APPENDIX I
POTENTIAL WOOD STORK IMPACTS RELATED TO CHANGES IN SHORT-HYDROPERIOD WETLANDS WITHIN THE LAKE BELT

I.1 POTENTIAL IMPACTS ON SHORT-HYDROPERIOD WETLANDS AND WOOD STORKS

As discussed in Section 4.3.2, this *Supplemental Environmental Impact Statement on Rock Mining in the Lake Belt Region of Miami-Dade County, Florida* (*Lake Belt SEIS*) evaluates the comparative impact on wood storks under each mining alternative by calculating the change in the number of wood storks as a result of changes in total fish biomass available compared with the 2002 baseline across all hydroperiod classes. This appendix considers the potential impacts on wood storks from the viewpoint of the potential loss of short-hydroperiod wetlands. There are many factors that can limit suitability of foraging habitat. The lack of a sufficient hydroperiod is one. Short-hydroperiod wetlands are inundated for 180 days or fewer and are separated into three classes: Class 1 (0–60 days), Class 2 (60–120 days), and Class 3 (120–180 days). Long-hydroperiod wetlands are broken into four classes (Classes 4 through 7) and are inundated for between 180 and 365 days per year. Altering wetland hydroperiods can affect the ability of wood storks to forage in a particular wetland. Since the Lake Belt area includes a much higher percentage of the short-hydroperiod wetlands within the core foraging areas of the three wood stork colonies that have a portion or all of the Lake Belt within their core foraging areas, projected losses of short-hydroperiod wetlands in the Lake Belt could represent a great danger to these colonies. For example, it is estimated that nearly 55 percent of the suitable short-hydroperiod wetlands within the 3B Mud East core foraging area are located in the Lake Belt, compared with 8.8 percent of the total suitable wetlands (see Section 4.3.1.3).

In addition to hydroperiod, some cover types are considered more conducive to foraging than others. To determine the relative suitability of one land cover type compared with another considering all birds that utilize the Lake Belt area, the number of species observed in a given cover type was multiplied by the number of individuals observed in that cover type, as shown in Table I–1. The product was then divided by the highest product for any of the cover types (in this case, prairie) to give a relative 'all birds' suitability index. For example, prairie is considered to have a suitability index of 1 when all bird species are considered, compared with a suitability index of 0.639 for prairie with 10 to 50 percent melaleuca (1,012 divided by 1,584).

Table I–1. All Birds Suitability Index

Cover Type	# Species Total	# Individuals Total	# Species × # Individuals	All Birds Suitability Index
Prairie	12	132	1,584	1.000
Prairie with melaleuca (10–50%)	11	92	1,012	0.639
Prairie with melaleuca (50–75%)	10	59	590	0.372
Dense mature melaleuca	1	2	2	0.001
Dense melaleuca saplings	4	10	40	0.025

Note: Developed from data in O'Hare and Dalrymple 1997.
Key: %=percent.

While the above calculations provide the suitability for all bird species observed in the Lake Belt, wood storks are wading birds, and wading birds may have a different habitat preference than other types of birds. Therefore, a separate calculation was completed to compare potential impacts using a 'wading birds' suitability index, as well as the 'all birds' suitability index. From data in "Wildlife in Southern Everglades Invaded by Melaleuca (*Melaleuca quinquenervia*)" (O'Hare and Dalrymple 1997), it was determined that the cumulative number of wading bird species and individuals was highest in areas with moderate melaleuca coverage (prairie with 10 to 50 percent melaleuca), as shown in Table I–2. Areas with dense melaleuca coverage barely supported wading bird species, with a single wading bird being observed in dense melaleuca saplings and none being observed in dense mature melaleuca. For wading birds, prairie is considered to have a suitability index of 0.582 because prairie with 10 to 50 percent melaleuca had a higher number of species and individuals observed. Thus, the prairie total of

32 (species times individuals) was divided by 55 (for prairie with 10 to 50 percent melaleuca) for a suitability index of 0.582. Prairie with 10 to 50 percent melaleuca is considered to have a suitability index of 1 for wading birds.

Table I–2. Wading Birds Suitability Index

Wading Birds	# Species Total	# Individuals Total	# Species × # Individuals	Wading Birds Suitability Index
Prairie	4	8	32	0.582
Prairie with melaleuca (10–50%)	5	11	55	1.000
Prairie with melaleuca (50–75%)	5	6	30	0.545
Dense mature melaleuca	0	0	0	0.000
Dense melaleuca saplings	1	1	1	0.018

Note: Developed from data in O'Hare and Dalrymple 1997.
Key: %=percent.

Because the sample size for wading birds is very small relative to all birds observed in the O'Hare and Dalrymple report (O'Hare and Dalrymple 1997), this SEIS uses both suitability indexes to present a range of potential impacts. Based on U.S. Fish and Wildlife Service (FWS) guidance, dense mature melaleuca is considered to represent densities between 90 and 100 percent, and dense melaleuca saplings are considered to represent densities between 75 and 90 percent. In the estimation of the FWS, the field distinction between 90 and 100 percent is not definable. Therefore, this Biological Assessment uses the suitability values for dense melaleuca saplings for dense mature melaleuca (0.025 using the all birds suitability factor and 0.018 using the wading birds suitability factor, as shown in Table I–3). Thus, potential wood stork impacts are presented as a range from a to b, for example, to incorporate the use of the different suitability indexes shown in Table I–3.

Table I–3. Wood Stork Foraging Suitability Weighting Factor for Lake Belt Area Cover Types

Cover Type	All Birds Foraging Suitability Value	Wading Birds Foraging Suitability Value
Prairie	1	0.582
Prairie with melaleuca (10–50%)	0.639	1
Prairie with melaleuca (50–75%)	0.372	0.545
Disturbed prairie[a]	1	0.582
Disturbed prairie with melaleuca (10–50%)[b]	0.639	1
Disturbed prairie with melaleuca (50–75%)[c]	0.372	0.545
FPL transmission corridor[d]	1	0.582
Other water[e]	0.025	0.018
Canals[e]	0.025	0.018
Dense melaleuca saplings	0.025	0.018
Dense mature melaleuca[e]	0.025	0.018

a Disturbed prairie assumed to be equal to prairie.
b Disturbed prairie with melaleuca (10–50%) assumed to be equal to prairie with melaleuca (10–50%).
c Disturbed prairie with melaleuca (50–75%) assumed to be equal to prairie with melaleuca (50–75%).
d FPL transmission corridor assumed to be equal to prairie (FWS 2006; USACE 2002).
e Other water, canals, and dense mature melaleuca assumed to be equal to dense melaleuca saplings.
Key: %=percent; FPL=Florida Power and Light Company.

Changes in fish biomass resulting from changes in hydroperiod classes for all suitable cover types in the Lake Belt area were estimated using biomass production data for the hydroperiod classes shown in Table I–4. These estimates are the same as those used in the 2006 "Fish and Wildlife Service's Biological Opinion for the Continued Mining of Limerock Within the Lake Belt Mining Region of Miami-Dade County and its Effects on the Endangered Wood Stork" (FWS 2006). Changes in fish biomass due to modeled hydroperiod changes in adjacent wetlands, such as Water Conservation Area-3B and Everglades National Park, are calculated as the difference between the fish biomass production as of the

baseline and production estimated at the end of the proposed mining alternative (assuming no seepage or wetland mitigation has been completed).

Table I–4. Fish Productivity for South Florida Wetland Hydroperiod Classes

Hydroperiod Class (days)	Fish Biomass Production (grams per square meter) [a]
1 (0–60)	0.26
2 (60–120)	0.52
3 (120–180)	1.20
4 (180–240)	2.18
5 (240–300)	2.70
6 (300–330)	3.12
7 (330–365)	3.38

[a] Values provided by the U.S. Fish and Wildlife Service (FWS 2008).

The first third of the wood stork nesting cycle is considered a critical time, corresponding to the greatest period of mortality in wood stork nest productivity (FWS 2006) based on impacts on the foraging areas. During this period, wood storks depend heavily on short-hydroperiod wetlands for foraging. Short-hydroperiod wetlands are considered Hydroperiod Classes 1 through 3, or wetlands that are wet between 0 and 180 days a year. Because of existing conditions (the drawdown effect of the Northwest Wellfield, the drainage impact of the surrounding canal system, etc.), wetlands in the Lake Belt are likely to be short-hydroperiod wetlands. Short-hydroperiod wetlands would be most threatened by further lowered water levels as a result of seepage. The Lake Belt Groundwater Flow Model (see Appendix C) was used to estimate changes in hydroperiod for active areas in the model. The baseline area covered by suitable short-hydroperiod wetlands in the Lake Belt is approximately 28,700 acres, as shown in Table I–5. This number was developed by taking the suitable foraging habitat in the Lake Belt area (35,068 acres), and, based on the modeling results, mapping the amount of the 35,068 suitable acres that are in Hydroperiod Classes 1 through 3. Mines were then added to the model domain based on the different alternatives under consideration, and the short-hydroperiod wetlands that had suitable foraging habitat were recalculated.

Table I–5. Baseline Short-Hydroperiod Wetlands Within the Lake Belt (acres)

Cover Type	Short Hydroperiod, Inactive	Hydroperiod Class			Total
		1	2	3	
Other water	794	4	33	3	834
Canals	189	20	26	53	288
Dense melaleuca saplings	4,175	94	583	961	5,813
Dense melaleuca	4,904	1,534	911	1,153	8,502
Prairie	1,036	1,320	478	3,339	6,173
Prairie with melaleuca (10–50%)	448	1,033	369	1,223	3,073
Prairie with melaleuca (50–75%)	651	905	531	1,060	3,147
FPL transmission corridor	535	4	27	22	588
Disturbed prairie with melaleuca (10–50%)	140	-	-	-	140
Disturbed prairie with melaleuca (50–75%)	108	-	-	-	108
Disturbed prairie	19	-	-	-	19
Total Suitable Habitat for Wood Storks	**12,999**	**4,914**	**2,958**	**7,814**	**28,685**

Note: Totals may not add due to rounding.
Key: %=percent; FPL=Florida Power and Light Company.

Based on the biomass production estimates included in the 2006 FWS Biological Opinion (FWS 2006) and the suitability factors developed for the different cover types, it is possible to calculate the estimated loss of biomass due to cover type and hydrologic changes as a result of mining activities. Each area

included in Hydroperiod Class 1, 2, or 3 columns was converted to square meters and then multiplied by the appropriate fish biomass productivity factor (see Table I–4) and the appropriate cover type suitability factor (see Table I–3). Since the areas designated as "Short Hydroperiod, Inactive" in the various tables in this appendix are not active in the model, a different technique was utilized to estimate their biomass losses. It was estimated by the FWS (FWS 2006) that 86 percent of the proposed mining area is considered to be short-hydroperiod wetlands, as shown in Table I–6. By multiplying the biomass production estimate for a given hydroperiod class by the percentage of that class in the Lake Belt mining area, it is possible to calculate a weighted average biomass production estimate for short-hydroperiod wetlands in the mining area. As shown in Table I–6, a weighted average biomass of 0.35 grams per square meter was calculated for this area. This product was then multiplied by the number of square meters for each cover type and the appropriate suitability factor (see Table I–3). The totals for each column were added to arrive at a total short-hydroperiod biomass estimate for each alternative with or without mitigation.

Table I–6. Estimated Biomass Production for Mining Area Within the Lake Belt

Wetland Hydroperiod Class (days)	Fish Biomass Production (g/m^2)	Percent of Mining Area[a]	Percent of Short-Hydroperiod Mining Area	Weighted Average Biomass (g/m^2)
1 (0–60)	0.26	68	79	0.21
2 (60–120)	0.52	13	15	0.08
3 (120–180)	1.20	5	6	0.07
Total		86	100	0.35

[a] FWS 2006.
Note: Totals may not add due to rounding.
Key: g/m^2=grams per square meter.

I.1.1 Potential Impacts of Short-Hydroperiod Wetlands on Wood Storks Under Alternative 1

Table I–7 presents a summary of the potential impacts of Alternative 1 on the amount of suitable short-hydroperiod cover types available for wood storks at the end of this alternative if it is implemented under average hydrologic conditions. Approximately 26,400 acres of suitable short-hydroperiod habitat would be available in the Lake Belt, compared with the baseline of approximately 28,700 acres.

Table I–7. Short-Hydroperiod Wetlands Within the Lake Belt After Proposed Mining Without Mitigation – Alternative 1 (acres)

Cover Type	Short Hydroperiod, Inactive	Hydroperiod Class			Total
		1	2	3	
Other water	794	4	34	2	834
Canals	189	19	26	53	287
Dense melaleuca saplings	3,728	94	611	944	5,377
Dense melaleuca	3,499	1,538	902	1,203	7,142
Prairie	963	1,319	515	3,315	6,112
Prairie with melaleuca (10–50%)	127	1,033	371	1,261	2,792
Prairie with melaleuca (50–75%)	488	905	524	1,079	2,996
FPL transmission corridor	525	4	30	24	583
Disturbed prairie with melaleuca (10–50%)	140	-	-	-	140
Disturbed prairie with melaleuca (50–75%)	108	-	-	-	108
Disturbed prairie	19	-	-	-	19
Total Suitable Habitat for Wood Storks	**10,580**	**4,916**	**3,013**	**7,881**	**26,390**

Note: Totals may not add due to rounding.
Key: %=percent; FPL=Florida Power and Light Company.

As shown in Table I–8, approximately 440 to 480 kilograms of short-hydroperiod prey fish production within the Lake Belt could be lost annually by the end of Alternative 1 under average hydrologic conditions due to the projected loss of approximately 2,300 acres of suitable short-hydroperiod habitat compared with the baseline and associated changes in the hydroperiods of remaining habitat. The loss of this amount of short-hydroperiod biomass is expected to have an adverse impact on wood storks that use the Lake Belt and its adjacent wetlands without mitigation actions being taken. From 2002 through the end of Alternative 1 (as soon as 2008), the projected loss of short-hydroperiod biomass would result in 1.8 to 2.6 fewer nests and 2.3 to 3.3 fewer birds per year on average using the all birds and wading birds suitability indexes, respectively, and a cumulative projected loss of 16 to 23 wood stork over the life of the alternative without considering the potential benefits of mitigation activities.

