Environmental Flow Regimes Trinity and San Jacinto Rivers

Presentation to the
Bay/Basin Stakeholder Committee

February 3, 2010

Flow Regime

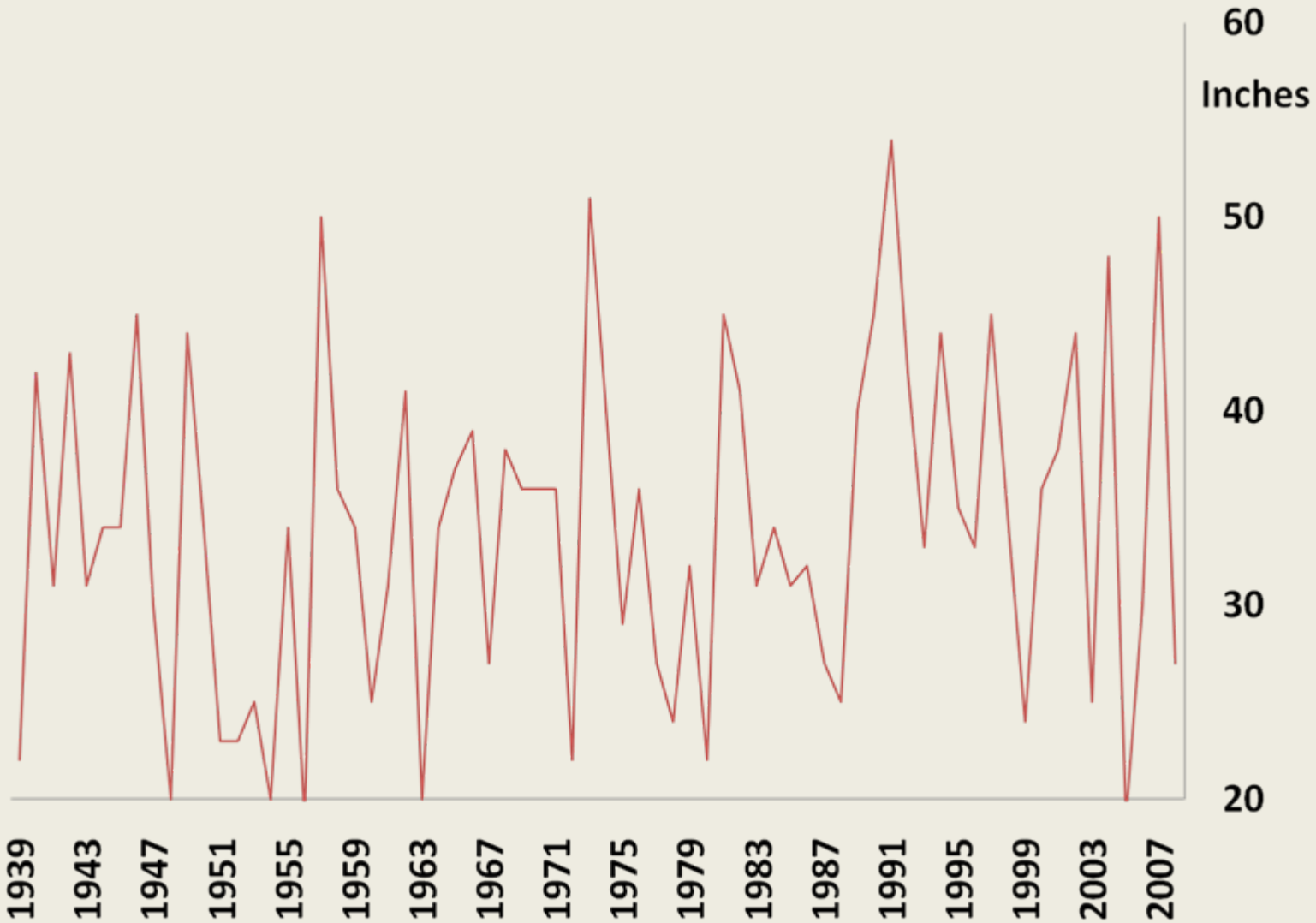
Description of flows to sustain existing ecosystem

