



NOAA
FISHERIES

Office of
Sustainable
Fisheries

Rebuilding Habitat- Limited Stocks

RAE-Coastal Society Summit 2014

Galen R. Tromble
Chief, Domestic Fisheries Division



NOAA
FISHERIES

Why are Fisheries Important?

- U.S. marine fisheries provide jobs, recreation, and healthy seafood. In 2013:
 - Commercial fishermen landed 9.9 billion pounds of seafood valued at \$5.5 billion.
 - 11 million anglers made more than 71 million marine recreational fishing trips and landed 239 million pounds of fish.



NOAA
FISHERIES

Rebuilding Overfished (Depleted) Fisheries

- When abundance of a fish stock drops below a threshold, the stock is determined to be **overfished** and enters a formal **rebuilding** program.
- This assumes that the reason for low abundance is overfishing.
- In some cases, habitat limitations, or other environmental factors, may be the cause of low abundance.

Rebuilt Stocks (37) – as of September 30, 2014



North Pacific:

1. Southern tanner crab - Bering Sea (2007 and 2012)
2. Blue king crab - Saint Matthews Island (2009)
3. Snow crab - Bering Sea (2011)

New England:

1. Sea scallop - Northwestern Atlantic Coast (2001)
2. Silver hake - Gulf of Maine/Northern Georges Bank (2002)
3. Silver hake - Southern Georges Bank / Middle Atlantic (2007)
4. Winter flounder - Georges Bank (2003)
5. Haddock - Georges Bank (2010)
6. Pollock - Gulf of Maine / Georges Bank (2010)
7. Haddock - Gulf of Maine (2011)
8. Acadian redfish - Gulf of Maine / Georges Bank (2012)
9. Windowpane - Southern New England / Mid-Atlantic (2012)
10. Yellowtail flounder - Southern New England / Mid-Atlantic (2012)

New England/ Mid-Atlantic

1. Goosefish (Monkfish) - Gulf of Maine / Northern Georges Bank (2008)
2. Goosefish (Monkfish) - Southern Georges Bank / Mid-Atlantic (2008)
3. Spiny dogfish - Atlantic Coast (2010)

Highly Migratory

Species:

1. Blacktip shark - Atlantic / Gulf of Mexico (2003)¹
2. Swordfish - North Atlantic (2009)

Mid-Atlantic:

1. Bluefish - Atlantic Coast (2008)
2. Scup - Atlantic Coast (2009)
3. Black sea bass - Mid-Atlantic Coast (2009)
4. Summer flounder - Mid-Atlantic Coast (2011)
5. Tilefish - Mid-Atlantic Coast (2014)
6. Butterfish - Gulf of Maine / Cape Hatteras (2014)

South Atlantic:

1. Pink shrimp - Southern Atlantic Coast (2012)
2. Black sea bass - Southern Atlantic Coast (2013)

South Atlantic/Gulf of Mexico:

1. Yellowtail snapper - South Atlantic / Gulf of Mexico (2003)

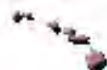
Gulf of Mexico:

1. Red grouper - Gulf of Mexico (2007)
2. King mackerel - Gulf of Mexico (2008)
3. Gag - Gulf of Mexico (2014)



Pacific:

1. Pacific whiting - Pacific Coast (2004)
2. Lingcod - Pacific Coast (2005)
3. Chinook salmon - Northern California Coast: Klamath (fall) (2011)
4. Widow rockfish - Pacific Coast (2011)
5. Coho salmon - Washington Coast: Queets (2011)
6. Coho salmon - Washington Coast: Western Strait of Juan de Fuca (2012)
7. Chinook salmon - California Central Valley: Sacramento (fall) (2013)



U.S. Department of Commerce
National Oceanic and Atmospheric
Administration
National Marine Fisheries Service
Office of Sustainable Fisheries



NOAA FISHERIES

¹ Blacktip shark is now two separate stocks, but was previously assessed as one combined Atlantic / Gulf of Mexico stock.



