Ecosystem-Based Fishery Management Communication tools

Andrew Applegate

EBFM Plan Coordinator

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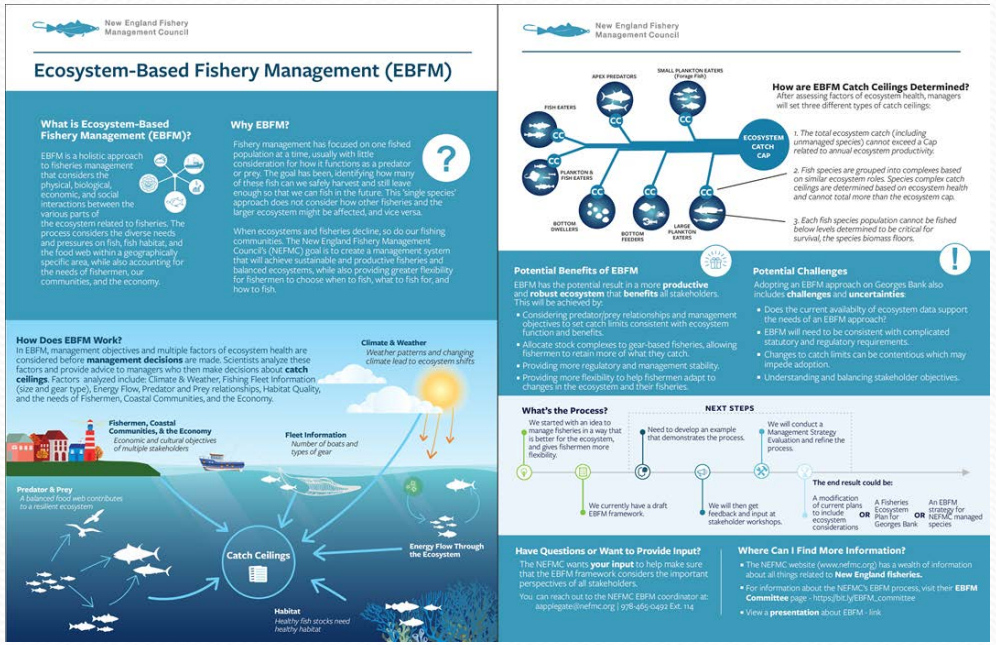
New England
Fishery Management Council

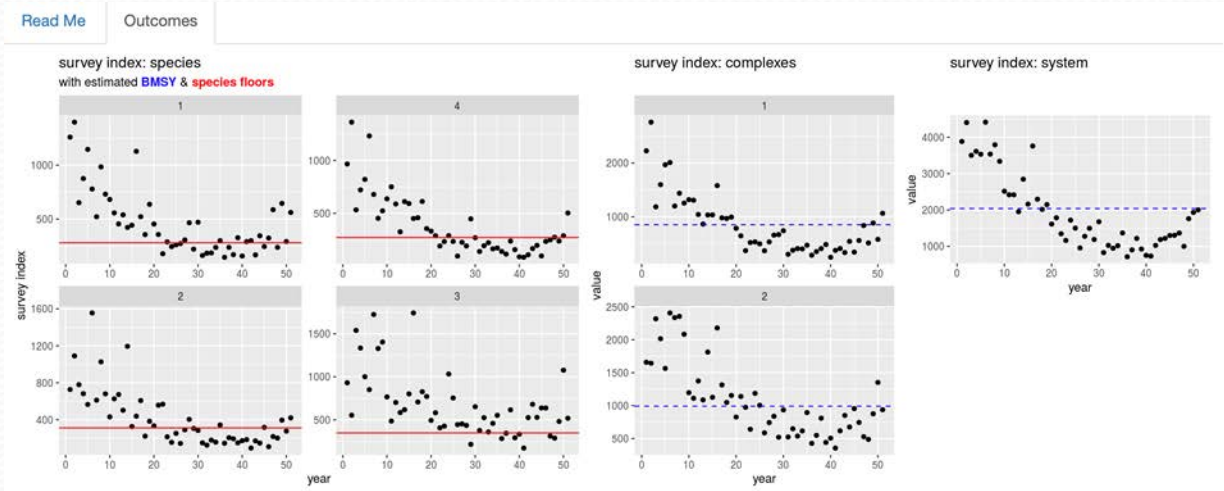
EBFM Communication
Green Fin Studio

- Summary of stakeholder perspectives
  - 11 groups
- Brochures
  - 3 stakeholder focused, 1 guide to eFEP, 1 Glossary
- Two Infographics
  - Summary of EBFM and the Georges Bank Ecosystem
- Four presentation
  - An Introduction to EBFM, EBFM Science, the eFEP and Worked Examples, Catch Management Framework
- Introductory Video
  - Stakeholder Perspectives



EBFM Communication Worked Example Tools

- Description of Hydra Operation Model with Example Scenarios
- Kraken Visualization Tool
  - Example effects of biological interactions
  - Runs interactively
- Catch Framework Demonstration Tool
  - Application of floors and ceilings approach
  - Stock complexes
  - Runs interactively



Neither stock complex has species assessed to be below the biomass floor, so F is not reduced.

