

Working Paper: Fishery Background and Fishing Industry Perspectives on Butterfish

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Primary contributors (via phone discussions with Jason Didden of the Butterfish Workgroup): Meghan Lapp (Seafreeze), Captain Chris Roebuck, Captain Glen Goodwin (Seafreeze), Dan Farnham (Silver Dollar Seafood), Eric Reid, Captain Phil Ruhle Jr., John Guerrieri (Town Dock), and Wayne Reichle (Lund's Fisheries). Information from Council staff's (J. Didden) discussions with the late Geir Mosen (Seafreeze) is also included given his wealth of knowledge about the butterfish market. Summary input from the Advisory Panel on related topics is also included, which also was asked to review a near-final draft.

ABSTRACT

As part of the butterfish research track assessment, the workgroup sought out industry perspectives on the butterfish fishery. The Mackerel, Squid, and Butterfish Advisory Panel was queried as were several other individuals identified through landings histories or other fishermen. This document summarizes relevant fishery background from several sources and the discussions with the contributors. Background information was provided to stimulate discussion with the contributors and their input was added around that background in this document. Relatively few fishery participants have focused on butterfish in recent years, and staff efforts to solicit input were re-directed to "the Goodwins" of Seafreeze several times as the best source for industry perspectives on butterfish. The assessment workgroup identified several broad areas of interest for discussion that form the structure of this document, but staff avoided being overly restrictive in directing discussion.

ORGANIZATION

- 1. Historical Fishery and Markets**
- 2. Spatial scope of Fishery**
- 3. Availability**
- 4. Catchability**

1. HISTORICAL FISHERY AND MARKETS

Relatively modern records date to the late 1800s and from then until 1962, catch was made by U.S. fishermen using a mix of fixed (e.g. pound nets) and mobile (e.g. bottom otter trawl) gears harvesting moderate quantities of butterfish - annual catches from 1920-1962 averaged about

3,500 metric tons (mt; 2204.6 pounds) (Waring 1975, Murawski and Waring 1979). From 1963-1986 a foreign fishery harvested butterfish, peaking at over 30,000 mt in 1973. The elimination of foreign fisheries began in 1976 with the commencement of federal/Council fishery management through the Magnuson Stevens Act (MSA). Foreign fisheries declined from over 14,000 mt in 1976 to about 3,000 mt in 1977 with the advent of domestic management and were gradually and fully phased out by 1987 (NMFS 2010, MAFMC 2011). In 2012 Geir Monsen (Seafreeze) reported to Council staff that representatives of Japanese fishing companies had told him that when they were allowed to fish what is now the U.S. EEZ they caught about 60,000 mt of butterfish each year for a period, but only reported a fraction of their butterfish landings (e.g., the mean annual catch during 1967–1976 in Table 1 of Murawski and Waring (1979) is 5481 mt).

The higher volume domestic butterfish fishery developed in the 1980s, primarily driven by one company, Seafreeze, Ltd, which still catches butterfish today. Seafreeze developed a frozen export Japanese market for butterfish, supplying high end hot spring resorts with butterfish primarily as a breakfast food (pers com G. Monsen 2012 and E. Reid). The domestic fishery averaged over 5,000 mt per year in the 1980s. Catches dwindled in the 1990s, reportedly due to both declines in abundance and market demand issues. Fish for export have been primarily targeted in the late fall to early winter periods to optimize fat content and minimize feed content. (Perscom Geir Monsen 2012). Meghan Lapp from Seafreeze reports that the Point Judith Co-Op did tremendous production in the 1980s, packing and shipping to Japan - they would pack the fish in “swim packs” with all the fish facing the same way, for presentation to Japanese customers. John Guerrieri, who worked for the Point Judith Co-Op at the time, remembers the Co-Op doing as many as 22 tractor trailer loads in one night (40,000 lbs per truck). Eventually, he said the fish got smaller and since the Japanese mostly wanted bigger fish, the market dried up. Chris Roebuck added that Japanese economic problems meant they wouldn’t pay what US fishermen needed to make targeting butterfish worthwhile. Other opportunities were worth more money to U.S. fishermen.¹