Not –creating an ecosystem that has not existed before

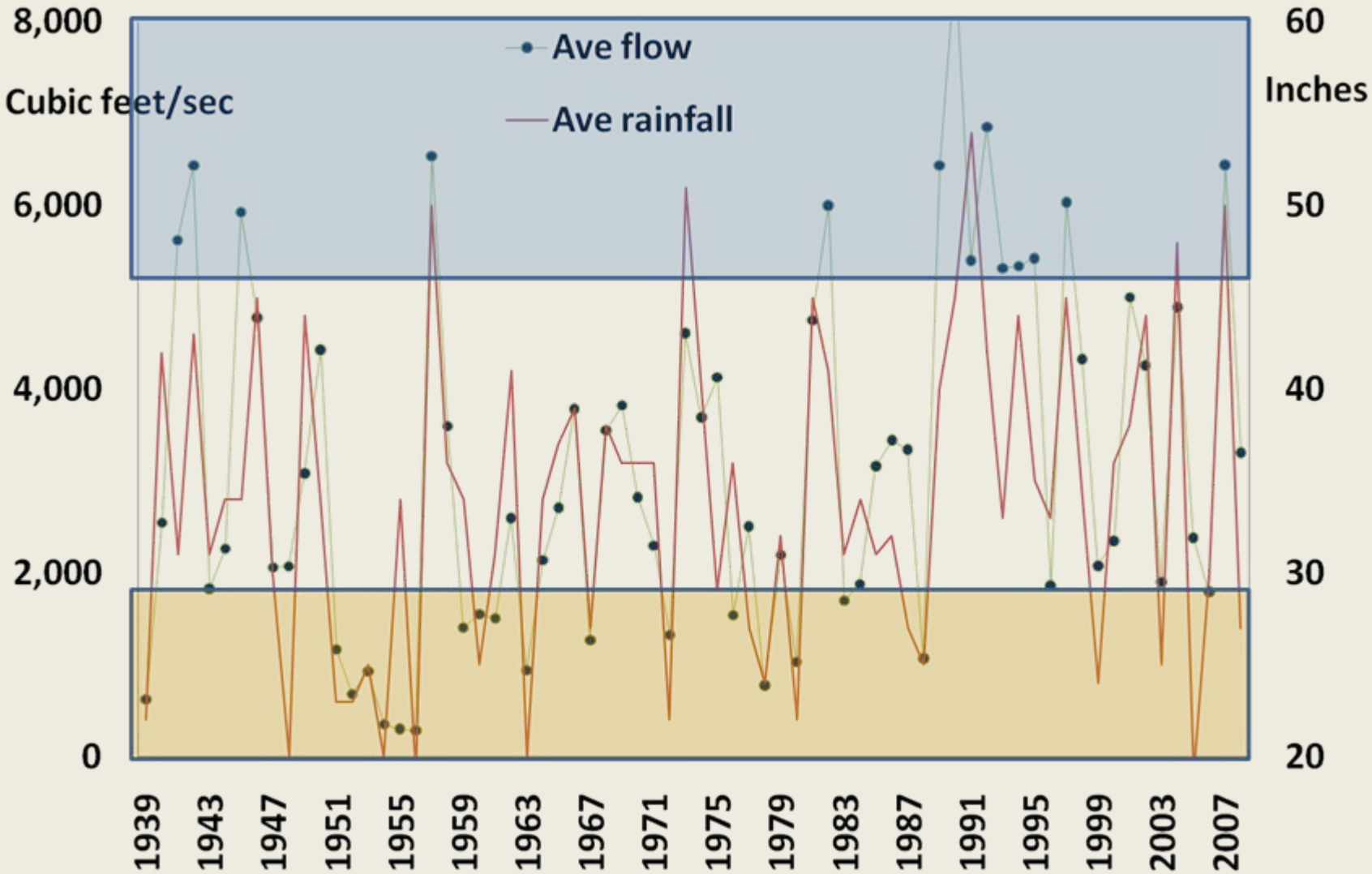
Not – mandate to set flow standards equal to flow regime

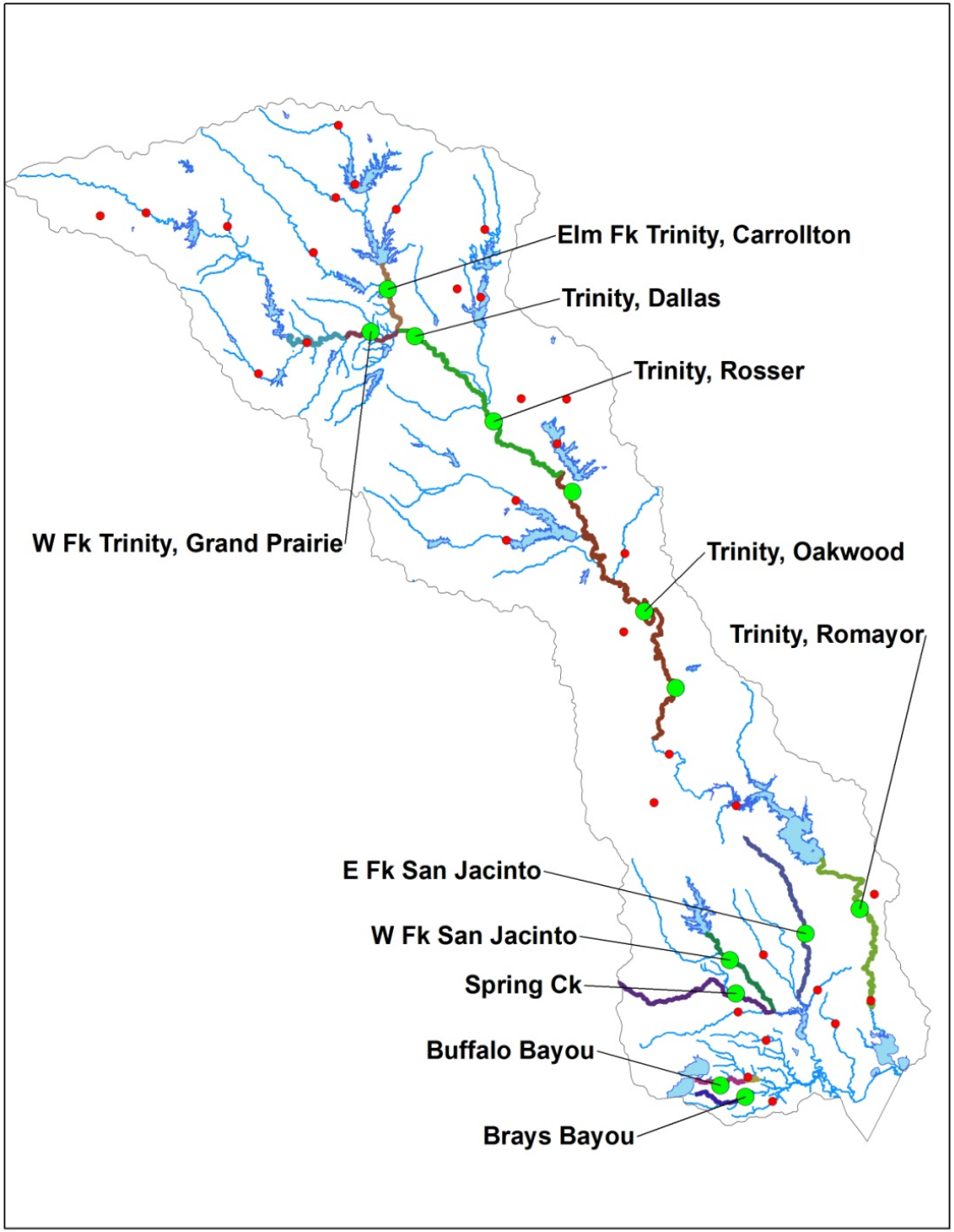
Not –values that should never be changed

