

LAKE OKEECHOBEE SYSTEM OPERATING MANUAL (LOSOM)

Overview of Conceptual Plan Analysis
and Selection of Iteration 1 Alternatives

Joint Working Group and Science
Coordination Group Meeting
28 January 2021



US Army Corps
of Engineers®





GOALS AND OBJECTIVES

Goal: Incorporate flexibility in Lake Okeechobee operations while balancing congressionally authorized project purposes.



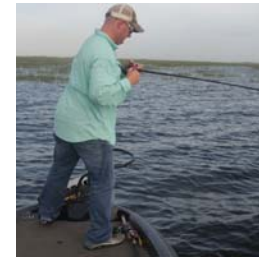
Flood
Control



Water
Supply



Navigation



Recreation

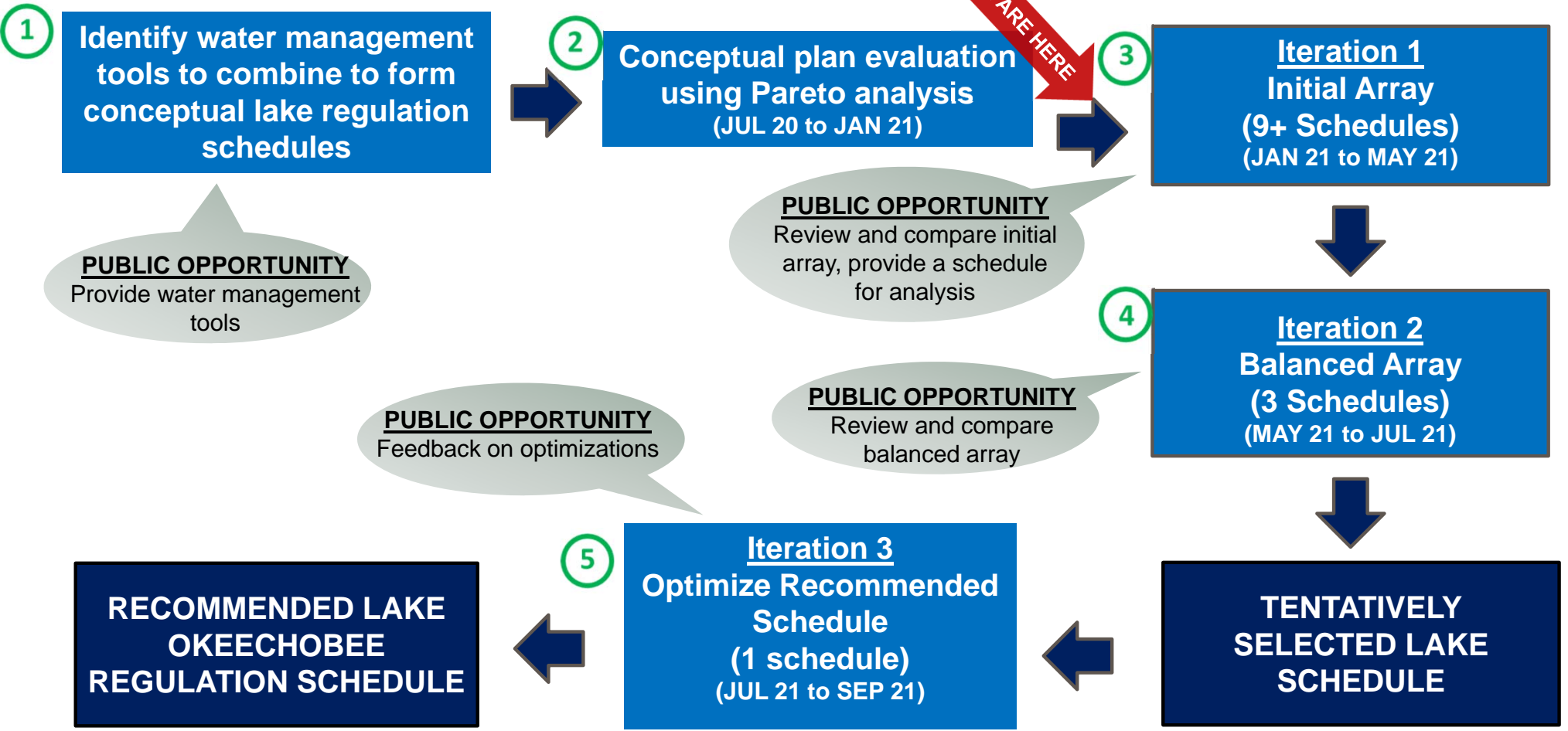


Preservation
of Fish
& Wildlife

- **Objective 1.** Manage risk to public health and safety, life and property
- **Objective 2.** Continue to meet authorized purposes for navigation, recreation and flood control
- **Objective 3.** Improve water supply performance
- **Objective 4.** Enhance ecology in Lake Okeechobee, northern estuaries and across the south Florida ecosystem.



LOSOM ALTERNATIVE EVALUATION SCHEDULE





HOW DID WE GET HERE AGAIN?



Water management tool feedback

- 14 Conceptual plans
- Defined parameter space
- Many different variations of each concept

120k model runs generated. Apply dam safety and WQBEL test (117K retained)

27k runs determined to be pareto optimal

Top 3 Identified for each sub-objective based on performance

Operational details extracted for Top 3 for each sub-objective and examined

Representative plan, per sub-objective, identified for Iteration 1 Array

25 JAN



BOTTOM LINE UP FRONT

REPRESENTATIVE PLANS FOR ITERATION 1 ARRAY



Plan #	Description	Recommended Plan
1A	Manage risk to public health and safety- Dam safety focused	NONE - constraint
1B	Manage risk to public health and safety- Algal Bloom Risk in Lake Okeechobee	NONE – focus on operations limiting releases to estuaries
1C	Manage risk to public health and safety – Algal Bloom Risk in Estuaries	1C-1_8086 (6329)
2A	Maintain congressionally authorized project purposes of navigation	4BC-1_7802 (15617)
2B	Maintain congressionally authorized project purposes of recreation	4C-1_687 (20814)
2C	Maintain congressionally authorized project purposes of flood control	NONE
3	Improve water supply performance	4BC-1_5423 (15122)
4A	Enhance ecology in Lake Okeechobee	LORS08flex_2827 (601)
4B	Enhance ecology in Caloosahatchee Estuary	2C_2193 (7023)
4C	Enhance ecology in St. Lucie Estuary	4C-1_3307 (22448)
4D	Enhance ecology in South Florida	4BC-2_6132 (18729)



BOTTOM LINE UP FRONT OTHER PLANS FOR ITERATION 1 ARRAY



Plan #	Description
WRDA 1	Evaluate implications of prohibiting Lake Okeechobee releases from S_308 and S-80
WRDA 2	Evaluate implications of prohibiting high volume releases from Lake Okeechobee through S-77, S-78 and S-79
Audubon1	Schedule submitted by Audubon
EF1	Schedule submitted by Everglades Foundation
GHCMH1	Glades and Hendry Counties and the Cities of Clewiston and Moore Haven

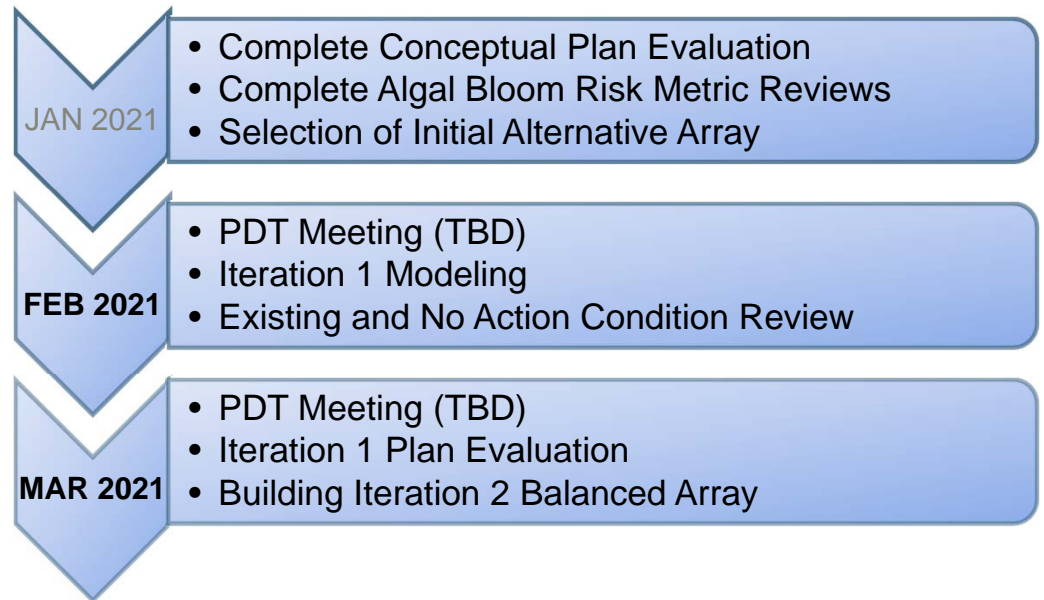


LOSOM SCHEDULE



90 DAY LOOK AHEAD

MILESTONE	DATE
Scoping Meetings (complete)	February - March 2019
Plan Formulation & Performance Evaluation Finalized	June 2020
Evaluation of Alternative Lake Schedules	July 2020 – September 2021
Draft NEPA Document Release	January 2022
Final NEPA Document Release	July 2022
Record of Decision (ROD)	October 2022



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SUPPLEMENTAL INFORMATION (PRESENTED AT LOSOM MEETING ON 25 JANUARY 2021)



EVALUATION OF TOP 3 PER SUB-OBJECTIVE



DAM SAFETY

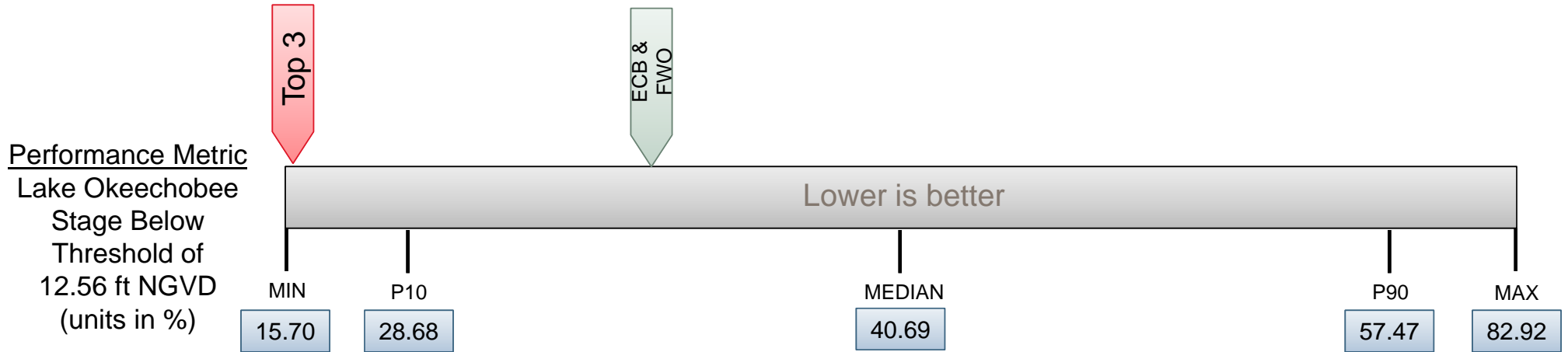
- Conceptual plan model runs that did not meet the required dam safety performance were considered infeasible and not retained
- Due to the implementation of this constraint, no plans have been specifically formulated for dam safety in the conceptual array



