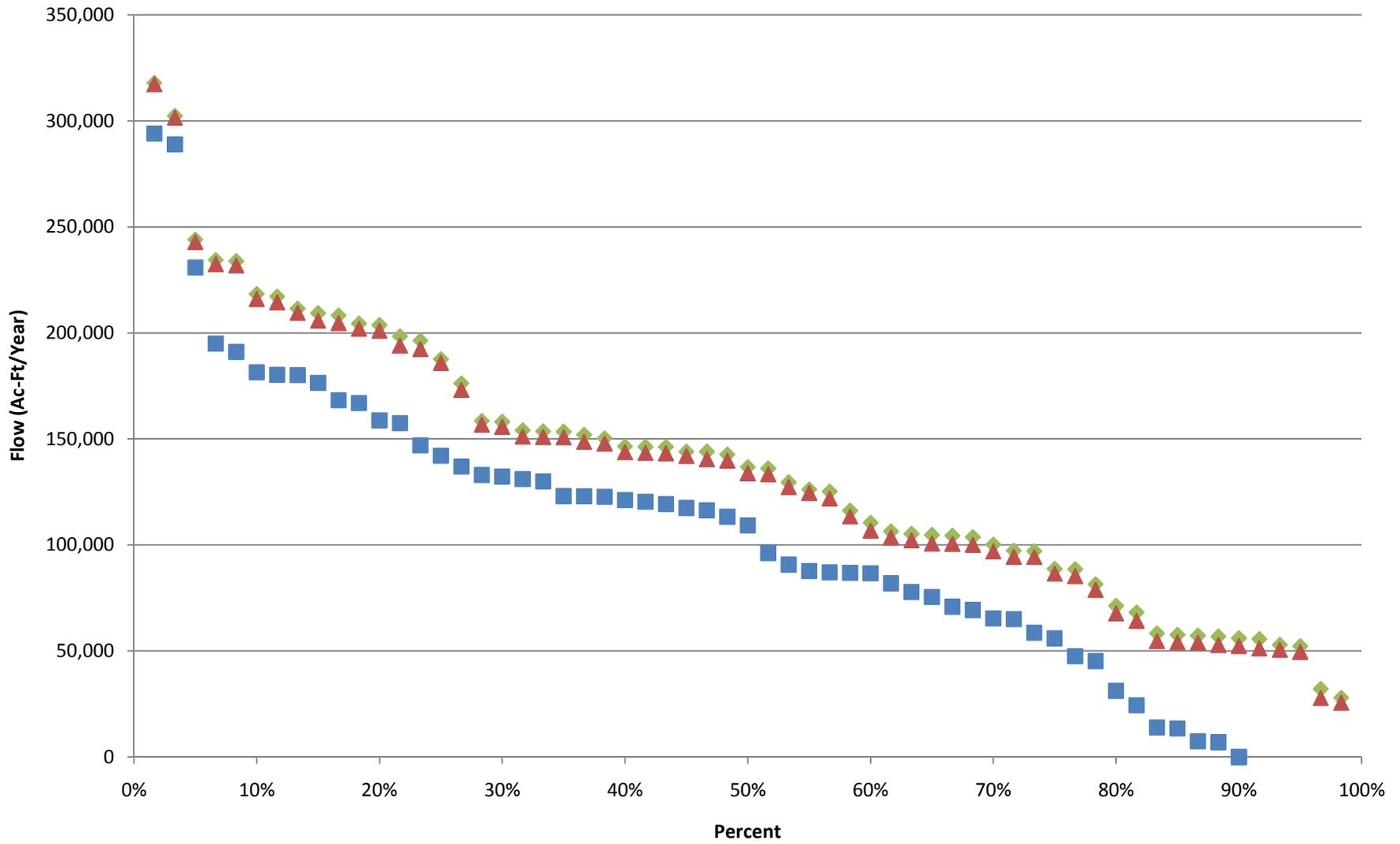


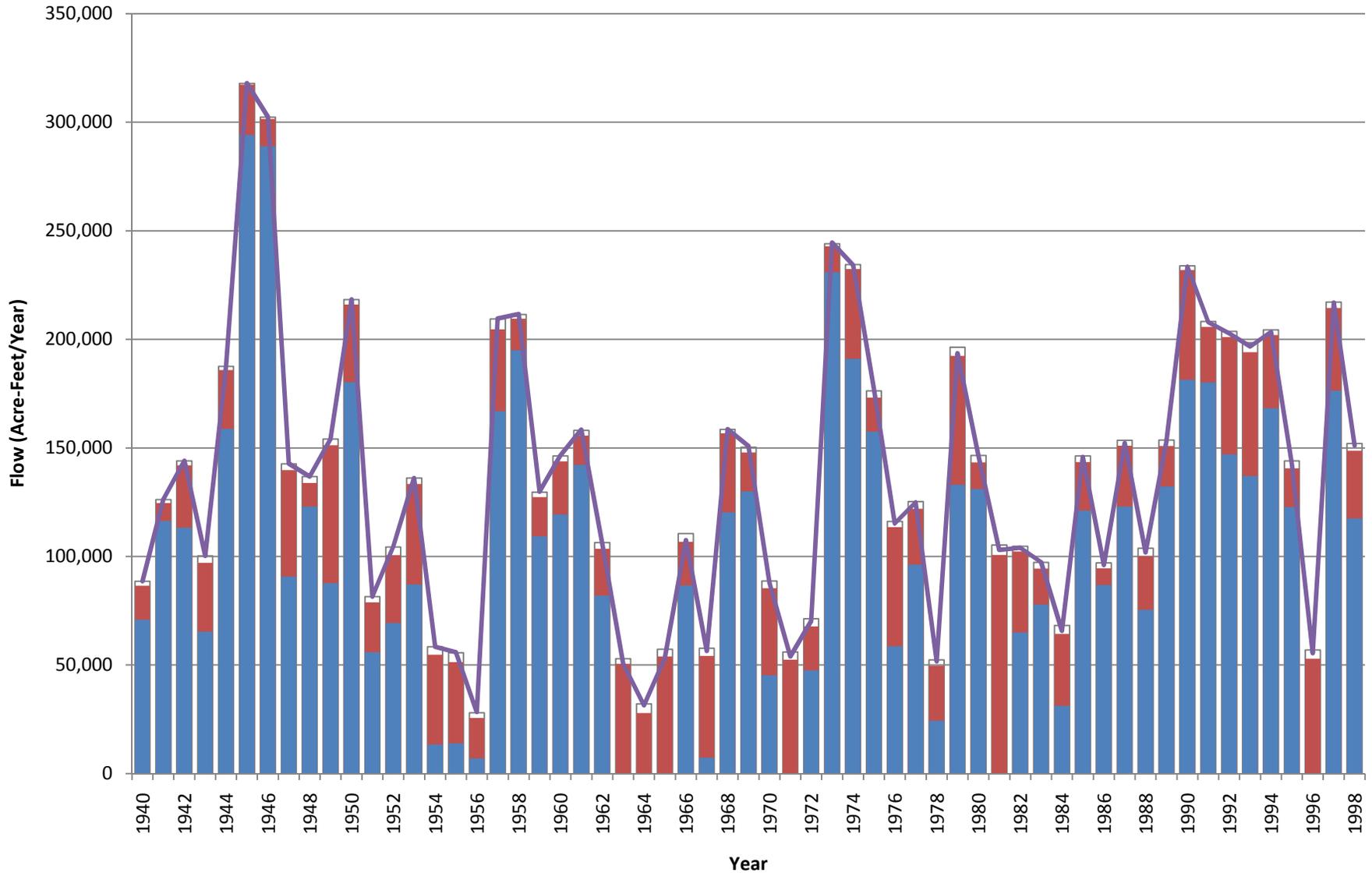
Attachment A
Annual WAM Flow Graphics for BBEST Gages

Run 8 Percent of Time Flow is Equaled or Exceeded USGS Gage 08019500 Big Sandy nr Big Sandy



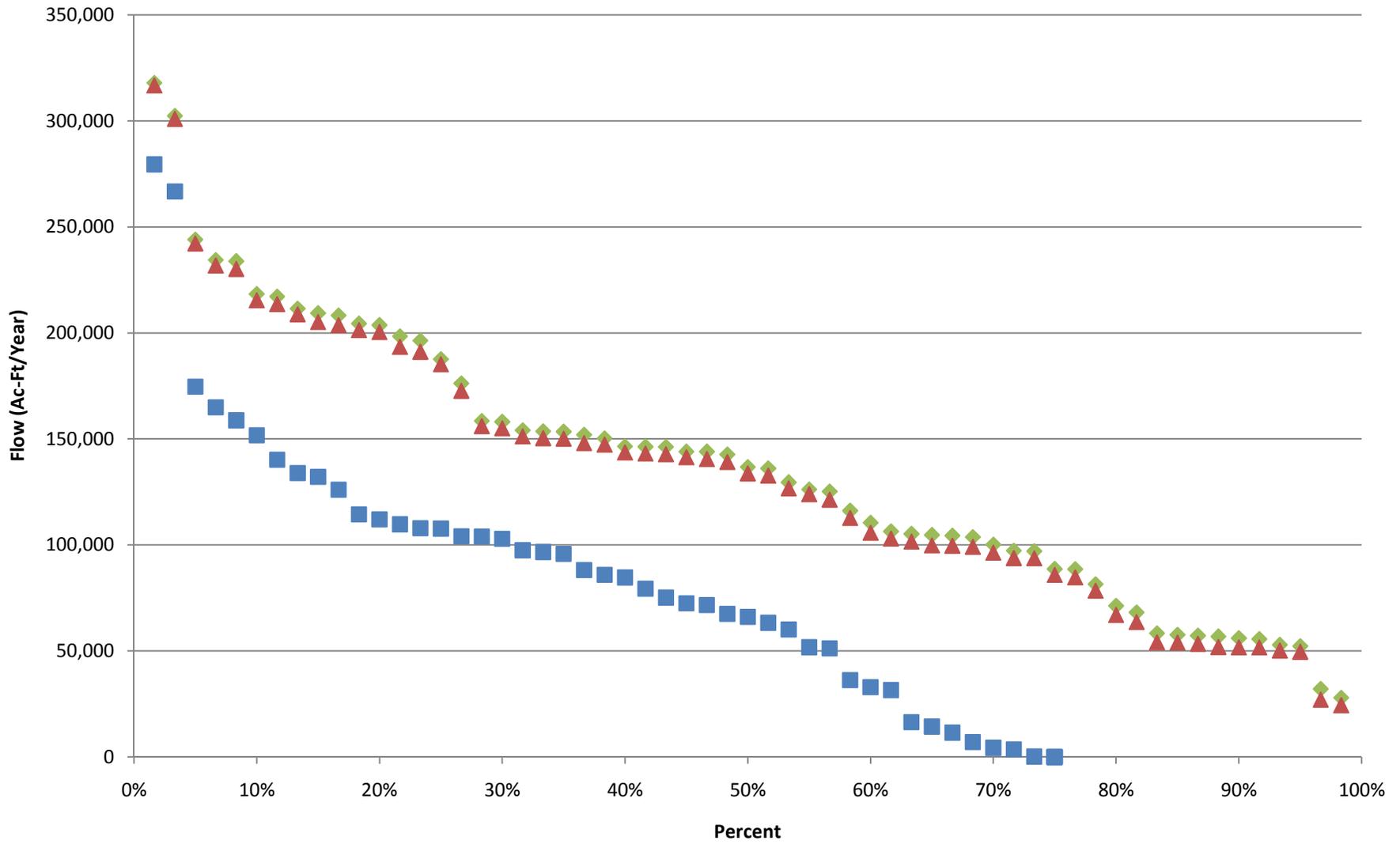
◆ Annual Naturalized Flow ▲ Annual Regulated Flow ■ Annual Unappropriated Flow

Run 8 USGS Gage 08019500 Big Sandy nr Big Sandy Flow Comparison



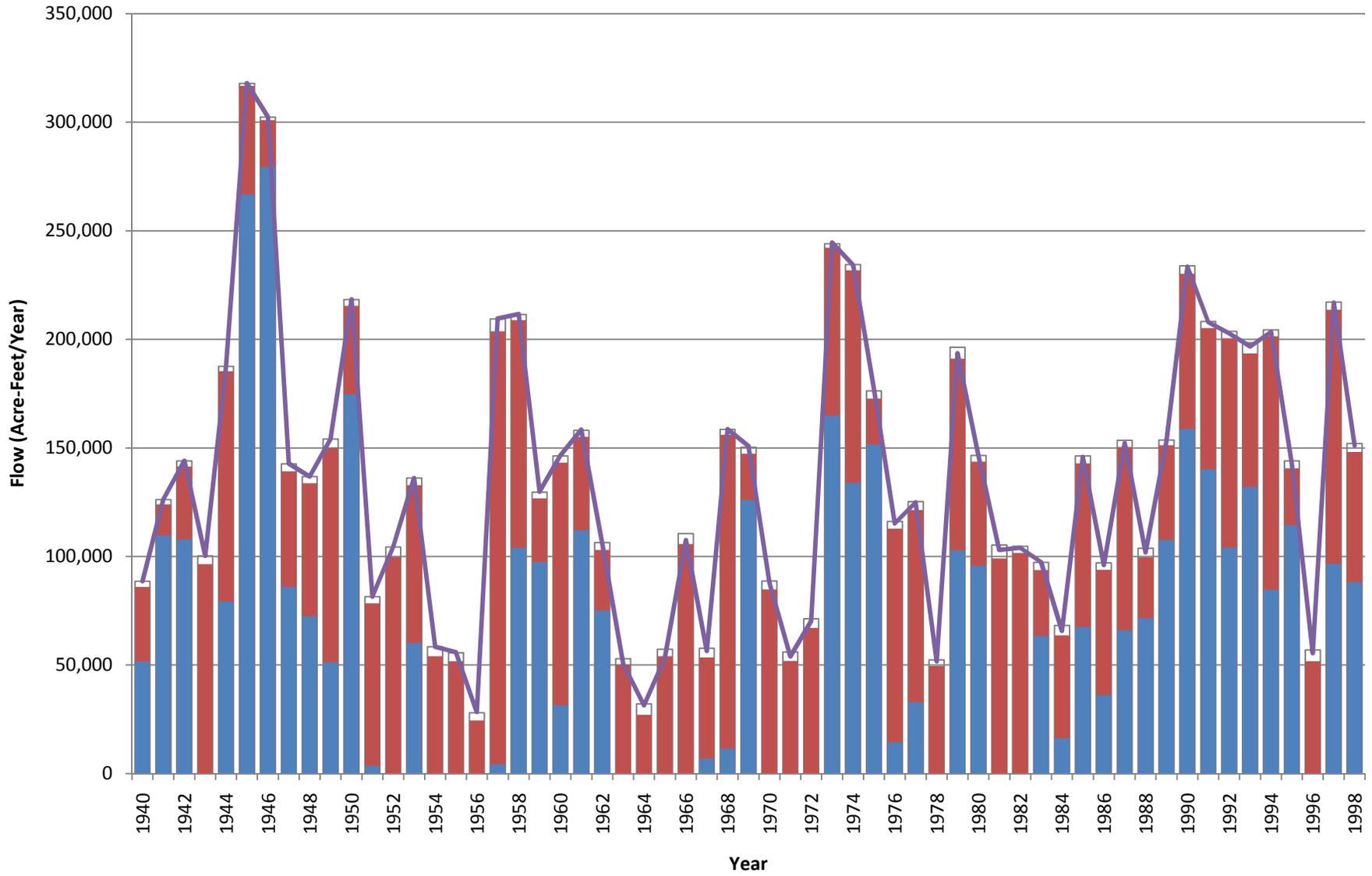
Flow Appropriated Upstream
 Flow Passed Downstream
 Unappropriated Flow
 USGS Gage Data

Run 3 Percent of Time Flow is Equaled or Exceeded USGS Gage 08019500 Big Sandy nr Big Sandy



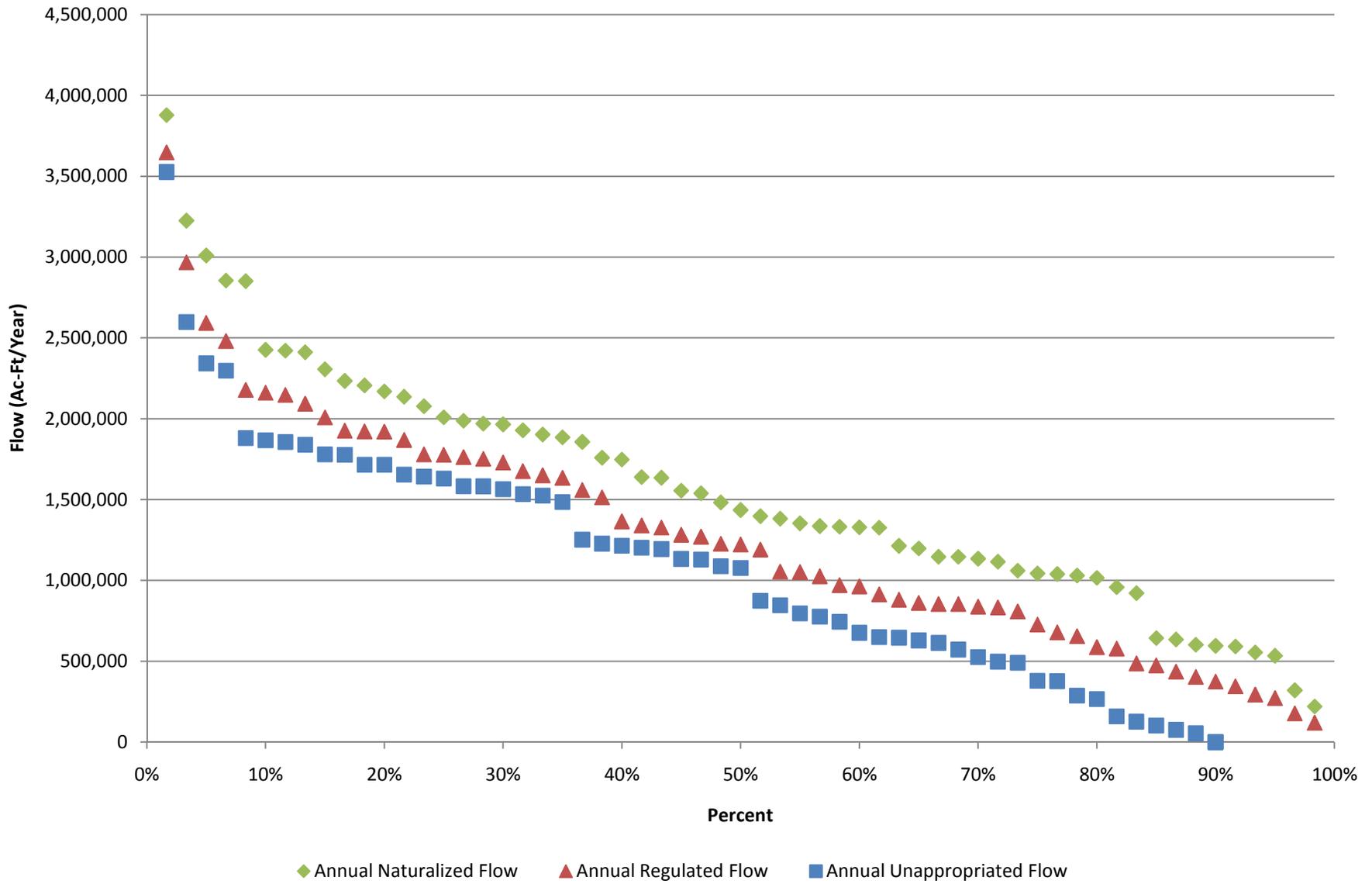
◆ Annual Naturalized Flow ▲ Annual Regulated Flow ■ Annual Unappropriated Flow

Run 3 USGS Gage 08019500 Big Sandy nr Big Sandy Flow Comparison

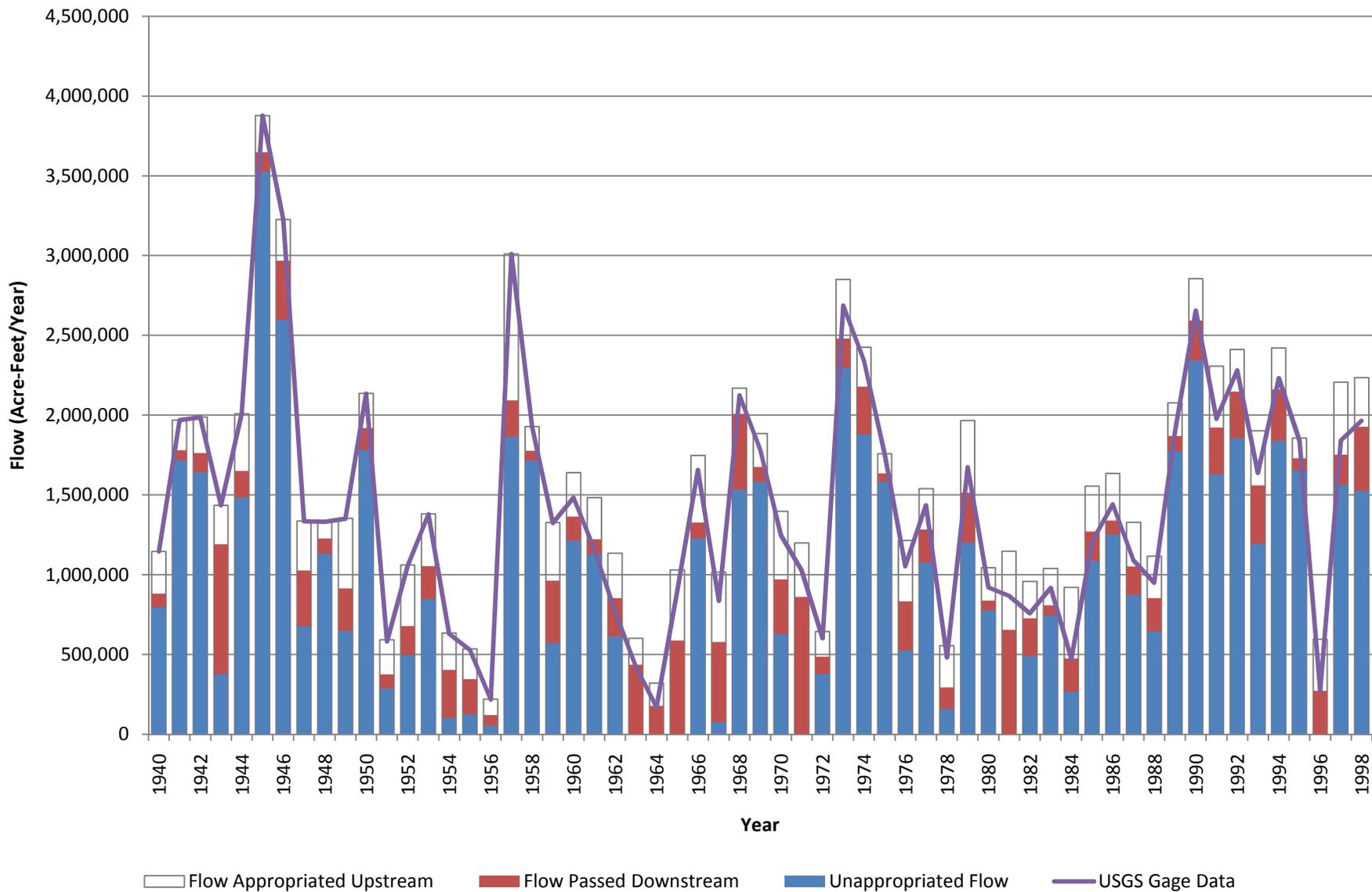


Flow Appropriated Upstream
 Flow Passed Downstream
 Unappropriated Flow
 USGS Gage Data

