

# MY NEIGHBORHOOD — HOW HAS IT CHANGED?

**Subject:** Social Studies, Science

**Skills:** Comparison, Mapping, Observation, Similarity and Differences, Writing

**Duration:** 3 class periods (or more depending on depth and discussion)

**Setting:** Classroom

**Materials:**

For each pair of students:

- copies and/or overheads of two aerial maps of the same location, taken approximately 10 years apart
- OPTIONAL: you may choose to use the 1990 and 2002 Fruitland aerial maps; make copies and/or overheads of the masters provided.

**Michigan Curriculum Framework Content Standards and Benchmarks:**

- **Science LEC- III.5 e-4:** Strand III. Using Life Science Knowledge, Standard 5. Ecosystems (LEC), Benchmark e-4. Describe positive and negative effects of humans on the environment. (Key concepts: Human effects on the environment — garbage, habitat destruction, land management, renewable and non-renewable resources. Real-world contexts: Household wastes, school wastes, waste water treatment, habitat destruction due to community growth, reforestation projects, establishing parks or other green spaces, recycling.)
- **Science II.III.5.MS 5:** LEC Ecosystems, Standard III.5. Describe how materials cycle through an ecosystem. Benchmark MS 5. Explain how humans use and benefit from plant and animal materials.
- **Social Studies I.2.LE 2:** Strand I. Historical Perspective, Standard 2. Comprehending the Past, Benchmark LE 2. Use narratives and graphic data to compare the past of their local community, the state of Michigan and other parts of the United States with present day life in those places.
- **Social Studies II.2.LE 4:** Strand II. Geographic Perspective, Standard 2. Human/Environment Interaction, Benchmark LE 4. Explain how various people and cultures have adapted to and modified the environment.
- **Social Studies V.1.LE 3:** Strand V. Inquiry, Standard 1. Information Processing, Benchmark LE 3. Interpret social science information about local, state, and national communities from maps, graphs, and charts.
- **Social Studies II.2.MS 4:** Geographic Perspective, Standard 2. Describe, compare, and explain the locations and characteristics of ecosystems. Benchmark MS 4. Explain how humans modify the environment and describe some of the possible consequences of those modifications.
- **Social Studies V.1.MS 2:** Inquiry, Standard 1. Acquire information from books, maps, newspapers, data sets and other sources. Benchmark MS 2. Use traditional and electronic means to organize social science information and to make maps, graphs, and tables.

**Kent County Collaborative Core Curriculum (KC<sup>4</sup>):**

- **Science:** 3:5  
5:1, 5:4
- **Social Studies:** 3:3  
4:4, 4:6, 4:8  
5:2, 5:5, 5:9  
6:1, 6:3, 6:4, 6:5, 6:10  
7:1, 7:3, 7:4, 7:5, 7:8, 7:9  
8:1, 8:2, 8:3, 8:9

## OVERVIEW

Students examine aerial photographs of their neighborhood and compare two photographs of the same area, taken at least 10 years apart. They will locate and identify changes that have taken place in the area and then write compare and contrast statements. (If local maps are unavailable, they can use the Fruitland maps that are provided.)

## OBJECTIVES

After participating in this activity, students will be able to:

- Compare and contrast the land use characteristics in aerial photographs of their neighborhood or a nearby community (or the maps of Fruitland in 1990 and 2002).
- Locate, gather, interpret, and explain information about communities using aerial photographs.
- Describe how people have modified the environment as well as describing positive and negative effects.
- Locate and describe objects in terms of their relative position, including grid locations and cardinal (N-S-E-W) and ordinal (NE-NW-SE-SW) directions.

## BACKGROUND

### CAUSES OF SPRAWL:

Unfortunately in Michigan, land use planning happens at the smallest level of government (e.g., town, township, city). More often, zoning ordinances and building codes govern most land development decisions. Since most zoning ordinances separate different types of land uses, establish minimum distances between houses, minimum setbacks from roads, minimum parking space requirements, minimum road widths, and so on, many times the only type of development that can occur is sprawl. The lack of land use planning and the over-reliance on zoning has essentially promoted sprawl.

### EFFECTS OF SPRAWL:

With little or no land use planning to offer protection, farm fields, rural countrysides, and other ecologically important habitats, such as wetlands, have been developed. More roads are needed to connect new developments to downtown. New developments on the outskirts attract more people, and the cycle continues. As more people and businesses move out to former greenfields, fewer taxpayers support older towns and cities, leaving the urban cores to deteriorate.