NAVIGATION

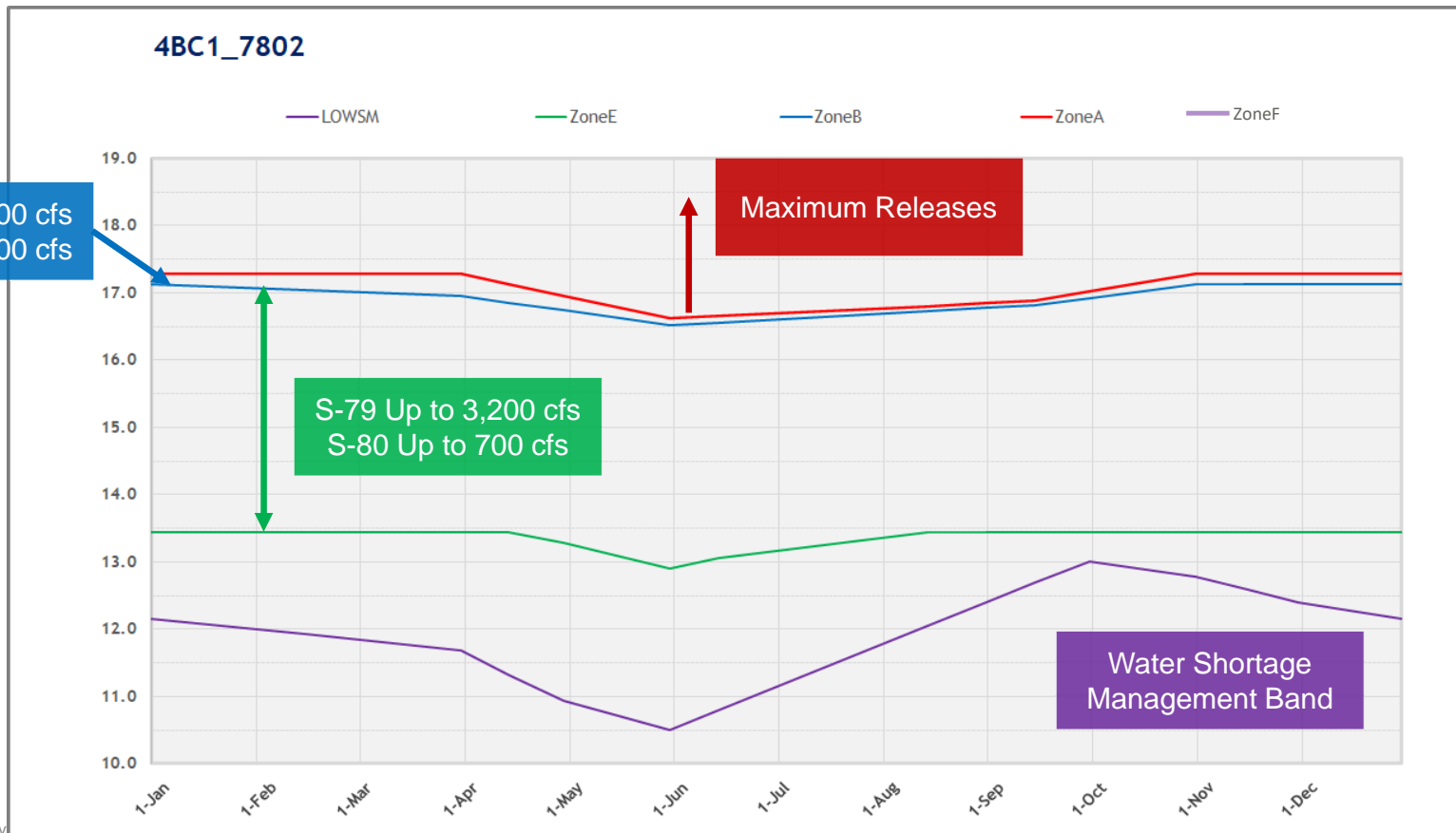


SELECTED RESULTS OF CONCEPTUAL PLAN ANALYSIS: NAVIGATION





REPRESENTATIVE PLAN FOR SUB-OBJECTIVE 2A, NAVIGATION 4BC-1_7802 (15617)



S-77 Up to 4,000 cfs
S-80 Up to 3,000 cfs

S-79 Up to 3,200 cfs
S-80 Up to 700 cfs

Maximum Releases

Water Shortage Management Band



SUB-OBJECTIVE 2A NAVIGATION TOP 3 SUMMARY



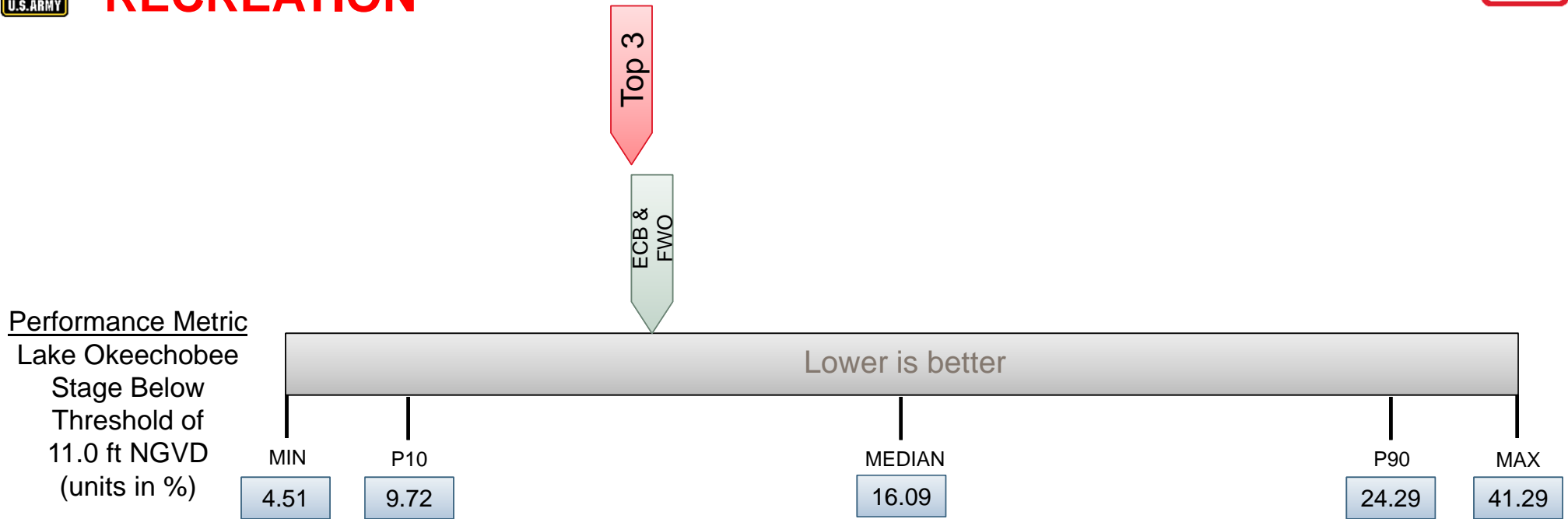
Pindex	Model Index	Water Supply						NAV	Lake O Ecology					Caloosahatchee Estuary Ecology					SLE	S. Florida Ecology	
		Big Cypress Demands not Met	Brighton Reservation Demands not Met	LOSA cutbacks-weighted average	LOSA 4in1 demands not met (EAA and non-EAA)	LOSA RECOVER duration count	% over POR lake levels < 12.56 ft.	Lake O % within stage envelope	Lake O MFL Exceedances	Lake O stages <10 ft	Lake O Stage Envelope- Lower Penalty	Lake O Stage Envelope- Upper Penalty	RECOVER high flows count	RECOVER damaging flows count	CAE <457	CAE >6500	RECOVER Optimal counts	S308 reg flows	LOK flow south	STA2+STA34 outflow	
Existing Condition Baseline	0	2.52%	4.58%	26.04%	8.17%	25	35.09%	25.53%	10	6.04%	17,860	13,525	346	437	548	60	465	220	57	750	
No Action 2025 Condition (FWO)	0	2.55%	4.63%	26.02%	8.28%	25	36.14%	27.32%	10	6.34%	18,717	12,160	292	333	77	51	600	238	56	739	
14445	4BC-1_2269	1.24%	1.32%	9.04%	2.12%	7	16.54%	20.82%	4	0.45%	6441	41719	300	289	321	46	549	289	64	752	
14928	4BC-1_4546	1.19%	1.18%	8.14%	1.93%	5	17.50%	21.50%	4	0.46%	6350	39924	265	414	324	65	482	181	34	725	
15617	4BC-1_7802	1.13%	1.04%	7.09%	1.66%	4	15.70%	21.52%	4	0.38%	5667	41917	249	399	325	59	486	187	62	749	



RECREATION



SELECTED RESULTS OF CONCEPTUAL PLAN ANALYSIS: RECREATION



Based on feedback from PDT and USACE independent analysis, USACE developed a repeatable rationale to ID plans that optimize recreation:

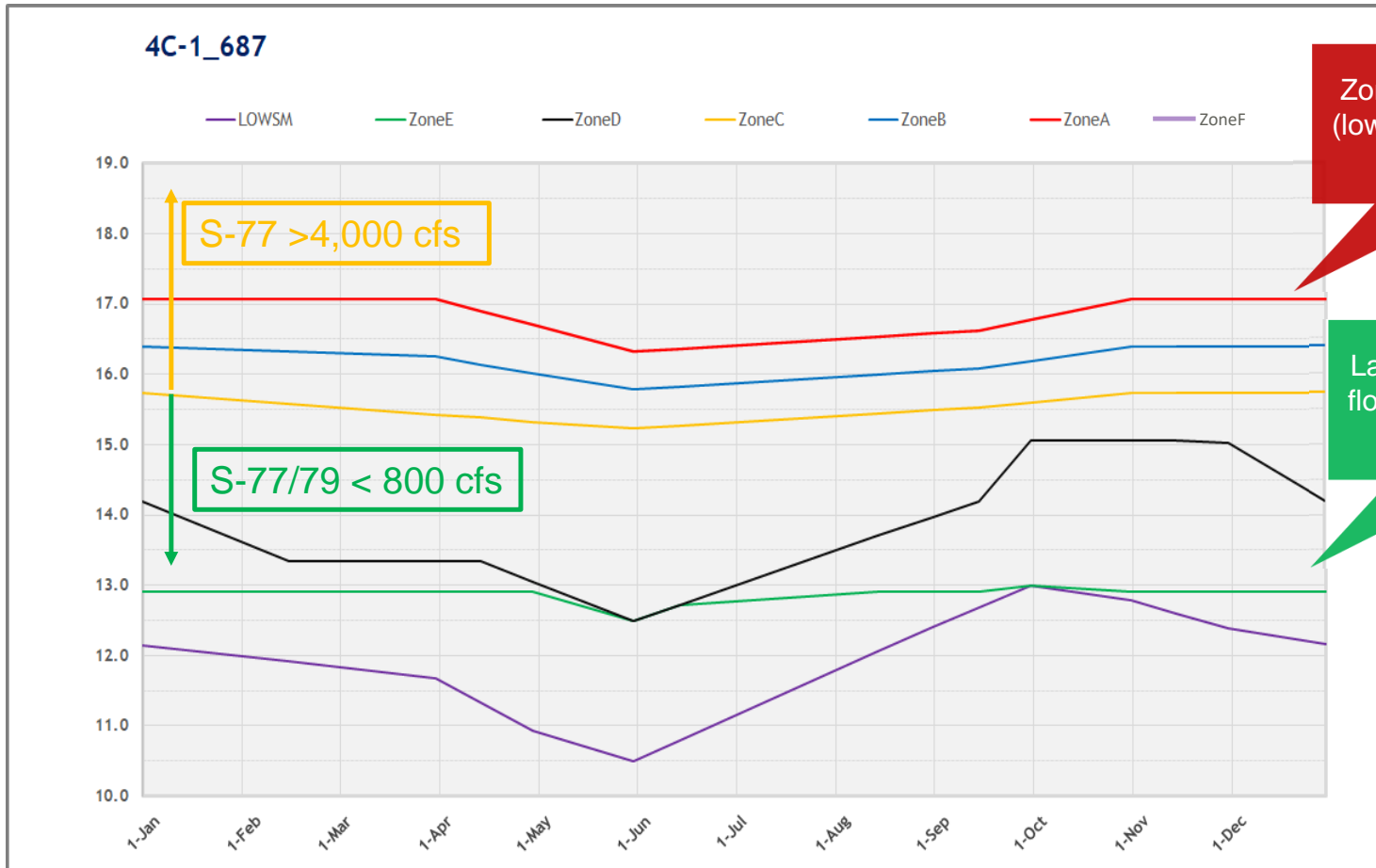
- **Step 1:** Identify plans that increase the % within the lake stage envelope to the extent practicable for enhanced lake ecology
- **Step 2:** Of the subset of plans that meet the criteria above, identify plans that perform well for the navigation and recreation metrics
- **Step 3:** Of the subset of plans that meet the criteria above, select top 3 plans based on estuary performance relative to other plans



OBJECTIVE 2B RECREATION



Plan: 4C-1_687 (20814) - No lake releases to St. Lucie estuary through S-80.



