

CENTRAL EVERGLADES PLANNING PROJECT



CEPP

Comparison of Final Array of Alternatives

PRESENTED BY

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District

WG/SCG Meeting
January 31, 2013

OUTLINE OF PRESENTATION

- Overview of the Comparison of Alternatives
 - ▶ WCA-3A (South of the Redline)
 - ▶ WCA-3B/ENP/Florida Bay (Greenline – Blueline)
- Overview of Tentatively Selected Plan
- Next Steps
- Schedule

Evaluation Account: National Ecosystem Restoration (NER)

(P&G - Efficiency)

Cost Component	SUMMARY OF COSTS FOR CEPP ALTERNATIVE PLANS			
	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Construction Features	\$952,000,000	\$1,123,000,000	\$1,175,000,000	\$1,091,000,000
Lands	\$41,200,000	\$38,700,000	\$38,700,000	\$38,700,000
Total First Cost	\$993,200,000	\$1,161,700,000	\$1,213,700,000	\$1,129,700,000
<u>Interest During Construction</u>				
Construction	\$52,971,800	\$62,486,400	\$65,380,300	\$60,706,100
Lands	\$4,250,000	\$3,990,000	\$3,990,000	\$3,990,000
Total Interest During Construction	\$57,221,800	\$66,476,400	\$69,370,300	\$64,696,100
Total Project Investment	\$1,050,421,800	\$1,228,176,400	\$1,283,070,300	\$1,194,396,100
<u>Average Annual Cost</u>				
Interest & Amortization	\$61,234,763	\$75,287,457	\$78,652,464	\$73,216,718
Operation & Maintenance	\$5,518,749	\$6,353,146	\$6,862,893	\$6,487,715
Total Average Annual Cost	\$66,800,000	\$81,600,000	\$85,500,000	\$79,700,000

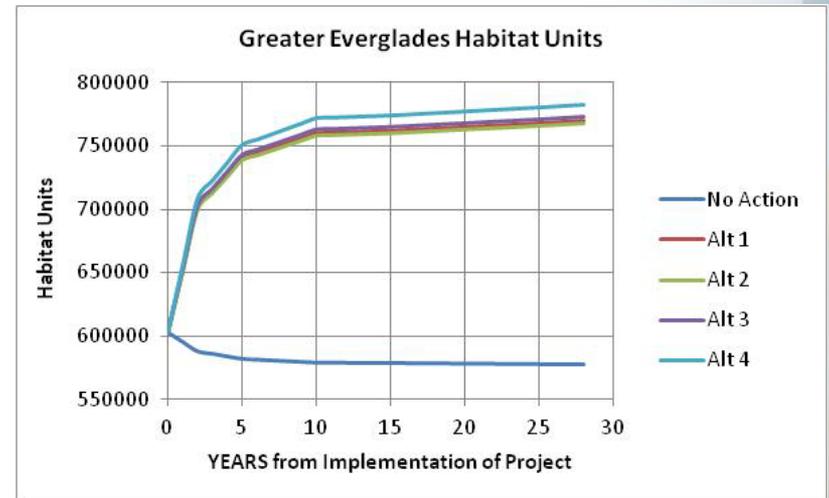
Evaluation Account: NER

P&G - Efficiency

Average Annual Benefits

	Habitat Units					
	ECB	FWO	ALT1	ALT2	ALT3	ALT4
Greater Everglades	602,962	572,778	799,979	796,570	803,735	814,800
Florida Bay	82,090	74,336	138,699	136,901	153,791	165,007
Caloosahatchee	2,839	34,070	39,038	39,038	39,038	39,038
St. Lucie	2,099	3,149	4,348	4,348	4,348	4,348
Total Habitat Units	689,990	684,333	982,064	976,857	1,000,912	1,023,193

	Average Annual Habitat Unit Lift			
	ALT 1	ALT 2	ALT 3	ALT 4
Greater Everglades	166,758	164,256	169,514	177,636
Florida Bay	53,987	52,479	66,646	76,054
St Lucie	1,054	1,054	1,054	1,054
Caloosahatchee	31,629	31,629	31,629	31,629
Average Habitat Unit Lift	253,427	249,417	268,843	286,372



Evaluation Account: NER

P&G - Efficiency

Cost Effectiveness Results – Two Alternatives (1 & 4)

	ALT1	ALT2	ALT3	ALT4
Average Annual Cost	\$66,800,000	\$81,600,000	\$85,500,000	\$79,700,000
Greater Everglades	166,758 Cost Effective	164,256	169,514	177,636 Cost Effective
Florida Bay	53,987 Cost Effective	52,479	66,646	76,054 Cost Effective
St Lucie	1,054 Cost Effective	1,054	1,054	1,054
Caloosahatchee	31,629 Cost Effective	31,629	31,629	31,629
Average Habitat Unit Lift	253,427 Cost Effective	249,417	268,843	286,372 Cost Effective

