

Supplementary Materials:

Table S1. Tagged Atlantic goliath grouper (*Epinephelus itajara*) demographic and summarized detection information, including: sex as evaluated in the field and/or determined via histological examination (“hist”) of gonad samples (female “F”; immature = “I”; male = “M”; transitional = “T”; undetermined = “U”); length at first capture (cm TL); age as determined from ageing of the dorsal spine; tag date; date of last detection; days at large (“DAL”); days detected (“Days”) across the two detection time series, 2010-2014 and 2015-2020.

Fish #	Sex (field)	Sex (hist)	Length	Age	Tag site	Tag date	Last detected	DAL	Days (2010-2014)	Days (2015-2020)
24	F	F	153	8	Zion Train	9/4/2010	4/16/2011	224	190	0
25	M	M	151	7	Zion Train	9/4/2010	11/9/2013	1162	1553	0
27	M	M	156	7	Zion Train	9/4/2010	6/30/2013	1030	884	0
28	F	F	136	6	Zion Train	9/4/2010	12/20/2014	1568	783	0
29	M	M	190	10	Zion Train	9/4/2010	12/23/2012	841	750	0
30	F	F	136	6	Three Holes	9/5/2010	10/31/2010	56	55	0
31	M	T	127	5	Three Holes	9/5/2010	5/5/2014	1338	1314	0
32	F	F	125	6	Three Holes	9/5/2010	7/3/2013	1032	75	0
33	F	F	163	9	Gulfland	9/5/2010	9/20/2012	746	128	0
34	F	F	162	7	Gulfland	9/5/2010	8/23/2013	1083	408	0
35	F	F	167	7	Gulfland	9/5/2010	2/20/2014	1264	819	0
37	M	M	147	8	Gulfland	9/5/2010	7/27/2013	1056	128	0
38	F	T	150	7	Gulfland	9/5/2010	11/14/2010	70	71	0
39	M	M	135	6	Gulfland	9/5/2010	9/22/2011	382	388	0
40	M	M	136	6	Gulfland	9/5/2010	10/3/2012	759	499	0
41	IMM	IMM	117	5	Gulfland	9/5/2010	3/8/2013	915	1110	0
42	IMM	IMM	104	4	Gulfland	9/5/2010	9/15/2018	2932	1104	125
43	IMM	IMM	120	5	Gulfland	9/5/2010	12/15/2012	832	750	0

44	M	M	137	8	Zion Train	9/25/2010	12/15/2013	1177	408	0
45	F	F	189	13	Zion Train	9/25/2010	7/18/2013	1027	278	0
46	F	F	179	10	Zion Train	9/25/2010	9/19/2013	1090	89	0
48	M	M	172	10	Zion Train	9/25/2010	6/28/2013	1007	1006	0
49	M	M	178	11	Zion Train	9/25/2010	1/29/2014	1222	516	0
51	F	F	130	6	Zion Train	9/25/2010	9/4/2013	1075	187	0
52	M	T	205	14	Zion Train	9/25/2010	5/26/2013	974	931	0
53	M	M	189	14	Zion Train	9/26/2010	4/6/2019	3114	1257	538
55	F	F	174	12	Zion Train	9/26/2010	12/16/2015	1907	315	317
57	M	M	181	10	Zion Train	9/26/2010	9/2/2012	707	616	0
58	F	F	180	10	Zion Train	9/26/2010	10/2/2013	1102	103	0
59	M	T	182	11	Zion Train	9/26/2010	7/19/2014	1392	1465	0
60	F	T	186	12	Zion Train	9/26/2010	10/2/2011	371	40	0
61	F	F	192	10	Zion Train	9/26/2010	3/26/2015	1642	467	1
62	F	F	156	8	Zion Train	9/26/2010	12/15/2017	2637	805	527
63	M	T	184	9	Zion Train	9/26/2010	3/11/2013	897	56	0
64	F	F	185	7	Zion Train	9/26/2010	9/5/2013	1075	300	0
65	M	T	127	6	Zion Train	9/26/2010	11/18/2013	1149	795	0
82	--	U	151	8	Zion Train	12/12/2010	9/1/2013	994	900	0
83	M	M	162	7	Zion Train	12/12/2010	1/31/2013	781	211	0
89	F	F	184	10	Three Holes	5/25/2011	4/2/2019	2869	1133	313
91	--	U	166	7	Three Holes	5/25/2011	11/7/2013	897	472	0
417	F	F	194	12	Zion Train	9/15/2012	8/21/2017	1801	282	371
436	F	F	174	8	Zion Train	9/16/2012	9/24/2012	8	6	0
438	F	F	168	9	Zion Train	9/16/2012	11/12/2017	1883	136	114
439	F	F	177	12	Zion Train	9/16/2012	9/28/2019	2568	131	214

