

Snook, Red Drum, Seatrout: Southwest Florida Update



Review and Discussion
February 19, 2020



Florida Fish and Wildlife Conservation Commission

Version 1

This presentation provides an update on fisheries monitoring information for snook, red drum, and spotted seatrout populations in southwest Florida relative to localized impacts from a prolonged red tide bloom and a request for direction on potential further management actions.

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Unless otherwise noted, images throughout the presentation are by FWC.

Outline

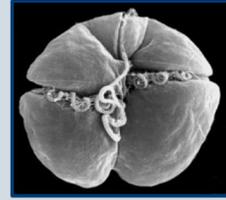
- What is red tide?
- Recent red tides and response
- Status update – snook, red drum, spotted seatrout
- Moving forward
- Staff recommendation



This presentation will provide information on what red tide is; information on red tide blooms in recent years and the agency response to these events; an update on the current status of snook, red drum, and spotted seatrout in southwest Florida; management options for these three inshore species moving forward; and will wrap up with a staff recommendation for future management.

What is Red Tide?

- Harmful algal bloom of marine algae, *Karenia brevis*
 - Produces toxins
 - Decaying blooms create low dissolved oxygen conditions
- Natural event that occurs nearly every year
 - First documented in Florida in 1844
 - Most common in southwest Florida
- Can cause fish kills and human respiratory irritation



Red tide is a bloom of a particular marine algae known as *Karenia brevis*. Red tide blooms produce toxins that kill fish, birds, sea turtles, manatees, and dolphins. Filter feeding shellfish (clams, oysters, mussels) accumulate the toxin and can cause Neurotoxic Shellfish Poisoning (NSP) in human consumers. Decaying blooms lead to low dissolved oxygen conditions in the water, which can cause fish kills. Red tide is a naturally occurring event that is seen nearly every year in Florida, most often on the southwest coast; However, severe, prolonged red tides are less common.

Toxins produced by red tide are carried in aerosol form in sea spray and can cause respiratory irritation in humans on beaches and near the coast. Massive fish kills on beaches create aesthetic problems, economic losses, and high clean up costs.

2017-2019 Red Tide Event

Nov. 2017: Began in southwest Florida

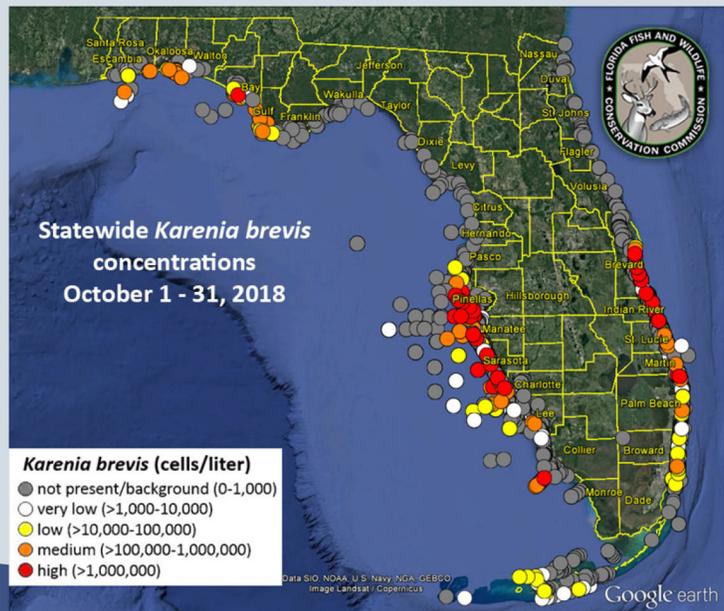
June – Sept. 2018: Spread south to Collier and north to Pinellas counties

Oct. 2018: Spread along the east coast from Dade through Brevard counties

Nov. 2018 – early-Feb. 2019: Patchy areas of high concentrations persisted between Pinellas and Monroe counties

