2025 Upper and Lower Goldwater Lake

SEDIMENT SURVEY AND LAKE CHARACTERIZATION

Presented to:

Jeremy Cordova, Environmental Project Manager
City of Prescott
433 N. Virginia Street
Prescott, AZ 86301



Aquatic Consulting & Testing, Inc.
1525 W. University Dr., Suite 106
Tempe, Arizona 85281

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Introduction and Activity Summary

Aquatic Consulting and Testing, Inc. (AC&T) conducted bathymetric and sediment surveys for the City of Prescott, which consisted of two (2) of the Cities lakes. The sediment surveys were conducted on May 20, 2025. It should be noted that Willow Lake was also scheduled for bathymetric mapping; however, when AC&T arrived onsite to conduct the survey the lake level was too low to gather useful data. Through discussions with a city representative it was learned that the lake had been lowered in support of a construction project farther downstream and will not be filled to normal operating level for 12-24 months.

Water depth and sediment composition measurements were made with a Lowrance bottom mapping sonar capable of taking more than 2,000 readings per minute. A calibrated sludge judge was used to verify sediment pockets and calibrate the sonar model. Collected data were uploaded to Biobase cloud servers for analysis and map generation. Two different contour maps were generated for each of the lakes. One map displays the total volume of the lake (water depth contours) and the other the sediment composition within the lake. Volume calculations were also conducted using Biobase.

Water and Sediment Depth Survey Results

Contour Maps

The sonar data was used to generate contour maps of lake water and sediment composition. The individual maps for each of the 2 lakes are provided in Appendix A. Total Lake and sediment volume data for each lake are listed below (Table 1).

Table 1. 2025 Water and Sediment Data

2025 Lake	Lake Surface Acres	Total Volume (Acre Feet)	Total Volume (Cubic Yards)	Sediment Volume (Cubic Yards)	Sediment Volume as % Total Volume
Upper	22.4	358	577,454	114,809	19.87%
Lower	13.7	174	280,662	104,084	37.07%

Discussion

Upper and Lower Goldwater Lakes have levels of sedimentation that would be expected given the age of the Lakes and the slope of the surrounding terrain. AC&T uses a general rule of thumb that lake sedimentation begins to cause water quality issues when it approaches 15-20% of the total lake volume. Upper Goldwater Lake's sediment occupies approximately 19.87% of the total lake volume. Lower Goldwater Lake's sediment occupies approximately 37.07% of the total lake volume. Aquatic vegetation was also mapped and shows that growth is limited to the areas of the lake with depths less than 10 feet (Vegetation maps are included in Appendix A-2). The accumulation of sediment within both lakes suggests the potential for water quality issues with the sediment serving as a major source of endogenous phosphorus loading which could cause widespread algae blooms and aquatic weed growth. Additionally, as lakes become more sedimented the percentage of the lake available to aquatic weed growth increases.

