Evaluating Potential Effectiveness of Demand-side Strategies in the Edisto and Broad River Basins

Agenda Item 6

Water Conservation and Efficiency Strategies

Agricultural Portfolio of Water Efficiency Strategies
Water Audits and Nozzle Retrofits
Irrigation Scheduling
Soil Management
Crop Variety, Crop Type, and Crop Conversions
Irrigation Equipment Changes

Municipal Portfolio of Water Conservation and Efficiency Strategies	
Conservation Pricing Structures	Public Education of Water Conservation
Toilet Rebate Program	Residential Water Audits
Landscape Irrigation Program and Codes	Water Efficiency Standards for New Construction
Leak Detection and Water Loss Control Program	Reclaimed Water Programs
Car Wash Recycling Ordinances	Time-of-Day Watering Limits
Water Waste Ordinance	

What Effect to Demand Side Reductions of 10, 15 and 20 Percent Have on Reducing Projected Shortages When Applied to Municipal Water Withdrawals in the Broad River Basin?

2070 High Demand Scenario

Water User	Frequency of Shortage				Maximum Shortage (MGD)			
	2070 High Demand	10% Demand Reduction	15% Demand Reduction	20% Demand Reduction	2070 High Demand	10% Demand Reduction	15% Demand Reduction	20% Demand Reduction
Gaffney	1.1%	1.0%	1.0%	0.8%	27.8	24.6	22.2	20.7
Spartanburg	0.4%	0.1%	0.1%	0.0%	36.9	19.8	4.8	0.0
SJWD	0.6%	0.4%	0.1%	0.0%	18.3	9.9	5.8	0.0
Greer	7.1%	5.4%	4.3%	3.4%	17.0	14.4	13.1	11.8

Approach to Evaluating Demand-Side Scenarios in the Edisto River Basin

- **Scenario 1** – Existing **Drought Management Plan** actions

- **Scenario 2** – Scenario 1 strategies, plus **agriculture water efficiency strategies** (assumed 15% reduction in water demand for 70% of existing and new users)

- **Scenario 3** – Scenario 1 and 2 strategies, plus **municipal water conservation strategies** (assumed 15% reduction in water demand)

Edisto - Results for High Demand 2070 Scenarios Comparison to Minimum Instream Flows

Percentage of Months below 20/30/40 threshold (Mean)

Strategic Node	Scenario	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
EDO05	**UIF Scenario**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**
	High Demand (2070)	**0**	**0**	**0**	**1**	**3**	**10**	**3**	**2**	**0**	**0**	**0**	**0**
	HD 2070 - Scenario 1	0	0	0	1	3	10	2	2	0	0	0	0
	HD 2070 - Scenario 2	0	0	0	1	3	8	2	2	0	0	0	0
	HD 2070 - Scenario 3	0	0	0	1	2	8	2	1	0	0	0	0
Outlet of Shaw Creek	**UIF Scenario**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**
	High Demand (2070)	**0**	**0**	**0**	**1**	**6**	**11**	**6**	**2**	**1**	**1**	**0**	**0**
	HD 2070 - Scenario 1	0	0	0	1	6	11	6	2	1	1	0	0
	HD 2070 - Scenario 2	0	0	0	1	6	11	6	2	1	1	0	0
	HD 2070 - Scenario 3	0	0	0	1	3	7	1	1	0	0	0	0
EDO13	**UIF Scenario**	**5**	**2**	**0**	**3**	**9**	**13**	**6**	**5**	**2**	**3**	**2**	**2**
	High Demand (2070)	**6**	**2**	**1**	**9**	**29**	**33**	**28**	**26**	**27**	**15**	**7**	**6**
	HD 2070 - Scenario 1	6	2	1	9	29	33	28	26	27	15	7	6
	HD 2070 - Scenario 2	6	2	1	9	29	32	26	26	27	15	7	6
	HD 2070 - Scenario 3	6	2	1	9	24	30	25	26	23	14	5	6
HUC 303	**UIF Scenario**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**
	High Demand (2070)	**0**	**0**	**0**	**0**	**0**	**5**	**0**	**0**	**0**	**0**	**0**	**0**
	HD 2070 - Scenario 1	0	0	0	0	0	5	0	0	0	0	0	0
	HD 2070 - Scenario 2	0	0	0	0	0	3	0	0	0	0	0	0
	HD 2070 - Scenario 3	0	0	0	0	0	3	0	0	0	0	0	0
EDO11	**UIF Scenario**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**
	High Demand (2070)	**0**	**0**	**0**	**1**	**0**	**6**	**1**	**1**	**0**	**0**	**0**	**0**
	HD 2070 - Scenario 1	0	0	0	1	0	6	1	1	0	0	0	0
	HD 2070 - Scenario 2	0	0	0	1	0	6	1	1	0	0	0	0
	HD 2070 - Scenario 3	0	0	0	1	0	5	1	1	0	0	0	0

