Are the last remaining Nassau grouper *Epinephelus striatus* fisheries sustainable? Status quo in the Bahamas

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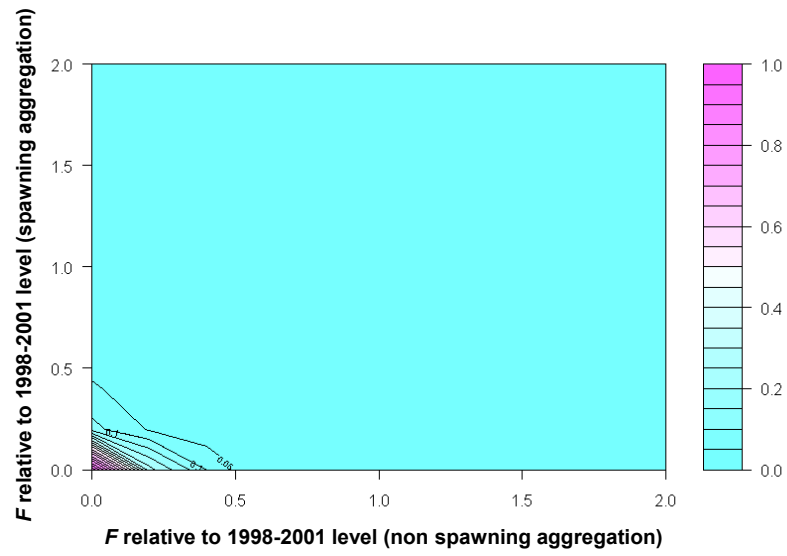[4]**Dept. of Marine Resources, Government of The Bahamas, PO Box N 3028, Nassau, Bahamas**
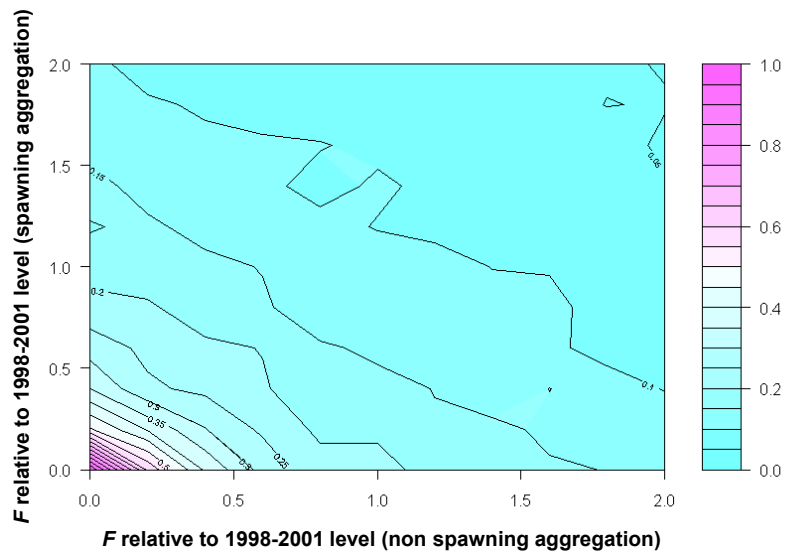