Evaluation Account: NER

P&G - Efficiency

Incremental Cost Analysis

Alt 1 and Alt 4 identified as “best buy plans” – highest production efficiency

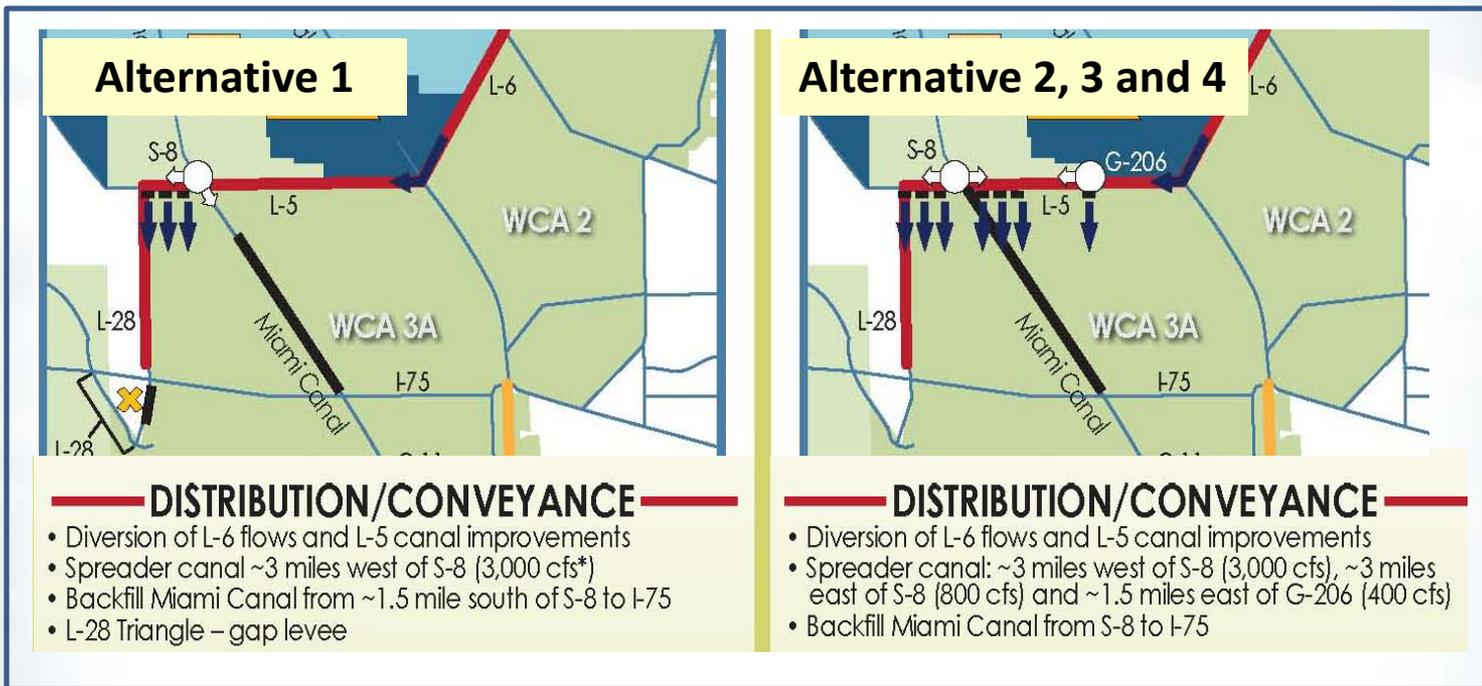
	Cost	Habitat Units	Cost Per HU	Incremental Cost Increase	Incremental Habitat Unit	Incremental Cost/Hu
Alt 1	\$66,800,000	253,427	\$264	\$66,800,000	253,427	\$264
Alt 4	\$79,700,000	286,372	\$278	\$12,900,000	32,945	\$392

*Average annual costs and benefits used in the analysis

Cost increase from Alt 1 to Alt 4 19%

Benefit Increase from Alt 1 to Alt 4 14%

Evaluation Account: NER P&G - Efficiency (WCA 3A)



	ALT1	ALT2	ALT3	ALT4
Cost	319,000,000	405,000,000	405,000,000	405,000,000
Habitat Units	125,931	122,917	122,135	123,741

Evaluation Account: NER P&G - Efficiency (WCA 3A)

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Spreader Works west of S-8 (3 mi/3,000 cfs)	\$108,000,000	\$135,000,000	\$135,000,000	\$135,000,000
Spreader Works east S-8 (3.5 mi/800 cfs)	N/A	\$21,000,000	\$21,000,000	\$21,000,000
G-206 1.5 mile spreader 400cfs PS	N/A	\$24,000,000	\$24,000,000	\$24,000,000
Miami canal S-8 to I-75	\$132,000,000	\$146,000,000	\$146,000,000	\$146,000,000
L-4 Levee Degrade	\$3,000,000	\$3,000,000	\$3,000,000	\$3,000,000
L-5 improvements	\$60,000,000	\$60,000,000	\$60,000,000	\$60,000,000
L-6 deliveries	\$16,000,000	\$16,000,000	\$16,000,000	\$16,000,000
Sub-total	\$319,000,000	\$405,000,000	\$405,000,000	\$405,000,000

