Draft Final Report

# CRITICAL LAND USE AREAS IN OHIO: AN OVERVIEW

July 31, 1975

Ohio Department of Natural Resources

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on

# CRITICAL LAND USE AREAS IN OHIO: AN OVERVIEW

COASTAL ZONE INFORMATION CENTER

to

OHIO DEPARTMENT OF NATURAL RESOURCES

July 31, 1975

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TABLE OF CONTENTS

Page

CHAPTER 1: INTRODUCTION

Objectives and Scope . . . . . 3

Report Contents . . . . . 4

CHAPTER 2. CONSIDERATIONS FOR IDENTIFYING CRITICAL AREAS IN OHIO . . . . . 6

Critical Areas Definition . . . . . 6

Classification of Critical Areas . . . . . 7

Types of Areas and Facilities Included in Other Programs . . . . . 8

Criteria for Identifying Generic Categories of Critical Areas and for Identifying Specific Candidate Areas Within the Generic Categories . . . . . 11

Criteria Structure . . . . . 12

Discussion of Criteria and Rationale for Their Selection . . . . . 14

Application of Generic Criteria . . . . . 29

CHAPTER 3: CONSIDERATIONS IN FORMULATING A CRITICAL AREAS PLANNING PROCESS . . . . . 34

Present Government Role in Ohio Land Use Planning . . . . . 35

State Programs . . . . . 36

Regional/Local Planning . . . . . 37

Federal Activities Affecting State Land Use Planning . . . . . 41

Critical Areas Planning Process in Other States . . . . . 45

Minimum Components of a State Critical Area Program . . . . . 48

Alternative Critical Area Planning and Regulation Structures . . . . . 51

Criteria for Evaluating Alternative Ohio Critical Area Planning and Regulation Structures . . . . . 56

TABLE OF CONTENTS
(Continued)


Page

Evaluation of Alternatives . . . . . 60

CHAPTER 4: ALTERNATIVE MEANS FOR MANAGING CRITICAL AREA LAND USE . . . . . 62

Police Power . . . . . 64

Acquisition of Interest in Lands . . . . . 72

Development Controls . . . . . 76

Incentives/Disincentives . . . . . 77

Criteria and Evaluation . . . . . 82

CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS . . . . . 87

APPENDIX A: SUMMARY OF CRITICAL AREA CATEGORIES AND DEFINITIONS FROM OTHER LEGISLATION AND PROGRAMS . . . . . A-1

APPENDIX B: PRELIMINARY ANALYSIS OF GEOGRAPHIC AREAS AND FACILITY TYPES . . . . . B-1

## LIST OF TABLES


Page

Table 1. TYPES OF FACILITIES AND GEOGRAPHIC AREAS INCLUDED IN OTHER STATE CRITICAL AREAS LEGISLATION OR PROGRAMS. . . . . 9

Table 2. CONSOLIDATED LIST OF GEOGRAPHIC AREAS AND FACILITIES . . . .10

Table 3. GENERIC CATEGORIES SELECTION CRITERIA. . . . . .15

Table 4. SPECIFIC AREA AND FACILITIES SELECTION CRITERIA. . . . . .24

Table 5. SUBJECTIVE EVALUATION OF FACILITIES AND GEOGRAPHIC AREAS . .30

Table 6. POTENTIAL ROLES OF GOVERNMENT IN A CRITICAL AREAS PLANNING AND REGULATION PROCESS. . . . . .50

Table 7. SUBJECTIVE EVALUATION OF RELATIVE RANKINGS OF PLANNING/REGULATION SCENARIOS. . . . . .61

Table 8. SUBJECTIVE EVALUATION OF GENERAL APPROPRIATENESS OF REGULATION TECHNIQUES FOR CRITICAL AREAS. . . . . .85

Table A-1 CLASSES OF CRITICAL AREAS. . . . . .A-2

Table A-2 TYPES OF CRITICAL AREAS. . . . . .A-3

Table B-1 OHIO NATURE PRESERVES WHICH INCLUDE VIRGIN OR NEAR VIRGIN FOREST . . . . . .B-3

Table B-2 WETLANDS INVENTORY OF OHIO: 1972-74 . . . . . .B-12

Table B-3 INVENTORY OF LAKE ERIE MARSHES . . . . . .B-13

Table B-4 AIRPORTS ON RECORD WITH FAA, DECEMBER 31, 1962-1971. . . . .B-49

Table B-5 MAJOR RESERVIORS IN OHIO . . . . . .B-55

# MANAGING CRITICAL LAND USE AREAS IN OHIO: AN OVERVIEW

## CHAPTER 1: INTRODUCTION

The term "land use" is rapidly becoming a cliche. Strictly speaking, land use refers to the activities or conditions associated with specific land parcels. More broadly, the term implies the complex spectrum of environmental, institutional, legal, and economic processes associated with public and private development or preservation decisions. It is this latter context that is the focus of increasing national, state, and local concern. This report is an attempt to relate on-going land use concerns to Ohio. More specifically, the report focuses on the issue of critical areas, as called for in a variety of national land use bills debated in recent years.*

Defeat of the 1974 Land Use Policy and Planning Assistance Act has probably only delayed the passage of some form of a National Land Use Bill. What form this legislation will take is uncertain. Recent discussions by U.S. Department of Interior officials, however, indicate conformance with certain basic principles including**

- States must be the main implementing agency of a land use program
- Legislation must focus on process rather than specifics
- Legislation must have a critical areas protection orientation

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* For example, Section 203 (a) (3) and Section 204 of the proposed Senate version of the Land Use Policy and Planning Assistance Act (S.268) called for states to develop methods of implementation for exercising control over land use in areas of critical environmental concern, in areas adjacent to key facilities, and in areas intended for large scale development. The proposed bill also called for methods of assuring that local regulations do not arbitrarily or capriciously restrict or exclude developments of a regional benefit.

** Guidelines for future land use legislation presented to Council of State Governments National Land Use Task Force in Lexington, Kentucky, Land Use Planning Reports. September 23, 1974, p 2.

- Legislation must contain requirements for implementation of land use programs
- The federal role must provide for review of state land use planning processes
- The federal role must not include federal identification of areas of more than state concern
- Legislation must recognize a federal constituency and include planning, programming, and budgeting provisions to meet their needs.

The focus on land use problems can be viewed as a logical outgrowth of the rising environmental consciousness of the last several years. Conceptually, land use patterns are shaped by a variety of interacting forces. Historical location of urban centers in the eastern U.S. was influenced strongly by proximity to water transportation, food supply, and raw materials. Development of the railroads and later the Federal-state highway systems has further defined the distribution, density, and composition of land use. Major factors shaping land use, today and in the foreseeable future include:

- Financial incentives/disincentives relative to property taxes, depreciation, capital gains, etc.
- Transportation technology and costs including food prices
- Rising real income and preferences for suburban living and second homes
- Fragmentation of governmental jurisdiction
- Demands for development of natural resources (mining of coal, oil, shale, etc.)

Poorly planned land use has many direct and indirect costs to governments, businesses, and private citizens. These costs include:

- Increased cost of providing public services (water, sewer, roads) due to urban sprawl as well as increased energy consumption
- Congestion of public facilities resulting in time costs (or excess fuel consumption in the case of auto traffic)

- Alteration of drainage patterns resulting in increased frequency of flooding damages, erosion, and deterioration of water quality
- Public and private expenditures for damage relief in natural hazard areas (flood plains, shore erosion areas)
- Loss of critical wildlife habitat resulting in declines or change in composition of commercial and sport species
- Deterioration of anemity values including natural and urban landscapes and quietude due to poor planning and regulation of incremental development decisions
- Loss of ready access to certain types of natural outdoor recreation areas
- Distruction or deterioration of historic and cultural areas
- Concentration of air and water pollutants.

The above list is neither exhaustive nor highly original. It relates to well known problems under discussion in a variety of public and private forums. Federal, state, and local governments already engage in a variety of responses to these types of problems. Future Federal legislation is expected to focus on the concept of critical areas (key facilities, large scale developments, and significant resource areas), development of planning processes, and the state rather than the Federal government as the focus for power. This report attempts to provide an overview of the major aspects of critical areas and planning process as they relate to Ohio. Many of the concepts and alternatives presented in this report are developed in greater detail in other state or Federal reports dealing with critical areas. The reader is referred to these documents as appropriate throughout this report.

## Objectives and Scope

The overall purpose of this report is to take a first cut at the subject of critical areas in the state of Ohio. It is not intended

as a detailed analysis of any of the many issues relative to land use in as state as complex as Ohio. Rather, it is intended to provide broad guidelines and investigation of potential considerations. Within this broad purpose, the report attempts to meet the following objectives:

- Establish criteria for identifying categories and specific candidates for consideration as critical areas in Ohio
- Assess alternative planning processes relative to the establishment of a critical areas program in Ohio
- Identify and evaluate the spectrum of land use management and control techniques relative to the problems of specific critical areas.

Because of the spectrum of subjects covered in this report, the scope must necessarily be highly general. The report attempts to identify alternatives, raise issues, present concepts, and specify potential criteria for dealing with the many issues that the problem of critical land use area management raises. The report, therefore, is intended to point the direction toward further work including inventory and analysis of specific types of critical areas as well as the legal and institutional basis for the regulation and management of critical areas by local, regional, or state government.

## Report Contents

The report is divided into four chapters and two appendices. In Chapter 2, background relative to the definition of critical areas and the types of areas to be considered in Ohio is presented. The chapter discusses the concept of necessary and sufficient conditions for identifing generic categories of critical areas for inclusion in a possible Ohio critical areas program. Chapter 3 discusses alternative planning processes relative to a state critical areas program and Chapter 4 presents alternative combinations of regulatory and management mechanisms for guiding land use in identified critical areas. The appendices present background material on critical areas in other states, and an

application of the criteria to the list of potential critical areas developed from the review of other state programs, Federal lists, and considerations particular to Ohio.

## CHAPTER 2. CONSIDERATIONS FOR IDENTIFYING CRITICAL AREAS IN OHIO

This Chapter present four key elements needed in the development of a critical areas program. These are:

- A definition of critical areas
- A classification of types of critical areas
- An initial list of areas
- A set of criteria for determining categories of areas that may contain candidates for consideration as critical.

### Critical Areas Definition

The starting point for considering a critical areas program is the definition of critical areas. A critical area was defined in one version of the proposed National Land Use Act as

> "Areas of critical environmental concern means areas as defined and designated by the state on non Federal lands where uncontrolled or incompatible development could result in significant damage to the environment, life or property, or the long term public interest which is of more than local significance.".*

A variety of types of areas were included within this definition such as fragile or historic land, natural hazard lands, renewable resource lands, or additional areas as determined to be of critical environmental concern by the states. A recent report produced by the Council of State Governments* stresses the role of critical areas as a workable method for initiating states' involvement in a field which almost all responsibility has been delegated to local government. The report emphasizes the role the state can play in increasing the beneficial use of land by dealing with problems that are not presently handled adequately at the local level or at least problems that are not dealt with locally. It emphasizes the importance of not duplicating local actions at another level, not increasing the cost of land development unnecessarily and without creating a time consuming inefficient administrative procedure for making land use decisions.

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* Land Use, Policy and Program Analysis, Issues and Recommendations/State Critical Areas Program, The Council of State Governments, Lexington, Kentucky (1975).

For purposes of this report, critical areas will be defined as follows:

> Carefully selected areas of the state of Ohio in which present or potential patterns, intensities, or types of land use are in conflict with broader established regional or public values or welfare and for which the probable degree of local governmental regulation is inadequate to protect the given public values on welfare.

The importance of this definition is the emphasis on carefully selected areas and on the conflict between broader public values and the ability of present public regulation to deal with threats to those values. The definition is sufficiently broad to cover the spectrum of possible areas that are likely under given circumstances to be critical for Ohio concerns.

## Classification of Critical Areas

Critical areas can be grouped in many ways. It is important, however, that any classification system be simple and all inclusive. For example, the American Law Institute classifies critical areas under three headings. These are:*

(1) Some areas of a state can be identified as critical because of their natural resources or characteristics of land in either its original state or its present status of development. Any future development in such areas becomes a matter of concern to the state, or at least to an area extending across several local jurisdictions.

(2) Conversely, some types of development almost always become matters of state or regional concern, regardless of their location and the natural or man-made conditions found there.

(3) Some types of development will range from local to areawide or state impact depending on size or scale.

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* American Law Institute, "A Model Land Development", Tentative Draft No. 3, Philadelphia, Pennsylvania (1971) pp 5-6.

For purposes of this analysis, two classifications of types of state concern are proposed. These are:

- Geographic areas of the state in which piece meal or large scale development threatens their environmental, historic, clutural as aesthetic integrity
- Public and private facilities or developments which, because of their operational characteristics or scale are likely to cause significant land use problems or environmental changes regardless of their location.

This classification corresponds approximately to the American Law Institute breakdown as described above. Because of the complexity of critical land use problems, it is probably most practical to have only a simple classification separating natural areas which are fixed in location from mobile types of land use activities which can be located in a variety of areas and can cause problems in those locations. This two-part classification is used throughout this report as the basis for developing criteria and classifying potential areas for consideration in a critical areas program.

## Types of Areas and Facilities Included in Other Programs

Development of a list of potential candidates for consideration in Ohio naturally starts with areas selected both at the Federal level and from other state programs. Table 1 summarize the categories and types of areas included in other state programs, other state legislation, and proposed Federal legislation. A discussion of these definitions and elaborations on these tables are presented in Appendix A. The purpose of presenting the list at this point is to show the diversity of types of facilities and natural areas considered in a variety of other programs. Any list such as this is recognized as being arbitrary and representing various levels of generality. This list was further refined in an attempt to provide consistently general categories as is shown in Table 2. These categories and facilities are proposed as appropriate for consideration and evaluation relative to Ohio topographic conditions and Ohio economic development. In attempting to cover such a wide spectrum of activities and types of geographic areas,

TABLE 1. TYPES OF FACILITIES AND GEOGRAPHIC AREAS INCLUDED IN OTHER STATE CRITICAL AREAS LEGISLATIVE OR PROGRAMS

| Facilities | Geographic Areas |
|---|---|
| New Communities | Rare/Fragil Ecosystems |
| Large Residential Subdivision | Wildlife/Waterfoul Refuges |
| Large Apartment/Townhouse Complexes | Interior Wetlands |
| Regional Shopping Centers | Coastal Wetlands |
| Large Office Parks | Coastal Dunes and Beaches |
| Industrial Parks | Mountain Lands |
| Major Industrial Plants | Flood Plains |
| Sports/Recreation Complexes | Steep Slopes |
| Petroleum Storage Areas & Pipeline RW. | Acquifer Recharge Areas |
| Electric Power Generation Plants & Transmission Line R.W. | Watersheds-Public Water Supply |
| Surface Extraction of Minerals | Urban Fringe |
| Underground Mining | Productive Farmland |
| Hospitals | Productive Forestland |
| Educational Institutions | Unreclaimed Mined Land |
| Airports | Sig. Mineral Deposits |
| Large Water Impoundments | Scenic Rivers |
| Lake/River Ports | Natural Parks/Monuments |
| Interstate/Limited Access Highway R.W. & Interchanges | State Parks |
| Urban/Mass Transit R.W. and Stations | State Forests |
| Water Treatment Plants and Distribution Line R.W. | Significant Public Open Space |
| Sewage Treatment Plant and Collection Systems | Scenic Highway Corridors |
| Solid Waste Disposal Sites | Historic/Cultural Sites |
| Other Major Public Development | Significant Archeological Sites |
| | Unique Geologic Formations |

Table 2. CONSOLIDATED LIST OF GEOGRAPHIC AREAS AND FACILITIES

## FACILITIES

- Power Plants & Facilities
- Airports & Facilities
- Medical Facilities
- Interurban Railroads & Facilities
- Regional Educational Institutions
- Reservoirs
- Sewage Treatment Plants
- Interstate Highways
- Ports
- Shopping Centers
- Industrial Plants & Parks
- New Communities
- Sports/Recreation Complexes
- Mineral Extraction Processing Transmissions
- Mass Transit Rights-of-Way, State, etc.
- Vacation/Second Home Developments
- Residential/Apartment & Other Planned Unit Developments
- Office Parks Complexes
- Solid Waste Disposal Sites

## GEOGRAPHICAL AREAS

- Rare or Fragile Ecosystems
- Interior Wetlands
- Coastal Wetlands
- Coastal Dunes and Beaches
- Flood Plains
- Erosion Areas, Steep Slopes, Geologically Unstable
- Aquifer Recharge Areas
- Farmland
- Geologic Formations
- Farmland
- Forestland
- Unreclaimed Steep Areas
- Areas with Air & Water Pollution Problems
- River Corridors

State & National Parks, Monuments

- Scenic Areas
- Historic Areas & Sites
- Archeological Sites

it is impossible to be all inclusive or necessarily always internally consistent. The list is proposed merely as a starting point in considering types of areas and facilities that could be included or should be included in a critical areas program for the state of Ohio. It is entirely possible that additional categories would be added to this list at a future date or categories combined or recombined in ways to reflect broader levels of generality and internal consistency. At this stage in the development of the concepts relative to critical areas, it is deemed inappropriate to provide any further refinements.

In the next section, criteria are proposed for screening this general list for categories that contain potential candidates for consideration as critical areas. These criteria serve as the basis for focusing attention on specific types of areas of state concern and further in identifying specific candidates within the general categories.

## Criteria for Identifying Generic Categories of Critical Areas and for Identifying Specific Candidate Areas Within the Generic Categories

The purpose of this section is to specify criteria for identification of critical areas in the state of Ohio. The section presents a proposed set of criteria, a structure for their use, and justification for the criteria that were selected.

In conjunction with growing national concern over land use, several states have begun to deal directly with local and regional land use problems. For states such as Ohio, this task will not be an easy one. Ohio is a highly complex state containing several major urban areas, a strong and well developed industrial base, and an important agricultural sector. The state is characterized by diversity of topographic features and types of land use. Lake Erie and the Lake Erie coast on the north play an important role in Ohio's economy. The coastal areas also is an integral part of the Lake Erie aquatic ecological system and related terristrial systems. The Ohio River along the eastern and southern border of the state has also been essential to the development of Ohio and its neighboring states. Ohio is a rich agricultural state with much of its land area devoted to a variety of crops and livestock. The eastern and southeastern areas of the state are characterized by the wooded foothills of the Appalachians and by extensive surface and underground coal mining.

In short, Ohio is a populous, well developed state with a variety of natural assets and an equal variety of land use problems. Selection of critical areas within this context is likely to be a long and difficult task. At a minimum, it will require a concensus on the part of a variety of private interests and on the part of a variety of local and state governmental jurisdictions. The diversity of problems and the diversity of topographical and related ecological features in Ohio probably precludes any blanket approach to the issue of critical land use areas. What are needed, are consistent criteria which, on the one hand, are general enough to cover the spectrum of cases that will be encountered, but on the other hand, specific enough so that a basis for selection of only the most significant areas can be established. This section proposes a procedure for critical areas identification using the concept from logic of necessary and sufficient conditions.

## Criteria Structure

The purpose of using a criteria structure based on the concept of necessary and sufficient conditions rests on the need for a variety of factors which indicate the criticality of a given category of geographic area or type of facility. The concept of necessary and sufficient conditions is based on the disciplines of logic and mathematics. The basic concept is that, if a certain condition or set of conditions is determined to be true or to hold, this implies that a dependent condition also holds or is true. A sufficient condition is one which, if it holds, it alone guarantees the occurrence or existence of the dependent or second condition. Any number of conditions may be sufficient to guarantee a dependent or second condition. On the other hand, a condition is termed necessary, if without this condition, a dependent or secondary condition cannot hold or be true. A necessary condition, however, is not enough to guarantee the existence of the dependent or secondary condition. A set of necessary conditions which, taken together, guarantee the dependent or secondary condition are said to be necessary and sufficient. The use of this type of approach has one major advantage. It allows for certain conditions (those conditions that are sufficient) to automatically indicate the criticality of an area or facility. At the same time, by requiring other areas to qualify on the basis of a combination of conditions, a degree of selectivity can be

introduced into the identification procedure. This structure will become more apparent after the presentation of the criteria below.

The structure for using the proposed criteria can be presented in a schematic form as is shown in Figure 1 below.

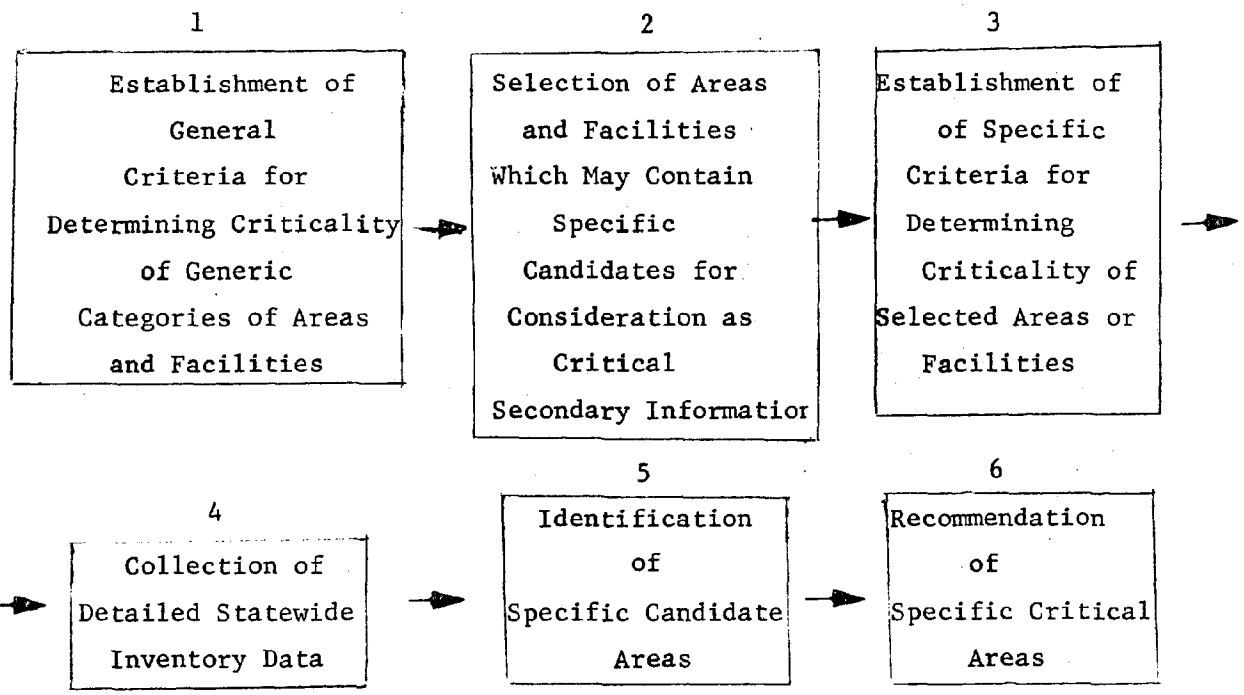


FIGURE 1. IDENTIFICATION PROCESS

The criteria are divided into two separate sets. The first set (Labeled 1 above) are used as the basis for reviewing a comprehensive list of types of areas and types of facilities for their potential for containing specific areas or facilities which would be considered critical. Application of the criteria would be conducted on the basis of available secondary information. Screening of the comprehensive lists produces proposed types areas and types facilities which are considered to contain candidates for designation as critical areas. Once a types of areas and types of facilities have been specified, a second set of criteria are used in reviewing detailed statewide inventory and relevant data for candidates for designation as critical areas. The general and specific criteria serves a further purpose of structuring the data collection process and in indicating what types of areas require further work and research before recommendations can be made on designation as to criticality. The proposed criteria for identifying types of areas and types

* This identification structure does not relate to any particular planning process. Discussion of alternative planning processes will be presented as a later working draft. The above identification process may serve as useful basis for evaluating alternation planning structures.

of facilities and for specifying candidates within these categories are presented in Table 3. Justification and reasons for including each of the proposed criteria is presented immediately following the criteria list. The criteria are organized as follows:

Generic Categories Selection Criteria

- Geographical Areas
  - Sufficient Conditions
  - Necessary Conditions
- Facilities
  - Sufficient Conditions
  - Necessary Conditions

Specific Area and Facilities Selection Criteria

- Geographical Areas
  - Sufficient Conditions
  - Necessary Conditions
- Facilities
  - Sufficient Conditions
  - Necessary Conditions

## Discussion of Criteria and Rationale for Their Selection

The table provides a sketch of the proposed criteria structure and content. The reasons for selection and ordering of the criteria are discussed in some detail below.

## Generic Categories Selection Criteria

These criteria are intended to be used in screening the comprehensive list of facilities and types of geographical areas using available secondary information. The screening is intended to identify those general types of areas and types of facilities which may contain, under certain conditions, candidates for consideration as critical areas. Geographical areas and facilities are discussed separately below.

Geographic Areas. Geographic areas include all of those areas identified through review of other state programs, other state legislation, federal legislation, and from general principles related to resource manage-

TABLE 3. GENERIC CATEGORIES SELECTION CRITERIA

| | | |
|---|---|---|
| **GEOGRAPHICAL AREAS** | | |
| **Proposed Sufficient Conditions Which Indicate Potential Criticality** | | |
| Habitat for Endangered Species | : | Area provides habitat for rare and/or endangered species of plants or animals. |
| Future Public and/or Private Costs | : | Unplanned development in the area will lead to unnecessary but predictable future public and private costs due to natural hazards |
| Extreme Environmental Deterioration | : | The area or region is severely degraded environmentally due to past practices and development. |
| **Proposed Necessary Conditions Which in Combination Indicate Potential Criticality** | | |
| Growing Scarcity in Ohio | : | Trend in abundance of areas of constant quality regionally, statewide, or nationally of the given type is steadily downward. |
| Private Sector Supply Response | : | No significant present or potential private market forces operative for ensuring long-run environmental integrity, quantity, and distribution of this type of area. |
| Governmental Programs | : | No present effective comprehensive governmental programs for ensuring the long run environmental integrity and adequate quantity and distribution of this type of area. |
| Sensitivity and Irreversibility | : | Environmental integrity or accessibility of this type of area easily destroyed by combined piecemeal development over time (in or near the area) or by large scale projects and their induced secondary developments (in or near the area). |

TABLE 3. (Continued)

| | | |
|---|---|---|
| Development Pressure | : | Area or surrounding area is typically subject to a variety of development pressures which substantially alter area's environmental integrity. |

FACILITIES

Proposed Sufficient Conditions Which Indicate Potential Criticality

| | | |
|---|---|---|
| Site Scarcity | : | Sites meeting the locational requirements for vital* public or semi-public services are becoming increasingly difficult to obtain due to technical, economic, environmental, and external safety requirements. |

Proposed Sufficient Conditions Which Indicate Potential Criticality

| | | |
|---|---|---|
| Secondary Developments | : | The facility typically induces or substantially shapes distribution and concentration of secondary development including commercial, industrial, or residential activities. |
| Environmental Problems | : | Construction and/or operation of existing or new facility itself may create significant environmental problems including air and water quality deterioration, ecological damage, aesthetic impacts, noise, and congestion. |
| Past or Likely Future Construction | : | There has been or is likely to be significant new construction of this type of facility in the state in both the short and long run. |
| Distribution of Sizes | : | This type of facility may include projects of significant physical scale or number of construction/ operation employees. |

Vital: defined as services or facilities which are essential to the operation of the regional, state, or national economy and for which there are few, if any, economically feasible substitutes.

ment. They were presented in Table 2. The list is recognized as being arbitrary, but is presented simply as a device for identifying the types of possible areas that may contain candidates for designation as critical.

Sufficient Conditions. A sufficient condition is one which, by itself, guarantees or suggests criticality. There may be several conditions which in themselves are sufficient for indicating criticality. They are not dependent, however, on each other for the determination of criticality of a given geographic area. For geographic areas, it is porposed that there should be three independent sufficient conditions, which if any one holds indicates the critical nature of the general type of area. These are:

- Habitat for endangered species: While the direct relation between survival of specific endangered species of plants and animals and man's welfare can be debated, there is increasing nation and worldwide emphasis being placed on the preservation of remaining wildlife. The problem and the growing concern have been recognized nationally in the form of the 1966 Endangered Species Preservation Act as amended in 1969 by the Endangered Species Conservation Act. An analysis and evaluation of the effectiveness of these acts is provided by Reitz in Environmental Planning: Law and Resources. While overharvesting a particular species has seriously dessimated many populations, loss of habitat through various forms of pollution and outright preemption by development represents the most significant threat to the long-run survival of many terrestrial and aquatic species. The value of preserving these species cannot be readily quantified or put in monetary terms but it is commonly agreed that our knowledge of particular species and their roles in overall life support systems is woefully inadequate. Further, the role of these species in scientific and educational research relative to man's welfare is another justification for the preservation and maintenance of diversity in our natural environment. It is on this basis, that the criteria relating to preservation of habitat supporting an endangered species in Ohio be considered a sufficient condition for consideration of an area as potentially critical. If this condition is determined to hold for a type of area, it should suffice for consideration of criticality of specific locations within the state.

- Future public and/or private costs: Man often develops geographic areas which over longer time periods are subject to natural forces destructive

of man-made improvements. Advances in the state of the art in prediction of natural occurrences as well as accumulated knowledge in specific locations has increased our ability to predict which areas are likely to be subject to natural events that are destructive. Examples include earthquake zones, coastline subject to hurricane wind and water damage, flood plains, areas of shoreland or shoreline erosion and areas of unstable soil conditions. Other destructive natural events are difficult to predict and can strike over broad geographic regions, tornadoes being a case in point. Assuming that it is possible through sound land use planning and development, to minimize the future damages associated with some natural events, it is in the long-run interest of both the private and public sectors to do so. Often the costs associated with restoration of areas damaged in natural catostrophics is born by the taxpayer and the general public. Minimizing such public and/or private costs balanced against the measures to avoid future damages is generally considered in the long-run interest of the state and nation. On this basis, it is proposed that those types of categories relevant to Ohio which contain predictable hazards be a sufficient condition for consideration as a type, of area containing candidates for designation as critical.

- Extreme Environmental Deterioration. There are areas of the nation and the state which, for a variety of reasons, are severly degraded environmentally. This degradation may include severe intermittent or continuing air and water quality problems, and degradation of the productive capacity of the land due to soil erosion, loss of vegetation cover, change in chemical constituents of the soil, or other factors related to the ability of the land to support natural and/or domestic plant and animal life. Though most areas of Ohio have been altered as a result of human development over the last two centuries, there may be areas whose environmental conditions are deteriorated to the point at which there is danger to human health and to the long-run usefulness of the area for direct and indirect human welfare. Standards and criteria are necessary for determing at what level an area is considered severely degraded, air and water quality standards being cases in point. Using such existing standards or standards that will be developed in the future, it is proposed that severe environmental degradation of an area be a sufficient condition for its consideration as critical. The

Necessary Conditions

The proposed necessary conditions for indicating criticality for geographic areas are discussed on the next page. A necessary condition is

one which is required for a type of area or facility to be considered critical, but which alone does not guarantee criticality. The list of necessary conditions taken together, however, are proposed as guaranteeing the potential of a geographic area as containing candidates for criticality. In other words, the necessary conditions taken together are sufficient to guarantee the criticality. The criteria are:

- Growing scarcity. Total land surface in the state is essentially fixed in supply. The quantity and distribution of natural features, both physical and living, does change in abundance in response to broader natural forces as well as to the activities and developments of man. As population and level and distribution of economic activity grow, many of the natural features associated with our environment become increasingly scarce. The same is often true for cultural assets.* Growing scarcity implies growing value associated with incremental losses of such natural or man-made assets or attributes (other things equal). The values may be either in monetary terms such as the rising real value associated with water-front properties or may be in more subjective or nonmonetary terms in the sense of values associated with scenic areas, wildlife appreciation, or outdoor recreation. Where natural assets or other attributes are not becoming scarce, relative to use, incremental losses of such areas would be of less concern from a public and private perspective. Thus, it is proposed that one necessary condition for consideration as critical be the total regional, state, and/or national long-run trend in the acreage or availability of the specific category under consideration. Growing scarcity would thus be one of the necessary conditions but not necessary and sufficient in itself.

- Private sector supply response. Growing scarcity does not in itself imply criticality because of the economic and social forces that may act to maintain a particular type of land area in uses associated with the attributes or services valued. With growing scarcity, there may be a private sector response in terms of increased monetary values associated with the goods or services produced from such lands. This normally results in a commitment on the part of corporations or individuals to maintain adequate acreages for providing the goods or services that are desired. Where such

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* Cultural assets in the context of this study would include historic areas, high quality architecture, archaeological sites, etc.

mechanisms do not exist or are ineffective relative to the level of perceived need or demand for such areas another proposed necessary condition exists for consideration of criticality. Again, scarcity and lack of private supply response are both necessary conditions but are not complete to guarantee criticality; i.e., the two taken together are not sufficient to guarantee criticality.

- Governmental programs. Even with growing scarcity and lack of private sector response to a land use or land use related environmental problem, government response at the local, state, and national levels may provide adequate quantity and distribution of types of areas of concern. The word "adequate" is obviously ambiguous in this context, but each land use related problem must be evaluated on a case-by-case basis for the level and sufficiency of government response. Where governmental programs are generally agreed to be insufficient to meet the nature of the land use problem or if there are no government programs, it is proposed that this lack be another necessary condition for reviewing general categories of geographic areas for potential candidates for criticality.

- Sensitivity and Irreversibility. The carrying capacity for human development of various types of land varies due to a number of factors including type of plant life, species dependent on the area, soil and water table conditions, slope, and relation of the area to larger hydrologic and ecological systems. A major concern in this criteria is that piecemeal or large scale development in or near the specified area seriously degrades the attributes or natural relationships which determine the integrity of the area. Thus, another necessary condition that is proposed is the sensitivity and irreversibility of damage caused by development to the area.

- Development pressure: Certain types of categories of geographic areas may be more subject to development pressures than others. Development pressure may be due to the areas attractiveness, its low cost relative to the value that can be obtained from altering it, or the existence in the area of valuable materials or minerals. The area also may traditionally be in the proximity of large population centers which in themselves create development pressure in terms of demands for residential and commercial areas as well as transportation corridors and lcoation for industrial plants. It is proposed that well known and documented development pressures on the category of area be a necessary condition for consideration as containing candidates for criticality.

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The five necessary conditions taken together are proposed as being sufficient for qualifying a type of area as containing candidates for consideration as critical. The type of area may be critical if, in a broader context, it is increasing in scarcity, there is no significant private sector response to this growing scarcity and governmental programs are nonexistent or inadequate, if the particular type of area is considered ecologically or physically sensitive to development and it it is typically subject to variety of development pressures. It is proposed that if all of these conditions hold, a general category of geographical area be considered to have specific candidates for designation as critical.

Facilities. Facilities include a arbitrary list of major public and private investments identified through review of other state programs, national legislation, and general activity related to regional economic development and growth. (The list is presented in Table 2).

Sufficient Conditions. The basis and rationale for sufficient conditions has been discussed previously under the geographical areas discussion. Only one condition appears to be important enough to be considered sufficient in itself for suggesting potential criticality. In general, the issues related to facilities focus on the availability of adequate sites for large scale facilities and the disruptive nature of the facility and its secondary development relative to adjacent land use. The disruptive aspects are grouped under necessary conditions and the site scarcity issue is discussed below as a sufficient condition.