Excepting one good year in 2001, landings steadily declined to around 500 mt by 2003 (in the absence of quota constraint). Seafreeze landed most of the 2001 butterfish and had trouble getting rid of them, attesting to the market issues hindering utilization of the resource (Perscom Geir Monsen 2012 - note low 2001 price in Figure 2 below). While regulations did not contribute to the demise of the directed fishery in the late 1990s and early 2000s, trip limits and quotas afterward locked the fishery into a state of a bycatch fishery. Low trip limits were implemented in 2005 and made more restrictive in 2008, while a rebuilding plan was being developed in response to an assessment finding in 2004 that butterfish was overfished (SAW 38). A constraining landings quota of 500 mt was also implemented in 2008 but the trip limits and availability had been limiting landings to about that amount already. Amendment 10 (MAFMC 2010) implemented the butterfish cap for the longfin squid fishery in 2011 (to control discarding in that fishery), and the Council’s AP has repeatedly reported that the longfin squid fishery’s

¹ John P. Lee, wrote an interesting blog piece on the history of the butterfish fishery with details on the Japanese market, available here: <https://www.thedentedbucket.com/a-fish-that-built-a-port/>.

butterfish cap created a general desire to avoid butterfish, related to fear of causing closure of the longfin squid fishery.

Regulations/quotas then precluded resumption of a directed fishery from 2005 until 2013, when a limited directed fishery quota was re-established based on empirical analyses conducted by NEFSC staff (<https://www.mafmc.org/ssc-meetings?year=2012>). The AP reported that from 2005-2013 landings primarily consisted of limited fresh markets and frozen bait. A 2014 assessment utilizing data through 2012 found that not only was butterfish not overfished, but that it had never been overfished, and quotas were substantially increased beginning in 2015 ([SAW/SARC 58](#) - the assessment review was delayed from late 2013 to early 2014 due to a government shutdown). Geir Mosen in 2012 predicted that “It will take many years to bring the market back and there will be plenty of time to adjust the management if the situation warrants it.” He also noted “Please keep in mind that with a short lived species like butterfish the natural swings in population can be huge. The recruitment can be very strong and the timeline between a stock high and a stock low can be very short.” (Perscom Geir Mosen 2012)

Ongoing input from the AP and other participants has emphasized both the limited markets for butterfish and the potential for rapid changes in butterfish abundance. 2021 input from the Advisory Panel also noted that US butterfish compete with fish from Ecuador (“pampano”) and Thailand currently, which can supply larger fish, further constraining resumption of directed fisheries. New inspections in Chinese ports due to COVID has also affected international trade (MAFMC 2021). Chris Roebuck noted that recently/currently other fish are worth more money – butterfish are out there but high prices for Longfin squid mean they are a better opportunity than butterfish especially since the Asian export market hasn’t re-developed. Dan Farnham stated that the fresh market is particularly limited and at trips over 10,000 pounds price collapses. Dan Farnham sees butterfish mostly as bycatch while whiting fishing. D. Farnham and others noted the Atlantic Monument area had been a good place to quickly catch large butterfish before the area was restricted. Wayne Reichle echoed the very strong constraining effect of the limited market for butterfish, and that the slow redevelopment of directed fishing was expected, and that major increases in landings would not be expected regardless of quotas unless substantial changes in the market occur. Glenn Goodwin added that there was a time period after 2016 when China was willing to buy smaller butterfish but between Covid and perhaps general trade issues, the Chinese market has softened; Seafreeze will land some butterfish when no other opportunities are available.

Figure 1. Butterfish Landings and Nominal Revenues since 1996. (unpublished NMFS data)

