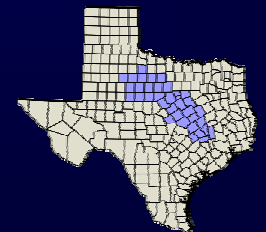


Agenda Item 7.8
Environmental Effects of Water Management
Strategies

April 26, 2005



Status

- ✓ **Hicks and Co. has completed environmental evaluation of potential reservoir projects**
 - **Copy of Hicks & Co. information is posted on Brazos G website (members only space) for review by RWPG**
- ✓ **New reservoirs present the most potential for adverse environmental effects**
- ✓ **Non-reservoir projects present minimal adverse effects**
- ✓ **Information is being incorporated into strategy evaluations**
- ✓ **Today: Present summary of effects of reservoir projects**

Minimal Effects of Other Project Types

- ✓ **Non-invasive projects/strategies include:**
 - **Pipelines/system interconnects**
 - **Wastewater reuse**
 - **Conservation**
 - **Groundwater development**
- ✓ **Have minimal effects on existing habitat and stream flows**
- ✓ **Discussed in water management strategy evaluations**

Methodology for Reservoir Evaluations

- ✓ **Effects on instream flows estimated by comparing “baseline” and “with-project” streamflows**

- ✓ **Five criteria considered for determining environmental effects of reservoirs:**
 1. **Instream flows**
 2. **Wildlife habitat**
 3. **Cultural resources**
 4. **Discharges to bays, estuaries, and arms of Gulf of Mexico**
 5. **Water quality**

Expected Changes in Stream Flows – On-Channel Reservoirs

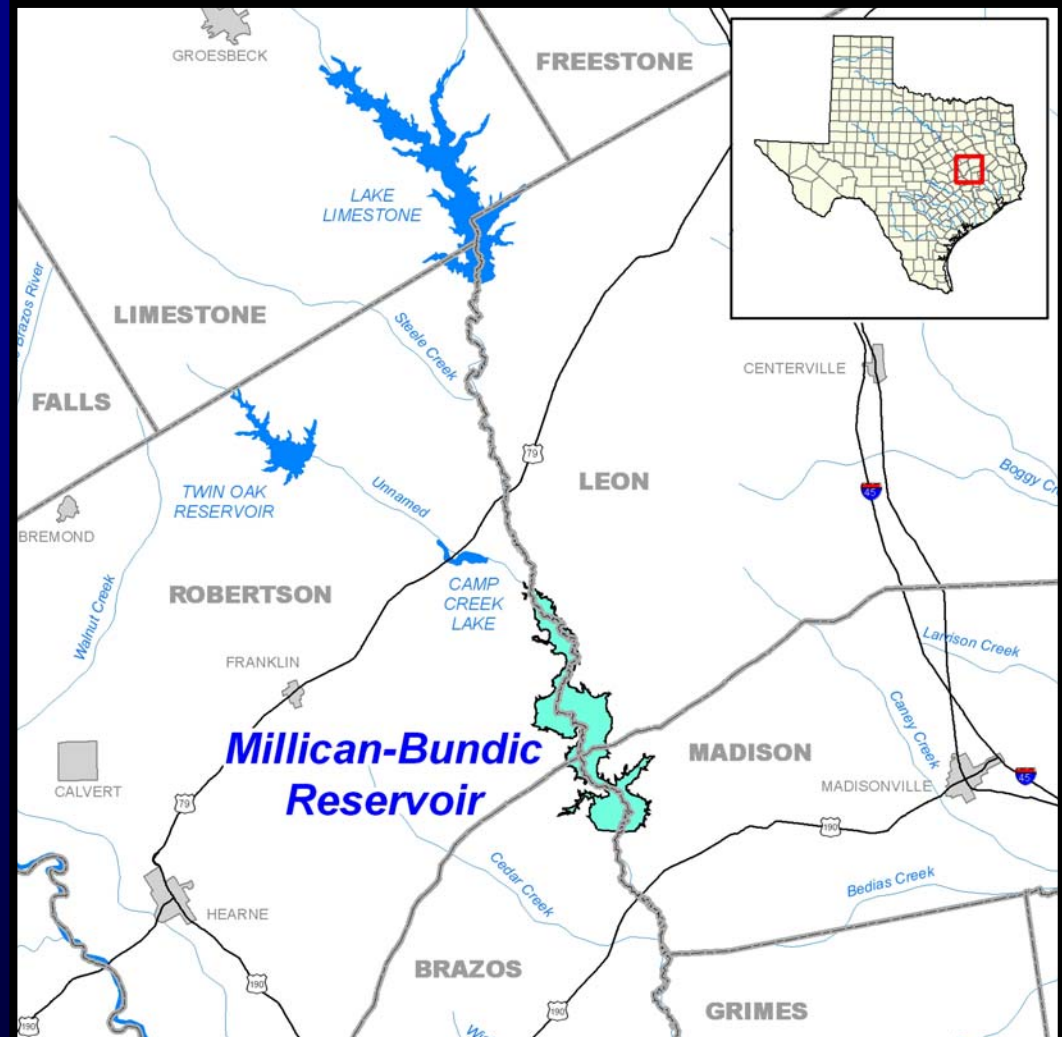
Reservoir	Change in Flow Expected			Median Monthly Instream Flow		Substantial Change in Variance Yes / No
	High	Med	Low	Without Project	With Project	
Little River			x	104,170	90,199	No
Millican-Bundic		x		28,116	23,164	No
Cedar Ridge	x			19,397	5,687	Yes
South Bend		x		200,376	119,282	No
Turkey Peak	x			13,698	451	Yes
Throckmorton		x		254	59	Yes
Double Mtn Fork - East		x		1,235	43	Yes
Double Mtn Fork - West		x		1,054	84	Yes