APPENDIX A

WATER AND SEDIMENT DEPTH CONTOUR MAPS

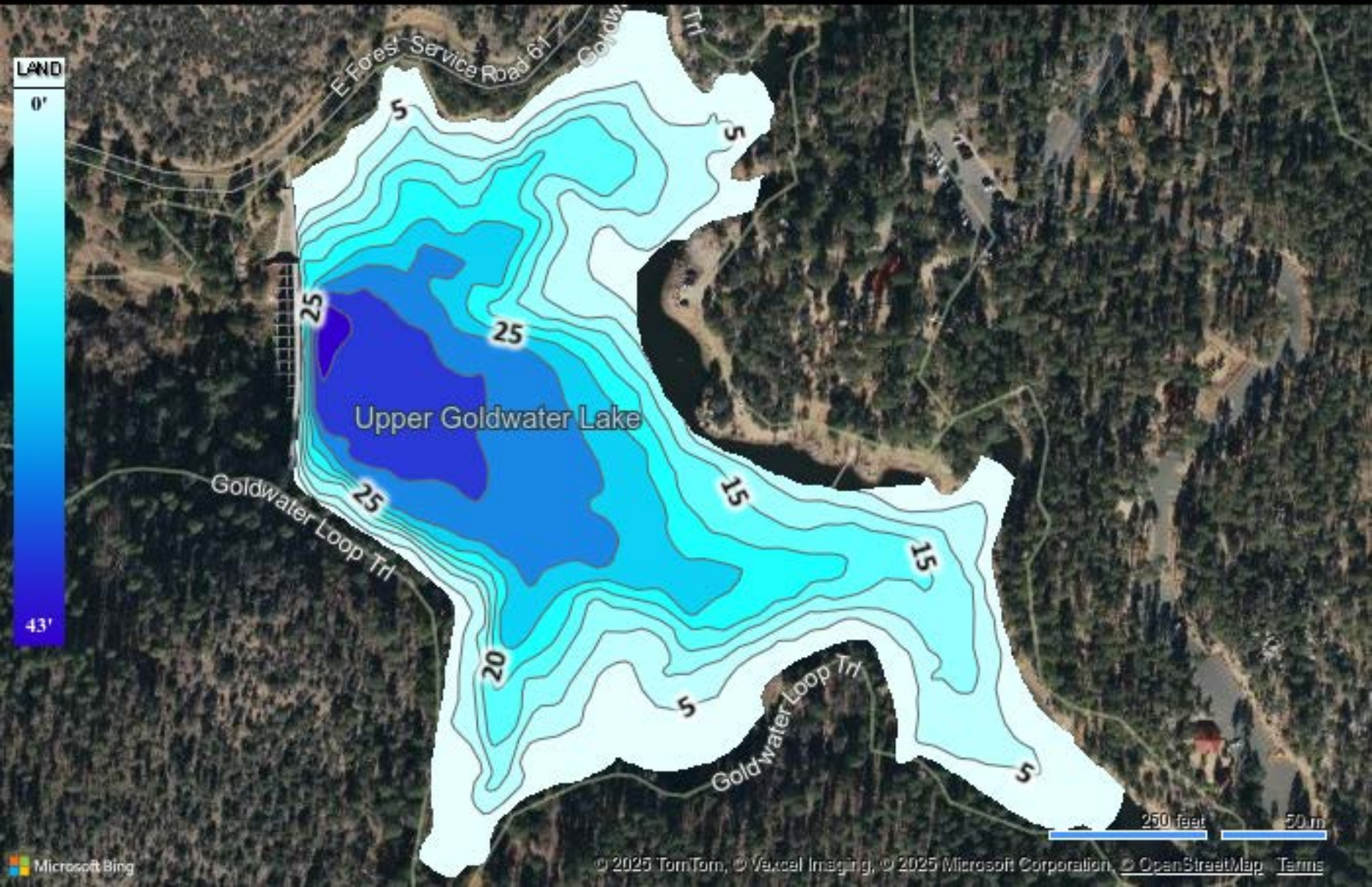
A-1: 2025 CONDITIONS

A-2: 2025 VEGITATION HEAT MAPS

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Upper