



***Palo Pinto County
MWD No. 1 and City of
Mineral Wells
Joint Meeting***

*Cory Shockley, P.E.
November 8, 2018*

***LAKE PALO PINTO
STORAGE RESTORATION
TURKEY PEAK PROJECT***





Drought and Growth

**Turkey Peak Project
History & Characteristics**

Turkey Peak Project Status

WHY TURKEY PEAK

- Drought
 - New Critical Drought
 - Drought Variability
 - Lake Palo Pinto Capacity
- Growth
 - District / Mineral Wells are Regional Providers
 - Significant Growth in Parker County
 - I-20 and along US 180
 - Receiving requests for additional water

The purpose of the Turkey Peak Project is to meet immediate water supply needs, provide resilient supply through future droughts, and prepare for additional demand as growth occurs.



HYDROLOGIC VARIABILITY IMPACT OF RECENT DROUGHT

2012 = 100%

2015 = 8%



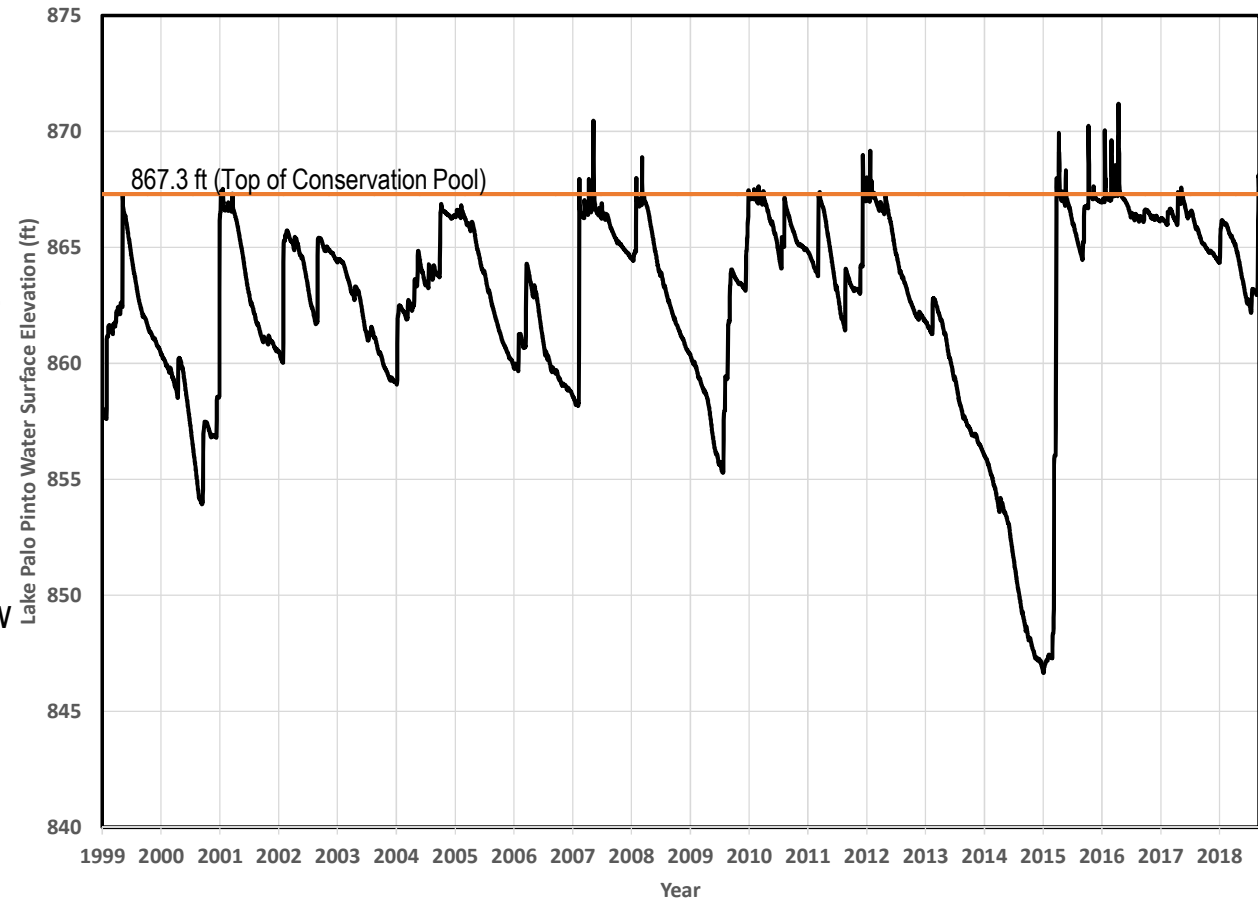
DROUGHT

- In early 2015, Lake Palo Pinto reached a historical low of 846.62 ft-msl
 - Defines a new critical drought
 - Approximately 2,200 acft of storage or about 8% of full
 - Projections showed that this volume was about 150 days of supply remaining
- The drought ending in 2015 was the most severe experienced in the last 80 years of hydrologic data