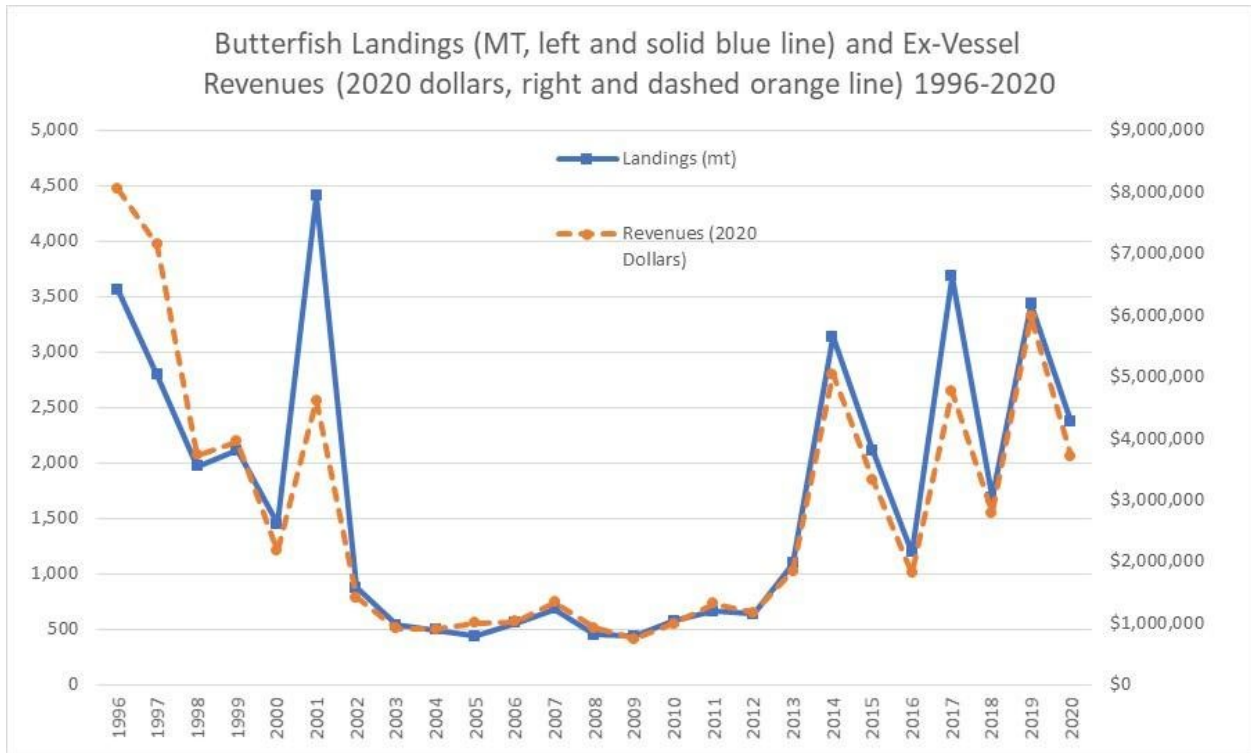
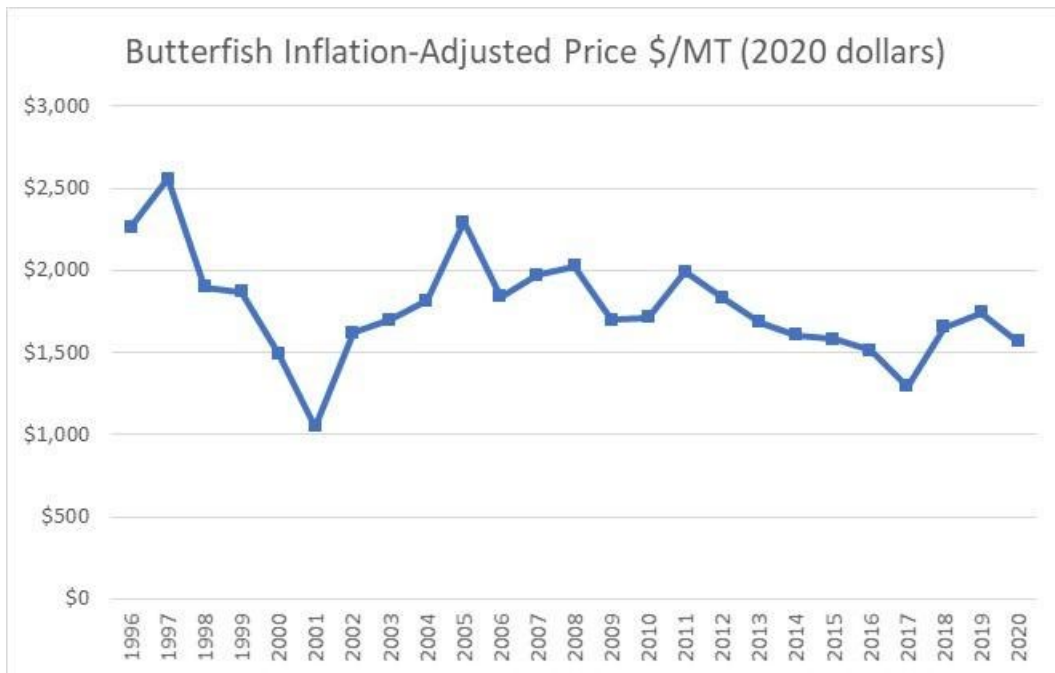


