

Monterey Bay Aquarium Seafood Watch®

Florida pompano

Trachinotus carolinus

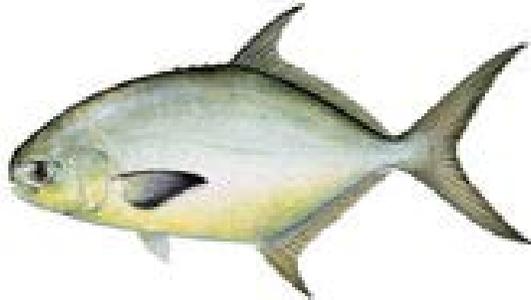


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United States

Drift gillnet, Seine net, Cast net, Handline

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About Seafood Watch®

The Monterey Bay Aquarium Seafood Watch® program evaluates the ecological sustainability of wild-caught and farmed seafood commonly found in the North American marketplace. Seafood Watch defines sustainable seafood as originating from sources, whether wild-caught or farmed, which can maintain or increase production in the long-term without jeopardizing the structure or function of affected ecosystems. The program's mission is to engage and empower consumers and businesses to purchase environmentally responsible seafood fished or farmed in ways that minimize their impact on the environment or are in a credible improvement project with the same goal.

Each sustainability recommendation is supported by a seafood report. Each report synthesizes and analyzes the most current ecological, fisheries and ecosystem science on a species, then evaluates this information against the program's sustainability criteria to arrive at a recommendation of "Best Choice," "Good Alternative," or "Avoid." In producing the seafood reports, Seafood Watch utilizes research published in academic, peer-reviewed journals whenever possible. Other sources of information include government technical publications, fishery management plans and supporting documents, and other scientific reviews of ecological sustainability. Seafood Watch research analysts also communicate with ecologists, fisheries and aquaculture scientists, and members of industry and conservation organizations when evaluating fisheries and aquaculture practices. Capture fisheries and aquaculture practices are highly dynamic; as the scientific information on each species changes, Seafood Watch's sustainability recommendations and the underlying seafood reports will be updated to reflect these changes. Both the detailed evaluation methodology and the scientific reports, are available on seafoodwatch.org.

For more information about Seafood Watch and seafood reports, please contact the Seafood Watch program at Monterey Bay Aquarium by calling 1-877-229-9990 or visit online at seafoodwatch.org.

Disclaimer

Seafood Watch® strives to ensure all its seafood reports and the recommendations contained therein are accurate and reflect the most up-to-date evidence available at time of publication. All our reports are peer reviewed for accuracy and completeness by external scientists with expertise in ecology, fisheries science or aquaculture. Scientific review, however, does not constitute an endorsement of the Seafood Watch program or its recommendations on the part of the reviewing scientists. Seafood Watch is solely responsible for the conclusions reached in this report. The program welcomes additional or updated data that can be used for the next revision. Seafood Watch and seafood reports are made possible through a grant from the David and Lucile Packard Foundation.

Guiding Principles

Seafood Watch® defines sustainable seafood as originating from sources, whether fished¹ or farmed, that can maintain or increase production in the long-term without jeopardizing the structure or function of affected ecosystems.

The following **guiding principles** illustrate the qualities that capture fisheries must possess to be considered sustainable by the Seafood Watch program:

- *Stocks are healthy and abundant.*
- *Fishing mortality does not threaten populations or impede the ecological role of any marine life.*
- *The fishery minimizes bycatch.*
- *The fishery is managed to sustain long-term productivity of all impacted species.*
- *The fishery is conducted such that impacts on the seafloor are minimized and the ecological and functional roles of seafloor habitats are maintained.*
- *Fishing activities should not seriously reduce ecosystem services provided by any fished species or result in harmful changes such as trophic cascades, phase shifts, or reduction of genetic diversity.*

Based on these guiding principles, Seafood Watch has developed a set of four sustainability **criteria** to evaluate capture fisheries for the purpose of developing a seafood recommendation for consumers and businesses. These criteria are:

1. Impacts on the species under assessment
2. Impacts on other species
3. Effectiveness of management
4. Habitat and ecosystem impacts

Each criterion includes:

- Factors to evaluate and score
- Evaluation guidelines to synthesize these factors and to produce a numerical score
- A resulting numerical score and **rating** for that criterion

Once a score and rating has been assigned to each criterion, an overall seafood recommendation is developed on additional evaluation guidelines. Criteria ratings and the overall recommendation are color-coded to correspond to the categories on the Seafood Watch pocket guide:

¹ “Fish” is used throughout this document to refer to finfish, shellfish and other invertebrates.

Best Choice/Green: Are well managed and caught or farmed in ways that cause little harm to habitats or other wildlife.

Good Alternative/Yellow: Buy, but be aware there are concerns with how they're caught or farmed.

Avoid/Red: Take a pass on these for now. These items are overfished or caught or farmed in ways that harm other marine life or the environment.

Summary

This report focuses on the Florida pompano (*Trachinotus carolinus*) fishery using hook and line, cast nets, and beach seines in Florida state waters and using gill nets in specified adjacent federal waters. Florida pompano is commercially fished in the United States from Virginia to Texas; landings of Florida pompano in Florida account for over 90% of the commercial harvest. In addition to the commercial fishery discussed in this report, there is an important recreational fishery for Florida pompano in Florida, the impact of which is not assessed in this report.

The most recent assessments of Florida pompano have indicated that their abundance along Florida's Gulf coast is stable and not threatened by fishing mortality. However, there is less certainty in the stock assessment and fishing mortality estimates for the population along Florida's Atlantic coast, but researchers concluded that the population was probably not overfished.

The Florida pompano fishery uses highly targeted techniques for all gear types, which results in very low bycatch. Hook and line, cast nets, beach seines, haul seines, and gill nets are used in the pompano fishery. Gill nets in many fisheries have very high bycatch rates, but fishermen in the Florida pompano fishery use these nets in a fairly unique way that results in almost no bycatch. Because all of the allowable gears for fishing Florida pompano have negligible bycatch, and because there are no other retained species in the fishery, there are no other species included in this assessment. Seafood Watch deems bycatch in this fishery to be a very low concern.

The Florida pompano fishery is a fairly well-managed fishery. There are bag limits, size limits, and gear restrictions in place to regulate the catch of Florida pompano in Florida state waters and adjacent federal waters off the southwest Florida coast. There is limited detailed scientific information on the status of Florida pompano stocks, which creates uncertainty in the effectiveness of current management practices.

Overall, fishing for Florida pompano has low to moderate impact on the habitat and ecosystem. Allowable gears rarely touch the sea floor, and those that do are only fished over sandy habitat. The only gear mitigation in the fishery is for gillnets, the use of which is restricted to a limited amount of habitat in federal waters. Finally, there is no assessment of the fishery's impact on the ecosystem, but the fishery does not catch any species of exceptional ecological importance.