Zone	ALT1	ALT2	ALT3	ALT4
3A-NE	66,677	66,677	66,677	66,677
3A-MC	30,501	29,719	28,937	29,719
3A-NW	24,636	23,228	23,228	23,228
3A-C	4,117	4,117	4,117	4,117
3A-S	0	-824	-824	0
WCA 3A Total	125,931	122,917	122,135	123,741

Evaluation Account: NER

Sensitivity Analysis (HRF Revision)

Total Average Annual Cost	\$66,800,000	\$74,500,000	\$78,300,000	\$72,500,000
Greater Everglades	166,758 Cost Effective	164,256	169,514	177,636 Cost Effective
Florida Bay	53,987 Cost Effective	52,479	66,646	76,054 Cost Effective
St Lucie	1,054 Cost Effective	1,054	1,054	1,054
Caloosahatchee	31,629 Cost Effective	31,629	31,629	31,629
Average Habitat Unit Lift	253,427 Cost Effective	249,417	268,843	286,372 Cost Effective

Cost increase from Alt 1 to Alt 4: 9% (Previously 19%) --- Alt 1 -Cost Per HU \$264

Benefit Increase from Alt 1 to Alt 4: 14% --- Alt 4 Cost Per HU \$253

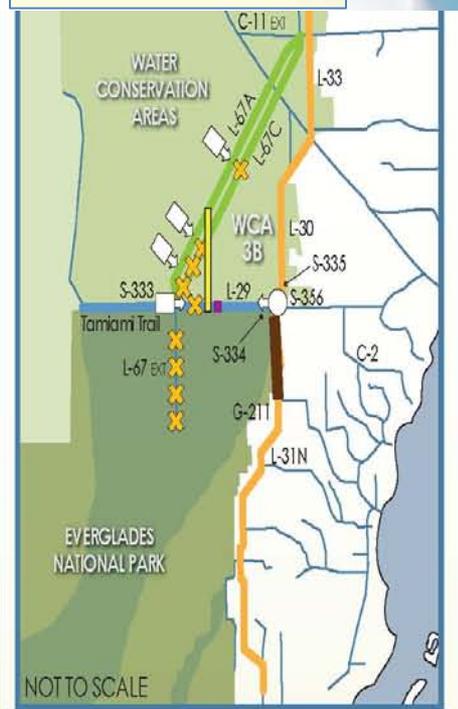
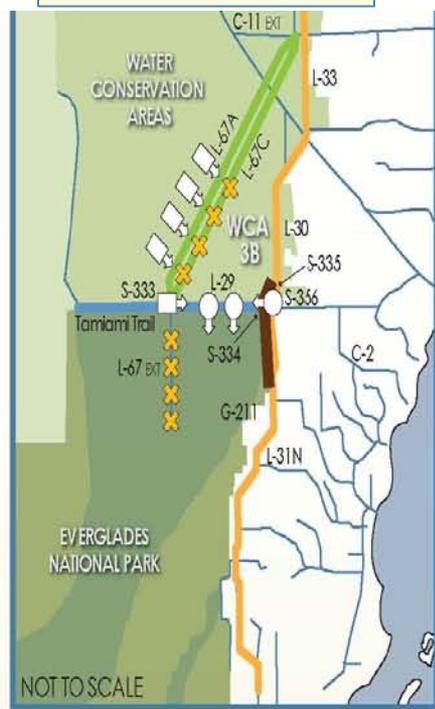
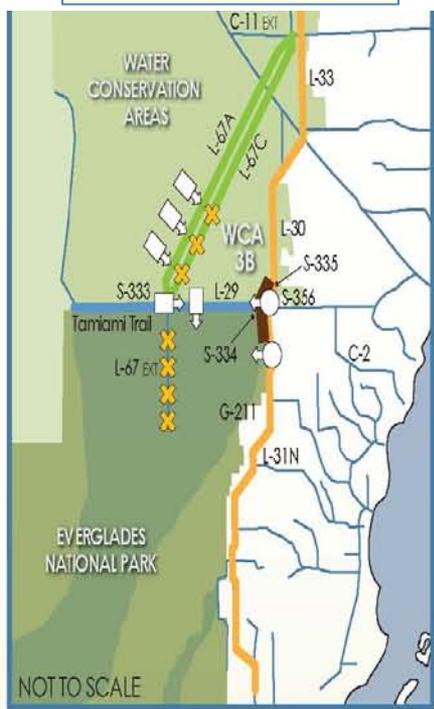
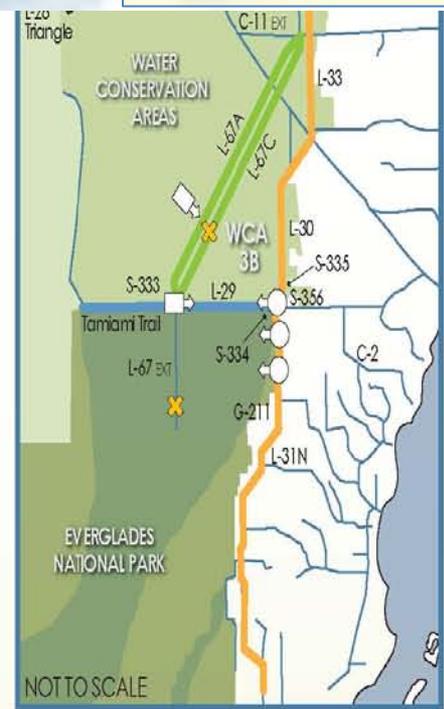
Final Array Comparison (Greenline & Blueline)

