



LANDSCAPE PERFORMANCE SERIES

Avalon Park and Preserve – Stony Brook, NY Methodology for Landscape Performance Benefits

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Environmental

- ***Increased the biodiversity of the site as evidenced by a 35% increase in identified bird species, including 11 species on the Audubon High Priority Watch List, and 7 species with populations of regional significance.***

Baseline bird counts obtained from a 2001 Inventory of Natural Resources of the pre-existing site. Several members of the the Four Harbors Audubon Society conducted an avian inventory of Avalon Park and Preserve and other elements of the preserve complex 33 times between 1994 and 1999. Altogether, 77 different species were identified over this period at what would become Avalon Park and Preserve, the adjacent Nature Conservancy Forest, and the adjacent Shep Jones Lane Right of Way. Seven species were found to have populations of regional significance.

From 2001-2011, Avalon Park and Preserve was surveyed by a member of the original Audubon Society team as part of the New York State Breeding Bird Atlas Survey, the Christmas Bird Count and the Smithtown Bird Count. Over this period 104 species were identified in Avalon Park & Preserve. Species were referenced with the Audubon Watch List, revealing 11 species of High Priority conservation status for Southern New England.

Increase in biodiversity: $(104-77)/77 = 0.35 = 35\%$

High Priority Watch List

American Woodcock
Baltimore Oriole
Bay-Breasted Warbler
Black-Throated Blue Warbler
Blackburnian Warbler
Blue-Winged Warbler
Bobolink
Canada Warbler
Louisiana Waterthrush
Wood Thrush
Worm-Eating Warbler

Populations of Regional Significance

American Black Duck
American Wigeon
Bufflehead
Canada Goose
Mallard
Red-Breasted Merganser
Snowy Egret

- ***Increased the ecological integrity of plant communities by more than doubling Avalon's Plant Stewardship Index to achieve a score of 54, reflecting a high diversity of native plants and sustained removal of invasive species.***

The Plant Stewardship Index (PSI) is a tool specifically developed to evaluate the ecological integrity of native plant communities in the Piedmont region of Pennsylvania and New Jersey. Modeled after the Floristic Quality Assessment Index, created by botanists and taxonomists Floyd Swink and Gerould Wilhelm, it has been applied to this site because of the proximity and similarity of conditions to those piedmont regions.

The PSI is based on the observation that plants may act as “generalists,” which are not particular about where they grow and might grow very well on roadside ditches or in dooryards, as opposed to “conservative” species, which may grow only in specialized habitats. Over 2000 plants have been cataloged and assigned a number from zero to ten by local experts and botanists. Zero represents the most “generalist” species, tolerant of disturbance and includes invasive or introduced nonnative species. Ten represents the most “conservative” species and includes many rare and endangered state-listed native plants that require special habitats and do not regrow after disturbance.

This database of plants and associated numerical values are available to users through Bowman’s Hill Wildflower Preserve website <http://www.bhwp.org/psi>. To use the PSI to evaluate a site, a list of plant species is compiled within an assessment area, large or small. The coefficient of conservatism (“CC Number”) is assigned to each plant and added together. The “Total Mean C” is obtained by dividing the total CC number by the total number of plant species. Finally, the Total Mean C is multiplied by the square root of the total number of native plants to get the Plant Stewardship Index value. The entire Park and Preserve was evaluated as follows.

Pre-restoration:

Total CC: 365
Total # of Plant Species: 140
Mean CC: $365/140 = 2.6$
Total # of Native Plant Species: 86
PSI: $2.6 \times \sqrt{86} = 24.18$

Post-Restoration:

Total CC: 686
Total # of Plant Species: 150
Mean CC: $365/140 = 4.6$
Total # of Native Plant Species: 138
PSI: $2.6 \times \sqrt{86} = 54.05$

Social

- ***Provides garden therapy and attention restoration to an estimated 129,600 annual visitors. 93% of those surveyed described Avalon's effect on their mood in positive terms, with 51% of all responses identifying some form of stress reduction.***

Trail counts took place during 2 weekdays (Wednesday and Thursday) and one weekend day (Saturday) in mid-July, 2011. Each day, park volunteers were stationed near the entrances of the Garden and the Preserve and counted all visitors that passed by over a 3 hour period in the morning and afternoon. Age, gender and activity characteristics describing each visitor were noted and visitors were invited to fill out a questionnaire describing their experience of Avalon.