Table of Conservation Concerns and Overall Recommendations

Stock / Fishery	Impacts on the Stock	Impacts on other Spp.	Management	Habitat and Ecosystem	Overall Recommendation
Florida pompano United States North Atlantic - Handline	Yellow (2.64)	Green (5.00)	Yellow (3.00)	Green (3.87)	Best Choice (3.520)
Florida pompano United States North Atlantic - Cast Net	Yellow (2.64)	Green (5.00)	Yellow (3.00)	Yellow (3.00)	Best Choice (3.303)
Florida pompano United States North Atlantic - Seine Net, Boat	Yellow (2.64)	Green (5.00)	Yellow (3.00)	Yellow (3.00)	Best Choice (3.303)
Florida pompano United States Gulf of Mexico - Cast Net	Green (3.83)	Green (5.00)	Yellow (3.00)	Yellow (3.00)	Best Choice (3.624)
Florida pompano United States Gulf of Mexico - Gillnet, Drift	Green (3.83)	Green (5.00)	Yellow (3.00)	Green (3.46)	Best Choice (3.756)
Florida pompano United States Gulf of Mexico - Handline	Green (3.83)	Green (5.00)	Yellow (3.00)	Green (3.87)	Best Choice (3.862)
Florida pompano United States Gulf of Mexico - Seine Net, Boat	Green (3.83)	Green (5.00)	Yellow (3.00)	Yellow (3.00)	Best Choice (3.624)

Scoring Guide

Scores range from zero to five where zero indicates very poor performance and five indicates the fishing operations have no significant impact.

Final Score = geometric mean of the four Scores (Criterion 1, Criterion 2, Criterion 3, Criterion 4).

- **Best Choice/Green** = Final Score >3.2, **and** no Red Criteria, **and** no Critical scores
- **Good Alternative/Yellow** = Final score >2.2, **and** neither Harvest Strategy (Factor 3.1) nor Bycatch Management Strategy (Factor 3.2) are Very High Concern², **and** no more than one Red Criterion, **and** no Critical scores, **and** does not meet the criteria for Best Choice (above)
- **Avoid/Red** = Final Score <=2.2, **or** either Harvest Strategy (Factor 3.1) or Bycatch Management Strategy (Factor 3.2) is Very High Concern, **or** two or more Red Criteria, **or** one or more Critical scores.

² Because effective management is an essential component of sustainable fisheries, Seafood Watch issues an Avoid recommendation for any fishery scored as a Very High Concern for either factor under Management (Criterion 3).

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Introduction

Scope of the analysis and ensuing recommendation

This report focuses on the Florida pompano (*Trachinotus carolinus*) commercial fishery using hook and line, cast nets, and beach seines in Florida state waters and using gill nets in specified adjacent federal waters off southwest Florida. Florida pompano is commercially fished in the United States from Virginia to Texas; landings of Florida pompano in Florida account for over 90% of the commercial harvest (FWRI 2011).

Overview of the species and management bodies

Florida pompano can occur from Cape Cod to northern Argentina, but are uncommon north of Chesapeake Bay (de Astarloa et al. 2000, FFWCC 2010). They are benthic feeders, very fast swimmers, and form large schools in nearshore waters. Florida pompano are relatively fast growing and short lived, and approximately half of the population is mature by the age of one (FFWCC 2010, Guindon et al. in prep).

The Florida Fish and Wildlife Conservation Commission (FFWCC) manages Florida pompano in Florida state waters and in a portion of federal waters designated as a special Pompano Endorsement Zone (PEZ), which was established in 2001 (FFWCC 2012).

Production Statistics

Over 90% of Florida pompano commercially harvested in the U.S. are landed in Florida (FWRI 2011). The Florida commercial harvest is divided approximately evenly between the Gulf and Atlantic coasts, with much of the Gulf coast harvest concentrated in Collier County, where most gillnetted Florida pompano are landed (FFWCC 2010). Overall landings are variable from year to year, but they show a decreasing trend, particularly since 2008, though this is likely due to changes in management rather than population declines (FFWCC 2010).

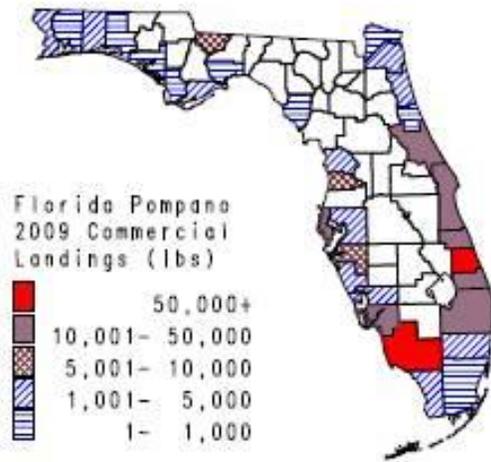


Figure 1: By-county commercial landings of Florida pompano from 2009, the most recent year for which these data have been generated. Note that Collier County, the red county on the Gulf coast, is where most landings from gillnetting in federal waters occur.

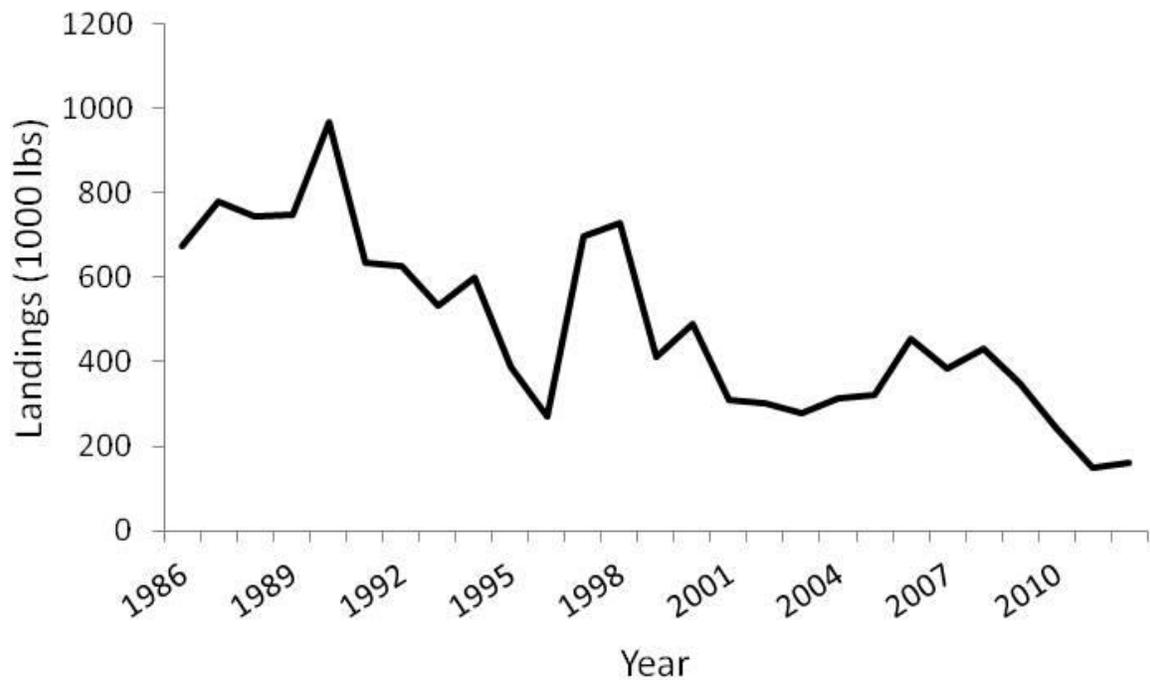


Figure 2: Annual commercial landings of Florida pompano from both coasts of Florida from 1986-2012. Though landings can vary dramatically from year to year, there has been an overall trend of declining landings.

Importance to the US/North American market

Florida pompano is of minor importance to the overall U.S. market, as landings are comparatively small and fish are seldom shipped far beyond their port of landing (FWRI 2011). They can be locally important in Florida, however, as the fish command some of the highest per pound prices of any species in the country (FWRI 2011). The export market for Florida pompano is negligible.

Common and market names

Florida pompano, pompano.

Primary product forms

Whole fish, sometimes with head and tail off.

Assessment

This section assesses the sustainability of the fishery(s) relative to the Seafood Watch Criteria for Fisheries, available at <http://www.seafoodwatch.org>.

