River-Reservoir Connectivity at Lake Buchanan

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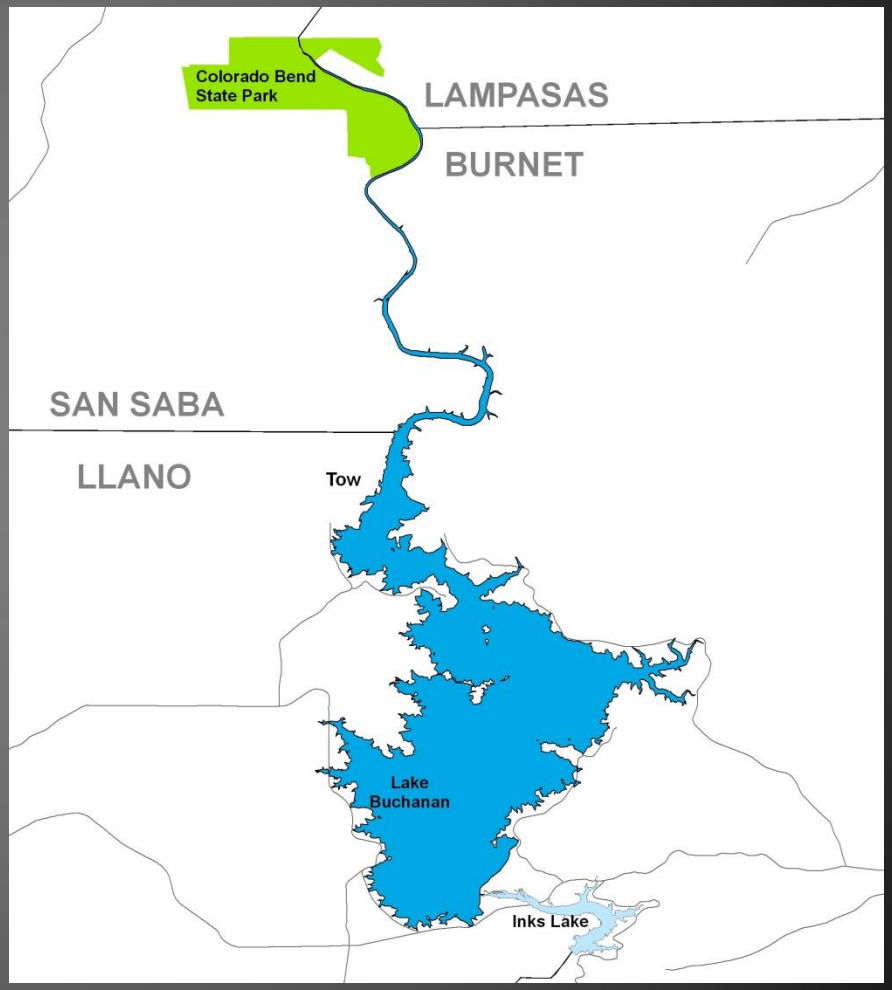
Lake Buchanan

- Dam constructed in 1937
- 22,211 surface acres at full pool
- Primarily developed for water storage and electricity



Lake Buchanan Fishing

- Diverse multi-species lake
- Provides angling opportunities year-around
- Fishing activities provide significant economic impact to the region