Expected Changes in Stream Flows – Off-Channel Reservoirs

Reservoir	Change in Flow Expected			Median Monthly Instream Flow		Substantial Change in Variance
	High	Med	Low	Without Project	With Project	Yes / No
Groesbeck			x	21,096	19,676	Yes
Peach Cr			x	18,312	18,031	No
Little River			x	582,675	552,801	No
Wheeler Branch			x	1,563	1,379	No

Example: Millican-Bundic Reservoir

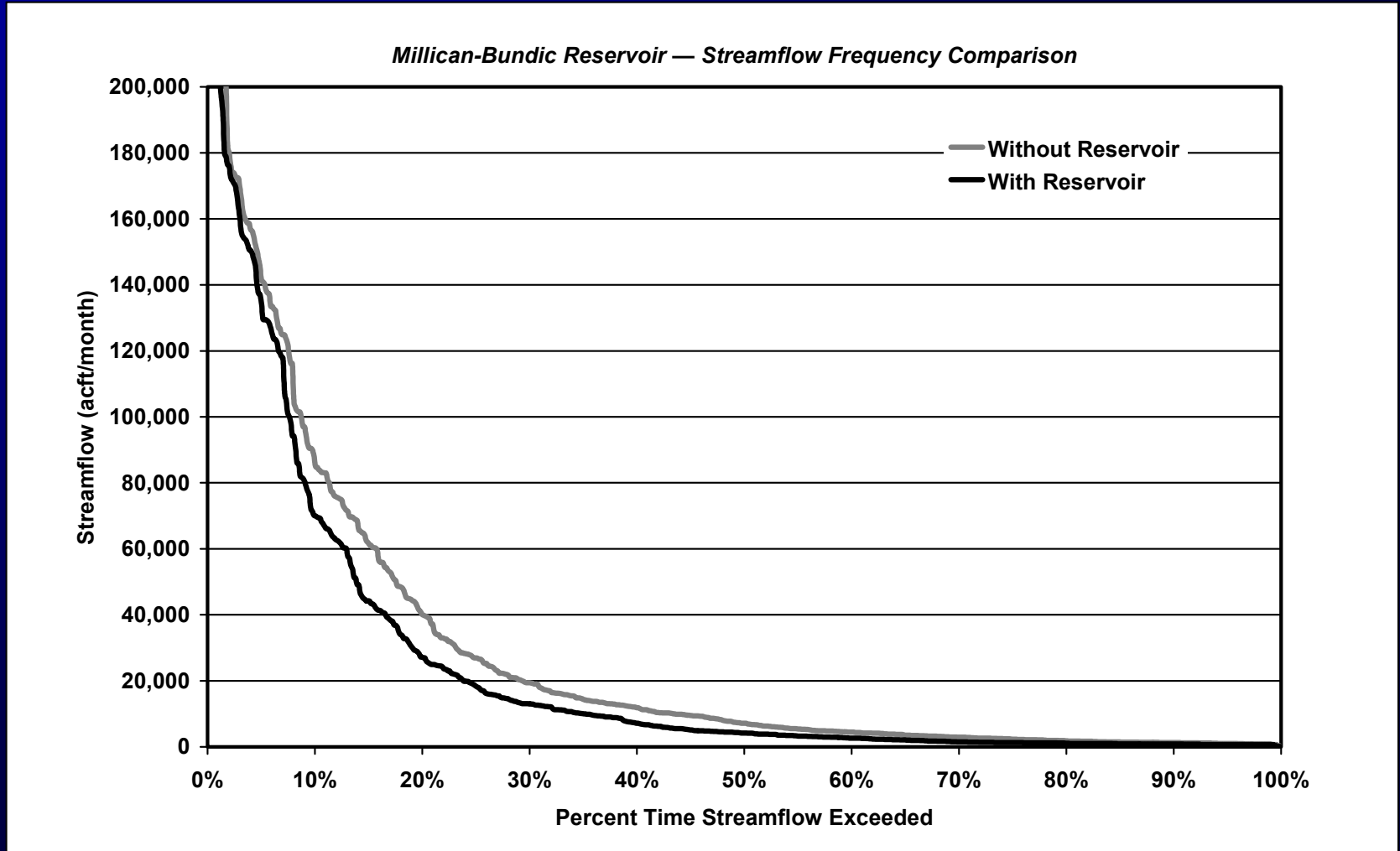
- ✓ Inundate approximately 14,630 acres
 - 4,086 grassland
 - 10,544 forest
 - ✓ 9,210 bottomland hardwoods
- ✓ Would affect physical, biological, and chemical components of the downstream river system
 - Dam – fish barrier
 - Transport of suspended solids downstream of dam
 - Downstream flows more highly regulated



