



Status of Stocks 2022 Annual Report to Congress on the Status of U.S. Fisheries

APRIL 2023



NOAA
FISHERIES

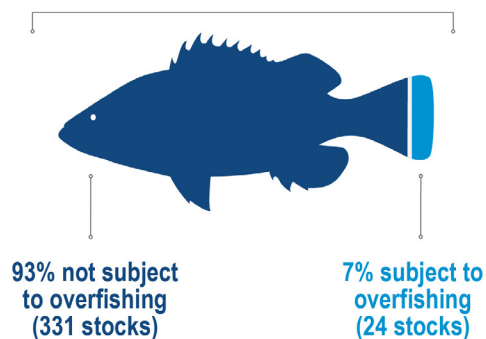
Status of Stocks 2022

The National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service (NMFS) is pleased to present the 2022 Report to Congress on the Status of U.S. Fisheries. This report highlights the achievements of NMFS, the eight Regional Fishery Management Councils (Councils), and our other partners. In 2022, the number of stocks on the overfishing list decreased slightly, the number of overfished stocks also slightly decreased, and two stocks were rebuilt. We continue to implement management measures that will end overfishing, rebuild overfished stocks, and sustain our fisheries for future generations. Sound science, an increasing focus on climate-informed management, effective enforcement, meaningful partnerships, and public engagement drive our success in managing the most sustainable fisheries in the world.

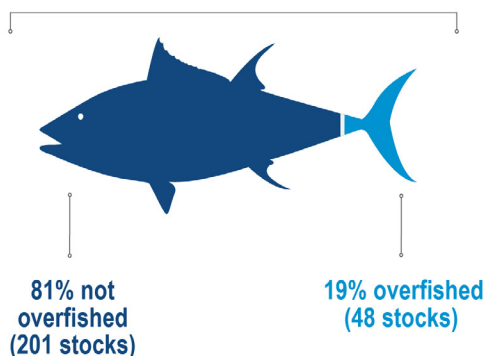
Benefits of Sustainable Fisheries Management

Sustainable fisheries support thriving fishing communities, healthy marine ecosystems, and a strong economy. Commercial, recreational, subsistence, and ceremonial fishing provide a valuable food source, important outdoor activities, and cultural significance for the nation. U.S. commercial and recreational fishing provided 1.7 million jobs and \$253 billion in sales across the broader economy in 2020.

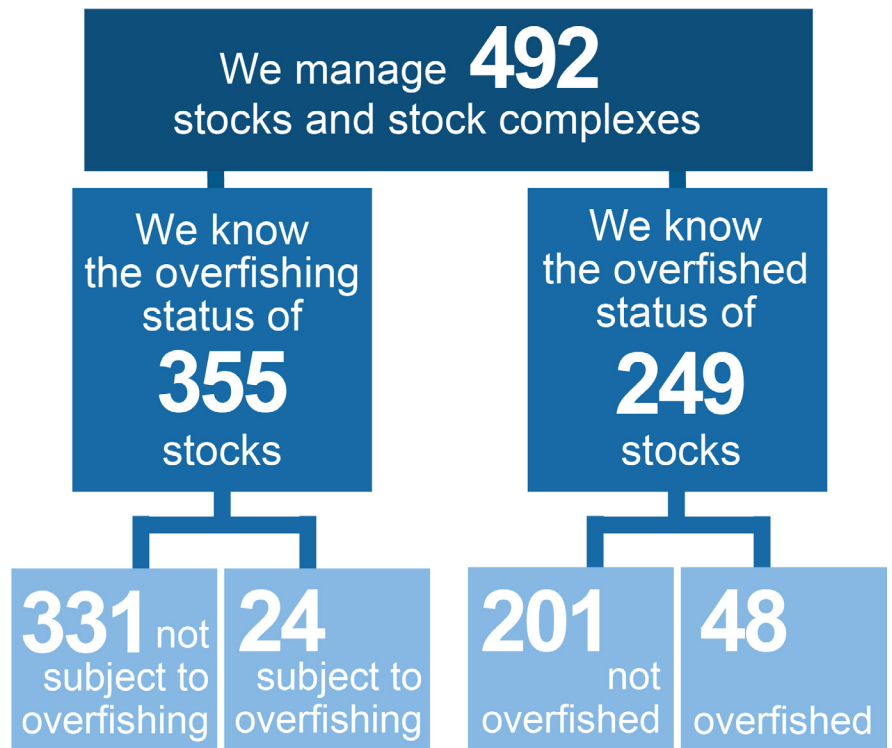
355 Stocks with Known Overfishing Status



