Red Drum, Snook, Seatrout: Southwest Florida Update

Review and Discussion
May 1, 2019

Florida Fish and Wildlife Conservation Commission

Version 1

This is a review and discussion of updated fisheries monitoring information for red drum, snook, and spotted seatrout populations in southwest Florida and localized impacts to these fisheries from a prolonged red tide bloom in the Gulf of Mexico that occurred from November 2017 through mid-February 2019. Staff will provide recommendations for further management actions related to these fisheries in the impacted area.

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

2017-2019 Red Tide Event

Nov. 2017: Began in southwest Florida

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

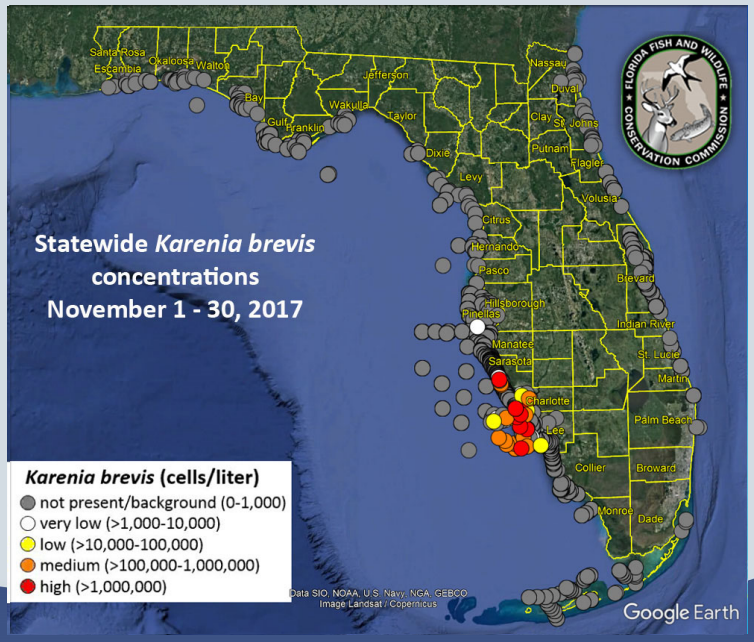
Oct. 2018: Spread along the east coast from Dade through Brevard counties

Nov. 2018 – Jan. 2019: Patchy areas of high concentrations persisted between Pinellas and Collier counties

Feb. 2019 – Present*: Not detected above background levels statewide

Blooms were patchy with local variation in severity and effects

*As of April 4, 2019



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 high concentrations of red tide persisted between Pinellas and Collier counties from November 2018 through January 2019. Concentrations of red tide above background (normal) levels have not been recorded to date (as of April 5, 2019) since mid-February 2019.

Managing Impacts to Fish Populations

- Large quantities of dead fish observed beginning in December 2017
- Stakeholder concerns initially focused on impacts to red drum and snook, but later also included spotted seatrout
- Extent of impacts to fish populations were unknown



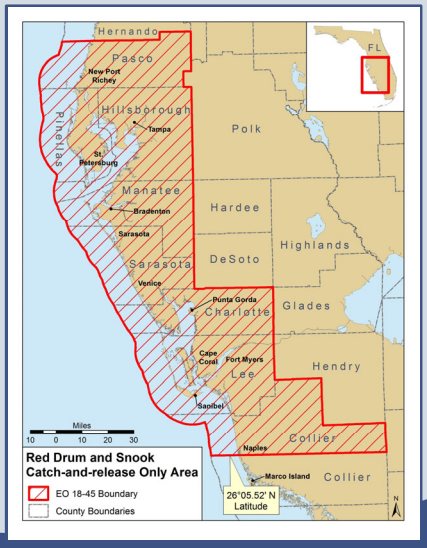
Photos courtesy Tom Twyford (left). Andrew Herzog (right)

The Florida red tide organism, *K. brevis*, produces toxins that can cause fish and other vertebrates to become sick or die. Fish kills associated with this red tide event began in December 2017 and were common and extensive in multiple counties in southwest Florida. Because of these fish kills, stakeholders expressed concerns about potential long-term impacts to local inshore fisheries. These concerns were initially focused on red drum and snook; however, stakeholders have also expressed similar concerns about spotted seatrout. While the extent of these potential impacts was unknown at the time, stakeholders requested that FWC take management action to conserve these world-class fisheries.