Criterion 1: Impacts on the Species Under Assessment

This criterion evaluates the impact of fishing mortality on the species, given its current abundance. The inherent vulnerability to fishing rating influences how abundance is scored, when abundance is unknown. The final Criterion 1 score is determined by taking the geometric mean of the abundance and fishing mortality scores. The Criterion 1 rating is determined as follows:

- Score >3.2=Green or Low Concern
- Score >2.2 and <=3.2=Yellow or Moderate Concern
- Score <=2.2=Red or High Concern

Rating is Critical if Factor 1.3 (Fishing Mortality) is Critical.

Criterion 1 Summary

FLORIDA POMPANO				
Region / Method	Inherent Vulnerability	Stock Status	Fishing Mortality	Subscore
United States Gulf of Mexico Cast Net	2.00:Medium	4.00:Low Concern	3.67:Low Concern	Green (3.831)
United States Gulf of Mexico Gillnet, Drift	2.00:Medium	4.00:Low Concern	3.67:Low Concern	Green (3.831)
United States Gulf of Mexico Handline	2.00:Medium	4.00:Low Concern	3.67:Low Concern	Green (3.831)
United States Gulf of Mexico Seine Net, Boat	2.00:Medium	4.00:Low Concern	3.67:Low Concern	Green (3.831)
United States North Atlantic Cast Net	2.00:Medium	3.00:Moderate Concern	2.33:Moderate Concern	Yellow (2.644)
United States North Atlantic Handline	2.00:Medium	3.00:Moderate Concern	2.33:Moderate Concern	Yellow (2.644)
United States North Atlantic Seine Net, Boat	2.00:Medium	3.00:Moderate Concern	2.33:Moderate Concern	Yellow (2.644)

Criterion 1 Assessment

FLORIDA POMPANO

Factor 1.1 — Inherent Vulnerability

Scoring guidelines

- *Low—The FishBase vulnerability score for species is 0-35, OR species exhibits life history characteristics that make it resilient to fishing, (e.g., early maturing (<5 years), short lived (< 10 years), small maximum size, and low on food chain).*
 - *Medium—The FishBase vulnerability score for species is 36-55, OR species exhibits life history characteristics that make it neither particularly vulnerable nor resilient to fishing, (e.g., moderate age at sexual maturity (5-15 years), moderate maximum age (10-25 years), moderate maximum size, and middle of food chain).*
- High—The FishBase vulnerability score for species is 56-100, OR species exhibits life history characteristics that make it particularly vulnerable to fishing, (e.g., long-lived (>25 years), late maturing (>15 years), low reproduction rate, large body size, and top-predator).*

Note: The FishBase vulnerability scores is an index of the inherent vulnerability of marine fishes to fishing based on life history parameters: maximum length, age at first maturity, longevity, growth rate, natural mortality rate, fecundity, spatial behaviors (e.g., schooling, aggregating for breeding, or consistently returning to the same sites for feeding or reproduction) and geographic range.

United States Gulf of Mexico, Cast Net

United States Gulf of Mexico, Gillnet, Drift

United States Gulf of Mexico, Handline

United States Gulf of Mexico, Seine Net, Boat

United States North Atlantic, Cast Net

United States North Atlantic, Handline

United States North Atlantic, Seine Net, Boat

2.00

Medium

Florida pompano has a Fishbase.org vulnerability score of 36, which places it in the "medium" category (Fishbase 2013). Florida pompano scores in the "medium" category based on its Fishbase.org vulnerability score, though it does have some attributes of a species with low vulnerability, such as early maturity, short longevity, small maximum size, and multiple batch spawning (K. Guindon, pers. comm.).

Factor 1.2 — Abundance

Scoring guidelines

- *5 (Very Low Concern)—Strong evidence exists that the population is above target abundance level (e.g., biomass at maximum sustainable yield, BMSY) or near virgin biomass.*

- 4 (Low Concern)—Population may be below target abundance level, but it is considered not overfished
- 3 (Moderate Concern) —Abundance level is unknown and the species has a low or medium inherent vulnerability to fishing.
- 2 (High Concern)—Population is overfished, depleted, or a species of concern, OR abundance is unknown and the species has a high inherent vulnerability to fishing.
- 1 (Very High Concern)—Population is listed as threatened or endangered.

United States Gulf of Mexico, Cast Net

United States Gulf of Mexico, Gillnet, Drift

United States Gulf of Mexico, Handline

United States Gulf of Mexico, Seine Net, Boat

4.00

Low Concern

The most recent stock assessment of Florida pompano concluded that the population on the Gulf coast of Florida were not overfished (Murphy et al. 2008). The population was stable and at an abundance well above biomass at maximum sustainable yield (Bmsy) according to both models considered. However, the stock assessment has not been updated for seven years, so Seafood Watch deems the stock status to be of low concern rather than very low concern.

Rationale:

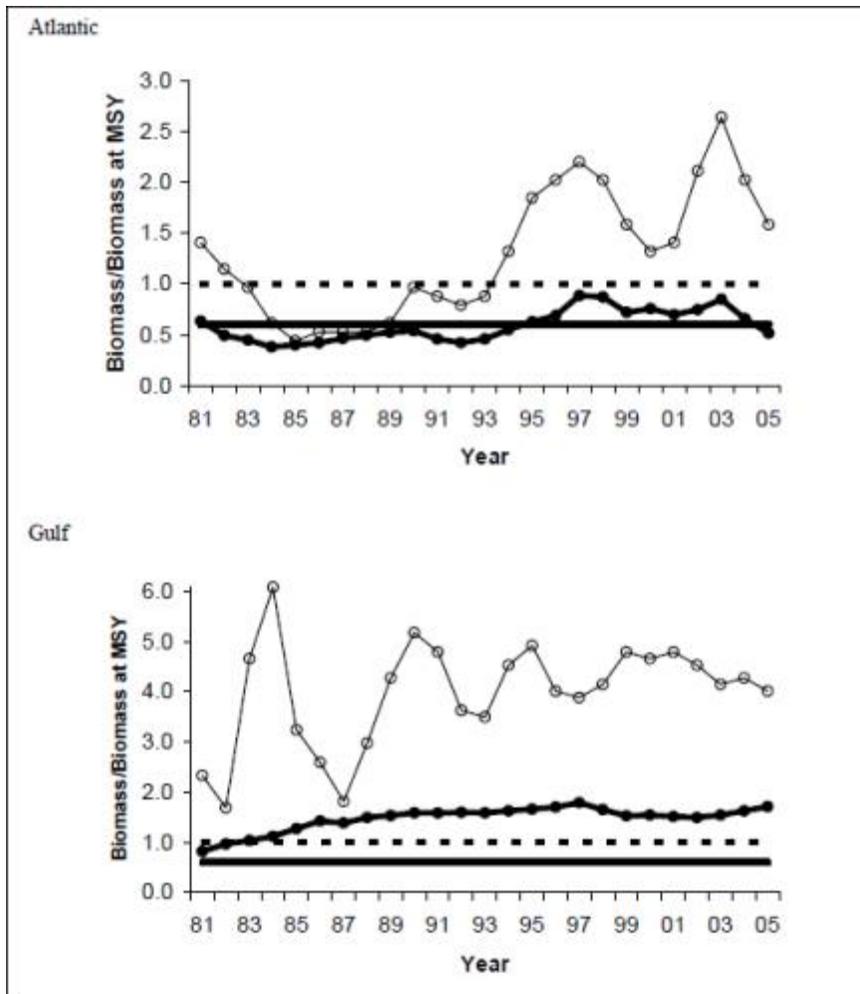


Figure 3: Estimated biomass to biomass at maximum sustainable yield (MSY) ratios for two models (filled and open circles) for the Atlantic (top) and Gulf (bottom) coasts of Florida from 1981-2005. Dashed line represents the biomass=MSY condition and the solid line represents the minimum stock size threshold. Both models indicate the Gulf coast population has been above MSY since 1981, while the models disagree about the stock status of the Atlantic coast population. (Figure from Murphy et al. 2008).

