

Appendix I:

Protection of Threatened and Endangered Species in Portions of the Suwannee, Withlacoochee, Santa Fe, New, and St. Johns Rivers

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Prepared by:

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1 Introduction

The purpose of the Endangered Species Act (ESA) passed by Congress in 1973 is to protect and promote recovery of imperiled species and the ecosystems upon which they depend. To accomplish this objective, the ESA affords additional protection to threatened and endangered species to prevent: 1) damage to, or destruction of, a species' habitat; 2) overutilization of the species for commercial, recreational, scientific, or educational purposes; 3) disease or predation; 4) inadequacy of existing protection; and 5) other natural or manmade factors that affect the continued existence of the species.

During the development of the proposed dissolved oxygen (DO) criteria, FDEP has worked with the U.S. Fish and Wildlife Service (FWS) and NOAA's National Marine Fisheries Service (NMFS) to assure that the threatened and endangered species occurring in Florida are provided adequate protection. During their review of the proposed freshwater criteria, FWS and NMFS determined that four endangered species may not be fully protected by the proposed DO criteria. These species are the young of the year Gulf sturgeon (*Acipenser oxyrinchus desotoi*) that can be found in portions of the Suwannee, Santa Fe, and Withlacoochee Rivers, the oval pigtoe mussel (*Pleurobema pyriforme*) that inhabits portions of the Santa Fe and New Rivers, and young Atlantic (*Acipenser oxyrinchus*) and shortnose sturgeon (*Acipenser brevirostrum*) that can inhabit the St. Johns River. The specific areas where the Gulf sturgeon and mussel may be found are illustrated in **Figure 1**.

The St. Johns River represents the southern extent of the range for the Atlantic and shortnose sturgeon. Even though the evidence suggests that the sturgeon occurring in the St. Johns River are transient individuals that do not spawn in the St. Johns, the ESA still requires that the portions of the river where spawning may occur in the future be afforded additional protection. A map showing the portions of the St. Johns River where the sturgeon could potentially spawn is provided in **Figure 2**.

2 Summary of Existing DO Conditions in Portions of the Suwannee, Santa Fe, New, and Withlacoochee Rivers

Because relatively little information is available concerning the specific DO requirements of these species, especially for the mussel, and since the populations of the sturgeon and mussel are stable and may actually be increasing in these river systems, it is reasonable to assume that maintaining the existing DO conditions would provide adequate protection in the future.

To summarize the existing DO conditions, data for each river segment in the potential range of the young sturgeon and mussel were obtained from the Impaired Waters Rule (IWR) database for the period since 1966. After reviewing the data for the entire period of record (*i.e.*, 1966 – 2011), the period from 1991 through 2011 was chosen for use in summarizing the existing conditions. The 1991 to 2011 period was selected because the 21-year period is long enough to

capture the expected range of temporal variability and covers a significant portion of the period when the sturgeon population in the region has been stable or increasing. Additionally, the monitoring conducted prior to 1991 was conducted less frequently and often only covered portions of the year. Data collection after 1990 was more consistent, with a greater amount of data being collected that generally covered all months of the year. Therefore, to avoid biasing the summary of the existing DO conditions, the data collected prior to 1991 were omitted from further data analyses.

A summary of the existing DO conditions during the period from 1991 through 2011 for the portions of the Santa Fe and New Rivers potentially utilized by the Oval Pigtoe mussel is provided in **Table 1** by river system and individual river segment (River km/WBID). Similarly, the summary statistics for the portions of the Suwannee, Santa Fe, and Withlacoochee Rivers potentially utilized by the gulf sturgeon are provided in **Table 2** by river system and individual river segment.

3 Determining Whether DO Values Have Decreased Below the Baseline Distribution

To evaluate whether DO values have decreased below the baseline distribution, it is recommended that a) no more than 10 percent of the DO measurements be below the 10th percentile of the existing data distribution for that river segment, b) no more than 50 percent of the **daily average values** ~~measured values~~ to be below the median of the existing data distribution for that river segment. The 10th percentiles and median DO values for each of the affected river segments are provided in **Table 3**.

