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LANDSAT PROGRESS REPORT

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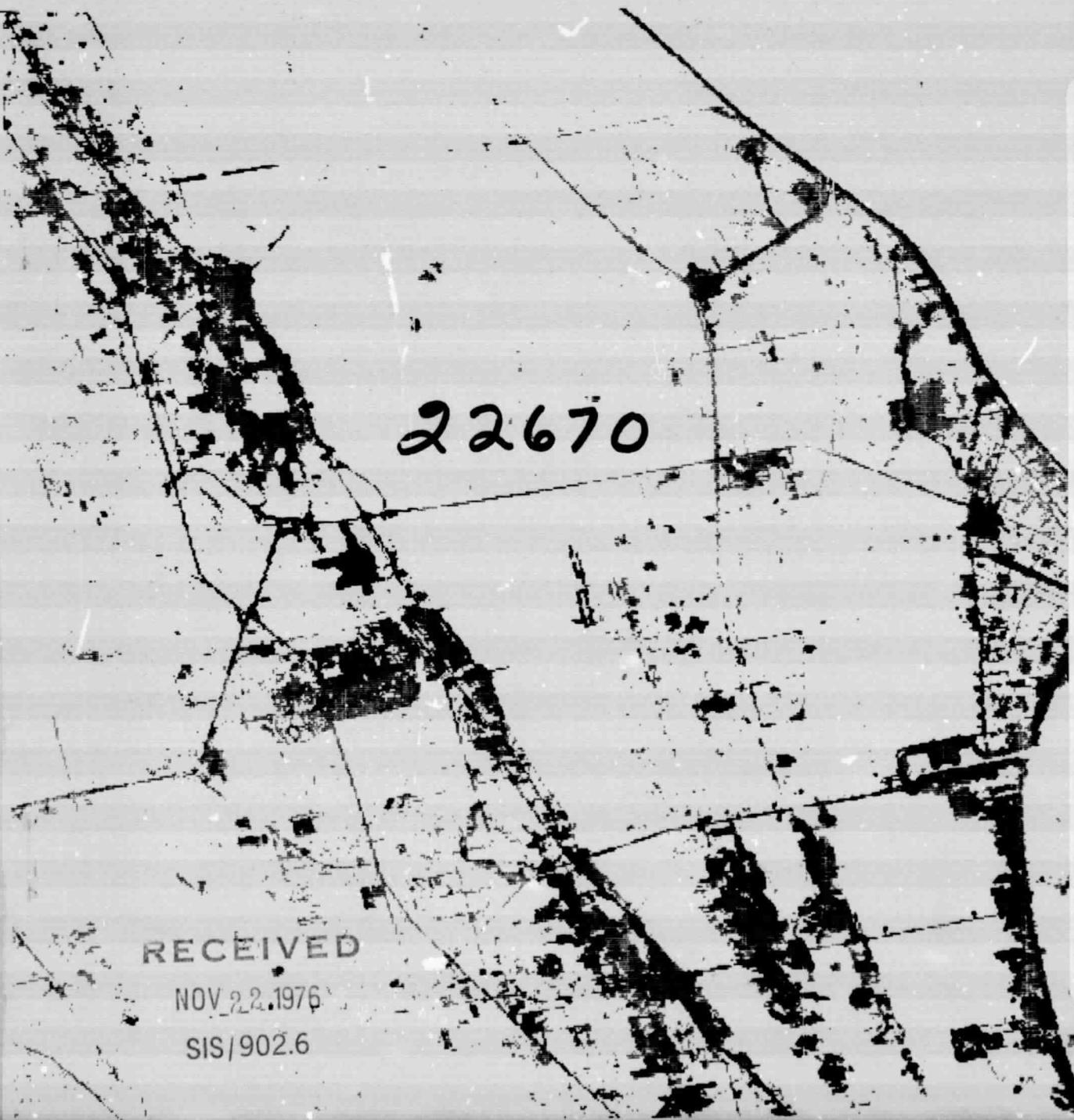
FOR THE PERIOD 12 MAY TO 11 AUGUST, 1976

PLANNING APPLICATIONS IN EAST CENTRAL FLORIDA

CONTRACT NO. NAS5-20907

BREVARD COUNTY PLANNING DEPARTMENT

REPORT NO. BCPD L2-6



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(E77-10044) PLANNING APPLICATIONS IN EAST
CENTRAL FLORIDA Progress Report, 12 May -
11 Aug. 1976 (Brevard County Planning Dept.,
Titusville) 35 p HC A03/MF A01 CACL 08E
G3/43 Unclas 00044
N77-12474

LANDSAT PROGRESS REPORT
FOR THE PERIOD 12 MAY TO 11 AUGUST, 1976
PLANNING APPLICATIONS IN EAST CENTRAL FLORIDA

CONTRACT NO. NAS5-20907

Principal Investigator: John W. Hannah*

Co-Investigators: Dr. Garland L. Thomas*
Fernando Esparza**

Computer Programming: James J. Millard**

REPORT NO. BCPD L2-6

* Brevard County Planning Department

** NASA, Kennedy Space Center

A. PROBLEMS

No unanticipated problems are impeding the progress of the investigation.

B. ACCOMPLISHMENTS

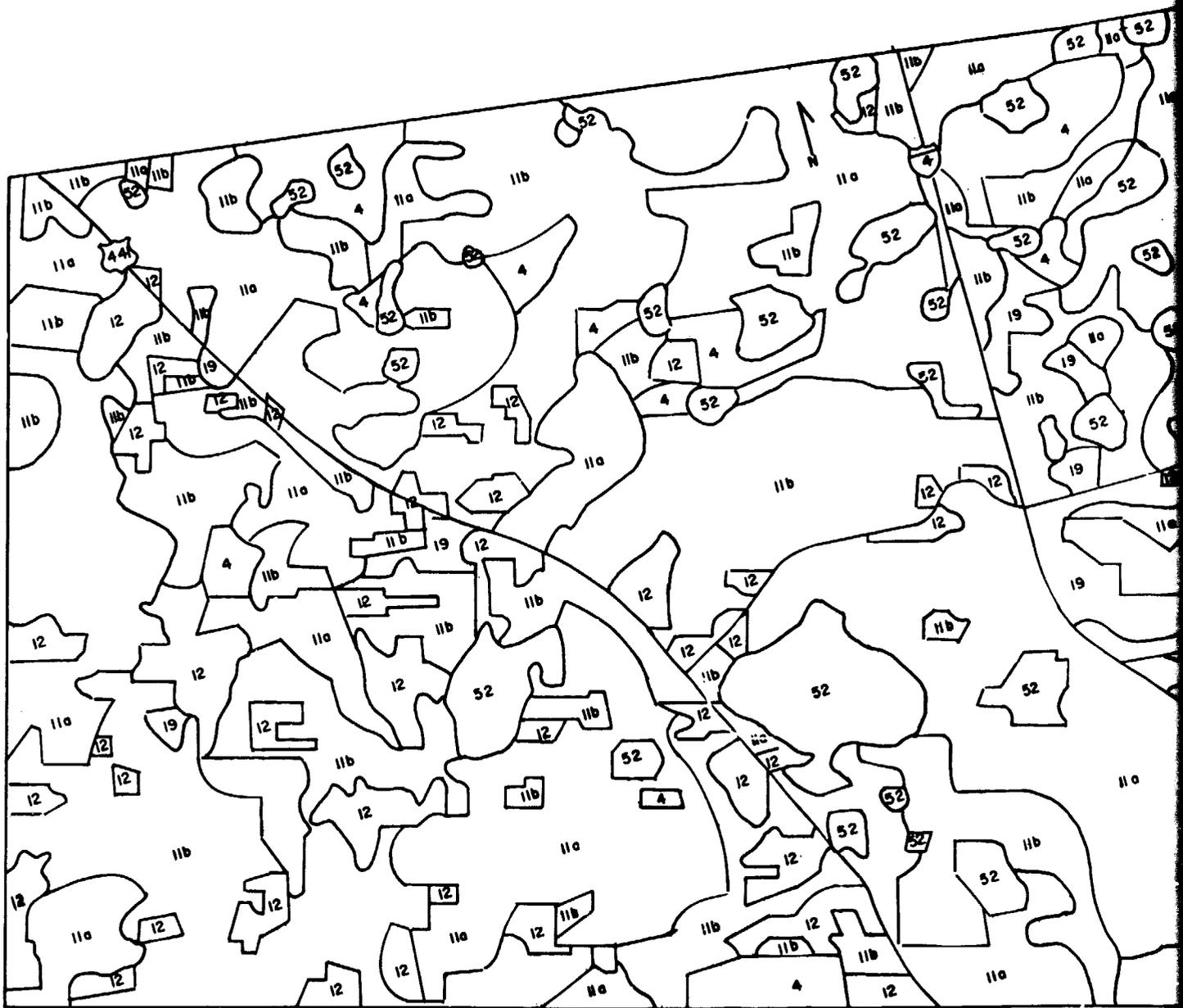
Land use mapping of Orange County has continued, with the urban area of metropolitan Orlando being mapped during this period. The procedure used has been described in earlier progress reports.¹