**NOAA
FISHERIES**

Sustainability of U.S. Fisheries has improved significantly in the past 20 years

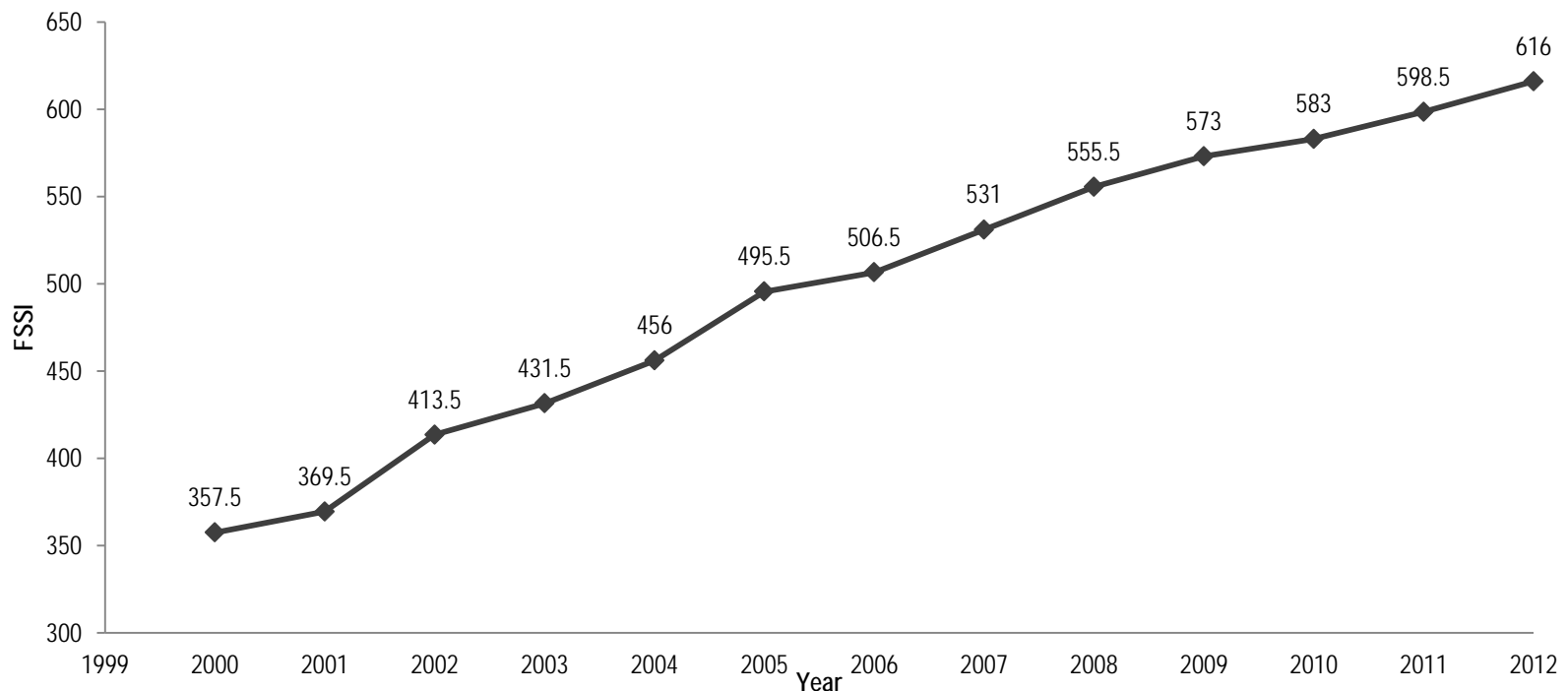
- 88% of stocks are not experiencing overfishing
- 81% of stocks are not overfished (depleted)



NOAA FISHERIES

Fish Stocks Sustainability Index

The FSSI shows continued progress in improving the status of fisheries throughout the U.S.



