

# **FLORIDA WILD CAUGHT BAIT/FORAGE FISH**

**A sustainable Florida marine resource not at risk.**



**Status of Florida's historical baitfish industry.**



# FLORIDA FISHERIES FOUNDATION LLC

## THE FLORIDA WILD CAUGHT BAITFISH INDUSTRY

The Florida baitfish industry is an under-appreciated sector of Florida's economy. The commercial fishermen's harvest of baitfish (forage fish) is critical to the pleasure and success of recreational fishing for residents and tourists. It is sustainable.

According to experts in fisheries economics and management, "The harvest, distribution and retailing of natural marine baits represents an important component of the commercial fishing industry and a vital input to marine, recreational fishing activities in Florida. A wide variety of marine baits are harvested for commercial sale in Florida. Species of greatest popularity include shrimp, ballyhoo, sardine, finger mullet, pinfish, "greenback" minnow, Gulf killifish and other assorted finfish. Other species of more local popularity include sand flea, small crab, eel, assorted mollusks, and others. In 1995, commercial landings of marine baits were reported to be 7.6 million pounds, valued at \$6.0 million dockside (Florida Department of Environmental Protection (FDEP), 1996(1)). The demand for some of these marine baits (e.g., sand flea, ballyhoo) may be local in nature, while others (e.g. bait shrimp) are in demand throughout the state. Even though the majority of the commercial harvest of these baits is primarily focused in specific locations within Florida (FDEP, 1996(1)), the distribution and retailing activities associated with natural marine baits occur throughout the state. Some of these baits are sold primarily as dead product, such as ballyhoo, sardine, frozen bait shrimp and others. However, the highest prices are associated with those species sold live, such as pinfish, bait shrimp, "greenback" minnow, Gulf killifish and other small baitfish."<sup>1</sup>

In a published article on forage fish a world-class scientist noted, "In many historical forage fish declines fishing pressure was much higher, often well over 50% of the population was taken each year and as the PNAS paper highlighted, this kind of fishing pressure does amplify the decline. However, many fisheries agencies have learned from this experience and not only keep fishing pressure much lower than in the past but reduce it more rapidly when recruitment declines. So, the lesson from the most recent decline of California sardine is we have to adapt to the natural fluctuations that nature provides. Yes, sea lions and birds will suffer when their food declines, but this has been happening for thousands of years long before industrial fishing. With good fisheries management as is now practiced in the U.S. and elsewhere forage fish declines will not be caused by fishing.... Dr. Ray Hilborn is a Professor in the School of Aquatic and Fishery Sciences, University of Washington specializing in natural resource management and conservation. He is one of the most respected experts on marine fishery population dynamics in the world."<sup>2</sup>

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<sup>1</sup> An Assessment of the Market for Live Marine Baitfish in Florida... Funds for this study were provided by the United States Department of Agriculture, Economic Research Service, through cooperative agreement 43-3AEN-5-80105 and the Aquaculture Grant Program of the Florida Department Environmental Protection. Dr. Charles M. Adams et al.

<sup>2</sup> Dr. RAY HILBORN: Analysis Shows California Sardine Decline Not Caused by Too High Harvest Rate- Editorial Note: The following article by Dr. Ray Hilborn appeared yesterday on SeafoodNews.com. SEAFOODNEWS.COM (Ray Hilborn) -- April 22, 2015

The Florida Wildlife Research Institute pointed out years ago how valuable the baitfish industry was to the recreational and commercial fishing industry writing; "Baitfish is the common term given to a multitude of small, schooling fish whose main claim to fame is that they are an important food source for other fish. This large and diverse group of fishes is an integral part of the complex, interconnected marine food web. Baitfish are used in a variety of products such as fish meal, oil, pet food and fertilizer and are, of course, used as bait. Regardless of the purpose of the catch, baitfish harvests support the state's lucrative and popular fishing industries, both recreational and commercial."<sup>3</sup>

There are no fish meal, fish oil, pet food or fertilizer factories in Florida. The price of land to unload boats and process is prohibitive and the Florida net limitation ban<sup>4</sup> prevents nets from harvesting in many areas where baitfish could be harvested. The Florida net ban reduced the harvest of historically sustainable baitfish by millions of pounds. The harvest under present regulations will always be below a science based optimum yield. The Florida baitfish industry hopes to increase their harvest on all species of baitfish to supply future demands for anglers and create new markets based on scientific findings.

