WINDING CYPRESS CDD

7180 Winding Cypress Drive
Naples, FL 34114

Lake Erosion Evaluation

Date: March 21, 2024

Prepared By:

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EMPLOYEE-OWNED.
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Assessment Overview

The Winding Cypress Community Development District ("District") contains approximately 358 acres of land with 29 water management lakes which total 83.4 Acres. The purpose of this report is to assess the condition of the existing lake banks and identify if there are any problems with erosion. Based upon the assessment and possible erosion of the lake banks, it may be necessary to repair the lake banks in order to restore them to their initial condition and/or improve the lake banks beyond their initial design. Before recommendations for repairs or additional alterations can be made, it is necessary to determine the extent of erosion throughout the lake banks. As such, the scope of work in this report will only focus on the lake bank assessment. This will identify the extent and number of erosion issues that are currently present before proceeding further.

The data for the on-site assessments was collected via an ArcGIS Collector Application. The information is categorized by the legend on the following page and includes photographs, measurements (if applicable), and notes. The on-site assessments can be accessed at the following web page:

https://www.maps.arcgis.com/apps/mapviewer/index.html?webmap=360049e3a6094331a6cec20466f266de

By clicking on the above link, a map viewer, titled "Winding Cypress Lake POIs," will open in the computer's default web browser. Once the web page is open the user is able to pan and zoom around the aerial based map to view any of the lakes within the District. The user may single-click on any graphic which will generate a "pop-up" window with the photograph at that location and any pertinent information.

Assessment Categories and Legend

For this assessment each of the 29 lake bank permimeters were walked by an LJA inspector from the period of December 2023 to January 2024. Data points were collected at regular intervals around the lake in order to establish a full picture of the existing lake conditions. Just because a data point was taken, it is not necessarily indicative of a problem. In many cases those points were taken to verify that a slope was in tolerance, locate littoral plantings or to locate a control structure. ALL instances of problems and/or erosion were noted in the data collector.

Ten common categories were used for data collection, with an additional category of miscellaneous/other to document any issues that do not fall neatly into the 10 catergories.

1) Escarpment
2) Lake Bank Slope
3) Off Site-Erosion *
   - Homes
   - Pools
   - Other
4) Rip-Rap
5) Rip-Rap Underlayment
6) Littoral Plantings
7) Exotic Plant Located
8) Erosion at Pipe
9) Silt in Pipes
10) Control Structure
11) Miscellaneous/Other

*Note – Sub-categories were added after the data was collected in the field.

See Legend on Following Page

LEGEND	
SYMBOL	DESCRIPTION
	ESCARPMENT
	LAKE BANK SLOPE
	OFF-SITE EROSION
	RIP-RAP
	RIP-RAP UNDERLAYMENT
	LITTORAL PLANTINGS
	EXOTIC PLANT LOCATED
	EROSION AT PIPE
	SILT IN PIPES
	CONTROL STRUCTURE
	MISCELLANEOUS/OTHER

South Florida Water Management District
Permit Information Volume IV

CONSTRUCTION INSPECTION NUMERICAL TOLERANCE GUIDELINES

ITEM	GENERAL TOLERANCE GUIDELINES
BLEEDER • Invert Elevation • Cross-sectional Area	 • ± 0.15 FT • ± 10%
OUTFALL CULVERT • Upstream Invert Elevation • Downstream Invert Elevation • Height • Diameter	 • ± 0.2 FT • ≤ Upstream Invert Elevation • No tolerance • ± 10%
DROP INLET • Crest Elevation • Width • Diameter • Length	 • ± 0.2 FT • ± 10% • ± 10% • ± 10%
SLIDE GATE • Invert Elevation • Crest Elevation • Width	 • ± 0.2 FT • (Cross-sectional area shall be ± 10%)
WEIR • Crest elevation • Length	 • ± 0.2 FT • ± 0.2 FT
PUMPS • "On" elevation • "Off" elevation • Capacity	 • ± 0.2 FT • ± 0.2 FT • No tolerance
GOLF COURSE SWALES • Width • Depth	 • ± 0.5 FT, or 10% • ± 0.5 FT, or 10%
EXTERNAL DITCHES • Top Width	 • ± 1 FT
DIKE SLOPES • Steeper than 4H:1V	 • ± 10%
SWM LAKES • Area • Side slopes: 4H:1V 5H:1V 6H:1V	 • N/A (at this time) • 3.5H:1V or shallower • 4.5H:1V or shallower • 5.5H:1V or shallower *Note: Step(s) or drop(s) near shoreline should not exceed 9 inches.

South Florida Water Management District (SFWMD) Tolerances

Criteria for water management lakes mostly focus on the minimum side slopes of the lakes and allow for a 0.5H steeper side slope and allow for side slopes to be shallower than the minimum.

See SFWMD Tolerance Guidelines on the Following Page

Collier County Land Development Code (LDC) Requirements

Excerpts from the LDC, pertinent to this lake assessment, are listed below.

Sec. 22-112. - Construction requirements for excavations.

All requirements of the South Florida Water Management District, Permit Information Volume IV, along with the following requirements, shall apply to all excavations.

(2) *Side* slopes. The finished side slopes of the excavated area, expressed as the ratio of the horizontal distance in feet to one foot of vertical drop, shall be as follows:

A maximum four to one slope shall be graded from the existing grade to a breakpoint at least ten feet below the control elevation. Below this breakpoint, slopes shall be no steeper than two to one.

Sec. 22-113. - Inspection and reporting requirements.

Reporting.

1. A sealed topographic survey prepared by the project's surveyor/engineer, containing the following:

   Side slopes shall be graded to within a reasonable tolerance as will be determined by the county manager or designee, depending upon local site conditions.

Master Lake Layout and Individual Lake Sheets

An aerial based location map indicates the location and orientation of each of the 27 lakes. The lake numbering system is based upon the original construction plans permitted through SFWMD.

See Location Map on the Following Page

Each lake will have a summary page that contains a data matrix with a brief description and write-up below. Following the summary page is an aerial based map of the individual lake with the data points graphically located. The lakes are listed in numerical order.

Individual Lake Sheets Follow the Master Lake Layout

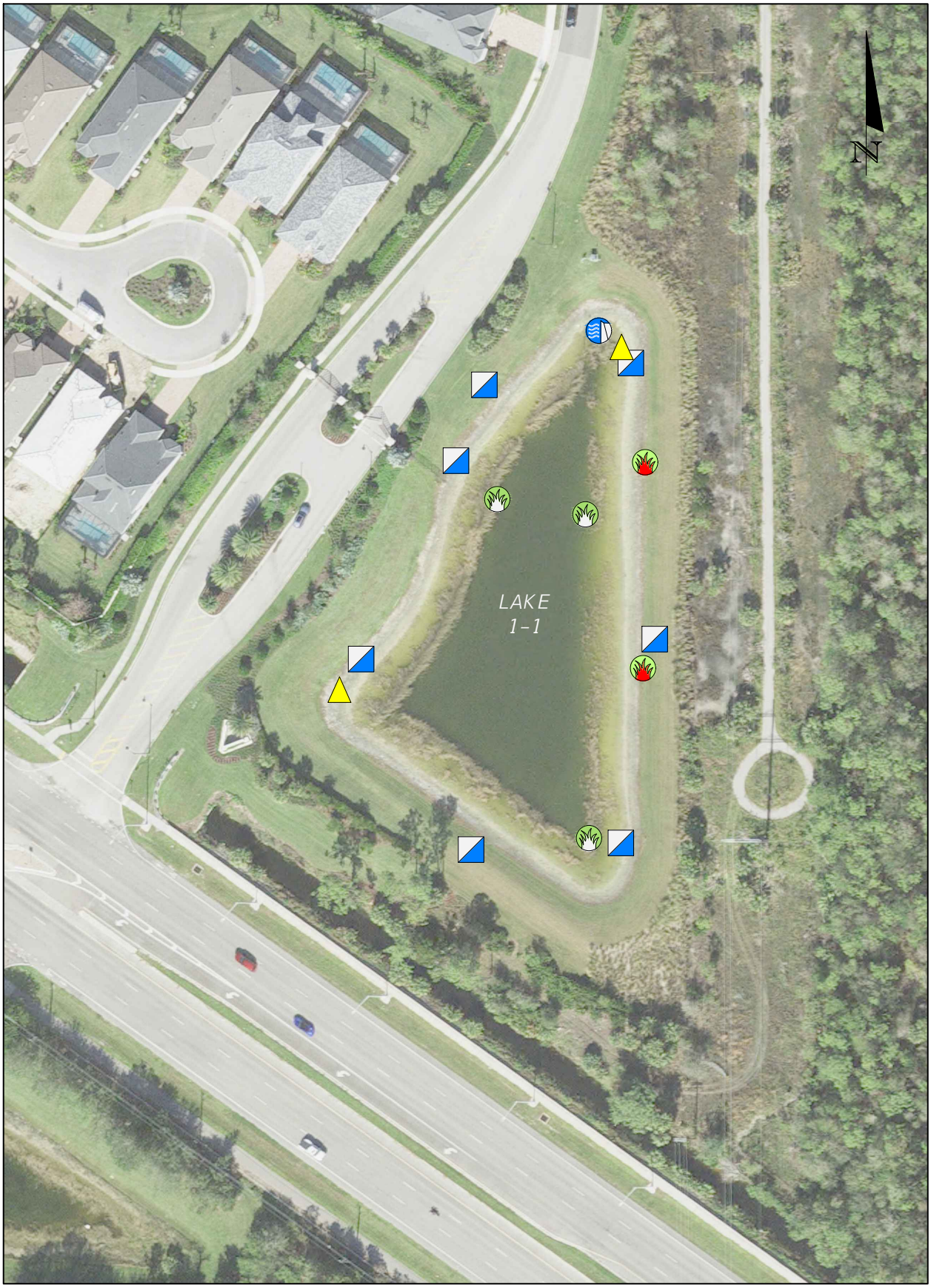

N
LAKE 5A-2
LAKE 5A-1
LAKE 4B-5
LAKE 4B-6B
LAKE 4B-6A
LAKE 4A-3
LAKE 4B-7
LAKE 4A-2
LAKE 4A-8
LAKE 4A-1
LAKE 1-5
LAKE 1-4
LAKE 1-3
LAKE 1-2
LAKE 1-1
LAKE 5B-1
LAKE 5B-2
LAKE 11-1
LAKE 11-6
LAKE 11-5
LAKE 11-2
LAKE 11-4
LAKE 11-3
LAKE 11-7
LAKE 10-5
LAKE 10-1
LAKE 10-2
LAKE 10-4
LAKE 10-3

Lake 1-1

Lake 1-1	Data Only	Problem
Escarpment		
Lank Bank Slope	7	
Off-Site Erosion - Homes		
Off-Site Erosion - Other		2
Off-Site Erosion - Pool		
Rip-Rap		
Rip-Rap Underlayment		
Littoral Plantings	3	
Exotic Plant Located		2
Erosion at Pipe		1
Silt in Pipes		
Control Structure		
Miscellaneous/Other		
Lake 1-1 Totals	**10**	**5**

Lake 1-1 is located at the entrance at US-41. A total of 15 data points were collected with 5 problems identified. It is atypical of most of the lakes since there are no homes located adjacent to the lake. There are not too many erosion issues associated with this lake. The offsite erosion is caused by the sharp points of the lake shape. Two exotic plants are found on the lake banks and should be removed. Minor erosion was observed at a pipe connection.

See Lake Map on Following Page

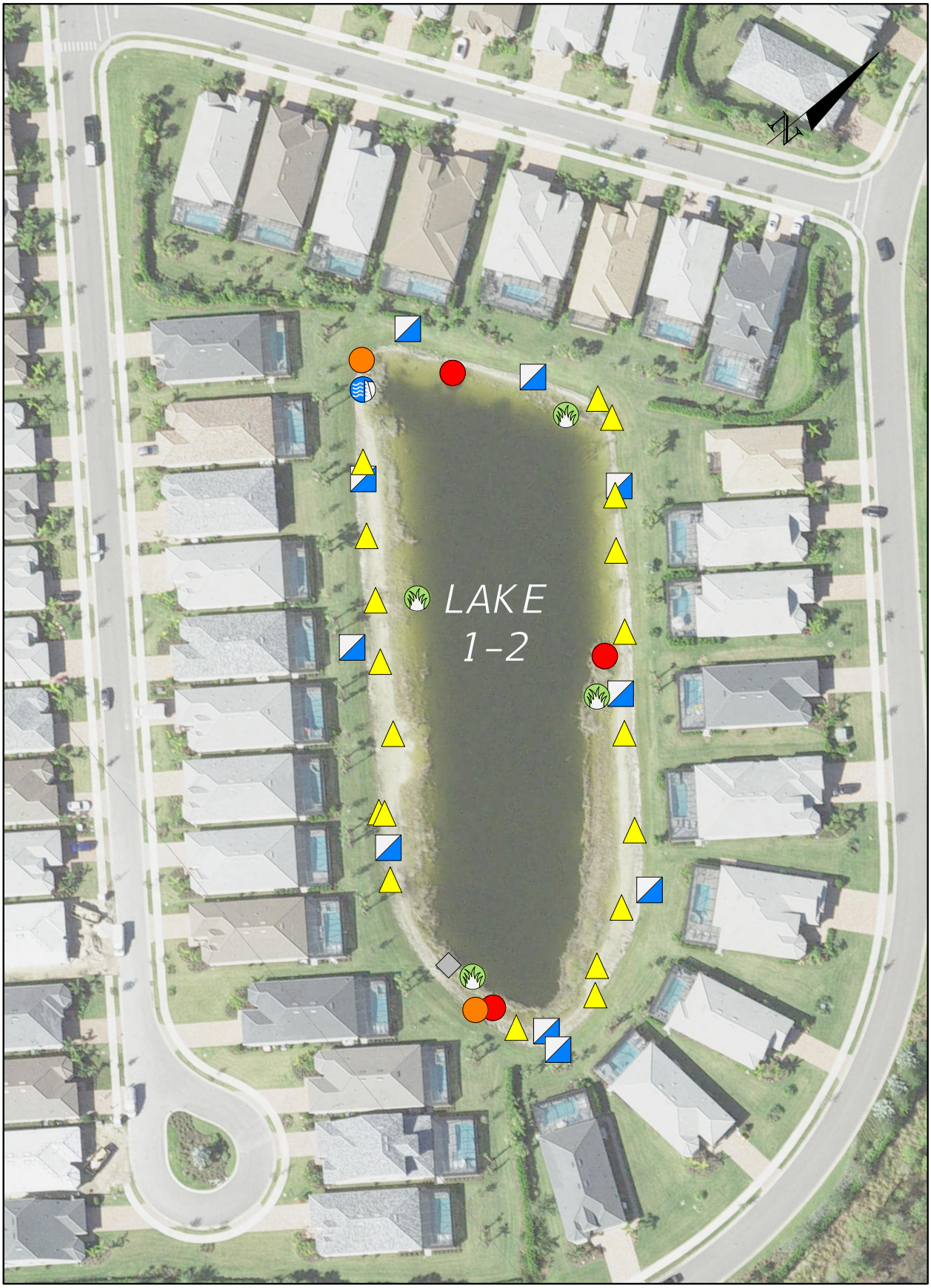

N
LAKE
1-1

Lake 1-2

Lake 1-2	Data Only	Problem
Escarpment		2
Lank Bank Slope	10	
Off-Site Erosion - Homes		19
Off-Site Erosion - Other		
Off-Site Erosion - Pool		
Rip-Rap		1
Rip-Rap Underlayment		
Littoral Plantings	4	
Exotic Plant Located		
Erosion at Pipe		1
Silt in Pipes		3
Control Structure		
Miscellaneous/Other		
Lake 1-2 Totals	**14**	**26**

Lake 1-2 is located at the entrance at US-41. A total of 40 data points were collected with 26 issues identified. The lake is surrounded by homes. Most of the lake erosion is caused by downspouts. Escarpment was noted in two locations. Erosion around a pipe connection and silt in the pipes was also noted.