249 Stocks with Known Overfished Status



STOCK STATUS BREAKDOWN



The Year in Review

NMFS manages 492 stocks or stock complexes in 45 fishery management plans. At the end of 2022, the overfishing list included 24 stocks, the overfished list included 48 stocks, and two stocks were rebuilt. One of those stocks is considered rebuilt based on changes to its reference points. Since 2000, 49 stocks have been rebuilt.

We determine the status of fish stocks and stock complexes through stock assessments and by comparing catch data to an overfishing reference level. Of the 492 stocks and stock complexes, 355 have a known overfishing status (331 not subject to overfishing and 24 subject to overfishing) and 249 have a known overfished status (201 not overfished and 48 overfished). Of the stocks most targeted by fishermen, 88 percent have a known overfishing or overfished status. These stocks are contained in the [Fish Stock Sustainability Index](#).

A significant achievement this year includes implementing island-based fishery management plans for Puerto Rico, St. Thomas and St. John, and St. Croix. This action consolidated four existing Caribbean fishery management plans into three island-based plans and added 32 stocks and stock complexes to our list of managed stocks. The island-based fishery management plans account for the differences between fishing sectors, available markets for harvested products, fishermen and their fishing communities, and the social and cultural attributes unique to each island area.

2021	*2022
26 (8%) on overfishing list	24 (7%) on overfishing list
51 (20%) on overfished list	48 (19%) on overfished list
47 stocks on rebuilt list	49 stocks on rebuilt list

**The number of managed stocks increased to 492 stocks/stock complexes in 2022 from 460 stocks/stock complexes in 2021. This increase in total number of stocks is partly responsible for the percentage decreases in 2022.*

Summary of 2022 Changes

2022 OVERFISHING LIST	
Removed	Added
Red porgy - Southern Atlantic Coast	Haddock – Gulf of Maine
Lane snapper - Gulf of Mexico	Cubera snapper - Gulf of Mexico
Bigeye tuna – Atlantic	Gulf of Mexico Mid-Water Snapper Complex
*Yellowtail flounder - Georges Bank	
Pacific bluefin tuna	
2022 OVERFISHED LIST	
Removed	Added
White hake - Gulf of Maine/Georges Bank	None
Winter flounder – Georges Bank	
Winter flounder - Southern New England/ Mid-Atlantic	
Rebuilt	
**Winter flounder - Southern New England/Mid-Atlantic	
Yellowtail flounder - Cape Cod/Gulf of Maine	

**Overfishing status changed to unknown because the 2013 stock assessment is too outdated to support a continued overfishing status determination. Catch limits remain in place.*

*** The target population level for this stock was reduced based on updated scientific information and stock abundance is above the new target.*

Ending Overfishing under Effective Laws

The Magnuson-Stevens Fishery Conservation and Management Act (MSA) is the primary law that governs marine fisheries management in federal waters, and under this law the United States is an international leader in fisheries management. In 2022, 90 percent of all stocks or complexes did not exceed their annual catch limits. When catch limit overages occur, NMFS and the Councils take steps to ensure overages do not continue. Annually monitoring catch levels and working to keep them within acceptable limits paired with taking corrective measures when limits are exceeded, helps reduce the chance of overfishing and ensures long-term biological and economic sustainability.

This year, new data and an updated stock assessment provided information that showed some stocks are now subject to overfishing. For example, an assessment found that the Gulf of Maine haddock stock declined unexpectedly, resulting in catch levels that were too high. Additionally, catch overages resulted in overfishing listings for Gulf of Mexico cubera snapper and the Gulf of Mexico Mid-Water

Snapper Complex. Fisheries managers will develop appropriate stock-specific measures that will end overfishing immediately on these stocks.

Success and Challenges in Rebuilding Fisheries

When a stock becomes overfished, a Council (or for Atlantic highly migratory species, NMFS) must develop a plan to rebuild the stock to a sustainable target level. Typically, the plan allows fishing to continue at a reduced level so the stock can rebuild to its target level and produce its MSY. This approach keeps the fishing industry working while stocks rebuild so that waterfronts remain vibrant. However, rebuilding stocks is a complex process that involves many factors that fall outside the control of managers.