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Supplement. Supplementary figures and tables summarizing the outputs from the population dynamic model and analysis of catch-per-unit-effort data
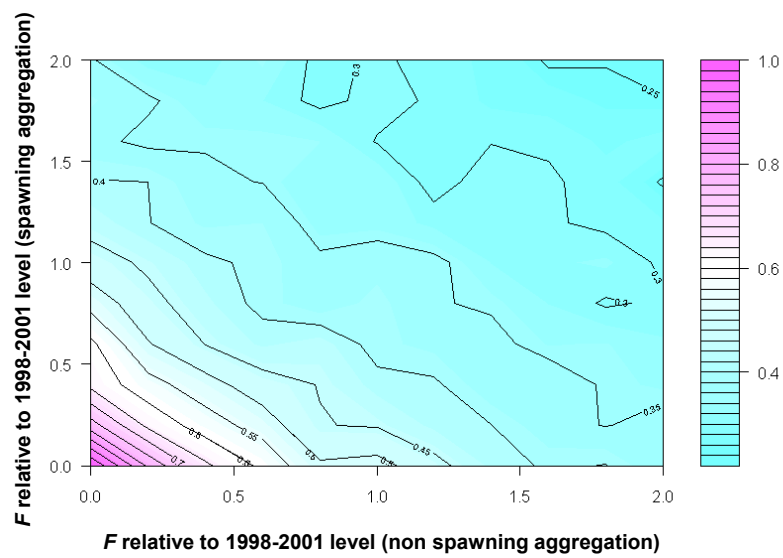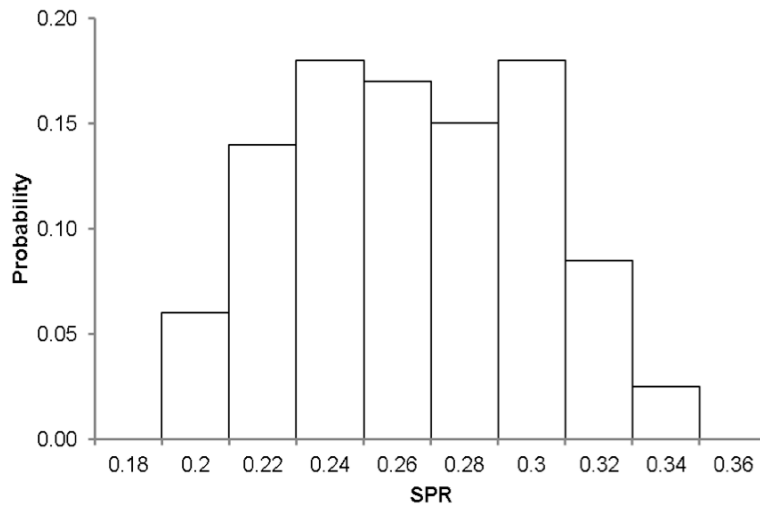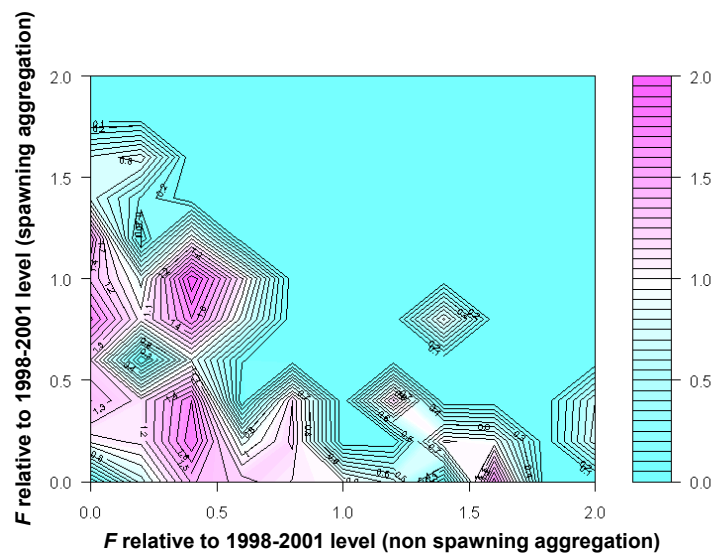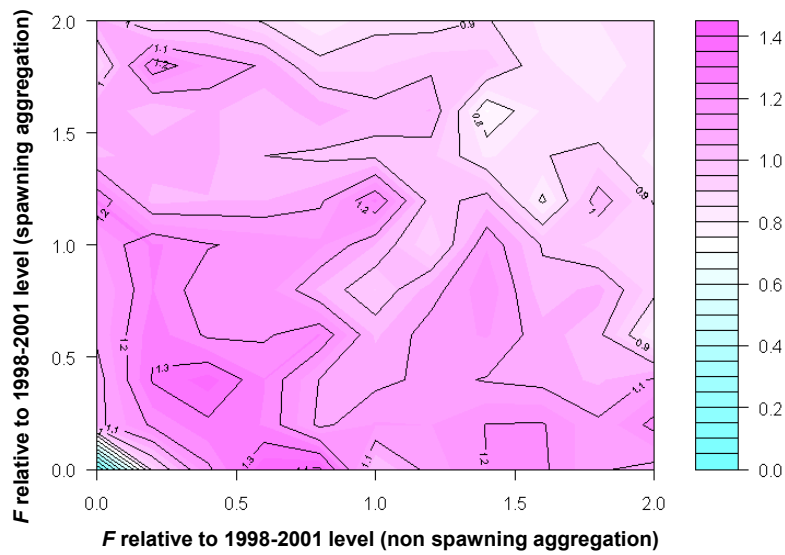
a