Goldwater Lake
5/20/2025

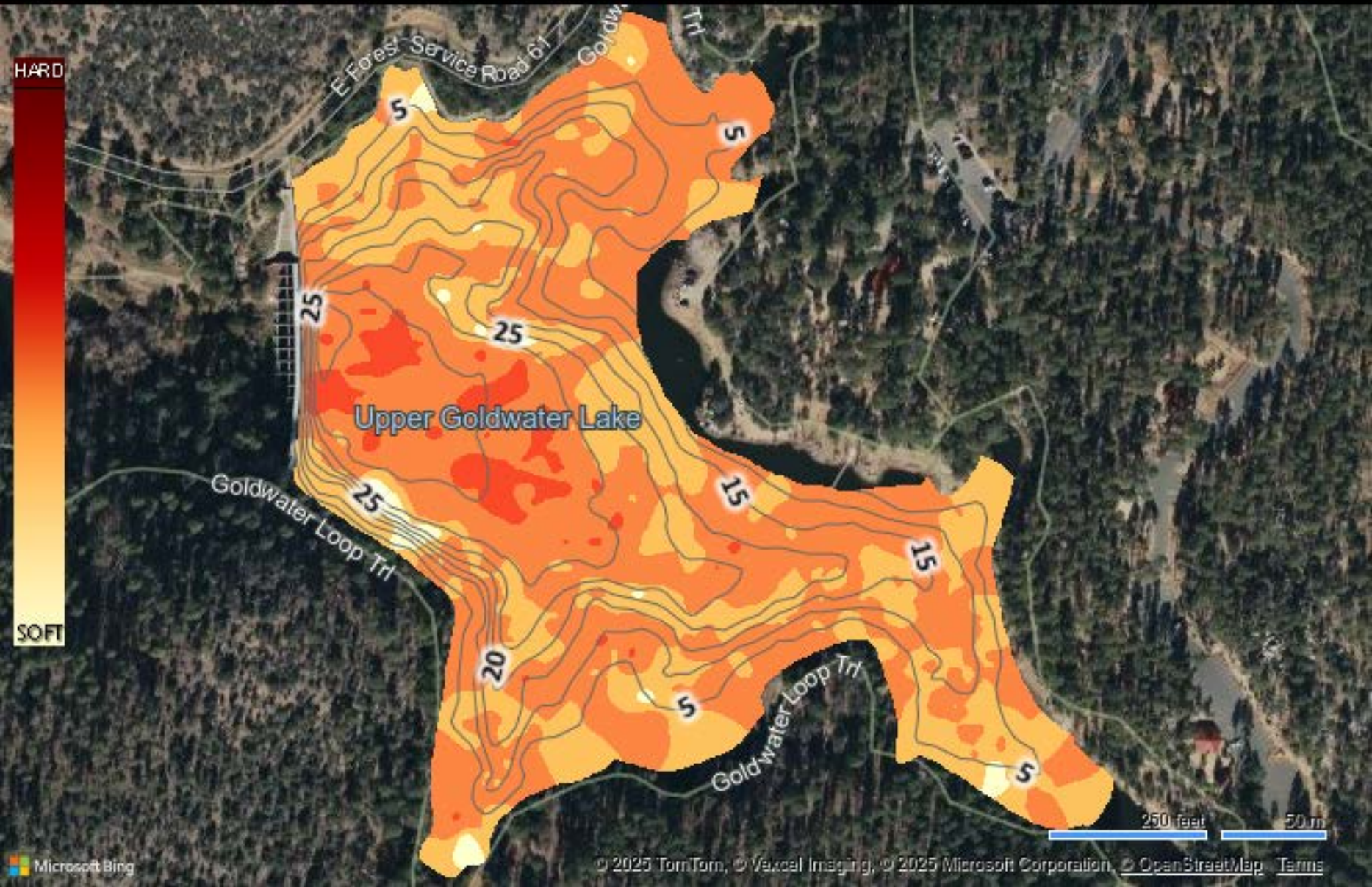
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Upper Goldwater Lake
5/20/2025