Assessment results & catch advice

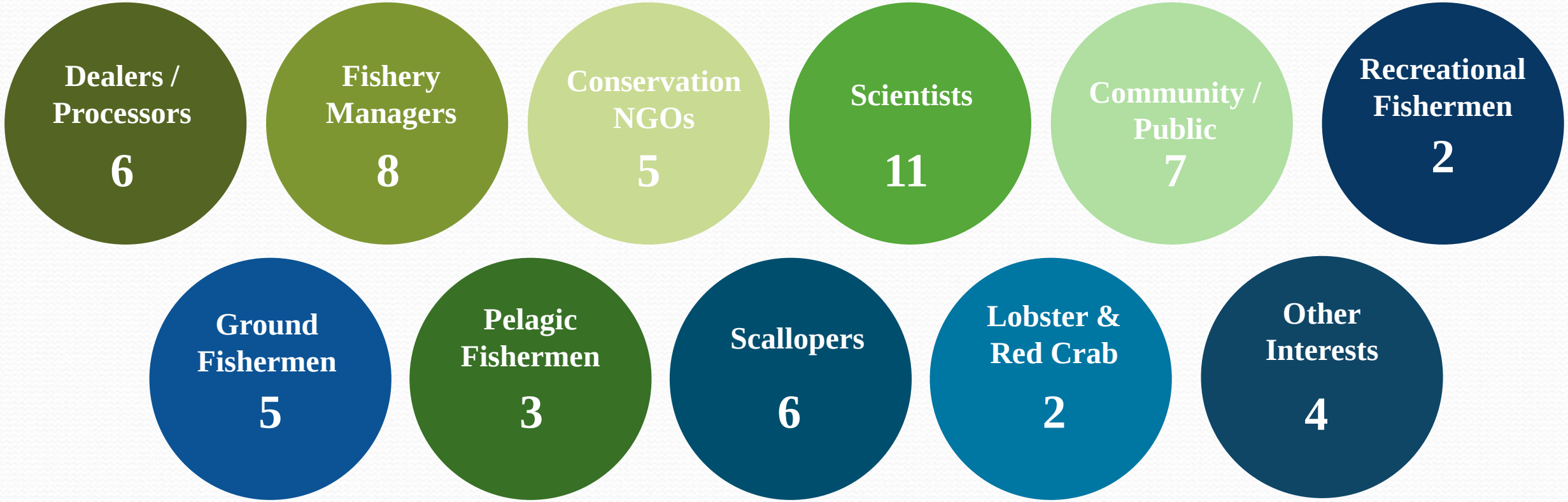
Complex	FMSY	BMSY	B_final	F/FMSY	B/BMSY	Catch at FMSY	Floor F multiplier	F	Catch at F	Ceiling	Advice
1	0.15	1,786	1,523	0.68	0.85	226	1	0.11	170	474	170
2	0.14	1,122	1,100	0.48	0.98	149	1	0.10	111	474	111

Assessment results & catch advice

Species	FMSY	BMSY	B_final	F/FMSY	B/BMSY	Catch at FMSY	F	Catch at F	Ceiling	Advice
1	0.15	983	913	0.73	0.93	141	0.12	106	474	106
2	0.12	727	510	0.72	0.70	62	0.09	46	474	46
3	0.16	406	520	0.31	1.28	85	0.12	64	474	64
4	0.10	991	669	0.70	0.67	69	0.08	52	474	52