Fort Worth/Dallas Annual Rainfall



Trinity at Rosser Flow



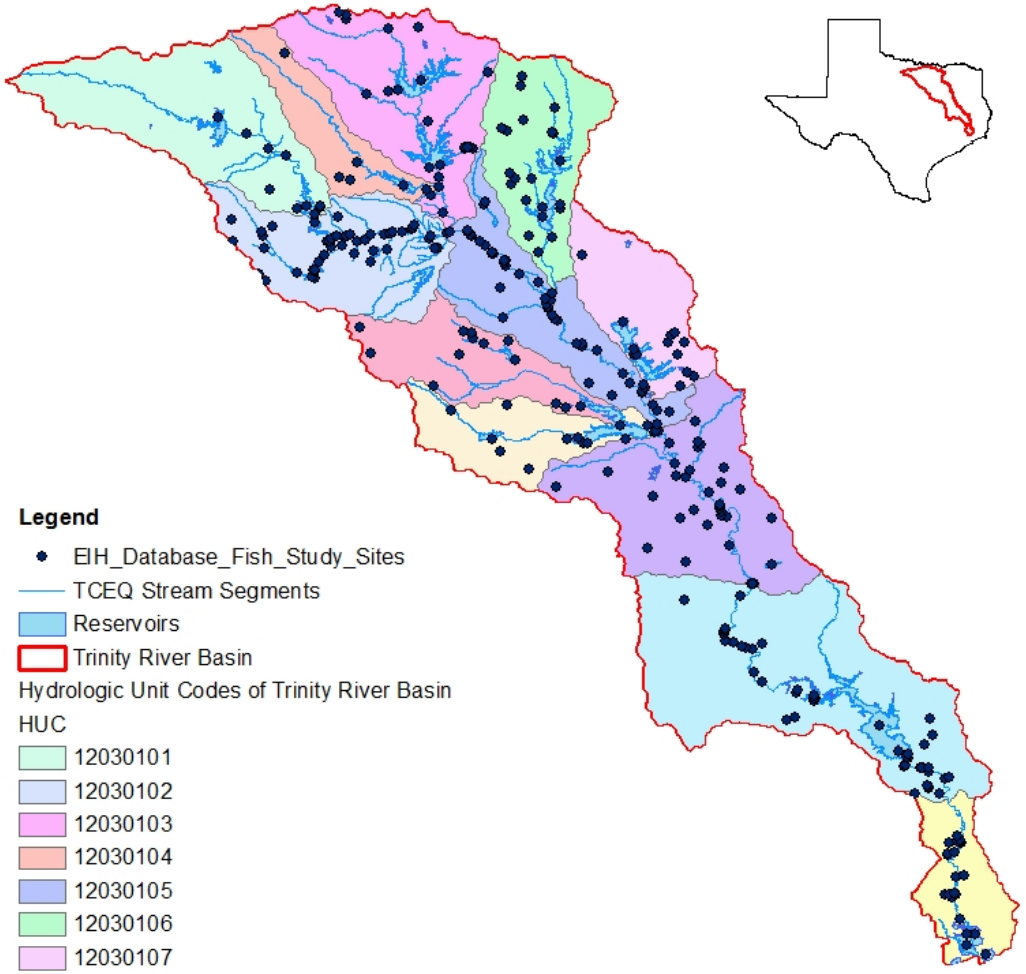

Elm Fk Trinity, Carrollton
Trinity, Dallas
Trinity, Rosser
W Fk Trinity, Grand Prairie
Trinity, Oakwood
Trinity, Romayor
E Fk San Jacinto
W Fk San Jacinto
Spring Ck
Buffalo Bayou
Brays Bayou

National Academy of Science (2005)