While we have successfully rebuilt 49 stocks over the last 20 years, rebuilding stocks to historical levels has become more challenging due to climate change and other factors. For example, waters off the northeastern United States are among the fastest warming in the world's oceans, causing shifts in the distribution of many fish stocks and decreasing reproductive capacity. In Alaska, changes in ocean conditions and low reproduction



East coast fishing port. Credit: iStock

are affecting population levels of some crab stocks such that conservation measures require a prohibition on fishing.

This year, our two rebuilt stocks highlight the success and challenges with rebuilding. Under a rebuilding plan that began in 2004, the Cape Cod/Gulf of Maine yellowtail flounder population size increased and the stock rebuilt to its sustainable target level. Conversely, the Southern New England/Mid-Atlantic winter flounder population size has significantly decreased since the beginning of its rebuilding plan, despite fisheries management actions to control fishing mortality. Due to changing environmental conditions and lower stock productivity, scientists concluded that the target population level should be changed to a lower target. Because stock abundance is above the new target, Southern New England/Mid-Atlantic winter flounder is considered rebuilt but still in poor condition. Fishery managers must proceed with precautionary management measures in cases like this.

Forty-eight stocks or stock complexes are currently in rebuilding plans. NMFS monitors rebuilding stocks and, through the fishery management process, adjusts measures to increase stock abundance to a target level that supports MSY. When a rebuilding stock increases above the overfished threshold, the stock is removed from the overfished list but remains under its rebuilding plan until it is fully rebuilt. Of the 48 stocks currently in rebuilding plans, seven are no longer overfished but continue to be managed under rebuilding plans.

Despite the complex challenges associated with fishery management, working with our partners and stakeholders we continually adapt our management response with innovative solutions using the most updated scientific information available. We are committed to reducing the number of stocks that are overfished and subject to overfishing, and to rebuilding stocks that support sustainable fisheries in our changing climate.



Children proudly displaying their recreational catches. Credit: iStock

Phrases to Know

The main concepts related to “overfishing” and “overfished” covered in this report are:

Maximum sustainable yield (MSY): *The largest long-term average catch that can be taken from a stock under prevailing environmental and fishery conditions.*

Overfishing: *A stock having a harvest rate higher than the rate that produces its MSY.*

Overfished: *A stock having a population size that is too low and that jeopardizes the stock’s ability to produce its MSY.*

Rebuilt: *A stock that was previously overfished and abundance is now at the target population size that supports its MSY.*

What’s the difference?

As a harvest rate, overfishing is generally a direct result of fishing activities. Allowed to continue unchecked, overfishing is associated with many negative outcomes, including an overfished population. Current management practices—such as annual catch limits and accountability measures—reduce the likelihood of this happening.

As a population size, overfished can be the result of many factors, including overfishing, as well as habitat degradation, pollution, climate change, and disease. While overfishing is sometimes the main cause of an overfished stock, these other factors can also play a role and may affect the stock’s ability to rebuild.

Overfishing and Overfished Stocks as of December 31, 2022

■ 48 On Overfished List

● 24 On Overfishing List

North Pacific

- Blue king crab – Pribilof Islands
- Blue king crab – St. Matthew Island
- Snow crab – Bering Sea

Pacific

- Chinook salmon – Klamath River fall
- Coho salmon – Queets¹
- Coho salmon – Juan de Fuca¹
- Pacific sardine - Northern subpopulation

Pacific and Western Pacific

- Pacific bluefin tuna – Pacific¹
- Swordfish – Eastern Pacific^{1, 2}

Western Pacific

- ● Striped marlin – Western/Central Pacific¹
- Seamount Groundfish Complex – Hancock Seamount
- ● American Samoa Bottomfish Multi-species Complex
- Guam Bottomfish Multi-species Complex
- ● Oceanic whitetip shark – Western/Central Pacific¹
- Silky shark – Western/Central Pacific

Gulf of Mexico

- ● Greater amberjack
- Cobia
- Mid-Water Snapper Complex
- Gulf of Mexico Jacks Complex
- ● Gag - Gulf of Mexico
- Cubera snapper