Zone A max is ~17.1 feet (lower than LORS 08) and min is ~16.4

Larger Zone E means low flows maintained at higher levels in dry season.

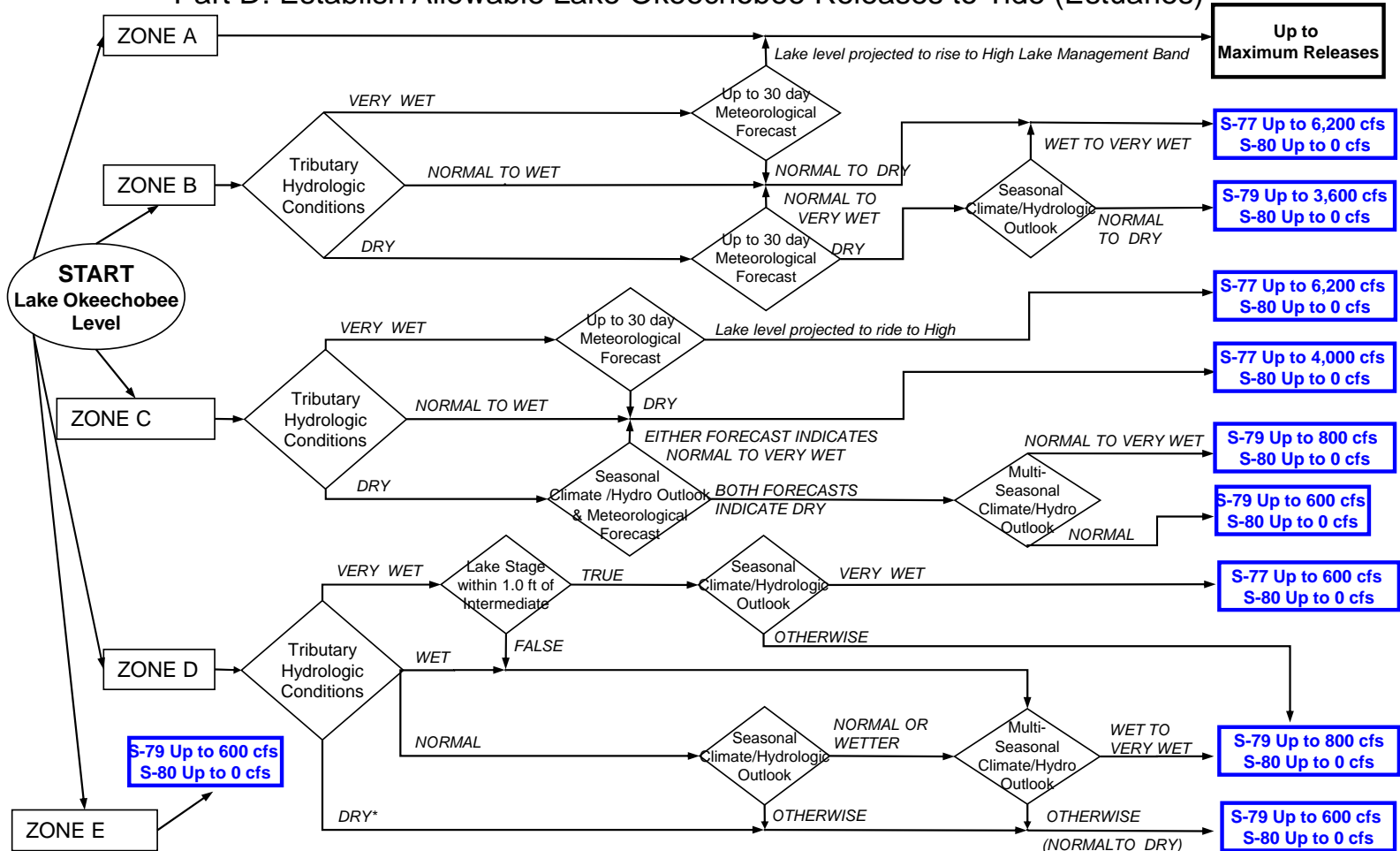


OBJECTIVE 2B RECREATION



"4C1_687" —St. Lucie releases are switched off except for Zone A

Part D: Establish Allowable Lake Okeechobee Releases to Tide (Estuaries)





SUB-OBJECTIVE 2B RECREATION TOP 3 SUMMARY



Pindex	Model Index	Water Supply					Lake Ecology						Caloosahatchee Estuary					St. Lucie Estuary	NAV	Lake Rec	S. Florida Ecology		
		Big Cypress Demands not Met	Brighton Reservation Demands not Met	LOSA cutbacks-weighted average	LOSA 4in1 demands not met (EAA and non-EAA)	LOSA RECOVER duration count	Lake O Stage Envelope- Lower Penalty	Lake O Stage Envelope- Upper Penalty	Lake O % within stage envelope	Lake O stages >17 ft	Lake O stages <10 ft	Lake O MFL Exceedances	RECOVER high flows count	Recover damaging flows count	CAE <457	CRE >6500	S77 reg flows	Optimal	S308 reg flows	% over POR lake levels < 12.56 ft.	% over POR lake levels >11 ft.	Lake O flows south in kaf/yr via S351 S354	STA2+STA34 outflow kaf/yr
ECB	0	2.52%	4.58%	26.04%	8.17%	25	17,860	13,525	25.53%	0.25%	6.04%	10	346	437	548	60	515	465	220	35.09%	11.93%	57	750
No Action 2025	0	2.55%	4.63%	26.02%	8.28%	25	18,717	12,160	27.32%	0.19%	6.34%	10	292	333	77	51	477	600	238	36.14%	12.42%	56	739
1377	LORS08flex_6335	2.43%	4.34%	25.32%	7.64%	24	16,538	10,762	30.94%	0.00%	5.82%	9	213	295	78	71	572	656	267	32.76%	11.28%	86	763
20814	4C-1_687	2.50%	4.47%	26.76%	7.91%	26	17,241	11,968	30.54%	0.05%	6.16%	8	235	431	79	81	662	572	34	33.73%	11.31%	86.6	763.76
25158	4C-2_9275	2.47%	4.37%	25.46%	7.87%	24	17,729	9,910	30.33%	0.09%	6.24%	10	211	332	85	100	590	710	118	34.01%	12.14%	87.87	764.97



FLOOD CONTROL

- Capacity of structures/canals within C&SF system built into model input
- Flood control for Lake Okeechobee is addressed within dam safety metric (Conceptual plan model runs that did not meet the required dam safety performance were considered infeasible and not retained)
- For these reasons plans were not specifically formulated for flood control