The recommended rule language is:

*In the portions of the Suwannee, Withlacoochee (North), and Santa Fe Rivers utilized by the Gulf Sturgeon, and in the portions of the Santa Fe and New Rivers utilized by the oval pigtoe mussel, DO levels shall not be lowered below the baseline distribution such that more than 50 percent of **daily average values** ~~measurements~~ are below the median of the baseline distribution or more than 10 percent of the daily average values are below the 10th percentile of the baseline distribution for the applicable waterbody. The baseline distributions are provided in Appendix I of the Technical Support Document for the Derivation of Dissolved Oxygen Criteria to Protect Aquatic Life in Florida's Fresh and Marine Waters, which is incorporated by reference.*

When assessing these waters in the future, compliance with both the 10th percentile and median DO values will be evaluated using a binomial hypothesis test at the 80 percent and 90 percent confidence levels necessary to place a water segment on the Planning List and Verified Lists, respectively, for TMDL development. The use of the binomial hypothesis test is consistent with the assessment for other water quality parameters conducted under Chapter 62-303, F.A.C. The number of exceedances required to have 80 percent and 90 percent confidence that more than 10 percent of the measurements are below the applicable 10th percentile value are provided in Chapter 62-303, F.A.C. Tables 1 and 3, respectively. The number exceedances required to have 80 percent and 90 percent confidence that more than 50 percent of the **daily average values** ~~measurements~~ are below the applicable median value for sample sizes up to 419 are provided in **Table 4**.