Tracings of the computer classification maps of approximately the four quadrants of Orlando are shown in Figures 1-4. Corrections are shown in Figures 5-8, with the new classification shown outside the parenthesis and the original classification inside the parenthesis. The corrected maps, with traffic zones, are shown in Figures 9-12.

Some differences between the classification schemes of the original and final maps may be noted:

- (1) The final map was made for a specific purpose: a land use inventory for transportation planning. The users were not interested in the distinction between wooded and non-wooded residential classes; hence, that distinction was omitted in the final version.
- (2) No attempt was made to separate industrial from commercial in the computer classification. The two were mapped as a single class, and the separation was made by the county planner by utilizing his local knowledge and referring to standard aircraft photography (Real Estate Atlas) available in the Planning Department.
- (3) Sectors on the outskirts of the city which had been designated as agricultural were called undeveloped urban by the county planner - a matter of semantics.

¹ Landsat Progress Report for the period 12 February to 11 May 1976, BCPD L2-5.



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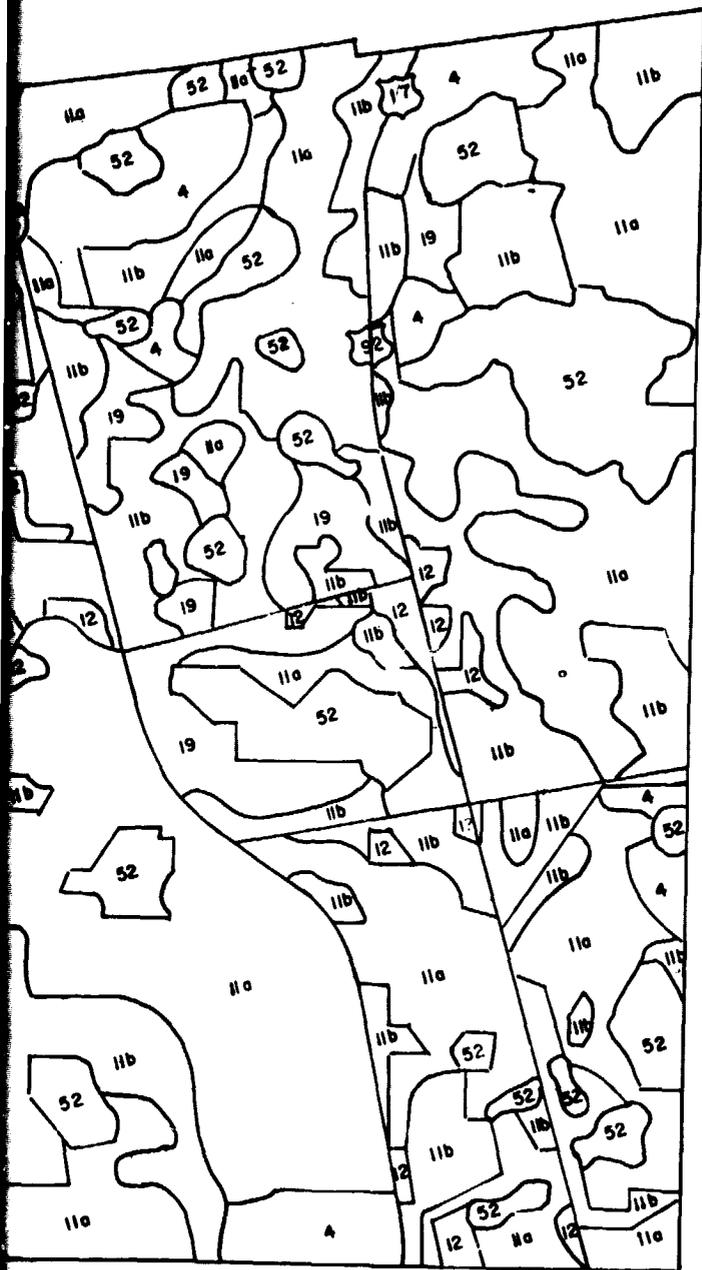


