



2022 MONKFISH FISHERY PERFORMANCE REPORT

This fishery performance report provides a brief overview of the biology, stock condition, management system, and fishery performance for monkfish, with an emphasis on the last few years. This report is intended to help the Monkfish Committee, Scientific and Statistical Committee, and Councils understand the fishery and to help interpret fishery data; it may help understand trends in and relationships between landings and abundance.

The Monkfish Plan Development Team (PDT) prepared this report in collaboration with the Monkfish Advisory Panel (AP). The AP met on [May 4, 2022](#) to review the data in this report and develop input on fishing effort, market trends, environmental changes, and other factors impacting the fishery. A few clarifications have been noted, as suggested by reviews of the PDT, Monkfish Committee, SSC, and Council staff. For more information about the monkfish fishery, visit the [Monkfish Fishery Management Plan webpage](#) of the New England Fishery Management Council (NEFMC) and the [Commercial Fishing Performance Measures](#) webpage of the Northeast Fisheries Science Center.

Key Points:

- The 2013 assessment determined that monkfish was not overfished, and overfishing was not occurring. Assessments in 2016 and 2019 could not update stock status (so considered unknown). There is substantial uncertainty regarding monkfish biomass and fishing mortality. Stock status will be reevaluated in 2022.
- The number of monkfish limited access permits has lowered over the past decade (670 to 562), about 9-20% landed \geq 10,000 lb of monkfish each year.
- There is a substantial amount of latent effort in the fishery; the number of monkfish Days-At-Sea (DAS) used is far below the DAS allocated.
- Recent discards as percent of catch is lower in the north (9-26%) vs. the south (36-62%).
- Advisors feel low monkfish prices have been the main limiter of the fishery. Costs are increasing and wages are not competitive with shoreside employers.
- There is substantial concern about the impacts of offshore energy development and potential restrictions regarding protected species.
- Advisors would like more flexibility to fish more efficiently than current effort controls allow.

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BASIC BIOLOGY

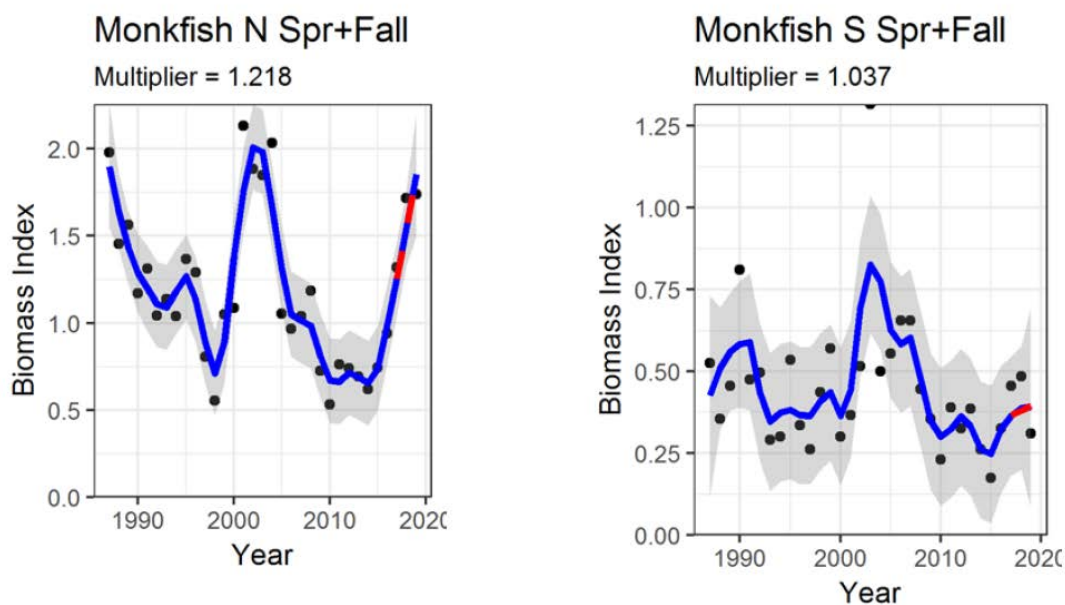
Monkfish (*Lophius americanus*), also called goosefish, occur in the Northwest Atlantic Ocean from the Grand Banks and northern Gulf of St. Lawrence south to Cape Hatteras, North Carolina (Collette & Klein-MacPhee 2002). Seasonal onshore-offshore migrations occur (from inshore areas to depths of at least 900 m) and appear to be related to spawning and possibly food availability (Richards *et al.* 2008). Stock structure is not well understood, but two assessment and management areas for monkfish, northern and southern, were defined in 1999 through the original Fishery Management Plan based on patterns of recruitment and growth and differences in how the fisheries are prosecuted (NEFSC 2020).

STATUS OF THE STOCKS

An overfishing limit (OFL) for each the northern and southern monkfish stocks has been defined as the product of the fishing mortality threshold (F_{max}) and the current estimate of exploitable biomass ($B_{current}$). The stock assessments in 2010 and 2013 concluded that the northern and southern monkfish stocks were not overfished, and overfishing was not occurring but recognized substantial uncertainty in this determination. After the 2013 assessment, the OFLs were lowered for FY 2014-2016 to 17,805 mt and 23,204 mt for the northern and southern stocks, respectively.

The stock assessments in 2016 and 2019 did not update the growth model that had been used since 2007 to assess the monkfish stocks after its use was rejected by age validation research in 2016. Instead, the stocks were assessed using the “Plan Bsmooth” method. These assessments concluded that many of the biological reference points were no longer appropriate due to invalidation of the growth model, and thus were not updated. Stock status has been unknown since 2016 and the OFLs have remained at the levels set for FY 2014. The 2019 assessment determined that a strong recruitment event in 2015 led to an increase in biomass in 2016-2018 (Figure 1), though abundance declined in 2019 as recruitment returned to average levels (NEFSC 2020; Richards 2016). Stock status was not updated in 2019 but will be revisited with updated data in the 2022 Monkfish Management Track Assessment, which will be peer reviewed in September 2022.

Figure 1. Results of "Plan Bsmooth" analysis from 2019 monkfish assessment (NEFSC 2020).



Note: Points are observed biomass indices, lines are loess-smoothed indices, “multiplier” is slope of log-linear regression through terminal three smoothed points. Results using spring and fall indices.

MANAGEMENT SYSTEM

The monkfish fishery in U.S. waters has been jointly managed since 1999 under the Monkfish Fishery Management Plan (FMP) by the NEFMC and the Mid-Atlantic Fishery Management Council (MAFMC), with the NEFMC having the administrative lead. The fishery extends from Maine to North Carolina out to the continental shelf margin. The fishery is managed as two separate stocks; the Northern Fishery Management Area (NFMA) covers the Gulf of Maine (GOM) and northern part of Georges Bank (GB), and the Southern Fishery Management Area (SFMA) extends from the southern flank of GB through the Mid-Atlantic Bight to North Carolina. The fishery is primarily managed with a yearly allocation of days-at-sea (DAS) and landing limits.