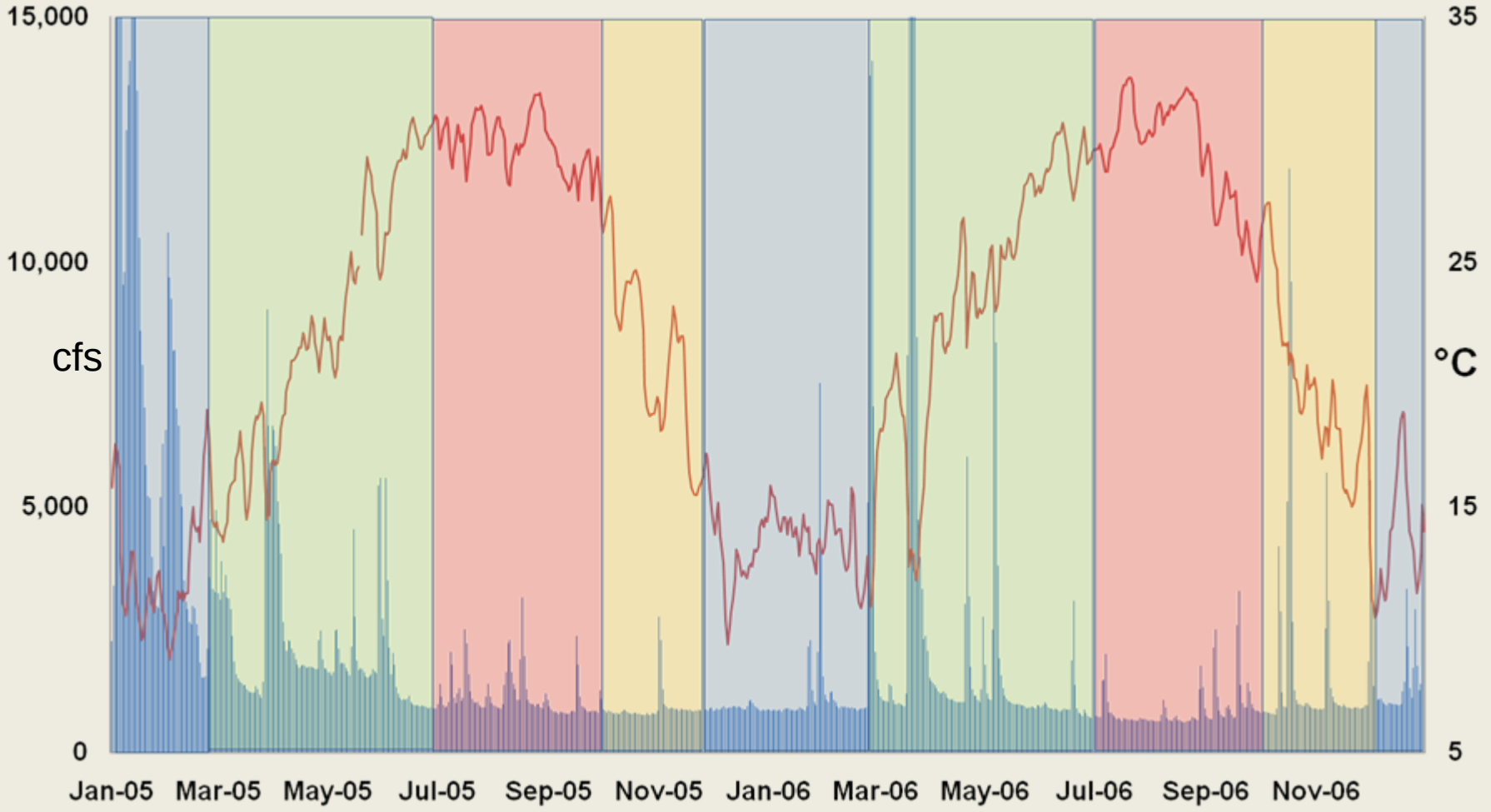
- "…instream flow science…a **range of flows that account for seasonal and inter-annual variation, magnitude, timing, frequency, and rate of change** (IFC, 2002; Poff et al., 1997; Postel and Richter, 2003).

- … translate into different levels of flow: **subsistence flows, base flows, high flow pulses, and overbank flows**."

EIH Trinity River Database
Fish Study Sites



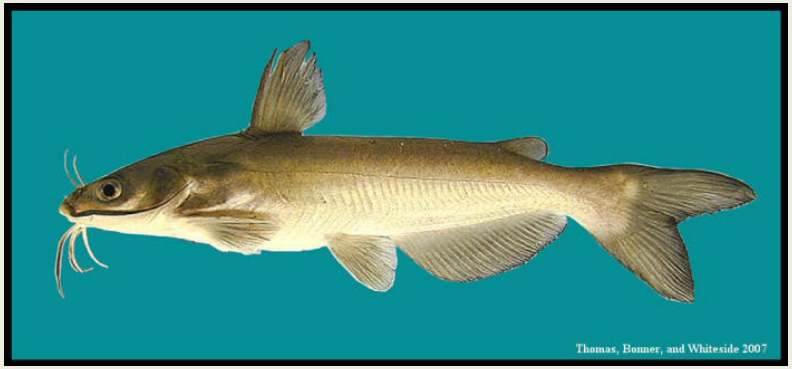
Trinity at Rosser



Dry Base Flow

Shallow riffles and pools

- Blacktail shiners, juvenile flathead and channel catfish
- Invertebrates in riffles