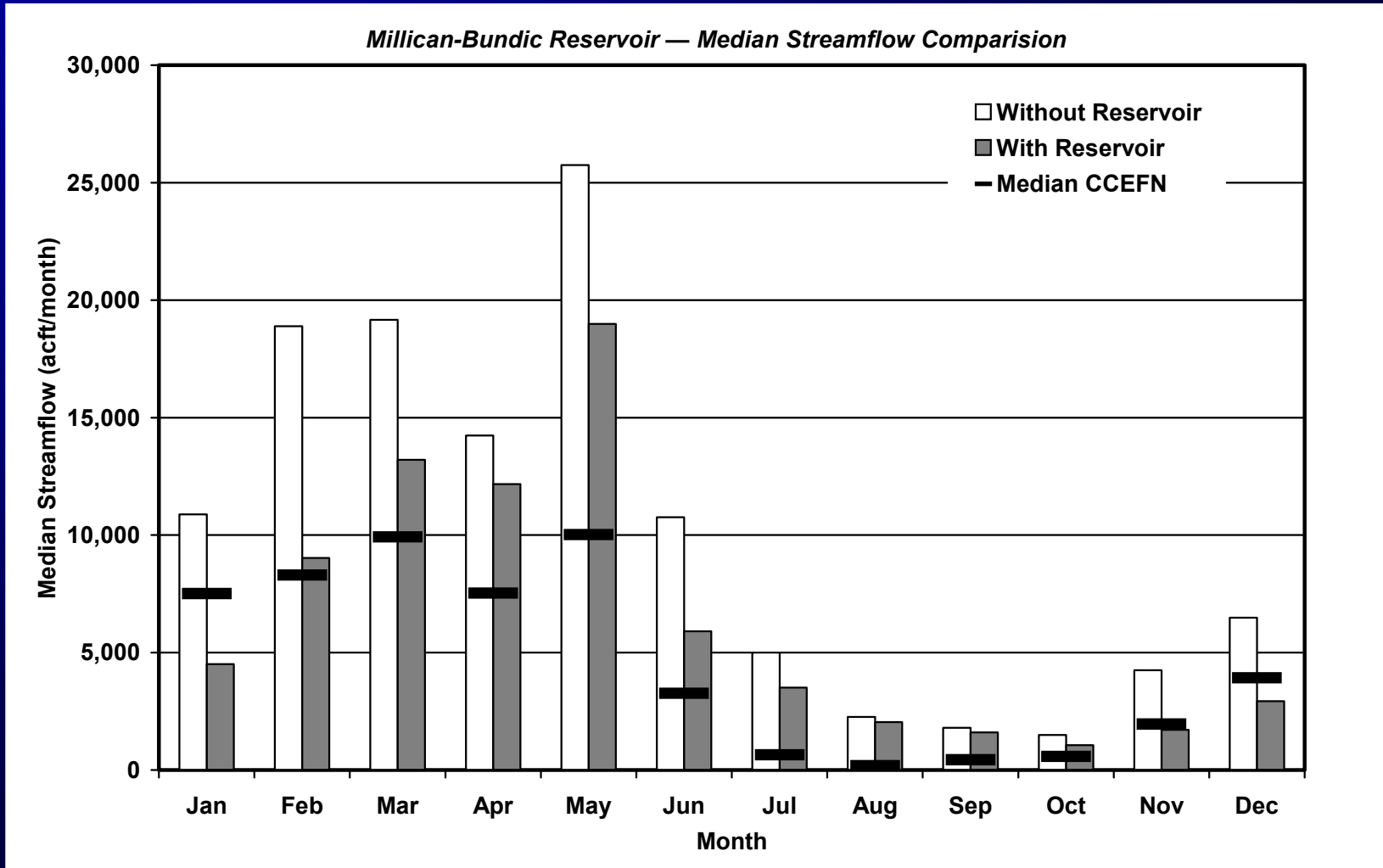
Millican-Bundic Reservoir (T&E Species)

- ✓ **33 species potentially within the vicinity of site that are state- or federally-listed as threatened or endangered, candidates for listing, or exhibit sufficient rarity to be listed as species of concern**
- ✓ **Seven species federally-listed as threatened or endangered could occur in the study area**
 - **Seasonal migrants not likely to be directly affected by the proposed reservoir**
 - ✓ Interior least tern
 - ✓ Piping plover
 - ✓ Whooping crane
 - **Permanent residents**
 - ✓ Large-fruited sand verbena
 - ✓ Houston toad
 - ✓ Bald eagle, nests in Robertson County, but no known nesting sites in or near the project area
 - ✓ Navasota ladies'-tresses