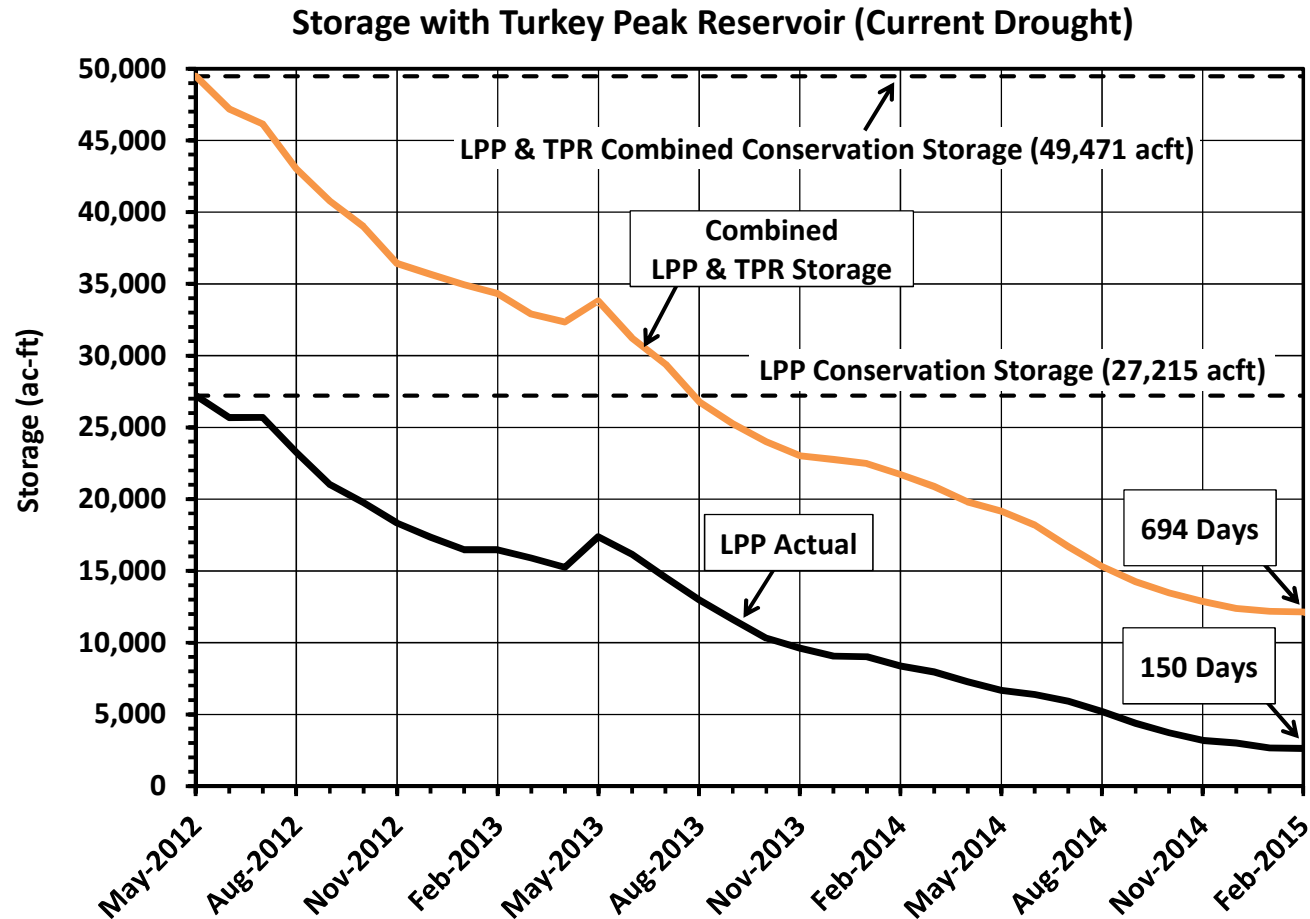


LAKE PALO PINTO ELEVATION (ACTUAL 1999-2018)

- “Typical” LPP drought
 - 18-24 months
 - 10-13 feet of drawdown
 - 20-30% full
 - Drought Stage – Stage 3 (29%)
- New Critical drought
 - 37 months
 - 21 feet of drawdown
 - 8% full
 - Drought Stage – Stage 4 (below BEPC intake)