Specifications follow a hierarchy of an acceptable biological catch (ABC), and an annual catch limit (ACL) set equal to the ABC, an annual catch target (ACT) set equal to 97% of the ACL, and total allowable landings (TAL) set equal to the difference between the ACT and expected discards. These specifications are set for each management area to reduce the likelihood of the ACL being exceeded. The NFMA monkfish fishery is closely integrated with the Northeast multispecies fishery, and is primarily a trawl fishery, while the SFMA fishery is primarily a gillnet fishery targeting monkfish (with some vessels also landing skates). The differences between the two areas have resulted in some variations in management measures, such as landing limits and DAS restrictions.

Fishery specifications are set every three years. For FY 2020-2022, the ABC in the NFMA increased by 10% and was status quo in the SFMA relative to FY 2017-2019 (Table 1). The discard rate and expected discards for the NFMA increased modestly from the FY 2017-2019 specifications (13.9% to 18.2%), but the increase in the SFMA was more pronounced (24.6% to 50.8%). The large increase in SFMA discards is likely due to the large 2015-year class and predominantly the discards in dredge gear.

Table 1. Specifications for FY 2020-2022 (Framework 12).

	Northern FMA	Southern FMA
	(mt)	(mt)
ABC = ACL	8,351	12,316
ACT (97% of ACL)	8,101	11,947
Expected Discards	(-18.2%) 1,477	(-50.8%) 6,065
Federal TAL (ACT – discards)	6,624	5,882

FISHERY PERFORMANCE

Permits and Vessels

The Monkfish FMP has [seven types of federal permits](#): six categories of limited access permits (A-D, F, H) and one open access permit (E, Table 2). The number of fishing vessels with limited access monkfish permits has decreased over the past decade, from 670 to 562 (Table 3). Of those vessels, about 35-48% landed over 1 lb of monkfish each year and about 9-20% landed \geq 10,000 lb of monkfish. Permit category C and D vessels consistently accounted for the greatest portion of vessels with monkfish permits and landing monkfish (Table 3, Table 4).

Fishery Effort

Effort controls such as possession limits and Days-at-Sea (DAS) are used to help ensure that the fishery landings remain within the TAL. Framework 10 established the possession limits and DAS allocations for FY 2017-2019, and these remain unchanged through FY 2022.

Table 2. Monkfish permit categories.

Permit Category	Description	
Limited Access	A	DAS permit that <i>does not</i> also have a groundfish or scallop limited access permit (possession limits vary with permit type).
	B	
	C	DAS permit that <i>also</i> has a groundfish or scallop limited access permit (possession limits vary with permit type).
	D	
	F	Seasonal permit for the offshore monkfish fishery.
	H	DAS permit for use in the Southern Fishery Management Area <i>only</i> .
Open Access	E	Open access incidental permit.

Table 3. Fishing vessels with federal monkfish permits, with number of vessels landing over 1 lb and 10,000 lb, FY 2012-2021.

Permit Category	2012			2015			2018			2021		
	All	>1lb	>10K lb	All	>1lb	>10K lb	All	>1lb	>10K lb	All	>1lb	>10K lb
A	22	6	4	22	4	*	20	*	*	18	8	6
B	44	9	5	42	4	*	38	6	4	38	19	15
C	295	148	60	267	128	30	268	110	30	255	114	42
D	292	94	28	242	59	10	226	77	18	229	115	50
F	9	6	4	17	9	*	17	14	4	14	13	0
H	8	5	4	8	6	5	7	6	3	8	*	0
Total LA	670	268	105	598	210	51	576	214	60	562	270	113
E	1,743	338	19	1,578	247	8	1,525	247	20	1,485	176	7

Source: GARFO Permit database and DMIS as of April 2022.

Table 4. Proportion of monkfish landings by permit category to total monkfish landings in the year, FY 2012-2021.

Permit Category	2012	2015	2018	2021
A and B	15%	13%	16%	12%
C and D	75%	80%	77%	83%
F	2%	2%	1%	>1%
H	1%	1%	1%	0%
E	7%	5%	5%	4%
All	100%	100%	100%	100%

Source: GARFO Permit database and DMIS as of April 2022.

Use of Days-At-Sea Allocated

DAS allocations have remained the same since FY 2017 (FW10). Limited access vessels are allocated 45.2 monkfish DAS per vessel per fishing year, 37 of which can be used in the Southern Fishery Management Area. An average of 575 permits were allocated DAS between FY 2019 – FY 2021, where permit categories C and D accounted for the greatest number of allocated DAS with about 10-11,000 DAS allocated for each (Table 5). There is a substantial amount of latent effort in the monkfish fishery; the number of DAS used is far below the DAS allocated. Further, the percentage of vessels that used at least one monkfish DAS varies by permit category. Of the Permit Category A and B vessels, 52-64% used at least one DAS in FY 2019-2020, but that decreased to 28-38% in FY 2021. The Category C and D vessels had more stable participation, but was generally lower, 4-18% these past three fishing years.

Table 5. Monkfish DAS usage, FY 2019 – 2021.

Permit Category	All Vessels			Vessels that used ≥ 1 DAS
	Total Vessels	DAS Allocated	DAS Used	
FY 2019				
A	21	909	385	11 (52%)
B	39	1,689	750	25 (64%)
C	273	11,821	583	24 (9%)
D	238	10,305	850	42 (18%)
FY 2020				
A	15	650	193	9 (60%)
B	37	1,602	444	23 (62%)
C	268	11,604	334	17 (6%)
D	229	9,916	490	32 (14%)
FY 2021				
A	18	779	130	5 (28%)
B	37	1,602	280	14 (38%)
C	255	11,042	177	11 (4%)
D	223	9,656	397	24 (11%)

Source: GARFO Vessel Permits and Allocation Management System (AMS) databases, accessed March 2022. *Notes:* Permit categories F and H account for a minor number of permits, DAS allocated, and DAS used, thus, are not included in table.

Fishery Catch

Methods for Calculating Catch

Total Discards. Historically, monkfish discards have been calculated two ways: i) by GARFO following the close of the fishing year for end of year ACL accounting and ii) by NEFSC by calendar year during the assessment process. Methods for calculating discards are evolving towards a unified estimate from GARFO and the NEFSC using the Catch Accounting and Monitoring System (CAMS), but the discard data presented in this report were calculated as follows:

- For ACL accounting (Table 6), GARFO estimates discards using a Cochran discard ratio estimator with observed trips stratified by gear, mesh group, management area and half year. Discard ratios estimated from observed trips were then applied to stratified unobserved trips to estimate discards on unobserved trips. Total discards were calculated by using the estimates of observed discards on observed trips and using the calculated rate and trip K_{all} on unobserved trips. Monkfish discard mortality was assumed to be 100% across all gear types, although recent research suggests that monkfish discard mortality may be lower, at least in the scallop dredge fishery (Weissman *et al.* 2021).
- For the 2020 assessment (Figure 2), the NEFSC estimated discards by gear, half year and management area using observer data. For otter trawls and gillnets, the observed monkfish discard-per-kept-monkfish ratio is expanded to total monkfish discards. For scallop dredges and shrimp trawls, the observed monkfish discard-per-all-kept-catch ratio is expanded to total monkfish discards. Monkfish discard mortality was also assumed to be 100% across all gear types in NEFSC estimates of monkfish discards. These discard methods are being reevaluated in the 2022 assessment.

Total Landings. Total landings of monkfish were calculated by GARFO using the CFDERS dealer dataset after the close of the fishing year for both commercial and state permits.