Sprawl can damage ecological systems and their natural functions, such as wildlife populations, habitats, and wetlands. Housing subdivisions, commercial developments, and the roads that connect them all divide a landscape, resulting in **habitat fragmentation**. This fragmentation forces wildlife to either find another place to live or to compete with each other for a smaller amount of land. Additionally, habitat fragmentation is detrimental to animals that require large spaces to roam, forage, and claim territory.

Urban sprawl is also threatening wetlands, an important key to healthy ecosystems. In addition to being home to a number of critical wildlife and plant species, wetlands improve water quality by filtering out sediments and other pollutants. They protect the shorelines of rivers and lakes from erosion and help control and reduce flooding. Whenever large areas of greenspace or wetlands become non-draining (roofs, parking lots), flooding and water pollution can become a problem.

Pollution is a cost of urban sprawl. Most sprawling towns are built for cars and force us to drive more frequently and for longer periods of time. This increased use of cars leads to more air and noise pollution as well as traffic jams.

### SOLUTIONS TO SPRAWL

To help combat sprawl, farms, greenfields, and urban cores need to be protected through comprehensive land use planning. With farmland and other greenfields rapidly disappearing, some organizations and states are planning for preservation. Organizations such as the “1,000 Friend” chapters (i.e. the 1,000 Friends of Oregon) and other grass-root efforts bring together concerned citizens with a variety of backgrounds and interests, such as farmers, environmentalists, government officials and planners. By forming a coalition, their concerns about land-use practices are better represented and create a stronger impact on local governments. *United Growth for Kent County* is one such coalition, based in Grand Rapids, Michigan. Citizens are working together to educate themselves as well as others in order to make the best land use decisions as possible for both urban and rural areas.

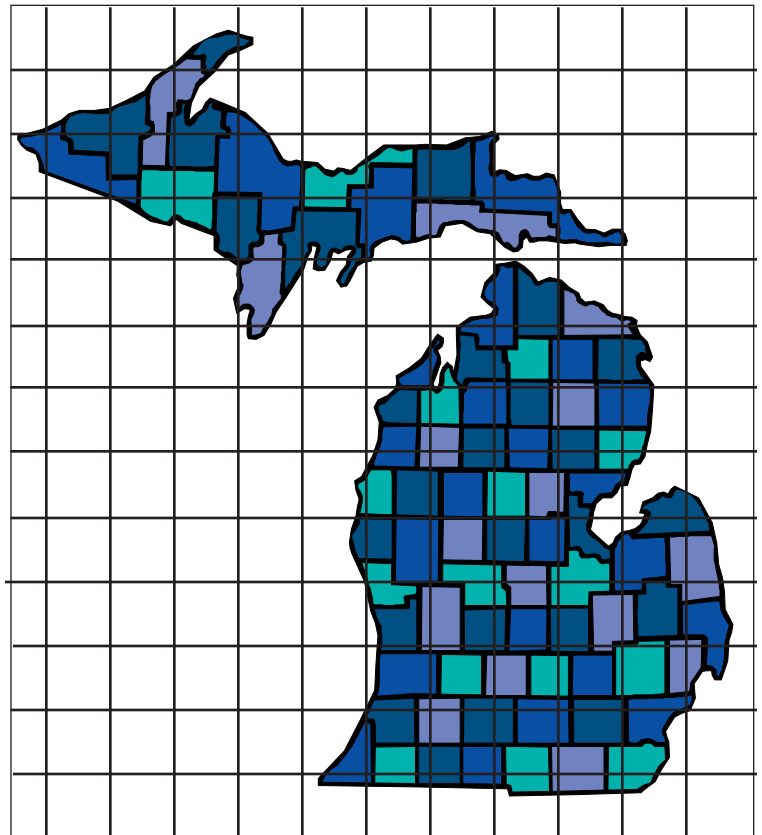
Land use decisions are best made when an entire region

is considered, rather than just one neighborhood, city, or even township. Development not only affects a community, but also those to the north, south, east, and west. Communities may be created within political boundaries, but ecosystems, rivers, wildlife habitats, and the air you breathe do not follow these boundaries. More responsible and efficient use of land results when neighboring communities are considered in land use planning. The Grand Valley Metro Council is a good example of regional cooperation, bringing together more than 30 communities in the Grand Rapids, Michigan area to address land use issues.