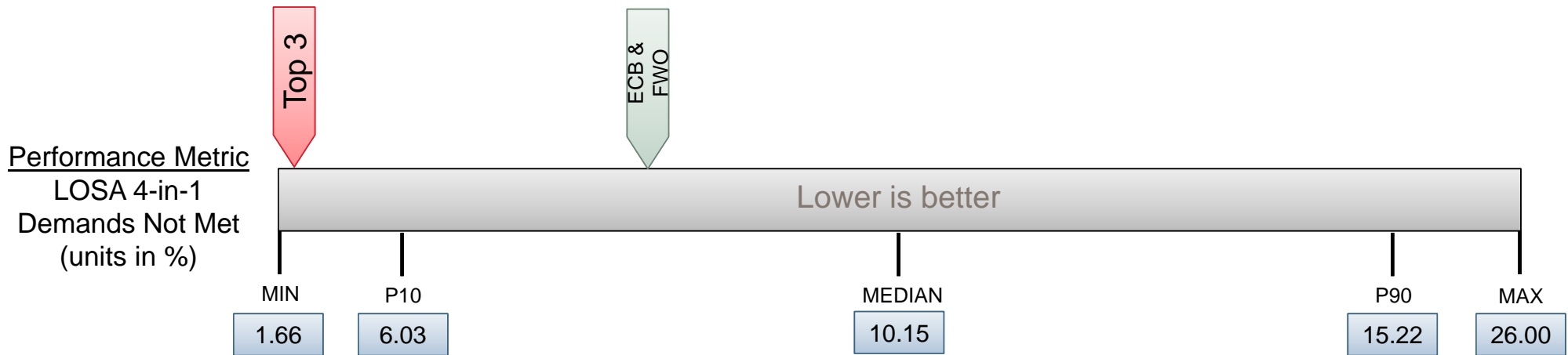


WATER SUPPLY



SELECTED RESULTS OF CONCEPTUAL PLAN ANALYSIS: WATER SUPPLY

23

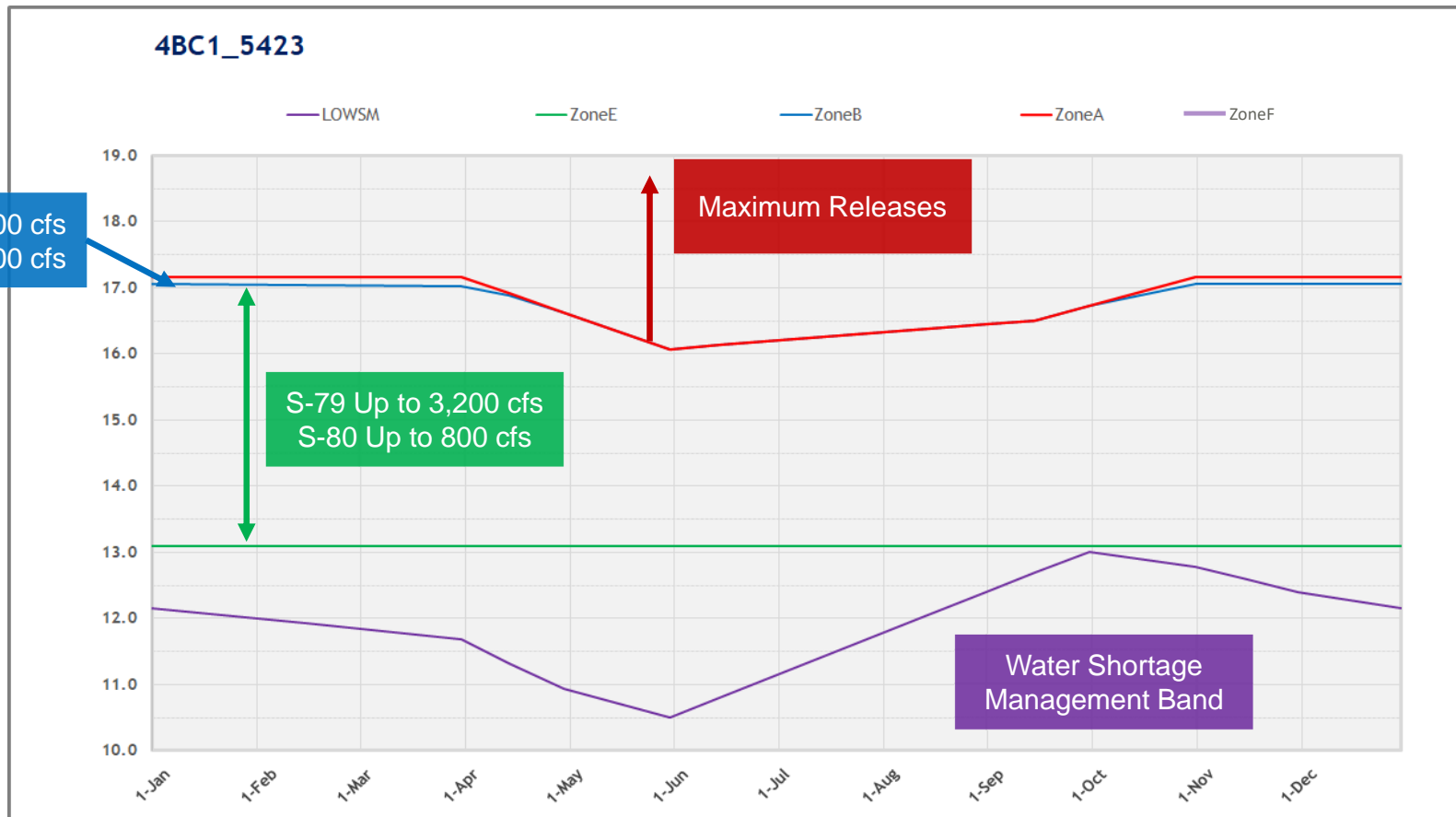


Based on feedback from PDT and USACE independent analysis, USACE developed a repeatable rationale to ID plans that optimize water supply:

- **Step 1:** Focus on reducing cutbacks for STOF Big Cypress and Brighton Reservation demands not met, LOSA weighted average, LOSA 4in1 demands not met (EAA and non-EAA)
- **Step 2:** Reduce RECOVER duration counts and severity score
- **Step 3:** Improve performance for 2001 LOSA cutbacks (most severe drought year)



REPRESENTATIVE PLAN FOR SUB-OBJECTIVE 3 WATER SUPPLY PLAN: 4BC-1_5423 (15122)



S-77 Up to 5,100 cfs
S-80 Up to 2,400 cfs

S-79 Up to 3,200 cfs
S-80 Up to 800 cfs

Maximum Releases

Water Shortage Management Band



WATER SUPPLY TOP 3 SUMMARY



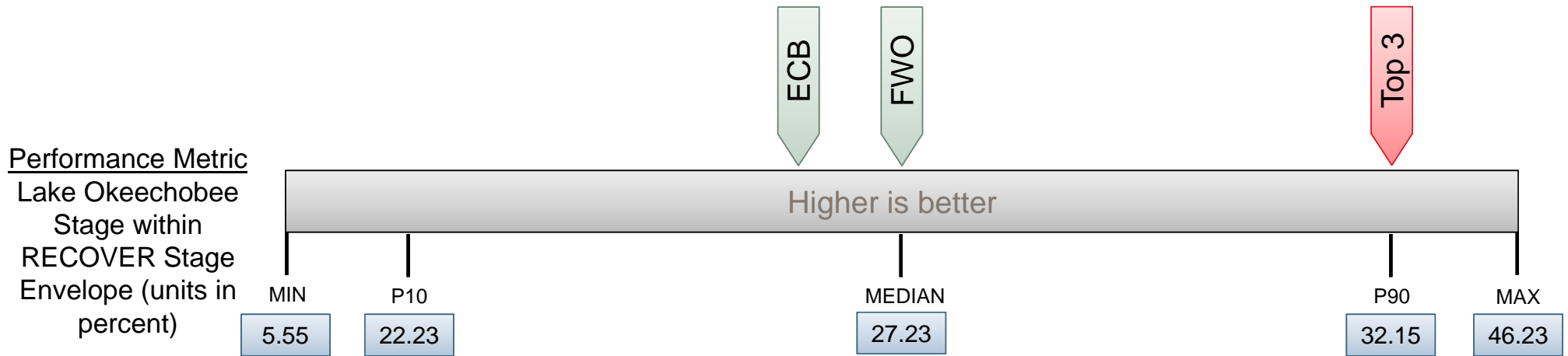
		Water Supply					Lake O Ecology					NAV	S. Florida Ecology	Caloosahatchee Estuary Ecology					SLE			
Pindex	Model Index	Big Cypress Demands not Met	Brighton Reservation Demands not Met	LOSA cutbacks-weighted average	LOSA 4in1 demands not met (EAA and non-EAA)	LOSA RECOVER duration count	Lake O Stage Envelope- Lower Penalty	Lake O Stage Envelope- Upper Penalty	Lake O % within stage envelope	Lake O stages>17 ft	Lake O stages <10 ft	Lake O MFL Exceedances	% over POR lake levels < 12.56 ft.	Lake O flows south in kaf/yr via S351 S354	STA2+S3A34 outflow kaf/yr	S77 reg flows	RECOVER high flows count	Recover damaging flows count	CAE <457	CAE Optimal	CAE >6500	S308 reg flows
ECB	0	2.52%	4.58%	26.04%	8.17%	25	17,860	13,525	25.53%	0.25%	6.04%	10	35.09%	57	750	515	346	437	548	465	60	220
No Action 2025	0	2.55%	4.63%	26.02%	8.28%	25	18,717	12,160	27.32%	0.19%	6.34%	10	36.14%	56	739	477	292	333	77	600	51	238
15617	4BC-1_7802	1.13%	1.04%	7.09%	1.66%	4	5,667	41,917	21.52%	3.96%	0.38%	4	15.70%	62	749	471	249	399	325	486	59	187
15122	4BC-1_5423	1.18%	1.20%	8.03%	1.93%	5	6,707	33,585	25.65%	2.42%	0.35%	4	18.76%	64	750	473	243	411	333	478	49	198
14928	4BC-1_4546	1.19%	1.18%	8.14%	1.93%	5	6,350	39,924	21.50%	2.66%	0.46%	4	17.50%	34	725	512	265	414	324	482	65	181



LAKE OKEECHOBEE ECOLOGY



SELECTED RESULTS OF CONCEPTUAL PLAN ANALYSIS: LAKE OKEECHOBEE ECOLOGY

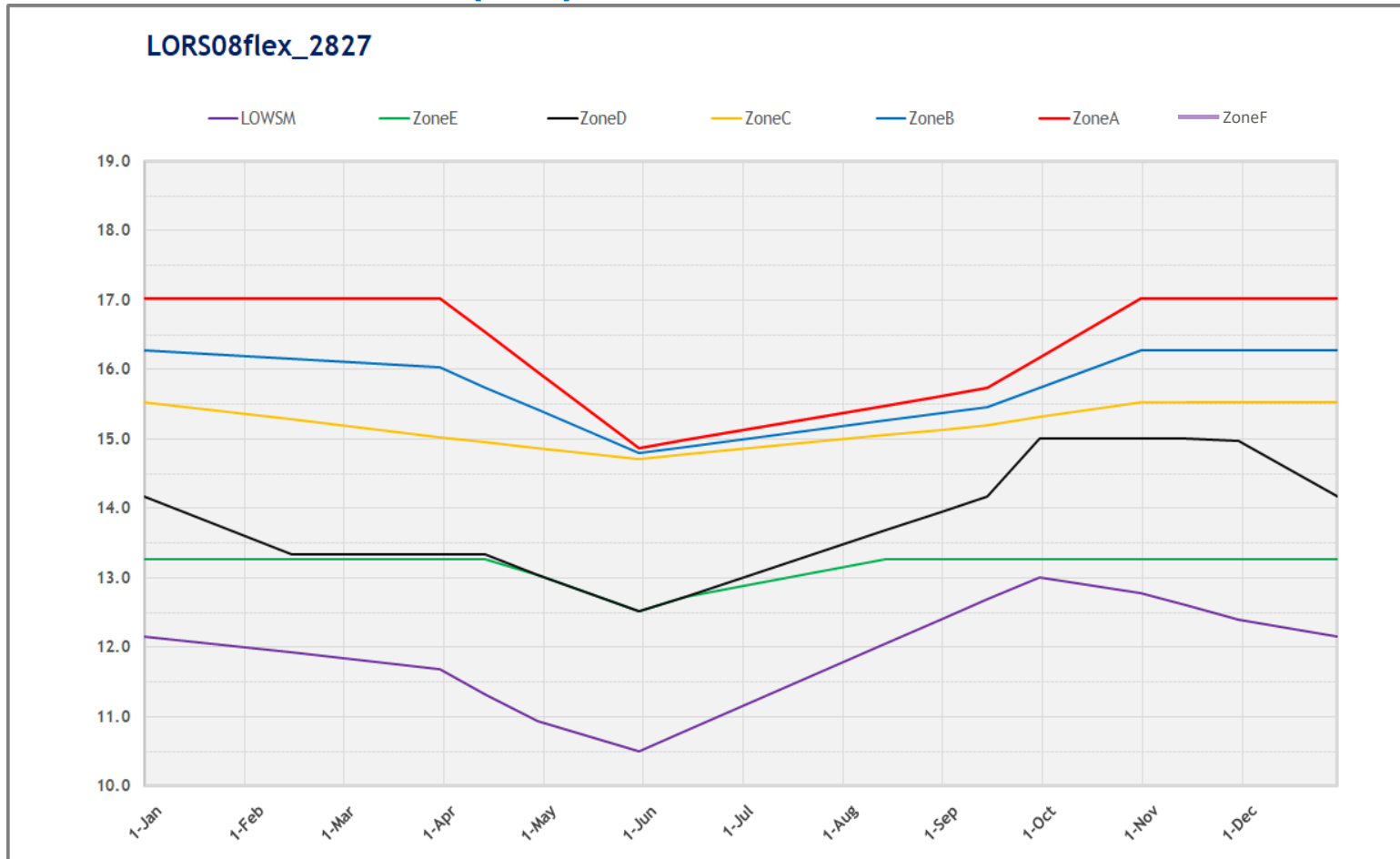


Based on feedback from PDT and USACE independent analysis, USACE developed a repeatable rationale to ID plans that optimize Lake O ecology:

- **Step 1:** Increase time within stage envelope
- **Step 2:** Reduce RECOVER upper lake stage penalty and % of time the lake is > 17 ft
- **Step 3:** Reduce RECOVER lower stage envelope penalties and % of time lake stages are < 10 ft



REPRESENTATIVE PLAN FOR SUB-OBJECTIVE 4A LAKE OKEECHOBEE ECOLOGY PLAN: LORS08FLEX_2827 (601)