Short-term Management Changes

Short-term regulatory changes made by Executive Order (EO) for areas where red tide-related fish kills most prevalent

- Red drum and snook: Catch-and-release only
  - Effective Aug. 30, 2018 – May 10, 2019
  - Expanded north in September 2018 to include Tampa Bay and Pasco County
- Spotted seatrout: Catch-and-release only for recreational seatrout larger than 20 inches
  - Effective Feb. 22, 2019 – May 10, 2019



In an abundance of caution and in response to stakeholder concerns, FWC implemented short-term conservative regulatory changes by Executive Order (EO) to reduce pressure on stressed fish populations where red tide-related fish kills were most prevalent.

Beginning Aug. 30 2018, regulatory changes were implemented to make red drum and snook catch-and-release only from the southern portion of Manatee County through the northern portion of Collier County until Oct. 12, 2018. At the September 2018 Commission meeting, Commissioners directed staff to expand the area where these catch-and-release measures apply north to include all of Tampa Bay (including all of Manatee, Hillsborough, and Pinellas counties) and Pasco County, 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 within Pasco County through northern Collier County based on stakeholder concerns about potential red tide-related impacts. These measures for spotted seatrout are also in place through May 10, 2019.

Evaluating Impacts to Inshore Fisheries

- Monthly fisheries-independent monitoring data used to compare changes in abundance
  - Tampa Bay and Charlotte Harbor: More than 20 years of monthly sampling
  - Sarasota Bay: Monthly sampling began in 2009
  - Can be used to evaluate potential impacts to red drum, snook, and spotted seatrout from red tide
- Species-specific reproductive characteristics and other life history traits are important to consider
- Past effects from previous red tides can also help assess likely impacts

Fish and Wildlife Research Institute (FWRI) staff conduct monthly fisheries-independent sampling to monitor the status and relative abundance of recreational and commercial fisheries species from six estuary systems around the state. This monthly sampling has been conducted for more than 20 years in Tampa Bay and Charlotte Harbor, and since 2009 in Sarasota Bay.

These fishery-independent monitoring data can be used to evaluate potential localized red tide-related impacts to red drum, snook, 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. To evaluate potential long-term impacts, it is important to consider species-specific reproductive characteristics and other life history traits. Past effects from previous red tides can also help to assess likely impacts.

Red Drum

- Mature ~age 3; maximum age ~35 to 50 years
- Spawn multiple times from mid-September through mid-November
- Fishery targets subadults
- Life cycle
  - Estuarine-dependent as juveniles and subadults (to age 3-4)
  - Offshore as adults
  - Form large spawning aggregations in coastal habitats near passes in the 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. Red drum spawn multiple times from mid-September through mid-November each year. The recreational fishery targets subadults while they are still dependent on estuarine habitats and before they move offshore as adults. 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. Red drum are less resilient to red tide-related impacts than other inshore species.

Red Drum Abundance Trends

- Abundance of subadults in Tampa Bay rebounding after 4-year declining trend
- Juvenile abundance in both Tampa Bay and Charlotte Harbor already low due to two closely spaced low recruitment years
- Inshore abundance during June 2018 – February 2019 compared to long-term average abundance:

	Tampa Bay	Sarasota Bay*	Charlotte Harbor
Subadults	Comparable	Below	Below
Juveniles	Below	Below	Below

*Sampling in Sarasota Bay began in 2009

Fisheries-independent monitoring data from June 2018 through February 2019 for inshore red drum indicate that the abundance of subadults in Tampa Bay is rebounding after a four-year declining trend and is now comparable to the long-term average.

Juvenile abundance in both Tampa Bay and Charlotte Harbor was already low prior to this red tide event as a result of two closely spaced years of poor recruitment. It remains below the long-term average in each of these estuaries. Juvenile abundance in Charlotte Harbor is the lowest average abundance on record and shows a four-year declining trend.

In Sarasota Bay, average subadult abundance recorded from June 2018 through February 2019 is the lowest recorded (equal with 2016 abundance) since sampling began in 2009. Juvenile abundance in Sarasota Bay during this period is also below the long-term average.

