

**Arthur R. Marshall Loxahatchee National Wildlife Refuge Total Phosphorus (TP) Compliance Status**

Yellow highlighted months' geometric means were higher than the long term levels, which became effective on December 31, 2006.

Green highlighted months' levels were not applicable (N/A) because the average stages were less than 15.42 feet NGVD29.

Month-Year_1	Average Stage (feet NGVD29)	Long-Term Level (ppb)	TP Geometric Means (ppb)	Stage Data (n)	TP Sample Data (n)
Jan-2007	16.57	9.3	6.9	3	14
Feb-2007	16.34	10.4	6.2	3	13
Mar-2007	16.10	11.8	7.3	3	10
Apr-2007	15.30	N/A	8.0	3	3
May-2007	14.68	N/A	No data	3	0
Jun-2007	15.37	N/A	13.6	3	4
Jul-2007	15.86	13.5	10.4	3	13
Aug-2007	16.33	10.5	10.1	3	13
Sep-2007	16.59	9.2	8.5	3	14
Oct-2007	17.26	7.2	8.4	3	14
Nov-2007	17.19	7.2	7.0	3	14
Dec-2007	16.84	8.2	7.9	3	14
Jan-2008	16.68	8.9	6.3	3	14
Feb-2008	16.55	9.4	7.6	3	14
Mar-2008	16.54	9.4	6.7	3	14
Apr-2008	16.36	10.3	5.8	3	14
May-2008	15.76	14.3	9.1	3	9
Jun-2008	15.68	14.9	8.9	3	8
Jul-2008	16.37	10.3	9.2	3	14
Aug-2008	16.39	10.2	8.6	3	14
Sep-2008	16.81	8.3	7.7	3	14
Oct-2008	17.42	7.2	7.2	3	14
Nov-2008	17.22	7.2	7.4	3	14
Dec-2008	16.96	7.8	6.3	3	14
Jan-2009	16.68	8.8	7.0	3	14
Feb-2009	16.35	10.4	4.7	3	12
Mar-2009	15.86	13.5	7.5	3	9
Apr-2009	15.69	14.9	9.7	3	8
May-2009	15.01	N/A	11.0	3	1
Jun-2009	16.05	12.1	13.2	3	12
Jul-2009	16.47	9.8	7.4	3	14
Aug-2009	16.16	11.5	8.8	3	14
Sep-2009	16.68	8.9	8.1	3	14
Oct-2009	16.86	8.2	7.0	3	14
Nov-2009	16.55	9.4	6.9	3	14
Dec-2009	16.36	10.4	5.8	3	12
Jan-2010	16.68	8.9	5.2	3	14
Feb-2010	16.62	9.1	6.7	3	14
Mar-2010	16.65	9.0	5.9	3	14
Apr-2010	16.51	9.6	7.2	3	14
May-2010	16.35	10.4	7.8	3	14

**Inflow TP Loads and Flow-weighted Mean Concentration (FWMC)**

TP loads are calculated using "no ratio-adjustment" and "14-day maximum for auto sampler composite concentration" algorithm.

Month-Year_1	Inflow (kac-ft)	TP loads (metric tons)	Inflow FWMC (ppb)
Jan-2007	4	0.2	34
Feb-2007	1.3	0.05	31
Mar-2007	0.6	0.03	44
Apr-2007	0.03	0.002	53
May-2007	0.03	0.003	80
Jun-2007	0.8	0.1	69
Jul-2007	15	0.7	36
Aug-2007	35	2.0	46
Sep-2007	45	2.2	40
Oct-2007	64	3.1	39
Nov-2007	8	0.3	28
Dec-2007	5	0.2	32
Jan-2008	1.0	0.02	20
Feb-2008	24	1.0	33
Mar-2008	31	0.9	24
Apr-2008	15	0.4	22
May-2008	0.4	0.01	23
Jun-2008	30	0.8	21
Jul-2008	57	1.4	19
Aug-2008	127	4.7	30
Sep-2008	70	3.2	37
Oct-2008	43	1.9	36
Nov-2008	2	0.04	19
Dec-2008	4	0.1	15
Jan-2009	0.9	0.02	15
Feb-2009	0.3	0.01	16
Mar-2009	0.01	0.005	304*
Apr-2009	0.3	0.01	24
May-2009	42	3.0	59
Jun-2009	71	5.5	63
Jul-2009	44	2.2	41
Aug-2009	25	1.6	52
Sep-2009	36	1.9	43
Oct-2009	6	0.3	41
Nov-2009	1.0	0.05	38
Dec-2009	12	0.4	29
Jan-2010	4	0.2	36
Feb-2010	5	0.3	49
Mar-2010	53	5.0	76
Apr-2010	10	0.8	59
May-2010	2	0.1	45

