APPENDIX 4.6. IMPLEMENTING A SLOT LIMIT IN THE SOUTHERN FLOUNDER FISHERY

July 29, 2021

I. ISSUE

Examine the impacts of changing size limits by implementing a harvest size slot limit in the southern flounder fishery.

II. ORIGINATION

This issue originated from a request brought forth by the North Carolina Marine Fisheries Commission (NCMFC).

III. BACKGROUND

Managing fisheries using size regulations to constrain harvest is common practice, but there is often a trade-off between conservation (i.e., spawning stock biomass) and fishery objectives (i.e., maximizing sustainable yield or harvest numbers; Gwinn et al. 2015; Ayllon et al. 2018, 2019). Often minimum size limits are used but can negatively impact a stock by truncating the age and size structure if effort is high (Moreau and Matthais 2018). Slot limits, particularly in freshwater recreational fisheries, are becoming more popular as they have the ability to protect juveniles and spawning adults (Gwinn et al. 2015) and can help maintain a more mature age structure when compared to minimum size limit regulations (Ayllon et al. 2019). However, if overfished stocks are to be recovered, management actions must first focus on reducing both fishing effort and hooking/bycatch mortality. Once these rates are under control, slot limit regulations could lead to improved sustainability (Ayllon et al. 2018).

Slot limits are not appropriate for all species, but should be considered if the population in question has the following characteristics (Baker et al. 1993; Brousseau and Armstrong 1987):

- good natural reproduction,
- slow growth, especially of young fish,
- relatively high natural mortality of young fish, and
- high angling effort.

Additionally, the upper limit of a slot limit should provide meaningful harvest protection for the species in question (Oliver et al. 2021). If discard mortality and non-compliance for a species are high, then slot limits become less effective as a management tool (Ayllon et al. 2019). Based on the criteria defined by Baker et al. (1993) for slot limits, southern flounder may not be an appropriate candidate as the current fishing mortality is above the threshold reference point, the spawner-recruit relationship is unknown, and juvenile flounder are fast growing (Flowers et al. 2019).

Slot limits may be useful to constrain harvest after fishing effort and mortality are reduced and the stock rebuilds. Benefits for the development of a slot limit for southern flounder revolve around increasing harvest of males, protection of large mature females, and the idea that

releasing all larger southern flounder would speed up recovery through increased egg production. Southern flounder are sexually dimorphic, with females reaching larger sizes than males. Males over 20 inches TL have not been recorded and few males are over 17 inches TL (Figure 4.6.1). While a 50:50 ratio is assumed for southern flounder smaller than 5-inches TL, the female proportion increases for fish 5.5-inches TL or greater and becomes more pronounced at 12-inches TL. Therefore, a slot limit does not guarantee a higher harvest of males. Water temperatures have been shown to influence the sex ratios of southern flounder where higher or lower temperatures can result in a higher proportion of males to females (Luckenbach et al. 2003, 2009; Honeycutt et al. 2019; Montalvo et al. 2012) indicating there may be more males available for harvest. It is unknown what impact annual changes in environmental factors have on the recovery of southern flounder, even if all fish over a certain size are released. For more information on environmental influence on sex ratios, see the *Ecosystem and Fishery Impacts* section.

Most, if not all, fish released over a potential slot limit would be female (Figure 4.6.1). However, the length at which half of female southern flounder are mature is 16-inches TL (Midway and Scharf 2012; Flowers et al. 2019). Division data indicates all females over 19 inches TL are likely mature (NCDMF, unpublished data). While there are no fecundity data currently available from wild individuals to indicate whether larger fish produce more offspring, fecundity generally increases with female body size. In a hatchery setting, southern flounder are capable of producing up to 18 million eggs with an average hatching rate of 15% (Watanabe et al. 2001). These estimates should be viewed with caution because the laboratory experiments were conducted under ideal conditions.