- Site Scracity: Requirements relative to the present national energy problem, transportation requirements, or land for other facilities that are essential for the operation of regional, state, or the national economy often require sites with specific and well defined characteristics. The benefits from such large scale facilities are generally to a broader region or to the nation as a whole, but many of the technological and social costs are born in or near the facility itself. The disparity between economic and monetary benefits and nonmonetary social and environmental costs creates an obvious conflict between local and broader regional or national interests. For facilities with these potential conflicts site scarcity is proposed as a sufficient condition indicating potential criticality.

Proposed necessary Conditions. The definitions and rationale for necessary conditions has been discussed previously. For facilities, four conditions are proposed which in combination indicate the potential that a given category may contain specific critical areas.

- Secondary Developments. Certain general types of facilities typically induce or substantially shape the distribution or concentration of secondary commercial, industrial, residential, or public development. Because secondary development is often poorly anticipated or unplanned, the disruption to the environment, the creation of future congestion or related land use problems and the need for additional public costs and expenditures must be considered. Secondary development is particularly likely where a facility acts as an attractant creating new markets for secondary business, where the facility lowers direct or indirect building costs, or where the facility increases accessibility of the area to larger population centers. For this reason, the potential for generation of secondary development is proposed as a necessary condition for identifying types of facilities that may contain candidates for criticality.

- Environmental Problems. Many existing and/or new facilities generate major environmental side effects of various types. These side effects include contribution to air and water quality deterioration of the region; direct ecological damage through preemption of habitat; aesthetic impacts due to size, scale, and design of the facility; noise associated with operations; and congestion related to input and output characteristics. Because land use, as broadly defined, relates to all these types of problems, it is proposed that facilities which are typically associated with significant environmental side effects be another necessary condition.

- Past and Future Construction. Importance of designating a type of facility as containing candidates for criticality will depend to a certain extent on past and future construction of such facilities in the state. For types of facilities which have not been or are not expected to be constructed in Ohio in the intermediate or long run, there is little relevance for their consideration in terms of criticality. On the other hand, there are types of facilities which because of trends in the economy, urban development, and technology, are likely to involve significant future activity. Forecasting this activity is obviously a major effort in itself, but there may be enough indicators which can be drawn on for specifying candidate types of facilities.

Predictions of likely future construcition is proposed as a necessary condition in combination with secondary development stimulus and nature of environmental problems associated with the facility.

• Distribution of Sizes. There are many types of facilities which meet some or all of the conditions specified above but are not of significant size to warrant consideration as containing potential candidates for designation as critical. The final necessary condition is proposed as a distribution of sizes which include projects of significantly large scale physically (in terms of plant, parking space, support facilities, etc.) or in terms of numbers of construction and/or operation related employs.

It is, therefore, proposed that four necessary conditions must exist before a type of facility is identified as containing potential candidates for criticality. The type of facility must induce or shape secondary development; create one of several environmental problems; be likely to see future construction in various locations in the state (or have had significant past construction in the state), and have a distribution of sizes which includes facilities on a very large scale*.

## Specific Area and Facilities Selection Criteria

These criteria are intended to be used in screening lists of specific facilities or specific geographic areas using adequate inventory data to identify those specific candidates which should be recommended for consideration as critical areas. The criteria are presented in Table 4. Geographical areas and facilities are discussed separately below. The write-up on geographical areas does not contain a large number of criteria. It may be impossible to specify criteria which cover the spectrum of cases and types of geographic areas and this means that specific criteria for each general type of geographic area will need to be developed.

Geographic Areas. Specific areas within a category or type of geographic area would presumably be identified through statewide inventory process. This list and relevant description of the characteristics of the areas would be the basis for reviewing and proposing the specific candidates which should be considered critical on the basis of the criteria presented below.

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* Large scale will have to be defined in the context of each particular type of facility.

Table 4

SPECIFIC AREA AND FACILITIES SELECTION CRITERIA

| Geographical Areas | |
|---|---|
| **Proposed Sufficient Conditions for Identifying Specific Critical Geographical Areas** | |
| Because of the complexity and diversity of problems related to geographical areas, no one condition appears to be sufficient for identifying a specific area as potentially critical. | |
| **Proposed Necessary Conditions Which in Combination Identify Specific Critical Geographical Areas** | |
| Development Pressure | : Specific area and immediately surrounding region subject to present or predictable future development pressure or related impacts. |
| Present Control | : Present local regional, state, or national governmental regulation in or around the specific critical area is inadequate to ensure area's long run environmental integrity or balanced development. |

Table 4 (Continued)

| | | |
|---|---|---|
| **Facilities** | | |
| **Proposed Sufficient Conditions for Identifying Specific Critical Facilities** | | |
| Proximity to Proposed Critical Geographical Area | : | The specific facility is in the immediate proximity to a proposed critical geographical area. |
| Scale of Facility Relative to Regional Absorptive Capacity | : | Direct and indirect public utility and service requirements generated by construction and operation of the facility and its associated secondary development greatly exceed present and planned regional/local capacity. |
| **Proposed Necessary Conditions Which in Combination Identify Specific Critical Facilities** | | |
| Proximity to Open or Undeveloped Areas | : | The facility is or will be located near presently open or undeveloped land. |
| Zoning and Master Plans | : | The area surrounding or adjacent to the facility does not have implemented zoning or an accepted master plan (or other regulation). |

Sufficient Conditions. The definition of sufficient condition has been given previously. For geographical areas, it does not appear that any one sufficient condition can be developed which would serve to identify specific candidates across the various categories of geographical areas. It would appear, rather, that a comprehensive list of necessary conditions, of which a few are specified below, will be more useful.

Necessary Conditions. The definition of necessary conditions has been given previously. At this stage, two necessary conditions have been identified for designating specific candidate areas for consideration as critical.

- Development Pressure. The obvious major threat to a critical geographical area is long term piecemeal development and/or development and spinoff effects associated with large-scale facilities. Development impact on the specific geographical area need not arise within its boundaries, but may occur in relation to changes in hydrologic systems, broader ecological systems, or other changes in land use adjacent to the specific area. Development in or near a critical area may either be an ongoing process or may be predictable based on changes in a region's economic structure, transportation system, or other factors leading to more intensive land use, population growth, and production of side effects from economic activity. It is, therefore, proposed that present or predictable development pressure be one necessary condition for the identification of specific candidates within geographical categories.*

- Present Control. Development pressure in itself is not sufficient to guarantee the criticality of a specific area. The degree of public regulation of the area and its surrounding buffer is proposed as the second necessary condition for designation of a specific area as critical. Where government regulation (zoning, ownership, easements, planning guidelines, etc.) do not appear to be adequate to meet the nature of the damages that may be caused by development, the second necessary condition for consideration as critical is proposed to exist.

Taken together, development pressure and lack of adequate regulation (either local, regional, or state, or national) are proposed as guaranteeing the critical nature of the specific area under consideration.

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* Development pressure will be defined in this context as a trend of increasing intensity of land use in the region and in or around the specific geographical area. Increasing intensity may mean more intensive agricultural practices, subdivision of an area, second home development, strip commercial development or any of a variety of capital or consumer durable developments.

Facilities. Specific facilities within a category or type of facility would be developed through a statewide inventory process.

Sufficient Conditions. The definition of sufficient conditions has been given previously. There are two proposed sufficient conditions either of which is proposed as indicating potential criticality of a specific facility.

- Proximity to Proposed Critical Georgraphical Area: The combination of any major facility in conjunction with location of a previously identified geographical critical area is proposed as a sufficient condition for designating the criticality of the specific facility.

- Scale of Facility Relative to Regional Adsorptive Capacity. One major concern associated with any large scale investment is the demand it generates for a variety of public or semipublicly provided services in a region. The facility and its secondary development can greatly exceed the ability of a local area to provide roads, schools, police and fire protection, and a spectrum of other services related to local government. While facilities and their secondary development also generates revenues accruing to the local government, the transition and disruption and pressures on local land use, if unplanned, can be disruptive of traditional values, overall environmental quality, and local community objectives. It is proposed that in those situations where the scale of a proposed facility greatly exceeds existing planned local/regional public service capabilities, that these circumstances be sufficient for consideration of a specific facility as critical.

Proposed Necessary Conditions. The definition of necessary conditions has been previously presented. It is proposed that two necessary conditions must exist in order to guarantee criticality of specific facilities.

- Proximity to open or Undeveloped Areas. Facilities located near open or presently undeveloped land have the potential for shaping development of that land depending on the characteristics of the facility and on other conditions of the locality and region. Open land near or around the facility does not guarantee future land use problems, but is proposed as one necessary condition for consideration of the specific facility as critical.

- Zoning and Master Plans (local regulation). The significance of a facility which will be located in or adjacent to undeveloped land is increased if that area does not have implemented zoning, an accepted master

plan, or planning process which adequately represents the various interests associated with the land. Lack of adequate regulation at the local or regional level surrounding a facility is thus proposed as a necessary condition for consideration of a specific facility as critical.

Existence of open space and the lack of control taken together are proposed as suggesting the criticality of specific facilities. These two conditions or either one of the sufficient conditions will be an indication that a facility should be considered as a candidate for designation as a critical area.

## Application of Generic Criteria

Table 6 on the next page shows the application of the criteria to the list of possible geographic areas and facilities. The scores in the table are based on a brief review of existing data on state facilities and areas. It was beyond the scope of this report to develop inventory data on these various areas and facilities. What information was obtained is presneted in Appendix B along with a discussion of the criteria application. The Appendix also attempts to develop more specific criteria for each category of facility and geographic area.

In the next chapter, a review of alternative critical areas planning processes is presented along with a preliminary evaluation of these alternatives.

Table 5 SUBJECTIVE EVALUATION OF FACILITIES AND GEOGRAPHIC AREAS

| SUMMARY MATRIX-GEOGRAPHICAL AREAS<br>Key: + = Condition judged to hold<br>- = Condition judged not to hold<br>? = Inadequate information<br>0 = Ambiguous in context of category | Rare or Fragile Ecasystems | Interior Wetlands | Coastal Wetlands | Coastal Dunes and Beaches | Flood Plains | Erosion-Areas steep slope Geological Unstable | Aquifier Recharge Areas | Farmland | Forestland | Unreclaimed Steep Mine Areas | Areas with Air and Water Pollution Problems | Minimally Developed Rivers Corridors |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sufficient Conditions | | | | | | | | | | | | |
| • Habitat for Endangered Species | +(?) | +,? | +,? | - | -(?) | - | - | - | -(?)* | - | -(?) | (?) |
| • Future Public and/or Private Costs | 0 | 0 | 0 | - | + | + | + | - | - | + | + | - |
| • Extreme Environmental Deterioration | 0 | - | - | - | - | 0 | - | - | - | + | + | - |
| Necessary Conditions | | | | | | | | | | | | |
| • Growing Scarcity in Ohio | + | + | + | +(?) | 0 | 0 | ? | - | - | 0 | 0 | + |
| • Lack of Private Sector Supply Response | + | + | + | +,0 | +,0 | + | + | - | - | +,? | + | + |
| • Lack of Effective Governmental Programs | + | + | + | c?)+,0 | -,0 | ? | +,? | - | -(?) | - | -?* | +,? |
| • Sensitivity and Irreversibility | + | + | + | + | - | 0 | + | -(+) | - | + | + | + |
| • Development Pressure | + | + | + | + | + | +,? | +,? | + | +(?) | 0 | 0 | + |
| • Considered to have Potential for having specific candidates | yes | yes | yes | yes? | yes | yes | yes | no | no | yes | yes | yes |

Table 5 (Continued)

| SUMMARY MATRIX- GEOGRAPHICAL AREAS (Continued)<br><br>Key: + = Condition judged to hold<br>- = Condition judged not to hold<br>? = Inadequate general information<br>0 = Ambignes in Context of category | State and National Parks Monuments | Scenic Areas | Historic Areas and Sites | Archeological Sites | Geologic Formations |
|---|---|---|---|---|---|
| • Sufficient Conditions | | | | | |
| • Habitat for Endangered Species | ? | ? | - | - | - |
| • Future Public and/or Private Costs | - | - | - | - | 0 |
| • Extreme Environments Deterioration | - | - | -(?) | - | - |
| Necessary Conditions | | | | | |
| • Growing Scarcity in Ohio | 0 | + | + | + | +(?) |
| • Lack of Private Sector Supply Response | + | + | +(?) | + | + |
| • Lack of Effective Governmental Programs | - | +(?) | +(?) | +(?) | +(?) |
| • Sensitivity and Irreversibility | + | + | + | ++ | +(?) |
| • Development Pressure | 0 | + | + | + | +(?) |
| • Considered to have potential for having special candidates | no | yes(?) | yes(?) | yes(?) | yes(?) |

Table 5 (Continued)

| SUMMARY MATRIX FACILITIES | Industrial Plants/Parks | New Communities | Sports/Recreation Complexes | Mineral Extraction Processing Transmission | Mass Transit Rights of Way, State, etc. | Vacation/Second Home Developments | Residential/Apartment and Their Planned Unit Developments | Office/Parks Complexes | Solid Waste Disposal Sites |
|---|---|---|---|---|---|---|---|---|---|
| SUFFICIENT CONDITIONS | | | | | | | | | |
| Site Scarcity | - | +(?) | - | + | + | - | - | - | + |
| NECESSARY CONDITIONS | | | | | | | | | |
| Secondary Development | + | + | + | + | + | -,0(?) | + | +(?) | - |
| Environmental Problems | + | _ | + | + | - | + | + | + | + |
| Likely future construction or extensive past construction | + | (?) | + | + | +(?) | -(?) | + | + | +(?) |
| Distribution of Sizes | + | 0 | + | + | 0 | + | + | + | + |
| nsidered to have potential for ving specific candidates | Yes | Yes(?) | No(?) Yes | Yes | Yes | No(?) | Yes | Yes(?) | Yes |

Key: + = Condition judged to hold
- = Condition judged not to hold
? = Inadequate information
0 = Ambiguous in context of category

Table 5 (continued)

SUMMARY MATRIX
FACILITIES

| | Power Plants and Facilities | Airports and Facilities | Medical Facilities | Interurban Railroads & Facilities | Regional Education Institutions | Reservoirs | Sewage Treatment Plants | Interstate Highways | Ports | Shopping Centers |
|---|---|---|---|---|---|---|---|---|---|---|
| SUFFICIENT CONDITIONS | | | | | | | | | | |
| Site Scarcity | + | + | - | - | - | + | -(?) | - | -(?) | - |
| NECESSARY CONDITIONS | | | | | | | | | | |
| Secondary Development | - | + | - | + | + | + | + | + | + | + |
| Environmental Problems | + | + | - | - | - | + | +(?) | + | + | + |
| Likely future construction or extensive past construction | + | +(?) | + | -(?) | -(?) | +(?) | = | = | -(?) | + |
| Distribution of Sizes | + | + | + | 0 | + | + | + | +,0 | + | + |
| nsidered to have potential for ving specific candidates | Yes | Yes | No | No | No | Yes | Yes(?) | Yes | No(?) | Yes |

Key: + = Condition judged to hold
- = Condition judged not to hold
? = Inadequate information
0 = Ambiguous in context of category

# CHAPTER III. CONSIDERATIONS IN FORMULATING A CRITICAL AREAS PLANNING PROCESS

## Introduction

A complex interaction of long run private and public decisions determine the distribution, density, and composition of land use in Ohio. The major interacting forces include the planning and location of major infrastructure and other public facilities (roads, railroads, airports, ports, parks, etc.); business decisions to develop or expand mining, manufacturing and agricultural operations; the decisions of consumers in buying or renting residential properties; and the decision of financial, commercial, and retail enterprises which service producers, distributors, and consumers. It is quite obvious that production, distribution, and consumption activities can result in different land use configurations, depending on production technology and costs, market demand, taxation policies and the effects of planning and regulation.

In analyzing long run problems, there is long accepted theoretical and practical knowledge that private market forces, under most circumstances, will produce the most efficient (least cost) allocation of resources subject to the demands of the consuming public. In the case of environmental and land use problems, however, it is also increasingly recognized that there are important considerations which may justify public involvement in what otherwise may have been strictly private sector decisions. These considerations are:

- Cumulative side effects resulting from numerous individual decisions, which taken alone, do not cause significant problems, but in the aggregate result in damage to other values (primarily nonmonetary public values)
- Direct and indirect impacts of large scale activities for which no present adequate system of monetary incentives on disincentives exists that would modify the decision process

education and technical assistance, direct ownership and management of some lands, and the regulation of land uses in some areas. These broad functional activities are carried out by various agencies at various lands of government (federal, state, regional, and local) through systems of assessment, reporting, coordination and review, management, and enforcement. It is the broad system of government agency/private sector interaction that comprises the planning process. It is a dynamic system that changes as government programs and administrations change and as the types of public environmental-land use problems change.

State Programs

In Ohio, as of 1974, there were at least 53 programs in 15 different state agencies significantly affecting various aspects of state land use.* State departments with direct or indirect influence in the various functional aspects of land use include:

- Department of Agriculture
- Department of Economic and Community Development
- Environmental Protection Agency
- Department of Health
- Department of Natural Resources
- Department of Transportation.

State land use programs in the various departments have been summarized in a recent state publication.** Specific aspects of these programs as they relate to critical areas or facilities are discussed in Appendix B of this report. The specific state programs and program provisions are of less interest in this section than the existing processes affecting land use planning that may relate to development of a state

*Ohio's Land Tomorrow: Policies and Actions for Today, Ohio Office of Budget and Management, Columbus, Ohio, 1974

**Ohio's Land: State Government's Response, A Guide to State Land Resource Programs for Citizens and Public Officials, Ohio Office of Budget and Management, Columbus, Ohio, 1974.

critical areas program. These processes include the coordination mechanisms inherent in regional planning agencies and various Federally mandated review and coordination requirements. These are discussed below.

Regional/Local Planning

Land use planning in Ohio is carried out primarily at the county and municipal level of government. Under Ohio law there are six different possible multiple jurisdiction planning organizations that serve to coordinate local land use planning. These are

- Regional Planning Commissions
- County Planning Commissions
- Regional Councils of Governments
- Interstate Regional Planning Commissions
- Delegation of powers under contract
- Nonprofit corporations.

In addition to the above forms of regional planning organization, the previous state administration established 15 uniform planning regions with one or more metropolitan cities as the hub of the region. The Department of Economic and Community Development encouraged other state departments to utilize the uniform planning region designations in their own facilities and land use planning.*

Multijurisdictional planning organizations in Ohio provide an opportunity for a number of political subdivisions to cooperate on a variety of regional service and land use problems. Multijurisdictional planning organizations may play a variety of roles including

- Preparation of land use, program facilities, and resource development plans
- Budgeting of capital and recurring expenditures
- Interagency and intergovernmental review and coordination

*A State Role in Land Use Management, Report No. 112, Ohio Legislative Service Commission, Columbus, Ohio, December, 1974.

- Preparation and enforcement of land use controls
- Provision of educational, information and technical services.*

The regional or multijurisdictional planning agency would necessarily be an important part of any critical areas planning process. Depending on the structure of a potential critical areas program, the multijurisdictional planning agency's role could range from participation in identification and designation of regional critical areas up to authority to advise and participate in regulation and enforcement of designated areas. Because of the potential importance of regional planning in any future critical areas program, each of the organizational forms will be briefly described based on a recent state report.*

Regional Planning Commissions. There are presently 65 regional planning commissions in Ohio. These are voluntary organizations created by mutual agreement among municipal planning commissions, boards of township trustees, and the board of county commissioners of one or more adjoining counties. Other governmental bodies may participate such as townships, municipal corporations and special jurisdictions such as transit, park or conservancy districts. Plans prepared and adopted by regional planning commissions and by the legislative body of a member political subdivision become binding on public improvements. Proposed public developments in conflict with the adopted plan can not be constructed or authorized by the political subdivision except by unanimous vote of its legislative body (city council, etc.).** The regional planning commission also has mandatory review powers over proposed township zoning changes. A two-thirds vote is required on the part of the township to override commission zoning recommendations.

*A State Role in Land Use Management.

**Section 713.25 of the Ohio Revised Code.

County Planning Commissions. As of 1974 there were 20 county planning commissions in Ohio. The county planning commissions are voluntary organizations created by the board of county commissioners. Membership consists of the board of county commissioners and eight citizens of the county appointed by the board. The county planning commission's powers are the same as regional planning commissions except that they have no jurisdiction in unincorporated territory. Further, they cannot be designated as a metropolitan review agency for federal grants.

Regional Councils of Governments. These voluntary organizations can be created by two or more political subdivisions (counties, municipalities, townships, or special districts) under Sections 167.01-167.08 of the Ohio Revised Code. The chief elected officials of the member governments usually make up the council representation. As of 1974, there were three regional councils of government in Ohio.

Regional councils of government are authorized to perform a variety of coordination and planning functions. These include areawide comprehensive planning and study of a wide range of mutual problems; promotion of cooperation and coordination among its members and between its members and other governmental agencies; conduct of areawide reviews for Federal grants, and contract with political subdivisions for rendering of certain services. In contrast to regional and county planning commissions, approved plans of regional councils of government are not binding on public improvements and utilities. Similarly, councils of government do not have authority to review township zoning.

Interstate Regional Planning Commissions. These entities may be created by agreements between county or municipal legislative bodies in Ohio and their respective counterparts in other states. As of 1974, there were three interstate regional planning commissions in which Ohio political subdivisions participated. These interstate planning commissions are authorized to conduct a wide range of planning and coordination activities. The three Ohio commissions have served as a metropolitan review agency for Federal grant purposes.

Delegation of Powers Under Contract. One multijurisdictional planning agency, Northeast Ohio Areawide Coordinating Agency (NOACA), has been established by county contracting powers under Sections 302.21-302.24 of the Ohio Revised Code. In 1974, NOACA consisted of seven counties and 137 municipal corporations. It has also been designated as a metropolitan clearinghouse for Federal grants.

Nonprofit Corporations. Three multijurisdiction planning agencies are operated as nonprofit corporations. Two were established under provisions of the Federal Public Works and Economic Development Act of 1965; the other under the Federal Appalachian Regional Development Act of 1965. None of these have been designated as metropolitan clearinghouses for Federal grants.

Other Regional Planning and Coordination. As was mentioned at the beginning of this section, in 1973 the previous administration divided the state into 15 uniform planning regions. The purpose of establishing these 15 distinct areas was to facilitate standardization of planning areas used in land use planning by other state agencies. Establishment of the 15 uniform planning areas was also to facilitate development of Regional Planning and Development Organizations (RPDO's), one for each Planning Region. The RPDO's were to coordinate and develop local, regional, state, and Federal programs and plans for their individual regions so that duplication of effort and overlap of function could be avoided. To implement this concept, the Department of Economic and Community Development certified in each Planning Region, one Regional Lead Organization which for that region is the multijurisdictional planning agency that can become an RPDO. The Regional Lead Agencies are either Councils of Government or Regional Planning Commissions. With the recent change in administrations the present status of this concept is uncertain on a statewide basis.

## Federal Activities Affecting State Land Use Planning

Any future state critical areas program will be directly and indirectly affected by a variety of federal programs and planning activities. There are at least 157 different Federal programs that have a direct impact on land use. This does not include those programs which provide financial support to land use or facility planning. The complexity of intergovernmental relations in formulating state land use programs, including critical areas, is shown by the following list as described in a recent Council of State Governments report.*

"
- 53 programs promote the construction of improvement of housing, from single dwelling units to entire communities. Several programs are directed to specific areas: core cities, the urban fringe, and rural farm and rural non-farm housing are examples.
- 19 programs support use of land for recreation, agriculture, forestry, wildlife, or other "open space" uses through conservation of soil, water, and plant materials, and other protective measures.
- 8 closely related programs are oriented to prevention of floods and erosion, stabilization of shorelines, and other protective measures, regardless of the intensity of use of the area concerned.
- 5 programs assist the construction or extension of utility systems and services required to support intensive land use.
- 17 programs provide similar support for transportation systems of all types.
- 9 programs are designed to stimulate economic development: in general, minority business, rural area, and other specific types.

*Land Use: Policy and Program Analysis, Number 1, Intergovernmental Relations in State Land Use Planning, The Council of State Governments, Lexington, Kentucky, 1974, page 6.

- 20 programs support construction or rehabilitation of community facilities for health, educational, cultural, and other purposes.
- 6 programs facilitiate transfer of land from federal to non-federal ownership."

Even this list is incomplete since it excludes the economic development assistance of the Department of Commerce and the acquisition programs under the 1972 Coastal Zone Management Act. Aspects of these programs as they relate to critical areas are discussed in Appendix B of this report. In addition, there are a variety of Federal coordination requirements that relate directly to land use planning and management at the state level. These are:

- A-95 review
- Comprehensive Planning Assistance Program (701 program)
- Integrated Grants Administration
- Environmental Impact Statements as required under the National Environmental Policy Act of 1969.

Relevance of these programs to expanded state land use planning or to any proposed development of a critical areas program would require detailed analyses beyond the scope of this report. A brief description is presented in this report to indicate the general relationship to state land use planning efforts.

A-95 Review. The U.S. Office of Management and Budget Circular A-95 was issued to implement the requirements of the Intergovernmental Cooperation Act of 1968. The Act requires that regulations should be established covering formulation, evaluation, and review of Federal programs and projects having a significant impact on area and community development, including programs providing Federal assistance to the states and localities. The Federal Office of Management and Budget circular A-95 (as revised) requires that specific project and grant applications be reviewed by either a state clearinghouse or an area clearinghouse or in

some cases by both. The objective of the review is to ensure compatibility of each proposed project with state and areawide facilities development and land use plans. The A-95 process also requires the clearinghouses to comment on the potential environmental impacts of proposed projects as provided under the National Environmental Policy Act of 1969.

In Ohio, (as of 1974) the State Clearinghouse was placed with the Director of the Office of Budget and Management. Similarly, the Federal Office of Management and Budget has designated 13 multijurisdictional planning agencies to serve as metropolitan clearinghouses to review projects in the 28 metropolitan counties of Ohio. The state clearinghouse has served as the clearinghouse for the other 60 nonmetropolitan Ohio counties, though the Office of Management and Budget Circular encourages designation of nonmetropolitan clearinghouses.*

Part I of the OMB Circular A-95 provides a mechanism for coordinating intergovernmental land use plans. However, only 67 of the 137 land use related Federal programs are subject to review by state clearinghouses under this requirement. Part II of the A-95 Circular, which requires that States be notified of several direct Federal development actions, covers only slightly more programs than Part I. Another problem in using the A-95 as a coordinating mechanism for land use planning is that Federal financial support has not been specifically provided to the agencies, limiting the effort state and regional planning agencies can allocate to project and proposal review.**

Comprehensive Planning Assistance Program (701). The Comprehensive Planning Assistance Program was established by Section 701 of the Housing Act of 1954. Although the original intent was to aid planning in smaller communities, a series of legislative amendments and administrative actions has changed this program into the basic Federal grant programs for most planning agencies. Initial planning activities funded through 701 programs focused on physical planning or related matters. Recent

*A State Role in Land Use Management

**Intergovernmental Relations in State Land Use Planning

direction of the program has involved inclusion of requirements for specific planning activities (initial housing element, equal opportunity, environmental assessment) and a broadening of the program into a planning and management effort. This latter effort is designed to assist chief executives at all levels of government to identify problems in a wide range of areas, formulate policies and programs, implement them and evaluate their effectiveness. It is also possible that Congress will add program elements on capital improvement programming and land use.* These developments would be important to any future state critical areas program.

National Environmental Policy Act. Section 102(2)(C) of the 1969 National Environmental Policy Act requires preparation of Environmental Impact Statements on all Federally funded projects. Interagency review of draft environmental impact statements including review through the state and area clearinghouses and public hearings on projects are included as part of impact statement preparation process. Analyses of the compatibility of proposed actions with existing land use plans and analyses of expected land use impacts is also required in impact statement preparation. In terms of a critical areas program, impact statements on Federally funded projects could be an important mechanism for identifying problems related to certain types of proposed changes in or near critical areas.

Integrated Grants Administration. The Integrated Grants Administration Program was established in 1972 as a means by which a state or local agency can apply for a number of federal categorical grants through a single application which is based on a single work program. The IGA program covers all Federal assistance programs except those involving construction of facilities or acquisition of land. Applications which combine program or services with land acquisition and construction can be included in the IGA procedure. The major implication for land use planning is the facilitation of obtaining support from several Federal agencies

*Intergovernmental Relations in State Land Use Planning.

through a single application procedure. It may be the only way some land use agencies can obtain adequate funding for land use planning and to maintain adequate coordination with Federal agencies. The IGA program relates primarily to the funding of land use planning rather than the planning coordination process itself.

## Critical Areas Planning Process in Other States

Planning processes implemented in other states and recent evaluation of these processes* are of direct interest in evaluating alternatives relative to Ohio. Other states which have adopted specific critical areas legislation include Utah, Oregon, Florida, Maine, Minnesota, and Colorado. Many of these programs have elements partially or wholly reflective of the American Law Institute's Model Code provisions for state land development regulation.** For example, Utah and Oregon have passed legislation mandating studies of critical areas. Results of the studies are to be reported to the legislature and designation of any state critical area would be by the legislature. As Mandelker states,

> "This deference to legislative review indicates the political hostility towards confering the all-important designation process on a state administrative agency. It also represents the increasingly widespread attitude of many legislative bodies that there should be a heavy legislative input in any state program of control such as that contained in the critical area concept."**

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*Fred Bosselmand and David Collies, The Quiet Revolution in Land Use Control, prepared for the Council on Environmental Quality, U.S. Government Printing Office, Washington, D. C., 1971.

Jon A. Kusler, Faculty Land Use Problem Definition Seminar: State Land Planning and Regulatory Function; Proposals and Programs from the Several States and a Draft Bill for Wisconsin, Work

Daniel R. Mandelker, "Critical Areas Controls: A New Dimension in American Land Development Regulation", Journal of the American Institute of Planners, Vol. 41, No. 1. January, 1975.

**Mandelker, loc cit., page 28

Both the Oregon and Utah legislation includes provisions for a planning process in the context of state and local planning efforts. The Utah statute includes in its list of critical areas, areas of major development potential. Under a liberal interpretation, the Utah statute would allow use of the critical area concept as a major tool in growth control.*

The states of Florida, Maine, and Minnesota have passed legislation which closely approximates the American Law Institute Model Code. The Florida law includes control over both developments of regional impact as well as critical geographical areas. Maine and Minnesota authorize the review of local plans as well as the review of local land development control regulations within critical areas. State powers for control over critical areas in Utah, Minnesota, and Florida are lodged in agencies other than the state planning office.** Utah has created a new land use commission. Florida uses its administrative commission, consisting of the governor and cabinet to decide on designation of critical areas and to review development control regulations. Minnesota has lodged the regulatory authority in the state's environmental quality council. Mandelker analyses these arrangements as

> ". . . not surprising. It suggests that state legislators will be hesitant to consolidate too much regulatory power in a single state agency, even if that agency exercises the planning function. They also want to involve the executive in the critical area process if critical area designators are taken from legislative hands."

Colorado's land development control reforms establishes state powers in areas of state interest and for activities of state interest (generally limited to selection of major public facility sites). The Colorado approach is particularly interesting in its delegation of regulatory authority. First, the Colorado Act establishes substantive guidelines for the regulation of areas of state interest. Second, the

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*Ibid.

**Ibid.

Colorado statute delegates substantial administrative control over areas and activities of state interest to the local levels of government. While the state land use commission (with input from state agencies) is permitted to adopt guidelines for the designation of areas and activities of state interest, local governments designate the areas and activities and adopt guidelines for their administration. Local veto power over recommendations of the land use commission is also established as long as local designation and administration is consistent with the guidelines specified in the state statute. In the case where local governments reject recommendations of the land use commission, the commission is limited to judicial review in state court.*

The Colorado statute requires that any individual or interest proposing a development in an area of state interest or to conduct an activity of state concern must obtain a permit from the local government having jurisdiction. Local governments rule on permits based on the statutory guidelines governing areas and activities of state interest. Denial of permits by local government is made subject to judicial review rather than appeal to a state level adjudiciary board.

On the other hand, Vermont has established a state environmental board and seven district commissions that issue permits in compliance with legislative standards and guidelines set forth in plans approved by the state legislature. As part of the legislation, the environmental board is preparing a three stage land use plan which will divide the state into specified land use zones.

To date, Hawaii is the only state to establish statewide zoning, enforced and administered at the state level. Other state programs relate to specific types of critical areas. For example, Wisconsin, Michigan, Delaware, and Oregon have all passed laws relating to protection of their

*Ibid.

shorelands and coastlines. Wetlands are protected in most Atlantic and Pacific coastal states. Ohio along with 13 other states have enacted power plant and major transmission line siting laws. Oregon, California, Michigan, and New York have enacted land sales disclosure laws. Minnesota has an Airport Zoning Act to control development around major airports. Several states such as Maryland have enacted legislation to minimize run-off sediments.*

The variety of comprehensive and specific state programs relating to critical areas and land use points to the spectrum of alternatives open to Ohio in considering a critical areas program.

## Minimum Components of a State Critical Area Program

Regardless of the specific future changes in Ohio land use planning, land use regulation, and land use related State/Federal activities, there are several basic components a state critical areas planning and regulatory process should include. Development of these components would include:

- Establishment of criteria and guidelines for identifying and designating critical areas and critical activites
- Establishment or expansion and long term funding of planning capabilities
- Establishment or designation of a legislative body or administrative agency to designate specific critical areas based on planning inputs
- Specification or enactment of regulatory mechanisms and enforcement including adequate funding for their administration by appropriate agencies
- Establishment of an appeal process to rule on contested administrative decisions.

*For a more complete discussion of land use legislation and programs in other states see A State Role in Land Use Management, Staff Research Report No. 112, Ohio Legislative Service Commission, December, 1974.

Criteria or guidelines are necessary if reasonably consistent decision on what specific areas are to be designated as critical are to be reached. Criteria could be highly detailed and specific or they could be in the form of broad guidelines.

Planning and coordination for critical areas designation and management are necessary if rationale choices and trade-offs are to be made. Planning requires both an administrative structure as well as adequate staff and support capabilities. The planning function realistically involves coordination among planning components of many federal, state, and local agencies. Administratively, a lead agency or central focus at the state level would probably be necessary. An alternative would be regional planning with some form of state review.

Designation of critical areas can be through a legislative body at the state regional or local level or by an administrative agency. State commissions are one approach. Another is use of a state planning office or office of management and budget, department of natural resources, or department of economic development depending on the specific state government structure.

Administration, regulation and enforcement of guidelines for development in or near citical areas is essential for long-run effectiveness of any critical areas program. Specific mechanisms (purchase, zoning, transfer of development rights, etc.) must be established and a government body (local, regional or state) established for administering and enforcing regulations.

An appeal process for contested administrative decisions is a final necessary minimum component if implementation of a critical areas program is to allow for meaningful negotiation among affected parties.

It is obvious that these minimum components can be combined in a variety of forms within existing or potential government structure.

Table 7 on the next page shows the potential roles of various levels of government in terms of the minimum components of a critical areas program. The overlap between potential roles for various levels of state, regional, and local government is clear from Table 7.