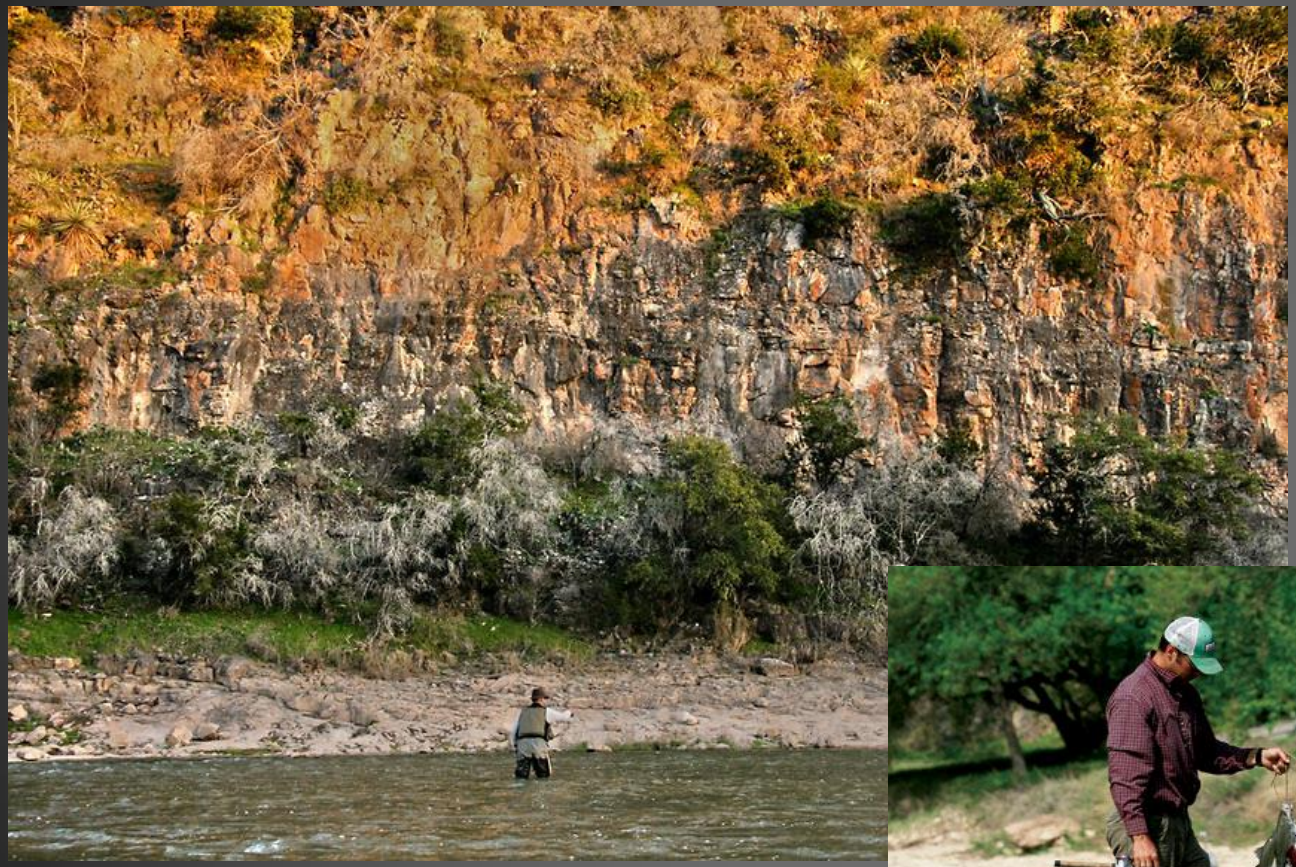
Lake Buchanan Fishing Economic Impact

- Direct expenditures by all anglers between March 1 and August 31, 2011 was estimated at $5.2 million ($2.1 million was spent locally)
- Nearly another million dollars of added economic value was estimated in indirect revenue ($571,772 locally)
- Median local expenses per day of angling for non-locals was estimated at $75 during this time

White Bass at Lake Buchanan

- White bass fishing accounted for over half the directed effort by anglers in the spring of 2011 (March – May)
- Most of this effort occurred upriver to Colorado Bend State Park
- Known as one of the most popular white bass runs in the state

Lake Buchanan White Bass Fishing



Lake Buchanan White Bass Economic Impact

- Direct expenditures by all anglers between March 1 and May 31, 2011 was estimated at $2.5 million (just over $1 million spent locally)
- Nearly another million dollars of added economic value was estimated in indirect revenue ($364,000 locally)
- Median local expenses per day of angling for non-locals was estimated at $80 during this time

White Bass Research

- Year-class strength is related to spring inflows
- Frequent (every 3-4 years) strong year classes required to sustain quality fisheries