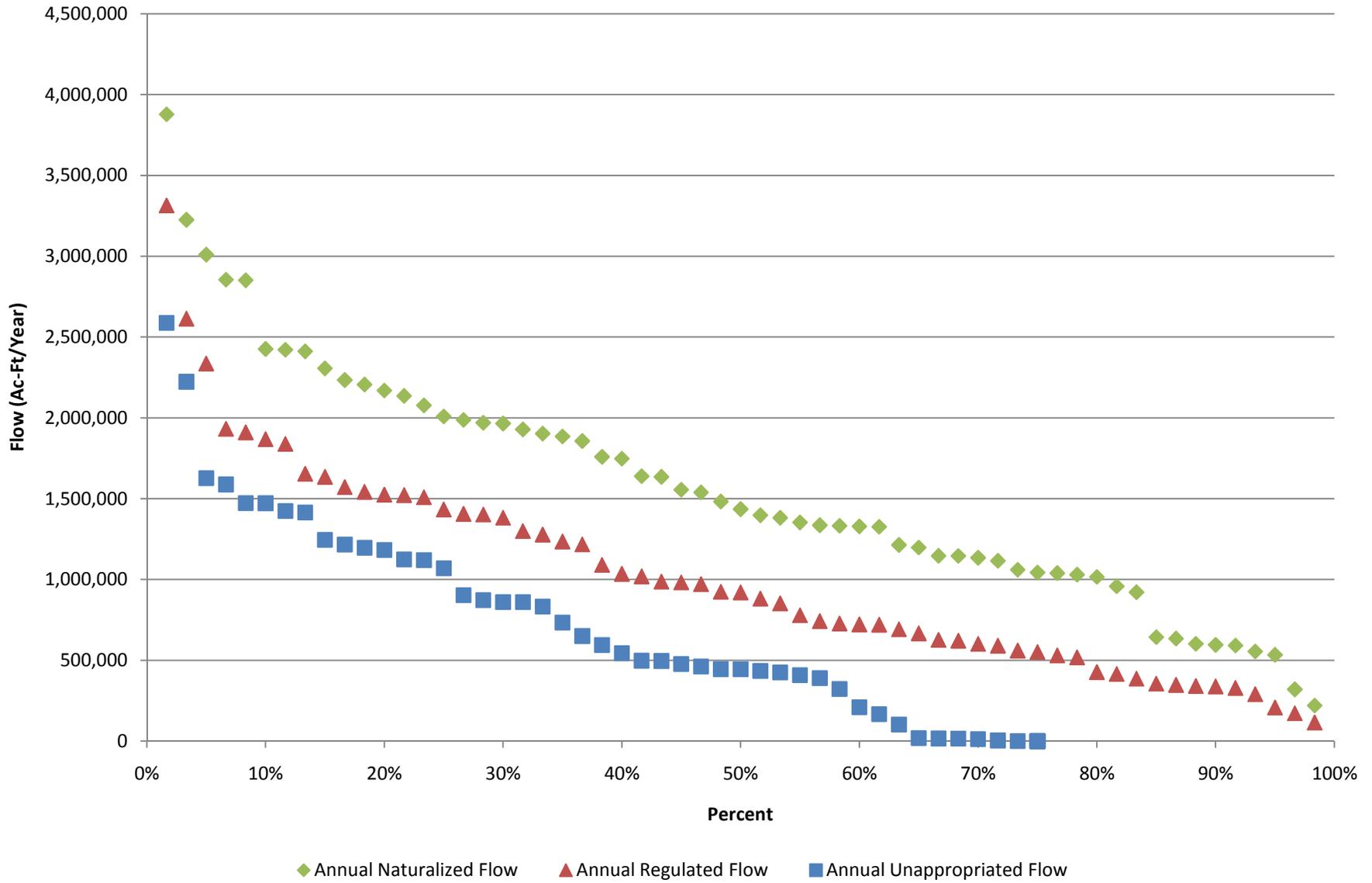
Run 8 Percent of Time Flow is Equaled or Exceeded USGS Gage 08020000 Sabine River nr Gladewater



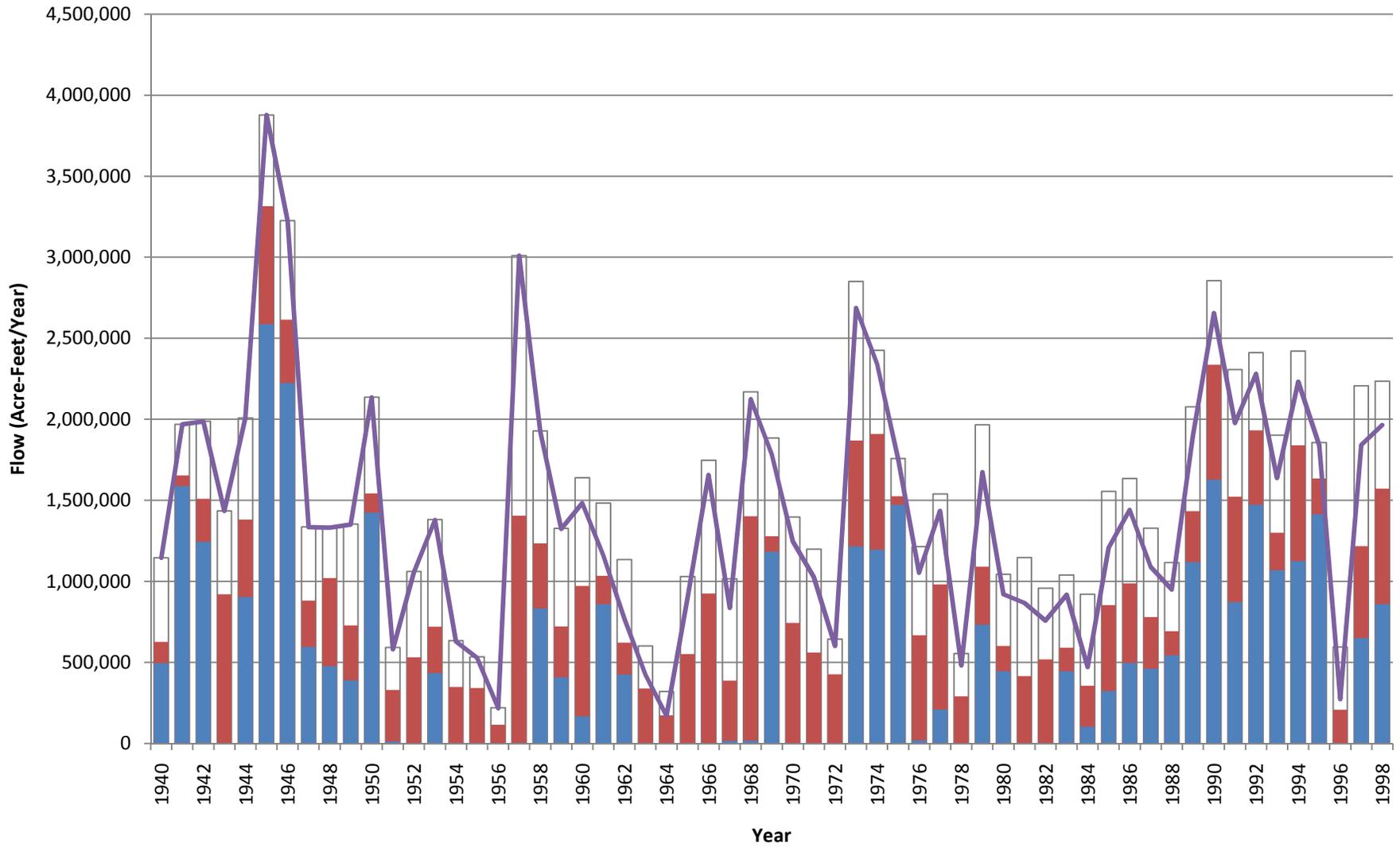
Run 8 USGS Gage 08020000 Sabine River nr Gladewater Flow Comparison



Run 3 Percent of Time Flow is Equaled or Exceeded USGS Gage 08020000 Sabine River nr Gladewater

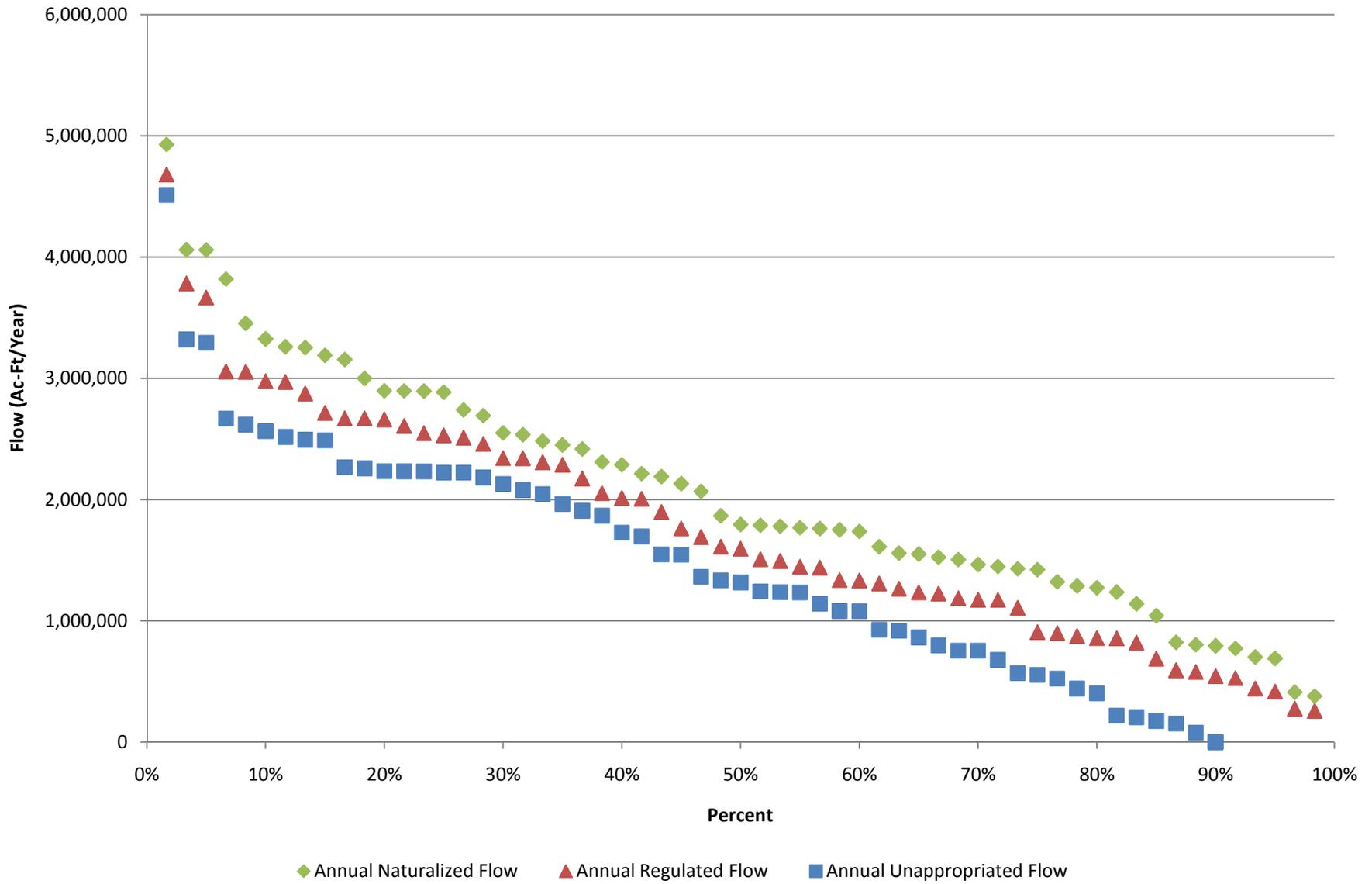


Run 3 USGS Gage 08020000 Sabine River nr Gladewater Flow Comparison

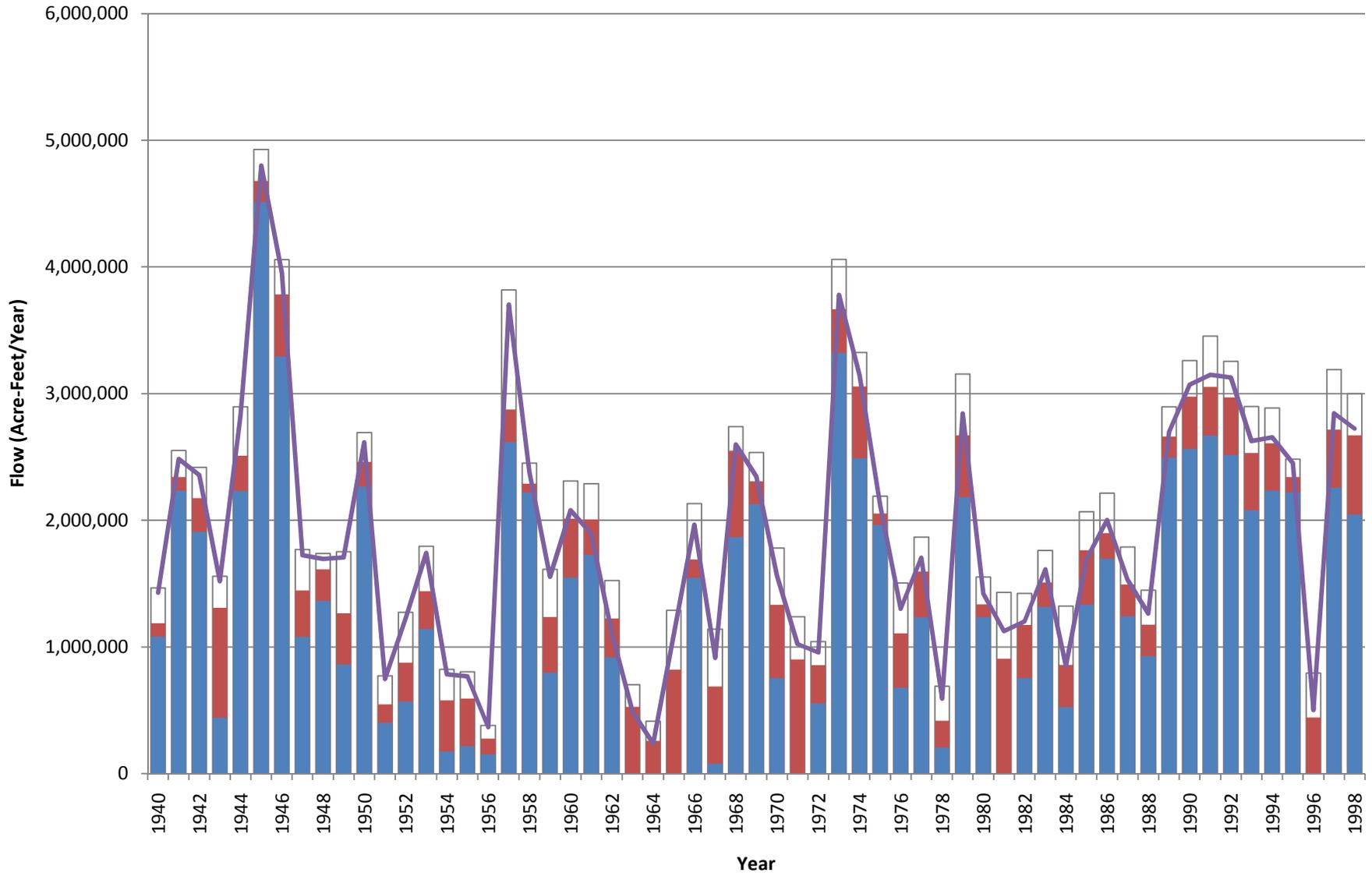


Flow Appropriated Upstream
 Flow Passed Downstream
 Unappropriated Flow
 USGS Gage Data

Run 8 Percent of Time Flow is Equaled or Exceeded USGS Gage 08022040 Sabine River nr Beckville

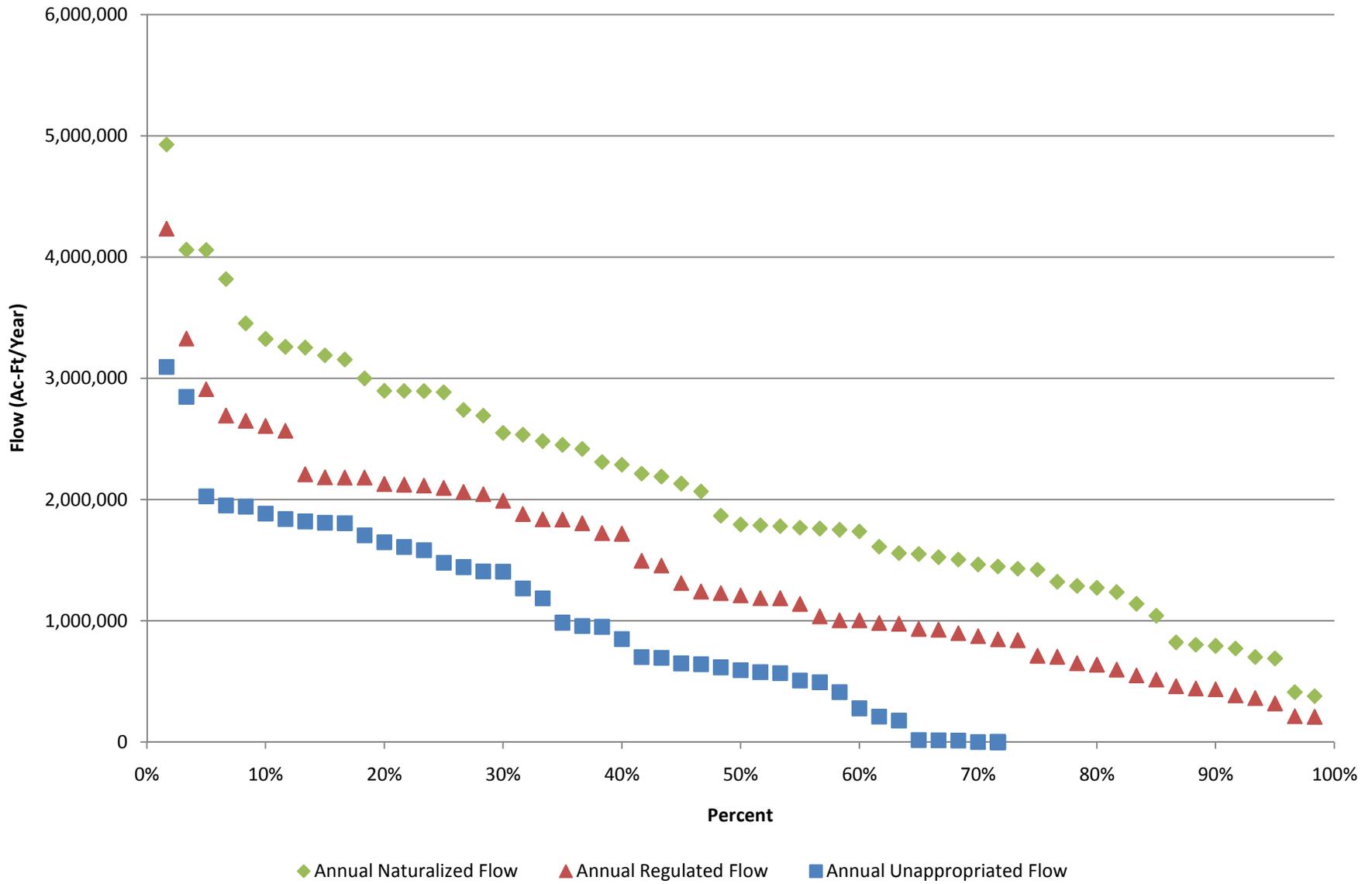


Run 8 USGS Gage 08022040 Sabine River nr Beckville Flow Comparison

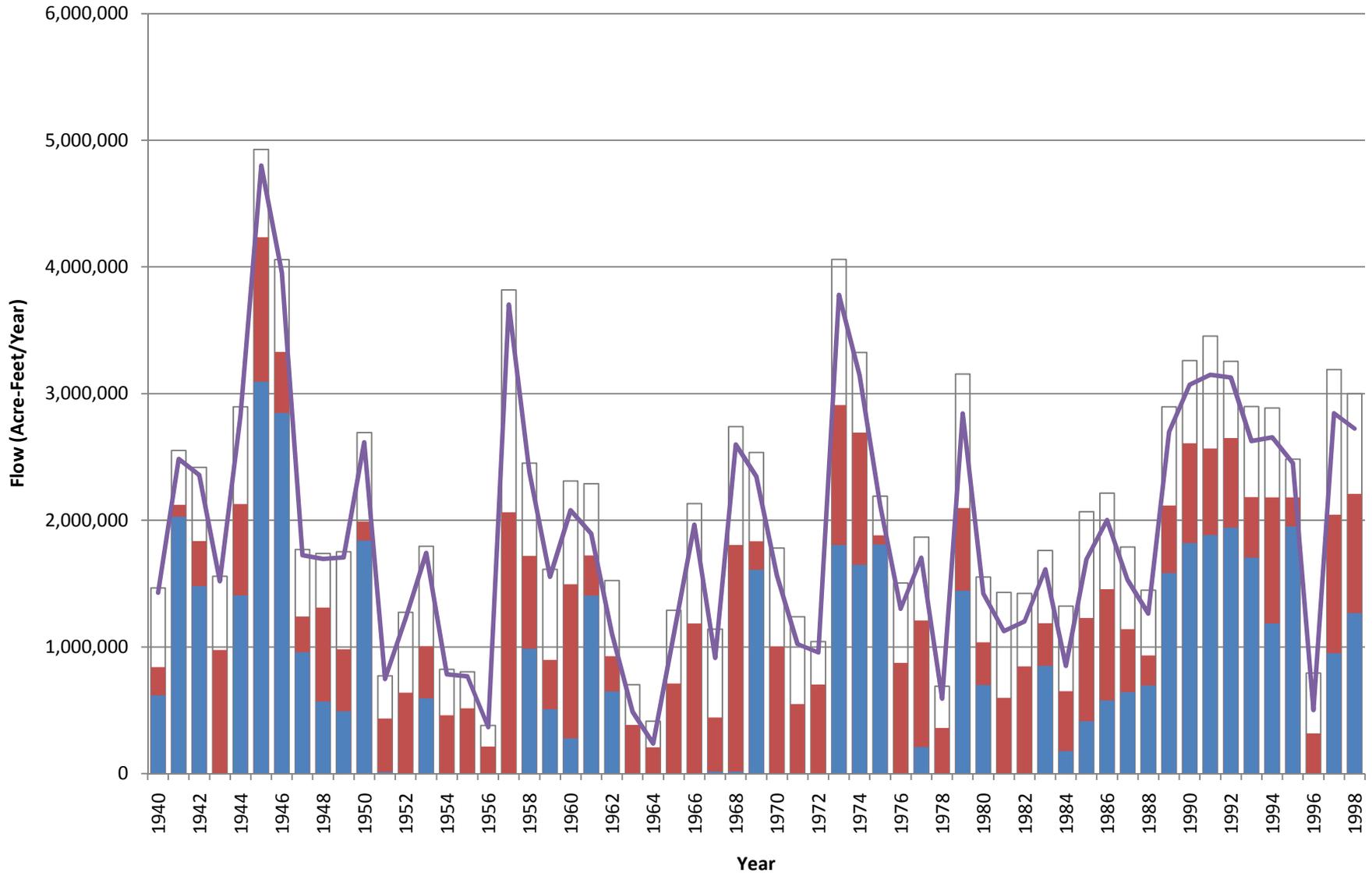


Flow Appropriated Upstream
 Flow Passed Downstream
 Unappropriated Flow
 USGS Gage Data

