



Orange Creek BMAP Amendment Update Technical Discussion

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Septic System Loadings

- Part of developed land use loading.
- Included as part of allocation.
- Total reduction = developed land stormwater + septic system.
- Not a requirement to connect septic systems to central sewer.



Septic System

Text Additions

- The entire reduction may be achieved by addressing stormwater loading from urban and agricultural areas. Local regulations may provide a mechanism or incentive to upgrade conventional septic systems to remove nutrients or convert from septic systems to central sewer. For example, the City of Gainesville Code of Ordinances requires the implementation of applicable sections of FDOH Chapter 64E-6, Florida Administrative Code (F.A.C.). The Florida Springs and Aquifer Protection Act may be a second mechanism for addressing septic systems located in the contributing areas of Outstanding Florida Springs through the implementation of the requirements for BMAPs focused on those spring systems.*



Timeline Modification

Blue text is addition.

- *“This document sets a target date of 2028, 20 years after the initial adoption of the BMAP, for identifying management actions and to the extent possible achieving loading reductions for these waterbodies.”*



Key Actions

New Section at end of Chapter 5.

- Complete evaluation of impact of septic systems on Lake Wauberg.
- Restart periodic collection of phytoplankton data (speciation and biovolume) for Lake Wauberg, Orange Lake, Newnans Lake, and Lochloosa Lake.
- Evaluate Lake Wauberg water quality for compliance with numeric nutrient criteria.
- Evaluate Newnans Lake sediment for nutrient content and contribution to in-lake nutrient loading.



Key Actions

Continued

- Identify Lochloosa Lake Watershed issues that contribute to impaired water quality.
- Reevaluation of Newnans Lake and Orange Lake watershed loadings, considering whether or not to include more recent land use data, watershed loading methods comparable to Lochloosa Lake TMDL, and routing of water and loading between lakes.



Questions

- Any comments or questions on material presented?



Agriculture

NOI Acreage through July 2018

Watershed	Total/Modeled Agricultural Acres	Total/Modeled Acres Covered by NOIs	Reduction in Loading from NOIs (lbs-TP/yr)	Reduction in Loading from NOIs (lbs-TN/yr)	Planning Target Maximum Reduction in Loading from NOIs (lbs-TP/yr/ lbs-TN/yr)
Newnans Lake	3,487.6	603.9	29	199	157/445
Orange Lake	30,811.3	10,014.4	584	NA	1,796
Lochloosa Lake	5,627	1,377.4	161	1,419	760/6,795
Alachua Sink	5,727.2	605.8	NA	363	3,430
Lake Wauberg	79.3	15.3	5	35	27/181
Hogtown Creek	1,321.1	98.2	NA	NA	NA
Orange Creek	24,391.3	4,226.8	NA	NA	NA

- Planning target is the maximum reduction attainable if all acreage has an NOI.



Agriculture Text

Corrections to Agricultural BMPs and Project Reductions

- **Table 5** lists the estimated maximum credit that could be obtained by implementing NOIs for each lake. The maximum credit represents 100 % of modeled agricultural land covered by NOIs and should only be considered as a planning goal. FDACS is revising the methods and data sources used to estimate active agricultural acreage in the Orange Creek Basin on an annual basis. FDACS maintains the Florida Statewide Agricultural Irrigation Demand (FSAID) geodatabase, which estimates active agricultural acreage throughout the state, including in the Orange Creek Basin.
- Addition of explanation of NOI loading reduction calculation: As an example, if 20 % of agricultural acreage is covered by NOIs, then 20% of the total agricultural loading was assigned to the NOI. The final reduction is credited as 30 % of the NOIs loading.



Alachua Sink and Lake Wauberg

Updated Budget

Sources	Lake Wauberg Net Estimated Load TP (lbs-TP/yr)	Lake Wauberg Net Estimated Load TN (lbs-TN/yr)	Alachua Sink Net Estimated TN Load (lbs-TN/yr)
Atmospheric Deposition	NA	NA	23
Point Sources	NA	NA	NA
Stormwater Runoff Undeveloped Land Use	NA	NA	72,252
Agricultural Runoff	NA	NA	11,071
Agricultural BMPs	NA	NA	-363
Stormwater Runoff Developed	469	2,566	28,861
Stormwater BMPs	-39	-199	-138,190
Septic Systems	240	1,299	4,667
Prairie Creek	NA	NA	210,444
Newnans Lake Projects			-2,304
Loading Information			
Net Loading	709	3,865	322,084
TMDLs	374	2,062	256,322
Additional Reduction Needed	335	1,803	65,762