Millican-Bundic Reservoir – Streamflow Frequency

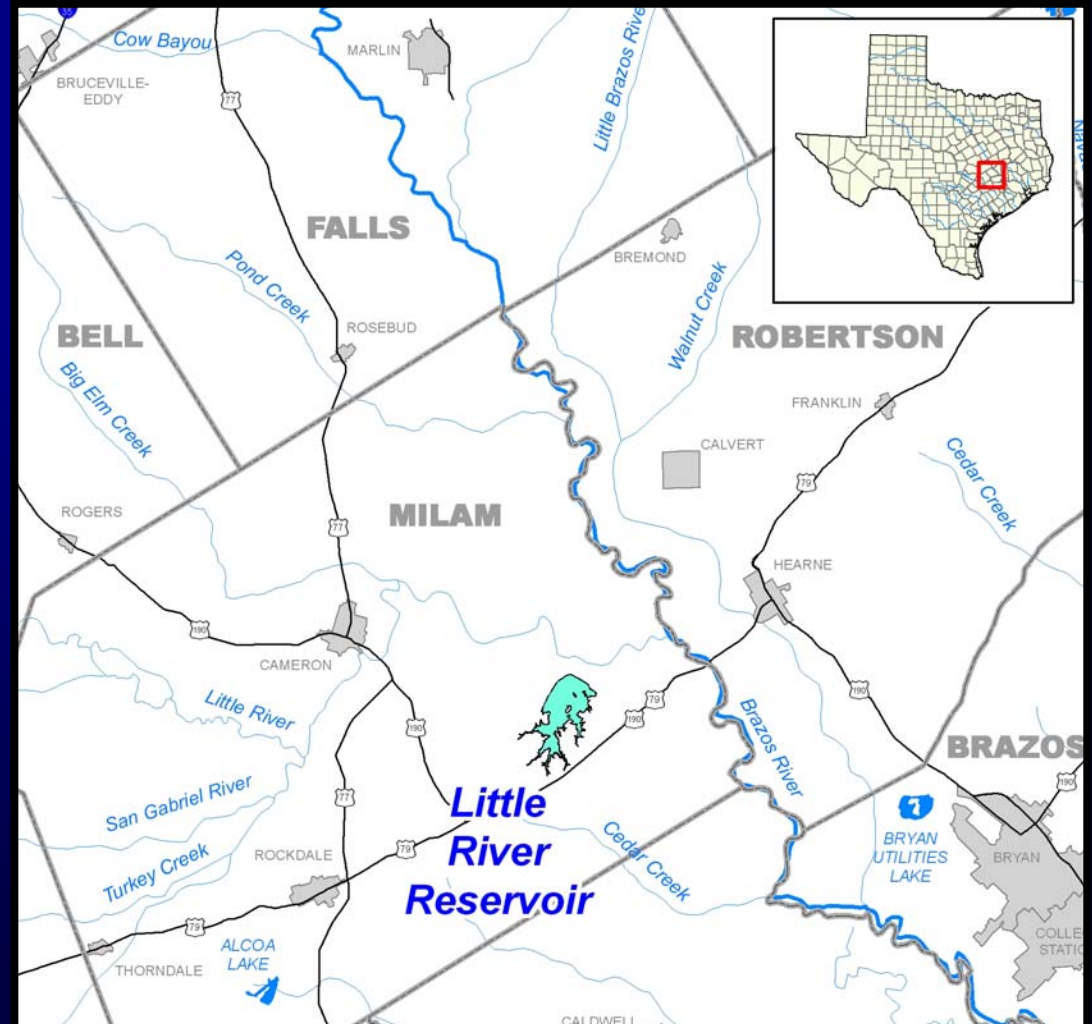


Millican-Bundic Reservoir – Median Streamflow



Example: Little River Off-channel Reservoir

- ✓ Inundate approximately 4,343 acres
 - 2,515 grassland
 - 2,128 forest/mixed
- ✓ Minimal impacts on Little River flows
- ✓ Substantial impact on flows from small watershed