EBFM Communication
11 Stakeholder Groups Interviewed

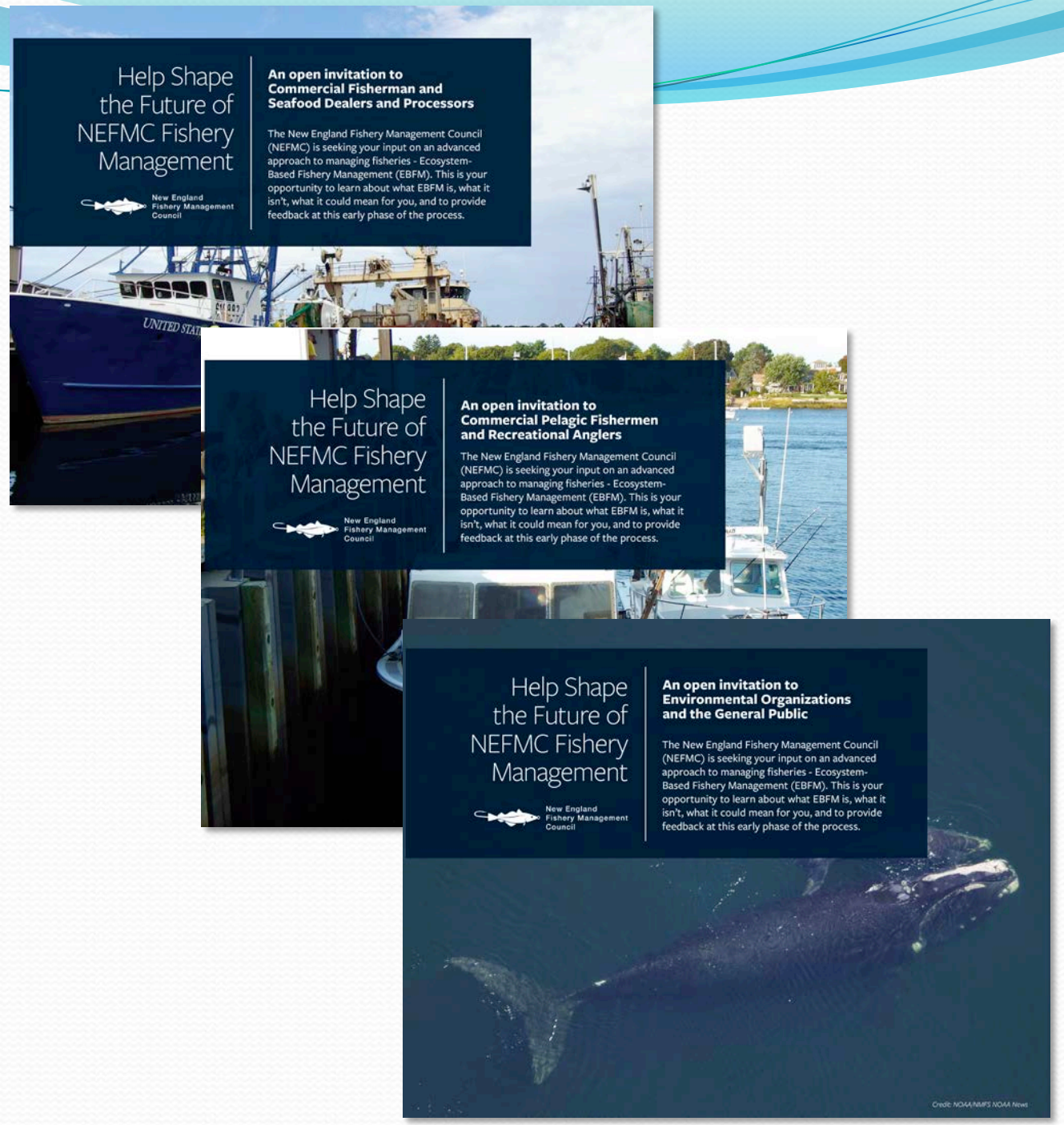
Stakeholder categories and the number of individuals interviewed per category are shown below