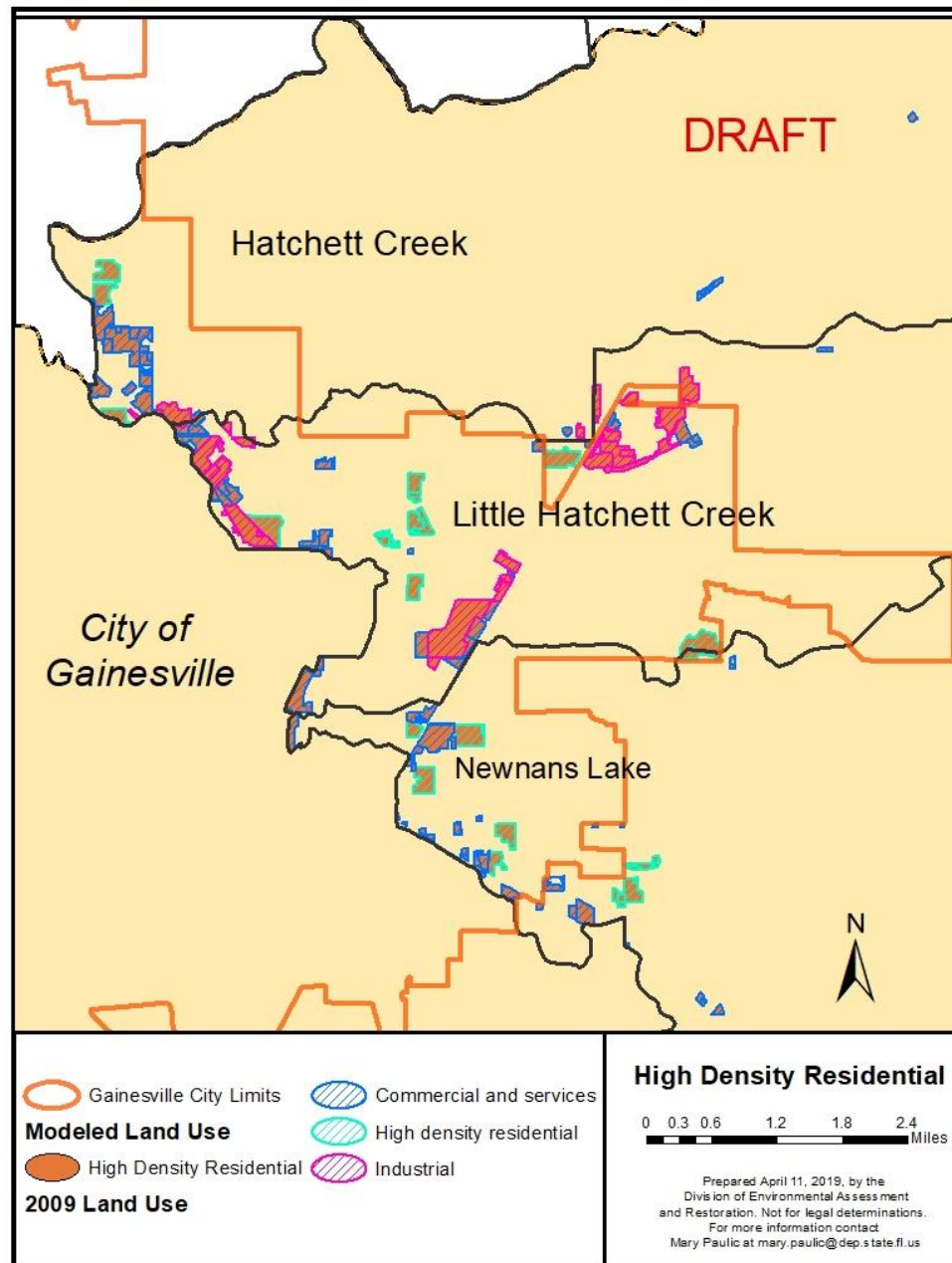


High Density Residential

- Used city limits as Gainesville boundary.
- Some land uses present in 2009 were not listed in the TMDL:
 - Converted to comparable category based on EMCs and amount of pervious surface. Decision made in 2016.
 - Industrial treated as high density residential.
 - Commercial treated as high density residential.
 - Institutional treated as low density residential.
 - Urban open includes parks and open land.



Distribution of High Density Land Use





Projects

- Re-adopt all projects because changes were made to the manner in which project information is collected.
- Did not update street sweeping to 2018 values.
 - Too large of a change occurred that could not be documented.
- Newnans Lake allocations adjusted with new project information.



Newnans Lake

Brittany Estates Point Source

- Initially included as part of overall controllable source loading at actual loading and not permit limits.
- TMDL assigns a wasteload allocation to this point source.
 - TP=386 lbs/yr.
 - TN=3,104 lbs/yr.
- Changes:
 - Wasteload allocation added to nutrient budget.
 - But not included in allocated reductions.