Overfished Stocks (38) – as of September 30, 2014



North Pacific:

1. Blue king crab – Pribilof Islands

New England:

1. Atlantic cod – Georges Bank
2. Atlantic cod – Gulf of Maine
3. Atlantic halibut
4. Atlantic salmon¹
5. Atlantic wolffish¹
6. Ocean pout
7. Thorny skate
8. Yellowtail flounder – Georges Bank
9. Yellowtail flounder – Cape Cod/Gulf of Maine
10. Windowpane – Gulf of Maine/Georges Bank
11. Winter flounder – Southern New England/Mid-Atlantic
12. Witch flounder

Pacific:

1. Canary rockfish
2. Pacific ocean perch
3. Yelloweye rockfish

Pacific/Western Pacific

1. Pacific bluefin tuna – Pacific²



Highly Migratory Species:

1. Blacknose shark – Atlantic
2. Blue marlin – Atlantic²
3. Bluefin tuna – West Atlantic²
4. Dusky shark – Atlantic
5. Porbeagle shark – Atlantic
6. Sandbar shark – Atlantic
7. White marlin – Atlantic²
8. Scalloped hammerhead – Atlantic²

South Atlantic:

1. Red porgy
2. Red snapper
3. Snowy grouper
4. Blueline tilefish¹

Western Pacific

1. Seamount Groundfish Complex – Hancock Seamount
2. Striped marlin – Central Western Pacific²

Gulf of Mexico:

1. Gray triggerfish
2. Greater amberjack
3. Red snapper

Caribbean:

1. Grouper Unit 1
2. Grouper Unit 2
3. Grouper Unit 4
4. Queen conch



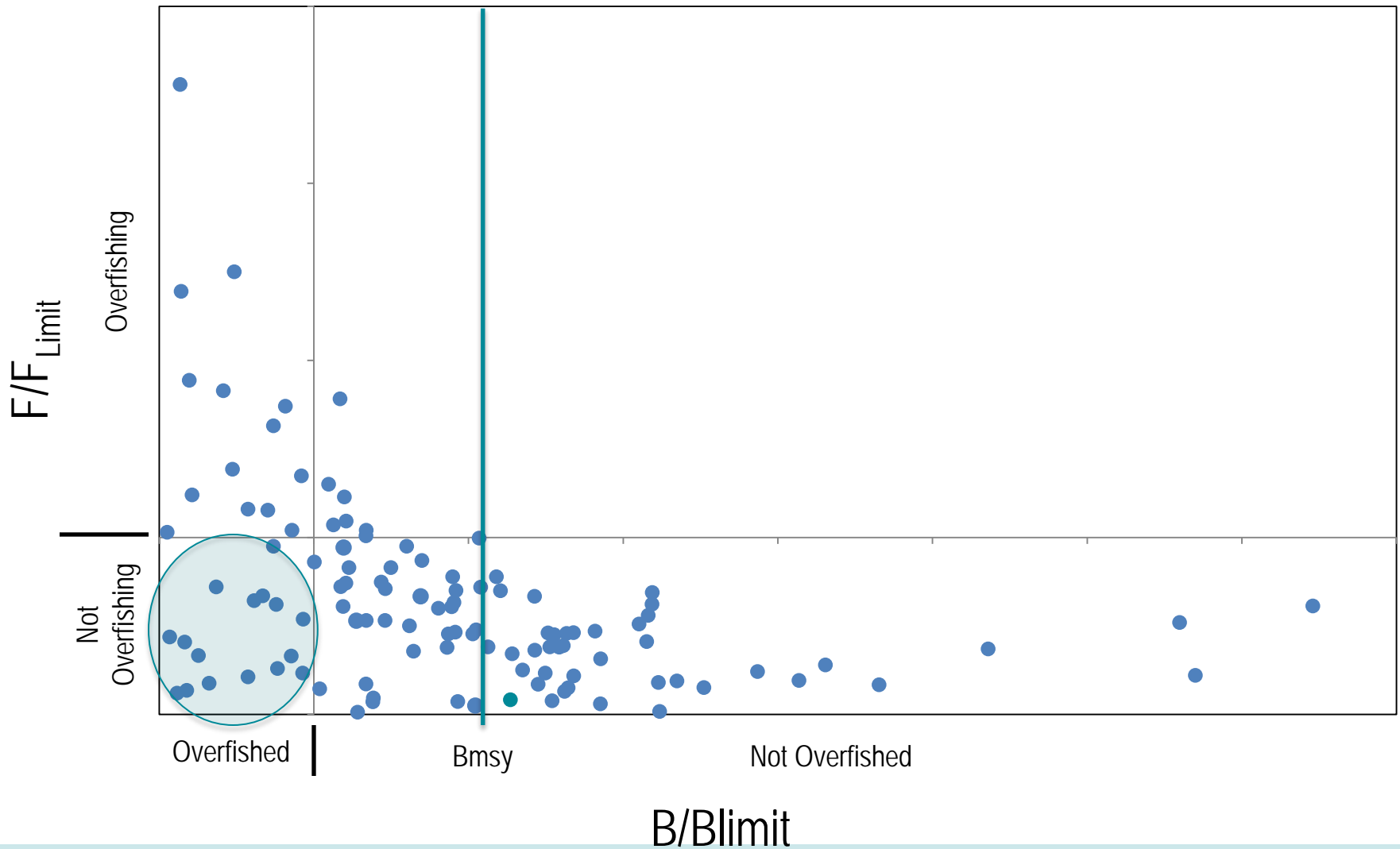
U.S. Department of Commerce
National Oceanic and Atmospheric
Administration
National Marine Fisheries Service
Office of Sustainable Fisheries