Figure 1

LANDSAT MAP
NORTHWEST ORLANDO
Scale ~ 1/48,000

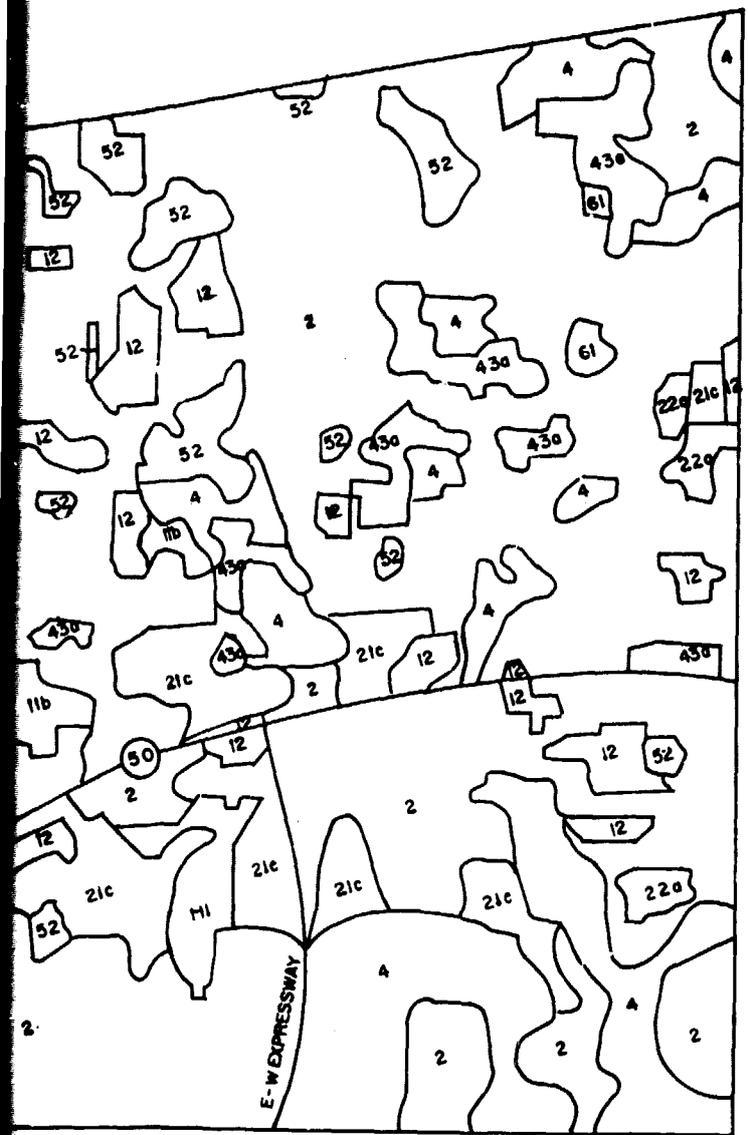
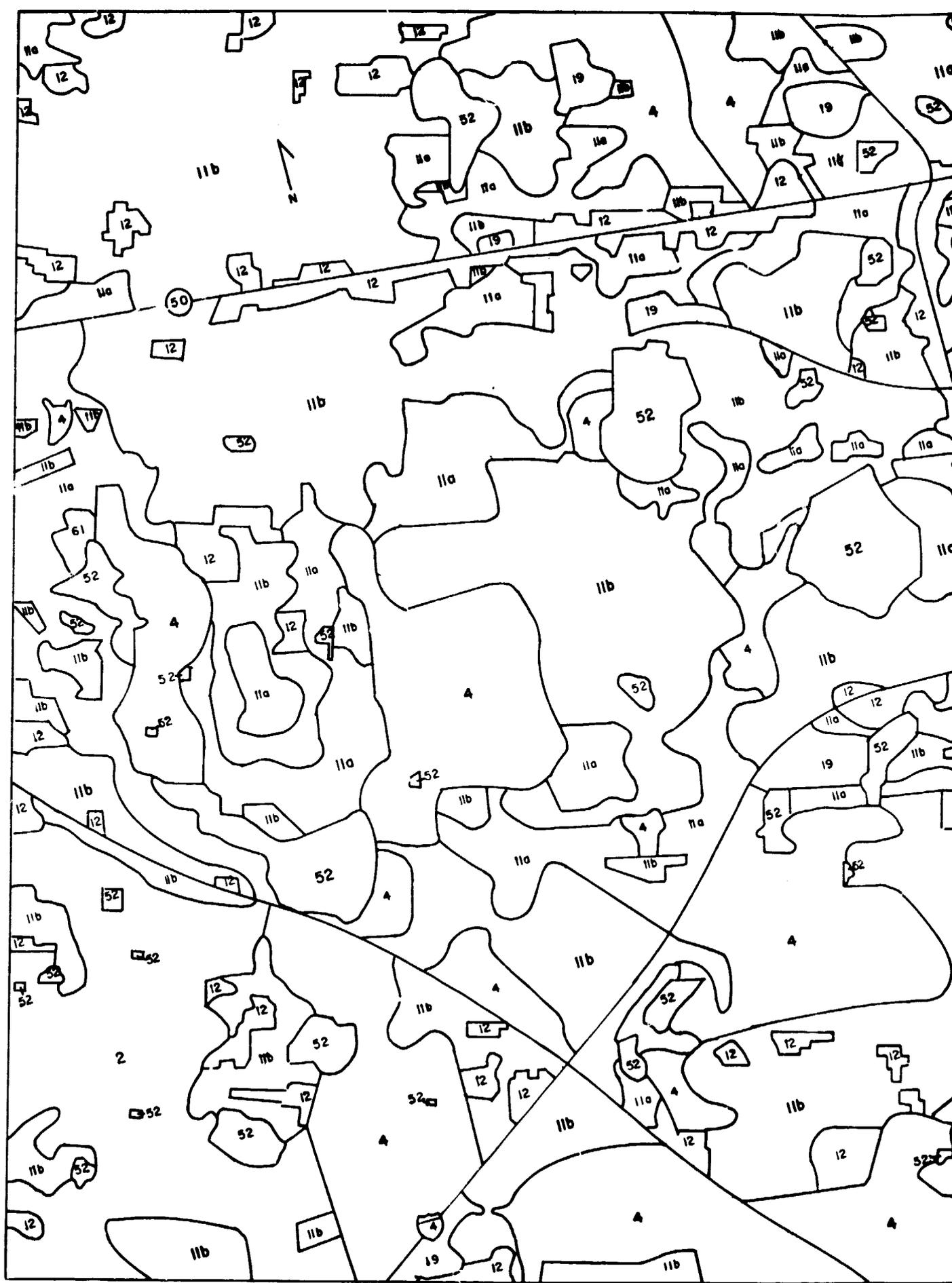


Figure 2

LANDSAT MAP
 NORTHEAST ORLANDO
 Scale ~ 1/48,000

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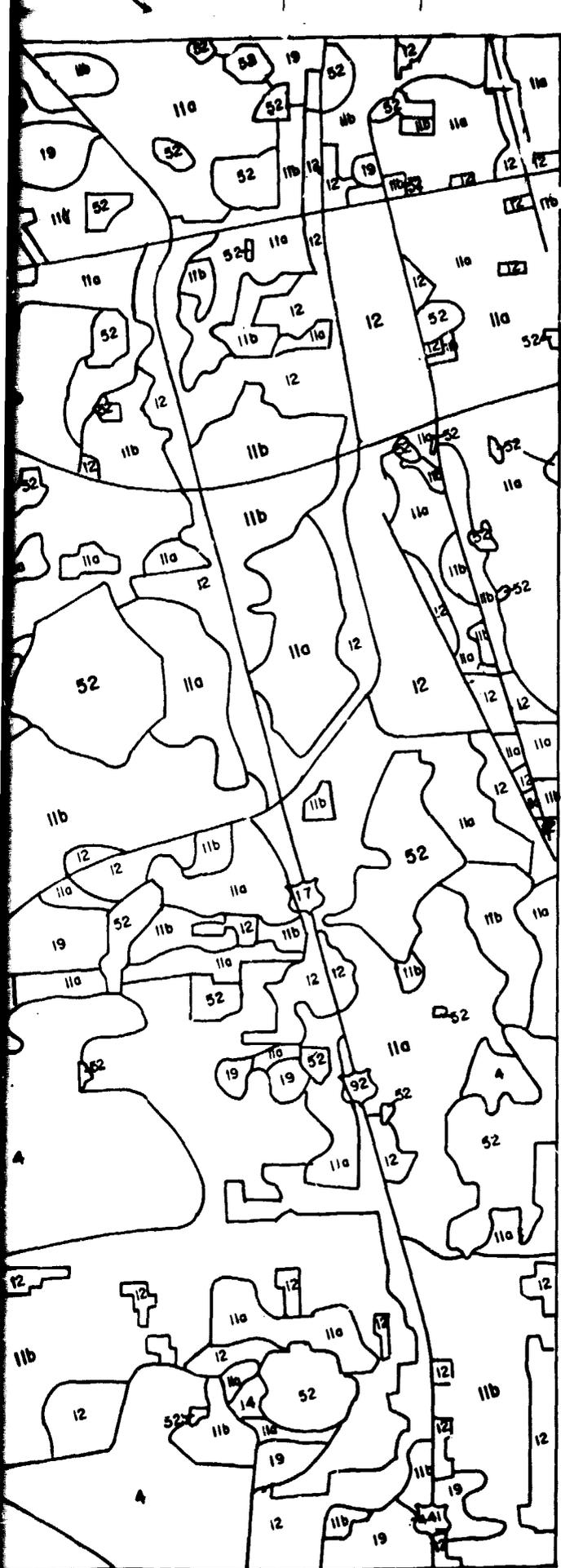
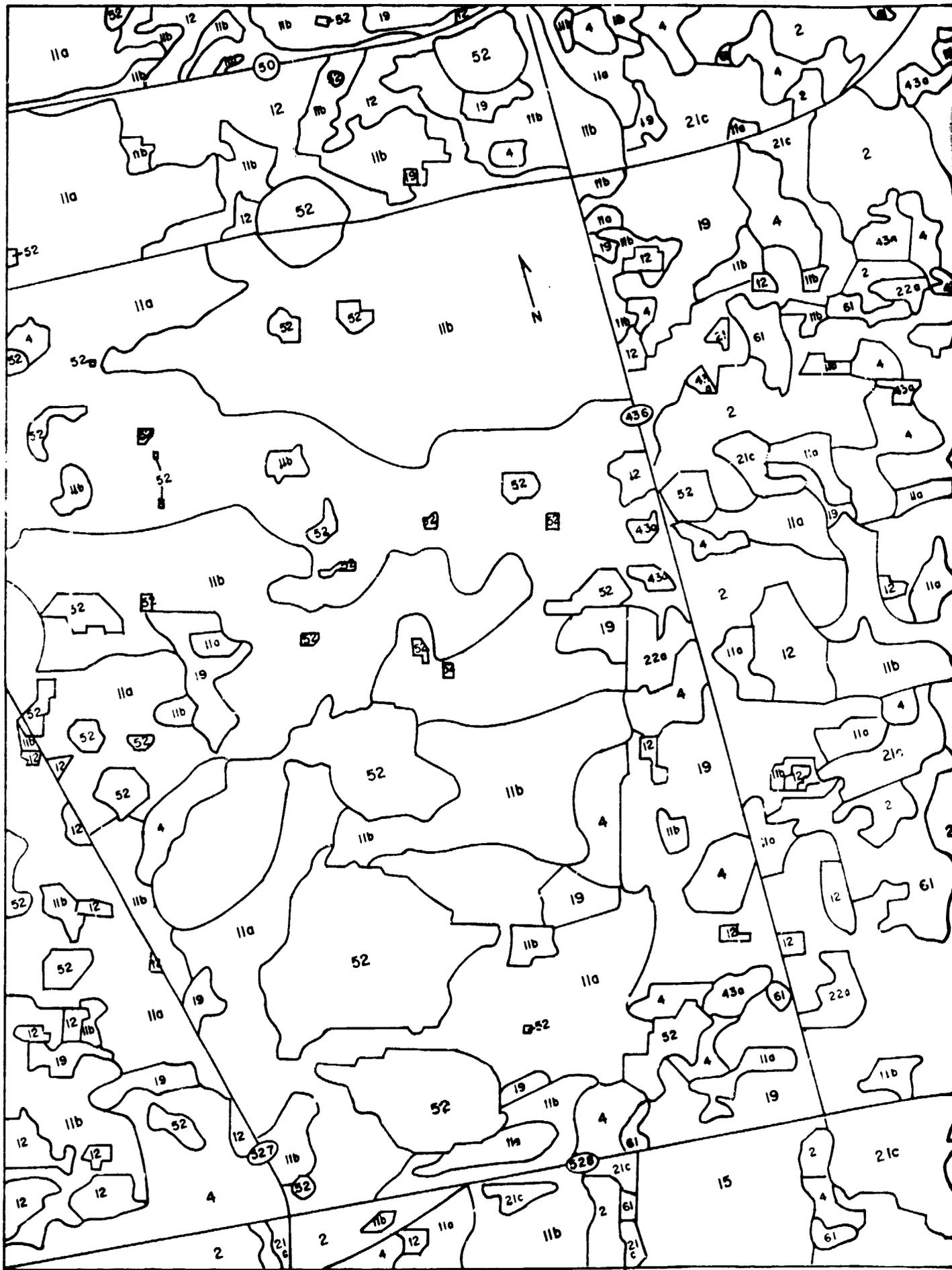