b

c

d

Fig. S1. *Epinephelus striatus*. Spawning biomass relative to unexploited levels (SPR; color scale and gray contour lines) under different levels of fishing mortality (*F*) targeting the Bahamas' Nassau grouper population during non-spawning and spawning periods at (a) median, (b) lower 5%, and (c) upper 5% confidence levels. Fishing mortality rate is expressed relative to the average of the 1998 to 2001 level (estimated from virtual population analysis), while *F* for the spawning aggregation was assumed to be 2 months (2/12th) of the overall annual average *F*. (d) Probability distribution when *F*(non-spawning aggregation) = 1 and *F*(spawning aggregation) = 0

a

b

c

Fig. S2. *Epinephelus striatus.* Equilibrium catch relative to the baseline level (color scale and gray contour lines) under different levels of fishing mortality (*F*) targeting the Bahamas' Nassau grouper population during non-spawning and spawning periods at (a) median, (b) lower 5%, and (c) upper 5% confidence levels. Fishing mortality rate is expressed relative to the average of the 1998 to 2001 level (estimated from virtual population analysis), while *F* for the spawning aggregation was assumed to be 2 months (2/12) of the overall annual average *F*
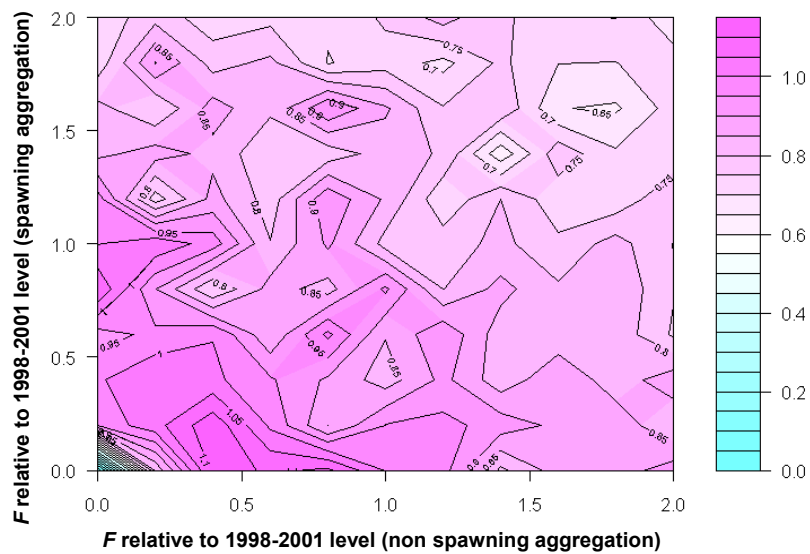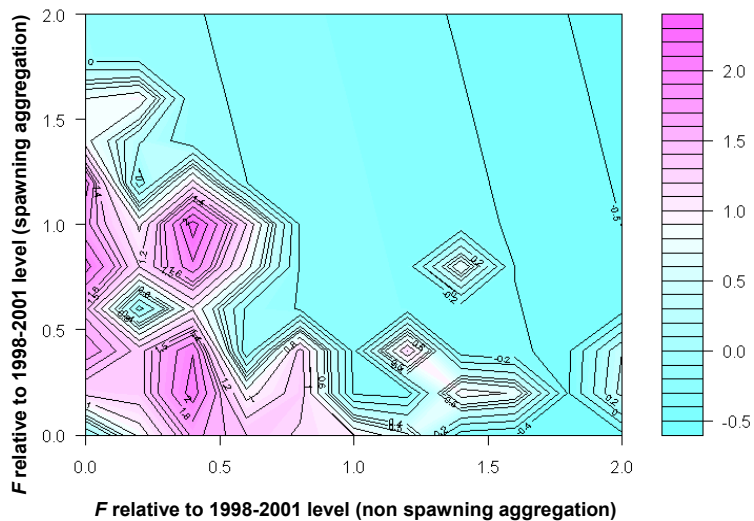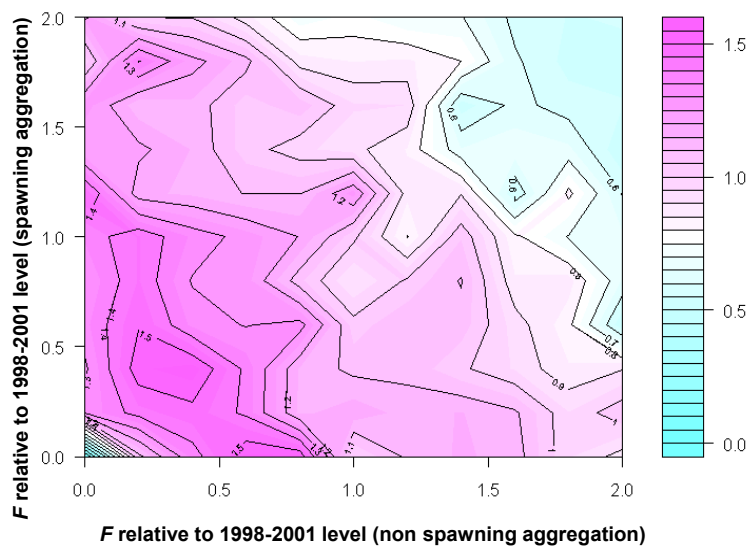