1. Non-FSSI stock
2. Stock is fished by U.S. and International fleets



NOAA FISHERIES

Overfishing (F = Fishing Mortality) and Overfished (B = Biomass) Ratios



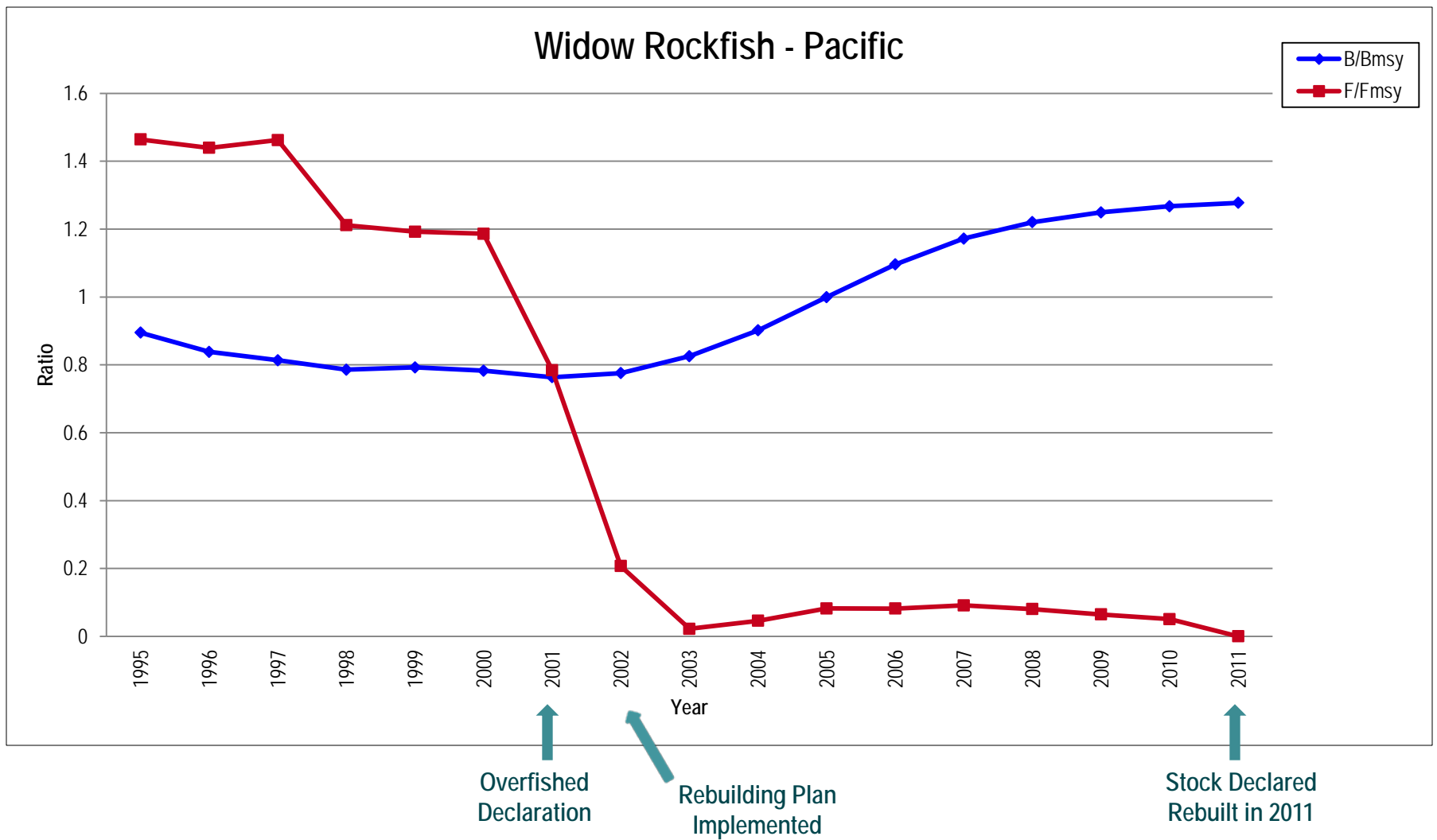


NOAA
FISHERIES

What Rebuilding Looks Like When the Stock Responds to Reduced Fishing