Alternative 1

Alternative 2

Alternative 3

Alternative 4



3B/ENP and Florida Bay Habitat Units

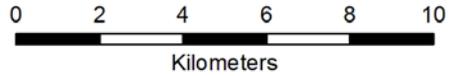
Zone	ECB	FWO	ALT1	ALT2	ALT3	ALT4
3B	55,697	48,842	58,268	59,124	57,411	54,840
ENP-N	57,557	55,054	102,601	101,350	103,852	102,601
ENP-S	124,068	126,454	169,400	169,400	176,558	188,488
ENP-SE	79,711	81,062	82,413	82,413	82,413	83,764
ENP TOTAL	602,962	572,778	799,979	796,570	803,735	814,800
FB-W	23,693	20,534	42,647	42,647	47,386	52,124
FB-C	8,205	8,205	15,589	14,769	17,230	17,230
FB-S	16,614	14,659	30,296	29,318	33,228	35,182
FB-EC	21,984	20,225	36,933	36,933	42,209	46,606
FB-NB	2,154	2,028	2,661	2,661	2,788	2,915
FB-E	9,440	8,685	10,573	10,573	10,950	10,950
Florida Bay Total	79,936	72,308	136,038	134,240	151,003	162,092

Evaluation Account: NER

P&G - Efficiency WCA 3B/ENP/Florida Bay

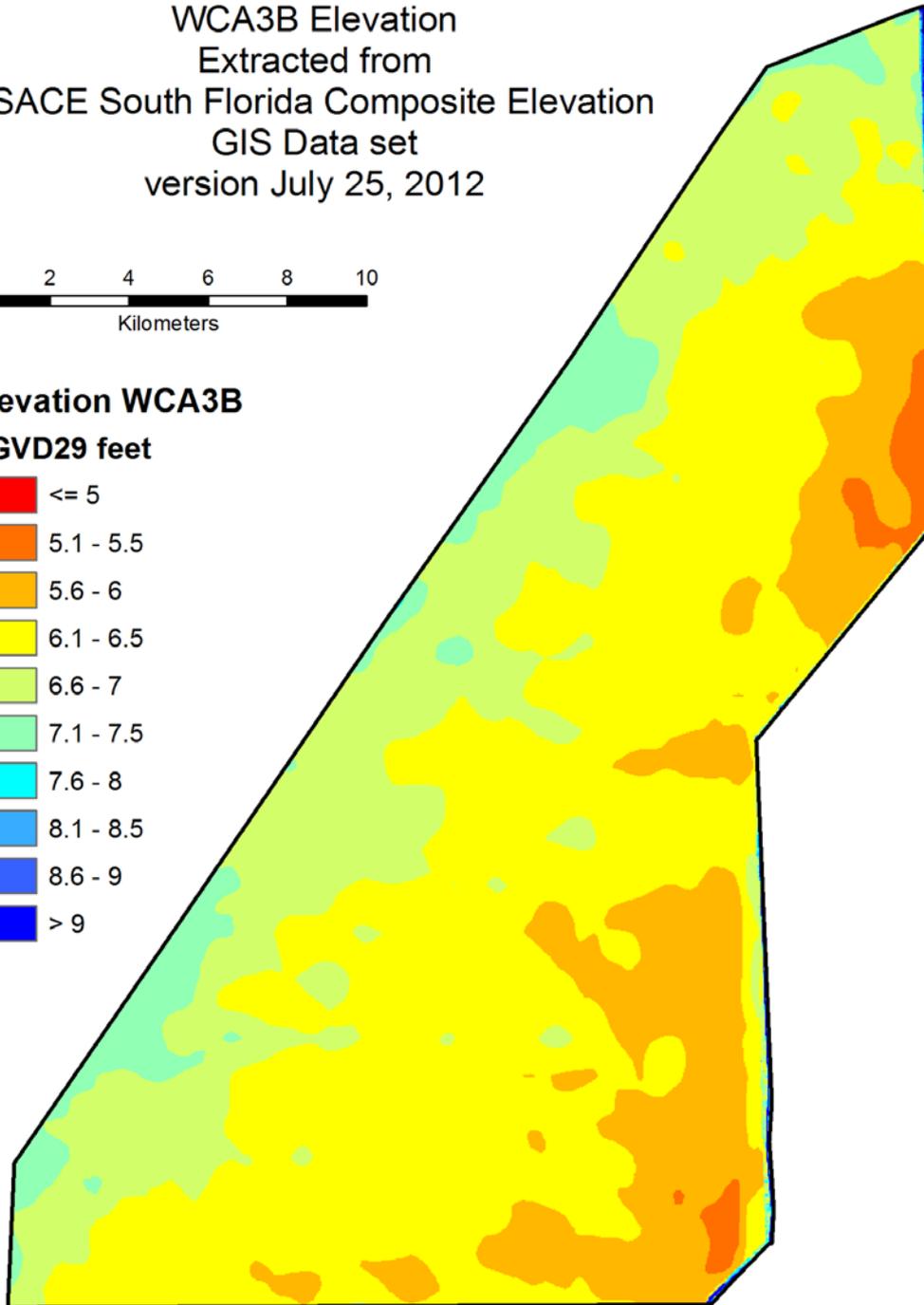
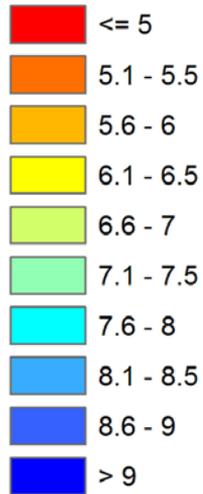
	ALT1	ALT2	ALT3	ALT4
3B/ENP Costs	\$87,900,000	\$150,000,000	\$198,400,000	\$127,100,000
3B	9,426	10,282	8,569	5,998
ENP	227,201	223,792	230,957	242,022
Florida Bay	63,730	61,932	78,695	89,784
Total	300,357	296,006	318,221	337,804