Run 3 Percent of Time Flow is Equaled or Exceeded USGS Gage 08022040 Sabine River nr Beckville

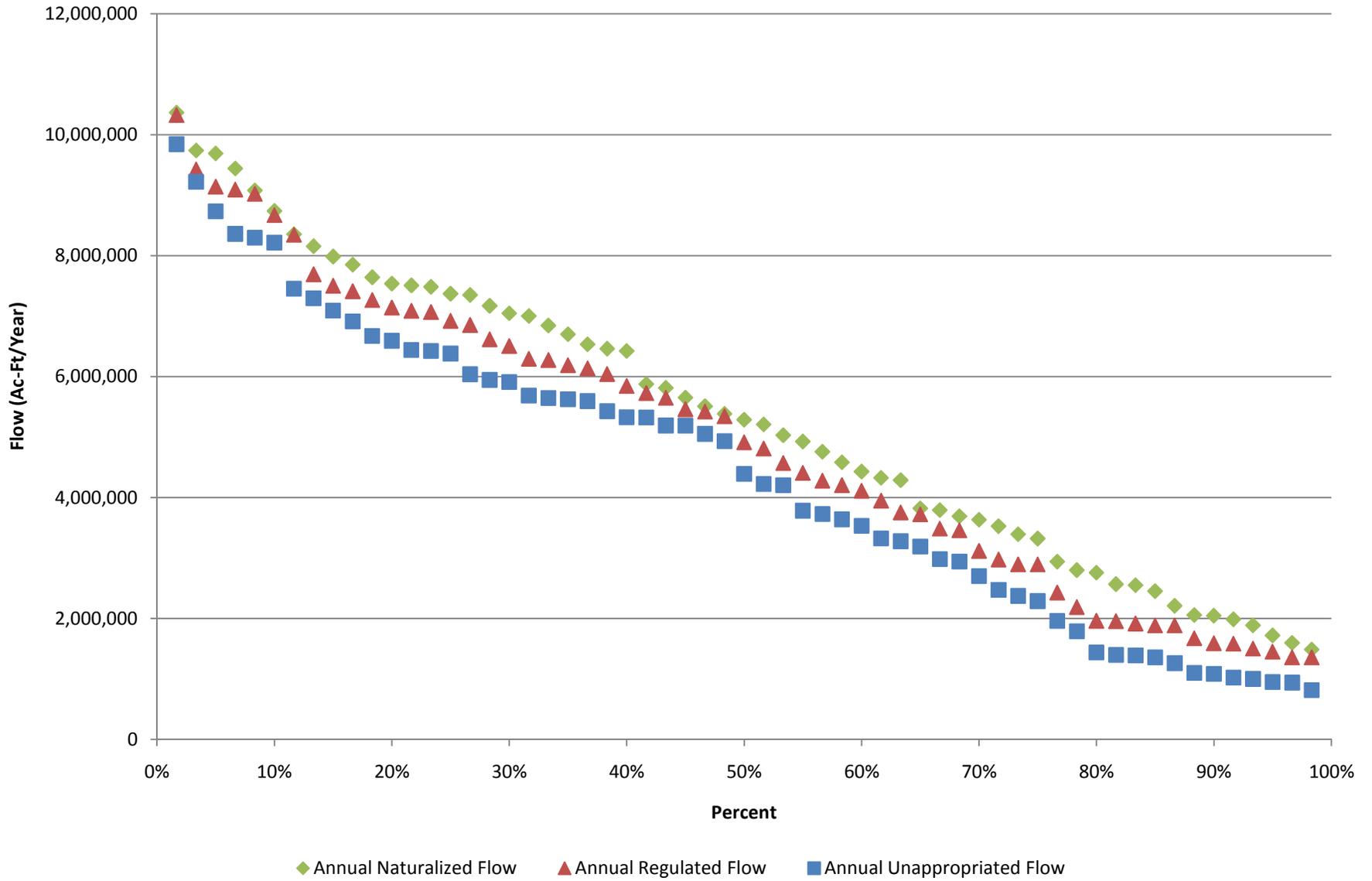


Run 3 USGS Gage 08022040 Sabine River nr Beckville Flow Comparison

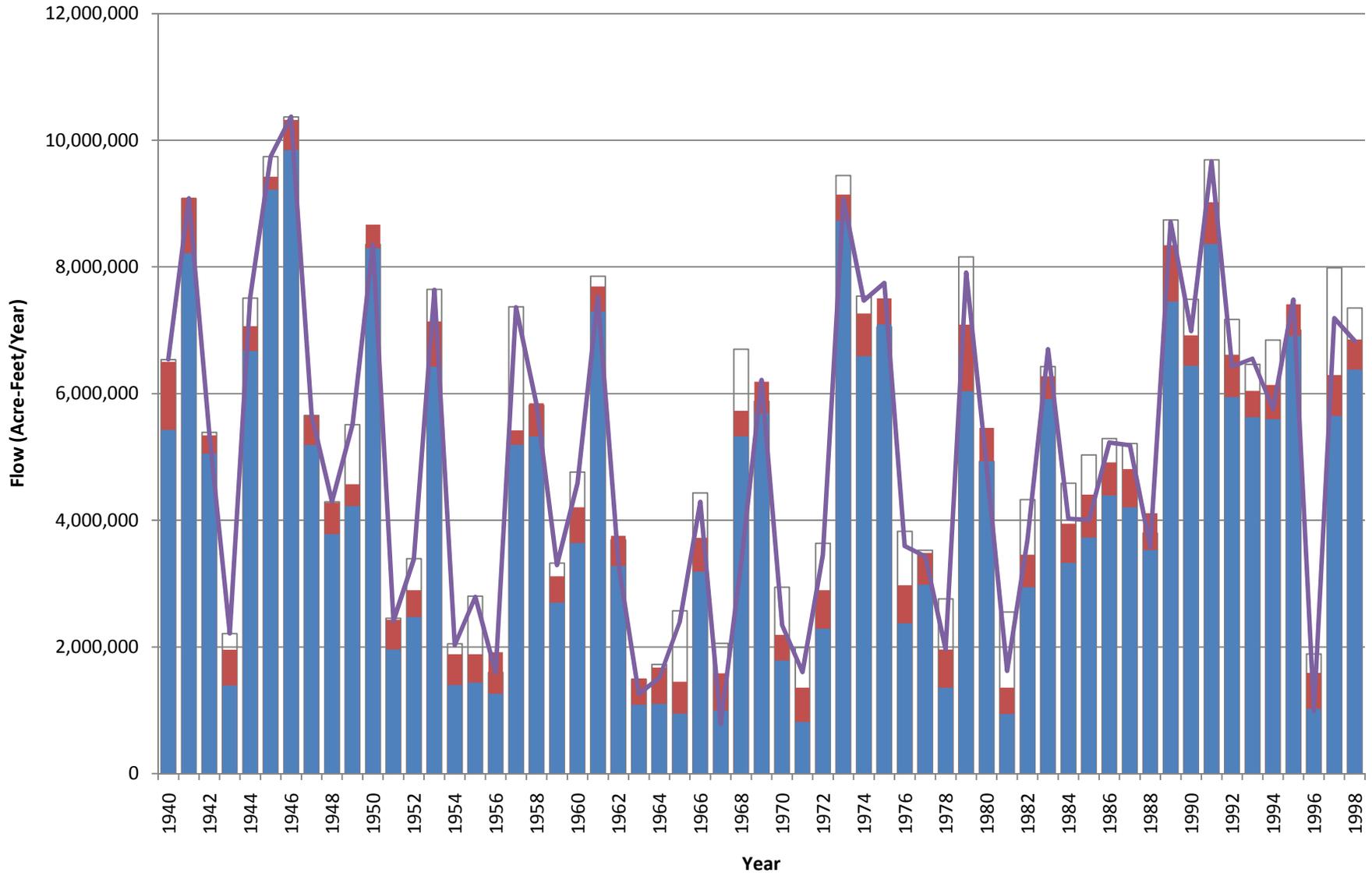


Legend:
 □ Flow Appropriated Upstream
 ■ Flow Passed Downstream
 ■ Unappropriated Flow
 — USGS Gage Data

Run 8 Percent of Time Flow is Equaled or Exceeded USGS Gage 08028500 Sabine River nr Bon Weir

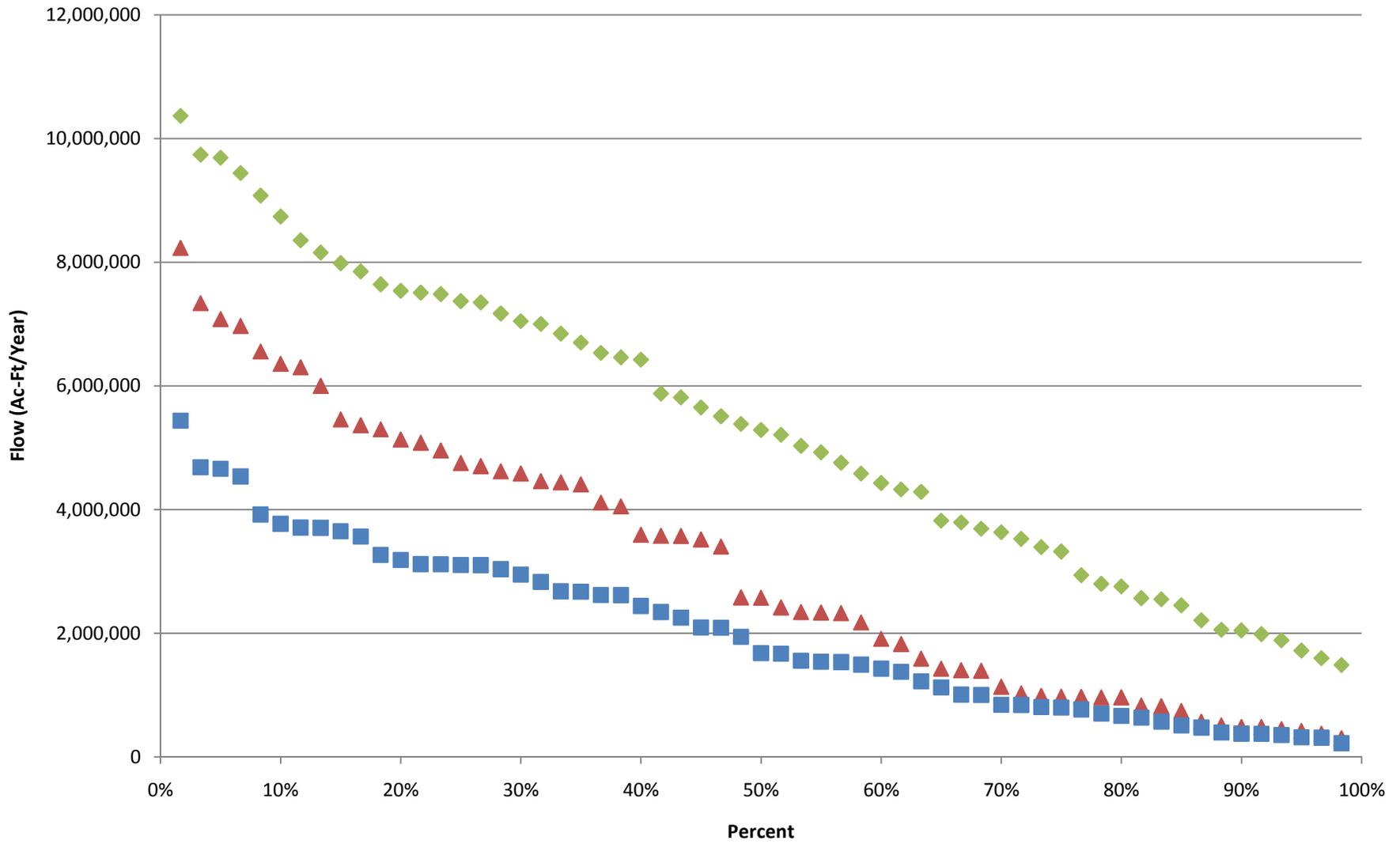


Run 8 USGS Gage 08028500 Sabine River nr Bon Weir Flow Comparison



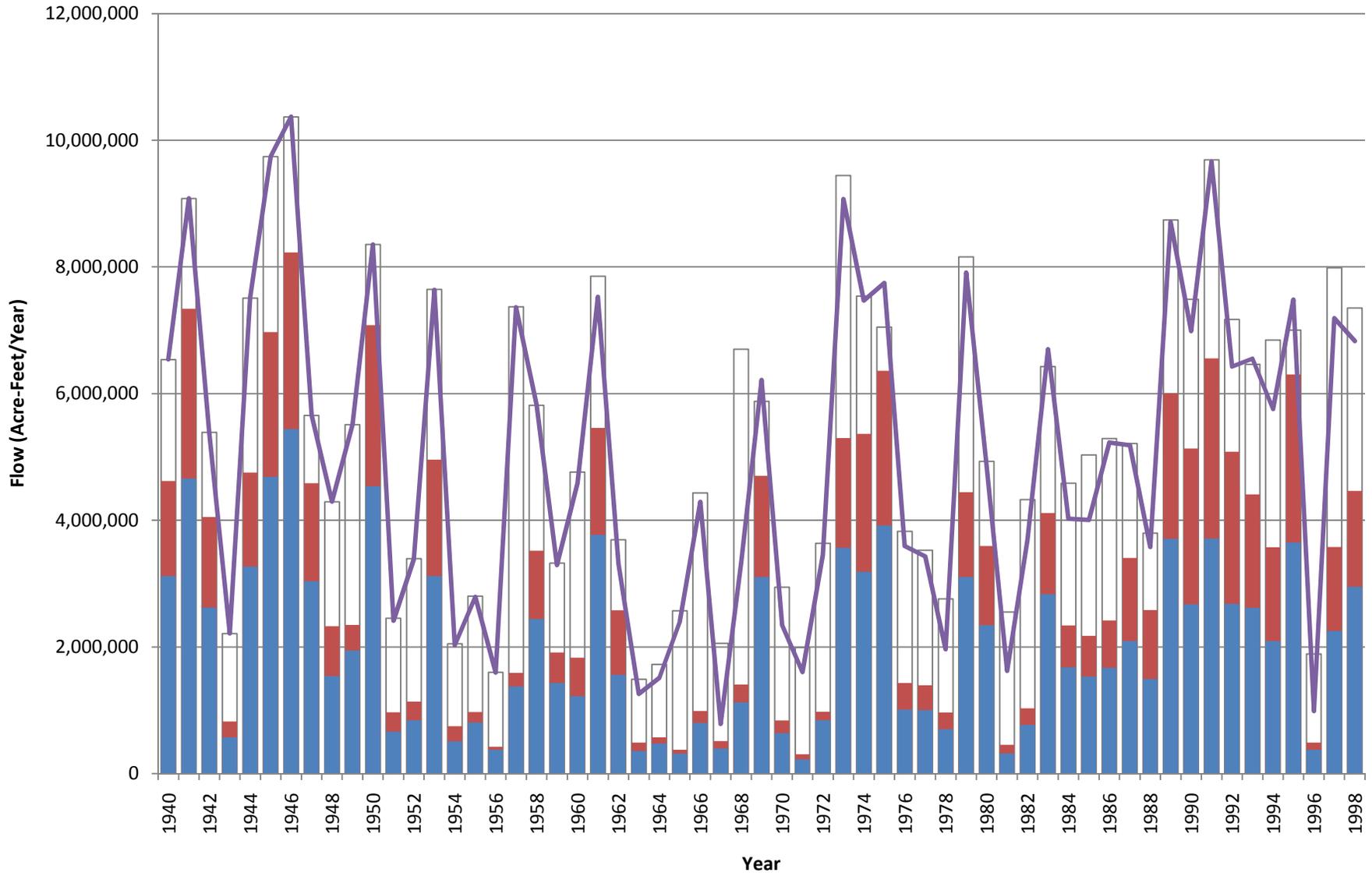
Flow Appropriated Upstream
 Flow Passed Downstream
 Unappropriated Flow
 USGS Gage Data

Run 3 Percent of Time Flow is Equaled or Exceeded USGS Gage 08028500 Sabine River nr Bon Weir



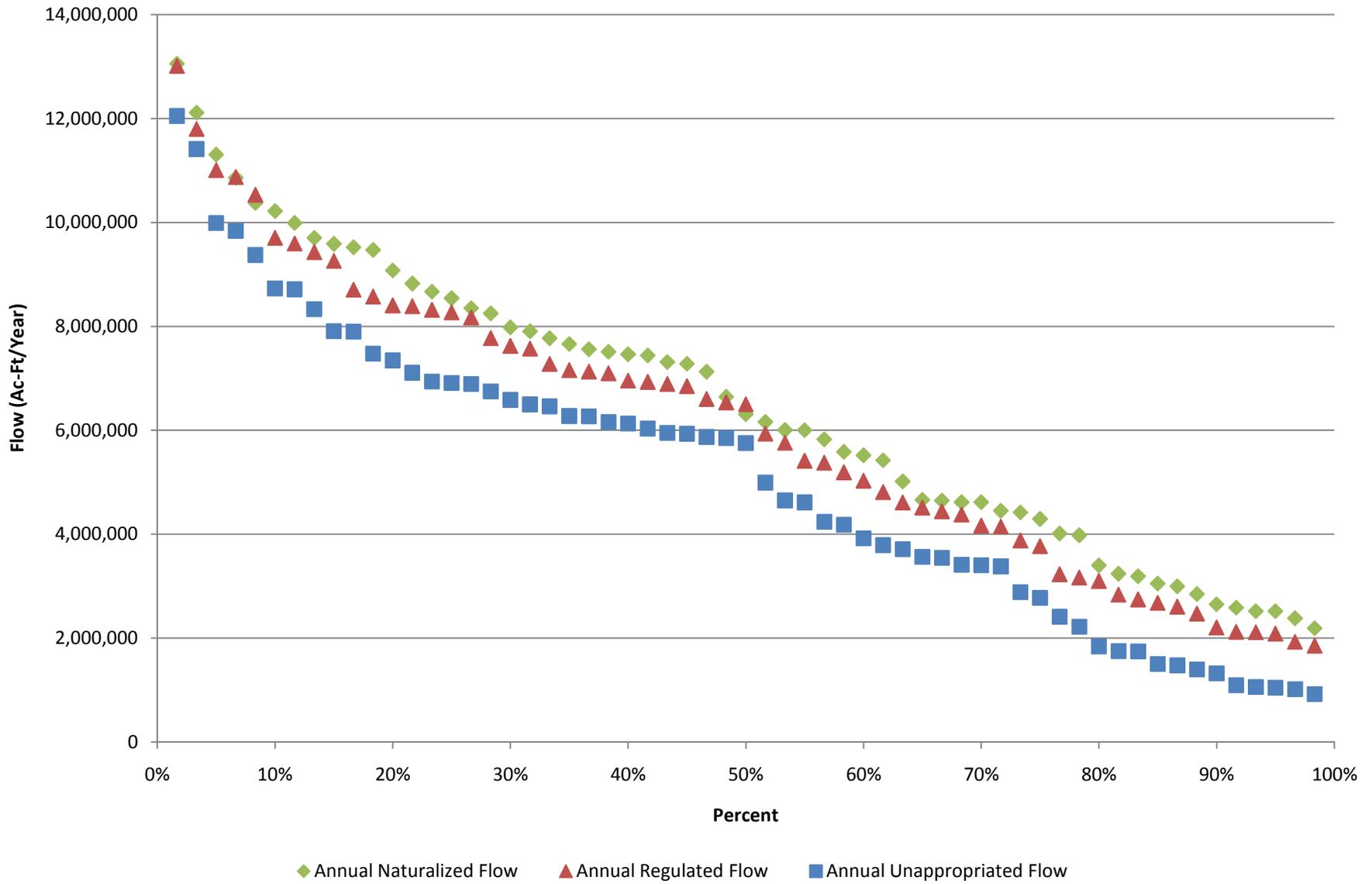
◆ Annual Naturalized Flow ▲ Annual Regulated Flow ■ Annual Unappropriated Flow