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a

b

c

Fig. S3. *Epinephelus striatus.* Equilibrium economic rent relative to the baseline level (color scale and gray contour lines) under different levels of fishing mortality (*F*) targeting the Bahamas' Nassau grouper population during non-spawning and spawning periods at (a) median, (b) lower 5%, and (c) upper 5% confidence levels. Fishing mortality rate is expressed relative to the average of the 1998 to 2001 level (estimated from virtual population analysis), while *F* for the spawning aggregation was assumed to be 2 months (2/12) of the overall annual average *F*
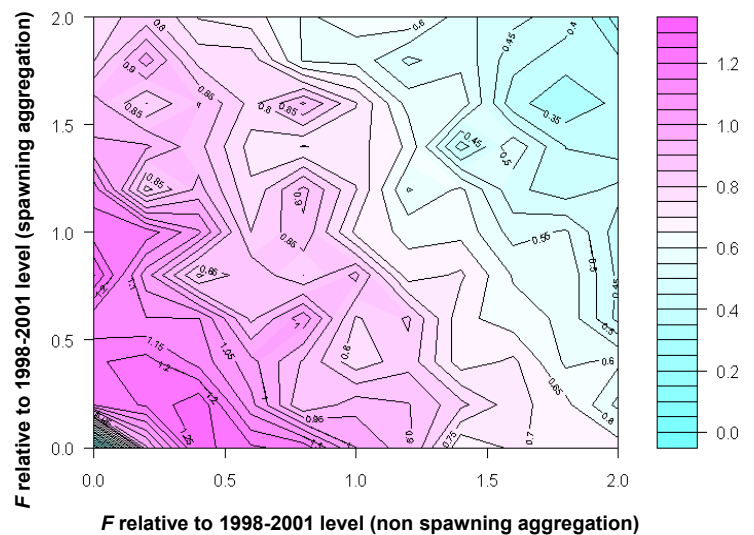
Table S1. *Epinephelus striatus.* Results from the assessment of catch per unit effort (CPUE) data using a generalized linear model. DIVE: diving, HKLN: hook and line, SEIN: seining, SPRS: spearfishing, TRLB: lobster traps, TRSF: scalefish traps, AFC: Fresh Creek, Andros, AGC: Grand Cay, Abaco, AFT: Fox Town, Abaco, ALS: Lowe Sound, Andros, AMB: Morgan's Bluff, Andros, AMP: Mastic Point, Andros, ARB: Red Bay, Andros, ASC: Stafford Creek, Andros, BAT: Alice Town, Bimini, GBF: Freeport, Grand Bahama, GBM: M' Cleans Town, Grand Bahama, GBW: West End, Grand Bahama, NPN: Nassau, New Providence, UNSP: unspecified, FGround: fishing ground. Significance: *p < 0.05, **p < 0.01, ***p < 0.001