WCA3B Elevation
Extracted from
USACE South Florida Composite Elevation
GIS Data set
version July 25, 2012

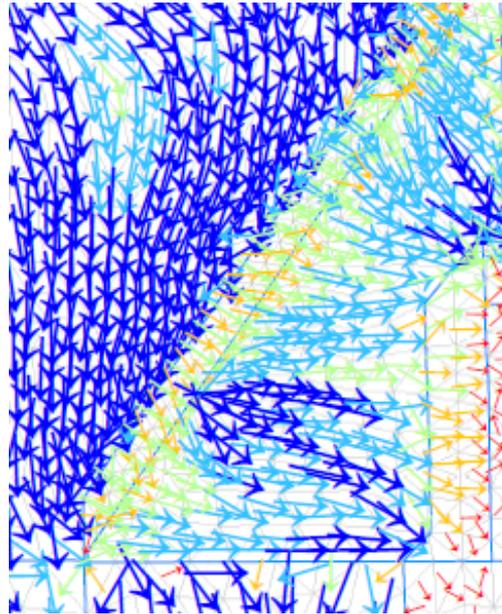


Elevation WCA3B

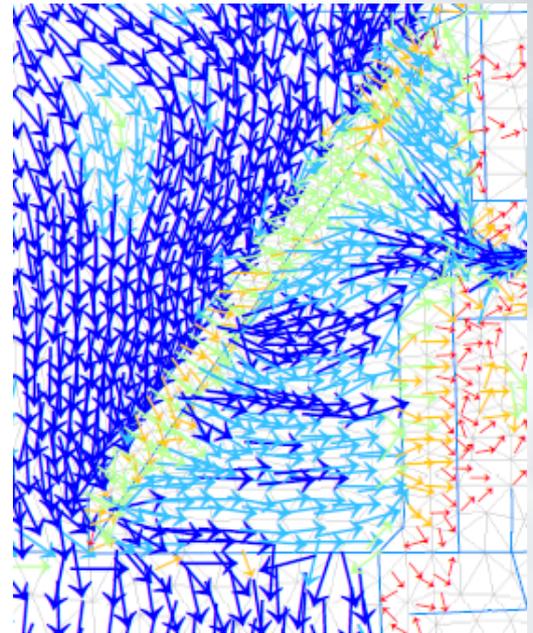
NGVD29 feet



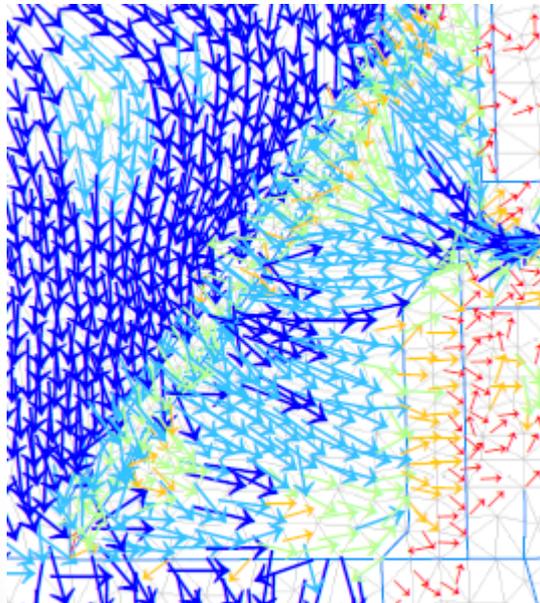
ALT1



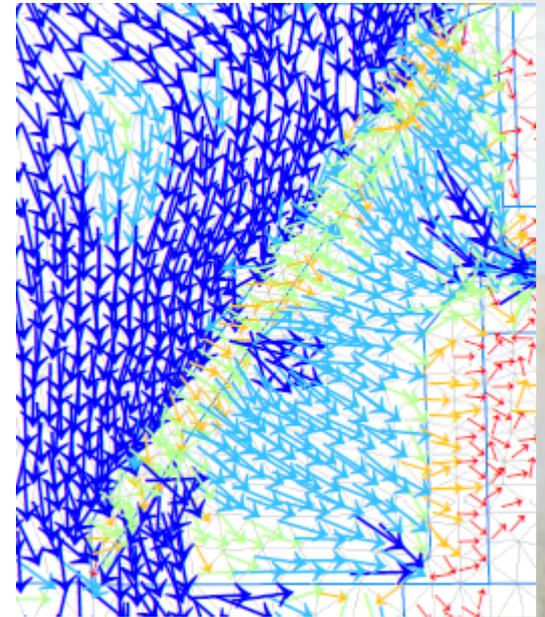
ALT2



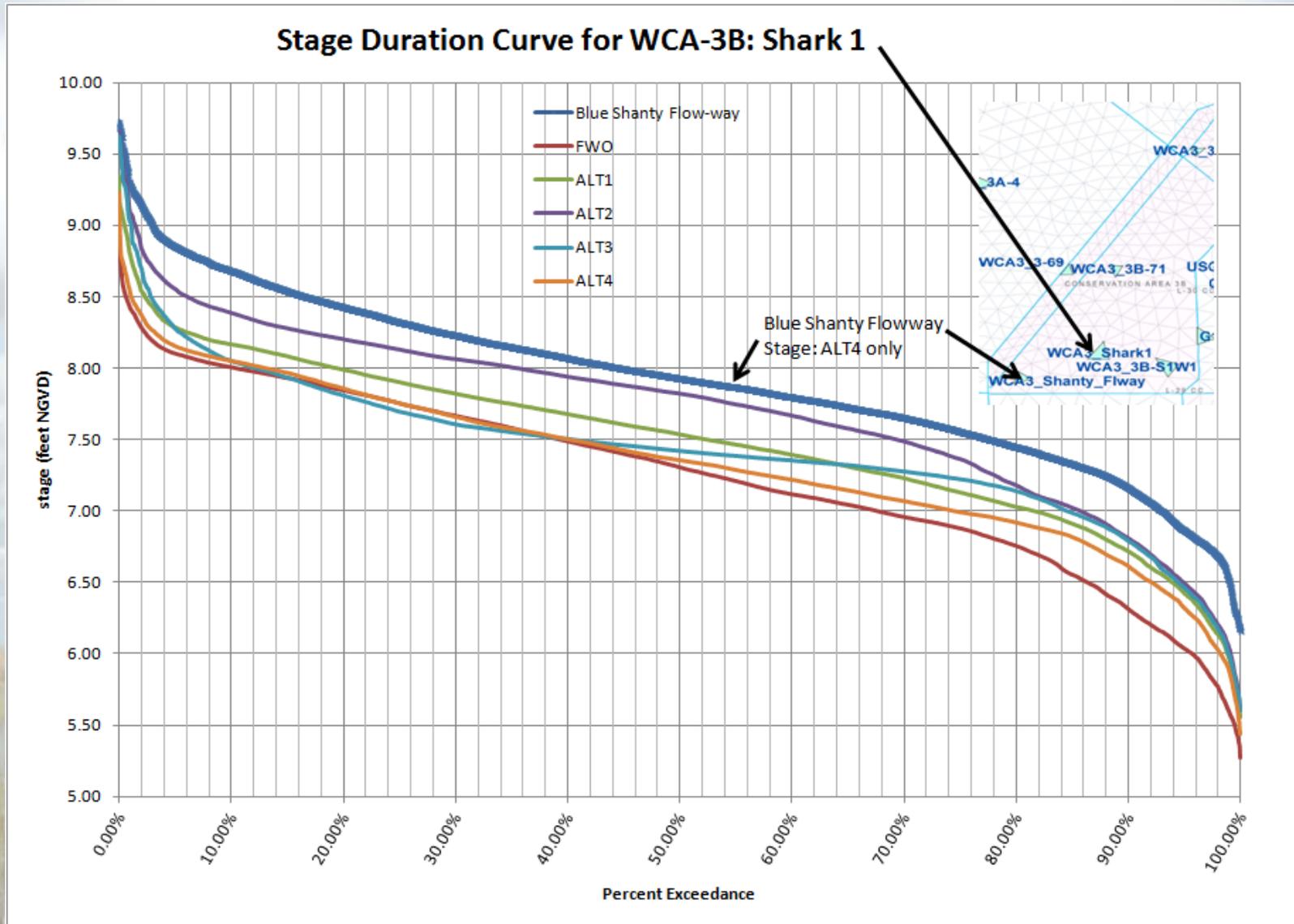
ALT3



ALT4



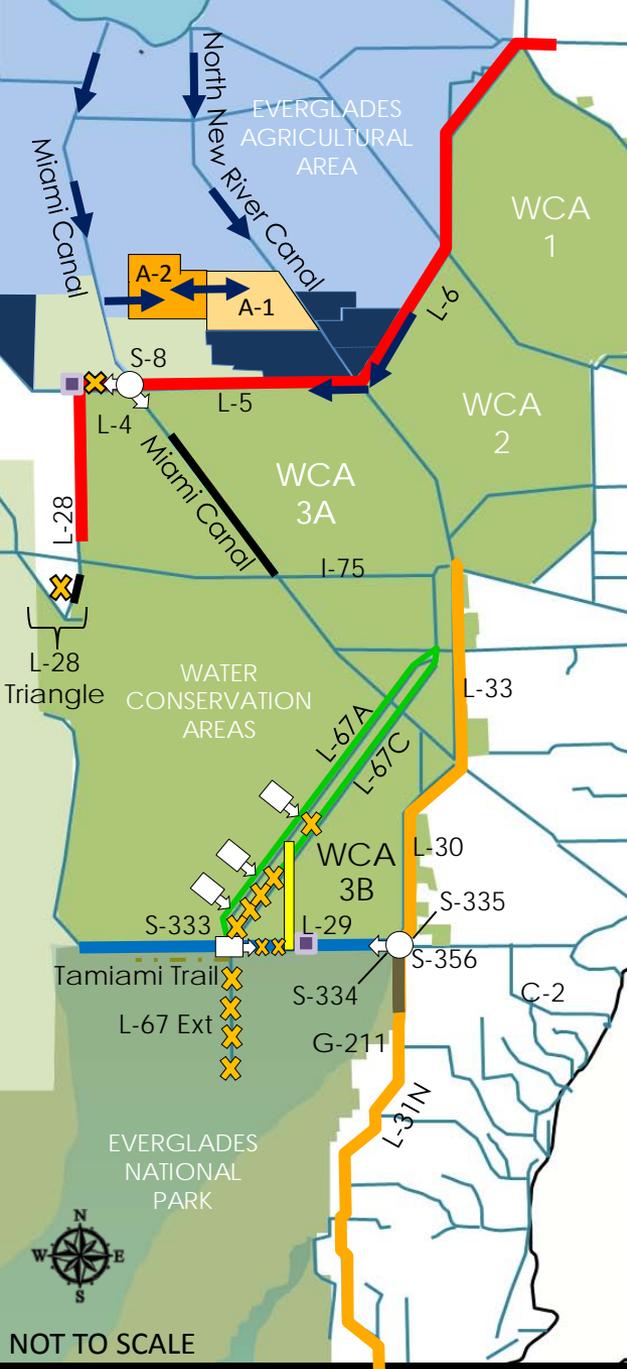
CEPP Stages in Southern WCA-3B



Tentatively Selected Plan -Alternative 4R (revised)-

- **Alternative 4 revised to reflect HRF of Alternative 1**
 - ▶ Provides the greatest overall benefits with the least cost per habitat unit
 - ▶ Provides the greatest ecological connectivity and longest uninterrupted flow-way via the removal of the L-29 Levee
 - ▶ Provides the greatest benefits to Everglades National Park and Florida Bay
- **Alternative 4 operational refinement of inflows into WCA 3B outside Blue Shanty flow-way**
 - ▶ Maximizes benefits in WCA 3B with no additional cost