Table I–8. Summary of Changes in Short-Hydroperiod Wetlands and Wood Stork Impacts Under Alternative 1

Net gain (loss) in suitable short-hydroperiod habitat from baseline (acres)	(2,295)
All Birds Suitability Index	
Net gain (loss) in short-hydroperiod biomass produced from baseline in final year (kilograms)[a]	(436)
Average gain (loss) of nests per year[b]	(1.8)
Average gain (loss) of birds per year[c]	(2.3)
Cumulative gain (loss) of birds[d]	(16)
Wading Birds Suitability Index	
Net gain (loss) in short-hydroperiod biomass produced from baseline in final year (kilograms)[a]	(483)
Average gain (loss) of nests per year[b]	(2.6)
Average gain (loss) of birds per year[c]	(3.3)
Cumulative gain (loss) of birds[d]	(23)

[a] Net gain (loss) in fish biomass (kilograms) is the change from the baseline in the amount of biomass available for wood storks each year at the end of the alternative.

[b] Average nests lost per year = total kilograms of fish biomass lost over the life of the alternative/total biomass produced in the core foraging area over the life of the alternative × average number of nesting pairs of wood storks observed (394 from 1997–2008).

[c] Average birds lost per year = average number of nests lost × 1.29 fledgling birds/nest.

[d] Cumulative loss figures = total nests lost × 1.29 fledgling birds/nest.

Compared with Alternative 4 without mitigation, Alternative 1 without mitigation would result in approximately 7,400 more acres of suitable short-hydroperiod habitat in the Lake Belt and about 330 to 630 more wood storks, assuming short-hydroperiod biomass production in the final year of Alternative 1 continues at the same level through the end of Alternative 4 (as soon as 2032).

I.1.2 Potential Impacts of Short-Hydroperiod Wetlands on Wood Storks Under Alternative 2

Table I–9 presents a summary of the potential impacts of Alternative 2 on the amount of suitable short-hydroperiod cover types available for wood storks at the end of this alternative if it is implemented under average hydrologic conditions. Approximately 18,400 acres of suitable short-hydroperiod habitat would be available in the Lake Belt, compared with the baseline of approximately 28,700 acres.

As shown in Table I–10, approximately 60 to 170 kilograms of short-hydroperiod prey fish production within the Lake Belt could be gained annually by the end of Alternative 2 under average hydrologic conditions. These potential gains are due to the shifting of longer-hydroperiod wetlands into Hydroperiod Class 3 despite the projected loss of approximately 3,000 acres of suitable short-hydroperiod habitat compared with the baseline. For example, Alternative 2 is estimated to have approximately 3,500 acres of Hydroperiod Class 3 prairie and 2,600 acres of Hydroperiod Class 4 prairie, compared with the baseline estimates of approximately 3,300 acres of Hydroperiod Class 3 prairie and 2,800 acres of Hydroperiod Class 4 prairie. Gains of this amount of short-hydroperiod biomass are expected to benefit wood storks that use the Lake Belt and its adjacent wetlands without mitigation actions being taken. However, actions that have already been taken in the Lake Belt have reduced the area of short-hydroperiod wetlands, and the impacts of these actions could adversely impact the Lake Belt without mitigation actions being considered. As a result, the negative impacts are not completely offset by the

potential gains at the end of Alternative 2 (as soon as 2012). The projected loss of short-hydroperiod biomass from 2002 through 2012 would result in 1.3 to 2.2 fewer nests and 1.6 to 2.8 fewer birds per year on average and a cumulative projected loss of 18 to 31 wood storks over the life of the alternative without considering the potential benefits of mitigation activities.

Table I–9. Short-Hydroperiod Wetlands Within the Lake Belt After Proposed Mining Without Mitigation – Alternative 2 (acres)

Cover Type	Short Hydroperiod, Inactive	Hydroperiod Class			Total
		1	2	3	
Other water	766	4	30	5	805
Canals	183	23	25	53	284
Dense melaleuca saplings	3,075	79	448	1,053	4,655
Dense melaleuca	3,561	1,695	774	1,305	7,335
Prairie	729	1,343	512	3,468	6,052
Prairie with melaleuca (10–50%)	132	1,047	328	1,347	2,854
Prairie with Melaleuca (50–75%)	421	950	428	1,134	2,933
FPL transmission corridor	505	2	24	33	564
Disturbed prairie with melaleuca (10–50%)	132	-	-	-	132
Disturbed prairie with melaleuca (50–75%)	58	-	-	-	58
Disturbed prairie	19	-	-	-	19
Total Suitable Habitat for Wood Storks	**9,581**	**5,143**	**2,569**	**8,398**	**25,691**

Note: Totals may not add due to rounding.
Key: %=percent; FPL=Florida Power and Light Company.

Table I–10. Summary of Changes in Short-Hydroperiod Wetlands and Wood Stork Impacts Under Alternative 2

Net gain (loss) in suitable short-hydroperiod habitat from baseline (acres)	(2,994)
All Birds Suitability Index	
Net gain (loss) in short-hydroperiod biomass produced from baseline in final year (kilograms)[a]	174
Average gain (loss) of nests per year[b]	(1.3)
Average gain (loss) of birds per year[c]	(1.6)
Cumulative gain (loss) of birds[d]	(18)
Wading Birds Suitability Index	
Net gain (loss) in short-hydroperiod biomass produced from baseline in final year (kilograms)[a]	64
Average gain (loss) of nests per year[b]	(2.2)
Average gain (loss) of birds per year[c]	(2.8)
Cumulative gain (loss) of birds[d]	(31)

[a] Net gain (loss) in fish biomass (kilograms) is the change from the baseline in the amount of biomass available for wood storks each year at the end of the alternative.

[b] Average nests lost per year = total kilograms of fish biomass lost over the life of the alternative/total biomass produced in the core foraging area over the life of the alternative × average number of nesting pairs of wood storks observed (394 from 1997–2008).

[c] Average birds lost per year = average number of nests lost × 1.29 fledgling birds/nest.

[d] Cumulative loss figures = total nests lost × 1.29 fledgling birds/nest.

Compared with Alternative 4 without mitigation, Alternative 2 without mitigation would result in approximately 6,700 more acres of suitable short-hydroperiod habitat in the Lake Belt and about 480 to 760 more wood storks, assuming the short-hydroperiod biomass production in the final year of Alternative 2 continues at the same level through the end of Alternative 4 (as soon as 2032).

I.1.3 Potential Impacts of Short-Hydroperiod Wetlands on Wood Storks Under Alternative 3

Table I–11 presents a summary of the potential impacts of Alternative 3 on the amount of suitable short-hydroperiod cover types available for wood storks at the end of this alternative if it is implemented under

average hydrologic conditions. Approximately 22,300 acres of suitable short-hydroperiod habitat would be available in the Lake Belt, compared with the baseline of approximately 28,700 acres.

Table I–11. Short-Hydroperiod Wetlands Within the Lake Belt After Proposed Mining Without Mitigation – Alternative 3 (acres)

Cover Type	Short Hydroperiod, Inactive	Hydroperiod Class			Total
		1	2	3	
Other water	734	5	31	2	772
Canals	169	33	26	40	268
Dense melaleuca saplings	2,386	91	211	725	3,413
Dense melaleuca	1,923	1,732	690	1,064	5,409
Prairie	656	1,276	1,060	3,525	6,517
Prairie with melaleuca (10–50%)	45	917	338	1,130	2,430
Prairie with melaleuca (50–75%)	281	983	394	1,042	2,700
FPL transmission corridor	469	-	34	31	534
Disturbed prairie with melaleuca (10–50%)	132	-	-	-	132
Disturbed prairie with melaleuca (50–75%)	58	-	-	-	58
Disturbed prairie	19	-	-	-	19
Total Suitable Habitat for Wood Storks	**6,872**	**5,037**	**2,784**	**7,559**	**22,252**

Note: Totals may not add due to rounding.
Key: %=percent; FPL=Florida Power and Light Company.

As shown in Table I–12, approximately 1,000 fewer to 130 more kilograms of short-hydroperiod prey fish production within the Lake Belt could be realized annually by the end of Alternative 3 under average hydrologic conditions due to the loss of 6,400 acres of suitable short-hydroperiod habitat compared with the baseline and associated changes in the hydroperiods of remaining habitat. The potential loss of short-hydroperiod biomass is expected to adversely affect wood storks that use the Lake Belt and its adjacent wetlands without mitigation actions being taken. As discussed above, actions that have already been taken in the Lake Belt have reduced the area of short-hydroperiod wetlands, and the impacts of these actions could adversely impact the Lake Belt without mitigation actions being considered. As a result, from 2002 through the end of Alternative 3 (as soon as 2022), the projected changes in the amount of short-hydroperiod biomass would result in 1.3 to 6.3 fewer nests and 1.6 to 8.1 fewer birds per year on average and a cumulative projected loss of 35 to 170 wood storks over the life of the alternative without considering the potential benefits of mitigation activities.

Table I–12. Summary of Changes in Short-Hydroperiod Wetlands and Wood Stork Impacts Under Alternative 3

Net gain (loss) in suitable short-hydroperiod habitat from baseline (acres)	(6,433)
All Birds Suitability Index	
Net gain (loss) in short-hydroperiod biomass produced from baseline in final year (kilograms)[a]	134
Average gain (loss) of nests per year[b]	(1.3)
Average gain (loss) of birds per year[c]	(1.6)
Cumulative gain (loss) of birds[d]	(35)
Wading Birds Suitability Index	
Net gain (loss) in short-hydroperiod biomass produced from baseline in final year (kilograms)[a]	(1,018)
Average gain (loss) of nests per year[b]	(6.3)
Average gain (loss) of birds per year[c]	(8.1)
Cumulative gain (loss) of birds[d]	(170)

[a] Net gain (loss) in fish biomass (kilograms) is the change from the baseline in the amount of biomass available for wood storks each year at the end of the alternative.

[b] Average nests lost per year = total kilograms of fish biomass lost over the life of the alternative/total biomass produced in the core foraging area over the life of the alternative × average number of nesting pairs of wood storks observed (394 from 1997–2008).

[c] Average birds lost per year = average number of nests lost × 1.29 fledgling birds/nest.

[d] Cumulative loss figures = total nests lost × 1.29 fledgling birds/nest.

Compared with Alternative 4 without mitigation, Alternative 3 without mitigation would result in approximately 3,200 more acres of suitable short-hydroperiod habitat in the Lake Belt and about 440 to 500 more wood storks, assuming the short-hydroperiod biomass production in the final year of Alternative 3 continues at the same level through the end of Alternative 4 (as soon as 2032).

I.1.4 Potential Impacts of Short-Hydroperiod Wetlands on Wood Storks Under Alternative 4

Table I–13 presents a summary of the potential impacts of Alternative 4 on the amount of suitable short-hydroperiod cover types available for wood storks at the end of this alternative if it is implemented under average hydrologic conditions. Approximately 19,000 acres of suitable short-hydroperiod habitat would be available in the Lake Belt, compared with the baseline of approximately 28,700 acres.

Table I–13. Short-Hydroperiod Wetlands Within the Lake Belt After Proposed Mining Without Mitigation – Alternative 4 (acres)

Cover Type	Short Hydroperiod, Inactive	Hydroperiod Class			Total
		1	2	3	
Other water	718	8	25	3	754
Canals	168	49	35	12	264
Dense melaleuca saplings	2,279	101	92	117	2,589
Dense melaleuca	1,224	1,716	426	546	3,912
Prairie	400	1,430	1,685	2,978	6,493
Prairie with melaleuca (10–50%)	-	795	289	913	1,996
Prairie with melaleuca (50–75%)	163	1,023	347	841	2,374
FPL transmission corridor	460	1	29	27	517
Disturbed prairie with melaleuca (10–50%)	73	-	-	-	73
Disturbed prairie with melaleuca (50–75%)	27	-	-	-	27
Disturbed prairie	9	-	-	-	9
Total Suitable Habitat for Wood Storks	**5,521**	**5,123**	**2,928**	**5,437**	**19,008**

Note: Totals may not add due to rounding.
Key: %=percent; FPL=Florida Power and Light Company.

As shown in Table I–14, approximately 3,000 to 4,200 kilograms of short-hydroperiod prey fish production within the Lake Belt could be lost annually by the end of Alternative 4 under average hydrologic conditions due to the loss of approximately 9,700 acres of suitable short-hydroperiod habitat compared with the baseline and associated changes in the hydroperiods of remaining habitat. The loss of this amount of short-hydroperiod biomass is expected to adversely affect wood storks that use the Lake Belt and its adjacent wetlands without mitigation actions being taken. From 2002 through the end of Alternative 4 (as soon as 2032), the projected loss of short-hydroperiod biomass would result in 11 to 20 fewer nests and 15 to 26 fewer birds per year on average and a cumulative projected loss of 458 to 813 wood storks over the life of the alternative without considering the potential benefits of mitigation activities.

Compared with Alternative 3 without mitigation, Alternative 4 without mitigation would result in the loss of approximately 3,200 acres of suitable short-hydroperiod habitat in the Lake Belt and about 440 to 500 fewer storks through the end of the alternative, assuming short-hydroperiod biomass production in the final year of Alternative 3 continues at the same level through the end of Alternative 4 (2032).

Table I–14. Summary of Changes in Short-Hydroperiod Wetlands and Wood Stork Impacts Under Alternative 4

Net gain (loss) in suitable short-hydroperiod habitat from baseline (acres)	(9,677)
All Birds Suitability Index	
Net gain (loss) in short-hydroperiod biomass produced from baseline in final year (kilograms)[a]	(3,027)
Average gain (loss) of nests per year[b]	(11)
Average gain (loss) of birds per year[c]	(15)
Cumulative gain (loss) of birds[d]	(458)
Wading Birds Suitability Index	
Net gain (loss) in short-hydroperiod biomass produced from baseline in final year (kilograms)[a]	(4,193)
Average gain (loss) of nests per year[b]	(20)
Average gain (loss) of birds per year[c]	(26)
Cumulative gain (loss) of birds[d]	(813)

[a] Net gain (loss) in fish biomass (kilograms) is the change from the baseline in the amount of biomass available for wood storks each year at the end of the alternative.

[b] Average nests lost per year = total kilograms of fish biomass lost over the life of the alternative/total biomass produced in the core foraging area over the life of the alternative × average number of nesting pairs of wood storks observed (394 from 1997–2008).

[c] Average birds lost per year = average number of nests lost × 1.29 fledgling birds/nest.

[d] Cumulative loss figures = total nests lost × 1.29 fledgling birds/nest.

