

Draft

Riverwalk Atlas



**A map-based summary of Santa Ana River
habitat surveys conducted annually from
2006-2024.**

**Provided by the
Santa Ana Sucker Conservation Team**



Atlas Contributors

The following members of the Santa Ana Sucker Conservation Team developed this Atlas: Orange County Water District, the City of Riverside, and the Santa Ana Watershed Project Authority.

Thanks to numerous volunteers who joined us for the 2024 Riverwalk. Thanks to them, the Team was able to compile the field survey results that are represented in this document.



About the Riverwalk

The Santa Ana River Watershed includes a mixture of urban, suburban, and rural areas that border the Pacific Ocean, small creeks and the region's central waterway, the Santa Ana River.

The water agencies and municipalities that provide water to these areas have partnered with regulatory agencies, conservation organizations, and other entities to conduct an annual fish habitat survey within the Santa Ana River with a focus on one of the region's federally listed threatened endemic aquatic species, the Santa Ana sucker, *Catostomus santaanae*.

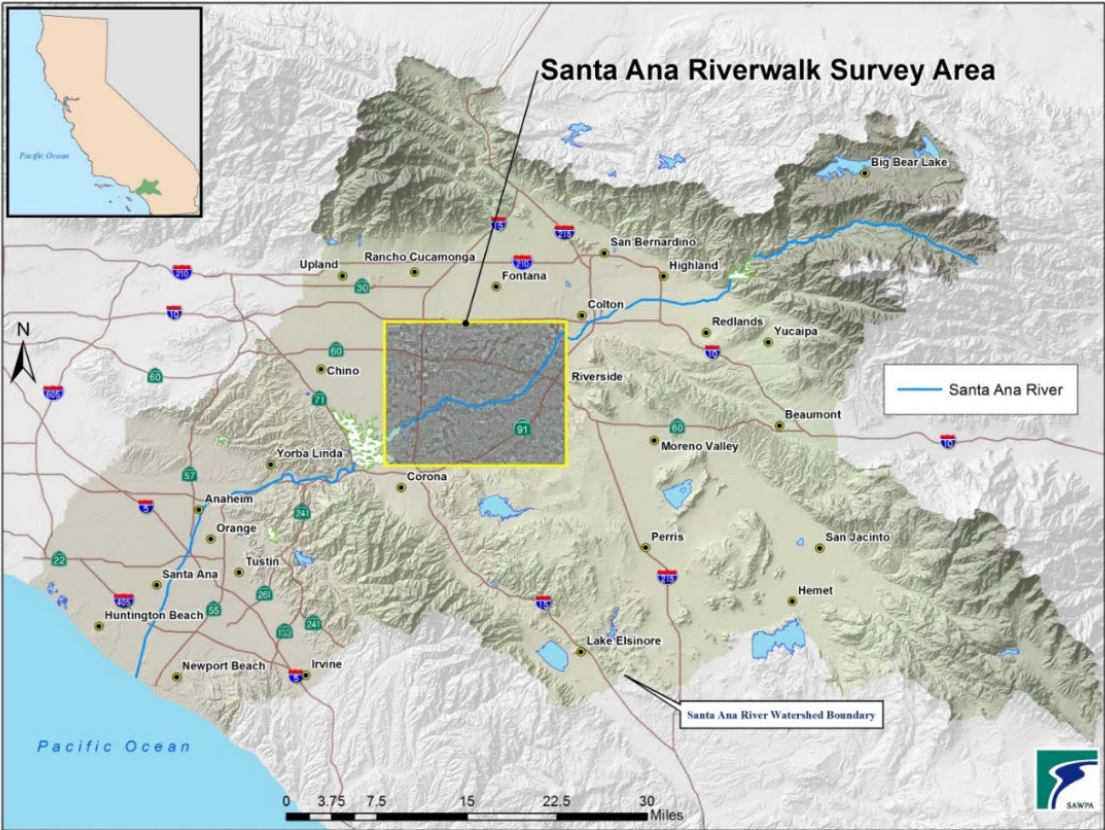
The **Santa Ana Sucker Conservation Team**, a partnership of agencies and municipalities, organizes the Riverwalk each year.



Credit: Brett Mills

Santa Ana Sucker

Location of the Riverwalk



The Riverwalk is an aquatic habitat survey and takes place on an 18 mile stretch of the Santa Ana River in California in fall of each year (the most recent taking place over two days on October 3 and 24, 2024). The River's namesake watershed, the Santa Ana River Watershed, covers an area from the Orange County oceanfront to the San Bernardino Mountains.