Mid-Feb. – May 2019: Not detected above background levels statewide

Blooms were patchy with local variation in severity and effects



In November 2017, a red tide bloom (higher-than-normal concentrations of the Florida red tide alga, *Karenia brevis*) began in the Gulf of Mexico offshore of southwest Florida and persisted mainly in Charlotte and Lee counties until May 2018. In summer 2018, the bloom expanded south to Collier County and north to Pinellas County, and moved into inshore waters. During the month of October, the Gulf Stream transported red tide along Florida's Atlantic coast and bloom concentrations were observed from Miami-Dade through Brevard counties. Patchy areas with low to high concentrations of red tide persisted between Pinellas and Monroe counties from November 2018 through early-February 2019. Concentrations of red tide above background (normal) levels were not recorded again until May 2019, when very low concentrations were recorded.

Proactive Short-term Management Changes

Aug. 30, 2018 – May 10, 2019: Snook and red drum catch-and-release only

- Aug. 30 – Sept. 27: Southern portion of Manatee County – northern Collier County
- Beginning Sept. 28: Expanded north through Pasco County

Feb. 22, 2019 – May 10, 2019: Spotted seatrout over 20 inches catch-and-release only

- Pasco – northern Collier County

May 2019 – May 31, 2020: Snook and red drum catch-and-release status extended, seatrout catch-and-release added

- Pasco – northern Collier County



Today: Review updated monitoring data and discuss potential next steps

In an abundance of caution and in response to stakeholder concerns, Florida Fish and Wildlife Conservation Commission's (FWC) implemented short-term conservative management measures by Executive Order (EO) to reduce pressure on stressed fish populations where red tide-related fish kills were most prevalent.

Beginning Aug. 30, 2018, snook and red drum were made catch-and-release only from the southern portion of Manatee County through the northern portion of Collier County. At the September 2018 Commission meeting, Commissioners directed staff to expand the area where these catch-and-release measures apply northward through Pasco County, including all of Tampa Bay (area shown on the map on the slide), and to extend the expiration date until May 10, 2019, to allow time for researchers to monitor these fisheries for signs of decline or rebuilding.

In February 2019, additional catch-and-release measures were implemented for spotted seatrout larger than 20 inches in Pasco County through northern Collier County based on stakeholder concerns about potential red tide-related impacts for this species. These measures for spotted seatrout were also in place through May 10, 2019.

At the May 2019 Commission meeting, the Commission extended the catch-and-release status for snook and red drum for an additional year and made spotted seatrout catch-and-release, making all three species catch-and-release only in this area through May 31, 2020.

Today we will be reviewing the latest monitoring data for these species and discuss potential next steps.

Non-regulatory Response Efforts

- Community engagement and responsiveness
 - FWC and DEP leadership visited affected areas, met with community leaders, fishing guides, and local anglers
- Partnerships to release hatchery fish
 - Mote, CCA, and FWC – snook
 - CCA, Duke Energy, EOG, and FWC – red drum
- Ongoing monitoring efforts
- Red Tide Task Force created



As part of ongoing efforts to respond to the needs of local communities, FWC and Florida Department of Environmental Protection (DEP) leadership have, and continue, to visit areas affected by red tide and met with local government and community leaders, fishing guides, and local anglers to better understand how local communities have been impacted.

To help local fish populations recover, FWC also worked with Mote Marine Laboratory, Coastal Conservation Association (CCA) Florida, and Duke Energy to raise and release snook and red drum to waters of southwest Florida. In addition, Governor Scott directed an additional \$1.2 million to FWC to increase stock enhancement research, production, and stocking of red drum at the FWC's Stock Enhancement Research Facility at Port Manatee.