Figure 3

LANDSAT MAP
SOUTHWEST ORLANDO
Scale ~ 1/48,000

SOUTHWEST L

4a



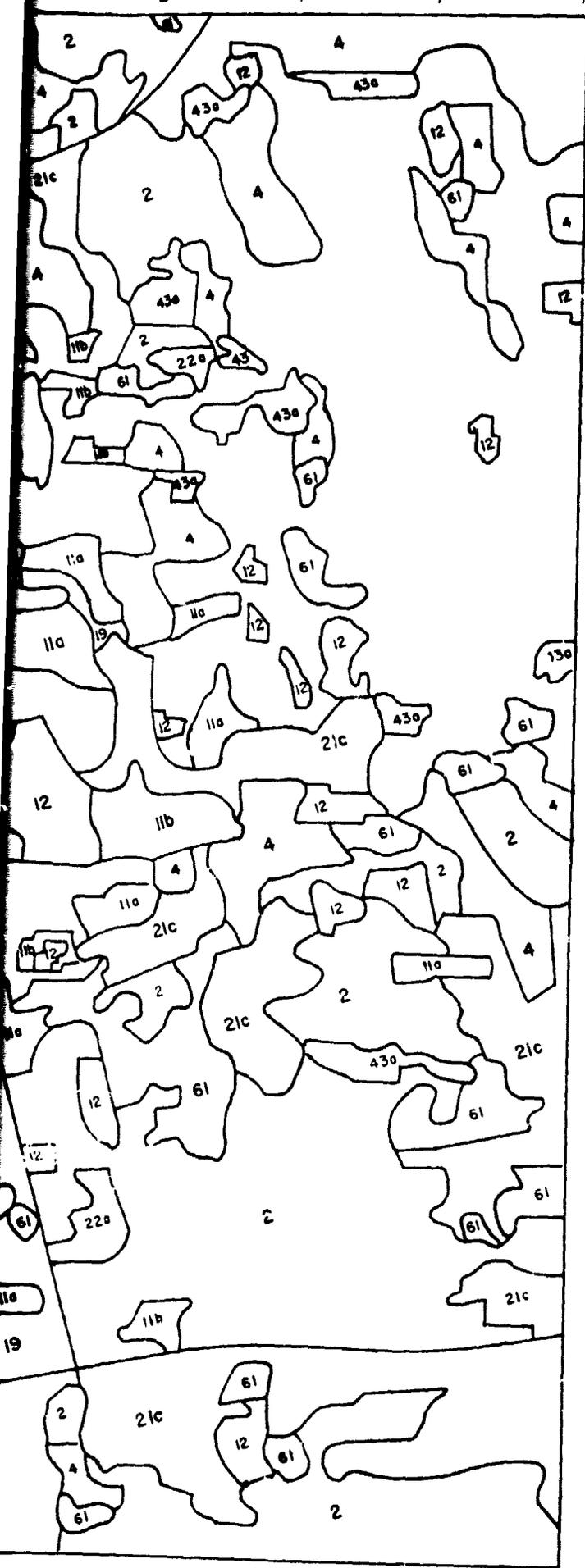


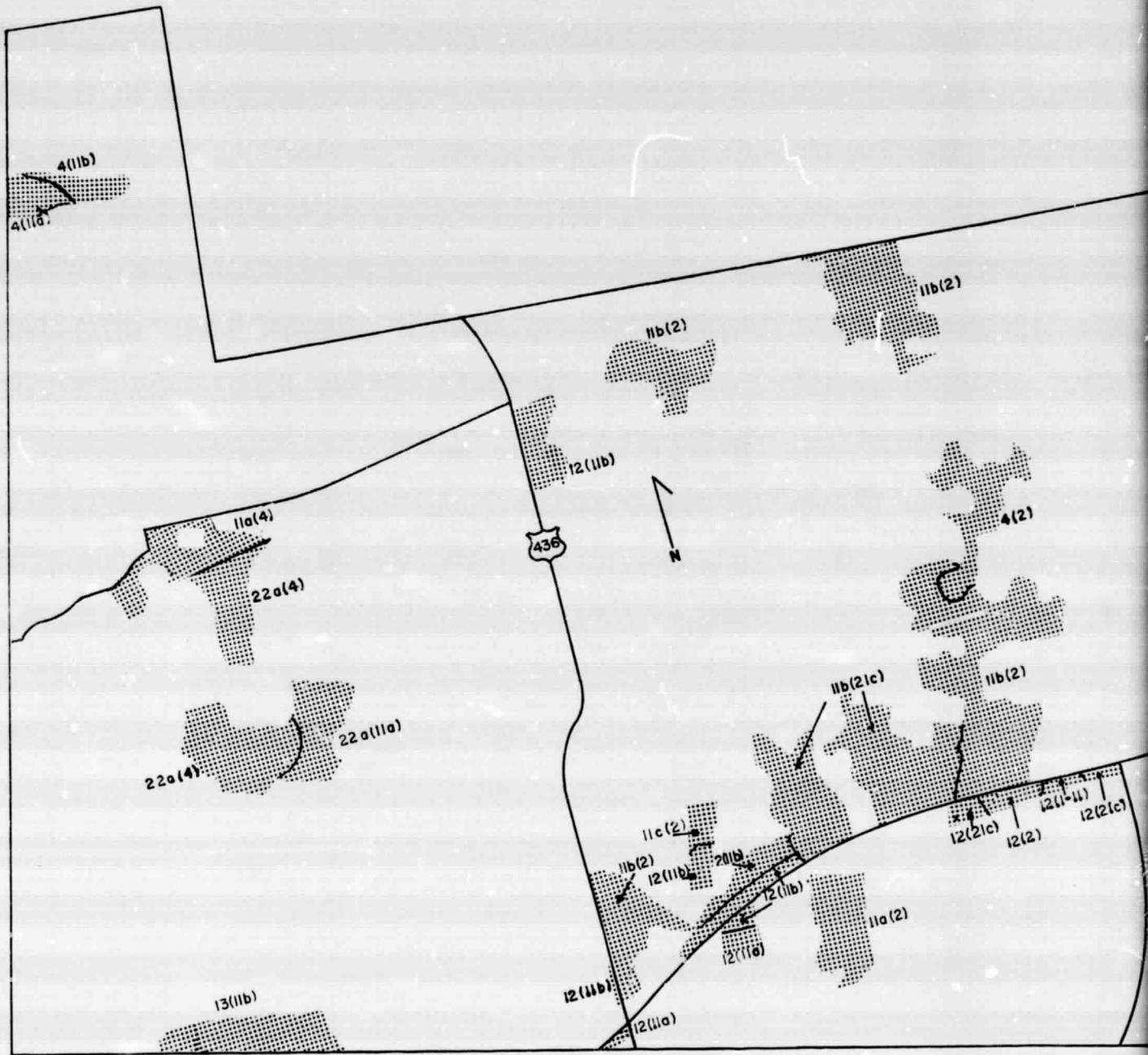