Caribbean

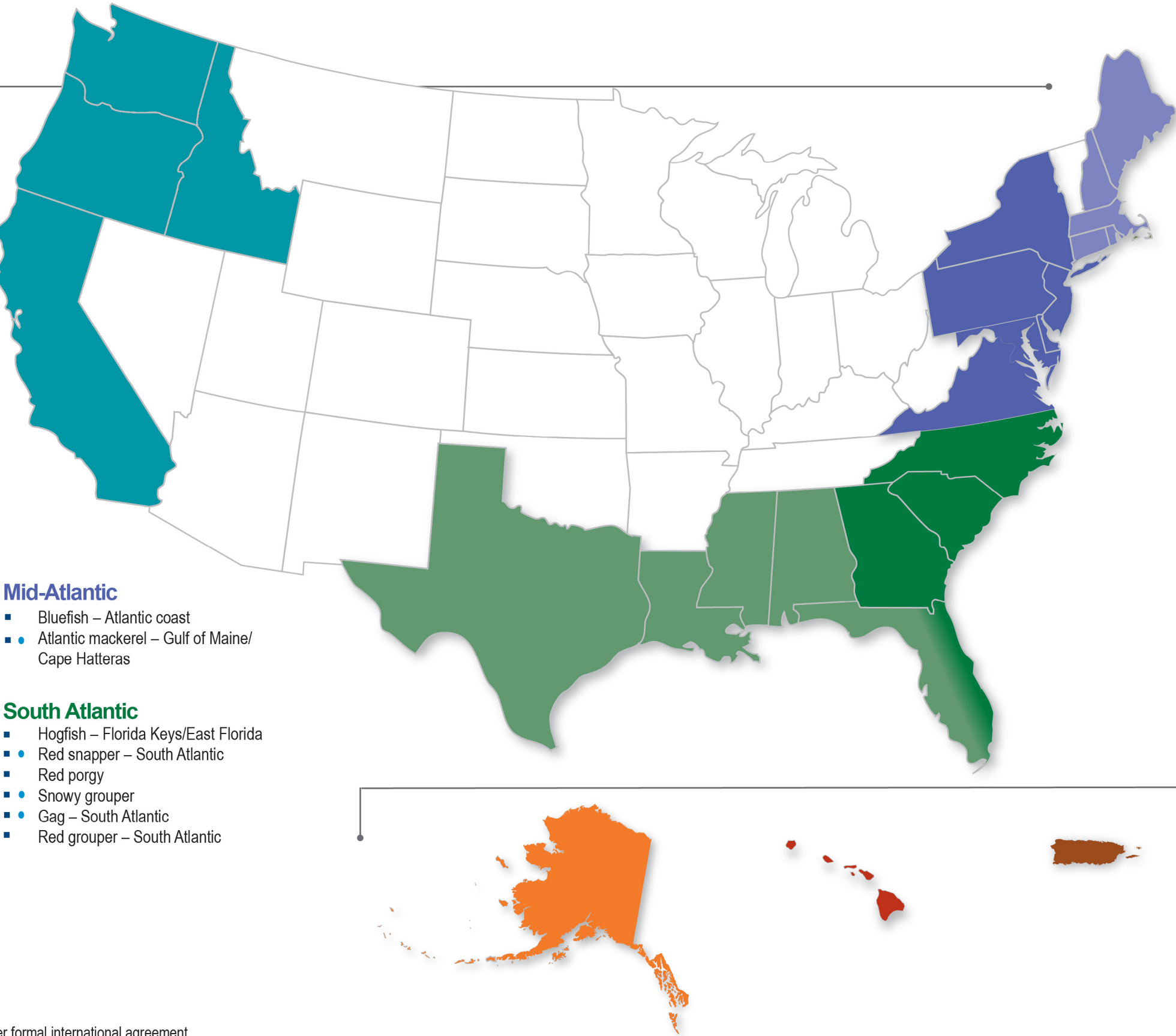
- Goliath grouper
- Nassau grouper
- Queen conch