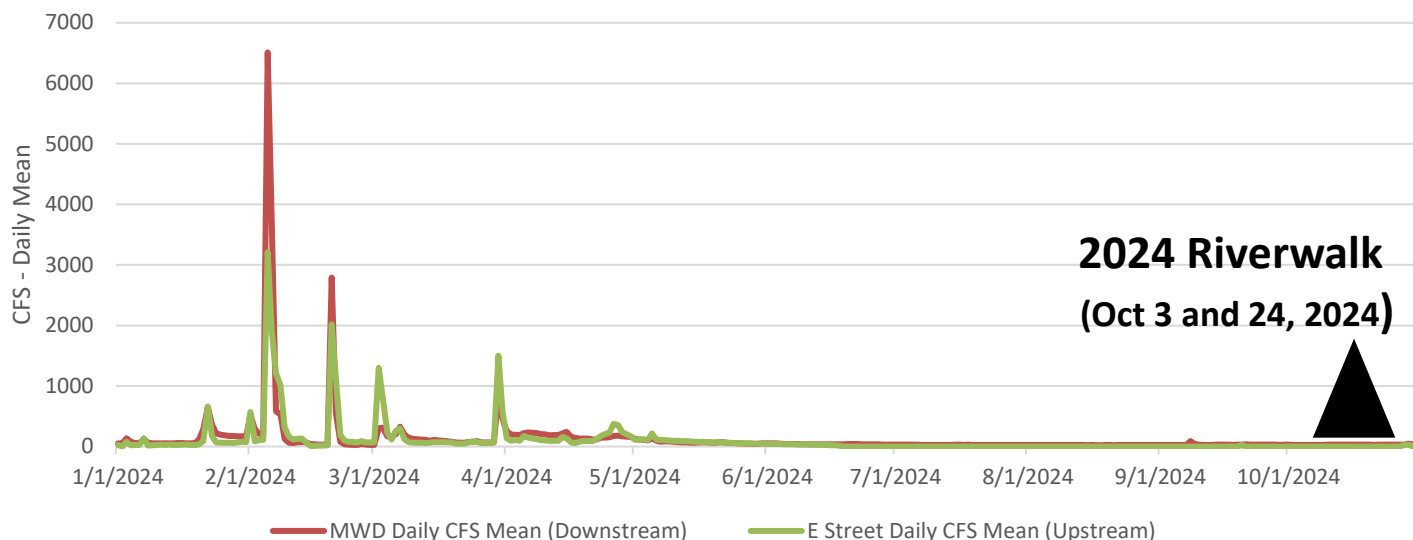
About the Santa Ana Sucker

The Santa Ana sucker is primarily a bottom feeder. A river bottom with a mixture of sand, cobble and gravel is ideal for the algae that the fish feeds on. Spawning can also take place over cobble and gravel riffles.



Recent Conditions on the River

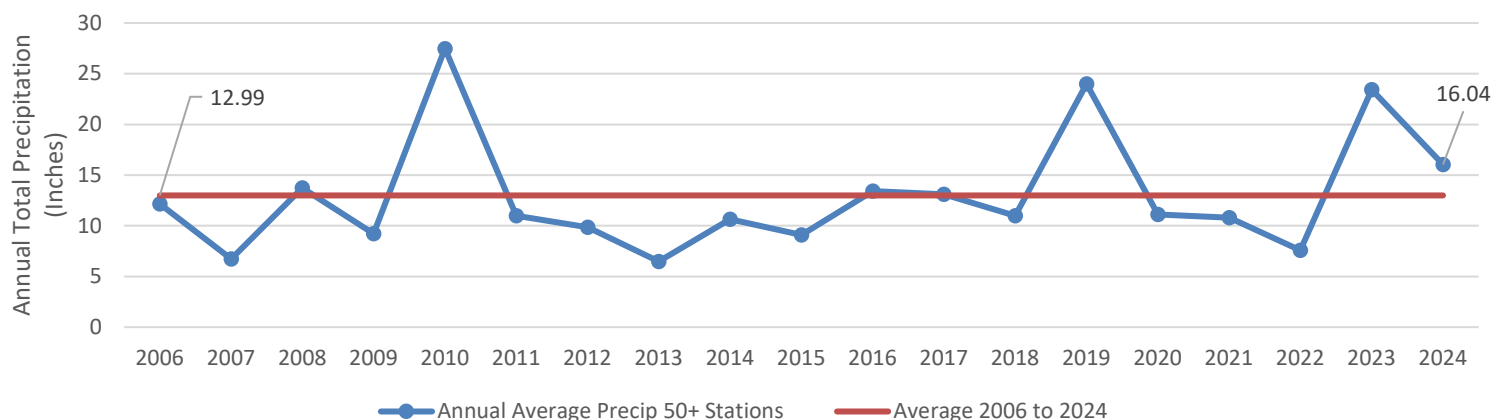
Figure 1: Recent Monthly Streamflow Mean at MWD Crossing and E Street USGS Gaging Stations



Streamflow in 2024 for two US Geological Survey (USGS) gaging stations along the upper Santa Ana River are shown above. Streamflow followed a largely common pattern of a Mediterranean climate of a mild summer and wet winter.

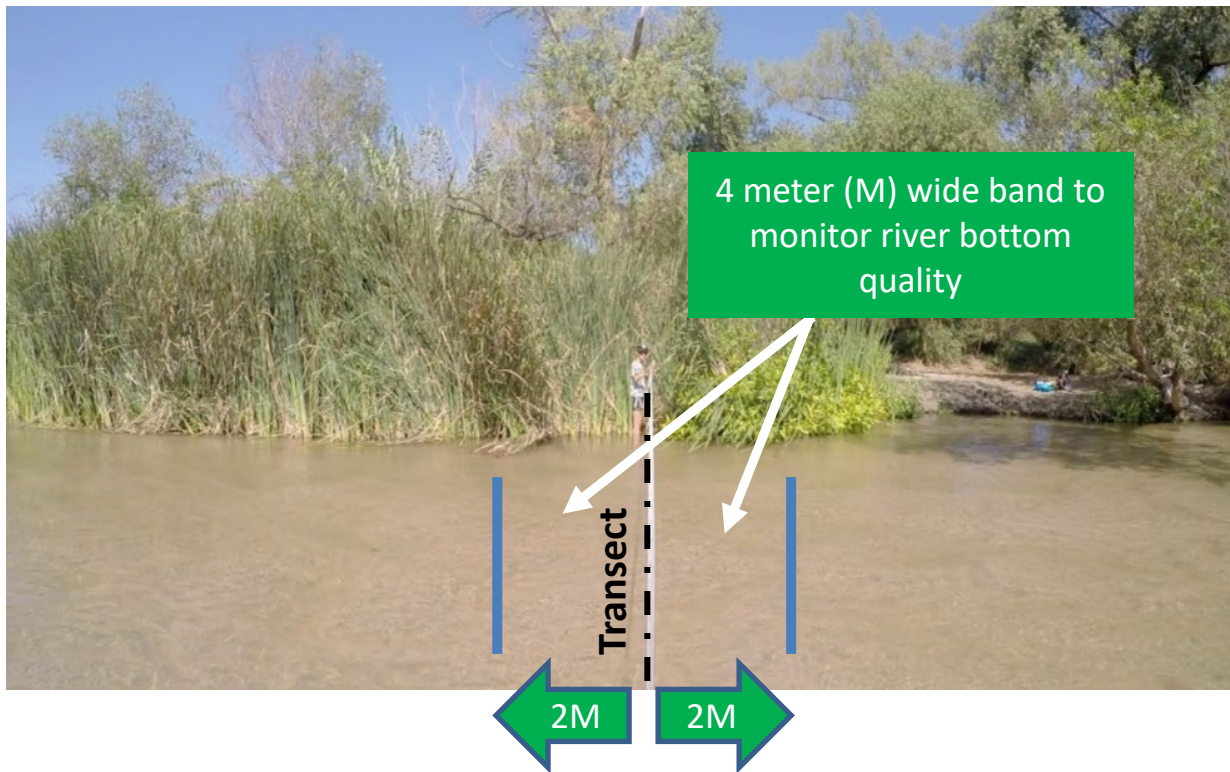
Provided below is an aggregate of 50+ precipitation stations across the Santa Ana River Watershed. The average precipitation of 19 years of this data shows an average of 12.99 inches for the watershed. At an annual total of 16.04 inches, 2024 had more precipitation than the 19-year average.

