

# **STORAGE VOLUME AND SEDIMENTATION IN LAKES BUCHANAN AND TRAVIS**

David Wheelock

Water Supply Planning Director

Aug. 29, 2018



# Overview

- Factors affecting sedimentation
- How a sedimentation rate is used
- Lake Buchanan sedimentation survey results
- Lake Travis sedimentation survey results

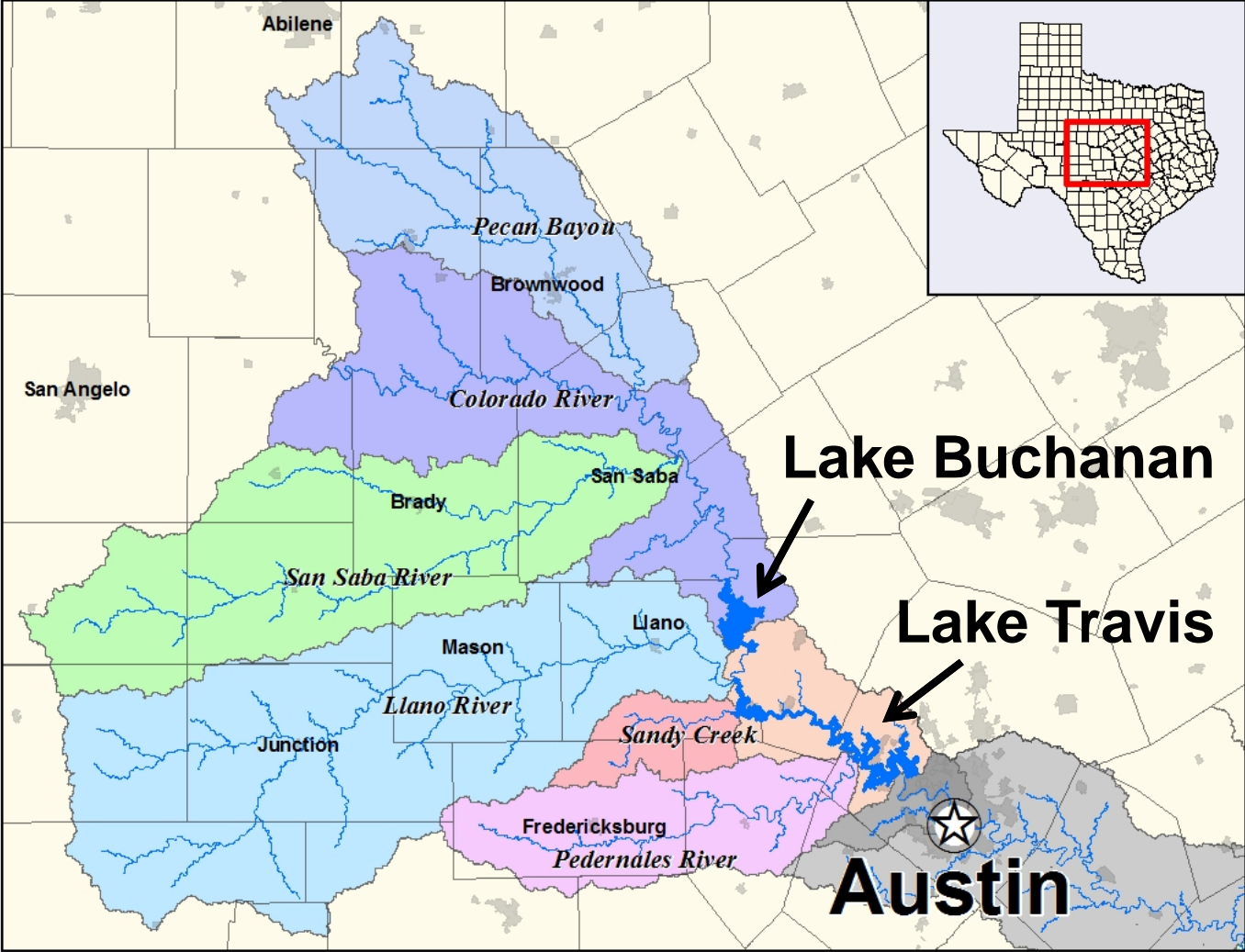
# Factors Affecting Sedimentation

- Contributing watershed size
- Rainfall/runoff
- Watershed topography and soil properties
- Land use
- Type and extent of vegetative cover
- Upstream reservoirs

# Why is Sedimentation Important and How is the Sedimentation Rate Used?

- Sedimentation reduces the usable volume of a water supply reservoir
- Sedimentation rates are used to estimate future reservoir storage volume
- Future storage volume is one aspect of estimating water supply

# Highland Lakes Watershed



# Lake Buchanan

- Impoundment started 1938
- LCRA volumetric survey 1991
- Survey updated with aerial mapping 1997
- TWDB volumetric survey 2007