New England

- ● Atlantic cod – Georges Bank
- ● Atlantic cod – Gulf of Maine
- Windowpane – Gulf of Maine/Georges Bank
- Witch flounder
- Yellowtail flounder – Georges Bank
- Yellowtail flounder – Southern New England/Mid-Atlantic
- Thorny skate – Gulf of Maine
- Atlantic halibut
- Atlantic salmon
- Atlantic wolffish
- Ocean pout
- ● Red hake – Southern Georges Bank/Mid-Atlantic
- Atlantic herring
- Haddock - Gulf of Maine

Highly Migratory Species

- ● Blacknose shark – Atlantic
- ● Blue marlin – Atlantic¹
- ● Dusky shark – Atlantic
- White marlin – Atlantic¹
- ● Scalloped hammerhead – Atlantic
- Porbeagle shark – Atlantic¹
- Sandbar shark – Atlantic
- Bigeye tuna – Atlantic¹
- ● Shortfin mako – North Atlantic¹



Mid-Atlantic

- Bluefish – Atlantic coast
- ● Atlantic mackerel – Gulf of Maine/Cape Hatteras

South Atlantic

- Hogfish – Florida Keys/East Florida
- ● Red snapper – South Atlantic
- Red porgy
- ● Snowy grouper
- ● Gag – South Atlantic
- Red grouper – South Atlantic

¹ Stock is fished by U.S. and international fleets under formal international agreement
² The geographic boundary of this stock extends from Mexico south and west to the Palmyra Atoll.

The Science Behind Stock Status

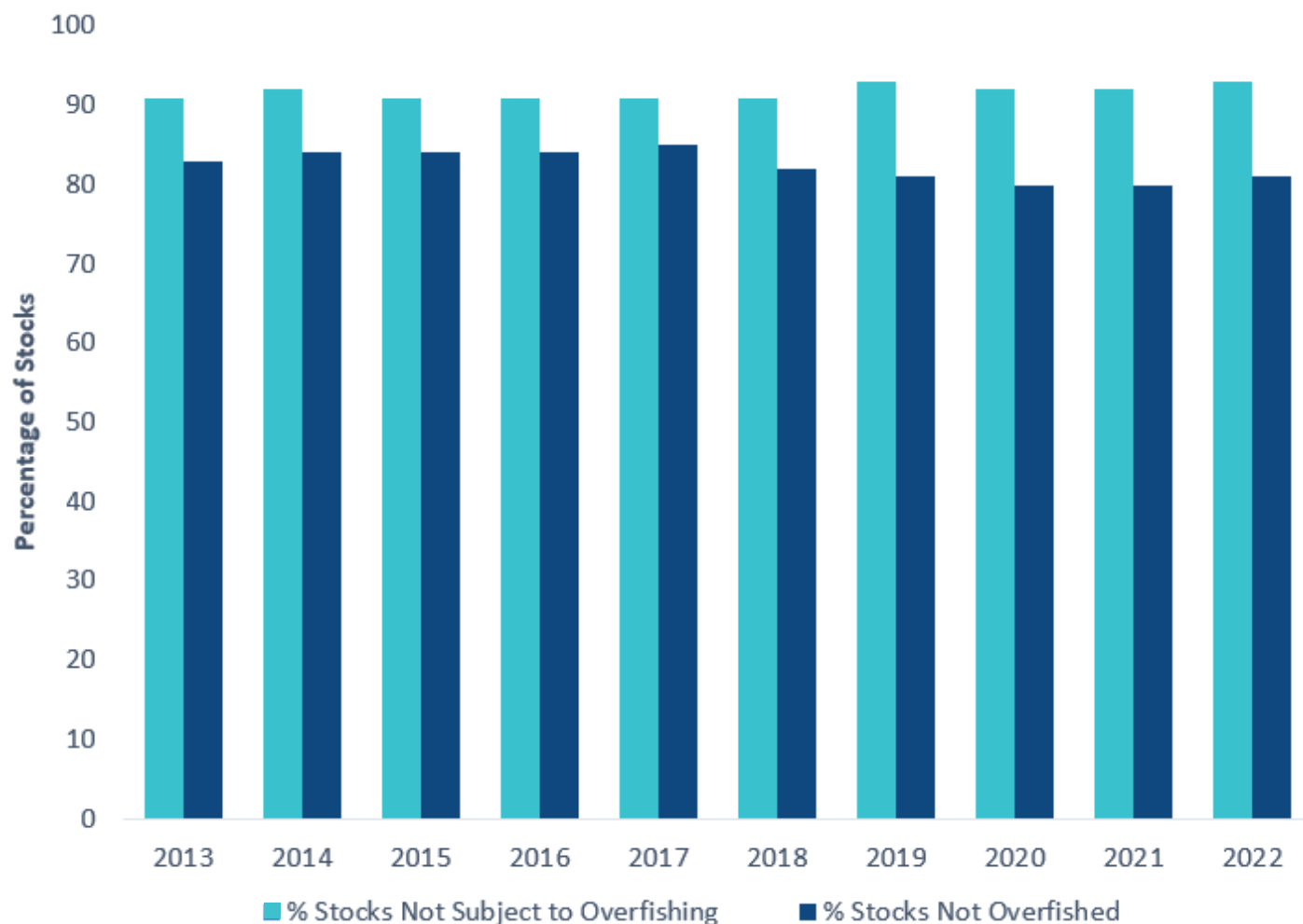
A scientific analysis of the abundance and composition of a fish stock, as well as the degree of fishing intensity, is called a stock assessment. Stock assessments are subject to regional peer review as part of the process to ensure that management decisions are based on the best scientific information available. In fiscal year 2022, NMFS conducted 198 stock assessments.