BENEFIT OF TPP DURING REPEAT OF THE CRITICAL DROUGHT



GROWTH

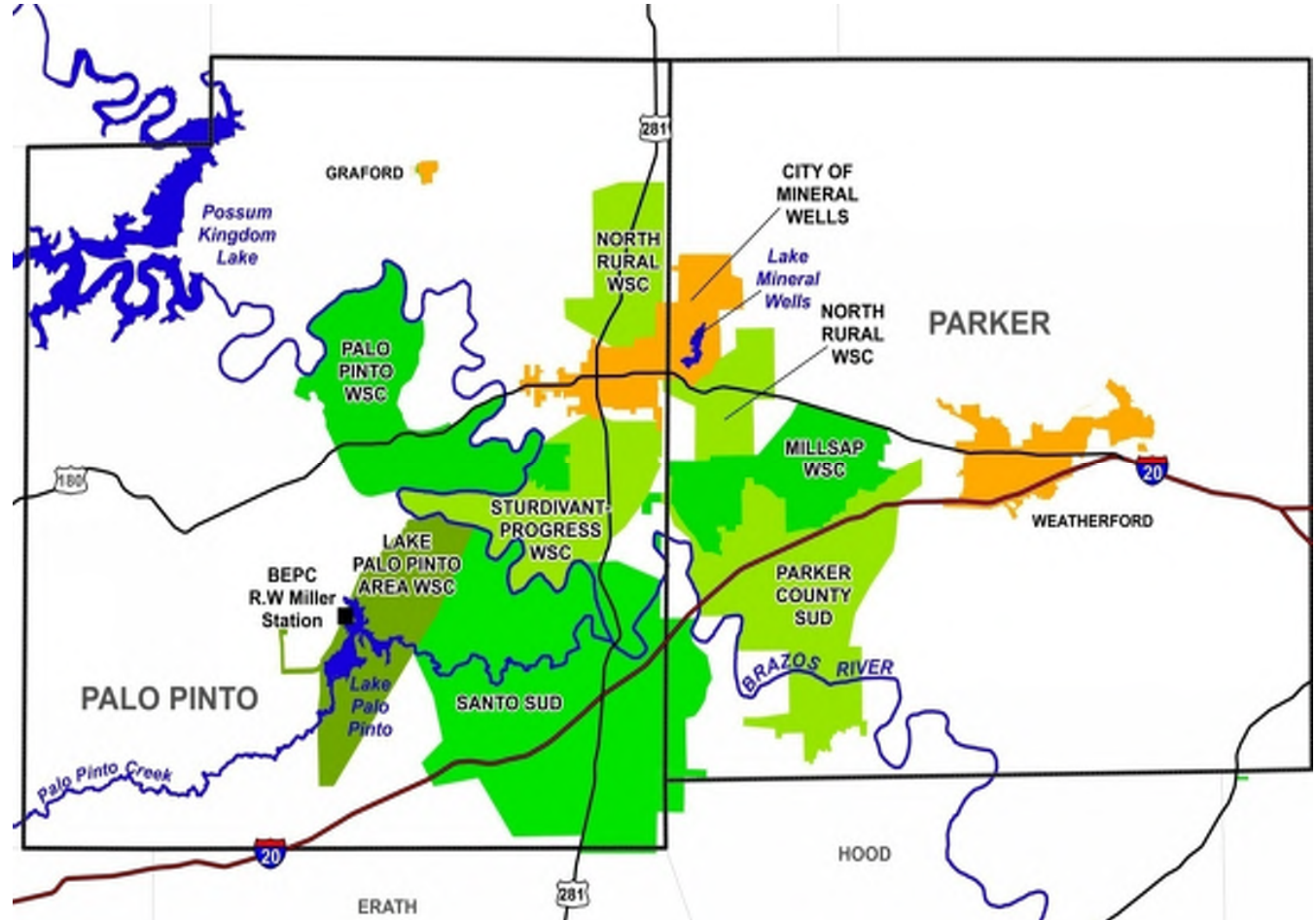
Key Points

- District / City serves as a regional provider
- Parker County Growth is significant
- The need for more water is already occurring in the service area
- Demands are projected to increase to about 10,000 acft/yr by 2070
 - Doubling in the next 50 years

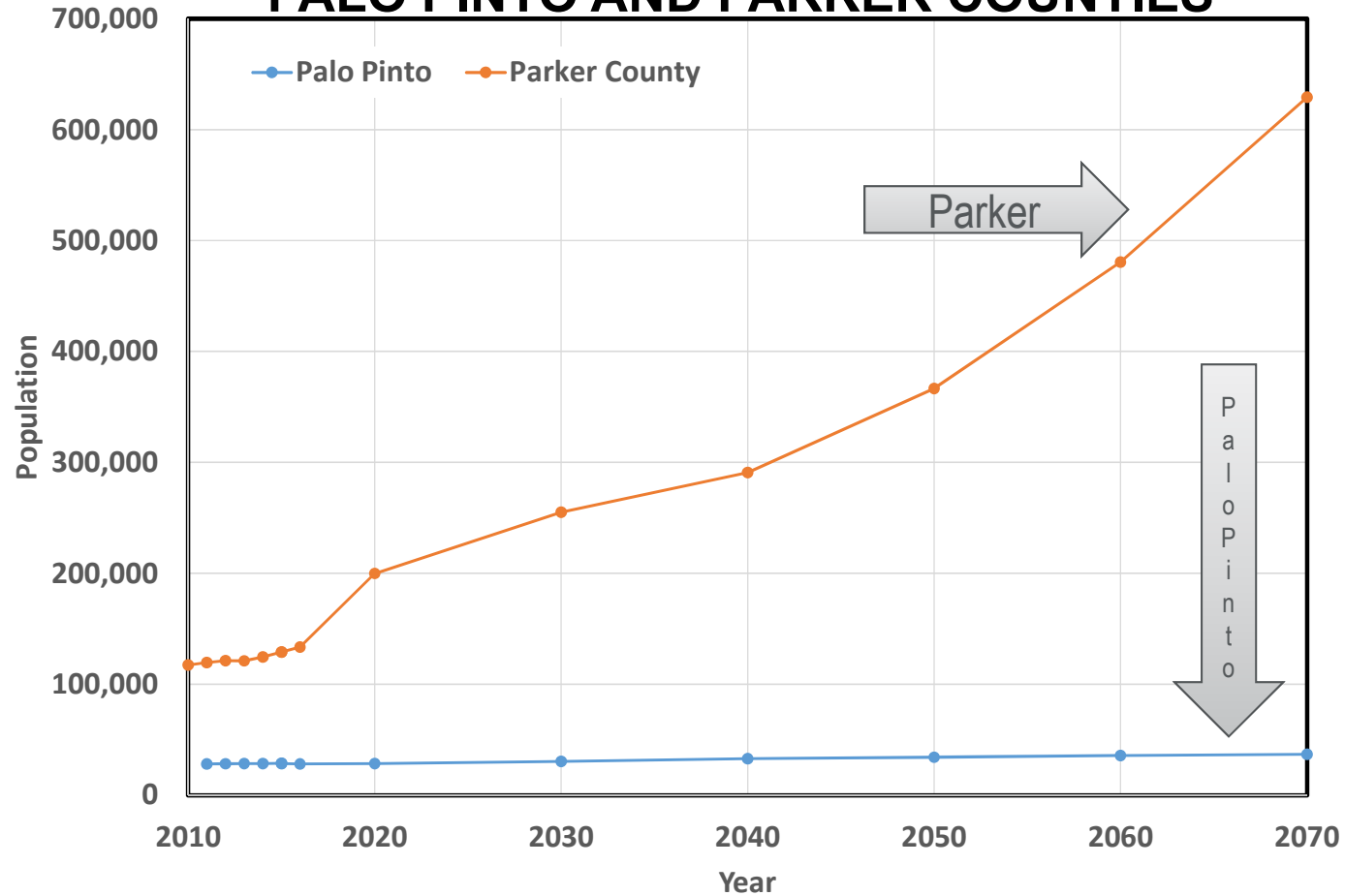


DISTRICT / CITY ARE REGIONAL PROVIDERS

- City of Mineral Wells (78%)
 - City of Graford
 - Parker County SUD
 - Santo SUD
 - North Rural WSC
 - Sturdivant-Progress WSC
 - Palo Pinto WSC
 - Millsap WSC
- Brazos Electric Power Co-op (20%)
- Lake Palo Pinto Area WSC (2%)