**Arthur R. Marshall Loxahatchee National Wildlife Refuge Total Phosphorus (TP) Compliance Status**

Yellow highlighted months' geometric means were higher than the long term levels, which became effective on December 31, 2006.

Green highlighted months' levels were not applicable (N/A) because the average stages were less than 15.42 feet NGVD29.

Month-Year_1	Average Stage (feet NGVD29)	Long-Term Level (ppb)	TP Geometric Means (ppb)	Stage Data (n)	TP Sample Data (n)
Jun-2010	16.26	10.9	7.3	3	14
Jul-2010	16.29	10.7	6.9	3	14
Aug-2010	16.15	11.6	6.1	3	10
Sep-2010	16.76	8.5	6.5	3	14
Oct-2010	16.99	7.7	6.2	3	14
Nov-2010	16.83	8.2	6.6	3	14
Dec-2010	16.52	9.6	4.0	3	13
Jan-2011	16.29	10.7	5.1	3	10
Feb-2011	16.20	11.3	6.0	3	10
Mar-2011	15.79	14.0	8.1	3	8
Apr-2011	15.53	16.3	11.4	3	7
May-2011	14.87	N/A	No data	3	0
Jun-2011	14.30	N/A	No sampling	3	0
Jul-2011	15.11	N/A	20.2	3	4
Aug-2011	15.53	16.4	11.5	3	8
Sep-2011	15.83	13.8	9.8	3	11
Oct-2011	16.06	12.1	7.4	3	11
Nov-2011	16.59	9.2	7.8	3	14
Dec-2011	16.59	9.2	6.2	3	7
Jan-2012	16.43	10.0	6.0	3	14
Feb-2012	16.23	11.1	7.5	3	13
Mar-2012	15.96	12.8	6.3	3	10
Apr-2012	15.92	13.1	8.1	3	10
May-2012	16.13	11.7	7.2	3	12
Jun-2012	16.14	11.6	7.4	3	14
Jul-2012	16.00	12.5	6.0	3	14
Aug-2012	16.18	11.3	5.5	3	13
Sep-2012	17.38	7.2	7.0	3	14
Oct-2012	17.20	7.2	7.6	3	14
Nov-2012	17.11	7.3	6.1	3	14
Dec-2012	16.82	8.3	6.7	3	14
Jan-2013	16.62	9.1	7.2	3	14
Feb-2013	16.36	10.3	6.7	3	13
Mar-2013	16.42	10.0	5.8	3	14
Apr-2013	16.12	11.7	7.0	3	11
May-2013	16.15	11.5	8.0	3	10
Jun-2013	16.36	10.4	7.8	3	12
Jul-2013	16.48	9.8	6.5	3	14
Aug-2013	16.55	9.4	5.8	3	14
Sep-2013	16.38	10.3	7.0	3	14
Oct-2013	16.83	8.3	6.6	3	14

**Inflow TP Loads and Flow-weighted Mean Concentration (FWMC)**

TP loads are calculated using "no ratio-adjustment" and "14-day maximum for auto sampler composite concentration" algorithm.