The Florida baitfish industry supplies wild caught live and dead baitfish to millions of sport fishermen annually. Baitfish industry jobs, especially in the Florida fiscally constrained counties recovering from Hurricanes Irma and Michael, are critical to the economic and cultural importance of rural communities. One lost fishing job in Cortez, Port St. Joe or any other port is one too many, especially in communities that have a recorded history of harvesting fish since 1898.<sup>5</sup>

According to a National Marine Fisheries Service, 2017 report, using 2014 NOAA data, "Saltwater Recreational Fishing Anglers make Florida the #1 Fishing Capitol in the nation. The Florida Fish and Wildlife Commission sold 1,779,030 recreational saltwater licenses (resident and nonresident and includes permits but not Gulf Reef Fish Angler) in fiscal year 2016/17 generating \$30,821,876 in revenue. Saltwater recreational fishing had an economic impact of \$8.0 billion and supported 114,898 jobs."<sup>6</sup>

"With an increased interest in aquaculture there is a higher demand for forage fish as a source for feed. A large portion of forage fish catches are used in aquaculture, much of the rest is used as feed for terrestrial farm animals such as pigs and chickens. When examining efficiencies of farmed fish production, researchers often use a conversion ratio which compares the amount of wild fish used for feed (input) versus the total harvested farmed fish (output).

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<sup>3</sup> Florida Wildlife Research Institute (FWRI) Sea Stats publication 2000

<sup>4</sup> ARTICLE 10 - FLORIDA CONSTITUTION---SECTION 16. Limiting marine net fishing.

(a) The marine resources of the State of Florida belong to all the people of the state and should be conserved and managed for the benefit of the state, its people, and future generations. To this end the people hereby enact limitations on marine net fishing in Florida waters to protect saltwater finfish, shellfish, and other marine animals from unnecessary killing, overfishing and waste."

<sup>5</sup> President US Grant designated Fullerton Baird as "Commissioner of Fish and Fisheries," in February 1871, and directed him to study "the decrease of the food fishes of the seacoasts and the lakes of the United States and to suggest remedial measures."

<https://training.fws.gov/History/Articles/FisheriesHistory.html>

<sup>6</sup> <https://myfwc.com/conservation/value/saltwater-fishing/>

This ratio has fallen by more than one-third since 1995 (Naylor et al., 2009), but is still high enough that forage fish populations are being depleted in order to accommodate for the growing aquaculture industry.”<sup>7</sup>

While forage fish populations somewhere on the planet are being depleted, Florida baitfish, both east and west coasts, are not harvested to an optimum yield. The professional fishermen believe 99% of Florida baitfish harvest goes for baitfish to catch other marine critters in Florida and throughout the southeast. Much of Florida baitfish is used to catch crabs and fish. Some is used for chum to entice fish, like yellowtail, to form a jubilee at the stern of a private angler’s or charter for hire boat. A substantial portion of Florida baitfish is used to harvest reef fish commercially and is the preferred bait for millions of recreational fishermen who fish from Florida ports every year.

Baitfish aquaculture could be an option to provide more bait for the ever-expanding number of anglers moving into the Florida angler fisheries.

Wild caught baitfish harvest depends on the weather. Some years fish are more abundant than others as can be seen by the landing charts found in the Appendix. Research funds are scarce with no big push by any entity to study the Florida baitfish industry as it should be. Since the net ban, FWC determined that the net ban reduced the harvest of baitfish by 50%.<sup>8</sup>