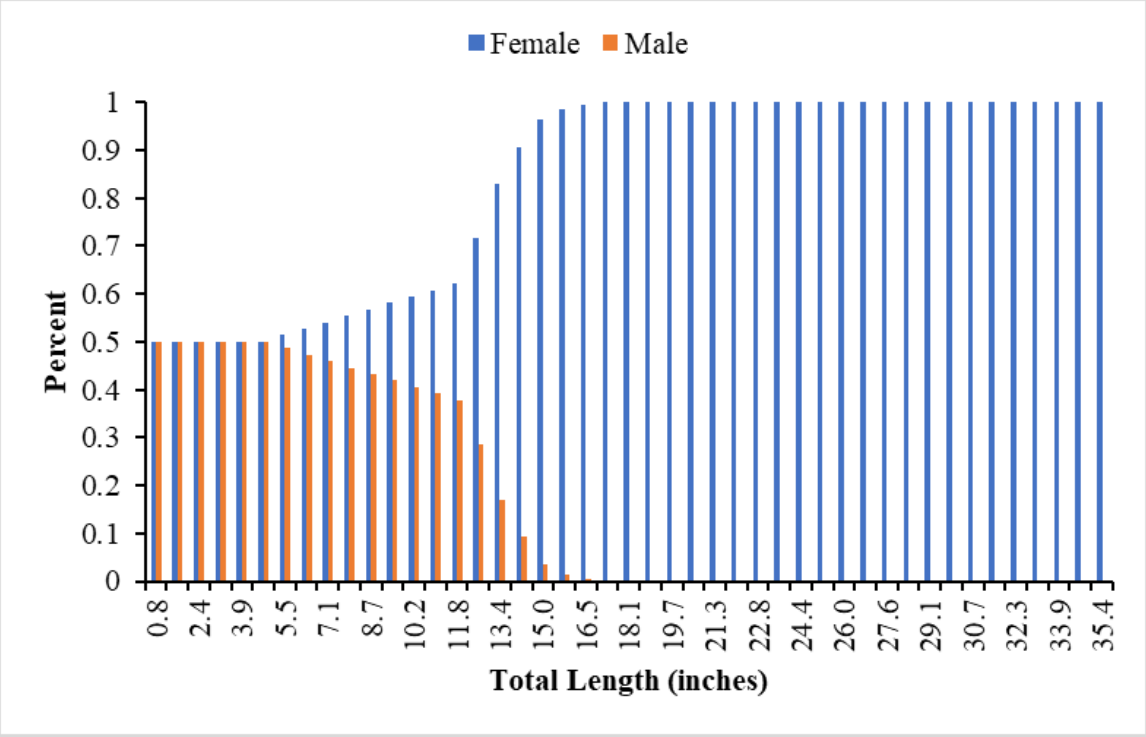

Figure 4.6.1 Sex ratios of southern flounder relative to total length.

In 2017, approximately 10% of the total commercial and recreational harvest were fish greater than 20 inches TL (Figures 4.6.2 and 4.6.3). In 2020, catches of fish larger than 20 inches TL increased for both sectors. It is expected that larger fish will continue to show up in the catches due to the limited seasons occurring in the fall which allow for a longer period of growth prior to being harvested. The current stock shows a truncated age and size structure (Flowers et al. 2019), meaning larger fish are not necessarily older fish. The maximum age observed in both fisheries has decreased over the last decade, and the majority of fishing pressure for both sectors is focused on one or two age classes of fish where most fish harvested are age-2 (NCDMF 2021). Both the age and length structure of the population are expected to improve as the stock recovers. Along with the poor age structure of the stock, it is unknown if the few fish over age-3 have spawned multiple times. It should be noted that while the additional escapement of larger fish may benefit the stock, any fish discarded outside of the slot have an associated post-release mortality, adding to the dead discards.

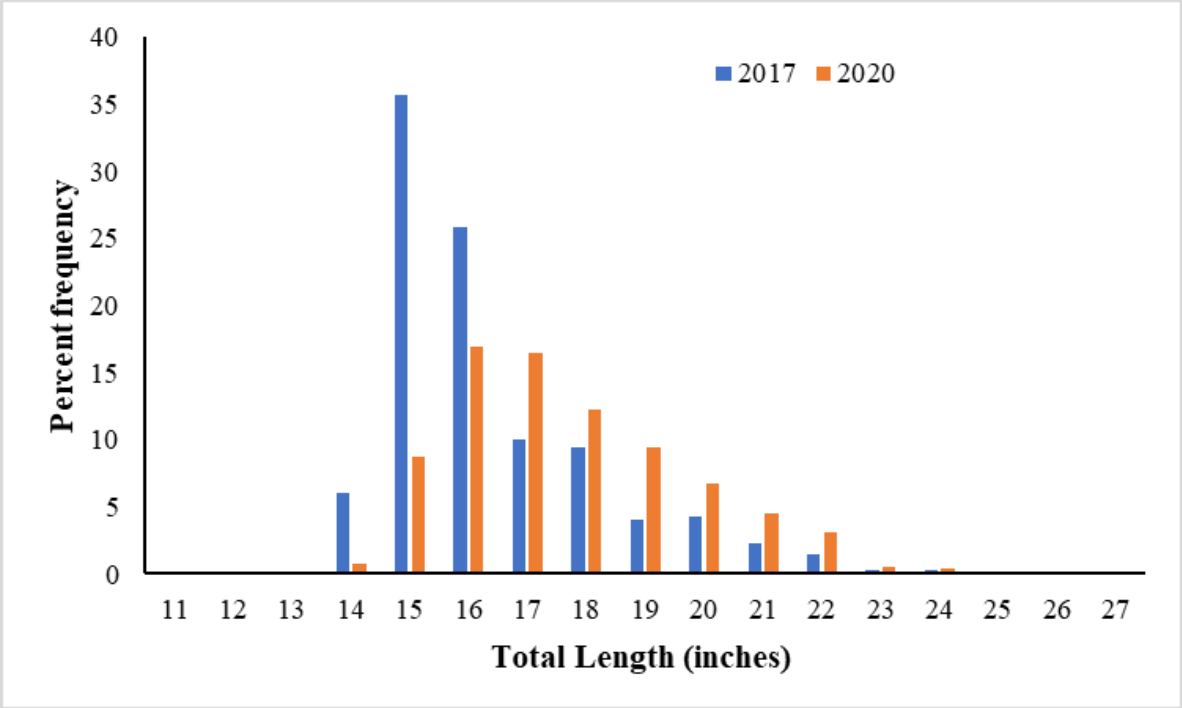

Figure 4.6.2. Percent frequency (by pound per inch) of commercial southern flounder harvest by total length, 2017. (Source: North Carolina Trip Ticket Program and NCDMF fish house sampling biological data)

