The Story of Natural Change

from an Abandoned Cornfield (1967) to a Young Forest Thirty-Nine Years Later (2005) Chester County, Pennsylvania

By William and Edith Overlease

THE STORY OF NATURAL CHANGE FROM AN ABANDONED CORNFIELD (1967) TO A YOUNG FOREST THIRTY-NINE YEARS LATER (2005) CHESTER COUNTY, PENNSYLVANIA

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INTRODUCTION

In 1967 farmland adjoining south campus of West Chester University was purchased by the University. It later became part of the Robert B. Gorden Natural Area for Environmental Studies.The property included a corn field that was abandoned when the property was purchased in 1967.In 1968 I began to study and record the abundance and distribution of plants on the area.

A convenient part of the cornfield at the junction of South New Street and Tigue Road was selected for intensive study.The study site was laid out with string and measured 40 meters (131.2 feet) by 40 meters square. It was further subdivided in into sixteen 10 by 10 meter subplots for detailed study.A vegetation map was drawn on graph paper at the end of each year recording the distribution of all major plant communities. The percent plant cover by species summarized in this report is based on these yearly vegetation maps.

During the course of the study over 165 species of plants have been identified on the 40 X40 meter study site. 118 species were herbaceous perennials,28 species were plants of annual growth form, 18 species were shrubs, and 17 species were trees.

The story of a cornfield is a presentation of the major dominant species that primarily controlled the area over time. It gives a clear picture of vegetation change without bogging down in detail.

STAGE 1. FIRST THREE YEARS,(1967-1969). SITE DOMINATED BY ANNUAL WEEDS

	1967	1968	1969	1970	1971	1972
Percent of study site covered by annual weeds		79%	61%	40%	4.5%	0%
Foxtail Grass (*Setaria faberii*)		41%	39%	34%	4%	0%
Common Ragweed (*Ambrosia artemisiifolia*)		38%	22%	6%	.5%	0%

Figure 1. Beginning of second year. Foxtail grass litter with corn stubble and narrow crow garlic leaves. May 7,1968.

Figure 2. End of second year with students from West Chester University ecology class sampling the site.Foxtail grass litter with darker common ragweed. November 1968.

STAGE II. FROM FOURTH YEAR TO TWENTITH YEAR (1970-1986) SITE DOMINATED BY PERENNIAL WEEDS. Seventeen years.

	1968	1969	1970	1971	1972	1973	1974	1975	1976
Percent of study site covered by perennial weeds	8%	26%	52%	88%	100%	100%	100%	100%	100%
Canada Thistle (Cirsium arvense)	8%	16%	21%	35%	15%	2%	0%	0%	0%
Goldenrod-Aster Tall Goldenrod (Solidago altissima)	29 plants	10%	21%	53%	85%	97%	100%	100%	100%
Frost Aster (Aster pilosus)									

	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
Goldenrod-Aster, Percent cover of site continued	100%	100%	91%	84%	69%	62%	61%	51%	49%	51%

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Percent cover by Tall Goldenrod.Aster dropped out after 1984	49%	48%	46%	50%	37%	26%	24%	21%	12%	13%

1997	1998	1999	2000	2005
18%	10%	10%	7.6%	0%

Figure 3. End of third year showing Tall Goldenrod beginning to become established on the study site. The darker plant on the right is Common Ragweed. October 1969.

STAGE III. STUDY SITE DOMINATED BY WOODY PLANTS (1987-2005)

	21yr 1987	26yr 1992	30yr 1996	34yr 2000	39yr 2005
Percent of study site covered by woody plants, percent shrub cover plus percent tree cover	51%	74%	75%	91%	94%

SHRUB COVER	1987	1992	1996	2000	2005
Percent of study site covered by woody shrubs	34%	33%	29%	26%	18%
Japanese Honeysuckle (Lonicera japonica)	33%	16%	1%	0%	0%
Mixed shrub,entangled masses of Japanese Honeysuckle, Oriental Bittersweet,Multiflora Rose,Blackberry	1%	17%	28%	26%	18%

Additional notes on shrubs

First Blackberry (Rubus allegheniensis)1year 4,34 year 6,171 year 8, 1091 on all 16 subplots,year 16.
First Japanese Honeysuckle 1 year 4,5 year 6,locally commom year 8 on 9 of 16 subplots,locally abundant on 11 of 16 subplots,year 11.

First Oriental Bittersweet (Celastrus orbiculatus) 3 year 5, 7 on 5 subplots,year 6,159 on all 16 subplots,year 13

First Multiflora Rose (Rosa multiflora) 1 year 5,12 on two subplots,year 7, 110 on 12 of 16 subplots,year 20.

Figure 4. Twenty-second year.Mary Jane with Box Elder.White Ash behind her. Tall Goldenrod in foreground.

Figure 5.Twenty-second year. Edith with sapling Crab Apple. Surrounded by Tall Goldenrod.Black Locust in background.

Figure 6.Twenty-second year. Standing by Black Walnut sapling with Multiflora Rose in foregrpund,Black Locust in background

Percent plot cover,twenty-second year

48% Tall Goldenrod,30% Shrub Cover

22% tree cover

STAGE III Continued. STUDY SITE DOMINATED BY WOODY PLANT COVER

TREE COVER	21yr 1987	26yr 1992	30yr 1996	34yr 2000	39yr 2005	44 yr 2010
Percent of study site covered by trees	17%	41%	46%	65%	76%	———
Percent of site covered by Black Locust (Robinia pseudoacacia)	16%	37%	37%	46%	49%	———
Percent of site covered by other tree species	1%	4%	9%	19%	27%	———
Black Walnut			4%	6%	10%	———
White Ash			1.6%	5%	7%	———
Box Elder					2%	———
Red Maple					2%	———
Black Cherry					2%	———
Crab Apple					2%	———
Flowering Dogwood					.1%	———

Additional notes on trees

First Black Locust, 5 year 7, on two subplots, 14 on 4 subplots, year 12, 43 on 11 of 16 subplots, year 21 (1987)
First White Ash, 3 on 3 subplots, year 8, 19 on 6 subplots, year 17
First Red Maple, 2 on 2 subplots, year 6
First Black Cherry 1 year 3
First Black Walnut 1 year 13, 6 on 5 subplots, year 22, 54 on 16 subplots, year 31.

First Box Elder 3 year 7, First Flowering Dogwood, 2 year 8

Figure 7. Thirty-third year. Edith measuring seven inch Black Locust. Japanese Honeysuckle in foreground. October,21,1999.

Figure8. Thirty-third year. Bill reviewing an area of mixed shrub entanglement. Japanese Honeysuckle,Multiflora Rose,Oriental Bittersweet,Blackberry on Black Locust.Two Black Raspberry in foreground.October 21,1999.

Figure 9.
Thirty-ninth year.Edith measuring a Thirteen inch Black Locust.August 25,05

Figure 10.Thirty-ninth year.Bill standing by ten inch White Ash. The recent invasion of the site by Japanese Stilt Grass (Microstegium vimineum) is very evident in the understory. It covered 50-80% of the understory in eight of 16 subplots.