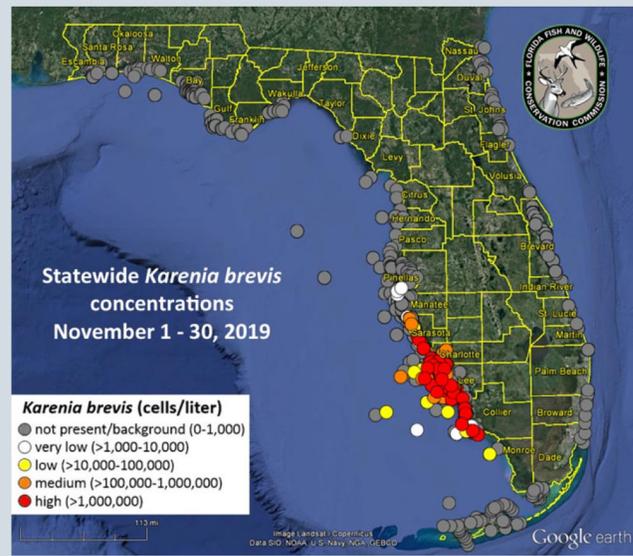
FWC also continues to monitor the status of inshore species and red tide status throughout the state and leads the Red Tide Task Force.

Late-2019 Red Tide Event

May – Dec. 2019

- Not prolonged
- Effected Manatee through Monroe counties
- Concentrations varied from very low to high
- Effects varied geographically

Early Jan. 2020: very low or background levels statewide



Although the prolonged red tide that originally prompted the implementation of catch-and-release measure dissipated by early-February 2019, another red tide bloom began in southwest Florida in May 2019 with very low concentrations found.

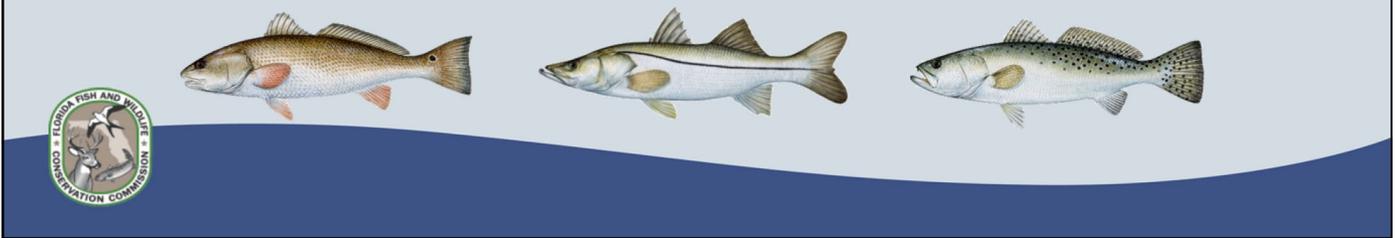
In September 2019, very low to medium concentrations were detected in Charlotte, Lee, and Collier counties. The bloom increased to medium and high concentrations and spread further south in Collier county and north to Sarasota county in October and November 2019.

Low to medium concentrations persisted in Charlotte through northern Monroe counties through December 2019 and by early January 2020 only very low or background levels were detected.

Some fish kills and respiratory irritation were reported due to this event but not to the extent or severity as during the previous prolonged red tide.

Evaluating Impacts to Inshore Fisheries

- Monthly fisheries-independent monitoring compares changes in abundance
 - Tampa Bay and Charlotte Harbor: 20+ years of monthly sampling
 - Sarasota Bay: Monthly sampling since 2009
 - Can be used to evaluate potential impacts to red drum, snook, and spotted seatrout from red tide
- Species-specific reproduction and life history traits important to consider
- Past red tide impacts can also help assess likely effects



FWC's Fish and Wildlife Research Institute (FWRI) staff conduct monthly fisheries-independent sampling to monitor the abundance of recreational and commercial fisheries species from six estuary systems around the state. Sampling occurs monthly throughout the year. This monthly sampling has been conducted for more than 20 years in Tampa Bay and Charlotte Harbor, and since 2009 in Sarasota Bay. Because of the timing of the prolonged red tide, data for this topic are looked at from June of one year through May of the following year. Based on sampling methods, juveniles are not encountered throughout the entire year.

These fishery-independent monitoring data can be used to evaluate potential localized red tide-related impacts to snook, red drum, and spotted seatrout by comparing current abundance to long-term averages within these systems. Recent changes in abundance can help describe short-term impacts to a population. In addition to these data, it is important to consider species-specific reproductive and life history traits when evaluating possible long-term impacts. Past effects from previous red tides can also help to assess likely impacts.