Normal Base Flow

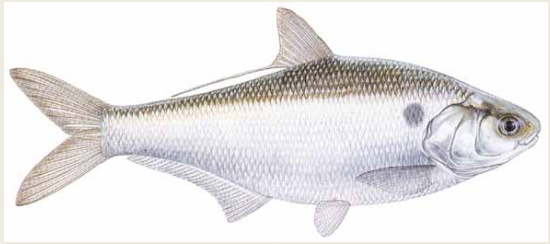
Pools and backwaters

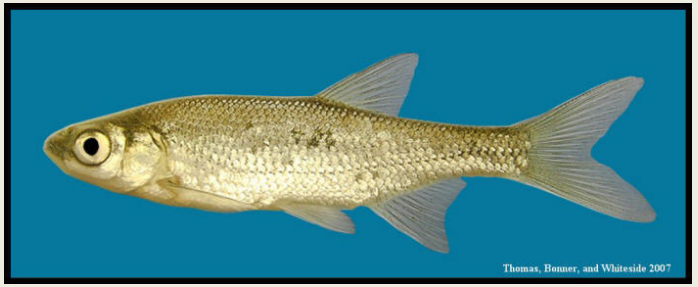
- **Bullhead minnow, largemouth bass, bluegill sunfish**

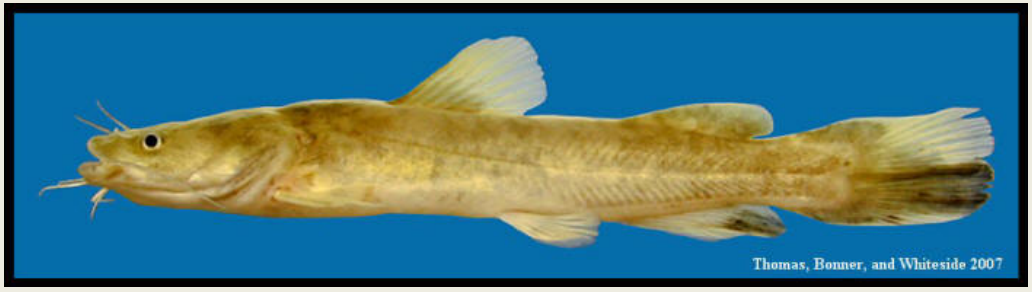
Wet Base Flow

Deep pools and runs

- **Golden shiner, gizzard shad, flathead catfish**







Base Flow Functions for EF SJR at Cleveland (25th percentile flow)