Figure 4

LANDSAT MAP
SOUTHEAST ORLANDO
Scale ~ 1/48,000

FOURTH FRAME 2

5a





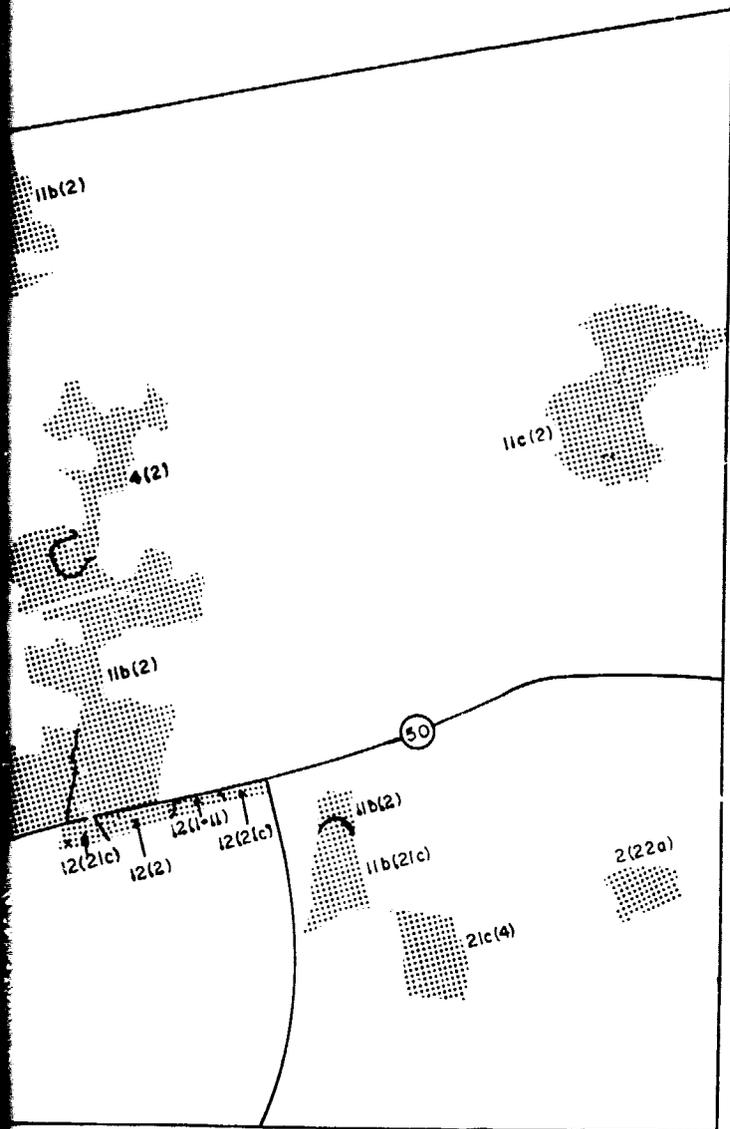
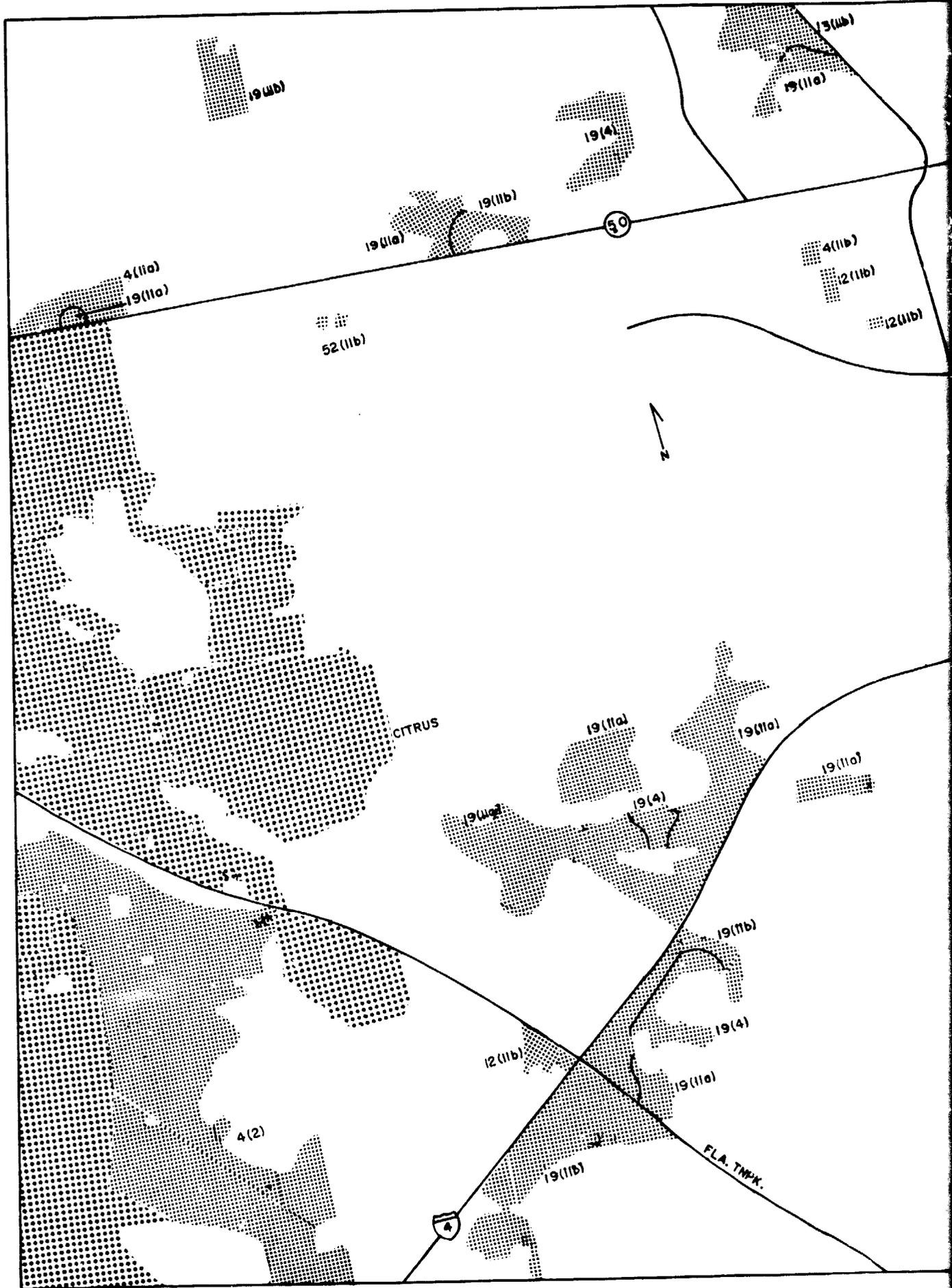