I.1.5 Potential Impacts of Short-Hydroperiod Wetlands on Wood Storks Under Alternative 5

Table I–15 presents a summary of the potential impacts of Alternative 5 on the amount of suitable short-hydroperiod cover types available for wood storks at the end of this alternative if it is implemented under average hydrologic conditions. Approximately 20,600 acres of suitable short-hydroperiod habitat would be available in the Lake Belt, compared with the baseline of approximately 28,700 acres.

Table I–15. Short-Hydroperiod Wetlands Within the Lake Belt After Proposed Mining Without Mitigation – Alternative 5 (acres)

Cover Type	Short Hydroperiod, Inactive	Hydroperiod Class			Total
		1	2	3	
Other water	718	21	15	-	754
Canals	170	28	39	32	269
Dense melaleuca saplings	2,286	91	354	533	3,264
Dense melaleuca	1,233	1,830	595	1,049	4,707
Prairie	400	1,278	978	3,303	5,959
Prairie with melaleuca (10–50%)	-	785	404	1,152	2,342
Prairie with melaleuca (50–75%)	171	1,017	401	1,060	2,649
FPL transmission corridor	459	2	49	15	525
Disturbed prairie with melaleuca (10–50%)	73	-	-	-	73
Disturbed prairie with melaleuca (50–75%)	27	-	-	-	27
Disturbed prairie	9	-	-	-	9
Total Suitable Habitat for Wood Storks	**5,546**	**5,052**	**2,835**	**7,144**	**20,578**

Note: Totals may not add due to rounding.
Key: %=percent; FPL=Florida Power and Light Company.

As shown in Table I–16, approximately 1,600 to 2,100 kilograms of short-hydroperiod prey fish production within the Lake Belt could be lost annually by the end of Alternative 5 under average hydrologic conditions due to the loss of approximately 8,100 acres of suitable short-hydroperiod habitat compared with the baseline and associated changes in the hydroperiods of remaining habitat. The loss of this amount of short-hydroperiod biomass is expected to adversely affect wood storks that use the Lake Belt and its adjacent wetlands without mitigation actions being taken. From 2002 through the end of Alternative 5 (as soon as 2028), the projected loss of short-hydroperiod biomass would result in 6.8 to

11 fewer nests and 8.8 to 14 fewer birds per year on average and a cumulative projected loss of 237 to 388 wood storks over the life of the alternative without considering the potential benefits of mitigation activities.

Table I–16. Summary of Changes in Short-Hydroperiod Wetlands and Wood Stork Impacts Under Alternative 5

Net gain (loss) in suitable short-hydroperiod habitat from baseline (acres)	(8,107)
All Birds Suitability Index	
Net gain (loss) in short-hydroperiod biomass produced from baseline in final year (kilograms)[a]	(1,648)
Average gain (loss) of nests per year[b]	(6.8)
Average gain (loss) of birds per year[c]	(8.8)
Cumulative gain (loss) of birds[d]	(237)
Wading Birds Suitability Index	
Net gain (loss) in short-hydroperiod biomass produced from baseline in final year (kilograms)[a]	(2,110)
Average gain (loss) of nests per year[b]	(11)
Average gain (loss) of birds per year[c]	(14)
Cumulative gain (loss) of birds[d]	(388)

[a] Net gain (loss) in fish biomass (kilograms) is the change from the baseline in the amount of biomass available for wood storks each year at the end of the alternative.

[b] Average nests lost per year = total kilograms of fish biomass lost over the life of the alternative/total biomass produced in the core foraging area over the life of the alternative × average number of nesting pairs of wood storks observed (394 from 1997–2008).

[c] Average birds lost per year = average number of nests lost × 1.29 fledgling birds/nest.

[d] Cumulative loss figures = total nests lost × 1.29 fledgling birds/nest.

Compared with Alternative 4 without mitigation, Alternative 5 without mitigation would result in approximately 1,600 more acres of suitable short-hydroperiod habitat in the Lake Belt and about 150 to 310 more wood storks, assuming short-hydroperiod biomass production in the final year of Alternative 5 continues at the same level through the end of Alternative 4 (as soon as 2032).

I.1.6 Potential Impacts of Short-Hydroperiod Wetlands on Wood Storks Under Alternative 6

Table I–17 presents a summary of the potential impacts of Alternative 6 on the amount of suitable short-hydroperiod cover types available for wood storks at the end of this alternative if it is implemented under average hydrologic conditions. Approximately 19,100 acres of suitable short-hydroperiod habitat would be available in the Lake Belt, compared with the baseline of approximately 28,700 acres.

Table I–17. Short-Hydroperiod Wetlands Within the Lake Belt After Proposed Mining Without Mitigation – Alternative 6 (acres)

Cover Type	Short Hydroperiod, Inactive	Hydroperiod Class			Total
		1	2	3	
Other water	719	8	25	3	755
Canals	168	49	35	12	264
Dense melaleuca saplings	2,279	101	92	117	2,589
Dense melaleuca	1,236	1,721	421	546	3,924
Prairie	443	1,430	1,685	2,978	6,536
Prairie with melaleuca (10–50%)	-	798	290	915	2,003
Prairie with melaleuca (50–75%)	164	1,023	346	841	2,374
FPL transmission corridor	460	1	29	27	517
Disturbed prairie with melaleuca (10–50%)	73	-	-	-	73
Disturbed prairie with melaleuca (50–75%)	27	-	-	-	27
Disturbed prairie	9	-	-	-	9
Total Suitable Habitat for Wood Storks	**5,578**	**5,131**	**2,923**	**5,439**	**19,071**

Note: Totals may not add due to rounding.
Key: %=percent; FPL=Florida Power and Light Company.

As shown in Table I–18, approximately 3,000 to 4,100 kilograms of short-hydroperiod prey fish production within the Lake Belt could be lost annually by the end of Alternative 6 under average hydrologic conditions due to the loss of approximately 9,600 acres of suitable short-hydroperiod habitat compared with the baseline and associated changes in the hydroperiods of remaining habitat. The loss of this amount of short-hydroperiod biomass is expected to adversely affect wood storks that use the Lake Belt and its adjacent wetlands without mitigation actions being taken. From 2002 through the end of Alternative 6 (as soon as 2031), the projected loss of short-hydroperiod biomass would result in 11 to 20 fewer nests and 14 to 26 fewer birds per year on average and a cumulative projected loss of 432 to 773 wood storks over the life of the alternative without considering the potential benefits of mitigation activities.

Table I–18. Summary of Changes in Short-Hydroperiod Wetlands and Wood Stork Impacts Under Alternative 6

Net gain (loss) in suitable short-hydroperiod habitat from baseline (acres)	(9,614)
All Birds Suitability Index	
Net gain (loss) in short-hydroperiod biomass produced from baseline in final year (kilograms)[a]	(2,954)
Average gain (loss) of nests per year[b]	(11)
Average gain (loss) of birds per year[c]	(14)
Cumulative gain (loss) of birds[d]	(432)
Wading Birds Suitability Index	
Net gain (loss) in short-hydroperiod biomass produced from baseline in final year (kilograms)[a]	(4,142)
Average gain (loss) of nests per year[b]	(20)
Average gain (loss) of birds per year[c]	(26)
Cumulative gain (loss) of birds[d]	(773)

[a] Net gain (loss) in fish biomass (kilograms) is the change from the baseline in the amount of biomass available for wood storks each year at the end of the alternative.

[b] Average nests lost per year = total kilograms of fish biomass lost over the life of the alternative/total biomass produced in the core foraging area over the life of the alternative × average number of nesting pairs of wood storks observed (394 from 1997–2008).

[c] Average birds lost per year = average number of nests lost × 1.29 fledgling birds/nest.

[d] Cumulative loss figures = total nests lost × 1.29 fledgling birds/nest.

Compared with Alternative 4 without mitigation, Alternative 6 without mitigation would result in approximately 60 more acres of suitable short-hydroperiod habitat in the Lake Belt. Even though additional short-hydroperiod habitat in the Lake Belt is projected under Alternative 6, compared with Alternative 4, Alternative 6 is projected to result in about 5 to 17 fewer wood storks, assuming short-hydroperiod biomass production in the final year of Alternative 6 continues at the same level through the end of Alternative 4 (as soon as 2032). This is because the maximum losses projected under Alternative 6 are nearly identical to those projected under Alternative 4 and are realized earlier than the end of Alternative 4 (2031 versus 2032), and then carried through the end of Alternative 4.

I.1.7 Potential Impacts of Short-Hydroperiod Wetlands on Wood Storks Under Alternative 7

Table I–19 presents a summary of the potential impacts of Alternative 7 on the amount of suitable short-hydroperiod cover types available for wood storks at the end of this alternative if it is implemented under average hydrologic conditions. Approximately 20,600 acres of suitable short-hydroperiod habitat would be available in the Lake Belt, compared with the baseline of approximately 28,700 acres.

As shown in Table I–20, approximately 1,600 to 2,100 kilograms of short-hydroperiod prey fish production within the Lake Belt could be lost annually by the end of Alternative 7 under average hydrologic conditions due to the loss of approximately 8,000 acres of suitable short-hydroperiod habitat compared with the baseline and associated changes in the hydroperiods of remaining habitat. The loss of this amount of short-hydroperiod biomass is expected to adversely affect wood storks that use the Lake Belt and its adjacent wetlands without mitigation actions being taken. From 2002 through the end of Alternative 7 (as soon as 2026), the projected loss of short-hydroperiod biomass would result in 6.5 to 11 fewer nests and 8.3 to 14 fewer birds per year on average and a cumulative projected loss of 209 to

345 wood storks over the life of the alternative without considering the potential benefits of mitigation activities.

Table I–19. Short-Hydroperiod Wetlands Within the Lake Belt After Proposed Mining Without Mitigation – Alternative 7 (acres)

Cover Type	Short Hydroperiod, Inactive	Hydroperiod Class			Total
		1	2	3	
Other water	719	21	15	-	755
Canals	170	28	39	32	269
Dense melaleuca saplings	2,286	91	354	533	3,264
Dense melaleuca	1,245	1,830	595	1,049	4,719
Prairie	443	1,278	978	3,303	6,002
Prairie with melaleuca (10–50%)	-	787	405	1,155	2,348
Prairie with melaleuca (50–75%)	171	1,017	401	1,060	2,649
FPL transmission corridor	459	2	49	15	525
Disturbed prairie with melaleuca (10–50%)	73	-	-	-	73
Disturbed prairie with melaleuca (50–75%)	27	-	-	-	27
Disturbed prairie	9	-	-	-	9
Total Suitable Habitat for Wood Storks	**5,602**	**5,054**	**2,836**	**7,147**	**20,640**

Note: Totals may not add due to rounding.
Key: %=percent; FPL=Florida Power and Light Company.

Table I–20. Summary of Changes in Short-Hydroperiod Wetlands and Wood Stork Impacts Under Alternative 7

Net gain (loss) in suitable short-hydroperiod habitat from baseline (acres)	(8,045)
All Birds Suitability Index	
Net gain (loss) in short-hydroperiod biomass produced from baseline in final year (kilograms)[a]	(1,575)
Average gain (loss) of nests per year[b]	(6.5)
Average gain (loss) of birds per year[c]	(8.3)
Cumulative gain (loss) of birds[d]	(209)
Wading Birds Suitability Index	
Net gain (loss) in short-hydroperiod biomass produced from baseline in final year (kilograms)[a]	(2,056)
Average gain (loss) of nests per year[b]	(11)
Average gain (loss) of birds per year[c]	(14)
Cumulative gain (loss) of birds[d]	(345)

[a] Net gain (loss) in fish biomass (kilograms) is the change from the baseline in the amount of biomass available for wood storks each year at the end of the alternative.

[b] Average nests lost per year = total kilograms of fish biomass lost over the life of the alternative/total biomass produced in the core foraging area over the life of the alternative × average number of nesting pairs of wood storks observed (394 from 1997–2008).

[c] Average birds lost per year = average number of nests lost × 1.29 fledgling birds/nest.

[d] Cumulative loss figures = total nests lost × 1.29 fledgling birds/nest.

Compared with Alternative 4 without mitigation, Alternative 7 without mitigation would result in approximately 1,600 more acres of suitable short-hydroperiod habitat in the Lake Belt and about 150 to 300 more wood storks, assuming short-hydroperiod biomass production in the final year of Alternative 7 continues at the same level through the end of Alternative 4 (as soon as 2032).

I.1.8 Potential Impacts of Short-Hydroperiod Wetlands on Wood Storks Under Alternative 8

Table I–21 presents a summary of the potential impacts of Alternative 8 on the amount of suitable short-hydroperiod cover types available for wood storks at the end of this alternative if it is implemented under average hydrologic conditions. Approximately 19,900 acres of suitable short-hydroperiod habitat would be available in the Lake Belt, compared with the baseline of approximately 28,700 acres.

Table I–21. Short-Hydroperiod Wetlands Within the Lake Belt After Proposed Mining Without Mitigation – Alternative 8 (acres)

Cover Type	Short Hydroperiod, Inactive	Hydroperiod Class			Total
		1	2	3	
Other water	720	18	15	2	755
Canals	170	35	42	20	267
Dense melaleuca saplings	2,280	113	312	241	2,946
Dense melaleuca	1,161	1,911	535	777	4,384
Prairie	428	1,314	1,416	3,082	6,240
Prairie with melaleuca (10–50%)	-	816	302	1,035	2,153
Prairie with melaleuca (50–75%)	140	1,040	389	931	2,500
FPL transmission corridor	458	2	32	30	522
Disturbed prairie with melaleuca (10–50%)	73	-	-	-	73
Disturbed prairie with melaleuca (50–75%)	27	-	-	-	27
Disturbed prairie	9	-	-	-	9
Total Suitable Habitat for Wood Storks	**5,466**	**5,249**	**3,043**	**6,118**	**19,876**

Note: Totals may not add due to rounding.
Key: %=percent; FPL=Florida Power and Light Company.

As shown in Table I–22, approximately 2,500 to 3,300 kilograms of short-hydroperiod prey fish production within the Lake Belt could be lost annually by the end of Alternative 8 under average hydrologic conditions due to the loss of approximately 8,800 acres of suitable short-hydroperiod habitat compared with the baseline and associated changes in the hydroperiods of remaining habitat. The loss of this amount of short-hydroperiod biomass is expected to adversely affect wood storks that use the Lake Belt and its adjacent wetlands without mitigation actions being taken. From 2002 through the end of Alternative 8 (as soon as 2028), the projected losses of biomass would result in 9 to 16 fewer nests and 12 to 21 fewer birds per year on average and a cumulative projected loss of 328 to 558 wood storks over the life of the alternative without considering the potential benefits of mitigation activities.