Figure 2: Precipitation Across the Watershed



Collecting Riverwalk Data in the Field

- Each year, approximately 40 to 50 volunteers collect data at various field points in the River which they locate with a global positioning unit, or a geographic information system (GIS) phone application.
- At each field point a transect line is drawn from bank to bank. To identify the area to monitor, a 4-meter-wide band is centered at the transect.



The area within the band is then surveyed by visually identifying what type of material makes up the river bottom:

- Mud/Silt
- Sand
- Gravel
- Cobble
- Boulder

How to Read the Riverwalk Ratings

The total number of transects surveyed each year are labeled with a unique designating number (1 through 116) that represent a pre-assigned location on the River. The 116 transect points are pre-assigned so the Team can compare trends at each point over time.

For 2024, there were 102 transects that were sampled. The further eight upstream transects did not have surface water and thus were not sampled. And there were five transects that were inaccessible due to dense vegetation preventing volunteers from reaching them. And one transect (16) did not have data recorded due to an error in the GIS-based phone application.

For information sharing purposes, the quality of the river bottom (substrate) is generalized in this Atlas in the following categories:



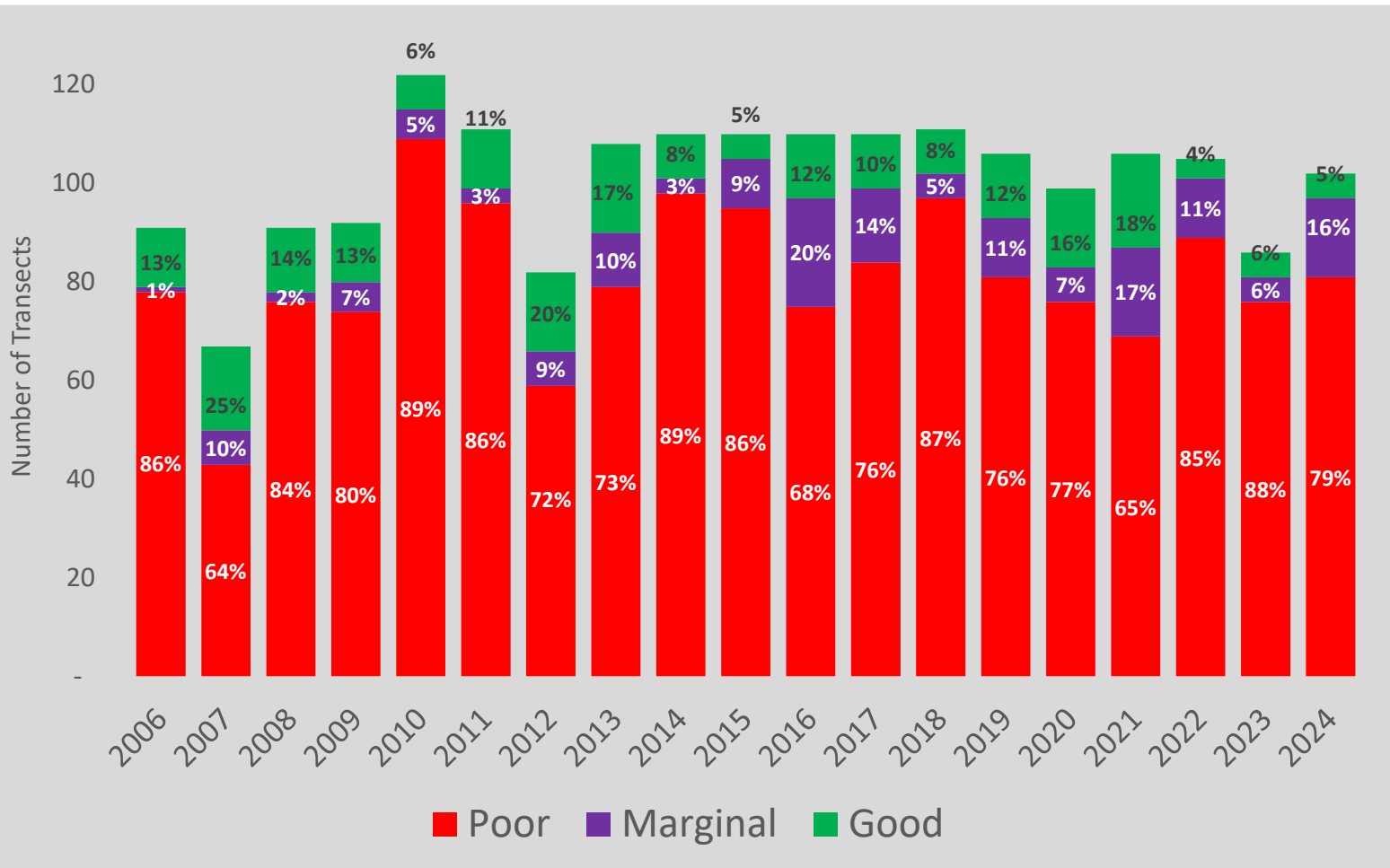
Riverwalk Rating	Formula for Rating	Rating Threshold
Poor	Sum of gravel, cobble and boulder	≤30%
Marginal		>30% to <65%
Good		≥65%

For example, if the sum of gravel, cobble and boulder is 29% of the total substrate (and the remaining 71% is sand, and/or mud) the Riverwalk transect will receive a poor rating.