- Example – Pacific Widow Rockfish

Widow Rockfish - Pacific



Fishing mortality was significantly reduced for widow rockfish, which resulted in a steady increase in biomass rebuilding throughout the rebuilding plan.

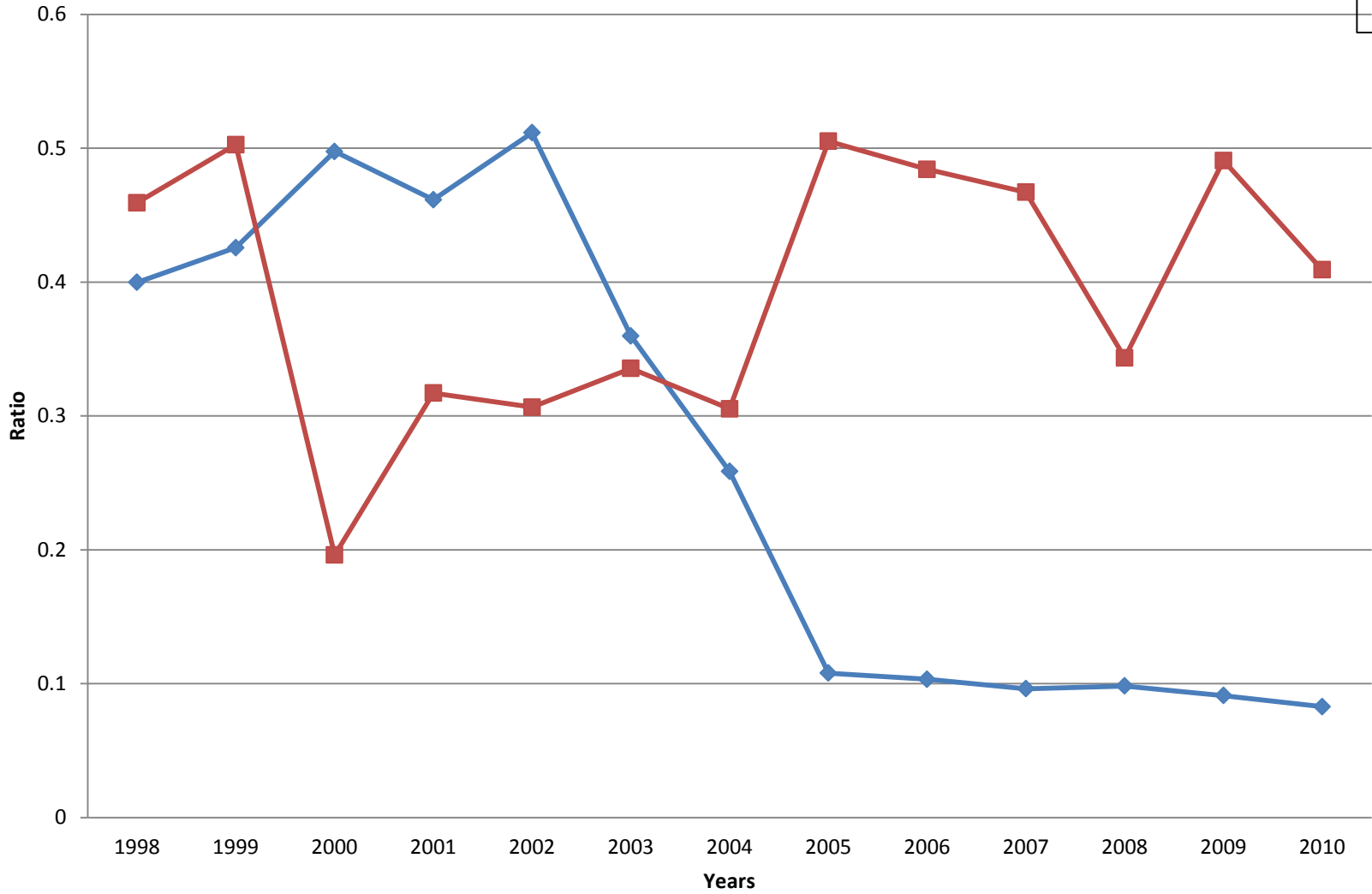
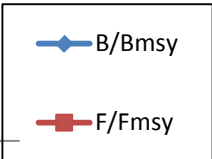