440	M	M	162	11	Zion Train	9/16/2012	10/10/2012	24	28	0
757	--	--	--	--	Three Holes	9/6/2013	5/5/2015	606	67	34
758	--	--	--	--	Three Holes	9/6/2013	5/2/2015	603	139	29
759	--	--	--	--	Three Holes	9/6/2013	6/24/2016	1022	105	188
760	--	--	--	--	Three Holes	9/6/2013	5/31/2015	632	415	143
761	--	--	--	--	Three Holes	9/6/2013	6/28/2020	2487	203	55

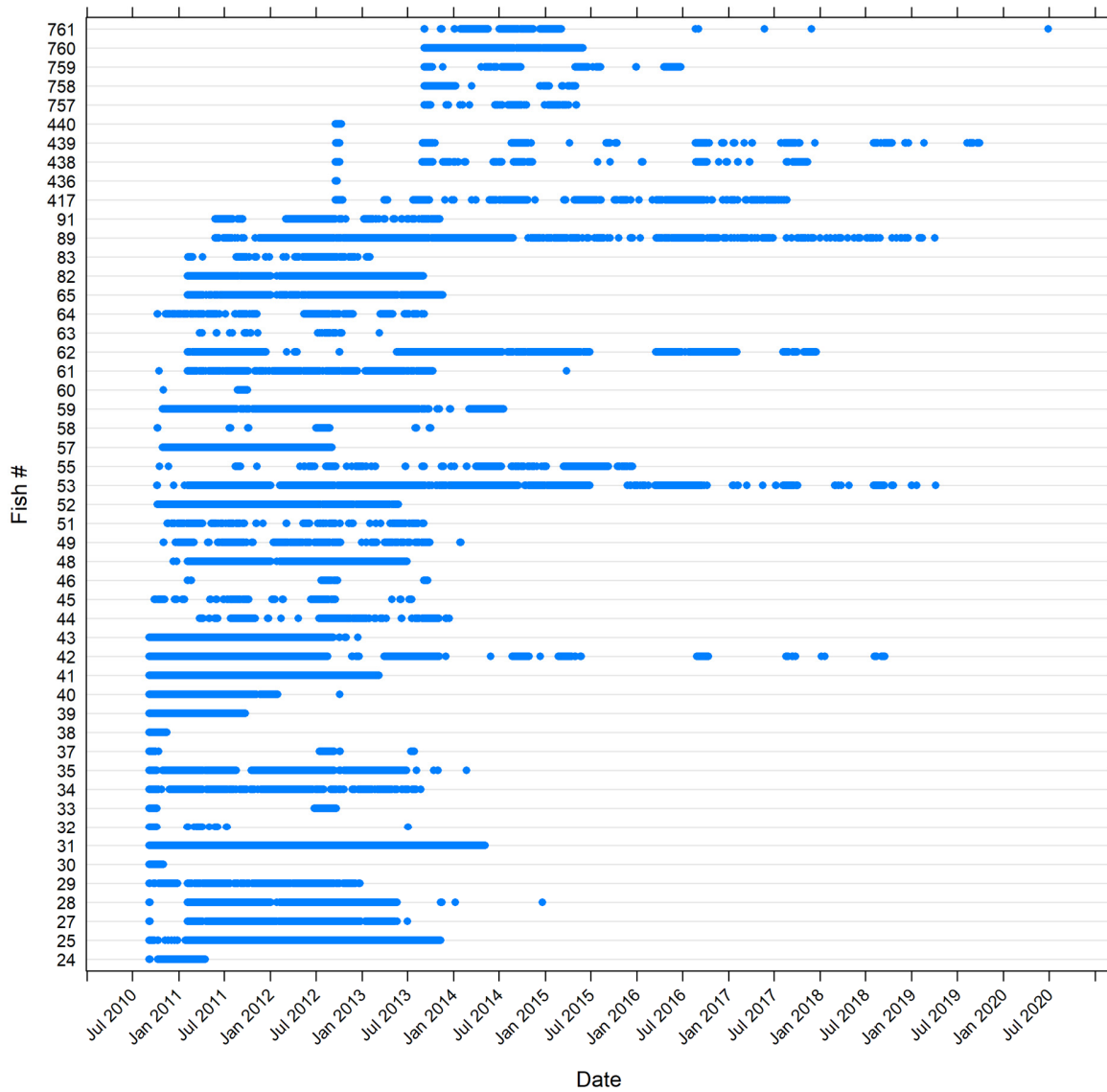


Figure S1. Detections of 50 tagged Atlantic goliath grouper (*Epinephelus itajara*) from the FACT Network array of receivers from mid-2010 through July 2020; each point represents a day with a validated detection for each individual.