### EXAMINING AERIAL PHOTOGRAPHS

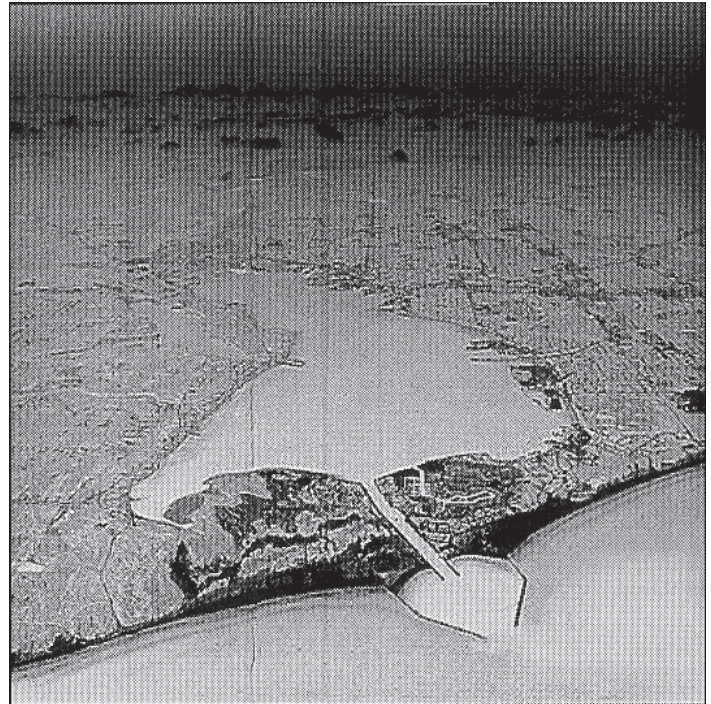
Aerial photographs are examined in this lesson to show the changes that take place in an area over a 10-year period. Obtain photographs of an area in your community so students can observe urban sprawl on a personal level. The lesson has the greatest impact if the area chosen has experienced significant change over the 10-year period. How to obtain aerial photographs is detailed in the Procedure section that follows.

The aerial photographs allow students the opportunity to discover first hand the effects of urban sprawl on local green spaces. For example, habitat fragmentation and loss of farmland can be directly observed. Discussion of observed changes can lead to higher levels of thinking such as cause and effect.



## PROCEDURE

1. Obtain aerial photographs of an area in your community that has changed significantly in the last 10 years. Obtain one photo that is current (within the last three years) and another map that is 10 years older. Each county has a USDA Farm Service Agency. They can be found in the U.S. Government section of the phone book. They take aerial photographs each year and have these slides on file. They will usually let people borrow them for a short period of time to make duplicates. **NOTE:** If customized aerial photographs can not be obtained, then copy and use the Fruitland maps provided.
2. Blow up the images at a photo lab or do-it-yourself machine. An 8x10 size works well. Be sure to enlarge the slides to the same proportions so students can make accurate comparisons. Draw and label grid lines (see the Fruitland maps) on the enlarged photo (usually 3/4" to 1" on an 8x10). Alphabet letters listed west to east and numbers north to south allow students to practice mapping skills.
3. Explain the activity. Tell the students that they will be looking at aerial maps of their neighborhood, and that the maps will look different because they were taken approximately 10 years apart. Inform the students that they will be responsible for comparing and identifying areas that have undergone land use changes in the most recent map.
4. Hand out the aerial maps and/or put up the overheads and assign the students to find and describe ten land use changes between the maps. Require them to use cardinal (N-S-E-W) and ordinal (NE-NW-SE-SW) directions as well as grid labels to describe the locations of the land use changes. Tell them to look for development (such as new buildings, parking lots, houses, condominiums, and roads) that has replaced green landscape (such as forest and farm fields). (If you choose to use the Fruitland maps, remind the students to use the legends to determine the land uses on the maps.) For easy observation of land use changes, superimpose one map on top of the other. Overhead transparencies work best, but students can hold paper maps up to the window, also.
5. Invite the students to share their favorite observations. See what kind of discussion arises from the changes in land use. Explain some of the background information about the effects of sprawl with the students during discussion. What landmarks do they recognize? Do the students think the land use changes were well planned or promote sprawling problems? (There could be rush-hour traffic congestion by all the new housing. Buildings and parking lots can cause flooding from rainwater runoff problems.) What are the rea-



MUSKEGON LAKE, MI --  
Graphicated Version of Original Aerial Photo Taken by Marge Beaver

sons changes are taking place? What are the pros and cons of development?