 - ▶ Address concerns about extent of seepage reduction
- **Alternative 4 seepage infrastructure and operations refinement**
 - ▶ Shift Blue Shanty levee east to coincide with bridge span opening and landscape patterns
 - ▶ Modify seepage barrier south of Tamiami Trail due to greater than desired reduction in seepage
 - ▶ Optimize operations and design during saving clause analyses and value engineering
- **Implementation will utilize adaptive management approach as envisioned in CERP**
 - ▶ Incrementally build infrastructure - Blue Shanty levee and L-29 levee degrade last

TENTATIVELY SELECTED PLAN



STORAGE AND TREATMENT

- Construct A-2 FEB and integrate with A-1 FEB operations
- Lake Okeechobee operation refinements within LORS

DISTRIBUTION/CONVEYANCE

- Diversion of L-6 flows, Infrastructure and L-5 canal improvements
- Remove western ~2.9 miles of L-4 levee (west of S-8 3,000 cfs capacity)
- Divide structure at western terminus of L-4 levee removal
- Backfill Miami Canal and Spoil Mound Removal ~1.5 miles south of S-8 to I-75
- L-28 Triangle – levee gap and canal backfill (~ 9,000 LF)

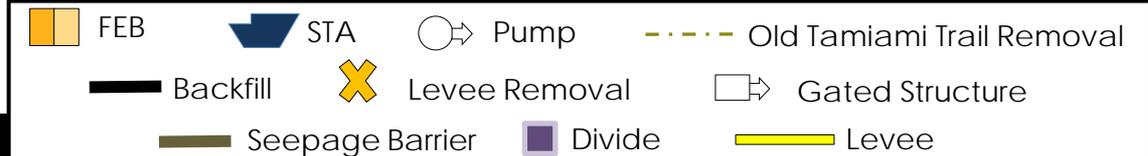
DISTRIBUTION/CONVEYANCE

- Increase S-333 capacity to 2,500 cfs
- Two 500 cfs gated structures in L-67A, 0.5 mile spoil removal west of L-67A canal north and south of structures
- Construct ~8.5 mile levee in WCA 3B, connecting L-67A to L-29
- Remove ~8 miles of L-67C levee in Blue Shanty flowway (no canal back fill)
- One 500 cfs gated structure north of Blue Shanty levee and 6,000-ft gap in L-67C levee
- Remove ~4.3 miles of L-29 levee in Blue Shanty flowway, divide structure east of Blue Shanty levee at terminus of western bridge
- Tamiami Trail western 2.6 mile bridge and L-29 canal max stage at 9.7 ft (FUTURE WORK BY OTHERS)
- Remove entire 5.5 miles L-67 Extension levee, backfill L-67 Extension canal
- Remove ~6 mile Old Tamiami Trail road (from L-67 Ext to Tram Rd)