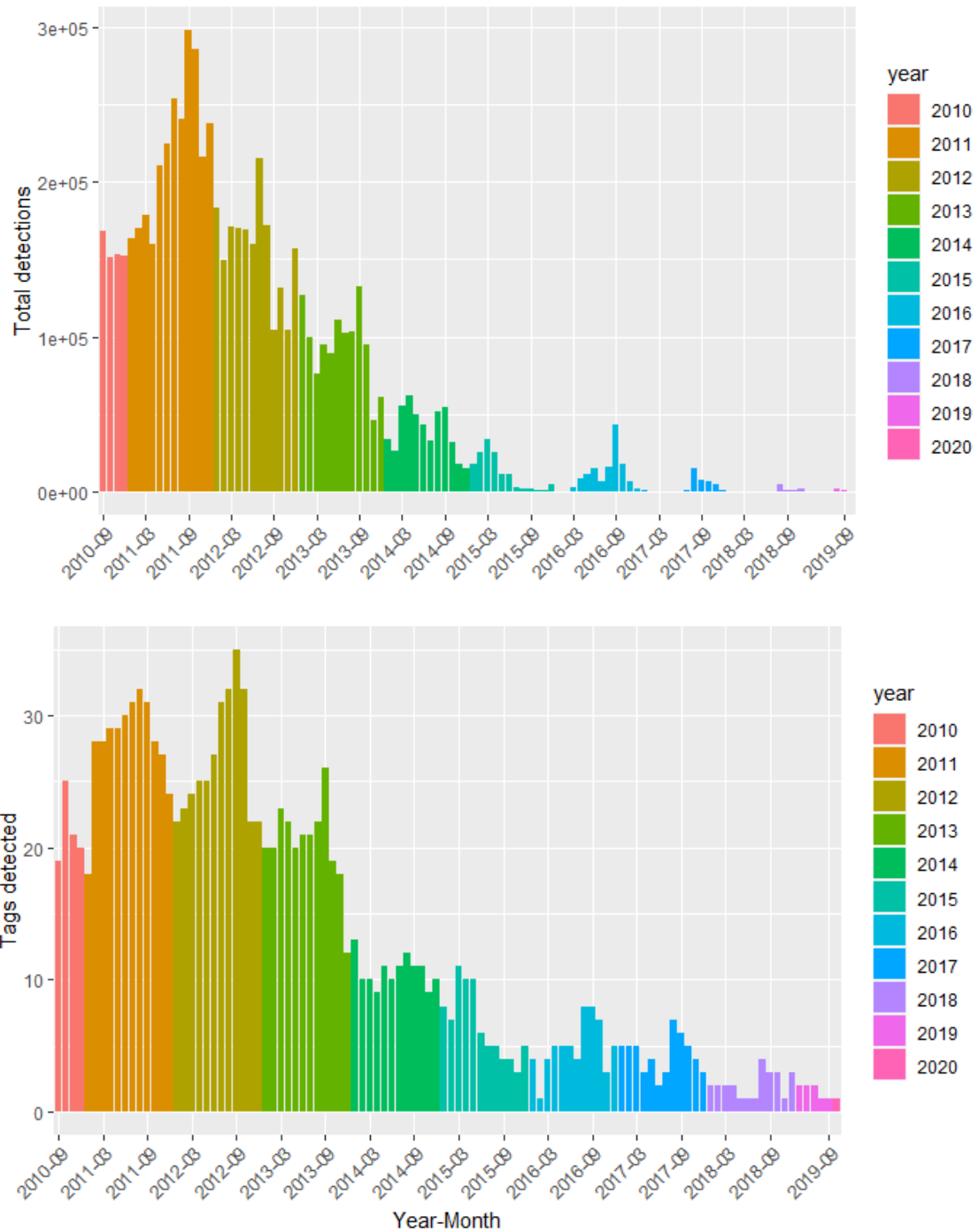


Figure S2. Detection results of Atlantic goliath grouper (*Epinephelus itajara*) detected by FACT Network monitored acoustic receivers deployed along the east coast of Florida from September 2010 – September 2019. **Top:** total detections per month, all tagged fish. **Bottom:** number of tagged fish detected per month.

