspended for special events at the discretion of *SLT*, which may limit access for individuals on particular days. If necessary, strategies such as coordinated 'deer drives' will be conducted as additional hunting days that will not reduce the 45 days available to Participants.

**8) Parking will be allowed at designated locations only.** Parking areas will be depicted on maps for each Preserve included in the DMP.

## Appendix C. Example Deer Management Program Rules

**9) No motorized vehicles of any kind are allowed on the Preserve.** However, participants may use motorized vehicles on established roads to remove harvested deer, but only with prior written consent of *SLT*.

**10) Respect private property and safety zones.** Letters will be provided to all Preserve neighbors to notify them of hunting activities on the Preserve. The Preserve may not be accessed from adjacent private land without the written permission of the affected landowner. Maps showing property boundaries and 450-foot safety zones around structures will be provided to Participants. Hunting is prohibited within safety zones without the written permission of affected landowners.

### **Hunter Identification**

**11) Participants shall provide their addresses, phone numbers, e-mail addresses, vehicle license plate numbers, and their Fish & Wildlife Conservation Identification Number.** Participants shall immediately notify *SLT* if there is a change in any of the requested information.

**12) Participants must carry identification while hunting the Preserve.** *SLT* will provide a permission letter, personal identification wallet card and personal dashboard tags that must be used by Participants. This is designed to reduce conflicts with neighbors and other users of the Preserve.

### **Conflict Resolution**

**13) Immediately report non-Participant hunters or other illegal/restricted activities.** In the course of hunting or performing stewardship activities, immediately report any illegal/restricted activities, hunting or otherwise, to *SLT*. Any Participant who observes an unauthorized hunter on the Preserve shall report that observation as soon as possible to *SLT* so that the proper local and state authorities may be notified. Participants may approach an unauthorized hunter or other persons performing illegal or unwanted activities in a non-confrontational manner only. The sole purpose of approaching any such persons is to inform them of Preserve rules and regulations.

### **Specific Restrictions on Hunting Methods**

**14) No permanent structures are allowed on the Preserve.** Construction of permanent tree stands/deer-hunting structures or baiting stations is prohibited. Temporary deer stands (including semi-permanent ladder stands) may be erected 30 days prior to the initiation of the hunting season, and must be removed within 14 days after the end of the season. All temporary structures must not damage trees or other plants. Damage or theft of temporary structures is solely the responsibility of Participants.

**15) No still hunting or stalking from the ground.** All hunting must take place from an elevated tree stand located at least 50 feet from any trail.

**16) No baiting or baiting stations are allowed on the Preserve.** However, with proper justification (e.g., access to deer utilizing adjacent areas as refuge), baiting may be allowed with prior written permission by *SLT*.

**17) Driving of deer is not allowed on the Preserve.** However, with proper justification, driving of deer may be allowed with prior written permission by *SLT*.

## Appendix C. Example Deer Management Program Rules

### **Other Restrictions**

**18) No unnecessary discharge of guns or bows is allowed.** This includes target practice. Used cartridges must be removed from the Preserve.

**19) No vegetation may be cut or removed.** This includes cutting brush to create shooting lanes. However, existing trails may be maintained to keep them clear of obstructing vegetation.

**20) Release of any animal species, native or non-native (such as pheasant), is strictly forbidden.**

**21) No fires, camping or littering is allowed.** Please clean up trash and litter that you come across. This includes any material (e.g., rubber gloves) that may be used during field dressing activities.

### **Communication with Sample Land Trust**

**22) Participants must maintain correspondence with *SLT*.** There will be one required meeting per year to discuss the past and upcoming hunting season.

**23) Participants should be familiar with relevant background information and adhere to management goals and objectives established for the Preserve.** *SLT* will supply information to each Participant.