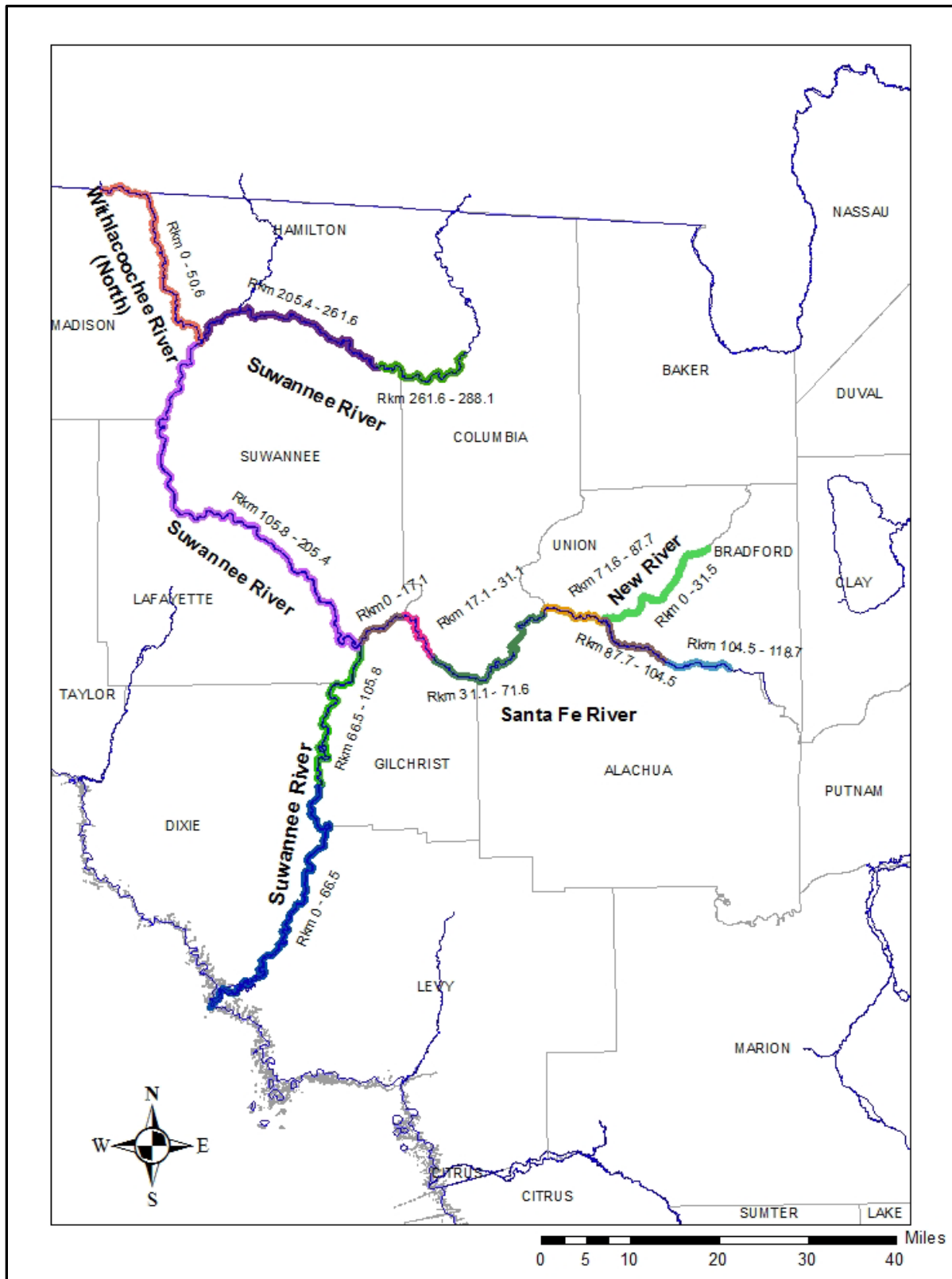


Figure 1. The portion of the Suwannee, Santa Fe, New, and Withlacoochee North Rivers utilized by the Gulf Sturgeon and oval pigtoe mussel requiring alternative DO criteria.

Table 1. Summary statistics for existing DO conditions in the portions of the Santa Fe and New Rivers utilized by the Oval Pigtoe mussel for the period from 1991 through 2011.

River System	WBID	River km	Statistic	DO Concentration, mg/L	DO Percent Saturation
New	3506	0 - 31.5 km	Count	406	404
New	3506	0 - 31.5 km	Avg	6.42	67.14
New	3506	0 - 31.5 km	Std Dev	1.77	13.80
New	3506	0 - 31.5 km	10th percentile	4.60	52.48
New	3506	0 - 31.5 km	25th percentile	5.30	60.20
New	3506	0 - 31.5 km	50th percentile	6.29	67.65
New	3506	0 - 31.5 km	75th percentile	7.50	74.76
New	3506	0 - 31.5 km	90th percentile	8.62	80.62
Santa Fe	3605D	71.6 - 87.7 km	Count	269	269
Santa Fe	3605D	71.6 - 87.7 km	Avg	6.77	72.54
Santa Fe	3605D	71.6 - 87.7 km	Std Dev	1.69	11.96
Santa Fe	3605D	71.6 - 87.7 km	10th percentile	5.00	59.51
Santa Fe	3605D	71.6 - 87.7 km	25th percentile	5.60	65.49
Santa Fe	3605D	71.6 - 87.7 km	50th percentile	6.50	72.95
Santa Fe	3605D	71.6 - 87.7 km	75th percentile	7.80	79.40
Santa Fe	3605D	71.6 - 87.7 km	90th percentile	9.00	86.58
Santa Fe	3605E	87.7 - 104.5 km	Count	239	237
Santa Fe	3605E	87.7 - 104.5 km	Avg	6.32	67.33
Santa Fe	3605E	87.7 - 104.5 km	Std Dev	1.89	18.35
Santa Fe	3605E	87.7 - 104.5 km	10th percentile	4.00	46.06
Santa Fe	3605E	87.7 - 104.5 km	25th percentile	5.00	54.65
Santa Fe	3605E	87.7 - 104.5 km	50th percentile	6.20	69.16
Santa Fe	3605E	87.7 - 104.5 km	75th percentile	7.40	78.00
Santa Fe	3605E	87.7 - 104.5 km	90th percentile	8.58	85.32
Santa Fe	3605	104.5 - 118.7 km	Count	83	83
Santa Fe	3605	104.5 - 118.7 km	Avg	6.30	65.66
Santa Fe	3605	104.5 - 118.7 km	Std Dev	2.23	19.27
Santa Fe	3605	104.5 - 118.7 km	10th percentile	3.17	37.14
Santa Fe	3605	104.5 - 118.7 km	25th percentile	5.40	60.40
Santa Fe	3605	104.5 - 118.7 km	50th percentile	6.23	69.30
Santa Fe	3605	104.5 - 118.7 km	75th percentile	7.81	77.14
Santa Fe	3605	104.5 - 118.7 km	90th percentile	8.89	84.00

Table 2. Summary statistics for existing DO conditions in the portions of the Suwannee, Santa Fe and Withlacoochee Rivers utilized by the Gulf Sturgeon for the period from 1991 through 2011.

