

APPENDIX B

**INDEX OF ECOLOGICAL INTEGRITY (IEI)
INDIVIDUAL METRIC & COMPOSITE SCORES**

CITY OF HUDSON, OHIO

Excerpted from:

LAND CHARACTERIZATION STUDY, HUDSON OHIO (December 1996)

Prepared by ACRT, Inc.

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Introduction

The following excerpts and IEI scores are taken verbatim from the December 1996 report entitled *“Land Characterization Study, Hudson Ohio,”* which was prepared by ACRT, Inc. The complete report is available for review at the office of the Community Development Director.

“ACRT, Inc. conducted a land characterization study for the City of Hudson, Ohio during 1996. The study was performed for the entire 25-square mile area within the City of Hudson using numerical rating system to show the relative ecological values of both undeveloped and developed land. The system, called the Index of Ecological Integrity (IEI), is a relatively new concept being used by municipalities for land use planning. The IEI is similar to other more intensive ecological indices used to assess rivers and streams (Ohio Environmental Protection Agency, 1987) and wetlands (Andreas and Lichvar, 1995). . . .”

“The IEI is based on several criteria, or metrics, which are combined to form a composite score indicative of the general ecological quality of an area. Undeveloped land areas are delineated based on vegetation cover types, and developed areas are delineated according to development type and/or density. IEI values are based on aerial photographs as well as extensive field verification.”

Summary of IEI Metrics

“Each polygon [land area] is scored for several distinct criteria called metrics. . . .The following is a summary of each metric [for undeveloped areas within the City of Hudson].”

“Level of Disturbance. The range of potential scores is zero to four with zero indicating the greatest amount of human-induced disturbance and four indicating the least amount of human-induced disturbance. Level of disturbance considers the effect of human activities on the area with the polygon, and also considers human activities within adjacent polygons that impact the environment of the subject polygon. This metric is used for both developed and undeveloped areas. Examples of the range of scores include:

- 0 - Large shopping mall, industrial complex, or high-density residential.
- 1 - Low to middle density residential, cemeteries, agricultural land.
- 2 - Successional fields and other areas recovering from past disturbances.
- 3 - Immature forest or mature forest adjacent to development.
- 4 - Mature forest land or climax vegetation surrounded by other natural area.”

“Habitat Quality. The range of potential scores is zero to four with zero indicating little or no habitat available to wildlife and four indicating unique and valuable habitats essential for desirable wildlife. This metric is used only for undeveloped areas. Examples of the range of scores include:

- 0 - Little or no available habitat for desirable wildlife.
- 1 - Limited cover or food sources for wildlife.
- 2 - Mid-successional habitats with acceptable levels of cover.
- 3 - Climax successional habitats requiring extensive time to develop.
- 4 - Exceptional habitat; nesting or breeding ground for rare, threatened, or endangered species; wildlife corridors.”

Species Diversity. The range of potential scores is zero to four with zero indicating habitats dominated by monocultures and four indicating a rich mix of flora or fauna. This metric is used only for undeveloped areas. Examples include:

- 0 - Agricultural fields.
- 1 - Old fields with few trees.
- 2 - Even aged forests dominated by pioneer species.
- 3 - Uneven aged forests with developed canopy and understory.
- 4 - Exceptionally diverse forests and wetlands.”

Hydrology. The range of potential scores is zero to four. This category considers the physical attributes of an area relative to the movement of water. It does not consider the biological attributes of wetlands, such as wildlife habitat. This metric is used only for undeveloped areas. Examples include:

- 0 - Barren fields and open soil.
- 1 - Upland fields.
- 2 - Forested uplands adjacent to wetlands.
- 3 - Forested wetlands.
- 4 - Natural wetlands serving as flood control basins.”

“In addition to the four metrics used in scoring undeveloped areas, two classes of qualifiers are used: *Impact on Adjacent Areas.* This qualifier class recognizes that land use types may impact the quality of the environment in adjacent areas. The potential scores are as follows:

- -1 - Characteristics of polygon negatively impact adjacent areas, such as agricultural lands immediately adjacent to a stream.
- 0 - Characteristics of polygon have no significant impact on adjacent areas, such as a hardwood forest adjacent to a coniferous forest.
- +1 - Characteristics of polygon positively impact adjacent areas, such as an open field providing edge habitat to a surrounding forest.”

Water Quality. For wetland polygons or polygons with included streams, water quality is considered. The potential scores include:

- -1 - Water quality is poor, such as a retention pond associated with a residential subdivision or an industrial development.
- 0 - Water quality is average.
- +1 - Water quality is superior, such as a stream flowing through a natural area.”

“The scores of the metrics are combined to form the composite IEI value.”

Individual Metric & Composite IEI Scores for Undeveloped Areas

The following attachments show the individual and composite IEI scores for undeveloped areas within the City of Hudson.

**Attachment 7:
COMPOSITE IEI SCORES FOR UNDEVELOPED AREAS**

COLOR REPRODUCTION OF UNDEVELOPED COMPOSITE HERE