Table I–22. Summary of Changes in Short-Hydroperiod Wetlands and Wood Stork Impacts Under Alternative 8

Net gain (loss) in suitable short-hydroperiod habitat from baseline (acres)	(8,809)
All Birds Suitability Index	
Net gain (loss) in short-hydroperiod biomass produced from baseline in final year (kilograms)[a]	(2,489)
Average gain (loss) of nests per year[b]	(9)
Average gain (loss) of birds per year[c]	(12)
Cumulative gain (loss) of birds[d]	(328)
Wading Birds Suitability Index	
Net gain (loss) in short-hydroperiod biomass produced from baseline in final year (kilograms)[a]	(3,300)
Average gain (loss) of nests per year[b]	(16)
Average gain (loss) of birds per year[c]	(21)
Cumulative gain (loss) of birds[d]	(558)

[a] Net gain (loss) in fish biomass (kilograms) is the change from the baseline in the amount of biomass available for wood storks each year at the end of the alternative.

[b] Average nests lost per year = total kilograms of fish biomass lost over the life of the alternative/total biomass produced in the core foraging area over the life of the alternative × average number of nesting pairs of wood storks observed (394 from 1997–2008).

[c] Average birds lost per year = average number of nests lost × 1.29 fledgling birds/nest.

[d] Cumulative loss figures = total nests lost × 1.29 fledgling birds/nest.

Compared with Alternative 4 without mitigation, Alternative 8 without mitigation would result in approximately 870 more acres of suitable short-hydroperiod habitat in the Lake Belt and about 27 to 75 more wood storks, assuming short-hydroperiod biomass production in the final year of Alternative 8 continues at the same level through the end of Alternative 4 (as soon as 2032).

I.1.9 Potential Impacts of Short-Hydroperiod Wetlands on Wood Storks Under Alternative 9

Table I–23 presents a summary of the potential impacts of Alternative 9 on the amount of suitable short-hydroperiod cover types available for wood storks at the end of this alternative if it is implemented under average hydrologic conditions. Approximately 19,500 acres of suitable short-hydroperiod habitat would be available in the Lake Belt, compared with the baseline of approximately 28,700 acres.

Table I–23. Short-Hydroperiod Wetlands Within the Lake Belt After Proposed Mining Without Mitigation – Alternative 9 (acres)

Cover Type	Short Hydroperiod, Inactive	Hydroperiod Class			Total
		1	2	3	
Other water	719	18	15	2	754
Canals	168	33	49	15	265
Dense melaleuca saplings	2,279	120	208	155	2,762
Dense melaleuca	1,226	1,800	563	646	4,235
Prairie	401	1,291	1,492	3,082	6,266
Prairie with melaleuca (10–50%)	-	747	378	971	2,096
Prairie with melaleuca (50–75%)	163	1,017	370	915	2,465
FPL transmission corridor	460	2	31	24	517
Disturbed prairie with melaleuca (10–50%)	73	-	-	-	73
Disturbed prairie with melaleuca (50–75%)	27	-	-	-	27
Disturbed prairie	9	-	-	-	9
Total Suitable Habitat for Wood Storks	**5,525**	**5,028**	**3,106**	**5,810**	**19,469**

Note: Totals may not add due to rounding.
Key: %=percent; FPL=Florida Power and Light Company.

As shown in Table I–24, approximately 2,600 to 3,600 kilograms of short-hydroperiod prey fish production within the Lake Belt could be lost annually by the end of Alternative 9 under average hydrologic conditions due to the loss of approximately 9,200 acres of suitable short-hydroperiod habitat compared with the baseline and associated changes in the hydroperiods of remaining habitat. The loss of this amount of short-hydroperiod biomass is expected to adversely affect wood storks that use the Lake Belt and its adjacent wetlands without mitigation actions being taken. From 2002 through the end of Alternative 9 (as soon as 2030), the projected losses of biomass would result in 10 to 17 fewer nests and 13 to 22 fewer birds per year on average and a cumulative projected loss of 376 to 650 wood storks over the life of the alternative without considering the potential benefits of mitigation activities.

Compared with Alternative 4 without mitigation, Alternative 9 without mitigation would result in approximately 460 more acres of suitable short-hydroperiod habitat in the Lake Belt and about 27 to 66 more wood storks, assuming short-hydroperiod biomass production in the final year of Alternative 9 continues at the same level through the end of Alternative 4 (as soon as 2032).

Table I–24. Summary of Changes in Short-Hydroperiod Wetlands and Wood Stork Impacts Under Alternative 9

Net gain (loss) in suitable short-hydroperiod habitat from baseline (acres)	(9,216)
All Birds Suitability Index	
Net gain (loss) in short-hydroperiod biomass produced from baseline in final year (kilograms)[a]	(2,632)
Average gain (loss) of nests per year[b]	(10)
Average gain (loss) of birds per year[c]	(13)
Cumulative gain (loss) of birds[d]	(376)
Wading Birds Suitability Index	
Net gain (loss) in short-hydroperiod biomass produced from baseline in final year (kilograms)[a]	(3,563)
Average gain (loss) of nests per year[b]	(17)
Average gain (loss) of birds per year[c]	(22)
Cumulative gain (loss) of birds[d]	(650)

[a] Net gain (loss) in fish biomass (kilograms) is the change from the baseline in the amount of biomass available for wood storks each year at the end of the alternative.

[b] Average nests lost per year = total kilograms of fish biomass lost over the life of the alternative/total biomass produced in the core foraging area over the life of the alternative × average number of nesting pairs of wood storks observed (394 from 1997–2008).

[c] Average birds lost per year = average number of nests lost × 1.29 fledgling birds/nest.

[d] Cumulative loss figures = total nests lost × 1.29 fledgling birds/nest.

I.2 POTENTIAL IMPACTS OF MITIGATION ON SHORT-HYDROPERIOD WETLANDS AND WOOD STORKS

As discussed in Section 5.1, one of the proposed mitigation activities already under way is improving suitable wood stork foraging habitat in the Lake Belt area by eradicating dense melaleuca from the Pennsuco Wetlands and maintaining these treated areas over the long term. This is particularly true with respect to short-hydroperiod wetlands since the majority of the wetlands within the Lake Belt are considered short-hydroperiod wetlands. To date, nearly 2,800 acres of wetlands in the Pennsuco Wetlands have been treated to eradiate melaleuca. Up to 6,200 acres of wetlands in the Pennsuco Wetlands are infested with melaleuca and could be treated. Some of these areas would be transformed from low-value suitable habitat (e.g., dense mature melaleuca, dense melaleuca saplings) to more valuable habitat in terms of wood stork suitability (e.g., prairie). Treatment of these areas could increase the value of suitable short-hydroperiod habitat for the wood stork within the Lake Belt.

I.2.1 Potential Impacts of Short-Hydroperiod Wetlands on Wood Storks Under Alternative 1 with Mitigation

Table I–25 presents a summary of the potential impacts of Alternative 1, coupled with mitigation, on the amount of suitable short-hydroperiod cover types available for wood storks at the end of this alternative if it is implemented under average hydrologic conditions. Approximately 26,400 acres of suitable short-hydroperiod habitat would be available in the Lake Belt, compared with the baseline of approximately 28,700 acres. However, there would be a large increase in high-value habitat (about 8,300 acres of prairie compared with 6,200 acres in the baseline) due to melaleuca eradication efforts in the Lake Belt. This increase is expected to help wood storks during their critical nesting period.

Table I–25. Short-Hydroperiod Wetlands Within the Lake Belt After Proposed Mining with Mitigation – Alternative 1 (acres)

Cover Type	Short Hydroperiod, Inactive	Hydroperiod Class			Total
		1	2	3	
Other water	794	4	34	2	834
Canals	189	19	26	53	287
Dense melaleuca saplings	3,728	88	571	882	5,269
Dense melaleuca	3,499	960	563	751	5,773
Prairie	963	2,156	1,041	4,131	8,291
Prairie with melaleuca (10–50%)	127	1,033	371	1,261	2,792
Prairie with melaleuca (50–75%)	488	652	377	777	2,294
FPL transmission corridor	525	4	30	24	583
Disturbed prairie with melaleuca (10–50%)	140	-	-	-	140
Disturbed prairie with melaleuca (50–75%)	108	-	-	-	108
Disturbed prairie	19	-	-	-	19
Total Suitable Habitat for Wood Storks	**10,580**	**4,916**	**3,013**	**7,881**	**26,390**

Note: Totals may not add due to rounding.
Key: %=percent; FPL=Florida Power and Light Company.

With the proposed mitigation activities already complete in the Pennsuco Wetlands, it is projected that approximately 2,300 to 5,100 kilograms of short-hydroperiod prey fish biomass would be gained compared with Alternative 1 without mitigation, as shown in Table I–26. Compared with the baseline, between 1,800 and 4,600 kilograms of short-hydroperiod prey fish biomass production within the Lake Belt could be gained annually by the end of Alternative 1 using the wading birds and all birds suitability factors, respectively. From 2002 through the end of Alternative 1 (as soon as 2008), the projected gains in fish biomass due to proposed mitigation activities could result in 9 to 19 more nests and 12 to 24 more birds per year on average and a cumulative gain of 85 to 168 wood storks over the life of the alternative.

Table I–26. Summary of Changes in Short-Hydroperiod Wetlands and Wood Stork Impacts Under Alternative 1 with Mitigation

Net gain (loss) in short-hydroperiod prairie habitat (acres)	2,118
All Birds Suitability Index	
Net gain (loss) in short-hydroperiod biomass produced from Alternative 1 without mitigation in final year (kilograms)	5,080
Net gain (loss) in short-hydroperiod biomass produced from baseline in final year (kilograms)[a]	4,644
Average gain (loss) of nests per year[b]	19
Average gain (loss) of birds per year[c]	24
Cumulative gain (loss) of birds[d]	168
Wading Birds Suitability Index	
Net gain (loss) in short-hydroperiod biomass produced from Alternative 1 without mitigation in final year (kilograms)	2,273
Net gain (loss) in short-hydroperiod biomass produced from baseline in final year (kilograms)[a]	1,790
Average gain (loss) of nests per year[b]	9
Average gain (loss) of birds per year[c]	12
Cumulative gain (loss) of birds[d]	85

[a] Net gain (loss) in fish biomass (kilograms) is the projected change from the baseline in the amount of biomass available for wood storks in the last year of the alternative.

[b] Average gain (loss) of nests per year = total kilograms fish biomass gained or lost over the life of the alternative/total biomass produced in the core foraging area over the life of the alternative × average number of nesting pairs of wood storks observed (394 from 1997–2008).

[c] Average gain (loss) of birds per year = average number of nests gained or lost per year over the life of the alternative × 1.29 fledgling birds/nest.

[d] Cumulative gain (loss) figures = total nests gained or lost over the life of the alternative × 1.29 fledgling birds/nest.

Compared with Alternative 4 with mitigation, Alternative 1 with mitigation would result in about 7,400 more acres of suitable short-hydroperiod habitat in the Lake Belt and about 100 to 640 more wood storks, assuming the biomass gains in the final year of Alternative 1 continue at the same level through the end of Alternative 4 (as soon as 2032).

I.2.2 Potential Impacts of Short-Hydroperiod Wetlands on Wood Storks Under Alternative 2 with Mitigation

Table I–27 presents a summary of the potential impacts of Alternative 2, coupled with mitigation, on the amount of suitable short-hydroperiod cover types available for wood storks at the end of this alternative if it is implemented under average hydrologic conditions. Approximately 25,700 acres of suitable short-hydroperiod habitat would be available in the Lake Belt, compared with the baseline of approximately 28,700 acres. However, there would be a large increase in high-value habitat (about 8,300 acres of prairie compared with 6,200 acres in the baseline) due to melaleuca eradication efforts in the Lake Belt. This increase is expected to help wood storks during their critical nesting period. As a result, short-hydroperiod biomass is projected to increase compared with the baseline.

Table I–27. Short-Hydroperiod Wetlands Within the Lake Belt After Proposed Mining with Mitigation – Alternative 2 (acres)

Cover Type	Short Hydroperiod, Inactive	Hydroperiod Class			Total
		1	2	3	
Other water	766	4	30	5	805
Canals	183	23	25	53	284
Dense melaleuca saplings	3,075	74	417	981	4,547
Dense melaleuca	3,561	1,049	479	808	5,897
Prairie	729	2,269	961	4,366	8,325
Prairie with melaleuca (10–50%)	132	1,047	328	1,347	2,854
Prairie with melaleuca (50–75%)	421	675	304	806	2,205
FPL transmission corridor	505	2	24	33	564
Disturbed prairie with melaleuca (10–50%)	132	-	-	-	132
Disturbed prairie with melaleuca (50–75%)	58	-	-	-	58
Disturbed prairie	19	-	-	-	19
Total Suitable Habitat for Wood Storks	**9,581**	**5,143**	**2,569**	**8,398**	**25,691**

Note: Totals may not add due to rounding.
Key: %=percent; FPL=Florida Power and Light Company.

With the proposed mitigation activities in the Pennsuco Wetlands, it is projected that approximately 2,700 to 5,400 kilograms of short-hydroperiod prey fish biomass would be gained compared with Alternative 2 without mitigation, as shown in Table I–28. Compared with the baseline, between 2,500 and 5,500 kilograms of short-hydroperiod prey fish biomass production within the Lake Belt could be gained annually by the end of Alternative 2 using the wading birds and all birds suitability factors, respectively. From 2002 through the end of Alternative 2 (as soon as 2012), the projected gains in fish biomass due to proposed mitigation activities could result in 15 to 27 more nests and 19 to 35 more birds per year on average and a cumulative gain of 206 to 383 wood storks over the life of the alternative.