Figure 2. Butterfish Ex-Vessel Prices Since 1996 in 2020 Adjusted Dollars. (unpublished NMFS data)



2. SCOPE OF FISHERY

Fishery observations are limited by the scope of fishing activities in space and time. Fishing activity is influenced by markets, abundance, availability, regulations, and weather. The figure immediately below was created for Amendment 9 to the FMP with 1996-2003 data (MAFMC 2008), and the next figure following represents a more recent (2018) visualization of landing locations (MAFMC 2019) (both VTR data). Given the different methods to create these they are not directly comparable, but there appears to be a general similarity to the range of catch locations across these time periods. AP members and contributors have reported that while locations of the fishery may have generally remained consistent over time, the Atlantic Monument closure affected access to product in some recent years and the Lobster Restricted Gear Area rules (designed to minimize gear conflicts) restrict butterfish fishing at times as well.

Figure 3. Geographic distribution of butterfish harvest according to VTR data (1996 – 2003) (unpublished NMFS data)

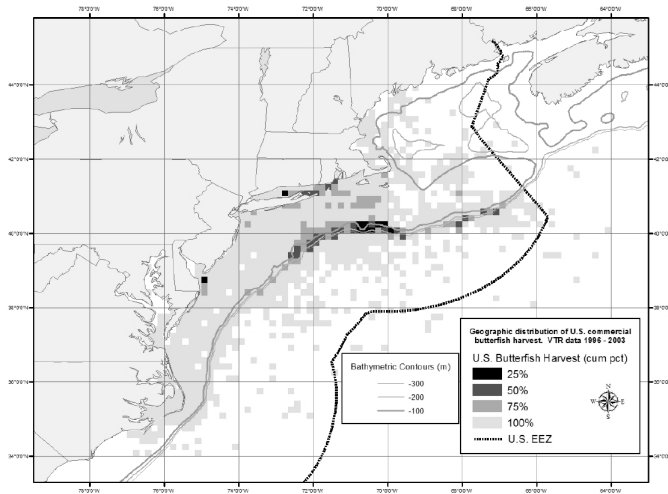
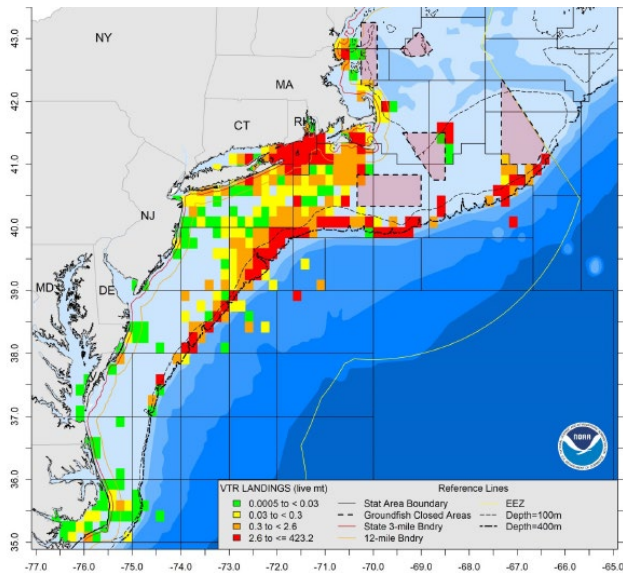


Figure 4. Geographic distribution of 2018 butterfish harvest according to VTR data. (unpublished NMFS data)



3. AVAILABILITY

The [Butterfish EFH Source Document](#) (NMFS 1999) indicates migration inshore in the spring/summer and offshore in the winter north of Delaware Bay. South of Delaware Bay, the winter offshore movement is not as extensive (individuals may move further south but still in shallow water), with more limited seasonal inshore-offshore migration south of Cape Hatteras. The “Butterfish Smackdown & Environmental Modeling” work done for the previous assessment identified regions and times when butterfish concentrations were likely to be high at scales of 10s of kilometers based largely on thermal preferences. Fishermen understood species-habitat associations at scales much finer than could be described by the data used to construct the model (and thus by the model itself). Contributors were asked “What do you think are the most important habitat characteristics (temperature, salinity, depth, prey, predators, water stratification, etc.)?”