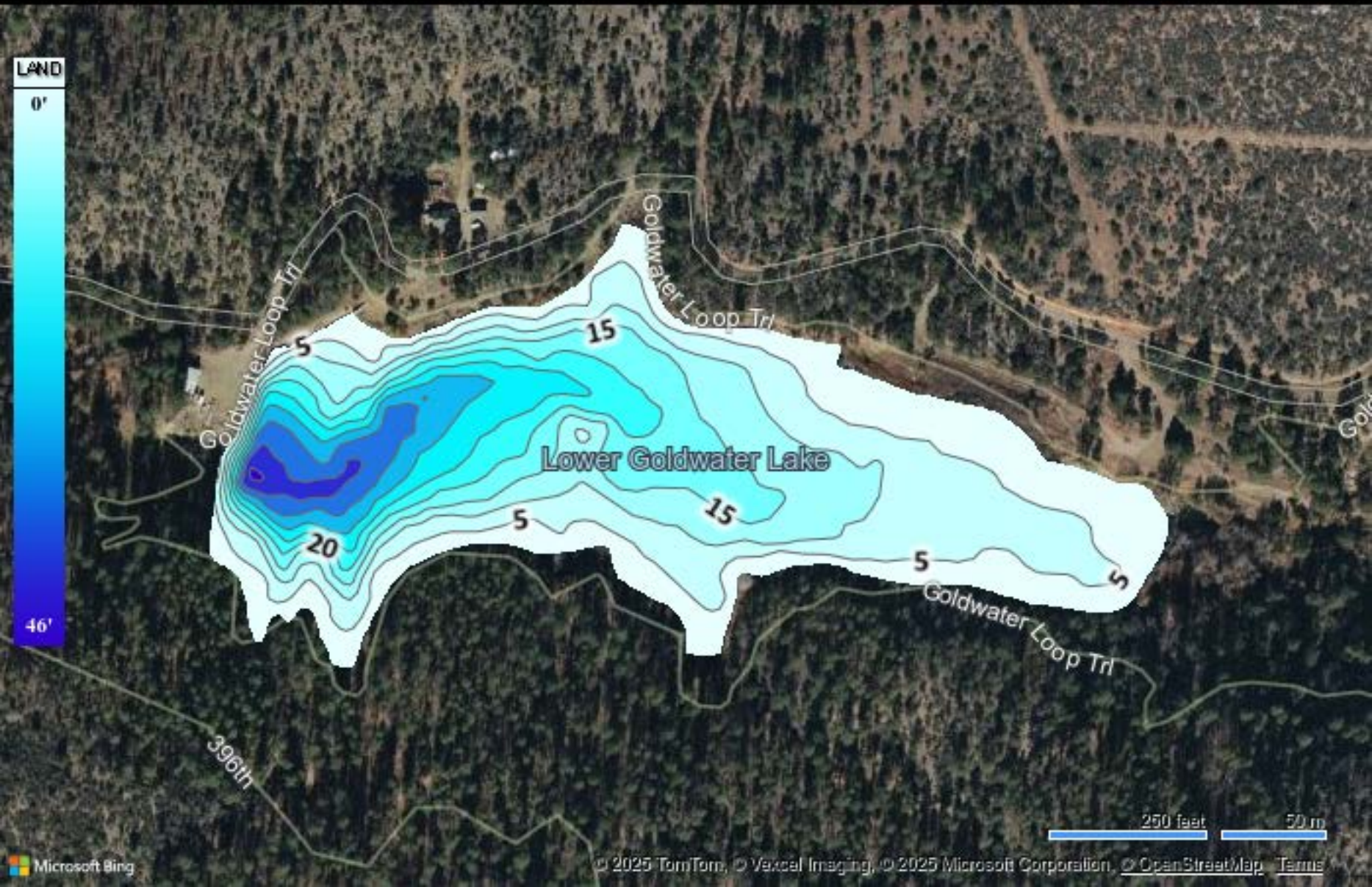
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Lower Goldwater Lake
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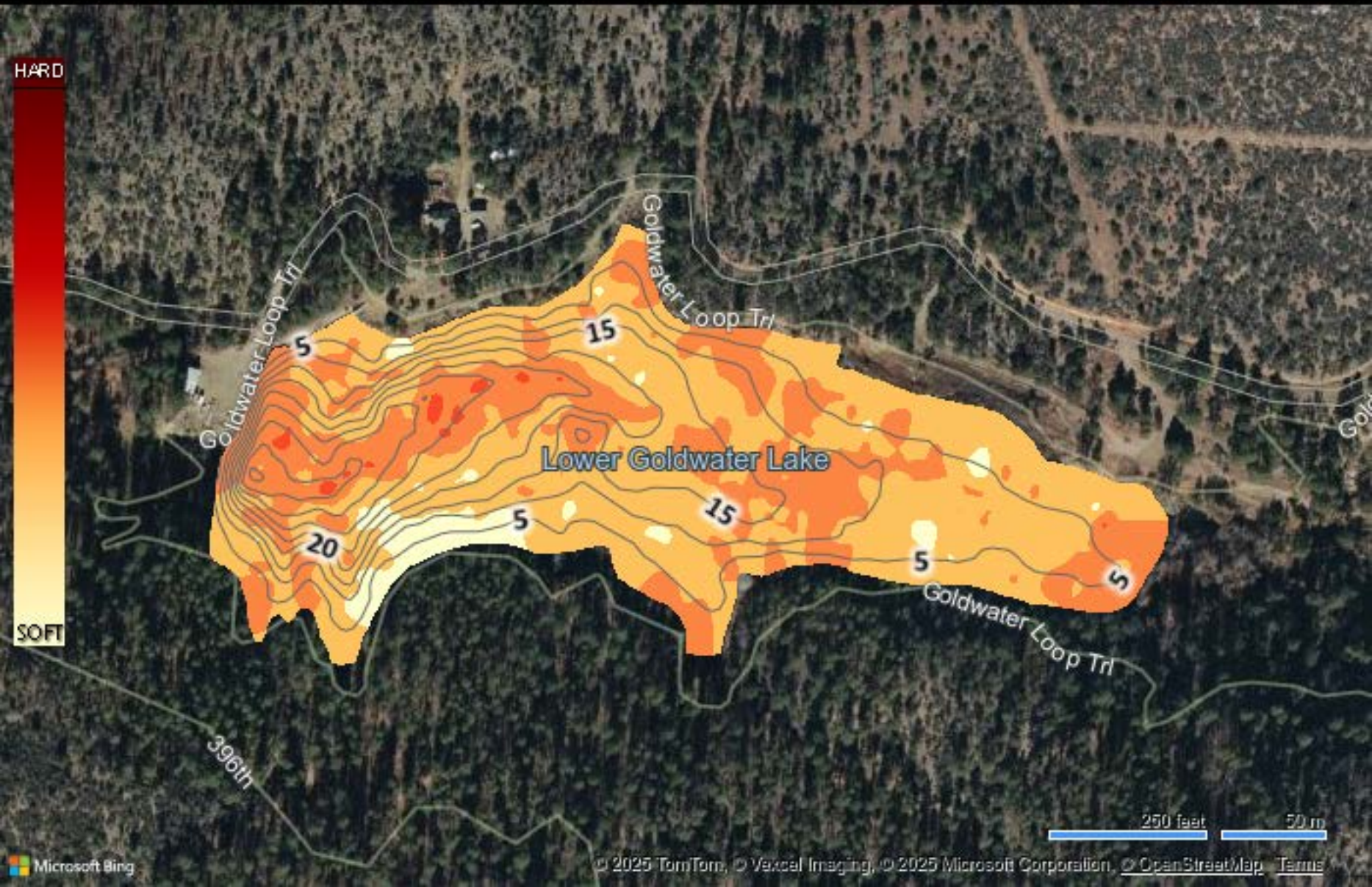