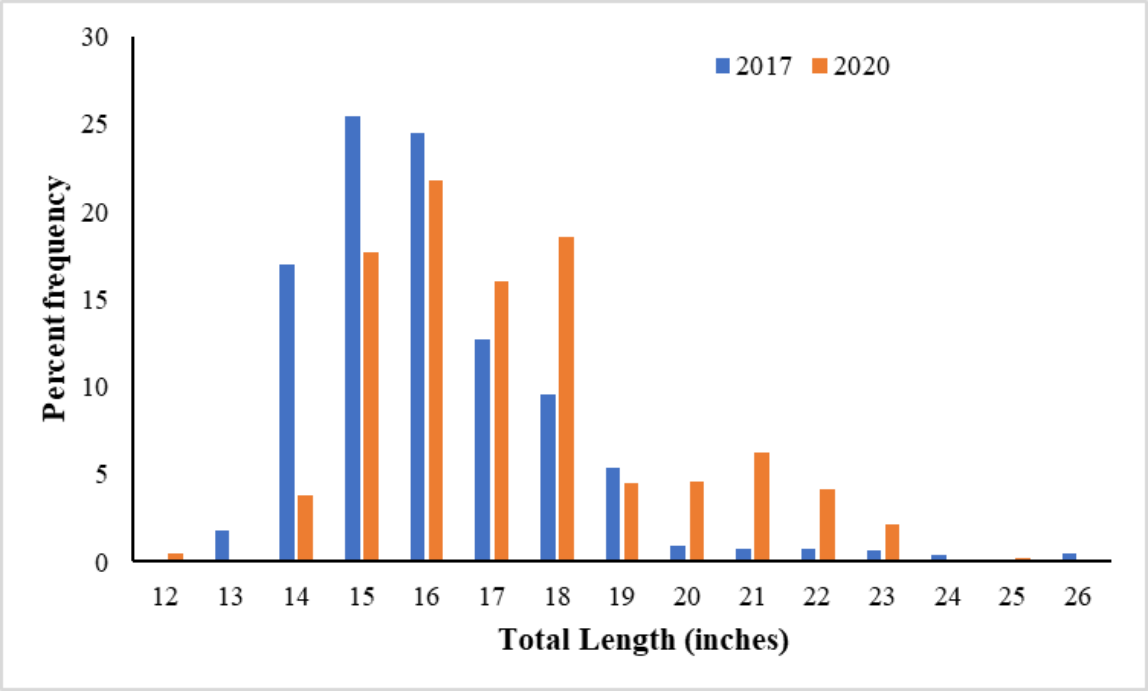

Figure 4.6.3. Percent frequency (by pound per inch) of recreational southern flounder harvest by length, 2017 and 2020. (Source: Marine Recreational Information Program)

In North Carolina, the management of flounder species has undergone several regulatory changes to promote the sustainability of the stock. The first implementation of a minimum size limit occurred in 1979 at 11 inches TL for both estuarine and ocean waters. Subsequent minimum size limits have been implemented through the original North Carolina Southern Flounder FMP (NCDMF 2005), Amendment 1 (NCDMF 2013), Supplement A to Amendment 1 (NCDMF 2017), and revisions to the joint Atlantic States Marine Fisheries Commission (ASMFC) and Mid-Atlantic Fishery Management Council Summer Flounder, Scup, and Black Sea Bass FMP (ASMFC 2018; MAFMC 2019). The use of a slot limit, as a potential management tool for curtailing harvest in the southern flounder fishery, has not been explored in previous management plans. A slot limit could be implemented for the recreational and/or commercial fisheries. At this time, the focus of this issue paper will be the potential implementation of a slot limit for the recreational hook-and-line fishery only as requested by the NCMFC.

IV. AUTHORITY

North Carolina General Statutes
§ 113-134 RULES
§ 113-182 REGULATION OF FISHING AND FISHERIES
§ 113-182.1 FISHERY MANAGEMENT PLANS
§ 113-221.1 PROCLAMATIONS; EMERGENCY REVIEW
§ 143B-289.52 MARINE FISHERIES COMMISSION – POWERS AND DUTIES

North Carolina Marine Fisheries Commission Rules
15A NCAC 03H .0103 PROCLAMATIONS, GENERAL
15A NCAC 03M .0503 FLOUNDER
15A NCAC 03M .0512 COMPLIANCE WITH FISHERY MANAGEMENT PLANS

V. DISCUSSION

The population level effects of implementing a slot limit for the recreational southern flounder hook-and-line fishery in North Carolina is non-quantifiable as developing projections based on a slot limit cannot be calculated on an individual state basis. The 2019 stock assessment does not include a spatial component; as a result, all size limit changes would be relative to the entire stock of southern flounder. There are multiple minimum size limits in place across the unit stock, which have ranged in recent years from 12- to 16-inches TL. The analyses of implementing a slot limit are based solely on North Carolina harvest estimates and may or may not be representative of the coast-wide stock and it would not be possible to attribute the implementation of a slot limit as the cause of changes to stock size. Discussion below addresses these effects, as well as potential benefits and drawbacks, to implementing a slot limit.

Slot limits of 15 to16 inches (1 inch), 15 to17 inches (2 inch), 15 to 18 inches (3 inch), and 15 to 19 inches (4 inch) TL were explored for the recreational hook-and-line fishery. For ease of enforcement and education, these slot limits include fish at but not greater than the maximum length. For example, the 15- to 16-inch TL slot is only one inch as it includes fish from 15 inches up to and no greater than 16 inches TL. Most harvest for both sectors is less than 20 inches TL thus, implementing a slot limit may act as a buffer to prevent overages to the TAL. The implementation of a slot limit will not extend the season or increase the TAL (Table 4.6.1). In fact, to account for the additional dead discards the TAL would need to be reduced, resulting in fewer harvest opportunities so not to exceed the TAC. Releasing larger fish may help in the recovery of the stock but at this time the effects cannot be quantified. It is also likely that more larger fish are emigrating to the ocean since implementation of the harvest reductions through seasonal closures implemented in Amendment 2.