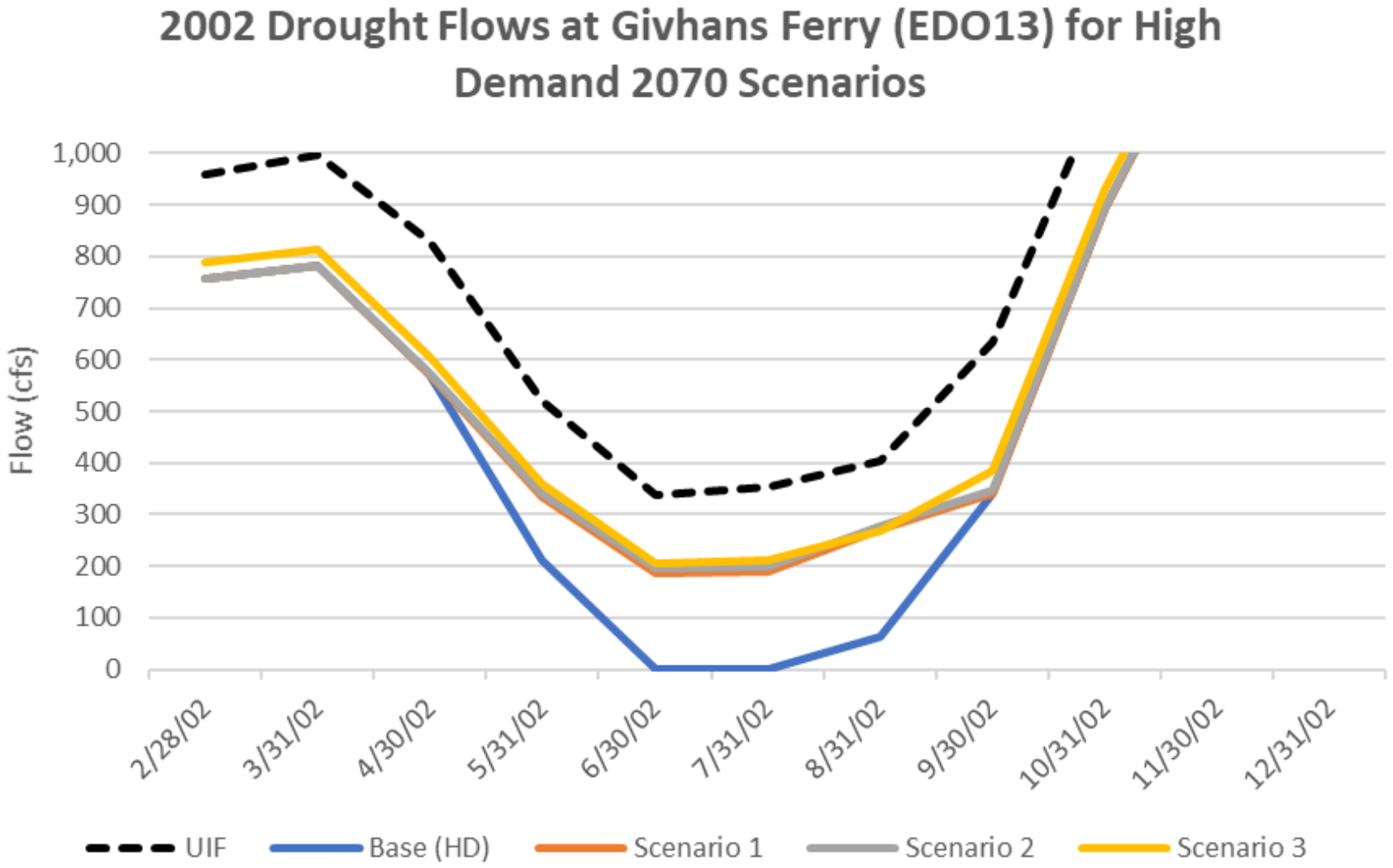
Only the strategic nodes where there was a change in the percentage of months for Scenarios 1, 2 or 3 compared to the base High Demand 2070 scenario are listed. The Unimpaired Flow (UIF) scenario is also shown for comparison.