“Florida’s recreational fishery has a \$7.5 billion annual economic impact—the highest in the United States. In 2006 Florida’s recreational saltwater fishery alone had an economic impact of \$5.2 billion and was responsible for 51,500 jobs. Despite Florida’s status as a premier fishing location, only two of the 257 baitfish farms recorded in the 2005 USDA Census of Aquaculture were located in Florida. Since 2005 about 10 new marine baitfish farms have been added, but this disparity clearly illustrates the potential for expansion and diversification of aquaculture within Florida to include marine baitfish production. Today almost all marine baitfishes sold in stores are wild caught using nets and traps, making availability of most species seasonal despite a year-round demand. Marine baitfish produced by aquaculture could provide anglers with a consistent supply of sought-after species in desired sizes regardless of season, as well as potentially alleviate collection pressure on targeted wild populations. Successful production and marketing of marine baitfish will require a business plan that includes production of multiple crops through controlled spawning during the off cycle. A year-round supply would allow marketing of cultured baitfish when the wild supply is limited so that a premium price can be attained. Substantial research to evaluate the aquaculture potential of many species of marine baitfish suggests that some species have high aquaculture potential while others, for a variety of reasons, are less promising.

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<sup>7</sup> <http://thefishproject.weebly.com/forage-fish-fisheries.html>

<sup>8</sup> From: Wiley, Nick [mailto:Nick.Wiley@MyFWC.com Sent: Tuesday, May 05, 2015 2:34 PM  
To: Jason Schratwieser; Justin Grubich; Manley Fuller; preston@fwfonline.org;  
twheatley@pewtrusts.org; taukeman@ccaflorida.org; Rob Kramer Cc: McCawley, Jessica; Sutton, Eric;  
Fitzwater, Jennifer; McRae, Gil  
Subject: Forage Fish (First sentence – second paragraph) “As you guys have noted, Florida is, and has been, at the forefront of successful management of marine forage species. Florida’s commercial baitfish fishery was reduced by more than 50% following the implementation of limitations on large nets in the mid-1990’s, and harvest rates are currently relatively small, particularly when compared with other coastal states.”

You can learn more by reading the research and extension publications referenced at the end of this document, and by visiting the University of Florida/IFAS Indian River Research and Education Center's aquaculture website: <http://irrec.ifas.ufl.edu/aquaculture/index.html>.<sup>9</sup>

**THE QUESTION IS:**

Can the highly regulated Florida commercial baitfish/forage fish industry continue to supply the needs of the sportfishing community on a sustainable basis?

**THE ANSWER: YES**

There is a false narrative that bait/forage fish depletions in other parts of the world are happening in Florida's baitfish industry. That is not factual. An honest narrative of Florida's baitfish industry based on empirical data follows.

This report validates the harvest level of Florida's baitfish/forage fish over many decades. It highlights the Florida Net Ban<sup>10</sup> in 1995, permanently reduced the harvest of Florida's baitfish/forage fish species.

Florida is the sportfishing fishing capitol of America. There were 2.3 million recreational saltwater licenses sold (resident and nonresident unique license participants) in fiscal year 18/19 totaling \$37.1 million in total saltwater license sales.<sup>11</sup> The economic impact for Saltwater recreational fishing was \$11.5 billion supporting 106,000 jobs.<sup>12</sup>

Supplying the ever-increasing number of sport fishermen are a few highly regulated commercial baitfish harvesters and a small number of shoreside baitfish processing plants. The Florida Fish and Wildlife Commission (FWC) passed a resolution that could give the impression Florida fishermen are engaged in multiple uses of bait/forage fish as occurs in other nations.

The most recent FWC Resolution pertaining to forage fish reads in part:

*"**WHEREAS**, global demand is surging for forage fish, which are used to make pet food, cosmetics, nutritional supplements, fertilizer, and feed for animals and aquaculture operations,"<sup>13</sup>*

However, very little, if any, of the forage/baitfish harvested in Florida by licensed fishermen are used for any of the industrial purposes described in the June 2015 FWC Resolution. It is true that forage fish products listed by FWC are produced for pet food, cosmetics, nutritional supplements, fertilizer, and feed for animals and aquaculture operations somewhere in the world; but Florida is not one of those places.