River System	WBID	River km	Statistic	DO Concentration, mg/L	DO Percent Saturation
Santa Fe	3605A	0 - 17.1 km	Count	268	268
Santa Fe	3605A	0 - 17.1 km	Avg	5.85	66.17
Santa Fe	3605A	0 - 17.1 km	Std Dev	1.11	12.49
Santa Fe	3605A	0 - 17.1 km	10th percentile	4.50	50.90
Santa Fe	3605A	0 - 17.1 km	25th percentile	5.24	59.78
Santa Fe	3605A	0 - 17.1 km	50th percentile	5.90	66.04
Santa Fe	3605A	0 - 17.1 km	75th percentile	6.50	73.30
Santa Fe	3605A	0 - 17.1 km	90th percentile	7.13	80.82
Santa Fe	3605B	17.1 - 31.1 km	Count	52	49
Santa Fe	3605B	17.1 - 31.1 km	Avg	6.30	71.08
Santa Fe	3605B	17.1 - 31.1 km	Std Dev	1.52	16.46
Santa Fe	3605B	17.1 - 31.1 km	10th percentile	3.95	47.62
Santa Fe	3605B	17.1 - 31.1 km	25th percentile	5.56	61.00
Santa Fe	3605B	17.1 - 31.1 km	50th percentile	6.60	74.00
Santa Fe	3605B	17.1 - 31.1 km	75th percentile	7.34	85.00
Santa Fe	3605B	17.1 - 31.1 km	90th percentile	8.10	89.32
Santa Fe	3605C	31.1 - 71.6 km	Count	1201	1202
Santa Fe	3605C	31.1 - 71.6 km	Avg	4.79	53.70
Santa Fe	3605C	31.1 - 71.6 km	Std Dev	1.70	17.85
Santa Fe	3605C	31.1 - 71.6 km	10th percentile	2.66	30.69
Santa Fe	3605C	31.1 - 71.6 km	25th percentile	3.80	43.25
Santa Fe	3605C	31.1 - 71.6 km	50th percentile	4.70	53.56
Santa Fe	3605C	31.1 - 71.6 km	75th percentile	5.70	63.08
Santa Fe	3605C	31.1 - 71.6 km	90th percentile	7.05	76.96
Suwannee	3422	66.5 - 105.8 km	Count	290	290
Suwannee	3422	66.5 - 105.8 km	Avg	6.62	74.64
Suwannee	3422	66.5 - 105.8 km	Std Dev	1.29	13.75
Suwannee	3422	66.5 - 105.8 km	10th percentile	5.00	60.25
Suwannee	3422	66.5 - 105.8 km	25th percentile	5.62	65.22
Suwannee	3422	66.5 - 105.8 km	50th percentile	6.55	74.55
Suwannee	3422	66.5 - 105.8 km	75th percentile	7.60	81.70
Suwannee	3422	66.5 - 105.8 km	90th percentile	8.30	94.00
Suwannee	3422A	0 - 66.5 km	Count	1600	1598
Suwannee	3422A	0 - 66.5 km	Avg	6.71	76.40
Suwannee	3422A	0 - 66.5 km	Std Dev	1.43	14.88
Suwannee	3422A	0 - 66.5 km	10th percentile	4.90	58.90
Suwannee	3422A	0 - 66.5 km	25th percentile	5.80	68.40
Suwannee	3422A	0 - 66.5 km	50th percentile	6.76	76.69
Suwannee	3422A	0 - 66.5 km	75th percentile	7.62	83.90
Suwannee	3422A	0 - 66.5 km	90th percentile	8.40	93.16

Table 2. Continued.