Estimates in recreational harvest can only be analyzed at the season and bag level for the hook-and-line fishery as length data are not available from the gig survey. The identified slot limits are very narrow and may be imperceptible to fishermen using gigs. Therefore, it is not realistic for the recreational gig fishery to operate under a slot limit as gigs have an assumed 100% mortality associated with capture. Due to the anticipated increase in dead discards that would occur outside of the slot limit, gigs become detrimental to re-building unless a non-lethal gig-like gear was implemented. The gig fishery could continue to operate under the current minimum size limit. However, this creates a greater potential for enforcement issues and non-compliance.

Table 4.6.1. Pounds of southern flounder harvest (no discards) at a four-fish and one-fish bag limit, 2013. This year represents a year of high harvest and what could happen as the stock rebuilds. For reference, the NCMFC allocations are 142,206 lb (30% recreational allocation), 189,608 lb (40%), and 237,010 lb (50%).

	Landings (pounds)- Slot Limit							
	15 to 16 inches		15 to 17 inches		15to 18 inches		15 to 19 inches	
Season	4-Fish Bag Limit	1-Fish Bag Limit	4-Fish Bag Limit	1-Fish Bag Limit	4-Fish Bag Limit	1-Fish Bag Limit	4-Fish Bag Limit	1-Fish Bag Limit
No closure	266,659	218,399	380,114	280,432	544,443	396,391	638,143	439,743
Apr 16–Jun 30	29,669	26,707	47,222	42,164	95,532	69,216	141,213	94,341
May 1–Jun 30	29,669	26,707	40,159	35,101	88,469	62,153	134,149	87,277
Jun 1–Jul 15	24,130	24,130	41,736	38,370	96,656	72,344	145,238	99,257
Aug 1–Sep 30	170,542	127,984	226,416	147,034	313,735	208,979	347,159	218,135
Aug 16–Sep 30	156,752	114,193	204,120	128,528	284,590	184,428	316,724	193,202
July 16–Sep. 30	178,324	135,232	234,197	154,282	323,470	217,495	359,504	229,262
July 1 -Sep.30	189,893	146,801	252,883	171,698	522,892	242,022	389,586	256,474
June 16–Sep. 15	161,353	131,993	222,932	162,920	354,683	257,242	437,354	293,976
Aug 16-Oct 15	159,344	116,785	209,928	133,809	295,774	195,085	330,095	206,047
Aug-16-Oct 30	183,686	138,921	253,082	164,360	344,925	231,068	385,245	243,618

The MRIP survey design for the hook-and-line fishery includes length data with an associated sampling weight equivalent to the sampling weight applied to generate the expanded harvest estimates. Therefore, slot limit analyses can be compared to estimates produced in reference to the TAL but not the TAC. Importantly, the contribution of generated discards can be substantial. For example, analysis of MRIP size data demonstrates that the only slot limit scenario with landings below the TAL during the 2020 6-week season was 15 to 16 inches TL (Table 4.6.2). Generated dead discards for those fish greater than the upper bound for this slot limit are 24,604 pounds. Estimates of existing dead discards average 41,331 pounds between 2008 and 2017. The additional generated dead discards would increase this average creating the need to reduce the TAL to offset the increase in discards. Additionally, changes in bag limits substantially decrease reliability of estimates. For example, in 2017 only 29 southern flounder were observed between Aug. 16 and Sept. 30. A one fish bag limit analysis during this season excludes 41.4% of the observations. This is further compounded by a skewed age structure where 88.7% of observed southern flounder were 19 inches TL or less. For these reasons, estimates produced for slot limits are not a reliable indicator of the effect a slot may have on recreational harvest.

Table 4.6.2. Pounds of southern flounder harvested by the recreational hook-and-line fishery during the 2020 season, by slot limit option. The no slot example shows the harvest under the current 15-inch TL minimum size limit. The TAL in 2020 was 126,315 pounds.

Season	Slot Limit (in)	Harvest (lb)
Aug. 16 - Sept. 30	No slot	362,119
Aug. 16 - Sept. 30	15-16	88,743
Aug. 16 - Sept. 30	15-17	140,448
Aug. 16 - Sept. 30	15-18	218,009
Aug. 16 - Sept. 30	15-19	238,565

There are several data limitations hindering the evaluation of slot limits including fecundity at age, effect of seasons on the size of fish harvested, and distribution of flounder as they emigrate into the ocean. Additionally, species level biological data is currently unavailable for unobserved discarded flounder. North Carolina's three constituent flounder species are notoriously difficult to differentiate. This ambiguity presents a unique challenge for fisheries management in that discard information provided by the recreational angling community may be inadvertently errant. To properly consider the discard estimates of these species produced by the Access Point Angler Intercept Survey (APAIS) conducted in North Carolina, the number of fish discarded and reported at the genus species level must be evaluated. Only a very small percentage of the angling community are perceived to have the ability to identify flounder to the species level. Thus, samplers are instructed to record all reported flounder discards at the left-eyed flounder genus level. To partition the unobserved catch to the species level, a ratio of southern, summer, and gulf flounder is first determined from the observed catch. The ratio of catch is applied to the estimated unobserved catch to produce estimates of discards for each species. It is unlikely that the relative contribution of each species within the harvested catch is identical with that of discarded catch. Specifically, the assumption that discarded individuals share the same spatiotemporal distribution as those harvested has not been validated. This concern is underscored by demonstrated ontogenetic differences in habitat use and migratory patterns for these congener species (Walsh et al. 1999, Dorval et al. 2005). The ability to accurately identify discarded flounder to the species level is critical to characterize unobserved dead discards. If these data limitations can be addressed, it will be possible to more accurately quantify the use of implementing a slot limit.