Table 6 POTENTIAL ROLES OF GOVERNMENT IN A CRITICAL AREAS PLANNING AND REGULATION PROCESS

| Agency or Level of Government \ Minimum Components | Criteria and Guidelines | Designation of Critical Areas | Planning and Coordination | Administration, Regulation, and Enforcement | Appeal | Financing |
|---|---|---|---|---|---|---|
| Legislative Commission | X | X | | | X | |
| State Planning or Budget Agency | X | X | X | X | | |
| State Agencies | X | X | X | X | | |
| State Judicial System | | | | | X | |
| Regional Planning Commission, or Council of Governments | | X | X | | | |
| County Planning Comm. | | X | X | | | |
| County Commissioners | | | | X | | |
| County Zoning Board | | | | X | X | |
| Municipal Planning Comm. | | X | X | | | |
| Municipal Government | | | | X | | |
| Municipal Zoning Board | | | | X | X | |
| Public | X | X | X | | | |

It is obvious that not all levels of government would be equally involved in the various function (designation, planning, administration, etc.) nor that the functions would necessarily be divided between agencies. It is conceivable that one agency would be ultimately responsible for all but the appeal process. At the other extreme, it is possible that the various functions could be performed through a complex process of interagency and intergovernmental coordination. In order to explore potential planning and regulation processes for critical areas in Ohio, a few general cases will be specified and evaluated rather than conducting a detailed analyses of one or another variation of particular administrative arrangements.

## Alternative Critical Area Planning and Regulation Structures

The following general cases are proposed for purposes of evaluating potential critical areas planning and regulation processes.

- Status Quo
- Strong direct state role
- Strong indirect state role including incremental building of state programs, technical assistance, state standards and criteria, and interagency coordination
- Strong regional/local role including state technical and planning assistance, standards and criteria, etc.

A general summary for each of these cases will be discussed first. Qualitative criteria for evaluating the alternatives are then presented along with a subjective evaluation of the four general cases.

### Status Quo

The present state land use role in Ohio has been described in 9 recent state publications.* Of the present state and state/federal programs

*Ohio's Land: State Governments Response, Ohio Office of Budget and Management, December, 1974.

A State Role in Land Use Management, Report No. 112. Ohio Legislative Service Commission, Columbus, Ohio, December, 1974.

only a few have structures that contain some or all of the major functions necessary for critical areas designation, planning and regulation. These are:

- Power Siting Commission
- Oil and Gas Drilling in Lake Erie
- Air Quality Permit Program
- Water Quality Permit Program
- Reclamation of Strip Mined Lands
- All Minerals Law
- Natural Areas Program
- Scenic Rivers Program
- Flood Plain Management Program
- Lake Erie Shore Zone Management Program.

Brief descriptions of these programs are provided in Appendix C under discussion of types of critical areas and facilities.

Maintenance of the status quo implies that state critical areas would be identified, designated and managed as under present programs. No new coordinating mechanisms would be established. Areas or facilities treated under the existing programs would be designated as potentially critical. Evaluation and strengthening of the programs in response to state legislative mandate or new federal initiatives and funding would be expected as part of this scenario. Present interagency and intergovernmental coordination (A-95, impact statement review, permits, and master plans) would be the primary vehicle for critical areas planning. Administration and regulation would be through local enforcement and compliance with zoning and building codes; through limited state purchases in fee simple or through easements on key properties; and continued technical assistance to local governments in planning relative to the programs specified above. State agencies presently responsible for these programs would continue, subject to any administrative or legislative modification. Appeal of governmental land use decisions would be through existing judicial systems and county and municipal zoning authorities.

Strong Direct State Role

At the opposite end of the spectrum to the status quo would be a centralized state critical areas program. There are numerous variations on the specific structure of critical areas program under this scenario. The major areas where alternative arrangements are possible are:

- Legislative body versus administrative agency responsible for establishing criteria and designating specific state critical areas or critical activities
- Coordination of critical areas planning and regulation through one lead agency or by an agency such as the Office of Budget and Management
- Enforcement and regulation at the state level or standards and guidelines for local government with automatic state involvement where localities fail to enact and enforce appropriate ordinances
- An appeal process through a legislative body or through normal judicial channels.

It is beyond the scope of this report to specify precise alternate structures relative to the above issues. This report can deal with the implications of a strong direct state role, however. A major strengthening of planning capabilities at the state level and enabling legislation for state authority to regulate land use in specified critical areas would be required. Further, a significant restructuring of interagency coordination processes, probably through a permit system and land use or environmental impact statement review process would be necessary. Without a significant local or regional input to the program, it is likely that the extent and coverage in terms of numbers and types of specific critical areas and activities would have to be limited due to obvious state budgetary restrictions.

Development of guidelines and designation of specific state critical areas would be conducted either by a legislative commission or

a state agency. In either case, extensive planning support would be necessary to develop criteria and to inventory, evaluate and designate specific critical areas. Regulation and management would require both significant state expenditures on land purchase as well as enforceable state zoning. Enabling legislation allowing implementation of innovative approaches to land use regulation such as transfer of development rights would need to be considered. A permit system administered by the state for designated critical areas would need to be established including an appeal process for contested decisions.

Strong Indirect State Role

A modification to the above scenario, but one also requiring considerable strengthening of existing state involvement would be a strong indirect state role. All of the same issues enumerated above (i.e., legislative versus administrative designation, lead agency versus budget or planning office administration and coordination, etc.) would also apply to this scenario. The major distinction would be a decentralized building and expansion of existing state and state/Federal land use programs and provision of technical and planning assistance to local governments in implementing regulation of designated critical areas. Implicit in this scenario would be the need for grants-in-aids to local or regional government to allow them to expand their planning and regulatory capabilities.

Criteria and guidelines for critical areas would be developed along the lines of existing programs which relate directly or indirectly to potential critical areas. New or expanded state programs in some areas would be a possibility. Agencies would conduct statewide inventories relative to their respective critical areas through coordination with local planning agencies and through additional state funded investigations. Candidate lists of specific potential critical areas and critical facilities would either be submitted to a legislative commission (established with

appropriate enabling legislation) or to a lead agency for designation. Regulation of state designated critical areas would be the responsibility of local units of government, with considerable technical and planning assistance from appropriate state agencies. Two alternatives for enforcement of local government compliance would be possible: State review of local ordinances and zoning relative to state established criteria; or state review of individual government decisions. The latter would appear to be prohibitively expensive and cumbersome. Appeal of specific decisions could be handled by local zoning authorities backed up by state review or simply by local review.

Strong Regional/Local Role

A final general case which goes beyond maintenance of the status quo is focus of the critical area program at the regional level. This scenario necessarily implies strengthening of the capabilities of regional planning agencies.

Under this scenario, the state would establish, through appropriate interagency coordination, criteria and guidelines for identifying and designating critical areas. Criteria could be established through a legislative commission (requiring enabling legislation), through a lead agency coordinating other agency inputs, or through a central agency such as the office of budget and management or astate planning office. Responsibility for designating critical areas would be lodged at the regional level, probably in regional planning commissions or councils of government. An identification and designation process would need to be established at the regional level involving local governments, citizens and interest groups, and state agency technical assistance. Candidate lists of potential critical areas would be prepared and submitted for state review (either by legislative commission, lead agency, etc.). Whether the state would retain veto power to modify the list would be an open issue. At a minimum, the state should be able to require minimum compliance with the established guidelines and criteria in terms of designation. Specific critical areas would then be designated by the

regional planning agency. Regulation under present arrangements would be through traditional local methods though the option of innovative approaches should not be overlooked. Appeal would also be handled through traditional channels.

## Criteria for Evaluating Alternative Ohio Critical Area Planning and Regulation Structures

There are several interrelated factors which must be taken into consideration in evaluating either alternative land use planning processes or specific administrative arrangements for managing critical land use areas. These criteria are not tailored to any one specific administrative level or to any one specific level of government. They are intended as guidance in analyzing the overall potential effectiveness of the alternatives for direct or indirect government involvement in critical land use area planning, management and regulation. They are applied in this report relative to the general scenarios presented in the previous section.

### Public Participation

An important consideration in the effectiveness and long run political viability of a planning process is the extent to which individuals that may be affected by decisions have an input to the process by which actions are taken. It is not only the economic interest that may be affected by the decisions that need to be included, but also those individuals who have no direct monetary stake in the outcome but who may speak for the broader public interest associated with a specific geographic area. While the definition of public may be problematic, any public participation in the process should allow easy access of all individuals in a community or groups in a community that may have direct or indirect interest in the outcome of the planning decision. As such, the planning process must be in a position to communicate to the broader public its intentions and the

alternatives that are being considered. Arrangements for facilitating public participation may include establishment of advisory committees, public meetings, public announcements, and decision sessions open to the public.

Accountability

Closely related to the issue of public participation is the structure under which the officials or directors of the planning apparatus serve. It is possible that they serve at the pleasure of elected officials (governors, mayors, county commissioners) or may be elected in their own right. An alternative structure may be one with both appointed and elected officials, commissioners, or other appropriate decision makers. If the planning entity is to be advisory in capacity only, it is important to assess where the information and advice will be received and what responsibilities and implementation powers the advisees have.

Total Capital and Recurring Cost

Crucial consideration in analyzing alternative modifications in existing planning processes or establishment of new processes are the annual costs. Costs are incurred to rent or build office space, for a variety of equipment, for staff and secretarial services, and for materials, supplies and contracted services. In analyzing alternatives, it is imperative that the setup costs as well as all of the recurring costs over the expected life or term of the planning entity be estimated. In looking at a statewide program, aggregation of these local, regional and departmental costs is necessarily a very important consideration in what sort of modifications or alterations can be considered to the existing land use planning process. The effectiveness and consideration of many of the other criteria discussed in this section hinge on the level of funding available

to the planning entity as well as the cost of hiring experienced capable staff. Cost of obtaining information for rational decision making are also another consideration which must be built into budgets and is directly related to the criteria discussed below.

Information Flow

One of the major problems in any planning process is access to comprehensive, reliable information which can be used to evaluate the implications of proposed actions. As most planners soon find out, detailed inventory information, statistics, time trends, etc. simply are not available in desired detail, particularly for land use and environmental-related problems. The ability to synthesize and evaluate the information that does exist is severely limited by staff capabilities, the state-of-the-art in development of integrated models, and the time constraints under which decision making generally takes place. On this basis, that arrangement of the planning process which can maximize information flow through local knowledge, expert judgment, and other available sources of data, will help to minimize information costs.

Balance

If modifications to the present process of land use planning in the state are to be effective and serve the broad public interest, it is essential that specific planning alternations provide a balance between the following potential tradeoff situations:

- Balance between local interests and interests of a regional, state, or national character
- Balance between short run considerations and longer run potentials
- Balance between intangible but important public values and the continued efficiency and effectiveness of private market forces.

Creation of balance in a planning process will depend on the specific administrative structure used, the degree of input of interested parties, the specific tools used in regulating land use, and the resources devoted to support analysis and evaluation of alternatives. Many of the factors affecting balance will also be determined outside of the local or state arena (such as some of those discussed in the next chapter such as taxing policy).

Coordination/Review

Related to the issue of balance is the extent to which modifications in the planning process can be coordinated with existing planning systems or planning requirements. As has been indicated elsewhere in this chapter, the number of federal and state activities which impinge on land use and land use planning are numerous. Modifications to the planning process relative to critical land use areas must necessarily interface planning requirements associated with other programs, such as air and water quality management. The effectiveness of a critical land use areas planning process will also be determined by the extent to which it can be coordinated with existing planning activities.

Flexibility

The diversity of potential critical areas in a state such as Ohio requires considerable latitude in the planning process. What may be a critical area in one portion of the state may not be considered critical in another. Likewise, the need for latitude and local interpretation of critical areas designationa and management requires that any management process that is considered at a statewide level include significant flexibility in substantive content of what constitutes a critical area.

## Action Orientation/Policy Input

Any planning process dealing with critical land use areas, to be effective, will necessarily require an action and implementation side. Action orientation implies the output of the planning process will result in specific decisions being taken by government officials at various levels. A specific action may include such things as purchase of areas to preserve their characteristics, regulations in terms of zoning, etc. The level of government (local, state, or federal) at which action takes place will vary depending on the type of critical land use area under consideration. In analyzing alternative planning processes and modifications to planning and regulation, an important consideration is the extent to which an action program is tied to the recommendations that are eventually generated through surveys, public participation, meetings, analysis, and planning evaluation.

## Private Cost

A final crucial consideration in evaluating alternative planning processes is the cost the system imposes on the private sector. Important costs include the time and effort required to obtain necessary permits for construction or alteration of existing land use patterns, the waiting time in terms of net costs to developers, and potential inefficiences which may be introduced to private market transactions.

## Evaluation of Alternatives

A subjective application of the criteria to each of the alternative critical area planning scenarios is shown in Table 8. While no precise significance can be attached to the relative rankings, the strong regional role appears on balance to be preferable to the other three alternatives. This conclusion is based, of course, on the specific criteria and their subjective application.

TABLE 7. SUBJECTIVE EVALUATION OF RELATIVE RANKINGS OF PLANNING/REGULATION SCENARIOS

| Alternative Planning and Regulation Scenarios / Criteria | Potential for Public Participation | Accountability | Minization of Total Capital and Recurring Costs | Maximization of Information Flow | Balance | Compatibility with Coordination and Reveiw | Flexibility | Action Orientation/ Policy Input | Private Cost |
|---|---|---|---|---|---|---|---|---|---|
| Status Quo | 4 | 2 | 1 | 4 | 4 | 1 | 4 | 4 | 1 |
| Strong Direct State Role | 2 | 4 | 4 | 2 | 1 | 4 | 3 | 1 | 4 |
| Strong Indirect State Role | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 3 |
| Strong Regional/ Local Role | 1 | 1 | 2 | 1 | 3 | 2 | 1 | 2 | 2 |

Key: Alternatives are ranked relative to each other for each criterion with 1 being the preferred scenarios based on the specific criterion.

# CHAPTER IV: ALTERNATIVE MEANS FOR MANAGING CRITICAL AREA LAND USE

This chapter presents the spectrum of alternatives available for influencing, modifying, or controlling land use decisions in or near critical areas. The use of various techniques by local, regional, state, and Federal government is the "action" side of any effective critical areas planning process. As such, regulatory techniques cannot ultimately be separated from the structure of a critical area or land use planning process. For purposes of analyzing the appropriateness of various techniques for different categories of critical areas, however, the techniques are presented separate from the discussion of alternative planning processes.

It has been said that we are undergoing a revolution in the way we regulate the use of our land.* This so called "revolution" is manifest in the passage of legislation by various states broadening the state and regional role in land use decisions. How local, regional, and state governments proceed in their efforts to guide or regulate land use will largely determine the long-run acceptance of such efforts by private citizens and businesses. The combination of techniques used will also determine the public and private costs of such regulations and the extent to which broader public values are maintained.

The basis for land use regulation by government is rooted in common and Constitutional law. The Federal government under various commonly accepted doctrines, has the authority to regulate land use.** As several recent publications emphasize, the principal constraint on Federal land use regulation is the compensation phrase of the Fifth Amendment to the Constitution. In essence, this amendment requires that private property shall not be taken for public use without just compensation.***

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* The Quiet Revolution in Land Use Control, prepared for the Council on Environmental Quality, by Fred Bosselman and David Callies, U.S. Government Printing Office, Washington, D.C., 1971.

** These doctrines include the commerce-navigation power; proprietary power; war power; admiralty; treaty power; general welfare power; and control of interstate relations.

*** Arnold W. Reitz, Jr., Environmental Planning: Law of Land and Resources, North American International, Washington, D.C., 1974.

State governments such as Ohio have many similar regulatory powers, especially the police power* as exercised by the state and their chartered minicipalities. As Reitze states, the power of states to regulate land use are constrained by the Federal Constitution's 14th Amendment which extends to the states the takings or compensation clause of the Fifth Amendment.**

In Ohio, the power to regulate land use is delegated to municipalities (both charter and noncharter) as specified in the Ohio Constitution and the Ohio Revised Code.***Local regulation in Ohio arises from Article-XVIII of the Constitution which was passed in 1912. This article granted the power of home rule to both charter and noncharter municipalities. Although counties have the power to adopt home rule, none have done so to date. Townships, on the other hand, can exercise only those powers specifically delegated to them by the General Assembly.****

While local regulation includes such direct measures as zoning, subdivision regulations, building codes and housing codes, other government actions have important direct and indirect effects on land use pattern intensity, distribution, and composition. In this section, direct and indirect regulatory tools that are potentially applicable to land use problems in critical areas are discussed.

It is beyond the scope of this report to provide detailed analysis of the legislative and legal implication of the regulatory techniques discussed on the next page. However, if an explicit planning process is ultimately adopted for dealing with Ohio's present and future critical land use areas, a combination of techniques will be necessary

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* The inherant right of governments to legislate for the advancement, preservation, and protection of the public health, safety, morale, convenience, and welfare." see Land Resorver Economics, The Economics of Real Property, by Releigh Barlowe, Prentice-Hall, Inc. 1972

** Reitz, Ibid., p 1-15.

*** Local Land Use Controls in Ohio: Their Extent and Effectiveness. A Report prepared for the Ohio Interagency Land Use Policy Work Group in the State of Ohio, Department of Economic and Community Development, December, 1974.

**** Ibid.

for effective regulation of development in or near such areas. Further legal and legislative research will be required for serious consideration of many of the useful techniques for regulation.

Direct and indirect regulatory techniques are discussed in this section under the following categories:

- o Police Power including zoning subdivision regulations, building codes, nuisance ordinances
- o Acquisition of Interests including fee simple and less than fee simple purchase
- o Development Controls including sewer and construction moritoriums
- o Incentives/Disincentives including subsidies and preferential taxation.

## Police Power

The police power of government refers to its authority to regulate private activity in the interest of safety, public health, morals, and the general welfare. While use of the police power for aesthetic or ammenity purposes has seen limited application in the United States, it has been accepted in several state courts for aesthetic regulation alone.* Under the police power, local or state government may attempt to protect the amenity or aesthetic quality of lands through the passage of regulations controlling nuisances, governing building codes, and establishing zoning.** These powers in Ohio are delegated primarily to local governments and may provide one basis for regulating development in critical land use areas. The advantage of using police power in regulating land for health or public welfare purposes is that compensation does not need to be paid. The disadvantage is that it may cause

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* Reitz, p 1-31. Also see Leighty, "Aesthetics as a Legal Basis for Environmental Control", 17, Wayne Law Review, 1347 (1971).

** Ibid. p 1-69

economic inefficiencies, inflexibilities, and potentials for political manipulation. Various techniques under the police power used in combination for regulating land use are discussed below.

Zoning

As was stated earlier, most land use regulatory authority, including zoning, is delegated to local units of government in Ohio. Zoning is the most common system of land use control nationally and in Ohio. The process of zoning attempts to segregate different types of land uses into assigned geographical areas. The extent and preceived effectiveness of zoning in Ohio has been analyzed in Local Land Use Controls in Ohio. For example:

> "County administered zoning, while regarded as being very difficult to institute, is actually practiced in thirteen of Ohio's eighty-eight counties. Butler, Clinton, Hamilton, Warren, Miami, Montgomery, Preble, Clark, Fulton, Delaware, Fayette, Franklin, and Madison Counties have all been successful at establishing county administered zoning in at least one township. Ninety-eight percent of Ohio's cities have employed zoning along with many of the state's larger villages."*

Zoning helps to eliminate conflicts in land use by excluding incompatible uses. The impact of zoning on land and property values will depend on how well it is administered as well as supply and demand factors in local real estate markets. By determining the "highest and best use" to which given parcels of land may be put, zoning can have an important influence on land values.

There are also certain negative features which may be associated with zoning. Zoning can create incentives for land use that work against desirable land use objectives. For example, "spot zoning" resulting from political influence of a developer with local zoning officials can produce undesirable and often irrational land use patterns. This problem

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* "Local Land Use Controls in Ohio: Their Extent and Effectiveness", State of Ohio, Department of Economic and Community Development, December, 1974.

is a question of administration and enforcement of established zoning. Another problem, as pointed out in the Fifth Annual Report of the Council on Environmental Quality, is the implicit assumption behind zoning that different uses should be segregated. Often environmental impacts, excessive energy consumption, and inconvenience result when neighborhood facilities are separated from residential areas. A third general problem is the question of long-run effectiveness. As the CEQ report notes, it is unrealistic to expect land use criteria to remain firm over long periods of time.

> "Amendments and variances which were originally intended as rarely used safety valves often become the rule. As a result, zoning provides neither stability of use nor a logical mechanism for definition of use".*

In terms of perception of effectiveness of present zoning in Ohio, the following types of problems were identified in a state survey.** These apply to the spectrum of local regulation, but are presented here:

Size of Coverage

- Local Governments rarely cooperate with each other to develop coordinated land use regulations to eliminate conflicting uses along common boundaries and address area-wide land use needs.
- Regulation of land use is often inadequate in outlying areas around urban centers where most growth is occurring.
- There is virtually no experimentation with innovative regulatory systems such as transfer of development rights and performance standard zoning.

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* Fifth Annual Report of the Council on Environmental Quality, 1974,

** Land Use Controls in Ohio, p 26-27.

- Many municipalities have adopted widely different regulatory standards, making it difficult for builders and developers to understand and comply with regulations.

(Quality of Ordinances)

- Many of Ohio's local land use regulations were drafted ten or more years ago and have not been reviewed or substantially revised since their enactment. In many communities which allow new housing types, specifications for platting, construction, etc., are out-of-date and inappropriate. This prevents the full realization of the many possible savings which new design and construction techniques offer.

(Administration of Local Regulations)

- Land Use decisions which are becoming increasingly technical in nature are frequently made by uncompensated lay persons who have little training or experience and are working under strong political pressure.
- Many small communities cannot afford to support a capable inspector or adequate staff to enforce regulations.
- Even in communities with zoning, housing, and building inspectors, enforcement is usually carried on in a reactive rather than active manner, with heavy reliance on citizen complaints in the detection of violations.
- In a significant number of cases, inspectors are inexperienced political appointees subject to strong political pressures in enforcement matters.
- Strict enforcement of modern land use regulations (setback requirements, construction specifications, side yard requirements, etc.) in older neighborhoods has hindered renovation and restoration in a number of cases.

- Strict enforcement of occupancy standards is not feasible in areas of poor housing unless used in conjunction with a housing program.
- As land use decisions become more complicated and controversial, lengthy delays in the decision-making process have become common.
- Delays and anti-growth sentiment raise development costs and discourage innovative projects."

There are numerous other documents on the use of zoning which provide great detail on the problems, mechanics, and potential of this method of land use regulation.* The potential for use of zoning as a method for dealing with critical land use areas is considered below.

Zoning as presently practiced has several potential drawbacks relative to its use in managing critical land use areas. On the other hand, there are a number of mechanisms using local or regional zoning which hold significant promise for managing critical land use areas.

Problems inherent in present zoning which limit its usefulness for controlling land use in or near critical areas include:

- Problem of "spot" zoning variances and ad hoc modifications resulting in ultimate erosion of any comprehensive attempt to regulate land use in or near critical areas.
- Windfall or wipe-out nature of imposition on existing patterns of land use (primarily the legal issue of the extent to which certain types of zoning may be interpreted as a taking of private property, thus requiring compensation or being declared unconstitutional).

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* See for example, Mary Cranston, et al., "A Handbook for Controlling Local Growth", Stanford Environmental Law Society, Stanford University, Stanford, California, September, 1973.

See Bibliography in Fifth Annual Report of the Council in Environmental Quality.

- Problem of competition among individual local governments for tax base resulting in potential failure of the decision making structure and process to adequately weigh broader regional values in management of identified critical land use areas.

Recent zoning techniques provide some alternatives to the type of problems that would be faced in relying on traditional zoning to protect critical land use areas. These include planned unit developments, establishment of special districts, and the use of zoning and transfer of development rights.

Planned Unit Developments. These are usually embodied as part of a local zoning ordinance, under which developers are allowed to locate the total density for a tract into high density and low density areas. The advantage of this approach include savings to developers in terms of building costs as well as preservation of open space.* The technique would be particularly applicable where development is occurring adjacent to critical land use areas and would threaten the integrity of the area if the development were not carefully planned.

Special Districts. Special districts are also part of a local zoning ordinance usually intended to deal with the problems of existing areas of historical, cultural, or social importance. Generally, a special purpose district requires conformance to certain architectural design and use criteria. A good example of the use of this type of technique in Ohio is the German Village in Columbus. A politically appointed commission reviews and approves all proposed architectural changes in the area before building permits are issued by the city. This mechanism has created an environment in which large numbers of individuals have been willing to buy and renovate residential property without any form of government subsidy.

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* Fifth Annual Report of the Council on Environmental Quality.

The use of special districts has considerable potential for dealing with identified critical areas in urban locations in Ohio. It is particularly appropriate for creating the necessary conditions for private sector renovation of existing areas which may be threatened by incompatible forms of redevelopment.

Zoning in Conjunction with Transfer of Development Rights. A concept which has received recent attention in the professional literature is transfer of development rights.* Transfer of development rights entails the use of comprehensive regional master plans accompanied by enforced zoning and the establishment of a "market" for development rights within the zoned areas. It differs from traditional zoning by providing a mechanism which mitigates the "windfall and wipe out" effects of traditional zoning. In its simplest form, the process works as follows. A master zoning plan would establish areas of high, medium, and low density development (presumably on the basis of land capabilities, cost of providing public service, etc.). All land within the planning area would be assigned

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* Phillips Foster, et al., Transferable Development Rights, Extension Bulletin 251, Cooperative Extension Service, University of Maryland, College Park, Maryland, 1974.

Fifth Annual Report of the Council on Environmental Quality.

John Castonis, "Development Rights Transfer: An Exploratory Essay", Yale Law Journal 83, November, 1973.

_____, "The Chicago Plan: Incentive Zoning and the Preservation of Urban Landmarks", Harvard Law Review, 85, no 574, 1972.

Tared B. Shlacs, "Who Pays for Transfer of Development Rights", Planning, 40, July, 1974.

B. Bud Chavooshian and Thomas Norman, "Transfer of Development Rights: A New Concept in Land Use Management", Urban Land, 32, December, 1973.

Norman Marcus, "Development Rights Transfers: Planning the Perspective", in Donald H. Sisskind, chairman, Air Rights, Commercial Law and Practice Course Handbook Series No. 103, New York: Practicing Law Institute, 1974.

an equal number of development rights per acre. The initial assigned number of development rights per acre would be insufficient to allow high density development in high density zones. This requires landowners in high density areas to purchase development rights from landowners in areas zoned for low density (who presumably have a surplus of development rights which they cannot exercise due to the density limitation). The result of this exchange process is the establishment of a market price for development rights. Those individuals who are not permitted to develop their land beyond a certain intensity are compensated by selling their surplus development rights to those landowners who are permitted to develop but do not have adequate initial endowments of development rights. In the process the potential "windfall gain" of landowners developing high density land is used to affect or eliminate potential wipe-out losses to owners of low density land. The benefits and burdens of preserving open space or low density areas are shared by the community rather than by just a few individuals.

This technique is not presently used in Ohio and its feasibility would require detailed legal analysis and enactment of appropriate legislation. The concept has considerable appeal as a comprehensive method of equitably controlling land use in or near critical geographical areas. It would be particularly applicable in selectively protecting critical areas subject to development pressure while still allowing flexibility in surrounding land use. Its major disadvantage is the limited experience with the technique and the time that would be required to implement necessary legal changes.

Building Codes, Housing Codes, Subdivision

Building codes provide for regulation of the minimum construction standards of new buildings while housing codes govern minimum occupancy standards for old and new buildings. Subdivision regulations establish minimum standards for density, for street alignment and surfacing, and for provision of sewage and water supply systems and for surface water

drainage. Local Land Use Controls in Ohio describes the extent to which these regulations are employed by Ohio communities. For example,

> "Subdivision regulations are employed extensively by Ohio's counties and cities (75 and 91 percents, respectively). Few villages use the control. It appears that rapidly growing communities in urban areas have been the heaviest users of subdivision regulations.
>
> As might be expected, building and housing codes have been used most extensively by Ohio's cities (84 and 63 percent respectively). Housing codes have generally been used less widely than building codes. Review of the data suggests that housing codes are common among older, built-up cities, and that building codes are most frequently adopted by communities confronted with the problem of regulating new one, two, and three-family residential construction."

The role of both building and housing codes in the regulation of critical areas is at best indirect. For construction in hazardous areas (flood plains, erosion areas) building codes can be used as a method of ensuring adequate safety in construction. In most situations, building codes, per se, will not play any significant role in regulation of development in critical areas.

Subdivision regulations provide a potential tool for shaping the development of new residential areas located near identified critical areas. Use of subdivision regulations by local government in conjunction with land use master plans could be used to establish densities, amount of open space, surface water management and buffer zones. The effectiveness of subdivision regulations in protecting critical areas would depend on official identification and explicit inclusion of identified critical land use areas within local jurisdictions. As with many of the other regulatory techniques, this relates to the structure of a critical area planning process.

## Acquisition of Interest in Lands

Outright purchase of threatened critical areas or purchase of development rights is the most effective way of regulating critical areas. It is also the most expensive. Given the pervasive nature of development

pressure on land resources in a state such as Ohio, acquisition of interests in land will necessarily see only limited use. Components within this category include fee simple purchase, acquisition of development rights, gifts or donations, sale and lease bank arrangements, and land banking.

Fee Simple Purchase

Fee simple acquisition of property involves outright purchase of the title to lands, either through voluntary sales or exercise of the right of eminent domain. Where extensive public use of the land is to be made, outright purchase is generally the preferred approach. The disadvantage, as mentioned earlier, is requirement of full payment over a short period. As Reitz points out, installment sales contracts can be used as well as other deferred payment plans.* A variety of Federal funding programs exist including the Land and Water Conservation Fund administered by the U.S. Bureau of Outdoor Recreation the Estuarine Sanctuaries Programs under the Department of Interior, and the Open Space Land Program of the Department of Housing and Urban Development. The variety of Federal programs available for land acquisition are described in the publications listed below.** Other methods of financing direct purchase include earmarking of tax revenues for open space acquisition, which is done in Maryland, for example. Maryland uses revenues from its property transfer tax to pay the principal and interest on the bonds issued by the state pursuant to the Outdoor Recreational Land Loan Act of 1969.*** The Maryland Department of Natural Resources was originally authorized to issue $80,000,000 worth of bonds to establish open space programs and to acquire open space. As of November, 1974, however, only $20,000,000 in bonds had been issued, and much of that had already been retired through revenue from the property transfer tax. The tax had been successful enough so that if projections hold, no further issuances of bonds will be necessary.

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* Reitze, Loc. Cit., p 1-73.

** Digest of Federal Outdoor Recreation Programs, U.S. Bureau of Outdoor Recreation, 1973, or the Catalog of Federal Domestic Assistance.

*** The Maryland State Property Transfer Tax-draft-no source listed.

Short of institutional changes which generate a significant source of revenue for acquisition of critical areas, it is unlikely that fee simple purchase will prove to be a major tool for managing critical land use areas in Ohio. This, of course, depends on the actual number acreage and location of the critical areas in Ohio under a future critical areas program.

Acquisition of Less than Fee Simple Interests

Purchase of scenic or conservation easements is another method of acquiring interests in land for purposes of environmental preservation. This technique essentially involves public acquisition of all or some of the rights to develop specific parcels of land.

While purchase of development rights may involve modest costs in rural areas not subject to development pressure, the cost of development rights in developing areas can approach the full purchase price of the land. Reitze points to other considerations in using this approach including:

- Appraisal costs can be large and the effectiveness of an acquisition program often depends on the skill of the negotiators.
- There is often difficulty in protecting and policing privately owned lands. Easements for passive rather than physical occupation are more likely to be effective.*

In terms of protecting critical areas in Ohio, easements may be useful in rural areas not subject to development pressure. Their use in urban areas or areas subject to extensive public use, however, will probably be infeasible due to prohibitive costs.

Dedication and Donations

Dedication occurs when a private individual transfers land to the government without receiving compensation. The term includes voluntary as well as required transfers of land. Public access to coastlines and the

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* Reitze, Op cit..

transfer of subdivision streets to local government by developers are examples. Dedication of parks in areas of development of previous open space is another example. Dedication also includes land donations which can be an important tool in protecting open space and critical areas. There is a strong financial incentive in Federal tax law encouraging donation of lands. Federal law allows deduction of up to thirty percent of gross annual income for charitable donations, including donations of land to the public. Further, if the value of land is in excess of thirty percent of gross income, this value can be carried over for up to five years as a tax deduction. The net cost of donations can be reduced by as much as fifty percent not to mention the avoidance of capital gains taxes if land were sold for development.* Other types of donations such as scenic easements and reserved life estate provide tax advantages. Willed gifts of land also avoid inheritance taxes.**

Gifts and donations could be a useful part of an array of tools for dealing with critical land use areas. The use requires careful planning, competent personnel, and recipients for donations. It could probably not be counted on as a major source for acquiring title to land in critical areas, however.

Leasing, Purchase/Leaseback, Purchase/Saleback

The benefits of leasing, purchase/leaseback, etc. may be advantageous in gaining control to land while minimizing the long-run costs. Leasing in itself can only temporarily protect land from development. Combined with a purchase option, leasing can defer acquisition costs while providing immediate protection. Purchase/leaseback is useful where the land is productive in low density uses (agriculture for example). Land is acquired in fee simple with costs being recovered through leasing

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* Mary Cranston, et al., A Handbook for Controlling Land Growth, Stanford Environmental Law Society, September, 1973, p 17.

** Ibid.

*** Ibid. p 35.

to individuals willing to use it productively. Purchase/saleback requires an initial public purchase with resale of the land under specific development restrictions. The approach assumes a willing buyer of the land and may involve commitment of public moneys for considerable periods of time.* Staged acquisition under an installment purchase program is another option which gives immediate control but spreads payments over an extended period.

The advantages of the above alternatives for any critical areas program is the immediate control they provide. They disadvantages relate to total costs and the assumption in the case of leaseback and saleback of willing leasees or buyers. The two techniques would probably work best in agricultural areas that are not presently subject to extensive land speculation.

Land Banking

Land banking involves acquisition of properties far enough in advance of development to assure minimum costs. Land can then be sold back in parcels under specific plans or used for public facilities. Although little used in the United States on any extensive scale, it does offer several advantages. It allows for more direct community control over the development process. If land is purchased far enough in advance, it minimizes the costs compared to purchase at a later date. Equally important land banking provides an opportunity for advance planning of large scale community facilities.

Land banking near urban areas could be a useful regional approach for protecting those portions of the region designated as critical areas. This would be particularly true for advance acquisition and buffering of sites for key facilities such as power plants or airports.

## Development Controls

Development controls, practiced in some communities in the United States, rely on moratoria on various phases of development. These may be on building permits or new sewer connections. In many cases, the

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* Cranston, Loc Cit., p 35.

moratoria are temporary, pending completion of treatment facilities. In other cases, moratoria have been intended as a vehicle for slowing or shaping growth. Use of moratoria, while perhaps appealing from a local perspective, can often cause other types of problems. Sewer moratoria can accelerate urban sprawl, as pointed out in the Fifth Annual Report to the Council on Environmental Quality.* Growth prohibited in one locality will most likely occur somewhere else. Fill-in of presently undeveloped land may be blocked. Housing costs may be increased if developers are forced to install package treatment plants. Likewise, larger lots capable of handling septic tanks may be the only alternative open to developers resulting generally in continued urban sprawl. The CEQ report, does emphasize the value of well-planned slow-growth policies on the part of communities.