*These downstream transects have been generally been rated poor in each of the past Riverwalks.

Riverwalk Ratings By Year

Figure 3: Riverwalk Ratings



Using the definitions of “poor”, “marginal”, and “good” ratings as described on page 6, the trends of the past 19 years are shown in Figure 3.

Over the 19-year period shown, the average amount of poor transects is 80% of total transects (or 81 transects) and the average for good transects is 12% (or 11 transects).

Comparison to Mean Results

Figure 4: Riverwalk Ratings in Comparison to Mean Poor Transects

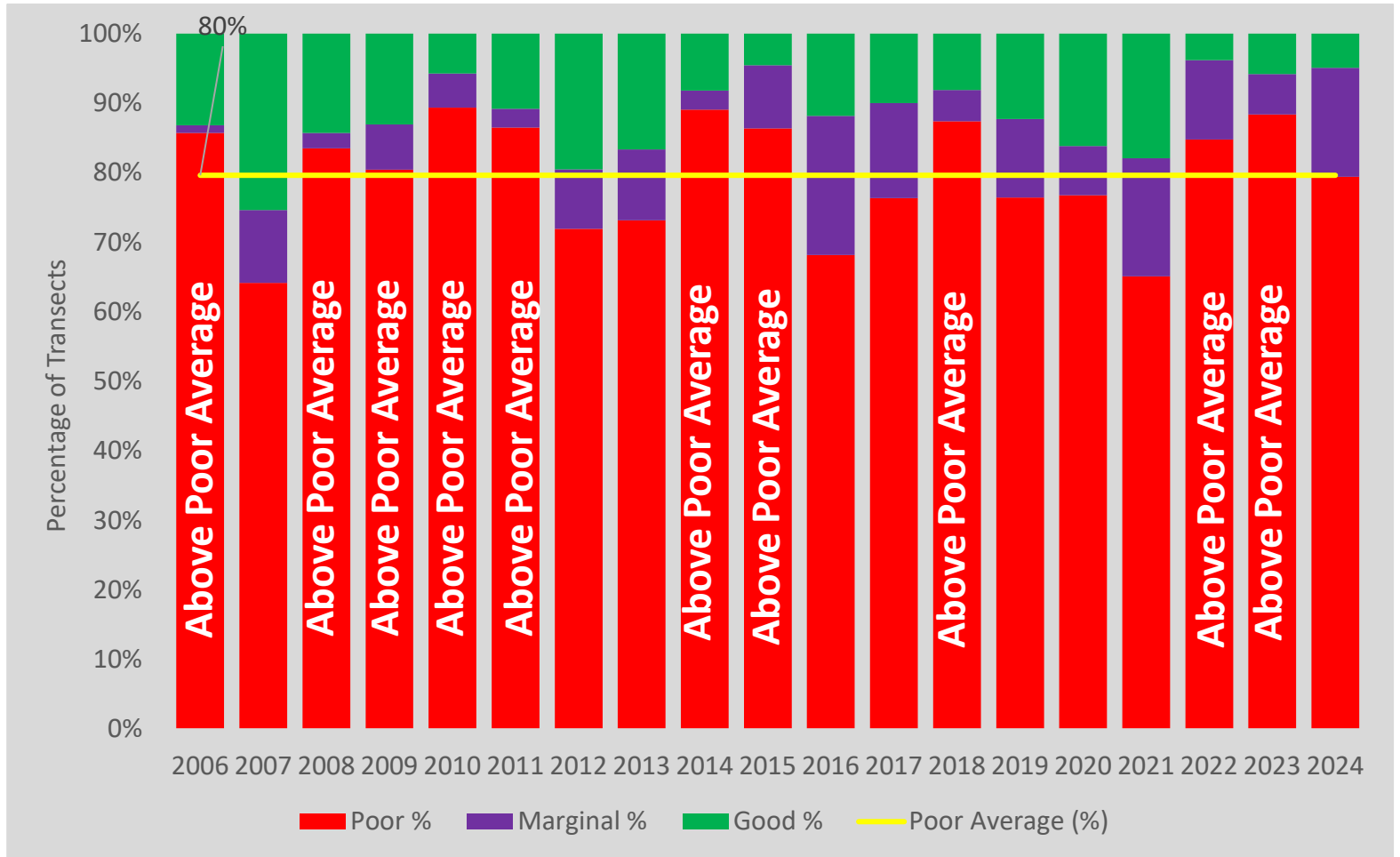


Figure 4 shows the Riverwalk years and which ones exceeded the mean “poor” rating of 80%. 10 (out of 19 years) have exceeded that mean with the latest being 2023. Over this same 19-year period, the amount of Riverwalk years with transects over the average “good” rating of 12% is 10 years, with 2021 being the latest of those years.

