

Razed Residential Sites Restored At Indiana Dunes

By Ronald D. Hiebert

The Indiana Dunes, located along the shores of the southern tip of Lake Michigan, have been recognized since the turn of the century as a unique landscape supporting unusual vegetation assemblages. The publications on plant succession in the dunes by Henry S. Cowles (1900, 1901) established the area as the "birthplace of ecology" and as a natural laboratory to study natural processes. Efforts to save the area from development began as early as 1909.

The first director of the National Park Service, Stephen Mather, held hearings on a proposal to make the dunes a national park in 1916. However, it was the state of Indiana which acted first to save the dunes when it created a 2,200 acre state park in 1923. It was to take the efforts of many dedicated conservationists another 43 years before authorization of the Indiana Dunes National Lakeshore would become a reality. Through the original authorization and additional legislative authorizations in 1976 and 1980, the Lakeshore now consists of over 13,000 acres.

Unfortunately, the dunes were not exempt from development during the first half of the century; the area surrounding the park became one of the largest industrial complexes in the United States. In addition, it attracted low density residential development. The South Shore Railroad made it convenient for people to commute daily to Chicago from the dunes. More than 600 past and present residential sites lie within the boundaries of the Lakeshore. About half have been razed to date; the others are under reservation-of-use agreements, some extending until the year 2010. Most of the residential sites are located within areas of the Lakeshore designated "natural zone." The management goals in areas thus designated are to restore and/or manage for the protection of natural ecosystems for the education and enjoyment of the public.

Residential use modifies the natural communities directly and indirectly in many ways. Natural vegetation is removed; exotic plants and non-biodegradable materials are introduced; and soil characteristics are modified. Studies are in progress to aid in understanding the effects of these perturbations on the recovery process, and to identify specific problems that can be mitigated or eliminated through active management.

The study began with a survey of 250 razed residential sites to get a feeling for the extent of the problem, to identify specific factors which appear to influence the revegetation process, and to select sites for study. Factors which appeared to affect succession were (1) introduced exotic species, (2) the distance to and composition of seed source, and (3) past land use (i.e. lawns, building site, drive, garden).

Based on the above observations and a thorough review of existing literature on secondary succession, studies were designed in an attempt to describe the succession process and to determine the effects of past land use, seed source, and site condition over time. Thirty sites were selected; 15 on uplands, surrounded by black oak woodlands, 15 in lowlands, surrounded by swamp white oak/maple dominated forests. Sites cleared in 1971, 1973, 1975, and 1979 are represented. Each site was mapped, indicating



Sampling vegetation at an old home site, Vicki Dunevitz and Dale Otto (top) set up their sample plot. The center picture shows a typical gravel road four years after abandonment. An "old lawn" in the lower picture provides a rich research resource for Ron Hiebert and biological technicians as they seek answers to questions of the struggle for dominance between lawn grasses and native species.

size, past land uses, and woody vegetation over 1 m in height. The site boundaries also were described. Herbaceous and small woody vegetation within old lawns, building sites, drives, and gardens were sampled at each study site in 1982 and will be resampled in 1983. Permanent photo stations also were established to estimate vertical cover (ground cover and vertical cover are being used to estimate relative productivity) and to allow monitoring over time.

The initial field studies will be completed in the fall of 1983. The data collected in 1982 have not been fully analyzed, yet, but some preliminary observations are possible. First, succession on razed residential sites does not fit the descriptions of old field succession in the Midwest. Past land uses appear to significantly influence the rates and patterns of revegetation. As would be expected, revegetation in old gardens most closely resembles that observed in old fields. Establishment of native species in actual building sites is relatively rapid, and in lawns very slow. Species richness on old drives is relatively high, but consists mainly of exotic and/or weedy native species.

A few exotic species appear to retard recovery of sites and/or are spreading into surrounding natural communities. These include black locust, several species of honeysuckle, tree of heaven, and multiflora rose. Means of eradicating and/or controlling the spread of these species deserve further attention. For example, Kentucky blue grass and fescue lawns are found to be persistent for a minimum of 10 years and to retard establishment of native species. Thus, methods to decrease the dominance of these lawn grasses are being investigated, including testing the effects of fire and stratification.

Also, the proximity and quality of seed source correlates highly with species composition within the disturbed site. For example, if the area is surrounded by mature native communities, colonization by native species is rapid and vice versa. Finally, if the site is cleared of non-degradable materials and exotic species, topped with a layer of bare soil, and a quality seed source is adjacent to the site, recovery towards that of the surrounding natural community is rapid. The vegetation of the Lakeshore appears to have a high degree of resiliency.

Based upon these preliminary observations, the specifications for future demolition contracts are being modified to include stratification of lawns, removal of all non-biodegradable materials and long-lived exotic species. Also, the sites are being topped with native soil so as to provide an open habitat for establishment of native vegetation. In addition, the initial survey identified potential safety and health hazards (i.e. open cisterns, caved-in septic tanks). This information has aided administration in setting priorities for which sites would be cleared first.

The present prescriptions for the razing of residential sites at the Lakeshore will mostly likely be modified based upon additional insight gained from further studies and complete data analysis. However, the utility of the information gained from these studies already is apparent as a guide to the management of the Lakeshore's natural resources. There is reason to be optimistic that former residential sites eventually will blend in with their surrounding natural communities.

Hiebert is a botanist and Chief of the Science staff at Indiana Dunes NL.