Drought Impacts on Fishery

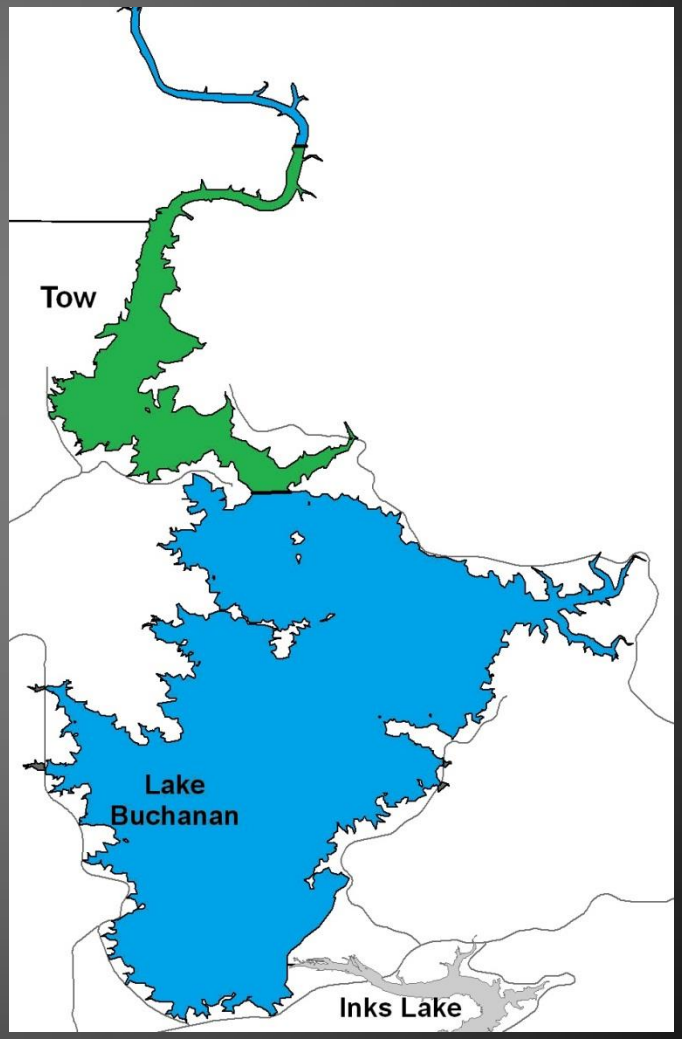
- Leads to poor inflows, which inhibit spawning runs
- Poor angler access as ramps close
- Loss of river-reservoir connectivity and recreational access

River-Reservoir Connectivity

- Along the river-reservoir interface (RRI)
- Transition zone for many fish species during different life stages, providing diversity
- Typical sedimentation features in this zone can create novel deltas that mimic natural floodplain habitats

Lake Buchanan RRI
(Buckmeier et al. 2013)