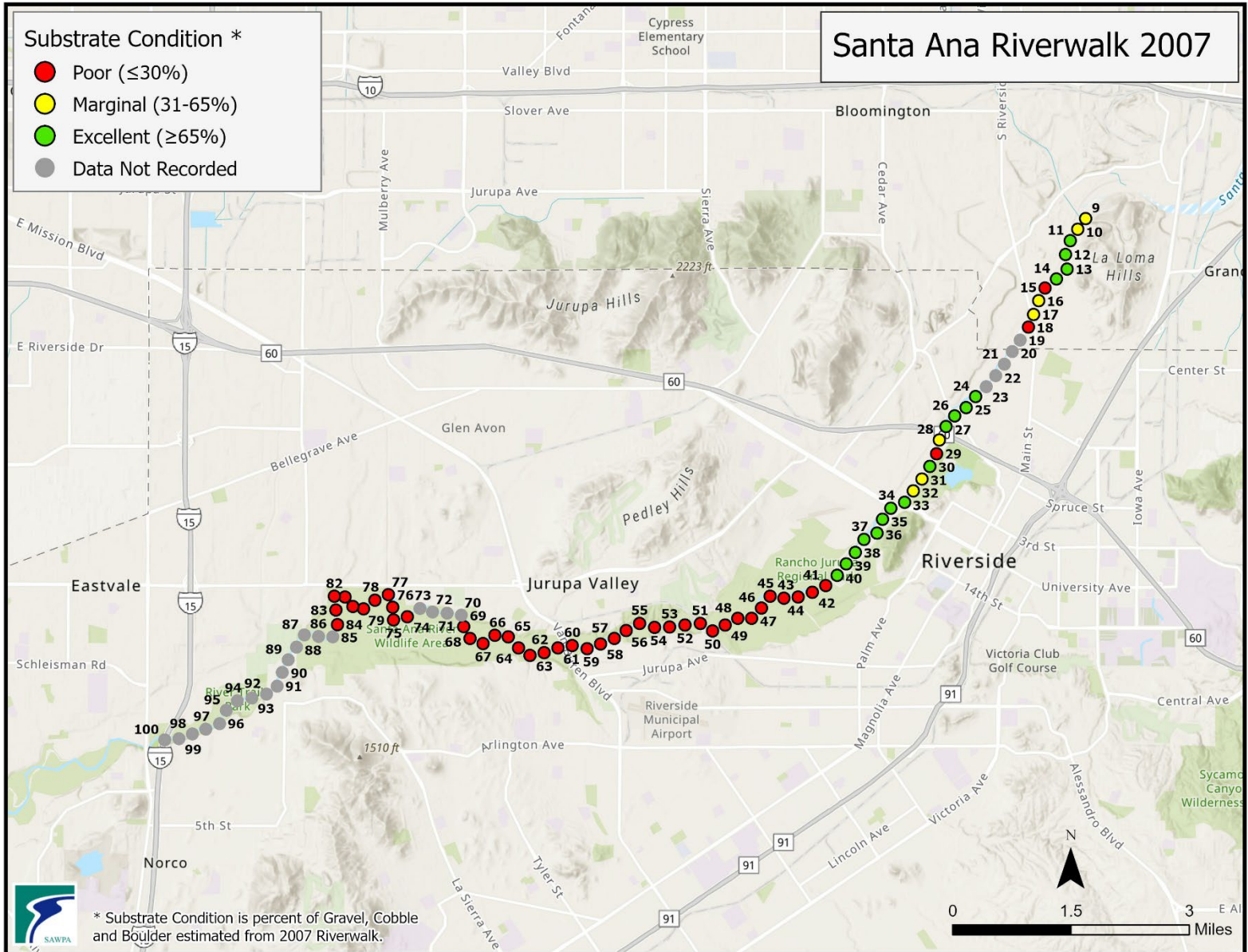
Riverwalk Ratings by Year and Location (Shown in Maps)

Note: Much of the data is collected by trained volunteers. Each volunteer is trained in collecting Riverwalk data during the morning of the event. The ranking described above is for general information purposes and the results do not denote an explicit assessment of all substrate conditions of this 18 mile stretch of the Santa Ana River.



P:\Projects\lan\Riverwalk_2006-2010Update\RiverwalkUpdate.aprx LoRiverwalk2006 SW-3290

Poor Average (2006 to 2024)	81
Poor	78
Marginal	1
Good	12
Total Transects This Year	91



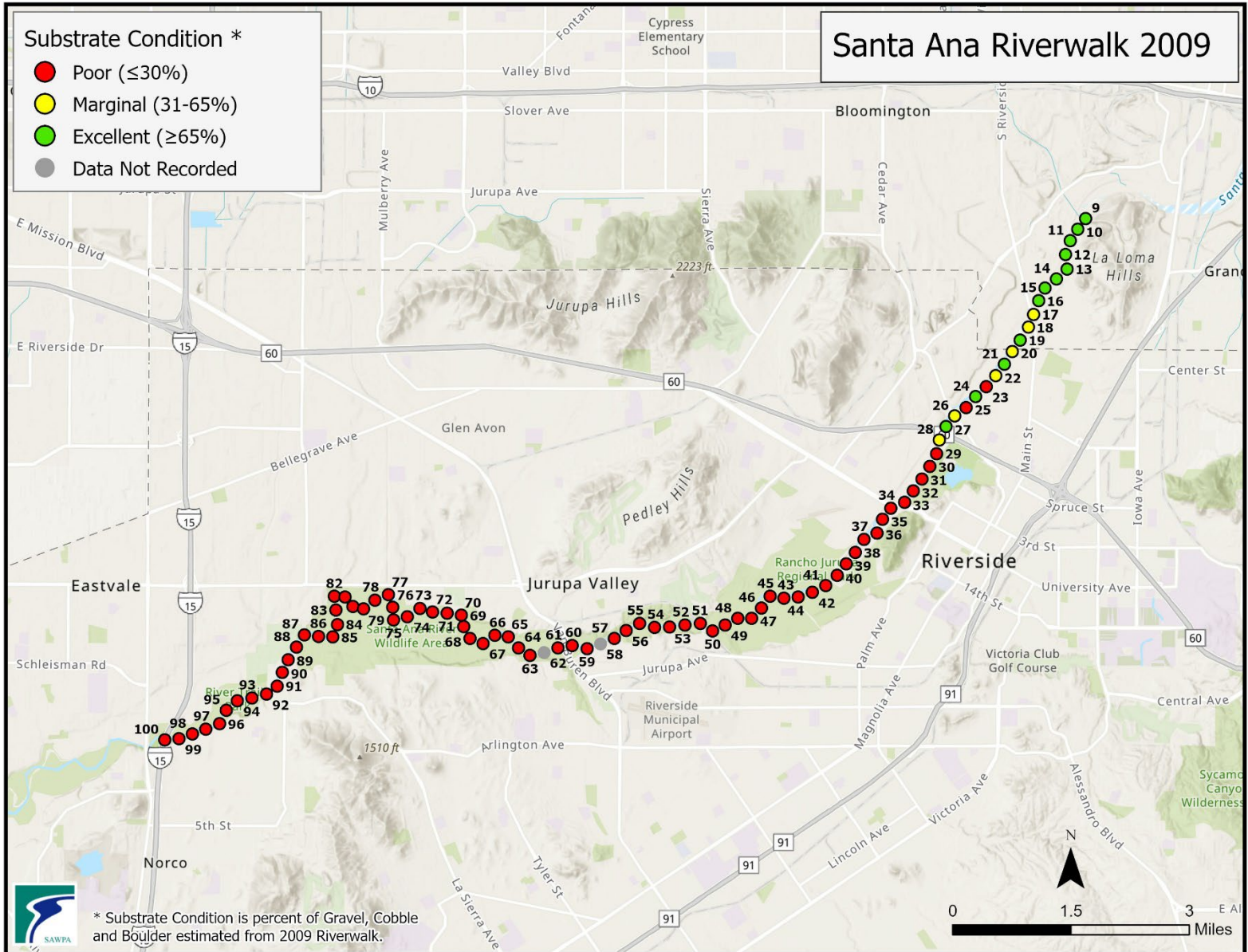
P:\Projects\lan\Riverwalk_2006-2010Update\RiverwalkUpdate.aprx LoRiverwalk2007 SW-3291