6. When students are familiar with the aerial maps and have found and discussed 10 differences, have them write compare and contrast statements about the differences. (For use as an assessment tool, the statements should include accurate information in complete sentences that have two parts and include a contrast word.) This could be an in class activity or a homework assignment.

## ASSESSMENT OPTIONS

1. Collect and evaluate the first assignment for completeness and accuracy (descriptions of 10 land use changes and their locations). Also evaluate the students' second assignment (compare and contrast statements).
2. Ask students to write their answers to the following questions and/or add your own questions:
  - Name one interesting land use change from the maps and explain two reasons why you think it was a wise use of land. Give the grid labels to describe its location.
  - Name one interesting land use change from the maps and explain two reasons why you think it was not a wise use of land. Give the grid labels to describe its location.
3. Have the students write a compare and contrast statement summarizing their overall observations of the land use changes. Evaluate the written statements for grade-level appropriate requirements.

## Adaptations/Extensions

1. Allow the students to choose a newly developed area from the most recent aerial photograph that was not well planned. Have them redesign the development using wise land use practices such as smaller condo plots, smaller parking lots (parking garages), and adding greenways.
2. If taking a fieldtrip during the year, ask the bus driver to tour developed areas that contribute to sprawl, or tour the area students studied in aerial photographs.

## Computer Extensions

1. Great Lakes Information Network (GLIN). TEACH - Great Lakes: Urban Sprawl in the Great Lakes Region. Aug. 2000. 18 June 2002. <[http://www.great-lakes.net/teach/pollution/sprawl/sprawl\\_1.html](http://www.great-lakes.net/teach/pollution/sprawl/sprawl_1.html)> Easy to read teacher information with education links.
2. National Geographic. Virtual World- The New Suburb? 2001. 18 June 2002. <[www.nationalgeographic.com](http://www.nationalgeographic.com)> Lesson plans, information, and virtual tour on urban sprawl and new urbanism.
3. Smart Growth Online. Homepage. 2002. 18 June 2002. <[www.smartgrowth.org](http://www.smartgrowth.org)> Provides information on every aspect of sprawl, including fostering community pride and preserving open space and farmland. Use the search engine to find articles in and about "Michigan."

## SOURCE

Adapted with permission from Geography Awareness Week 1998, "What's Happening?" by Michigan Geographic Alliance Teacher Consultants Susan Husiak and Sarah Gilbert, pages 5-6. Background information from Great Lakes Information Network (GLIN) - TEACH Great Lakes. 14 August 2001. <[http://www.great-lakes.net/teach/pollution/sprawl/sprawl\\_1.html](http://www.great-lakes.net/teach/pollution/sprawl/sprawl_1.html)> Worksheets developed by Anne Williamson, curriculum consultant for *United Growth for Kent County*, a project of Michigan State University Extension.

## ADDITIONAL RESOURCES

### Contacts:

Farm Bureau  
 Grand Valley Metro Council  
 Great Lakes Commission  
 Local Planning Commission  
 Michigan Department of Transportation  
 Michigan Geographic Alliance  
 Michigan Society of Planning  
 Timberland Resource Conservation and Development  
 United Growth for Kent County  
 USDA Farm Service Agency

### References and Teacher Resources:

Arendt, Randall. "Patterns in the Rural Landscape." Orion Nature Quarterly. Vol. 8, No. 4: 22-27.

Arendt, Randall. Conservation Designs for Subdivisions: A Practical Guide to Creating Open Space Networks. Washington, DC: Island Press, 1996.

Livingston County Planning Department. Open Space Planning: Techniques, Design Guidelines, Case Studies, and Model Ordinances. Howell, MI: Livingston County Planning Department, 1996.

Lyle, John Tillman. Design for Human Ecosystems: Landscape, Land Use, and Natural Resources. Washington, DC: Island Press, 1999.

Small, Stephen. Preserving Family Lands. Boston: Landowner Planning Center, 1992.

Earth Almanac. "Panoramic Maps Depict 19th-century Urban Sprawl." National Geographic, November 1999.

