

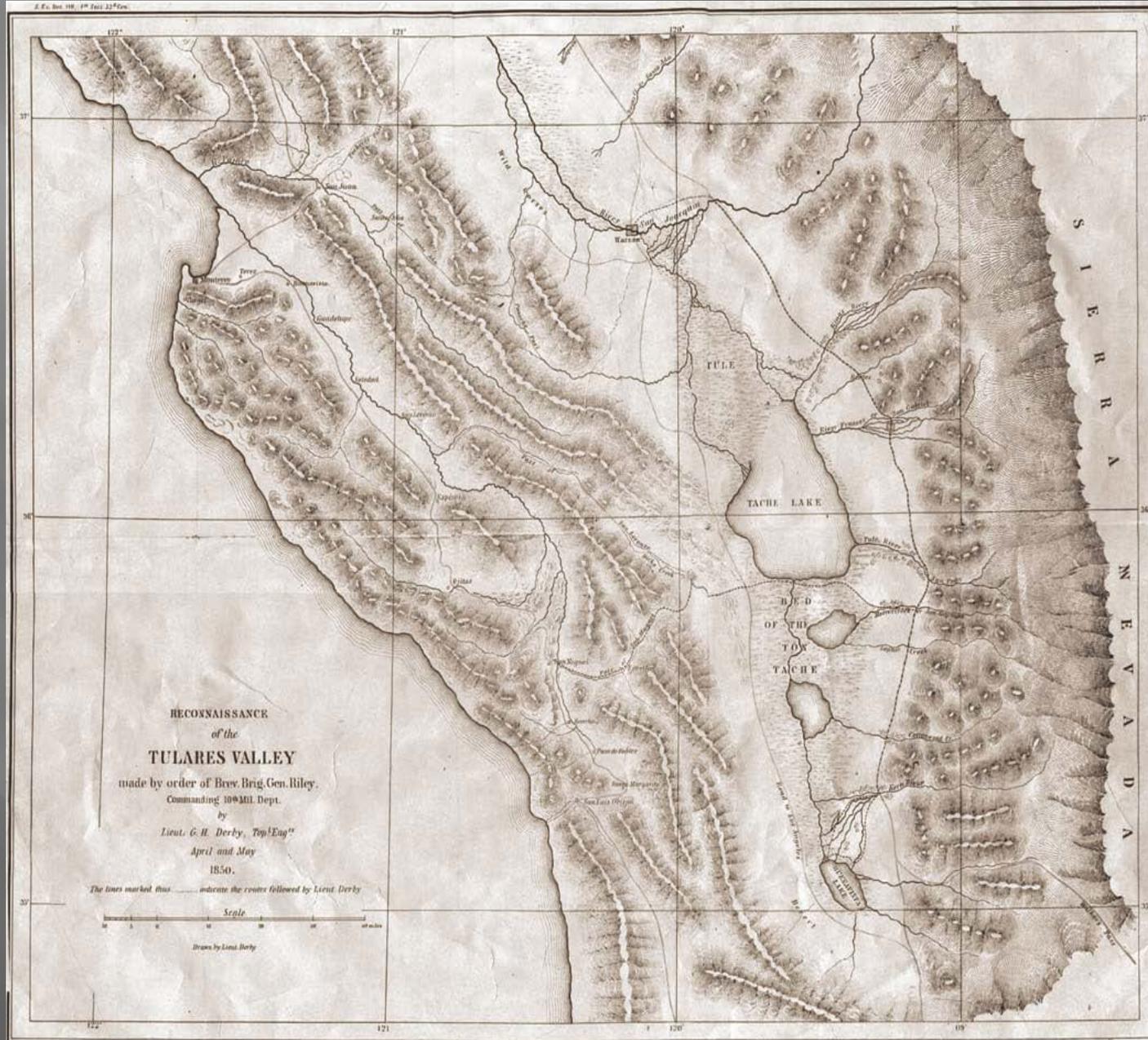
Tulare Lake Basin

Nick Stanley, Kern National Wildlife Refuge
Jonathan Pickett, California Waterfowl Association