Spring Creek – 65 cfs, 01/11/2009

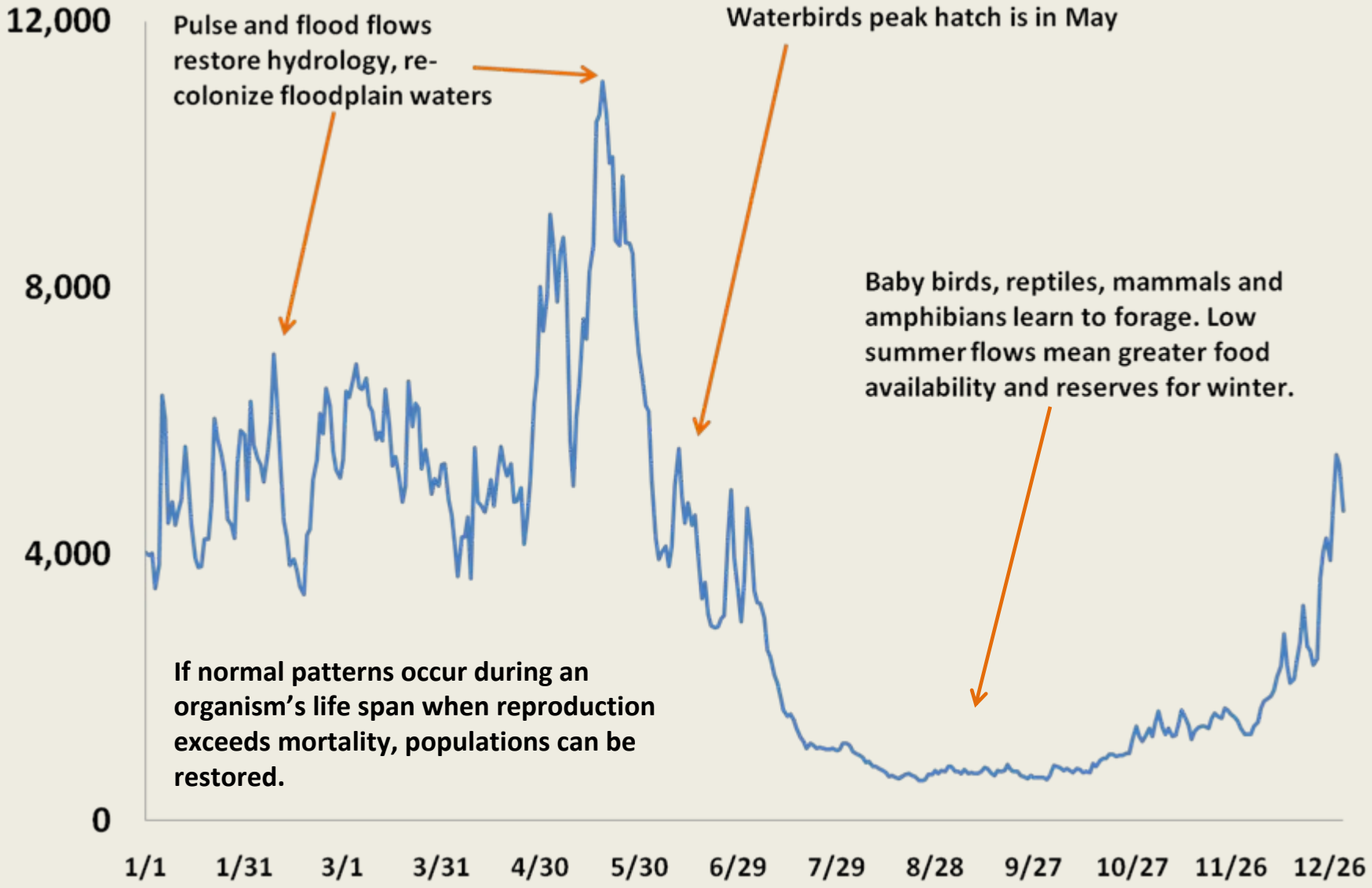
East Fork San Jacinto River at SH105

Pulse Flows – Ecological Functions

- Spawning triggered
- Seeds deposited
- Water enters tributaries, sloughs, backwaters, and riparian zones
- High banks store water
- Woody debris moved

Trinity near Romayor

Pulse Flow Functions for Trinity at Romayor (50th percentile flow)



Trinity River at Oakwood

Aug 19, 1985, flow=641 cfs

Overbank Flows – Ecological Functions

- Gar spawn, larvae and juveniles enter isolated waters
- Water, sediment, nutrients nourish floodplain
- Sediments scoured and deposited
- Isolated waters flushed and recolonized
- Plants maintained in hydrologic habitats

Trinity at Oakwood –Oct.17, 1994-Feb. 7, 1995 (unpublished NWF analysis)