Run 3 USGS Gage 08028500 Sabine River nr Bon Weir Flow Comparison

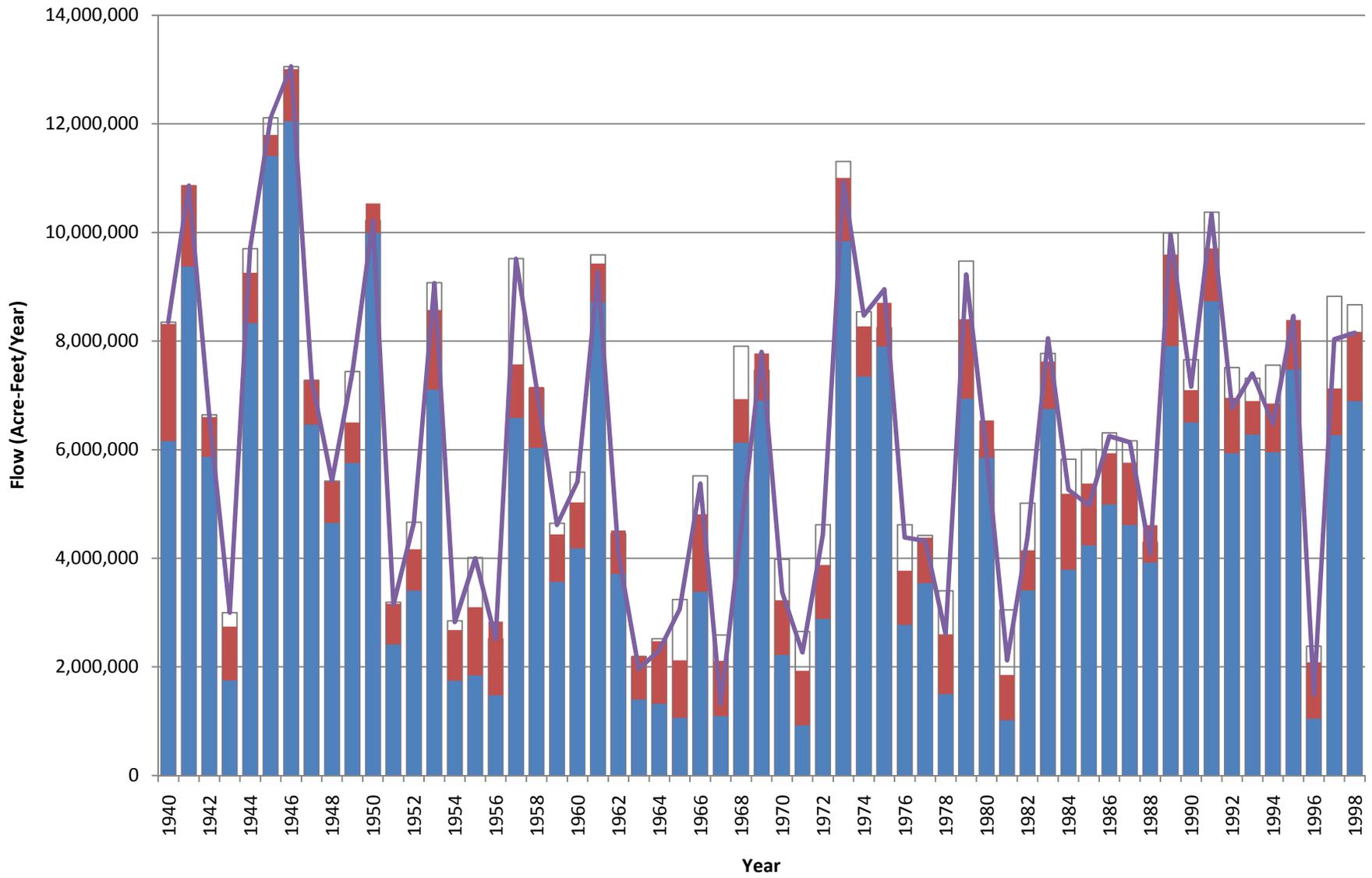


Legend:
 □ Flow Appropriated Upstream
 ■ Flow Passed Downstream
 ■ Unappropriated Flow
 — USGS Gage Data

Run 8 Percent of Time Flow is Equaled or Exceeded USGS Gage 08030500 Sabine River nr Ruliff

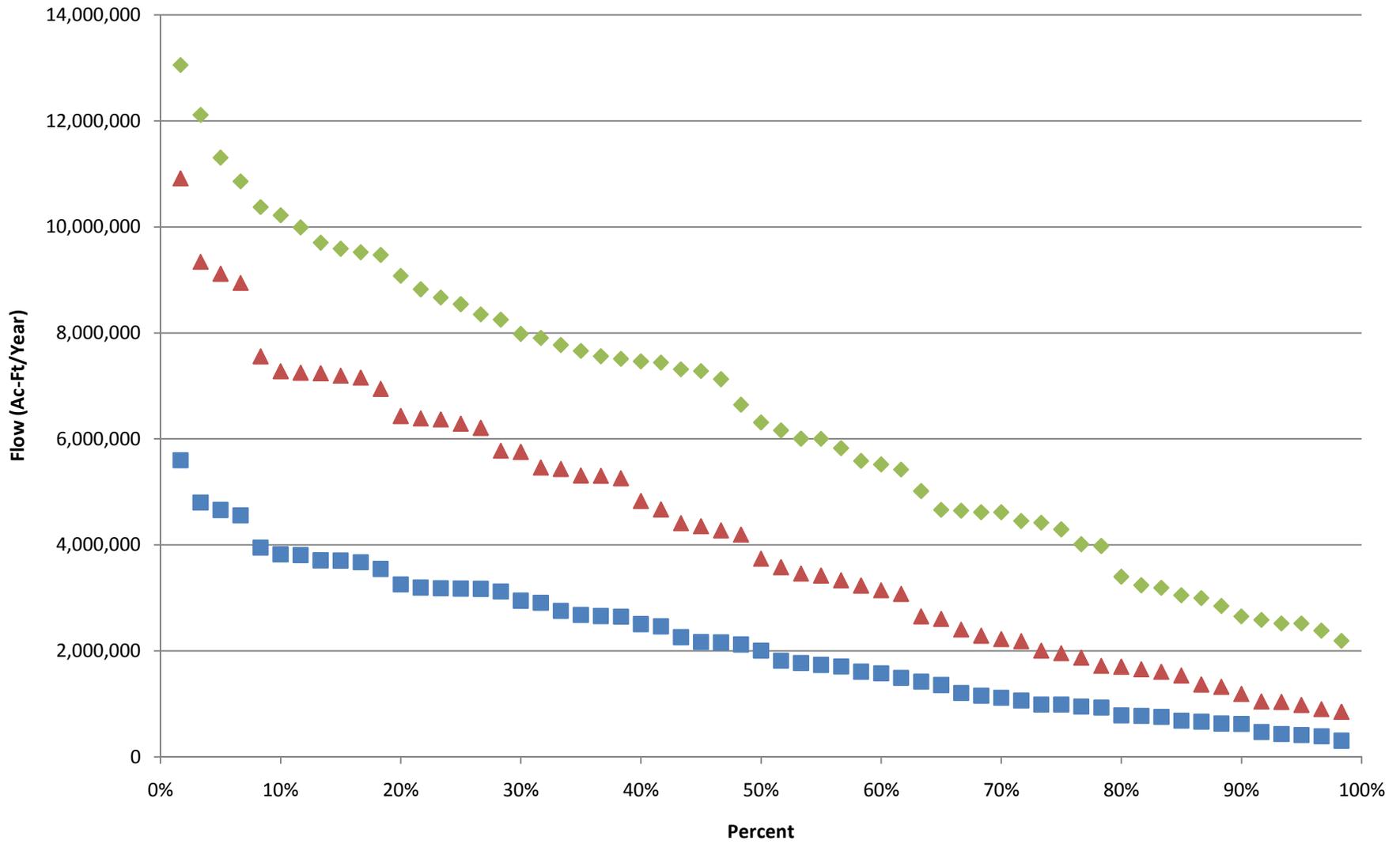


Run 8 USGS Gage 08030500 Sabine River nr Ruliff Flow Comparison



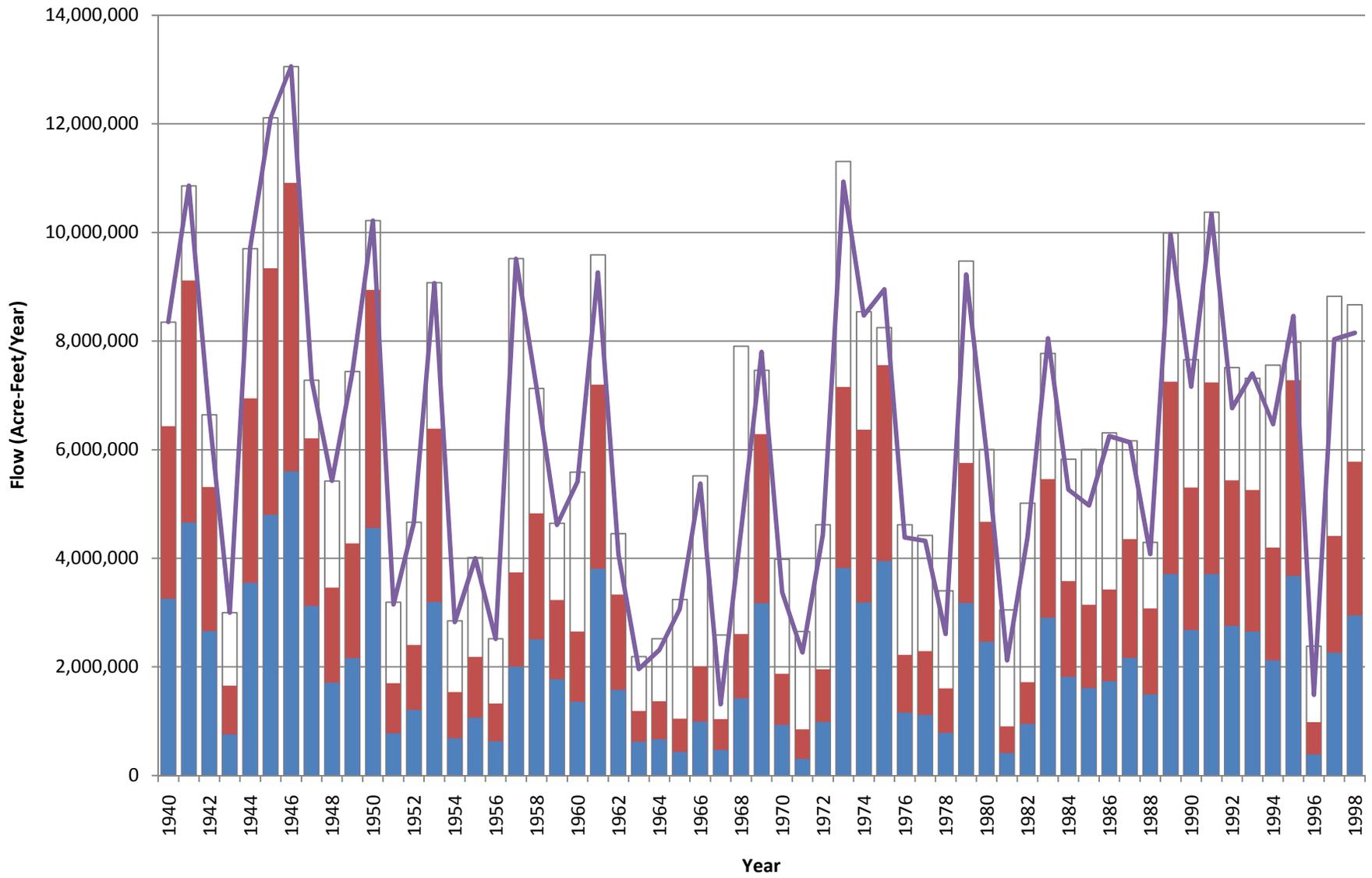
Flow Appropriated Upstream
 Flow Passed Downstream
 Unappropriated Flow
 USGS Gage Data

Run 3 Percent of Time Flow is Equaled or Exceeded USGS Gage 08030500 Sabine River nr Ruliff



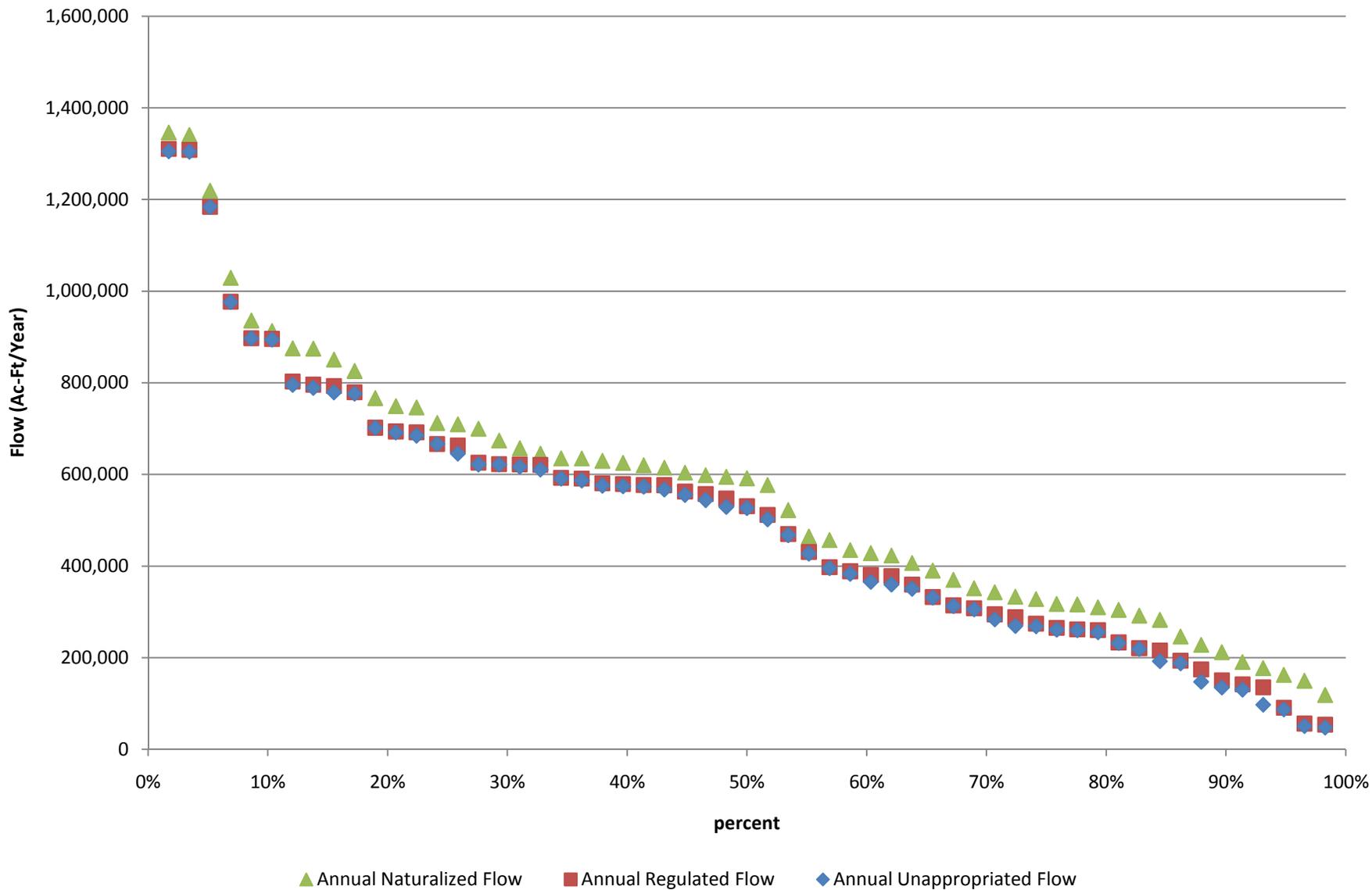
◆ Annual Naturalized Flow ▲ Annual Regulated Flow ■ Annual Unappropriated Flow

Run 3 USGS Gage 08030500 Sabine River nr Ruliff Flow Comparison

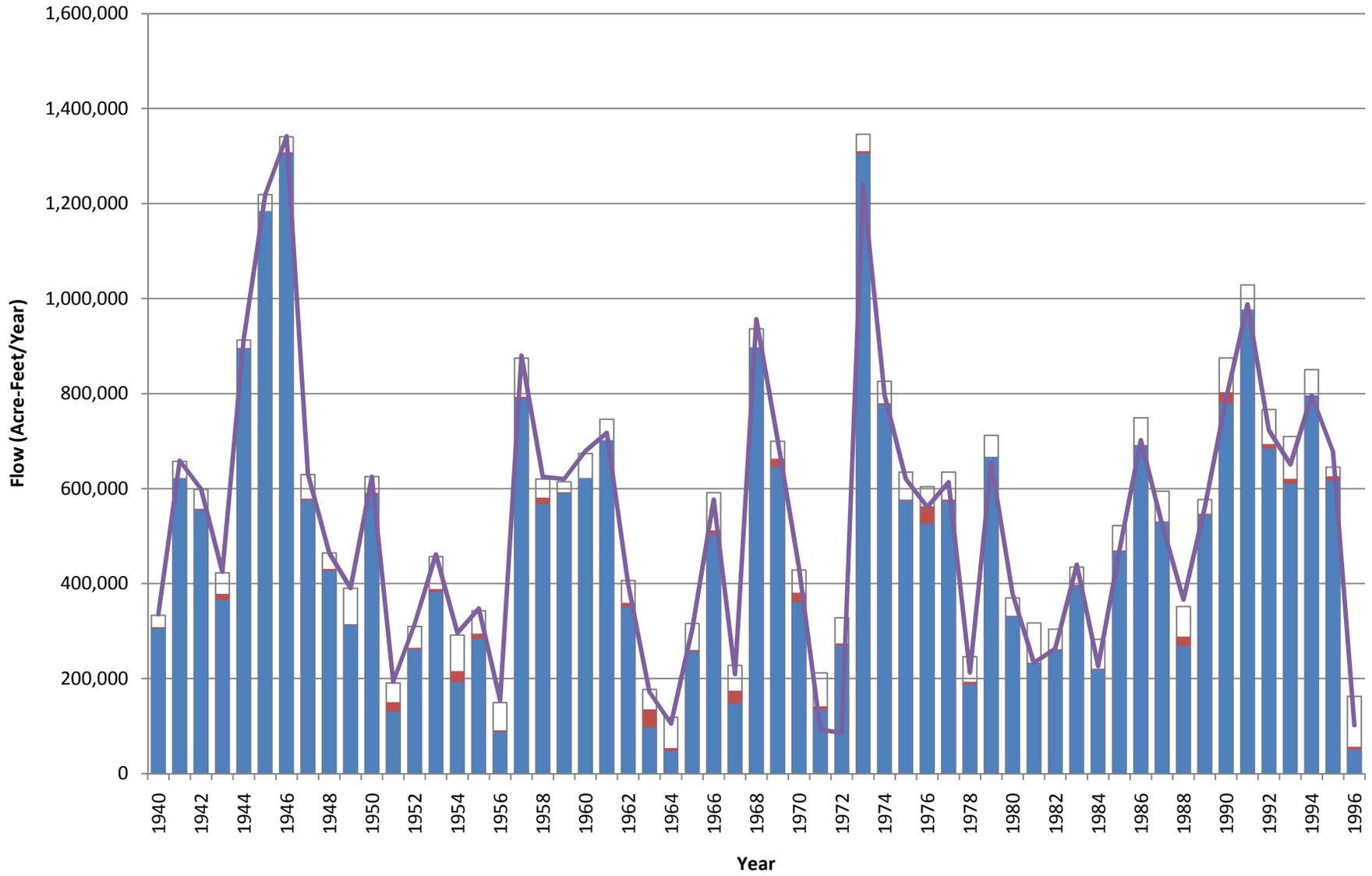


Flow Appropriated Upstream Flow Passed Downstream Unappropriated Flow USGS Gage Data

Run 8 Percent of Time Flow is Equaled or Exceeded USGS Gage 08032000 Neches River at Neches