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<sup>9</sup> A guide to Florida's common marine baitfish and their potential for aquaculture MARINE BAITFISH  
Cortney L. Ohs r. Leroy Creswell Matthew A. DiMaggio University of Florida/iFAs Indian River Research and Education  
Center 2199 South Rock Road Fort Pierce, Florida 34945 sgeB 69 February 2013

<sup>10</sup> Article 10 Section 16. Limiting Marine Net Fishing. Fla. Constitution

<sup>11</sup> <https://myfwc.com/conservation/value/saltwater-fishing/>

<sup>12</sup> Source: *American Sportfishing Association and Southwick Associates*, based on USFWS 2011 survey data updated to 2018 using FWC-OLP's license trend data plus inflation data

<sup>13</sup> FWC Resolution dated 25<sup>th</sup> of June 2015

Florida's bait/forage fish fishery has been described by the Florida Wildlife Research Institute in a publication that is worth reading.<sup>14</sup>

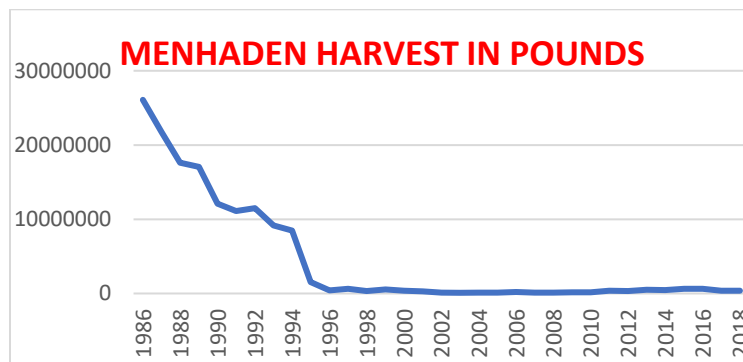
### **WHAT'S THE PROBLEM?**

The species receiving most of the negative press in America is menhaden *Brevoortia patronus* Goode, 1878 (Gulf menhaden) and *Brevoortia tyrannus* (Latrobe, 1802) (Atlantic menhaden) .



There is a real or perceived belief that overfishing of menhaden occurs in Virginia<sup>15</sup>, but overfishing of menhaden is not a problem in Florida as proven by the annual menhaden landings published by the Florida Wildlife Research Institute (FWRI).<sup>16</sup>

There are no menhaden reduction plants in Florida. The last two plants closed decades ago. The menhaden reduction plant in Apalachicola, Florida, closed in about 1942<sup>17</sup> and the Nassau Fertilizer & Oil plant in Fernandina, Florida, closed in about 1988<sup>18</sup>. When the Florida Trip Ticket records were available in 1986, Florida harvested 26 million pounds of menhaden that year. The Florida menhaden industry averaged around 15 million pounds for the next five years then dramatically plunged to 432 thousand pounds in 1996 after the Florida Net Ban.<sup>19</sup>



### **Florida Net Ban 1995**

Source: <https://myfwc.com/research/saltwater/fishstats/commercial-fisheries/landings-in-florida/> (Menhaden landings)

<sup>14</sup> <https://myfwc.com/media/7101/22-foragefishpresentation.pdf>

<sup>15</sup> <https://chesapeakebay.noaa.gov/fish-facts/menhaden> Stock: According to the 2015 benchmark stock assessment, Atlantic menhaden are not overfished, and overfishing is not occurring.

<sup>16</sup> <https://public.myfwc.com/FWRI/PFDM/ReportCreator.aspx>

<sup>17</sup> Gulf States Marine Fisheries Commission report, "Menhaden Fishing in the Gulf of Mexico" Vanderkooys 2014

<sup>18</sup> *News Leader* Fernandina Weekly Newspaper, 4/16/19-Julia Roberts

<sup>19</sup> <https://public.myfwc.com/FWRI/PFDM/ReportCreator.aspx>

## ROUND SCAD

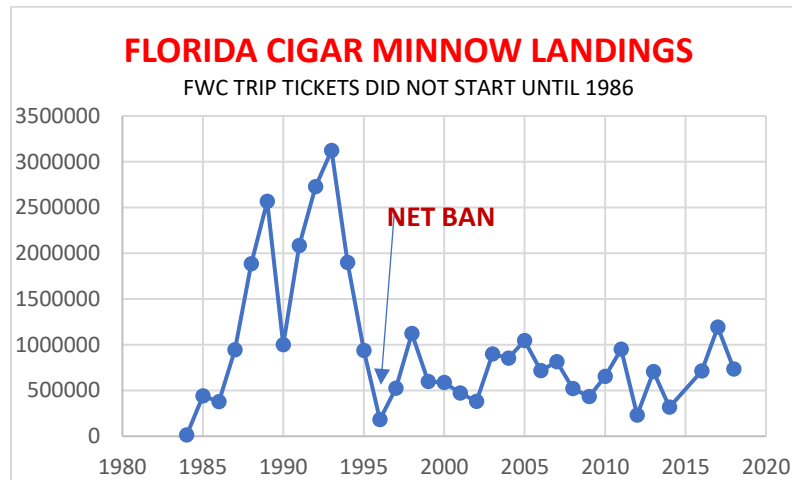
(*Decapterus punctatus*) also called Cigar Minnow, Cigar fish, Bunker, Hardtail etc., is a popular, highly productive reef fish bait.