United States North Atlantic, Cast Net

United States North Atlantic, Handline

United States North Atlantic, Seine Net, Boat

3.00

Moderate Concern

The most recent stock assessment of Florida pompano on the Atlantic coast (2006) indicated that there is a great deal of uncertainty in the abundance estimates for this population. One population model

estimated abundance to be above the overfished threshold, while another model estimated abundance to be below the overfished threshold. Scientists concluded the population was likely not overfished/depleted (Murphy et al. 2008). However, due to the high uncertainty in the abundance estimates and lack of more recent abundance information, Seafood Watch considers the Atlantic coast population of Florida pompano to be of "Moderate Concern."

Factor 1.3 - Fishing Mortality

Scoring guidelines

- *5 (Very Low Concern)—Highly likely that fishing mortality is below a sustainable level (e.g., below fishing mortality at maximum sustainable yield, FMSY), OR fishery does not target species and its contribution to the mortality of species is negligible ($\leq 5\%$ of a sustainable level of fishing mortality).*
- *3.67 (Low Concern)—Probable (>50%) chance that fishing mortality is at or below a sustainable level, but some uncertainty exists, OR fishery does not target species and does not adversely affect species, but its contribution to mortality is not negligible, OR fishing mortality is unknown, but the population is healthy and the species has a low susceptibility to the fishery (low chance of being caught).*
- *2.33 (Moderate Concern)—Fishing mortality is fluctuating around sustainable levels, OR fishing mortality is unknown and species has a moderate-high susceptibility to the fishery and, if species is depleted, reasonable management is in place.*
- *1 (High Concern)—Overfishing is occurring, but management is in place to curtail overfishing, OR fishing mortality is unknown, species is depleted, and no management is in place.*
- *0 (Critical)—Overfishing is known to be occurring and no reasonable management is in place to curtail overfishing.*

United States Gulf of Mexico, Cast Net

United States Gulf of Mexico, Gillnet, Drift

United States Gulf of Mexico, Handline

United States Gulf of Mexico, Seine Net, Boat

3.67

Low Concern

As with the stock status, there are differences in estimated fishing mortality between the two coasts of Florida. On the Gulf coast, annual estimates of fishing mortality on Florida pompano have been lower than the estimated maximum fishing mortality threshold (MFMT) since 1981, indicating that fishing mortality is sustainable (Murphy et al. 2008). There is some indication that Florida pompano on the Gulf coast are experiencing reduced fishing mortality in recent years because their population has moved

farther inshore, which places them in state waters, where it is illegal to use gill nets, the allowable fishing gear with the highest yield (R. Muller, pers. comm.). Seafood Watch ranks this population as "Low Concern" rather than "Very Low Concern" because the assessment has not been updated recently.

Rationale:

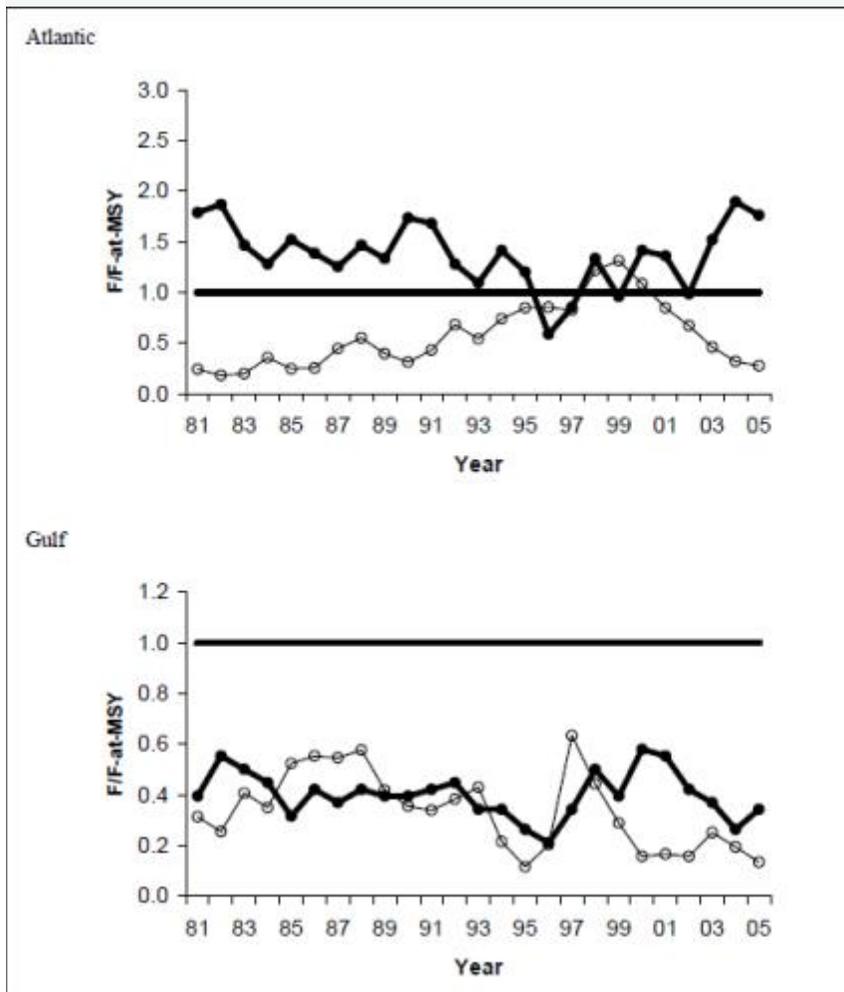


Figure 4: Estimated fishing mortality to fishing mortality at maximum sustainable yield (MSY) ratios for two models (filled and open circles) for the Atlantic (top) and Gulf (bottom) coasts of Florida from 1981-2005. The solid line represents the fishing mortality=fishing mortality at MSY condition. Both models indicate that fishing mortality of the Gulf coast population has been well below MSY since 1981, while the models are in disagreement about the fishing mortality of the Atlantic coast population. (Figure from Murphy et al. 2008).

United States North Atlantic, Handline**United States North Atlantic, Seine Net, Boat****2.33****Moderate Concern**

As with the stock status, there are differences in estimated fishing mortality between the two coasts of Florida. On the Atlantic coast, the models disagree and one shows estimated fishing mortality above the maximum fishing mortality threshold (MFMT), which would suggest overfishing is occurring), while the other shows it mostly below the MFMT, indicating fishing levels are sustainable (Murphy et al. 2008). Additionally, recreational catch rates have increased in recent years on the Atlantic coast (R. Muller, pers. comm.). Due to this uncertainty in the impact of fishing mortality on the Atlantic coast population, Seafood Watch ranks it as "Moderate Concern."

Criterion 2: Impacts on Other Species

All main retained and bycatch species in the fishery are evaluated in the same way as the species under assessment were evaluated in Criterion 1. Seafood Watch® defines bycatch as all fisheries-related mortality or injury to species other than the retained catch. Examples include discards, endangered or threatened species catch, and ghost fishing.