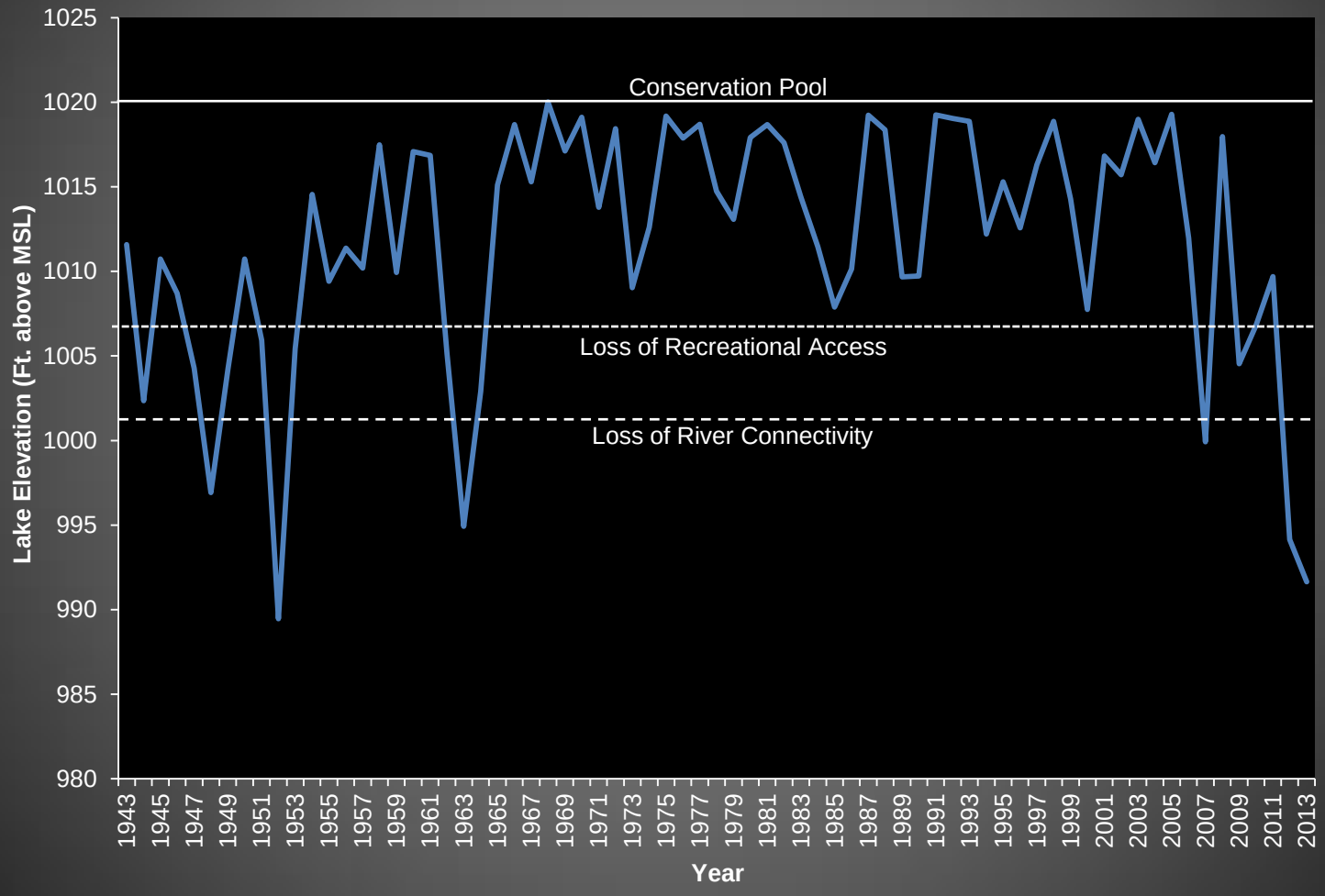
- RRIs provide migration passage, nursery habitat, and seasonal refuge for many fish species
- 36 of 45 (80%) of available fish species used RRI in Lake Buchanan
- RRI management essential to overall sportfish management