Recreational Catch. Recreational catch was calculated from the MRIP database. Monkfish recreational discard mortality was assumed to be 100%.

Total Catch – Year-End ACL Accounting

From FY 2017-2021, the ACL was exceeded in the NFMA twice and never in the SFMA (Table 6). Commercial landings were 74-90% of total catch in the NFMA and 37-59% in the SFMA. State landings, defined as vessels that have never had a federal fishing permit (permit # = 000000), consistently make up under 0.5% of catch. Recreational catch is consistently under 5% of catch. In the NFMA, discards were 9% of catch in FY 2017 and have since fluctuated between 20-26% of catch. In the SFMA, discards were 51-58% of catch FY 2017-2019, lowered to 36% in FY 2020, but increased again to 62% in FY 2021.

Table 6. Year-end monkfish annual catch limit (ACL) accounting, FY 2017-2021.

Catch accounting element	Pounds	Metric tons	% of catch	% of ACL
FY 2017				
Northern Fishery Management Area (ACL = 7,592 mt)				
Commercial landings	15,003,103	6,805	90%	89.6%
State-permitted only vessel landings	60,031	27	0.4%	0.4%
Estimated discards	1,567,883	711	9%	9.4%
Recreational catch	11,725	5.3	0.1%	0.1%
Total Northern monkfish catch	16,642,742	7,549	100%	99.4%
Southern Fishery Management Area (ACL = 12,316 mt)				
Commercial landings	8,392,979	3,807	42%	30.9%
State-permitted only vessel landings	66,936	30	0.3%	0.2%
Estimated discards	11,531,614	5,231	58%	42.5%
Recreational catch	1,627	1	0.0%	0.0%
Total Southern monkfish catch	19,993,156	9,068	100%	73.6%
FY 2018				
Northern Fishery Management Area (ACL = 7,592 mt)				
Commercial landings	13,237,011	6,004	74%	79.1%
State-permitted only vessel landings	37,468	17	0.2%	0.2%
Estimated discards	4,666,815	2,117	26%	27.9%
Recreational catch	6,977	3	0.0%	0.0%
Total Northern monkfish catch	17,948,271	8,141	100%	107.2%
Southern Fishery Management Area (ACL = 12,316 mt)				
Commercial landings	10,133,407	4,596	45%	37.3%
State-permitted only vessel landings	64,841	29	0.3%	0.2%
Estimated discards	11,505,833	5,219	51%	42.4%
Recreational catch	742,988	337	3.3%	2.7%
Total Southern monkfish catch	22,447,069	10,181	100%	82.7%
FY 2019				
Northern Fishery Management Area (ACL = 7,592 mt)				
Commercial landings	13,673,898	6,202	79%	81.7%
State-permitted only vessel landings	16,474	7	0.1%	0.1%
Estimated discards	3,418,346	1,551	20%	20.4%
Recreational catch	164,771	75	1.0%	1.0%
Total Northern monkfish catch	17,273,489	7,835	100%	103.2%
Southern Fishery Management Area (ACL = 12,316 mt)				
Commercial landings	8,236,922	3,736	42%	30.3%
State-permitted only vessel landings	66,673	30	0.3%	0.2%
Estimated discards	11,174,259	5,069	57%	41.2%
Recreational catch	11,410	5	0.1%	0.0%

Total Southern monkfish catch	19,489,264	8,840	100%	71.7%
FY 2020				
Northern Fishery Management Area (ACL = 8,351 mt)				
Commercial landings	11,684,519	5,300	77%	63.5%
State-permitted only vessel landings	13,416	6	0.1%	0.1%
Estimated discards	3,503,282	1,589	23%	19.0%
Recreational catch	23,077	10	0.1%	0.1%
Total Northern monkfish catch	15,224,294	6,905	100%	82.7%
Southern Fishery Management Area (ACL = 12,316 mt)				
Commercial landings	4,944,794	2,243	59%	18.2%
State-permitted only vessel landings	20,749	9	0.2%	0.1%
Estimated discards	3,078,040	1,396	36%	11.3%
Recreational catch	359,987	163	4.3%	1.3%
Total Southern monkfish catch	8,453,570	3,834	100%	31.1%
FY 2021				
Northern Fishery Management Area (ACL = 8,351 mt)				
Commercial landings	11,496,640	5,215	75%	62.4%
State-permitted only vessel landings	18,511	8	0.1%	0.1%
Estimated discards	3,857,341	1,750	25%	21.0%
Recreational catch	7	0	0.0%	0.0%
Total Northern monkfish catch	15,372,499	6,973	100%	83.5%
Southern Fishery Management Area (ACL = 12,316 mt)				
Commercial landings	4,338,159	1,968	37%	16.0%
State-permitted only vessel landings	32,185	15	0.3%	0.1%
Estimated discards	7,278,106	3,301	62%	26.8%
Recreational catch	30,056	14	0.3%	0.1%
Total Southern monkfish catch	11,678,506	5,298	100%	43.0%
<i>Notes:</i>				
<ul style="list-style-type: none"> • “Commercial landings” includes all monkfish landings by vessels with a permit number greater than zero and party/charter landings sold to a federal dealer. • “State-permitted only vessel landings” are landings from vessels that never had a federal fishing permit (so the permit #=0). • “Recreational catch” includes landings and discards from party charter vessels and private anglers, not sold to a federal dealer. 				
<i>Source:</i> Commercial fisheries dealer and Northeast Fishery Observer Program databases: FY 2017 data accessed 10/2018; FY 2018 accessed 3/2020; FY 2019 accessed 3/2021; FY 2020 accessed 4/22; FY 2021 accessed 7/2022; also Marine Recreational Information Program database.				

FY 2021 Landings

For FY 2021, 79% of the TAL was landed in the northern area and 34% in the southern area (Table 7). In the northern area, monthly landings were lower in May-November 2021 relative to December-March (312-417 lb/month vs. 501-654 lb/month). Otter trawls accounted for 63% of the FY 2021 landings to date. In the southern area, monthly landings were highest in May and June 2021 (439-535 lb/month), then dropped to a low in July-November (9-59 lb/month), then have been moderate since December (117-227 lb/month).

Table 7. FY 2021 Preliminary commercial monkfish landings by stock area and gear type: May 2021 – April 2022 (landings in live weight).