Figure 6

CORRECTIONS
 NORTHEAST ORLANDO
 Scale ~ 1/48,000

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7a



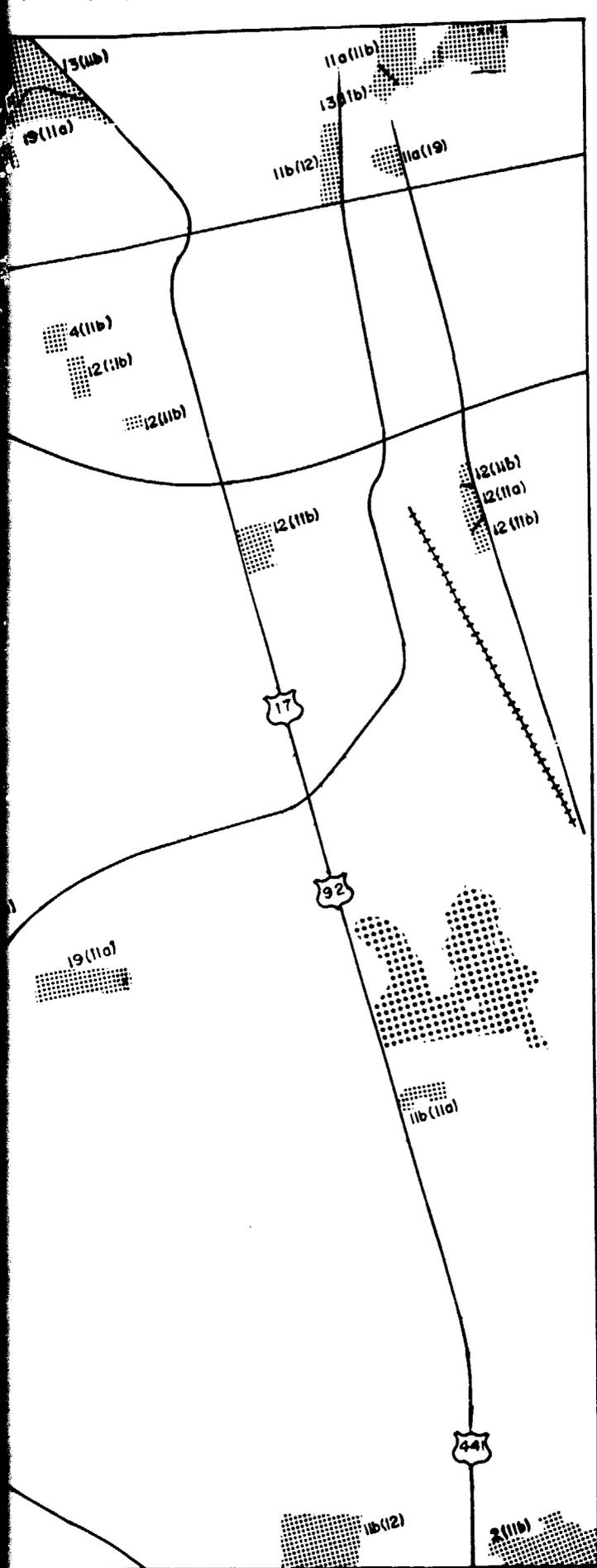
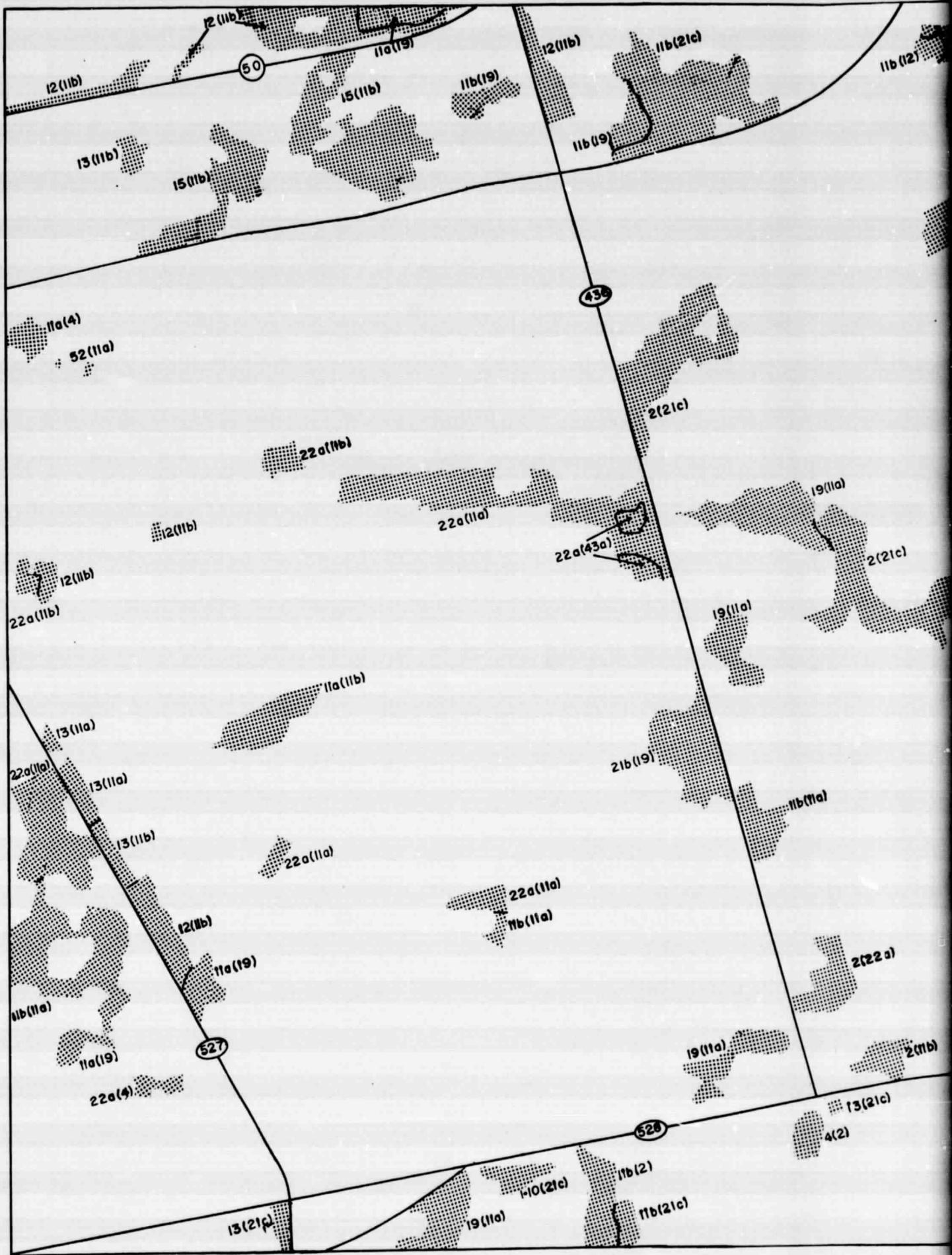