Snook

- Mature age 1; maximum age ~20 years
- Protandric hermaphrodites; transition from male to female between age 1-7
- Spawn multiple times from ~April through November
- 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 in low salinity habitats

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 can be moderately resilient to red tide-related impacts.

Snook Abundance Trends

- Abundance during June 2018 – February 2019 compared to long-term average abundance:

	Tampa Bay	Sarasota Bay*	Charlotte Harbor
Adults	Higher	Higher	Higher
Juveniles	Comparable	Not Sampled	Comparable

*Sampling in Sarasota Bay began in 2009

FWRI fisheries-independent monitoring data from June 2018 through February 2019 indicate that adult snook abundance and juvenile recruitment across the region is higher than or comparable to long-term averages in Tampa Bay, Sarasota Bay, and Charlotte Harbor.

Spotted Seatrout

- Mature age 1; maximum age 12 years
- Spawn multiple times from April through September
- 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

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

Spotted Seatrout Abundance Trends

- Tampa Bay and Sarasota Bay: Adult abundance low prior to red tide
- Charlotte Harbor: Potential red tide-related declines in abundance
- Abundance during June 2018 – February 2019 compared to long-term average abundance:

	Tampa Bay	Sarasota Bay*	Charlotte Harbor
Adults	Below	Below	Below
Juveniles	Comparable	Below	Below

*Sampling in Sarasota Bay began in 2009

Adult seatrout abundance in Tampa Bay and Sarasota Bay was already low prior to this red tide event. Current declines in abundance in Charlotte Harbor may be related to impacts from red tide.

In Tampa Bay, adult abundance has been below the long-term average for the past four years. Juvenile abundance has been comparable to the long-term average for the past four years and has been increasing for the past three years.

In Sarasota Bay, fisheries-independent monitoring data from June 2018 through February 2019 indicate the lowest adult abundance on record (since sampling began in 2009) following a three-year declining trend. This period also shows the lowest juvenile abundance on record following a three-year declining trend.

In Charlotte Harbor, data from June 2018 through February 2019 shows the lowest adult abundance on record and the lowest juvenile abundance on record, following three years of poor recruitment.

Moving Forward

Red Drum

- Red tide may have intensified recent declining trends in abundance and recruitment in Sarasota Bay and Charlotte Harbor
- Consider continuing catch-and-release measures

Snook

- Likely minimal impacts across affected area
- Season closed in Gulf Region May 1 – Aug. 31
- Consider proactively continuing catch-and-release measures

Spotted Seatrout

- Concerns about adult abundance and recruitment in Tampa Bay, Sarasota Bay, and Charlotte Harbor
- Consider making catch-and-release only; no commercial harvest

Direction requested

Comparing recent fisheries-independent monitoring data with long-term averages in abundance while considering species-specific reproductive characteristics and life history traits allows for a preliminary evaluation of potential red tide-related impacts to local red drum, snook, and spotted seatrout populations.

Monitoring data suggest that red tide may have intensified recent declining trends in red drum subadult abundance and juvenile recruitment in Sarasota Bay and Charlotte Harbor. Additional management actions may be necessary for red drum in these estuaries. Staff suggests considering continuing existing catch-and-release measures for red drum.

Available information suggests that there were likely minimal impacts to adult and juvenile snook abundance in Tampa Bay, Sarasota Bay, and Charlotte Harbor. Current catch-and-release measures for snook will expire on May 10, 2019; however, snook will remain catch-and-release during the annual Gulf season closure that occurs from May 1 – Aug. 31 each year. Staff suggests considering a proactive approach by continuing existing catch-and-release measures for snook in southwest Florida.

Monitoring data indicate concerning trends for both adult abundance and juvenile recruitment of spotted seatrout in Tampa Bay, Sarasota Bay, and Charlotte Harbor. Staff suggests considering making spotted seatrout catch-and-release only within southwest Florida, including not allowing commercial harvest. The commercial season for seatrout in this region occurs from June 1 through Oct. 31 each year.