To determine the final Criterion 2 score, the score for the lowest scoring retained/bycatch species is multiplied by the discard rate score (ranges from 0-1), which evaluates the amount of non-retained catch (discards) and bait use relative to the retained catch. The Criterion 2 rating is determined as follows:

- Subscore >3.2=Green or Low Concern
- Subscore >2.2 and <=3.2=Yellow or Moderate Concern
- Subscore <=2.2=Red or High Concern

Rating is Critical if Factor 2.3 (Fishing Mortality) is Critical.

Criterion 2 Summary

Only the lowest scoring main species is/are listed in the table and text in this Criterion 2 section; a full list and assessment of the main species can be found in Appendix B.

Florida pompano: United States Gulf of Mexico, Cast Net				
Subscore::	5.000	Discard Rate:	1.00	C2 Rate: 5.000
Species	Inherent Vulnerability	Stock Status	Fishing Mortality	Subscore
FLORIDA POMPANO	2.00: Medium	4.00: Low Concern	3.67: Low Concern	3.831

Florida pompano: United States Gulf of Mexico, Gillnet, Drift				
Subscore::	5.000	Discard Rate:	1.00	C2 Rate: 5.000
Species	Inherent Vulnerability	Stock Status	Fishing Mortality	Subscore
FLORIDA POMPANO	2.00: Medium	4.00: Low Concern	3.67: Low Concern	3.831

Florida pompano: United States Gulf of Mexico, Handline

Subscore:: **5.000** Discard Rate: **1.00** C2 Rate: **5.000**

Species	Inherent Vulnerability	Stock Status	Fishing Mortality	Subscore
FLORIDA POMPANO	2.00: Medium	4.00: Low Concern	3.67: Low Concern	3.831

Florida pompano: United States Gulf of Mexico, Seine Net, Boat

Subscore:: **5.000** Discard Rate: **1.00** C2 Rate: **5.000**

Species	Inherent Vulnerability	Stock Status	Fishing Mortality	Subscore
FLORIDA POMPANO	2.00: Medium	4.00: Low Concern	3.67: Low Concern	3.831

Florida pompano: United States North Atlantic, Cast Net

Subscore:: **5.000** Discard Rate: **1.00** C2 Rate: **5.000**

Species	Inherent Vulnerability	Stock Status	Fishing Mortality	Subscore
FLORIDA POMPANO	2.00: Medium	3.00: Moderate Concern	2.33: Moderate Concern	2.644

Florida pompano: United States North Atlantic, Handline

Subscore:: **5.000** Discard Rate: **1.00** C2 Rate: **5.000**

Species	Inherent Vulnerability	Stock Status	Fishing Mortality	Subscore
FLORIDA POMPANO	2.00: Medium	3.00: Moderate Concern	2.33: Moderate Concern	2.644

Florida pompano: United States North Atlantic, Seine Net, Boat

Subscore:: **5.000** Discard Rate: **1.00** C2 Rate: **5.000**

Species	Inherent Vulnerability	Stock Status	Fishing Mortality	Subscore
FLORIDA POMPANO	2.00: Medium	3.00: Moderate Concern	2.33: Moderate Concern	2.644

Bycatch in the Florida pompano fishery is negligible for all allowable gears, and there are no other retained species besides pompano, thus no species are assessed in Criterion 2. Hook and line and cast nets are fishing gears that usually have very low bycatch, and the pompano fishery is no exception. Beach seines and haul seines also have very low bycatch in the pompano fishery. Gill nets in many fisheries have very high bycatch rates, but fishermen in the Florida pompano fishery use these gill and entangling nets in a fairly unique way that results in almost no bycatch. Fishermen use the nets in a manner similar to a purse seine, where they find a school of pompano, set the gill net on one side of it, then move the boat to the other side of the school and make noise to scare the fish into the net, or they encircle the school (R. Muller, pers. comm.). They then immediately haul the net, resulting in a very short and targeted soak time, and thus almost no bycatch. Because all of the allowable gears for fishing Florida pompano have negligible bycatch, Seafood Watch deems this fishery to have insignificant bycatch.

Criterion 2 Assessment

2.4 - Discard + Bait/Landings

United States/Gulf of Mexico, Cast Net

United States/Gulf of Mexico, Gillnet, Drift

United States/Gulf of Mexico, Handline

United States/Gulf of Mexico, Seine Net, Boat

United States/North Atlantic, Cast Net

United States/North Atlantic, Handline

United States/North Atlantic, Seine Net, Boat

1.00

< 20%

The Florida pompano fishery uses highly targeted techniques for all gear types, which results in very low bycatch (R. Muller, pers. comm.). The majority of bycatch consists of undersized Florida pompano, which are returned to the water alive and are expected to survive (R. Muller, pers. comm.). Therefore, the fishery has a discards/landings ratio of less than 20%.

Criterion 3: Management Effectiveness

Management is separated into management of retained species (harvest strategy) and management of non-retained species (bycatch strategy).

The final score for this criterion is the geometric mean of the two scores. The Criterion 3 rating is determined as follows:

- Score > 3.2 = Green or Low Concern;
- Score > 2.2 and ≤ 3.2 = Yellow or Moderate Concern;
- Score ≤ 2.2 or either the Harvest Strategy (Factor 3.1) or Bycatch Management Strategy (Factor 3.2) is Very High Concern = Red or High Concern.

Rating is Critical if either or both of Harvest Strategy (Factor 3.1) and Bycatch Management Strategy (Factor 3.2) ratings are Critical.

Criterion 3 Summary

Region / Method	Management of Retained Species	Management of Non-Retained Species	Overall Recommendation
United States Gulf of Mexico Cast Net	3.000	All Species Retained	Yellow(3.000)
United States Gulf of Mexico Gillnet, Drift	3.000	All Species Retained	Yellow(3.000)
United States Gulf of Mexico Handline	3.000	All Species Retained	Yellow(3.000)
United States Gulf of Mexico Seine Net, Boat	3.000	All Species Retained	Yellow(3.000)
United States North Atlantic Cast Net	3.000	All Species Retained	Yellow(3.000)
United States North Atlantic Handline	3.000	All Species Retained	Yellow(3.000)
United States North Atlantic Seine Net, Boat	3.000	All Species Retained	Yellow(3.000)

The Florida pompano fishery is a fairly well-managed fishery. There are bag limits, size limits, and gear restrictions in place to regulate the catch of Florida pompano in Florida state waters and adjacent

federal waters. There is limited detailed scientific information on the status of Florida pompano stocks, which creates uncertainty in the effectiveness of current fishery regulations. This level of uncertainty results in an overall ranking of 'Moderately Effective' for the fishery management. Because all of the allowable gears for fishing Florida pompano have negligible bycatch, Seafood watch deems this fishery to have insignificant bycatch, and thus does not score the fishery for effectiveness of bycatch management.

Factor 3.1: Harvest Strategy

Scoring Guidelines

Seven subfactors are evaluated: Management Strategy, Recovery of Species of Concern, Scientific Research/Monitoring, Following of Scientific Advice, Enforcement of Regulations, Management Track Record, and Inclusion of Stakeholders. Each is rated as 'ineffective,' 'moderately effective,' or 'highly effective.'

- 5 (Very Low Concern)—Rated as 'highly effective' for all seven subfactors considered.
- 4 (Low Concern)—Management Strategy and Recovery of Species of Concern rated 'highly effective' and all other subfactors rated at least 'moderately effective.'
- 3 (Moderate Concern)—All subfactors rated at least 'moderately effective.'
- 2 (High Concern)—At minimum, meets standards for 'moderately effective' for Management Strategy and Recovery of Species of Concern, but at least one other subfactor rated 'ineffective.'
- 1 (Very High Concern)—Management exists, but Management Strategy and/or Recovery of Species of Concern rated 'ineffective.'
- 0 (Critical)—No management exists when there is a clear need for management (i.e., fishery catches threatened, endangered, or high concern species), OR there is a high level of Illegal, unregulated, and unreported fishing occurring.