Coefficients	Estimate	SE	t	p
(Intercept)	−0.598	1.433	−0.417	0.676
factor(Gear)DIVE	0.764	0.500	1.526	0.127
factor(Gear)HKLN	0.693	0.691	1.003	0.316
factor(Gear)SEIN	0.743	0.790	0.940	0.348
factor(Gear)SPRS	1.136	0.385	2.954	0.003**
factor(Gear)TRLB	0.014	0.461	0.031	0.976
factor(Gear)TRSF	1.352	0.387	3.494	0.000***
factor(Gear)UNSP	1.324	0.555	2.385	0.017*
factor(Month)2	−0.270	0.116	−2.339	0.019*
factor(Month)3	−0.329	0.112	−2.927	0.003**
factor(Month)4	−0.088	0.149	−0.590	0.555
factor(Month)5	0.060	0.151	0.399	0.690
factor(Month)6	−0.075	0.178	−0.423	0.672
factor(Month)7	−0.359	0.182	−1.975	0.048*
factor(Month)8	−0.434	0.119	−3.639	0.000***
factor(Month)9	−0.256	0.117	−2.184	0.029*
factor(Month)10	0.013	0.110	0.119	0.905
factor(Month)11	−0.213	0.122	−1.748	0.081
factor(Month)12	−0.017	0.119	−0.142	0.887
factor(Year)2000	1.012	1.199	0.844	0.399
factor(Year)2001	1.140	1.198	0.951	0.342
factor(Year)2002	1.186	1.199	0.989	0.323
factor(Year)2003	1.161	1.263	0.919	0.358
factor(Year)2004	1.105	1.199	0.922	0.357
factor(FGround2)AFC	1.436	0.980	1.465	0.143
factor(FGround2)AFT	1.295	1.103	1.174	0.241
factor(FGround2)AGC	0.398	1.383	0.288	0.774
factor(FGround2)ALS	0.244	0.780	0.313	0.754
factor(FGround2)AMB	0.297	1.129	0.263	0.792
factor(FGround2)AMP	0.101	1.092	0.092	0.927
factor(FGround2)ARB	−0.184	0.882	−0.209	0.834
factor(FGround2)ASC	0.223	1.507	0.148	0.882
factor(FGround2)BAT	−1.107	1.384	−0.800	0.424
factor(FGround2)GBF	0.798	0.695	1.148	0.251
factor(FGround2)GBM	−4.143	1.382	−2.997	0.003**
factor(FGround2)GBW	0.219	0.756	0.290	0.772
factor(FGround2)NPN	1.408	0.692	2.036	0.042*
factor(FGround2)UNSP	0.907	0.916	0.990	0.322