See Lake Map on Following Page


LAKE
1-2

Lake 1-3

Lake 1-3	Data Only	Problem
Escarpment		9
Lank Bank Slope	32	
Off-Site Erosion - Homes		51
Off-Site Erosion - Other		
Off-Site Erosion - Pool		2
Rip-Rap	2	
Rip-Rap Underlayment		
Littoral Plantings	15	
Exotic Plant Located		
Erosion at Pipe		5
Silt in Pipes		1
Control Structure		
Miscellaneous/Other		1
Lake 1-3 Totals	**49**	**69**

Lake 1-3 is the largest lake in the district. A total of 118 data points were collected with 69 problems identified. The lake is surrounded by homes. A majority of the erosion is caused by downspouts. Escarpment was noted in nine locations. Erosion around five pipes and silt in a pipe was also present. There were two problems associated with pool overflow.

See Lake Map on Following Page

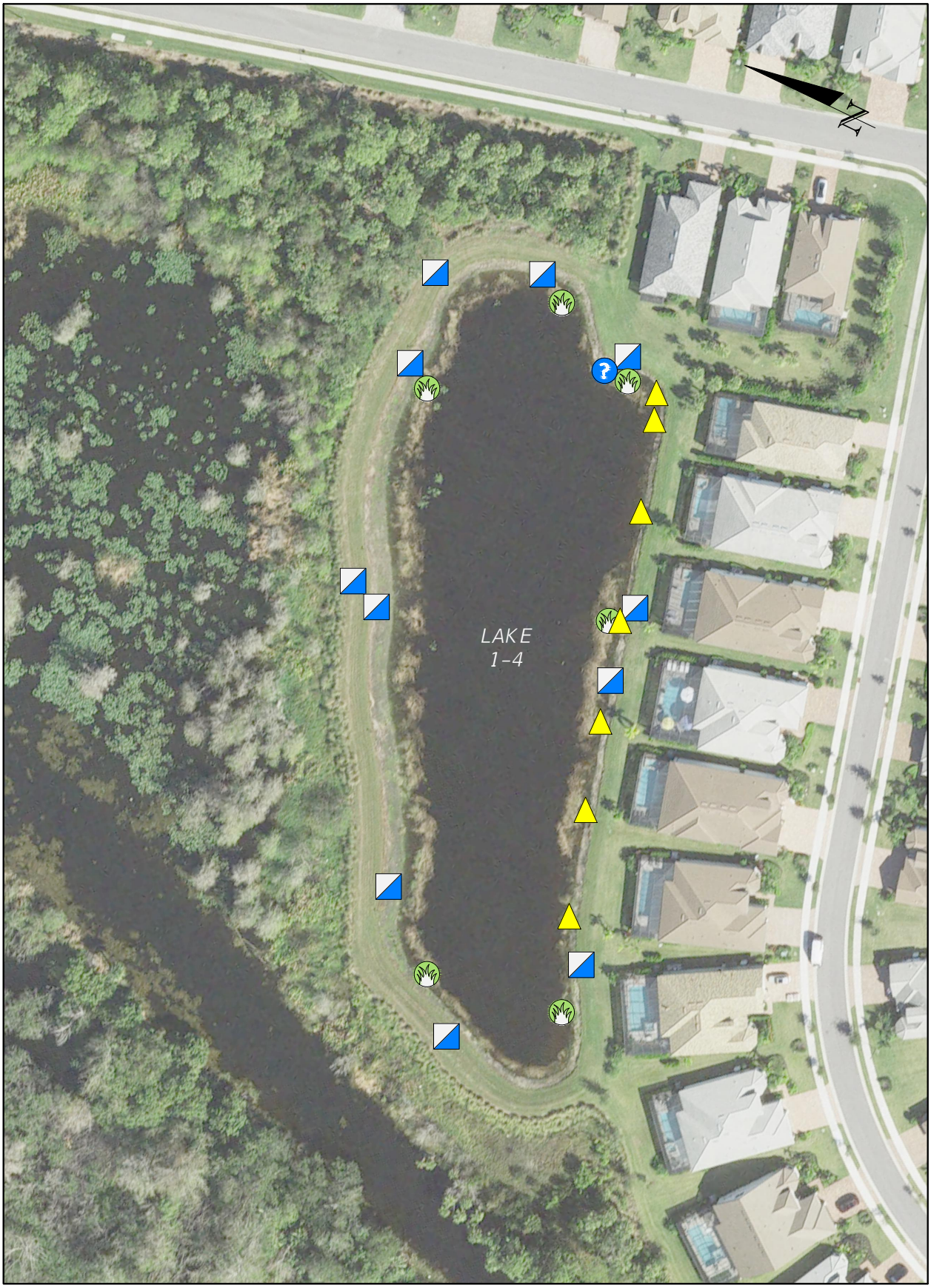

LAKE
1-3
N

Lake 1-4

Lake 1-4	Data Only	Problem
Escarpment		
Lank Bank Slope	11	
Off-Site Erosion - Homes		7
Off-Site Erosion - Other		
Off-Site Erosion - Pool		
Rip-Rap		
Rip-Rap Underlayment		
Littoral Plantings	6	
Exotic Plant Located		
Erosion at Pipe		
Silt in Pipes		
Control Structure		
Miscellaneous/Other		1
Lake 1-4 Totals	**17**	**8**

Lake 1-4 is bordered by homes on one side and surrounded by natural area on the other three sides. A total of 25 data points were collected with eight issues identified. Seven of them are due downspouts from adjacent homes. There are no issues where the lake borders the preserve areas.

See Lake Map on Following Page

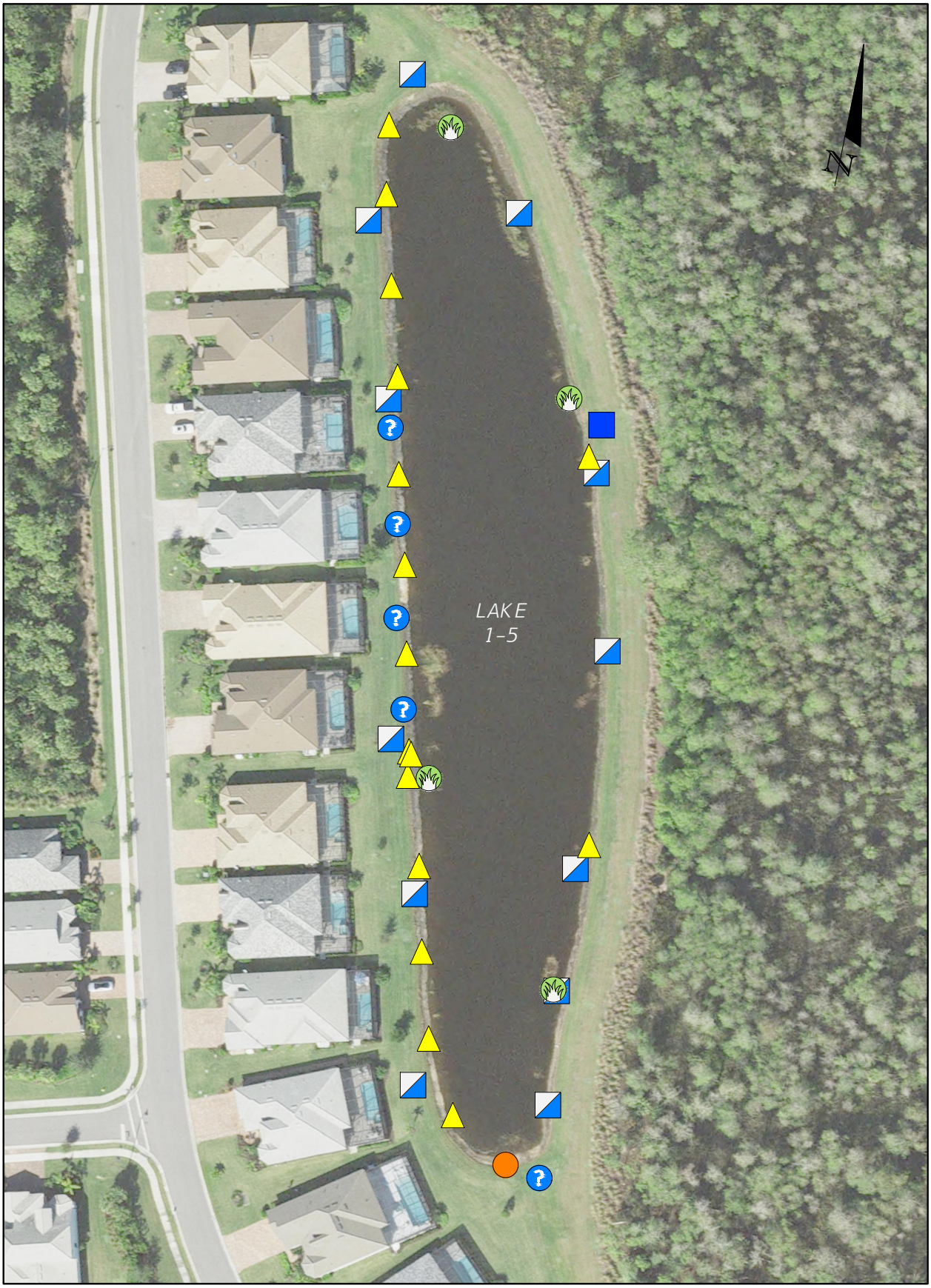

LAKE
1-4

Lake 1-5

Lake 1-5	Data Only	Problem
Escarpment		1
Lank Bank Slope	12	1
Off-Site Erosion - Homes	2	13
Off-Site Erosion - Other		
Off-Site Erosion - Pool		4
Rip-Rap		
Rip-Rap Underlayment		
Littoral Plantings	4	
Exotic Plant Located		
Erosion at Pipe		
Silt in Pipes		
Control Structure		1
Miscellaneous/Other	1	
Lake 1-5 Totals	**19**	**20**

Lake 1-5 is similar to Lake 1-4 in that homes are only present on one side of the lake. A total of 39 data points were collected with 20 known issues. Most of the issues are from off-site drainage associated with homes, both downspouts and pool connections. The only instance of a lank bank slope exceeding the maximum slope was located on this lake. No erosion issues were noted in the native areas bordering the lake.

See Lake Map on Following Page

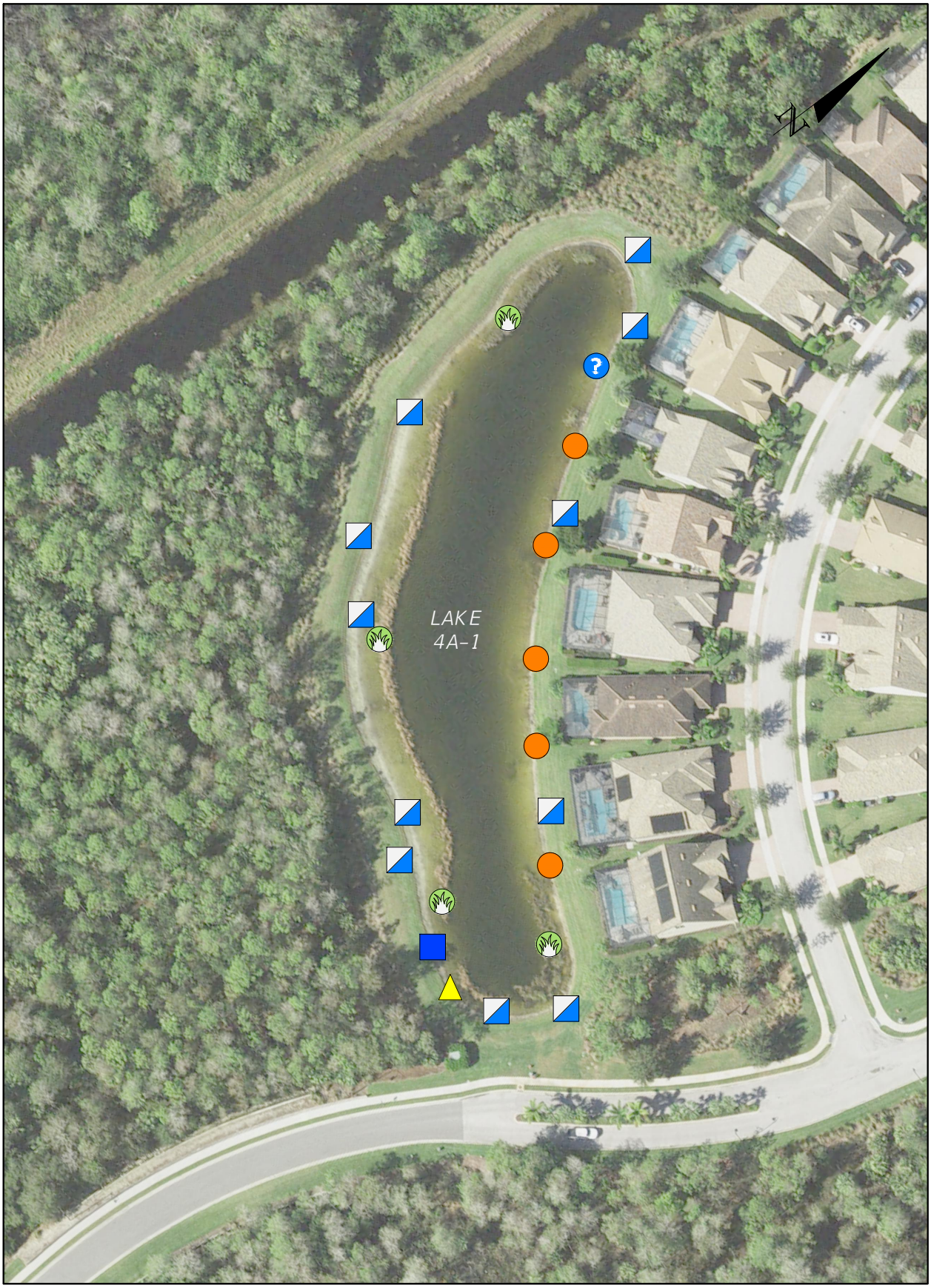

LAKE
1-5
N

Lake 4A-1

Lake 4A-1	Data Only	Problem
Escarpment		2
Lank Bank Slope	11	
Off-Site Erosion - Homes		3
Off-Site Erosion - Other		1
Off-Site Erosion - Pool		
Rip-Rap		
Rip-Rap Underlayment		
Littoral Plantings	4	
Exotic Plant Located		
Erosion at Pipe		
Silt in Pipes		1
Control Structure	1	
Miscellaneous/Other		1
Lake 4A-1 Totals	**16**	**8**

Lake 4A-1 is encumbered by homes on one side. A total of 24 data points were collected with eight issues observed. Half of the instances of erosion were caused off-site erosion. Three of those instances were from home-sites and the fourth from the grades at the corner of the lake. Drop-offs were noted in two located.