Factor 3.1 Summary

Factor 3.1: Management of fishing impacts on retained species							
Region / Method	Strategy	Recovery	Research	Advice	Enforce	Track	Inclusion
United States Gulf of Mexico Cast Net	Moderately Effective	N/A	Moderately Effective	Moderately Effective	Moderately Effective	Moderately Effective	Highly Effective
United States Gulf of Mexico Gillnet, Drift	Moderately Effective	N/A	Moderately Effective	Moderately Effective	Moderately Effective	Moderately Effective	Highly Effective
United States Gulf of Mexico Handline	Moderately Effective	N/A	Moderately Effective	Moderately Effective	Moderately Effective	Moderately Effective	Highly Effective
United States Gulf of Mexico	Moderately Effective	N/A	Moderately Effective	Moderately Effective	Moderately Effective	Moderately Effective	Highly Effective

Seine Net, Boat							
United States North Atlantic Cast Net	Moderately Effective	N/A	Moderately Effective	Moderately Effective	Moderately Effective	Moderately Effective	Highly Effective
United States North Atlantic Handline	Moderately Effective	N/A	Moderately Effective	Moderately Effective	Moderately Effective	Moderately Effective	Highly Effective
United States North Atlantic Seine Net, Boat	Moderately Effective	N/A	Moderately Effective	Moderately Effective	Moderately Effective	Moderately Effective	Highly Effective

Factor 3.1 Assessment

Subfactor 3.1.1 – Management Strategy and Implementation

Considerations: What type of management measures are in place? Are there appropriate management goals, and is there evidence that management goals are being met? To achieve a highly effective rating, there must be appropriate management goals, and evidence that the measures in place have been successful at maintaining/rebuilding species.

United States Gulf of Mexico, Cast Net

United States Gulf of Mexico, Gillnet, Drift

United States Gulf of Mexico, Handline

United States Gulf of Mexico, Seine Net, Boat

United States North Atlantic, Cast Net

United States North Atlantic, Handline

United States North Atlantic, Seine Net, Boat

2.00

Moderately Effective

Florida pompano are managed by the Florida Fish and Wildlife Conservation Commission (FFWCC), and their take has been regulated by the state since 1989 (FFWCC 2013). The FFWCC manages Florida pompano both in state waters and in adjacent federal waters where take of the species is allowed. Legal gears for Florida pompano include hook and line, cast net, beach or haul seine in state and federal waters, and gill or entangling nets in federal waters off southwest Florida (FFWCC 2012). Only pompano between 11" and 20" fork length (length from nose to where the tail forks) may be harvested (FFWCC 2012). Commercial fishermen with a saltwater products license and a restricted species endorsement may take up to 250 pompano per trip. They may take an unlimited amount if they have a pompano endorsement and are targeting pompano using gill nets (FFWCC 2012). Fishermen are only allowed to target pompano with gill nets in a special pompano endorsement zone (PEZ) in federal waters.

Fishermen targeting other species with gillnets in federal waters outside of the PEZ may land 100 Florida pompano as incidental bycatch. Additionally, vessels using gill nets in federal waters must transit state waters without stopping, and there are restrictions on the mesh size and overall size of allowable gill nets (FFWCC 2012). Without a current stock assessment (the latest assessment was completed in 2008), it is difficult to determine how successful the current Florida pompano management strategy is at achieving its goals. In 2011, the FFWCC commissioned a report investigating the potential effect of increasing the minimum allowable size for Florida pompano (FWRI 2011). The report shows that increasing the minimum size would likely increase Florida pompano biomass and help buffer against unforeseen changes in stock status (FWRI 2011). The FFWCC has proposed changing the size limit. Due to the uncertainty of whether or not the current management strategy is meeting its goals, Seafood Watch deems the management strategy and implementation to be ‘moderately effective.’

Subfactor 3.1.2 – Recovery of Species of Concern

Considerations: When needed, are recovery strategies/management measures in place to rebuild overfished/threatened/ endangered species or to limit fishery’s impact on these species and what is their likelihood of success? To achieve a rating of Highly Effective, rebuilding strategies that have a high likelihood of success in an appropriate timeframe must be in place when needed, as well as measures to minimize mortality for any overfished/threatened/endangered species.

United States Gulf of Mexico, Cast Net

United States Gulf of Mexico, Gillnet, Drift

United States Gulf of Mexico, Handline

United States Gulf of Mexico, Seine Net, Boat

United States North Atlantic, Cast Net

United States North Atlantic, Handline

United States North Atlantic, Seine Net, Boat

-1.00

N/A

The pompano fishery does not negatively impact any species or stocks of concern. Though gill nets can have negative impacts on species of concern in some other fisheries, pompano fishermen use gill nets differently, using them to directly target pompano schools and quickly hauling them in (R. Muller, pers. comm.). Therefore, they do not result in the high bycatch that gill nets can accumulate in other fisheries during long soak times or indiscriminate setting.

Subfactor 3.1.3 – Scientific Research and Monitoring

Considerations: How much and what types of data are collected to evaluate the health of the population and the fishery's impact on the species? To achieve a Highly Effective rating, population assessments must be conducted regularly and they must be robust enough to reliably determine the population status.

United States Gulf of Mexico, Cast Net

United States Gulf of Mexico, Gillnet, Drift

United States Gulf of Mexico, Handline

United States Gulf of Mexico, Seine Net, Boat

United States North Atlantic, Cast Net

United States North Atlantic, Handline

United States North Atlantic, Seine Net, Boat

2.00

Moderately Effective

Florida's Fish and Wildlife Research Institute (FWRI) conducts scientific monitoring of Florida's fish populations for the FFWCC. The latest full stock assessment for Florida pompano stocks was completed with data through 2005 (Murphy et al. 2008), though an updated assessment was done in 2011 to investigate whether a change in management regulations was needed. This assessment included data from 2006-2009 (FWRI 2011) and provided some information on stock status. Most other fishery-independent monitoring of Florida pompano is to compile young-of-the-year indices of relative abundance (K. Guindon, pers. comm.). Due to the lack of regular stock assessments, Seafood Watch deems scientific research and monitoring for this fishery to be 'Moderately Effective.'

Subfactor 3.1.4 – Management Record of Following Scientific Advice

Considerations: How often (always, sometimes, rarely) do managers of the fishery follow scientific recommendations/advice (e.g. do they set catch limits at recommended levels)? A Highly Effective rating is given if managers nearly always follow scientific advice.

United States Gulf of Mexico, Cast Net

United States Gulf of Mexico, Gillnet, Drift

United States Gulf of Mexico, Handline

United States Gulf of Mexico, Seine Net, Boat

United States North Atlantic, Cast Net

United States North Atlantic, Handline**United States North Atlantic, Seine Net, Boat****2.00****Moderately Effective**

Management has a fairly good history of following scientific advice and implementing recommended changes to fishery regulations, such as ending gillnetting in state waters and increasing the minimum allowable size from ten inches to eleven inches (Muller et al. 2008; FWRI 2011). However, a recently commissioned report found that raising the minimum allowable size limit to twelve inches would increase biomass/abundance of both the Gulf and Atlantic coast Florida pompano populations, yet managers have not increased the size limit (FWRI 2011). Therefore, Seafood Watch deems scientific advice for the Florida pompano fishery to be 'Moderately Effective.'