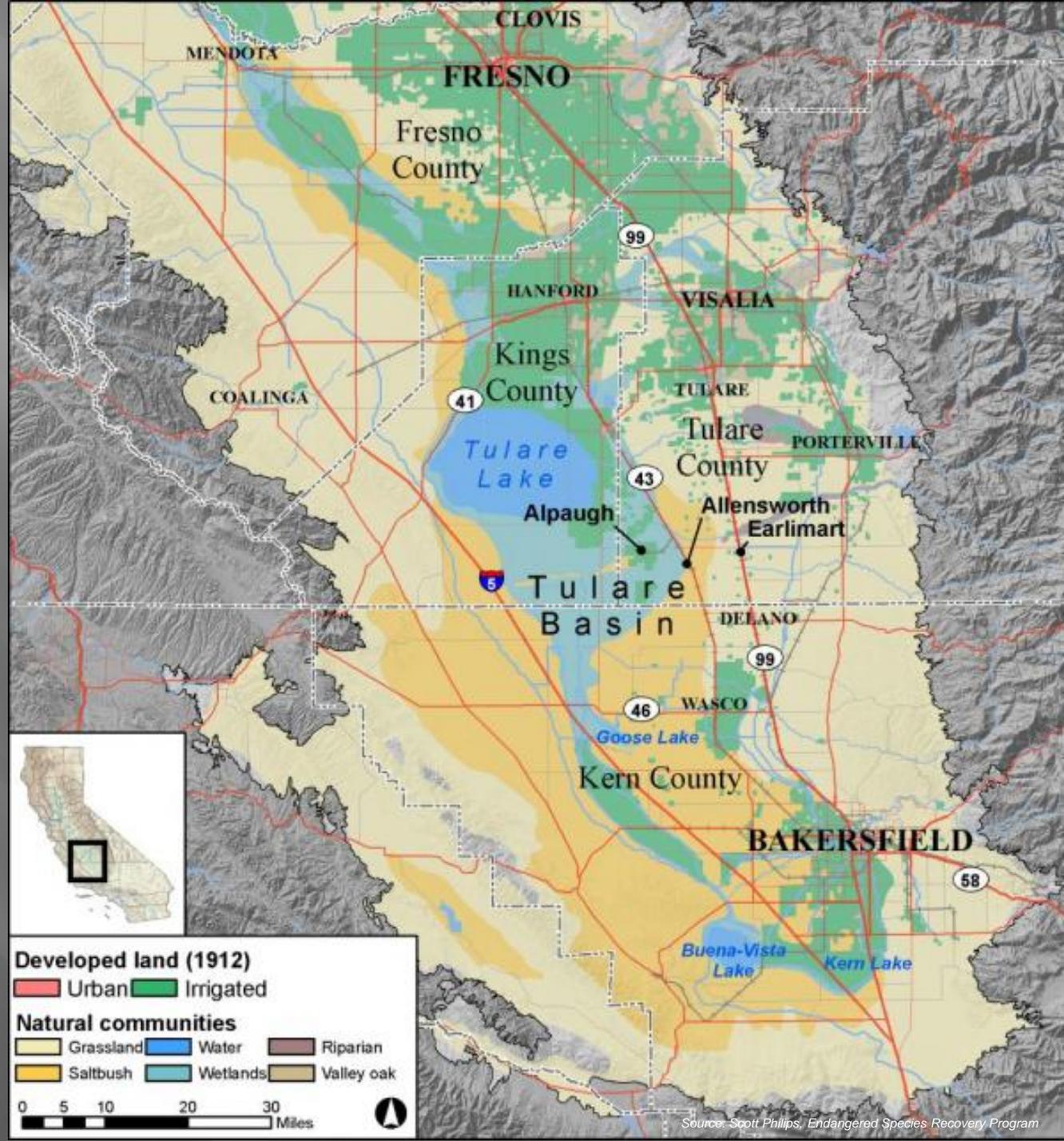
Tulare Lake Basin Geographic Region

- Pre 1850, the Tulare Lake was the largest freshwater wetland complex west of Mississippi, est. 500,000 acres
- Tulare, Kern, Buena Vista and Goose Lakes would swell during heavy rains, eventually flowing into the San Joaquin River