# Lake Buchanan – Survey Results

Survey date	Volume at 1020 feet msl (acre-feet)
1991	881,474
1997	877,674
2007	875,588

nb8

# Lake Buchanan – Estimated Sedimentation Using Surveyed Volumes

Survey Dates	Difference in Volume at 1020 feet msl (acre-feet)	Estimated Sedimentation Rate (acre-feet/year)
1997,1991	3,880	633
2007,1997	2,086	209
2007,1991	5,886	368



# Lake Buchanan – estimated sedimentation using surveyed volumes

Survey Date	Volume at 1020-ft (acre-feet)	Change in volume (acre-feet)	Est'd Sedimentation Rate (acre-feet per year)
1991	881,474		
1997	877,674	-3,800	633
2007	875,588	-2,086	209
Total volume change (1991-2007)		-5,886	368

# Lake Buchanan – Measured Sediment Volume and Sedimentation Rate

- TWDB 2007 survey sediment accumulation since impoundment in 1938: 34,275 acre-feet
- Equals a sedimentation rate of 504 acre-feet per year over 69 years

# Lake Buchanan – Effect of Sedimentation Rate

- Estimated sedimentation rate: 504 acre-feet per year
- For the 2070 planning horizon (63 years after survey), the estimated sediment accumulation: an additional 31,752 acre-feet
- Lake Buchanan volume in 2070: 843,329 acre-feet

# Lake Travis

- Impoundment started 1940
- LCRA volumetric survey 1993
- Survey updated with aerial mapping 1997
- TWDB volumetric survey 2008

# Lake Travis– survey results

Survey Date	Volume at 681 feet msl (acre-feet)
1993	1,128,974
1997	1,132,172
2008	1,134,956

As noted by TWDB in its 2009 report: *“Due to differences in the methodologies used during this 2008 survey and previous Lake Travis surveys, comparison of these values is not recommended.”*

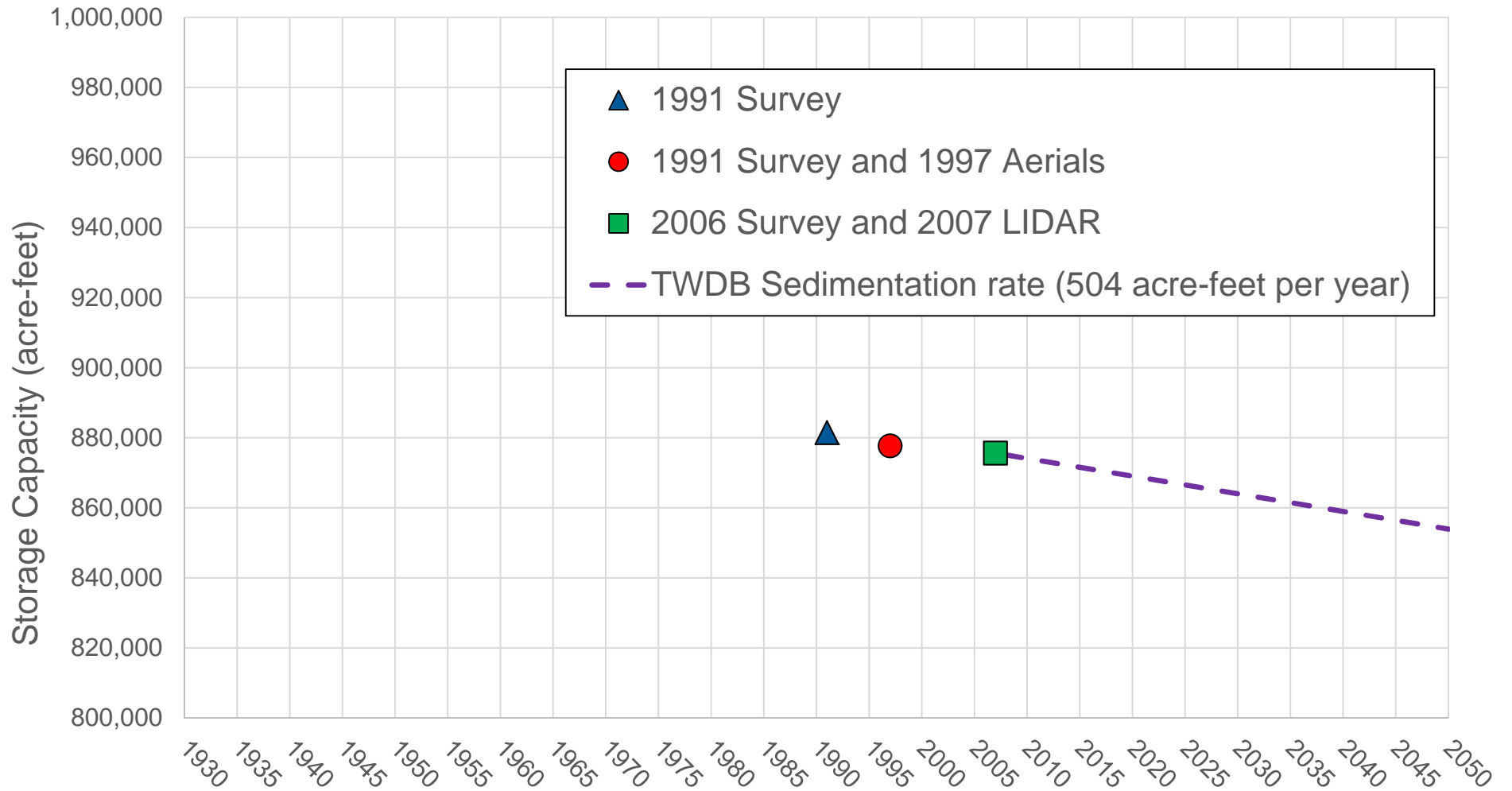
# Lake Travis – Measured Sediment Volume and Sedimentation Rate