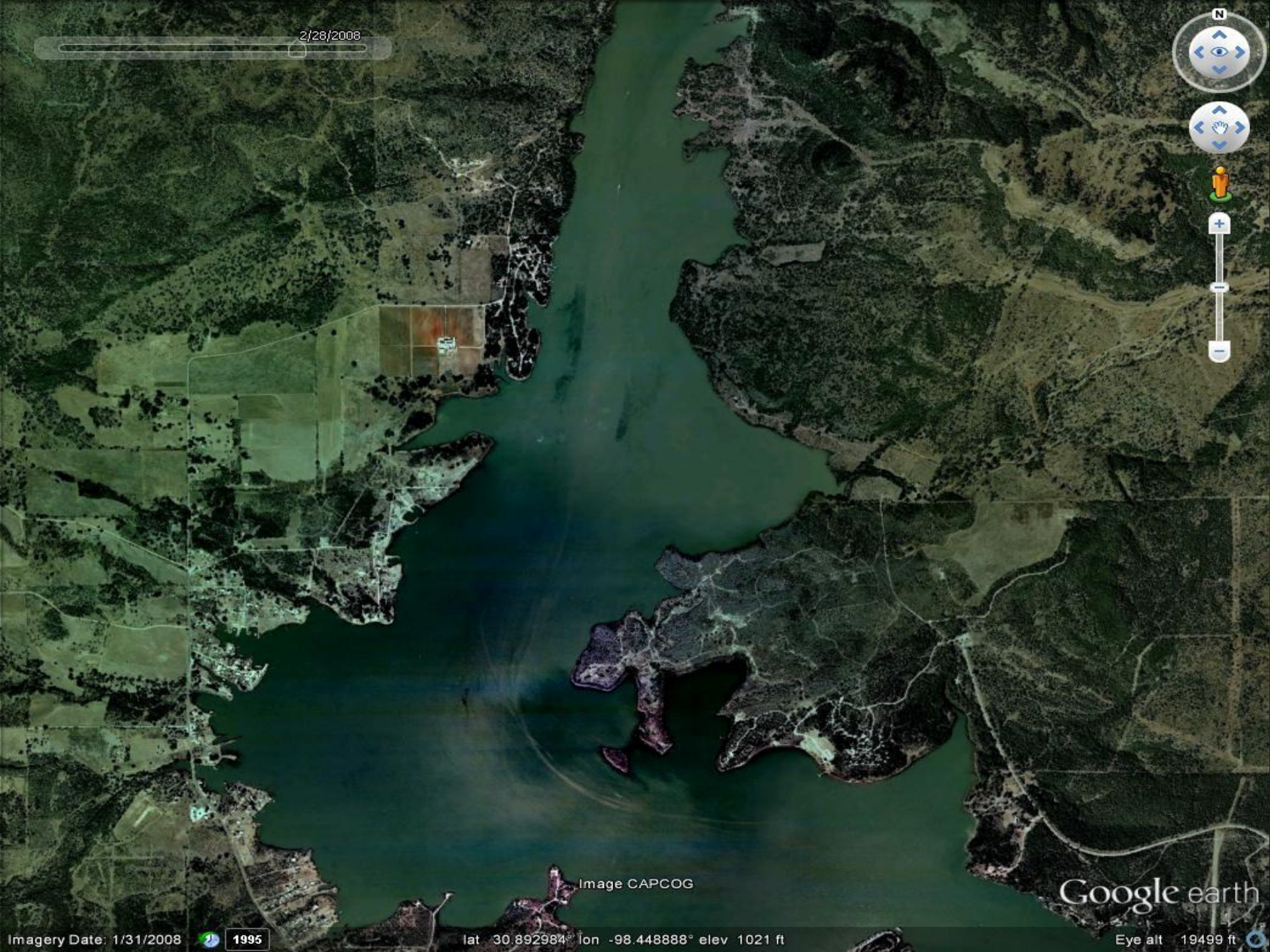


Lake Buchanan Water Level Thresholds

- Full pool at 1,020 ft. msl
- Loss of recreational river access at 1,007 ft. msl
- Loss of river-reservoir connectivity at 1,001 ft. msl
- Connectivity has been lost since summer 2011