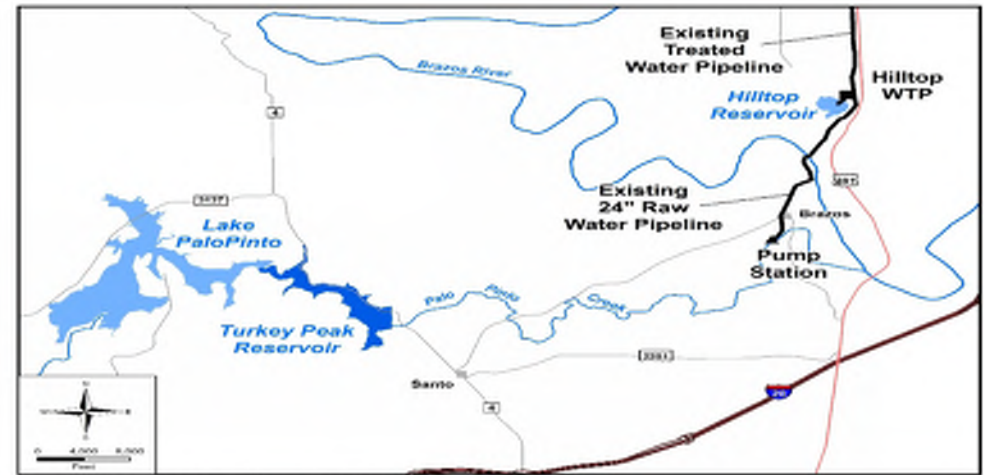
POPULATION GROWTH PALO PINTO AND PARKER COUNTIES



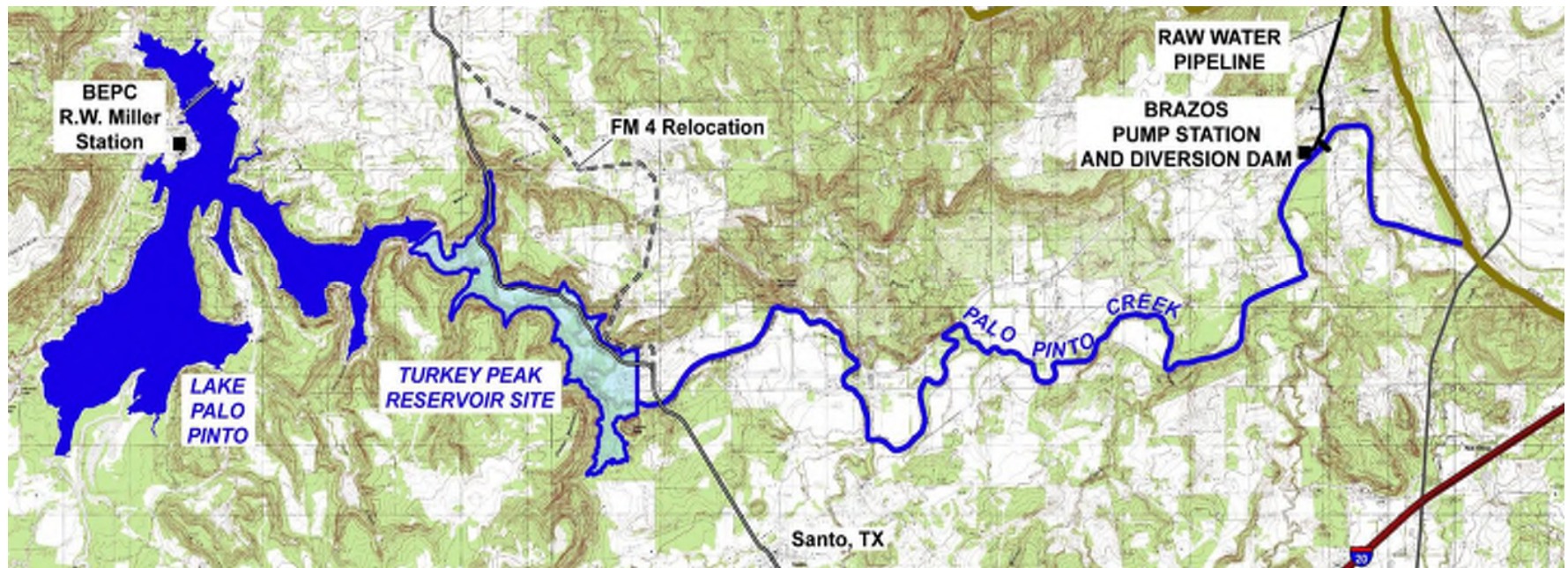
TURKEY PEAK PROJECT

History & Characteristics

- PPCMWD No. 1 / City of Mineral Wells Water Supply System
 - Lake Palo Pinto
 - Brazos Pumpstation
 - Hilltop Reservoir
 - Hilltop Water Treatment Plant