Table I–28. Summary of Changes in Short-Hydroperiod Wetlands and Wood Stork Impacts Under Alternative 2 with Mitigation

Net gain (loss) in short-hydroperiod prairie habitat (acres)	2,152
All Birds Suitability Index	
Net gain (loss) in short-hydroperiod biomass produced from Alternative 2 without mitigation in final year (kilograms)	5,364
Net gain (loss) in short-hydroperiod biomass produced from baseline in final year (kilograms)[a]	5,538
Average gain (loss) of nests per year[b]	27
Average gain (loss) of birds per year[c]	35
Cumulative gain (loss) of birds[d]	383
Wading Birds Suitability Index	
Net gain (loss) in short-hydroperiod biomass produced from Alternative 2 without mitigation in final year (kilograms)	2,402
Net gain (loss) in short-hydroperiod biomass produced from baseline in final year (kilograms)[a]	2,466
Average gain (loss) of nests per year[b]	15
Average gain (loss) of birds per year[c]	19
Cumulative gain (loss) of birds[d]	206

[a] Net gain (loss) in fish biomass (kilograms) is the projected change from the baseline in the amount of biomass available for wood storks in the last year of the alternative.

[b] Average gain (loss) of nests per year = total kilograms fish biomass gained or lost over the life of the alternative/total biomass produced in the core foraging area over the life of the alternative × average number of nesting pairs of wood storks observed (394 from 1997–2008).

[c] Average gain (loss) of birds per year = average number of nests gained or lost per year over the life of the alternative × 1.29 fledgling birds/nest.

[d] Cumulative gain (loss) figures = total nests gained or lost over the life of the alternative × 1.29 fledgling birds/nest.

Compared with Alternative 4 with mitigation, Alternative 2 with mitigation would result in about 6,700 more acres of suitable short-hydroperiod habitat in the Lake Belt and about 300 to 850 more wood storks, assuming the short-hydroperiod biomass changes in the final year of Alternative 2 continue at the same level through the end of Alternative 4 (as soon as 2032).

I.2.3 Potential Impacts of Short-Hydroperiod Wetlands on Wood Storks Under Alternative 3 with Mitigation

Table I–29 presents a summary of the potential impacts of Alternative 3, coupled with mitigation, on the amount of suitable short-hydroperiod cover types available for wood storks at the end of this alternative if it is implemented under average hydrologic conditions. Approximately 22,300 acres of suitable short-hydroperiod habitat would be available in the Lake Belt, compared with the baseline of approximately 28,700 acres. Even with a large projected decrease of suitable short-hydroperiod habitat, there would be a large increase in high-value habitat (about 10,400 acres of prairie compared with 6,200 acres in the baseline) due to melaleuca eradication efforts in the Lake Belt. This increase is expected to help wood storks during their critical nesting period. As a result, short-hydroperiod biomass is projected to increase compared with the baseline.

Table I–29. Short-Hydroperiod Wetlands Within the Lake Belt After Proposed Mining with Mitigation – Alternative 3 (acres)

Cover Type	Short Hydroperiod, Inactive	Hydroperiod Class			Total
		1	2	3	
Other water	734	5	31	2	772
Canals	169	33	26	40	268
Dense melaleuca saplings	2,386	81	188	646	3,301
Dense melaleuca	1,923	939	374	577	3,812
Prairie	656	2,945	1,741	5,033	10,375
Prairie with melaleuca (10–50%)	45	777	286	957	2,066
Prairie with melaleuca (50–75%)	281	258	103	273	915
FPL transmission corridor	469	-	34	31	534
Disturbed prairie with melaleuca (10–50%)	132	-	-	-	132
Disturbed prairie with melaleuca (50–75%)	58	-	-	-	58
Disturbed prairie	19	-	-	-	19
Total Suitable Habitat for Wood Storks	**6,872**	**5,037**	**2,784**	**7,559**	**22,252**

Note: Totals may not add due to rounding.
Key: %=percent; FPL=Florida Power and Light Company.

With the proposed mitigation activities in the Pennsuco Wetlands, it is projected that approximately 2,600 to 7,800 kilograms of short-hydroperiod prey fish biomass would be gained compared with Alternative 3 without mitigation, as shown in Table I–30. Compared with the baseline, between 1,600 and 7,900 kilograms of short-hydroperiod prey fish biomass production within the Lake Belt could be gained annually by the end of Alternative 3 using the wading birds and all birds suitability factors, respectively. From 2002 through the end of Alternative 3 (as soon as 2022), the projected gains in fish biomass due to proposed mitigation activities could result in 15 to 40 more nests and 19 to 52 more birds per year on average and a cumulative gain of 406 to 1,093 wood storks over the life of the alternative.

Table I–30. Summary of Changes in Short-Hydroperiod Wetlands and Wood Stork Impacts Under Alternative 3 with Mitigation

Net gain (loss) in short-hydroperiod prairie habitat (acres)	4,202
All Birds Suitability Index	
Net gain (loss) in short-hydroperiod biomass produced from Alternative 3 without mitigation in final year (kilograms)	7,784
Net gain (loss) in short-hydroperiod biomass produced from baseline in final year (kilograms)[a]	7,918
Average gain (loss) of nests per year[b]	40
Average gain (loss) of birds per year[c]	52
Cumulative gain (loss) of birds[d]	1,093
Wading Birds Suitability Index	
Net gain (loss) in short-hydroperiod biomass produced from Alternative 3 without mitigation in final year (kilograms)	2,608
Net gain (loss) in short-hydroperiod biomass produced from baseline in final year (kilograms)[a]	1,590
Average gain (loss) of nests per year[b]	15
Average gain (loss) of birds per year[c]	19
Cumulative gain (loss) of birds[d]	406

[a] Net gain (loss) in fish biomass (kilograms) is the projected change from the baseline in the amount of biomass available for wood storks in the last year of the alternative.

[b] Average gain (loss) of nests per year = total kilograms fish biomass gained or lost over the life of the alternative/total biomass produced in the core foraging area over the life of the alternative × average number of nesting pairs of wood storks observed (394 from 1997–2008).

[c] Average gain (loss) of birds per year = average number of nests gained or lost per year over the life of the alternative × 1.29 fledgling birds/nest.

[d] Cumulative gain (loss) figures = total nests gained or lost over the life of the alternative × 1.29 fledgling birds/nest.

Compared with Alternative 4 with mitigation, Alternative 3 with mitigation would result in about 3,200 more acres of suitable short-hydroperiod habitat in the Lake Belt and about 600 to 690 more wood storks, assuming the short-hydroperiod biomass changes in the final year of Alternative 3 continue at the same level through the end of Alternative 4 (as soon as 2032).

I.2.4 Potential Impacts of Short-Hydroperiod Wetlands on Wood Storks Under Alternative 4 with Mitigation

Table I–31 presents a summary of the potential impacts of Alternative 4, coupled with mitigation, on the amount of suitable short-hydroperiod cover types available for wood storks at the end of this alternative if it is implemented under average hydrologic conditions. Approximately 19,000 acres of suitable short-hydroperiod habitat would be available in the Lake Belt, compared with the baseline of approximately 28,700 acres. Even with a large projected decrease of suitable short-hydroperiod habitat, there would be a large increase in high-value habitat (about 10,400 acres of prairie compared with 6,200 acres in the baseline) due to melaleuca eradication efforts in the Lake Belt. This increase is expected to help wood storks during their critical nesting period. As a result, short-hydroperiod biomass is projected to increase compared with the baseline using the all birds suitability index and to decrease using the wading birds suitability index.

Table I–31. Short-Hydroperiod Wetlands Within the Lake Belt After Proposed Mining with Mitigation – Alternative 4 (acres)

Cover Type	Short Hydroperiod, Inactive	Hydroperiod Class			Total
		1	2	3	
Other water	718	8	25	3	754
Canals	168	49	35	12	264
Dense melaleuca saplings	2,279	65	59	75	2,479
Dense melaleuca	1,224	658	163	209	2,254
Prairie	400	3,511	2,319	4,215	10,445
Prairie with melaleuca (10–50%)	-	651	237	748	1,636
Prairie with melaleuca (50–75%)	163	179	61	148	551
FPL transmission corridor	460	1	29	27	517
Disturbed prairie with melaleuca (10–50%)	73	-	-	-	73
Disturbed prairie with melaleuca (50–75%)	27	-	-	-	27
Disturbed prairie	9	-	-	-	9
Total Suitable Habitat for Wood Storks	**5,521**	**5,122**	**2,928**	**5,437**	**19,008**

Note: Totals may not add due to rounding.
Key: %=percent; FPL=Florida Power and Light Company.

With the proposed mitigation activities in the Pennsuco Wetlands, it is projected that approximately 2,200 to 6,900 kilograms of short-hydroperiod prey fish biomass would be gained compared with Alternative 4 without mitigation, as shown in Table I–32. Compared to the baseline, between 2,000 fewer and 3,900 more kilograms of short-hydroperiod prey fish biomass production within the Lake Belt could be realized annually by the end of Alternative 4 using the wading birds and all birds suitability factors, respectively. Eventually, the decreased biomass compared with the baseline using the wading birds suitability factor is expected to adversely affect wood storks that use the Lake Belt and its adjacent wetlands. However, because a large number of acres of melaleuca-infested wetlands would be treated before the end of the alternative and gains from current mitigation activities would occur prior to the end of the alternative, there could be a cumulative positive impact through the end of the alternative. From 2002 through the end of Alternative 4 (as soon as 2032), the projected gains in fish biomass due to proposed mitigation activities could result in 0.7 to 31 more nests and 0.9 to 40 more birds per year on average and a cumulative gain of 27 to 1,225 wood storks over the life of the alternative.

Table I–32. Summary of Changes in Short-Hydroperiod Wetlands and Wood Stork Impacts Under Alternative 4 with Mitigation

Net gain (loss) in short-hydroperiod prairie habitat (acres)	4,272
All Birds Suitability Index	
Net gain (loss) in short-hydroperiod biomass produced from Alternative 4 without mitigation in final year (kilograms)	6,937
Net gain (loss) in short-hydroperiod biomass produced from baseline in final year (kilograms)[a]	3,910
Average gain (loss) of nests per year[b]	31
Average gain (loss) of birds per year[c]	40
Cumulative gain (loss) of birds[d]	1,225
Wading Birds Suitability Index	
Net gain (loss) in short-hydroperiod biomass produced from Alternative 4 without mitigation in final year (kilograms)	2,208
Net gain (loss) in short-hydroperiod biomass produced from baseline in final year (kilograms)[a]	(1,985)
Average gain (loss) of nests per year[b]	0.7
Average gain (loss) of birds per year[c]	0.9
Cumulative gain (loss) of birds[d]	27

[a] Net gain (loss) in fish biomass (kilograms) is the projected change from the baseline in the amount of biomass available for wood storks in the last year of the alternative.

[b] Average gain (loss) of nests per year = total kilograms fish biomass gained or lost over the life of the alternative/total biomass produced in the core foraging area over the life of the alternative × average number of nesting pairs of wood storks observed (394 from 1997–2008).

[c] Average gain (loss) of birds per year = average number of nests gained or lost per year over the life of the alternative × 1.29 fledgling birds/nest.

[d] Cumulative gain (loss) figures = total nests gained or lost over the life of the alternative × 1.29 fledgling birds/nest.

Compared with Alternative 3 with mitigation, Alternative 4 with mitigation would result in the loss of about 3,200 acres of suitable short-hydroperiod habitat in the Lake Belt and the cumulative loss of about an additional 600 to 690 wood storks, assuming the biomass changes in the final year of Alternative 3 continue at the same level through the end of Alternative 4 (2032).

I.2.5 Potential Impacts of Short-Hydroperiod Wetlands on Wood Storks Under Alternative 5 with Mitigation

Table I–33 presents a summary of the potential impacts of Alternative 5, coupled with mitigation, on the amount of suitable short-hydroperiod cover types available for wood storks at the end of this alternative if it is implemented under average hydrologic conditions. Approximately 20,600 acres of suitable short-hydroperiod habitat would be available in the Lake Belt, compared with the baseline of approximately 28,700 acres. Even with a large projected decrease of suitable short-hydroperiod habitat, there would be a large increase in high-value habitat (about 9,900 acres of prairie compared with 6,200 acres in the baseline) due to melaleuca eradication efforts in the Lake Belt. This increase is expected to help wood storks during their critical nesting period. As a result, short-hydroperiod biomass is projected to increase compared with the baseline.

Table I–33. Short-Hydroperiod Wetlands Within the Lake Belt After Proposed Mining with Mitigation – Alternative 5 (acres)

Cover Type	Short Hydroperiod, Inactive	Hydroperiod Class			Total
		1	2	3	
Other water	718	21	15	-	754
Canals	170	28	39	32	269
Dense melaleuca saplings	2,286	80	312	470	3,148
Dense melaleuca	1,233	949	309	544	3,035
Prairie	400	3,045	1,666	4,836	9,947
Prairie with melaleuca (10–50%)	-	662	341	972	1,976
Prairie with melaleuca (50–75%)	171	264	104	275	815
FPL transmission corridor	459	2	49	15	525
Disturbed prairie with melaleuca (10–50%)	73	-	-	-	73
Disturbed prairie with melaleuca (50–75%)	27	-	-	-	27
Disturbed prairie	9	-	-	-	9
Total Suitable Habitat for Wood Storks	**5,546**	**5,052**	**2,835**	**7,145**	**20,577**

Note: Totals may not add due to rounding.
Key: %=percent; FPL=Florida Power and Light Company.

With the proposed mitigation activities in the Pennsuco Wetlands, it is projected that approximately 2,700 to 7,900 kilograms of short-hydroperiod prey fish biomass would be gained compared with Alternative 5 without mitigation, as shown in Table I–34. Compared with the baseline, between 550 and 6,300 kilograms of short-hydroperiod prey fish biomass production within the Lake Belt could be gained annually by the end of Alternative 5 using the wading birds and all birds suitability factors, respectively. From 2002 through the end of Alternative 5 (as soon as 2028), the projected gains in fish biomass due to proposed mitigation activities could result in 11 to 38 more nests and 15 to 48 more birds per year on average and a cumulative gain of 396 to 1,307 wood storks over the life of the alternative.

Table I–34. Summary of Changes in Short-Hydroperiod Wetlands and Wood Stork Impacts Under Alternative 5 with Mitigation

Net gain (loss) in short-hydroperiod prairie habitat (acres)	3,774
All Birds Suitability Index	
Net gain (loss) in short-hydroperiod biomass produced from Alternative 5 without mitigation in final year (kilograms)	7,949
Net gain (loss) in short-hydroperiod biomass produced from baseline in final year (kilograms)[a]	6,301
Average gain (loss) of nests per year[b]	38
Average gain (loss) of birds per year[c]	48
Cumulative gain (loss) of birds[d]	1,307
Wading Birds Suitability Index	
Net gain (loss) in short-hydroperiod biomass produced from Alternative 5 without mitigation in final year (kilograms)	2,658
Net gain (loss) in short-hydroperiod biomass produced from baseline in final year (kilograms)[a]	548
Average gain (loss) of nests per year[b]	11
Average gain (loss) of birds per year[c]	15
Cumulative gain (loss) of birds[d]	396

[a] Net gain (loss) in fish biomass (kilograms) is the projected change from the baseline in the amount of biomass available for wood storks in the last year of the alternative.