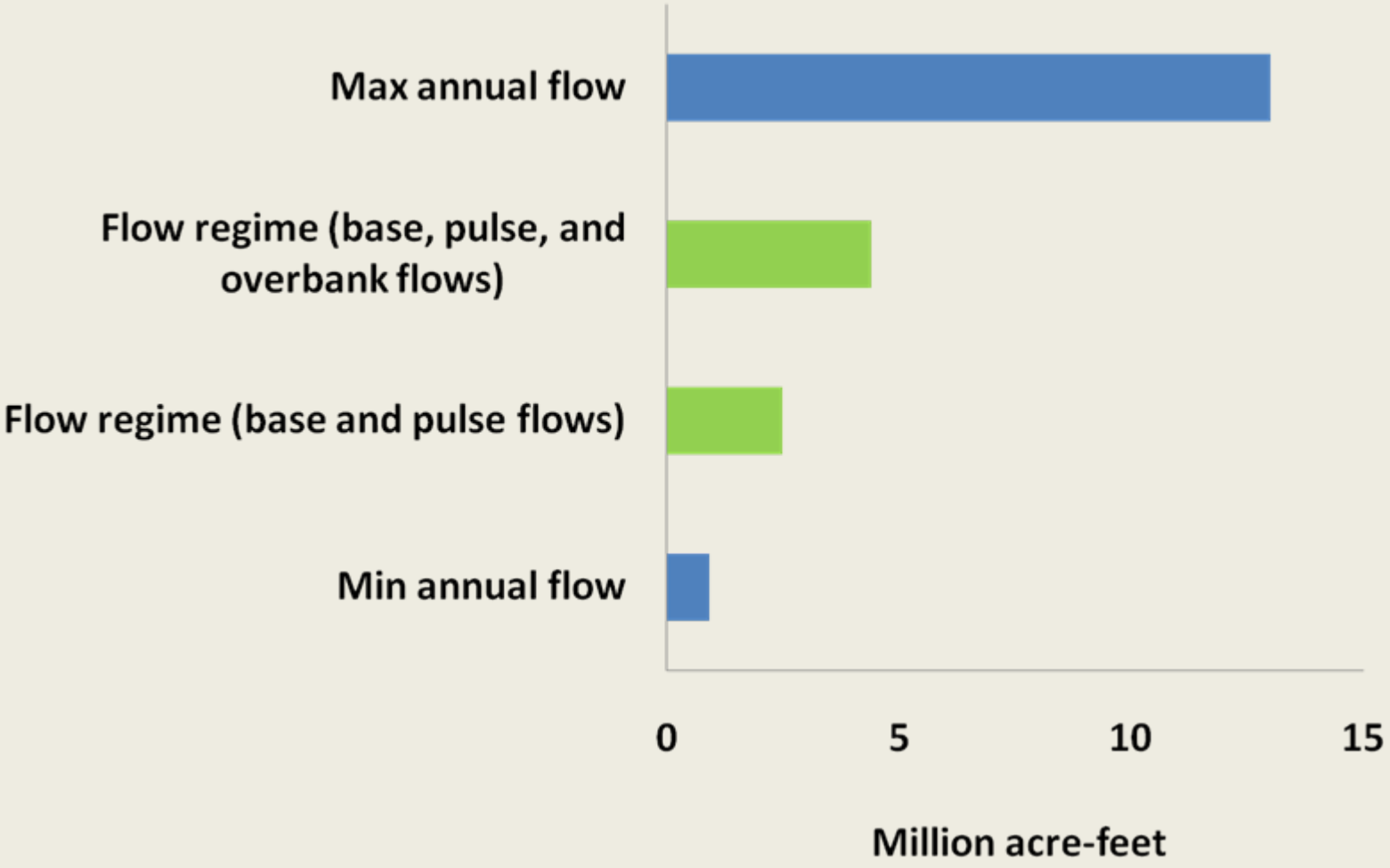
11.02.2009

Trinity nr Oakwood

- Overbank flow near 60,000 cfs
- Flow over 20,000 cfs for 25 days

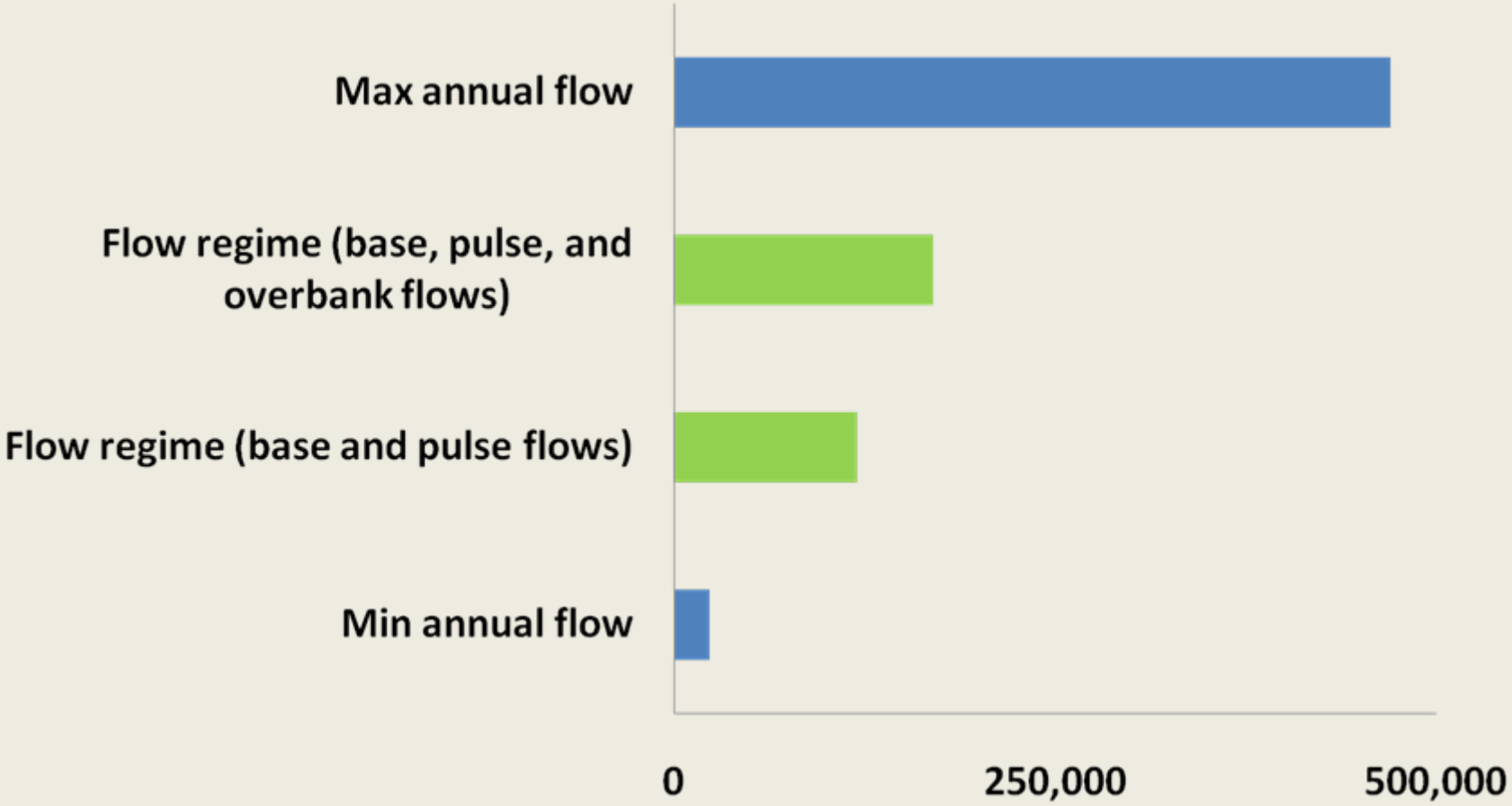
Trinity at Romayor

Total annual flow (million acre-ft)



East Fork San Jacinto at Cleveland

Total annual flow (acre-ft)