See Lake Map on Following Page

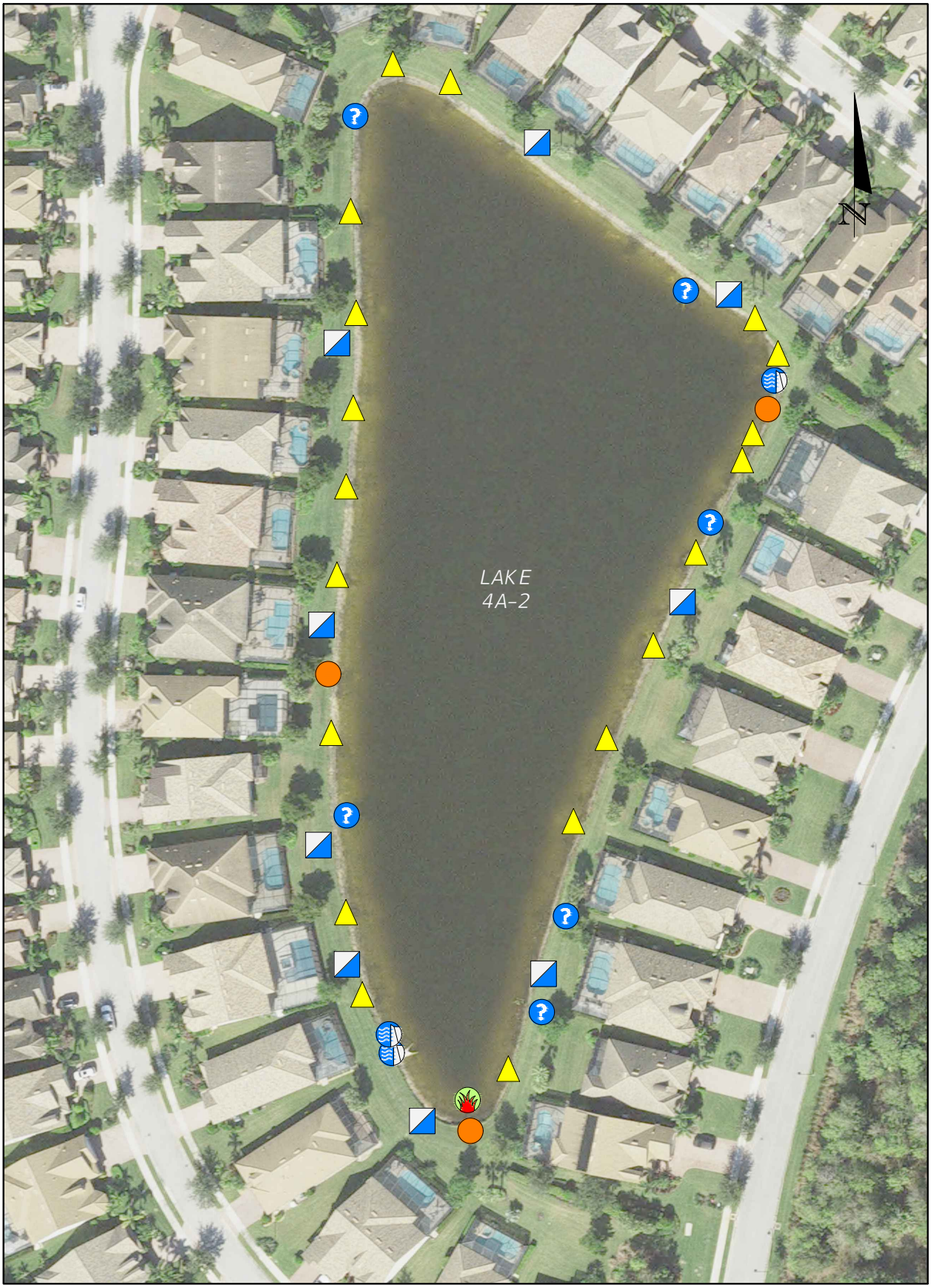

LAKE
4A-1

Lake 4A-2

Lake 4A-2	Data Only	Problem
Escarpment		2
Lank Bank Slope	9	
Off-Site Erosion - Homes	1	20
Off-Site Erosion - Other		
Off-Site Erosion - Pool		
Rip-Rap		
Rip-Rap Underlayment		
Littoral Plantings		
Exotic Plant Located		
Erosion at Pipe		3
Silt in Pipes		1
Control Structure		
Miscellaneous/Other	2	2
Lake 4A-2 Totals	**12**	**28**

Lake 4A-2 is surrounded by homes. A total of 40 data points were collected with 28 issues identified. Approximately 70% of the erosion points were caused by roof drainage from adjacent homes. Escarpment was noted in two locations. Erosion around a pipe connections and silt in the one of the pipes was also present.

See Lake Map on Following Page

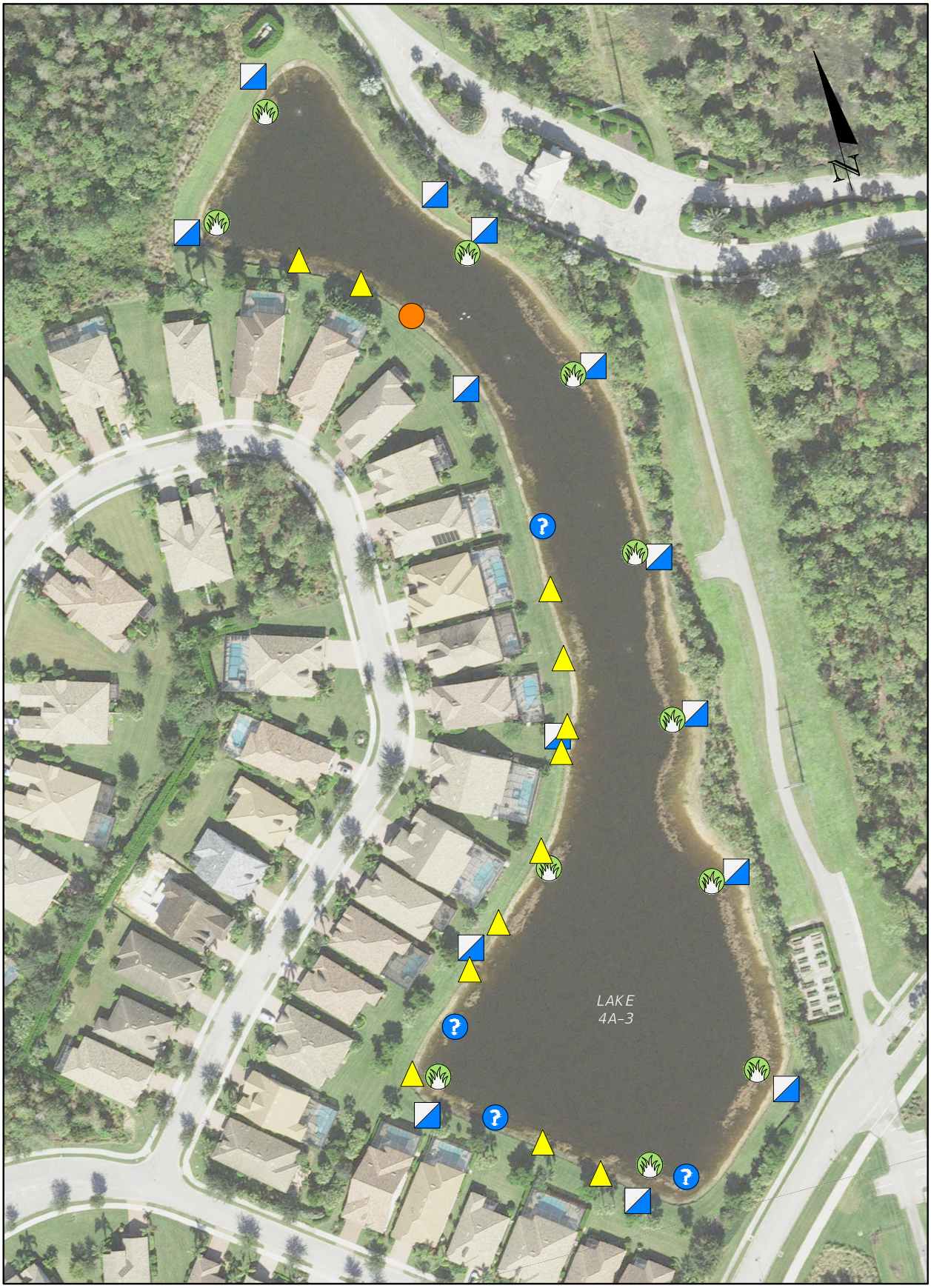

LAKE
4A-2
N

Lake 4A-3

Lake 4A-3	Data Only	Problem
Escarpment		1
Lank Bank Slope	14	
Off-Site Erosion - Homes		11
Off-Site Erosion - Other		
Off-Site Erosion - Pool		1
Rip-Rap		
Rip-Rap Underlayment		
Littoral Plantings	11	
Exotic Plant Located		
Erosion at Pipe		
Silt in Pipes		
Control Structure		
Miscellaneous/Other		4
Lake 4A-3 Totals	**25**	**17**

Lake 4A-3 is bordered by homes on two sides. A total of 42 data points were collected with 17 issues called out. As with Lake 4A-2, 70% of the erosion areas were from adjacent home drainage with one instance associated with a pool overflow. One drop-off point was identified.

See Lake Map on Following Page

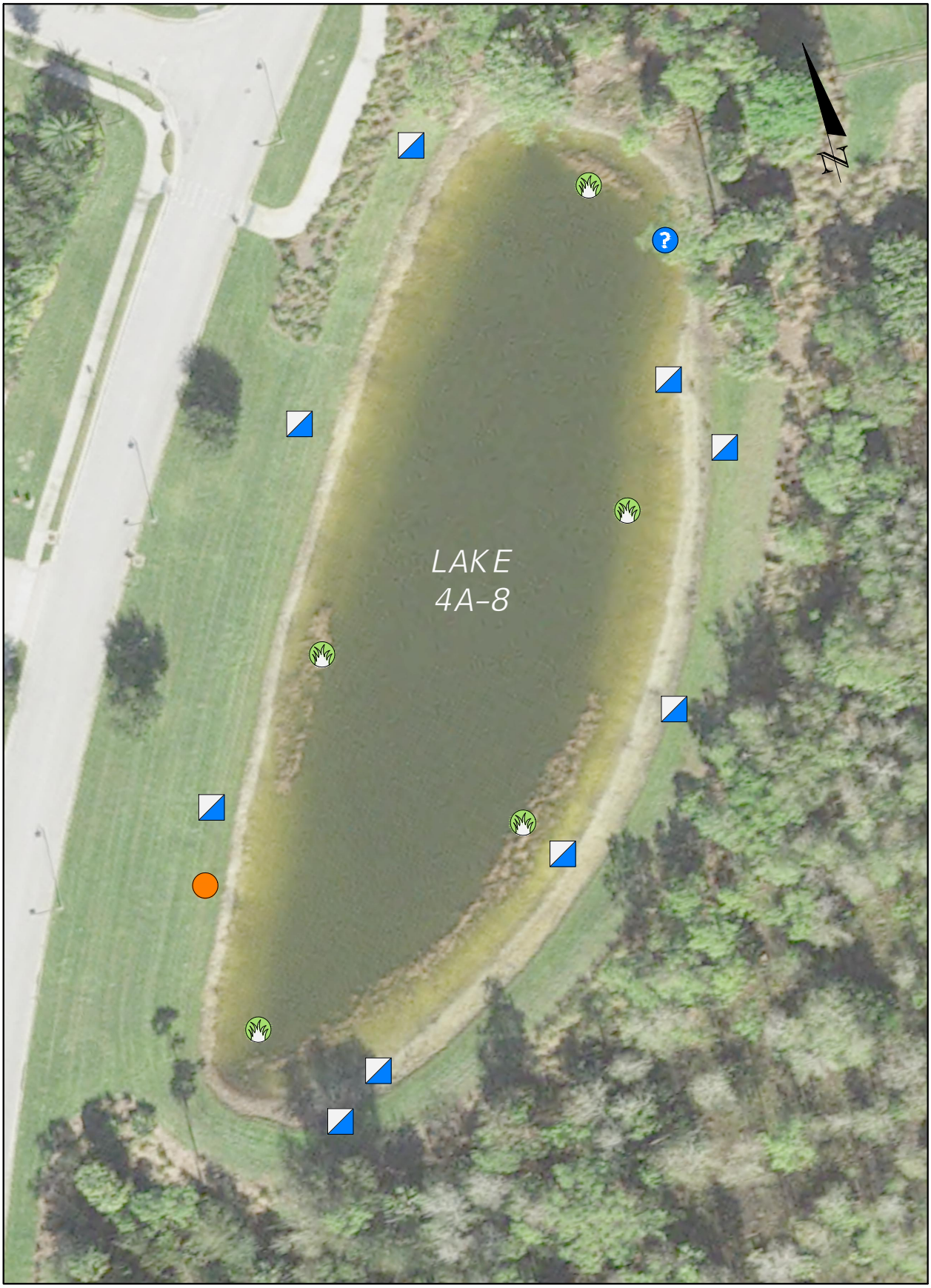

LAKE
4A-3
N

Lake 4A-8

Lake 4A-8	Data Only	Problem
Escarpment		1
Lank Bank Slope	9	
Off-Site Erosion - Homes		
Off-Site Erosion - Other		
Off-Site Erosion - Pool		
Rip-Rap		
Rip-Rap Underlayment		
Littoral Plantings	5	
Exotic Plant Located		
Erosion at Pipe		
Silt in Pipes		
Control Structure		
Miscellaneous/Other	1	
Lake 4A-8 Totals	**15**	**1**

Lake 4A-8 is located to the east of Cypress Lake Drive and there are no homes adjacent to the lake. A total of 16 data points were collected with only a single instance of escarpment.