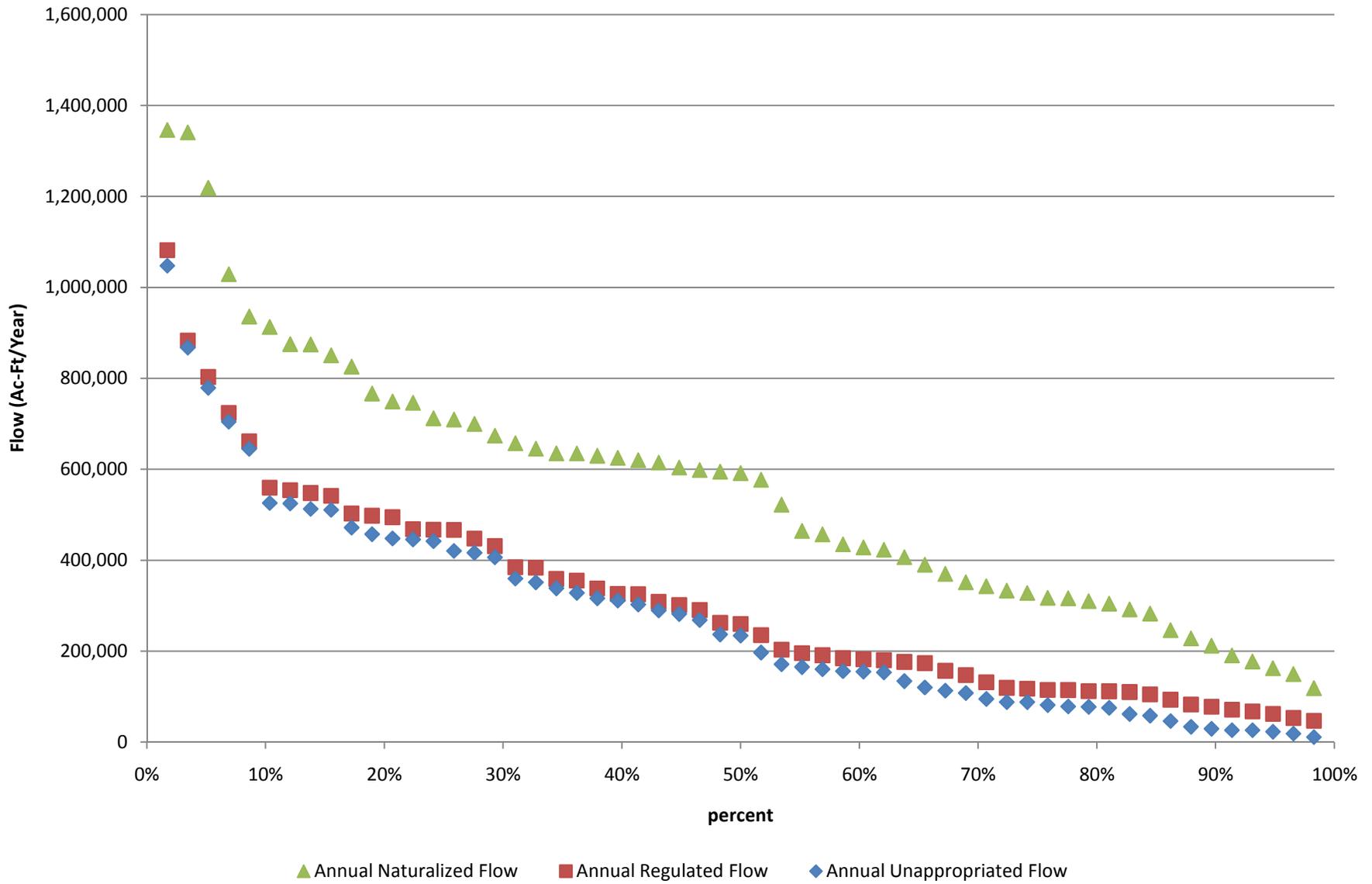


Run 8 USGS Gage 08032000 Neches River at Neches Flow Comparison

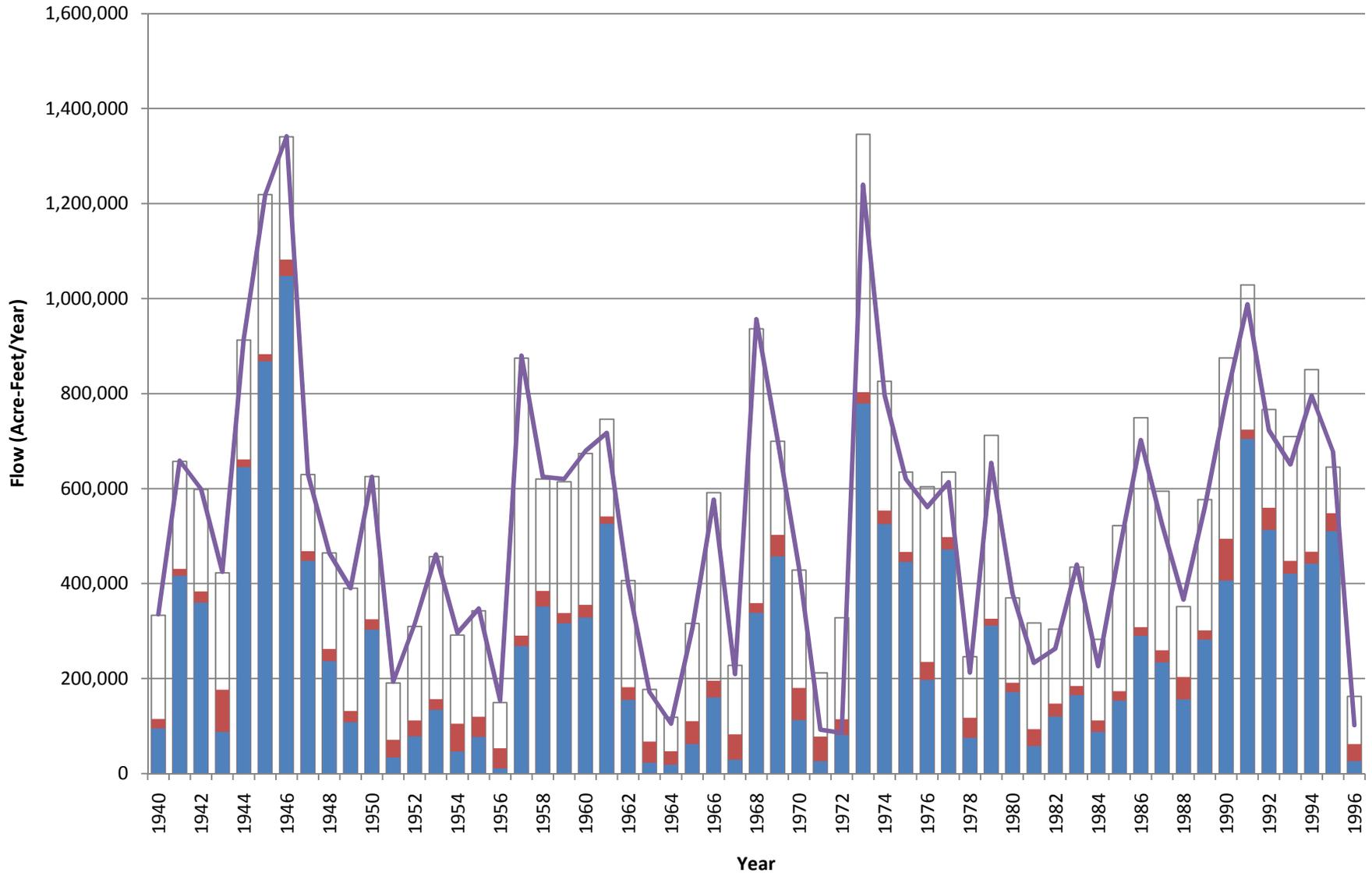


Legend:
 □ Flow Appropriated Upstream
 ■ Flow Passed Downstream
 ■ Unappropriated Flow
 — USGS Gage Data

Run 3 Percent of Time Flow is Equaled or Exceeded USGS Gage 08032000 Neches River at Neches

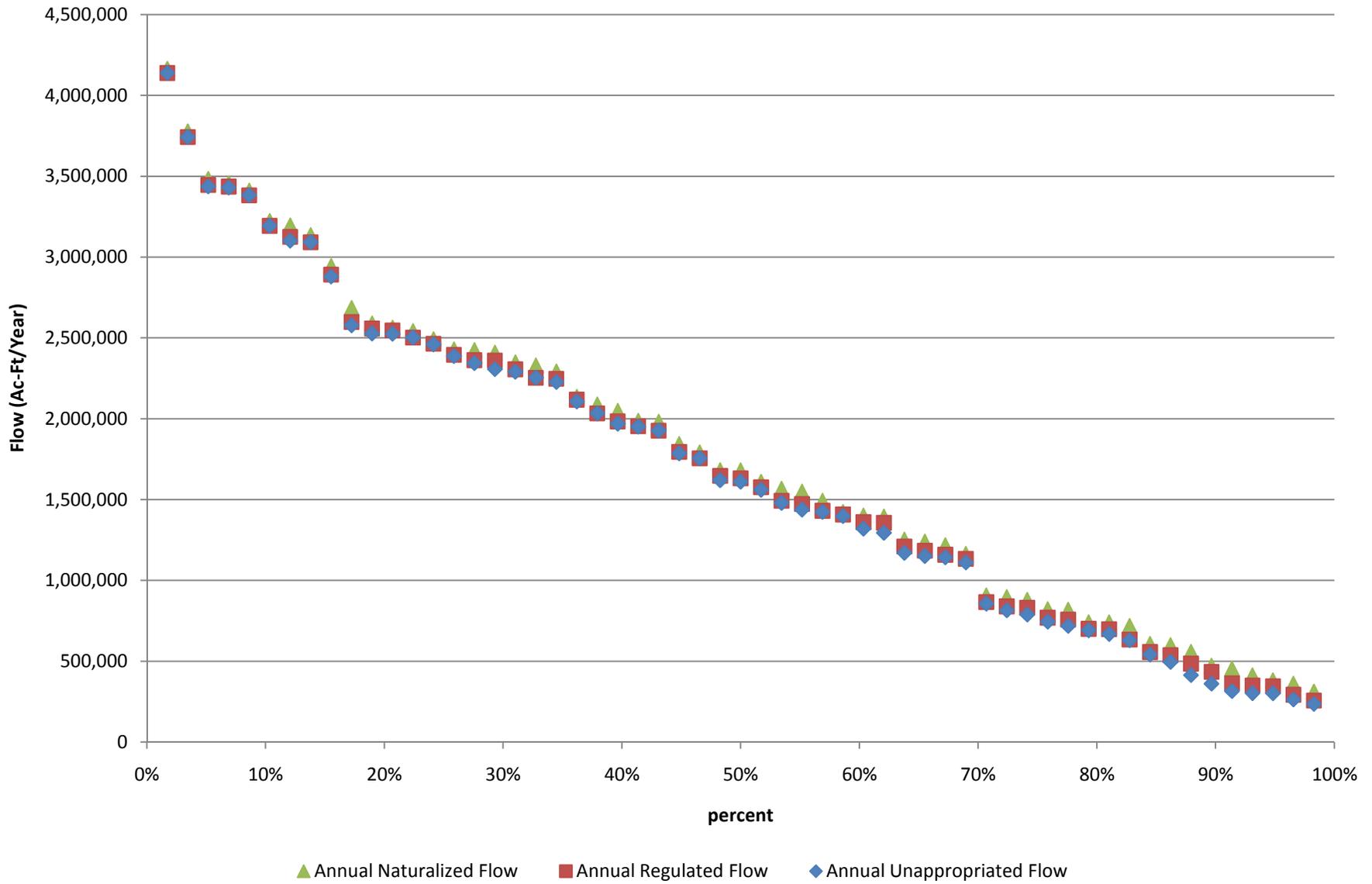


Run 3 USGS Gage 08032000 Neches River at Neches Flow Comparison

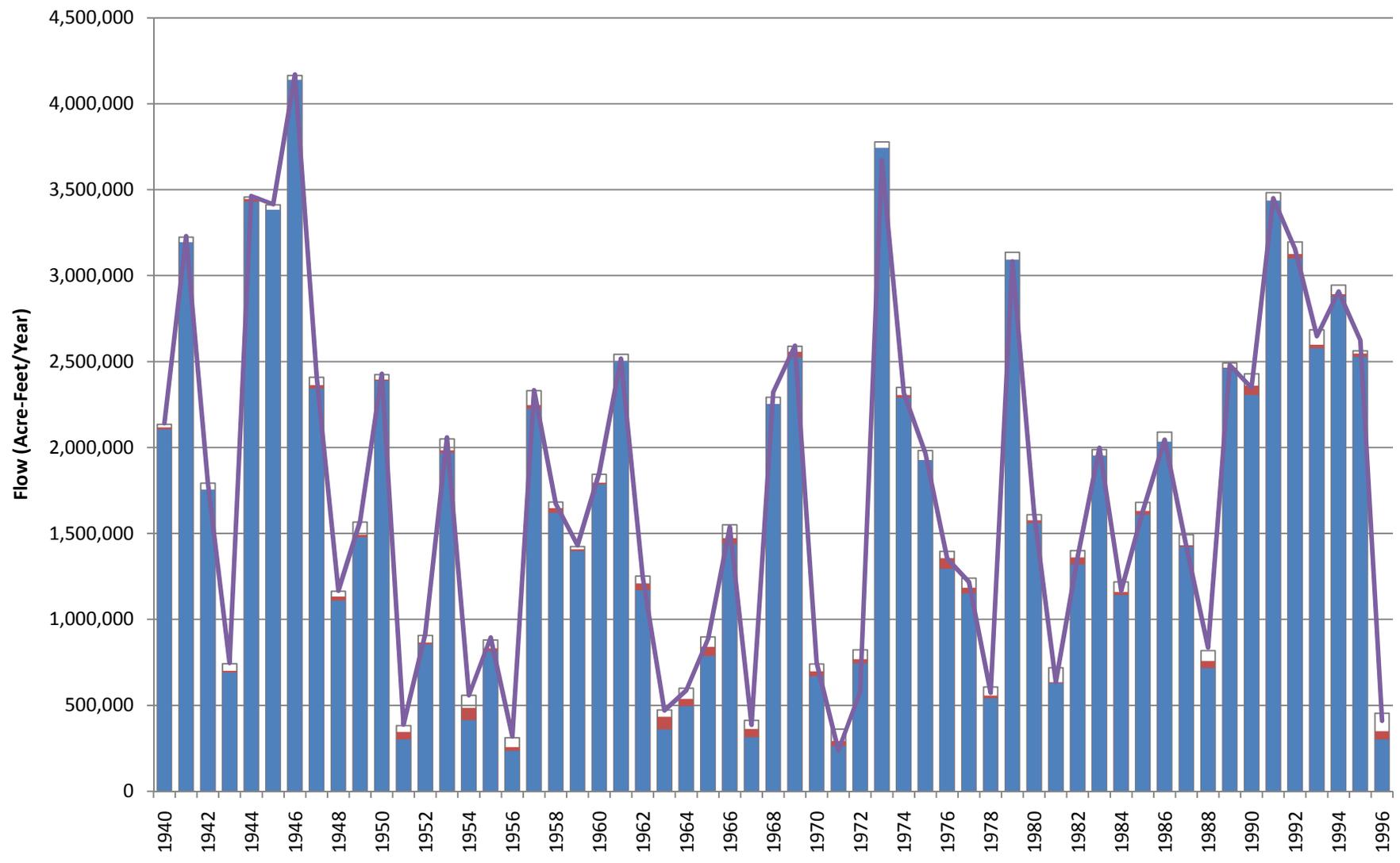


Legend:
 □ Flow Appropriated Upstream
 ■ Flow Passed Downstream
 ■ Unappropriated Flow
 — USGS Gage Data

Run 8 Percent of Time Flow is Equaled or Exceeded USGS Gage 08033500 Neches River nr Rockland

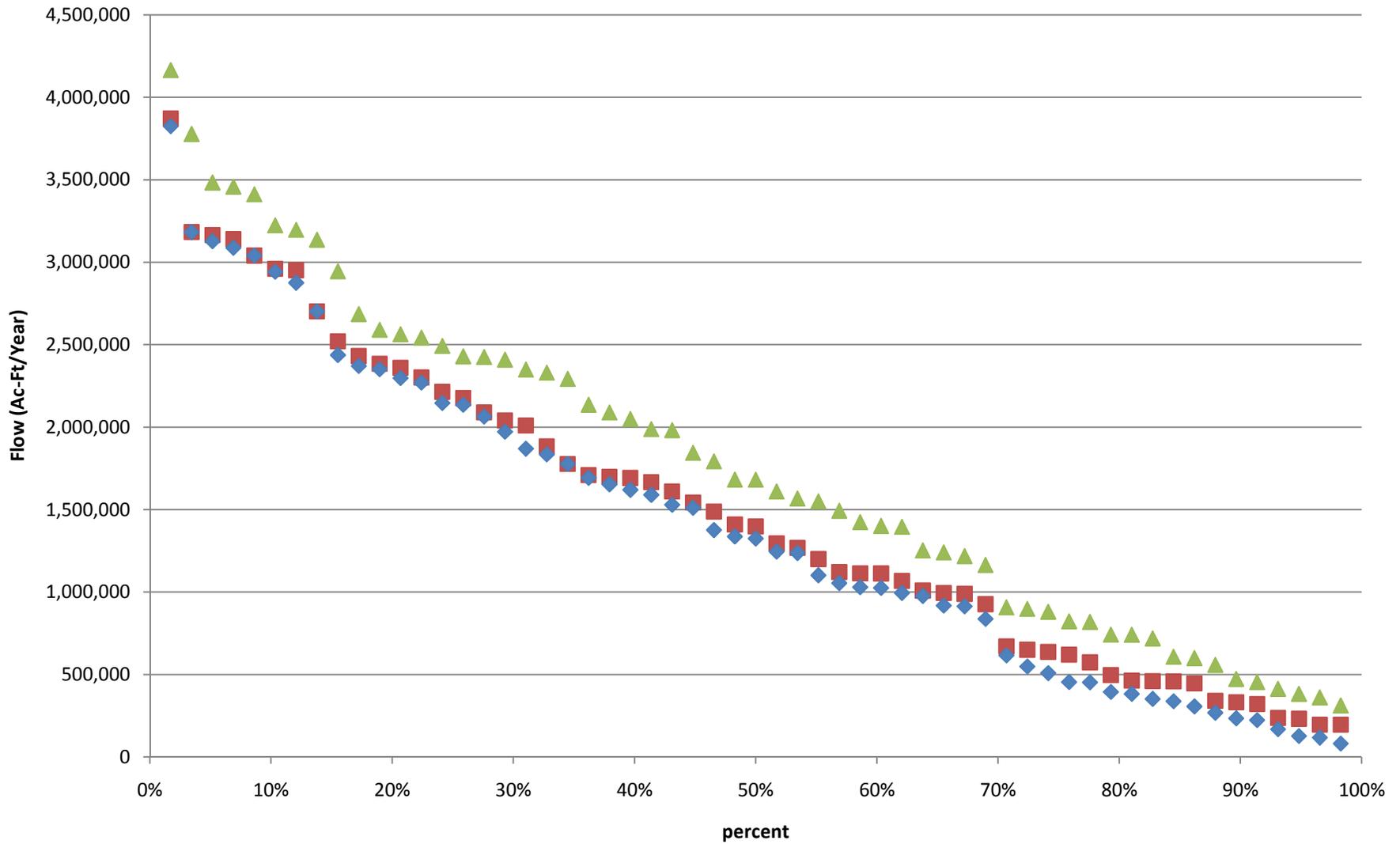


Run 8 USGS Gage 08033500 Neches River nr Rockland Flow Comparison



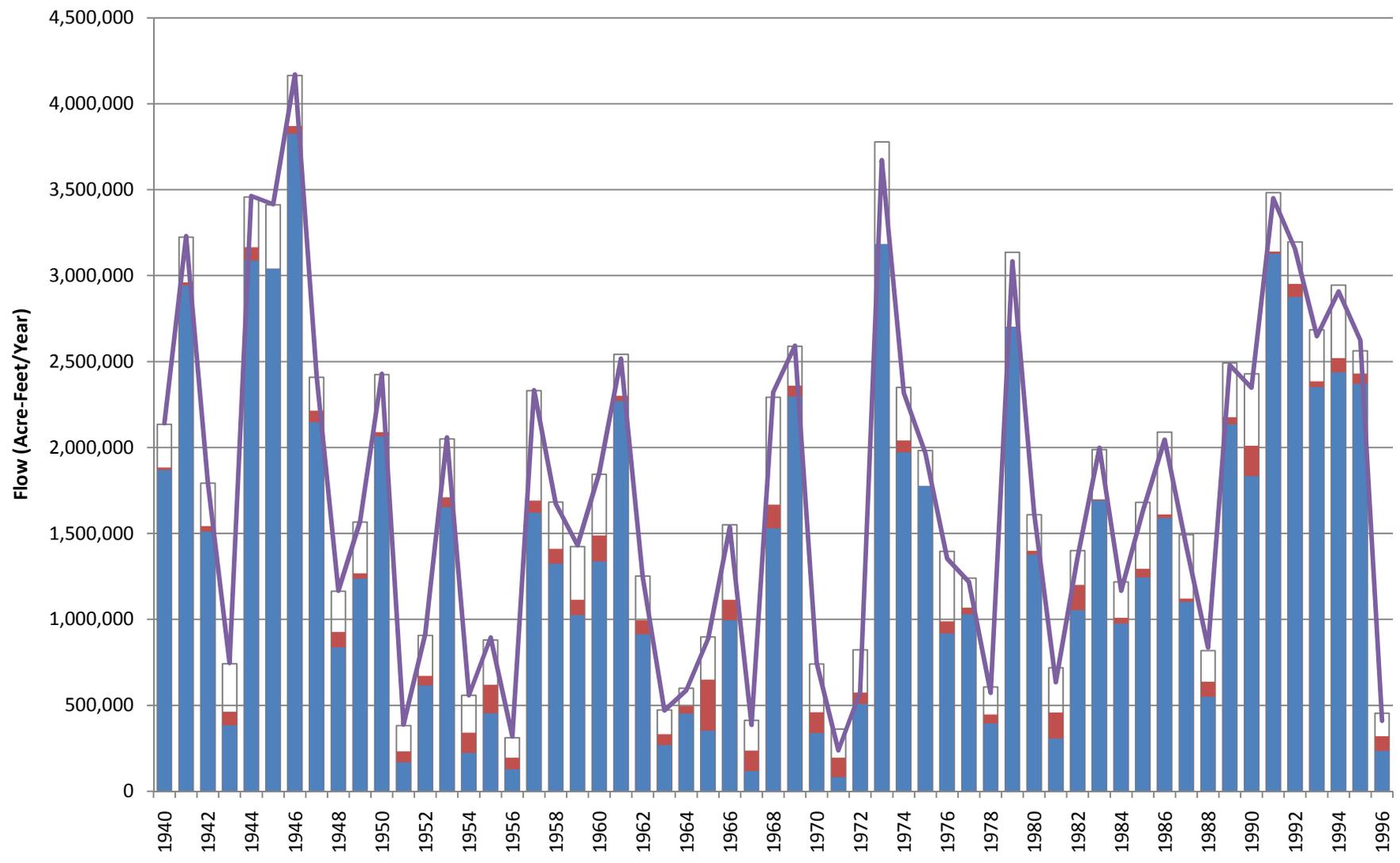
Flow Appropriated Upstream
 Flow Passed Downstream
 Unappropriated Flow
 USGS Gage Data