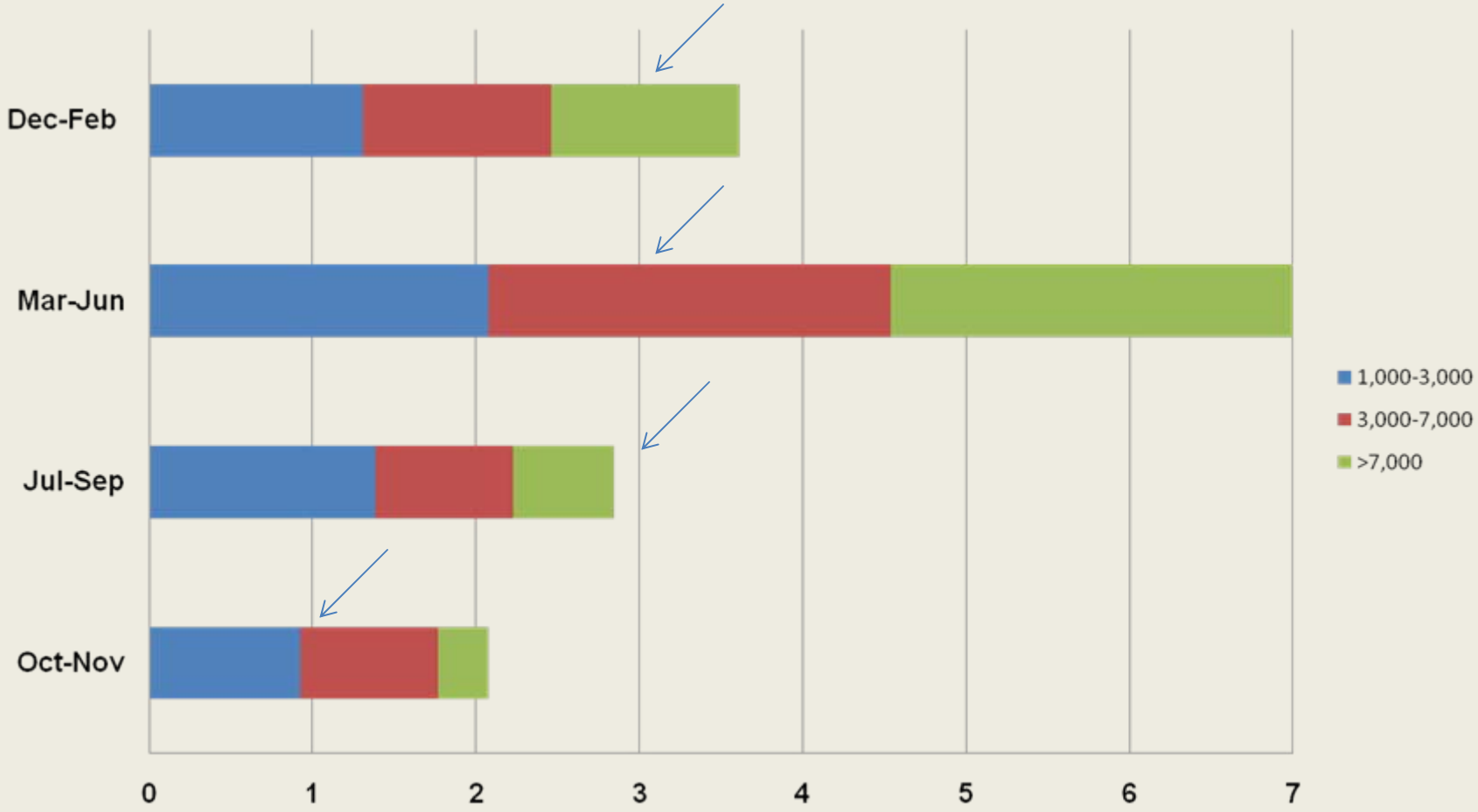
Trinity at Rosser

(Percent occurrence from 10/87 to present)

	Subsistence	Dry	Normal	Wet
Winter	**0**	**0**	**<.1**	**16**
Spring	**0**	**0**	**2**	**38**
Summer	**0**	**0**	**0**	**1**
Fall	**0**	**0**	**0**	**2**

Trinity at Rosser

Mean number of pulses (1939-1952)



Comparison of Flow Regime Recommendations

	Science-based, Conditional Flow Regime	Science-based Flow Regime
Floods	Support valuable ecological functions. Should happen naturally.	Support valuable ecological functions. Should happen naturally.
Pulses	Support valuable ecological functions. Consider pulse flows in future.	Support valuable ecological functions. 3 pulse flows by season
Base	1 base flow, varies seasonally. Consider a wet base flow in future.	3 base flows, vary seasonally
Subsistence	Flows exceeded 96-100% of time	Flows exceeded 95% of time

Comfort level with Flow Regimes?

Increases – with subsistence and base flows greater than flow regime recommendations

Decreases – with subsistence and base flows lower than flow regime recommendation

Decreases – with distance from flow regime site on the Trinity River

Decreases – in tributaries

Future

Revise environmental flow standards based on new information

Next 8 yrs: State instream flow study of middle Trinity.
Additional analyses and studies if funded.

Environmental Flow Standards by TCEQ

Environmental Flows Advisory Group and Stakeholders Recommendations to TCEQ

Flow regime identified

Next for stakeholders?

- What if….? Ask BBEST to help answer “what if” questions.
- Do regimes provide adequate water?
- Tour flow regime sites?
- What information is needed from future studies?
- How flow regimes compare to water availability modeling (WAMs)?
- ????

Questions