The Cigar Minnow is short-lived like most of the baitfish harvested in Florida. “99.9% of *D. punctatus* live less than three winters.”<sup>20</sup> *D. Punctatus* are not considered overfished or of great concern to the International Union for Conservation of Nature - IUCN<sup>21</sup>

Cigar Minnows are a mainstay for thousands of bait shops throughout the southeast, especially in Florida. Cigar minnows are harvested with small purse seines. Harvesting must be high volume in order to maintain a competitive cost of the product to the sport fishermen, commercial fishermen and profitable economic viability to maintain shore side facilities. Cigar Minnow biomass is largely controlled by environmental conditions.

Red tide, algae blooms, oil spills, Mississippi River flooding, hurricanes and temperature and salinity impact harvesting all baitfish species. This issue needs significant research.

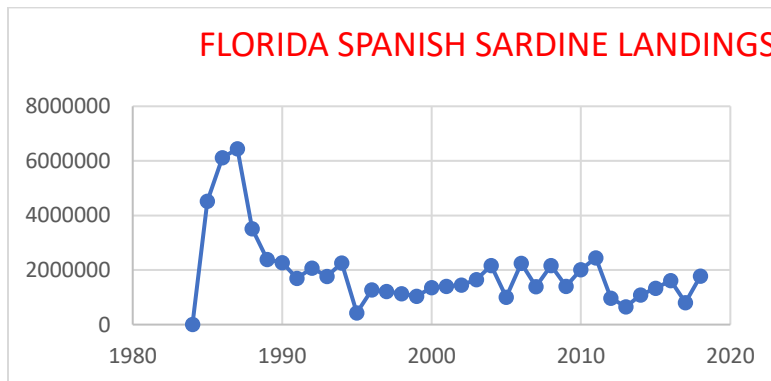


<sup>20</sup> *Marine Biology* (2002 140: 713-722 Houde et al. (1983)

<sup>21</sup> <https://www.iucn.org/>

## SPANISH SARDINE

“Spawning occurs at night in the open waters of the Gulf of Mexico. Most spawning in the eastern Gulf occurs over wide areas where depths are between 30 and 160 feet, although some eggs and larvae have been recovered from much greater depths. In the western Gulf, larvae have been reported from as far out as the Continental Shelf off Texas. Eggs and larvae have been collected in the eastern Gulf in all seasons but are not abundant from May to September. Larvae begin actively feeding three days after hatching, and metamorphosis is complete in about 18 days. Spanish sardines live to around 5-6 years”.<sup>22</sup>



Source: <https://myfwc.com/research/saltwater/fishstats/commercial-fisheries/landings-in-florida/>

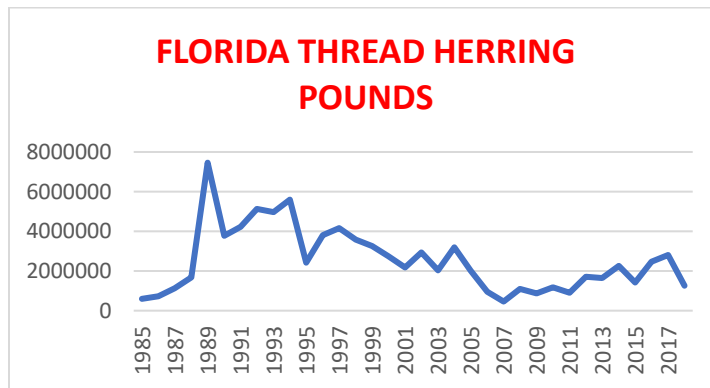
<sup>22</sup> <http://blogs.ifas.ufl.edu/charlotteco/2016/06/01/southwest-florida-baitfish-species-profiles/>



## THREAD HERRING

“Threadfin herring are estimated to live 7-8 years. Female’s reach maturity at 5.7 inches fork length (FL) and males at 5 inches FL., and at ages of one or two plus years. Adult threadfin herring generally follow a seasonal north-south and inshore-offshore migration pattern along the west coast of Florida. Schools of fish move south in the fall and concentrate in the winter within 10 miles of shore.