Subfactor 3.1.5 – Enforcement of Management Regulations

Considerations: Do fishermen comply with regulations, and how is this monitored? To achieve a Highly Effective rating, there must be regular enforcement of regulations and verification of compliance.

United States Gulf of Mexico, Cast Net**United States Gulf of Mexico, Gillnet, Drift****United States Gulf of Mexico, Handline****United States Gulf of Mexico, Seine Net, Boat****United States North Atlantic, Cast Net****United States North Atlantic, Handline****United States North Atlantic, Seine Net, Boat****2.00****Moderately Effective**

The FFWCC operates a division of law enforcement that enforces regulations and includes both uniformed and plainclothes investigators (FFWCC 2013b). There is no onboard observer system for the Florida pompano commercial fishery, and most enforcement of regulations occurs at the dock (R. Muller, pers. comm.). Because enforcement and monitoring are in place but their effectiveness is uncertain, Seafood Watch deems the enforcement to be 'Moderately Effective.'

Subfactor 3.1.6 – Management Track Record

Considerations: Does management have a history of successfully maintaining populations at sustainable levels or a history of failing to maintain populations at sustainable levels? A Highly Effective rating is given if measures enacted by management have been shown to result in the long-term maintenance of species overtime.

United States Gulf of Mexico, Cast Net

United States Gulf of Mexico, Gillnet, Drift

United States Gulf of Mexico, Handline

United States Gulf of Mexico, Seine Net, Boat

United States North Atlantic, Cast Net

United States North Atlantic, Handline

United States North Atlantic, Seine Net, Boat

2.00

Moderately Effective

The most recent stock assessment showed that management practices have resulted in the maintenance of biomass in the Gulf coast Florida pompano population, but the status of the Atlantic coast population is uncertain and a recent assessment has not been conducted (Murphy et al. 2008). Given this uncertainty around whether or not management practices have resulted in the maintenance of both Florida pompano populations, Seafood Watch rates the fishery's track record as 'Moderately Effective.'

Subfactor 3.1.7 – Stakeholder Inclusion

Considerations: Are stakeholders involved/included in the decision-making process? Stakeholders are individuals/groups/organizations that have an interest in the fishery or that may be affected by the management of the fishery (e.g., fishermen, conservation groups, etc.). A Highly Effective rating is given if the management process is transparent and includes stakeholder input.

United States Gulf of Mexico, Cast Net

United States Gulf of Mexico, Gillnet, Drift

United States Gulf of Mexico, Handline

United States Gulf of Mexico, Seine Net, Boat

United States North Atlantic, Cast Net

United States North Atlantic, Handline

United States North Atlantic, Seine Net, Boat

3.00 **Highly Effective**

The FFWCC has an excellent record of stakeholder inclusion, with public meetings held throughout the state and posted to their website (FFWCC 2012).

Factor 3.2: Bycatch Management Strategy

Scoring Guidelines

Four subfactors are evaluated: Management Strategy, Scientific Research/Monitoring, Following of Scientific Advice, and Enforcement of Regulations. Each is rated as 'ineffective,' 'moderately effective,' or 'highly effective.' Unless reason exists to rank Scientific Research/Monitoring, Following Scientific Advice, and Enforcement of Regulations differently, these ranks are the same as in 3.1.

- 5 (Very Low Concern)—Rated as 'highly effective' for all four subfactors considered.
- 4 (Low Concern)—Management Strategy rated 'highly effective' and all other subfactors rated at least 'moderately effective.'
- 3 (Moderate Concern)—All subfactors rate at least 'moderately effective.'
- 2 (High Concern) — meets standards for 'moderately effective' for Management Strategy but some other factors rated 'ineffective.'
- 1 (Very High Concern)—Management exists, but Management Strategy is rated 'ineffective.'
- 0 (Critical)—No bycatch management exists even when overfished, depleted, endangered or threatened species are known to be regular components of bycatch and are substantially impacted by the fishery.

Criterion 3.2 Summary

Factor 3.2: Management of fishing impacts on bycatch species						
Region / Method	All Kept?	Strategy	Research	Advice	Enforce	
United States Gulf of Mexico Cast Net	Yes					
United States Gulf of Mexico Gillnet, Drift	Yes					
United States Gulf of Mexico Handline	Yes					
United States Gulf of Mexico Seine Net, Boat	Yes					
United States North Atlantic Cast Net	Yes					
United States North Atlantic	Yes					

Handline					
United States North Atlantic Seine Net, Boat	Yes				

3.2.0 - All Species Retained?

United States Gulf of Mexico, Cast Net

United States Gulf of Mexico, Gillnet, Drift

United States Gulf of Mexico, Handline

United States Gulf of Mexico, Seine Net, Boat

United States North Atlantic, Cast Net

1.00 **Yes**

United States North Atlantic, Handline

1.00 **Yes**

United States North Atlantic, Seine Net, Boat

1.00 **Yes**

Criterion 4: Impacts on the Habitat and Ecosystem

This Criterion assesses the impact of the fishery on seafloor habitats, and increases that base score if there are measures in place to mitigate any impacts. The fishery's overall impact on the ecosystem and food web and the use of ecosystem-based fisheries management (EBFM) principles is also evaluated. Ecosystem Based Fisheries Management aims to consider the interconnections among species and all natural and human stressors on the environment.

The final score is the geometric mean of the impact of fishing gear on habitat score (plus the mitigation of gear impacts score) and the Ecosystem Based Fishery Management score. The Criterion 2 rating is determined as follows:

- Score >3.2=Green or Low Concern
- Score >2.2 and <=3.2=Yellow or Moderate Concern
- Score <=2.2=Red or High Concern

Rating cannot be Critical for Criterion 4.

Criterion 4 Summary

Region / Method	Gear Type and Substrate	Mitigation of Gear Impacts	EBFM	Overall Recomm.
United States Gulf of Mexico Cast Net	3.00:Low Concern	0.00:No Effective Mitigation	3.00:Moderate Concern	Yellow (3.000)
United States Gulf of Mexico Gillnet, Drift	3.00:Low Concern	1.00:Strong Mitigation	3.00:Moderate Concern	Green (3.464)
United States Gulf of Mexico Handline	5.00:None	0.00:No Effective Mitigation	3.00:Moderate Concern	Green (3.873)
United States Gulf of Mexico Seine Net, Boat	3.00:Low Concern	0.00:No Effective Mitigation	3.00:Moderate Concern	Yellow (3.000)
United States North Atlantic Cast Net	3.00:Low Concern	0.00:No Effective Mitigation	3.00:Moderate Concern	Yellow (3.000)
United States North Atlantic Handline	5.00:None	0.00:No Effective Mitigation	3.00:Moderate Concern	Green (3.873)
United States North Atlantic Seine Net, Boat	3.00:Low Concern	0.00:No Effective Mitigation	3.00:Moderate Concern	Yellow (3.000)

Criterion 4 Assessment

Factor 4.1 – Impact of Fishing Gear on the Habitat/Substrate

Scoring Guidelines

- 5 (None)—Fishing gear does not contact the bottom
- 4 (Very Low)—Vertical line gear
- 3 (Low)—Gears that contacts the bottom, but is not dragged along the bottom (e.g. gillnet, bottom longline, trap) and is not fished on sensitive habitats. Bottom seine on resilient mud/sand habitats. Midwater trawl that is known to contact bottom occasionally (<25% of the time) or purse seine known to commonly contact bottom.
- 2 (Moderate)—Bottom dragging gears (dredge, trawl) fished on resilient mud/sand habitats. Gillnet, trap, or bottom longline fished on sensitive boulder or coral reef habitat. Bottom seine except on mud/sand
- 1 (High)—Hydraulic clam dredge. Dredge or trawl gear fished on moderately sensitive habitats (e.g., cobble or boulder)
- 0 (Very High)—Dredge or trawl fished on biogenic habitat, (e.g., deep-sea corals, eelgrass and maerl)

Note: When multiple habitat types are commonly encountered, and/or the habitat classification is uncertain, the score will be based on the most sensitive, plausible habitat type.