TURKEY PEAK PROJECT – LOCATION MAP



ABBREVIATED HISTORY OF LAKE PALO PINTO AND TURKEY PEAK PROJECT

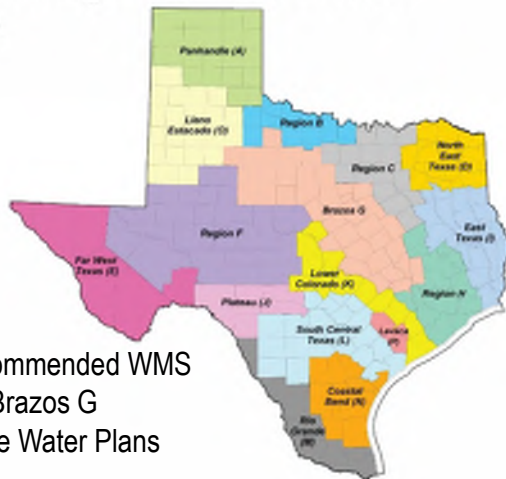
- **1962** – Lake Palo Pinto Permitted to store 34,250 acre-feet
- **1964** – Lake Palo Pinto Dam constructed
- **1964** – Lake Palo Pinto Permitted to store 44,100 acre-feet (Pool raised 4 feet)
- **1965** – Lake Palo Pinto spillway raised 4 feet
- **1979** – Long Range Planning study recommended Turkey Peak Project
- **1985** – Volumetric Survey of Lake Palo Pinto: 27,650 acre-feet (63% of permit)
- **1993** – Hilltop Reservoir Constructed for Water Quality Improvement; added 1,150 acre-feet of storage adjacent to Hilltop WTP
- **2004** – Alternative Storage Sites Evaluated to increase storage of Lake Palo Pinto
- **2005** – District is notified of BRA's Sys-Ops Permit Application at TCEQ
- **2006** – District decides to move forward with Turkey Peak Project
- **2007** – District and BRA agree not to protest each other's Permit Applications
- **2007** – Sediment survey of Lake Palo Pinto determines original capacity was about 29,000 acre-feet

ABBREVIATED HISTORY OF LAKE PALO PINTO AND TURKEY PEAK PROJECT

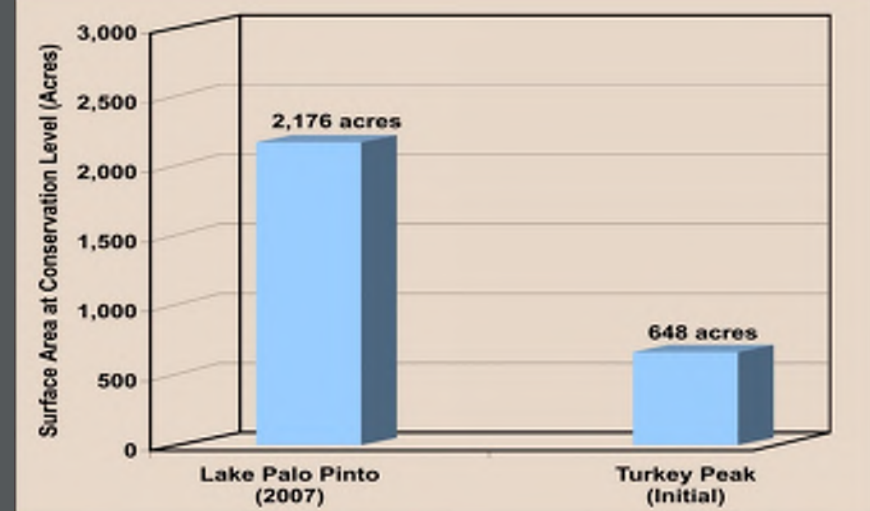
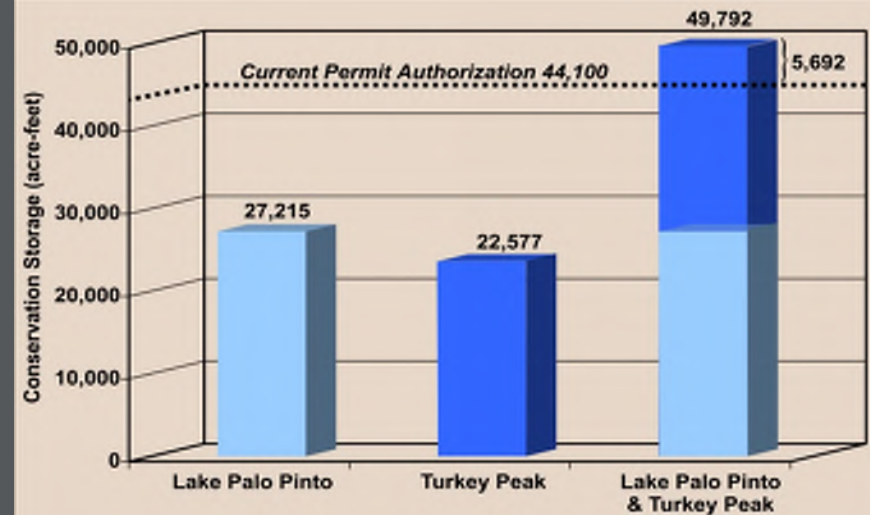
- **2008** – Environmental Studies for Turkey Peak initiated
- **2009** – District obtains TWDB funding for Permitting and Preliminary Design of TP Project (\$8M)
- **2009** – District submits TCEQ Water Rights Permit and COE Section 404 Permit Applications
- **2011 to 2012** – Preliminary Design and Geotechnical Investigations
- **2014** – TCEQ resumes processing of Turkey Peak permit application – draft permit issued December 2014
- **2014** – District purchases 450 acres of land in Stephens County near new Palo Pinto Mountains State Park for potential TP mitigation site
- **2014 - 2015** – Drought and Emergency supply options initiated
- **2015** - Phase 3 Geotechnical Investigation
- **2018** – USACE 404 Permit secured
- **2018 to 2019** – Final Design, Land Acquisition
- **2020** - Construction Planned