NOAA
FISHERIES

In Contrast, there are stocks that haven't rebuilt in spite of moderate fishing pressure

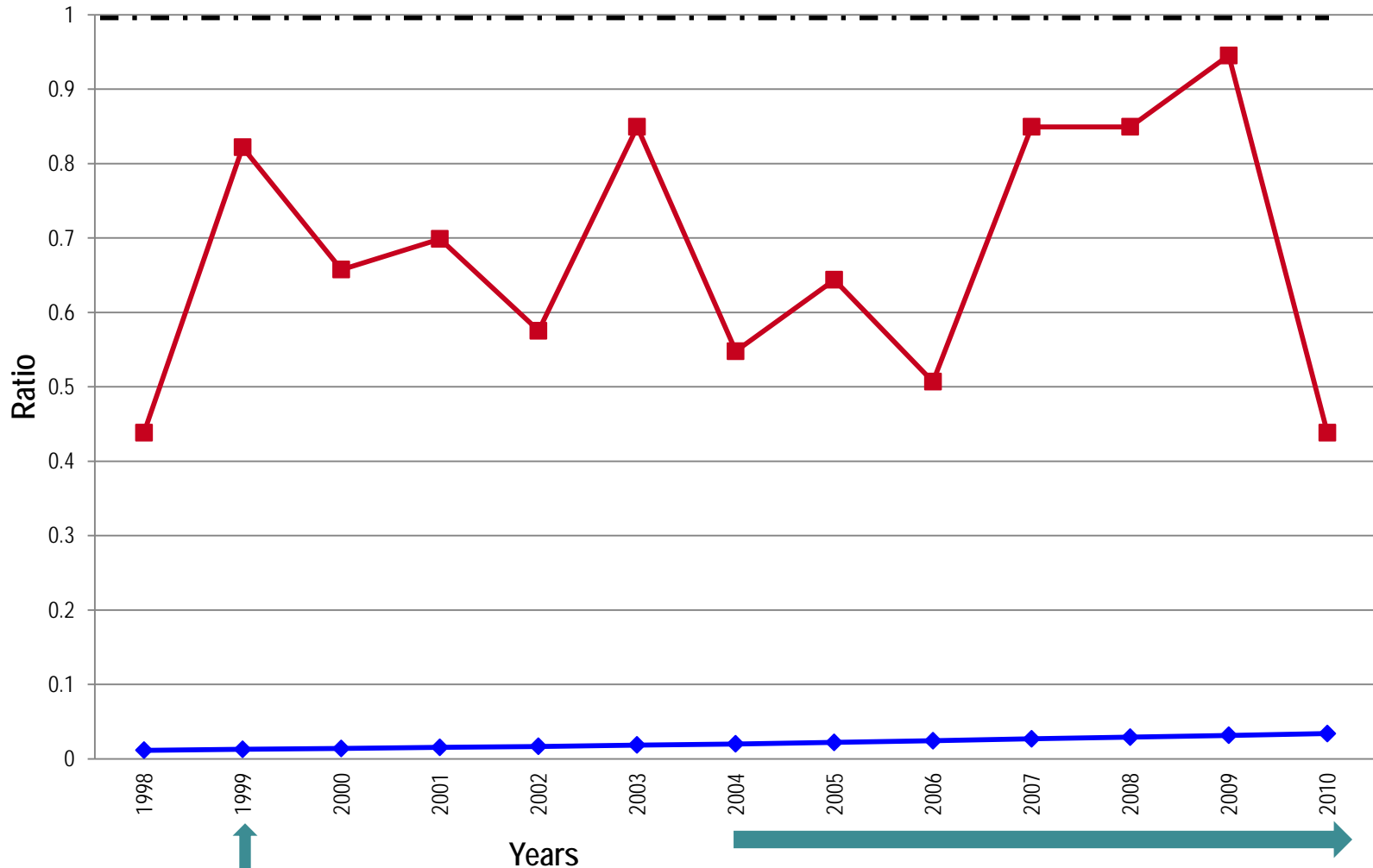
- Example – Ocean Pout
- Example – Atlantic Halibut