Newnans Lake Nutrient Budget

Revised Total Phosphorus Budget

Sources of total phosphorus (all loading in lbs/yr)	TMDL Baseline loading	% of Baseline Loading	TMDL Baseline Loading without Forest and Point Source	Controllable TMDL baseline loading	Controllable TMDL baseline % contribution	Proportional reduction needed to meet TMDL	Remaining TP load
Point sources Brittany Estates Mobile Home Park	386	1.48					
Stormwater runoff forest Newnans Lake	338	1.30					
Stormwater runoff undeveloped land uses Newnans Lake	1,538	5.90	1,538	0			1,538
Stormwater runoff from developed uses Newnans Lake	460	1.76	460	460	2.97	386	460
Agriculture Newnans Lake	215	0.82	215	215	1.39	180	215
Groundwater seepage Newnans Lake	556	2.13	556	0			556
Septic systems Newnans Lake	111	0.43	111	111	0.72	93	111
Stormwater runoff forest Hatchett Creek	1,137	4.36					
Stormwater runoff undeveloped land uses Hatchett Creek	1,394	5.35	1,394	0			1,394
Stormwater runoff from developed uses Hatchett Creek	422	1.62	422	422	2.72	354	422
Agriculture Hatchett Creek	283	1.09	283	283	1.83	237	283
Septic systems Hatchett Creek	142	0.55	142	142	0.92	119	142
Groundwater seepage Hatchett Creek	1,005	3.85	1,005				1,005
Stormwater runoff forest Little Hatchett Creek	292	1.12					
Stormwater runoff undeveloped land uses Little Hatchett Creek	440	1.69	440	0			440
Stormwater runoff from developed uses Little Hatchett Creek	364	1.40	364	364	2.35	305	364
Agriculture Little Hatchett Creek	24	0.09	24	24	0.15	20	24
Septic systems Little Hatchett Creek	3	0.01	3	3	0.02	2	3
Groundwater seepage Little Hatchett Creek	267	1.02	267				267
Internal nutrient recycling	13,478	51.69	13,478	13,478	86.94	11,302	13,478
Atmospheric deposition (wet/dry)	3,223	12.36	3,223	0			3,223
Loading information							
TMDL baseline TP-loading and % (lbs/yr)	26,076	100.00	23,923	15,502	100.00	12,999	23,923
Total Maximum Daily Load (lbs/yr)	10,924		10,924				10,924
Reduction needed in loading (lbs/yr)	15,152		12,999				12,999



Newnans Lake Nutrient Budget

Revised Total Nitrogen Budget

Sources of total nitrogen (all loading in lbs/yr)	TMDL Baseline loading	% of Baseline Loading	TMDL Baseline Loading without Forest	Controllable TMDL baseline loading	Controllable TMDL baseline % contribution	Proportional reduction needed to meet TMDL	Remaining nitrogen load
Point sources Brittany Estates Mobile Home Park	3,104	0.97					
Stormwater runoff forest Newnans Lake	5,457	1.71					
Stormwater runoff undeveloped land uses Newnans Lake	15,028	4.70	15,028	0			15,028
Stormwater runoff from developed uses Newnans Lake	3,991	1.25	3,991	3,991	1.64	3,332	3,991
Agriculture Newnans Lake	1,483	0.46	1,483	1,483	0.61	1,238	1,483
Seepage/groundwater Newnans Lake	2,038	0.64	2,038	0		0	2,038
Septic systems Newnans Lake	818	0.26	818	818	0.34	683	818
Stormwater runoff forest Hatchett Creek	18,925	5.92					
Stormwater undeveloped land use Hatchett Creek	13,639	4.26	13,639	0			13,639
Stormwater runoff from developed land uses Hatchett Creek	3,848	1.20	3,848	3,848	1.58	3,213	3,848
Agriculture Hatchett Creek	1954	0.61	1,954	1,954	0.80%	1,631	1,954
Seepage/groundwater Hatchett Creek	3,683	1.15	3,683	0			3,683
Septic systems Hatchett Creek	1,042	0.33	1,042	1,042	0.43	870	1,042
Stormwater runoff forest Little Hatchett Creek	3,861	1.21					
Stormwater undeveloped land use Little Hatchett Creek	3,518	1.10	3,518	0			3,518
Stormwater runoff from developed uses Little Hatchett Creek	3,378	1.06	3,378	3,378	1.39	2,820	3,378
Agriculture Little Hatchett Creek	143	0.04	143	143	0.06	120	143
Seepage/groundwater Little Hatchett Creek	978	0.31	978				978
Septic systems Little Hatchett Creek	10	0.00	10	10	0.00	8	10
Atmospheric deposition (wet/dry)	6,446	2.02	6,446				6,446
Internal nutrient recycling	226,527	70.82	226,527	226,527	93.15	189,137	226,527
Loading information							
TMDL baseline TN-loading and % (lbs/yr)	319,869	100.00	288,523	243,194	100.00	203,053	288,523
Total Maximum Daily Load (lbs/yr)	85,470		85,470				85,470
Reduction needed in loading and % (lbs/yr)	234,399		203,053				203,053