River System	WBID	River km	Statistic	DO Concentration, mg/L	DO Percent Saturation
Suwannee	3422B	105.8 - 205.4 km	Count	1898	1894
Suwannee	3422B	105.8 - 205.4 km	Avg	6.31	69.96
Suwannee	3422B	105.8 - 205.4 km	Std Dev	1.51	15.30
Suwannee	3422B	105.8 - 205.4 km	10th percentile	4.60	53.31
Suwannee	3422B	105.8 - 205.4 km	25th percentile	5.20	60.61
Suwannee	3422B	105.8 - 205.4 km	50th percentile	6.16	68.95
Suwannee	3422B	105.8 - 205.4 km	75th percentile	7.26	77.30
Suwannee	3422B	105.8 - 205.4 km	90th percentile	8.30	86.57
Suwannee	3341	205.4 - 261.6 km	Count	599	599
Suwannee	3341	205.4 - 261.6 km	Avg	5.91	64.04
Suwannee	3341	205.4 - 261.6 km	Std Dev	1.94	17.04
Suwannee	3341	205.4 - 261.6 km	10th percentile	3.55	41.07
Suwannee	3341	205.4 - 261.6 km	25th percentile	4.50	51.93
Suwannee	3341	205.4 - 261.6 km	50th percentile	5.70	66.40
Suwannee	3341	205.4 - 261.6 km	75th percentile	7.20	76.35
Suwannee	3341	205.4 - 261.6 km	90th percentile	8.60	84.24
Suwannee	3341A	261.6 - 288.1 km	Count	350	350
Suwannee	3341A	261.6 - 288.1 km	Avg	7.08	77.46
Suwannee	3341A	261.6 - 288.1 km	Std Dev	1.62	10.78
Suwannee	3341A	261.6 - 288.1 km	10th percentile	5.49	65.45
Suwannee	3341A	261.6 - 288.1 km	25th percentile	5.90	71.55
Suwannee	3341A	261.6 - 288.1 km	50th percentile	6.60	78.16
Suwannee	3341A	261.6 - 288.1 km	75th percentile	8.30	84.90
Suwannee	3341A	261.6 - 288.1 km	90th percentile	9.40	90.01
Withlacoochee	3315	0 - 50.6 km	Count	986	986
Withlacoochee	3315	0 - 50.6 km	Avg	6.51	69.93
Withlacoochee	3315	0 - 50.6 km	Std Dev	1.64	12.70
Withlacoochee	3315	0 - 50.6 km	10th percentile	4.71	54.90
Withlacoochee	3315	0 - 50.6 km	25th percentile	5.30	61.70
Withlacoochee	3315	0 - 50.6 km	50th percentile	6.13	68.20
Withlacoochee	3315	0 - 50.6 km	75th percentile	7.50	78.28
Withlacoochee	3315	0 - 50.6 km	90th percentile	8.90	86.30

Table 3. Baseline DO conditions for portions of the Suwannee, Santa Fe, New, and Withlacoochee Rivers utilized by the Gulf Sturgeon and Oval Pigtoe Mussel. The 10th percentile and median percent DO saturation values were determined from data collected from 1991 through 2011.

Species	River System	River km	10th Percentile	Median
Oval Pigtoe Mussel	New River	0 - 31.5	52.5	67.7
Gulf Sturgeon	Santa Fe River	0 - 17.1	50.9	66.0
Gulf Sturgeon	Santa Fe River	17.1 - 31.1	47.6	74.0
Gulf Sturgeon	Santa Fe River	31.1 - 71.6	30.7	53.6
Oval Pigtoe Mussel	Santa Fe River	71.6 - 87.7	59.5	73.0
Oval Pigtoe Mussel	Santa Fe River	87.7 - 104.5	46.1	69.2
Oval Pigtoe Mussel	Santa Fe River	104.5 - 118.7	37.1	69.3
Gulf Sturgeon	Suwannee River	0 - 66.5	58.9	76.7
Gulf Sturgeon	Suwannee River	66.5 - 105.8	60.2	74.6
Gulf Sturgeon	Suwannee River	105.8 - 205.4	53.3	69.0
Gulf Sturgeon	Suwannee River	205.4 - 261.6	41.1	66.4
Gulf Sturgeon	Suwannee River	261.6 - 288.1	65.5	78.2
Gulf Sturgeon	Withlacoochee River	0 - 50.6	54.9	68.2

Table 4. Minimum number of samples not meeting applicable median criterion needed to put a water on the planning list with 80% confidence and on verified list with 90% confidence that more than 50% of **daily average values measurements** are below median.