Brochure–

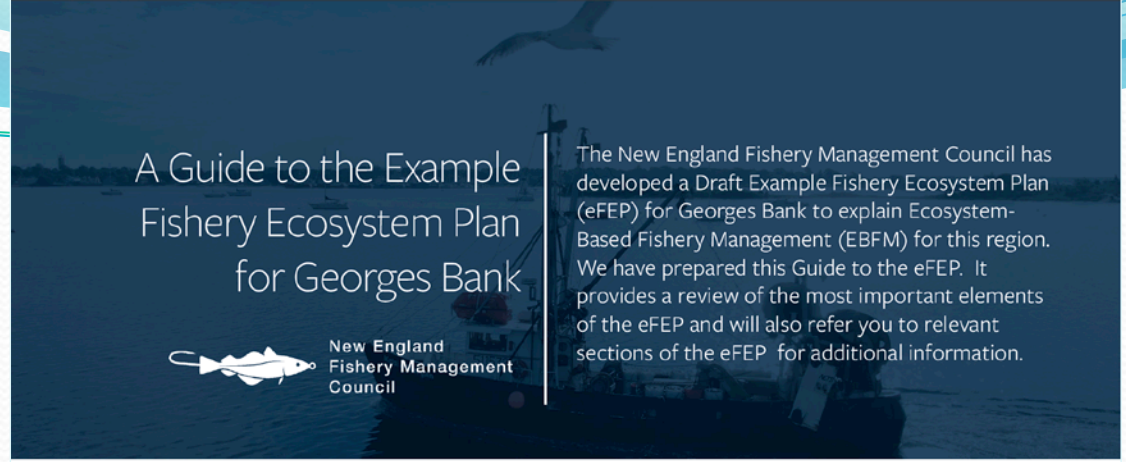
EBFM Process

- Written as an invitation to participate in the process.
- Three different versions:
  - **Fishermen and Seafood Dealers & Processors**
  - **Commercial Pelagic Fishermen & Recreational Anglers**
  - **Conservation NGOs & the Public**
- Differences based on a “What does it mean for me?” section.
  - **Potential benefits and concerns**
  - **Introduction to the other stakeholders.**



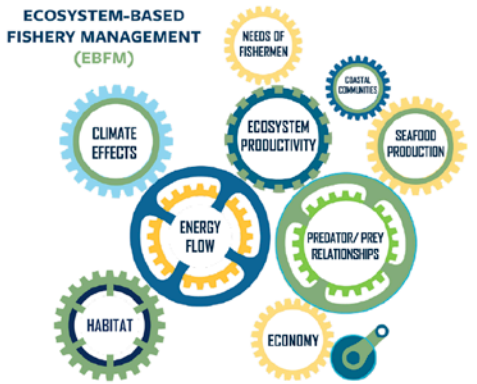
Brochure–
Guide to the eFEP

- A description of the important parts of the eFEP
  - Why the eFEP was developed
  - Goals and objectives
  - Boundaries of the EPU
  - Harvest Management
  - How it comes together
    - Setting ceilings
    - Special priority management
    - Incentive-based measures
    - Fishing impacts and spatial management
    - Jurisdictional and limited access issues
  - Data
  - The MSE process



Why was the eFEP developed?

Scientists, managers, fishermen and stakeholders have long realized the problems associated with single species management, where harvest control rules are specified for a stock often ignoring the role of that stock as a predator or prey. Often the focus of management is to achieve Maximum Sustainable Yield as an attainable goal for a stock and simultaneously for all other stocks in the region. This approach may not be optimizing the non-fishing benefits to be achieved from the ecosystem or take into account how energy moves through the ecosystem in terms of impacts to the food web.



The process takes into account the diverse needs and pressures on fish, fish habitat, and the food web within a geographically specific area, while also considering the needs of fishermen, our communities, and the economy.

Why Georges Bank?