Threadfin herring spawn over a wide area in the Gulf of Mexico and south Atlantic and over a period of several months. Spawning can occur from February to September, but peak spawning is from April to August. Most spawning takes place within 30 miles of shore over the inner continental shelf at depths less than 100 feet. The primary spawning area for threadfin herring is in coastal waters from Tampa Bay to just south of Fort Myers. Spawning generally occurs when water temperatures exceed 78 degrees F and when salinity is above 35 parts per thousand (full strength sea water”).<sup>23</sup>



Source: <https://myfwc.com/research/saltwater/fishstats/commercial-fisheries/landings-in-florida/>

<sup>23</sup> <http://blogs.ifas.ufl.edu/charlotteco/2016/06/01/southwest-florida-baitfish-species-profiles/>

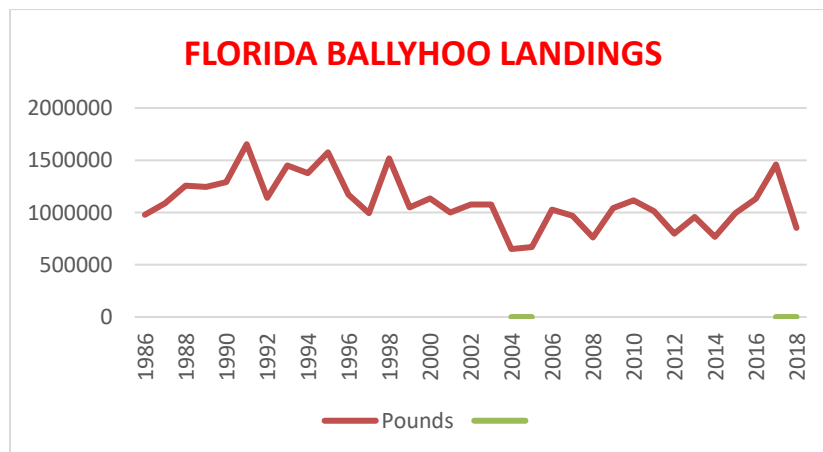
## **BALLYHOO**

“*Hemiramphus brasiliensis*, is very common in its distribution range. The bally is a fish that is mostly used as bait; they are cut and used for trolling as they are prey to many fish, resulting in them being very effective in tournaments for sports fishermen. There has been some decline in the number of ballyhoo due to overfishing, but the overall population has not been affected. According to IUCN, it is listed as Least Concern (IUCN, 2016)”<sup>24</sup>

There are schools of ballyhoo along both coasts of Florida. My son fishes in Key Largo and from Miami north, inside the one-mile line. Sixty miles of grounds we used to fish are closed (author, personal communication).

All of everglades national park is also closed. Millions of pounds of forage fish there are never touched. No one fishes the west coast. Ballyhoo are caught in one small area by only about 5 boats.

Hurricanes don't seem to harm. When the water clears up fish are there. Fish move from the pollution coming out of Biscayne Bay. No harm to stock. The demand is not greater than available. Can't sell what you can catch. I don't know who does the landings. PS. We also have trip limits”<sup>25</sup>



<sup>24</sup> Fishbase. (2016)

<sup>25</sup> (Personal Communication from historical Ballyhoo fisherman.)

## Forage Fish Policy of the Florida Fish & Wildlife Commission

On May 5, 2015 the following email was sent by Nick Wiley, Executive Director of the Florida Fish and Wildlife Commission to "Conservation Colleagues".