See Lake Map on Following Page

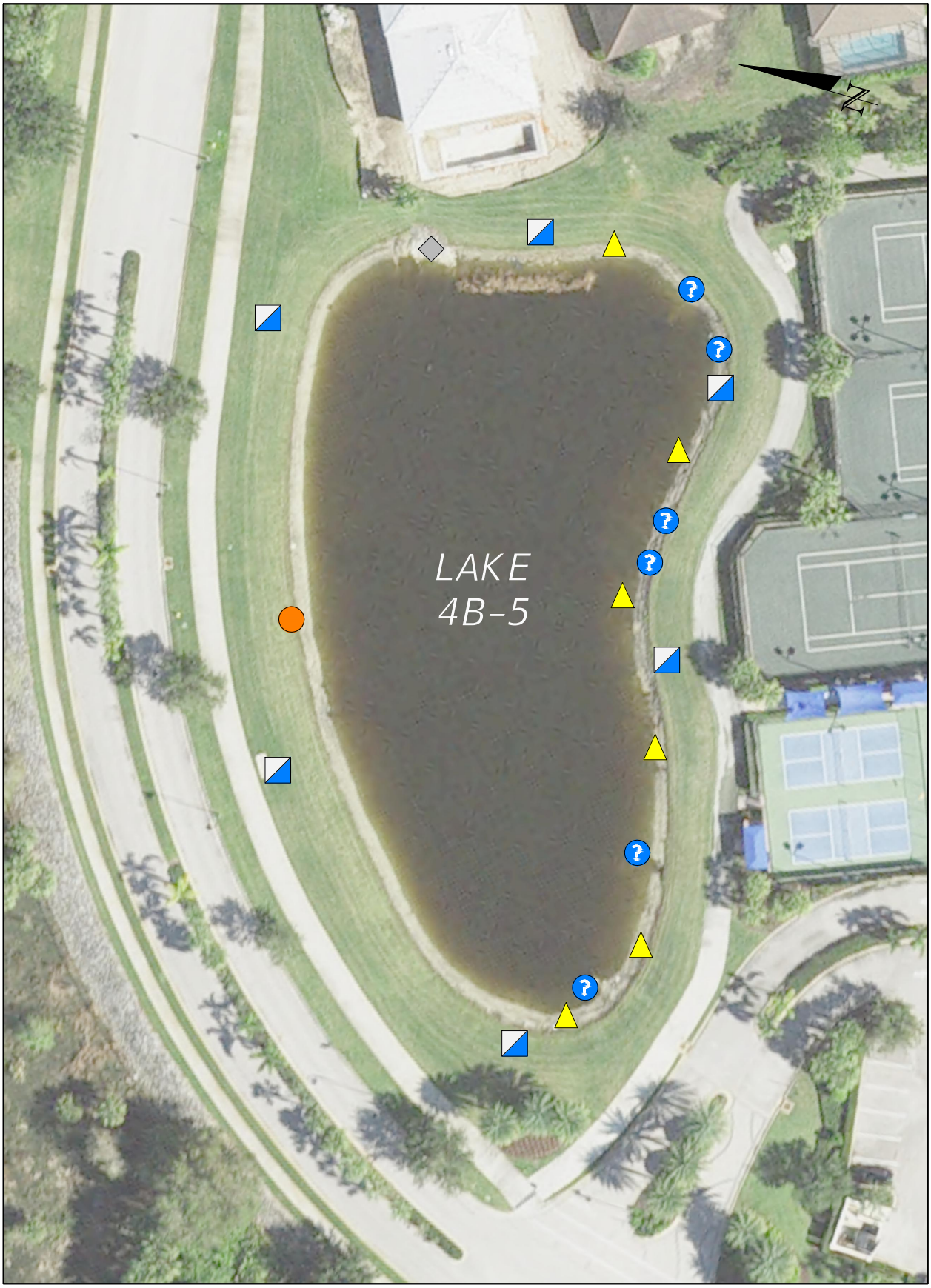

LAKE
4A-8
N

Lake 4B-5

Lake 4B-5	Data Only	Problem
Escarpment		1
Lank Bank Slope	6	
Off-Site Erosion - Homes		1
Off-Site Erosion - Other		5
Off-Site Erosion - Pool		
Rip-Rap		1
Rip-Rap Underlayment		
Littoral Plantings		
Exotic Plant Located		
Erosion at Pipe		
Silt in Pipes		
Control Structure		
Miscellaneous/Other		6
Lake 4B-5 Totals	**6**	**14**

Lake 4B-5 is located adjacent to the tennis and pickle ball courts. A total of 20 data points were collected with 14 issues present. Most of the erosion is due to the sidewalk near the courts. It appears that yard drains have been installed adjacent to the sidewalk with HDPE pipes constructed to the lake. The HDPE pipe is very shallow, and the pipes are visible on the surface of the lake. One instance of erosion was caused by a residential lot. Rip-rap was added in one area to presumably address an area of erosion. There was also one location of escarpment.

See Lake Map on Following Page


LAKE
4B-5
N

Lake 4B-6A

Lake 4B-6A	Data Only	Problem
Escarpment		2
Lank Bank Slope	11	
Off-Site Erosion - Homes		3
Off-Site Erosion - Other		1
Off-Site Erosion - Pool		
Rip-Rap		
Rip-Rap Underlayment		
Littoral Plantings	5	
Exotic Plant Located		
Erosion at Pipe		
Silt in Pipes		
Control Structure		
Miscellaneous/Other		4
Lake 4B-6A Totals	**16**	**10**

Lake 4B-6A is also located adjacent to the tennis and pickle ball courts. A total of 36 data points were taken with ten issues present. Home sites caused three issues of off-site erosion with the sidewalk contributing to the fourth area. Two drop-offs were observed on the lake banks.

See Lake Map on Following Page

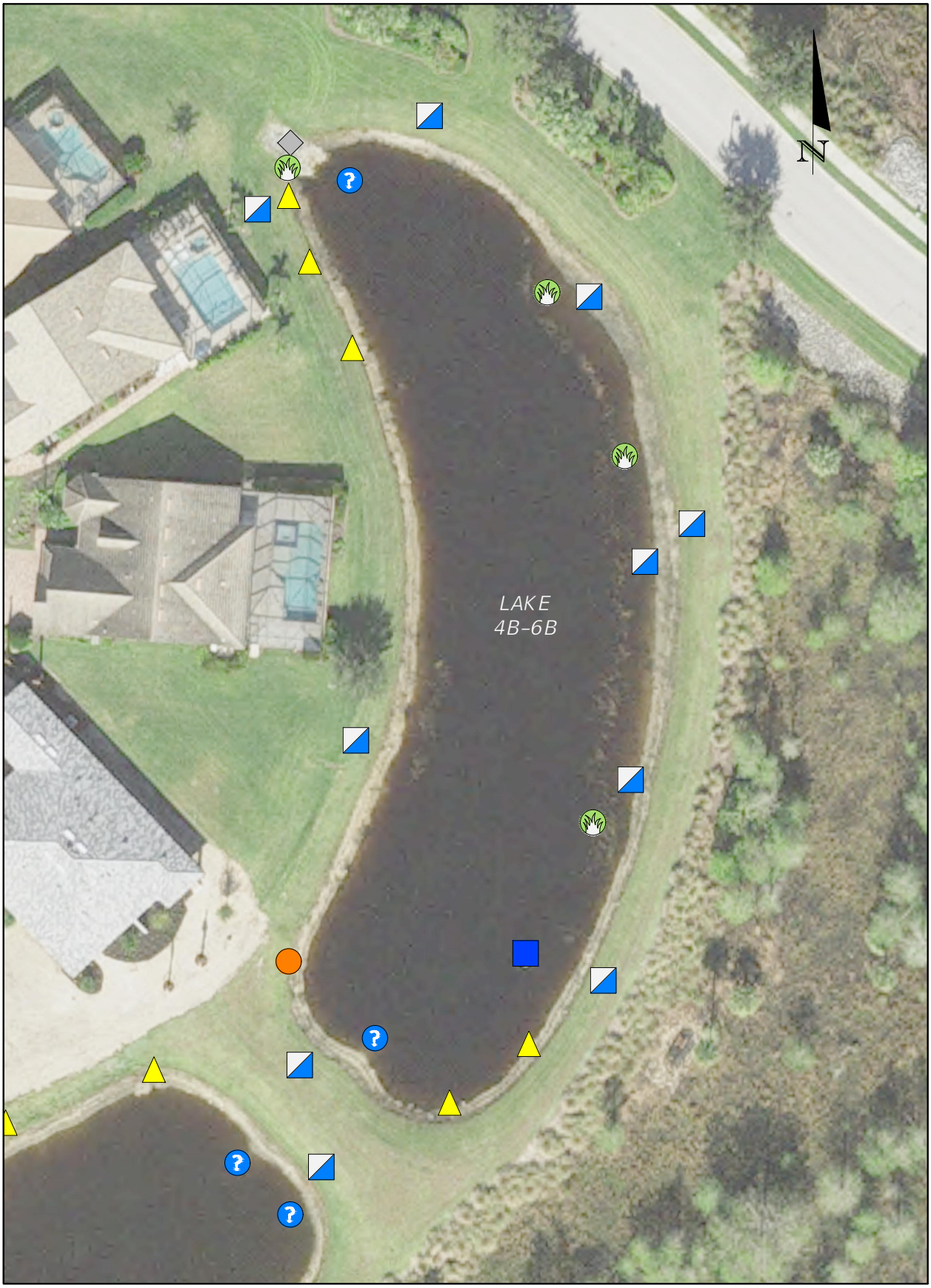

LAKE
4B-6A
N

Lake 4B-6B

Lake 4B-6B	Data Only	Problem
Escarpment		1
Lank Bank Slope	9	
Off-Site Erosion - Homes		2
Off-Site Erosion - Other		2
Off-Site Erosion - Pool		
Rip-Rap		1
Rip-Rap Underlayment		1
Littoral Plantings	3	
Exotic Plant Located		
Erosion at Pipe		
Silt in Pipes		
Control Structure	1	
Miscellaneous/Other		2
Lake 4B-6B Totals	**13**	**9**

Lake 4B-6B is located just north of Lake 4B-6A. A total of 22 data points were collected with 9 problems identified. Four areas of erosion were noted. Two caused by downspouts from the adjacent home and two from grading around the corner of the lake. Rip-rap was present in the northeast corner, presumably to address an erosion issue. However, it appears the area has continued to erode and expose the fabric under the riprap and caused displacement of the rip-rap.

See Lake Map on Following Page

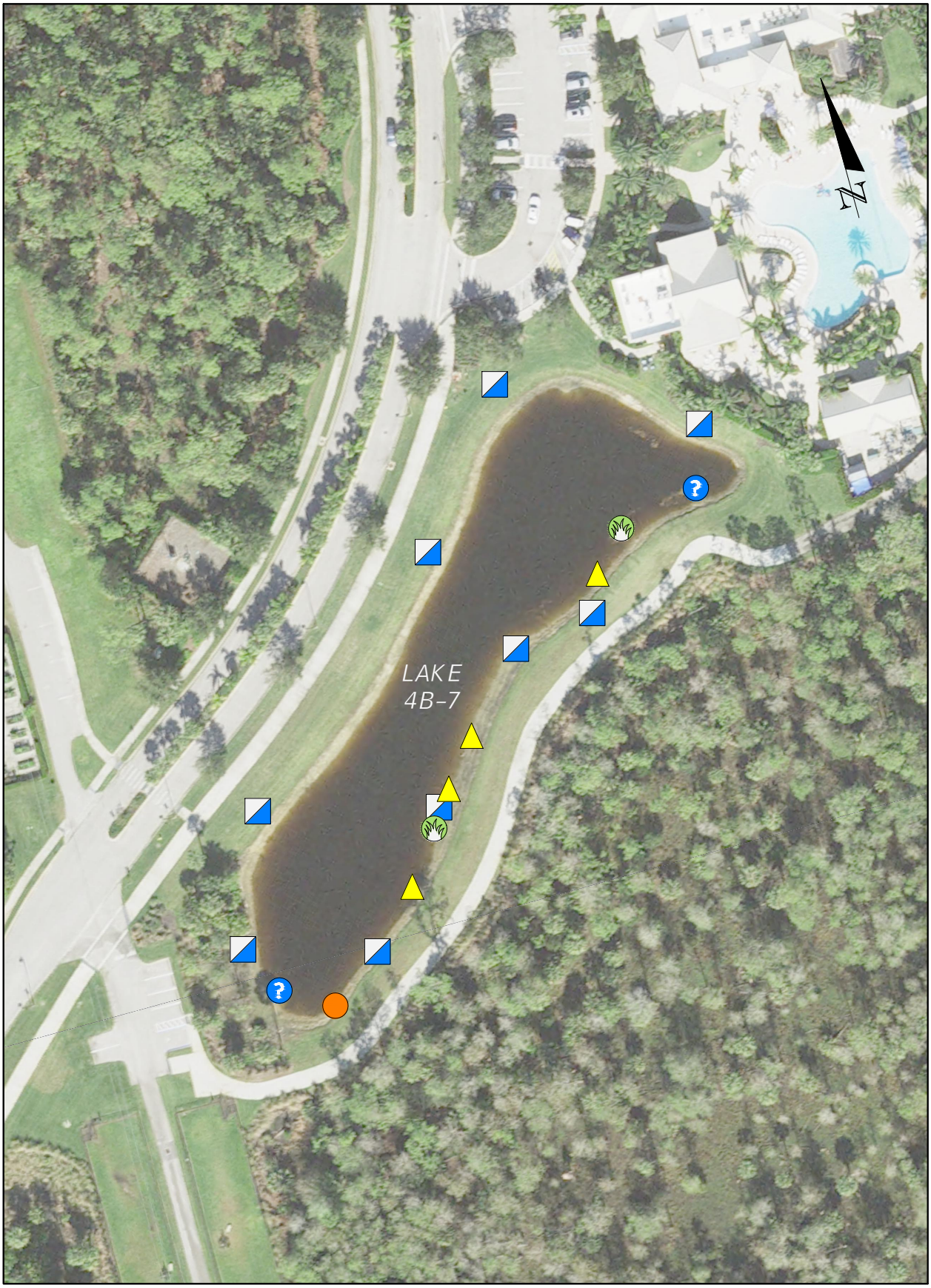

N
LAKE
4B-6B

Lake 4B-7

Lake 4B-7	Data Only	Problem
Escarpment		1
Lank Bank Slope	9	
Off-Site Erosion - Homes		
Off-Site Erosion - Other		4
Off-Site Erosion - Pool		
Rip-Rap		
Rip-Rap Underlayment		
Littoral Plantings	1	1
Exotic Plant Located		
Erosion at Pipe		
Silt in Pipes		
Control Structure		
Miscellaneous/Other		2
Lake 4B-7 Totals	**10**	**8**

Lake 4B-7 is located to the east of Cypress Lake Drive and there are no homes adjacent to the lake. A total of 18 data points were collected with 8 known issues. The adjacent sidewalk caused four points of erosion. There was one area of escarpment. Littoral plantings are missing in a portion of the littoral shelf.