Fishery management plans must specify objective and measurable criteria, called reference points, to determine if a stock is overfished or subject to overfishing. The Councils and NMFS use information from stock assessments to calculate reference points and determine whether catch limits have successfully ended or prevented overfishing and whether a stock is overfished. Outside the stock assessment process, NMFS may also use a comparison of catch to the overfishing limit to determine if a stock is subject to overfishing. If the catch-to-overfishing-limit comparison is used, an overfishing determination is made annually. If a stock assessment is used, due to timing of the next stock assessment it may take several years before we are able to determine if catch limits successfully ended overfishing. NMFS is constantly improving catch accounting, data collection, and assessment science to expand our understanding of previously assessed stocks and gain insight into unassessed stocks.



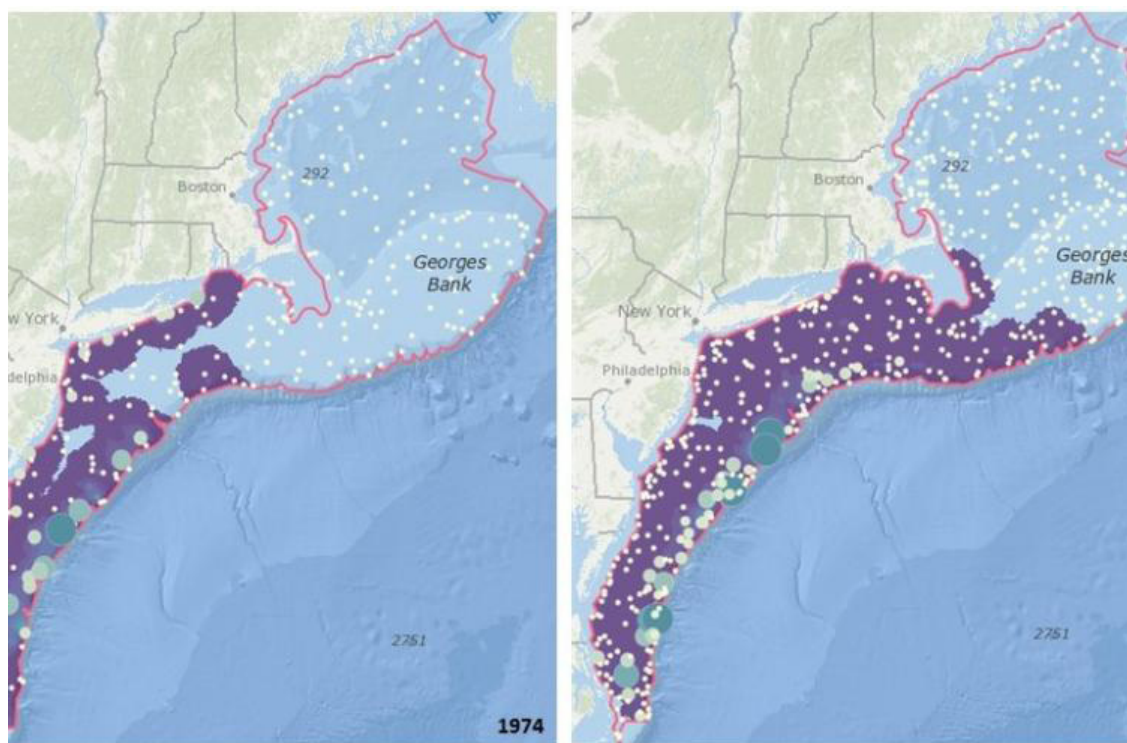
Fisherman offloading yellowfin tuna. Credit: iStock