Ocean Pout - Northwestern Atlantic Coast



Atlantic Halibut - Northwestern Atlantic Coast

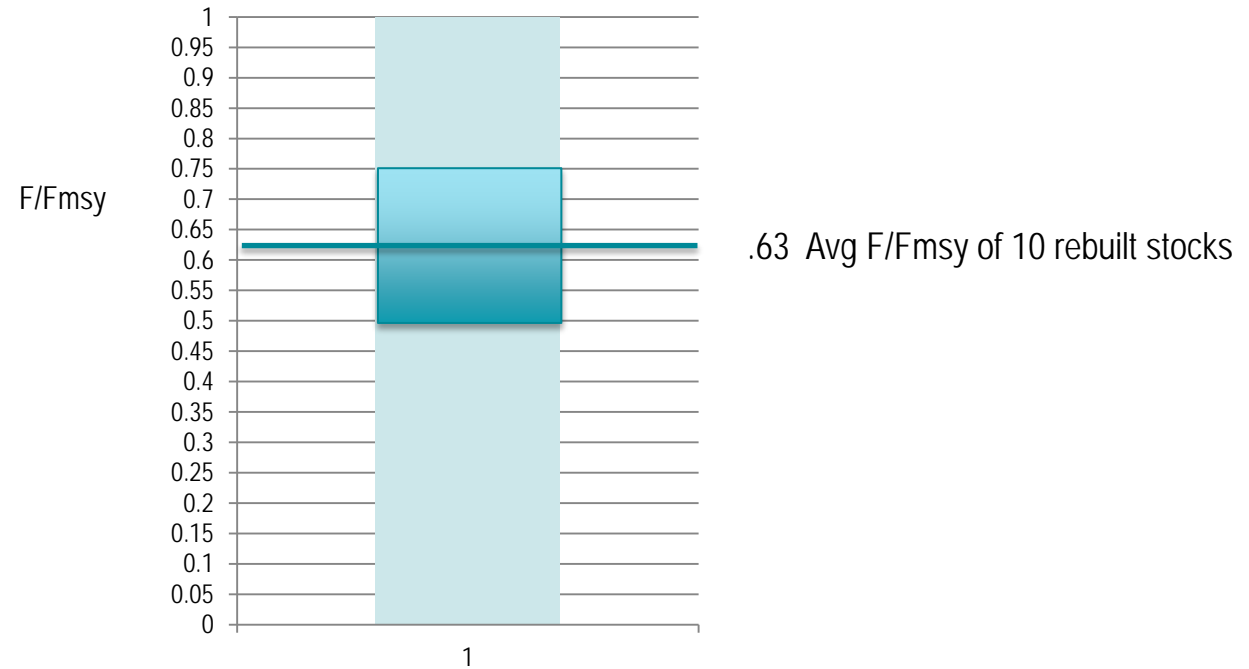
A



Overfished Declaration

Rebuilding Plan 2004-2052

Fishing Mortality Rate Rebuilding "Zone"



What could be preventing rebuilding, if overfishing isn't the problem?

- Short term poor environmental conditions – more time, and rebuilding will occur
- Long term directional environmental change – e.g. Climate change - Bmsy should be reevaluated
- Habitat loss or degradation – Mitigate habitat losses – Restore habitat



NOAA
FISHERIES

What Can Fisheries Managers Do?