"From: Wiley, Nick [mailto:Nick.Wiley@MyFWC.com]  
Sent: Tuesday, May 05, 2015 2:34 PM  
To: Jason Schratwieser; Justin Grubich; Manley Fuller; preston@fwfonline.org; twheatley@pewtrusts.org; taukeman@ccaflorida.org; Rob Kramer  
Cc: McCawley, Jessica; Sutton, Eric; Fitzwater, Jennifer; McRae, Gil  
Subject: Forage Fish

Dear Conservation Colleagues:

Thank you again for taking the initiative to meet recently with Commission staff to provide your input and share your concerns regarding forage fish in Florida. As we have discussed in the past, the Commission recognizes the ecological importance of the forage base in marine ecosystems. I wanted to reiterate how Commission staff currently view this issue and our plans for addressing it at the upcoming Commission meeting. We are preparing a presentation for the June Commission meeting that will highlight the current effective management measures in place relating to these species as well as the ongoing research efforts aimed at monitoring these stocks. The presentation will include information about the stable or increasing trends in forage fish populations in Florida as well as discuss Florida's proactive management of these species. This presentation will be given by Jessica and Gil.

As you guys have noted, Florida is, and has been, at the forefront of successful management of marine forage species. Florida's commercial baitfish fishery was reduced by more than 50% following the implementation of limitations on large nets in the mid-1990's, and harvest rates are currently relatively small, particularly when compared with other coastal states. The effectiveness of Florida's fisheries management can be seen in the outcomes of our robust monitoring program that tracks not only stocks of forage fish, but also other fish that depend on them for food. These monitoring programs have been in place for over twenty years and indicate that, while baitfish populations are naturally variable, they have remained relatively constant over recent years. In addition, fish species that are higher up the food chain and rely on a strong forage base are also in good condition, which supports the findings that forage fish populations, are stable or increasing in Florida.

As I have noted in a number of discussions with you, we believe FWC's existing regulations and extensive monitoring programs provide strong measures for forage fish conservation and management. We welcome the opportunity to work with you to elevate awareness of the importance of forage fish in Florida's marine ecosystems and with regard to maintaining Florida's status as the "Fishing Capital of the World". We believe there are ways to reinforce the importance of forage fish without considering additional regulations, and we do not believe additional regulations focused on forage fish are necessary or warranted at this time. We have reviewed your recommendations with regard to possible proposed regulations and we are just not ready to support or recommend this approach to our Commission. Of course, you are welcome to share these ideas with our Commissioners at the Commission meeting or in advance of the meeting if you wish, I just wanted to make sure we were clear and open with you regarding our view and planned approach. Please let me know if you have questions. Thank you. Nick

Nick Wiley  
Executive Director  
Florida Fish and Wildlife Conservation Commission  
Office Phone (850) 487-3796  
FAX (850) 921-5786  
Please visit our website at the following link:  
Florida Fish and Wildlife Conservation Commission

### **AT THE FEDERAL LEVEL**

At the 2019 meeting of NOAA's Council Coordinating Committee, the forage fish issue was discussed in order to develop a consensus opinion. The following draft of the opinion follows.

#### **"NOAA'S COUNCIL COORDINATING COMMITTEE** Legislative Working Paper Updates 2019

The LC recommends the following revised consensus statement for forage fish:

1. The Councils recognize that forage fish cannot be defined with a one-size-fits-all description or criteria.
2. Species identified as forage fish by the Councils tend to be small species with short lifespans and may have an important role in the marine ecosystem of the region.
3. Some of these species may exhibit schooling behavior, highly variable stock sizes due to their short life spans, and sensitivity to environmental conditions.
4. Some forage species may consume plankton, and some may be an important food source for marine mammals and seabirds.
5. The term "forage fish" appears to imply a special importance of the species as prey, however nearly all fish species are prey to larger predators and thus all fish species provide energy transfer up the food chain.
6. Councils should have the authority to determine which species should be considered and managed as forage fish.
7. Under existing MSA provisions, some Councils already recognize the importance of forage fish to the larger ecosystem functions and those species are regulated under the Council's FMPs where appropriate.
8. The CCC is concerned that any legislative definition of forage fish, based on broad criteria -- such as all low trophic level fish (plankton consumers) that contribute to the diets of upper trophic levels -- will not include other important types of forage (e.g., squid), unintentionally include important target fish species (e.g., sockeye salmon), and allow for various interpretations by different interested parties and thus invite litigation.
9. Provisions that would require Councils to specify catch limits for forage fish species to account for the diet needs of marine mammals, birds, and other marine life would greatly impact the ability of Councils to fulfill their responsibilities under the MSA.
10. Many predators are opportunistic feeders and shift their prey based on abundance and availability. As a result, determining the exact amount of individual prey needed each year would be an enormous undertaking, and would divert limited research monies away from other critical research such as surveys and stock assessments.