Snook

- Mature age 1; maximum age ~20 years
- Protandric hermaphrodites; transition from male to female between age 1-7
- Spawn multiple times from Apr. – Nov.
- Life cycle
 - Use both rivers and estuarine habitats
 - Migrate to passes and barrier islands to spawn
 - Fairly diverse spawning sites
- In previous red tides, known to seek refuge



Moderately resilient to red tide-related impacts

Snook mature at age 1 and have a lifespan of approximately 20 years. Snook are protandric hermaphrodites and transition from male to female between age 1 and age 7. Snook spawn multiple times each year, typically from April through November.

Snook live in both rivers and estuaries and migrate to inlets and barrier islands to spawn. Snook can tolerate a wide range of salinities and have been known to take refuge from red tide in low salinity habitats where red tide is less likely to occur.

Because of these unique reproductive characteristics and life history traits, snook are moderately resilient to red tide-related impacts.

Snook Abundance Trends

- Tampa Bay and Sarasota Bay: decline in adult abundance from 2018 to 2019
 - Tampa Bay still above long-term average
 - Sarasota Bay comparable to long-term average

2019 abundance compared to long-term average

| | Tampa Bay | Sarasota Bay | Charlotte Harbor |
|-----------|-----------|--------------|------------------|
| Adults | Higher | Comparable | Higher |
| Juveniles | Below | Not Sampled | Comparable |



Despite the monitoring data from Tampa Bay indicating a decline in adult abundance between 2018 and 2019, abundance in Tampa Bay is still higher than the long-term average, but below the last five-year average. Juvenile recruitment tends to vary with a few strong years interspersed among multiple lower years, which is not a significant cause for concern because adults are made up of multiple year classes of juveniles and a single good year of juvenile abundance can carry over into several years of good adult abundance. Juvenile abundance in Tampa Bay is below the long-term average in 2019.

Similar to Tampa Bay, adult abundance in Sarasota Bay declined in 2019 but is comparable to the long-term average. Juvenile abundance is not sampled in Sarasota Bay.

In Charlotte Harbor, data thus far this sampling year indicate adult snook abundance is higher than both the long-term average and 2018 abundance, while juvenile abundance is slightly below, but nearing, the long-term average.

Red Drum

- Mature ~age 3; maximum age ~35 to 50 years
 - Fishery targets subadults
- Spawn multiple times from mid-Sept. – mid-Nov.
- Life cycle
 - Estuarine-dependent as juveniles and subadults (to age 3-4)
 - Move offshore as adults
 - Form large spawning aggregations near passes in fall



Less resilient to red tide-related impacts than other inshore species

Red drum mature at approximately age 3 and can live for 35 to 50 years. The recreational fishery targets subadults when they are still dependent on estuarine habitats and before they move offshore as adults. Red drum spawn multiple times from mid-September through mid-November each year. Adults form large spawning aggregations in coastal habitats near passes in the fall.

During previous red tide events, fewer spawning aggregations occurred in impacted areas than typically occur when red tide is not present. Because of these life history and reproductive traits, red drum are less resilient to red tide-related impacts than other inshore species.

Red Drum Abundance Trends

- Before 2019, all 3 estuaries below average subadult abundance since 2015

2019 abundance compared to long-term average

| | Tampa Bay | Sarasota Bay | Charlotte Harbor |
|-----------|-----------|--------------|------------------|
| Subadults | Below | Comparable | Higher |
| Juveniles | Below | Below | Comparable |



Prior to 2019, subadult abundance in Tampa Bay, Sarasota Bay, and Charlotte Harbor was below the long-term average since 2015.

In Tampa Bay, both the subadult and juvenile abundance is below the long-term average. In Sarasota Bay, the current subadult abundance is comparable to the long-term average while the juvenile abundance is below, but approaching, the average. Finally, adult abundance in Charlotte Harbor is above and juvenile abundance is comparable to the long-term average.