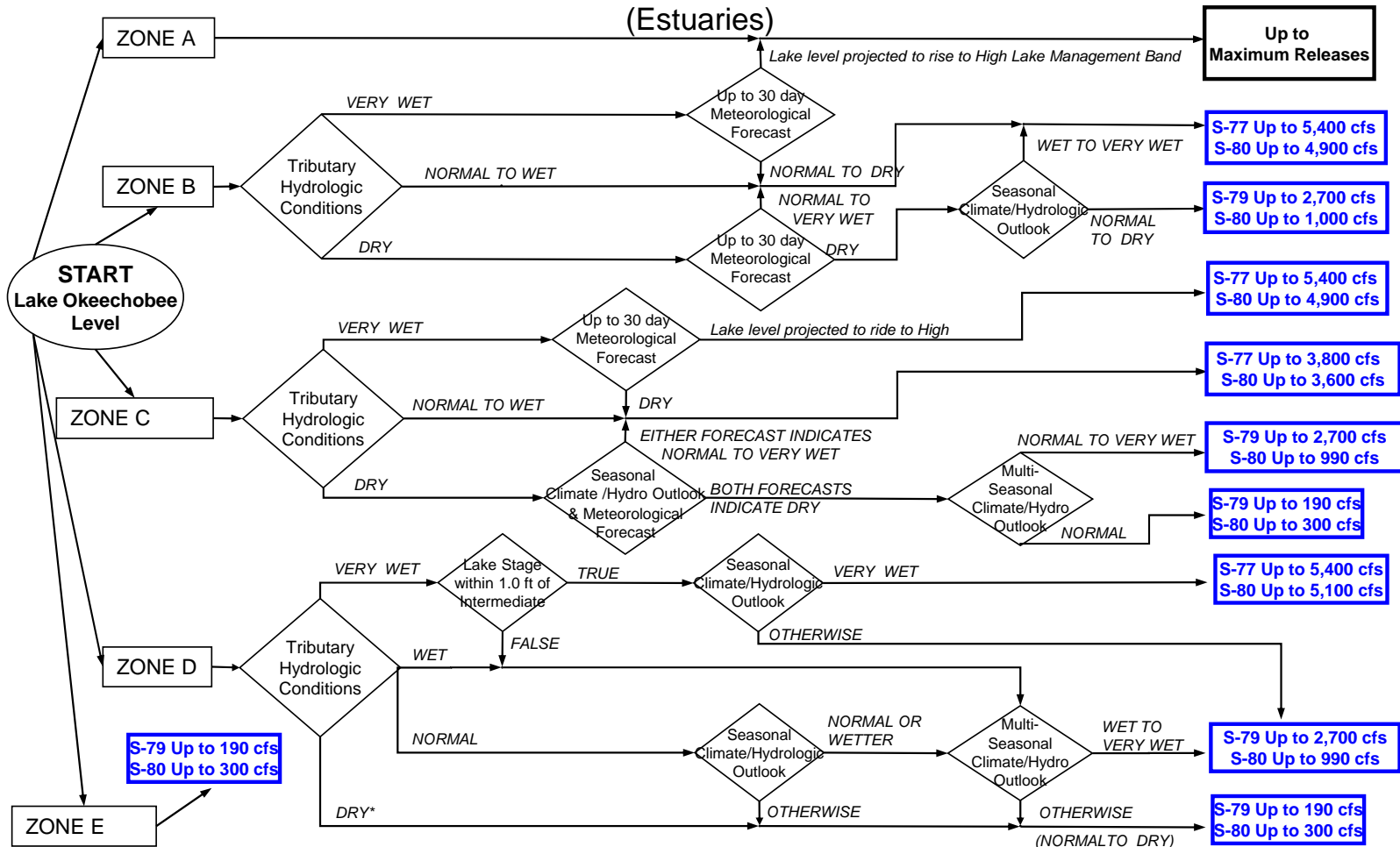




REPRESENTATIVE PLAN FOR SUB-OBJECTIVE 4A LAKE OKEECHOBEE ECOLOGY



“LORS08flex_2827” Part D: Establish Allowable Lake Okeechobee Releases to Tide





LAKE OKEECHOBEE SUMMARY OF TOP 3



Pindex	Model Index	Lake Ecology					Water Supply						S. FL Ecology		Caloosahatchee Estuary Ecology					SLE	
		Lake O Stage Envelope- Lower Envelope- Penalty	Lake O Stage Envelope- Upper Envelope- Penalty	Lake O % within stage envelope	Lake MFL exceedances	% over POR Lake <10 ft	Big Cypress Demands not Met	Brighton Reservation Demands not Met	LOSA cutbacks-weighted average	LOSA 4in1 demands not met (FAA and non-FAA)	LOSA RECOVER duration count	LOSA Cutbacks 2001	Lake flows south	STA2+STA34 outflow	CAE <457	CAE >6500	RECOVER Optimal flows count	RECOVER high flows count	Recover damaging flows count	S77 reg flows	S308 reg flows
ECB	0	17,860	13,525	25.53%	10	6.04%	2.52%	4.58%	26.04%	8.17%	25	31.00%	57	750	548	60	465	346	437	515	220
No Action 2025	0	18,717	12,160	27.32%	10	6.34%	2.55%	4.63%	26.02%	8.28%	25	30.83%	56	739	77	51	600	292	333	477	238
608	LORS08flex_2881	15,573	8,350	32.08%	7	5.10%	2.24%	3.68%	22.42%	6.76%	21	26.20%	110	777	107	62	578	257	306	404	302
2955	LORS08flex_13439	16812	7069	33.49%	7	5.68%	2.41%	4.13%	25.57%	7.57%	22	27.76%	72	753	128	55	491	252	355	434	311
601	LORS08flex_2827	17889	6985	34.36%	8	6.36%	2.53%	4.35%	26.67%	7.94%	22	28.79%	96	765	120	50	498	257	364	436	316

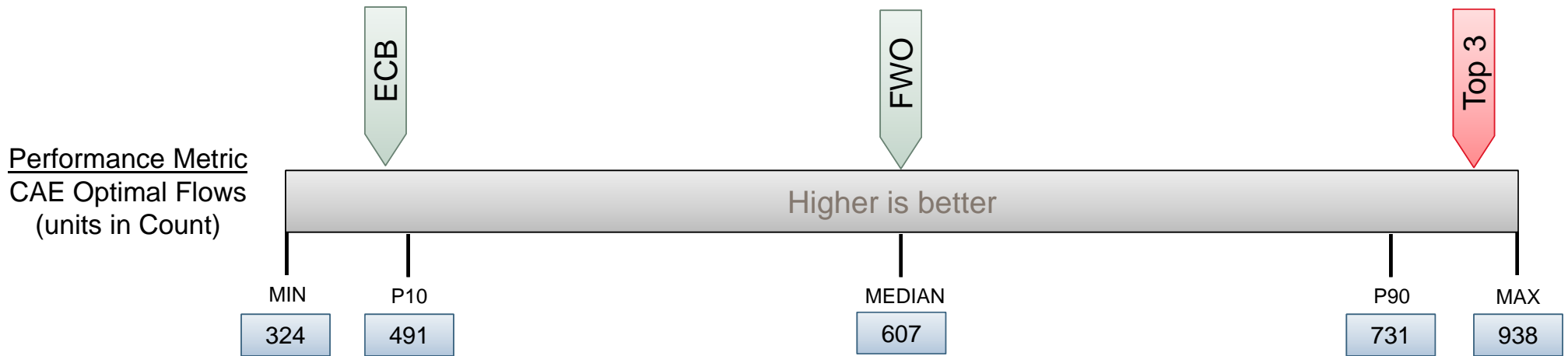


CALOOSAHATCHEE ESTUARY ECOLOGY



SELECTED RESULTS OF CONCEPTUAL PLAN ANALYSIS: CALOOSAHATCHEE RIVER AND ESTUARY ECOLOGY

32



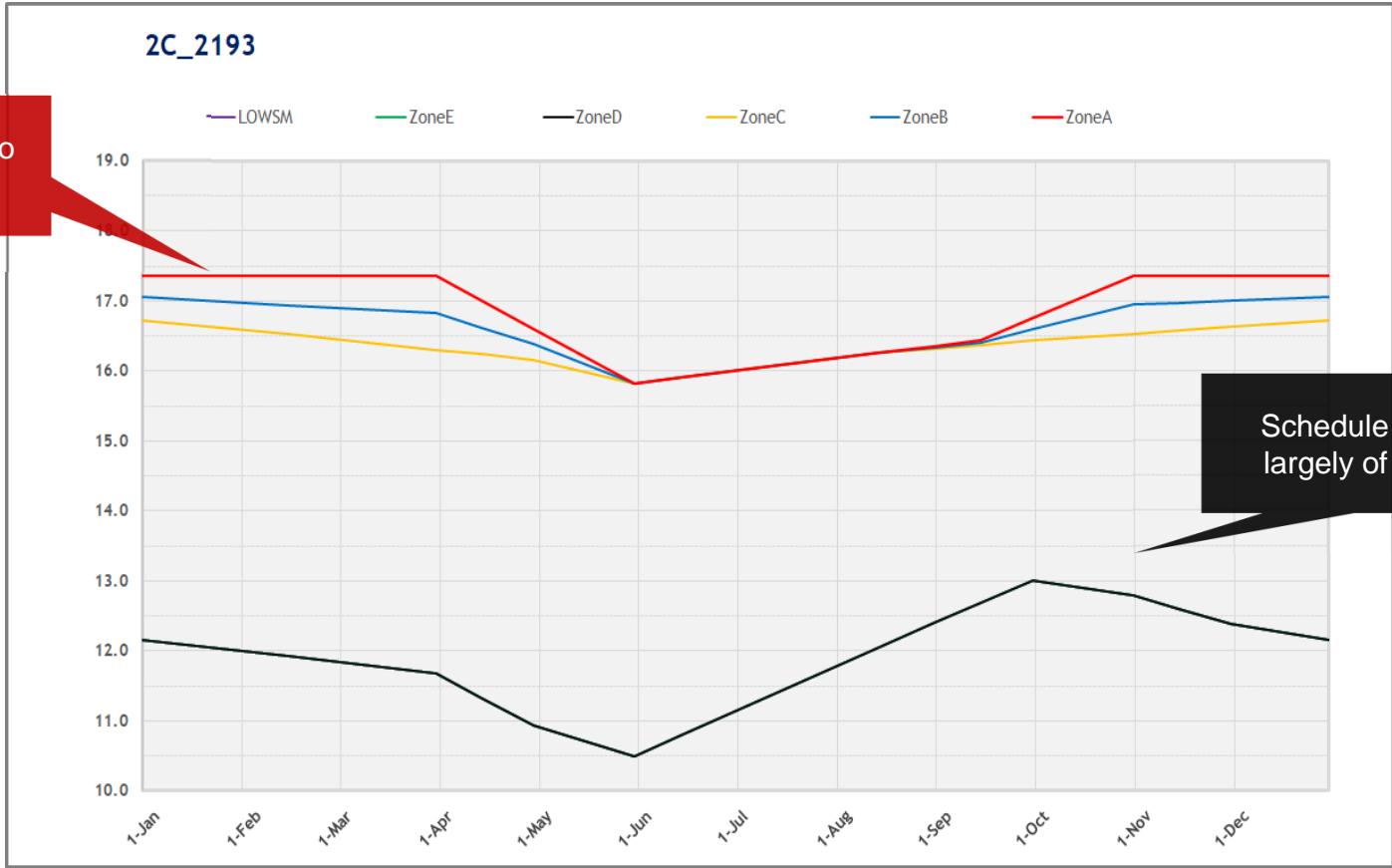
Based on feedback from PDT and USACE independent analysis, USACE developed a repeatable rationale to ID plans that optimize CRE ecology:

- **Step 1:** Retain plans with fewer extreme high and low event counts (flow counts at S-79 with # of times 14 day moving average <457 cfs and >6500 cfs)
- **Step 2:** Of the subset of plans that meets the criteria above, retain plans with more RECOVER optimal flow counts and fewer RECOVER stress and damage counts when compared to other plans



REPRESENTATIVE PLAN FOR SUB-OBJECTIVE 4B CALOOSA HATCHEE ECOLOGY PLAN: 2C_2193 (7023)

Zone A very similar to LORS 08



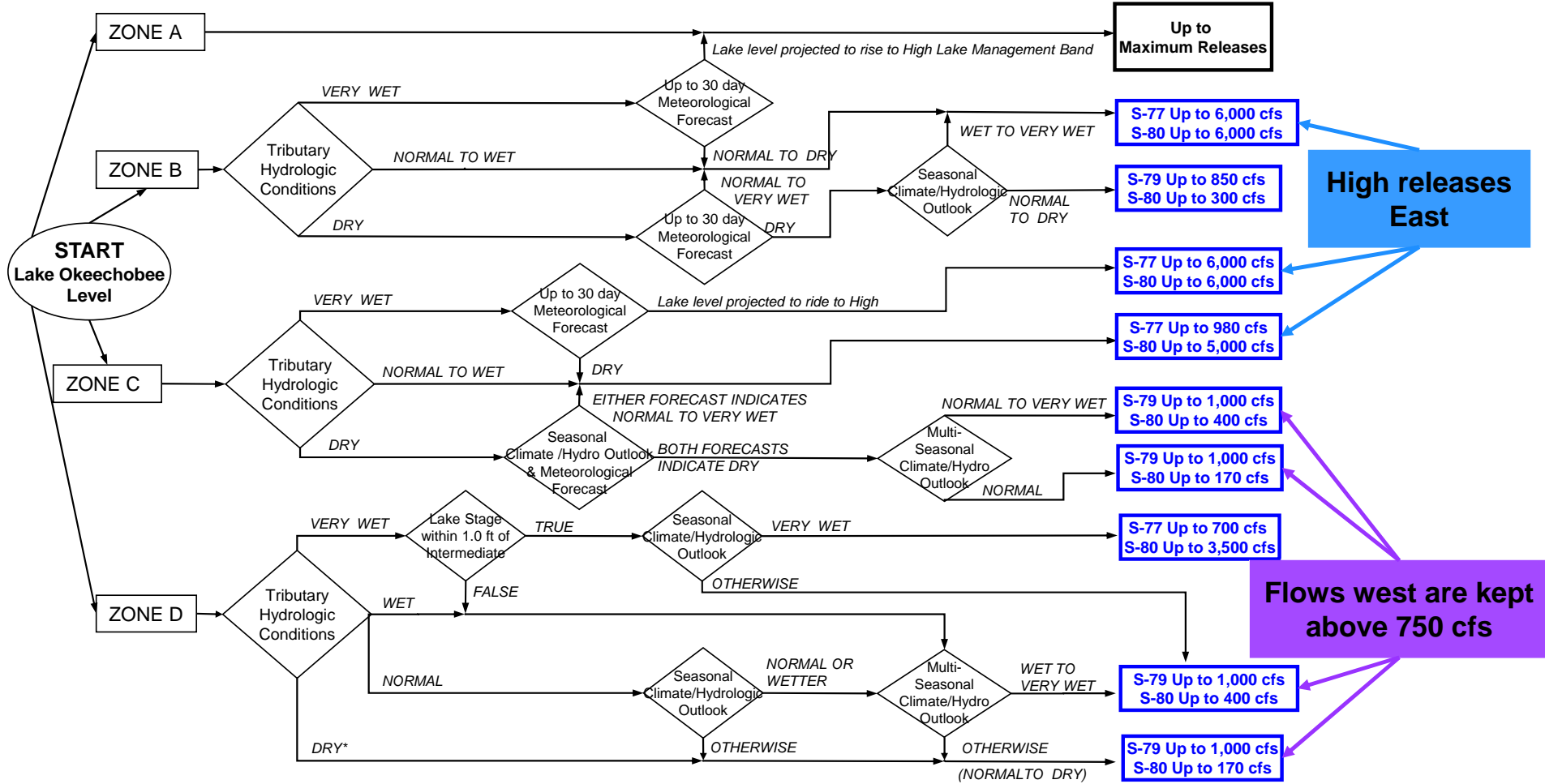
Schedule consists largely of Zone D.



REPRESENTATIVE PLAN FOR SUB-OBJECTIVE 4B CALOOSAHAATCHEE ECOLOGY



“2C_2193” Part D: Establish Allowable Lake Okeechobee Releases to Tide (Estuaries)





CALOOSAHATCHEE ESTUARY TOP 3 SUMMARY



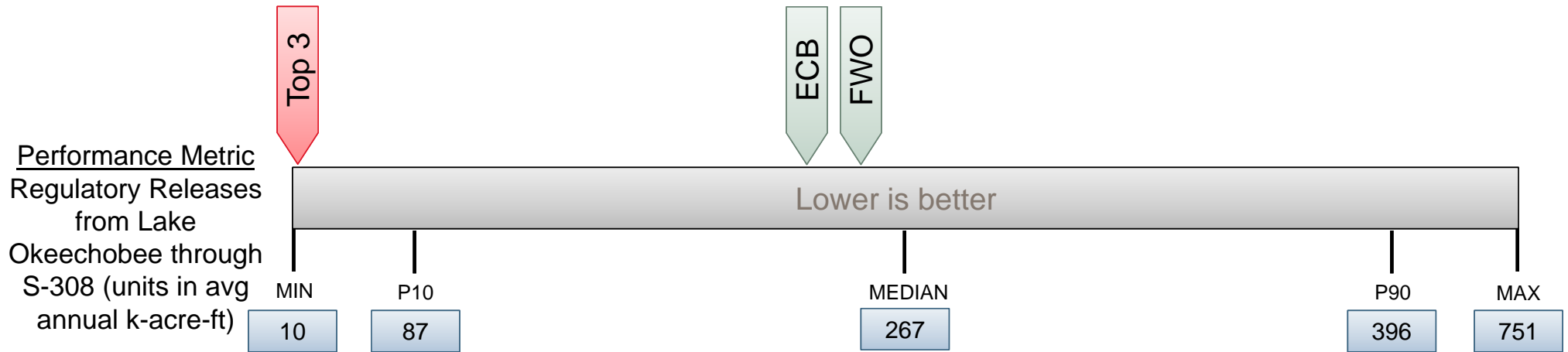
Pindex	Model Index	Caloosahatchee Estuary						Water Supply					Lake O Ecology				S. Florida Ecology		St. Lucie Estuary Ecology
		RECOVER Optimal	RECOVER High	RECOVER Damaging	<457 cfs counts	>6500 cfs counts	S77 reg flow kaf/yr	Big Cypress Demands not Met	Brighton Reservation Demands not Met	LOSA cutbacks-weighted average	LOSA 4in1 demands not met (EAA and non-EAA)	LOSA RECOVER duration count	Lake O % within stage envelope	Lake O Stage Envelope- Lower Penalty	Lake O Stage Envelope- Upper Penalty	Lake O stages <10 ft	Lake O flows south in kaf/yr via S351 S354	STA2+STA34 outflow kaf/yr	S308 reg flows
Existing Condition Baseline	0	465	346	437	548	60	515	2.52%	4.58%	26.04%	8.17%	25	25.53%	17860	13525	6.04%	57	750	220
No Action 2025 Condition (FWO)	0	600	292	333	77	51	477	2.55%	4.63%	26.02%	8.28%	25	27.32%	18717	12160	6.34%	56	739	238
3742	LORS08sim p_2253	937	200	236	57	41	320	2.82%	5.17%	25.34%	9.58%	29	17.51%	19124	24749	6.86%	123.72	788.03	358.86
5930	1C-1_6622	885	190	231	61	44	342	2.94%	5.35%	25.43%	9.87%	30	17.38%	19708	25467	7.13%	184.84	841.45	270.9
7023	2C_2193	902	215	226	66	33	319	3.26%	6.28%	27.91%	11.41%	33	24.03%	23147	12271	8.27%	100.14	769.1	363.99



ST. LUCIE ESTUARY ECOLOGY



SELECTED RESULTS OF CONCEPTUAL PLAN ANALYSIS: ST. LUCIE RIVER AND ESTUARY ECOLOGY



Based on feedback from PDT and USACE independent analysis, USACE developed a repeatable rationale to ID plans that optimize CRE ecology:

- **Step 1:** Retain plans with the lowest S308 regulatory flow volumes
- **Step 2:** Of the subset of plans that meets the criteria above, retain plans with more RECOVER optimal flow counts and fewer RECOVER stress and damage counts when compared to other plans

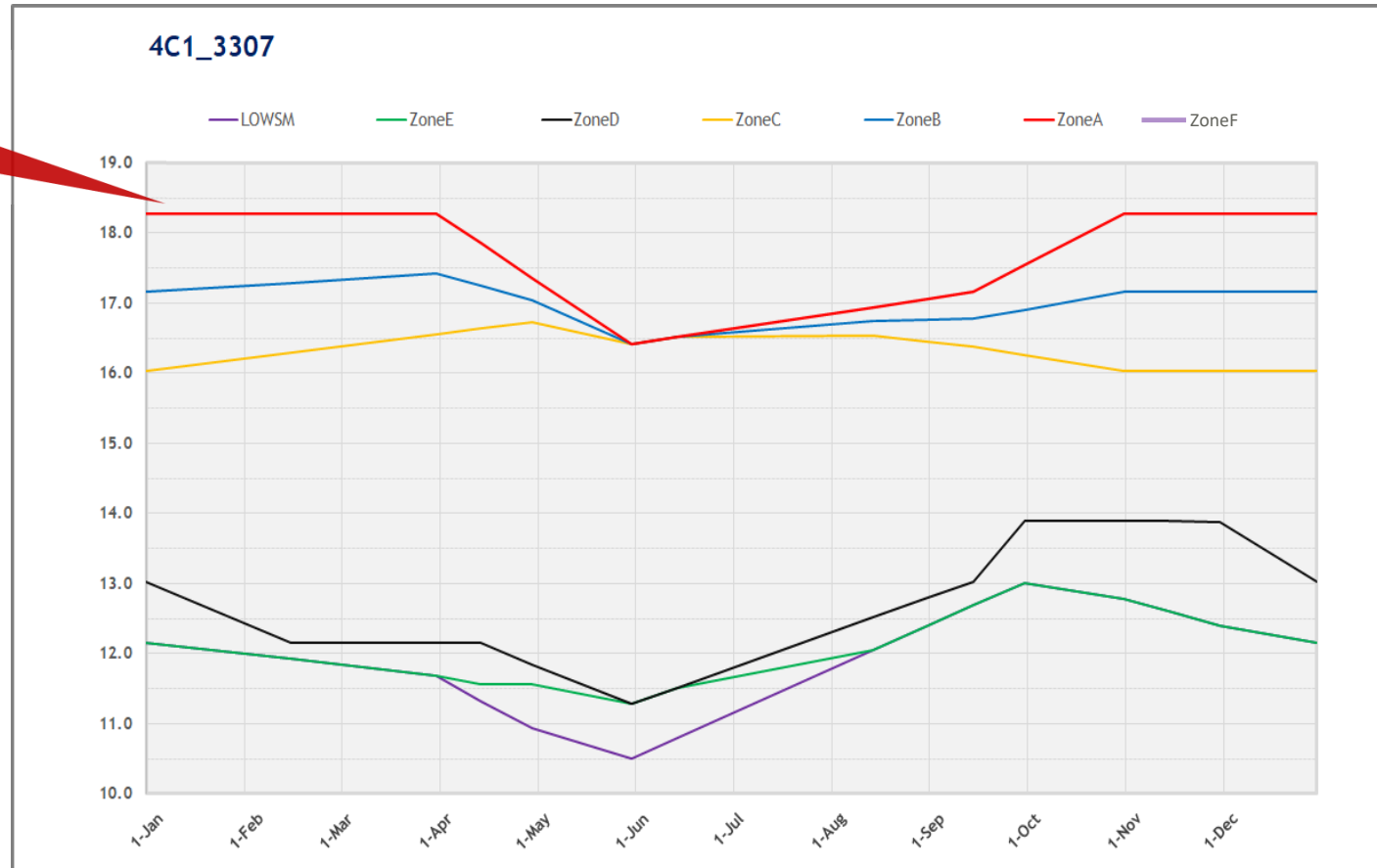


REPRESENTATIVE PLAN FOR SUB-OBJECTIVE 4C ST. LUCIE ECOLOGY

PLAN: 4C-1_3307 (22448)