SEEPAGE MANAGEMENT

- Increase S-356 pump station to ~1,000 cfs
- Partial depth seepage barrier south of Tamiami Trail (along L-31N)
- G-211 operational refinements; use coastal canals to convey seepage

Note: System wide operational changes and adaptive management considerations will be include in project



NOT TO SCALE

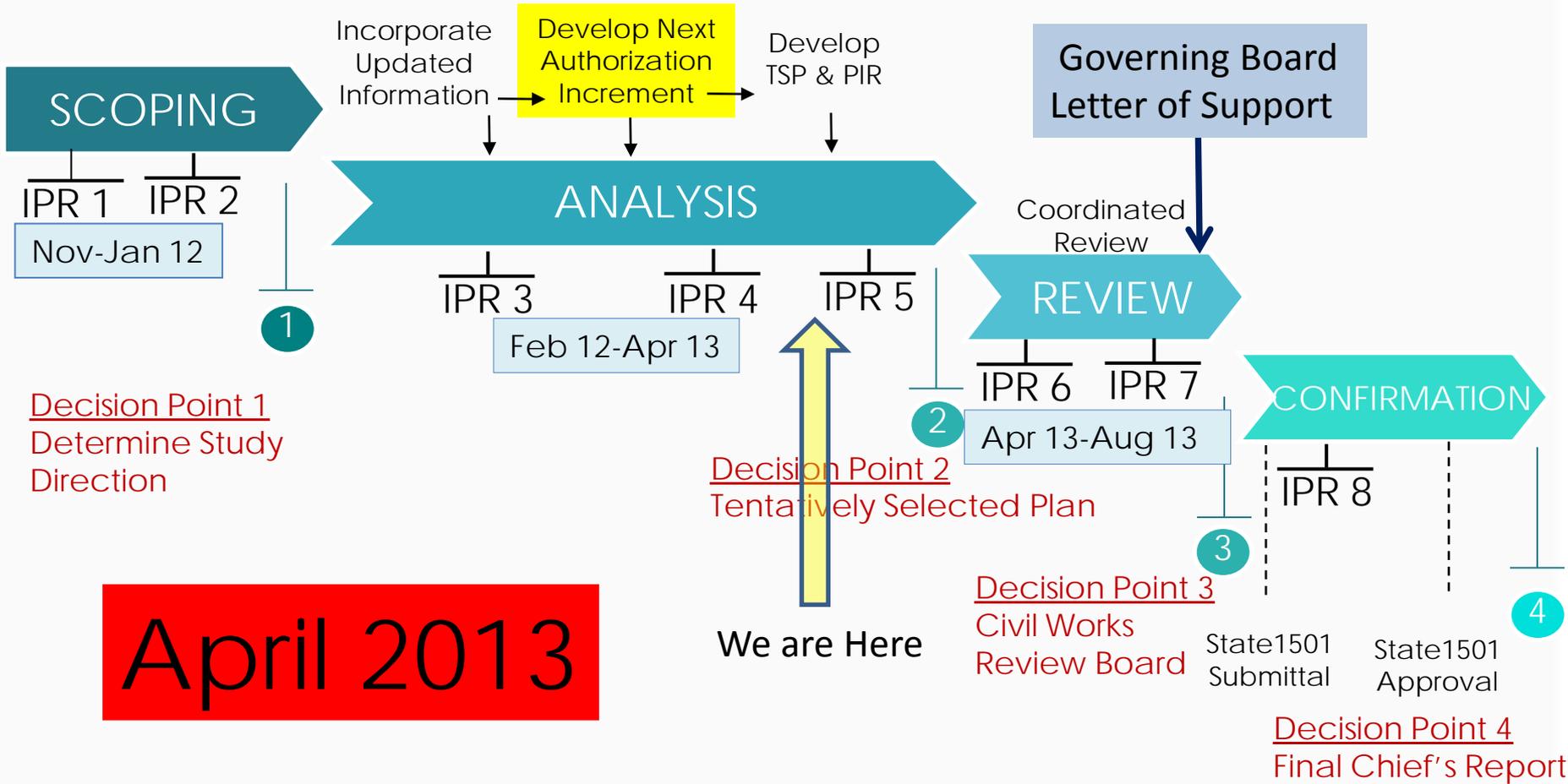
Next Steps

- Savings Clause/Project Assurances Analysis
- Implementation Strategy
- Draft Preliminary Operating Manual
- Adaptive Management Plan
- Monitoring Plan



CENTRAL EVERGLADES PROCESS

TARGET - 18 MONTHS



IPR: In-Progress Review with Corps Leadership



THANK YOU

Visit www.evergladesplan.org for information