Month-Year_1	Inflow (kac-ft)	TP loads (metric tons)	Inflow FWMC (ppb)
Jun-2010	30	1.2	32
Jul-2010	19	0.6	25
Aug-2010	37	1.0	22
Sep-2010	39	1.0	20
Oct-2010	7	0.2	18
Nov-2010	0.8	0.01	15
Dec-2010	0.3	0.01	19
Jan-2011	7	0.3	32
Feb-2011	3	0.1	23
Mar-2011	3	0.1	31
Apr-2011	4	0.2	32
May-2011	5	0.1	21
Jun-2011	2	0.1	21
Jul-2011	31	1.1	30
Aug-2011	21	0.5	20
Sep-2011	27	0.6	19
Oct-2011	36	0.9	20
Nov-2011	34	0.7	18
Dec-2011	4	0.1	24
Jan-2012	0.5	0.02	31
Feb-2012	1.5	0.1	30
Mar-2012	6	0.2	31
Apr-2012	3	0.1	28
May-2012	20	0.7	27
Jun-2012	31	0.8	22
Jul-2012	19	0.3	15
Aug-2012	100	9.0	72
Sep-2012	121	9.1	61
Oct-2012	30	1.2	32
Nov-2012	2	0.1	28
Dec-2012	9	0.7	65
Jan-2013	1.4	0.1	51
Feb-2013	19	1.2	51
Mar-2013	6	0.5	66
Apr-2013	7	0.3	36
May-2013	14	0.5	33
Jun-2013	106	9.0	69
Jul-2013	86	2.4	22
Aug-2013	20	0.9	34
Sep-2013	56	2.3	34
Oct-2013	42	1.3	25

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Month-Year_1	Average Stage (feet NGVD29)	Long-Term Level (ppb)	TP Geometric Means (ppb)	Stage Data (n)	TP Sample Data (n)
Nov-2013	16.62	9.1	5.6	3	14
Dec-2013	16.63	9.1	4.4	3	13
Jan-2014	16.41	10.1	5.2	3	12
Feb-2014	16.61	9.1	7.4	3	14
Mar-2014	16.49	9.7	6.1	3	14
Apr-2014	16.23	11.0	6.1	3	12
May-2014	15.79	14.1	8.1	3	9
Jun-2014	15.56	16.0	6.6	3	6
Jul-2014	16.19	11.3	7.7	3	12
Aug-2014	16.48	9.8	7.4	3	14
Sep-2014	16.40	10.1	7.2	3	14
Oct-2014	17.34	7.2	7.9	3	14
Nov-2014	17.10	7.3	6.0	3	14
Dec-2014	17.01	7.6	5.6	3	14
Jan-2015	16.92	7.9	8.1	3	14
Feb-2015	16.67	8.9	5.5	3	14
Mar-2015	16.57	9.3	7.0	3	14
Apr-2015	16.25	11.0	7.6	3	12
May-2015	15.91	13.1	8.2	3	10
Jun-2015	15.65	15.3	9.7	3	5
Jul-2015	15.19	N/A	18.0	3	2
Aug-2015	15.78	14.1	12.3	3	8
Sep-2015	16.23	11.1	10.9	3	14
Oct-2015	16.92	7.9	7.4	3	14
Nov-2015	17.00	7.7	6.3	3	14
Dec-2015*	17.00 (17.02)	7.7 (7.6)	6.1 (5.9)	3	12 (14)
Jan-2016	17.15	7.2	6.5	3	14
Feb-2016	17.30	7.2	5.3	3	14
Mar-2016	16.82	8.3	6.0	3	14
Apr-2016	16.36	10.3	6.9	3	14
May-2016	15.96	12.7	8.8	3	9
Jun-2016	15.97	12.7	7.2	3	9
Jul-2016	16.07	12.0	7.1	3	13
Aug-2016	15.92	13.1	6.6	3	6
Sep-2016	16.62	9.1	7.3	3	14
Oct-2016	16.96	7.8	6.1	3	14
Nov-2016	16.78	8.4	6.9	3	14
Dec-2016	16.64	9.0	5.6	3	14
Jan-2017	16.57	9.3	7.1	3	13
Feb-2017	16.52	9.6	4.4	3	13
Mar-2017	16.28	10.8	5.7	3	12

**Inflow TP Loads and Flow-weighted Mean Concentration (FWMC)**

TP loads are calculated using "no ratio-adjustment" and "14-day maximum for auto sampler composite concentration" algorithm.