Chris Roebuck indicated temperature is the dominant factor and that butterfish have tended to inhabit the same spaces seasonally year to year for the last 20 years. He sees vertical day/night movements but less concrete patterns than species such as longfin or mackerel, which likely contributes to variability in surveys. He sees smaller fish to the southwest, and bigger fish to the east across different temperature ranges. Other factors that he/we don’t understand as well drive local abundance and distribution. Glenn Goodwin also finds them to be temperature sensitive. When the water temperature starts increasing when *Illex* fishing they start to see more butterfish offshore. Generally they are looking for *Illex* in low 50s F (10 C) – once it gets into mid 50s F (about 12 C) it’s more favorable for butterfish. In winter butterfish seem dormant – once you find them they don’t seem to move much and haven’t been feeding.

Contributors were asked specifically about observations about changes in availability/distribution over time. The Advisory Panel has noted that spiny dogfish are often a problem. The schools of dogfish are over the schools of butterfish, feeding on them from above. You can’t set the net on the butterfish without catching dogfish (which would destroy any product). So vessels targeting butterfish have to hunt for miles to find a stretch of a butterfish school without dogfish

covering it. Chris Roebuck noted that especially off to the east, butterfish won't go to the bottom because of high dogfish numbers, making areas unfishable. Dogfish populations seem to be higher and higher after it was thought they collapsed. Glenn Goodwin indicated that fishermen don't see overall swings in abundance, but do see swings in size and year-classes that drive the marketability of the fish that are out there (which drives interest and landings). He indicated that Lobster Restricted Gear Areas (RGAs) influence access, as did the Atlantic Monument especially for larger fish that historically are found to the east. Fish south of Hudson Canyon are usually too small for marketability. The Monument acted as a fence of sorts – not worth getting across and fishing even further east. He cited the 2001 trawl survey steaming past them when they were catching high amounts of butterfish in 2001 and patchy distribution as why trawl survey results are going to be more noisy than anything else. Weather and water temperature are creating swings spatially and in the water column making butterfish very difficult to assess due to the varying availability to survey gear and since so few vessels target them (rather most stay away). Meghan Lapp added that she has been told that the Vineyard Wind survey is seeing a lot of butterfish and could be a source of additional information. Hank Lackner of the Advisory Panel added that a shift further and further east to the Canadian line has occurred, possibly driven by an influx of sea robins, which may also be driving butterfish off the bottom.

4. CATCHABILITY

Most input from contributors related to fishing offshore, but typical inshore gear (e.g. trawl/boxnets) was reported as generally effective when the fish are on the bottom. Offshore, typical gear is believed to be likewise effective when the fish are on the bottom, and their similar behavior to longfin has made gear-based bycatch solutions challenging to develop.

Conversations turned to acoustics and fishery participants' use of acoustics to target butterfish. Chris Roebuck indicated butterfish are very difficult to ID without proper equipment – only 4-5 boats on the east coast have this. Mike Jech of the NEFSC worked with him – can see them on appropriate acoustic equipment. When butterfish come up off the bottom they tend to disperse and are undetectable. On the bottom they look like carpet, a fine line. Usually most fishermen are just trying to avoid. Garrett Lawson of WHOI has footage of classic behavior on acoustics. 200/50-kHz split typical, 38-kHz split won't see them. See them on 200-kHz, but not on 50-kHz. Rely on what appears and does not appear on different frequencies.

Glenn Goodwin indicated they use acoustics to search for butterfish without dogfish. In steep areas butterfish become undetectable. If catch sensors alert without seeing anything on acoustics they are often butterfish. Butterfish's fingerprint on acoustics can be like a pencil stripe. They will adjust gain across equipment – when marking on some and not on others can determine which are butterfish. They develop expertise on bigger boats since they do more search time rather than going with the fleet as often. A lot of nets fleet uses were designed to shed dogfish. Bigger mesh in bottom and sides with kites so only sweep is on the bottom. Avoiding dogfish is key.