Figure 7
 CORRECTIONS
 SOUTHWEST ORLANDO
 Scale ~ 1/48,000

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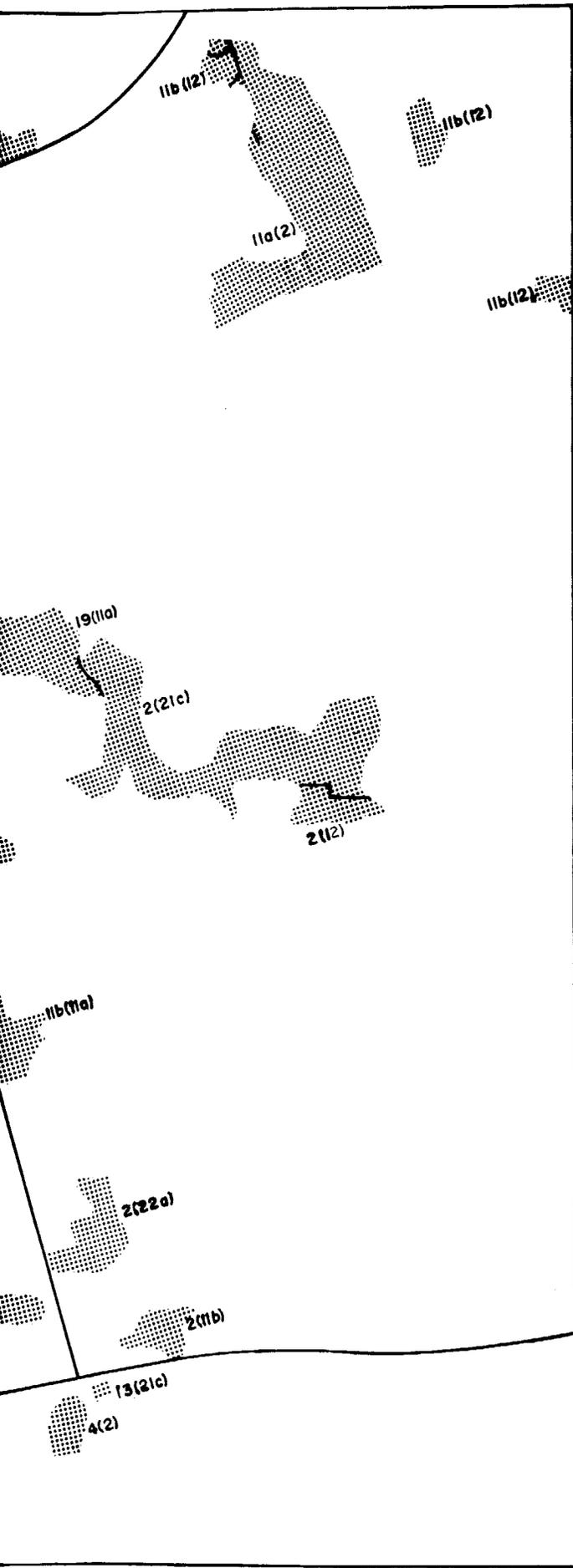
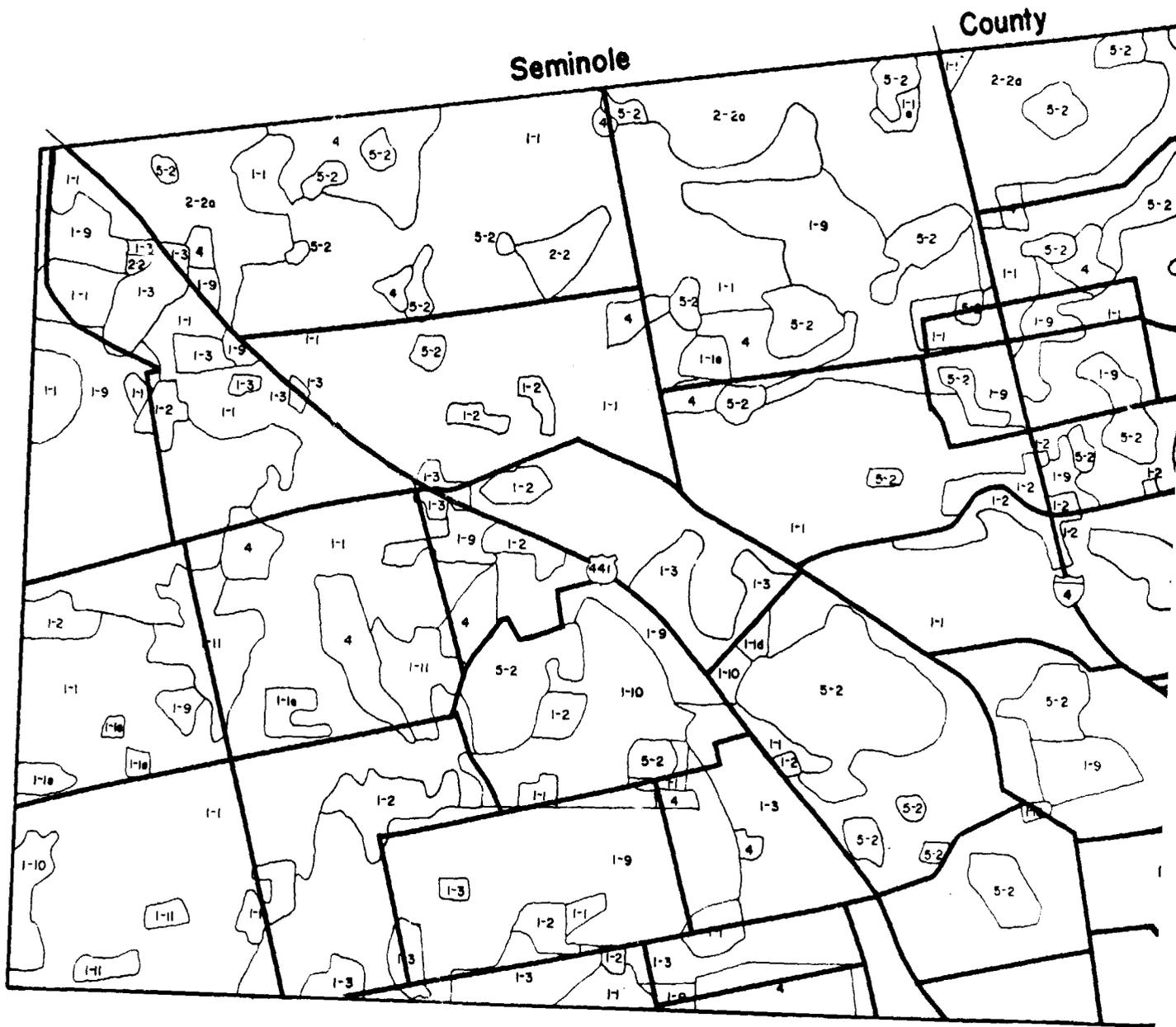


Figure 8
CORRECTIONS
SOUTHEAST ORLANDO
Scale ~ 1/48,000



REPRODUCIBILITY OF
ORIGINAL PAGE IS



Figure 10

CORRECTED MAP
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Scale ~ 1/48,000

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Figure 11

CORRECTED MAP
 SOUTHWEST ORLANDO
 Scale ~ 1/48,000

12a



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Some local knowledge was used in making the original map, for example, in identifying an institutional area (Navy Training Center) and in locating the boundaries of the airports.

Tabulations of the various areas and the errors for the four sectors combined are given in Table 1. Tabulation of the accuracy figures is made in such a way that a given small area on the map has the indicated probability of being correct as shown by the map.

The following features represent changes which were not counted as errors in the tabulations for Table 1:

- (1) New construction² which appeared as commercial/industrial;
- (2) Bare sand² (non-landscaped), sectors which appeared as commercial/industrial;
- (3) Extraction sectors which appeared as commercial/industrial;
- (4) Parks² which appeared as non-wooded residential and as open urban;
- (5) Mobile home parks² which appeared as commercial/industrial and as non-wooded residential;
- (6) Transportation features (terminal and built-up sectors of airports) which were classified as commercial industrial; and
- (7) Features which appeared after the date of the Landsat pass.

If one disregards the distinction between wooded and non-wooded classes in tabulating errors, the overall accuracy increases from 88% to 89%.

It will be noted that Figure 7 shows a significant error area shown by a different pattern and identified as citrus. A significant amount of citrus was not expected in that portion of the map, and a citrus class was not sought. Hence, the error is human rather than system. The figures of Table 1 do not include this as error.

²Not included as a class in the computer classification.