In view of the problems inherent in moratoria and the undesirable side effects, their use as a tool in regulating critical land use areas appears limited. Phased development by communities in combination with other types of regulatory tools appears to be a more rational approach in dealing with critical areas from the local level.

## Incentives/Disincentives

Income and property tax policies and practices play an important role in shaping density, distribution, and composition of land use in Ohio. These are indirect forces affecting general land use in urban areas and the urban fringe. As such, they are subject to change only through long-term alteration in Federal and state tax laws and practices. In looking at problems of critical land use areas, however, it is important to recognize the role a variety of incentives and disincentives play in private market decisions on land use. The following aspects are briefly discussed: Property taxes, income taxes, and preferential taxation.

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* Fifth Annual Report of the Council on Environmental Quality.

Property Tax

Details of the property tax in Ohio are described in a recent Advisory Commission on Ingergovernmental Relations publication.* The report discusses such aspects as the tax base, assessing responsibilities, assessment variations, and review and appeal procedures. These facets of the Ohio tax system are of considerable importance to individual property owners and to community officials. The importance of the property tax to problems of critical areas, however, is its effect on broad land use decisions. This subject is complex, but the major land use implications were summarized in the First Annual Report of the Council on Environmental Quality.**

> "At present, land in urban areas tends to be undervalued and the improvements on land overvalued for tax purposes. Consequently, landowners in urban areas are discouraged from restoring structurally sound buildings or replacing deteriorated ones with new structures, since such improvements will raise the taxes disproportionately. On the developing fringe of urban areas, low taxes on raw land have encouraged speculative purchase and leapfrog development."***

The effect of this type of issue can only be interpreted in terms of broad land use problems and inefficiencies. Effects on critical areas result from urban sprawl and leapfrog development which, it is thought, is spurred by present property tax assessment practices. Changes in these practices will only have an effect on land use in the longer run. As the CEQ report suggests, communities may be able to use the property tax as a mechanism for shaping development.

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* The Property Tax in a Changing Environment, Selected State Studies, M-83, Advisory Commission in Intergovernmental Relations, Washington, D.C., March, 1974.

** Environmental Quality, The First Annual Report of the Council on Environmental Quality, U.S. Government Printing Office, August, 1970, p 189.

*** First Annual Report of the Council on Environmental Quality, p 190.

> "Finally, few communities have constructively exploited the interrelationships of zoning, subdivision controls, and other land use devices with property tax policy. The local property tax could be a useful device, particularly in encouraging cluster development and open space preservation where no such options exist. Special tax treatment for commonly owned open space and community facilities also encourages protection or enhancement of the environment by subdivision developers."*

Preferential Assessment

It is possible to attempt to protect open space through varying alterations in the property tax assessed on the land. Preferential assessment occurs when land is valued according to its current use. No penalty is imposed if the land is transferred to another more intensive use. Deferred taxation occurs when land is taxed according to its current use value, but when the land is shifted to a higher value use, a rollback or deferred payment is imposed requiring the seller to pay several years of "tax savings". A restrictive agreement occurs when the landowners and the local government agree to use restrictions in return for differential assessment.** In Ohio. land devoted exclusively to agricultural use is valued for taxation at current value for agriculture.

Although differential assessment is widely used, it is not without problems. Recent literature has emphasized many of these problems. First, revenues lost by differential assessment are usually made up by higher taxes on the remaining tax base.*** Another problem is lowering the cost of holding land for future development can stimulate leapfrog development on the urban fringe. Rollback processes, depending on their severity, may offset speculative holding. On the other hand, if such

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* First Annual Report of the Council on Environmental Quality, p 190.

** Thomas F. Haly and Ann Gordon Sibold, State Programs for the Differential Assessment of Farm and Open Space Land, Agricultural Economic Report No. 256, Economic Research Service, U.S. Department of Agriculture, April, 1974.

*** See State Programs for the Differential Assessment of Farm and Open Space Land for a discussion of recent literature.

provisions are too severe, they may reduce the participation by landowners in any preferential assessment program.*

With the proper arrangements, preferential assessment could be a highly useful tool for managing specific critical areas. To be effective, however, it is likely that preferential treatment would need to be tied to negotiated contracts requiring the landowner to maintain his or her land in an undeveloped status for a specified number of years. California has this type of provision in its agricultural preferential assessment program. Contracts cover a ten-year period and are automatically reviewed each year unless the land owner specifies otherwise. In that case, the assessment is gradually raised to full market value as the number of years remaining in the contract decreases. It would seem that if preferential assessment is to be a useful tool in dealing with specific critical land use areas, some form of long-term contractual arrangement will be necessary.

Income Taxes

As with property taxes, Federal income taxes play an important but indirect role in shaping land use. Because the effects of taxation policies are pervasive, they are likely to be important constraints (or aids) on the effectiveness of any proposed critical areas program in Ohio. For that reason a brief summary of the findings of previous studies presented in the CEQ Annual Report is included here. The unintended land use problems generated by Federal tax policy, are of course, outside of the ability of any one state, regional, or local governments to change. Such changes will only result from collective efforts on the part of a variety of governmental, environmental, and economic interests.

The following factors in the Federal income tax are viewed as creating significant effects on land use:

- Tax deductions are allowed for interest payments and property taxes by homeowners, but renters are not allowed to deduct rental payment. It is thought that

* For a discussion and listing of recent literature, see Fifth Annual Report of the Council on Environmental Quality.

this provides an incentive for high priced, low density, single-family homes.* This case is not clear-cut, however, since owners of apartments can deduct expense and depreciation and these tax advantages can be passed on as lower rents. Recent trends toward condominiums, however, will encourage denser housing patterns.

- Depreciation of buildings is an important factor favoring new construction over renovation of older structures.

"For investments in residential structures, the depreciation schedules favor investment in new construction over rehabilitation of older housing by allowing the former to be depreciated more rapidly. The rules also encourage a rapid turnover of ownership of buildings because the major advantage of depreciation for tax purposes occurs during the early years of ownership, and accelerated depreciation (although at a lower rate than with a new building) begins anew with each subsequent owner. Since the profit in a building can result from the depreciation deductions as much as from the income it generates, there is a disincentive to maintain the building in expectation of long-run income-producing potential. The incentive is to build, depreciate, sell, and then build again. This creates an inducement to continue constructing new buildings where land is cheap--the land cannot be depreciated--while allowing older buildings to decay.**

- Treatment of profits from land sales or capital gains which are taxed at a lower rate than other types of income serves as a stimulus for land speculation.

"Some observers identify this capital gains treatment as perhaps the most important Federal tax provision in stimulating the conversion of open rural land to development."***

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* References recommended on the subject include: Stephen Gurko, "Federal Income Taxes and Urban Sprawl", Denver Law Journal, Vol. 48:329, 1972, or Richard E. Slitor, The Federal Income Tax in Relation to Housing, prepared for the National Commission on Urban Problems, U.S. Government Printing Office, Washington, D.C., 1968.

** Fifth Annual Report of the Council on Environmental Quality.

*** Ibid.

- Estate tax provisions also play an important role in land use decisions. For example, no capital gains taxes are presently paid on appreciation of property before an owner's death if that property is passed on to his heirs. The effect of such a tax policy is especially pronounced on the urban fringe where farm families may hold onto land long after it is ready for development. Federal estate tax law also requires that farmland, woodland, and open space be appraised at full market value for purposes of valuing estates. This may force sale to pay estate taxes, especially in the case of the farmland.

It must be emphasized that most of these Federal tax provisions were designed with other beneficial objectives in mind. Stimulation of housing construction or overall economic stimulation were some of the major intentions. The side effects on land use were mostly unintended, but are nonetheless important factors influencing the long-run feasibility of managing development in or near critical land use areas.

## Criteria and Evaluation

Criteria for evaluating the various regulatory alternatives described above are presented in this last section. These are intended as interrelated factors which are important in recommending or considering any of the specific alternatives discussed in detail in the draft.

### Public Costs

The public costs of using a specific regulatory alternative would entail essentially two components. Public costs may relate to the expenditures necessary to acquire, manage, and police land for preservation. Public costs may also entain the effects a specific alternative may have on

anticipated or unanticipated costs for utilities, public services, or other public expenditures resulting from use of a specific regulatory alternative.

Private Costs

Private costs refer to the burdens borne by the private sector as a result of implementation of a specific regulatory alternative. Private costs may mean higher prices of products, higher costs of doing business, loss of revenue, or any other change in personal income streams due to inefficiencies or impacts which the regulatory technique fosters.

Long-run Effectiveness

Long-run effectiveness is defined simply as the extent to which the control provides protection for critical areas in the face of a variety of long-run development and alteration pressures.

Flexibility

Flexibility entails the extent to which the regulatory technique can be used under a variety of circumstances and still maintain its overall effectiveness.

Comprehensiveness

Comprehensiveness is the scope of coverage of the regulation in terms of dealing with the variety of potential threats to critical areas.

Feasibility of Implementation

Feasibility refers to the ease with which the regulatory technique may be implemented under existing Ohio laws and the extent to which such techniques will be politically feasible for use at the local and regional level.

## Equity

Equity refers to the extent to which the technique treats equals equally. In other words, are people or pieces of property in similar circumstances dealt with in a similar manner.

The table on the following page provides a subjective evaluation of the various regulatory techniques. Development of any critical areas program will require reliance on these regulatory tools in varying combinations. More innovative approaches, such as transfer of development rights will require considerable public support for passage of enabling legislation, but will also provide comparably large benefits in terms of effective and equitable land use regulation.

Table 8.

SUBJECTIVE EVALUATION OF GENERAL APPROPRIATENESS

OF REGULATION TECHNIQUES FOR CRITICAL AREAS

| Mechanisms / Proposed Criteria* | Police Power | | | | | | Aquisition of Interest in Land | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Traditional Zoning | Planned Unit Developments | Special Districts | Transfer of Development Rights | Building Codes | Subdivision Regulations | Fee Simple | Less than Fee Simple | Dedication and Donations | Leasing etc. | Land Banking |
| Public Costs | -,0 | - | - | - | 0 | 0 | + | +,0 | - | - | +,0 |
| Private Costs | +,0 | - | - | - | 0,+ | 0,+ | - | - | -,0 | - | - |
| Long Run Effectiveness | - | +,0 | + | + | + | 0,? | + | 0,? | 0,- | - | + |
| Flexibility | - | +,0 | + | + | | 0,? | +,0 | 0 | 0 | + | -,0 |
| Comprehensiveness | -,0 | 0 | + | + | - | - | +,0 | -,0 | - | - | 0 |
| Feasibility of Implementation | + | +,? | +,? | - | +,0 | + | - | -,0 | + | +,? | -,? |
| Equity | - | 0 | + | + | + | + | + | + | + | + | + |

Possible Modification
-Direct public costs
-Indirect public costs

* As defined in text

Key: -= Judged to be relatively low

?= General information and previous research insufficient to make judgment

Key: += Judged to be relatively high

0= Judged to be neutral, indeterminate, or dependent on particular circumstances

Table 8.

SUBJECTIVE EVALUATION OF GENERAL APPROPRIATENESS OF REGULATION TECHNIQUES

| Mechanisms / Proposed Criteria | Development Controls | | Incentives/Disincentives | | |
|---|---|---|---|---|---|
| | Moratoria | Slow Growth | Property Tax | Preferential Assessment | Income Tax Provisions |
| Public Costs | - | - | | +,0 | 0 |
| Private Costs | + | +,0 | | - | + |
| Long Run Effectiveness | -? | +,0 | + | -? | + |
| Flexibility | - | +,0 | 0 | 0 | 0 |
| Comprehensiveness | - | - | - | - | - |
| Feasibility | -,0? | ? | ? | + | ? |
| Equity | - | +,0 | ? | 0 | 0 |

# CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS

It is apparent from the breadth of topics covered in this report that a considerable amount of further work and thought will be necessary before the options for an Ohio critical areas program become clear. This report shows that for a complex state such as Ohio, a large number of types of potential critical areas are necessary. Blanket designation of general categories of critical areas, however, would be virtually infeasible for Ohio because of the diversity in the state. Rather, specific carefully selected candidate areas within agreed upon general categories appears to be a more workable concept. Such an approach would allow for selection of specific critical areas based on regional priorities, problems, and needs.

The report showed the spectrum of possible general administration structures for a critical areas program. Although no mechanisms can be drawn from the limited analysis in the report, a strong regional involvement in any future program will be very important to its success. A strong regional role will be necessary for two reasons. First, it is essential that maximum use of local knowledge and information be achieved due to the high costs of obtaining usable data. Second, effective implementation of the critical areas concept will hinge on active local and regional support. Since the critical areas concept implies some form of regulation of development, acceptance will require a political consensus on the part of various state and regional interests.

Of the mechanisms for regulating land use, transfer of development rights has considerable appeal. Use of this concept, particularly in areas undergoing growth and development, allows for equitable balancing of the opportunity costs imposed on the private sector by preservation or other land use regulation.

Several areas of further planning and research are evident. Those include:

- Development of specific proposed guidelines for each type of critical area or facility. These guidelines would be similar to those

used in flood plain regulation. For some types of critical areas, guidelines already exist and for others a general set may cover several types of areas. Such guidelines would be necessary regardless of the future administrative structure of a critical areas program.

- Exploration of the legal requirements for implementation of innovative concepts of land use regulation such as transfer of development rights
- Specification and evaluation of specific alternative state agencies and regional organizational structure for administration and management of a critical areas program
- Statewide inventory of proposed categories of critical areas and facilities using surveys and secondary data

While this report has attempted to provide some of the above types of information, the magnitude and scope of the subject of critical areas is sufficient for a variety of additional analysis. At a minimum, this report should provide direction and structure for further research and planning.

# APPENDIX A
# SUMMARY OF CRITICAL AREA CATEGORIES AND DEFINITIONS FROM OTHER LEGISLATION AND PROGRAMS

This appendix summarizes the variety of categories and definitions employed in other state legislation, other state programs, various proposed and existing national acts, and the American Law Institute Code. Table A-1 presents the spectrum of classes of critical areas. Table A-2 summarizes types of critical areas. The text following the tables provides definitions for each of the entries in the two tables. Information contained in this appendix provided the basis for development of the list of areas and facilities presented in Table 2 in Chapter 2.

## CLASSES OF CRITICAL AREAS

1. Areas of Critical (Environmental) Concern

(e) Areas of state-wide critical concern include the following geographic areas: coastal zone, mountains, rivers, heritage sites, major highways and interchanges, and airports.

(h) (y) (z) (aa) State area of critical concern means an area designated by the commission where uncontrolled or incompatible development could result in damage to the environment, life or property, or an area where the long-term public interest is of more than local significance. Such areas shall include but not necessarily be limited to fragile or historic lands where uncontrolled or incompatible development could result in irreversible damage to historic, cultural, scientific, or aesthetic values or natural systems which are of more than local significance including shorelands of rivers, lakes and streams (z: significant beaches, dunes, and estuaries), rare or valuable ecosystems and geologic formations, significant wildlife habitats, and unique scenic or historic sites (z: and natural areas with significant scientific and educational values); natural hazard lands where uncontrolled or incompatible development could unreasonably endanger life and property including floodplains and areas frequently subject to weather disasters, and areas of unstable geologic formations (y, z: and areas of high seismic or volcanic activity); and renewable resource lands where uncontrolled or incompatible development which results in the loss or reduction of continued long-range productivity could endanger future food, water, and fiber requirements of more than local concern including watershed lands, aquifers and aquifer recharge areas, and forest lands.

(i) Sites or areas of unusual natural, scenic, or historic significance.

(j) An area of critical state concern is an area where any substantial development will have a state or regional economic or environmental impact because of the nature or location of the land upon which the development is located.

Land suitable for agricultural, horticultural, or forestry uses on the basis of soil, topography, location, etc, and necessary to assure adequate land for the production of food and fiber in the state; sensitive or unique environmental areas which may include wetlands and wildlife habitats, other undeveloped natural areas designated in the state land-use plan as irreplaceable or irretrievable if destroyed or if devoted to intensive development or use; undeveloped land containing deposits of mineral resources necessary to meet economic, commercial, and human needs; a site, structure, district, or archaeological landmark included in the national register of historic places or designated by state or federal land as a historic site.

(1) (m) An area significantly affected by, or having a significant effect upon, an existing or proposed major government development which is intended to serve substantial numbers of persons beyond the vicinity in which the development is located and which tends to generate substantial development on urbanization. An area containing or having a significant impact upon historical, natural, scientific, or cultural resources of regional or state-wide importance.

(s) Criteria for designation: an area where current land-use trends clearly exist that significantly endanger human life or endanger property whose replacement would be a significant cost to the entire state; an area in which a specific change in land use would clearly create a significant hazard to the life or health of persons living in or near the area; an area which contains or has a significant impact upon archaeological, historic, scientific, or cultural resources or sites of state-wide importance; a lake shore, stream bank, or wetland area in which development of a certain type or intensity does or would limit access to or disposal of a resource of state-wide importance; a water supply area in which development does or would degrade the quantity or quality of that water supply and endanger the health and safety of a significant number of persons dependent upon that water supply; an area which contains or has an impact upon a recreation area of state-wide importance; a wildlife habitat which supports substantial wildlife populations of state-wide

importance; an area where prime agricultural land is threatened by development which clearly does not provide increased benefit to the state; an area significantly affected by, or having a significant effect upon, an existing or proposed major public development which is intended to serve substantial numbers of persons beyond the vicinity in which the development is located and which tends to generate substantial development around it; or an area or site having key economic development potential of state-wide importance, for some future use.

(v) An area where uncontrolled or incompatible development could result in irreversible damage to important historic, cultural, scientific, or aesthetic values or natural systems, which are of more than local significance, such lands to include shorelands or rivers, lakes, and streams; rare or valuable ecosystems and geological formations; significant wildlife habitats; and unique scenic or historic areas.

An area where uncontrolled or incompatible development could unreasonably endanger life and property, such lands to include floodplains and areas frequently subject to weather disasters, and areas of unstable geological formations.

An area where uncontrolled or incompatible development which results in the loss or reduction of continued long-range productivity could endanger future water requirements of more than local concern, such lands to include watershed lands, aquifers and aquifer-recharge areas, mineral deposits, significant agricultural and grazing lands, and forest lands.

(w) "Areas of critical environmental concern" means areas defined and designated as such by the state as provided in Section 6 of this act on nonfederal lands, by the tribe on reservation or other tribal lands, or by the public land management agency head with respect to federal public lands.

Areas of critical environmental concern are those areas where uncontrolled or incompatible development could result in damage to the environment, life or property, or the long-term public interest which is of more than local significance. The criteria for the identification of areas of

critical environmental concern shall include, but not be limited to, the following:

(i) Fragile or historic lands, where uncontrolled or incompatible development could result in irreversible damage to important, historic, cultural, scientific, or aesthetic values or natural systems which are of more than local significance, such lands to include coastal zones; significant beaches, dunes, and estuaries; significant shorelands of rivers, lakes, and streams; rare or valuable ecosystems and geological formations; significant wildlife habitats; scenic or historic areas; and natural areas with significant scientific and educational values

(ii) Natural hazard lands, where uncontrolled or incompatible development could unreasonably endanger life and property, such lands to include floodplains and areas frequently subject to weather disasters, areas of unstable geological, ice, or snow formations, and areas with high seismic or volcanic activity

(iii) Renewable resource lands, where uncontrolled or incompatible development which results in the loss or reduction of continued long-range productivity could endanger future water, food, and fiber requirements of more than local concern, such lands to include watershed lands, aquifers and aquifer recharge areas, significant agricultural and grazing lands, and forest lands

(iv) Areas containing geothermal resources

(v) Areas in which mineral resources are located, when the mineral is of major significance, or an area contains a significant quantity of mineral resources

(vi) Fire hazard areas.

(ee) To be eligible for natural landmark designation, a site must be nationally significant as possessing exceptional value or quality in illustrating or interpreting the natural heritage of our nation and must present a true, accurate, essentially unspoiled example of natural history. Examples are outstanding geologic formations or features significantly illustrating geologic processes; significant fossil evidence of life on earth; an ecological community significantly illustrating characteristics of a physiographic province of a brome; a biota

of relative stability maintaining itself under prevailing natural conditions following disruptive change; a habitat supporting a vanishing, rare or restricted species; a relict flora or fauna persisting from an earlier period; a site containing significant evidence illustrating important scientific discoveries; examples of the scenic grandeur of our natural heritage.

(hh) See areas of state interest or of state-wide significance.

2. Areas of State Interest or of State-Wide Significance

(b) Plans for protecting land and water resources of the state which are of state-wide significance in terms of the state's natural resource base and the preservation and enhancement of environmental quality and are threatened due to urban expansion, incompatible public or private use or development or other circumstances.

(c) Areas of state interest include mineral resource lands; natural hazard areas; areas containing or having a significant impact upon natural or archaeological resources of state-wide importance; and areas around key facilities in which development may have a material effect upon the facility or surrounding community.

(d) (1) An area of critical state concern may be designated only for an area containing or having a significant impact upon environmental, historical, natural, or archaeological resources of regional or state-wide importance; an area significantly affected by or having a significant effect upon an existing or proposed major public facility or other area of major public investment; a proposed area of major development potential, which may include a proposed site of a new community, designated in a state land development plan.

(h) Area of state concern means any state area of critical concern, key facility, mining operation, or large-scale development.

(q) The planning and siting of public transportation facilities, public sewage and water systems and solid waste sites and facilities, and public schools.

(hh) Districts of Critical State Concern. Portions of the state in which, because of their natural resources or the characteristics of development

that have previously taken place, future development of any character becomes an issue of state-wide concern (also applies to Areas of Critical Concern, Areas of Greater Than Local Concern, Areas of Particular Public Concern, Significant Land Resource Areas, and to a major extent, Areas Around Key Facilities).

A District of State Concern may be designated only for an area significantly affected by or having a significant effect upon an existing or proposed major public facility or other area of major public investment; an area containing or having a significant impact upon historic, natural,or environmental resources of regional or state-wide importance; or a proposed site of a new community designated in a State Land Development plan, together with a reasonable amount of surrounding land, and any land within the jurisdiction of a local government that at any time more than 3 years after the effective date of this code has no development ordinance in effect. Most portions of the state having a special state-wide interest either involve major public facilities, the usefulness of which is affected by the development in the surrounding area, or involve present land resources that could be damaged by undesirable development.

3. Areas of Greater Than Local Concern

(t) Areas containing or activities having a significant impact upon historical, natural, archaeological, or environmental resources of greater than local importance; areas containing or activities having a significant impact upon important watersheds or proposed areas of major public facilities or other areas of major public investment; areas of major development potential such as a proposed site for a power generation plant, an area identified as a major mineral deposit, a major industrial development, a new community, an airport, or a major highway system; and areas which, because of unique intrinsic qualities, are such that the development or nondevelopment will have a significant impact on the economic, recreational, or social opportunities of the citizens of the state.

Use in a particular area which would be incompatible with Federal, state, or local plans to achieve essential government objectives or which would be inconsistent with the long-term public interest which is of more than local significance.

(hh) See Areas of State Interest or of State-Wide Significance.

4. Areas of Particular Public Concern

(p) Those areas of the state where uncontrolled development, unregulated use, or other man-related activities could result in irreversible damage to important environmental, historic, or cultural values, or natural systems or processes which are of more than local significance, or could unreasonably endanger life and property as a result of natural hazards of more than local significance.

(u) The rural, scenic, wildlife, agricultural and forestry resources that are the basis of the state's tourist industries, outdoor recreation opportunities and economy, and the irreplaceable, limited, or significant natural, recreational scenic, historic, or other resources of the state shall be recognized in any state, regional, or town plan as being resources within the public interest.

(hh) See Areas of State Interest or of State-Wide Significance.

5. Significant Land Resource Areas

(b) Plan for protecting land and water resources of the state which are of state-wide significance in terms of the state's natural resource base and the preservation and enhancement of environmental quality and are threatened due to urban expansion, incompatible public or private use or other circumstances.

(x) Significant land resource areas may be designated only for

- Areas where incompatible or polluting land uses or developments could threated the public health and safety or the quality of public water supplies by contamination of major groundwater acquifers which function as a regional water supply for the citizens of more than one local jurisdiction.

- Agricultural land areas which are essential for continued production of food and fiber products.

- Areas and structures that are of particular historic, archaeological, architectural, or cultural significance to the region, state or nation, including structures or areas in which the board cultural, political, economic, or social history of this state or region is exemplified, which are identified with historic personages or important events in state or regional history, which embodies the distinguishing characteristics of a period style of architecture or construction or a notable work of a significant builder or designer, outstanding archaeological sites which produce information of major scientific importance or which illustrate major aspects of past cultures.

- Wetland areas in excess of 5 acres which are eligible for typing as an inland fresh water wetland area type 3, 4, 5, 6, 7, or 8 under U.S. Department of Interior classifications and areas adjacent to or in close proximity to such wetlands in which inappropriate land uses or developments may directly affect their functioning as important duck nesting, fish spawning or habitat for other wildlife, flood storage areas, aquifer recharge and discharge areas, areas of special scientific or ecological interest, or areas of scenic beauty.

- Areas which provide natural breeding, rearing, feeding, or nesting habitat for endangered wildlife species of birds, fish, mammals, or other animal forms; areas which provide a concentration of a great variety of natural habitats essential to many animal species; and small areas of specialized habitat essential to the existence of wildlife from a large surrounding place and essential movement corridors between such areas.

- Natural wilderness areas in which the land area and its community of life forms have been primarily affected by the forces of nature and are still in a primitive, natural state and which contain important ecological or geological values; including natural areas with outstanding opportunities for solitude or primitive, unconfined recreation and areas adjacent to designated wild and scenic rivers and designated wilderness and wild lakes.

• Areas of special scientific and natural value, including natural areas needed to protect remnant or rare plant and animal species or groupings and unique geological features for the educational and research opportunities of future generations and to provide benchmarks for measuring future changes in the environment.

• Areas of the landscape with outstanding scenic quality and recreational potential which provide unique visual contrasts or diversities or special vistas or provide major concentrations of physical and biological features, such as distinctive waterfalls, caves, bluffs, and other exceptional geological formations.

• Areas adjacent or in close proximity to existing major public facilities or other areas of major public investment in which incompatible land uses or developments may threaten the public safety or diminish the public use and enjoyment of the public facilities.

• Areas which have been precisely identified as the sites of future state governmental facilities and which require reservation against incompatible uses or developments. Such sites shall be included only upon a written determination in writing by the governor that funds will be available to purchase the lands in the event reservation controls are challenged in a court action initiated by the affected landowner. Powers available to municipalities under s. 62.23 (6) shall be extended to counties for purposes of implementing standards under this paragraph, and the facilities which may be the subject to official map controls shall be extended to any state facility designated hereunder. Municipalities and counties shall act as agents of the state in establishing official map regulations for designated state facilities.

• Areas which hold major deposits of nonmetallic minerals, including but not limited to sand and gravel, which are needed to meet construction needs in a region.

(hh) See Areas of State Interest or of State-Wide Significance.

6. Key Facilities

(h)(w)(y)(z) (aa) Key facilities means public facilities which tend to induce development and urbanization of more than local impact including, but not limited to, any major airport to serve as a terminal for regularly scheduled passenger service, major interchanges between interstate highways or other limited access highways and frontage access streets or highways, and major recreational land or facilities; major facilities for the development, generation, and transmission of energy.

(p) Key facilities means public facilities which tend to induce development and urbanization of more than local impact and includes, but is not limited to, major facilities for the development, generation, and transmission of energy, for communication, and for transportation.

(v) Key facilities such as major airports, highway interchanges, and recreational facilities.

(hh) See Areas of State Interest or of State-Wide Significance.

7. Areas Significantly Affected by or Having a Significant Effect on a Major Government Development

(j) Major Public Facility means any publicly owned facility, state licensed airport, or water and sewage facility of regional significance. Does not include any street or highway except an interchange on a limited access highway; or any educational institution serving primarily the residents of a local community.

(m) An area significantly affected by, or having a significant effect upon an existing or proposed major government development which is intended to serve substantial members of persons beyond the vicinity in which the development is located and which tends to generate substantial development or urbanization.

(hh) A major public facility means any publicly owned facility of regional significance but does not include any public facility operated by a local government, or an agency created by it, for the benefit of the residents of that local government; any street or highway except an

interchange between a limited access highway and a frontage access street or highway; an airport that is not to be used for instrument landings; or an educational institution serving primarily the residents of a local community.

8. Land Use of Regional Benefit

(g) Types of developments which shall be considered to be of regional benefit: airports and seaports serving regular passenger or freight traffic; systems of solid or liquid waste collection, treatment, or disposal; power generation and distribution facilities; interchanges between the interstate highway system and frontage access streets or highways, and interstate highway rights-of-way; other transportation systems of regional or state concern; domestic water storage and distribution systems; Federal or state institutions. Does not include any public facility located and operated within the jurisdiction of a local government, or an agency created by it, primarily for the residents of the local government; any segment of a transportation system that is not used for regional or state transportation; any airport that is not used for instrument landings; and any educational institution serving primarily the residents of a local community.

9. Activities of State Interest or of State-Wide Significance

(c) Activities of state interest are site selection and construction of major new domestic water and sewage treatment systems and major extensions of existing domestic water and sewage treatment systems; site selection and development of solid waste disposal sites; site selection of airports; site selection of rapid or mass transit terminals, stations, and fixed guideways; site selection of arterial highways and interchanges and collector highways; site selection and construction of major facilities of a public utility; site selection and development of new communities; efficient utilization of municipal and industrial water projects.

10. Developments of Regional Impact/Benefit

(d) Any development which, because of its character, magnitude, or location would have a substantial effect upon the health, safety, or welfare of the citizens of more than one county. Includes impact on environment and natural resources, on the economy, on public facilities, on transportation facilities, and on airports, attractions and recreational facilities, schools, port facilities, petroleum storage facilities, transmitting lines, electric generating facilities, mining operations.

(k) Development by an agency of state government which is or will be employed to provide services or to serve the population in an area beyond the territorial jurisdiction of a city, village, or township such as but not limited to any project which will affect public services and utilities.

(p) Means land use, public development, and private development on non-governmental lands for which there is a demonstrated impact affecting the interests of constituents of more than one local unit of government.

"Development and land use of regional benefit" means private development and land use for which there is a demonstrable need affecting the interests of constituents of more than one local government which outweighs the requirements of any applicable restrictive or exclusionary local regulation.

(y) Assuring that local regulations do not arbitrarily or capriciously restrict or exclude development of public facilities, housing, or utilities of regional benefit and influencing the location of new communities and controlling the use of land around new communities.

(z) (aa) Development and land use of regional benefit includes private development and land use for which there is a demonstrable need affecting the interests of constituents of more than one local government which outweighs the benefits of any applicable or exlusionary local regulation.

(hh) Development of Regional Impact (DRI) are those categories of development which, because of the nature or magnitude of the development or the nature or magnitude of its effect on the surrounding environment is

likely to present issues of state or regional significance. DRI means development by a governmental agency other than the local government; development which will be used for charitable purposes, including religious or educational facilities or which serves or is intended to serve a substantial number of persons who do not reside within the boundaries of the local government; development by a public utility which is or will be employed to a substantial degree to provide services in an area beyond the territorial jurisdiction of the local government; and development of housing for persons of low or moderate income.

The types of development included within the category "development of state or regional benefit" are those that typically provide benefits to an area beyond the boundaries of a single government, but that may cause some problems within the local area.

State government agencies are intended to serve the needs of a constituency larger than the local government. Similarly, state or Federal grant programs for the aid of development are almost always instituted for the purpose of achieving goals of a broader community than the residents of a particular local government. It is important to insure that the local governments do not allow their own constituents' fears of the adverse effects of development to outweigh completely the interests of a broader section of society that might be entitled to greater concern.

Charitable uses serving persons outside the local government provide a valuable public function; this section does not establish any special privileges for religious development but merely gives it an avenue of appeal by which a coercive restriction can be removed.

The term public utility is intended to include transmission and pipeline systems, gas and electric companies, transmission systems, and other public services whether interstate or intrastate.

Local governments often believe that heavily subsidized housing programs have an unfavorable cost-revenue impact, and there may be social and racial prejudice against the anticipated occupants. Thus, it has been difficult to find sites for housing of this type that will be approved by local governments.

Some types of development almost invariably become matters of state or regional significance regardless of their location (airports, public utility transmission lines, major highways, etc) and would include many other types of development if undertaken on a large scale.

The State Land Planning Agency is required to adopt rules distinguishing the types of development that would have an impact outside the boundaries of a single local government. The rules defining the line between small- and large-scale development of a particular type might be based on, among other factors, those listed below:

- Some types of development may have regional impact merely because of the amount of traffic they generate; e.g., the rules might designate as large-scale development any truck terminal with loading area for 15 or more trucks.

- The number of users or occupiers may often be the most workable test of magnitude. Any development which is used by a large number of people will have a substantial impact on a large area even though the development itself may occupy only a small area. Thus, for example, the scale of an apartment building might be measured by the number of dwelling units.

- Some types of development may attract few people and occupy only small acreage but create a serious potential for air or water pollution. Specific types of industrial use (e.g., an oil refinery) might be treated as development of regional impact regardless of size.

- Development may also have a substantial regional impact if it occupies a large land area even if it is used only by a few people; the withdrawal of large acreage from other potential use is itself a decision of important state or regional concern. Thus, development of any type occupying more than a specific number of acres might be considered to have regional impact.

- Some types of development have major impact because of the type and amount of subsidiary development that they attract, so the Agency might designate as large-scale development, e.g., any skiing facility containing three or more tows or lifts.

• Peculiar characteristics of particular parts of a state may may make certain types of development of regional significance there but not elsewhere. For example, development over an underground aquifer may require special consideration.

The State Land Planning Agency should have a high degree of flexibility in designing rules to meet the conditions of its particular state. It is recognized that these lines will be hard to draw and require the exercise of a sound judgment. In drafting the rules it is important to keep in mind both the need to protect state interests and the need to avoid forcing small developers to engage in unnecessary red tape. A procedure of state review such as outlined in this Code is likely to be successful only if it concentrates on the truly important decisions. If it gets bogged down in a backlog of meaningless paperwork or minor decisions, it may create more harm than good.

11. Developments Which Substantially Affect the Environment

Any state, municipal, quasi-municipal, educational, charitable, commercial, or industrial development, including subdivisions, but excluding state highways, which requires a license from the commission, or which occupies a land or water area in excess of 20 acres, or which contemplates drilling for or excavating natural resources, on land or under water, but excluding borrow pits for sand, fill, or gravel, regulated by the State Highway Commission and pits of less than 5 acres, or which occupies on a single parcel a structure or structures in excess of a ground area of 60,000 square feet.

(o) Shall mean any development to which a zoning law or ordinance and subdivision regulations of any town, village, or city or the land development controls printed in the general municipal law do not apply or which in a residential development is planned to contain more than 25 dwelling units; if a commercial or industrial development is planned to have a total projected building area on the ground of 200,000 square feet, including parking; proposes development in the flood plain; proposes development on a slope greater than 10 percent; proposes any development

which would exceed such additional criteria relating to size, density, attitude, slope, soil, impoundments, proximity to roads, highways, bodies or course of water or unique irreplaceable natural areas or other matters of critical environmental concern as the commissioner may promulgate in rules and regulations.