Spotted Seatrout

- Mature age 1; maximum age 12 years
- Spawn multiple times from Apr. – Sept.
- Life cycle
 - Completely within estuary
 - Diverse spawning sites/habitat
- Red tide in 2005 reduced spawning stock in Tampa Bay and Charlotte Harbor, but rebounded within 3-4 years



Photo courtesy of Matt Smith



Reproductively resilient to red tide-related impacts

Spotted seatrout mature at age 1, can live approximately 12 years, and spawn multiple times each year from April through September. Seatrout live entirely within estuaries and use a diverse range of spawning sites and habitats throughout the estuarine system. Impacts from red tide in 2005 reduced the spawning stock of seatrout in Tampa Bay and Charlotte Harbor, but those populations rebounded within 3-4 years.

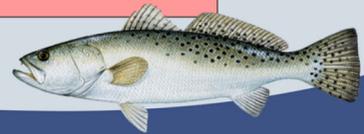
Because they are relatively short-lived and quick to mature, seatrout are reproductively resilient to red tide-related impacts.

Spotted Seatrout Abundance Trends

- Adult abundance increased in all 3 estuaries
- Juvenile abundance below long-term average in all 3 estuaries
 - Sarasota Bay and Charlotte Harbor: Abundance increased since 2018

2019 abundance compared to long-term average

| | Tampa Bay | Sarasota Bay | Charlotte Harbor |
|-----------|------------|--------------|------------------|
| Adults | Comparable | Comparable | Comparable |
| Juveniles | Below | Below | Below |



Overall, adult abundance is comparable to long-term averages and increased from 2018 in all three estuaries; however, adult abundance in Tampa Bay and Sarasota Bay was low prior to the prolonged red tide event. Juvenile abundance remains below the long-term average in all three estuaries, but increased in Sarasota Bay and Charlotte Harbor in 2019.

Moving Forward

Snook

- Adult abundance declined in 2019 in Tampa Bay and Sarasota Bay
- Juvenile abundance still below average



Red Drum

- Red tide may have intensified declining abundance and recruitment in Sarasota Bay and Charlotte Harbor
- Tampa Bay subadult and juvenile abundance below average



Spotted Seatrout

- Adult abundance low prior to red tide in Tampa Bay and Sarasota Bay
- Juvenile abundance below average in all 3 estuaries



*Direction requested
on continuing catch-and-release measures for these species*

Comparing recent abundance data with long-term averages while considering species-specific reproductive characteristics and life history traits allows for a preliminary evaluation of potential red tide-related impacts and can inform how to move forward with management of these three species in southwest Florida.

Although adult snook abundance is either above or comparable to the long-term average in all three estuaries systems, it did decline in Tampa Bay and Sarasota Bay in 2019. Juvenile snook abundance is still below the long-term average in the two estuaries where sampling occurs.

For red drum, monitoring data suggest that red tide may have intensified recent declining trends in subadult and juvenile abundance in Sarasota Bay and Charlotte Harbor. In Tampa Bay, both the subadult and juvenile abundance are below the long-term average.

Adult spotted seatrout abundance in Tampa Bay and Sarasota Bay was low prior to the prolonged red tide. Although adult abundance is currently near the long-term average for this species, juvenile abundance is below average.

While monitoring data does show some signs of recovery, allowing additional time without harvest pressure could help the species continue to improve. Staff is seeking direction on continuing the catch-and-release measures for snook, red drum, and spotted seatrout.

Staff Recommendation

Approve extending the current management actions in response to red tide impacts in southwest Florida by EO

Snook, red drum, and spotted seatrout:
Continue current catch-and-release measures through May 31, 2021

If necessary, staff will return with an update in early 2021



Staff recommends extending the current management actions that were implemented for southwest Florida in response to impacts from the 2017-2019 prolonged red tide. If approved, these changes would be implemented by EO.

Specifically, staff recommends continuing the current catch-and-release only measures for snook, red drum, and spotted seatrout from the Hernando-Pasco County line south through Gordon Pass in Collier County (shown with the map on the slide) for an additional year, through May 31, 2021.

Staff will continue monthly monitoring of inshore fish populations and, if necessary, return to the Commission with an update in early 2021.