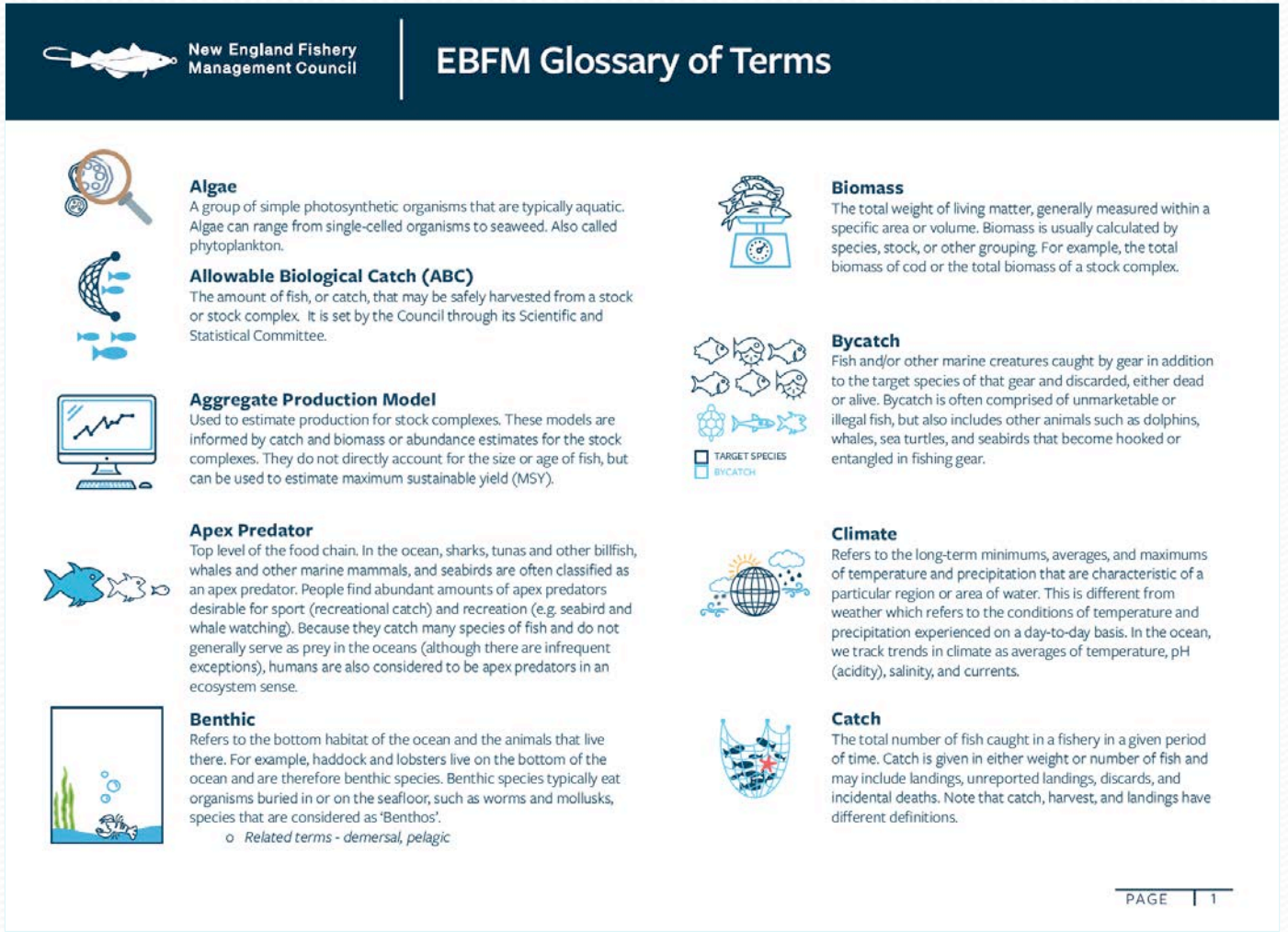
Georges Bank was chosen because a considerable amount of ecological science and modeling has focused on this distinct area. Scientists already know a lot about the Georges Bank ecosystem and fisheries and therefore have much of the information they need to understand how the system will respond to EBFM.

The New England Fishery Management Council is exploring the development and application of a new type of management for Georges Bank, commonly known as Ecosystem-Based Fishery Management, or EBFM. It is intended to be a more inclusive approach than standard fishery management. One that considers a variety of goals while taking into account factors including the physical, biological, economic, and social interactions between the various parts of the ecosystem that are related to managed fisheries.

Because EBFM is a new concept, the Council has chosen to start in a specific area where we have a lot of data and existing ecosystem models. The eFEP is therefore focused specifically on Georges Bank. The intent of the eFEP is to identify viable management approaches to achieve a range of goals and objectives. We will then work through a Management Strategy Evaluation (MSE) process with the goal of these management approaches becoming an approved Fishery Ecosystem Plan (FEP) for Georges Bank. If successful, similar FEPs could be developed elsewhere by the Council.

Brochure–
Glossary

- 44 terms and phrases.
- Intended for a broad audience.
- Highly visual



New England Fishery Management Council

EBFM Glossary of Terms

Algae
A group of simple photosynthetic organisms that are typically aquatic. Algae can range from single-celled organisms to seaweed. Also called phytoplankton.

Allowable Biological Catch (ABC)
The amount of fish, or catch, that may be safely harvested from a stock or stock complex. It is set by the Council through its Scientific and Statistical Committee.

Aggregate Production Model
Used to estimate production for stock complexes. These models are informed by catch and biomass or abundance estimates for the stock complexes. They do not directly account for the size or age of fish, but can be used to estimate maximum sustainable yield (MSY).

Apex Predator
Top level of the food chain. In the ocean, sharks, tunas and other billfish, whales and other marine mammals, and seabirds are often classified as an apex predator. People find abundant amounts of apex predators desirable for sport (recreational catch) and recreation (e.g. seabird and whale watching). Because they catch many species of fish and do not generally serve as prey in the oceans (although there are infrequent exceptions), humans are also considered to be apex predators in an ecosystem sense.