PROJECT CHARACTERISTICS

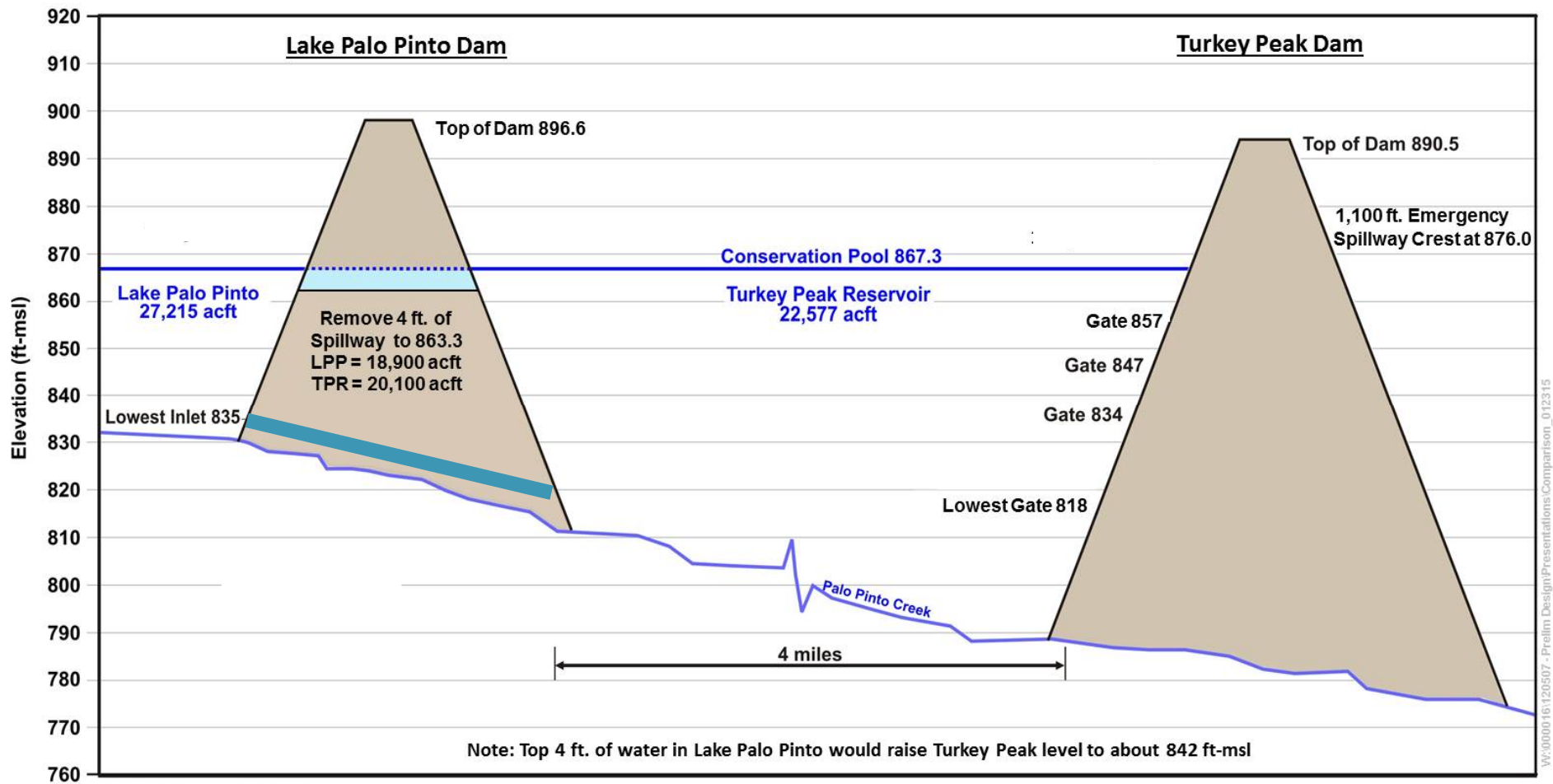
- Reservoir Capacities
- Turkey Peak:
 - More Efficient Surface Area
 - Increased Supply (+6,000 acft/yr)
 - Drought Resiliency
 - Meets demand through 2070 with a 6-month safety reserve



