

## Southeast Reef Fish Survey (SERFS) Annual Report 2021

### *Contacts:*

- Southeast Fishery-Independent Survey (Nate Bacheler: [nate.bacheler@noaa.gov](mailto:nate.bacheler@noaa.gov))
- Marine Resources Monitoring, Assessment, and Prediction program (Wally Bublely: [bublelyw@dnr.sc.gov](mailto:bublelyw@dnr.sc.gov); Marcel Reichert: [ReichertM@dnr.sc.gov](mailto:ReichertM@dnr.sc.gov))

The Southeast Reef Fish Survey (SERFS) uses traps and video cameras to sample for a variety of reef-associated fish species on hardbottom reef habitats between Cape Hatteras, North Carolina, and St. Lucie Inlet, Florida. SERFS consists of three fishery-independent sampling groups: (1) the NMFS-Beaufort Southeast Fishery-Independent Survey (SEFIS), (2) the SCDNR Marine Resources Monitoring, Assessment, and Prediction program (MARMAP), and (3) the SCDNR Southeast Area Monitoring and Assessment Program – South Atlantic (SEAMAP-SA). All programs are funded by the National Marine Fisheries Service and sample reef fishes collaboratively using identical trap and video methodologies in the region.

A total of 2,025 traps outfitted with video cameras were deployed by SERFS in 2021, 1,177 by SEFIS and 848 by MARMAP/SEAMAP-SA (Figure 1). This total exceeds the previous high of 1,784 traps deployed in 2018 by 14%, and was possible due to being able to carry over some days at-sea from 2020 when no regular monitoring occurred due to covid-19. A total of 70 taxa were caught by SERFS in chevron traps in 2021 (Table 1). Tomtate were the most commonly caught species in 2021 ( $N=18,318$ ), followed by black sea bass ( $N=3,583$ ), vermilion snapper ( $N=3,580$ ), red snapper ( $N=1,969$ ), *Stenotomus* sp. ( $N=1,834$ ), white grunt ( $N=914$ ), gray triggerfish ( $N=890$ ), and red porgy ( $N=852$ ; Table 1).

Due to covid-19 protocols in 2021, reduced science crews (5–6 instead of 8–9 scientists) participated in research cruises, which necessitated that fewer biological samples could be taken from fish than in previous years (Table 2). Decisions about which and how many biological samples should be taken were made before the cruise season based on conversations between SEFSC stock assessment scientists and SEFIS and MARMAP personnel. Age structures were taken from nearly all red snapper ( $N=1,968$ ) and most gray triggerfish ( $N=691$ ), red porgy ( $N=850$ ), and groupers ( $N=81$ ) caught in chevron traps, while subsampling of age structures occurred for black sea bass ( $N=676$ ), vermilion snapper ( $N=664$ ), and white grunt ( $N=476$ ). Histological samples were taken from nearly all red porgy ( $N=850$ ) and haphazardly from some other species when time allowed (Table 2). Last, two DNA samples were taken from each red snapper collected in 2021 as part of the South Atlantic's Great Red Snapper Count. DNA samples were also taken from some additional species when possible for specific projects (Table 2).

Development of updated annual video-based indices of abundance is underway for species that have undergone a SEDAR assessment that have utilized a SERFS-based video index. We anticipate that those species-specific indices will be completed by spring of 2022 and will be updated annually early in subsequent calendar years. We are also exploring options for developing updated video-based annual indices for a broader range of species in subsequent years.