	MAY - 2021	JUN - 2021	JUL - 2021	AUG - 2021	SEP - 2021	OCT - 2021	NOV - 2021	DEC - 2021	JAN - 2022	FEB - 2022	MAR - 2022	APR - 2022	May–April, FY2021		FY 2021*		FY 2020*		Fishing Year* Landings		
													Metric Tons	Percent of Area	April 21 as a % of Target TAL	Target TAL	April 20 as a % of Target TAL	Target TAL		Metric Tons	Metric Tons
NORTHERN	312	417	364	348	372	338	342	539	549	501	637	509	5,228	73%	79%	6,624	80%	6,624			
OTTER TRAWL	280	294	206	167	206	234	280	493	530	482	614	484	4,250	59%	64%		70%				
GILLNET	25	103	150	178	164	96	58	45	18	14	8	45	804	13%	14%		9%				
DREDGE	0	1	3	2	1	8	3	1	1	0	0	0	20	0%	0%		0%				
OTHER GEARS	7	19	5	1	1	0	1	0	0	5	15	0	54	1%	1%		1%				
SOUTHERN	535	439	59	19	9	9	24	227	117	120	236	188	1,982	27%	34%	5,882	39%	5,882			
OTTER TRAWL	26	14	7	1	5	6	11	43	36	41	42	30	282	4%	4%		7%				
GILLNET	443	342	29	8	0	1	11	153	63	62	187	150	1,449	20%	25%		29%				
DREDGE	39	30	23	10	4	2	1	11	9	4	2	7	142	2%	2%		3%				
OTHER GEARS	27	53	0	0	0	0	1	20	9	13	5	1	129	2%	2%		1%				
ALL AREAS	847	856	423	367	381	347	366	766	666	621	873	697	7,210	100%							
OTTER TRAWL	306	308	213	168	211	240	291	536	566	523	666	494	4,612	63%							
GILLNET	468	445	179	186	164	97	69	198	81	76	195	195	2,353	33%							
DREDGE	39	31	26	12	5	10	4	12	10	4	2	7	162	2%							
OTHER GEARS	34	72	5	1	1	0	2	20	9	18	20	1	183	3%							
LANDINGS - ALL AREAS																					
Fishing Year 2021	847	856	423	367	381	347	366	766	666	621	873	697	6,513						7,605		
Fishing Year 2020	815	1,096	464	413	373	459	574	596	881	570	683	681	6,924						9,960		
Fishing Year 2019	1,506	1,221	786	541	505	590	558	888	1,086	1,004	720	555	9,405						10,768		
Fishing Year 2018	1,423	1,215	620	531	534	767	666	1,068	998	851	1,021	1,074	9,694						10,768		
Fishing Year 2017	1,067	1,153	607	654	634	953	780	1,122	1,057	1,004	607	697	9,638						10,319		
Fishing Year 2016	1,417	1,069	511	420	358	447	713	887	880	912	939	1,239	8,553						9,792		
Fishing Year 2015	1,256	963	590	431	389	482	578	848	594	755	992	935	7,878						8,813		
Fishing Year 2014	1,313	1,149	453	415	357	463	654	900	824	395	785	1,110	7,708						8,818		
Fishing Year 2013	1,232	919	522	350	412	556	745	952	630	765	756	845	7,839						8,684		
Fishing Year 2012	1,574	1,266	502	394	439	672	547	806	733	530	654	988	8,116						9,104		
Fishing Year 2011	1,044	1,066	542	338	385	530	809	982	867	1,000	929	1,008	8,491						9,499		
Fishing Year 2010	928	839	422	306	282	350	561	643	716	712	730	830	6,488						7,318		
Fishing Year 2009	1,253	1,182	647	396	331	479	554	418	753	696	644	795	7,353						8,148		
Fishing Year 2008	1,641	1,359	674	537	539	665	808	812	1,084	703	634	824	9,455						10,279		
Fishing Year 2007	1,413	1,206	917	776	695	934	1,163	1,314	1,088	897	737	1,090	11,140						12,230		
Fishing Year 2006	1,314	1,490	1,181	909	880	1,104	1,140	1,130	967	671	951	848	11,738						12,586		
Fishing Year 2005	2,040	3,040	1,862	1,487	1,343	1,100	1,616	1,413	1,523	1,143	1,309	1,313	17,876						19,189		
Fishing Year 2004	1,806	1,979	1,381	1,380	1,304	1,243	1,803	1,681	1,264	1,173	1,235	1,478	16,449						17,927		
Fishing Year 2003	2,881	3,199	1,913	1,746	1,420	2,253	2,823	1,907	1,976	2,386	2,172	1,797	24,475						26,273		
Fishing Year 2002	1,574	2,093	1,489	1,382	1,524	1,643	1,937	2,203	2,015	1,762	2,631	1,553	20,255						21,807		

Source: [GARFO quota monitoring website](#), accessed July 2022.

Landings Relative to TAL

The NFMA has had a higher TAL and higher possession limits relative to the SFMA. Landings relative to TAL in the NFMA have been between 79-107% since FY 2016 (Table 8), which could be a combination of revised management measures (possession limits) and the large 2015-year class. The NFMA TAL was increased by 10% for FY 2020-2022 (relative to FY 2017-2019) and the individuals from the 2015-year class have grown large enough to be retained by the fishery and are less likely to be discarded because of minimum size regulations. The landings relative to TAL in the SFMA have been lower than the NFMA, between 34-51% since FY 2016.

Table 8. Recent landings (live weight, mt) in the NFMA and SFMA compared to target TAL.

Fishing Year	Northern Area			Southern Area		
	TAL (mt)	Landings (mt)	Percent of TAL achieved	TAL (mt)	Landings (mt)	Percent of TAL achieved
2014	5,854	3,403	58%	8,925	5,415	61%
2015	5,854	4,080	70%	8,825	4,733	53%
2016	5,854	5,447	93%	8,925	4,345	49%
2017	6,338	6,807	107%	9,011	3,802	42%
2018	6,338	6,168	97%	9,011	4,600	51%
2019	6,338	6,211	98%	9,011	3,785	42%
2020	6,624	5,299	80%	5,882	2,294	39%
2021	6,624	5,228	79%	5,882	1,982	34%

Source: GARFO quota monitoring [data](#), accessed July 2022.

Landings and Discards by Gear Type

The northern and southern areas have distinctions in terms of gear type. Since at least 1980, monkfish landings in the northern area have largely been by vessels using trawls (Figure 2). In the southern area, landings were primarily by vessels using dredges and trawls from 1980 to the early 1990s.¹ Through the 1990s and to today, gillnets have been the predominant gear for vessels landing monkfish. Discards have traditionally been higher in the south relative to the north, and recently, southern discards have approximated or exceeded landings. Since FY 2018, discards in the north and south have largely been from scallop dredges, with lesser amounts by otter trawl, gillnets, and other gears (Table 9).