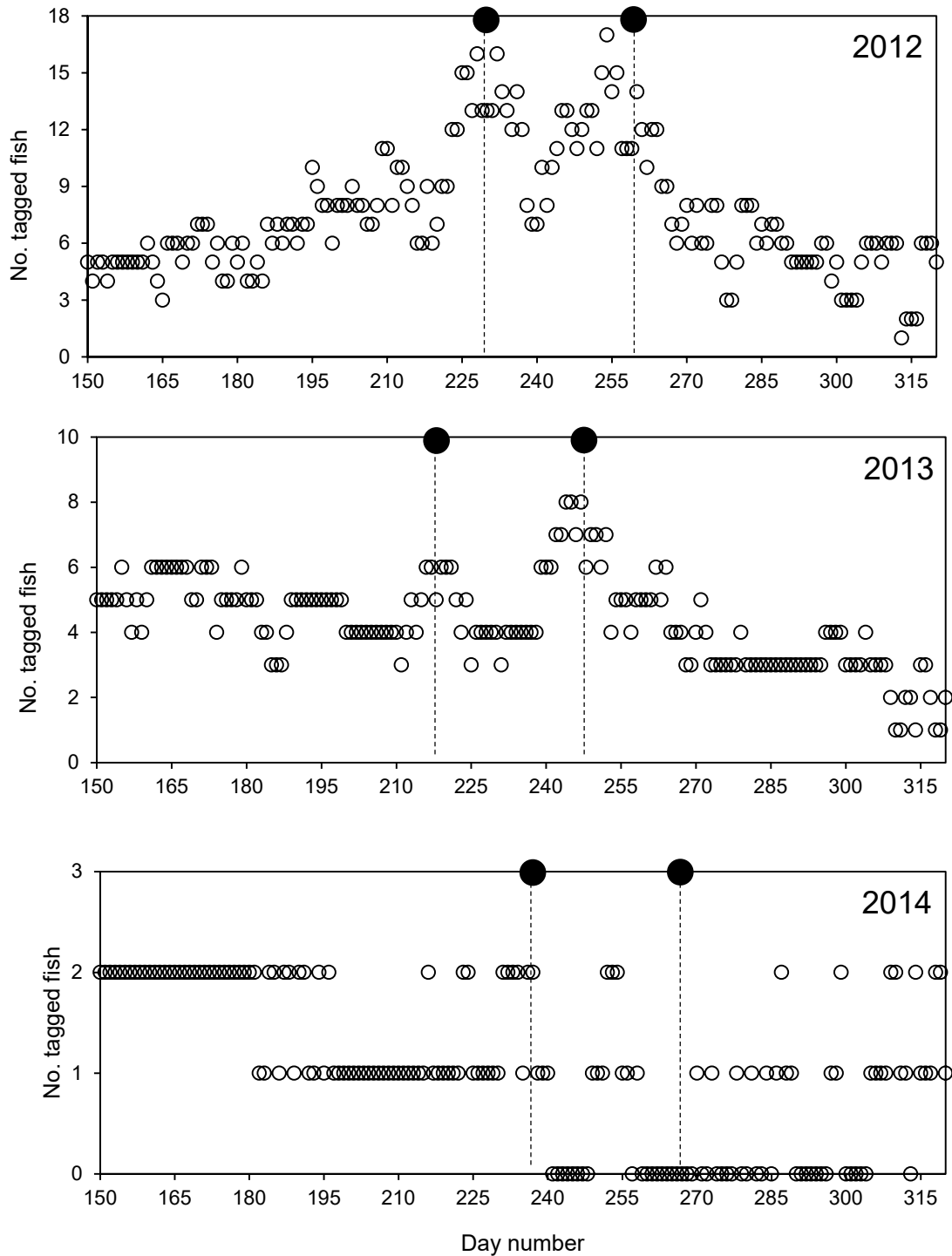


Figure S3. Number of tagged Atlantic goliath grouper (*Epinephelus itajara*) that were detected at the Zion Train (ZT) FSA site from late May to mid-November in 2012 (top), 2013 (middle), and 2014 (bottom). Vertical dashed lines indicate the approximate dates of the new moon for August and September each year. Note the change in scale of the y-axis between years.

