Summary information for hogfish *Lachnolaimus maximus* seen on videos collected by the SouthEast Reef Fish Survey in 2010 – 2012 between North Carolina and Florida

Nathan M. Bacheler[1] and Marcel M.J. Reichert[2]

[1] *Southeast Fisheries Science Center, National Marine Fisheries Service, 101 Pivers Island Road, Beaufort, NC 28516*

[2] *Marine Resources Research Institute, South Carolina Department of Natural Resources, 217 Fort Johnson Road, Charleston, SC 29412*

Objectives

The SouthEast Reef Fish Survey (SERFS) is a combination of three fishery independent sampling programs – the SouthEast Fishery-Independent Survey, the South East Area Monitoring and Assessment Program – South Atlantic, and the Marine Resources Monitoring, Assessment, and Prediction program – that sample reef fish between North Carolina and Florida using identical trap and video methodologies. The objective of this summary is to describe hogfish *Lachnolaimus maximus* presence-absence as seen in SERFS videos in 2010 – 2012, years in which video data were collected and are currently available.

Methods

Hard bottom sampling sites were selected for sampling in one of two ways. First, each year, SERFS randomly selects a portion of its total available sampling universe sites for reef fish sampling (stations on or near confirmed hard bottom). Second, some SERFS sampling stations were sampled opportunistically that were not randomly chosen for sampling in a given year. Sampling for this study occurred aboard four vessels: the R/V *Palmetto*, the R/V *Savannah*, the NOAA Ship *Nancy Foster*, and the NOAA Ship *Pisces*.

Chevron fish traps with attached video cameras were deployed at each station sampled in the study. These traps were constructed from plastic-coated galvanized 12.5 ga. wire (mesh size = 34 × 34 mm), and were shaped like an arrowhead that measured 1.7 m × 1.5 m × 0.6 m, with a total volume of 0.91 m^3. Each trap was baited with 24 *Brevoortia* spp. Chevron traps soaked for approximately 90 minutes. No hogfish were caught in the 2,050 chevron traps deployed in 2010-2012, but chevron traps provided the platform upon which video cameras were attached and used to view hogfish (Figure 1). In 2010, high-definition GoPro Hero® video cameras in underwater housings were attached over the mouth of the trap, facing away from the trap. Note that video samples were only obtained in Georgia and Florida in 2010. In 2011 and 2012, Canon Vixia HF S200 high-definition cameras were used instead and sampling occurred from North Carolina to Florida. Cameras were turned on and set to record immediately before traps were deployed, and were turned off immediately after traps were retrieved. Overall, 232 of 2,282 video samples (10.2%) were excluded from our analysis because they were unreadable (e.g., too turbid or dark, camera out of focus, files corrupt), leaving 2,050 readable videos that were included in the analysis.

Videos were read using the MeanCount approach of Conn (2011) and Schobernd et al. (in press). MeanCount was calculated by computing the average number of individuals of a target

species (in our case, hogfish) in a number of video frames in a video sample. Specifically, we counted hogfish in video snapshots every 30 seconds over a 20-minute interval beginning 10 minutes after the trap landed on the bottom, for a total of 41 snapshots. For this analysis, only presence-absence of hogfish was summarized due to low hogfish MeanCount values and the few videos in which hogfish were seen.

Results

SERFS video sampling only occurred in Georgia and Florida waters in 2010, but expanded to include the Carolinas and increase the number of stations off Georgia and Florida in 2011–2012 (Table 1; Figure 2). In 2010, sampling occurred in summer and fall, while sampling occurred in spring through fall in 2011–2012 (Table 1). Depths sampled ranged from 14 – 106 m, with little inter-annual variability (Table 1).

Hogfish were seen in 86 of 2,050 (4.2%) readable SERFS videos collected in 2010–2012, with the lowest frequency of occurrence in 2012 (3.2%) and highest frequency of occurrence in 2011 (5.9%; Table 1). Hogfish were seen more often in deeper, shelf-break waters (Figure 2); mean depth when hogfish were seen on videos ranged from 46.6 m in 2011 to 51.4 m in 2012 (overall mean = 48.3 m; Table 1).

References

Conn, P.B. 2011. An evaluation and power analysis of fishery independent reef fish sampling in the Gulf of Mexico and U.S. South Atlantic. NOAA Technical Memorandum NMFS-SEFSC-610.

Schobernd, Z., N.M. Bacheler, and P. Conn. *In press*. Examining the utility of alternative video monitoring metrics for indexing reef fish abundance. Canadian Journal of Fisheries and Aquatic Sciences.

Table 1. Summary information for hogfish *Lachnolaimus maximus* in videos collected by the SouthEast Reef Fish Survey, 2010 – 2012. Video deployments target hardbottom habitats between North Carolina and Florida except in 2010, when sampling only occurred in Georgia and Florida.