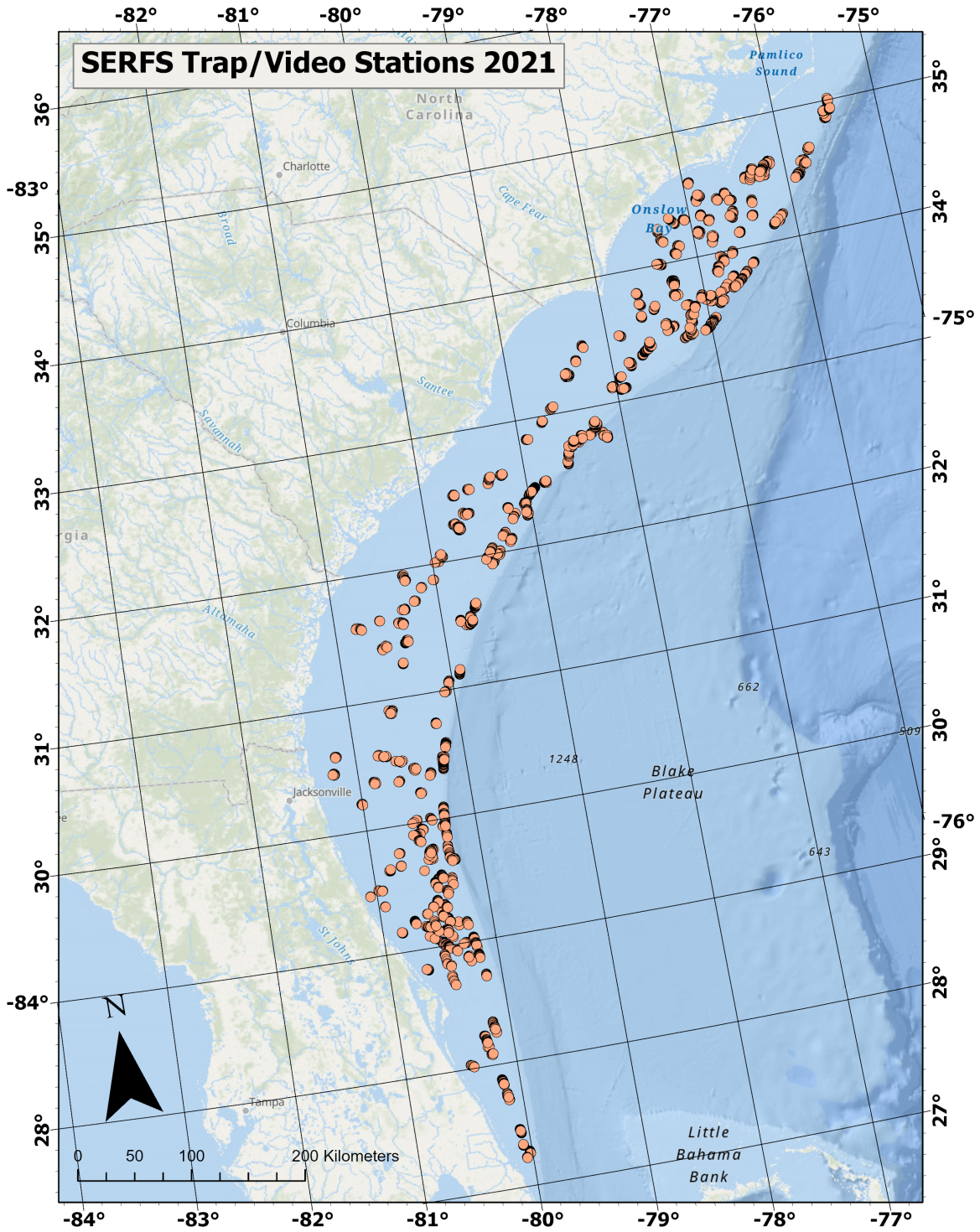


Figure 1. Locations sampled by SERFS using chevron traps and video cameras in 2021.

Table 1. Total number of individuals of various fish taxa caught by SERFS in chevron traps in 2021.

<b>Taxa</b>	<b>SEFIS</b>	<b>MARMAP</b>	<b>Total</b>
<i>Haemulon aurolineatum</i>	9066	9252	18318
<i>Centropristis striata</i>	2740	843	3583
<i>Rhomboplites aurorubens</i>	1661	1919	3580
<i>Lutjanus campechanus</i>	1507	462	1969
<i>Stenotomus sp.</i>	1463	371	1834
<i>Haemulon plumierii</i>	331	583	914
<i>Balistes capriscus</i>	516	374	890
<i>Pagrus pagrus</i>	232	620	852
<i>Diplectrum formosum</i>	347	219	566
<i>Diplodus holbrookii</i>	240	248	488
<i>Centropristis ocyurus</i>	290	139	429
<i>Calamus nodosus</i>	20	131	151
<i>Lagodon rhomboides</i>	99	10	109
<i>Equetus lanceolatus</i>	69	14	83
<i>Lutjanus vivanus</i>	11	57	68
<i>Calamus leucosteus</i>	34	28	62
<i>Stephanolepis hispidus</i>	28	26	54
<i>Chaetodon ocellatus</i>	22	26	48
<i>Lutjanus synagris</i>	48	0	48
<i>Pareques umbrosus</i>	39	6	45
<i>Chaetodon sedentarius</i>	11	25	36
<i>Mycteroperca microlepis</i>	23	3	26
<i>Seriola rivoliana</i>	11	14	25
<i>Gymnothorax moringa</i>	18	5	23
<i>Mycteroperca phenax</i>	9	14	23
<i>Holocentrus adscensionis</i>	8	11	19
<i>Orthopristis chrysoptera</i>	17	0	17
<i>Seriola dumerili</i>	11	3	14
<i>Epinephelus niveatus</i>	2	10	12
<i>Echeneis naucrates</i>	8	3	11
<i>Epinephelus morio</i>	8	3	11
<i>Opsanus sp.</i>	10	1	11
<i>Gymnothorax vicinus</i>	8	1	9
<i>Cephalopholis cruentata</i>	5	1	6
<i>Muraena retifera</i>	6	0	6
<i>Rypticus maculatus</i>	5	1	6
<i>Lutjanus analis</i>	3	2	5
<i>Bodianus pulchellus</i>	1	3	4