Benthic
Refers to the bottom habitat of the ocean and the animals that live there. For example, haddock and lobsters live on the bottom of the ocean and are therefore benthic species. Benthic species typically eat organisms buried in or on the seafloor, such as worms and mollusks, species that are considered as 'Benthos'.
- *Related terms - demersal, pelagic*

Biomass
The total weight of living matter, generally measured within a specific area or volume. Biomass is usually calculated by species, stock, or other grouping. For example, the total biomass of cod or the total biomass of a stock complex.

Bycatch
Fish and/or other marine creatures caught by gear in addition to the target species of that gear and discarded, either dead or alive. Bycatch is often comprised of unmarketable or illegal fish, but also includes other animals such as dolphins, whales, sea turtles, and seabirds that become hooked or entangled in fishing gear.

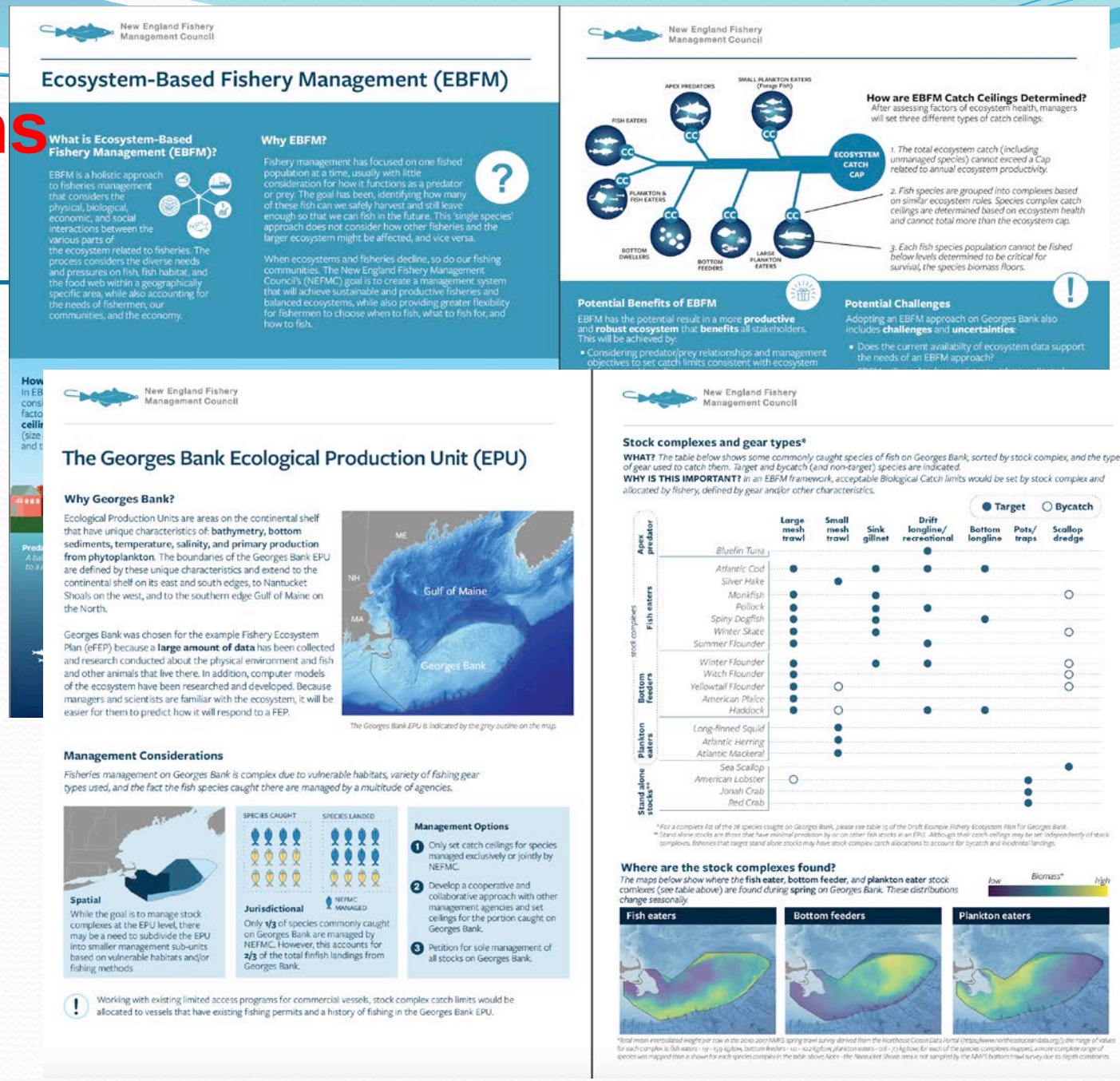
TARGET SPECIES
BYCATCH

Climate
Refers to the long-term minimums, averages, and maximums of temperature and precipitation that are characteristic of a particular region or area of water. This is different from weather which refers to the conditions of temperature and precipitation experienced on a day-to-day basis. In the ocean, we track trends in climate as averages of temperature, pH (acidity), salinity, and currents.