See Lake Map on Following Page

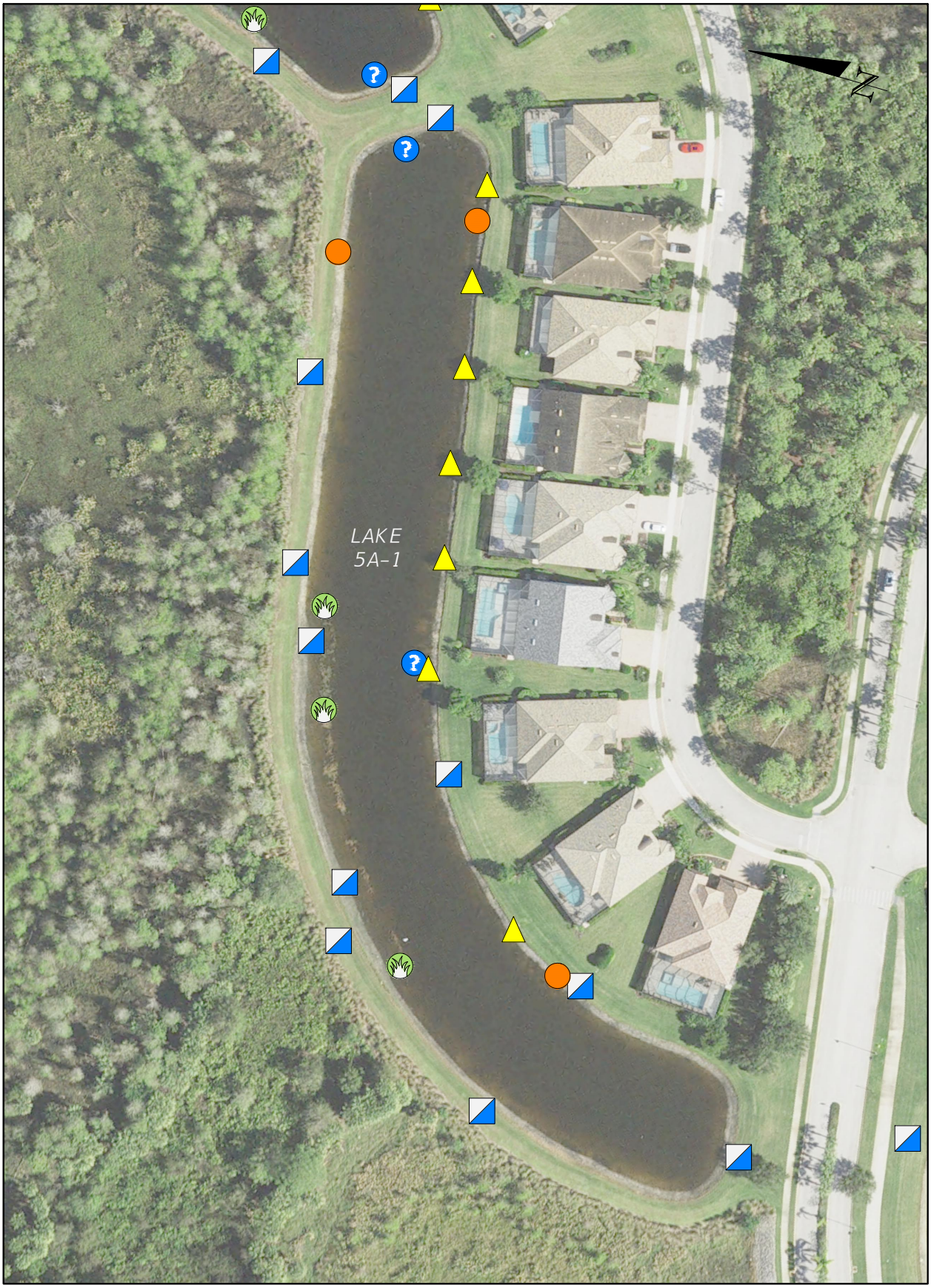

LAKE
4B-7
N

Lake 5A-1

Lake 5A-1	Data Only	Problem
Escarpment		3
Lank Bank Slope	10	
Off-Site Erosion - Homes		6
Off-Site Erosion - Other		
Off-Site Erosion - Pool		1
Rip-Rap		
Rip-Rap Underlayment		
Littoral Plantings	3	
Exotic Plant Located		
Erosion at Pipe		
Silt in Pipes		
Control Structure		
Miscellaneous/Other		2
Lake 5A-1 Totals	**13**	**12**

Lake 5A-1 is bordered by homes on one side and surrounded by natural area on the other three sides. A total of 25 data points were collected with 12 problems identified. There were 7 erosion issues caused by off-site drainage, with 6 instances caused from downspouts and one from a pool overflow. Escarpment was observed in 3 locations.

See Lake Map on Following Page

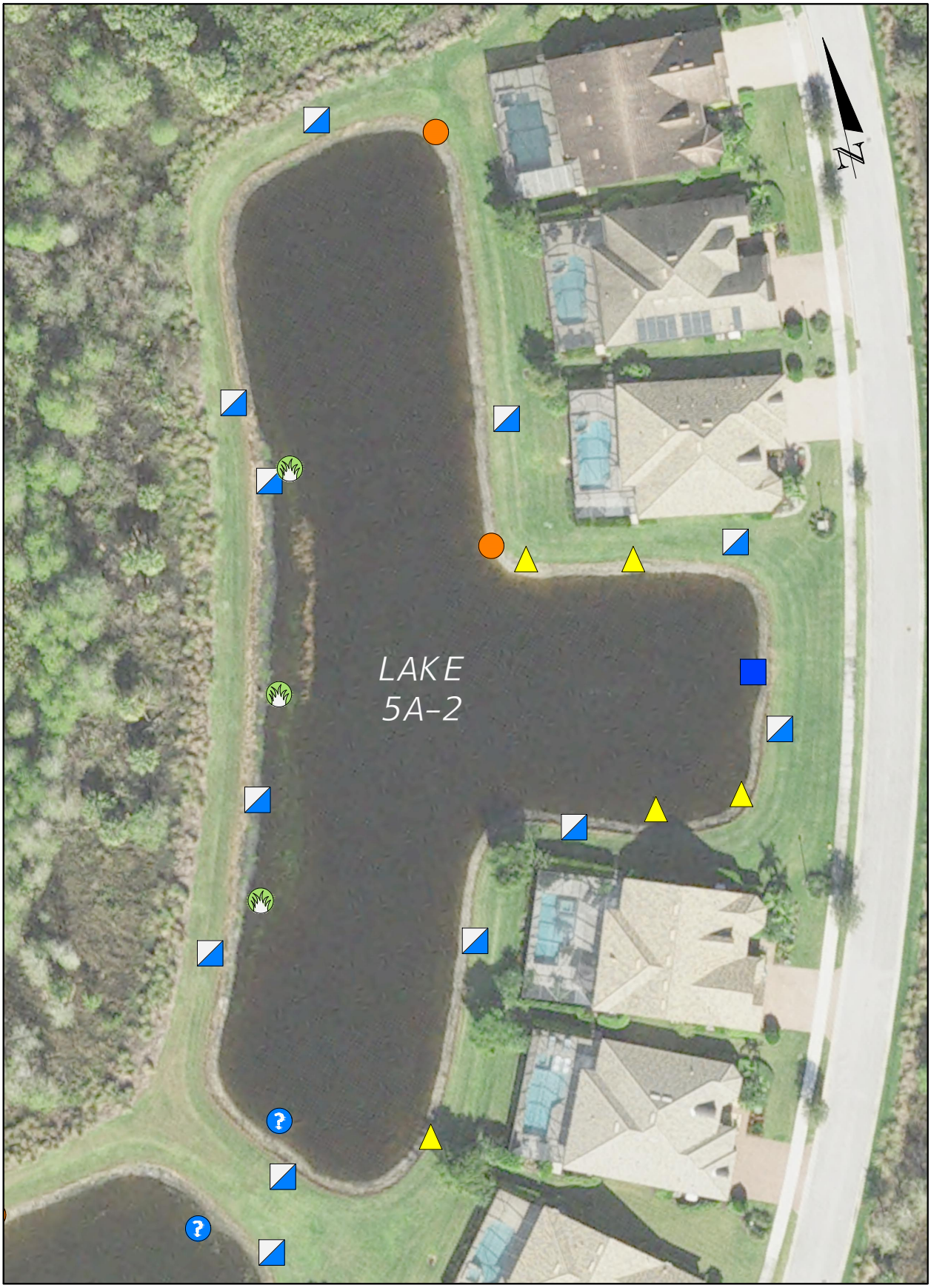

LAKE
5A-1
N

Lake 5A-2

Lake 5A-2	Data Only	Problem
Escarpment		2
Lank Bank Slope	11	
Off-Site Erosion - Homes		3
Off-Site Erosion - Other		2
Off-Site Erosion - Pool		
Rip-Rap		
Rip-Rap Underlayment		
Littoral Plantings	3	
Exotic Plant Located		
Erosion at Pipe		
Silt in Pipes		
Control Structure	1	
Miscellaneous/Other		1
Lake 5A-2 Totals	**15**	**8**

Lake 5A-2 is the northernmost lake in the community. A total of 23 data points were collected with 8 issues identified Off-site drainage from downspouts and pool connections caused most of the erosion. Two areas of escarpment were noted. There were no issues on the lake banks that bordered natural areas.

See Lake Map on Following Page


LAKE
5A-2
N

Lake 5B-1

Lake 5B-1	Data Only	Problem
Escarpment		
Lank Bank Slope	14	
Off-Site Erosion - Homes		8
Off-Site Erosion - Other		3
Off-Site Erosion - Pool		
Rip-Rap		
Rip-Rap Underlayment		
Littoral Plantings	5	
Exotic Plant Located		
Erosion at Pipe		
Silt in Pipes		
Control Structure		
Miscellaneous/Other	3	3
Lake 5B-1 Totals	**22**	**14**

Lake 5B-1 is located to the west of Mockingbird Court. A total of 36 data points were collected with 14 problems noted. A majority of the erosion was caused by off-site drainage from home-sites. There were two instances of erosion on the roadside of the lake. No erosion issues were present on the lake side that borders the preserve area.

See Lake Map on Following Page

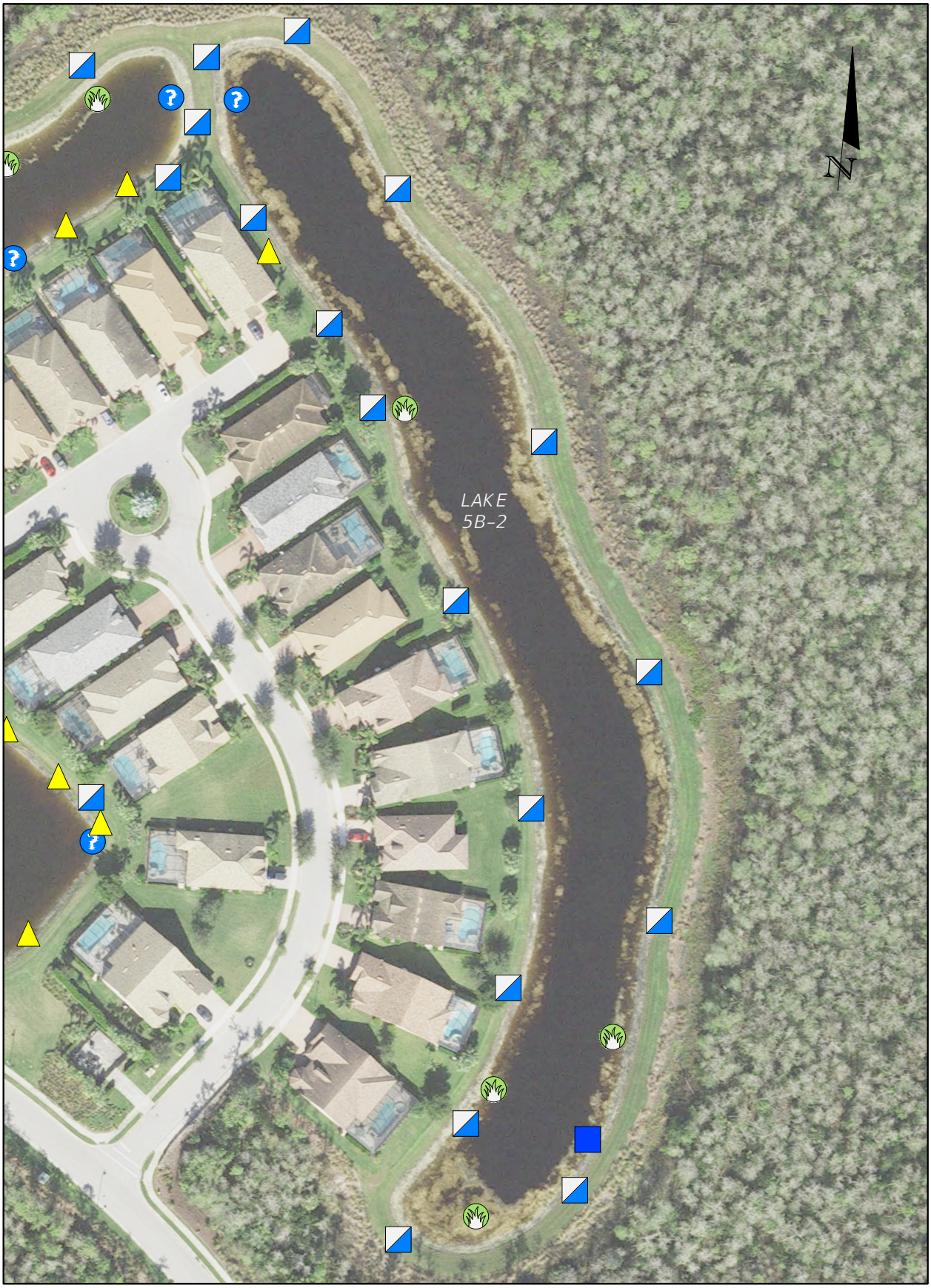

LAKE
5B-1
N

Lake 5B-2

Lake 5B-2	Data Only	Problem
Escarpment		
Lank Bank Slope	15	
Off-Site Erosion - Homes		1
Off-Site Erosion - Other		
Off-Site Erosion - Pool		
Rip-Rap		
Rip-Rap Underlayment		
Littoral Plantings	4	
Exotic Plant Located		
Erosion at Pipe		
Silt in Pipes		
Control Structure		1
Miscellaneous/Other	1	
Lake 5B-2 Totals	**20**	**2**

Lake 5B-2 is located to the east of Mockingbird Court. A total of 22 data points were collected with only two problems identified. There was only one instance of erosion caused by roof drainage. There was a small drainage swale installed in between most of the homes and the lake. This configuration has prevented erosion from the adjacent homes that is present in most other parts of the district. The other issue is the control structure is missing a grate top.