12. Large-Scale Development

(h)(p)(y) Large-scale development means private development which, because of its magnitude or the magnitude of its effect on the surrounding environment, is likely to present issues of more than local significance.

(w)(z)(aa) "Large-scale development" means private development on non-Federal lands which, because of its magnitude or the magnitude of its effect on the surrounding environments, is likely to present issues of more than local significance in the judgment of the state agency. In determining what constitutes "large-scale development" the state agency shall consider (a) the amount of pedestrian or vehicular traffic likely to be generated, (b) the number of persons likely to be present, (c) the potential for creating environmental problems such as air, water, or noise pollution, (d) the size of the site to be occupied, and (e) the likelihood that additional or subsidiary development will be generated.

13. Developments Which Spill Over From the Locality in Which Sited to Other Localities

14. Developments With Multijursidictional Impact

(k) Development which, because of the magnitude of its effect on the surrounding environment or adjacent jurisdictions is likely to present issues of state or multijurisdictional impact. Included are developments where the cost of providing public services cannot be met without a state or Federal grant or loan; the development creates increased demand across jurisdictional lines on public facilities or public services and involves air and water pollution or soil erosion; a development is proposed which has the capacity to accommodate 25 percent of the city's, village's, or township's population.

15. Designated Significant Growth and Development Zones

(i) Development districts: areas discernable as having homogeneous patterns of intensive residential, recreational, commercial, or industrial use, or commercial removal of minerals or other natural resources, and areas appropriate for designation as development districts when measured against the purpose, intent, and provisions of this statute.

(x) The department may designate zones within the state within which new development is presently occurring or is expected to occur at a rapid pace or at a significant scale relative to existing uses and development patterns. Upon designation of such significant growth and development zones, the department shall coordinate the extension by state and University of Wisconsin system resources and regional planning agencies of advisory standards, research and technical assistance, toward the end of helping local governments deal adequately with the land use, public finance, and local government organizational impact of such development.

16. Mining Operations

17. Agricultural Zones or Rural Areas

(f) Lands with a high capacity for agricultural production, lands with significant potential for grazing or other agricultural uses, land surrounded by or contiguous to agricultural lands - Rural - areas consisting of small farms, low density residential lots of not less than 1/2 acre and a density of not more than one single family dwelling per 1/2 acre.

(u) The Rural Area. The rural area includes lands, not within an urban or village area, which are generally close to existing cities, and urban communities, or are otherwise convenient to employment and shopping, have few apparent physical limitations for development, and can be developed consistent with the balance of this plan and the capability and development plan, or which are already committed to low density residential use.

The purpose of the rural area is to provide for the development of housing at low to moderate densities to meet the needs of Vermont's residents on lands which are suitable for such development and conveniently accessible to employment and shopping. The second purpose is to provide for the development of vacation homes on rural lands where their initial use or conversion to permanent homes will not result in high environmental, economic, or social costs and will be consistent with the orderly development of the town and nearby urban and village areas under this plan. As a general rule, the rural area will be the most appropriate location for residential and second home developments which utilize cluster planning. The continuation of agriculture or the preservation of the potential of agricultural soils shall be encouraged on the more productive agricultural soils within the rural area.

18. Urban Areas

Characterized by "city-like" concentrations of people, structures, streets, urban level of services and other related land uses, land contiguous with existing urban areas and suitable for urban use, lands in appropriate locations for new urban concentrations, lands with a gentle slope of 20 percent or more which do not provide open space amenities or scenic values and are desirable, suitable, and safe for urban purposes.

(i) Areas which are appropriate for commercial forest product or agricultural uses and for which plans for additional development are not presently formulated nor additional development anticipated.

(u) The urban area shall include the lands within existing cities and urban communities and sufficient lands adjacent to such cities and urban communities to support growth for at least 30 years at a density of approximately 2,000 persons per square mile or higher. Only those lands which generally have few physical limitations for development and can be developed consistent with this plan and the Capability and Development Plan shall be included in the urban area.

In establishing the intensity of development and uses of lands within the urban areas, the towns and regional planning commissions should give due consideration to the essential public services that will or may be required, such as public water and sewer systems and fire and police protection.

The purpose of the urban area is to provide for residential, commercial, industrial, and other development primarily to serve the needs of the resident population. Urban areas are to provide the state's residents with a wide choice of housing, employment, shopping, educational, recreational, and cultural opportunities, and a broad range of community services, such as medical and dental care, and allow them to be served by economical and high quality governmental and public utility facilities and services.

19. Village Areas

(u) The village area shall include the lands within and adjacent to existing villages which have the facilities and resources to support an increase in resident population or are conveniently accessible to a city, urban community, or village that can do so.

An existing village means an area identified by a regional planning commission and having the following characteristics: it is settled at a density significantly greater than the surrounding area; it generally has an intensity of development of one or more principal buildings per acre; and it has one or more retail trade outlets or private or governmental facilities or services such as sewer and water systems, fire departments, etc. Only those lands which generally have few physical limitations for development and can be developed consistent with this plan and the Capability and Development Plan shall be included in the village area.

In establishing the intensity of development and uses of lands within the village area, the towns and regional planning commissions should give due consideration to the essential services that will or may be required such as water and sewer systems and fire and police protection.

The purpose of the village area is to support the traditional role of the village as the focus of many of the economic and social activities of the surrounding community and to provide adequate development to serve the needs of the residents of the village and the community. Such development should occur at intensities of development and include uses which maintain the traditional character of such villages.

20. Natural Resource Areas

(u) The natural resource area shall include lands which: generally have potential for agriculture, forestry, or mineral extraction; and, in addition, have one or more of the following characteristics--they have one or more physical limitations for development, they are not conveniently located to employment and shopping, they do not have direct access to improved public roads, or they include irreplaceable, limited, or significant natural, recreational, scenic, historic, wildlife habitat, or other resources.

The purpose of the natural resource area is to provide for uses which are compatible with the potential of the land for agriculture, forestry, or mineral extraction, to protect the rural character and scenic resources that form a basis for the state's outdoor recreational opportunities and tourist industries, and to benefit the citizens of the state by protecting irreplaceable, limited, or significant natural, recreational, scenic, historic, wildlife habitat, or other resources.

21. Conservation Areas or Zones

(f) Lands necessary for protecting watersheds, water resources, and water supplies; lands susceptible to floods and soil erosion, lands susceptible to inundation by flooding, to volcanic activity, or to landslide; lands for national or state parks, lands necessary for the conservation, preservation, and enhancement of scenic, historic, or archeological sites, and sites of unique physiographic or ecological significance; lands necessary for providing and preserving parklands, wilderness and beach reserves, and for conserving natural ecosystems of endemic plants, fish,

and wildlife, and for forestry; lands having an elevation below the maximum inland line of the zone of wave action and all marine waters, fish ponds, and tide pools; lands with topography, soils, climate, or other related environmental factors that are not normally adaptable or presently needed for urban, rural, or agricultural use; lands with a gentle slope of 20 percent or more which provide for open space amenities or scenic value.

(ii) Protection Districts: Areas where development could jeopardize significant natural, recreational, and historic resources, including, but not limited to flood plains, precipitous slopes, wildlife habitat, and other areas critical to the ecology of the region or state.

(iii) The conservation area shall include areas of lands generally of a size of five square miles or more which are essentially undeveloped and predominantly forested and generally do not have direct access to an improved public road, and, in addition, have one or more of the following characteristics: they have potential for commercial forestry, they have one or more physical limitations for development, they are generally in excess of 1500 feet in elevation, they have a high probability of providing significant recharge to groundwater supplies, or they include irreplaceable, limited, or significant natural, recreational, scenic, historic, wildlife habitat, or other resources. The conservation area may also include areas of lands of a size of less than five square miles if they have physical limitations for development and include major public forest or game lands or major wetlands or wetland systems. In addition to the purposes of the natural resource area, the purpose of the conservation area is to protect Vermont backlands because they are valuable natural resources. In addition there are ample lands available elsewhere which are more suitable for intensive development and which can be provided with governmental and public utility facilities and services at far lower cost. The lands in the conservation area should be protected until there is a public need for their development and governmental and public utility facilities and services can be provided at reasonable cost.

22. Roadside Areas

(u) The roadside area includes lands which are located within 100 feet of the right-of-way of an interstate, state or state aid (Class I, II, and III as defined in 19 VSA § 17) highway within a rural, natural resource or conservation area.

The purpose of the roadside area is to regulate development and subdivision along roadways of the kind which imperils highway safety, makes wasteful and uneconomic use of land, or is wholly inconsistent with maintenance of the scenic character and quality of the rural, natural resource and conservation areas of the state.

23. Shoreline Areas

(u) The shoreline area includes land lying within 100 feet from the top of the established bank of any watercourse having a drainage area of 10 square miles or more, or the mean water level of any lake, pond, or reservoir having an area of 20 acres or more. The purposes of the shoreline area are to protect the character and quality of shorelines and reduce the hazards of flooding to life and property.

24. Transitional or Intensely Developed Areas Where Reclamation, Restoration, Public Access, and Other Actions Are Especially Needed

TYPES OF CRITICAL AREAS

1. Historic/Heritage/Cultural/Architectural Sites

(c)(k)(p) Historic or archaeological resources of state-wide importance means resources which have been officially included in the national register of historic places, designated by statute, or included in an established list of places compiled by the state historical society.

(h) Where uncontrolled or incompatible development could result in irreversible damage to important historic, cultural, scientific, or aesthetic values or natural systems which are of more than local significance - including shorelands of rivers, lakes, and streams, rare or valuable ecosystems and geologic formations, significant wildlife habitats, and unique scenic or historic sites.

(j) Historical areas, monuments, structures, and sites that have been or are being identified by the state historical trust as being of significant importance in their inventory of such areas, monuments, structures, and sites.

(dd) Sites, buildings, structures, and objects significant in American history, architecture, archaeology, and culture.

2. Archaeological Sites

(c) Historical or archaeological resources of state-wide importance means resources which have been officially included in the national register of historic places, designated by statute, or included in an established list of places compiled by the state historical society.

(dd) Districts, sites, buildings, structures, and objects significant in American history, architecture, archaeology, and culture.

(ee) Significant fossil evidence of the development of life on earth.

2A. Natural or Environmental Resources

( ) Natural resources of state-wide importance is limited to shorelands of major public owned reservoirs and significant wildlife habitats in which

the wildlife species, as identified by the Division of Wildlife of the Department of Natural Resources, in the proposed area could be endangered - also includes unique geologic formations and shorelands of major reservoirs, rivers, lakes, and streams.

3. Rare Ecosystems (Natural Areas) of Scientific or Historic Significance

(c) Ecosystem means a natural unit of land or water and all living organisms and nonliving materials found therein.

(h) Where uncontrolled or incompatible development could result in irreversible damage to important historic,cultural, scientific, or aesthetic values or natural systems including rare or valuable ecosystems.

(k) Undeveloped natural areas designated in the state land-use plan as irreplaceable or irretrievable if destroyed, or if devoted to intensive development or use.

(ee) An ecological community significantly illustrating characteristics of a physiographic province or brome; a biota of relative stability maintaining itself under pervailing natural conditions, such as a climatic climax community; an ecological community significantly illustrating the process of succession and restoration to natural condition following disruptive change; a relic flora or fauna persisting from an earlier period; a site containing significant evidence illustrating important scientific discoveries.

4. Rare Geologic Formations

(h) Where uncontrolled or incompatible development could result in irreversible damage to important historic, cultural, scientific, or aesthetic values or natural systems including rare or valuable geologic formations.

(ee) Outstanding geologic formations or features significantly illustrating geologic processes.

5. Fish and Wildlife Habitat

Areas which are required as habitat for significant fish and wildlife resources, including rare and endangered species.

( Any area designated as a wildlife area by a state, regional, or local land planning program.

(h) Where uncontrolled or incompatible development could result in irreversible damage to important historic, cultural, scientific, or aesthetic values or natural systems including significant wildlife habitats.

(k) Necessary wildlife habitats which are identifiable and are demonstrated as being decisive to the survival of a species of wildlife at any period of its life, including breeding and migratory periods. Land contiguous to wildlife habitats necessary to protect the areas from encroachment.

(ee) A habitat supporting a vanishing, rare, or restricted species; a seasonal haven for concentrations of native animals, or a vantage point for observing concentrated populations, such as a constricted migration route.

6. Mountain Lands

1500-foot contour line and above.

7. Coastal Dunes and Beaches

(e) Coastal vital area is all land and water area extending 2000 feet inland from the mean high water mark - all land and water areas of coastal islands.

(i) Shoreland areas defined as within 250 feet of the normal high water mark of any pond, river, or salt water body to be subjected to zoning and subdivision controls.

(n) Bays, harbors, sounds, wetlands, inlets, the tidal portions of fresh, saline, or partically saline streams and tributaries and <u>their adjoining fastland drainage area nets</u>, channels, estuaries, <u>barrier beaches</u>, near shore waters and intertidal areas.

8. Wetlands - Freshwater, estuarine, coastal

(i) Shoreland areas defined as land within 250 feet of the normal high water mark of any pond, river, or salt water body to be subjected to zoning

and subdivision controls.

Pond - any inland body of water which has a surface area in excess of 10 acres, except where such water body is man made and, in addition, is completely surrounded by land area held by a single owner.

River - any free flowing body of water from that point at which it provides drainage for a watershed of 25 square miles to its mouth.

Coastal Wetland - any swamp, marsh, log, beach, flat, or other contiguous lowland above extreme low water which is subject to tidal action or normal storm flowage at any time excepting periods of maximum storm activity.

(k) Lands contiguous to wetlands necessary to protect the areas from encroachment.

(n) The bays, harbors, sounds, wetlands, inlets, the tidal portions of fresh, saline, or partially saline streams and tributaries and their adjoining upland fastland drainage area nets, channels, estuaries, barrier beaches, near shore waters, and intertidal areas.

9. Areas of Scenic, Aesthetic, Natural Beauty

(ee) Examples of scenic grandeur of our natural heritage.

10. Scenic Highway Corridors

11. Wild, Scenic, Natural Rivers

12. Public Recreation Areas

13. State Parks

14. State Forests

15. Access Sites in Water Recreation Areas

(b) Areas required to provide needed access to coastal beaches, lake shores, and river banks.

Areas such as waterways and lands under or flowed by tidal waters or navigable waters to which the public may have rights of access or public trust rights.

16. Mineral Resource Lands

(c) Mineral resource area means an area in which minerals are located in sufficient concentration in veins, deposits, bodies, beds, fields, pools, or otherwise, as to be capable of economic recovery. The term includes but is not limited to any area in which there has been significant mining activity in the present, mining activity is planned or in progress, or mineral rights are held by mineral patent or valid mining claim with the intention of mining. - Areas containing geothermal resources and areas in which a mineral is located, when the mineral is of major significance or an area contains a significant quantity of mineral resources.

(d) Undeveloped land containing deposits of mineral resources necessary to meet economic, commercial, or human needs.

17. Agricultural Lands

(b) Forest and agricultural lands judged to be of major importance in meeting future needs for food, fibre, and timber.

(k) Soils meeting the standards of the USDA's land capability classes I-IV, or soils that are suitable for agricultural or horticultural purposes such as fruit or specialty crops or soils such as drained mucks or peats.

(p) Prime agricultural land, at least 50 percent of which can be farmed with normal management practices as identified by the Commissioner of Agriculture.

18. Forest Lands

(b) Forest and agricultural lands which are judged to be of major importance in meeting future needs for food, fibre, and timber.

( ) Prime forestry land - sites capable of producing 85 cubic feet per acre per year or more of marketable timber as identified by the state forest service.

(gg) Forests and related land which require long stability for continuing renewal.

19. Aquifer Recharge Areas

(j) Intake areas for significant quantities of water that will be transmitted through aquifers, as defined by the state and U.S. geological surveys.

(p) Watersheds or aquifers that are present sources of public water supply as identified by the State Board of Health/Water Resources or that are classified for water supply use pursuant to G.S. 143-214.1.

20. Watersheds for Public Water Supplies

(b) Area which requires special development regulations because of special conditions.

(j) Water supply reservoirs and their watersheds; all water impoundments greater than 50 acres, and their immediate drainage basin, including tributaries.

(p) Watersheds or aquifers that are present sources of public water supply as identified by the State Board of Health/Water Resources or that are classified for water supply use pursuant to G.S. 143-214.1.

20A. Natural Hazard Areas

(c) Areas containing or directly affected by a geologic hazard, a wildfire hazard, or a flood.

21. Flood Plains

(b) Areas which require special development regulations because of hazardous or special conditions.

An area adjacent to a stream, which area is subject to flooding as a result of the occurrence of an intermediate regional flood and which

area thus is so adverse to past, current, or foreseeable construction or land use as to constitute a significant hazard to public health and safety or to property - identify 100-year (storm return frequency) floodway.

(e) 2000 feet either side of the bank or the 100-year flood frequency area, whichever is greater, of specified rivers.

(j) The areas expected to be covered by water, tidal or nontidal, during a flood on an average of once every 100 years, or which has a 1 percent chance of being covered by flood water in any given year when the watershed has been completely developed.

(o) That maximum area adjoining a river, stream, ocean, embankment or estuary, lake, or impoundment which is likely to be flooded every 100 years.

(ff and others) Flood plains and areas frequently subject to weather disasters.

22. Earthquake Fault on Seismic Zones

(b) Areas which require special development regulations because of hazardous conditions.

(c) Seismic effects means direct and indirect effects caused by an earthquake or an underground nuclear detonation.

23. Geologically Unstable Areas

(b) Areas which require special development regulations because of hazardous conditions.

(c) Geologic hazard means a geologic phenomenon which is so adverse to past, current, or foreseeable construction or land use as to constitute a significant hazard to public health and safety or to property. Term includes avalanches, landslides, rock falls, mud flows, and unstable or potentially unstable slopes; seismic effects, radioactivity, ground subsidence.

24. Steep Slopes

Unstable or potentially unstable slope means an area susceptible to a landslide, a mud flow, a rock fall, or accelerated creep of slope-forming materials.

(j) Steep slopes as determined by the nature of the soils and geologic condition.

25. Erosion Prone Areas

26. Wildfire Areas

(c) Wildfire hazard means a wildfire phenomenon which is so adverse to past, current, or foreseeable construction or land use to constitute a significant hazard to public health and safety or to property. Fire hazard area means an area in which the combination of fuels, topography, and weather may create the uncontrolled and unwanted burning of vegetation and structures. Fire chimney means a steep, narrow drainage or ravine which generally confines smoke or heat along with the natural conversion currents and thus causes rapid, upward increases in fire spread and intensity.

27. Areas of Major Public Facilities and/or Public Investment

(hh) A major public facility means any publicly owned facility of regional significance but does not include any public facility operated by a local government, or an agency created by it, primarily for the benefit of the residents of that local government; any street or highway except an interchange between a limited access highway and a frontage access street or highway; any airport that is not to be used for instrument landings; or any educational institution serving the residents of a local community.

28. Educational Facilities

29. Hospitals

30. Federal/State/Municipal Institutions

31. Electric Power Generation and Transmission Facilities

(k) Development by a public utility of a power plant site or a transmission corridor which is or will be employed to provide services in an area beyond the territorial jurisdiction of a city, village, or township.

32. Petroleum Storage Areas and Transmission Facilities

33. Airports

(c) Any municipal or county airport or airport under the jurisdiction of an airport authority.

(e) Those airports defined and established by the Federal Department of Transportation (FAA Advisory Circular No. 150/5090-2; 25 June 1971) to be in the primary category of the U.S. Airport System; an area of three miles radius from the center of the approach and departure runways - also secondary systems and military airports put into operation prior to 1983 - would include the structural hazard zone and the noise hazard zone as defined by the FAA.

(h)(1)(o)(w) Any major airport to serve as a terminal for regularly scheduled air passenger services.

(j) Circumference areas around airports.

34. Ports

(j) Circumference area around ports.

35. Interstate and Limited Access Highway Interchanges and Rights-of-Way

(c)(g) Arterial highway means any limited access highway which is a part of the Federal-aid interstate system or any limited access highway constructed under the supervision of the state department of highways.

(  ) 1000 feet beyond the rights-of-way of the interstate highway system (as created, defined, and established in Title 23 U.S.C.), major regional parkways (Title 23 U.S.C.), tollways (as defined in state law), and interchanges of the interstate highway system, major regional parkways and tollways.

(j) Circumference areas around interchanges on limited access highways.

(o)(w) Major interchanges between the interstate highway system/limited access highways and frontage access streets or highways.

36. Urban Rapid and Mass Transit Systems

(c) Mass transit means a coordinated system of transit modes providing transportation for use by the general public. Rapid transit means an element of a mass transit system involving a mechanical conveyance or an exclusive land or guideway constructed solely for that purpose.

(j) Circumference area around rail and rapid transit facilities and rail and rapid transit corridors.

37. Public Utilities

(hh) The term public utility is intended to include transportation and pipeline systems, gas and electric companies, transmission systems, and other similar public services whether interstate or intrastate.

38. Developments Affecting Two or More Political Jurisdictions

(j) An area of regional interest where development decisions will have a substantial impact on the land use plans, natural systems, or resources, or public facilities within or serving another jurisdiction.

(1) Development with more than 20 percent of its service area or service population located outside the boundaries of the municipality, township, or county, in which the development is located or a development which produces more than 10 percent increase in pedestrian or vehicular traffic, or hazard, or noise, or light (??), or air pollution, or water

pollution on any area of population located outside the boundaries of the general purpose local unit of government in which the development is located. A development which because of its magnitude or the magnitude of the development or urbanization it generates requires a 20 percent increase in support services provided by neighboring local units of governments, included but not limited to water, sewage disposal, fire and police protection, health, and recreational facilities.

(m) An existing or proposed major government which is intended to serve substantial numbers of persons beyond the vicinity in which the development is located and which tends to generate substantial development or urbanization.

39. New Communities

(c) New communities means the major centralization of existing municipalities or the establishment of urbanized growth centers in unincorporated areas.

(d) Proposed site of a new community designated in a state land development plan.

40. Major Industrial Facilities

41. Major Commercial Facilities - Shopping Centers and Office Parks

42. Major Residential Subdivisions and Apartment Complexes

43. Major Sports Complexes

44. Water Supply, Power Generation, and Flood Control Reservoirs

(e) Designated lakes and islands therein and all those areas within 2000 horizontal feet landward from the high water mark of such designated lakes.

(j) Water supply reservoirs and their watersheds; all water supply impoundments greater than 50 acres, and their immediate drainage basin, including tributaries.

45. Water Treatment Plants

46. Sewage Treatment Plants

47. Solid Waste Sites

48. Any land within the jurisdiction of a local government that, at any time
(hh) more than 3 years after the effective date of the Code, has no development ordinance in effect.

# APPENDIX B
# PRELIMINARY ANALYSIS OF GEOGRAPHIC AREAS AND FACILITY TYPES

The identification criteria presented in Chapter II are applied to the various geographic areas and facility types in this Appendix. This application is not based on hard data or statewide inventories since development of such information was beyond the resources available for this study. Rather, the criteria were applied on a subjective basis, using readily available data where possible. Areas and facilities that were reviewed are those shown in Table 2 in Chapter II. For those types of areas and facilities which the criteria showed potential for certain specific critical areas condidates, the following additional topics are included:

- Present direct government regulation and programs
- Potential evaluation criteria relative to critical areas concern
- Information requirements
- Management requirements.

The Appendix attempts to deal with these topics with the information and resources available for this study. It is clear from this attempt, however, that considerable additional work will be required before clear definable selections of critical areas and facilities will be possible.

## Geographic Areas

### Rare or Fragile Ecosystems

An ecosystem is defined by Kendeigh[1] as a group of plants and animal communities which occur together in the same habitat, and have many interrelations. These biotic communities along with the abiotic environment makes an ecosystem. Odum[2] considers the ecosystem to be the basic functional unit in ecology, whose parts are operationally inseparable from the whole.

For this report, an ecosystem will be considered rare if it is uncommon in Ohio, i.e., comprises less than 5 percent of Ohio's land area.

An ecosystem will be considered fragile if it can be easily destroyed or permanently altered.

Ecosystems in Ohio which appear to fall into the rate and/or fragile category are prairie grasslands, oak savannas (openings) and virgin or near-virgin forests. Wetland ecosystems such as bogs, ponds, streams, swamps, marshes, and springs could also be considered rare and/or fragile in Ohio. Descriptions of the above ecosystems follow.

Prairie grasslands: Areas with tall dense grasses which have the original vegetation that was present before human disturbance. Ohio prairies can be both dry or wet and plant species vary accordingly.(3)

Oak savannas: Thin groves, scattered clumps, or individual oak trees in an area covered by grasses and other herbaceous vegetation. These areas are found primarily in Lucas County, Ohio on sand-hills.(3)

Virgin or near-virgin forests: Forest areas which still have the natural vegetation that was present before the pioneers.

The wetland ecosystems called bogs, ponds, swamps, and marshes have been defined under the "Wetlands" section; other water areas in Ohio that can be considered rare and/or fragile are:

> Small streams: Channels with flowing water less than 3 meters (10 feet) wide; includes creeks and brooks but not rivers(1).
>
> Springs: A natural flow of water originating underground and emerging where a water table or perched water table intersects the ground surface.(4)

No complete list of Ohio's rare or fragile ecosystems is presently available. However, Herrick's(5) list of natural areas includes many areas which would fit under the previously defined categories. His list includes most, if not all, of the rare or fragile ecosystems described by Melvin(6) in her list of Ohio's outdoor education areas. Melvin's(6) list of nature preserves (areas with essentially virgin or near-virgin vegetation) probably includes most of the virgin forest areas in Ohio. Table 1 lists the oldest forests described in her list of nature preserves.

TABLE B-1 OHIO NATURE PRESERVES WHICH INCLUDE VIRGIN OR NEAR-VIRGIN FOREST(6)

| Name | Acres | Forest Status |
|---|---|---|
| Crall Woods | 55 | near-virgin |
| Dysart Woods | 40 | virgin |
| Tschanen Woodland Tract | 26 | climax |
| Goll Woods | 322 | near-virgin |
| Galpin Wildlife Preserve | 37 | many virgin trees |
| Clifton Gorge | --- | northern relics |
| Moore Memorial Woods | 78 | some reported virgin |
| Fort Glenford | 85 | uncut woodland |
| Trumbull Arboretum | 120 | near climax |
| Opdycke Woods | 45 | near-virgin |
| Total | 808 | |

Source: Melvin(6)

Nine of these 10 forests comprise 808 acres; acreage on one forest was not given.

Consideration of Criticality. This category qualifies for consideration on both the sufficient conditions and the necessary conditions. By definition, rare or fragile ecosystems have a high probability of being habitat for endangered species of plants and animals. Other sufficient conditions are judged to be ambiguous in the context of this category.

All necessary conditions in this category are judged to hold. Increasing intensity of land use in Ohio for variety of private and public purposes puts increasing pressure on rare and fragile ecosystems and thus reduce the number and extent of such areas. There is no comprehensive effective private sector response in terms of private organizations acquiring or protecting such areas in sufficient numbers to maintain their integrity. Likewise, the funding limitations of State and Federal government programs for acquiring areas that can be identified restrict the effectiveness of government programs in meeting comprehensive needs of protection or preservation. Rare or fragile ecosystems also by definition are sensitive and development pressures can produce irreversible damages. Finally, directly related to the criterion of scarcity is development pressure. Increasingly intense land use in the state in terms of urban development and more intensive agricultural practices as well as strip mining and other types of developments are a direct threat to rare or fragile ecosystems.

Direct Government Regulation and Programs. Ohio currently has one of the strongest Nature Preserve Systems of any state. The Natural Areas Act of 1970, which modified parts of Section 1517 of the Ohio Revised Code, authorized the inventory and acquisition of areas significant to Ohio's natural history or heritage. Three classes of areas have been established:

(1) Scientific - this consists of fragile or unique natural areas which can't stand heavy visitor use but which will support research activities. Trails and other human visitor inducements are absent.

(2) Interpretive - visitor use is allowed because these areas are not as unique or fragile, but significant nonetheless.

(3) Scenic - these areas can withstand considerable human use although they are yet worthy of inclusion within the Nature Preserve System. Passive recreation, such as hiking, is encouraged, but there are no provisions for campling, picnicking, etc.

The program currently covers one Scientific area, eleven Interpretive areas, and three Scenic areas. Total acreage is 2462. Approximately 150 areas exist in the program's inventory as worthy of potential inclusion within the system, and 12 additional are under active consideration. Negotiation with the landowner is the preferred method of land acquisition, but eminent domain proceedings are occasionally undertaken for critical parcels.

Other Federal and State Programs which have potential significance here are

Federal

(1) Department of Commerce - Coastal Zone Management Program

(2) Department of Interior - Estuary Protection Program, National Park Service Programs, Wild and Scenic Rivers Program.

Ohio

(1) Department of Natural Resources - Scenic Rivers Program, State Parks Program.

Potential Evaluation Criteria Relation to a Critical Areas Program

The greatest threats to Ohio's natural communities are urban expansion, highway development, and industrial operations. Therefore,

preservation and maintenance of these ecosystems is necessary to prevent developments which can damage or destroy them[6]. Pollution is probably a greater threat to the small wetlands, since dilution is minimal in these water bodies.

As indicated in the "Wetlands" section, all wetlands require protection from draining, filling, permanent flooding, and dredging. Other adverse impacts on wetlands are described in the "Wetlands" section.

The wet prairies must also be protected from drainage. In the Toledo area, drainage of surrounding areas lowered the water table of prairies in Lucas County, with a resulting invasion of aspens and many types of shrubs. Prairie habitat was also eliminated when fires burned the peak and left only a sandy soil which brought on a growth of aspens and populars. Many prairies were plowed up by farmers because the soil was black and little clearing was required[7]. Overgrazing during pioneer days caused the disappearance of prairie grasses[3].

Some of the ecosystems described in this section, especially bogs and prairies, include relict vegetation which could not be reestablished by surrounding vegetation if the area was destroyed. Gordon[3] defines relict as follows: "species or colonies of plants surviving in local situations where surrounding areas are generally unfavorable to their migration and establishment. The concept implies that they were part of a vegetation type which once covered the region more extensively and then disappeared as a result of change in climate, uplift, or submergence".

Fragile ecosystems, including most of the relict communities, must be used by the public only on a very restricted basis, in order to maintain vegetation which cannot be easily replaced. Melvin[6] suggests that the following guidelines be observed to protect these fragile areas:

1. "There will be no removal of vegetation or rock specimens for any reason.
2. Extreme care in not trampling one plant in order to reach another will be exercised. This means staying on paths. Experience has shown that photographers are great offenders. If photographs are necessary for study purposes, consideration for other plants is imperative.

3. Users will respect the confidence of location lest others not as careful will trespass and destroy."

Criteria for including specific rare or fragile ecosystems in a critical areas program would include

- Long run direct or indirect threat to the integrity of the area from various forms of urban expansion (roads, second homes, etc.) or agricultural expansion
- Threat to the area from potential over use
- Indirect threat to the area from upstream pollution.

Based on these criteria, most ifentified rare or fragile ecosystems would probably qualify for inclusion in a critical areas program.

Information Requirements. A complete list of Ohio's rare or fragile ecosystems needs to be compiled. Herrick's[5] list of natural areas provides an excellent starting place, but many of the areas he describes were included because they are "of special interest to local naturalists", "the best such area in the vicinity", "an area needing and deserving protection", of "a park, a forest, or other preserve". Certainly these areas are worthy of preservation, but not all of the areas listed by Herrick can be considered rare or fragile ecosystems, as previously defined.

Herrick's[5] list of natural areas is a progress report on the data presently available. This list should be expanded, with an effort made to categorize new and previously mentioned natural areas which can be considered rare or fragile ecosystems. Specific information requirements include

- Size of the area and minimum contiguous buffer zone to maintain its integrity
- Development pressure on the general region based on expected population growth, highway plans, industrial development, etc.
- Extent of present protection through public ownership
- Extent of present management and maintenance capability.

Management Requirements. The most important management requirement in this category is the financial capabiltiy to acquire ownership of rare and fragile areas and the regulatory authority to enforce land uses adjacent to the area to mitigate potential adverse effects. Development of guidelines for planning and evaluating adjacent land use would also be important in local/regional or state management of rare and fragile ecosystems.

## Wetlands - Interior and Coastal Wetlands

The term "wetlands", as used here, refers to lowlands covered with shallow and sometimes temporary or intermittant waters. These areas are referred to by such names as marshes, swamps, bogs, wet meadows, potholes, sloughs, and river-overflow lands. Shallow ponds and lakes are included in the definition, but the permanent waters of streams, reservoirs, and deep lakes are not. Temporary water areas that have little or no effect on development of moist-soil vegetation are not included[1].

Wetlands have been classified by the U.S. Fish and Wildlife Service[1] into twenty types. The eight wetland types found in Ohio[2] are described below:

### Type No. 1 - Seasonally Flooded Basins or Flats

Soil covered with water or waterlogged during variable seasonal periods; usually well drained during much of the growing season. Found both in upland depressions and in overflow bottomlands. Along river courses, flooding ordinarily occurs in late fall, winter, or spring; in upland areas, basins or flats may be filled with water during periods of heavy rain or melting snow.

Vegetation varies greatly, depending mainly on the season and duration of flooding. It includes bottomland woods as well as herbaceous growths. In marginal zones where the water has receded early in the growing season, smartweeds, wild millet, fall panicum, tealgrass, chufa,

redroot cyperus, and cockleburs are likely to occur. Shallow basins that are submerged only very temporarily usually develop little or no wetland vegetation.

Type No. 2 - Fresh Meadows

Soil without standing water but waterlogged within at least a few inches of its surface during the growing season.

Vegetation of grasses, sedges, rushes, and various broad-leaved plants. In the North, representative plants include carex, rushes, redtop, reedgrasses, mannagrasses, prairie cordgrass, and mints. Meadows may fill shallow lake basins, sloughs, or farmland sags, or these meadows may border shallow marshes on the landward side.

Type No. 3 - Shallow Fresh Marshes

Soil normally waterlogged during the growing season; often covered with as much as 6 inches of water.

Vegetation of grasses, bulrushes, spikerushes, and various other marsh plants such as cattails, arrowheads, pickerelweed, and smartweeds. Common representatives in the North include reed, whitetop, rice cutgrass, carex, and giant burreed; in the Southeast, maidencane, sawgrass, arrowhead, and pickerelweed are characteristic. These marshes may nearly fill shallow lake basins or sloughs, or they may border deep marshes on the landward side. They are also common as seep areas on irrigated lands.

Type No. 4 - Deep Fresh Marshes

Soil covered with 1/2 foot to 3 feet of water during the growing season.

Vegetation mainly of plants such as cattails, reeds, round-stemmed bulrushes, spikerushes, and wildrice. In open areas, pondweeds, naiads, coontail, watermilfoils, waterweeds, duckweeds, waterlilies, spatterdocks, or other aquatics may occur. Water-hyacinth and waterprimroses form surface mats in some localities in the Southeast of the United States. These deep marshes may almost completely fill shallow lake basins, potholes, limestone sinks, and sloughs, or they may border open water in such depressions.

Type No. 5 - Open Fresh Water

Water depth is usually less than 10 feet deep and is fringed by a border of emergent vegetation.