Year	Latitude range sampled (°N)	Date range sampled	Depth range sampled (m)	# Videos examined	# Videos with hogfish present	Frequency of occurrence (%)	Mean depth of readable videos	Mean depth when hogfish were seen on video
2010	28.7-31.7	7/28-10/27	16-83	231	9	3.9	40.1	51.4
2011	27.2-34.3	5/12-10/25	14-94	717	42	5.9	40.4	46.6
2012	27.2-35.0	4/24-10/10	15-106	1102	35	3.2	40.7	49.6
Overall	27.2-35.0	4/24-10/27	14-106	2050	86	4.2	40.5	48.3

Figure 1. Chevron trap and video camera used to sample reef fish by the SouthEast Reef Fish Survey in North Carolina through Florida in 2010–2012. Pictured is the Canon Vixia HF S200 video camera used in 2011–2012, while a GoPro Hero® camera was used in 2010.

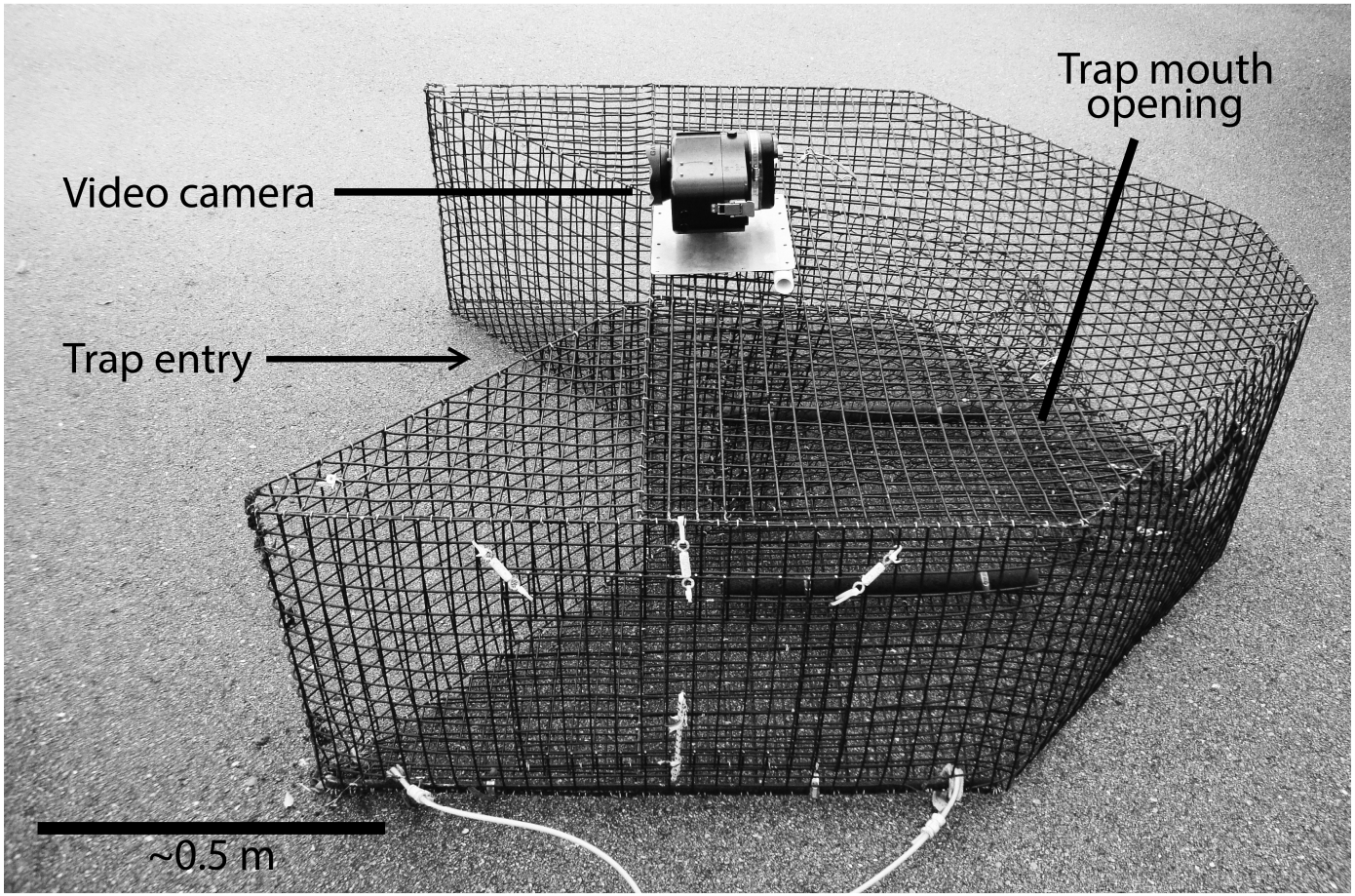

Figure 2. Map of video deployments where hogfish *Lachnolaimus maximus* were present (red dots) and absent (gray dots) from videos collected by the SouthEast Reef Fish Survey, 2010 – 2012. Gray isobaths indicate 30 and 50 m.