United States Gulf of Mexico, Cast Net

United States North Atlantic, Cast Net

3.00 **Low Concern**

Cast nets used in the Florida pompano fishery use heavy weights to cause the net to sink quickly to trap the fish, so they contact the substrate. However, they are used in a dynamic sandy habitat, so they are ranked as "low concern" (SFW Criteria Document 2013).

United States Gulf of Mexico, Gillnet, Drift

3.00 **Low Concern**

Gillnetting for pompano takes place over sandy substrates and only rarely touches the bottom, so this gear is ranked as "low concern" (SFW Criteria Document 2013).

United States Gulf of Mexico, Handline

United States North Atlantic, Handline

5.00 **None**

Handlines in the pompano fishery do not generally contact the bottom, so they are ranked as "no concern" (SFW Criteria Document 2013).

United States Gulf of Mexico, Seine Net, Boat

United States North Atlantic, Seine Net, Boat

3.00

Low Concern

Seines can contact the substrate, but their impact is limited due to the sandy, dynamic habitat in which they are used, so they are ranked as "low concern" (SFW Criteria Document 2013).

Factor 4.2 – Mitigation of Gear Impacts

Scoring Guidelines

- *+1 (Strong Mitigation)—Examples include large proportion of habitat protected from fishing (>50%) with gear, fishing intensity low/limited, gear specifically modified to reduce damage to seafloor and modifications shown to be effective at reducing damage, or an effective combination of 'moderate' mitigation measures.*
- *+0.5 (Moderate Mitigation)—20% of habitat protected from fishing with gear or other measures in place to limit fishing effort, fishing intensity, and spatial footprint of damage caused from fishing.*
- *+0.25 (Low Mitigation)—A few measures are in place (e.g., vulnerable habitats protected but other habitats not protected); there are some limits on fishing effort/intensity, but not actively being reduced.*
- *0 (No Mitigation)—No effective measures are in place to limit gear impacts on habitats.*

United States Gulf of Mexico, Gillnet, Drift

1.00

Strong Mitigation

Commercial fishermen with the proper license and endorsements can take an unlimited number of Florida pompano (FFWCC 2012). However, gill netting can only take place in a limited pompano endorsement zone, which is less than 50% of the representative habitat (FFWCC 2012). Therefore, Seafood Watch deems the Florida pompano gillnet fishery to have strong mitigation of gear impacts (SFW Criteria Document 2013).

United States Gulf of Mexico, Cast Net

United States Gulf of Mexico, Handline

United States Gulf of Mexico, Seine Net, Boat

United States North Atlantic, Cast Net

United States North Atlantic, Handline

United States North Atlantic, Seine Net, Boat

0.00

No Effective Mitigation

There are no temporal closures in the Florida pompano fishery, and there are no spatial closures for gears other than gill nets (FFWCC 2012). Therefore, Seafood Watch deems the Florida pompano fishery to have no effective mitigation of gear impacts for this gear, though it should be mentioned this gear has limited impacts on the substrate.

Factor 4.3 – Ecosystem-Based Fisheries Management

Scoring Guidelines

- *5 (Very Low Concern)—Substantial efforts have been made to protect species’ ecological roles and ensure fishing practices do not have negative ecological effects (e.g., large proportion of fishery area is protected with marine reserves, and abundance is maintained at sufficient levels to provide food to predators).*
- *4 (Low Concern)—Studies are underway to assess the ecological role of species and measures are in place to protect the ecological role of any species that plays an exceptionally large role in the ecosystem. Measures are in place to minimize potentially negative ecological effect if hatchery supplementation or fish aggregating devices (FADs) are used.*
- *3 (Moderate Concern)—Fishery does not catch species that play an exceptionally large role in the ecosystem, or if it does, studies are underway to determine how to protect the ecological role of these species, OR negative ecological effects from hatchery supplementation or FADs are possible and management is not place to mitigate these impacts.*
- *2 (High Concern)—Fishery catches species that play an exceptionally large role in the ecosystem and no efforts are being made to incorporate their ecological role into management.*
- *1 (Very High Concern)—Use of hatchery supplementation or fish aggregating devices (FADs) in the fishery is having serious negative ecological or genetic consequences, OR fishery has resulted in trophic cascades or other detrimental impacts to the food web.*

United States Gulf of Mexico, Cast Net

United States Gulf of Mexico, Gillnet, Drift

United States Gulf of Mexico, Handline

United States Gulf of Mexico, Seine Net, Boat

United States North Atlantic, Cast Net

United States North Atlantic, Handline

United States North Atlantic, Seine Net, Boat

3.00

Moderate Concern

The fishery does not catch any species of exceptional ecological importance. However, scientific assessment and management of the fishery's impact on the ecosystem is not yet underway. Therefore, this factor is rated a moderate concern.

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Scientific review does not constitute an endorsement of the Seafood Watch® program, or its seafood recommendations, on the part of the reviewing scientists. Seafood Watch® is solely responsible for the conclusions reached in this report.

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References

FFWCC. 2013. Florida Fish and Wildlife Conservation Commission. 2013. Rulemaking. Available at: <http://myfwc.com/fishing/saltwater/rulemaking/>.

FFWCC. 2013. Florida Fish and Wildlife Conservation Commission. 2013b. Law Enforcement. Available at: <http://myfwc.com/about/inside-fwc/le/>.

FFWCC. 2012. Florida Fish and Wildlife Conservation Commission. 2012. Pompano endorsement regulations. Rule 68B-35.005. Available at: <https://www.flrules.org/gateway/RuleNo.asp?title=POMPANO, AFRICAN POMPANO, AND PERMITID=68B-35.005>.

FFWCC. 2010. Florida Fish and Wildlife Conservation Commission. 2010. Florida pompano, *Trachinotus carolinus* (Linnaeus, 1766).

FWRI. 2011. Fish and Wildlife Research Institute. 2011. Evaluation of a 12-inch minimum size limit on the Florida pompano populations and fisheries in Florida. Florida Fish and Wildlife Conservation Commission.

Guindon, K. Y., C. Powell, and L. R. Barbieri. 2014. Guindon, K. Y., C. Powell, and L. R. Barbieri. Size, age structure, growth and mortality of Florida pompano in the Tampa Bay area, Florida, USA with notes on reproductive biology. In prep for Transactions of the American Fisheries Society.

J. M. D. de Astarloa, D. E. Figueroa, M. B. Cousseau, and M. Barragan. 2000. de Astarloa, J. M. D., D. E. Figueroa, M. B. Cousseau, and M. Barragan. 2000. Occurrence of *Trachinotus carolinus* (Carangidae) in Laguna Costera Mar Chiguita, with comments on other occasionally recorded fishes in Argentinean waters. *Bulletin of Marine Science* 66 (2): 399-403.

Murphy et al.. 2008. Murphy, M. D., R. G. Muller, and K. Guindon. 2008. A stock assessment for pompano, *Trachinotus carolinus*, in Florida waters through 2005. FWRI In House Report 2008-004. 118 pp.