See Lake Map on Following Page

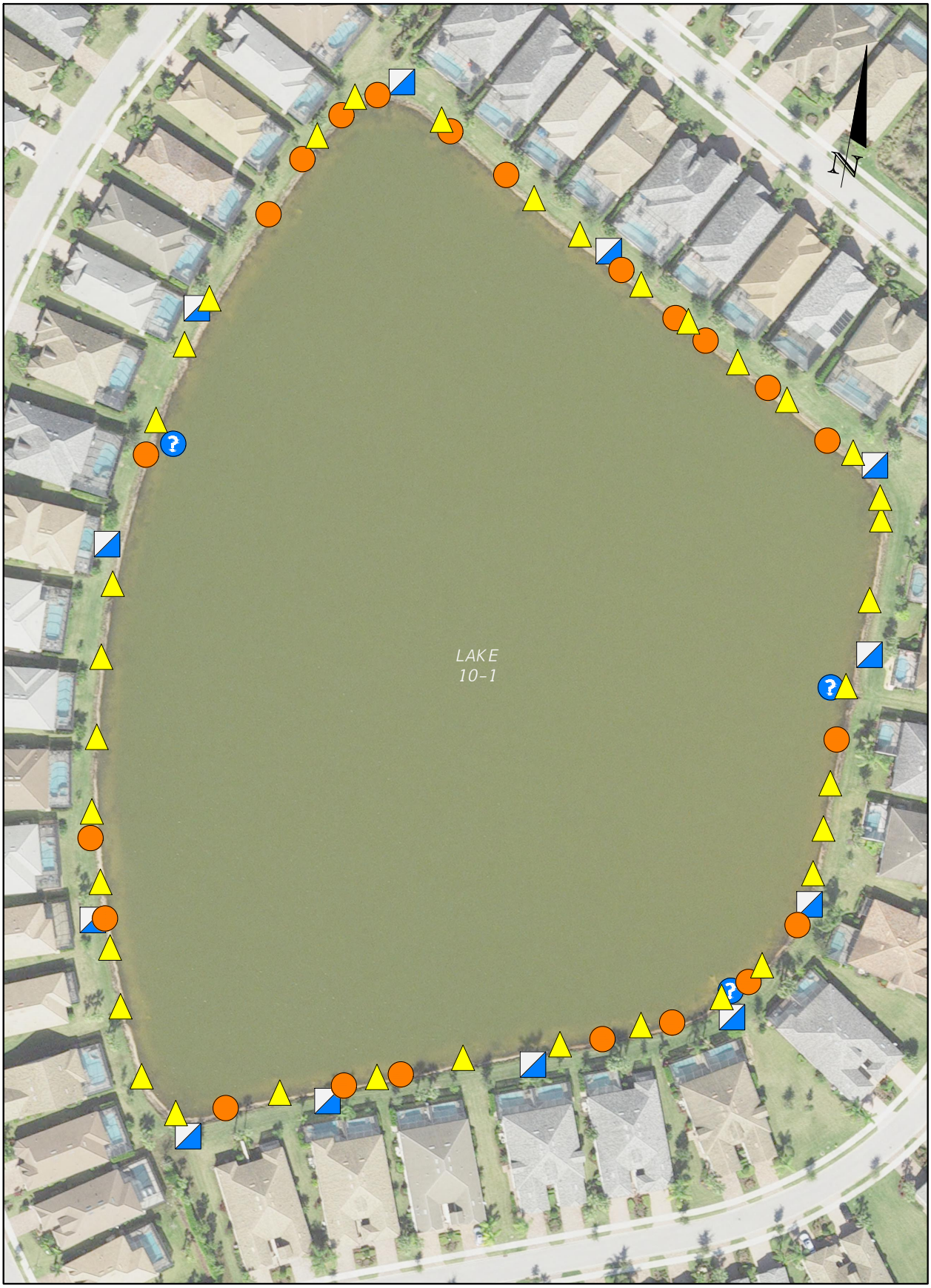

LAKE
5B-2
N

Lake 10-1

Lake 10-1	Data Only	Problem
Escarpment		22
Lank Bank Slope	12	
Off-Site Erosion - Homes		33
Off-Site Erosion - Other		1
Off-Site Erosion - Pool		2
Rip-Rap		
Rip-Rap Underlayment		
Littoral Plantings		
Exotic Plant Located		
Erosion at Pipe		
Silt in Pipes		
Control Structure		
Miscellaneous/Other	3	
Lake 10-1 Totals	**15**	**58**

Lake 10-1 is one of the largest lakes on-site and is surrounded by homes. A total of 73 data points were collected with 58 issues identified. There were 36 points of erosion cause by home-site drainage. This lake had the most cases of drop-off with 22 occurrences.

See Lake Map on Following Page


N
LAKE
10-1

Lake 10-2

Lake 10-2	Data Only	Problem
Escarpment		1
Lank Bank Slope	13	
Off-Site Erosion - Homes		14
Off-Site Erosion - Other		1
Off-Site Erosion - Pool		2
Rip-Rap		
Rip-Rap Underlayment		
Littoral Plantings	7	
Exotic Plant Located		
Erosion at Pipe		
Silt in Pipes		
Control Structure		
Miscellaneous/Other	4	
Lake 10-2 Totals	**24**	**18**

Lake 10-2 is triangular in shape and surrounded by homes on two sides. A total of 42 data points were collected with 18 problems identified. Almost all of the erosion issues are caused from downspouts and a couple of instances of poll overflow. One area of escarpment was observed. There were no issues on the third side of the lake where no homes are present.

See Lake Map on Following Page

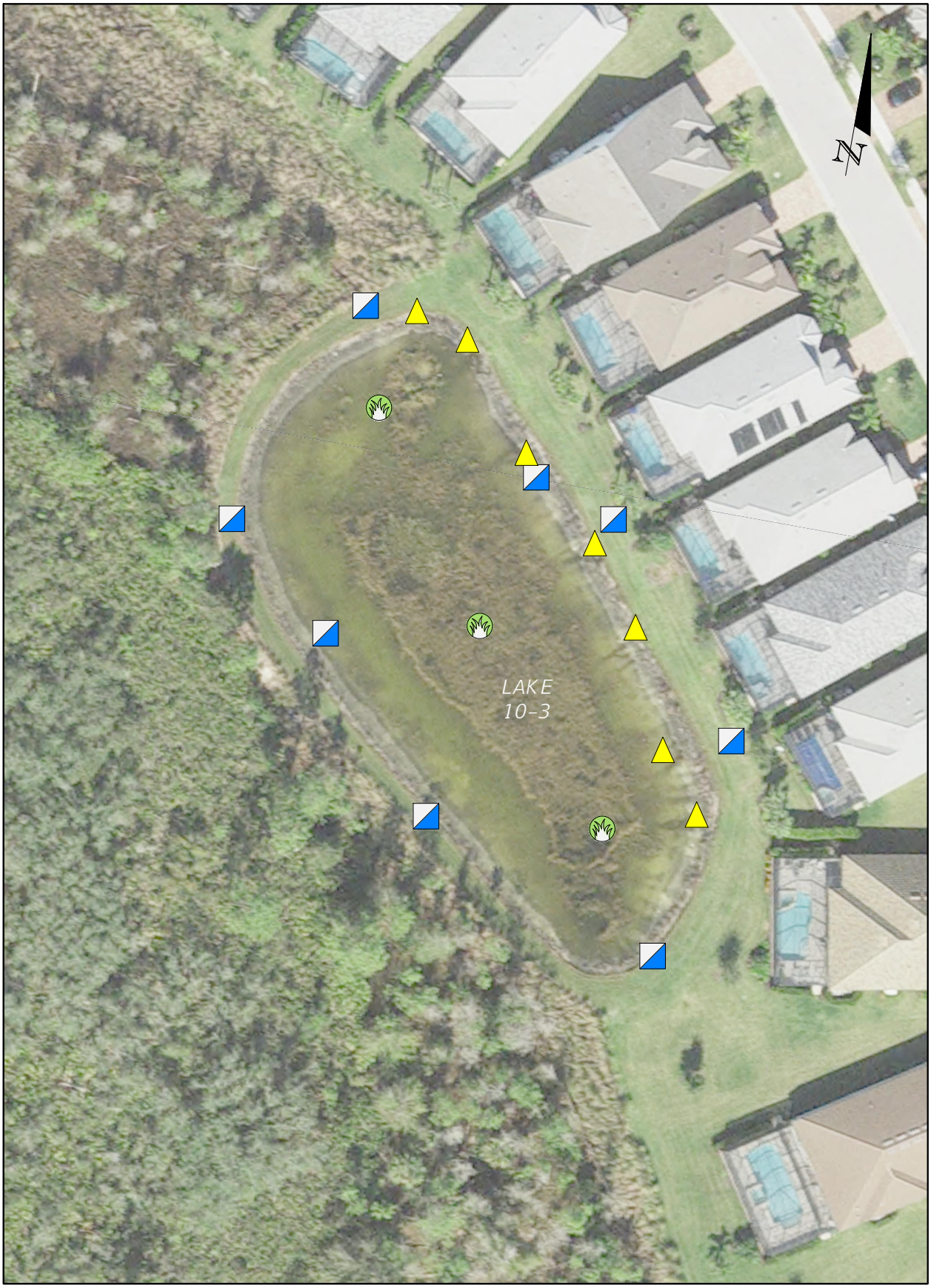

N
LAKE
10-2

Lake 10-3

Lake 10-3	Data Only	Problem
Escarpment		
Lank Bank Slope	8	
Off-Site Erosion - Homes		7
Off-Site Erosion - Other		
Off-Site Erosion - Pool		
Rip-Rap		
Rip-Rap Underlayment		
Littoral Plantings	3	
Exotic Plant Located		
Erosion at Pipe		
Silt in Pipes		
Control Structure		
Miscellaneous/Other		
Lake 10-3 Totals	**11**	**7**

Lake 10-3 is located at the southern end of Winding Cypress Drive and is one of the smaller lakes. A total of 18 data points were collected with 7 problems identified. All of the erosion issues are on one side of the lake which is adjacent to homes and caused by rooftop drainage.

See Lake Map on Following Page

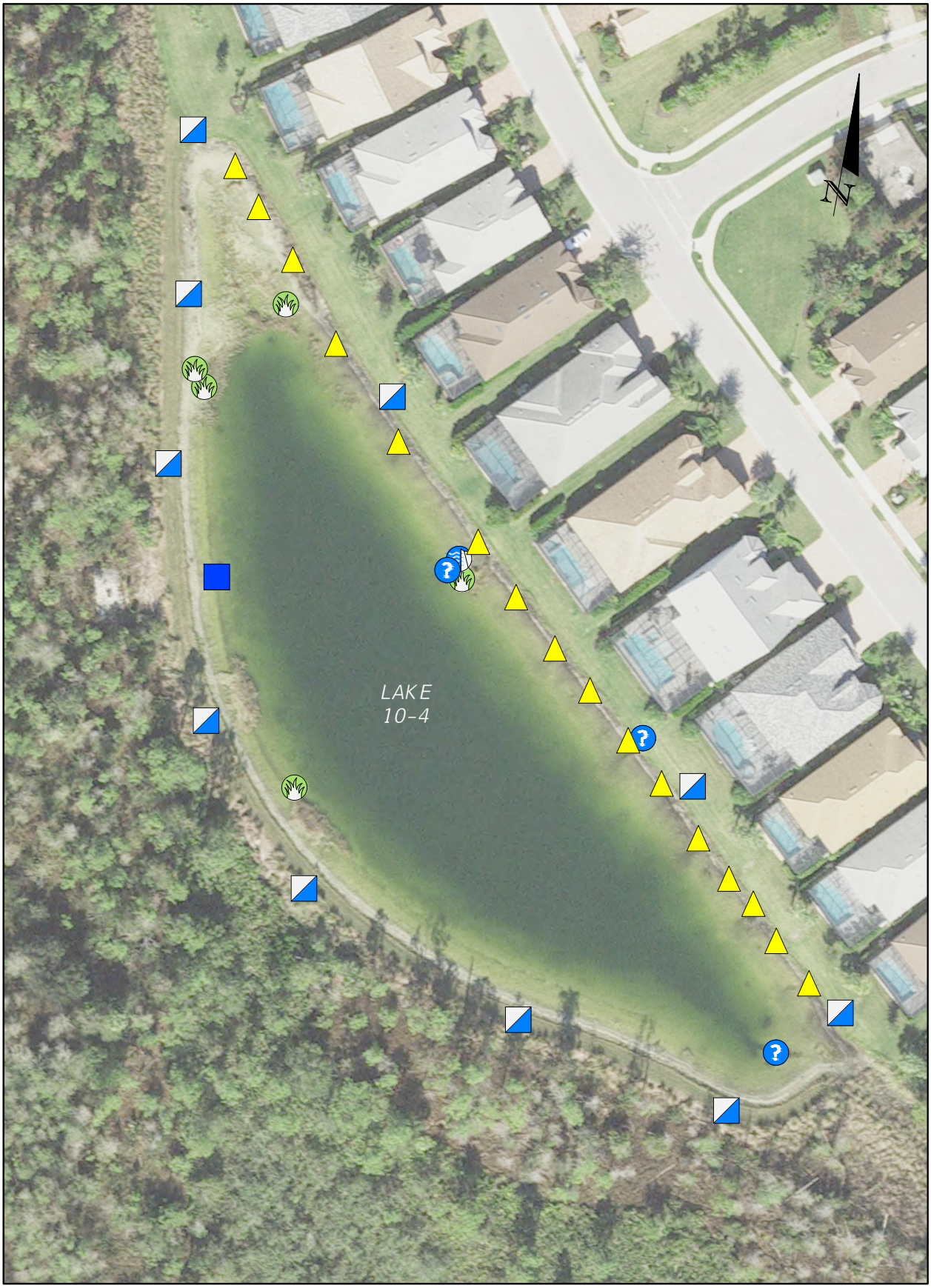

N
LAKE
10-3

Lake 10-4

Lake 10-4	Data Only	Problem
Escarpment		
Lank Bank Slope	10	
Off-Site Erosion - Homes		10
Off-Site Erosion - Other		
Off-Site Erosion - Pool		6
Rip-Rap		
Rip-Rap Underlayment		
Littoral Plantings	5	
Exotic Plant Located		
Erosion at Pipe		1
Silt in Pipes		
Control Structure	1	
Miscellaneous/Other	2	1
Lake 10-4 Totals	**18**	**18**

Lake 10-4 is located just north of Lake 10-3. A total of 36 data points were taken with 18 problems observed. Much like the previous lake, all of the erosion issues are on the one side of the lake where homes are present. 10 of the erosion issues were caused by downspouts, while 6 where a result of pool overflow connection. One instance of erosion around a drainage pipe was noted.