- TWDB 2008 survey sediment accumulation since impoundment in 1940: 16,974 acre-feet
- Equals a sedimentation rate of 250 acre-feet per year over 68 years

## Lake Travis – Effect of Sedimentation Rate

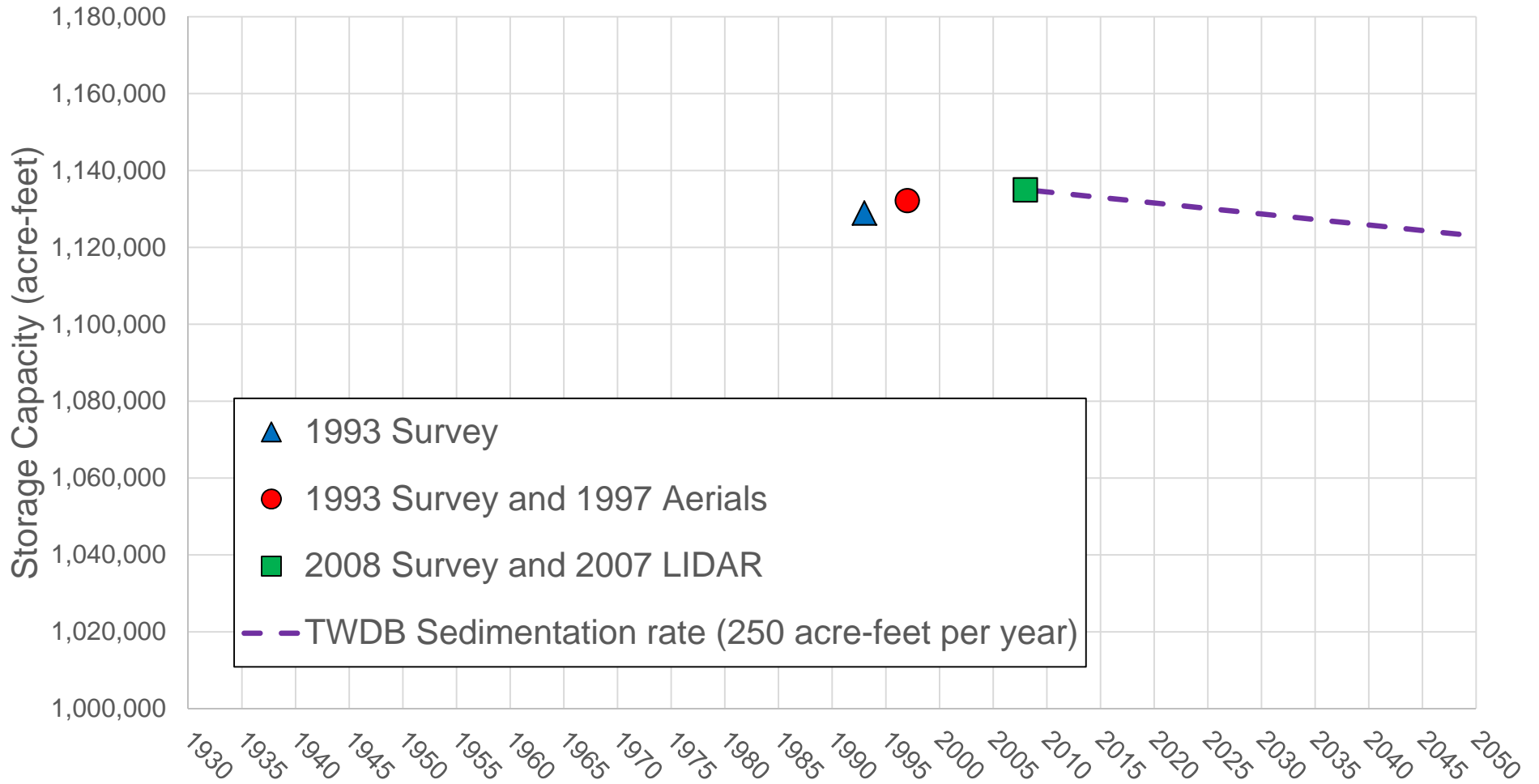
- Estimated sedimentation rate: 250 acre-feet per year
- For the 2070 planning horizon (62 years after survey), the estimated sediment accumulation: an additional 15,500 acre-feet
- Lake Travis volume in 2070: 1,119,456 acre-feet

# Historical and Projected Conservation Storage Capacity for Lake Buchanan





# Historical and Projected Conservation Storage Capacity for Lake Travis



**END**