Month-Year_1	Inflow (kac-ft)	TP loads (metric tons)	Inflow FWMC (ppb)
Nov-2013	4	0.2	51
Dec-2013	7	0.4	40
Jan-2014	9	0.5	44
Feb-2014	32	1.6	40
Mar-2014	3	0.2	42
Apr-2014	2	0.1	42
May-2014	4	0.1	27
Jun-2014	41	1.3	26
Jul-2014	29	0.7	20
Aug-2014	58	1.2	17
Sep-2014	37	0.8	17
Oct-2014	33	0.9	21
Nov-2014	7	0.2	19
Dec-2014	25	0.5	16
Jan-2015	1	0.03	20
Feb-2015	3	0.1	22
Mar-2015	6	0.2	28
Apr-2015	1.5	0.04	24
May-2015	5	0.1	23
Jun-2015	4	0.2	37
Jul-2015	6	0.1	15
Aug-2015	28	0.6	16
Sep-2015	79	1.5	15
Oct-2015	42	0.8	16
Nov-2015	14	0.3	19
Dec-2015	28	0.6	17
Jan-2016	67	3.0	36
Feb-2016	50	3.6	58
Mar-2016	9	0.3	30
Apr-2016	21	0.6	25
May-2016	40	1.3	27
Jun-2016	21	0.6	25
Jul-2016	8	0.2	22
Aug-2016	37	1.1	23
Sep-2016	40	0.9	18
Oct-2016	31	0.7	18
Nov-2016	13	0.2	14
Dec-2016	21	0.4	15
Jan-2017	10	0.3	20
Feb-2017	1.5	0.05	24
Mar-2017	2	0.1	27

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Month-Year_1	Average Stage (feet NGVD29)	Long-Term Level (ppb)	TP Geometric Means (ppb)	Stage Data (n)	TP Sample Data (n)
Apr-2017	16.06	12.1	6.5	3	7
May-2017	16.17	11.4	8.3	3	13
Jun-2017	16.93	7.9	7.9	3	14
Jul-2017	16.40	10.1	7.9	3	13
Aug-2017	16.69	8.8	6.6	3	14
Sep-2017	16.89	8.0	7.5	3	13
Oct-2017	17.50	7.2	7.6	3	14
Nov-2017	17.71	7.2	5.5	3	14
Dec-2017	17.43	7.2	7.2	3	14
Jan-2018	17.12	7.3	4.5	3	14
Feb-2018	16.85	8.2	5.8	3	14
Mar-2018	16.45	9.9	6.0	3	14
Apr-2018	16.00	12.5	9.2	3	9
May-2018	16.13	11.6	6.3	3	9
Jun-2018	16.66	8.9	7.4	3	14
Jul-2018	16.41	10.1	7.5	3	13
Aug-2018	16.27	10.8	7.0	3	12
Sep-2018	16.64	9.0	6.0	3	14
Oct-2018	16.55	9.4	6.2	3	14
Nov-2018	16.47	9.8	7.9	3	12
Dec-2018	16.36	10.4	6.0	3	11
Jan-2019	16.18	11.4	6.1	3	10
Feb-2019	16.62	9.1	9.1	3	14
Mar-2019	16.64	9.0	6.3	3	14
Apr-2019	16.24	11.0	7.4	3	12
May-2019	16.16	11.5	10.4	3	10
Jun-2019	16.04	12.2	8.6	3	9
Jul-2019	16.33	10.5	7.3	3	14
Aug-2019	16.58	9.3	7.1	3	14
Sep-2019	16.61	9.2	7.1	3	14
Oct-2019	16.47	9.8	6.7	3	13
Nov-2019	16.75	8.6	5.6	3	14
Dec-2019	16.59	9.3	5.2	3	14
Jan-2020	16.73	8.7	4.8	3	14
Feb-2020	16.73	8.6	5.8	3	14
Mar-2020	16.66	8.9	5.2	3	14
Apr-2020	16.21	11.2	8.2	3	11
May-2020	15.79	14.0	6.5	3	6
Jun-2020	16.20	11.2	7.9	3	12
Jul-2020	16.15	11.6	6.2	3	12
Aug-2020	16.57	9.3	6.8	3	14

**Inflow TP Loads and Flow-weighted Mean Concentration (FWMC)**

TP loads are calculated using "no ratio-adjustment" and "14-day maximum for auto sampler composite concentration" algorithm.