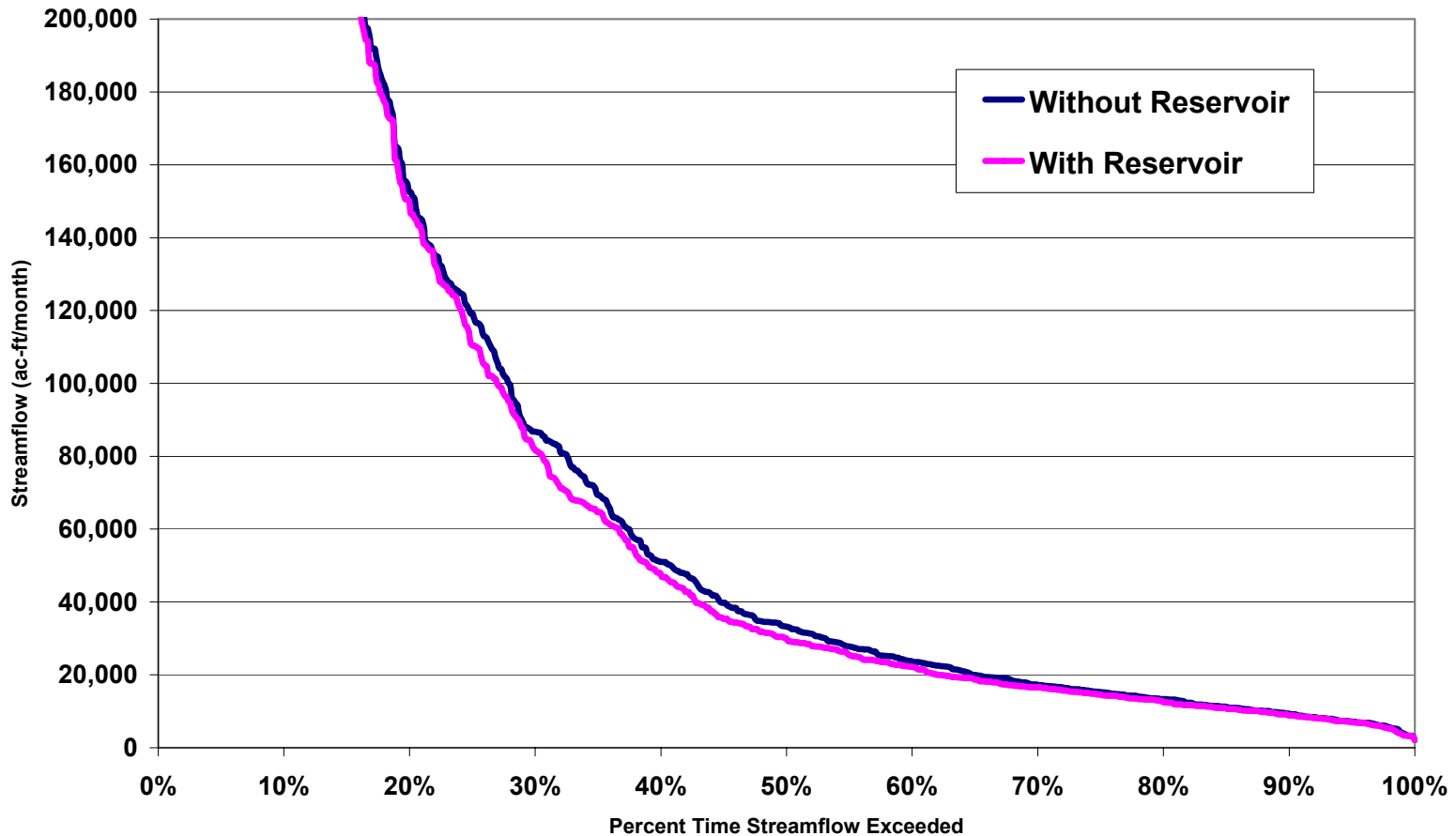


Little River Off-channel Reservoir (T&E species)

- ✓ **23 species potentially within the vicinity of site that are state- or federally-listed as threatened or endangered, candidates for listing, or exhibit sufficient rarity to be listed as species of concern**
- ✓ **Seven species federally-listed as threatened or endangered could occur in the study area**
 - **Seasonal migrants not likely to be directly affected by the proposed reservoir**
 - ✓ **Interior least tern**
 - ✓ **Piping plover**
 - ✓ **Whooping crane**
 - ✓ **Bald eagle**
 - **Permanent residents**
 - ✓ **Large-fruited sand verbena**
 - ✓ **Houston toad**
 - ✓ **Navasota ladies'-tresses**