Vegetation (mainly at depths less than 6 feet) of pondweeds, naiads, wildcelery, coontail, watermilfoils, muskgrasses, waterlilies, spatterdocks, water-hyacinth (in the South), and other aquatics.

Type No. 6 - Shrub Swamps

Soil normally waterlogged during the growing season; often covered with as much as 6 inches of water.

Vegetation of alders, willows, buttonbush, dogwoods, swamp-privet, etc. Shrub swamps occur mostly along sluggish streams and occasionally on flood plains.

Type No. 7 - Wooded Swamps

Soil waterlogged at least to within a few inches of its surface during the growing season; often covered with as much as 1 foot of water. Wooded swamps occur mostly along sluggish streams, on flood plains, on flat uplands, and in very shallow lake basins.

Vegetation mainly of trees; in the North, of tamarack, aborvitae, black spruce, balsam, red maple, and black ash; in the South, water oak, overcup oak, tupelo gum, swamp black gum, and cypress; and in the Northwest, western hemlock, red alder and willows. Northern evergreen swamps usually have a thick ground-covering of mosses; deciduous swamps frequently support beds of duckweeds, smartweeds, and other herbaceous vegetation.

Type No. 8 - Bogs

Soil usually waterlogged; generally blanketed with a spongy covering of mosses or other plant material. Bogs occur mostly in shallow lake basins, on flat uplands, and along sluggish streams.

Vegetation woody or herbaceous or both; typical plants are heath shrubs, sphagnum moss and sedges. Representatives in the North include leather-leaf, Labrador-tea, cranberries, carex, and cottongrass, in the South, cyrilla, persea, gordonia, sweetbay, virginia chainfern, and pitcherplants. Scattered, often stunted, black spruce and tamarack may occur in Northern bogs and pond pine in southern ones.

Extent of Wetlands in Ohio

A survey of wetlands in Ohio was carried out by John L. Weeks of the Ohio Division of Wildlife from July 1, 1972 through June 31, 1974[2]. The results of this survey are discussed in the following paragraphs. A total of 150,324.80 acres of wetlands were inventoried (Table B-2), which represents about 0.57 percent of Ohio's land area. The survey included an inventory of 6,966 wetland areas, in addition to a survey of the Lake Erie marshes.

The Lake Erie marshes (types 3 and 4) were inventoried by the physical modification applied, i.e., diked, undiked, cultivated, or washed out, rather than by plant occurrence and water depth. Of the 17,949 acres surveyed (Table B-3), 14,372 acres were considered diked marsh. The diked marshes are largely deeper marsh areas adjacent to Lake Erie. The shallower marsh areas have been drained and cultivated for several years.

The marshland which had been recently cultivated made up 1,386 acres. These marshes are close to the Lake and would have been classed as the deeper type four marsh before cultivation. Many of these areas have well developed dikes.

The aerial photographs used in determining marsh acreages were taken in 1970-71. Therefore, they reflect the increasing water levels of those years, but not the extremely high water levels of 1973-74.

The most drastic losses in Ohio wetlands habitat were noted in shallow and deep fresh marshes (wetland types 3 and 4), which are concentrated along the southwestern Lake Erie shore. Since surveys made in 1954, the shallow marsh has decreased by 66 percent and the deep fresh marsh has decreased by 44 percent. Recent reductions in prime marsh areas along Lake Erie include the loss of 1,386 acres to cultivation and 1,857 acres washed out by high water.

Drainage of Lake Erie marshes for agriculture has made a drastic reduction in both shallow and deep marshes. The shallow marshes were drained primarily before the 1954 survey by primitive methods. The deep marsh area has been reduced by 15,000 acres for farming or residential and

TABLE B-2 WETLANDS INVENTORY OF OHIO: 1972-74[a]

| Wetland Type | Number of Areas | Total Acreage |
|---|---|---|
| Farm Pond [b] | 3,153 | 5,250.40 |
| Gravel Pit | 29 | 415.00 |
| Borrow Pond | 35 | 353.70 |
| Strip Pit | 2,865 | 3,271.50 |
| Fish Pond | 3 | 28.50 |
| Unknown | 73 | 4,561.25 |
| Seasonally Flooded Basins or Flats [c] | No Data | 50,206.00 |
| Fresh Meadows [c] | No Data | 8,658.00 |
| Shallow Fresh Marshes | 95 | 1,748.80 |
| Deep Fresh Marshes | 114[d] | 21,421.36 |
| Open Fresh Water | 374 | 45,847.31 |
| Shrub Swamps | 103 | 3,835.18 |
| Wooded Swamps | 116 | 4,696.80 |
| Bogs | 6 | 31.00 |
| Statewide Total (Inventoried to Date) | | 150,324.80 |

(a) Revised from Weeks[2]

(b) Approximately a 10 percent sample.

(c) Data derived from Soil Conservation Service "Wetness Hazard" acreage estimates.

(d) Number of Lake Erie marshes are not included.

TABLE B-3 INVENTORY OF LAKE ERIE MARSHES[a]

| Location | Acres of Marsh | | | |
|---|---|---|---|---|
| | Diked | Undiked | Cultivated | Washed Out |
| Sandusky Bay | 5,054 | 221 | 1,340 | 561 |
| Toussaint River | 191 | -- | -- | -- |
| Portage River | 273 | -- | 46 | -- |
| Lake Front Marshes | 8,854 | 28 | -- | 1,296 |
| Huron River | -- | 85 | - | -- |
| Totals = | 14,372 | 334 | 1,386 | 1,857 |
| Total Surveyed = | 17,939 | | | |

(a) After Weeks [2]

industrial development. The impact of this loss should be emphasized, since it has taken place in the most important waterfowling area in Ohio.

Rounds[3] observed that wetlands are most common in the central and northeastern part of Ohio. However, the most important wetlands in Ohio to waterfowl are the Lake Erie marshes. The western half of Ohio has few wetlands, but these areas are rather heavily used by waterfowl due to their location along major waterfowl migration corridors. The southeastern part of Ohio has the smallest number of wetland areas per square mile, resulting in a dependence by waterfowl on rivers and reservoirs.

Consideration of Criticality - Interior Wetlands. Qualifications for consideration as containing candidates for potential criticality on the basis of the sufficient conditions is undetermined. Interior wetlands may be habitat for endangered species, but detailed studies are necessary to determine this. The criterion of future private and public costs is ambiguous in this context and the criteria of extreme environmental deteroriation, as defined, does not appear to hold.

In terms of necessary conditions interior wetlands are judged to be a potential category. The acreage of interior wetlands has declined steadily over the last two centuries in Ohio, though no specific figures are available for precisely quantifying the magnitude of such decline. There is no comprehensive private sector supply response that will guarantee the continued availability of interior wetlands, nor do the combined effects of governmental programs insure integrity of such areas. Wetlands are sensitive to external changes in the environment in terms of physical, chemical or biological pollution and to changes in the water level tables and other factors affecting hydrologic regimes. Due to agricultural practices, wetlands have been subject to significant development pressure, relating again to the first criteria.

Consideration of Criticality - Coastal Wetlands. All the considerations applying to interior wetlands hold for coastal wetlands. Sufficient conditions are indeterminant due to the lack of information on location of habitat for endangered species, the ambiguity of the future public/private cost criteria, and the judgement that coastal wetlands are not a case of extreme environmental deteroriation.

On the other hand, all the necessary conditions are judged to hold, qualifying coastal wetlands for cosnideration as containing candidates for criticality. The number of acres of coastal wetlands along Lake Erie has declined over the last century due primarily to filling for shoreland development purposes. There is no private mechanism operating to insure the integrity of these areas nor do the combined effects of governmental programs and the levels of funding available for purchase insure long run maintenance and integrity. Coastal wetlands are sensitive to external environment changes and are subject to development pressure because of their low market value and attractiveness for filling and development.

Direct Government Regulation and Programs - Interior Wetlands. There are no specific or outstanding programs covering this area of natural resource concern. Several Federal and State programs which might input here are listed below:

Federal

(1) Department of Agriculture - Water Bank Program, Soil Conservation Service activities
(2) Department of Interior - Wild and Scenic River Program, Fish and Wildlife Service activities
(3) Department of Housing and Urban Development - Flood Insurance Program

Ohio

(1) Department of Natural Resources - Scenic River Program, Nature Preserves Program, Flood Plain Planning Program, Habitat Improvement Program.

Direct Government Regulation and Programs - Coastal Wetlands. The Coastal Zone Management Act (P.L. 92-583) was passed by the U.S. Congress and signed into law in October of 1972. It is designed to provide a framework for Federal participation in and funding of state management programs covering this critical area, and it is administered by the Department of Commerce. Pursuant to this Act, the Ohio Governor issued an executive order on February 28, 1973, designating the State's Department of Natural Resources as lead agency in this effort. The Department of Natural Resources has, therefore, established a Lake Erie Shore Zone Management Program.

The Federal law includes the Great Lakes within its purview, and Ohio has assigned all sections of the nine-county area bordering Lake Erie to the program. During the first year covered by Federal assistance in the program, which will terminate in July of 1975, the Department of Natural Resources is directing both a resource analysis component as well as a legal and administrative analysis component for the nine-county coastal zone. These elements will concentrate on an inventory and analysis of current information. During the second year, management alternatives and strategies for the nine-county areas will be more narrowly defined. The ultimate objective of the program is to develop processes whereby development within the area can be coordinated and conflicts resolved.

The Federal legislation offers the formula of two-thirds Federal funds if the State provides one-third. For the current fiscal year, however, the State has been providing more than this fraction; the State contribution has been about $160,000, and the Federal share is about $200,000.

There are several other programs which could affect this Area. Also, although there are no specific programs (other than this) for Coastal Dunes and Beaches, several might have implications. Combining these, one would include

Federal

(1) Department of Agriculture - Water Bank Program

(2) Department of Defense - Army Corps of Engineers' navigation activities

(3) Department of Interior - Fish and Wildlife Service activities, Estuary Protection Program

Ohio

(1) Department of Natural Resources - Nature Preserves Program, State Parks Program, Habitat Improvement Program.

Potential Evaluation Criteria Relative to Critical Areas Concern. Protection of wetlands involves prevention and/or regulation of habitat reducing activities such as draining, filling, flooding, and dredging. These activities are generally initiated in Ohio to increase the land area available for cultivation, or to provide dry land for industrail and residential development. Flooding of wetlands is often associated with construction of reservoirs. As stated earlier, loss of prime waterfowl marshes along the southwestern Lake Erie shore is due primarily to drainage for agriculture.

Adverse impacts on wetlands can be expected from the following disturbances unless controls are set:

(1) Airports - disturbance and runoff
(2) Residential Land Care - biocide and fertilizer runoff.
(3) Agriculture - sedimentation, animal waste, biocides, and fertilizers in runoff waters
(4) Septic Tank and Municipal Sewage Treatment Effluent
(5) Strip-mining for Coal
(6) Road Building - includes bridges and causeways
(7) Electric Power Plants - thermal pollution
(8) Dredging - even though it may not cut through a wetland it can alter natural water flow patterns
(9) Extractive Industries - including oil, gas, sand, and gravel removal
(10) Heavy Industry - release of toxic materials
(11) Solid Waste Disposal.

Management of wetlands for waterfowl may include water level manipulation, construction of impoundments, seeding, nest island construction, controlled burning, vegetation control (with herbidices or by mechanical methods), land clearing, pothole and pond construction, or level ditching.(4)

Features for consideration of specific areas as critical are similar to the previous category:

- Long-run threat to the integrity of the wetlands from various forms of urban development (primarily filling)
- Indirect threat due to water pollution or change in hydrologic regime nearby
- Percent of regional supply of the wetland type threatened by long-run development.

Information Requirements. Current information on Ohio wetlands is limited to a survey conducted by the Ohio Division of Wildlife,(2) which included data derived from Soil Conservation Service "wetness hazard" acreage estimates, field information collected by Game Protectors, and study of A.S.C.S. aerial photos of Lake Erie marshes. Weeks suggested that information gathered in the survey should be used as background data for a statistically designed sampling method. Aerial transect samples could be established to determine wetland type occurrence per square mile, with the use of an aerial/ground index determined from survey data presently available.

Remote sensing using aerial photography may be a more accurate method for mapping wetlands, but it is still a relatively new technique. Proper timing of flights, use of multispectral photography, and knowledge of the ecology of the area are considered essential for wetland mapping.(5) Specific information needed includes:

- Complete statewide inventory of average and type of wetland
- Classification of wetlands according to immediate and long run threats to their integrity based or projected population growth, urban development and preliminary plans for new private and public facilities construction

- Extent of present and planned public ownership.

Management Requirements. Management requirements include the need to establish funded programs for acquisition of wetlands as well as development of guidelines and standards for development in areas adjacent to wetlands.

Sand Dunes and Beaches

These two areas are defined as follows:

Sand Dunes: Extensive areas of sand where strong winds pile the sand into shifting mounds. These dunes have a characteristic shape; the windward slope is gentle and the lee slope is steep. Dunes continue to move until they reach the shelter of another dune, get beyond the force of the wind, or until they are anchored by invading vegetation.(1)

Beach: "The zone of unconsolidated material that extends landward from the low water line to the place where there is marked change in material or physiographic form, or to the line of permanent vegetation usually the effective limit of storm waves. The seaward limit of the beach includes foreshore and backshore."(2)

Very little information is available on the amount of beaches and sand dunes along the Ohio shoreline of Lake Erie. The Army Corps of Engineers(2) reports that there are 138 miles of beach zone, or about 52 percent of Ohio's mainland shoreline. Of the total miles of beach zone, 49.6 miles occur along the shoreline of Lucas, Ottawa, Sandusky, and Erie Counties, and 88.4 miles occurs along the shoreline of Lorain, Cuyahoga, Lake, and Ashtabula Counties. It should be kept in mind that Lake levels fluctuate, and the amount of beach area changes with these levels. Beach areas should increase when the extremely high Lake levels of 1974 begin to lower. Charles Carter (Ohio Division of Geological Survey, Sandusky, personal communication, October 24, 1974) indicated that a study presently underway to map the beach areas along Ohio's shoreline should be finished in 1975.

The few sand dunes found along the Lake Erie shoreline of Ohio are considered low dunes (less than 30 feet high). The Army Corps of Engineers[2] indicated five areas with low dunes in the following counties: Ottawa County - two areas, Erie County - two areas, and Lake County - one area. Field work done by the Ohio Division of Shore Erosion[3] from 1950 - 1957 indicated dune areas in the following five locations: Lucas County - near Locust Point; Ottawa County - East Harbor State Park and Sand Point; and Erie County - Cedar Point and Big Island.

Two reports by Melvin[4] and Herrick[5] give descriptive information on seven Ohio dune areas near Lake Erie. Herrick describes Irwin Prairie (Lucas County), Sand Point (Ottawa County), and Cedar Point (Erie County). Melvin provides information on the following three areas in Lucas County: Oak Openings Metropolitan Park, Secor Park and Arboretum, and Booker Nature Sanctuary. Mentor Marsh in Lake County is also described by Melvin.

Consideration of Criticality. None of the sufficient conditions for this category are judged to hold. As a general rule, they would not be considered habitat for rare or endangered species. Inappropriate or private development in these areas does not entail significant future public or private cost (excepting the situation where shore erosion is a problem due to water level fluctuations, which is another category) nor is extreme environmental deterioration generally a problem for these areas in Ohio. On this basis none of the sufficient conditions are judged to hold.

The situation in terms of necessary conditions is ambiguous. Growing scarcity, if defined to mean areas accessible to the public, would hold for coastal dunes and beaches. This is based on the premise that significant portions of the coastline are already privately owned and that access to beach areas is an important public value requiring future state, regional, and local attention. As a rule, the private sector responds to supply in this area through creation of private facilities and private clubs. The issue of adquancy of governmental programs for protecting coastal dunes and beaches cannot be analyzed in the scope of this report,

but this criterion is given a tentative evaluation as overall lack of adequacy. Further information will be needed in this area to determine the extent to which public beach areas in terms of recreation standards meet the nominal needs of the population of Ohio. Coastal dunes and beaches are sensitive to manmade changes and dunes, in particular, can easily be altered through manipulation of vegetation. Dunes and beaches are subject to significant development pressure in terms of cottages and other types of private facilities. On the basis of the above, this category is tentatively suggested as having candidates for criticality.

Potential Evaluation Criteria Relative to Critical Areas Concern. Natural succession, if allowed to occure without residential or industrial development, will stabilize the sand dunes which are not immediately adjacent to the beach. Some dunes, such as those in Secor Park and Arboretum, have already been stabilized with natural vegetation.(4) Dunes which are adjacent to the beach may need to be protected with a groin, sea wall, or breakwater, if they are eroding from wave action during storms. In some cases, human visitation to a dune area may have to be limited. Disturbance of dune vegetation can result in wind movement of exposed sand, and change a partially anchored dune into a moving one.(1)

Of the 265.1 miles of Ohio shoreline along Lake Erie, 24.5 miles sustain critical erosion, 96.9 miles are subject to noncritical erosion or flooding, and 143.7 miles are considered noneroding (stable, accreting, or prtoected) by the Army Corps of Engineers.(2) Some of the areas sustaining erosion at the time of the Corps study included beach area. The high water period since that study undoubtedly increased erosion problems at additional beach areas.

Artificial earth dikes reinforced on the lakeside by bulkheads and short groins have been used to maintain sand beaches.(2) However, these dikes have been breached at times, resulting in flooding of lowlands behind the dikes. Therefore, the Corps has recommended the protection of State park frontage by the use of groins and articifical sand fill.

Offshore sand deposits in Lake Erie are sufficient for extensive replenishment of beaches. The cost of this protection is extremely high, and is probably too expensive for the protection of private property, which accounts for the greatest amount (89 percent) of the beach frontage.

Criteria for considering the criticality of specific areas include:

- Present and future expected recreation use
- Potential of the site for recreation development
- Extent to which potential recreation or other public uses may be preempted by present development patterns
- Extent to which present development of beach and shoreline area will create future damage potential and probable public expense (discussed further under "flood plains").

Information Requirements. Available data does not indicate the acreage of beaches and/or sand dunes which presently occur along Ohio's Lake Erie Shoreline, nor does it predict the effect of fluctuating lake levels on these natural resources. The study currently underway by the Ohio Division of Geological Survey should provide some of this information.

Information relative to consideration of specific areas in a critical areas program include:

- Identification and inventory of areas with public recreation potential
- Classification of areas threatened by present development patterns.

Management Requirements. As with most of the natural or geographical critical areas, public ownership or control is the major management requirement. Guidelines on shore development which can be implemented as part of lozal land use regulations would also be important for this area.

Flood Plains. Flood plains are the natural overflow areas of all rivers and streams. The extent of the flood plain can be determined from topographic features relating to elevation above the main stream or view channel. Flood plains are of concern because of the potential for significant property damage and loss of life associated with their improper development.

Consideration of Criticality. Of the sufficient conditions, future public and/or private costs are judged to hold. Unplanned development of flood plains raises the potential for future flood damages resulting in costs both to individuals in the private sector as well to public sector in terms of relief and restoration subsidies or direct costs. Flood plains may be a habitat for endangered species, but this has to be determined on a case-by-case basis.

In terms of the necessary condition, growing scarcity is ambiguous in terms of this category. Private sector supply response if defined to mean private adjustment to anticipated flood risks, is judged to be inadequate. There are governmental programs (federal flood insurance program) which provide incentives and requirements for flood plain land use planning. Sensitivity and irreversibility of flood plains is not generally relevant other than the ecological aspect which are treated under other categories. It is generally recognized that flood plains are subject to development pressure, particularly those in proximity to urban areas. On the basis of the above, flood plains are proposed for consideration based on the sufficient condition of future public and/or private costs.

Direct Government Regulation and Programs. The National Flood Insurance Act of 1973 has thrust the Federal Government into the arena of flood plain management and regulation. Ohio's Department of Natural Resources, pursuant to the Federal requirements, has established a Flood Plain Planning Section to handle the state responsibilities designated in the legislation.

The program works as follows. The Secretary of the Federal Department of Housing and Urban Development is authorized to enter into agreements with any state of local agency - for Ohio, this is the Department of Natural Resources - to identify and publish information on flood plain areas and to establish on a map the flood risk zones of those areas. This process implicates Federal assistance for flood insurance in that insurance rates are based on these flood risk zones. Moreover, any community wishing to take advantage of this Federal assistance must be willing to participate in a Federally-funded and State-administered study of the flood plain. It is intended that these studies will specify zoning and other regulations on development for the floodway and other areas of the flood plain. When the study is complete, the community is required to adopt the included regulations. There is no specific provision for land acquisition, but this can of course be considered at the local level.

The Department of Natural Resources' Flood Plain Planning Section has identified 571 Ohio communities which might consider participating in the program, but less than 10 percent of these have as yet done so. Moreover, even fewere have chosen to handle the problem at the local level in the absence of Federal or State assistance.

Other programs of potential importance here include

<u>Federal</u>

(1) Department of Agriculture - Soil Conservation Service activities, Water Bank Program

(2) Department of Defense - Army Corps of Engineers' activities

(3) Department of Interior - Wild and Scenic Rivers Program.

<u>Ohio</u>

(1) Department of Natural Resources - Scenic Rivers Program.

Potential Evaluation Criteria Relative to Critical Areas Concern. Criteria for identifying regulating state flood plains have been developed by the Ohio Department of Natural Resources.* Criteria for evaluating the inclusion of specific flood plain areas in a critical areas program include:

- Potential of the area for extensive future development with probable high damage potential
- Degree of implementation of local or regional controls based on state or Federal floow plain guidelines.

Information Requirements. Information required includes an identification of flood plain areas which are presently subject to development as well as those where past development has created the potential for extensive flood damage. Expansion of information presently collected as part of the state flood plain management program is one alternative for developing information that could be used in identifying critical flood plains.

Management Requirements. The major management requirement in this category is the strengthening of present state flood plain management analysis capability. Authority to regulate development in the case where localities do not act would also be necessary if improper development is to be avoided in identifical critical areas.

Erosion Areas, Steep Slopes, Geologically Unstable Areas. As with flood plains, these areas are of concern because of their potential for significant public damage if imporperly developed.

Consideration of Criticality. Of the sufficient conditions, future public and/or private costs is judged to hold. Unplanned and inappropriate

*Minimum Criteria for the Regulation of Ohio Flood Plains, Ohio Department of Natural Resources, Division of Planning, Columbus, Ohio.

development of such areas may lead to future disasters imposing costs on both the private sector and the public sector. The other two criteria are judged not to hold or to be ambiguous.

In terms of necessary conditions, the scarcity criteria is ambiguous. As with flood plains, the private sector does not respond generally in a comprehensive and long-range manner to hazards associated with these types of areas. The adequacy of governmental programs for dealing with these types of problems is indeterminant based on general information. Sensitivity and irreversibility is an ambiguous criteria in this case, and the degree of development pressure on this general type of area is unknown but judged to be an important consideration.

Direct Government Regulation and Programs. Under Chapter 1513 of the Ohio Revised Code, Section 1513.07(a)(9) provides that the Department of Natural Resources, through the Chief of the Division of Reclamation, may prohibit mining in any area if reclamation cannot be properly completed. This power is discretionary with the Division Chief, and it has not been used often. More formal criteria have been included in proposed legislation, but there is no current legal mandate which is more precise.

Another program within the Department of Natural Resources combines the expertise of the Division of Geological Survey and the Division of Planning. DGS is currently involved in collecting data and preparing hazard maps regarding geologically unstable areas within the state. This information is then input to the Division of Planning. There is no provision in these programs for state-initiated land-use controls on the basis of these data, but local governments may find the maps highly useful in their approach to the problem.

Other Federal activities in this area are

Federal

(1) Department of the Interior - Bureau of Mines projects, U.S. Geological Survey Programs.

Potential Evaluation Criteria Relative to Critical Areas

Concern. Criteria for determining specific candidate areas include:

- Present and expected damage potential of the area
- Extent of local regional plans and control in the specific area.

Information Requirements. As with the present categories the major information requirement is a detailed inventory of affected areas in the state, cross-classified with population growth and development projections for the specific areas.

Management Requirements. Management requirements include development of guidelines for erosion areas (similar to those for flood plains), expansion of regulatory authority where local governments fail to act and strengthening of comprehensive planning abilities.

Aquifer Recharge Areas

Aquifer recharge areas are those in which surface water percolation provides continuous replenishment of underground water. Recharge areas are important for maintenance of productive groundwater sources.

Consideration of Criticality - Aquifer Recharge Areas. As in the previous two categories, the sufficient condition of future public and on private costs is judged to hold. The other two criteria are judged not to hold.

Depending on the degree of information availabke for assessment, all the necessary conditions potentially could hold. The issue of scarcity is indeterminant due to lack of general knowledge. Private land use decisions are unlikely to be adequate to protect the integrity of regional aquifer recharge areas and the extent and effectivenss of governmental programs is unknown. Aquifer areas would be judged to be sensitive and subject to irreversible damage depending on the types of developments occurring in or around them. The extent of development pressure on aquifer areas is

unknown but those in or near urban areas are likely to be subject to the same types of pressures that other potential critical areas would have.

Direct Government Regulation. There are no current programs in Ohio for the protection of aquifer recharge areas. The Department of Natural Resources through the Division of Geological Survey collects information on the loaction and extent of these areas as well as on all existing wells, and the Ohio Environmental Protection Agency collects data on the water quality of quaifer areas. Ohio EPA is attempting to restrict as much as possible the disposal of sludge and other wastes in these areas, but the statutory authority is limited. At the urging of the Ohio Legislative Service Commission, several public hearings have been held on the issue of further legislation for protecting significant aquifer zones, but there have been no concrete proposals as of the writing of this report.

Potential Evaluation Criteria Relative to Critical Areas Concern. Evaluation criteria relative to the identification of specific recharge areas for consideration in a critical areas program include:

- Present and projected importance of groundwater in regional water supply
- Present and projected development on or near recharge areas that threaten their overall productivity
- Extent of local/regional development controls for balancing land uses in or near aquifer recharge areas.

Information Requirements. Information needed to determine the merits of including specific recharge areas in a critical areas program include:

- Statewide inventory of aquifer recharge areas
- Estimated long run yields relative to present and projected importance to regional water supply
- Projected incompatible development likely to occur in or near recharge areas and extent of local planning and control.

Management Requirements. Management requirements relate to preparation of development and land use guidelines for recharge areas.

## Farmlands

None of the sufficient conditions are judged to hold for farmlands. In terms of the necessary conditions, farmland acreage in Ohio is not a commodity that is decreasing in availability. Around urban areas there is a preemption of farmland for residential and commercial purposes. In general, however, total acreage in the state is not threatened through urban development. The private market works in maintaining those areas in agricultural production for which higher value (monetary value) uses do not exist. Rising prices of agricultural products will insure a slowdown in conversion of land to competing uses. There have been governmental programs for supporting prices, for maintenance of soil banks, improved crop rotation programs, and a variety of other incentives and disincentives aimed at the agricultural sector. Agricultural land is not generally as sensitive to environmental changes as are certain types of habitat such as marshes or wetlands. In this category, it could be argued certain special conditions associated with soil, climate, or other natural factors make specific areas of the state suitable for certain types of higher value crops. Preemption by urban development would effectively eliminate such areas. The extent to which such problems should be treated outside of the market area cannot be determined in the scope of this report, but it is proposed that these cases not be considered general enough to include farmland as a category with candidates for potential criticality. There is development pressure on farmlands along urban fringes. On the basis of the above, farmlands are judged not to be a category for consideration for candidtaes for criticality.

## Forestlands

None of the sufficient conditions are judged to hold in this case though forestland may be a type of area which contains habitat for endangered species.

In terms of the necessary conditions, forestland per se is not growing in scarcity in Ohio. The availability of high quality saw timber would be considered a problem of the private market sector. With sufficiently high timber prices incentives for intensive long term management of private and public lands would result in an increase in production of saw timber from Ohio forests. Both state and federal governments have responded to this sector in terms of providing state and national forests. Forests are capable of tolerating certain types of development without irreversibly damaging their environmental integrity. In terms of development pressure, insufficient information is available at this point to make an informed judgment. On the basis of the above, forestland is not propbsed as a category containing candidates for criticality.

Unclaimed Strip Mine Areas/Depleted Land

These category include abandoned strip mine lands located in eastern and southeastern Ohio. It also include other areas whose productivity has been lost through neglect or mismanagement.

Consideration of Criticality. In terms of the sufficient conditions, future public and private costs is judged to hold as well the condition of extreme environmental deterioration. On the basis of sufficient conditions alone, this area is considered to have candidates for consideration as critical.

In terms of the necessary conditions, growing scarcity is ambiguous relative to this category and private sector response is subject to evaluation relative to standards for reclaiming strip mine areas. There are governmental programs at the state level governing strip mine reclamation and there are proposed bills at the federal level dealing with this problem. The conditions of development pressure is judged to be ambiguous relative to the category. On the basis of the sufficient conditions, this category is proposed for consideration as containing critical areas.

Direct Government Regulation and Programs. In most cases, land that is of bad quality is rehabilitated privately if at all. One area here which Ohio is currently involved in concerns Strip Mine Reclamation, a program operated by the Department of Natural Resources. The program is just beginning and is mostly a proposal. An inventory has been completed, in which it was determined that 370,000 acreas of Ohio land are in need of some form of reclamation as a result of strip mining and that 180,000 acres will require a major effort. The total cost to perform this task was estimated at $290 million 1973 dollars, with an additional $440 million to abate the associated water pollution and acid mine drainage. It is expected, however, that the state's activities will be mostly in the nature of research and demonstration projects, activities paralleling those of the Federal Department of the Interior's Bureau of Mines. The Ohio efforts are taking place pursuant to the 1972 Ohio Strip Mine Law, which constitutes parts of Chapter 1513 of the Ohio Revised Code.

Potential Evaluation Criteria Relative to Critical Areas Concern.

Criteria for determining potential candidates for inclusion in a critical area program include:

- Potential use of reclaimed area and benefits of reclamation versus costs
- Magnitude of ecological or other damages (acid mine drainage, erosion, etc.) of not reclaiming area
- Extent of private plans for reclamation.

Information Requirements. Information needed includes

- Inventory of unreclaimed areas (already completed)
- Prioritization of those areas with highest potential payoff from reclamation.

*Land Reborn, A study of unreclaimed coal strip mine land in Ohio proposed by Board of Unreclaimed Strip Mined Lands with resistance of the Ohio Department of Natural Resources, January 1, 1974.

Management Requirements. Management requirements include designation of priority areas through a classification system, development of a financing mechanism for reclaiming areas, and the provision in new strip mining of reclamation.

Areas with Air/Water Pollution Problems

This category includes geographic areas in which deterioration of air or water quality constitutes a potential threat to human health or other human activites dependent on maintenance of adequate quality.

Consideration of Criticality. Sufficient conditions which are judged to hold for this category would include future public and/or private costs (primarily associated with damage to human health), loss of recreational opportunities, or agricultural losses due to air or water pollutin) and to the condition of extreme environmental deterioration (since this condition only holds for this category and the previous one and the public/private costs criterion is judged to hold, it may mean that this condition is redundant and could be eliminated). On the basis of sufficient conditions alone, this category would be judged to be contain areas for consideration as critical.

The criteria of Scarcity is meaningless in relation to this category and private response to pollution problems are judged to be inadequate based on past performance with little or no regulation. Adequacy of government programs is subject to debate and no judgement will be made in this report. Areas subject to intensive pollution are capable of suffering irreversible damages. In terms of development pressures, this condition is judged to be ambiguous relative to this category. On the basis of the sufficient conditions, this category is proposed for consideration.

Direct Government Regulation and Programs. Water and air quality problems are handled by the Federal and the Ohio Environmental Protection Agencies. Land-use considerations may be implicated on Ohio's Water Quality

segments, which by definition are so polluted that the state's water quality standards cannot be implemented with normal effluent limitations; in these areas the state may have to prevent discharges from so locating unless they can guarantee zero pollutant discharge. Under a separate section of the Federal Water Quality Law, planning officials in highly-polluted metropolitan areas must consider land-use controls in their abatement efforts. In terms of Ohio's air quality regions where standards are being exceeded and will not be met with application of already-specified controls on automobiles and other point sources, land-use and transportation measures may have to be implemented. Land-use measures proposed for areas of high damage to both water and air quality have caused a great deal of controversy, and although current laws would suggest they will be necessary, there is some doubt that they will be enforced as presently proposed.

Potential Evaluation Criteria Relation to Critical Areas Concern. Identification and selection of specific areas for inclusion in a critical areas program would include:

- Level of potential benefits (or damages avoided) from upgrading of polluted area
- Extent to which broader land use and location decisions are likely to contribute to further deterioration of the area
- Extent of public or private plans to abate pollution and their implementation.

Information Requirements. Information needed in this category includes:

- Detailed statewide inventory identifying and prioritizing the most severely degraded air and water quality areas
- Identification of private and public plans for dealing with pollution problems and the degree to which they are expected to improve the areas
- Potential increase in other uses of the area (recreation for example) or the level of reduction in damages to other uses (fisheries, etc.).

Management Requirements. Coordination with ongoing Federal and state programs as well as determination of the authority for regulation of land use to deal with water and air quality problems are the primary management related requirements in this category.

Minimally Developed River Corridors

These areas include all river reaches which are presently non-urban or not used extensively by industry. They are important for the role in open space, scenic values, and for recreation and fish and wildlife.

Consideration of Criticality. None of the sufficient conditions for this category are judged to hold. The role of undeveloped or minimally developed river corridors in terms of provision for habitat for endangered species would be the only exception to the rejection of the criteria for sufficeint conditions.

Tentatively, all the necessary conditions for consideration as a category containing potential critical areas are judged to hold. Remaining undeveloped river corridors are decreasing in number and the extent in Ohio due to development pressure and there do not appear to be any comprehensive effective private market mechanisms acting to preserve these corridors for broader public uses. Although questionable, the low level of funding of state scenic river and federal scenic wild river programs for acquisition of land for preservation purposes would indicate that these programs are presently inadquate to meet the goal of preservation and maintenance of integrity of such rivers. The aesthetic and natural characteristics of these rivers are easily altered due to various types of development and as a rule such areas are subject to development pressure. On the basis of the necessary conditions, this category is proposed as containing candidates for potential criticality.

Direct Government Regulation and Programs. The major program in Ohio relative to this category is the scenic river program.

Ohio's Scenic River Planning Program started in 1968 pursuant to the State's Scenic River Act, Section 1501.16 of the Ohio Code, which was passed in 1968 and updated in 1971. Updating was needed to insure conformity with the Federal Wild and Scenic Rivers Act, passed in 1969 as P.L. 90-542. The Ohio Act authorizes the Department of Natural Resources to designate stream segments within three classes: Wild, Scenic, or Recreational. After the designation, a plan is prepared for development of the area within 1000 feet of each river bank. Plans will identify areas suitable or unsuitable for development, critical natural resource areas, and sites which might be preserved. The Department of Natural Resources is empowered to acquire land or development rights to land for preservation purposes, and this ability may extend to fragile or unique ecosystems, fish and wildlife habitat, wetlands of significance, historic sites, archaeological sites, and even areas highly suited for development. The plans may also specify that local zoning, subdivision regulations, or other methods be used to effect this purpose - especially in larger areas such as flood plains. Segment areas are protected from strip-mining, if the Director of the Division of Reclamation so indicates.