Month-Year_1	Inflow (kac-ft)	TP loads (metric tons)	Inflow FWMC (ppb)
Apr-2017	10	0.4	35
May-2017	26	0.8	26
Jun-2017	123	5.4	36
Jul-2017	7	0.2	28
Aug-2017	11	0.3	23
Sep-2017	70	5.5	63
Oct-2017	105	6.2	48
Nov-2017	28	1.5	43
Dec-2017	6	0.3	34
Jan-2018	3	0.1	25
Feb-2018	4	0.1	22
Mar-2018	6	0.1	18
Apr-2018	10	0.2	17
May-2018	93	4.7	41
Jun-2018	28	1.9	54
Jul-2018	30	1.0	27
Aug-2018	18	0.5	25
Sep-2018	30	0.9	23
Oct-2018	18	0.4	19
Nov-2018	15	0.3	17
Dec-2018	9	0.2	17
Jan-2019	24	1.1	35
Feb-2019	26	1.6	50
Mar-2019	5	0.2	36
Apr-2019	2	0.1	36
May-2019	22	0.8	30
Jun-2019	39	1.1	23
Jul-2019	43	1.1	21
Aug-2019	77	2.8	30
Sep-2019	27	1.2	36
Oct-2019	13	0.4	27
Nov-2019	7	0.1	17
Dec-2019	11	0.3	22
Jan-2020	7	0.2	25
Feb-2020	6	0.2	31
Mar-2020	4	0.1	30
Apr-2020	2	0.1	29
May-2020	40	1.1	23
Jun-2020	72	2.5	28
Jul-2020	47	1.4	24
Aug-2020	73	1.9	21

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Month-Year_1	Average Stage (feet NGVD29)	Long-Term Level (ppb)	TP Geometric Means (ppb)	Stage Data (n)	TP Sample Data (n)
Sep-2020	17.19	7.2	7.8	3	14
Oct-2020	17.45	7.2	6.4	3	14
Nov-2020	17.54	7.2	5.3	3	14
Dec-2020	17.39	7.2	5.6	3	14
Jan-2021	17.28	7.2	4.6	3	14
Feb-2021	17.02	7.6	4.7	3	14
Mar-2021	16.78	8.4	6.9	3	14
Apr-2021	16.27	10.8	6.1	3	11
May-2021	16.02	12.4	8.7	3	9
Jun-2021	15.54	16.3	7.6	3	5
Jul-2021	16.00	12.5	11.1	3	8
Aug-2021	16.49	9.7	8.6	3	13
Sep-2021	16.79	8.4	7.0	3	13
Oct-2021	17.30	7.2	6.6	3	14
Nov-2021	17.35	7.2	7.1	3	14
Dec-2021	17.44	7.2	5.3	3	14
Jan-2022	17.32	7.2	5.7	3	14
Feb-2022	17.12	7.3	5.0	3	13
Mar-2022	16.80	8.4	7.3	3	14
Apr-2022	16.31	10.6	7.7	3	13
May-2022	15.89	13.3	9.1	3	7
Jun-2022	16.59	9.3	9.7	3	14
Jul-2022	16.36	10.3	7.6	3	12
Aug-2022	16.56	9.4	6.7	3	13
Sep-2022	16.41	10.1	7.3	3	11
Oct-2022	17.16	7.2	6.5	3	14
Nov-2022	17.20	7.2	6.7	3	14
Dec-2022	17.39	7.2	5.9	3	14
Jan-2023	17.25	7.2	5.5	3	14
Feb-2023	16.95	7.8	5.3	3	14
Mar-2023	16.53	9.5	6.3	3	13
Apr-2023	16.22	11.1	7.9	3	10
May-2023	16.24	11.0	7.1	3	14
Jun-2023	16.30	10.7	6.4	3	14
Jul-2023	16.41	10.1	5.8	3	14
Aug-2023	16.51	9.6	5.5	3	14
Sep-2023	16.82	8.3	5.6	3	14
Oct-2023	17.55	7.2	6.8	3	14
Nov-2023	17.15	7.2	6.3	3	8
Dec-2023	17.29	7.2	6.9	3	14
Jan-2024	17.44	7.2	4.3	3	14
Feb-2024	16.87	8.1	6.1	3	7
Mar-2024	16.82	8.3	6.9	3	14
Apr-2024	16.32	10.5	6.7	6	12