Poor Average (2006 to 2024)	81
Poor	43
Marginal	7
Good	17
Total Transects This Year	67



P:\Projects\lan\Riverwalk_2006-2010Update\RiverwalkUpdate.aprx LoRiverwalk2008 SW-3292

Poor Average (2006 to 2024)	81
Poor	76
Marginal	2
Good	13
Total Transects This Year	91



P:\Projects\lan\Riverwalk_2006-2010Update\RiverwalkUpdate.aprx LoRiverwalk2009 SW-3293

Poor Average (2006 to 2024)	81
Poor	74
Marginal	6
Good	12
Total Transects This Year	92



P:\Projects\lan\Riverwalk_2006-2010Update\RiverwalkUpdate.aprx LoRiverwalk2010 SW-3294

Poor Average (2006 to 2024)	81
Poor	109
Marginal	6
Good	7
Total Transects This Year	122



P:\Projects\lan\Riverwalk_2011_2019Update\RiverwalkUpdate\RiverwalkUpdate.aprx LoRiverwalk2011 SW-3297

Poor Average (2006 to 2024)	81
Poor	96
Marginal	3
Good	12
Total Transects This Year	111



P:\Projects\lan\Riverwalk_2011_2019Update\RiverwalkUpdate\RiverwalkUpdate.aprx LoRiverwalk2012 SW-3298

Poor Average (2006 to 2024)	81
Poor	59
Marginal	7
Good	16
Total Transects This Year	82



P:\Projects\lan\Riverwalk_2011_2019Update\RiverwalkUpdate\RiverwalkUpdate.aprx LoRiverwalk2013 SW-3299

Poor Average (2006 to 2024)	81
Poor	79
Marginal	11
Good	18
Total Transects This Year	108



P:\Projects\lan\Riverwalk_2011_2019Update\RiverwalkUpdate\RiverwalkUpdate.aprx LoRiverwalk2014 SW-3300

Poor Average (2006 to 2024)	81
Poor	98
Marginal	3
Good	9
Total Transects This Year	110



P:\Projects\lan\Riverwalk_2011_2019Update\RiverwalkUpdate\RiverwalkUpdate.aprx LoRiverwalk2015 SW-3301

Poor Average (2006 to 2024)	81
Poor	95
Marginal	10
Good	5
Total Transects This Year	110



P:\Projects\lan\Riverwalk_2011_2019Update\RiverwalkUpdate\RiverwalkUpdate.aprx LoRiverwalk2016 SW-3302

Poor Average (2006 to 2024)	81
Poor	75
Marginal	22
Good	13
Total Transects This Year	110



P:\Projects\lan\Riverwalk_2011_2019Update\RiverwalkUpdate\RiverwalkUpdate.aprx LoRiverwalk2017 SW-3303

Poor Average (2006 to 2024)	81
Poor	84
Marginal	15
Good	11
Total Transects This Year	110



P:\Projects\lan\Riverwalk_2011_2019Update\RiverwalkUpdate\RiverwalkUpdate.aprx LoRiverwalk2018 SW-3304

Poor Average (2006 to 2024)	81
Poor	97
Marginal	5
Good	9
Total Transects This Year	111