Zone A > 18 feet



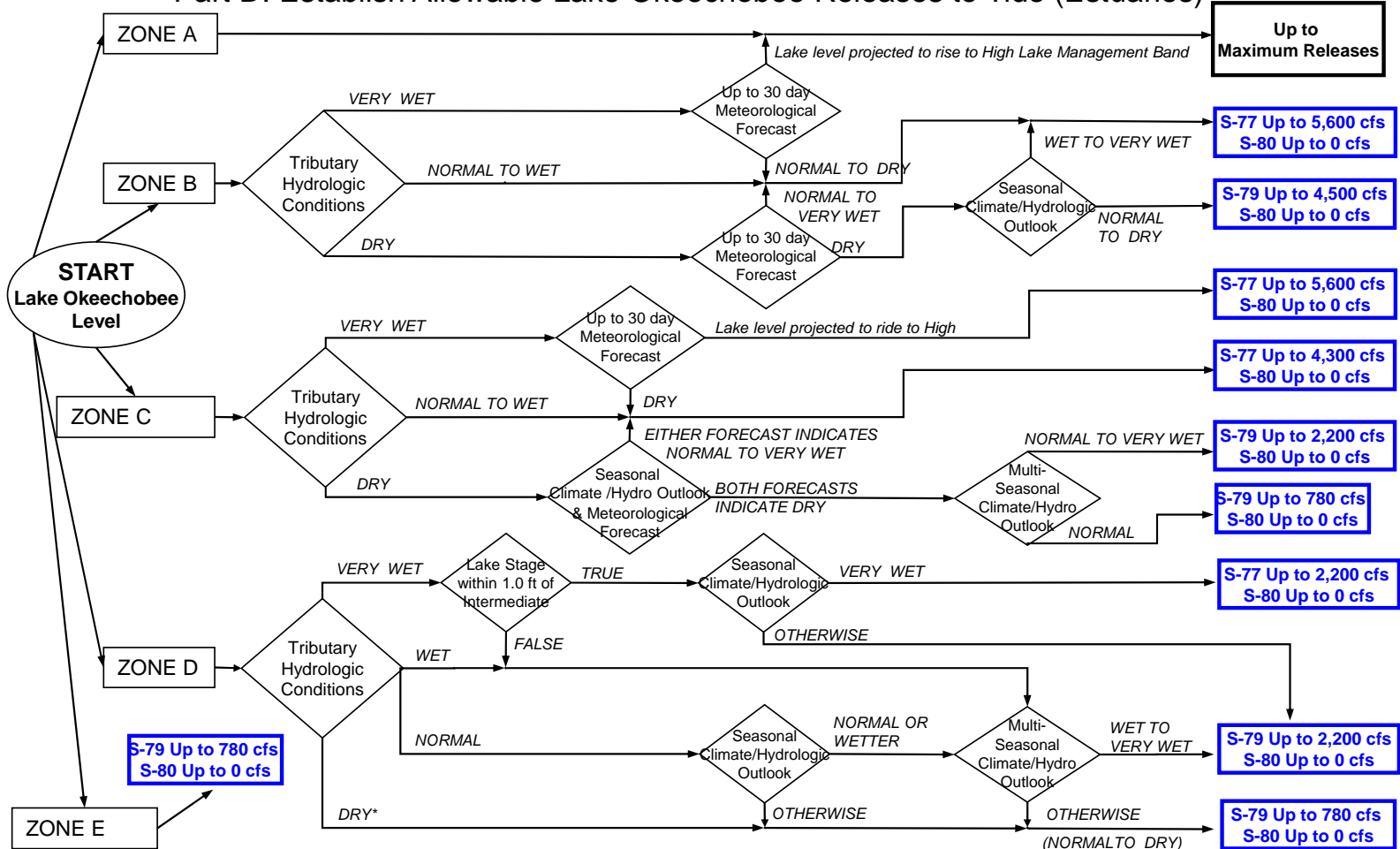


OBJECTIVE 4C ST. LUCIE ECOLOGY



“4C1_3307” —St. Lucie releases are switched off except for Zone A

Part D: Establish Allowable Lake Okeechobee Releases to Tide (Estuaries)





ST. LUCIE ESTUARY TOP 3 SUMMARY



Pindex	Model Index	SLE S308 flows (kaf/yr)	Water Supply					Lake O Ecology					Navigation	S. Florida Ecology		Caloosahatchee Estuary Ecology				
			Big Cypress Demands not Met Brighton Reservation Demands not Met	LOSA cutbacks- weighted average	LOSA 4in1 demands not met (EAA and non- EAA)	LOSA RECOVER duration count	Lake O % within stage envelope	Lake O Stage Envelope- Lower Penalty	Lake O Stage Envelope- Upper Penalty	% over POR Lake stage < 10 ft	% over POR lake levels > 12.56 ft.	Lake O flows south in kaf/yr via S351 S354		STA2+STA34 outflow kaf/yr	RECOVER high flows count	Recover damaging flows count	CAE <457	CAE Optimal	CAE >6500	S77 reg flow kaf/yr
ECB	0	220	2.52%	4.58%	26.04%	8.17%	25	25.53%	17860	13525	6.04%	35.09%	57	750	346	437	548	465	60	515
No Action 2025	0	238	2.55%	4.63%	26.02%	8.28%	25	27.32%	18717	12160	6.34%	36.14%	56	739	292	333	77	600	51	477
21352	4C-1_1543	10	2.70%	4.93%	27.45%	8.92%	27	29.17%	18204	13869	5.95%	36.33%	99	771	280	442	67	583	47	690
22448	4C-1_3307	11	2.86%	5.19%	26.93%	9.52%	30	26.05%	20922	12607	6.81%	39.45%	135	797	296	444	55	729	56	688
23094	4C-1_4316	13	3.11%	5.83%	28.24%	10.38%	35	25.13%	21285	12402	7.70%	39.28%	115	796	193	375	64	616	112	690

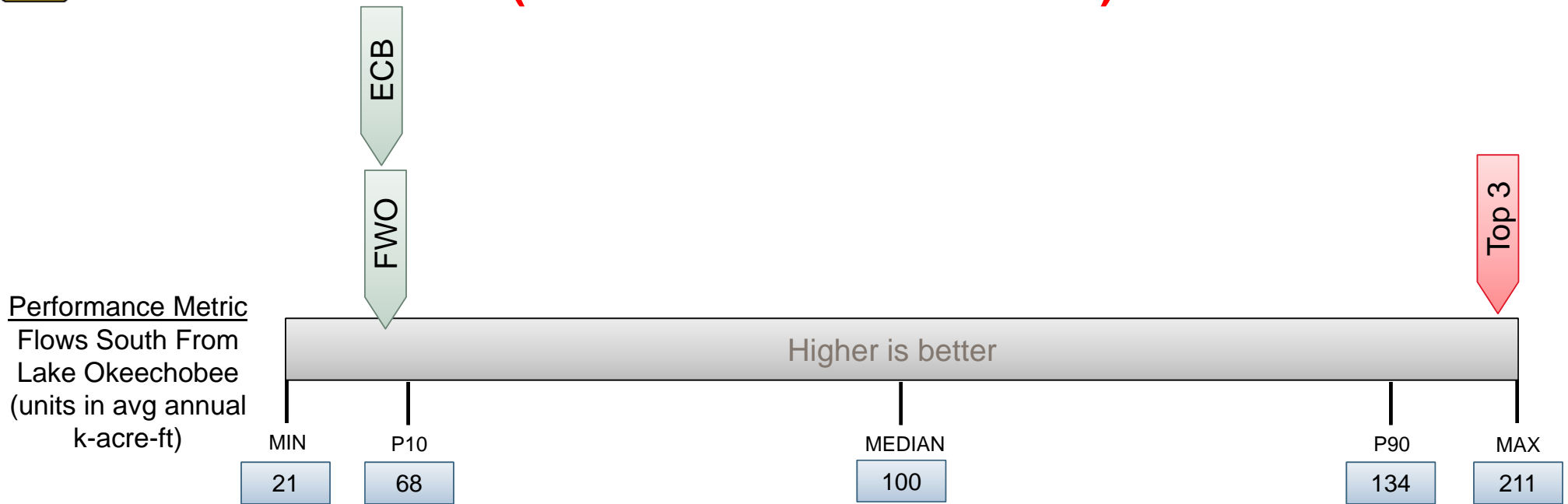


SOUTH FLORIDA ECOLOGY



SELECTED RESULTS OF CONCEPTUAL PLAN ANALYSIS: SOUTH FLORIDA (GREATER EVERGLADES) ECOLOGY

42



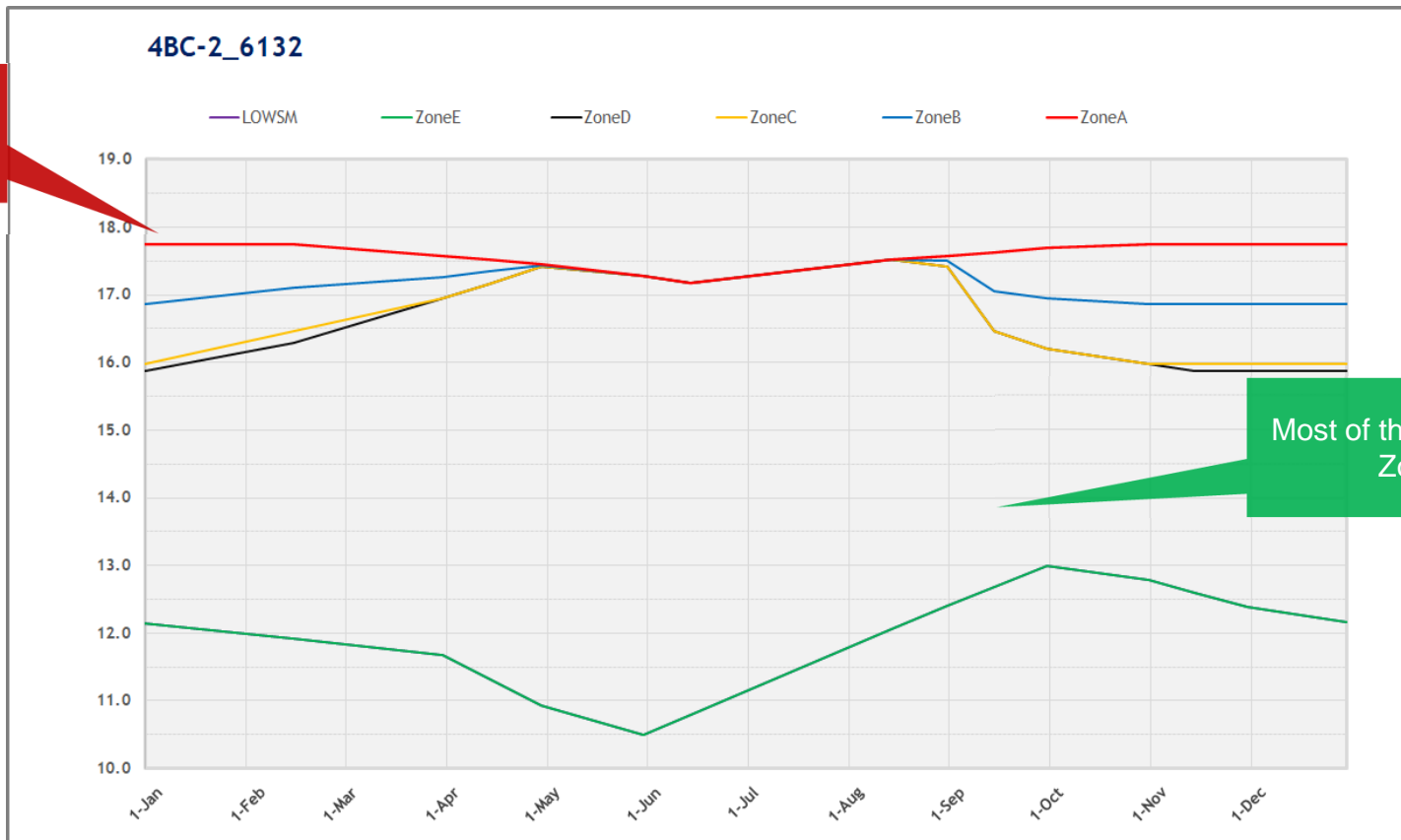
Based on feedback from PDT and USACE independent analysis, USACE developed a repeatable rationale to ID plans that optimize CRE ecology:

- **Step 1:** Minimize central flowpathindex score and maximize average annual Lake Okeechobee flows south via S-354 and S-351 and combined average annual STA 2 and STA 3/4 outflow
- **Step 2:** Of the plans that meet the criteria above, select plans that use mode 2 for flows south because CERP-like dry season flow pattern timing is more environmentally desirable than estuary diversion or uniform 'fill in the gaps' flows south



REPRESENTATIVE PLAN FOR SUB-OBJECTIVE 4D SOUTH FLORIDA ECOLOGY PLAN: 4BC-2_6132 (18729)

Zone A ~17.5 feet



Most of the schedule in Zone E

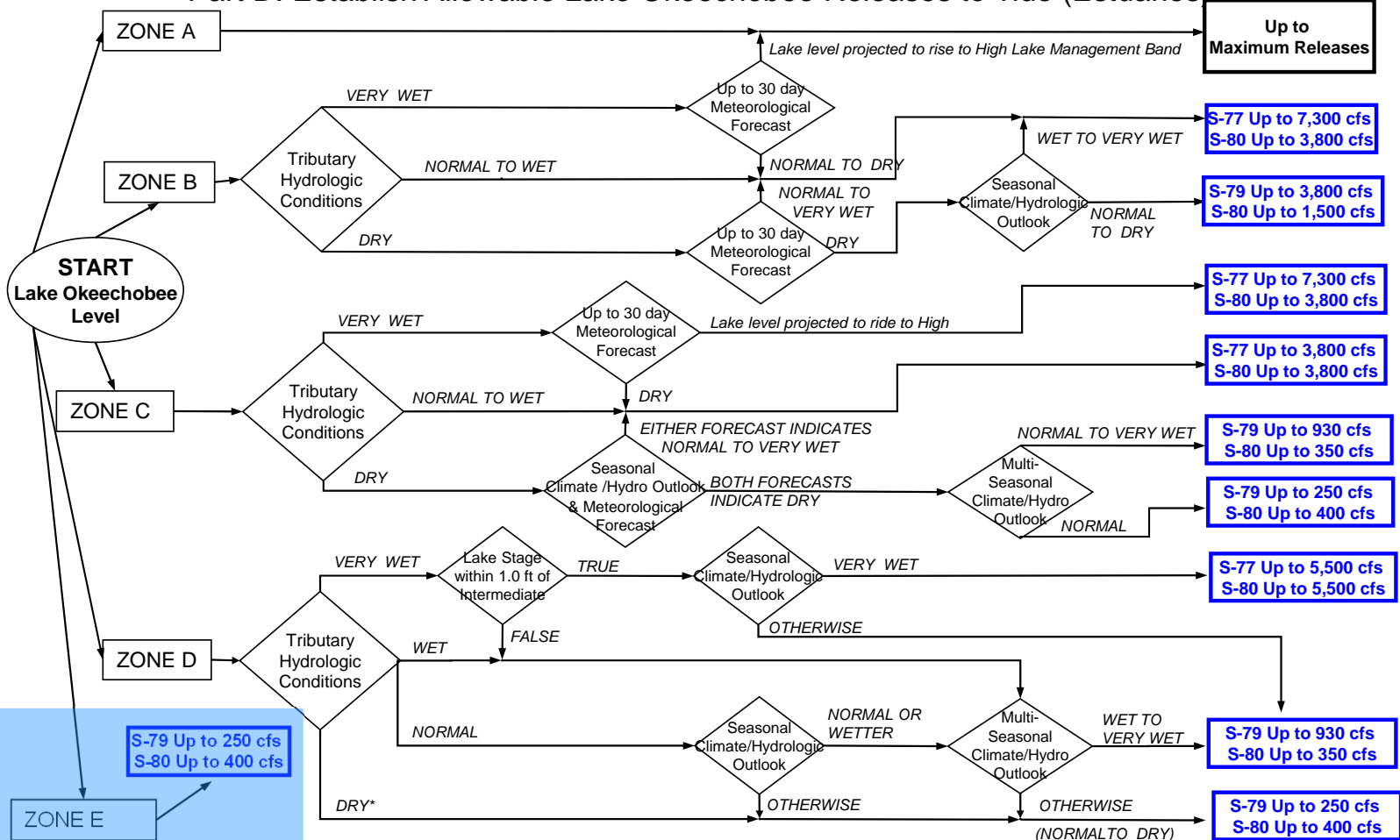


REPRESENTATIVE PLAN FOR SUB-OBJECTIVE 4D SOUTH FLORIDA ECOLOGY



“4BC-2_6132” – Below High Lake Management Band, lake releases use either S-77 or S-308 but not both (on a yearly-basis)
This switching between the estuaries may or may not happen every other year

Part D: Establish Allowable Lake Okeechobee Releases to Tide (Estuaries)



Majority of schedule is this zone

S-79 Up to 250 cfs
S-80 Up to 400 cfs

ZONE E



SOUTH FLORIDA ECOLOGY TOP 3 SUMMARY



Pindex	Model Index	S. Florida Ecology		Water Supply					Lake O Ecology				Navigation	Caloosahatchee Estuary Ecology					St. Lucie Estuary	
		Lake O flows south in kaf/yr via S351 S354	STA2+STA34 outflow kaf/yr	Big Cypress Demands not Met	Brighton Reservation Demands not Met	LOSA cutbacks-weighted average	LOSA 4in1 demands not met (EAA and non-EAA)	LOSA RECOVER duration count	Lake O % within stage envelope	Lake O Stage Envelope- Lower Penalty	Lake O Stage Envelope- Upper Penalty	% Over POR lake stage <10 ft		% over POR lake levels > 12.56 ft.	RECOVER high flows count	Recover damaging flows count	CAE <457	CAE Optimal	CAE >6500	S77 reg flows
LSMECB (Existing Condition Baseline)	0	57	750	2.52%	4.58%	26.04%	8.17%	25	25.53%	17860	13525	6.04%	35.09%	346	437	548	465	60	515	220
LSM25B (No Action 2025 Condition (FWO))	0	56	739	2.55%	4.63%	26.02%	8.28%	25	27.32%	18717	12160	6.34%	36.14%	292	333	77	600	51	477	238
7986 (mode 2)	3_1490	207	867	1.51%	1.93%	12.94%	3.39%	10	20.17%	9298	35681	1.42%	21.95%	200	240	85	651	55	277	230
17563 (mode 2)	4BC-2_3539	211	866	1.91%	2.99%	18.13%	5.30%	18	19.08%	12011	33560	3.15%	26.74%	191	225	95	640	62	299	221
18729 (mode 2)	4BC-2_6132	205	858	2.07%	3.40%	19.85%	6.10%	19	17.69%	13031	33476	4.27%	28.43%	185	236	82	601	72	332	206



REDUCE ALGAL BLOOM RISK

- The algal bloom risk metric is still draft and is not currently being used for formulation (informational only)
- Results of draft metric will continue to be shared with the PDT
- 3 plans have been identified to reduce algal bloom risk in the northern estuaries based on operations (not risk metric)



SUB-OBJECTIVE 1C REDUCE ALGAL BLOOM RISK IN NORTHERN ESTUARIES



IDENTIFY TOP 3 PLANS TO REDUCE ALGAL BLOOM RISK FOR NORTHERN ESTUARIES (OPERATIONS-BASED)

- **Step 1:** Consider Model Index 1C-1 plans
- **Step 2:** Sort by S308 releases (lowest to highest)
- **Step 3:** Sort by Caloosahatchee Estuary RECOVER optimal event counts (highest to lowest)
- **Step 4:** Compare relative plan performance
 - Retain plans with fewer S308 releases
 - Retain plans with more CRE RECOVER optimal event counts
 - Retain plans with fewer CRE RECOVER stress & damage counts, and CRE extreme low <457 and extreme high >6500 counts

Model Index 1C-1

Increase releases to northern estuaries in the wintertime and reduce the releases in the June/July/August time frame from Lake to zero when algal bloom risk is the highest. Releases to northern estuaries occur in September-December time frame to bring lake levels down from wet season



ALGAL BLOOM RISK- NORTHERN ESTUARIES TOP 3 SUMMARY



Pindex	Model Index	Water Supply					Lake O Ecology						S. Florida Ecology		Caloosahatchee Estuary Ecology						St. Lucie Estuary
		Big Cypress Demands not Met	Brighton Reservation Demands not Met	LOSA cutbacks-weighted average	LOSA 4in1 demands not met (EAA and non-EAA)	LOSA RECOVER duration count	Lake O Stage Envelope- Lower Penalty	Lake O Stage Envelope- Upper Penalty	Lake O % within stage envelope	Lake O stages>17 ft	Lake O stages <10 ft	Lake O MFL Exceedances	LOK_flow_south	STA2+STA34 outflow	RECOVER high flows count	RECOVER damaging flows count	<457 cfs	RECOVER Optimal	>6500 cfs	MFL Exceedances	S308_reg_flow
Existing Condition Baseline	0	2.52%	4.58%	26.04%	8.17%	25	17860	13525	25.53%	0.25%	6.04%	10	57	750	346	437	548	465	60	36	220
No Action 2025 Condition (FWO)	0	2.55%	4.63%	26.02%	8.28%	25	18717	12160	27.32%	0.19%	6.34%	10	56	739	292	333	77	600	51	12	238
5552	1C-1_5194	2.69%	4.86%	24.92%	8.83%	28	18827	18716	22.46%	2.00%	5.74%	12	150	811	234	292	69	819	42	10	212
6329	1C-1_8086	3.00%	5.48%	26.06%	10.08%	31	20190	22035	20.19%	3.00%	7.34%	11	169.08	826.69	241	261	62	891	47	8	202
6089	1C-1_7172	2.80%	5.01%	24.41%	9.29%	29	18113	28951	16.46%	4.35%	6.57%	11	162.23	837.77	199	267	53	901	48	9	201