**Inflow TP Loads and Flow-weighted Mean Concentration (FWMC)**

TP loads are calculated using "no ratio-adjustment" and "14-day maximum for auto sampler composite concentration" algorithm.

Month-Year_1	Inflow (kac-ft)	TP loads (metric tons)	Inflow FWMC (ppb)
Sep-2020	69	2.3	27
Oct-2020	107	6.5	49
Nov-2020	70	6.1	71
Dec-2020	13	0.9	52
Jan-2021	0.9	0.04	33
Feb-2021	1	0.1	38
Mar-2021	1	0.1	43
Apr-2021	7	0.4	42
May-2021	1	0.04	32
Jun-2021	10	0.3	25
Jul-2021	38	1.0	22
Aug-2021	55	1.3	19
Sep-2021	44	1.3	23
Oct-2021	23	0.8	27
Nov-2021	15	0.4	22
Dec-2021	7	0.2	25
Jan-2022	2	0.1	26
Feb-2022	0.4	0.01	23
Mar-2022	1	0.03	32
Apr-2022	0.002	0.00007	26
May-2022	5	0.1	25
Jun-2022	78	2.3	24
Jul-2022	25	0.7	21
Aug-2022	0.3	0.007	19
Sep-2022	56	1.6	22
Oct-2022	42	1.0	20
Nov-2022	30	0.8	21
Dec-2022	9	0.2	21
Jan-2023	1	0.01	19
Feb-2023	2	0.04	18
Mar-2023	0.03	0.001	29
Apr-2023	12	0.34	23
May-2023	18	0.57	25
Jun-2023	45	1.03	19
Jul-2023	44	1.12	21
Aug-2023	60	1.34	18
Sep-2023	33	0.69	17
Oct-2023	27	0.60	18
Nov-2023	18	0.45	20
Dec-2023	31	0.70	19
Jan-2024	26	0.70	22
Feb-2024	12	0.32	21
Mar-2024	11	0.32	23
Apr-2024	3	0.08	20

**Arthur R. Marshall Loxahatchee National Wildlife Refuge Total Phosphorus (TP) Compliance Status**

Yellow highlighted months' geometric means were higher than the long term levels, which became effective on December 31, 2006.

Green highlighted months' levels were not applicable (N/A) because the average stages were less than 15.42 feet NGVD29.

Month-Year_1	Average Stage (feet NGVD29)	Long-Term Level (ppb)	TP Geometric Means (ppb)	Stage Data (n)	TP Sample Data (n)
May-2024	15.78	14.2	11.0	6	6
Jun-2024	15.09	N/A	No data	6	0
Jul-2024	16.52	9.6	9.0	6	14
Aug-2024	16.58	9.3	8.2	6	13
Sep-2024	16.79	8.4	7.1	6	14

\* December 2015 values for Refuge including resampled data (at LOX14 and LOX15) are presented in parentheses.

**Inflow TP Loads and Flow-weighted Mean Concentration (FWMC)**

TP loads are calculated using "no ratio-adjustment" and "14-day maximum for auto sampler composite concentration" algorithm.

Month-Year_1	Inflow (kac-ft)	TP loads (metric tons)	Inflow FWMC (ppb)
May-2024	1	0.03	24
Jun-2024	53	1.69	26
Jul-2024	31	0.97	25
Aug-2024	24	0.57	20
Sep-2024	51	1.2	19

\* March 2009 inflow was too low to calculate inflow FWMC accurately.