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Lower Goldwater Lake
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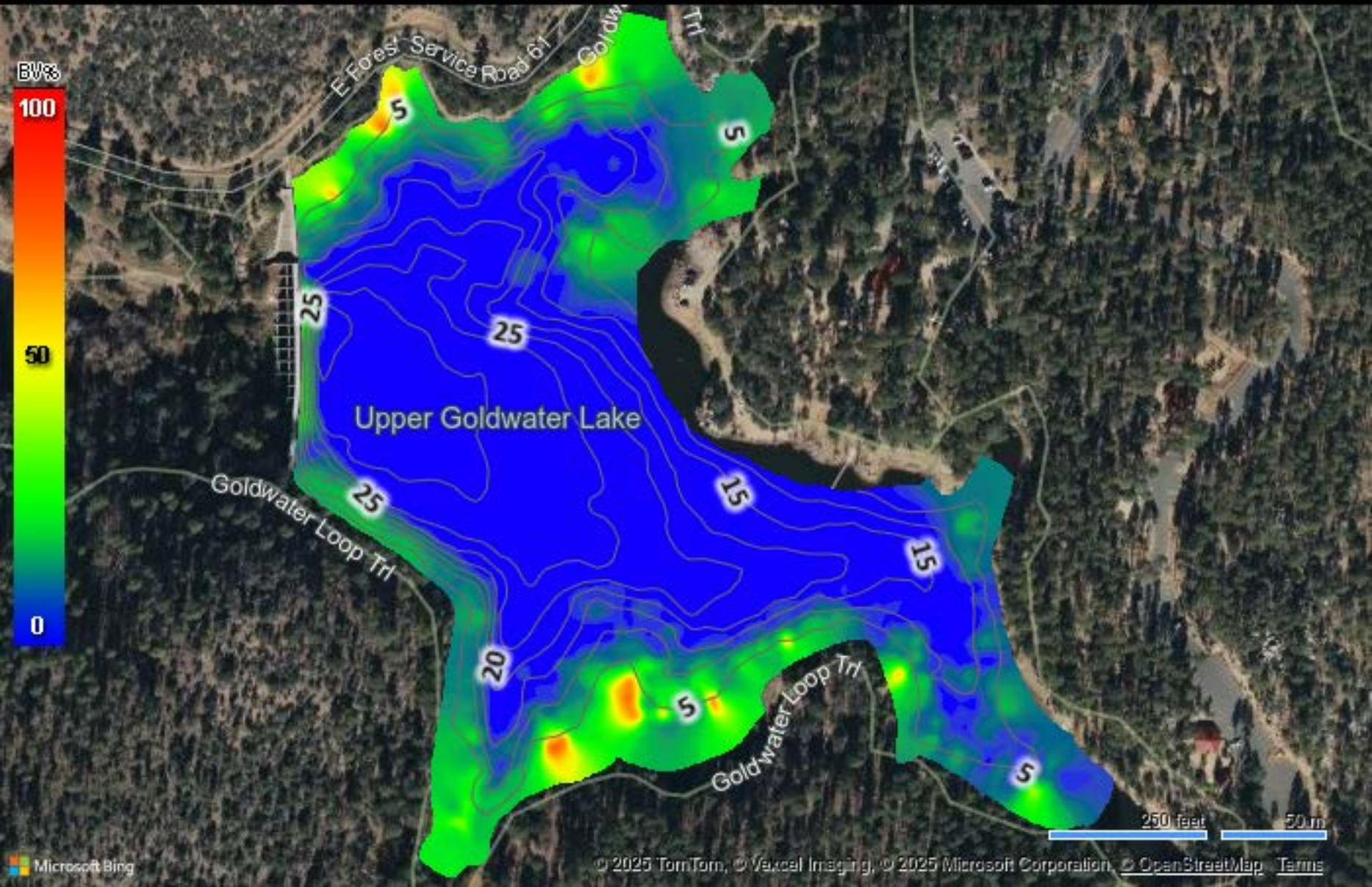
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