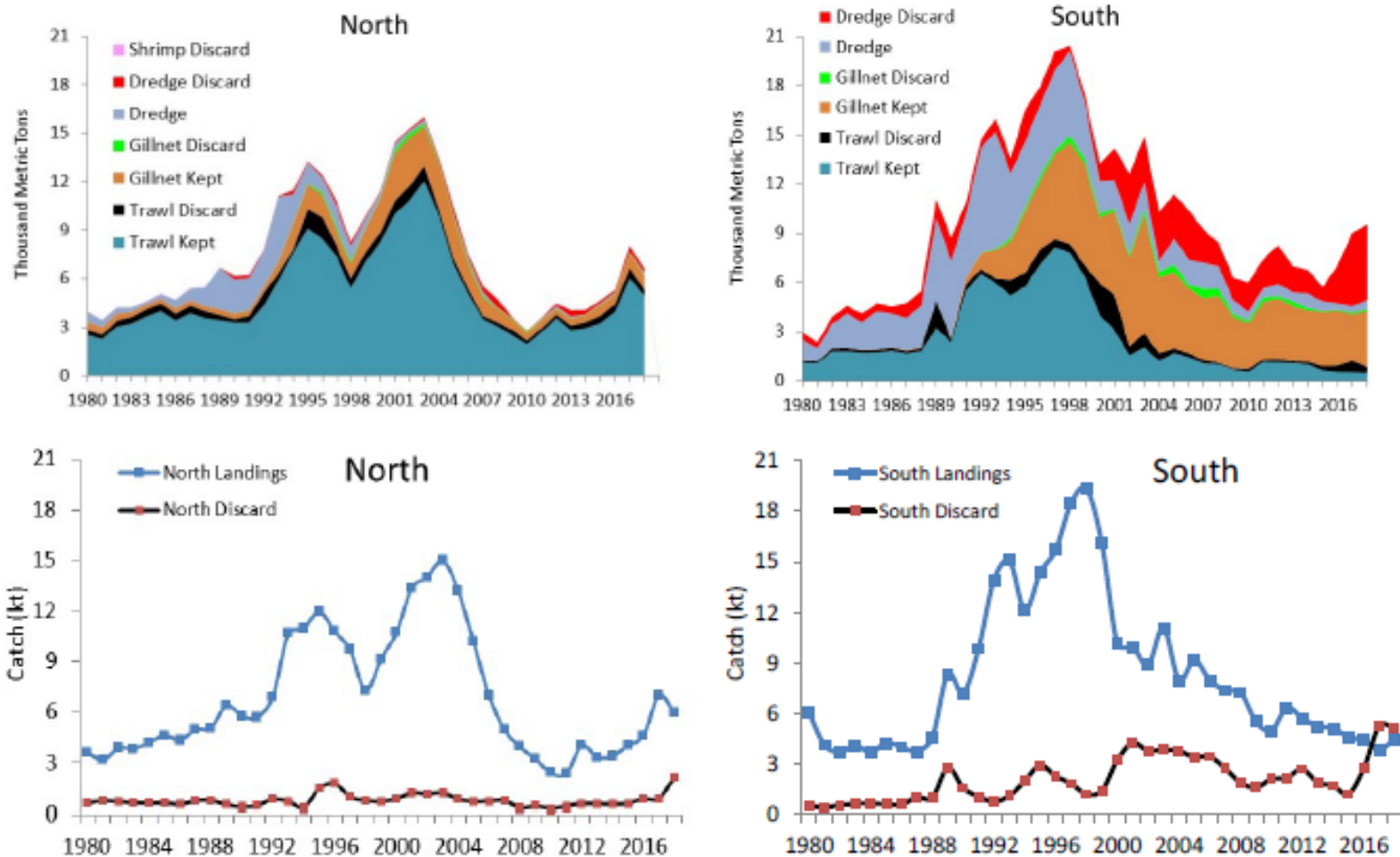
Table 9. Average monkfish discards by gear type, FY 2018-2021.

	Scallop Dredge	Otter Trawl	Gillnet	Other
Northern Area	52%	23%	13%	13%
Southern Area	83%	8%	3%	6%

Source: CAMS, accessed July 2022.

¹ Monkfish Committee notes this is likely due to new monkfish possession limits intended to rebuild the southern monkfish stock that made the offshore trawl fishery less feasible.

Figure 2. Monkfish landings and discards by gear type (top panel) and total (bottom panel) for North (left) and South (right), CY 1980-2019.



Source: NEFSC (2020, Figure D5).

Revenue

Monkfish fishery revenue has generally declined in recent years, from \$42.2M in CY 2005 to \$10.3M in CY 2021 (Table , not adjusted for inflation). Since at least CY 2011, about half of this revenue is from trips where monkfish was over 50% of total revenue (Table 11). There is a declining number of vessels that had trips where the monkfish revenue was over 50% of total revenue, from 206 in CY 2011 to 76 in CY 2021. CY 2020 and 2021 were particularly low revenue years. Monkfish price per live pound has been on a declining trend since 2010, though prices have been increasing within the last year (Figure 3). Seasonally, prices tend to be lower in spring to summer months and higher in fall to winter.

Table 10. Total monkfish revenue, CY 2005-2021.

Calendar Year	Revenue	Calendar Year	Revenue
2005	\$42.2M	2014	\$18.7M
2006	\$38.0M	2015	\$19.1M
2007	\$28.9M	2016	\$20.0M
2008	\$27.2M	2017	\$18.4M
2009	\$19.6M	2018	\$14.8M
2010	\$19.2M	2019	\$14.5M
2011	\$26.6M	2020	\$9.3M
2012	\$27.1M	2021	\$10.3M
2013	\$18.7M		

Source: ACCSP data, accessed April 2022.
Note: Revenues not adjusted for inflation.

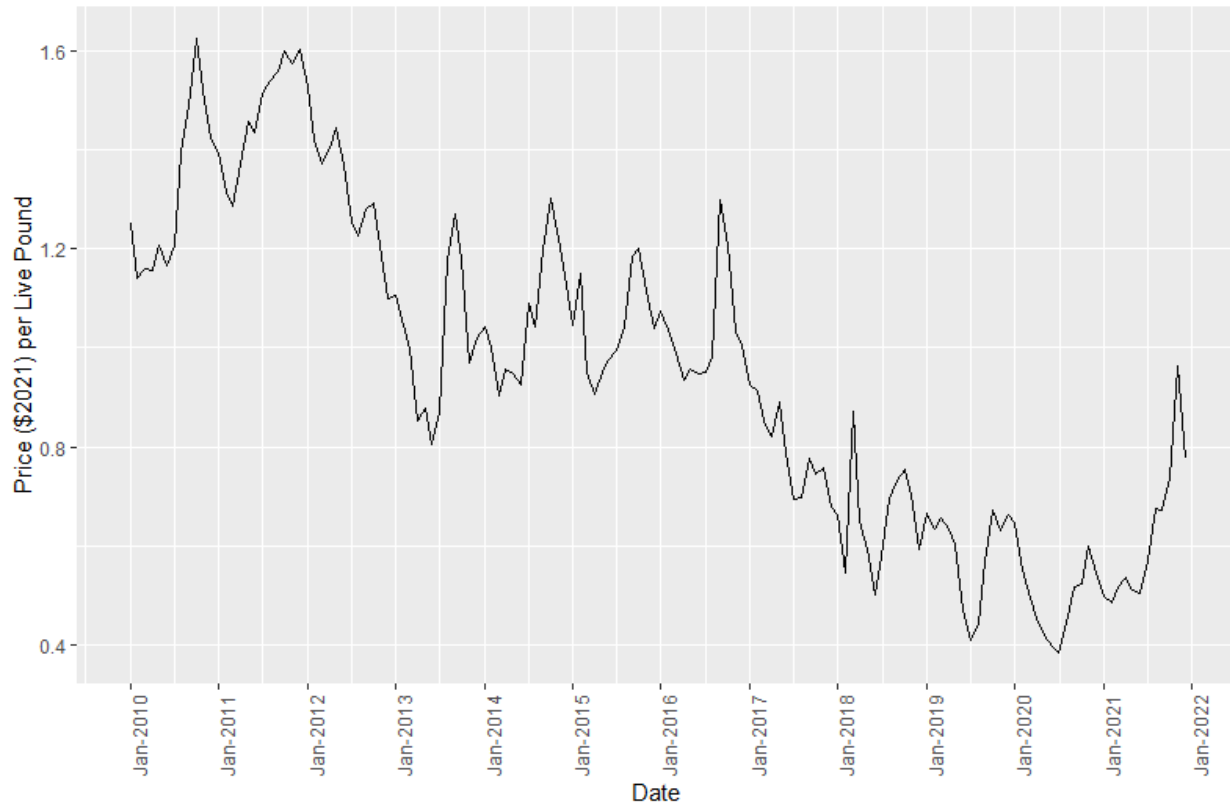
Table 11. Monkfish revenue and revenue dependence on trips where over 50% of revenue is from monkfish, CY 2011-2021.