Newnans Lake

Total Phosphorus Allocation

Jurisdiction	Total Developed Land Use Reduction	First 5-Year 50 % Developed Land Use Reduction	Education Credit	Project Credits	Remaining Developed Land Use Reductions with a Target Date of 2023	Second 5-Year 50 % Developed Land Use Reduction	Remaining Developed Land Use Reduction with a Target Date of 2028	Total Septic System Reduction with a Target Date of 2028	Total Reduction to be Achieved with a Target Date of 2028*
Alachua County	465	233	33	42	158	232	390	198	588
FDOT, District 2	93	47	4	525	-482	46	-436	0	0
Gainesville	461	231	33	259	-61	230	169	16	185
Waldo	27	14	1	0	13	13	26	0	26
Total	1,046	525	71	826		521	149	214	799



Newnans Lake

Total Nitrogen Allocation

Jurisdiction	Total Developed Land Use Reduction	First 5-Year 50 % Developed Land Use Reduction	Education Credit	Project Credits	Remaining Developed Land Use Reductions with a Target Date of 2023	Second 5-Year 50 % Developed Land Use Reduction	Remaining Developed Land Use Reduction with a Target Date of 2028	Total Septic System Reduction with a Target Date of 2028	Total Reduction to be Achieved with a Target Date of 2028*
Alachua County	4,155	2,078	299	65	1,714	2,077	3,791	1,448	5,239
FDOT, District 2	878	439	42	3,414	-3,017	439	-2,578	0	0
Gainesville	4,094	2,047	294	1,034	719	2,047	2,766	113	2,879
Waldo	239	120	10	0	110	119	229	0	229
Total	9,366	4,684	645	4,513		4,682	4,208	1,561	8,347



Education Tables

Planning estimate if all local governments have 6% credit

	Newnans Lake TP Credit	Newnans Lake TN Credit	Orange Lake TP Credit	Lochloosa Lake TP Credit	Lochloosa Lake TN Credit
Current total credit awarded	71	645	40	78	642
Potential credit with maximum percent credit	75	673	57	93	796



Questions?

- Revised document and allocation workbook posted to http://publicfiles.dep.state.fl.us/DEAR/BMAP/OrangeCreek/2018_BMAP/



Appendix A

Loading Comparison

- Compared watershed loadings between 1995 TMDL estimate and 2009 land use estimate.
 - Applied to Orange and Newnans Lakes.
 - Used same rainfall, coefficients, and factors as used in the TMDLs. Only acreage of a land use was different.
 - Spreadsheet model used to calculate both TMDL and 2009 loading.



Newnans Lake

Watershed Loading Comparison

TP (lbs/yr)	Newnans Lake 2009 Land Use	Newnans Lake TMDL Land Use	Hatchet Creek 2009 Land Use	Hatchet Creek TMDL Land Use	Little Hatchet Creek 2009 Land Use	Little Hatchet Creek TMDL Land Use
1996	4,926	5,033	9,256	9,017	3,258	2,754
1997	5,725	5,849	10,756	10,479	3,786	3,200
1998	2,907	2,970	5,462	5,321	1,923	1,625
1999	1,279	1,307	2,403	2,341	846	715
2000	396	404	744	725	262	221
TN lbs/yr						
1996	42,111	41,976	64,662	62,319	24,061	20,036
1997	48,935	48,778	75,140	72,418	27,960	23,283
1998	24,850	24,770	38,157	36,775	14,198	11,824
1999	10,934	10,899	16,789	16,181	6,247	5,202
2000	3,383	3373	5,195	5,007	1,933	1,610



Orange Lake

Watershed Loading Comparison

TP (lbs/yr)	Orange Lake 2009 Land Use	Orange Lake TMDL Land Use	Camps Canal 2009 Land Use	Camps Canal TMDL Land Use
1995	12,044	11,370	1,607	1,529
1996	12,078	11,402	1,611	1,533
1997	18,076	17,064	2,412	2,294
1998	9,369	8,845	1,250	1,189
1999	8,018	7,569	1,070	1,018
2000	648	612	87	82
TN lbs/yr				
1995	88,307	85,482	15,323	15,312
1996	88,555	85,722	15,366	15,355
1997	132,535	128,295	22,998	22,980
1998	68,694	66,497	11,920	11,911
1999	58,789	56,908	10,201	10,193
2000	4,755	4,603	825	824