Number of Samples	Number of exceedances required for 80% confidence that more than 50% of daily average values measurements are below median	Number of exceedances required for 90% confidence that more than 50% of daily average values measurements are below median	Number of Samples	Number of exceedances required for 80% confidence that more than 50% of daily average values measurements are below median	Number of exceedances required for 90% confidence that more than 50% of daily average values measurements are below median
10	7	8	76	43	45
11	8	9	77	43	45
12	8	9	78	44	46
13	9	10	79	44	46
14	10	10	80	45	47
15	10	11	81	45	47
16	11	12	82	46	48
17	11	12	83	46	48
18	12	13	84	47	49
19	12	13	85	47	49
20	13	14	86	48	50
21	13	14	87	48	50
22	14	15	88	49	51
23	15	16	89	49	52
24	15	16	90	50	52
25	16	17	91	51	53
26	16	17	92	51	53
27	17	18	93	52	54
28	17	18	94	52	54
29	18	19	95	53	55
30	18	20	96	53	55
31	19	20	97	54	56
32	19	21	98	54	56
33	20	21	99	55	57
34	20	22	100	55	57
35	21	22	101	56	58
36	22	23	102	56	58
37	22	23	103	57	59
38	23	24	104	57	60
39	23	24	105	58	60
40	24	25	106	58	61
41	24	26	107	59	61
42	25	26	108	59	62
43	25	27	109	60	62
44	26	27	110	60	63
45	26	28	111	61	63
46	27	28	112	61	64
47	27	29	113	62	64
48	28	29	114	62	65
49	28	30	115	63	65
50	29	31	116	64	66
51	30	31	117	64	66
52	30	32	118	65	67
53	31	32	119	65	67
54	31	33	120	66	68
55	32	33	121	66	69
56	32	34	122	67	69
57	33	34	123	67	70
58	33	35	124	68	70
59	34	35	125	68	71
60	34	36	126	69	71
61	35	37	127	69	72
62	35	37	128	70	72
63	36	38	129	70	73
64	36	38	130	71	73
65	37	39	131	71	74
66	37	39	132	72	74
67	38	40	133	72	75
68	38	40	134	73	75
69	39	41	135	73	76
70	40	41	136	74	76
71	40	42	137	74	77
72	41	42	138	75	78
73	41	43	139	75	78
74	42	44	140	76	79
75	42	44	141	76	79

Table 4. Continued.

Number of Samples	Number of exceedances required for 80% confidence that more than 50% of daily average values measurements are below median	Number of exceedances required for 90% confidence that more than 50% of daily average values measurements are below median	Number of Samples	Number of exceedances required for 80% confidence that more than 50% of daily average values measurements are below median	Number of exceedances required for 90% confidence that more than 50% of daily average values measurements are below median
142	77	80	211	113	116
143	78	80	212	113	116
144	78	81	213	114	117
145	79	81	214	114	117
146	79	82	215	115	118
147	80	82	216	115	118
148	80	83	217	116	119
149	81	83	218	116	119
150	81	84	219	117	120
151	82	84	220	117	121
152	82	85	221	118	121
153	83	85	222	118	122
154	83	86	223	119	122
155	84	86	224	119	123
156	84	87	225	120	123
157	85	88	226	120	124
158	85	88	227	121	124
159	86	89	228	121	125
160	86	89	229	122	125
161	87	90	230	122	126
162	87	90	231	123	126
163	88	91	232	123	127
164	88	91	233	124	127
165	89	92	234	124	128
166	89	92	235	125	128
167	90	93	236	125	129
168	90	93	237	126	129
169	91	94	238	126	130
170	91	94	239	127	130
171	92	95	240	128	131
172	93	95	241	128	131
173	93	96	242	129	132
174	94	96	243	129	132
175	94	97	244	130	133
176	95	97	245	130	134
177	95	98	246	131	134
178	96	99	247	131	135
179	96	99	248	132	135
180	97	100	249	132	136
181	97	100	250	133	136
182	98	101	251	133	137
183	98	101	252	134	137
184	99	102	253	134	138
185	99	102	254	135	138
186	100	103	255	135	139
187	100	103	256	136	139
188	101	104	257	136	140
189	101	104	258	137	140
190	102	105	259	137	141
191	102	105	260	138	141
192	103	106	261	138	142
193	103	106	262	139	142
194	104	107	263	139	143
195	104	107	264	140	143
196	105	108	265	140	144
197	105	108	266	141	144
198	106	109	267	141	145
199	106	110	268	142	145
200	107	110	269	142	146
201	107	111	270	143	147
202	108	111	271	143	147
203	108	112	272	144	148
204	109	112	273	144	148
205	110	113	274	145	149
206	110	113	275	145	149
207	111	114	276	146	150
208	111	114	277	147	150
209	112	115	278	147	151
210	112	115	279	148	151

Table 4. Continued.