Calendar Year	Vessels	Monkfish Revenue		Non-Monkfish Revenue		Total Revenue	% Monkfish
		Total	Per vessel	Total	Per vessel		
2011	206	\$17,205,690	\$83,523	\$3,494,295	\$16,963	\$20,699,985	83%
2012	196	\$15,769,087	\$80,455	\$3,478,988	\$17,750	\$19,248,075	82%
2013	164	\$9,369,415	\$57,131	\$2,515,464	\$15,338	\$11,884,878	79%
2014	173	\$9,695,813	\$56,045	\$3,169,701	\$18,322	\$12,865,514	75%
2015	140	\$9,708,039	\$69,343	\$2,381,412	\$17,010	\$12,089,451	80%
2016	127	\$10,057,253	\$79,191	\$2,039,105	\$16,056	\$12,096,359	83%
2017	135	\$9,866,710	\$73,087	\$2,651,370	\$19,640	\$12,518,080	79%
2018	108	\$7,293,408	\$67,532	\$1,730,010	\$16,019	\$9,023,418	81%
2019	96	\$7,314,437	\$76,192	\$1,992,488	\$20,755	\$9,306,926	79%
2020	70	\$2,813,271	\$40,190	\$1,036,824	\$14,812	\$3,850,094	73%
2021	76	\$3,611,791	\$47,524	\$1,057,492	\$13,914	\$4,669,283	77%

Source: NEFSC SSB.
Note: Revenues adjusted to 2021 USD.

Figure 3. Monthly monkfish price per live pound (\$2021), 2010-2021

Source: NEFSC SSB, July 2022.



Fishing Communities

Primary and secondary monkfish fishing ports are identified for the Monkfish FMP. Based on the criteria below, there are six primary ports in the fishery (Table 12). Of these, the highest revenue ports are New Bedford, Gloucester, and Boston, MA (Table 13). There are 14 secondary ports. The primary and secondary ports comprised 66% and 28% of total fishery revenue, respectively, during 2010-2019. There are 138 other ports that have had more minor participation (6%) in the fishery recently. More community information is available from the NEFSC [Social Sciences Branch website](#) and in Clay et al. (2007).

Primary Port Criteria. The monkfish fishery primary ports are those that are substantially engaged in the fishery. The primary ports meet at least one of the following criteria:

1. At least \$1M average annual revenue of monkfish during 2010-2019, or
2. Ranking of very high (factor score ≥ 5)² for engagement in the monkfish fishery on average in 2016-2020, using the NOAA Fisheries [Community Social Vulnerability Indicators](#) (Table).

Secondary Port Criteria. The monkfish fishery secondary ports are involved to a lesser extent. The secondary ports meet at least one of the following criteria:

1. At least \$100,000 average annual revenue of monkfish, 2010-2019, or
2. A ranking of high (factor score 1-4.99) for engagement in the monkfish fishery on average in 2016-2020, using the NOAA Fisheries [Community Social Vulnerability Indicators](#) (Table).

² A score of 1.0 or more places the community at 1 standard deviation above the mean.

Table 12. Primary and secondary ports in the monkfish fishery.

State	Port	Average revenue 2010-2019		Monkfish Engagement, 2016-2020		Primary/Secondary
		>\$100K	>\$1M	High	Very High	
ME	Portland	√		√		Secondary
NH	Portsmouth	√		√		Secondary
MA	Gloucester		√		√	Primary
	Boston		√		√	Primary
	Scituate	√		√		Secondary
	Chatham	√		√		Secondary
	Harwichport	√		√		Secondary
	New Bedford		√		√	Primary
	Westport	√		√		Secondary
RI	Little Compton	√		√		Secondary
	Newport	√		√		Secondary
	Narragansett/Point Judith		√		√	Primary
CT	New London	√		√		Secondary
NY	Montauk	√			√	Primary
	Hampton Bays/ Shinnecock	√		√		Secondary
NJ	Point Pleasant	√		√		Secondary
	Barnegat Light/Long Beach		√	√		Primary
	Cape May			√		Secondary
VA	Chincoteague	√				Secondary
	Newport News			√		Secondary

Table 13. Fishing revenue (unadjusted for inflation) and vessels in top Monkfish ports by revenue, calendar years 2010-2019.

Port	Average revenue, 2010-2019			Total active monkfish vessels, 2010-2019
	All fisheries	Monkfish only	% Monkfish	
New Bedford, MA	\$368,627,420	\$4,240,639	1%	479
Gloucester, MA	\$48,514,248	\$2,924,748	6%	190
Boston, MA	\$15,999,540	\$1,809,192	11%	44
Pt. Judith, RI	\$47,753,305	\$1,604,760	3%	214
Long Beach, NJ	\$26,124,402	\$1,459,529	6%	74
Chatham, MA	\$11,764,003	\$817,736	7%	57
Little Compton, RI	\$2,398,385	\$802,384	33%	31
Montauk, NY	\$17,192,554	\$726,690	4%	116
Hampton Bay, NY	\$5,746,477	\$578,235	10%	64
Portland, ME	\$24,798,943	\$559,798	2%	71
Other (n=146)	\$368,846,866	\$3,750,338	1%	
Total	\$937,766,141	\$19,274,049	2%	

Source: NMFS Commercial Fisheries Database (AA data), accessed April 2022.
Note: "Active" defined as landing > 1 lb of monkfish.

The Engagement Index can be used to determine trends in a fishery over time. Those ports with very high monkfish engagement in 2016-2020, generally had very high engagement in 2006-2010 and 2011-2015, except for Boston, MA, which had increasing engagement over this time (Table 14). There are 14 ports that have had high or very high engagement during all three periods, indicating a stable presence in those communities. Annual data on port engagement is available at the [Commercial Fishing Performance Measures website](https://www.st.nmfs.noaa.gov/humandimensions/social-indicators/index).

Table 14. Changes in monkfish fishery engagement over time for all ports with high engagement during at least one year, 2006-2020.

State	Community	Engagement Index			
		2006-2010	2011-2015	2016-2020	2020 only
ME	Portland	High	High	High	High
NH	Portsmouth	High	Med.-High	High	High
MA	Gloucester	Very High	Very High	Very High	Very High
	Boston	High	High	Very High	Very High
	Scituate	High	High	High	High
	Chatham	High	High	High	High
	Harwichport	Medium	Medium	High	High
	New Bedford	Very High	Very High	Very High	Very High
	Westport	Med.-High	High	High	Med.-High
RI	Tiverton	Med.-High	Medium	Medium	Medium
	Little Compton	High	High	High	High
	Newport	High	High	High	High
	Narragansett/Pt. Judith	Very High	Very High	Very High	Very High
CT	Stonington	Med.-High	Med.-High	Med.-High	High
	New London	Med.-High	High	High	High
NY	Montauk	Very High	Very High	Very High	High
	Hampton Bays/Shinnecock	High	High	High	High
NJ	Point Pleasant	High	High	High	High
	Barneгат Light/Long Beach	Very High	Very High	High	High
	Cape May	High	High	High	High
MD	Ocean City	High	High	Med.-High	Med.-High
VA	Chincoteague	High	High	Medium	Medium
	Newport News	Med.-High	High	High	High
NC	Wanchese	High	Med.-High	Med.-High	Med.-High
	Beaufort	Medium	Med.-High	Med.-High	Medium

Source: <http://www.st.nmfs.noaa.gov/humandimensions/social-indicators/index>.