- Work with Stock Assessment, Ecosystem, and Habitat Scientists to improve understanding of factors driving stock dynamics
- Define objectives for fisheries habitat needed to sustain or rebuild fisheries.
- Engage proactively with other agencies to improve fisheries habitat

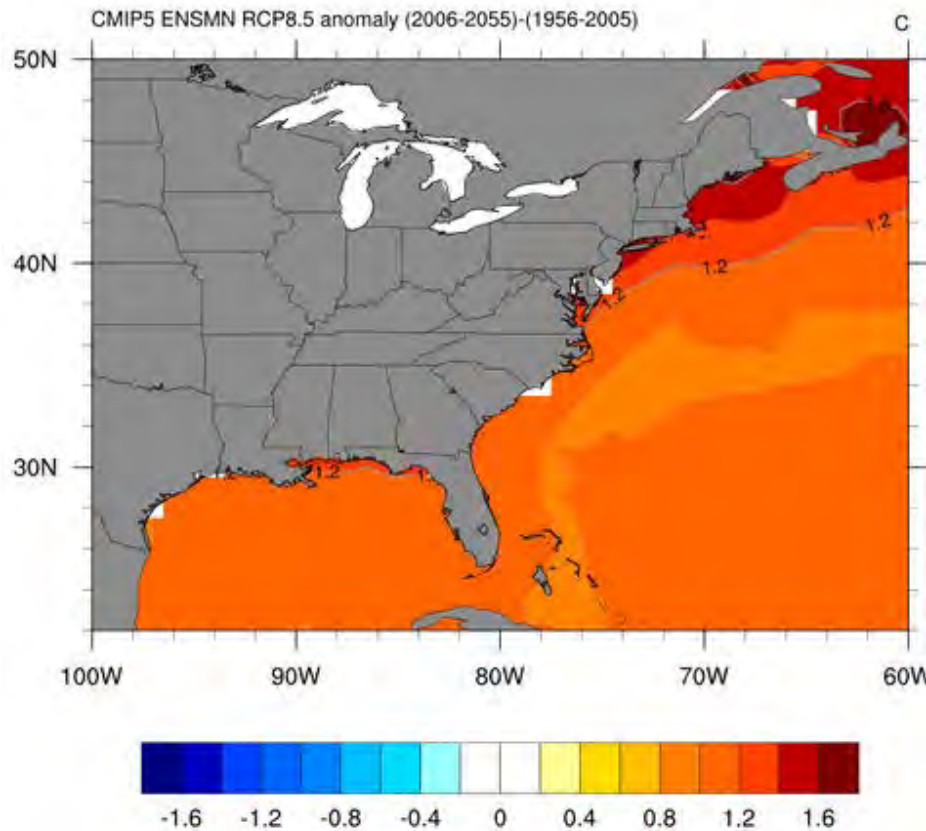
Incorporating Environmental Variables into Stock Assessment



The new stock assessment for butterfish accounted for the effects of ocean temperatures on the distribution of the stock, something that will become increasingly important as the climate changes and the oceans warm

Vulnerability of Fish Stocks to Climate Change

Climate Exposure



- Projected magnitude of change
- Overlap of current species distribution and expected climate change
- Comparing 2006-2055 to 1956-2005

<http://www.esrl.noaa.gov/psd/ipcc/ocn/>

Vulnerability of Fish Stocks to Climate Change

Stock Vulnerability

Exposure

- Sea surface temperature
- Air temperature
- Salinity
- Ocean acidification (pH)
- Precipitation
- Currents
- Sea level rise

*** Exposure factors will vary depending on the region*

Sensitivity

- Habitat Specificity
- Prey Specificity
- Sensitivity to Ocean Acidification
- Sensitivity to Temperature
- Stock Size/Status
- Other Stressors
- Adult Mobility
- Spawning Cycle
- Complexity in Reproductive Strategy
- Early Life History Survival and Settlement Requirements
- Population Growth Rate
- Dispersal of Early Life Stages

Rebuilding Fisheries is a Journey



Without healthy habitat, we won't get to Happy.