While these analyses have data limitations, they do illustrate potential annual variation. Figures 4.6.4-4.6.7 illustrate the effect a slot limit may have on the recreational fishery relative to the allocation changes passed by the NCMFC in March 2021. As the stock rebuilds the potential recreational seasons identified in the *Sustainable Harvest* issue paper may fail to meet the target harvest reduction due to increased angler success (Figures 4.6.4-4.6.7). In 2020, angler success increased relative to the last five years, particularly for anglers catching only one fish. Catch rates, indicative of success, almost doubled between 2019 and 2020. Therefore, decreasing the bag limit, even if a slot limit is implemented, is necessary to constrain harvest and prevent massive overages. For further discussion on the effects of increased angler success and bag limits, see the *Achieving Sustainable Harvest in the North Carolina Southern Flounder Fishery* issue paper.

Moreau and Matthias (2018) found narrow slot limits for certain freshwater species can be used to prevent overharvest when bag limits are left unchanged. However, in this study if the bag limit was reduced to one fish, the slot limit range could potentially be expanded allowing for the harvest of larger fish. This would be more appropriate as the stock rebounds and the length and age structure expands. Any slot limit will potentially increase the discarded fish which is problematic for species such as southern flounder which have high post-release mortality (9%) and discard to catch ratios (nine released for every fish kept; Moreau and Matthias 2018). Slot limits generally result in lower harvest and more discards by weight, and therefore higher and more frequent overages would occur compared to a minimum size limit (Wiedenmann et al. 2013). As older, larger fish become more abundant, the volume of removals due to discard mortality and non-compliant harvest is expected to increase (Kasper et al. 2020).

The discards of larger, heavier fish will increase the poundage of dead discards. This increase could be especially problematic for the recreational fishery due to the volume of releases each year. It is assumed that most fish discarded in the recreational fishery are discarded because they are below the minimum size limit and therefore weigh less than half a pound. By discarding fish above the slot limit the overall weight of dead discards would increase, potentially to greater than five pounds per fish. Thus, increasing the likelihood of not just exceeding the TAL each year but the TAC as well.

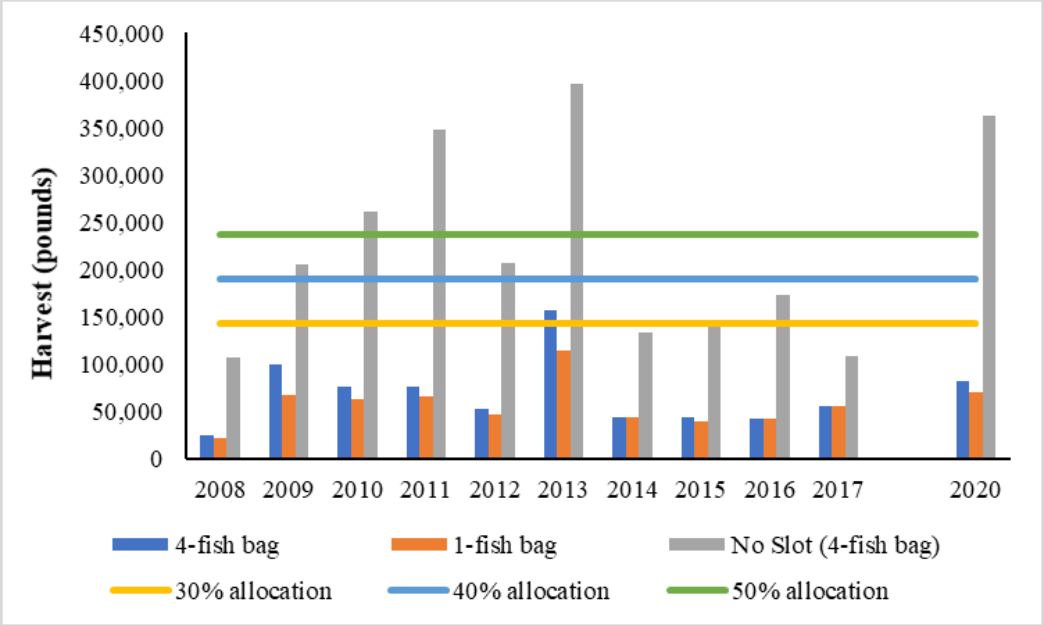

Figure 4.6.4. Total hook-and-line harvest during Aug. 16–Sept.30 at a four-fish and one-fish bag limit and a 15–16-inch slot based on data from 2008 to 2017 and 2020. The years 2010, 2011, and 2013 represent years of above average harvest; 2020 represents the first full year under seasonal management through Amendment 2. NCMFC allocations are presented for reference.