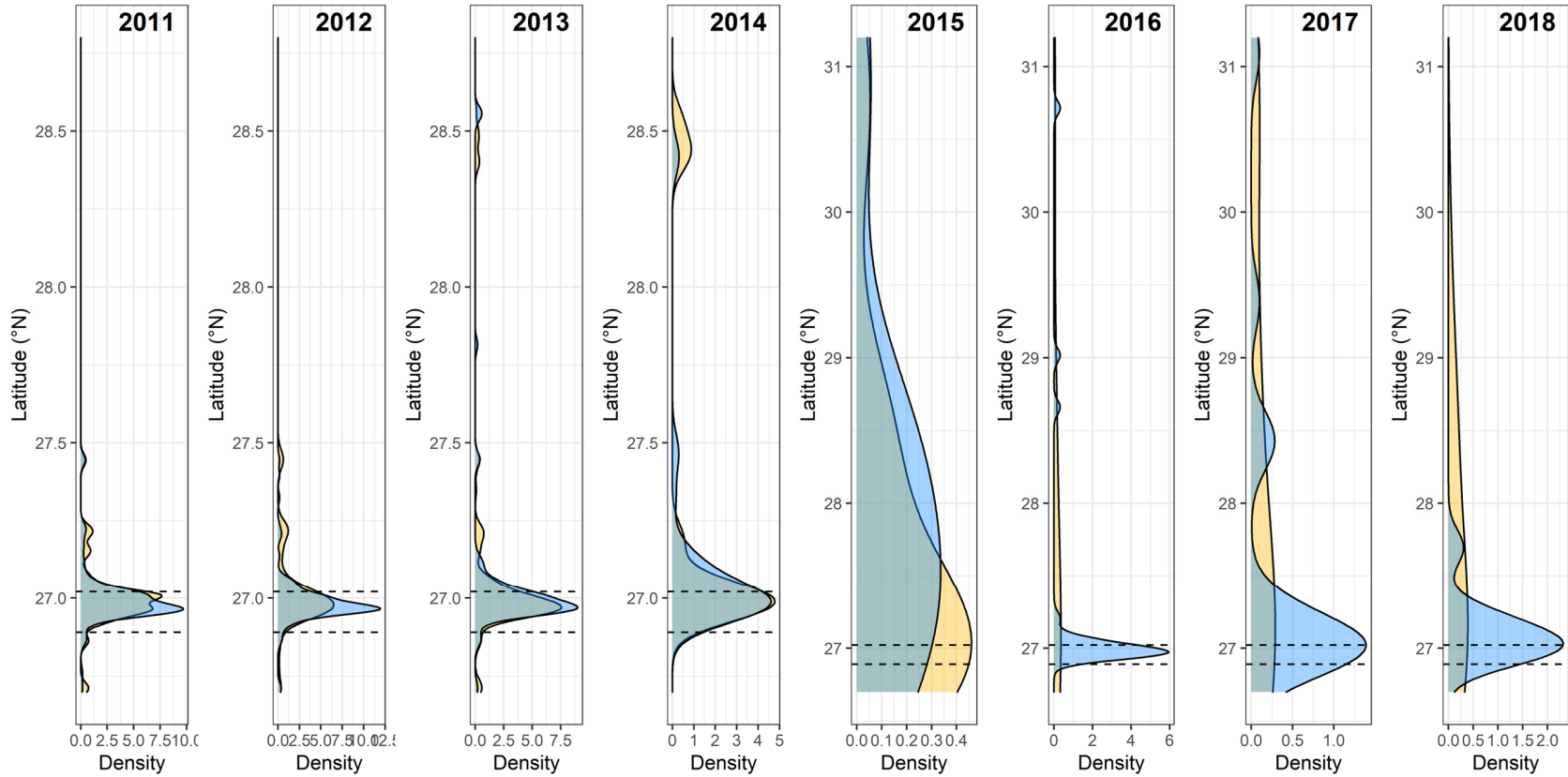


Figure S4. Annual kernel density plots of the likelihood of detecting a tagged Atlantic goliath grouper (*Epinephelus itajara*) at a given latitude during the spawning season (July to Oct, blue shaded region), versus non-spawning months (Nov to June, yellow shaded region), for 2011-2018.