Catch
The total number of fish caught in a fishery in a given period of time. Catch is given in either weight or number of fish and may include landings, unreported landings, discards, and incidental deaths. Note that catch, harvest, and landings have different definitions.

EBFM Communications Infographics

- Defines EBFM and why it is being explored.
- Explains the main components of EBFM.
- Timeline for the process.
- Defines the boundaries of the EPU and why it was chosen for the eFEP.
- Management considerations
- What is being fished, how, and where?



EBFM Communication Presentations

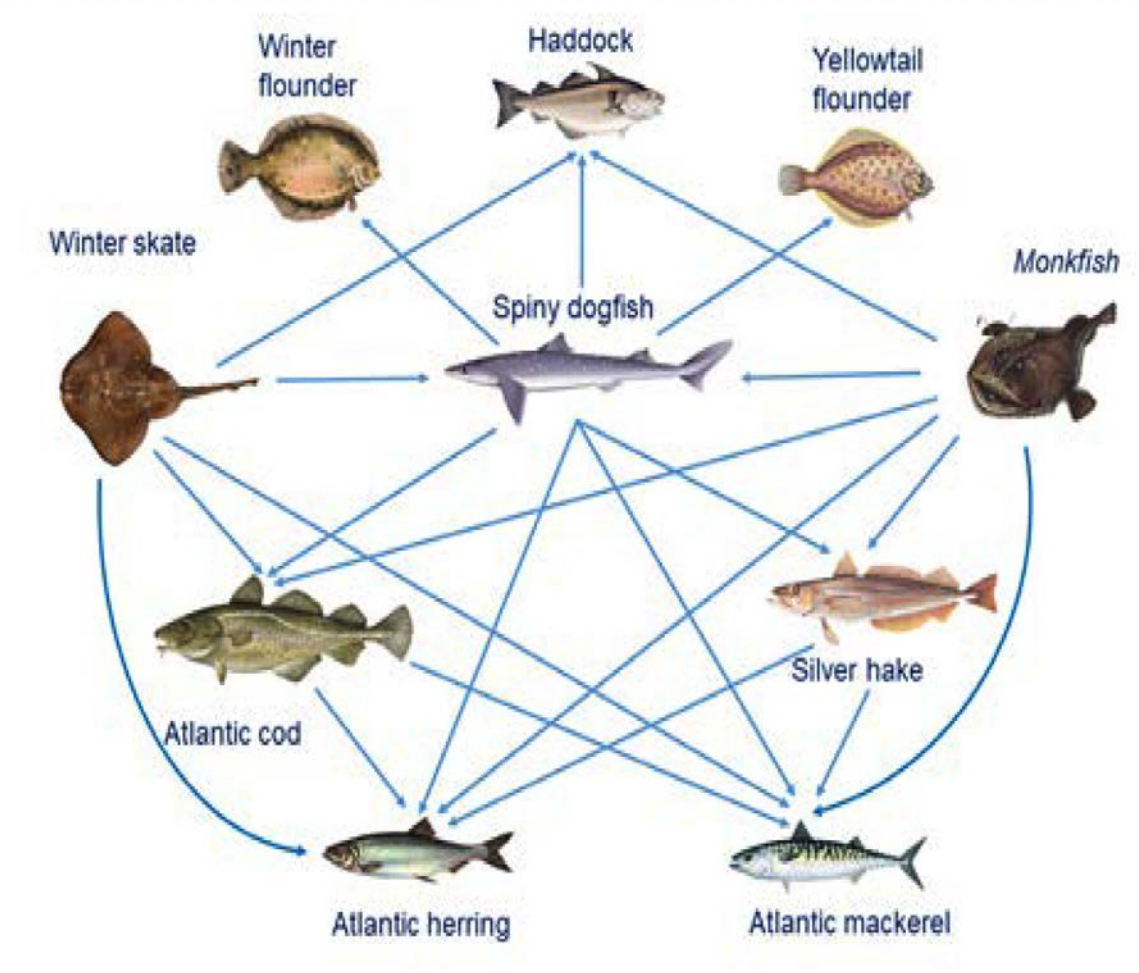
- Introduction to EBFM
- Science supporting EBFM
- An Introduction to the eFEP and Worked Example tools
- Catch ceilings and how they are determined