Number of Samples	Number of exceedances required for 80% confidence that more than 50% of daily average values measurements are below median	Number of exceedances required for 90% confidence that more than 50% of daily average values measurements are below median	Number of Samples	Number of exceedances required for 80% confidence that more than 50% of daily average values measurements are below median	Number of exceedances required for 90% confidence that more than 50% of daily average values measurements are below median
280	148	152	350	184	188
281	149	152	351	184	189
282	149	153	352	185	189
283	150	153	353	185	190
284	150	154	354	186	190
285	151	154	355	186	191
286	151	155	356	187	191
287	152	155	357	187	192
288	152	156	358	188	192
289	153	156	359	188	193
290	153	157	360	189	193
291	154	157	361	189	194
292	154	158	362	190	194
293	155	158	363	191	195
294	155	159	364	191	195
295	156	160	365	192	196
296	156	160	366	192	196
297	157	161	367	193	197
298	157	161	368	193	197
299	158	162	369	194	198
300	158	162	370	194	198
301	159	163	371	195	199
302	159	163	372	195	199
303	160	164	373	196	200
304	160	164	374	196	200
305	161	165	375	197	201
306	161	165	376	197	201
307	162	166	377	198	202
308	162	166	378	198	202
309	163	167	379	199	203
310	163	167	380	199	203
311	164	168	381	200	204
312	164	168	382	200	205
313	165	169	383	201	205
314	165	169	384	201	206
315	166	170	385	202	206
316	166	170	386	202	207
317	167	171	387	203	207
318	168	171	388	203	208
319	168	172	389	204	208
320	169	172	390	204	209
321	169	173	391	205	209
322	170	173	392	205	210
323	170	174	393	206	210
324	171	175	394	206	211
325	171	175	395	207	211
326	172	176	396	207	212
327	172	176	397	208	212
328	173	177	398	208	213
329	173	177	399	209	213
330	174	178	400	209	214
331	174	178	401	210	214
332	175	179	402	210	215
333	175	179	403	211	215
334	176	180	404	211	216
335	176	180	405	212	216
336	177	181	406	212	217
337	177	181	407	213	217
338	178	182	408	214	218
339	178	182	409	214	218
340	179	183	410	215	219
341	179	183	411	215	219
342	180	184	412	216	220
343	180	184	413	216	221
344	181	185	414	217	221
345	181	185	415	217	222
346	182	186	416	218	222
347	182	186	417	218	223
348	183	187	418	219	223
349	183	187	419	219	224

4 Protection of the Atlantic and Shortnose Sturgeon

Based on discussions with NOAA's National Marine Fisheries Service (NMFS) staff responsible for the protection of the Atlantic and shortnose sturgeon, the area in the St. Johns River between the U.S. Highway 17 Bridge in Palatka north to the Shands Bridge (U.S. Highway 16) bridge near Green Cove Springs (**Figure 2**) is an area where both species could potentially spawn in the future. According to the NMFS, any future spawning of the sturgeon in the St. Johns River would occur during the period from February through March.

To assure no adverse effects on the Atlantic and shortnose sturgeon juveniles, the current 5.0 mg/L DO criterion will be maintained in the St. Johns River between the U.S. Highway 17 Bridge in Palatka north to the Shands Bridge (U.S. Highway 16) bridge near Green Cove Springs during the months of February and March. During the other times of the year when the sturgeon are less sensitive, the DO criteria proposed for the Northeast and Big Bend bioregion would apply.

4.1 *Sturgeon in the St. Marys River*

Historically, Atlantic and shortnose sturgeon have occasionally been found in portions of the St. Marys River. According to NMFS staff, most of the sturgeon captures in the St. Marys have occurred between river km 26 and 44. However, there is no evidence that spawning has occurred in the St. Marys River due to natural conditions not being favorable. Even though the portions of the Marys River where sturgeon have been captured have very limited anthropogenic inputs, the DO levels are naturally low with significant portions of the river commonly exhibiting DO concentrations below 3 mg/L as a result of the natural conditions including wetland inputs, high color, high degree of shading/canopy cover, low flow, etc. Additionally, NMFS staff have indicated that sturgeon have been captured in the St. Marys at DO concentrations as low as 2.7 mg/L.

While the natural DO levels in the St. Marys may not be ideal for the widespread occurrence of the sturgeon, FDEP is prohibited by state statute from implementing regulations that would require natural background conditions to be ameliorated. Since the DO criteria proposed for the Northeast and Big Bend bioregion are protective of the natural DO levels found in the St. Marys River, no additional modification was deemed necessary.