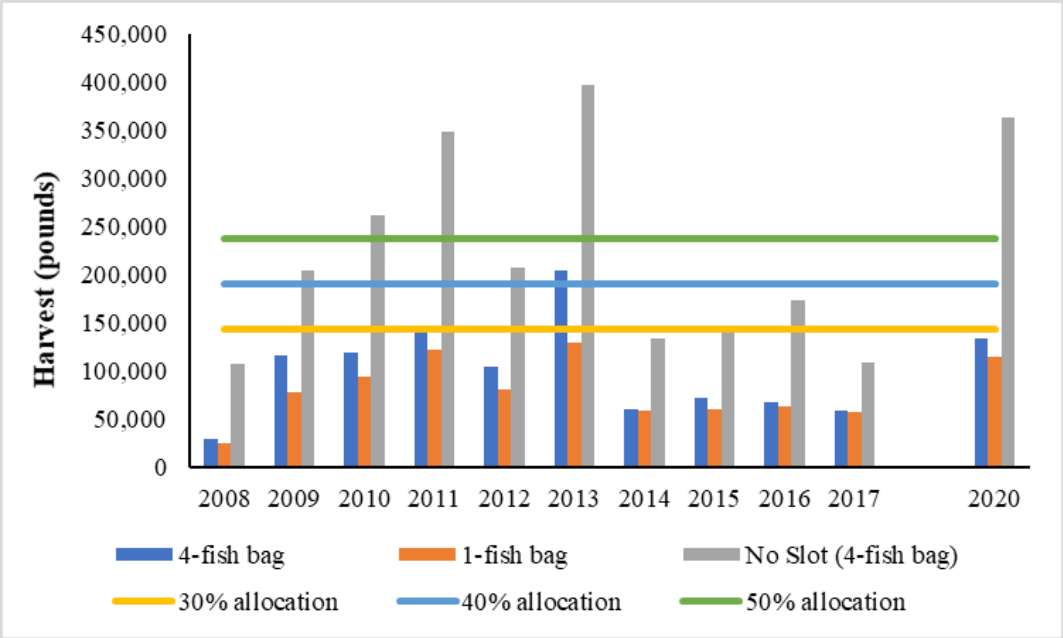

Figure 4.6.5. Total hook-and-line harvest during Aug. 16–Sept.30 at a four-fish and one-fish bag limit and a 15–17-inch slot based on data from 2008 to 2017 and 2020. The years 2010, 2011, and 2013 represent years of above average harvest; 2020 represents the first full year under seasonal management through Amendment 2. NCMFC allocations are presented for reference.

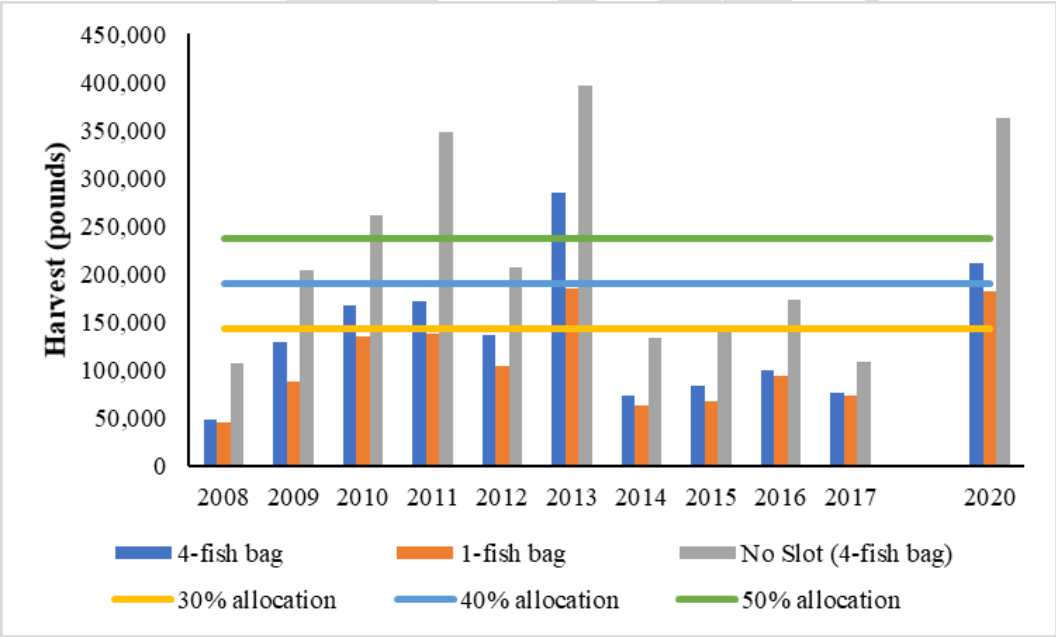

Figure 4.6.6. Total hook-and-line harvest during Aug. 16–Sept.30 at a four-fish and one-fish bag limit and a 15–18-inch slot based on data from 2008 to 2017 and 2020. The years 2010, 2011, and 2013 represent years of above average harvest; 2020 represents the first full year under seasonal management through Amendment 2. NCMFC allocations are presented for reference.