Introductory Video

- Stakeholder perspectives
- Intended to initiate discussion and further inquiry

Phase III
Worked Example tools

Description of Hydra Operating Model with example scenarios



Phase III
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Description of Hydra Operating Model with example scenarios

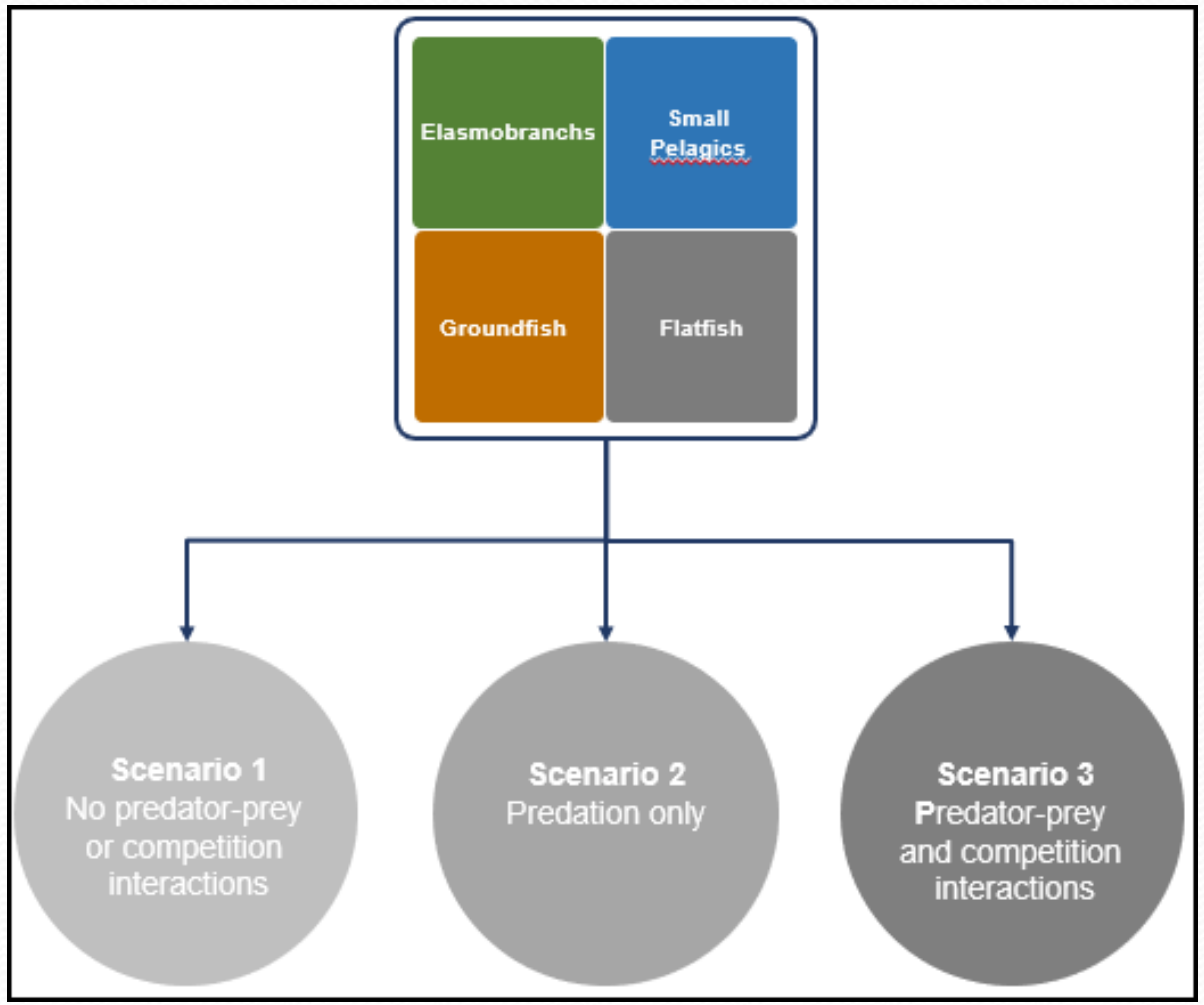
Kraken visualization tool

Effect of biological interactions

Catch framework demonstration tool

Application of floors and ceilings approach

Stock complexes



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