Class designation is based on water and scenic quality, where Recreational Rivers exhibit the minimum acceptable level of natural quality, and Wild Rivers the maximum. Seven rivers have received state designation, and only a 68-mile stretch of the Little Miami River has been included as of yet in the Federal program. The state plan for the Little Miami River is the first to be scheduled, and it is to be completed by June, 1975. At that time, implementation of the recommendations will be considered by the State Legislature.

The Federal Wild and Scenic Rivers Act, which is administered by the Department of Interior's Bureau of Outdoor Recreation, listed segments of three rivers in Ohio for study and possible inclusion within a national system: (1) the Little Miami River, (2) the Little Beaver River, and

(3) the Maumee River. The Little Miami River was recommended to be included within the national system but as a state-administered river; this recommendation was later accepted by both Ohio and the Federal government, allowing for both to participate in the development and planning of the river. The Little Beaver River, in a proposed report, was recommended for status similar to the Little Miami. The Maumee River has been reported to be unqualified for national inclusion.

Several other agencies also might affect the status of actual or potential wild, scenic, and recretaional rivers. They are

Federal

(1) Department of Agriculture - Soil Conservation Service activities, Water Bank Program
(2) Department of Defense - Army Corps of Engineers' activities
(3) Department of the Interior - other Bureau of Outdoor Recreation Programs, Fish and Wildlife Service activities
(4) Department of Housing and Urban Development - Flood Insurance Program
(5) Environmental Protection Agency - Water Quality Planning and Permit Programs
(6) Federal Power Commission - Hydroelectric Power Plant Permitting Program.

Ohio

(1) Department of Natural Resources - State Parks Program, Nature Preserves Program, Flood Plain Planning Program, Habitat Improvement Program
(2) Environmental Protection Agency - Water Quality Planning and Permit Programs.

Potential Evaluation Criteria Relative to Critical Areas Concern. Major factors to consider in considering specific areas as candidates for inclusion in a critical areas program include

- Present and potential scenic and recreational value of the area

- Expected development pressure (second homes, commercial, industrial, etc.
- Comprehensiveness of local development controls and effectiveness in pressuring integrity of river corridor
- Effectiveness of present scenic rivers designation.

Information Requirements. Information requirements include:

- Inventory of undeveloped river corridors
- Identification of those subject to development pressure
- Determination of effectiveness of present development regulations in maintaining the integrity of the area.

Management Requirements. Because of the multiple use and linear nature of river corridors management to maintain the integrity of the area will require a great deal of cooperation between local governments, private land owners and other private interests. Local jurisdiction and priority setting coordinated with State and Federal programs appears to be especially important for this category.

State and National Parks/Monuments

Excluding considerations of habitat for endangered species, neither of the other two sufficient conditions are judged to hold for this category. The extent to which state or national parks contain habitat for endangered species would qualify these areas for consideration as critical though this designation is ambiguous due to the fact that they are already set aside for preservation.

In terms of the necessary conditions, the scarcity condition is considered to be ambiguous. There is no private sector supply response providing new parks but state and federal programs have assured preservation of several thousand of acres. The extent to which such programs are judged to be adequate is beyond the scope of this report. State and national parks could be considered sensitive environmentally depending on the extent to

which buffer zones are included in the evaluation. Development pressure in state and national parks is ambiguous in the context of this category. On the basis of no sufficient condition holding and incomplete necessary conditions, this category is proposed for elimination from consideration as containing potential c didates for criticality.

Scenic Areas. This category is not easily defined and overlaps with many other areas. Generally, it would include scenic highways, overlooks or other natural areas whose physical or natural beauty is especially outstanding.

Consideration of Criticality. Except for habitat for endangered species again, none of the sufficient conditions are judged to hold.

Depending on the evaluation of government programs, all of the necessary conditions are proposed as holding. Scenic areas (however defined) are growing in scarcity in Ohio due to various types of development. There is no private market mechanism insuring integrity of scenic areas from the basis of public access. To the extent that governmental programs providing state or national parks protect scenic terrain, this necessary condition may be judged not to hold. On the other hand, those areas fully outside the domain of such parks would not be subject to such protection and there would be no comprehensive effective governmental program. The sensitivity and irreversibility of scenic areas is due primarily to aesthetic alteration due to manmade structures and development pressures on such areas must generally be considered significant. On the basis of the necessary conditions, this category is proposed for consideration as containing candidates for criticality.

Direct Government Regulation and Programs. Outside of the scenic rivers program, there is no active program dealing with scenic areas explicitly. There has in the past been a program to designate certain highways in Ohio as Scenic Highways. Almost 1700 miles within the state

have been included. On the official state map they are noted with a green stripe next to the roadway marking. The Scenic Highway Program was developed in the 1950's and 1960's, but there has been little or no activity for several years. There never was a budget for developing the designations, and criteria were not established. Currently there are no funds expended for erecting or maintaining the signs denoting these highways.

There is currently study activity being led by the Federal Highway Administration to establish a system of National Scenic Highways, but implementation of this program will be several years away.

Potential Evaluation Criteria Relative to Critical Areas Concern. Criteria that could be employed in selecting specific areas within this category include:

- Statewide recognition and level of attraction of the area as a scenic asset
- Development pressure on the area and the degree of incompatibility of this development with scenic values
- Degree of present control (inclusion in state park, scenic view area, etc.)

Information Requirements. Information needed in this category includes:

- Inventory of significant state scenic areas and cross classification with existing uses (parks, private forestland, etc.)
- Identification of areas where present development trends threaten the integrity of the scenic values (i.e., proliferation of signs, towers, high rise structures, incompatible color and design, etc.)

Management Requirements. Coordination and identification of overlap with other programs and potential for inclusion of scenic areas in other programs is the primary requirements in this category. Funding of programs for purchase of easements or other methods of guaranteeing the long run integrity of the area would also be necessary.

Historic Areas and Sites

This category includes a variety of buildings, urban and rural districts, and locations of buildings or sites relevant to Ohio's development and growth.

Consideration of Criticality. None of the sufficient conditions are judged to hold for this category except for possibly the case of extreme environmental deterioration.

On the other hand, all the necessary conditions may hold for specific cases thus qualifying this category for consideration. Nearby conflicting uses, destruction due to urban renewal, and general blight of inner city areas has seriously threatened many historical areas in Ohio. Remnants of previous transportation systems, notably the old canal systems, are also threatened by various forms of filling and adjacent uses. Adequate lack of private sector response is thus judged to hold for this category. On the other hand, there are examples in Ohio of notable successes of private preservation and renovation of historical areas. In particular, German Village in Columbus, the villiage of Zoar, sections of Cincinnati, areas in Lancaster, and a variety of other cities have made considerable progress in restoration of old residential or commercial areas. The extent to which the condition is judged to hold depends on how one defines historical areas and how extensively their preservation should be promoted. Tentatively, we will define this broadly in terms of preservation of individual landmarks as well as older neighborhoods where the private sector has responded. The support on the part of government in terms of funding, low interest loans for renovating historical areas are generally judged to be adequate. In particular, depreciation laws, land and improvement assessment practices, and general transportation planning and construction has affected many historical areas. On the other hand, creation of special districts and local government response to preservation of historical areas may require alteration in the evaluation of this condition. Historical areas would be sensitive to certain types of incompatible developments and many older historical areas are subject to a variety of development pressures which are in conflict with their general architectural and area characteristics. On

the basis of the necessary conditions, subject to further definition of the second and third criteria, these areas would be proposed as containing candidates for consideration as critical.

Direct Government Regulation and Programs. Most of the programs dealing with dealing with significant historical and archaeological areas are coordinated by the Ohio Historical Society. One important program concerns the National Register of Historical Places, for which the Director of the Ohio Historical Society is the State Historic Preservation Officer. He is responsible in Ohio for administering the federal program and the federal funds, which are authorized pursuant to the National Historic Preservation Act of 1966. State funds are not involved in this particular activity of the Ohio Historical Society.

Approximately 500 sites within the state are on the National Register. In 1973, about 70 of them applied for federal preservation and maintenance funds; federal grants will provide 50 percent of these costs, if the private site owner matches the amount and if federal funds are available. The Ohio Historical Society acts as clearinghouse and coordinator of this program.

Cirteria for inclusion in this list are broad. A candidate must have some general significance within Ohio history. Most of the sites are historical buildings with some architectural importance, but about 125 of the 500 sites date from prehistorical times. Inclusion on the list in no way affects property rights of the site owner.

There is no specific state legislation to protect historic areas, although in some instances - e.g., German Village in Columbus - the local authorities will enact special zoning ordinances to protect historic areas. Local activities also center on County Historical Societies.

State efforts are more concentrated in the program of State Memorials, which are owned and operated by the Ohio Historical Society. The Society has designated 63 State Memorials, many of which are also on the National Register of Historical Places, and the total acreage is 4,569. There are three classes of sites: (1) Historical - buildings of historical or architectural significance, places where historic events took place or where famous people are implicated, (2) Archaeological - prehistorical sites of particular significance, and (3) Natural - places with unique flora

or fauna, or unique geological aspects. Proposed sites within the system are screened by the Society and ratified by the State Legislature.

The Ohio Historical Society is a quasipublic institution which has contractual arrangements with the state. Approximately 75 percent of its operating budget in the area of State Memorials comes from the state, with the rest coming from membership and entrance fees, sale of items at the memorials, and private donations.

The Department of Natural Resources is also an affected agency in the area of historical and archaeological sites. Several state parks are centered on these themes.

Potential Evaluation Criteria Relative to Critical Areas Concern. Consideration of specific historical sites in areas for inclusion or designation as critical areas include:

- The significance of the site
- The threat to the site and its adjacent area from incompatible development and land use
- The degree of local interest and private financing for restoration or preservation
- The degree of local regulation of the area.

Information Requirements. Necessary information includes:

- An inventory of present and potential historical sites
- Identification of sites threatened by development, demolition or incompatible adjacent uses
- Identification of the capability financial and political capability of local interests to maintain and preserve the site.

Management Requirements. Strengthening of the financial and legal capabilities of local and regional interests to preserve and maintain the integrity of historical sites is the primary management requirement in this category.

## Archaeological Sites

Archaeological sites include all evidence of indians and prehistoric habitation of Ohio by man.

Consideration of Criticality. No one of the sufficient conditions is judged to hold for this category other than the possibility that such sites may be habitat for endangered species.

With the exception of governmental programs, all of the necessary conditions are judged to hold. Archaeological sites are decreasing in availability due to development pressure, there is no comprehensive effective private sector supply response, and the effectiveness of governmental programs is subject to debate. Archaeological sites are easily destroyed or irreversibly damaged by incompatible development and as mentioned above in the scarcity cirterion, development pressure and loss of such sites is likely to continue in the future. On the basis of necessary conditions, this category is proposed as containing candidates for consideration as critical.

Discussion of government programs, evaluation criteria, information requirements and management requirements are essentially the same as the previous section and will not be repeated here.

## Geological Formations

These areas include caves, unique river valley cliffs and other forms of rock outcropping of particular scenic or geological interest.

Consideration of Criticality. None of the sufficient conditions are judged to hold for this category.

With some reservations, all of the necessary conditions are judged to hold. It is assumed that significant geological alterations are threatened by various types of development and are thus increasing in scarcity in Ohio; and that there is no adequate private sector supply response that will preserve and protect such areas.

No information was obtained to provide a general judgment in terms of effective or lack of effective governmental programs. Geological formations would be sensitive to certain types of development primarily on the basis that they alter the character of the area more than they destroy the actual formation. More information is needed for elaboration of this subject. Likewise, further information on the types of development pressure on these areas are subject to is needed before a judgment can be made on the last criterion. On the basis of the necessary conditions, geological formations would tentatively be proposed as a category containing candidates for criticality.

Direct Government Regulation and Programs. No state or federal activity is specifically designed to affect this area. But several programs described elsewhere have a potential relationship with it. When joined with data collection efforts, they are

Federal

1. Department of Interior - U.S. Geological Survey activities

Ohio

1. Department of Natural Resources - Scenic Rivers Program, Nature Preserve Program, State Parks Program.

Potential evaluation criteria, information requirements and management requirements would be similar to scenic areas and are not repeated here.

## Facilities

### Power Plants and Facilities

As a category of major facilities, power plants include coal, oil, gas, and nuclear fueled facilities. In Ohio in the majority of power plants are presently coal fired with 98 percent of total BTU generation coming from coal fueled facilities.* Nuclear and coal fired facilities dominant fuel sources for planned future generating capacity. The national and

*Steam-Electric Plant Factors. 1973 Edition. An Annual Study by the Economics and Statistics Division, National Coal Association, Washington, D.C., January, 1974.

international energy situation can be expected to provide further incentives for shifts from oil and gas to coal and nuclear fuel. Abundant Ohio coal and delays in nuclear plant construction due to safety and environmental considerations will add additional incentives for use of coal in expansion plans.

Consideration of Criticality. This facility was judged to be a candidate for containing critical areas due to the sufficient condition of site scarcity. Power plant siting requirements are stringent and the number of areas within the state qualifying for location are both limited in number and subject to preemption for other uses. Safety considerations, proximity to load centers, cooling requirements and environmental considerations underscore the need for advanced planning and site selection coordinated through appropriate public regulations. The vital nature of power supply coupled with the environmental impacts of power facilities are the basis for judging that the sufficient condition in this case holds.

In terms of necessary conditions, power facilities as a rule do not generate significant secondary development, particularly in the well developed state such as Ohio. Environmental problems involving facilities are well known. Likewise power plants and power facilities entail distribution of size ranging from gas turbines which are relatively small facilities to 1000 megawatt or larger nuclear power plants.

Present Brief Government Regulations and Programs. Because of the public utility nature of power facilities and the environmental and safety aspects of nuclear plants, this category is subject to considerable federal and state government involvement.

Private power companies are regulated by the state through the Public Utilities Commission of Ohio (PUCO). Proposed facility expansions and requested rate increases are subject to approval by PUCO. Power plant siting is now also subject to state review.

The Ohio Power Siting Commission was established in October of 1972 pursuant to the same legislation which created the Ohio Environmental Protection Act. All major utility facilities - the construction of which

began after October of 1972 - have to secure from the Commission a "Certificate of Environmental Compatibility and Public Need". Facilities affected include electric generating plants with a capacity of 50 megawatts or greater and transmission lines of 125 kilovolts or more. The application process is expected to consume about 1 year's time on the average. Applicants are required to file several documents, one of which involves a consideration of alternative sites for the facility. A hearing process is then undertaken, after which the Commission makes its determination on the proposal's "Environmental Compatibility" as well as the "Public Need" for it.

Nuclear power plants and hydroelectric generating facilities, in addition, are required to receive licenses from Federal regulating agencies - namely the Nuclear Regulatory Commission and the Federal Power Commission, respectively. Federal licensing procedures in these cases involve the preparation of Environmental Impact Statements under the National Environmental Policy Act of 1969, and these statements are required to discuss alternative sites. Thus, both federal and state siting reviews take place for these facilities, in addition to the usual local zoning process.

Potential Evaluation Criteria Relative to Critical Areas Concern. Major factors that would be important in considering power generation facilities in a future critical areas program include costs of obtaining acceptible sites and environmental and land use impacts of plant construction and operation.

The issue in future site availability is what role the public, through existing or new agencies, should play in guaranteeing acceptable site availability to investor owned utilities. On the one hand, it can be argued that the vital nature of electric supply necessitates direct public involvement in setting aside future sites that simultaneously meet environmental, safety and load center proximity considerations. This would presumably involve some form of public land banking program. On the other hand, it can also be argued that private utilities are capable of

competing in local real estate markets for future sites based on their own assessment of future needs. Again, land banking is one method for assuring future availability. It is beyond the scope of this study to evaluate the pros and cons of the above issue. Assuming that a formal public or private land banking program is determined to be necessary to meet future site requirements, the following criteria or considerations are important

- Establishment of local or state policy on interim use of the site and explicit action programs for assuring smooth transition from interim to final use
- Development of an income generating easily terminable interim use of the site or similar easily terminable use of public benefit
- Establishment of local or state plans and action programs for coordinating adjacent land development with the future existence of a power generation facility.
- Assurance of reasonable expectation that proposed future sites will be acceptable on environmental and safety grounds in view of present regional development trends.

In terms of environmental and land use considerations, the following general criteria are important

- Visual proximity of site or transmission equipment to designated scenic, historical or natural areas including state and national parks
- Location and magnitude of discharge of heated effluents to streams or standing bodies of water
- Effect of the facilitiy on applicable regional air quality standards
- Requirements of the facility for secondary development such as transportation infrastructure and the expected magnitude of use resulting from such requirements.

Information Requirements. Inclusion of power plant facilties in any formal critical areas program would require a variety of detailed information. Data on information requirements include:*

- Detailed plant expansion forecasts and preliminary site selection (Available from the Ohio Power Siting Commission)
- Detailed environmental and land use impact assessments for specific proposed facilities and site alternatives.

Management Requirements. Including power plants in a comprehensive statewide critical areas program would require two necessary ingredients

- Explicit state policy on regional tradeoffs in future power plant siting
- Local, regional, or state development and enforcement of land use restrictions in the vicinity of future sites.

Airport and Facilities

The growing long run demand for airport transportation and increasing size of jets results in demands for bigger airports and longer runways. As with other transportation facilities, Ohio has a well developed system of air traffic hubs. These play an integral role in linking major metropolitan areas of Ohio with other national and international transportation hubs.

*General reference material includes:

Hubert E. Risser. "Power and the Environment--A Potential Crisis in Energy Supply", Environmental Geology Notes, Number 40, Illinois State Geological Survey, Urbana, 1970.

J. G. Terrill, Jr., et al. "Environmental Aspects of Nuclear and Conventional Power Plants", Industrial Medicine and Surgery, June, 1967, p 412-419.

M. M. Yarosh, "Changing Emphasis in the Siting of Steam Electric Power Plants", Presented at the American Society of Mechanical Engineers Winter Annual Meeting, November 29-December 3, 1970, New York.

For a detailed discussion of Environmental factors associated with coal fired power plants, see "Chapter V: Power Plants" in Baseline Data Environmental Assessment of a Large Coal Conversion Complex, report to the Office of Coal Research, U. S. Department of the Interior, Washington, D.C., 1974.

Considerations Affecting Steam Power Plant Site Selection. A report sponsored by the Energy Policy Staff, Office of Science and Technology, U. S. Goverment Printing Office, Washington, D.C., 1968.

John Fisher. The Energy Crisis in Perspective.

Table B-4 below shows the total number of airports in Ohio for 1962-1971 as compared to the national figures.

AIRPORTS ON RECORD WITH FAA, DECEMBER 31, 1962-1971*

| | 1962 | 1963 | 1964 | 1965 | 1966 | 1967 | 1968 | 1969 | 1970 | 1971 |
|---|---|---|---|---|---|---|---|---|---|---|
| Total U.S. | 8,084 | 8,814 | 9,490 | 9,566 | 9,673 | 10,126 | 10,470 | 11,050 | 11,261 | 12,070 |
| Ohio | 371 | 377 | 397 | 401 | 383 | 397 | 436 | 451 | 447 | 491 |
| Ohio Share | .046 | .043 | .042 | .042 | .04 | .039 | .040 | .041 | .040 | .041 |

Table  presents statistics on small, medium, and large air hubs for Ohio for 1972 and Table  shows distribution by size of runway for 1971.

U.S. CIVIL AND JOINT-USE AIRPORTS, HELIPORTS AND SEAPLANE BASES ON RECORD BY LENGTH OF LONGEST RUNWAY, DECEMBER 31, 1971

| | By Length of Runway (in feet) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Total 1/ | Under 3,000 | 3,000-3,999 | 4,000-4,999 | 5,000-5,999 | 6,000-6,999 | 7,000-7,999 | 8,000-8,999 | 9,000-9,999 | 10,000- and over |
| Ohio 491 | 338 | 88 | 37 | 13 | 7 | 2 | 1 | 4 | 1 |

* FAA Statistical Handbook of Aviation, 1972 Edition. Department of Transportation, Federal Aviation Administration, U.S. Government Printing Office, Washington, D.C.

Demand for large scale regional airport expansion in northeast Ohio indicates the importance of consideration of airport facilities in critical area land use planning.*

Consideration of Criticality. Requirements for new and large scale airports as well as the need to mitigate the environmental impacts (primarily noise) are judged to qualify this category on the sufficient conditions of site scarcity. The population density of Ohio in and around major metropolitan areas is such that major new airport construction is likely to have significant social, economic, environmental impacts for a significant number of people near proposed facilities.

Airports also qualify in terms of meeting the four necessary conditions. Airports both stimulate and shape secondary development in a region. This is particularly true for commercial locations such as hotels and restaurants as well as certain types of businesses. Noise from airports as well as exhaust from jets can be major environmental problems. It is likely that the nature of demand for air travel and predictable population and economic growth in Ohio will necessitate new airport construction in the future. Airports obviously have a wide distribution of sizes with those handling major metropolitan areas encompassing several thousand acres.

Present Direct Government Regulation and Programs. Airport development in Ohio is taking place mostly on land already dedicated to aviation activities. This is true for all expansions of existing facilities in the state, but it is not true for the one instance where a new airport is being considered. This case concerns Cleveland, where it is projected that Cleveland-Hopkins Airport will soon be unable to handle the expected traffic volume. Planning for a potential new site--or for continued expansion of the existing facility, which is yet a possibility--is being

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* Summary. A Comparison of Regional Airport Sites in Northeast Ohio, Prepared for the Northeastern Ohio Aviation Council, Kent State University, Center for Urban Regionalism, April, 1970.

Airport Master Planning Grant Application, Cleveland Service Area Airport, Northeastern Ohio, to Federal Aviation Administration, from Lake Erie Regional Transportation Authority, March 15, 1974.

conducted by the Lake Erie Regional Transit Authority. This effort is 66-2/3 percent funded by a planning grant from the Federal Aviation Authority, administered pursuant to Public Law 91-258, the Airport and Airways Development Act of 1970. As of now, the planning activities have specified four possible new sites, one of which has aroused considerable publicity because it is off the city in Lake Erie. The final decision on the site will probably be made sometime in 1975.

A specific review of the proposed site for an airport does not take place with the administration of a planning grant, but it does with the FAA's Development and Construction Program, which will fund 75 percent of such costs at most airports but only 50 percent at the most major airports. Within this latter category in Ohio, there is only Cleveland-Hopkins Airport. In addition to the FAA review, new airports and those being elevated to a higher classification must also receive a State permit from the Division of Aviation within the Ohio Department of Commerce.

Potential Evaluation Criteria Relative to Critical Areas Concern. Major issues of concern in airport siting and expansion are the same as for power plants: site scarcity and management of environmental socioeconomic side effects.

As indicated above, only one major new airport is presently planned in Ohio. In considering airports as a category for critical areas designation, the following site related factors would need to be resolved:

- Size of facilities to be included (i.e., only hub airports, all facilities, those over a specified runway length, etc.)
- State policy regarding land acquisition, interim use and regulation of adjacent off-site development (i.e., should the state play a direct role in guaranteeing future sites?).

General criteria or factors that need to be considered in terms of management of environmental, land use, and socioeconomic impacts include

- Regulation of surrounding land use to minimize the significance of noise impacts

- Design of access facilities (roads, primarily) and regulation of adjacent land use to ensure orderly, coordinated secondary development and
- Design of approach and access facilities to minimize impacts of traffic flow on adjacent land uses (residential, commercial, etc.)
- Selection and design of airport facilities to minimize impact on surface drainage, and damage to wildlike habitat (marshland in particular)
- Location of airport site to minimize or avoid impacts on aesthetic, scenic or historical assets.

Information Requirements. Inclusion of airports in a critical areas program would require information similar to that presently developed for other major facility expansion. This would include*

- Estimation of expansion requirements by region including site size and expected traffic volume
- Systematic (though not necessarily detailed) evaluation of impacts and abatement measures associated with promising sites (i.e., development of a comprehensive environmental and socioeconomic assessment).

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* Background information includes

A Study of the Magnitude of Transportation Noise Generation and Potential Abatement, Volume I, Summary, Final Report, Department of Transportation, Office of Noise Abatement. Washington, D.C., November, 1970.

Legal and Institutional Analysis of Aircraft and Aircraft Noise and Apportionment of Authority Between Federal, State, and Local Governments, U.S. Environmental Protection Agency, Arlington, Virginia, 1973.

Airport Environs: Land Use Controls, Environmental Planning Paper, U.S. Department of Housing and Urban Development, May, 1970.

Foster, Joseph A., "The Airport--A Center of Economic Gravity", in Air Transportation Conference, Proceedings published by the Society of Automotive Engineers, Inc., New York. 1972.

Dean, Ernest E., "Construction Economics and Community Impact", in Air Transportation Conference, Proceedings published by the Society of Automotive Engineers, Inc., New York. 1972.

Management Requirements. If airports were to be included in a regional or state critical areas program.

- Size of airports to be included in the program
- Local or regional (or state) authority to regulate adjacent land use.
- Identification and evaluation of impacts and abatement measures associated with promising sites (i.e. development of a comprehensive environmental and socioeconomic assessment)

## Medical Facilities

Medical facilities are judged not to be a category which would contain candidates for criticality. In terms of sufficient conditions, sites for medical facilities may be a financial problem or assemblage problem for local or regional government, but land in Ohio is available and the siting of such facilities can typically be handled within a local/regional planning context.

In terms of necessary conditions, hospitals do not generally induce significant secondary development or significant environmental problems. It is probable that new hospitals will be constructed in Ohio and that they will have a distribution of sizes. Because all the proposed necessary conditions do not hold nor does the sufficient condition, it is proposed that medical facilities not be included on a list of categories potentially having candidates containing critical areas.

## Interurban Railroads and Facilities

The sufficient condition in this case is judged not to hold since existing road bed in Ohio, although in need of repair, is adequate to service metropolitan areas. The issue of new switching and assembly yards may qualify this point, but at this level of analysis it is proposed that railroads not be judged to be a type of facility with a shortage of available sites.

In terms of necessary conditions, railroads historically served to shape secondary development and could in the future, depending on the extent of dependence on railroads for passenger and freight shipments. Railroads are not generally considered to be a significant source of environmental problems. Future construction of new railroads and railroad facilities is

not expected to be significant though extensive repair and upgrading is probable. In terms of distribution of sizes, this criteria is amibiguous in the context of the category. On the basis of the above, railroad facilities are proposed to be excluded from a list of candidate categories.

Regional Educational Facilities

Regional educational facilities are not judged to be a type of facility whose sites are in short supply. Siting requirements are again a financial and assemblage problem more than a problem of constrained availability. On this basis, the sufficient condition is judged not to hold.

In terms of necessary conditions, it can be argued that educational facilities help to shape or create certain types of secondary development, primarily commercial such as restaurants or entertainment places and apartments. Educational facilities are not generally a cause of significant environmental problems and it is likely that future construction in the state will be fairly limited. Obviously, educational facilities can encompass a distribution of sizes. On the basis of the above, all necessary conditions are judged not to hold and this category is not recommended for consideration as having candidates for critical areas.

Reservoirs

Reservoirs are constructed to provide a variety of goods and services, primarily water supply, flood control, hydroelectric power, and recreation and fish and wildlife. In Ohio, reservoirs have been constructed primarily by the U.S. Army Corps of Engineers, by the State, by various municipalities, and by state conservancy districts. Table below shows the major state reservoirs by year of construction, ownership, and size. Proposed Corps of Engineers projects are also listed.

Consideration of Criticality. Many of the economically acceptable reservoir sites in Ohio have already been developed. Needs for water supply, recreation, and to a limited extent, power production in the state would indicate a future siting problem due to the conflicts in use

TABLE B-5 MAJOR RESERVOIRS IN OHIO*

| Year of Construction | Name | Surface Area | Ownership |
|---|---|---|---|
| 1832 | Buckeye Lake | 3,140 | State of Ohio |
| 1912 | Auglaize River | 1,240 | Toledo Edison Company |
| 1914 | Lake Rockwell | 539 | Akron |
| 1916 | Milton Lake | 1,685 | Youngstown |
| 1922 | Englewood | 7,900 | Miami Conservancy District |
| 1922 | Germantown | 3,600 | Miami Conservancy District |
| 1924 | O'Shaughnessy | 829 | Columbus |
| 1929 | Meander Creek | 2,010 | Mahoning Valley Sanitary District |
| 1936 | Charles Mill | 6,050 | Corps of Engineers |
| 1936 | Mohicanville | 8,800 | Corps of Engineers |
| 1936 | Tappan | 3,100 | Corps of Engineers |
| 1937 | Atwood | 2,460 | Corps of Engineers |
| 1937 | Beach City | 6,150 | Corps of Engineers |
| 1937 | Bolivar | 6,500 | Corps of Engineers |
| 1937 | Clendening | 2,620 | Corps of Engineers |
| 1937 | Dover | 10,100 | Corps of Engineers |
| 1937 | Mohawk | 7,950 | Corps of Engineers |
| 1937 | Piedmont | 3,200 | Corps of Engineers |
| 1937 | Senecaville | 5,170 | Corps of Engineers |
| 1937 | Wills Creek | 11,450 | Corps of Engineers |
| 1938 | Pleasant Hill | 2,600 | Corps of Engineers |
| 1939 | Mogadore | 900 | City of Akron |
| 1939 | Nimisilla | 811 | State of Ohio |
| 1942 | Berlin | 5,500 | Corps of Engineers |
| 1944 | Mosquito Creek | 8,900 | Corps of Engineers |
| 1948 | Cowan Creek Lake | 648 | State of Ohio |
| 1948 | Evans Lake | 580 | Ohio Water Service Company |
| 1949 | Clear Fork | 1,010 | City of Mansfield |
| 1951 | Delaware | 8,700 | Corps of Engineers |

TABLE B-5. (Continued)

| Year of Construction | Name | Surface Area | Ownership |
|---|---|---|---|
| 1952 | Burr Oak | 1,192 | Corps of Engineers |
| 1952 | Rocky Fork | 2,000 | State of Ohio |
| 1953 | West Fork Mill Creek | 557 | Corps of Engineers |
| 1956 | Hoover | 3,825 | Columbus |
| 1956 | Acton Lake | 625 | State of Ohio |
| 1959 | Dillon | 10,285 | Corps of Engineers |
| 1960 | La Due | 1,500 | Akron |
| 1966 | Michael J. Kirwan | 2,650 | Corps of Engineers |
| 1967 | Shenango River Lake | 3,760** | Corps of Engineers |
| 1969 | Bresler | 582 | Lima*** |
| 1970 | Findlay | 700 | Findlay*** |
| 1971 | Upper Deer Creek | 670 | Alliance |
| 1971 | North Branch of Kokosing River Lake | 1,140 | Corps of Engineers |
| ? | Deer Creek | 4,046 | Corps of Engineers |
| | Under Construction or Planned | | |
| 1971-1976 | Caesar Creek Lake | 6,110 | Corps of Engineers |
| 1970-1976 | East Fork Lake | 4,600 | Corps of Engineers |
| 1966-1974 | Clarence J. Brown | 2,720 | Corps of Engineers |
| 1966-1973 | Paint Creek Lake | 1,190 | Corps of Engineers |
| | Planned or Deferred Authorized | | |
| ? | Logan Lake | 3,100 | Corps of Engineers |
| ? | Frazeysburg Lake | 3,440 | Corps of Engineers |
| Start 1975 | Utica Lake | 4,023 | Corps of Engineers |
| ? | Whiteoak Creek Lake | 931 | Corps of Engineers |
| ? | Big Darby Lake | 4,630 | Corps of Engineers |
| ? | Salt Creek Lake | 1,250 | Corps of Engineers |
| @ 1970 | Spencerville No. 1 | 610 | N.W. Ohio Water Development Plan |
| @ 1990 | Spencerville No. 2 | 560 | |

* Over 500 surface.

** Total area is 11,090 acres, located in Pennsylvania.

*** Northwest Ohio Water Development Plan.

TABLE B-5. (Continued)

| Year of Construction | Name | Surface Area | Ownership |
|---|---|---|---|
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* Over 500 surface.

** Total area is 11,090 acres, located in Pennsylvania.

*** Northwest Ohio Water Development Plan.

between reservoir sites and other uses of valley bottoms. A primary consideration in this case is also growing opposition to reservoir construction on the basis of environmental considerations. The sufficient condition is judged to hold in this case on the basis of conflict in use and diminishing number of available sites for future reservoir construction.

The necessary conditions for this category are also judged to hold. Reservoirs helped to shape secondary development as well as inducing certain types of activities related to recreational or second home use. Reservoirs create significant environmental problems in terms of preemption of wild life habitat and water qualities changes below the reservoir. There has been extensive past construction of reservoirs in the state and status of future construction is a function of political and economic decisions which may change as state and Federal policy changes. Reservoirs also include a wide distribution of sizes.

Direct Government Programs and Regulation. Large water impoundments in the state of Ohio are usually constructed by the U.S. Army Corps of Engineers. Various economic benefits--water supply, recreation, flood control, etc., are identified and evaluated as are the economic costs of the project; a Benefit/Cost ratio is then determined for a proposed impoundment so that it can be compared with alternatives. An Environmental Impact Statement process is also undertaken, although this began in 1970 and is thus relatively recent. Proposed projects are then prioritized in order of economic and environmental desirability, and those identified as best are funded by Congress and implemented by the Corps.

When a project has significant recreation value, a lease arrangement is often reached with the Ohio Department of Natural Resources' Division of Parks and Recreation. The state will then operate the impoundment as part of the State Parks program.

When a project has significant water supply potential, on the other hand, it is often the case that the Corps will enter into an arrangement with the Ohio Department of Natural Resources' Division of Water such that the proposed dam will be built higher. The state will then own that excess of water brought about by the heightening of the dam; it will then sell the water to local authorities and use the revenues to pay back the Corps for the extra construction costs involved.

The state's Division of Water is also empowered to implement dams with local authorities for local purposes. The Ohio Legislature in 1965 authorized the Northwest Ohio Water Development Plan; a 1968 state bond issue authorized water development plans for the other areas of the state, but as of yet the only other completed plan is for northeast Ohio. Implementation is beginning now in the northwest. When a recommendation is made in the plan, an interested community will pass a bond issue and apply for any available Federal funds. If the total money is not enough to create a reservoir adequately sized for its perceived needs, the local authority will apply for state help from the Division of Water's Water Management Section. To the extent that the state then contributes, it will own the water and sell it, but there is usually a desire on the part of the community to repurchase that part of the project controlled by the state.

There are currently eight such reservoirs in northwest Ohio, the largest being about 700 acres. There are also several hundred municipal-only reservoirs in the state as well as thousands of farm ponds.

Potential Evaluation Criteria Relative to Critical Areas Concern. Probably the most significant issue in reservoir development is the trade-off between the services obtained on the one hand and the ultimate uses lost on the other. Future reservoir construction is also very likely to conflict with proposed natural or geographic critical areas due to the need for relatively undeveloped sites. In conjunction with the siting issue, establishment of any statewide critical areas program will require regional and/or state policy on the issue of preservation versus development of natural areas suitable for reservoirs. Clear policy guidelines on preservation versus development is also crucial for the spectrum of major facilities, as their siting requirements relate to natural or sparsely developed areas.

In terms of environmental and land use considerations, factors which a regional or state critical areas program would need to consider include

- Alteration of stream and valley areas to flat water area
- Impacts on downstream aquatic ecology

- Secondary development induced by presence of the reservoir.