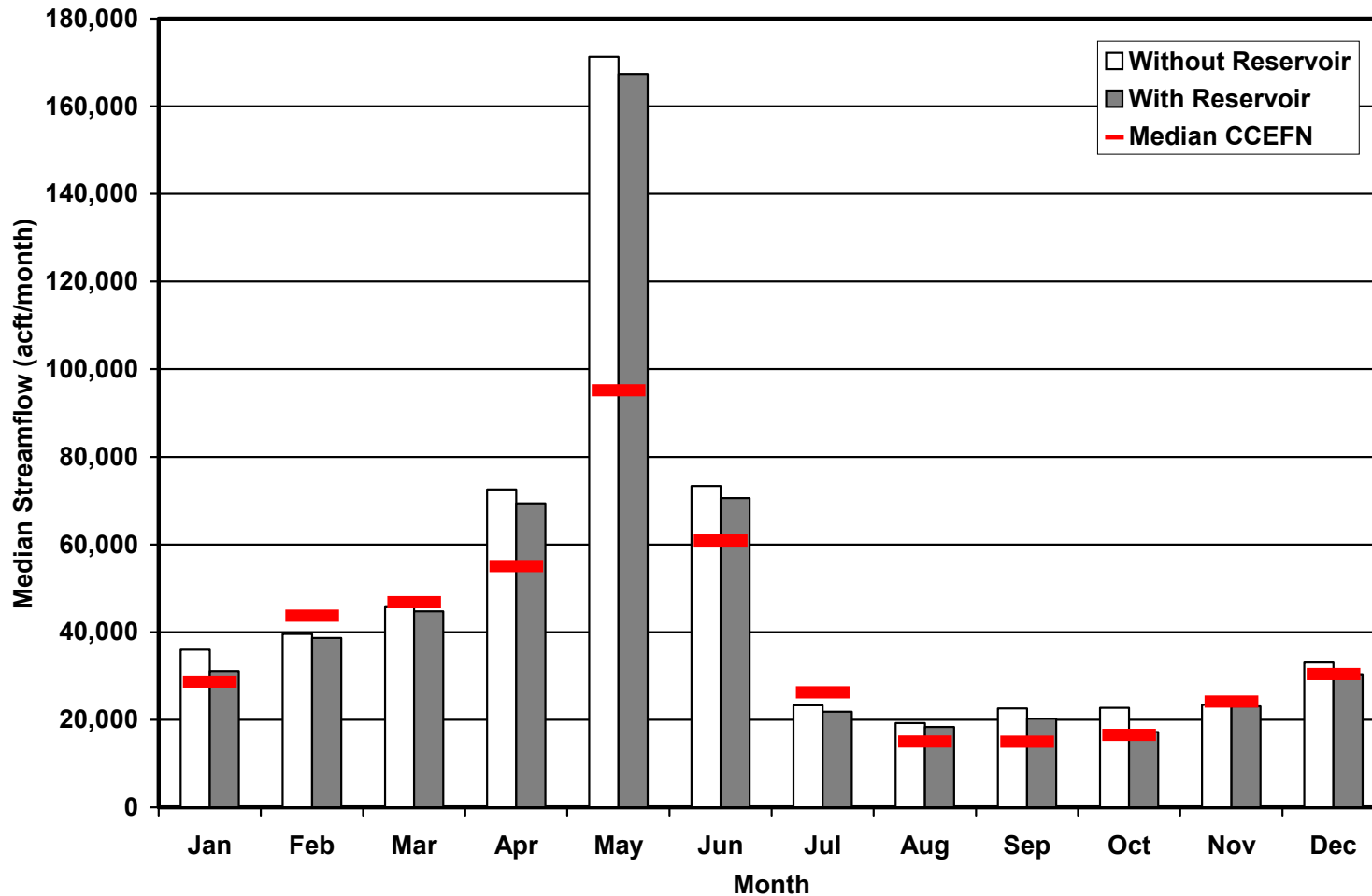
Little River Off-channel Reservoir - Streamflow Frequency

Little River Off-channel Reservoir Diversion - Streamflow Frequency Comparison



Little River Off-channel Reservoir – Median Streamflow

Little River Off-Channel Diversion - Median Streamflow Comparison



Questions?