Landings by State

During CY 2012-2021, monkfish were landed in 11 states, mostly in Massachusetts (61%), followed by Rhode Island (13%), and New Jersey (9%, Table). Massachusetts continues to account for the greatest proportion of all monkfish landings.

Table 15. Monkfish landings by state, CY 2012-2021.

STATE	Monkfish landings (mt)											
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total	
ME	488	115	257	345	243	178	219	170	411	442	4,062	4%
NH	57	86	74	38	50	68	123	119	175	213	1,463	2%
MA	5,247	3,812	4,972	4,303	4,227	4,581	5,067	5,943	6,306	6,057	55,961	61%
RI	1,303	1,598	2,122	1,495	1,488	1,819	1,648	1,560	1,412	2,306	11,441	13%
CT	347	305	457	547	724	380	464	275	246	324	2,123	2%
NY	841	766	1,059	1,183	773	748	827	1,193	829	1,005	5,996	7%
NJ	1,003	1,418	1,676	1,389	1,351	1,740	1,250	1,335	1,229	1,205	7,946	9%
DE	0										0	0%
MD	51	83	98	69	86	78	36	51	32	19	285	0%
VA	412	402	638	567	413	352	259	218	88	142	1,748	2%
NC	10	27	10	3	38	47	56	33	36	20	244	0%
Total	9,758	8,612	11,365	9,940	9,394	9,992	9,949	10,897	10,765	11,735	91,271	100%

Source: ACCSP database, accessed April 2022.

Research-Set-Aside Program

Monkfish regulations indicate that 500 DAS be made available for cooperative research through the Research-Set-Aside (RSA) program (this total is deducted from the 46 DAS allocated to each limited access permit; currently, each permit receives 45.2 DAS for commercial fishing). When the Experimental Fisheries Permit is approved for an RSA research project, the project has a DAS cap and poundage cap, calculated by setting each RSA DAS to be equal to double the possession limit for vessels with permit categories A and C fishing in the SFMA. For individual RSA trips, there is no possession limit, and vessels may not switch from using a monkfish DAS to an RSA DAS mid-trip.

Use of RSA DAS and landings allowed has generally declined since FY 2013 (Table 16). Of the three monkfish awards made in 2018/2019, one of the projects was successful in using almost all their DAS, while the other two less so. About half of the anticipated revenue was generated for research (~\$200,000). Use of 2020 and 2021 RSA DAS has been low.

Table 16. Monkfish RSA awards compared to RSA landed catch, FY 2013-2021.

Fishing Year	DAS Awarded	DAS used	% DAS Used	Allowed (lb)	Landed (lb)
2013	426	342	80%	1,363,200	1,207,174 89%
2014	500	354	71%	1,600,000	1,289,243 81%
2015	500	301	60%	1,600,000	1,290,238 81%
2016	500	332	66%	1,776,000	1,541,240 87%
2017	500	117	23%	1,776,000	679,180 38%
2018	500	285	57%	2,307,000	1,236,288 61%
2019	500	249	50%	2,307,000	1,024,955 50%
2020	500	Awards ongoing			
2021	500				

MONKFISH ADVISORY PANEL INFORMATION

The Advisory Panel was asked the following questions sequentially, but responses are organized below according to themes. These are the responses of individual AP members and may not reflect the experience or viewpoints of the entire AP, or the fishery at-large, and have not been independently verified. This summary captures the flavor of the comments but should not be assumed to be direct quotes. A few explanatory footnotes have been added by the PDT. There are 12 AP members; of the ten active monkfish fishermen on the AP, most are from ports south of Massachusetts and most fish in the SFMA, though a few may also fish in the NFMA.

1. *What factors have influenced recent fishing activity and how (e.g., domestic and foreign markets, costs, environment, fish distribution, regulations)?*
2. *How might these factors change in FY 2022? How do you expect the fishery to adjust?*
3. *How has the global pandemic changed the fishery? Do you see the fishery returning to a pre-pandemic state or is there a new normal emerging?*
4. *Considering the fishery data, are there specific regional or port differences in fishery performance that are important?*
5. *Are the current fishery regulations appropriate? How could they be improved and how would the improvements affect the fishery?*
6. *Have any recent regulatory changes affected the fishery and how (e.g., implemented in 2020, vessels using the Interactive Voice Response system now must submit a trip declaration within an hour of leaving port, like vessels using the Vessel Monitoring System)?*
7. *What would you recommend as research priorities?*
8. *What is hindering the use of RSA DAS to raise funds for monkfish research? How might the Monkfish RSA program improve?*
9. *What else is important for the Council to know (e.g., impacts of right whale regulations, offshore wind development)?*

Market prices and demand. Low monkfish prices have been the major factor driving the fishery in recent years. Markets have closed. The pandemic has been a factor in reducing demand, however, prices were decreasing well beforehand. For example, a New Jersey-based processor had been a significant buyer of monkfish, but demand for exports has dropped. Monkfish had been exported to Korea,³ but the demographics of that country are changing and there is less desire among the younger generations there for monkfish. There needs to be efforts to find new markets to build prices back up. There seems to be a small increase in monkfish prices this year, which is encouraging.

Costs increasing relative to price. The costs for fuels, buoys, gillnets, and other gear have increased substantially. Sometimes necessary gear replacements have not been available. It used to be possible to buy a gillnet for \$150, but it is now more like \$300 per net. Other costs to consider are the shoreside/shipping costs to transport landed fish to dealers and/or processors. For example, for boats landing on Long Island (e.g., Montauk and Shinnecock), the costs to ship monkfish to New Bedford are too high. It costs \$0.38 per pound to ship, and the shipper can only get \$0.30 for the fish. Fishermen have done that for the last few years but will not continue doing so.

Employment and economic impacts. It is getting increasingly difficult to find reliable captains and crew. With price declines and cost increases, it is difficult for wages to be competitive with onshore industries. Unseasoned captains tend to cause more gear damage, which drives up the cost of gear with buying new nets. The possession limits constrain the fishery to a daily income limit that is crippling. Inshore gillnetters are financially struggling. The market issues are solvable but being trapped in DAS daily income trap is killing us. Fishing is a tough lifestyle, and we must be able to pay people more than what

³ Monkfish Committee notes the Korean market for whole monkfish developed in the mid-1990s.

they would make onshore and that is not happening. We are hiring people that 10 years ago we would not have hired; you take live bodies – good enough.

Recent regulatory changes. Starting in FY 2020, the ability to “preload” DAS was removed for vessels declaring trips with the Interactive Voice Response System (IVR),⁴ has reduced flexibility and efficiency. Vessels can no longer “triple load” DAS and fish farther offshore. This change caught fishermen off guard, and AP members do not recall any discussion about this by the Council or people advocating for that change. Those vessels using IVR are primarily the small Category A and B gillnet vessels fishing in the south, not part of the groundfish fishery. This change is hurting this fleet and the change happened without warning.