Historic Tulare Lake Basin Then and Now

- 1905 full-scale levee, canal, reservoir construction and water diversion for AG and municipal use, wetlands reduced to less than est. 25,000 acres
- Natural hydrology mostly eliminated
- 1879 last time Tulare Lake flowed into San Joaquin River
- Now Tulare Lake Basin is a closed basin, water does not leave the basin



Tulare Lake Basin Wetlands Now

- In Tulare Basin, wetlands are primarily private or federally owned.
- At one time 200 private wetlands maintained thousands of wetland acres, today less than 40 remain
- Two Federal National Wildlife Refuge, Kern and Pixley



Tulare Lake Basin Wetlands
Kern, Tulare and Kings County, CA

■	TLB Private Wetlands
■	NRCS WRP Easements
■	USFWS Interest
	CVJV Tulare Basin Boundary

0 3 6 12 18 24 Miles

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Geomapping, Aerogrid, IGN, IGP, Swisstopo, and the GIS User Community, Esri, HERE, DeLorme.

Map Produced by California Waterfowl, October 2014, California Waterfowl NAD 83



Kern NWR Complex

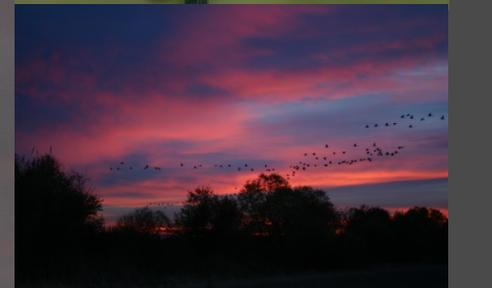
Nick Stanley, Project Leader

U.S. DEPARTMENT OF THE INTERIOR
U.S. Fish and Wildlife Service



**NATIONAL
WILDLIFE
REFUGE
SYSTEM**

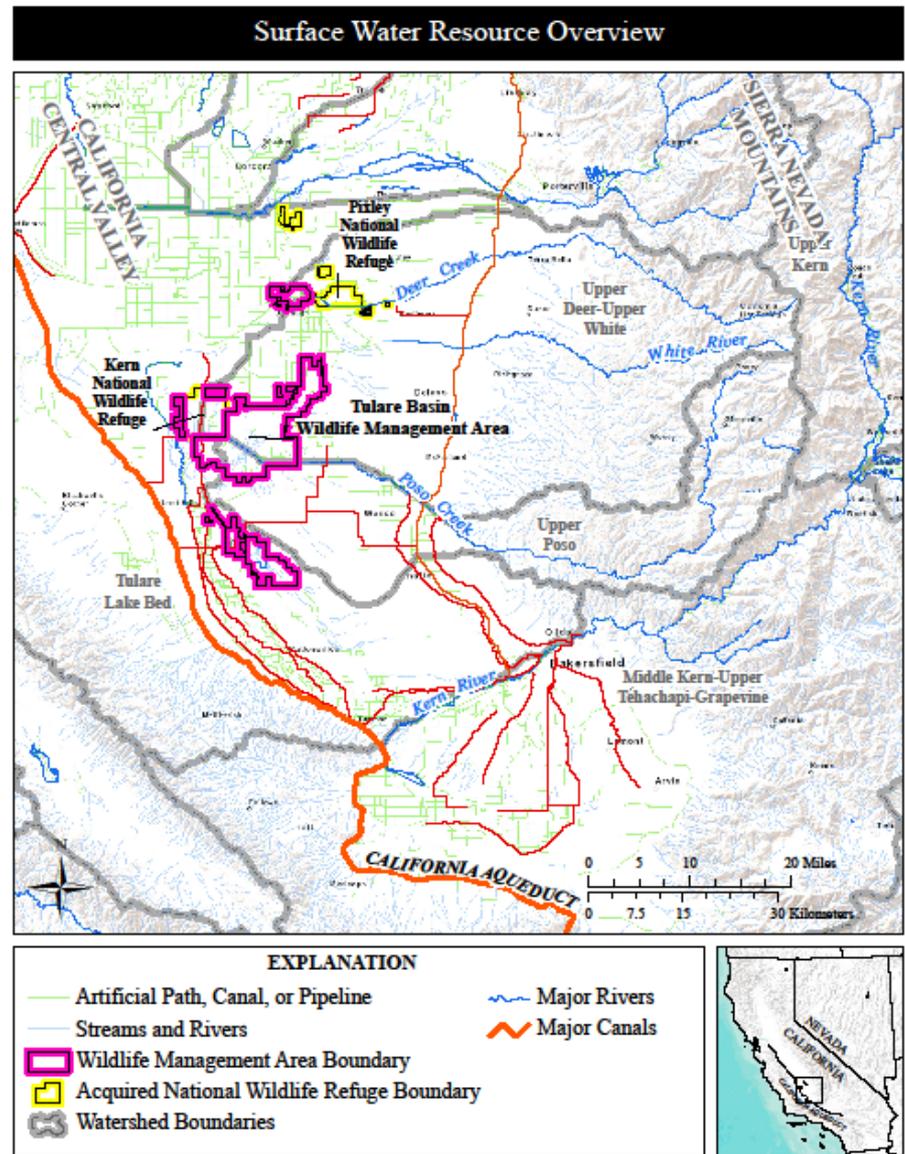
Kern National Wildlife Refuge 6500
Pixley National Wildlife Refuge 600
Tulare Wildlife Management Area 4000