Red Drum Releases

- Coastal Conservation Association (CCA) Florida, Duke Energy, and FWC partnered to help address red tide impacts
  - More than 16,000 red drum released February – March 2019 in Pasco through Collier counties
  - Approximately 2,000 juveniles and 25-30 adults released in each county
  - First Lady Casey DeSantis assisted with release event in Naples
- FWC received funding to increase research, production, and stocking of red drum to help mitigate red tide impacts
  - Approximately 27,000 juveniles released into Tampa Bay in October 2018
  - Will support production of approximately 500,000 red drum for stocking each year

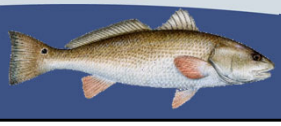


Photo credit: Governor's Press Office

In September 2018, Coastal Conservation Association (CCA) Florida, Duke Energy, and the FWC announced a partnership to release hatchery-reared red drum to help address impacts from red tide in southwest Florida. In February and March 2019, more than 16,000 red drum from Duke Energy's Crystal River Mariculture Center were released into waters of Pasco through Collier counties. Approximately 2,000 juveniles and 25-30 tagged adult red drum were released in each county. First Lady Casey DeSantis assisted with the red drum release event in Naples on March 15, 2019.

The FWC also recently received an additional $1.2 million in funding to increase stock enhancement research, production, and stocking of red drum at the FWC's Stock Enhancement Research Facility (SERF) in Port Manatee. In October 2018, FWC released approximately 27,000 juvenile red drum from SERF into the Tampa Bay area. Since receiving the additional funding, SERF will now be able to produce approximately 500,000 juvenile red drum for stocking per year. Additional red drum releases are currently being planned and are expected to occur in fall 2019.

Snook Releases

- Partnership between CCA Florida, Mote Marine Laboratory, and FWC to release hatchery-reared snook to help address red tide impacts
  - Two-year initiative will begin in May 2019
  - Goal to raise and release approximately 5,000 juvenile snook
  - Snook will be released into tidal creek nursery areas

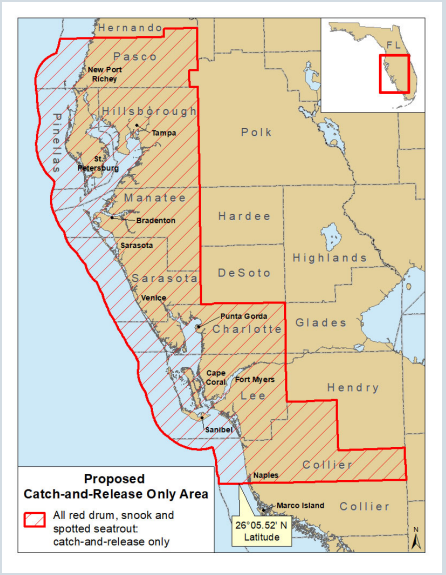
CCA Florida, Mote Marine Laboratory, and FWC are partnering to release hatchery-reared snook into waters of southwest Florida to help address impacts from red tide. This two-year initiative will begin in May 2019 and aims to raise and release approximately 5,000 juvenile snook into tidal creek nursery areas that would normally be supplied by spawning aggregations that may have been impacted by the prolonged red tide bloom.

Staff Recommendation

Approve the following proposed management actions to further conserve local red drum, snook, and spotted seatrout populations impacted by red tide in southwest Florida

- Red drum and snook: Continue current catch-and-release measures for 1 year by EO
- Spotted seatrout: Make catch-and-release only with no commercial harvest in southwest Florida for 1 year by EO

Staff would return with an update in early 2020



Staff recommends approving the proposed management actions to further conserve local red drum, snook, and spotted seatrout populations impacted by red tide in southwest Florida.

Staff recommends continuing catch-and-release measures currently in place for red drum and snook in southwest Florida for an additional year by EO. Staff also recommends making spotted seatrout in southwest Florida catch-and-release only with no commercial harvest for one year by EO. Staff suggests applying these measures in the portion of southwest Florida where current catch-and-release measures apply, from the Pasco-Hernando county line south through Gordon Pass in Collier County (including all waters of Tampa Bay). Staff will continue monthly monitoring of local red drum, snook, and spotted seatrout populations to help detect signs of decline or rebuilding, and will return with an update in early 2020.