Included as Recommended WMS
in 2016 Brazos G
and 2017 State Water Plans



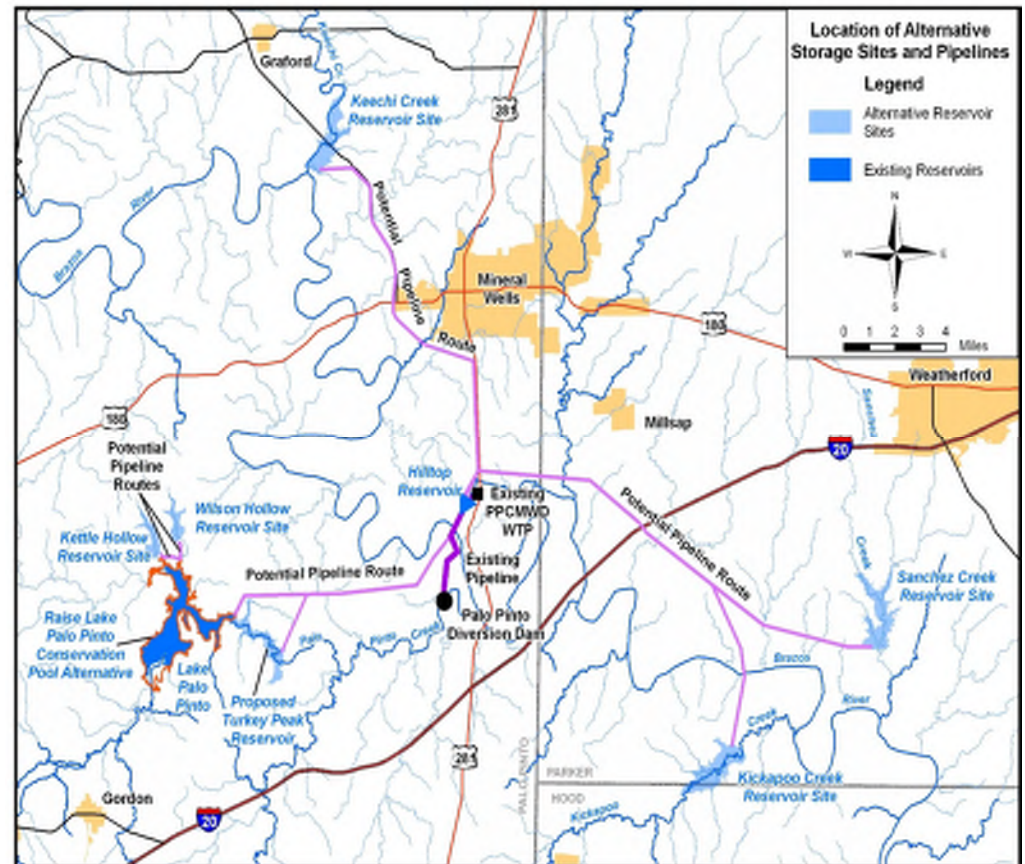
SCHEMATIC OF LPP / TPP



Comparison Between Lake Palo Pinto and Proposed Turkey Peak Reservoir

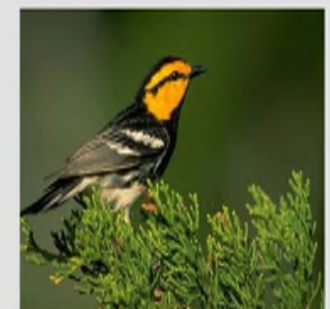
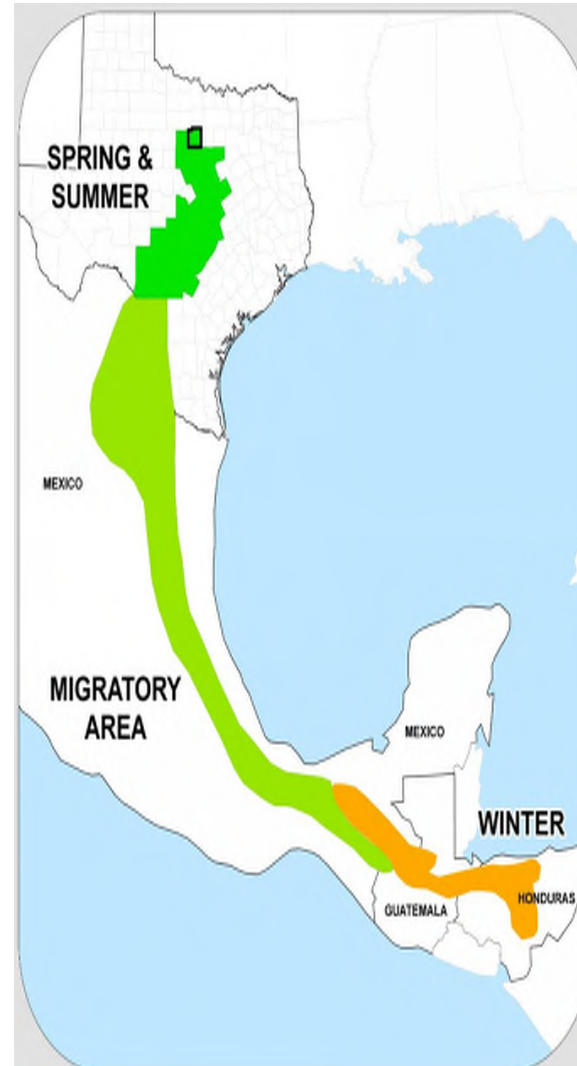
PROJECT ALTERNATIVES

- Wilson / Kettle Hollow Off Channel Reservoirs
- Keechi Reservoir
- Kickapoo Reservoir
- Sanchez Reservoir
- Dredging Lake Palo Pinto
- Raise Lake Palo Pinto
- Lake Mineral Wells
- Pipeline from LPP to Hilltop
- Brazos River Water (Reverse Osmosis)
- Direct Potable Reuse



PROJECT ALTERNATIVES

- Primary Alternative evaluations included:
 - Able to meet purpose and need
 - Impacts to waters of the US
 - Endangered species considerations
 - Practicable
 - Feasible
- Secondary Considerations included:
 - Cost
 - Length of New Pipelines
 - Cost
 - Operations and Maintenance



PROJECT PERMITTING

- TCEQ Water Rights Permit – November 2015
 - Pre & Post Construction Sampling Events (ALM)
- USACE Section 401/404 Permit – March 2018
 - Compliance with the approved mitigation plan
- TPWD
 - Sand, Gravel, and Marl Permit – before construction
 - ARRP – Aquatic Resource Relocation Permit – before construction
- TCEQ Dam Safety – Approve construction plans during final design



PROJECT FINANCING PROVIDED BY TWDB

- 2009 - TWDB approved \$8.0 M for Planning, Permitting & Preliminary Design
 - Sources: 60% EDAP & 40% WIF
- 2015 - TWDB approves \$17.1 M for Permitting, Final Design, Relocations, & Land Acquisition
 - Source: 30-year SWIFT funds
- 2019 – District plans to apply to TWDB for Financial Assistance for Construction Activities
 - Source: 30-year SWIFT funds



ONGOING ACTIVITIES

- Continue with:
 - Land Acquisition
 - Mitigation Preparation
 - 404 Permit Requirements
 - Environmental Sampling
 - Aquatic Life Monitoring
 - Cultural Resources
 - Utility Relocations
 - Final Design
 - Roadway
 - Bridge
 - Dam
- Define Project Unknowns
- Apply to TWDB for construction funds



USACE 404 PERMIT PERMITTEE RESPONSIBLE MITIGATION

- Mitigation for impacts to Waters of the US (WOTUS)
- Perennial, Intermittent, and Ephemeral Stream Impacts
- Preservation, Enhancement and Restoration Activities
 - Upstream
 - On-site
 - Downstream