Run 3 Percent of Time Flow is Equaled or Exceeded USGS Gage 08033500 Neches River nr Rockland



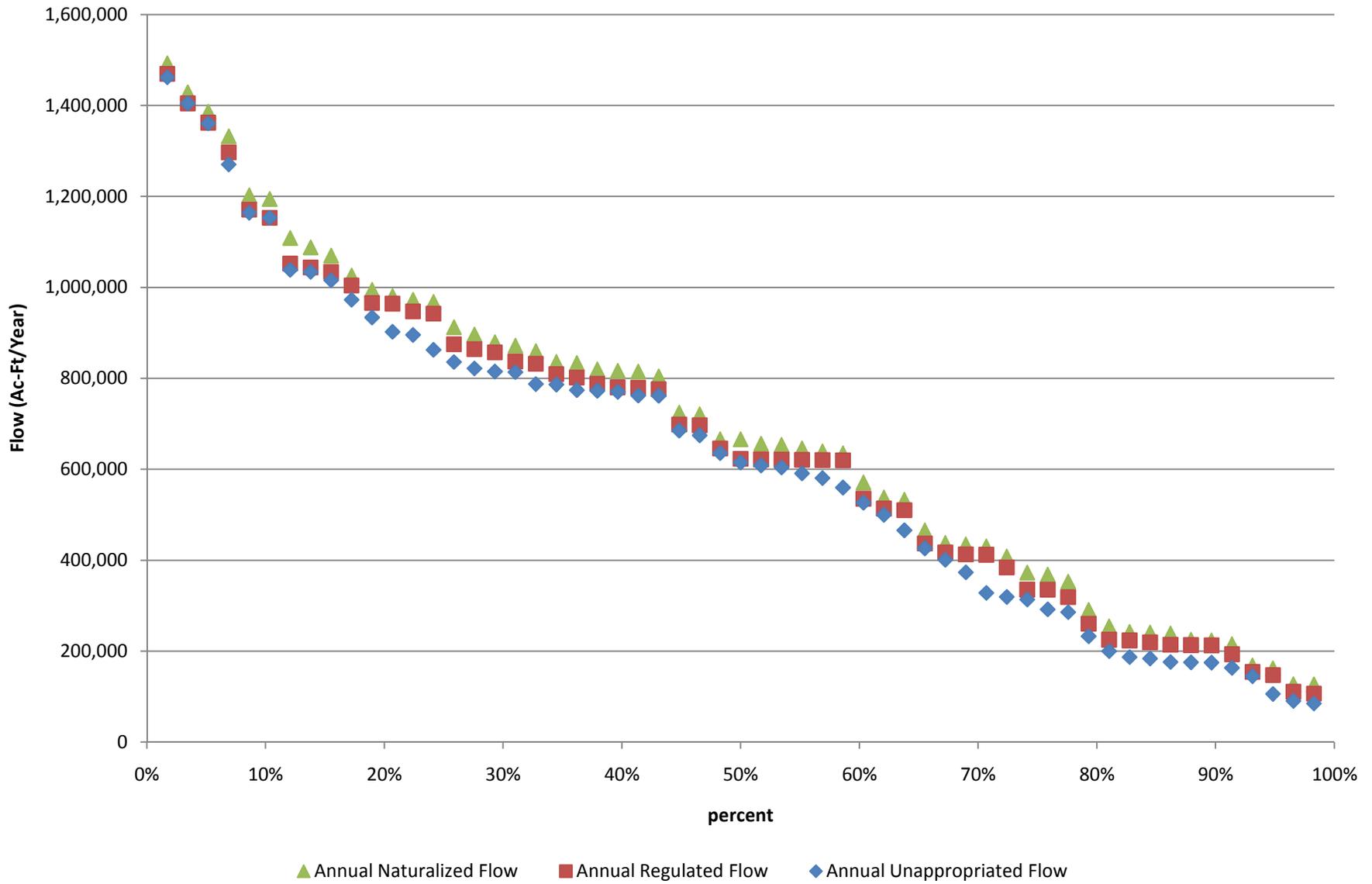
▲ Annual Naturalized Flow ■ Annual Regulated Flow ◆ Annual Unappropriated Flow

Run 3 USGS Gage 08033500 Neches River nr Rockland Flow Comparison

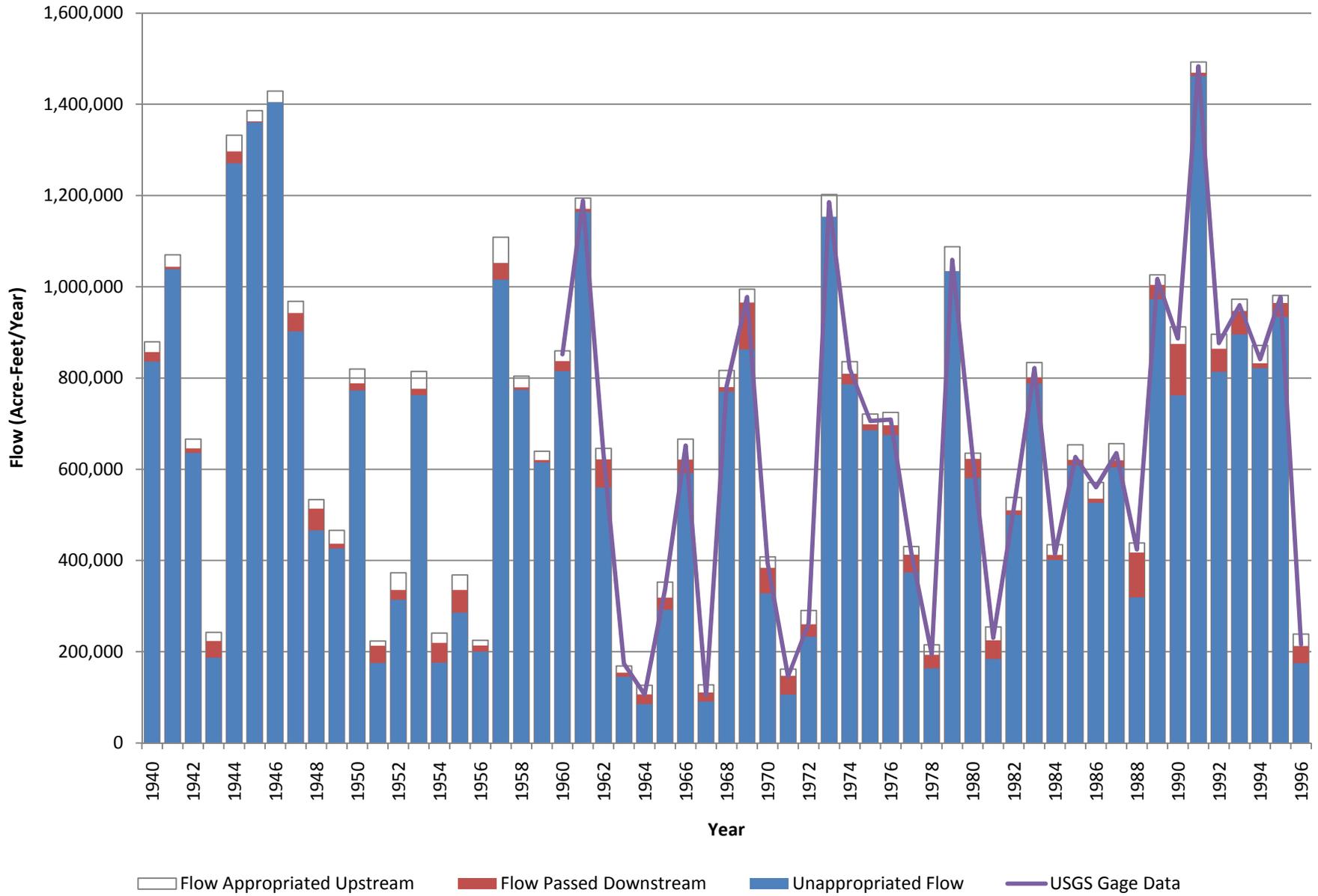


Flow Appropriated Upstream
 Flow Passed Downstream
 Unappropriated Flow
 USGS Gage Data

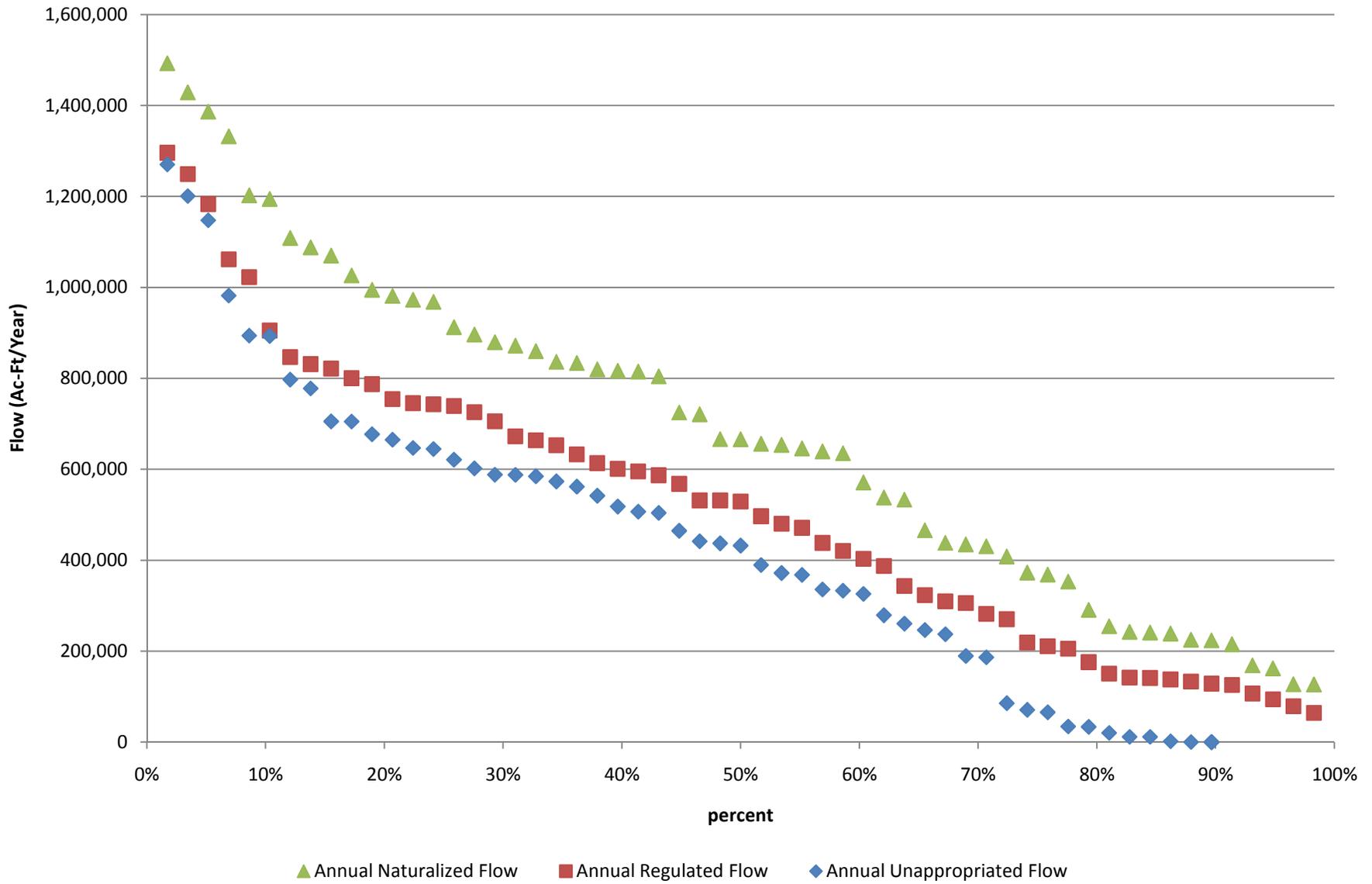
Run 8 Percent of Time Flow is Equaled or Exceeded USGS Gage 0803650 Angelina River nr Alto



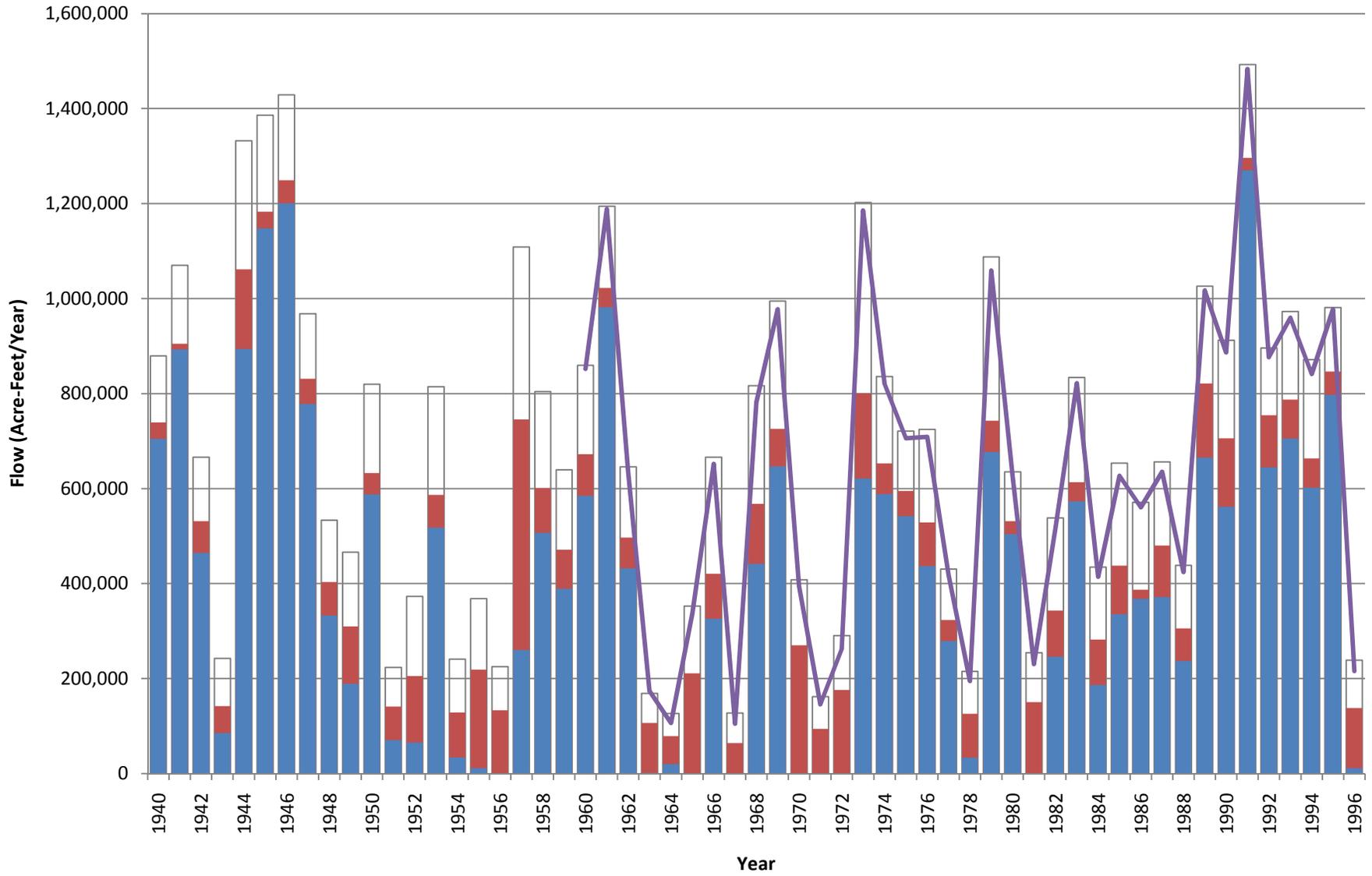
Run 8 USGS Gage 08036500 Angelina River nr Alto Flow Comparison



Run 3 Percent of Time Flow is Equaled or Exceeded USGS Gage 08036500 Angelina River nr Alto

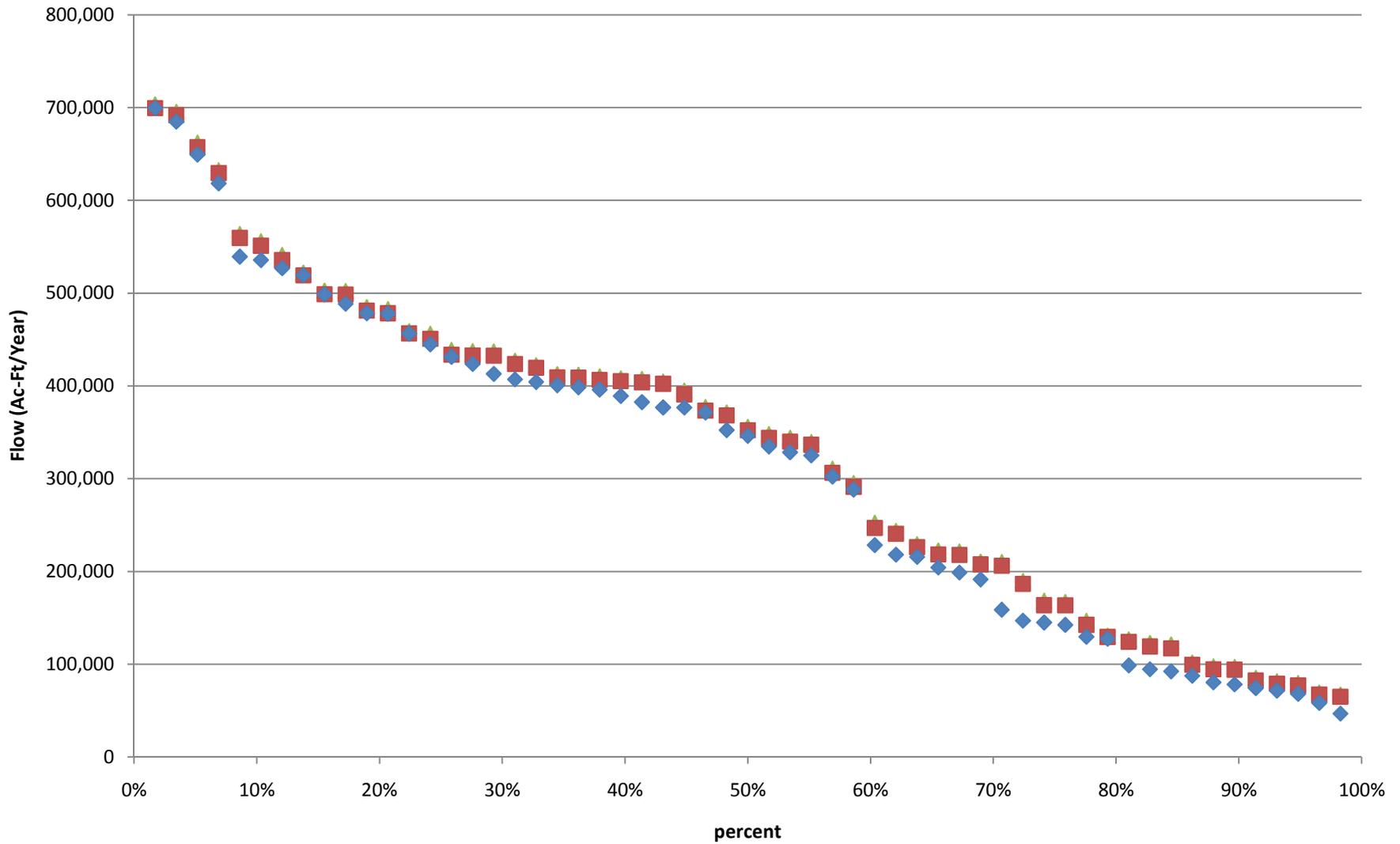


Run 3 USGS Gage 08036500 Angelina River nr Alto Flow Comparison



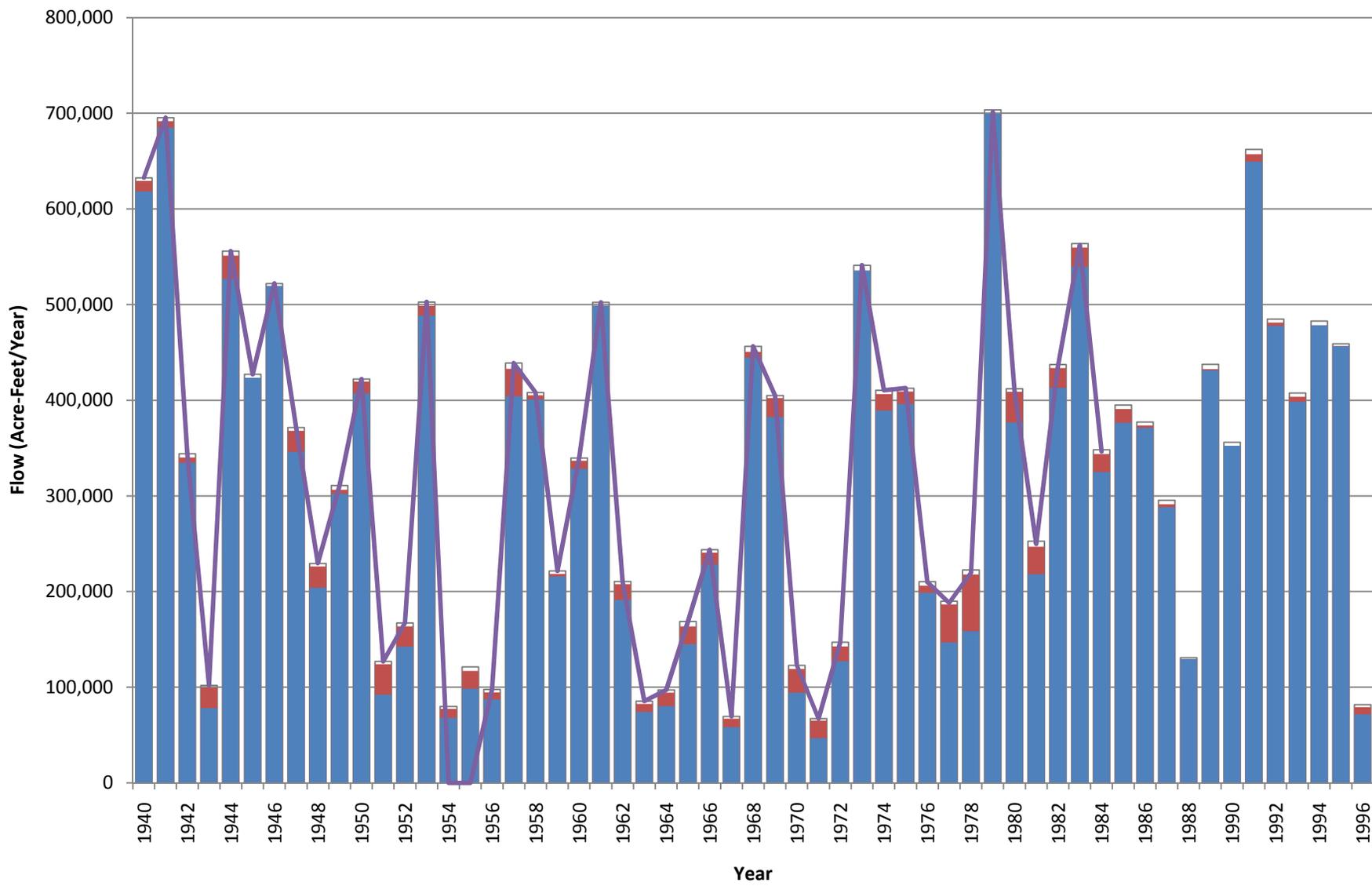
Flow Appropriated Upstream
 Flow Passed Downstream
 Unappropriated Flow
 USGS Gage Data