<i>Caulolatilus microps</i>	4	0	4
<i>Gymnothorax saxicola</i>	4	0	4
<i>Lutjanus griseus</i>	4	0	4
<i>Paralichthys albigutta</i>	4	0	4
<i>Pterois</i> sp.	0	4	4
<i>Leiostomus xanthurus</i>	3	0	3
<i>Lutjanus buccanella</i>	1	2	3
<i>Synodus intermedius</i>	2	1	3
<i>Epinephelus adscensionis</i>	0	2	2
<i>Holacanthus bermudensis</i>	0	2	2
<i>Rypticus saponaceus</i>	1	1	2
<i>Sphyræna barracuda</i>	0	2	2
<i>Trachinocephalus myops</i>	1	1	2
<i>Antennarius ocellatus</i>	1	0	1
<i>Calamus proridens</i>	1	0	1
<i>Epinephelus drummondhayi</i>	1	0	1
<i>Fowlerichthys ocellatus</i>	0	1	1
<i>Ginglymostoma cirratum</i>	1	0	1
<i>Gymnothorax nigromarginatus</i>	1	0	1
<i>Haemulon striatum</i>	0	1	1
Labridae	0	1	1
<i>Micropogonias undulatus</i>	1	0	1
Mullidae	0	1	1
<i>Mullus auratus</i>	0	1	1
Muraenidae	0	1	1
<i>Paralichthys</i> sp.	0	1	1
<i>Pseudupeneus maculatus</i>	1	0	1
<i>Seriola</i> sp.	0	1	1
<i>Seriola zonata</i>	0	1	1
<i>Sphoeroides maculatus</i>	1	0	1
<i>Sphoeroides spengleri</i>	1	0	1
<i>Upeneus parvus</i>	1	0	1

Table 2. Number of individuals of each taxa for which age structures, gonads, or DNA samples were extracted in 2021.

Taxa	SEFIS			MARMAP			TOTAL		
	Age	Gonad	DNA	Age	Gonad	DNA	Age	Gonad	DNA
<i>Lutjanus campechanus</i>	1508	0	1507	460	255	461	1968	255	1968
<i>Pagrus pagrus</i>	231	231	0	619	619	0	850	850	0
<i>Balistes capriscus</i>	504	0	0	187	0	0	691	0	0
<i>Centropristis striata</i>	546	0	0	130	0	0	676	0	0
<i>Rhomboplites aurorubens</i>	333	0	0	331	0	2	664	0	2
<i>Haemulon plumierii</i>	168	0	0	308	0	0	476	0	0
<i>Calamus nodosus</i>	1	0	0	130	99	0	131	99	0
<i>Lutjanus vivanus</i>	11	0	0	57	56	0	68	56	0
<i>Mycteroperca microlepis</i>	23	0	0	3	3	0	26	3	0
<i>Mycteroperca phenax</i>	9	0	0	14	14	14	23	14	14
<i>Seriola rivoliana</i>	0	0	0	14	14	1	14	14	1
<i>Epinephelus niveatus</i>	2	0	0	10	10	0	12	10	0
<i>Epinephelus morio</i>	8	0	0	3	3	3	11	3	3
<i>Cephalopholis cruentata</i>	5	0	0	1	1	0	6	1	0
<i>Lutjanus analis</i>	3	0	0	2	2	0	5	2	0
<i>Caulolatilus microps</i>	4	0	0	0	0	0	4	0	0
<i>Lutjanus griseus</i>	4	0	0	0	0	0	4	0	0
<i>Lutjanus buccanella</i>	1	0	0	2	0	0	3	0	0
<i>Epinephelus adscensionis</i>	0	0	0	2	2	0	2	2	0
<i>Lutjanus synagris</i>	1	0	0	0	0	0	1	0	0
<i>Epinephelus drummondhayi</i>	1	0	1	0	0	0	1	0	1
<i>Seriola zonata</i>	0	0	0	1	1	0	1	1	0
<i>Seriola dumerili</i>	0	0	0	1	0	0	1	0	0
<i>Holocentrus adscensionis</i>	0	0	0	1	0	0	1	0	0
<i>Pterois</i> sp.	0	0	0	1	0	0	1	0	0
<i>Diplodus holbrookii</i>	0	0	0	1	0	1	1	0	1
<i>Seriola</i> sp.	0	0	0	1	0	1	1	0	1