MITIGATION PLAN OVERVIEW

Upstream Areas:

- Copeland –
 - Fencing of outer boundary, juniper & hog management
 - Modify low-head concrete dam
 - 11,700 feet of stream rehab or restoration & removal of 2 ponds
- Nall Ragsdale –
 - 9,520 feet of Palo Pinto Creek enhancement
 - Buffer juniper & hog management

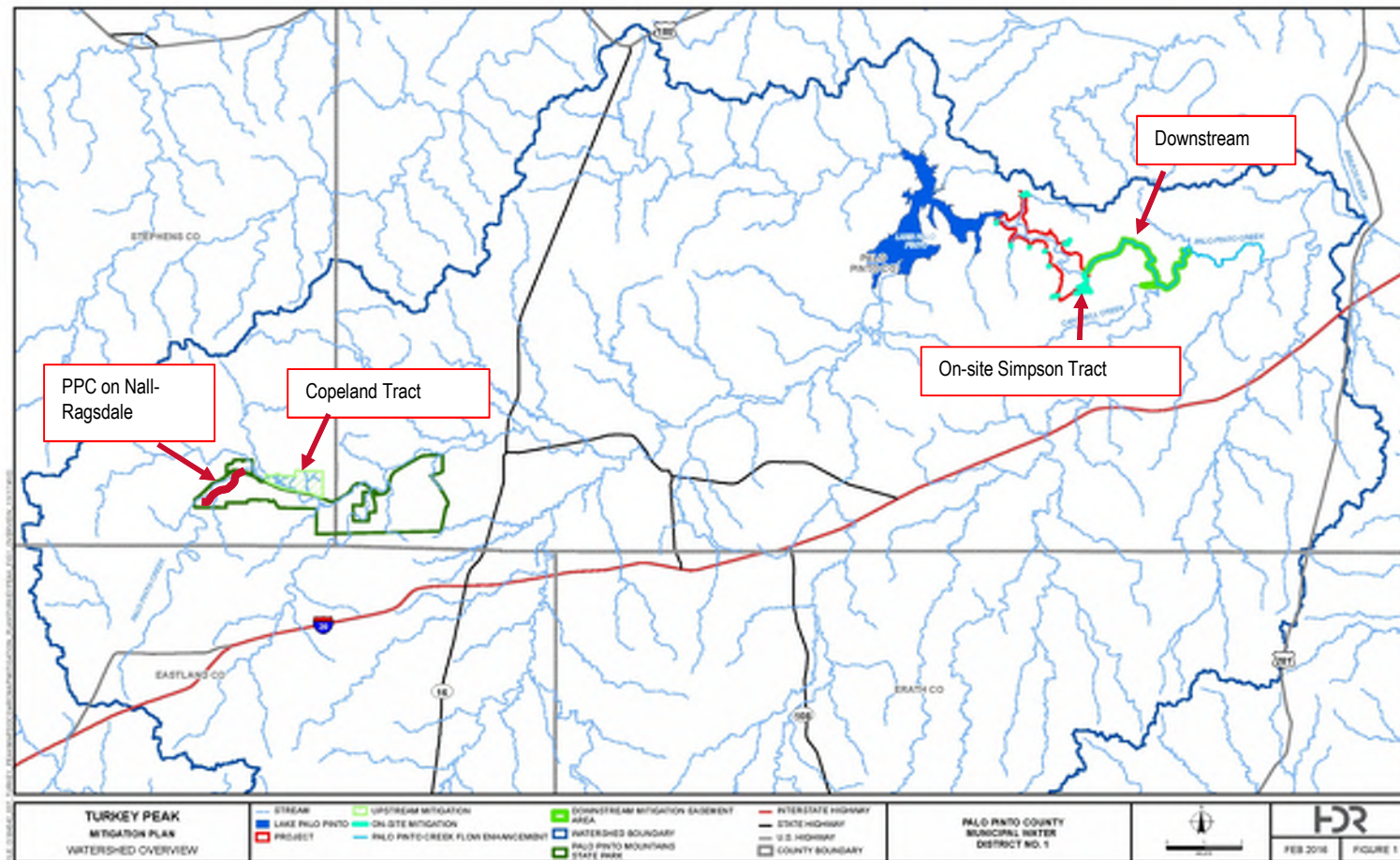
On-site (Simpson Tract) Areas:

- 3,587 feet of ephemeral stream restoration design & construction
- Pond removal and vegetation management / plantings

Downstream Areas:

- ~250 feet of riffle reconstruction (Cockburn tract)
- Flow provisions per Adaptive Management Plan
- 5.1 miles of protected conservation easements (300 ft wide) with 63 acres of plantings

OVERVIEW OF MITIGATION AREAS



TOP MITIGATION PRIORITIES

- Golden-cheeked warbler surveys of footprint / TNMP line
 - Survey complete being submitted to USFWS
- Cultural resource completion
- Coordination with Texas Forest Service and Tarleton State University for seed collection / start of grow out
- Fencing of Copeland
- Landowner and TPWD negotiations for Conservation Easements (Lake, Simpson, TPWD, to downstream)
- Finalize stream designs & interview contractors



DOWNSTREAM MITIGATION – ADAPTIVE MANAGEMENT PLAN

- Minimum flow requirements to be based on combined TCEQ and USACE requirements
- Adaptive management plan will be based on
 - Water Quality
 - Aquatic Life Monitoring condition scores
 - USACE added Special Condition for temperature sensors on tower gates



DOWNSTREAM MITIGATION (CONT'D) – AQUATIC LIFE MONITORING

- Fish and invertebrate sampling
 - Twice annually 1 year before construction (anticipated in 2019)
 - Twice annually for 3 years post filling (Phase I)
 - Phase II – Based on scores and PPCMWD1 proposed minimum flow