NOAA and the states do not currently have enough resources to survey target stocks, let alone prepare stocks assessments for forage species that would be needed to set scientifically based

annual catch limits. In the absence of this critical information and necessary resources, catch limits would need to be restricted to account for this largely incalculable uncertainty. **Prey needs for upper trophic predators are already accounted for as natural mortality removals in stock assessment models.**

Councils should retain the authority to determine species requiring conservation and management through development of FMPs. **Any legislation that directs the Secretary to prepare or amend fishery management plans (e.g., recent legislation to add shad and river herring as managed species) creates conflicts with current management under other existing authorities.** (Emphasis added)

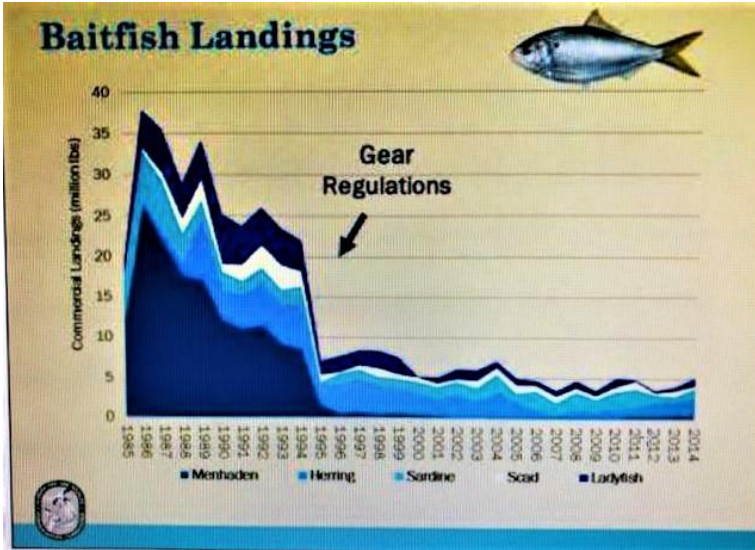
### Suggested Research

1. Research related to number of fish killed during red tide events, by species, sex and size.
2. Research related to environmentally controlled variation in natural mortality (such as red tide other blooms, excess heat and cold, wind).
3. Research on the effects of the environment on recruitment.
4. Research on the effects of the environment on matchability (vulnerability and availability). This would be for all species including forage species.
5. Research on impact of bait harvested by private fishermen for personal use
6. Research on long-term impact from oil spills.
7. Joint research with licensed fishermen to determine any impacts due to climate change.

“FWRI’s FDM program monitors forage fish that are harvested for commercial sale, including menhaden, herring, sardines, scad, and ladyfish. This graph illustrates commercial landings from state and federal waters off Florida only since 1985 and includes the mid-1990s when a suite of gear regulations was enacted for state waters. As a result of these regulations, baitfish harvest levels decreased dramatically, and harvest continues only at low levels today due to this proactive limitation of allowable gear.”<sup>26</sup>

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<sup>26</sup> <https://myfwc.com/media/7101/22-foragefishpresentation.pdf>



Authors note: ‘Gear Regulations’ above was actually the “Net Ban” enacted by Plebiscite as an amendment to the Florida Constitution (Article 10-Section 16) that banned all gill nets and reduced size of all other nets in state waters.<sup>27</sup>

## CONCLUSION

The Florida Baitfish/Forage Fish industry is healthy. The professional Florida fishermen believe harvest can be increased for all the short-lived species if scientific monitoring takes place. The Florida baitfish/forage fish industry pledges joint research with FWC.

Submitted by:

Robert P. Jones  
[ruleoflaw3@gmail.com](mailto:ruleoflaw3@gmail.com)  
 December 7, 2019

<sup>27</sup> <http://flsenate.gov/laws/constitution#A10S16>