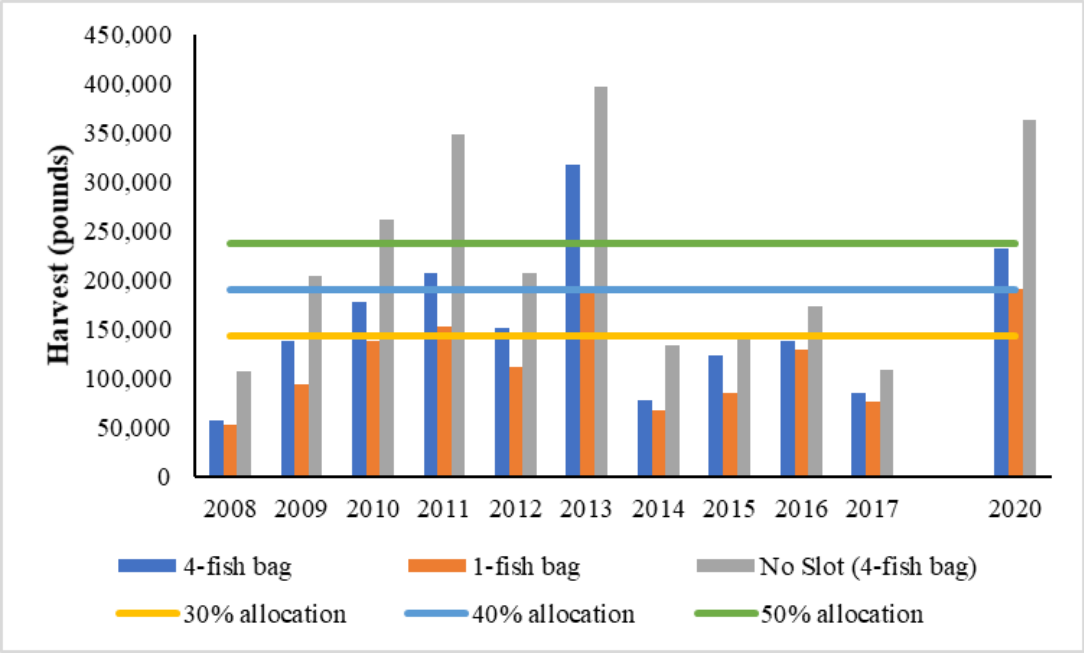

Figure 4.6.7. Total hook-and-line harvest during Aug. 16–Sept.30 at a four-fish and one-fish bag limit and a 15–19-inch slot based on data from 2008 to 2017 and 2020. The years 2010, 2011, and 2013 represent years of above average harvest; 2020 represents the first full year under seasonal management through Amendment 2. NCMFC allocations are presented for reference.

Previous analysis of summer flounder slot limits showed an increase in harvest of smaller fish, while only reducing some harvest on the larger fish. This increased fishing mortality rates and resulted in only marginal benefits (Wong 2009). Non-compliance and high-grading within the slot were concerns with the implementation of a slot limit. As such, it was recommended that narrow slot ranges be avoided due to issues related to angler satisfaction, non-compliance, and enforcement. Importantly, the use of slot limits for a flounder species was not recommended until rebuilding goals and data needs for the species were met (Wong 2009; ASMFC 2018).

As the stock rebuilds, any benefit of a buffer may disappear as more fish become available within the slot. Though slot limits are normally associated with the recreational sector, slot limits may be implemented in both sectors since there are differences in fishing seasons. Any savings may be lost if larger fish are released by the recreational sector only to be available for harvest in the commercial fishery (as is currently being discussed). This is also true within the recreational sector if gigs are not held to the same slot. Finally, it is also an important consideration for the recreational fishery if there is an early and late season; fish may grow into or out of the slot between those seasons to an unknown effect.

Though size limits could not be changed under Amendment 2, the 2020 season offers an opportunity to see how the implementation of a slot limit may have affected landings under seasonal management. Of the options presented in this issue paper, only the narrowest slot limit may have possibly prevented the recreational hook-and-line fishery from exceeding their TAL

(126,315 pounds) in 2020 (Table 4.6.2). The other options presented would have minimized the overages when compared to no slot limit.

Selection of Slot Limits with a Minimum Size Limit Lower than 15 Inches

Decreasing the minimum size limit could potentially increase harvest on males while decreasing pressure on larger females. However, it cannot be guaranteed that more males will be harvested. Depending on the minimum slot size, males could account for 10% to 40% of the fish available for harvest (Figure 4.6.1). In the summer flounder headboat fishery, Morson et al. (2017) found that lowering the minimum size for a slot limit below the current minimum size regulations could potentially meet management goals while distributing harvest over both sexes for summer flounder. However, the slot limits that did not increase fishing mortality were all narrow (2-4 inches), contained the current minimum size within the slot limit, and were not applicable to all areas and habitats.

Even at previous minimum size limits, southern flounder landings were still dominated by female fish (NCDMF, unpublished data). It is thought that males move offshore at a smaller size than females and do not return to the estuary after spawning (Stokes 1977), potentially decreasing the efficacy of a lower minimum size. While it is understood that harvest of larger females could be detrimental to the recovery of the stock, many female fish less than 16 inches TL are not mature, and harvest of these fish can also negatively impact recovery. It is not possible to determine the sex of southern flounder prior to harvest, therefore immature females would still be harvested.

Slot limits with a minimum length smaller than the current minimum length would increase the harvest of small fish. Because the southern flounder population is dominated by young fish (Flowers et al. 2019), this could significantly increase the overall number of fish harvested due to their greater availability. This increase in harvest would increase the fishing mortality rate.

In contrast, a reduction in the minimum size limit when implementing a slot limit may allow increased harvest on summer flounder. Summer flounder caught in North Carolina are typically smaller than southern flounder. As recreational size limits have increased through regulatory changes over the years, the ratio of harvest between summer and southern flounder has changed (Figure 14 *in Description of Fisheries* section).

The recreational size limit for flounder has been 15 inches TL since 2011 and multiple size limit changes have occurred over the time series making it difficult to determine any effect lowering the size limit would have. Any calculations performed would introduce a high level of imprecision and be based on data that may not be representative of the current fishery. There are numerous concerns with decreasing the minimum size limit for the recreational sector. These concerns revolve around the large volume of recreational discards of fish that are currently under the 15-inch TL minimum size limit (approximately 1.9 million fish in 2017). Lowering the minimum size limit would potentially turn these discards into harvest. Increasing the harvest from the recreational fishery would not meet the projected reductions necessary for rebuilding, and under adaptive management would lead to shortened or closed seasons. Data are not

available on the size of discards so it is unclear how harvest would change if the minimum size for a slot was dropped to 12- or 13-inches TL. When the size limits were lower (1989-2007), these smaller fish accounted for 30-40% of the recreational harvest.