As can be seen from Table B5, a typical reservoir will preempt several hundred acres. Loss of undeveloped valleys can be particularly significant where they are used for outdoor recreation such as stream fishing, canoeing, hiking, and camping. Inundation of valleys also has major implications in terms of displacement of existing land use, blocking of transportation routes and disruption of established rural communities.

Creation of large standing bodies of water cause two significant changes in the downstream water regions. First, natural variation in downstream flow is altered by impoundment. Timing of downstream releases can significantly alter the natural water level changes which are critical to life cycles of various aquatic species. Second, impoundment creates bio-chemical changes in the water relating to dissolved oxygen levels, nutrients, and turbidity. These water quality changes also have direct and indirect impacts on downstream aquatic ecology.*

In addition to the direct use of land, reservoirs also have the potential for creating changes in surrounding land use.** These changes will depend on accessibility, regional population levels, income, and the reservoir purpose. Land use changes may occur as a result of

- Location of recreation serving businesses on roads leading to the reservoir
- Residential/recreational home development on or adjacent to the reservoir.

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* Maurice L. Warner, et al. An Assessment Methodology for the Environmental Impact of Water Resource Projects, Office of Research and Development, U.S. Environmental Protection Agency, Washington, D.C.

** R. L. Ludtke, et al. Evaluation of the Social Impacts of Reservoir Construction on the Residential Plans of Displaced Persons in Kentucky and Ohio. University of Kentucky Water Resources Institute Research Report No. 26, Lexington, 1970.

M. B. Hargrove, Economic Development of Areas Contiguous to Multipurpose Reservoirs. The Kentucky-Tennessee Experience, University of Kentucky Water Resource Institute Research Report No. 21, Lexington, Kentucky, 1971.

B. R. Prebble, Patterns of Land Use Change Around a Large Reservoir. University of Kentucky Water Resources Institute Research Department Report No. 22, Lexington, 1969.

In some cases a reservoir may contribute to industrial location decisions through assurance of dependable water supply. In most situations other factors such as accessibility to markets and labor supply will be more important factors determining location.

Information Requirements. Requirements for regional or state evaluation of reservoir proposals relative to critical areas concern are the same as for other major facilities. These include

- Identification of potential sites
- Evaluation and analysis of general environmental and socioeconomic impacts associated with alternate sites
- Evaluation of economic, social, and environmental aspects of alternatives to reservoir construction (ground water pumping, alternate power source, reduction in growth in use, etc.).

Management Requirements. In order to adequately manage reservoir construction and long run use in the context of a regional or state critical areas program, the following factors would be necessary:

- Development of performance standards for minimizing or eliminating downstream water quality and related ecological effects
- Development of local, regional or state plans and regulations for ensuring balanced development along the reservoir and/or approach roads
- State land prioritizations of potential reservoir sites and policy or trade-offs between regional locations.

## Interceptor Sewers and Sewage Treatment Facilities

Construction grants from the Federal Environmental Protection Agency provide communities with up to 75 percent Federal financing of interceptors and treatment plants. Although many factors affect residential land development patterns, building of interceptor sewers ahead of development has been found to be an important contributor to urban sprawl. A recent study indicates that procedures now employed in the physical design of interceptors, the local review of project plans, and the local and Federal methods of financing have important land use implications which have not been given adequate recognition or evaluation.* Interceptor construction relates primarily to development patterns on the urban fringe, specifically urban density and pressure on farmland and open space bordering metropolitan areas.

Major factors that have resulted in sprawl and inefficient land use relative to interceptor construction include**

- Over capitalization of waste collection and treatment systems by creation of interceptor capacity in excess of current population requirements; long life design capacities (often over 100 years); and use of per capita requirements figures that exceed current utilization rates
- Incentives in present Federal financing methods which induce communities to encourage new development to help pay for sewers

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* Interceptor Sewers and Suburban Sprawl: The Impact of Construction Grants on Residential Land Use, Executive Summary by Urban Systems Research and Engineering, Inc., prepared for the Council on Environmental Quality, National Technical Information Service, Springfield, Virginia, July, 1974.

** From Address of the Honorable Russel W. Peterson, Chairman, Council on Environmental Quality before the Forty-Seventh Annual Conference of the Water Pollution Control Federation, Denver, Colorado, October 8, 1974.

- Lack of adequate information in grant applications in the amount of vacant land to be served, the basis for population estimates, design capacities, and opportunities for incremental rather than comprehensive development
- Need for circulation of complete environmental impact statements on all major grants.*

Consideration of Criticality. Although siting locations may be a problem for specific facilities, in general, physical site scarcity is not considered a significant factor in sewage treatment plant construction. On the other hand, objections from residents in near proximity to facilities may be significant enough factor to warrant consideration for judging site scarcity as important enough for the sufficient condition to hold.

It is judged that all four necessary conditions hold for sewage treatment plants and thus they are tentatively qualified as a category for potential candidates for critical area consideration. Sewage treatment plants and their interceptor systems have been shown to be a significant factor in shaping secondary development particularly in open or urban fringe areas. Depending on how environmental problems are defined, sewage treatment plants may cause significant opposition due to aesthetic considerations. This point is debatable and that is the reason for the question mark in the matrix. Major Federal/State financial support is certain to guarantee future construction of sewage treatment plants, like most facilities, they entail a wide distribution of sizes. On this basis, the necessary conditions are judged to hold and sewage treatment plants are proposed as a category which may contain specific candidates.

Present Direct Government Programs and Regulations. The siting of sewage treatment plants and their collection systems is a matter of local concern, but municipalities or regional authorities which undertake this activity are required to submit their ideas to the state for review. Under Section 201 of Federal Public Law 92-500, the 1972 Amendments to the Federal

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* op.cit.

Water Pollution Control Act, plans for treatment facilities and collection systems are to be drawn up in detail. These are then sent by the local authority to the Ohio Environmental Protection Agency, which will review the proposed facilities and make a determination on their priority with respect to other proposed facilities within the state. A review function is also exercised by the Ohio Department of Natural Resources in cases where the proposal involves a flood plain or a scenic river. When the priority list is established, items at the top will be first to receive the 75 percent Federal construction funds authorized under P.L. 92-500.

Potential Evaluation Criteria Relative to Critical Areas Concern. The major issues relative to critical areas in the potential for stimulation of unplanned urban growth and the possible site specific conflicts in land use associated with construction of sewage treatment plants, and the environmental effects of region wide waste water collections in terms of change in surface flow patterns and water quality below plant outfalls. Criteria for evaluating individual sites and their potential impacts include

- Amount of presenting undeveloped land to be serviced by the completed system
- The anticipated additional housing units and their probable location and density
- Compatibility of proposed site with adjacent land use
- Volume, rate, quality, and location of system, return flow relative to recreational or natural areas.

Information Requirements. Including selected sewage treatment plants in a critical area program would require availability of the following types of information:

- Detailed inventory of present and planned facilities, location, or alternative proposed locations, facility capacity, and extent of adjacent open space
- For specific proposed facilities, an environmental and socioeconomic assessment of including analysis of alternatives to control treatment (septic tanks, stream reaeration etc)

- Data on local/regional land use plans and extent of enforcement
- Projections on regional population growth.

Management Requirements. To include sewage treatment plants and interceptor sewers in a critical area program, the following factors would be necessary:

- Development of standards or guidelines on the size and characteristics of facilities to be considered for review (how large relative to regional capacity, how many miles of interceptors, what volume of flow, etc.)
- Development of standards for planning development of areas to be served by treatment systems (density, amount of open space, continuity of development, etc.)
- Development of local, regional, or state authority for regulating or guiding land use in areas serviced by interceptors.

Highways and Highway Interchanges

The category includes major limited access highways and their interchanges which connect with major crossroads. The automobile and new highways have been one of the major forces shaping American land use patterns in the last 50 years. Ohio, like all states, has undertaken extensive highway construction as part of the Federal Interstate system. Of primary interest to this analysis is expansion of the interstate system. In 1972, the Federal Interstate system in Ohio consisted of 1,526 miles, of which 561 miles were in urban areas.* Ohio mileage in 1966 was 1,475 of which 410 miles were in urban areas. Future construction will primarily involve completion of the present systems as well as upgrading of many roads

* Source: U.S. Department of Transportation, Federal Highway Administration, 1972, and 1966 Highway Statistics, U.S. Government Printing Office, Washington, D.C.

Consideration of Criticality. Most of the major interstate highways in Ohio have already been completed. Selection of new roads, while causing many financial and dislocational problems, are not generally so significant as to preclude highway development. On this basis, the site scarcity condition is judged not to hold.

On the other hand, all four necessary conditions are judged to hold. Interstate highway interchanges are major forces causing changes in the distribution and concentration of secondary developments. Highways can create a variety of environmental problems related to noise, air pollution, and congestion. There has been extensive past construction of highways in Ohio. The criterion of distribution of sizes is judged to be ambiguous in this context since interstate construction is designed to specifications which vary only in terms of number of miles of highway constructed.

Present Direct Government Regulation and Programs. Highway planning in Ohio takes place in three phases: (1) Systems Planning, (2) Corridor Location, and (3) Design. Complementing these stages is the "Action Plan Program", which is to insure full public involvement in the decision making at each of these levels.

Systems Planning takes place at the state and regional level in Ohio, and it consists of defining a need for new transportation facilities between two given points. The transportation mode is also specified at this level. Systems Planning is a form of long-range needs determination, and it is handled by the Regional Planning Commission and/or the State Department of Transportation. Federal planning grants are available to supplement state and regional funds.

Corridor Location takes place next, during which a more precise routing is situated for the place and mode determined above. Highway Corridors in Ohio must be defined to 1/10 of a mile in width in rural areas, although several of these corridors can be located between two given control points. In urban areas, corridors must be defined to 1/100 mile, but again many of these may be identified. Before the routing is adopted, public meetings are instituted.

The Design phase is then implemented during which final plans and specifications are drawn up for the precise location of the highway. A public design hearing is held after the final design has been prepared, and if no major deficiencies are then pointed out, the Department Director may then certify that the official location of the highway has been determined.

The most important time factor in this process is identified when priorities are assigned to the planned routes. This will establish how many years will lapse before construction begins. There are many plans at ODOT which have been waiting for implementation for more than 10 years.

The corridor and location planning for Ohio's Interstate Highways is largely complete, except for a small piece of I-490 near Cleveland. Thus, unless new Interstate segments are added within Ohio, the bulk of the corridor and location planning will take place for Federal Aid Primary and Federal Aid Secondary routes, where the Federal level of assistance is 50 percent of the right-of-way and construction costs, and the local streets or roads, where there is no Federal assistance. The remaining sections of the Interstate network will continue to receive 90 percent Federal funding, as they have in the past.

Potential Evaluation Criteria Relative to Critical Areas Concern. Important factors relevant to land use considerations in highway construction and operation include:

- Direct and indirect ecological alterations caused by ground water alteration and direct destruction of habitat (e.g., filling of wetlands or cutting of forests)
- Aesthetic alterations resulting from changed terrain, vegetation, and land profile
- Proximity effects due to noise and air pollution (effects on property values and land in transition)
- Locational affects including secondary development at interchanges, on access roads, and in areas made more easily accessible by the highway.

In terms of criteria for selecting specific candidates within this category, the following are the most important:

- Proximity to previously designated natural or geographic critical areas
- Extent of undeveloped land surrounding interchanges in rapidly growing urban or rural areas and the degree of local control and plans for such areas.

Information Requirements. The major information required for the consideration of highways in any critical area program includes:

- Location of planned additions to the system
- Visual and noise proximity of the route to natural, or wildlife areas, scenic areas, or historic locations including parks
- Extent and effectiveness of local land or controls and guidelines in areas adjacent to interchanges.

Although no research was conducted on the subject, most of the above type of information would be generated in the highway planning process. The major factor is comprehensive, though not necessarily detailed, assessment of the range of alternatives for various alternate routes.*

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* References on the subject include:

A Study of the Magnitude of Transportation Noise Generation and Potential Abatement, Volume I. Summary, Department of Transportation, Office of Noise Abatement, Washington, D.C., November, 1970.

Social and Economic Effects of Highways, U.S. Department of Transportation Federal Highway Administration, Washington, D.C., 1974.

Hays B. Gamble, Community Effects of Highways Reflected by Property Values, Institute for Research on Land and Water Resources, Pennsylvania State University, August, 1973.

Highways and Communities, John R. Maiolo, Editor, The Pennsylvania State University in cooperation with the Pennsylvania Department of Highways and the Bureau of Public Roads, U.S. Department of Commerce, University Park, Pennsylvania, June, 1966, p 1.

Sauerlauder, Owen, and Donaldson, Robert, Factors That Influence Economic Development at Non-Urban Interchange Locations, Research Report No. 9, Institute for Research on Land and Water Resources, University Park, Pennsylvania, 1966.

Management Requirements. Including selected interchanges and highway segments in a critical areas program would require extensive coordination between on-going highway planning, and other state agencies dealing with the state's natural resources and economic development. Specific measurable criteria would have to be developed for determining which interchanges and highway segments to include as critical areas.

Ports

Barring construction of an entirely new port in the state, site scarcity is not judged to hold for this category. Most port construction relates to existing areas and includes expansion of facilities, deeping of channels, construction of new unloading and loading equipment. On this basis, the site scarcity condition is judged not to hold.

In terms of necessary conditions, ports are a major force in shaping and inducing secondary development. Environmental problems associated with ports include water pollution, and the need to dispose at large volumes of dredged materials either in open water or in diked facilities along shore or near shore. Information to determine the extent of new port construction was not obtained. Expansion of existing facilities and past construction may require alteration of the third necessary condition to a plus (see Fig.5 ). In terms of distribution of sizes, there are broad distribution of port sizes in Ohio. The decision not to include ports is subject to change based on further knowledge relating to the third necessary condition (future construction).

Shopping Centers

Shopping centers are an integral part of our auto-dependent transportation systems and suburban land use patterns. The shopping center combines a broad spectrum of goods and services in one location with easy access and parking. As such, the center is both a direct and indirect force in shaping urban and urban-fringe land use patterns. Shopping centers are defined as "... a commercial development which is designed, developed, operated, and controlled by a single ownership with off-street parking placed on the site to serve jointly all establishments in the center".*,**

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* J. Ross McKeever, Shopping Center Zoning, Urban Land Institute Technical Bulletin 69, The Urban Land Institute, Washington, D.C., 1973, p 8.

** No attempt was made to obtain detailed statistics on present Ohio shopping centers exits, entries in the 14th Edition (1973) of Shopping Center Directory (The National Research Bureau, Inc., Burlington, Iowa) list over 16,000 centers of all types in the U.S. and Canada.

Consideration of Criticality. As a rule, shopping centers are not a facility with site scarcity problems. The major problems with sites for shopping centers or probably land costs incurred by private developers and acquisition of local zoning approval.

In terms of necessary conditions, shopping centers play a major role in focusing secondary strip commercial development. Environmental problems related to shopping centers include congestion and air pollution, as well as the aesthetic impacts associated with induced secondary developments. Shopping centers have seen considerable construction in the last two decades in Ohio and it is likely this trend will continue in metropolitan areas. Shopping centers including a wide spectrum of sizes. On this basis the category is proposed for consideration as containing specific candidates.

Direct Government Regulations and Programs. Shopping centers as well as the facilities on activities listed below, are described at this point because local controls exercise siting responsibility for all of them. The other listed facilities must also be responsive to local controls, but the above items are distinguished because they are affected predominantly at this jurisdictional level only. State and Federal agencies do not influence directly the decisions for these activities.

The Ohio Revised Code authorizes the establishment of zoning ordinances as follows: (1) County level in Chapter 303, (2) Township level in Chapter 519, and (3) Municipal coporation level in Chapter 713. A given zoning ordinance will in general specify different areas within the jurisdiction where different classes of development will be allowed; commercial, industrial, and residential classes of development are typical but many zoning ordinances allow a multiple-class designation for larger scale developments. Restrictions such as building height, setback, size of open space, density of population, uses of buildings, and so on will differ from class to class. All developments, including the activities listed below, must conform to the applicable zoning requirements unless the site developer has secured a variance issued by the local zoning authority.

Separate provisions within the Ohio Revised Code establish additional regulations for subdivision plats and condominium properties. These are located, respectively, in Chapters 711 and 5311. The laws enumerate requirements on these categories of development after the land use designation has been made.

In addition, the Ohio Department of Health through its Division of Sanitation exercises review and permitting authority over trailer parks, camps, and bathing beaches. Local or county Health Departments determine usability of land for septic tanks and suitability of sites for subdivisions and schools. Ohio law prevents all these developments from being instituted on flood plains in specific, but the state and local health units are empowered to undertake a complete site review.

Large Apartment/Town House Complexes
Vacation/Second Home Developments
Regional Shopping Centers
Large Office Parks
Industrial Parks
Sports/Recreation Complexes

Potential Evaluation Criteria Relative to Critical Areas Program

Direct and indirect land use implications of these centers include such factors as the following:

- Modifications and extension of public facilities including feeder roads, water and service, and power and lights
- Stimulus of secondary investments in various service and retail related enterprises along main routes liking shopping centers to interstate and intraurban freeways
- Increase in urban drainage problems
- Traffic increases, congestion leading to need to upgrade and widen approach roads

- Proliferation of outdoor advertising associated with secondary developments.

Unplanned strip commercial development on major arteries is one of the more significant land use problems facing local planning and zoning authorities. While regional shopping centers themselves are often attractive, well-planned facilities, unplanned commercial development of adjacent highways can result in major social costs. Individual and commercial investments along approach roads require parking space, curb cuts for access, advertising signs, and public services. If poorly planned, significant social costs result from traffic congestion at peak periods, inefficiency of signs due to visual clutter, and added service costs due to sprawl. Lack of coordinated planning for development of strip commercial areas adjacent to regional shopping centers is one major reason for the congestion and social costs typical of many strip commercial areas. Criteria for including selected shopping centers in a critical area program include:

- Size of the shopping center relative to the capacity of existing public facilities (sewers, roads)
- Amount of undeveloped land on highway approach roads and the extent to which comprehensive, implementable development plans exist for these areas (including the regulation of outdoor advertising).

Information Requirements. In order to include selected shopping centers in a critical area program, it would be necessary to have access to preliminary site and design plans for all proposed facilities over a specified size. Information on capacity and expansion plans for public facilities as well as master plans for areas adjacent to shopping centers would also be necessary.

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* Other reasons are more fundamental such as dominance of the automobile in our transportation systems and the problem of rationing use of public facilities during peak load periods.

Management Requirements. To include shopping centers in a critical areas program work requires development of model zoning ordinances, sign ordinances, and facility design characteristics. These would provide a consistant basis for local and private planning relative to the location of large shopping complexes.

## Industrial Parks and Large Scale Industrial Development

This category includes all planned integrated industrial developments involving more than a single operation or involving expansion or new construction of major facilities (refineries or steel mills, for example.)

Consideration of Criticality. In general, sites for industrial plants or parks in the state are not in short supply. Local siting problems may arise due to conflicts in adjacent usage, but overall private industry is generally able to assemble the parcels of land either for expansion or new location. On this basis, the sufficient conditions is judged not to hold.

On the basis of necessary conditions, however, industrial plants and parks would be considered to be a category containing candidates for consideration as critical areas. Industrial plants induce secondary development of various types, including commercial, as well as industrial, serving businesses. Depending on the type of plant, various levels and severity of environmental problems can result including air and water deterioration, and problems of solid waste disposal. Assuming continued growth of the state, plant modernization and some new construction is obviously anticipated. Plants can be expected to encompass a wide spectrum of sizes. On the basis of the above, this category is proposed for consideration as containing candidates for criticality.

Direct Government Programs. (See the same discussion under Shopping Centers.)

Potential Evaluation Criteria Relative to a Critical Areas Program. Criteria for including specific industrial parks of large scale plants in a critical areas program will include

- Size of the plant or park relative to the local labor market and public service capacity

- Extent to which plant may stimulate extensive secondary development either through population influx or further development of supporting industries
- Amount of underdeveloped land adjacent to the facility
- Extent to which comprehensive planning exists for areas likely to develop as a result of location expansion, or continued operation of specific facilities
- Magnitude duration and frequency of discharge of waste products to air, water, and land
- Noise associated with the facility operation
- Proximity to designated critical geographical or natural areas.

Information Requirements. As with large shopping centers, inclusion of this category would require access to business plans or proposals for expansion and location.

Environmental and socioeconomics impact assessment of proposed facilities would also be necessary for evaluation of the effects on adjacent communities and natural areas.

Management Requirements. Guidelines relative to access and secondary development are probably the major management need if plants or industrial parks are to be evaluated for their developmental and environmental impacts.

Mineral Extraction and Processing Areas

This category includes all oil and gas sites, sand and gravel operations, and surface and deep mining of coal.

Consideration of Criticality. This category may be inappropriate for the facilities list, but will be included for the time being. If this facility is defined to include mineral sites there are certain types of extractive minerals for which conflict in site use creates a site scarcity problem. On this basis, the sufficient condition is judged to hold

Likewise, all necessary conditions are judged to hold under the proposed definities. Mineral extraction and processing facilities can spur secondary development, and certainly create environmental problems in terms of alteration of hydrologic regimes, air-water pollution, and aesthetic impacts. Demands for fossil fuels available in Ohio and the capital improvements necessary for their extraction, processing, and transportation all point to future construction of this type in the state. Again, these types of facilities entail a distribution of sizes. On the basis of both the sufficient and the combined necessary conditions, this category is proposed for consideration, as containing candidates for critical areas.

In the past, surface extraction of minerals has been an activity where the State of Ohio has played little or no role. This situation changed in large part as a result of the 1972 Ohio Strip Mine Law, now Chapter 1513 of the Ohio Revised Code, which empowers the Department of Natural Resources through the Chief of the Division of Reclamation to prohibit coal surface mining activities if reclamation cannot be achieved to the Department's satisfaction. This policy has not yet been developed into formal criteria, but land-use authority does exist. A permitting process is undertaken by means of an application which requires submission of a mining and reclamation plan; total project review takes place during this time.

At the other jurisdictional levels, little has been done in this regard. Because of a variety of factors, local officials have largely ignored the ramifications of this activity. The Federal government, on the other hand, has viewed strip mining as a local or state issue, but this posture has changed recently with proposed legislation which would prohibit

surface mining in certain unreclaimable areas, authorize more than $100 million for state administration and regulatory programs, and establish a fund of $200 million for reclamation and aid efforts.

Other than coal, additional minerals being surface mined are covered by the Ohio Surface Mine Law of 1974, which is administered by the Industrial Minerals Section of the Division of Reclamation. Specific implicated minerals are clay, shale, sand and gravel, coal when mined incidentally, limestone, dolomite, gypsum, and peat. A permit must be issued by the Division of Reclamation, and the developer must certify that the land will afterwards be repaired for the future use to be made of it; future uses are determined by local officials. After the application--including a mining and reclamation plan, as well as a $500 per acre assurance--has been filed, a field inspection has taken place, and the proper review has been undergone, a Surface Mining Permit is issued for a period no longer than 10 years.

With the exception of oil and gas, there is no state licensing of permitting procedure involved with the activity of underground mining. For the two exceptions, the regulatory authority is the Department of Natural Resources' Division of Oil and Gas; its application legislation is codified by Chapter 1509 of the Ohio Revised Code and has existed in some form since about 1900. Permits are required for all drilling activities except where the target resource is potable water to be used as such. The application must include a certificate of ownership of the relevant property rights, a map, and other materials. Permits are often denied because the applicant does not have the required amount of surface area to drill to a certain depth; the rationale for the entire permitting procedure, in fact, is that correlative property rights should be preserved. Permits are also issued for plugging abandoned wells.

Recent speculation has centered on the feasibility of developing the oil and gas which exist under Lake Erie. If drilling does occur, the Division of Oil and Gas would be the agency to consider the necessary permits. The Ohio Legislature, however, has extended an existing moratorium on such drilling until July 1, 1978.

Potential Evaluation Criteria Relative to A Critical Areas Program. Criteria for including candidates in any of these diverse areas in a critical areas program include

- State or national importance of the material or product produced from the specific area (natural gas, oil, etc.)
- Potential short- and long-run damage to other natural or human uses of the area from improper or poorly planned extraction or development (recreation, fishery, habitat, etc.) in the specific area.

Information Needs. Consideration of any of these areas in a critical areas program will require detailed statewide inventories of the known deposits of the various minerals. Estimates of present and potential use of the areas will also have to be developed if identification of area of potential conflicts are to be developed.

Management Requirements. A state and national energy policy framework is crucial to setting priorities and tradeoffs for the development of Ohio mineral and oil/gas areas.

New Communities

New communities include planned development of semi- or fully self-contained residential, retail, and employment areas. No precise size distinction is possible, but generally these developments will involve several thousand individuals when completed.

Consideration of Criticality. Depending on the size of such ventures, new communities can entail large blocks of land requiring considerable advance planning and coordination. On this basis, new communities are tentatively proposed as qualifying on the sufficient condition of site scarcity.

Under necessary conditions, secondary development seems to hold in this case. New communities have in the past been a focus for further regional development. In general they are designed to minimize direct environmental problems, and therefore do not qualify on the basis of the second criteria. Information on the extent of planned new communities in Ohio is discussed below. As for most facilities, it is likely that new communities would cover a spectrum of sizes.

Direct Government Programs and Regulation. New communities are being planned by the State of Ohio in two particular sites, both of which are lands currently held by the state but used formerly in the State Hospital programs. In Cleveland, there is a parcel of 106 acres which is now the Cleveland State Hospital, but which is being phased out; planning for this tract is not advanced. The other concerns 700 acres that used to be farmland associated with the Dayton State Hospital located within the city limits of Kettering. Kettering first had to change the zoning from a rural to an urban designation, and this procedure involved a site review. The city and the Ohio Department of Economic and Community Development then jointly appointed a 27-member Dayton State Farm Development Commission, and it has been delegated the authority to hire planning consultants. Planning funds came from the Federal Department of Housing and Urban Development (HUD) and were accompanied by matching state funds; a Federal project review was then

undertaken. An 18-month planning program begun in 1972 is currently near the state of readiness for implementation, and it is expected that the project will develop economic self-sufficiency.

There are also a number of new community developments within the state where private interests are in the lead. A siting determination for these parcels will take place pursuant to local zoning ordinances. Additionally, Federal planning funds from HUD's New Communities Administration are in general available under Table VII of the Housing and Urban Development Act of 1970. This implicates a siting review process as well as preparation of an Environmental Impact Statement before Federal money is disbursed.

Potential Evaluation Criteria Relation to a Critical Areas Program. Criteria for including specific proposed new communities in a critical areas program include

- Amount of undeveloped land adjacent to the proposed new community and the potential of the community to draw additional unplanned secondary development (industrial, residential, etc.)
- Demands generated by the fully developed community on existing or planned public services and the potential need for expansion of these services
- Comprehensiveness and extent of implementation of local or regional land use planning.

Information Requirements. The major information requirements in this catetory include

- Population size of full development, extent of independent industrial base development, and acreage to be included in the proposed new community
- Expected potential of the community to draw secondary development, either residential, commerical or industrial

- Extent of local/regional land use planning and implementation
- Proximity of new community to designated or proposed geographical or natural critical area.

Management Requirements. Management requirements in this category relate to guidelines for secondary development adjacent to the planned community.

Sports/Recreation Complexes

Although certain types of sports or recreation complexes may require large amounts of land which may be difficult to assemble, the non-vital (as defined previously in the criteria discussion) nature of this activity would preclude qualification on the basis of the sufficient condition.

In terms of necessary conditions, the situation is ambiguous. Sports complexes in general stimulate and distribute certain types of secondary development, primarily or recreation serving activities. They create environmental problems to the extent that secondary development does evolve and in terms of congestion during periods of peak use. There are several major sports stadiums in the state including professional facilities as well as large university stadiums. There are also several large amusement parks which would qualify. The extent of future construction of such facilities is unknown and this category is left undefined for the present. Sports and recreation complexes also encompass a wide distribution of sizes. On the basis of the above, sports and recreation complexes are tentatively rejected from the list of categories. Further definition of past construction and planned future construction could change this classification.

Mass Transit Rights of Way

Mass transit rights of way refers to corridors for location of future mass transit systems or for upgrading of existing systems.

Consideration of Criticality. Because land assemblage for mass transit rights of way in urban areas is costly, advance planning and identification of potential routes may result in considerable savings to the public. To the extent that feasible routes are in short supply, the sufficient condition would be considered to hold for this category.

In terms of necessary conditions, mass transit facilities and stations serve to shape secondary development, driving up property values in the vicinity of stops. As a rule, mass transit is not considered to be a major cause of environmental problems in urban area. Likely future construction is uncertain and no information is available at the time of this writing to make any judgment in this category. In view of our major energy problems and probable long-run shift away from the automobile, urban mass transit will probably see future construction in some Ohi cities. Size of distribution is ambiguous in regard to this category due to the fairly standard scale that characterize mass transit facilities.

Direct Government Regulation and Programs There are currently no provisions within Ohio law for reserving rights of way for railroads or for future urban/mass transit. The Ohio Transportation Development Study, however, which is currently in process, may make the recommendation that abandoned railroad rights of way be preserved as corridors for future development, whether it be for mass transit, future railroads, pipelines, and so on, or for any combination of these activities. For the present, however, there are no relevant programs.

Federal activities in this spere--in addition to Amtrak and other rail programs, which deal mostly with operation of existing facilities--will center largely within the U.S. Department of Transportati on's Urban and Mass Transit Administration. Legislatin under consideration would channel Federal money into local systems, both for operating existing facilities and constructing new ones. Grants would be attended by the Environmental Impact Statement process, which entails in part a siting review and consideration of alternatives.

Potential Evaluation Criteria Relative to a Critical Areas Program. Criteria for selecting specific corridors as candidates for inclusion in a critical areas program include

- Future expected need to develop alternate urban transportation
- Expected demand for mass transportation in the specific urban area
- Present use and cost of acquisition compared with expected future costs
- Potential interim use of corridor to defray holding costs.

Information Requirements. To be in a position to recommend that specific corridor areas be designated as critical, it will be necessary to have information on

- Potential available areas, costs of acquisition and potential interim use
- Future needs and demand for mass transportation relative to its economic feasibility.

Management requirements. Development of Federal and state policy on urban transportation priorities need funding will be an important factor in determining the role of mass transit corridors in future critical areas programs.

Vacation, Second Home Developments.

While locations for private second home developments in Ohio may be in short supply, the nonvital nature of this activity precludes qualification on the sufficient condition of site scarcity.

In terms of necessary conditions, second home development may or may not be a stimulus for other secondary types of developments including retail and commercial. No information was obtained to further define this problem but in major resort areas, second home and condominium development can spur other types of commercial activities. Second home development can be associated with environmental problems in terms of adequate provision of sanitary facilities, erosion control, or destruction of certain types of wild life habitat. No information is presently available on the trend in construction of second homes and vacation homes in Ohio. Past construction along Lake Erie and the development of certain river corridors may require alteration of the present evaluation in the matrix. Vacation homes and second home development will encompass a wide spectrum of scales, depending on the population served. On the basis of the above, second home developments are tentatively excluded from the list of proposed categories.

Residential, Apartment, and Planned Unit Developments.

Generally speaking, locational problems for these types of developments are confined to business aspects in the private sector. On this basis, the category is judged not to meet the sufficient condition of site scarcity.

All of the necessary conditions for this category are judged not to hold. Residential or other planned unit developments can influence retail and commercial locations, but no more so than general development in an urban area. Such developments can create environmental problems in terms of congestion, overloading of sewage treatment facilities, and removal of certain types of wild life habitat, but again not in a degree that warrants distinguishing the category for separate treatment. It

is probable, given the predicted growth of the Ohio economy that there will be considerable future construction in this general category. The move to multifamily units, high rises, and large integrated complexes is likely to accelerate in the future. As with most of the other facilities, there is a wide distribution of sizes characteristic of this category. On the basis of the above, this category is considered not to have potential for containing candidates for criticality.

Office Parks and Complexes

Assemblage of land for office parks and complexes is a private sector problem and is generally adequately handled by corporations and other businesses. On this basis, the sufficient condition of site of scarcity is judged not to hold.

As with planned unit residential developments, office parks and complexes generally are part of urban growth and development, but cannot be singled out for special consideration. Office parks and complexes, depending on the number of workers involved, may generate demand for various types of retail services located in the proximity to the complexes but generally would only contribute to further growth in a given area. Environmental problems relate only to potential rush hour traffic on adjacent roads and other public facilities. The trend in office construction would indicate continued numbers of such complexes in Ohio. As with the other facilities, office parks and complexes entail a specrum of sizes. On this basis, this category is considered not to include potential condidates.

## Solid Waste Disposal Sites

Solid waste disposal sites present unique problems for many urban areas. Development of new technology may reduce the need for landfill, but for purposes of the report the category will be maintained as a possibility for critical areas programs.

Consideration of Criticality. The availability of adequate size and location of sites for disposal sites of growing amounts of solid waste is a problem for most metropolitan areas. The extent to which this is a major problem in Ohio has not been determined, but at this stage of the assessment, site scarcity is assumed to be a significant problem. On this basis, the sufficient condition is judged to hold.

In terms of necessary condition, solid waste disposal sites in general do not induce or shape the distribution of secondary development. Environmental problems associated with solid waste disposal sites depend in part on the technology used, management practices, and scale of the facility. Environmental problems relate to sanitary conditions, aesthetic impact to adjacent properties, and possible ground water problems. Depending on technology, degree of recycling, extent of packaging and durability of goods, it is anticipated that there will be a continued demand for new solid waste disposal sites in metropolitan as well as rural areas. These sites entail a distribution of sizes, depending on the population served. On this basis of the necessary conditions, this category is proposed as having potential candidates.

Direct Government Regulation and Programs. There are 260 sanitary landfills in Ohio, about half of which are public and half private. Because of rising labor and other costs, the trend is to private landfills, and in fact, the city of Cleveland, as an example, uses private landfills exclusively. About 97 percent of the solid waste disposal in Ohio takes place in landfills; the remainder is by incinerators, with a very small amount in dumps.

Public and private landfill operators must submit plans to the Division of Waste Management and Engineering within the Ohio Environmental Protection Agency. A siting review takes place pursuant to Section 3734 of the Ohio Revised Code, which was enacted in 1968. If a determination is made that pollution of ground or surface water will be a result of the proposed facility, the application can be denied. Otherwise, if a site investigation reveals that no such pollution will ensue, a Permit to Install will be granted. In instances where health problems may be a factor in a facility, the applicant is required to redesign the proposal so that these will be eliminated, but this is usually not a major concern.

Potential Evaluation Criteria Relative to a Critical Areas Program. If selected solid waste disposal sites were included in a critical areas program, the following criteria would be important in determining which areas should be included.

- Long run demand for disposal and the estimated acreage required
- Expected difficulty of assuring long-run disposal sites
- Present and future conflict in adjacent land use of surrounding proposed disposal site
- Potential ultimate use of the land fill (park, open spur, etc.)
- Potential pollution hazard to ground water at selected sites.

Information Requirements. Information required on this category includes estimates of future solid waste disposal requirements based on population growth and changing per capita generation characteristics, inventory of available sites and expected future uses in the vicinity of the sites.

Management Requirements. The major requirement for management in this category is the authority and financial capability to acquire sites in advance of need. Authority to regulate adjacent land use to minimize conflicts would also be necessary.

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