### Additional Lessons:

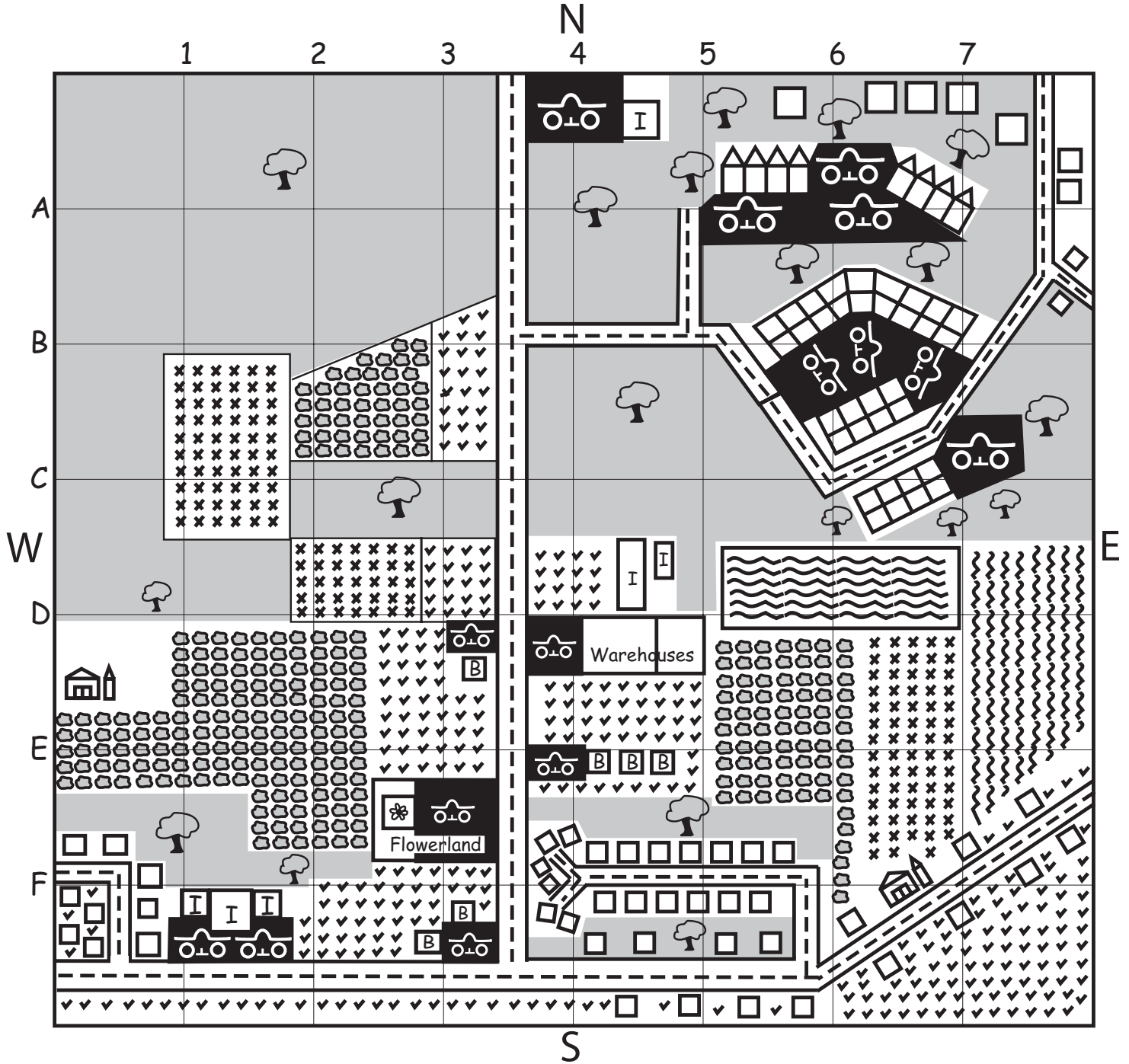
Project WILD: "Migration Barriers," Pgs. 262-263.