See Lake Map on Following Page

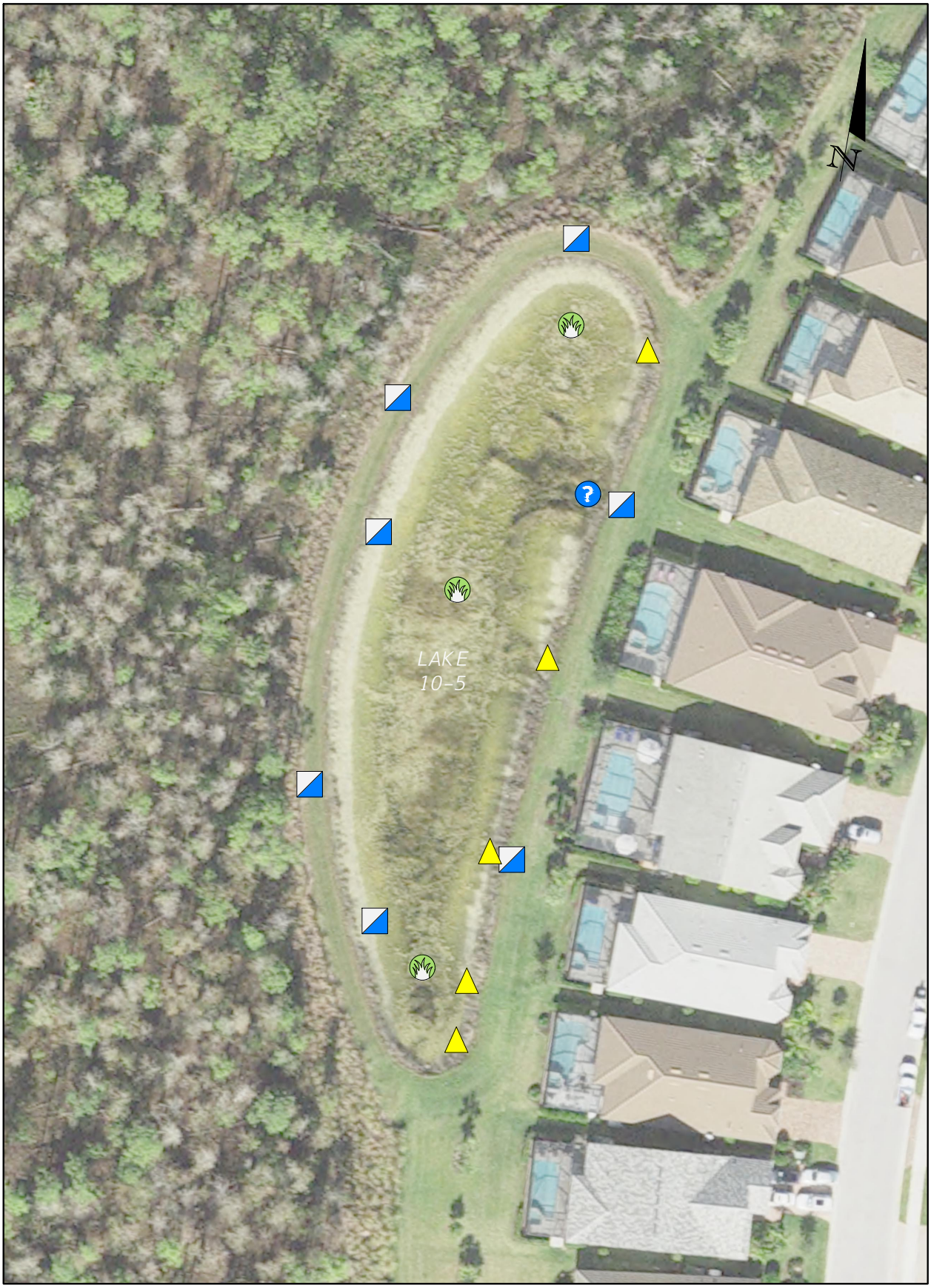

N
LAKE
10-4

Lake 10-5

Lake 10-5	Data Only	Problem
Escarpment		
Lank Bank Slope	7	
Off-Site Erosion - Homes		5
Off-Site Erosion - Other		
Off-Site Erosion - Pool		
Rip-Rap		
Rip-Rap Underlayment		
Littoral Plantings	3	
Exotic Plant Located		
Erosion at Pipe		
Silt in Pipes		
Control Structure		
Miscellaneous/Other	1	
Lake 10-5 Totals	**11**	**5**

Lake 10-5 is a small lake with homes bordering on one side. A total of 16 data points were collected with 5 problems identified. All of the erosion issues are on one side of the lake which is adjacent to homes and caused by rooftop drainage.

See Lake Map on Following Page

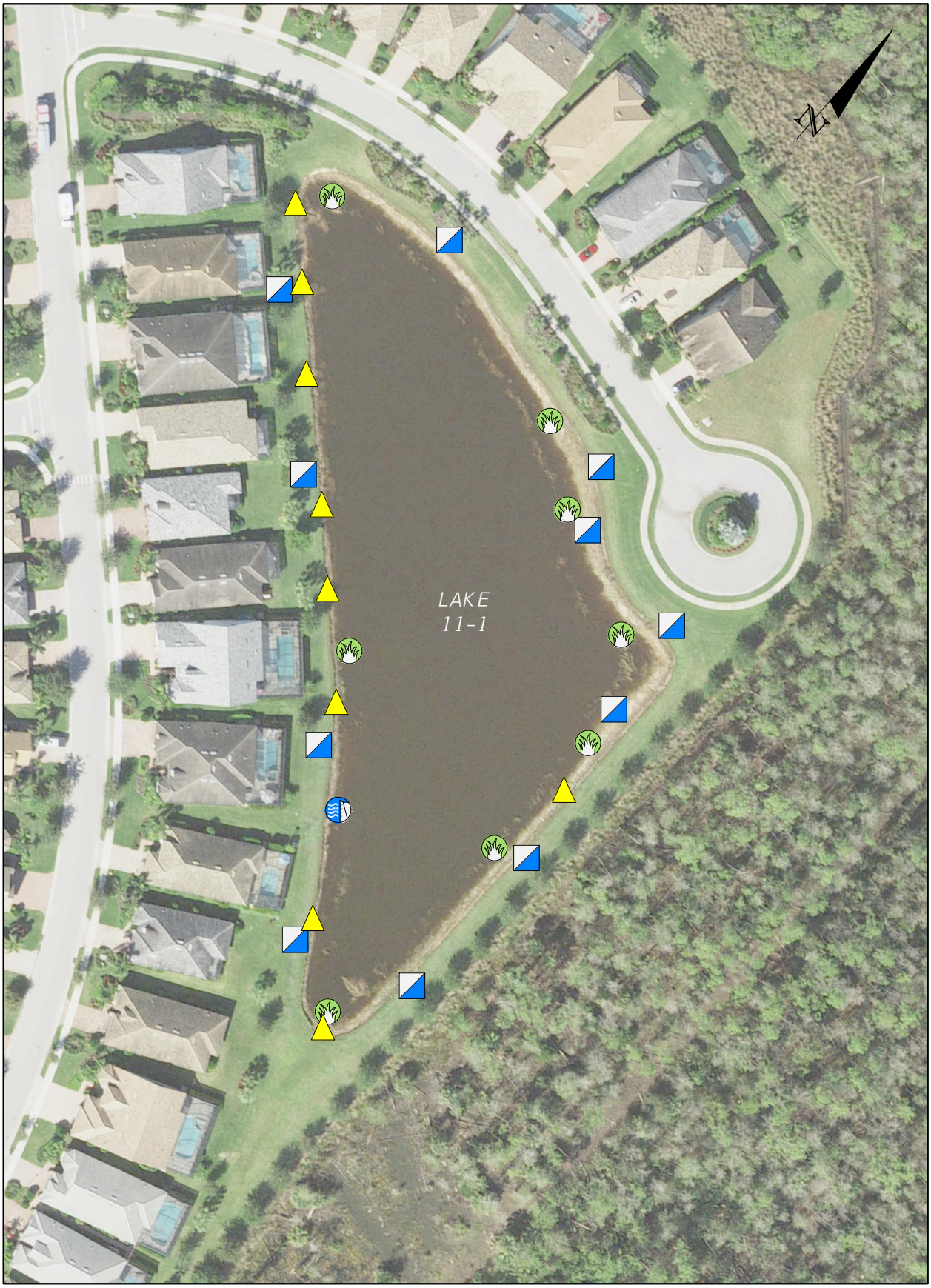

N
LAKE
10-5

Lake 11-1

Lake 11-1	Data Only	Problem
Escarpment		
Lank Bank Slope	11	
Off-Site Erosion - Homes		7
Off-Site Erosion - Other		2
Off-Site Erosion - Pool		
Rip-Rap		
Rip-Rap Underlayment		
Littoral Plantings	7	1
Exotic Plant Located		
Erosion at Pipe		1
Silt in Pipes		
Control Structure		
Miscellaneous/Other		
Lake 11-1 Totals	**18**	**11**

Lake 11-1 is located along Chenille Court. A total of 29 data points were collected with 11 issues identified Nearly all of the erosion was caused by downspouts from adjacent homes. There was one instance of off-site erosion on the natural side. Erosion was noted at the connection pipe.

See Lake Map on Following Page

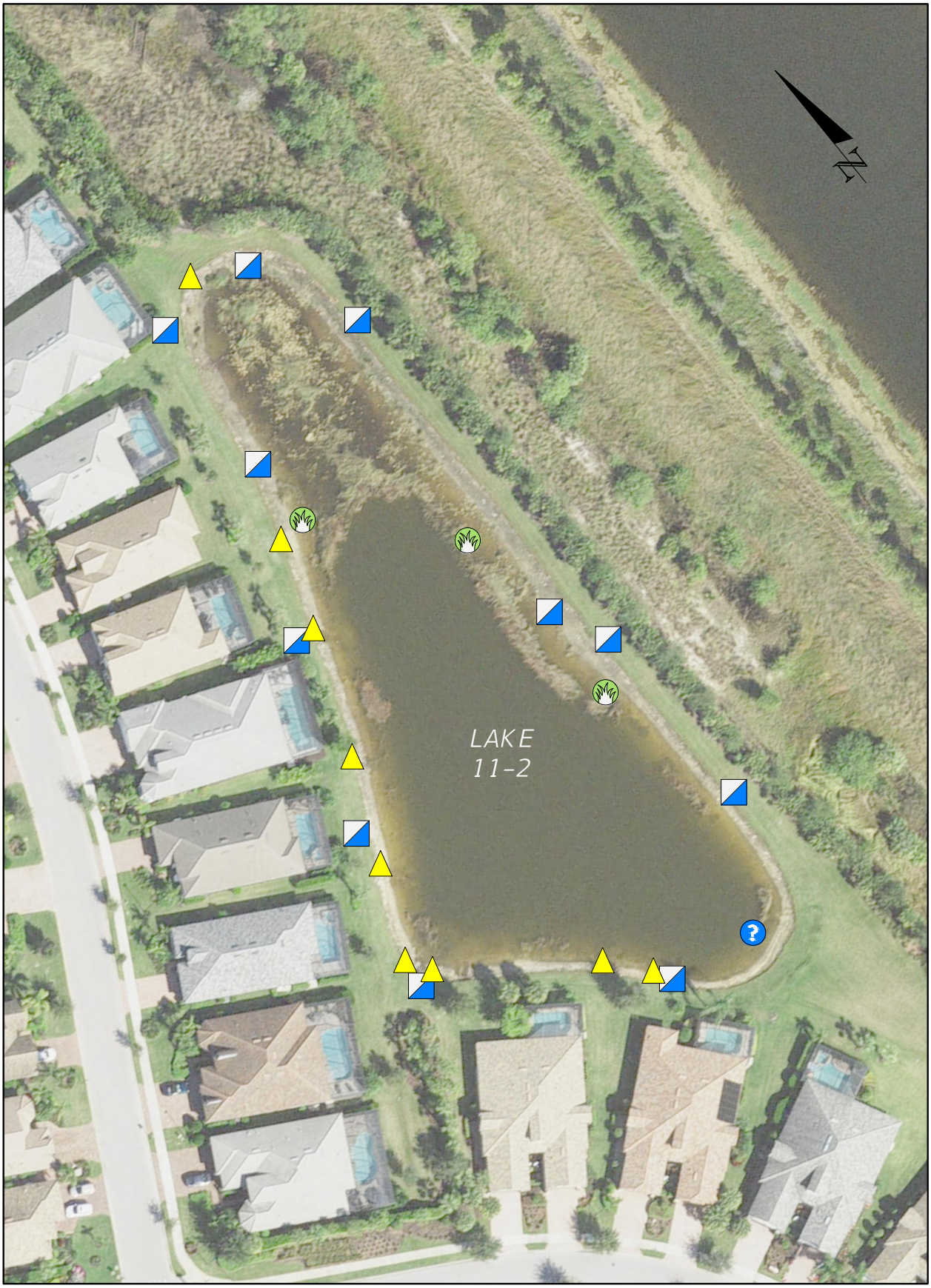

LAKE
11-1
N

Lake 11-2

Lake 11-2	Data Only	Problem
Escarpment		
Lank Bank Slope	11	
Off-Site Erosion - Homes		8
Off-Site Erosion - Other		1
Off-Site Erosion - Pool		
Rip-Rap		
Rip-Rap Underlayment		
Littoral Plantings	3	
Exotic Plant Located		
Erosion at Pipe		
Silt in Pipes		
Control Structure		
Miscellaneous/Other	1	
Lake 11-2 Totals	**15**	**9**

Lake 11-2 is located south of Lake 11-1. A total of 24 data points were collected with 9 problems identified. All of the erosion was caused by off-site drainage. 8 instances were from rooftop drainage, and one was from a swale on the north side of the lake.