[b] Average gain (loss) of nests per year = total kilograms fish biomass gained or lost over the life of the alternative/total biomass produced in the core foraging area over the life of the alternative × average number of nesting pairs of wood storks observed (394 from 1997–2008).

[c] Average gain (loss) of birds per year = average number of nests gained or lost per year over the life of the alternative × 1.29 fledgling birds/nest.

[d] Cumulative gain (loss) figures = total nests gained or lost over the life of the alternative × 1.29 fledgling birds/nest.

Compared with Alternative 4 with mitigation, Alternative 5 with mitigation would result in about 1,600 more acres of suitable short-hydroperiod habitat in the Lake Belt and about 340 to 400 more wood storks, assuming the biomass changes in the final year of Alternative 5 continue at the same level through the end of Alternative 4 (as soon as 2032).

I.2.6 Potential Impacts of Short-Hydroperiod Wetlands on Wood Storks Under Alternative 6 with Mitigation

Table I–35 presents a summary of the potential impacts of Alternative 6, coupled with mitigation, on the amount of suitable short-hydroperiod cover types available for wood storks at the end of this alternative if it is implemented under average hydrologic conditions. Approximately 19,100 acres of suitable short-hydroperiod habitat would be available in the Lake Belt, compared with the baseline of approximately 28,700 acres. Even with a large projected decrease of suitable short-hydroperiod habitat, there would be a large increase in high-value habitat (about 10,500 acres of prairie compared with 6,200 acres in the baseline) due to melaleuca eradication efforts in the Lake Belt. This increase is expected to help wood storks during their critical nesting period. As a result, short-hydroperiod biomass is projected to increase compared with the baseline using the all birds suitability index and to decrease using the wading birds suitability index.

Table I–35. Short-Hydroperiod Wetlands Within the Lake Belt After Proposed Mining with Mitigation – Alternative 6 (acres)

Cover Type	Short Hydroperiod, Inactive	Hydroperiod Class			Total
		1	2	3	
Other water	719	8	25	3	755
Canals	168	49	35	12	264
Dense melaleuca saplings	2,279	65	59	75	2,479
Dense melaleuca	1,236	660	161	209	2,266
Prairie	443	3,515	2,315	4,215	10,488
Prairie with melaleuca (10–50%)	-	654	238	750	1,642
Prairie with melaleuca (50–75%)	164	179	61	147	551
FPL transmission corridor	460	1	29	27	517
Disturbed prairie with melaleuca (10–50%)	73	-	-	-	73
Disturbed prairie with melaleuca (50–75%)	27	-	-	-	27
Disturbed prairie	9	-	-	-	9
Total Suitable Habitat for Wood Storks	**5,578**	**5,131**	**2,923**	**5,439**	**19,071**

Note: Totals may not add due to rounding.
Key: %=percent; FPL=Florida Power and Light Company.

With the proposed mitigation activities in the Pennsuco Wetlands, it is projected that approximately 2,200 to 6,900 kilograms of short-hydroperiod prey fish biomass would be gained compared with Alternative 6 without mitigation, as shown in Table I–36. Compared with the baseline, between 1,900 fewer and 4,000 more kilograms of short-hydroperiod prey fish biomass production within the Lake Belt could be realized annually by the end of Alternative 6 using the wading birds and all birds suitability factors, respectively. Eventually, the decreased biomass compared with the baseline using the wading birds suitability factor is expected to adversely affect wood storks that use the Lake Belt and its adjacent wetlands. However, because a large number of acres of melaleuca-infested wetlands would be treated before the end of the alternative and gains from current mitigation activities would occur prior to the end of the alternative, there could be a cumulative positive impact through the end of the alternative. From 2002 through the end of Alternative 6 (as soon as 2031), the projected gains in fish biomass due to proposed mitigation activities could result in 1.0 to 31 more nests and 1.3 to 40 more birds per year on average and a cumulative gain of 38 to 1,190 wood storks over the life of the alternative.

Table I–36. Summary of Changes in Short-Hydroperiod Wetlands and Wood Stork Impacts Under Alternative 6 with Mitigation

Net gain (loss) in short-hydroperiod prairie habitat (acres)	4,315
All Birds Suitability Index	
Net gain (loss) in short-hydroperiod biomass produced from Alternative 6 without mitigation in final year (kilograms)	6,933
Net gain (loss) in short-hydroperiod biomass produced from baseline in final year (kilograms)[a]	3,979
Average gain (loss) of nests per year[b]	31
Average gain (loss) of birds per year[c]	40
Cumulative gain (loss) of birds[d]	1,190
Wading Birds Suitability Index	
Net gain (loss) in short-hydroperiod biomass produced from Alternative 6 without mitigation in final year (kilograms)	2,207
Net gain (loss) in short-hydroperiod biomass produced from baseline in final year (kilograms)[a]	(1,935)
Average gain (loss) of nests per year[b]	1.0
Average gain (loss) of birds per year[c]	1.3
Cumulative gain (loss) of birds[d]	38

[a] Net gain (loss) in fish biomass (kilograms) is the projected change from the baseline in the amount of biomass available for wood storks in the last year of the alternative.

[b] Average gain (loss) of nests per year = total kilograms fish biomass gained or lost over the life of the alternative/total biomass produced in the core foraging area over the life of the alternative × average number of nesting pairs of wood storks observed (394 from 1997–2008).

[c] Average gain (loss) of birds per year = average number of nests gained or lost per year over the life of the alternative × 1.29 fledgling birds/nest.

[d] Cumulative gain (loss) figures = total nests gained or lost over the life of the alternative × 1.29 fledgling birds/nest.

Compared with Alternative 4 with mitigation, Alternative 6 with mitigation would result in about 60 more acres of suitable short-hydroperiod habitat in the Lake Belt and between 16 fewer and 6 more wood storks, assuming the biomass changes in the final year of Alternative 6 continue at the same level through the end of Alternative 4 (as soon as 2032). The reason that there could be fewer wood storks under Alternative 6 compared with Alternative 4 is the shorter possible duration of Alternative 6 (2031 versus 2032), which would result in a faster reduction in the benefits realized from mitigation activities already taken in the Lake Belt over the life of the alternative when using the wading birds suitability factor.

I.2.7 Potential Impacts of Short-Hydroperiod Wetlands on Wood Storks Under Alternative 7 with Mitigation

Table I–37 presents a summary of the potential impacts of Alternative 7, coupled with mitigation, on the amount of suitable short-hydroperiod cover types available to wood storks at the end of this alternative if it is implemented under average hydrologic conditions. Approximately 20,600 acres of suitable short-hydroperiod habitat would be available in the Lake Belt, compared with the baseline of approximately 28,700 acres. Even with a large projected decrease of suitable short-hydroperiod habitat, there would be a large increase in high-value habitat (about 10,000 acres of prairie compared with 6,200 acres in the baseline) due to melaleuca eradication efforts in the Lake Belt. This increase is expected to help wood storks during their critical nesting period. As a result, short-hydroperiod biomass is projected to increase compared with the baseline.

With the proposed mitigation activities in the Pennsuco Wetlands, it is projected that approximately 2,700 to 7,900 kilograms of short-hydroperiod prey fish biomass would be gained compared with Alternative 7 without mitigation, as shown in Table I–38. Compared with the baseline, between 600 and 6,400 kilograms of short-hydroperiod prey fish biomass production within the Lake Belt could be gained annually by the end of Alternative 7 using the wading birds and all birds suitability factors, respectively. From 2002 through the end of Alternative 7 (as soon as 2026), the projected gains in fish biomass due to proposed mitigation activities could result in 12 to 37 more nests and 15 to 48 more birds per year on average and a cumulative gain of 571 to 1,201 wood storks over the life of the alternative.

Table I–37. Short-Hydroperiod Wetlands Within the Lake Belt After Proposed Mining with Mitigation – Alternative 7 (acres)

Cover Type	Short Hydroperiod, Inactive	Hydroperiod Class			Total
		1	2	3	
Other water	719	21	15	-	755
Canals	170	28	39	32	269
Dense melaleuca saplings	2,286	80	312	470	3,148
Dense melaleuca	1,245	949	309	544	3,047
Prairie	443	3,045	1,666	4,836	9,990
Prairie with melaleuca (10–50%)	-	787	405	1,155	2,348
Prairie with melaleuca (50–75%)	171	264	104	275	815
FPL transmission corridor	459	2	49	15	525
Disturbed prairie with melaleuca (10–50%)	73	-	-	-	73
Disturbed prairie with melaleuca (50–75%)	27	-	-	-	27
Disturbed prairie	9	-	-	-	9
Total Suitable Habitat for Wood Storks	**5,602**	**5,054**	**2,836**	**7,148**	**20,639**

Note: Totals may not add due to rounding.
Key: %=percent; FPL=Florida Power and Light Company.

Table I–38. Summary of Changes in Short-Hydroperiod Wetlands and Wood Stork Impacts Under Alternative 7 with Mitigation

Net gain (loss) in short-hydroperiod prairie habitat (acres)	3,817
All Birds Suitability Index	
Net gain (loss) in short-hydroperiod biomass produced from Alternative 7 without mitigation in final year (kilograms)	7,949
Net gain (loss) in short-hydroperiod biomass produced from baseline in final year (kilograms)[a]	6,374
Average gain (loss) of nests per year[b]	37
Average gain (loss) of birds per year[c]	48
Cumulative gain (loss) of birds[d]	1,201
Wading Birds Suitability Index	
Net gain (loss) in short-hydroperiod biomass produced from Alternative 7 without mitigation in final year (kilograms)	2,658
Net gain (loss) in short-hydroperiod biomass produced from baseline in final year (kilograms)[a]	602
Average gain (loss) of nests per year[b]	12
Average gain (loss) of birds per year[c]	15
Cumulative gain (loss) of birds[d]	371

[a] Net gain (loss) in fish biomass (kilograms) is the projected change from the baseline in the amount of biomass available for wood storks in the last year of the alternative.

[b] Average gain (loss) of nests per year = total kilograms fish biomass gained or lost over the life of the alternative/total biomass produced in the core foraging area over the life of the alternative × average number of nesting pairs of wood storks observed (394 from 1997–2008).

[c] Average gain (loss) of birds per year = average number of nests gained or lost per year over the life of the alternative × 1.29 fledgling birds/nest.

[d] Cumulative gain (loss) figures = total nests gained or lost over the life of the alternative × 1.29 fledgling birds/nest.

Compared with Alternative 4 with mitigation, Alternative 7 with mitigation would result in about 1,600 more acres of suitable short-hydroperiod habitat in the Lake Belt and about 370 to 400 more wood storks, assuming the projected biomass changes in the final year of Alternative 7 continue at the same level through the end of Alternative 4 (as soon as 2032).

I.2.8 Potential Impacts of Short-Hydroperiod Wetlands on Wood Storks Under Alternative 8 with Mitigation

As discussed in Section 2.8, Alternative 8 includes an exclusion area that runs from north to south along the eastern border of the Pennsuco Wetlands. Seepage impacts associated with this alternative are discussed in Section 4.6.8. In an attempt to offset these impacts, a seepage mitigation effort that includes construction of the Dade-Broward Levee Recharge Canal has been proposed by the Miami-Dade Limestone Products Association. There are a number of possible mitigation efforts associated with this alternative that could be taken and would result in different potential impacts on wood storks. These potential impacts are discussed below.

I.2.8.1 Potential Impacts of Short-Hydroperiod Wetlands on Wood Storks Under Alternative 8 with Mitigation, Including the Dade-Broward Levee Recharge Canal with Water Pumped from a Lake North of the Northwest Wellfield Recharge Canal

Table I–39 presents a summary of the potential impacts of Alternative 8, coupled with mitigation, on the amount of suitable short-hydroperiod cover types available for wood storks at the end of this alternative if it is implemented under average hydrologic conditions. Under this scenario, water would be pumped into the proposed Dade-Broward Levee Recharge Canal from a quarry lake north of the Northwest Wellfield (NWWF) Recharge Canal. Approximately 18,200 acres of suitable short-hydroperiod habitat would be available in the Lake Belt, compared with the baseline of approximately 28,700 acres. Even with a large projected decrease of suitable short-hydroperiod habitat, there would be a large increase in high-value habitat (about 10,300 acres of prairie compared with 6,200 acres in the baseline) due to melaleuca eradication efforts in the Lake Belt. This increase is expected to help wood storks during their critical nesting period. Due to a combination of mitigation actions, including eradication of melaleuca from the Pennsuco Wetlands and from an approximately 1,500-foot-wide exclusion area to the east of the Pennsuco Wetlands running along the Dade-Broward Levee and excavation of a Dade-Broward Levee Recharge Canal, along with a plan to pump 60 million gallons per day from a nearby lake north of the NWWF Recharge Canal into the Dade-Broward Levee Recharge Canal to help maintain hydroperiods within the Pennsuco Wetlands, it is expected that more of the short-hydroperiod wetlands will be Hydroperiod Class 3 wetlands with much higher biomass productivity levels (up to 1.13 grams per square meter), as opposed to Hydroperiod Classes 1 and 2 (up to 0.25 and 0.49 grams per square meter, respectively). For example, under Alternative 8 with this mitigation scenario, approximately 7,200 acres of suitable Hydroperiod Class 3 habitat are estimated, compared with approximately 6,100 acres under the baseline. As a result, short-hydroperiod biomass is projected to increase compared with the baseline.

Table I–39. Short-Hydroperiod Wetlands Within the Lake Belt After Proposed Mining with Mitigation – Alternative 8 (acres)

Cover Type	Short Hydroperiod, Inactive	Hydroperiod Class			Total
		1	2	3	
Other water	720	4	22	10	756
Canals	170	18	14	110	312
Dense melaleuca saplings	2,280	38	4	68	2,391
Dense melaleuca	1,161	419	74	232	1,886
Prairie	428	3,228	959	5,646	10,261
Prairie with melaleuca (10–50%)	-	460	83	889	1,432
Prairie with melaleuca (50–75%)	140	134	38	193	504
FPL transmission corridor	458	3	23	43	527
Disturbed prairie with melaleuca (10–50%)	73	-	-	-	73
Disturbed prairie with melaleuca (50–75%)	27	-	-	-	27
Disturbed prairie	9	-	-	-	9
Total Suitable Habitat for Wood Storks	**5,466**	**4,304**	**1,216**	**7,191**	**18,177**

Note: Totals may not add due to rounding.
Key: %=percent; FPL=Florida Power and Light Company.