Protected resources. There are several area closures, particularly for protected species, that have had negative impacts on the fishery. The last round of Atlantic Large Whale Take Reduction Team regulations did not go well for the lobster fishery, and there is much concern about potential new regulations targeting other pot gear and gillnets⁵ that could put many vessels out of business. If there are large-scale closures, that could trump every other concern for the fishery.

Impacts of offshore development. In Rhode Island Sound, there were recently three or four years of geotechnical and geophysical surveying for wind farm development around the clock on top of Cox’s Ledge. Some of that sonar equipment can penetrate the bottom up to 1 km deep. Fishermen were told that the surveys were not impacting the ecosystem, and less impactful than the fish finders used by fishing vessels, but that is difficult to believe. There is no doubt that these surveys had an effect. Fishermen must steam farther offshore now to make a living; we used to count on fishing on Cox’s Ledge in the spring and early fall. However, the fall fishery is seemingly gone out of Rhode Island and southern Massachusetts. There are so many issues with wind. Skates are impacted by electromagnetic fields; monkfish impacts are unknown. With unexperienced crew, the captain will not be able to rest during transit due to navigation concerns.

Interaction with skates. When fishing on a Monkfish DAS, vessels are constrained by possession limits for monkfish and skates. Particularly when skate possession limits are low,⁶ vessels get constrained by the skate possession limit and are unable to land the full limit for monkfish (e.g., if there are 12 gillnet panels loaded with skates, there will not be monkfish). Sometimes on a Monkfish DAS trip, the value of the skate or other landings can exceed monkfish. There are boats that go out on a Monkfish DAS to target skates because they do not have to go as far offshore in January-March. They will take a bycatch of monkfish at that point. Skates are a blessing overall, but they can be constraining as well. Especially in the spring, there is less monkfish landed because of the skate limits.

Regional differences. Southern boats are more limited by DAS and trip limits than northern boats, which have more DAS and unlimited possession limits when fishing on both a monkfish and groundfish DAS. Having the preloading option taken away (for the boats using IVR), has jeopardized use of the TAL even

⁴ When the FY 2020 specifications were [implemented](#), NOAA Fisheries clarified the trip declaration requirements such that vessels using IVR had to call in a trip no later than one hour ahead of leaving port (no timeframe was specified prior). This change made the call-in timeframe for vessels using IVR match that of vessels using the Vessel Monitoring System, so that declaration requirements were consistent across the monkfish fishery (no vessels can “preload” DAS now), and vessels using IVR could no longer use three DAS. This was an administrative change not developed by the Council.

⁵ [Phase 2 of the Atlantic Large Whale Take Reduction Plan](#) is under development, and it is not yet known if/what restrictions will be placed upon the gillnet fishery to reduce risk of right whale entanglements.

⁶ Since FY 2020, the skate wing possession limit has been 3,000 lb (wing weight) from May 1 – August 30 and 5,000 for the rest of the year. Possession limits were lower in years prior.

more. There are fishermen in Southern New England with monkfish Category C and D permits but fish in the southern management area and use IVR rather than VMS.

The impetus for having no monkfish possession limit when fishing on both a monkfish and groundfish DAS was to better use the monkfish TAL in the northern area and provide more revenue to groundfish vessels.⁷ In the southern area, fishermen are looking to target monkfish, and abundance is not the issue. The issue is the DAS and landing limits; southern boats could be more efficient with more of both. There are fewer Category A vessels over time, and that is due to economics. Vessels are selling out or keeping tied to the dock.

Fishery adjustments. Because of the low ex-vessel revenue and cost increases, vessels have shifted fishing to more inshore areas to reduce operating costs. Vessels in the south have been fishing on skates and catching fewer monkfish as a result. With all these challenges, there are multiple vessel owners that are choosing to either not fish or be more selective in the seasons and/or areas they fish. Owners of multiple vessels used to run one vessel themselves, and hire a captain and crew for the other, but there is little of that going on now with crew, price, and cost issues.

In the southern area, there has not been much of a monkfish fishery for the last four years, whether that is due to wind farms or warmer waters; it is hard to be definitive. The fishery has become nonexistent; in October and November, there is nothing. That used to be a good time of year, but there is no point in putting nets out this fall. Some vessels will not set their gillnets until the price improves.

Most other fisheries are at record high prices (e.g., lobster, scallops), or their seasonal peak is what boats are getting now year-round (e.g., black sea bass, fluke). In the monkfish and skate fisheries, they generally both go to the same dealers. The prices are low, and it all must be exported. Maybe that is the problem, but dealers need to be helping find new inroads elsewhere. FY 2005-12 were good years; FY 2016-19 were not. Hopefully, dealers will look more to domestic markets. One dealer in Rhode Island is doing that. It is necessary, because the fishery has hit the bottom on what it can take for prices. Some of the price drop is related to the pandemic, but it is unfortunately the “new normal” until new markets can be developed.

Ideas for management improvements. The skate and monkfish fisheries should be managed together. Skates should not be an open access fishery and the Skate Committee does not control access to the fishery. Skate is limiting monkfish landings in the southern management area.

Like the Monkfish RSA program, there should be a running clock, so that if monkfish is caught it can be landed rather than wasted. This would help a lot of people out, and there would be fewer concerns about whales with less gear in the water. If a vessel has the DAS, it should be able to use as many on a trip as needed to not be wasteful and have lower bycatch. However, any increases should be considered with caution. While fishermen want more DAS and higher trip limits, there is a concern about the number of latent permits in the fishery, and potential incentives for vessels to reactivate if limits are raised. With a running clock, there is potential to land all the monkfish too early in the year, and that would drive prices down. A derby fishery should be avoided.

Ideas for research priorities. It is very important to develop domestic markets, so research to develop markets is key.⁸ The pingers used on gillnets to deter harbor porpoise attract seals. The sound frequency that must be used in our area is not used in other parts of the world and is thought to be less successful at deterring seals. There should be research about the number of pingers per net that are necessary (fishery must use twice as many pingers as the manufacturer’s specifications call for).

⁷ This measure was implemented in Monkfish Framework 9 (2016).

⁸ There is a project funded by the 2022 Saltonstall-Kennedy Grant Program on monkfish market development.

Dredge discards have been high and there could be research to reduce those discards, but notably, the 2015 year-class has moved through the fishery. Scallop vessels are not landing monkfish, because it is not economical to do so. There would be fewer discards if markets improve. There was recent research on discard mortality that showed the mortality rate is much lower than the 100% assumption (Weissman *et al.* 2021). Also, scallop fishing in the Mid-Atlantic is becoming more limited, which will reduce southern discards (e.g., area around the Mud Hole is now closed⁹).

Monkfish RSA program. The RSA DAS are not getting fished now due to economics. Boats are not able to fish their own DAS, let alone RSA. Because revenue and the ability to land large quantities of monkfish are both down (e.g., skate is limiting the monkfish fishery), there is less incentive to fish the RSA DAS. Hopefully, markets will improve soon. The program has been very good and has produced many useful research projects. Some of the fishermen awarded RSA DAS have had some complaints about the number of additional reporting requirements that disincentivizes applying for use of RSA DAS.

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⁹ Likely referring to the New York Bight scallop closure.