Run 8 Percent of Time Flow is Equaled or Exceeded USGS Gage 08038000 Attoyac Bayou nr Chireno



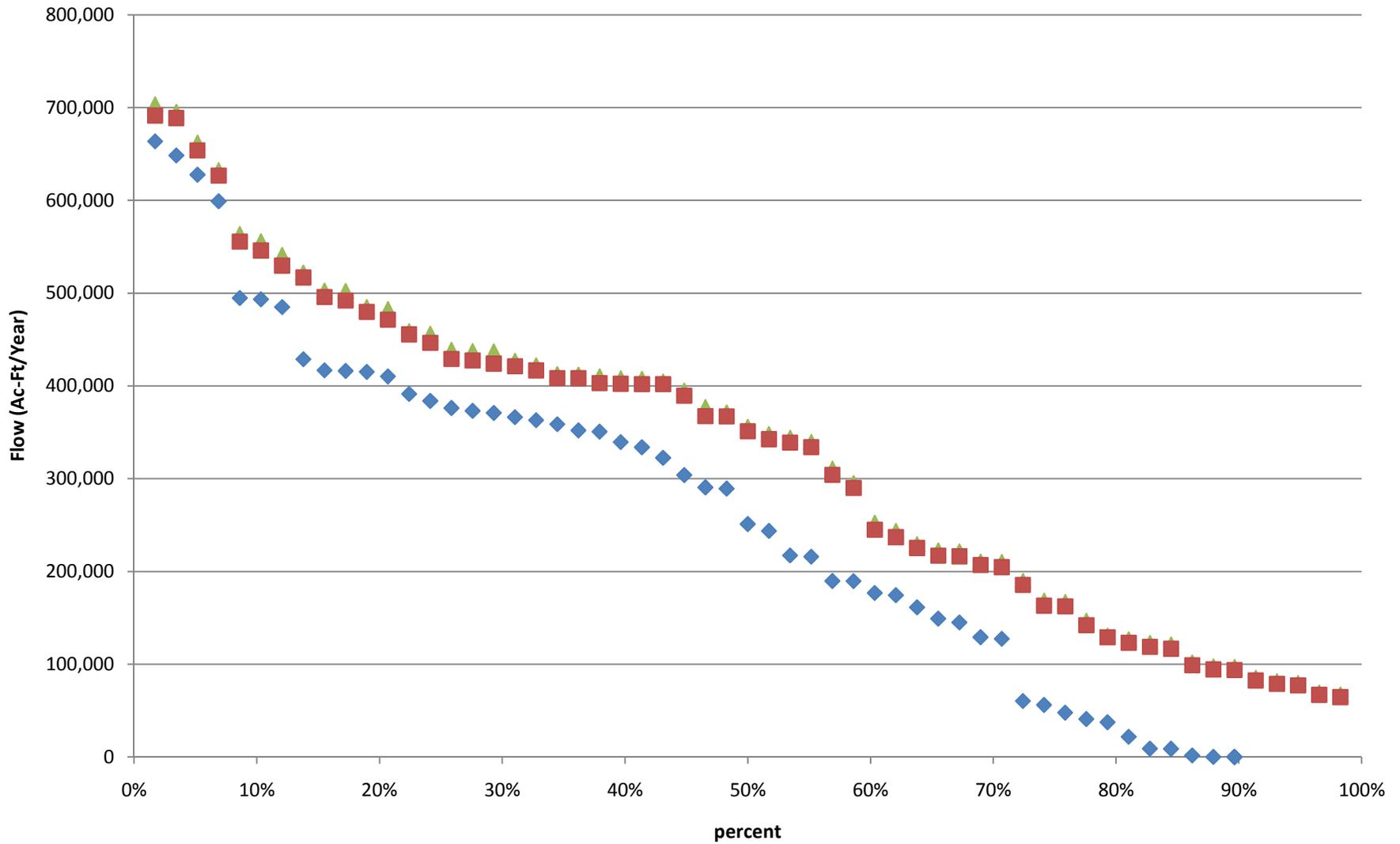
▲ Annual Naturalized Flow ■ Annual Regulated Flow ◆ Annual Unappropriated Flow

Run 8 USGS Gage 08038000 Attoyac Bayou nr Chireno Flow Comparison



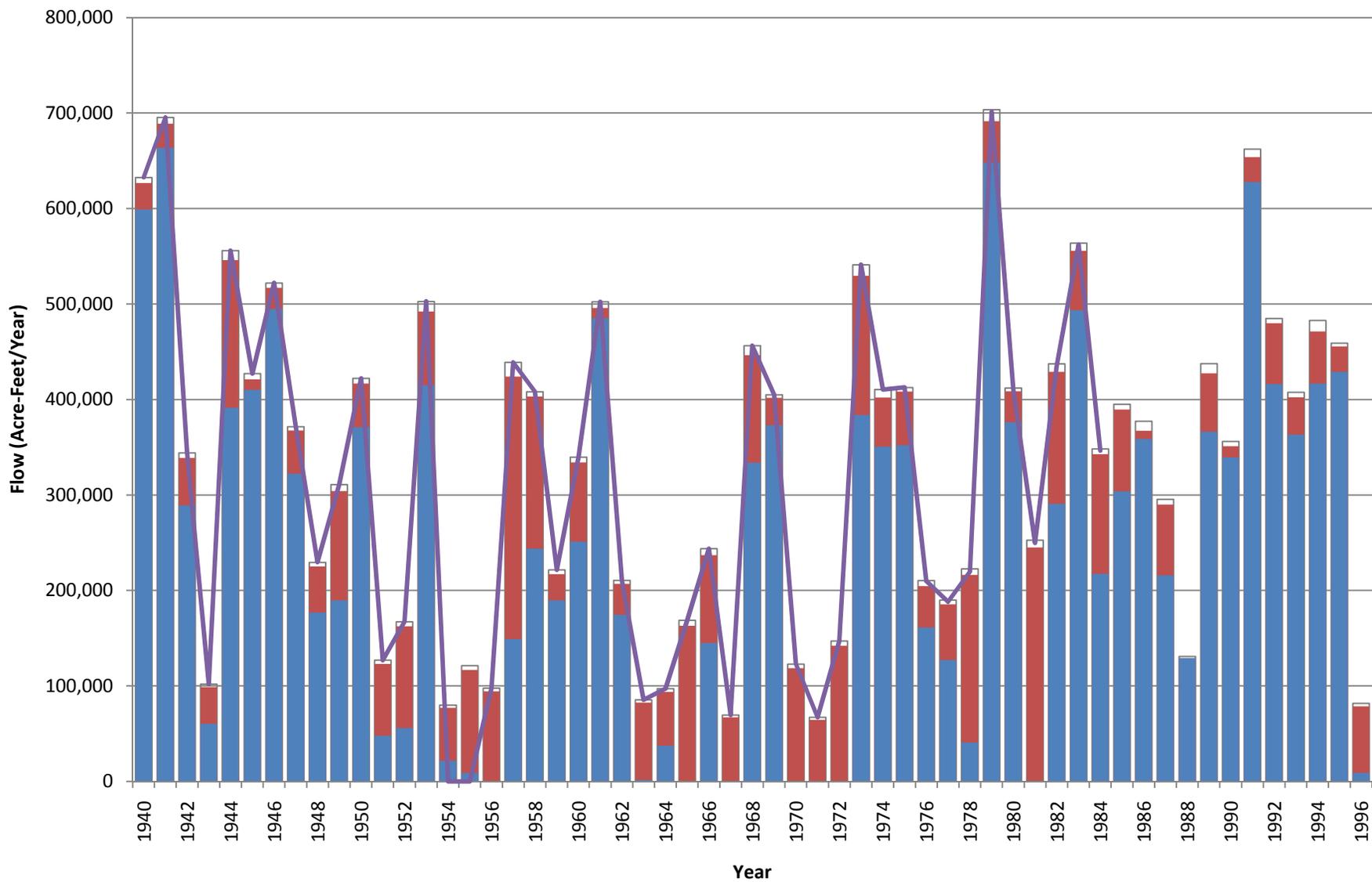
Flow Appropriated Upstream
 Flow Passed Downstream
 Unappropriated Flow
 USGS Gage Data

Run 3 Percent of Time Flow is Equaled or Exceeded USGS Gage 08038000 Attoyac Bayou nr Chireno



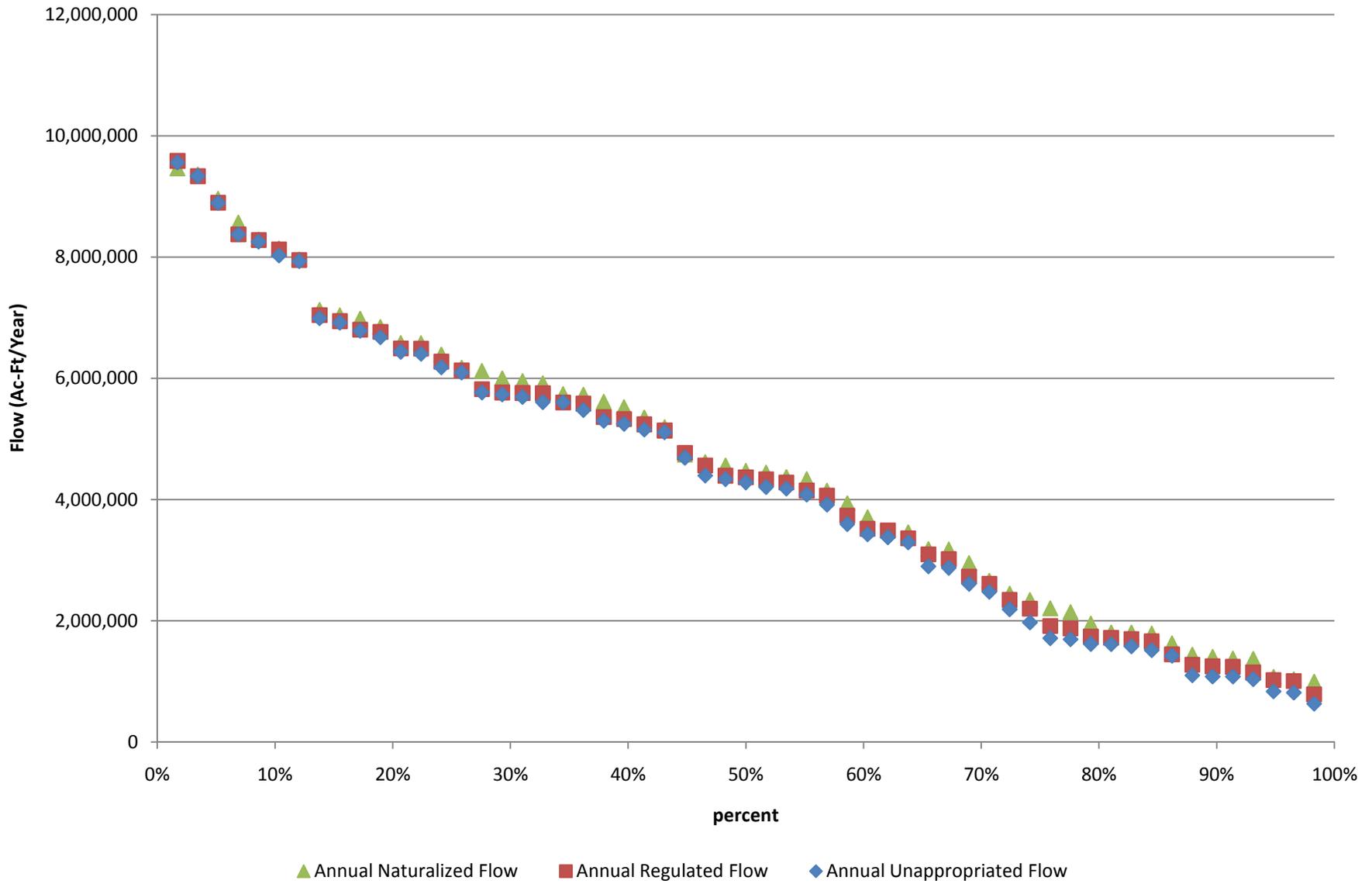
▲ Annual Naturalized Flow ■ Annual Regulated Flow ◆ Annual Unappropriated Flow

Run 3 USGS Gage 08038000 Attoyac Bayou nr Chireno Flow Comparison

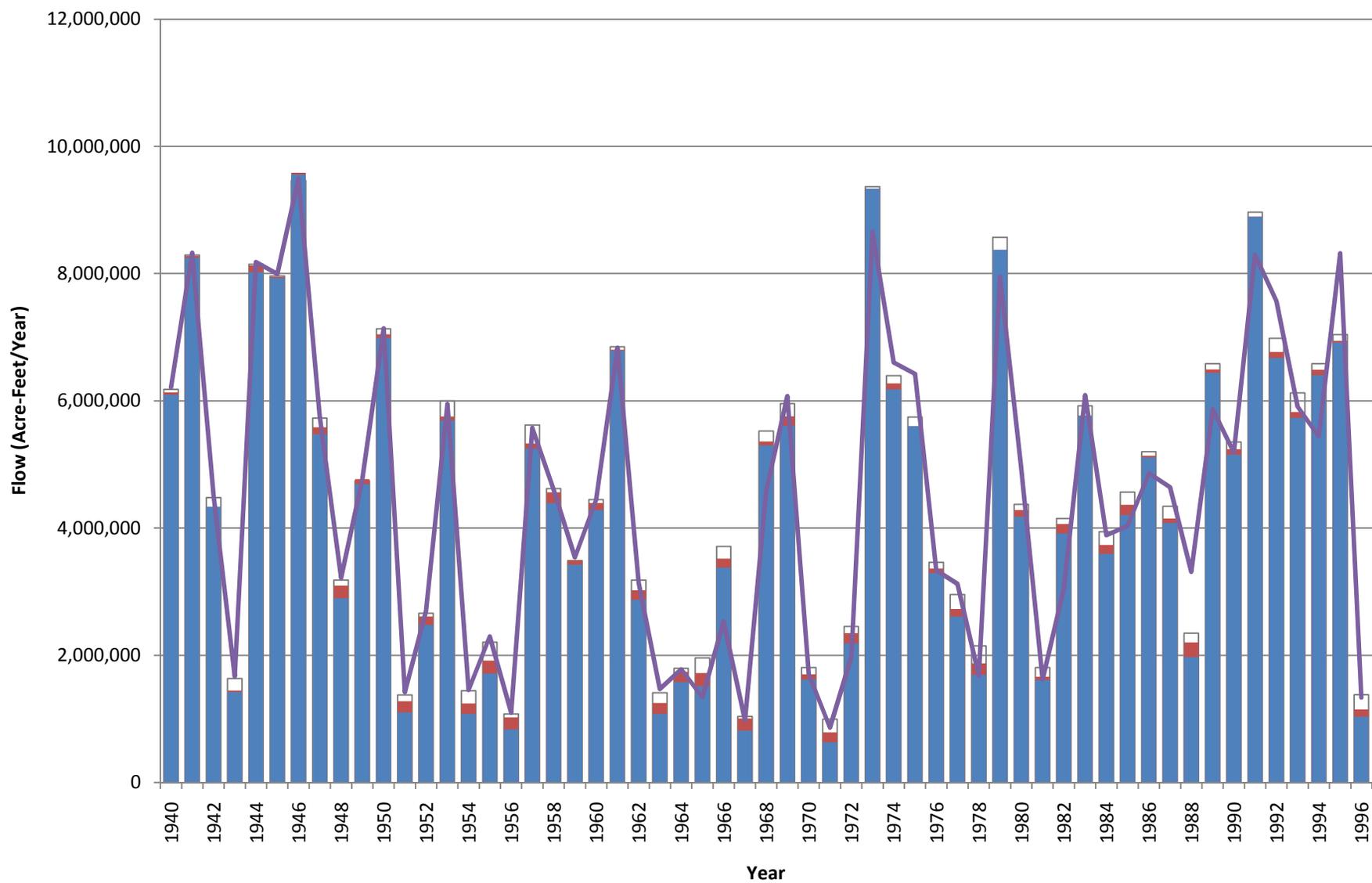


Flow Appropriated Upstream
 Flow Passed Downstream
 Unappropriated Flow
 USGS Gage Data

Run 8 Percent of Time Flow is Equaled or Exceeded USGS Gage 08041000 Neches River at Evadale

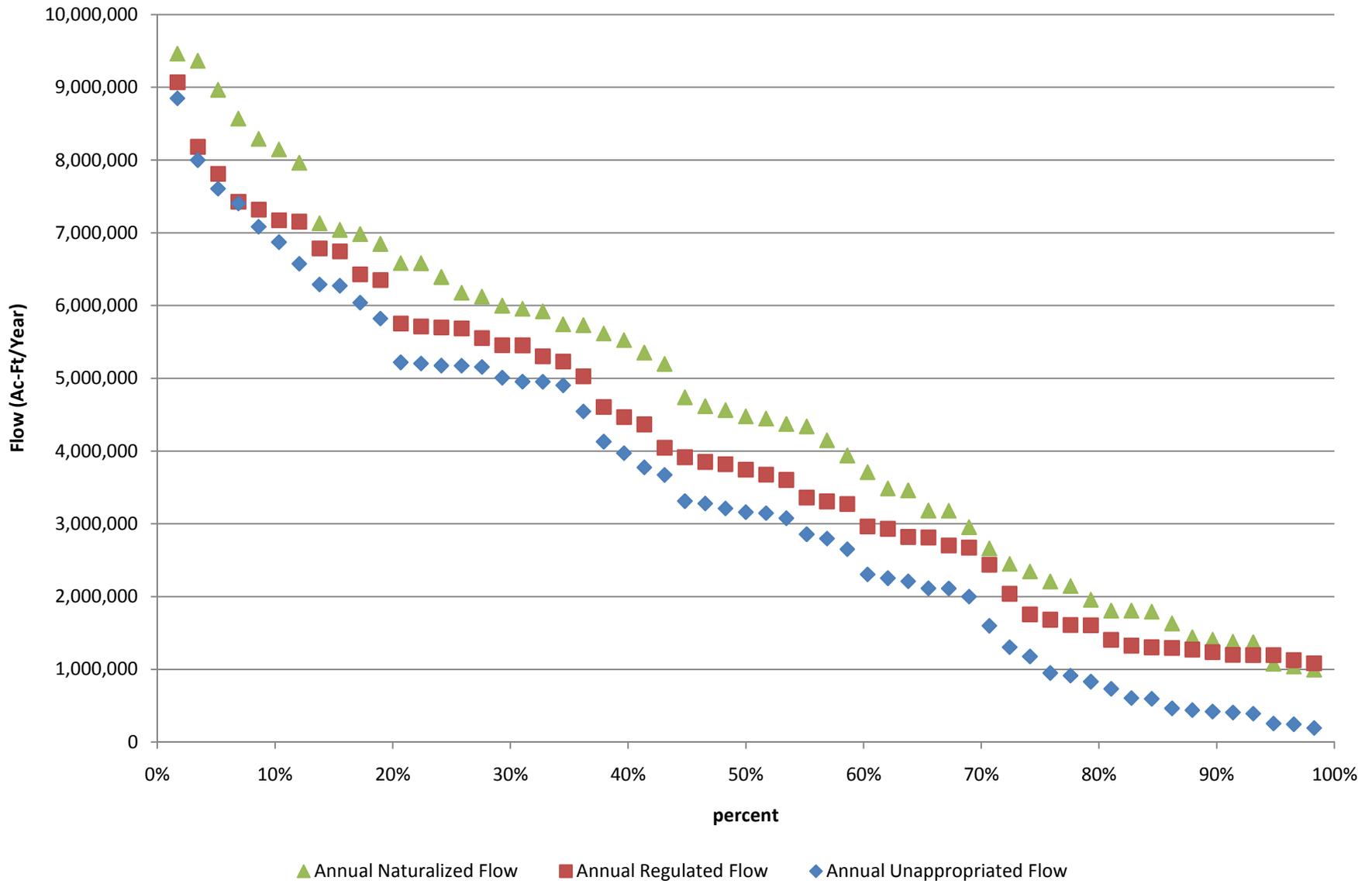


Run 8 USGS Gage 08041000 Neches River at Evadale Flow Comparison

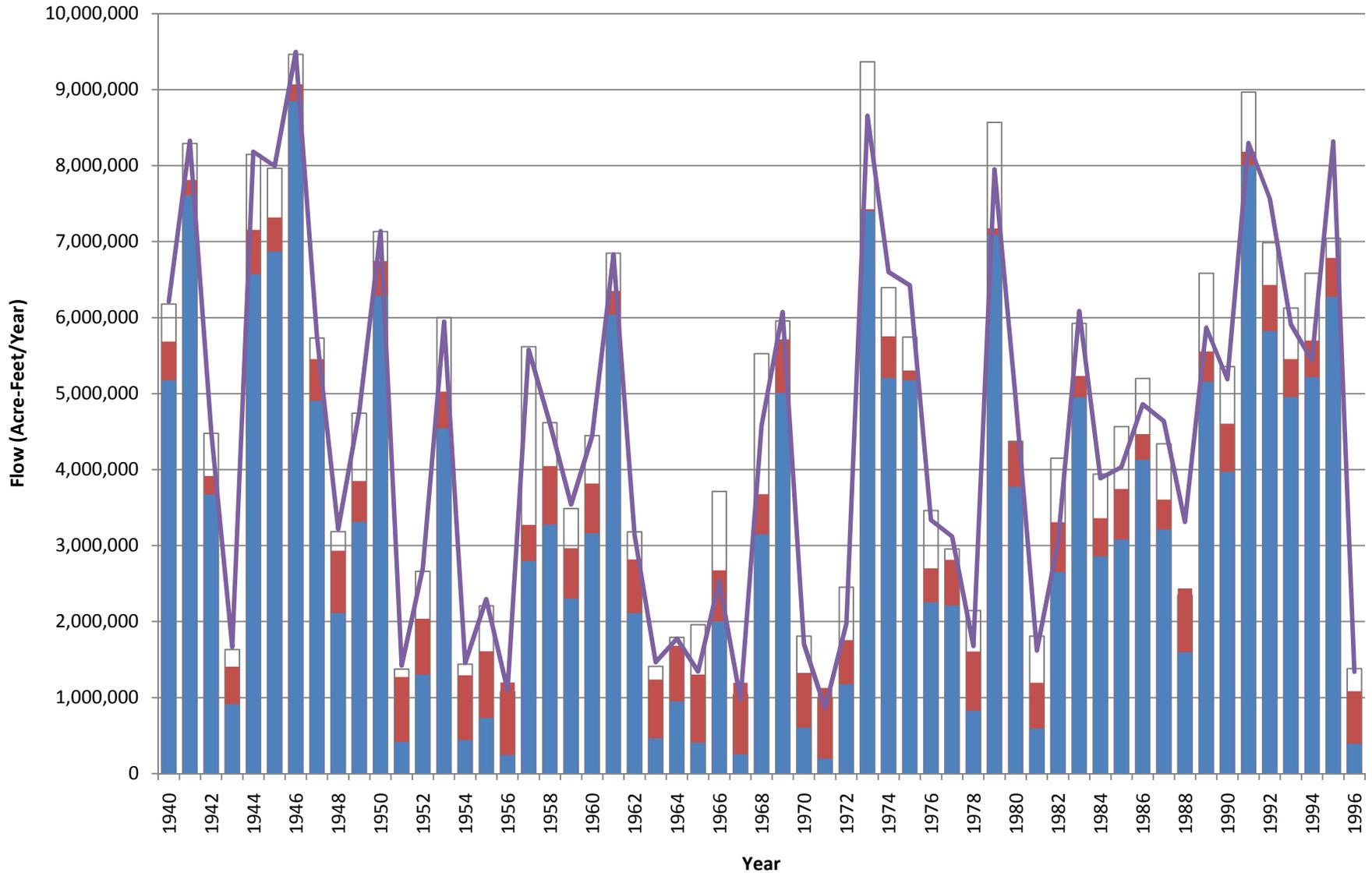


Flow Appropriated Upstream
 Flow Passed Downstream
 Unappropriated Flow
 USGS Gage Data