Lake Buchanan Mean Water Elevation February-April

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Loss of recreational access


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Loss of connectivity
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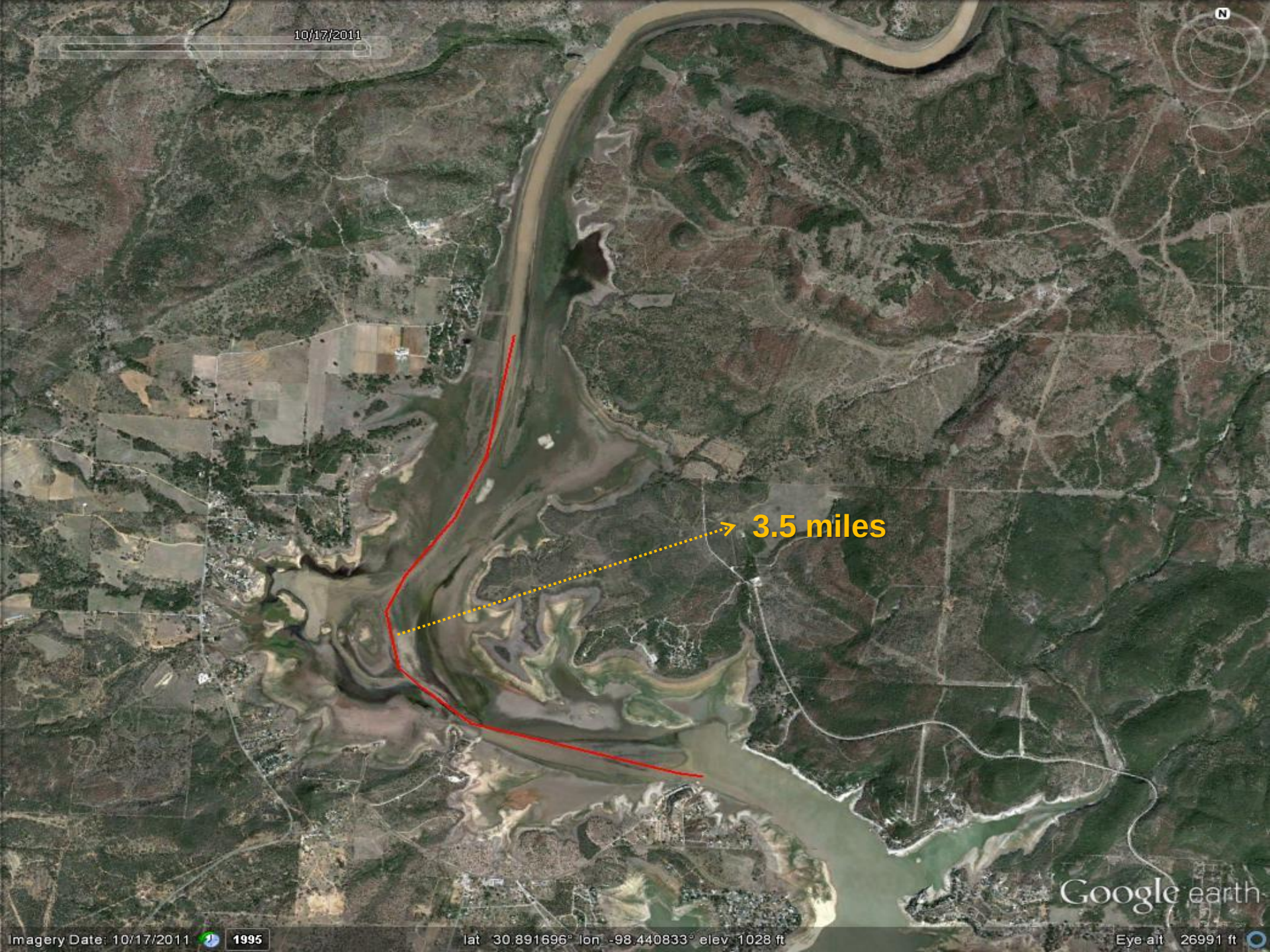
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lat 30.891696° lon -98.440833° elev 1028 ft
Eye alt 26991 ft

Management Issues

- Loss of connectivity is detrimental to fish populations and inhibits essential RRI usage
- Loss of recreational access is detrimental to the economic output of the lake

What Can Be Done?

- Need to restore the river-reservoir connectivity in an ecologically-friendly and sustainable way
- Seasonal lake water level management may help maintain connectivity
- Restructuring the RRI is one option, but it can be expensive and will require partnerships and expertise

Benefits

- Restore valuable fish and wildlife habitat
- Maintain RRI usage and recreational access during drought
- Boost local economy

Moving On

- We cannot do this alone
- Partnerships with public and private stakeholders are essential
- The positive impacts would be invaluable

Thank You

TEXAS PARKS & WILDLIFE

SPORT FISH RESTORATION