TABLE 1

Class	Area Prior To Correction (Hectares)	Incorrect (Hectares)	Accuracy (Per Cent)
11a Wooded Residential	10,150	1,845	82
11b Non-wooded Residential	12,055	1,193	89
11c Bare Sand ³	28		
12 Commercial/Industrial	3,015	83	97
1-11 New Construction ³	46	3	93
14 Extraction ³	7		
15 Transportation	202		
19 Open Urban ⁴	7,709	1,242	84
21c Pasture	1,404	426	70
22a Citrus	105	11	90
4 Forest (exclusive of 43a)	4,734	400	92
43a Pine and Palmetto	300	12	96
52 Lakes	3,041	-	100
61 Marsh	370	-	100
TOTALS	43,171	5,215	88

³Based on local knowledge

⁴Sectors classified as 2 on the original map are here included in 19

If it is included, the overall accuracy figure decreases from 38% to 85%. This sector of the map could have been improved by a new classification after discovery of this error, but a deadline for use of the data - as discussed below - did not permit making a new classification.

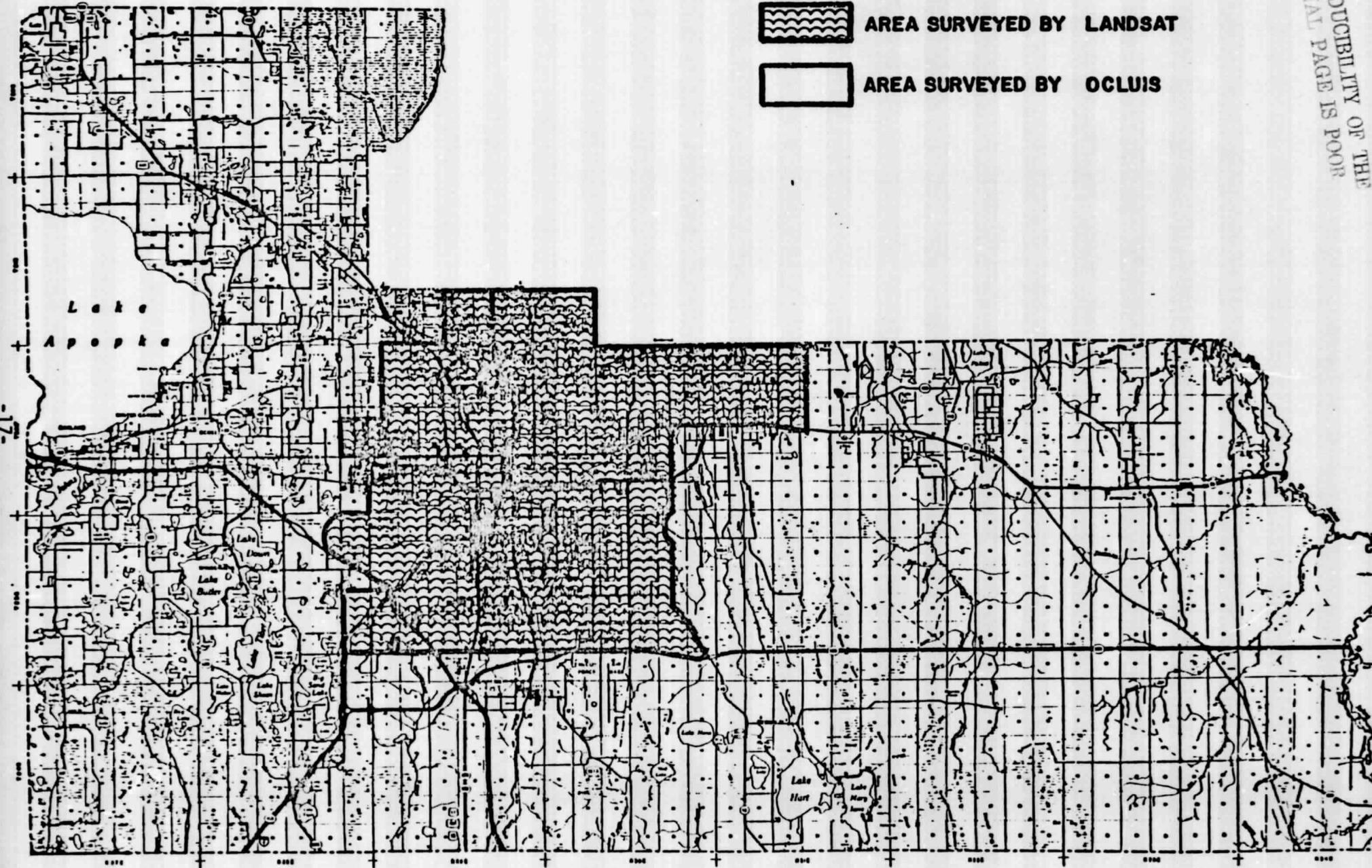
The Orange County Planning Department has under way a program to develop a computer-stored land use inventory of the county, with the information obtained by direct observation of individual parcels. That tabulation, then, will be more detailed than Landsat-obtained information and also will contain economic and political information which Landsat cannot provide. Since there was an immediate need for a land use inventory to meet transportation planning requirements and since the direct-observation tabulation was not yet complete, Landsat-obtained information was called upon to fill in the incompletd sectors. This turned out to be the metropolitan Orlando region, approximately the region described in this report. This region amounted to 14% of the area of the county but approximately half of the traffic zones, as the traffic zones are smaller in urban regions. The region for which Landsat results were used is shown by Figure 13, which is taken from the planners' report.⁵

When the figures of Table 1 are combined with previously-obtained results¹, the cumulative results given in Table 2 are obtained.

⁵Land use data for OUATS Sketch Planning Process, Orange County Planning Department, July 1976.

FIGURE 13

 AREA SURVEYED BY LANDSAT
 AREA SURVEYED BY OCLUIS



REPRODUCIBILITY OF THE ORIGINAL PAGE IS POOR

TABLE 2

Class	Area Prior to Correction		Incorrect (Hectares)	Accuracy (Per Cent)
	Hectares	Acres		
11a Wooded Residential	10,150	25,070	1,845	82
11b Non-wooded Residential	12,055	29,776	1,193	89
11c Rural Residential	2	5		
11e Bare Sand	28	69		
11d Mobile Home Park	11	27		
12 Commercial/Industrial	3,015	7,447		97
14 Extraction	22	54		
15 Transportation	202	499		
19 Open Urban	7,709	19,041	1,242	84
1-11 new Construction	46	114	3	
21a Vegetable Farming	4,325	11,918	99	98
12c Pasture	4,414	10,903	926	79
22a Citrus ⁶	15,142	37,401	4,286	72
4 Forest (exclusive of 43a)	12,107	29,904	572	95
43a Pine and Palmetto	300	741	12	96
52 Lakes	13,161	32,508	-	100
61 Marsh	1,134	2,801	124	89
TOTALS	84,323	208,278	10,302	88

⁶ Does not include the citrus shown in Figure 7 and discussed on page .

C. SIGNIFICANT RESULTS

None

D. PUBLICATIONS

None

E. RECOMMENDATIONS

None

ACKNOWLEDGMENTS

Greg Adkins, of the Orange County Planning Department, is an active collaborator in the Orange County work. He helps with training sample selection, helps check the computer-based maps against photography, makes the final versions of the maps, and makes the planimeter measurements.

APPENDIX

LAND-USE CATEGORIES:

Level 1

01. Urban and built-up land

02. Agricultural land

03. Rangeland

04. Forest land

05. Water

06. Nonforested wetland

07. Barren land

Level 2

01. Residential
a. Wooded residential
b. Non-wooded residential
c. Rural residential
d. Mobile-home parks
e. Bare sand (non-landscaped)
02. Commercial and services
03. Industrial
04. Extraction
a. Phosphate mines
b. Reclaimed phosphate mines
c. Clay mining
05. Transportation
07. Strip
09. Open
10. Institutional & recreational
11. New construction

01. Cropland and pasture
a. Muck farms (vegetable)
b. Vegetable farming
c. Pasture
02. Groves
a. Primarily citrus
03. Bare sand in agricultural sector

01. Grass

01. Deciduous
a. Cypress
b. Hardwoods
02. Evergreen (pine)
03. Mixed
a. Pine and palmetto

01. Streams and waterways
02. Lakes
03. Other (Gulf of Mexico)

01. Vegetated
02. Bare

03. Sand other than beaches