Percentage of Stocks Not Subject to Overfishing and Not Overfished 2013–2022



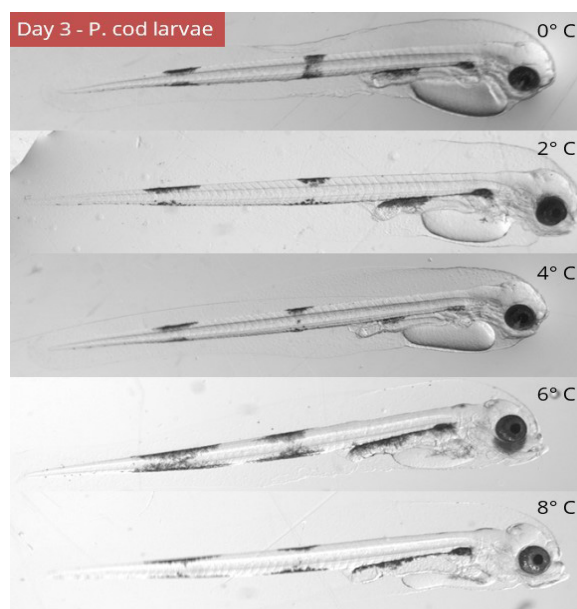
Advancements for Climate-Resilient Fisheries

Closure of Alaska crab fisheries, contraction of Atlantic cod's range, reduced productivity of Southern New England/Mid-Atlantic winter flounder, and continued poor recruitment of South Atlantic gag grouper demonstrate some of the challenges of managing fisheries in the face of climate change. Advances such as accurately predicting stock conditions, tracking species distribution, and incorporating environmental data into stock assessments help address these challenges and are leading the way toward climate-resilient fisheries. For example, managers can now track shifting stock distributions through the NOAA [Distribution Mapping and Analysis Portal](#) (DisMAP) and obtain advance notice of marine heat waves through [NOAA's new global forecasting system](#). These tools play a critical role in decision-making, by allowing fishermen to anticipate geographic shifts in their target species and managers to better target fishing seasons and other management measures.



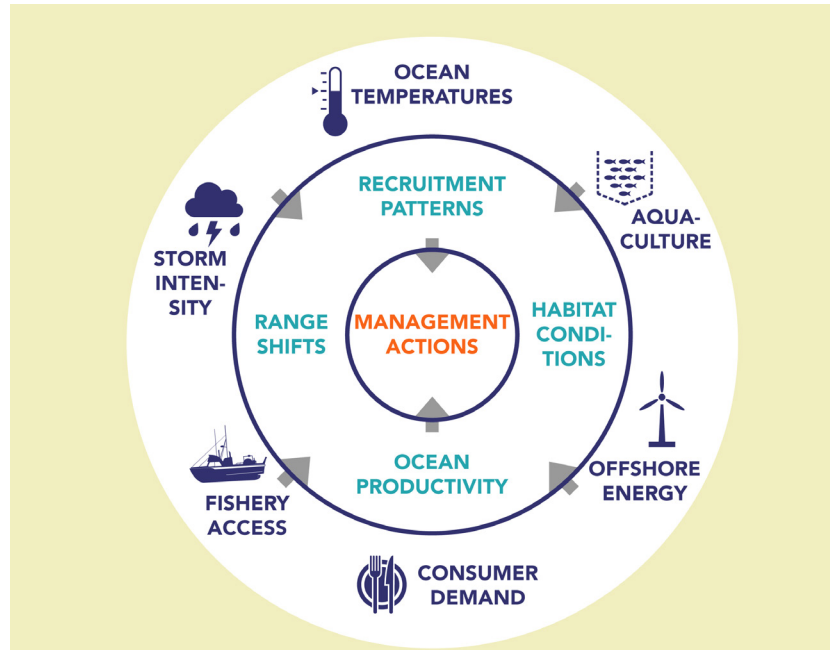
Black sea bass distribution from 1974 to 2019 moved about 140 miles north over this time period. Credit: NOAA Fisheries