Run 3 Percent of Time Flow is Equaled or Exceeded USGS Gage 08041000 Neches River at Evadale

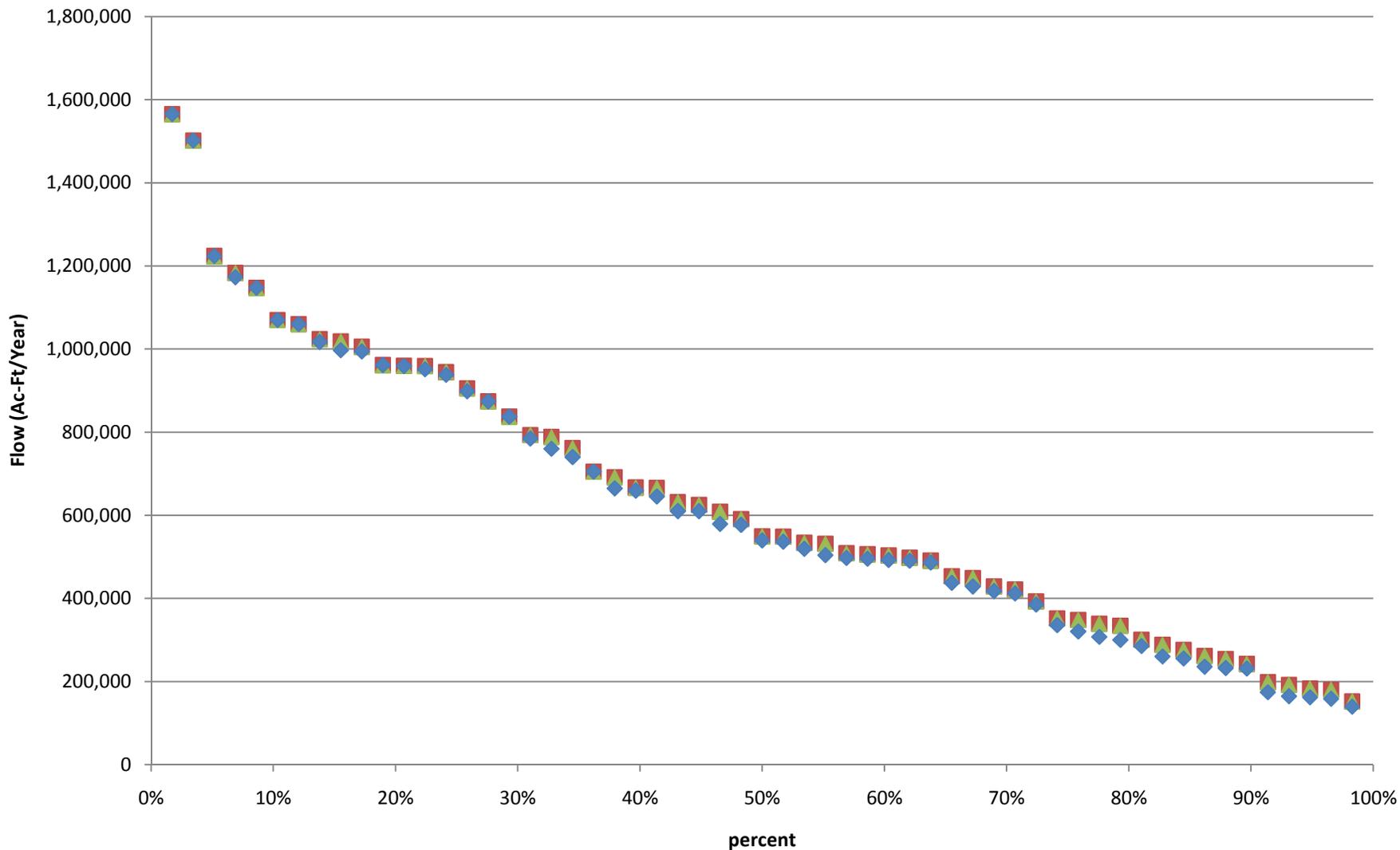


Run 3 USGS Gage 08041000 Neches River at Evadale Flow Comparison



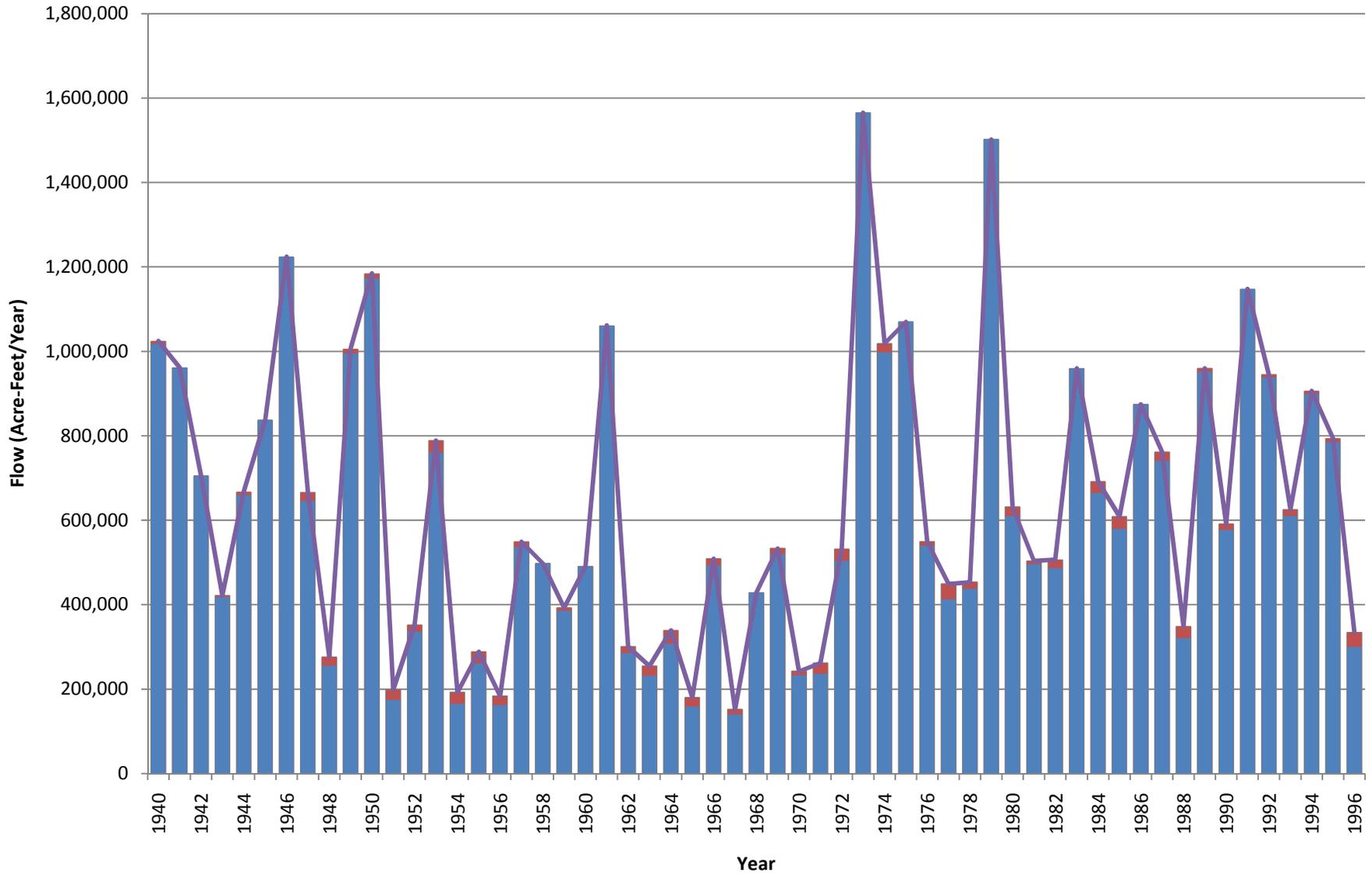
Flow Appropriated Upstream
 Flow Passed Downstream
 Unappropriated Flow
 USGS Gage Data

Run 8 Percent of Time Flow is Equaled or Exceeded USGS Gage 08041500 Village Creek nr Kountze



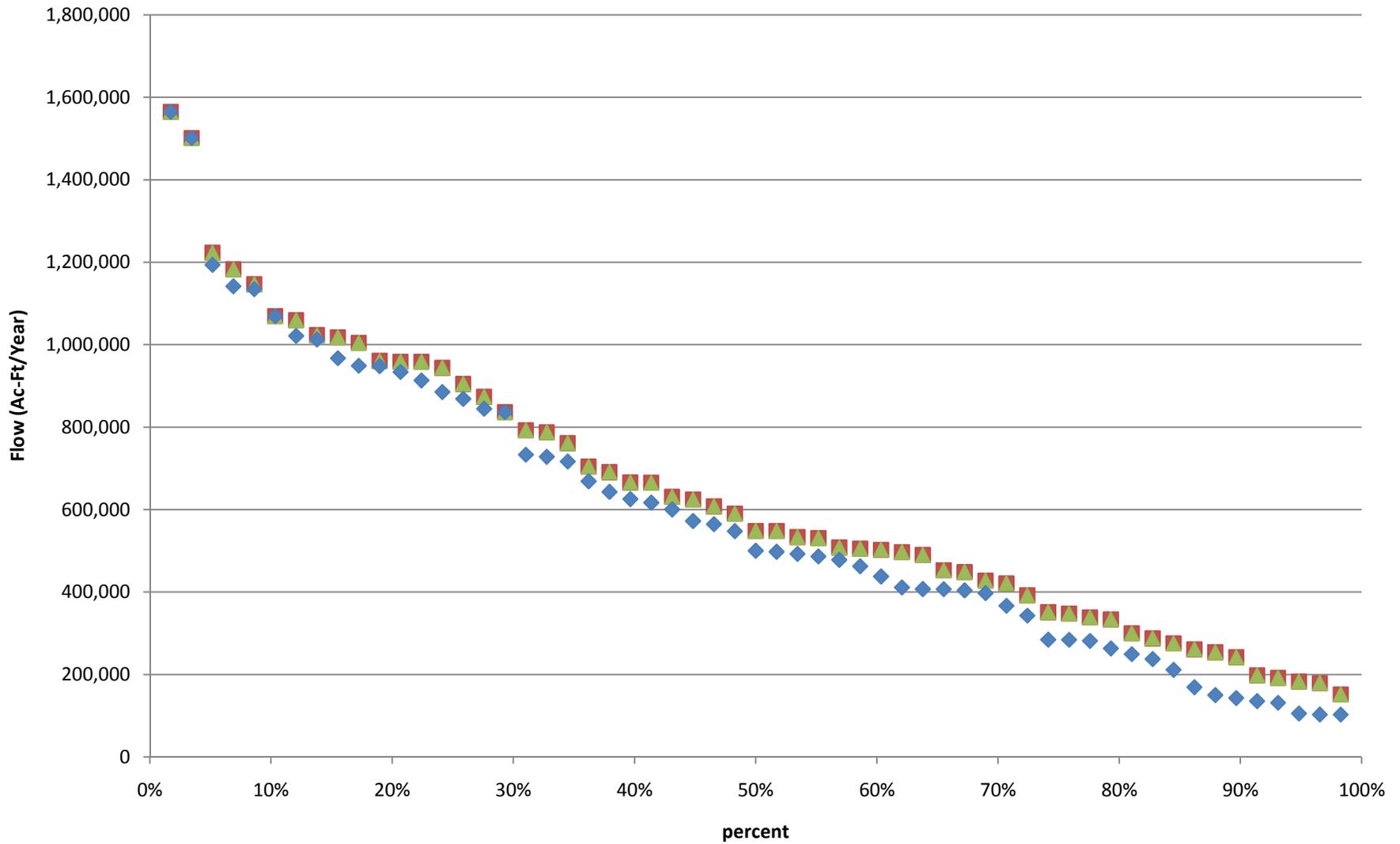
■ Annual Regulated Flow ▲ Annual Naturalized Flow ◆ Annual Unappropriated Flow

Run 8 USGS Gage 08041500 Village Creek nr Kountze Flow Comparison



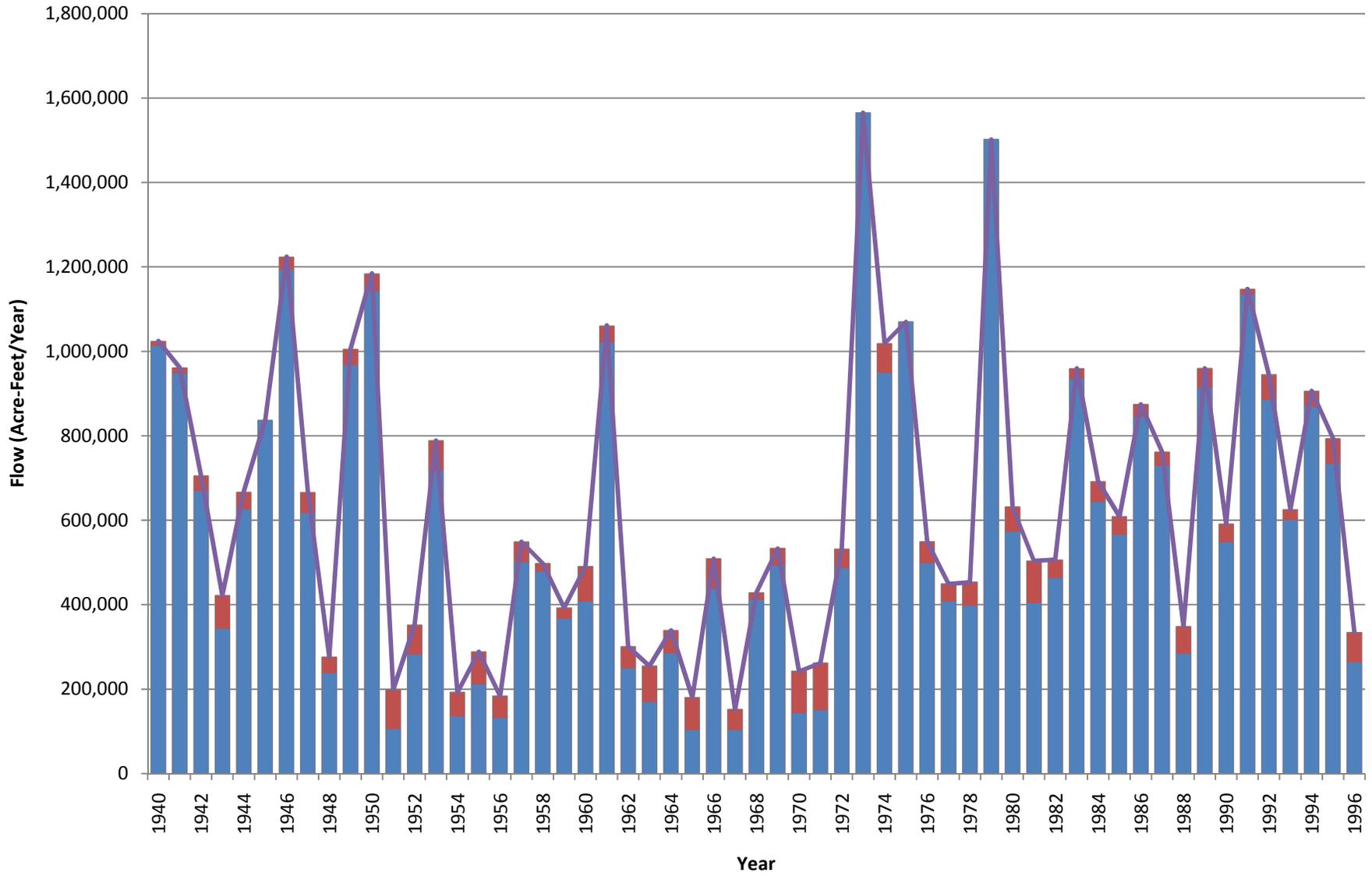
Flow Appropriated Upstream
 Flow Passed Downstream
 Unappropriated Flow
 USGS Gage Data

Run 3 Percent of Time Flow is Equaled or Exceeded USGS Gage 08041500 Village Creek nr Kountze



■ Annual Regulated Flow ▲ Annual Naturalized Flow ◆ Annual Unappropriated Flow

Run 3 USGS Gage 08041500 Village Creek nr Kountze Flow Comparison



Flow Appropriated Upstream Flow Passed Downstream Unappropriated Flow USGS Gage Data

Attachment B
Method to Classify Historical Wet, Average and Dry Seasons

Attachment B: Method to Classify Historical Wet, Average and Dry Seasons

Determining Dry, Average, and Wet Seasons Using Flow Data

First the 12 months were divided into 4 seasons labeled A, B, C, and D. These seasons correspond to the Winter, Spring, Summer and Fall seasons in the HEFR Analysis.

For all 12 gages in the Sabine and Neches basins, the total flow was summed for each season from 1940 to 2008. For gages with missing data for that time period, the available data was summed and any flow totals for incomplete seasons were deleted.

For each gage, the seasonal total was filtered to order the data from smallest flow to largest flow. The top 25% of the smallest flows were designated as dry flows, the middle 50% as average flows and the bottom 25% as wet flow. All dry flows were marked with the number one, average flows were marked with the number 2, and wet flows were marked with the number 3. The filter was undone so the data would be in chronological order with the flow designation still attached to each season.

All flow designation for all the gages were pasted in to a new spreadsheet. Flow designations for all gages for the same year and season were lined up in this spreadsheet. For each season from 1940 to 2008 the number of dry, average, and wet gages was counted (using the 1, 2, or 3 flow designation). Each season was designated as dry, average or wet, based on the number of gages that were dry, average, or wet during that season. For example, if the majority of gages were dry, then that season was labeled as a dry season.

For seasons that had the same number of gages designated as, for example wet and average, either wet or average was chosen in order to make the total number of dry seasons and wet seasons 25% each and average seasons 50% of the total.

Determining Dry, Average, and Wet Seasons Using Palmer Index Data

Palmer Index data came from <http://www.cdc.noaa.gov/data/timeseries/>. The time series used was the "US Climate Division: temperature, precipitation and Palmer Drought Severity Index (PDSI)" dataset for division 4 and years 1940-2009.

In an Excel spreadsheet the seasonal average was calculated for each year. Wet/Average/Dry Seasons were determined by sorting all the season from smallest to largest Palmer index. The top 25% of the smallest indexes were designated as dry seasons, the middle 50% were marked as average seasons, and 25% of the largest indexes were designated as wet seasons.

Determining Dry, Average, and Wet Seasons Using WAM Storage

Reservoir storage data were extracted from the WAM Run 3 output for each major reservoir in the Sabine and Neches Basins. The total reservoir storage was calculated for each month in the simulation. The monthly totals were grouped by season and the average storage in each season was calculated from the monthly total. The analysis was limited to the 57-year period of the Neches WAM: 1940 to 1996. For each season, the monthly storages were ranked from smallest to largest. Within each season, the 14 seasons with the least storage were classified as dry, and the 14 seasons with the most storage were classified as wet. The remaining 29 seasons were classified as average.