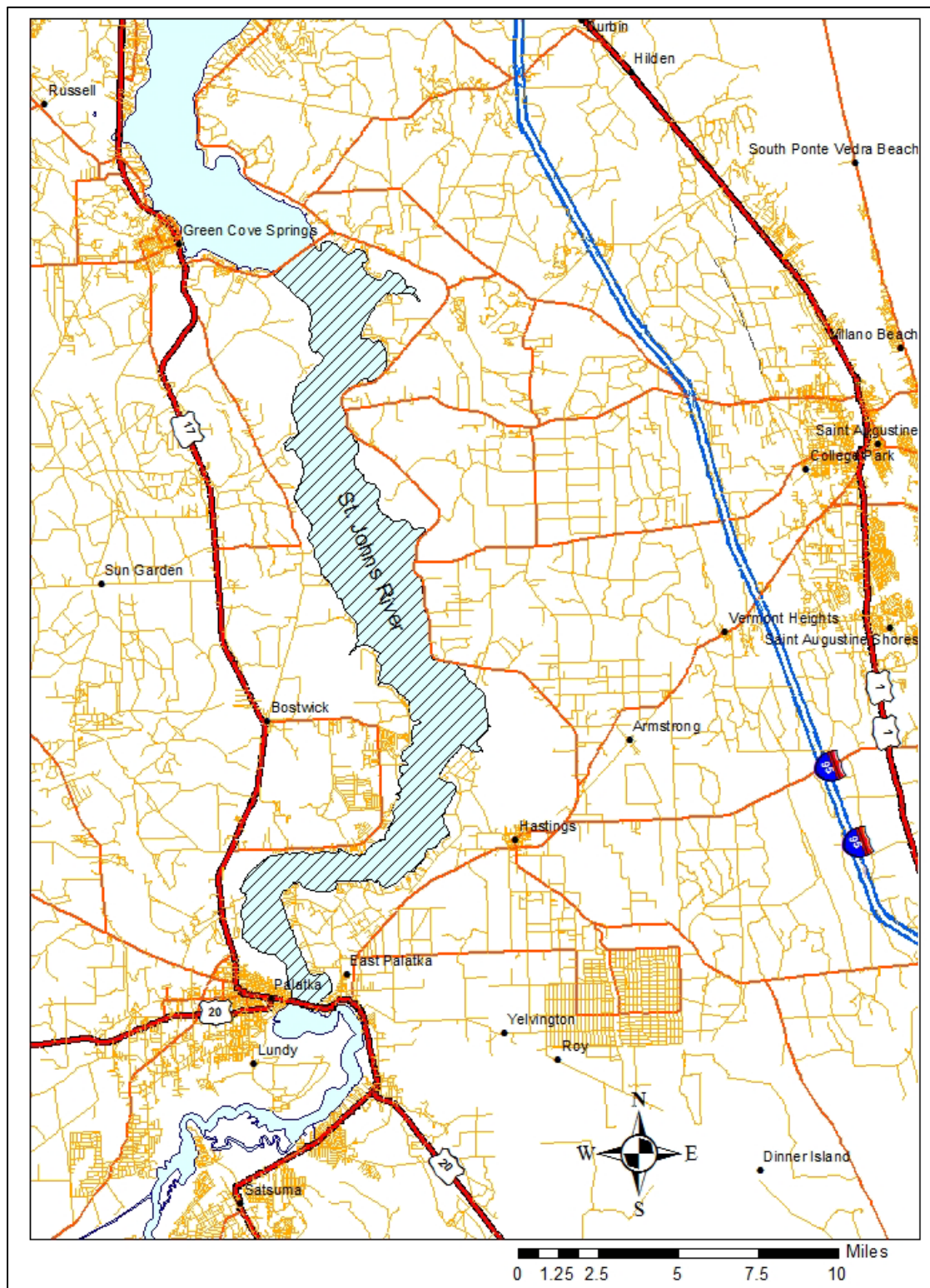


Figure 2. The portion of the St. Johns River between the U.S. Highway 17 Bridge in Palatka north to the Shands Bridge (U.S. Highway 16) bridge near Green Cove Springs (shown by hatching) requiring alternative DO criteria to assure potential sturgeon spawning habitat is protected.