To estimate annual visitorship, the methodology established by the National Bicycle and Pedestrian Documentation Project was used to extrapolate daily, monthly, and annual users based on counts taken during any period of a day, month, or year. The NBPD establishes adjustment factors to weight counts based on hour, day, month and local climate and is designed to be used by (a) multi-use pathways (PATH) and (b) higher density pedestrian and entertainment areas (PED).

Because of extreme heat, the Saturday counts were much lower than expected and not used to estimate volume. An average hourly count was calculated from Wednesday and Thursday morning garden counts and an adjustment factor of 1.05 was applied to reflect those who use the facility after hours. The weekday count was calculated by applying an adjustment factor of 7% based on a 11 am average trail count, classifying Avalon Garden as a “pedestrian entertainment area.” An average weekly volume was reached based on a daily adjustment factor of 12% for Wednesday and Thursday counts, and the result was multiplied by 4.33 to calculate the monthly

volume. The climate of Long Island was classified as “Long Winter/Short Summer” and “Very Hot Summer/Mild Winter” and the annual total was reached by applying the monthly adjustment factors of both climate types and averaging both calculations.

Average Hourly Count:	21.8 Visitors
Adjustment Factor: 21.8 x 1.05	22.89 Visitors
Adjusted Weekday Hourly Count: 22.89/.07	327 Daily Visitors
Average Weekly Volume: 327/.12	2725 Weekly Visitors
Average Monthly Volume: 2725 x 4.33	11799 Monthly Visitors
Annual Total: ((11799/.13)+(11799.07))/2	129,659 Annual Visitors

Of the 502 visitors observed during the trail counts, 100 questionnaires were sampled to evaluate the visitor experience of Avalon. In response to the question, “How would you describe your mood after visiting Avalon?” visitors overwhelmingly responded in positive terms, with only 6 visitors declining to respond, and 1 visitor responding “tired.” The “stress reduction” classification which accounted for 51% of all responses, was a compilation of “calm,” “clear,” “enlightened,” “improved,” “mellow,” “peaceful,” “quiet,” “refreshed,” “rejuvenated,” “relaxed,” “sedate,” “serene,” “tranquil” and “zen.” Visitors were not limited to one response and there were 117 total.

- ***Provides an outdoor classroom for 135 school-age children and teens annually, using Avalon's seven distinct plant communities to lead programs in local ecology and environmental stewardship. Annually, approximately 1,500 local residents attend educational events hosted at Avalon.***

Information obtained from the Paul Simons Foundation records. In addition to youth summer programs hosted at Avalon and paid for by the foundation, a volunteer program has also been established to train and educate local teens. Educational events hosted at Avalon include a monthly lecture series, quarterly astronomy viewing, and biannual orienteering workshop. Although visitorship is not documented, other organizations frequently use Avalon for painting and photography classes.

- ***Supplements the physical health of visitors with 77% of interviewees reporting spending most of their time walking, hiking, running or jogging, and approximately 20% of visits involving running as the principle activity.***

Collected during POE described above. In response to the question, “What do you spend the most time doing at Avalon?” 77% of interviewees listed “walking,” “hiking,” “jogging,” or “running.” Additionally, 27% of interviewees said they came to Avalon specifically for exercise when asked “Why do you visit Avalon?” Activity observation during the POE revealed that 20% of visitors spend most of their time running, with Avalon's many long trails described as a particular attraction.

Cost Comparison Methodology

- ***Only the most skilled and highest performing construction and nursery companies were hired. This quality of workmanship approximately tripled the cost of labor. Avalon is atypical in that it has an on-going maintenance program. Site management is, in fact, closer to an arboretum or special garden than to a typical restoration area.***
- ***Far more plants were used at Avalon as compared to a typical project because this restoration was to be complete from ground layer to canopy. Plants were often difficult to find, both because of the size desired and because they were rare or not commonly***

available native species. All the plants were located and tagged by the landscape architects. This combination of factors increased the cost of plants by approximately 2.5 times.

- ***The entire exercise was in part a test to see what it really costs to re-create or restore an entire plant community, such as beech-oak forest or andropogon field. Innovations in installation techniques, such as “plugging” the meadows, or buying very large canopy trees to give the landscape a sense of instant establishment resulted in a 5-fold increase in costs for plant materials, as compared to a standard restoration project for a public entity or non-profit.***

Estimates provided by Andropogon based on contract documents and past experience with restoration projects.