Values of Tulare Lake Basin

- Provides vital seasonal habitat for migratory wildlife
- First stopover for migrating waterfowl and shorebirds
- Value to endangered / threatened species who are wetland and upland codependent – Tricolored blackbird, Blunt nosed leopard lizard, San Joaquin kit fox, and many other species who's habitats are literally disappearing over night.
- Over 9,000 Acres of Wetlands for Recreation uses – Bird watching, hunting, environmental education

- All Rivers within Tulare Basin only have water flow during flood events.



Map Projection: North American Datum (NAD) 1983 Teale Albers; Map Produced on February, 6, 2013
 Source Data: Refuge Boundary from U.S. Fish and Wildlife Service Cadastral dataset, Terrain basemap from ESRI Online Map Services; Canals, Lakes and Rivers from U.S. Geological Survey National Hydrography Dataset. Major Canals from U.S. Bureau of Reclamation Mid-Pacific Region

Management Aspects Private and Federal Wetlands

- Almost all private wetlands rely solely on ground water through deep wells to flood habitat, costing \$50-75 AF, in addition to water district assessment which do not provide water
- Moist soil plant management practices prescribed targeting timothy to mimic the historical disturbance regime of wetlands
- Typically mechanical management $\frac{1}{4}$ of wetland habitat yearly to renew vigor of moist soil plants and abate invasive weeds
- Nitrogen and fertilizers are not added



Intensive Water Management

- Deep wells begin pumping ground water in late September for staged flood up. Wetland water maintained through March
- Drawdown in late March into water recirculation systems designed for irrigations and brood habitat, no water discharged off property
- If budgets allow, irrigate moist soil plants in late May-June
- Brood habitat maintained until mid-July, water used for wetland irrigation
- Mimic the historical wetland hydraulic regimes through timing of water applications and wetland infrastructure - swales, levees, water controls, wells



National and Regional Investments

- Through funding partners such as NAWCA, WCB, Cal Duck Stamp Program, NRCS, tens of millions have been spent on wetland restoration and enhanced infrastructure to intensively manage habitat with water conservation in mind



Public Use



Negative Implications of Added Cost

- Private wetlands can't afford the added cost, resulting in the loss of wetland habitat, possibly converted to Agriculture
- Wetlands who can afford will flood less acres to make up for the added cost
- Less money spent on management resulting in lower quality habitat

All resulting in.....

- Less or lower quality habitat provides less resources available for foraging water dependent birds, resulting in lower quality body conditions when returning to breeding grounds. This has shown to lower breeding success, which could result in lower bird populations



Differing factors from other wetlands throughout the state

- Water is not discharged off property, recirculated for brood ponds, wetland irrigations
- Coalitions within TLB charging inconsistent rate \$6.50-\$7.50, Grasslands paying around \$2
- Tulare Lake Basin is a closed Basin. Water ways such as rivers, streams and lakes do not leave basin
- Almost all private wetlands rely solely on ground water through deep well pumping to flood wetland habitat

Questions?