With the proposed mitigation activities in the Pennsuco Wetlands, the proposed exclusion area along the eastern side of the Pennsuco Wetlands, and construction of the Dade-Broward Levee Recharge Canal, it is projected that approximately 2,900 to 8,500 kilograms of short-hydroperiod prey fish biomass would be gained compared with Alternative 8 without mitigation, as shown in Table I–40. Compared with the baseline, between 520 and 7,500 more kilograms of short-hydroperiod prey fish biomass production within the Lake Belt could be realized annually by the end of Alternative 8 using the wading birds and all birds suitability factors, respectively. From 2002 through the end of Alternative 8 (as soon as 2028), the projected gains in fish biomass due to proposed mitigation activities could result in 11 to 41 more nests and 14 to 53 more birds per year on average and a cumulative gain of 391 to 1,439 wood storks over the life of the alternative.

Table I–40. Summary of Changes in Short-Hydroperiod Wetlands and Wood Stork Impacts Under Alternative 8 with Mitigation

Net gain (loss) in short-hydroperiod prairie habitat (acres)	4,088
All Birds Suitability Index	
Net gain (loss) in short-hydroperiod biomass produced from Alternative 8 without mitigation in final year (kilograms)	8,465
Net gain (loss) in short-hydroperiod biomass produced from baseline in final year (kilograms)[a]	7,516
Average gain (loss) of nests per year[b]	41
Average gain (loss) of birds per year[c]	53
Cumulative gain (loss) of birds[d]	1,439
Wading Birds Suitability Index	
Net gain (loss) in short-hydroperiod biomass produced from Alternative 8 without mitigation in final year (kilograms)	2,890
Net gain (loss) in short-hydroperiod biomass produced from baseline in final year (kilograms)[a]	519
Average gain (loss) of nests per year[b]	11
Average gain (loss) of birds per year[c]	14
Cumulative gain (loss) of birds[d]	391

[a] Net gain (loss) in fish biomass (kilograms) is the projected change from the baseline in the amount of biomass available for wood storks in the last year of the alternative.

[b] Average gain (loss) of nests per year = total kilograms fish biomass gained or lost over the life of the alternative/total biomass produced in the core foraging area over the life of the alternative × average number of nesting pairs of wood storks observed (394 from 1997–2008).

[c] Average gain (loss) of birds per year = average number of nests gained or lost per year over the life of the alternative × 1.29 fledgling birds/nest.

[d] Cumulative gain (loss) figures = total nests gained or lost over the life of the alternative × 1.29 fledgling birds/nest.

Compared with Alternative 4 with mitigation, Alternative 8 with this mitigation scenario would result in about 830 fewer acres of suitable short-hydroperiod habitat in the Lake Belt, but, due to inclusion of the Dade-Broward Levee Recharge Canal, it is expected that more of the short-hydroperiod wetlands will be Hydroperiod Class 3 wetlands with much higher biomass productivity levels compared with Hydroperiod Class 1 or 2 wetlands, as discussed above. As a result, Alternative 8 could support about 390 to 525 more wood storks over the life of the alternative, assuming the projected biomass changes in the final year of Alternative 8 continue at the same level through the end of Alternative 4 (as soon as 2032).

I.2.8.2 Potential Impacts of Short-Hydroperiod Wetlands on Wood Storks Under Alternative 8 with Mitigation, Including the Dade-Broward Levee Recharge Canal with Water Pumped from a Lake South of the Northwest Wellfield Recharge Canal

Table I–41 presents a summary of the potential impacts of Alternative 8, coupled with mitigation, on the amount of suitable short-hydroperiod cover types available for wood storks at the end of this alternative if it is implemented under average hydrologic conditions. Under this scenario, water would be pumped into the proposed Dade-Broward Levee Recharge Canal from a quarry lake south of the NWWF Recharge Canal. Approximately 18,500 acres of suitable short-hydroperiod habitat would be available in the Lake Belt, compared with the baseline of approximately 28,700 acres. Even with a large projected decrease of suitable short-hydroperiod habitat, there would be a large increase in high-value habitat (about

10,600 acres of prairie compared with 6,200 acres in the baseline) due to melaleuca eradication efforts in the Lake Belt. This increase is expected to help wood storks during their critical nesting period. Due to a combination of mitigation actions, including eradication of melaleuca from the Pennsuco Wetlands and from an approximately 1,500-foot-wide exclusion area to the east of the Pennsuco Wetlands running along the Dade-Broward Levee and the excavation of a Dade-Broward Levee Recharge Canal, along with a plan to pump 60 million gallons per day from a nearby lake south of the NWWF Recharge Canal into the Dade-Broward Levee Recharge Canal to help maintain hydroperiods within the Pennsuco Wetlands, it is expected that more of the short-hydroperiod wetlands will be Hydroperiod Class 3 wetlands with much higher biomass productivity levels (up to 1.13 grams per square meter), as opposed to Hydroperiod Classes 1 and 2 (up to 0.25 and 0.49 grams per square meter, respectively). For example, under Alternative 8 with this mitigation scenario, approximately 7,200 acres of suitable Hydroperiod Class 3 habitat are estimated, compared with approximately 6,100 acres under the baseline. As a result, short-hydroperiod biomass is projected to increase compared with the baseline.

Table I–41. Short-Hydroperiod Wetlands Within the Lake Belt After Proposed Mining with Mitigation – Alternative 8 (acres)

Cover Type	Short Hydroperiod, Inactive	Hydroperiod Class			Total
		1	2	3	
Other water	720	4	32	-	756
Canals	170	19	21	103	313
Dense melaleuca saplings	2,280	39	6	71	2,395
Dense melaleuca	1,161	442	83	206	1,893
Prairie	427	3,300	1,137	5,729	10,593
Prairie with melaleuca (10–50%)	-	461	88	904	1,454
Prairie with melaleuca (50–75%)	140	134	36	186	495
FPL transmission corridor	458	-	55	14	527
Disturbed prairie with melaleuca (10–50%)	73	-	-	-	73
Disturbed prairie with melaleuca (50–75%)	27	-	-	-	27
Disturbed prairie	9	-	-	-	9
Total Suitable Habitat for Wood Storks	**5,465**	**4,399**	**1,458**	**7,213**	**18,535**

Note: Totals may not add due to rounding.
Key: %=percent; FPL=Florida Power and Light Company.

With the proposed mitigation activities in the Pennsuco Wetlands, the proposed exclusion area along the eastern side of the Pennsuco Wetlands, and construction of the Dade-Broward Levee Recharge Canal, it is projected that approximately 3,600 to 9,600 kilograms of short-hydroperiod prey fish biomass would be gained compared with Alternative 8 without mitigation, as shown in Table I–42. Compared with the baseline, between 1,200 and 8,700 more kilograms of short-hydroperiod prey fish biomass production within the Lake Belt could be realized annually by the end of Alternative 8 using the wading birds and all birds suitability factors, respectively. From 2002 through the end of Alternative 8 (as soon as 2028), the projected gains in fish biomass due to proposed mitigation activities could result in 14 to 45 more nests and 18 to 58 more birds per year on average and a cumulative gain of 494 to 1,565 wood storks over the life of the alternative.

Compared with Alternative 8 with the Dade-Broward Levee Recharge Canal and water pumped from a quarry lake north of the NWWF Recharge Canal, Alternative 8 with the Dade-Broward Levee Recharge Canal and water pumped from a quarry lake south of the NWWF Recharge Canal would result in about 100 to 120 more wood storks over the life of the alternative (as soon as 2028).

Compared with Alternative 4 with mitigation, Alternative 8 with this mitigation scenario would result in about 470 fewer acres of suitable short-hydroperiod habitat in the Lake Belt, but, due to inclusion of the Dade-Broward Levee Recharge Canal, it is expected that more of the short-hydroperiod wetlands will be Hydroperiod Class 3 wetlands with much higher biomass productivity levels compared with Hydroperiod Class 1 or 2 wetlands, as discussed above. As a result, Alternative 8 could support about 540 to

700 more wood storks over the life of the alternative, assuming the projected biomass changes in the final year of Alternative 8 continue at the same level through the end of Alternative 4 (as soon as 2032).

Table I–42. Summary of Changes in Short-Hydroperiod Wetlands and Wood Stork Impacts Under Alternative 8 with Mitigation

Net gain (loss) in short-hydroperiod prairie habitat (acres)	4,420
All Birds Suitability Index	
Net gain (loss) in short-hydroperiod biomass produced from Alternative 8 without mitigation in final year (kilograms)	9,624
Net gain (loss) in short-hydroperiod biomass produced from baseline in final year (kilograms)[a]	8,675
Average gain (loss) of nests per year[b]	45
Average gain (loss) of birds per year[c]	58
Cumulative gain (loss) of birds[d]	1,565
Wading Birds Suitability Index	
Net gain (loss) in short-hydroperiod biomass produced from Alternative 8 without mitigation in final year (kilograms)	3,608
Net gain (loss) in short-hydroperiod biomass produced from baseline in final year (kilograms)[a]	1,237
Average gain (loss) of nests per year[b]	14
Average gain (loss) of birds per year[c]	18
Cumulative gain (loss) of birds[d]	494

[a] Net gain (loss) in fish biomass (kilograms) is the projected change from the baseline in the amount of biomass available for wood storks in the last year of the alternative.

[b] Average gain (loss) of nests per year = total kilograms fish biomass gained or lost over the life of the alternative/total biomass produced in the core foraging area over the life of the alternative × average number of nesting pairs of wood storks observed (394 from 1997–2008).

[c] Average gain (loss) of birds per year = average number of nests gained or lost per year over the life of the alternative × 1.29 fledgling birds/nest.

[d] Cumulative gain (loss) figures = total nests gained or lost over the life of the alternative × 1.29 fledgling birds/nest.

I.2.8.3 Potential Impacts of Short-Hydroperiod Wetlands on Wood Storks Under Alternative 8 with Mitigation, Including Exclusion of Mining in an Area North of the Northwest Wellfield Recharge Canal

Table I–43 presents a summary of the potential impacts of Alternative 8, coupled with mitigation, on the amount of suitable short-hydroperiod cover types available for wood storks at the end of this alternative if it is implemented under average hydrologic conditions. Under this scenario, an additional exclusion area would be included that is south of the Miami Canal and north of the NWWF Recharge Canal. Approximately 20,200 acres of suitable short-hydroperiod habitat would be available in the Lake Belt, compared with the baseline of approximately 28,700 acres. Even with a large projected decrease of suitable short-hydroperiod habitat, there would be a large increase in high-value habitat (about 12,600 acres of prairie compared with 6,200 acres in the baseline) due to melaleuca eradication efforts in the Lake Belt. This increase is expected to help wood storks during their critical nesting period. Due to a combination of mitigation actions, including eradication of melaleuca from the Pennsuco Wetlands and from an approximately 1,500-foot-wide exclusion area to the east of the Pennsuco Wetlands running along the Dade-Broward Levee and the additional exclusion area north of the NWWF Recharge Canal, it is expected that more of the short-hydroperiod wetlands will be Hydroperiod Class 3 wetlands with much higher biomass productivity levels (up to 1.13 grams per square meter), as opposed to Hydroperiod Classes 1 and 2 (up to 0.25 and 0.49 grams per square meter, respectively). For example, under Alternative 8 with this mitigation scenario, approximately 6,500 acres of suitable Hydroperiod Class 3 habitat are estimated, compared with approximately 6,100 acres under the baseline. As a result, short-hydroperiod biomass is projected to increase compared with the baseline.

Table I–43. Short-Hydroperiod Wetlands Within the Lake Belt After Proposed Mining with Mitigation – Alternative 8 (acres)

Cover Type	Short Hydroperiod, Inactive	Hydroperiod Class			Total
		1	2	3	
Other water	721	14	20	2	757
Canals	181	34	38	23	276
Dense melaleuca saplings	2,271	38	7	44	2,359
Dense melaleuca	900	491	111	77	1,578
Prairie	990	3,851	2,431	5,360	12,632
Prairie with melaleuca (10–50%)	-	488	194	807	1,488
Prairie with melaleuca (50–75%)	128	155	60	142	485
FPL transmission corridor	477	2	32	24	535
Disturbed prairie with melaleuca (10–50%)	73	-	-	-	73
Disturbed prairie with melaleuca (50–75%)	27	-	-	-	27
Disturbed prairie	9	-	-	-	9
Total Suitable Habitat for Wood Storks	**5,777**	**5,072**	**2,892**	**6,479**	**20,220**

Note: Totals may not add due to rounding.
Key: %=percent; FPL=Florida Power and Light Company.

With the proposed mitigation activities in the Pennsuco Wetlands, the proposed exclusion area along the eastern side the Pennsuco Wetlands, and the additional exclusion area discussed above, it is projected that approximately 5,600 to 13,300 kilograms of short-hydroperiod prey fish biomass would be gained compared with Alternative 8 without mitigation, as shown in Table I–44. Compared with the baseline, between 2,300 and 10,800 more kilograms of short-hydroperiod prey fish biomass production within the Lake Belt could be realized annually by the end of Alternative 8 using the wading birds and all birds suitability factors, respectively. From 2002 through the end of Alternative 8 (as soon as 2028), the projected gains in fish biomass due to proposed mitigation activities could result in 19 to 52 more nests and 24 to 67 more birds per year on average and a cumulative gain of 650 to 1,800 wood storks over the life of the alternative.