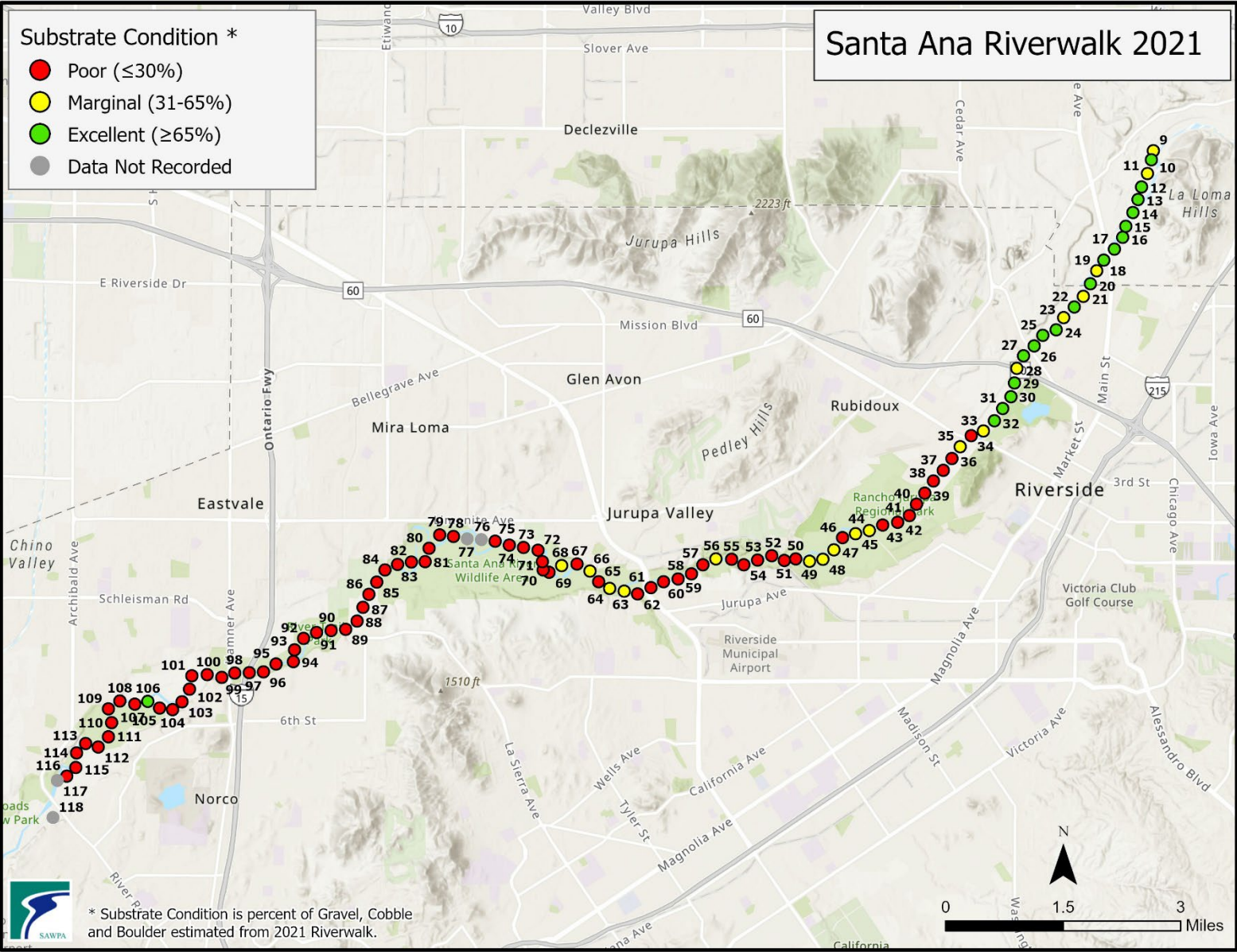
P:\Projects\lan\Riverwalk_2011_2019Update\RiverwalkUpdate\RiverwalkUpdate.aprx LoRiverwalk2019 SW-3305

Poor Average (2006 to 2023)	81
Poor	81
Marginal	12
Good	13
Total Transects This Year	106



P:\projects\lan\RiverWalk2020\RiverWalkMap2020.aprx LoRiverWalk2020 SW-3013

Poor Average (2006 to 2024)	81
Poor	76
Marginal	7
Good	16
Total Transects This Year	99



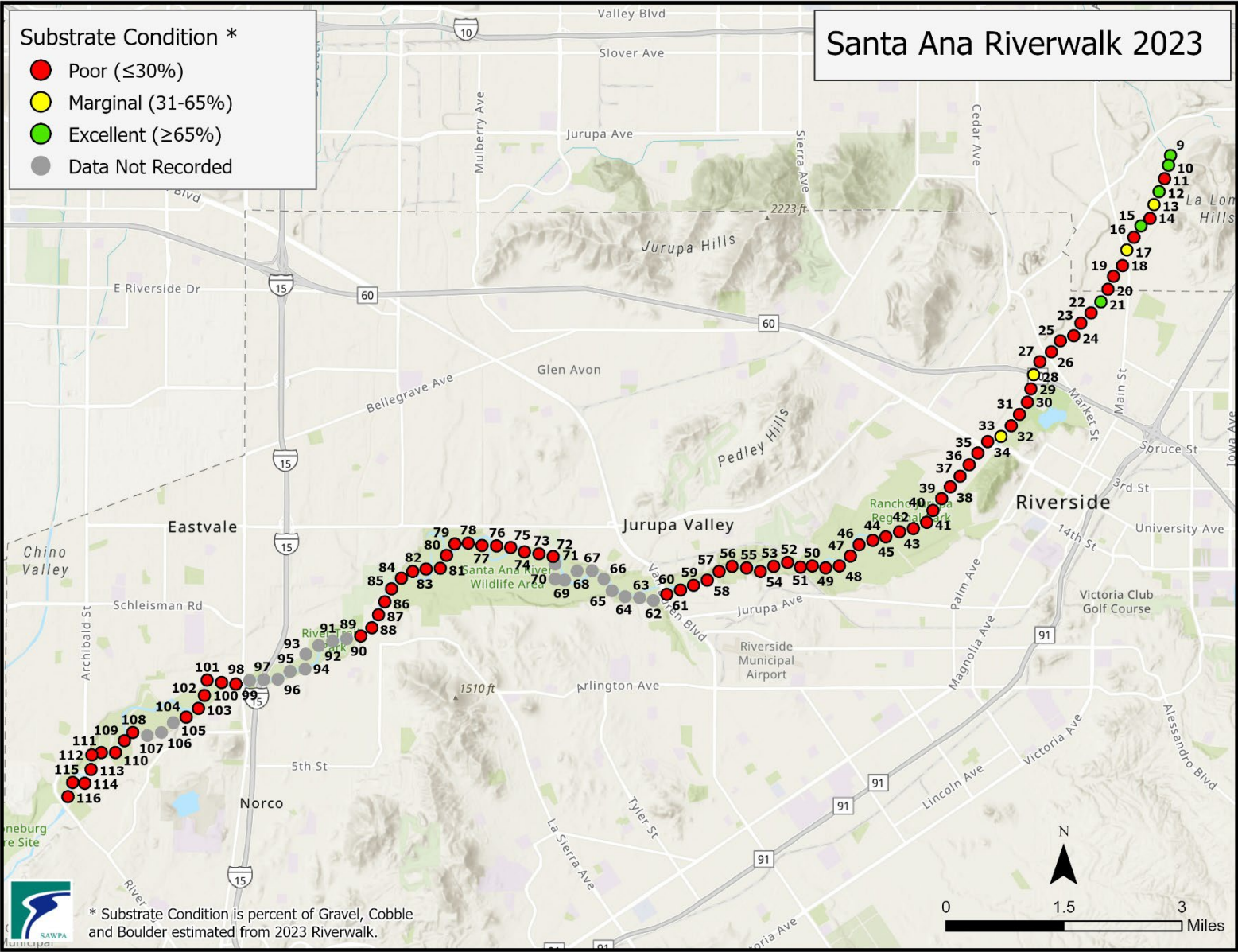
P:\projects\lan\RiverWalk2021\Riverwalk2021Map\Riverwalk2021Map.aprx LoRiverwalk2021 SW-3109