Incorporating environmental data into stock assessments also provides essential data for fisheries managers. Researchers studying Pacific cod in Alaska recently found that bottom temperatures of 3-6 degrees Celsius are ideal for young fish to survive to adulthood. Incorporating bottom temperature data into stock assessments has allowed better predictions of Pacific cod spawning and improved planning for fishing seasons. Studies on the East Coast yielded similar findings. By incorporating bottom temperatures into stock assessments, scientists recently discovered that “cold pools” were essential to the survival of young yellowtail flounder off southern New England and the Mid-Atlantic. These findings show that integrating environmental data into stock assessments provides more accurate estimates of current and future stock size, giving fishery managers better tools to set appropriate catch limits.



Three-day old Pacific cod larvae reared in the laboratory, show that under warmer temperatures they lose their yolk faster and are forced to find prey earlier in their development, when they are most vulnerable. Credit: NOAA Fisheries

New scientific breakthroughs aren't the only tools that help create climate-resilient fisheries. Scenario planning, including efforts on the East and West coasts, provides a structured process for managers to explore and describe multiple plausible futures, termed "scenarios," and identify robust adaptation actions to respond to them. All of these efforts provide decision-makers with the information needed to tackle challenging fishery management issues in a changing climate.



Factors to consider in scenario planning that may impact fisheries. Credit: East Coast Scenario Planning Core Team

Pacific Bluefin Tuna Rebound with Coordinated International Actions

Following coordinated action by the United States and other countries, the population of Pacific bluefin tuna is increasing, and includes many younger fish that will help accelerate its rebound. Ten years ago, the Pacific bluefin tuna population was a small fraction of its historical size. NOAA's investment in research that supported reducing fishery catch on younger fish to increase biomass proved successful. A recent stock assessment co-developed by NOAA scientists shows that the stock is no longer subject to overfishing and is recovering faster than anticipated.



Pacific bluefin tuna. Credit: Shutterstock

NMFS Continues Engagement with the Recreational Fishing Community

This year's fourth annual National Saltwater Recreational Fisheries Summit brought together members of the recreational fishing community to discuss and collaborate around the most pressing issues facing marine anglers across the country. Participants identified several important themes, including more precise and timely data, community engagement and trust, incorporating the human dimension into decision-making, and balancing the trade-offs of new management initiatives. Together with science and management partners, NMFS will continue to advance these issues, including by initiating review of the 2015 National Saltwater Recreational Fisheries Policy.

Our Proud Tradition of Sustainable Fisheries

This year marks 50 years since the enactment of the Coastal Zone Management Act, the Marine Mammal Protection Act, the National Marine Sanctuaries Act, and the Clean Water Act. These laws, the MSA, and others have positioned the United States as a global leader in marine conservation and sustainable fisheries management.

Through harvest quotas, size limits, and other management measures, we ensure sustainably harvested U.S. seafood products and robust recreational fisheries. Our fisheries support a strong economy and provide a healthy local source of food. In 2021, commercial fishermen harvested over 8.5 billion pounds of seafood valued at \$6.3 billion. In 2020, saltwater angling generated \$98 billion in sales impacts, contributed \$55 billion to the gross domestic product, and supported 595,000 jobs in the marine recreational fishing industry and across the broader economy. Compared to 2019, these numbers represent an increase for recreational fisheries, but a notable decrease for commercial fisheries, primarily due to safety measures put in place for the COVID-19 pandemic. Also in 2020, U.S. commercial fisheries and the seafood industry generated \$47 billion in sales impacts, contributed \$24.4 billion to the gross domestic product, and supported 588,000 jobs.

NMFS continues to engage with partners to accomplish the work necessary to keep fisheries thriving across the country. We will continue to work with Congress, the Councils, interstate fisheries commissions, our state partners, and other stakeholders to end overfishing and rebuild stocks so that our sustainable fisheries continue to support a strong economy.



Red snapper on display at local fish market. Credit: iStock



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