Table I–44. Summary of Changes in Short-Hydroperiod Wetlands and Wood Stork Impacts Under Alternative 8 with Mitigation

Net gain (loss) in short-hydroperiod prairie habitat (acres)	6,459
All Birds Suitability Index	
Net gain (loss) in short-hydroperiod biomass produced from Alternative 8 without mitigation in final year (kilograms)	13,282
Net gain (loss) in short-hydroperiod biomass produced from baseline in final year (kilograms)[a]	10,844
Average gain (loss) of nests per year[b]	52
Average gain (loss) of birds per year[c]	67
Cumulative gain (loss) of birds[d]	1,800
Wading Birds Suitability Index	
Net gain (loss) in short-hydroperiod biomass produced from Alternative 8 without mitigation in final year (kilograms)	5,597
Net gain (loss) in short-hydroperiod biomass produced from baseline in final year (kilograms)[a]	2,327
Average gain (loss) of nests per year[b]	19
Average gain (loss) of birds per year[c]	24
Cumulative gain (loss) of birds[d]	650

[a] Net gain (loss) in fish biomass (kilograms) is the projected change from the baseline in the amount of biomass available for wood storks in the last year of the alternative.

[b] Average gain (loss) of nests per year = total kilograms fish biomass gained or lost over the life of the alternative/total biomass produced in the core foraging area over the life of the alternative × average number of nesting pairs of wood storks observed (394 from 1997–2008).

[c] Average gain (loss) of birds per year = average number of nests gained or lost per year over the life of the alternative × 1.29 fledgling birds/nest.

[d] Cumulative gain (loss) figures = total nests gained or lost over the life of the alternative × 1.29 fledgling birds/nest.

Compared with Alternative 8 with the Dade-Broward Levee Recharge Canal and water pumped from a quarry lake north of the NWWF Recharge Canal, Alternative 8 with an additional exclusion area south of the Miami Canal and north of the NWWF Recharge Canal would result in about 260 to 360 more wood storks over the life of the alternative (as soon as 2028).

Compared with Alternative 4 with mitigation, Alternative 8 with this mitigation scenario would result in about 1,200 more acres of suitable short-hydroperiod habitat in the Lake Belt. It is expected that more of the short-hydroperiod wetlands will be Hydroperiod Class 3 wetlands with much higher biomass productivity levels compared with Hydroperiod Class 1 or 2 wetlands, as discussed above. As a result, Alternative 8 could support about 750 to 1,000 more wood storks over the life of the alternative, assuming the projected biomass changes in the final year of Alternative 8 continue at the same level through the end of Alternative 4 (as soon as 2032).

I.2.8.4 Potential Impacts of Short-Hydroperiod Wetlands on Wood Storks Under Alternative 8 with Mitigation, Including Exclusion of Mining in an Area North of the Wellfield Protection Canal with Water Pumped from a Lake South of the Northwest Wellfield Recharge Canal

Table I–45 presents a summary of the potential impacts of Alternative 8, coupled with mitigation, on the amount of suitable short-hydroperiod cover types available for wood storks at the end of this alternative if it is implemented under average hydrologic conditions. Under this scenario, an additional exclusion area south of the Miami Canal and north of the NWWF Recharge Canal would be included and water would be pumped into the proposed Dade-Broward Levee Recharge Canal from a quarry lake south of the NWWF Recharge Canal. Approximately 18,900 acres of suitable short-hydroperiod habitat would be available in the Lake Belt, compared with the baseline of approximately 28,700 acres. Even with a large projected decrease of suitable short-hydroperiod habitat, there would be a large increase in high-value habitat (about 11,400 acres of prairie compared with 6,200 acres in the baseline) due to melaleuca eradication efforts in the Lake Belt. This increase is expected to help wood storks during their critical nesting period. Due to a combination of mitigation actions, including the eradication of melaleuca from the Pennsuco Wetlands, eradication of melaleuca from an approximately 1,500-foot wide exclusion area to the east of the Pennsuco Wetlands running along the Dade-Broward Levee, and an exclusion area north of the NWWF Recharge Canal, it is expected that more of the short-hydroperiod wetlands will be Hydroperiod Class 3 wetlands with much higher biomass productivity levels (up to 1.13 grams per square meter), as opposed to Hydroperiod Classes 1 and 2 (up to 0.25 and 0.49 grams per square meter, respectively). For example, under Alternative 8 with this mitigation scenario, approximately 7,400 acres of suitable Hydroperiod Class 3 habitat are estimated, compared with approximately 6,100 acres under the baseline. As a result, short-hydroperiod biomass is projected to increase compared with the baseline.

Table I–45. Short-Hydroperiod Wetlands Within the Lake Belt After Proposed Mining with Mitigation – Alternative 8 (acres)

Cover Type	Short Hydroperiod, Inactive	Hydroperiod Class			Total
		1	2	3	
Other water	721	3	32	-	756
Canals	181	19	18	106	324
Dense melaleuca saplings	2,271	35	4	51	2,360
Dense melaleuca	901	383	62	194	1,540
Prairie	990	3,341	1,032	6,000	11,363
Prairie with melaleuca (10–50%)	-	461	74	895	1,430
Prairie with melaleuca (50–75%)	128	131	34	175	468
FPL transmission corridor	477	-	52	15	544
Disturbed prairie with melaleuca (10–50%)	73	-	-	-	73
Disturbed prairie with melaleuca (50–75%)	27	-	-	-	27
Disturbed prairie	9	-	-	-	9
Total Suitable Habitat for Wood Storks	**5,778**	**4,372**	**1,308**	**7,436**	**18,894**

Note: Totals may not add due to rounding.
Key: %=percent; FPL=Florida Power and Light Company.

With the proposed mitigation activities in the Pennsuco Wetlands, the proposed exclusion area along the eastern side of the Pennsuco Wetlands, the additional exclusion area discussed above, and construction of the Dade-Broward Levee Recharge Canal, it is projected that approximately 4,700 to 11,500 kilograms of short-hydroperiod prey fish biomass would be gained compared with Alternative 8 without mitigation, as shown in Table I–46. Compared with the baseline, between 2,300 and 10,600 more kilograms of short-hydroperiod prey fish biomass production within the Lake Belt could be realized annually by the end of Alternative 8 using the wading birds and all birds suitability factors, respectively. From 2002 through the end of Alternative 8 (as soon as 2028), the projected gains in fish biomass due to proposed mitigation activities could result in 19 to 51 more nests and 24 to 65 more birds per year on average and a cumulative gain of 645 to 1,768 wood storks over the life of the alternative.

Table I–46. Summary of Changes in Short-Hydroperiod Wetlands and Wood Stork Impacts Under Alternative 8 with Mitigation

Net gain (loss) in short-hydroperiod prairie habitat (acres)	5,190
All Birds Suitability Index	
Net gain (loss) in short-hydroperiod biomass produced from Alternative 8 without mitigation in final year (kilograms)	11,501
Net gain (loss) in short-hydroperiod biomass produced from baseline in final year (kilograms)[a]	10,552
Average gain (loss) of nests per year[b]	51
Average gain (loss) of birds per year[c]	65
Cumulative gain (loss) of birds[d]	1,768
Wading Birds Suitability Index	
Net gain (loss) in short-hydroperiod biomass produced from Alternative 8 without mitigation in final year (kilograms)	4,659
Net gain (loss) in short-hydroperiod biomass produced from baseline in final year (kilograms)[a]	2,288
Average gain (loss) of nests per year[b]	19
Average gain (loss) of birds per year[c]	24
Cumulative gain (loss) of birds[d]	645

[a] Net gain (loss) in fish biomass (kilograms) is the projected change from the baseline in the amount of biomass available for wood storks in the last year of the alternative.

[b] Average gain (loss) of nests per year = total kilograms fish biomass gained or lost over the life of the alternative/total biomass produced in the core foraging area over the life of the alternative × average number of nesting pairs of wood storks observed (394 from 1997–2008).

[c] Average gain (loss) of birds per year = average number of nests gained or lost per year over the life of the alternative × 1.29 fledgling birds/nest.

[d] Cumulative gain (loss) figures = total nests gained or lost over the life of the alternative × 1.29 fledgling birds/nest.

Compared with Alternative 8 with the Dade-Broward Levee Recharge Canal and water pumped from a quarry lake north of the NWWF Recharge Canal, Alternative 8 with an additional exclusion area south of the Miami Canal and north of the NWWF Recharge Canal and the Dade-Broward Levee Recharge Canal and water pumped from a quarry lake south of the NWWF Recharge Canal would result in about 250 to 330 more wood storks over the life of the alternative (as soon as 2028).

Compared with Alternative 4 with mitigation, Alternative 8 with this mitigation scenario would result in about 114 fewer acres of suitable short-hydroperiod habitat in the Lake Belt, but, due to inclusion of the Dade-Broward Levee Recharge Canal, it is expected that more of the short-hydroperiod wetlands will be Hydroperiod Class 3 wetlands with much higher biomass productivity levels compared with Hydroperiod Class 1 or 2 wetlands, as discussed above. As a result, Alternative 8 could support about 740 to 980 more wood storks over the life of the alternative, assuming the projected biomass changes in the final year of Alternative 8 continue at the same level through the end of Alternative 4 (as soon as 2032).

I.2.9 Potential Impacts of Short-Hydroperiod Wetlands on Wood Storks Under Alternative 9 with Mitigation

Table I–47 presents a summary of the potential impacts of Alternative 9, coupled with mitigation, on the amount of suitable short-hydroperiod cover types available for wood storks at the end of this alternative if it is implemented under average hydrologic conditions. Approximately 17,700 acres of suitable short-hydroperiod habitat would be available in the Lake Belt, compared with the baseline of approximately 28,700 acres. Even with a large projected decrease of suitable short-hydroperiod habitat, there would be a large increase in high-value habitat (about 9,900 acres of prairie compared with 6,200 acres in the baseline) due to melaleuca eradication efforts in the Lake Belt. This increase is expected to help wood storks during their critical nesting period. In addition, under Alternative 9 with mitigation, the Dade-Broward Levee Recharge Canal would be built, improving the hydrologic conditions in the Lake Belt. Due to inclusion of the Dade-Broward Levee Recharge Canal in Alternative 9, it is expected that more of the short-hydroperiod wetlands will be Hydroperiod Class 3 wetlands with much higher biomass productivity levels (up to 1.13 grams per meter), as opposed to Hydroperiod Classes 1 and 2 (up to 0.25 and 0.49 grams per square meter, respectively). For example, under Alternative 9, approximately 7,100 acres of suitable Hydroperiod Class 3 habitat are estimated, compared with approximately 6,100 acres under the baseline. As a result, short-hydroperiod biomass is projected to increase compared with the baseline.

Table I–47. Short-Hydroperiod Wetlands Within the Lake Belt After Proposed Mining with Mitigation – Alternative 9 (acres)

Cover Type	Short Hydroperiod, Inactive	Hydroperiod Class			Total
		1	2	3	
Other water	719	3	21	12	755
Canals	168	17	10	112	307
Dense melaleuca saplings	2,279	38	4	65	2,387
Dense melaleuca	1,226	419	62	150	1,857
Prairie	401	3,177	694	5,582	9,854
Prairie with melaleuca (10–50%)	-	455	59	925	1,439
Prairie with melaleuca (50–75%)	163	127	36	180	505
FPL transmission corridor	460	2	23	44	529
Disturbed prairie with melaleuca (10–50%)	73	-	-	-	73
Disturbed prairie with melaleuca (50–75%)	27	-	-	-	27
Disturbed prairie	9	-	-	-	9
Total Suitable Habitat for Wood Storks	**5,525**	**4,238**	**909**	**7,070**	**17,742**

Note: Totals may not add due to rounding.
Key: %=percent; FPL=Florida Power and Light Company.

With the proposed mitigation activities in the Pennsuco Wetlands and construction of the Dade-Broward Levee Recharge Canal, it is projected that approximately 2,300 to 7,900 kilograms of short-hydroperiod prey fish biomass would be gained compared with Alternative 9 without mitigation, as shown in Table I–48. Compared with the baseline, between 230 and 6,900 more kilograms of short-hydroperiod prey fish biomass production within the Lake Belt could be realized annually by the end of Alternative 9 using the wading birds and all birds suitability factors, respectively. There could be a cumulative positive impact through the end of the alternative because a large number of acres of melaleuca-infested wetlands would be treated before the end of the alternative and gains from current mitigation activities would occur prior to the end of the alternative. From 2002 through the end of Alternative 9 (as soon as 2030), the projected gains in fish biomass due to proposed mitigation activities could result in 10 to 40 more nests and 13 to 51 more birds per year on average and a cumulative gain of 377 to 1,485 wood storks over the life of the alternative.

Table I–48. Summary of Changes in Short-Hydroperiod Wetlands and Wood Stork Impacts Under Alternative 9 with Mitigation

Net gain (loss) in short-hydroperiod prairie habitat (acres)	3,681
All Birds Suitability Index	
Net gain (loss) in short-hydroperiod biomass produced from Alternative 8 without mitigation in final year (kilograms)	7,943
Net gain (loss) in short-hydroperiod biomass produced from baseline in final year (kilograms)[a]	6,851
Average gain (loss) of nests per year[b]	40
Average gain (loss) of birds per year[c]	51
Cumulative gain (loss) of birds[d]	1,485
Wading Birds Suitability Index	
Net gain (loss) in short-hydroperiod biomass produced from Alternative 8 without mitigation in final year (kilograms)	2,864
Net gain (loss) in short-hydroperiod biomass produced from baseline in final year (kilograms)[a]	231
Average gain (loss) of nests per year[b]	10
Average gain (loss) of birds per year[c]	13
Cumulative gain (loss) of birds[d]	377

[a] Net gain (loss) in fish biomass (kilograms) is the projected change from the baseline in the amount of biomass available for wood storks in the last year of the alternative.

[b] Average gain (loss) of nests per year = total kilograms fish biomass gained or lost over the life of the alternative/total biomass produced in the core foraging area over the life of the alternative × average number of nesting pairs of wood storks observed (394 from 1997–2008).

[c] Average gain (loss) of birds per year = average number of nests gained or lost per year over the life of the alternative × 1.29 fledgling birds/nest.

[d] Cumulative gain (loss) figures = total nests gained or lost over the life of the alternative × 1.29 fledgling birds/nest.

Compared with Alternative 4 with mitigation, Alternative 9 with mitigation would result in about 1,300 fewer acres of suitable short-hydroperiod habitat in the Lake Belt, but, due to inclusion of the Dade-Broward Levee Recharge Canal, it is expected that more of the short-hydroperiod wetlands will be Hydroperiod Class 3 wetlands with much higher biomass productivity levels compared with Hydroperiod Class 1 or 2 wetlands, as discussed above. As a result, Alternative 9 could support about 400 more wood storks over the life of the alternative, assuming the projected biomass changes in the final year of Alternative 9 continue at the same level through the end of Alternative 4 (as soon as 2032).

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