Poor Average (2006 to 2024)	81
Poor	69
Marginal	18
Good	19
Total Transects This Year	106



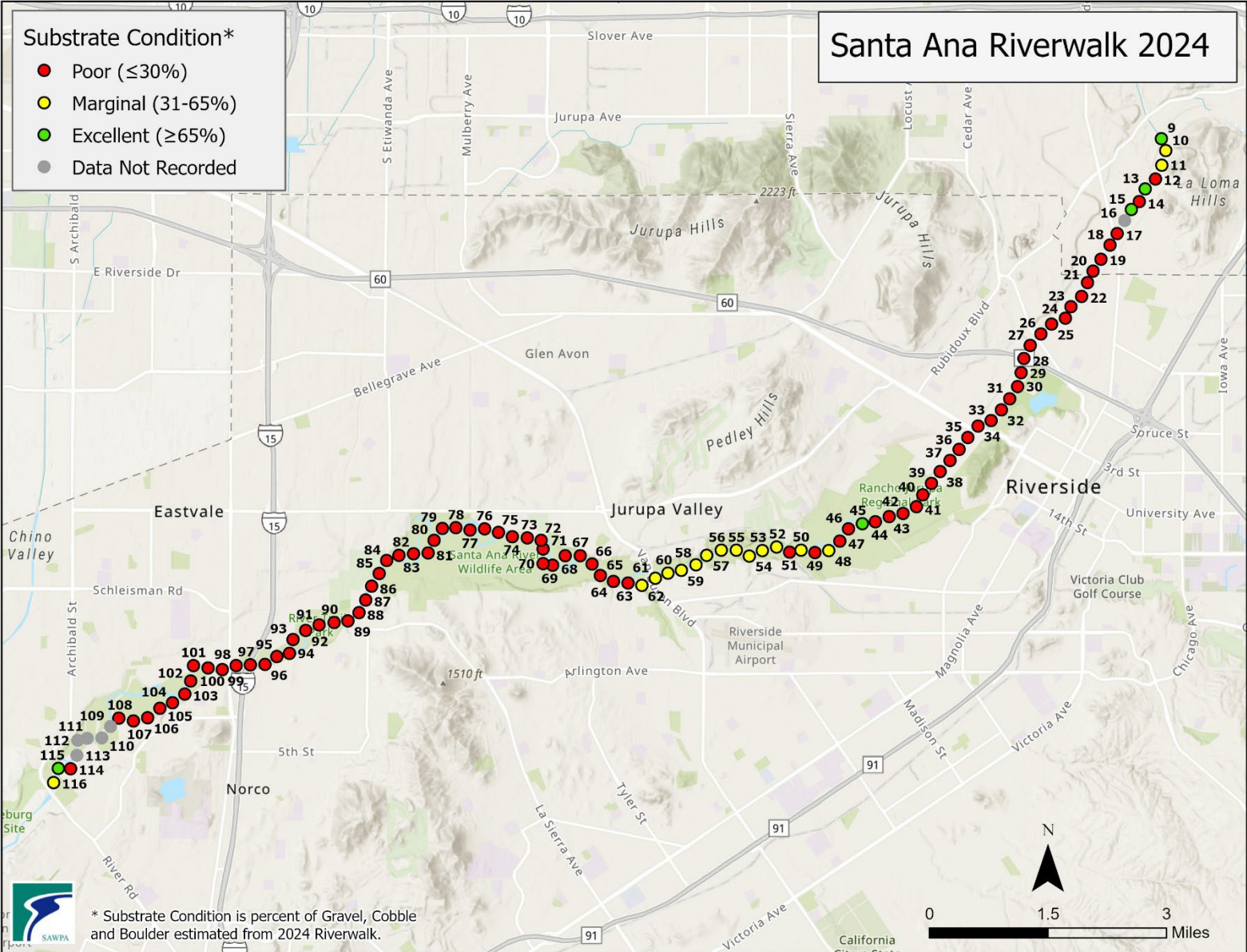
P:\Projects\lan\Riverwalk2022\Riverwalk2022Map\Riverwalk2022Map.aprx Layout SW-3295

Poor Average (2006 to 2024)	81
Poor	89
Marginal	12
Good	4
Total Transects This Year	105



P:\Projects\lan\Riverwalk2023\Riverwalk2023Map\Riverwalk2023Map.aprx Layout SW-3296

Poor Average (2006 to 2024)	81
Poor	76
Marginal	5
Good	5
Total Transects This Year	86



P:\Projects\lan\Riverwalk2024\RiverWalkMap2024\RiverWalkMap2024.aprx LoRiverwalk2024 SW-3395

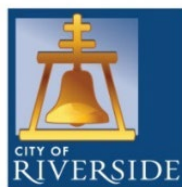
Poor Average (2006 to 2024)	81
Poor	81
Marginal	16
Good	5
Total Transects This Year	102



Santa Ana Sucker Conservation Team

<https://sawpa.gov/task-force/santa-ana-sucker-conservation-team/>

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City of Arts & Innovation