The slot limit options proposed have a minimum size of 15 inches TL. This is because MRIP staff do not see discarded flounder and therefore do not collect any associated biological data. Data on the species composition and length of discarded flounder is not available. This overwhelming data limitation prohibits calculating the potential impact of lowering the size limit or implementing a slot limit with a lower bound below the current size limit. The division's License and Statistics section has developed a smartphone application (Catch U Later!) to collect information on discarded flounder to help identify not only species composition of discards but length frequency as well. Data from this app will be available over the next several years. As these data are collected, determining the impact of lowering the size limit will be possible.

The following are additional positive and negative impacts on lowering the minimum size limit below 15 inches TL.

+ Would reduce the harvest of larger females
+ May increase the harvest of males
- Cannot evaluate sustainable harvest of slot limits with a reduced minimum size limit
- Would likely increase the number of fish harvested
- Smaller minimum size limit would expose smaller fish to harvest, including smaller females
- No guarantee that harvest of males will increase
- Would not prevent dead discards of larger fish
- The larger fish that are released and die will contribute to increasing the average weight of dead discards reducing the available weight for harvest
- The combination of increased harvest of small fish and increased dead discard weight of larger fish is likely to lead to overages in the fishery
- Would impact summer flounder harvest and require ASMFC/MAFMC approval

Additional Management Considerations

It should be noted that while the NCMFC may choose a preferred slot limit as a management option, the NCDMF would need approval from ASMFC to implement any changes to the current minimum size limit. The ASMFC has implemented state and/or regional level conservation equivalencies for the management of summer flounder since 2001 (ASMFC 2017). Conservation equivalency management measures are reviewed annually and based on the coastwide summer flounder recreational harvest limit and overages when they occur. The ASMFC must be notified of any changes to the summer flounder fishery in North Carolina state waters; however, approval of changes by the ASMFC is not required if the changes are expected to be more restrictive than the management measures already approved by the ASMFC. Conservation equivalencies may not be approved by ASMFC until the February following Amendment 3 implementation. Therefore, slot limits, if approved by the NCMFC and the ASMFC, would not be implemented until the 2023 fishing year at the earliest. If ASMFC does not approve slot limits as part of North

Carolina's conservation equivalency for summer flounder, the state could be found out of compliance through the Summer Flounder, Scup, and Black Sea Bass FMP. These interjurisdictional regulations impact the North Carolina fishery as state management of flounder is collective and not by individual species. Further, management regulations through ASMFC continue to increase the summer flounder minimum size limit, indicating approval of a lower minimum size might not occur. If the NCMFC were to implement a slot limit with a lower minimum size without ASMFC approval, North Carolina could be found out of compliance leading to a closure of the fishery.

Changes to the summer flounder fishery in EEZ waters off North Carolina may be impacted by the Mid-Atlantic Fishery Management Council and National Marine Fisheries Service (NMFS). Until conservation equivalencies are approved by NMFS (which usually occurs in May or June), coast-wide measures for summer flounder in the EEZ include a four-fish possession limit, a 19-inch TL minimum size limit, and an open season of May 15–Sept. 15 (MAFMC 2019). These measures serve as a default each year until annual conservation equivalencies are approved by the NMFS, which allow state regulations to be applied to EEZ waters.

VI. PROPOSED MANAGEMENT OPTIONS

Management Options

(+ potential positive impact of action)
(- potential negative impact of action)

Below are overarching positive and negative impacts for all options, specific impacts from an option may be found below that option.

Option 1. Status quo, Do not implement a slot limit.

+ Maintains current regulations and allows anglers to harvest citation size flounder
+ Meets compliance requirements for summer flounder through the joint ASMFC/MAFMC plans
+ Doesn't create regulatory disparity between the recreational hook-and-line and gig fisheries
+ Meets sustainability if harvest is below the TAL
+ Escapement of mature fish is occurring through the 72% reduction
- Would not reduce the harvest of larger, more fecund females
- Does not provide additional protections to the stock

Option 2. Implement a slot limit for the recreational hook-and-line fishery.

The following positive and negative impacts apply to all of option 2.

+ May help to constrain harvest and prevent overages if used in conjunction with the TAL and seasons for the recreational hook-and-line fishery
+ Meets sustainability if harvest is below the TAL

+/- Potentially allows for additional escapement of the larger, more fecund females
- Requires approval from ASMFC for conservation equivalency, which may not be approved
- Larger fish protected by the slot limit in the recreational fishery may be harvested by the commercial fishery later in the year
- Fish discarded outside of the slot have an associated mortality and dead discards would increase
- May increase the number of fish harvested to meet the same TAL
- Would increase overall weight of dead discards and could potentially lead to exceeding TAC and not meeting the needed overall reduction
- May disproportionately impact gig and RCGL gill-net fisheries if applied to all recreational gear, not just the hook-and-line fishery
- Greater potential for noncompliance and high grading
- Does not allow anglers to harvest citation size flounder

2A. Implement a 15 to16 Inch (1 inch) TL Slot Limit.
2B. Implement a 15 to 17 Inch (2 inch) TL Slot Limit.
2C. Implement a 15 to 18 Inch (3 inch) TL Slot Limit.
2D. Implement a 15 to 19 Inch (4 inch) TL Slot Limit.

VII. RECOMMENDATIONS

*PDT Initial Recommendation**

Status quo, do not implement a slot limit at this time. Slot limits can be an important tool for management, and the division supports considering them as the age and size structures of the population expands. Additionally, the division is working to collect information on the size structure of the discarded southern flounder to inform future management decisions.

VIII. LITERATURE CITED

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