## CONCEPTUAL FRAMEWORK REFERENCE

IB2,IB3,IB4,ID1,IIB1,IIB2,IID2,IIIA4,IIIB2,IIIC1,IVA,IVE1



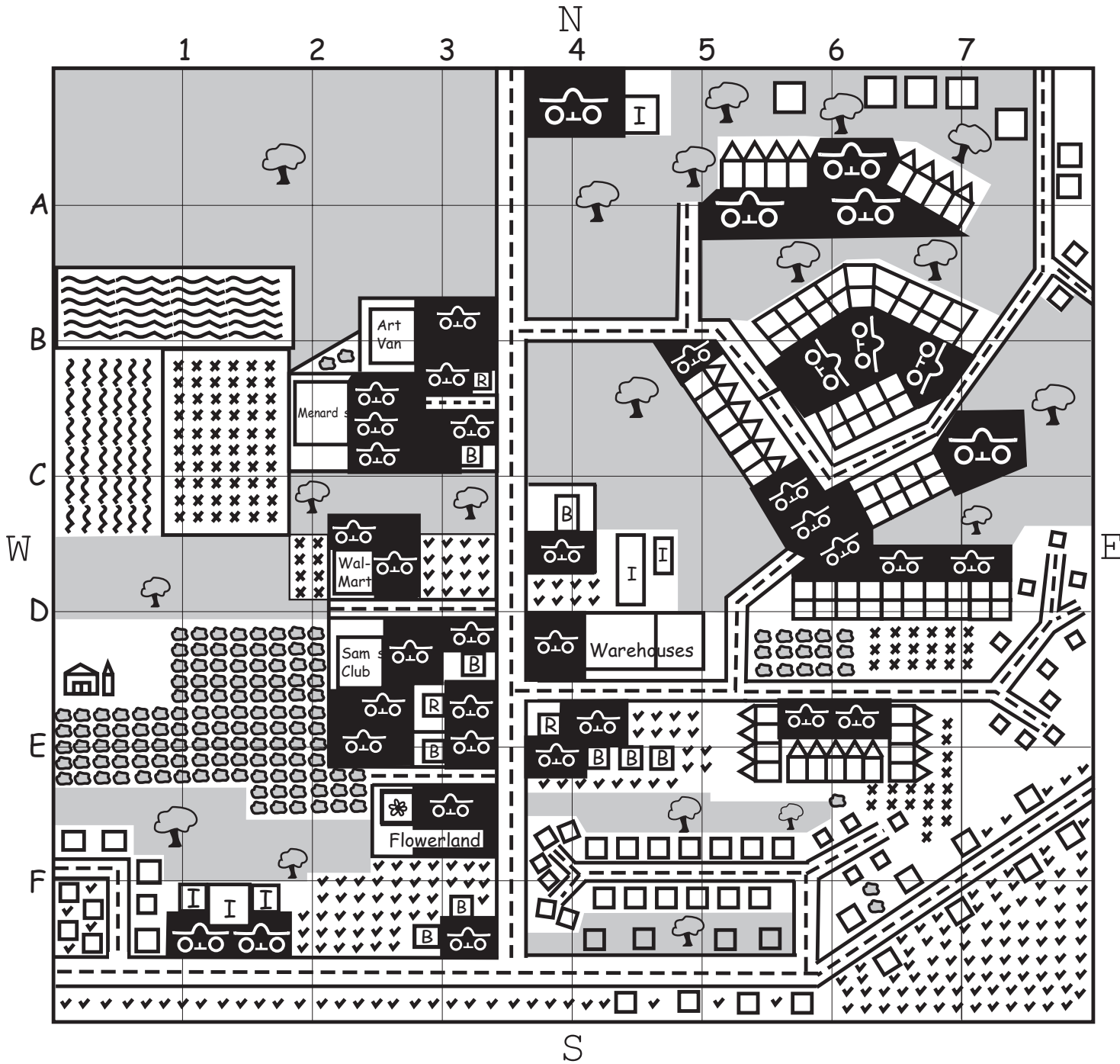
# FRUITLAND 1990



## MAP LEGEND

- |  |               |  |                    |  |                     |
|--|---------------|--|--------------------|--|---------------------|
|  | Wooded Forest |  | Single Family Home |  | Parking Lot         |
|  | Prairie       |  | Condominiums       |  | Industrial Building |
|  | Peach Trees   |  | Apartments         |  | Corn Field          |
|  | Apple Trees   |  | Restaurant         |  | Soybean Field       |
|  | Farm          |  | Business Building  |  | Paved Road          |

# FRUITLAND 2002



## MAP LEGEND

- |  |               |  |                    |  |                     |
|--|---------------|--|--------------------|--|---------------------|
|  | Wooded Forest |  | Single Family Home |  | Parking Lot         |
|  | Prairie       |  | Condominiums       |  | Industrial Building |
|  | Peach Trees   |  | Apartments         |  | Corn Field          |
|  | Apple Trees   |  | Restaurant         |  | Soybean Field       |
|  | Farm          |  | Business Building  |  | Paved Road          |