See Lake Map on Following Page


LAKE
11-2
N

Lake 11-3

Lake 11-3	Data Only	Problem
Escarpment		5
Lank Bank Slope	10	
Off-Site Erosion - Homes		19
Off-Site Erosion - Other		
Off-Site Erosion - Pool		4
Rip-Rap		
Rip-Rap Underlayment		
Littoral Plantings		
Exotic Plant Located		
Erosion at Pipe		1
Silt in Pipes		
Control Structure		
Miscellaneous/Other	2	
Lake 11-3 Totals	**12**	**29**

Lake 11-3 is triangular and completely surrounded by homes. A total of 41 data points were collected with 29 problems identified. Nearly 80% of the erosion points were caused by discharge from adjacent homes, mostly from downspouts and 4 instances of pool overflow. Escarpment was noted in 5 locations. Erosion around a pipe connection was also present.

See Lake Map on Following Page


LAKE
11-3
N

Lake 11-4

Lake 11-4	Data Only	Problem
Escarpment		5
Lank Bank Slope	11	
Off-Site Erosion - Homes		27
Off-Site Erosion - Other		
Off-Site Erosion - Pool		3
Rip-Rap		
Rip-Rap Underlayment		
Littoral Plantings		
Exotic Plant Located		
Erosion at Pipe		
Silt in Pipes		
Control Structure		
Miscellaneous/Other	2	1
Lake 11-4 Totals	**13**	**36**

Lake 11-4 is also triangular in shape and surrounding be homes. A total of 49 data points were collected with 36 problems identified. Similar to Lake 11-3, a majority of the erosion is due to off-site drainage from residential lots. There were 27 instances of erosion from rooftop drainage and 3 issues with pool overflow connections.

See Lake Map on Following Page

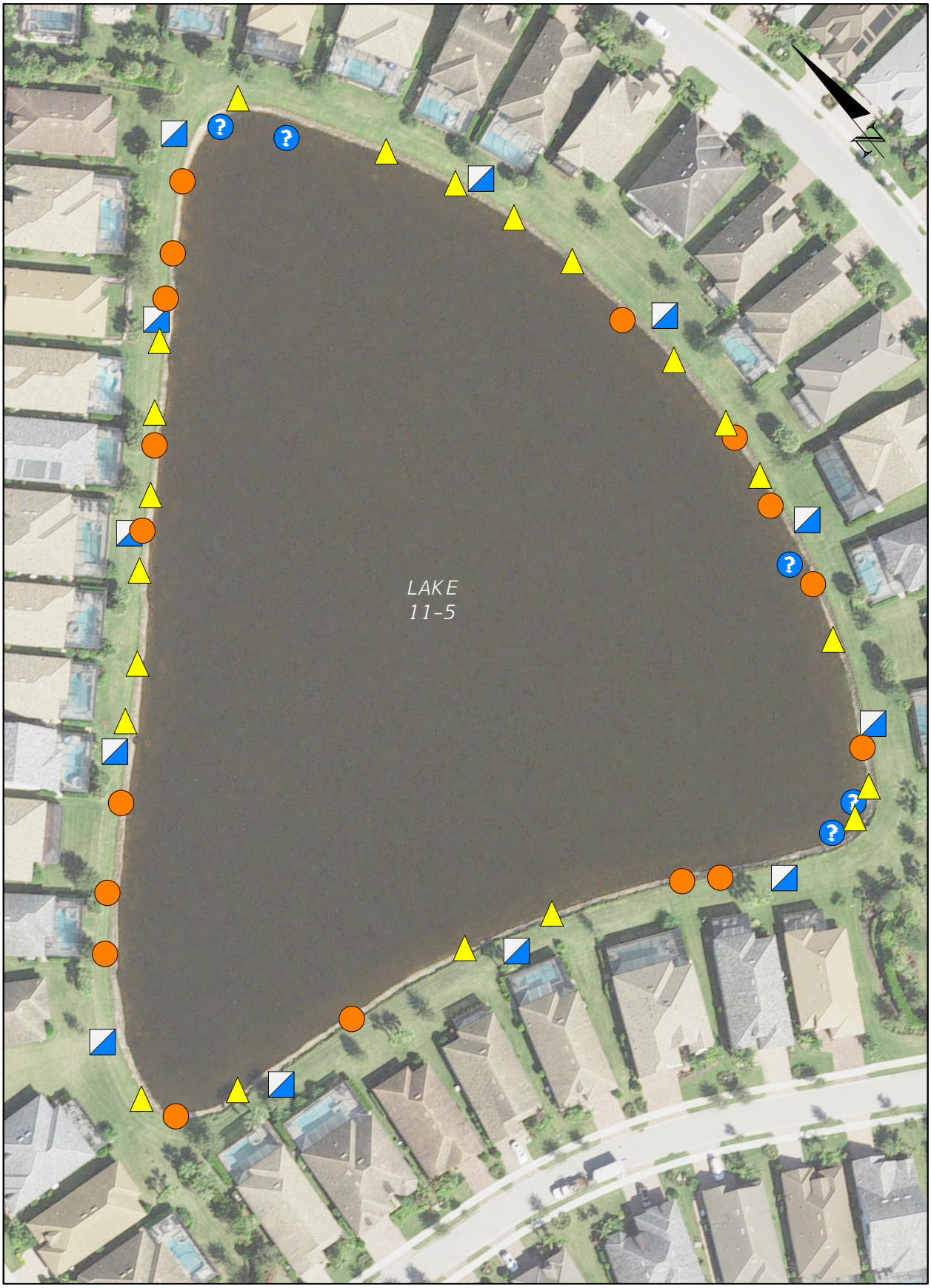

LAKE
11-4
N

Lake 11-5

Lake 11-5	Data Only	Problem
Escarpment		17
Lank Bank Slope	12	
Off-Site Erosion - Homes		20
Off-Site Erosion - Other		1
Off-Site Erosion - Pool		
Rip-Rap		
Rip-Rap Underlayment		
Littoral Plantings		
Exotic Plant Located		
Erosion at Pipe		
Silt in Pipes		
Control Structure		
Miscellaneous/Other	5	
Lake 11-5 Totals	**17**	**38**

Lake 11-5 is located across the street from Lake 11-4. Residential homes border the entire lake perimeter. A total of 55 data points were collected with 38 problems identified. 20 points of erosion were due to downspouts, and one was from a swale located on the southeast corner of the lake. This lake also had a large amount of escarpment with 17 areas noted.

See Lake Map on Following Page


LAKE
11-5
N

Lake 11-6

Lake 11-6	Data Only	Problem
Escarpment		
Lank Bank Slope	14	
Off-Site Erosion - Homes		16
Off-Site Erosion - Other		2
Off-Site Erosion - Pool		3
Rip-Rap		
Rip-Rap Underlayment		
Littoral Plantings	7	
Exotic Plant Located		
Erosion at Pipe		1
Silt in Pipes		
Control Structure	1	
Miscellaneous/Other	1	1
Lake 11-6 Totals	**23**	**23**

Lake 11-6 is located at the northern corner of Winding Cypress Drive and Blackberry Drive. A total of 46 data points were collected with half of them identified as problems. 16 of the 21 erosion points were caused by downspouts from rooftops and 2 were a result of pool connections. The other 2 instances were on the preserve side of the lake. Erosion around a connection pipe was also observed.

See Lake Map on Following Page

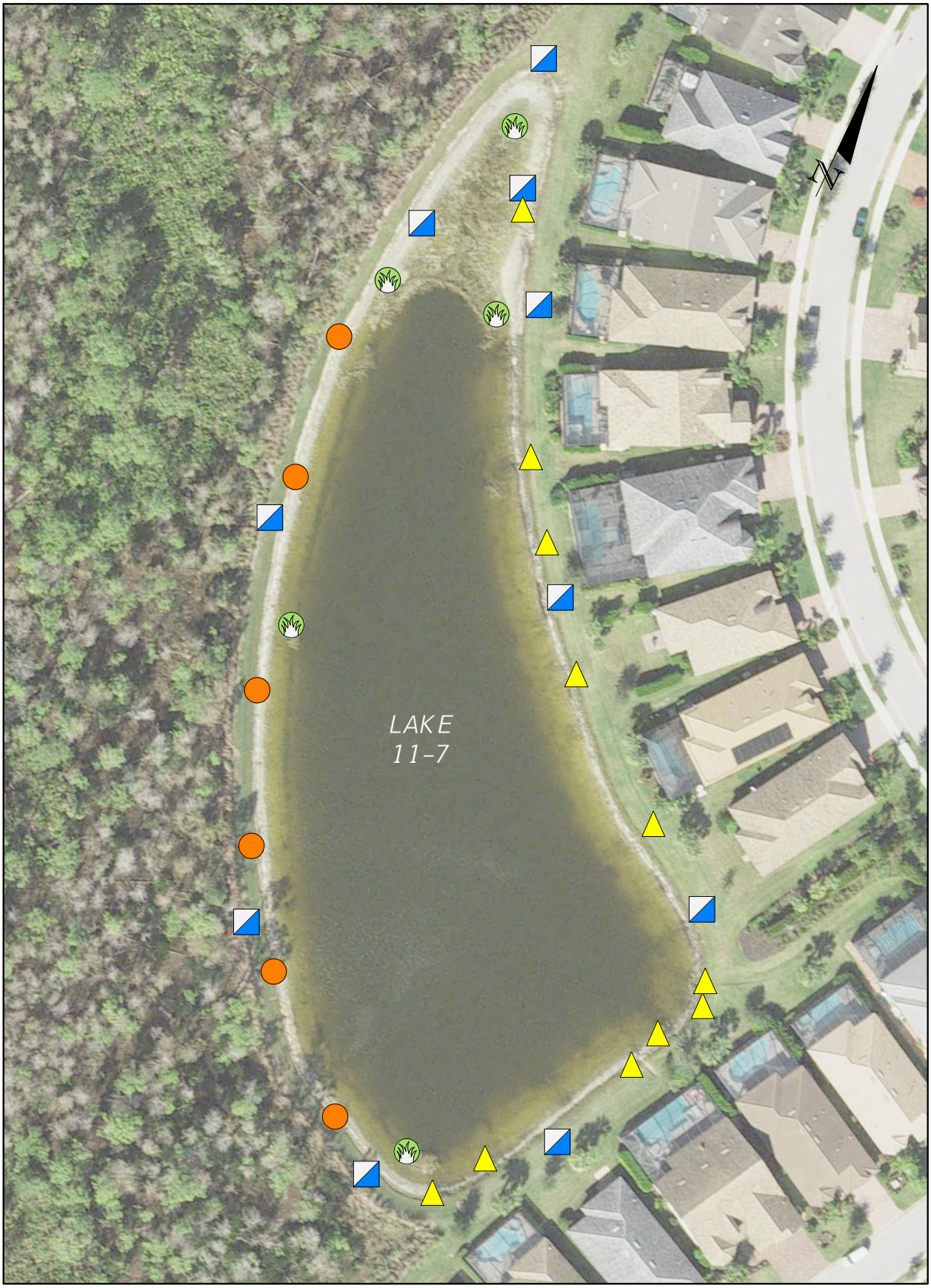

LAKE
11-6
N

Lake 11-7

Lake 11-7	Data Only	Problem
Escarpment		6
Lank Bank Slope	10	
Off-Site Erosion - Homes		8
Off-Site Erosion - Other		1
Off-Site Erosion - Pool		2
Rip-Rap		
Rip-Rap Underlayment		
Littoral Plantings	5	
Exotic Plant Located		
Erosion at Pipe		
Silt in Pipes		
Control Structure		
Miscellaneous/Other		
Lake 11-7 Totals	**15**	**17**

Lake 11-7 is located at the southern corner of Winding Cypress Drive and Blackberry Drive. A total of 32 data points were collected with 17 identified as problems. There were 11 erosion issues caused by off-site drainage, with 8 instances caused from downspouts, two from a pool overflow pipes, and one from a swale in the northeast corner. Escarpment was observed in 6 locations, all of which were located on the natural side of the lake.

See Lake Map on Following Page


LAKE
11-7

Lake Totals

Lake Totals	Data Only	Problem	Pct. of Problem
Escarpment	0	84	15.91%
Lank Bank Slope	329	1	0.19%
Off-Site Erosion - Homes	3	322	60.98%
Off-Site Erosion - Other	0	29	5.49%
Off-Site Erosion - Pool	0	30	5.68%
Rip-Rap	2	3	0.57%
Rip-Rap Underlayment	0	1	0.19%
Littoral Plantings	116	2	0.38%
Exotic Plant Located	0	2	0.38%
Erosion at Pipe	0	14	2.65%
Silt in Pipes	0	6	1.14%
Control Structure	5	2	0.38%
Miscellaneous/Other	29	32	6.06%
LAKE TOTALS	**484**	**528**	

1,012 data points were collected in the 29 lakes contained within the district. Just over half of these points were identified as problems. Over 70% of the instances are cause by off-site drainage entering the lake. 66% are directly from home sites mostly associated with downspouts conveying rooftop drainage while about 5% can be attributed to pool overflow pipes. Escarpment made up approximately 16% of the lake issues and was noted on 19 of the 29 lakes. There was only one instance where the side slope of a lake bank exceeded the maximum slope. It should be noted that many of the banks were well below the minimum slope required. The rest of the issues were minor in nature regarding erosion around connection pipes and mitered end sections into the lakes and/or silt build-up in these connection.