Edisto - Results for High Demand 2070 Scenarios Comparison of 5th percentile Flows

5th percentile flow (cfs)	EDO14 SOUTH FORK EDISTO RIVER ABOVE SPRINGFIELD	HUC402 OUTLET	EDO05 SOUTH FORK EDISTO RIVER NEAR DENMARK	EDO06 SOUTH FORK EDISTO RIVER NEAR COPE	EDO07 SOUTH FORK EDISTO RIVER NEAR BAMBERG	EDO11 EDISTO RIVER NEAR BRANCHVILLE	HUC601 OUTLET	EDO13 EDISTO RIVER NR GIVHANS	SHAW CREEK OUTLET	HUC301 OUTLET	HUC302 OUTLET	EDO10 NORTH FORK EDISTO RIVER AT ORANGEBURG	HUC303 OUTLET
UIF Scenario	166	187	281	285	296	641	551	623	52	110	199	325	336
High Demand 2070	123	134	219	223	226	541	452	299	38	104	194	292	303
HD 2070 - Scenario 1	123	134	220	224	226	543	453	359	38	104	194	292	303
HD 2070 - Scenario 2	125	136	223	227	229	550	458	363	38	105	194	293	305
HD 2070 - Scenario 3	128	140	227	231	232	555	464	371	42	105	195	297	307

Only the strategic nodes where there was a change in the percentage of flows for Scenarios 1, 2 or 3 compared to the base High Demand 2070 scenario are listed. The Unimpaired Flow (UIF) scenario 5th percentile flows are also shown for comparison.

Results for High Demand 2070 Scenarios
2002 Drought Flows at Givhans Ferry



Note: This graph compares flows generated from model simulations using a **monthly** time step. The unimpaired flow (UIF) scenario results are also shown for comparison.

Surface Water Management Strategies

	Portfolios of Strategies assessed:	Reduced or Eliminated (real) Shortages*	Relative Effectiveness of Increasing Supply** 1=Least Effective 7=Most Effective
Demand Side (mostly)	1. Existing Drought Management Plans	Eliminated	3
	2. Existing Drought Management Plans + Agriculture Water Efficiency Strategies	Eliminated	4
	3. Existing Drought Management Plans + Agriculture Water Efficiency Strategies + Municipal Water Efficiency Strategies	Eliminated	5
Supply Side and Combination	A. Conjunctive Use (20% SW Reduction) during basin low flows	Reduced	1
	B. Conjunctive Use (50% SW Reduction) during basin low flows	Eliminated	2
	C. Existing Drought Management Plans + Agriculture Water Efficiency Strategies + Municipal Water Efficiency Strategies + Conjunctive Use (20% SW Reduction) during basin low flows	Eliminated	6
	D. Existing Drought Management Plans + Agriculture Water Efficiency Strategies + Municipal Water Efficiency Strategies + Conjunctive Use (50% SW Reduction) during basin low flows	Eliminated	7

* In High Demand 2070 Scenario

** At the bottom of the basin