Scup

2025 Management Track Assessment Report

U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Northeast Fisheries Science Center
Woods Hole, Massachusetts

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This assessment of the scup (Stenotomus chrysops) stock is a level 2 management track assessment updating the previous 2023 management track assessment (NEFSC 2023). Based on the previous assessment the stock was not overfished and overfishing was not occurring. This assessment updates commercial fishery catch data, research survey indices of abundance, the ASAP assessment model and reference points through 2024. Additionally, stock projections have been updated through 2027.

State of Stock: Based on this updated assessment, the scup (*Stenotomus chrysops*) stock is not overfished and overfishing is not occurring (Figures 1-2). Retrospective adjustments were made to the model results. Adjusted spawning stock biomass (SSB) in 2024 was estimated to be 234,593 mt which is 322% of the biomass target (SSB_{MSY} *proxy* = 72,783; Figure 1). The adjusted 2024 fully selected fishing mortality was estimated to be 0.099 which is 56% of the overfishing threshold proxy (F_{MSY} *proxy* = 0.177; Figure 2).

Table 1: Catch and status table for scup. All weights are in mt, recruitment is in 000s and F_{Full} is the fishing mortality on fully selected ages (age 4). Model results are from the current updated ASAP assessment. Note that the spawning stock biomass and fishing mortality estimates given in this table have not undergone retrospective adjustment.

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Data										
Commercial landings	7,725	7,147	7,006	6,064	6,252	6,213	5,965	5,518	5,906	6,567
Commercial discards	1,718	2,778	4,733	3,293	2,779	2,642	1,932	2,299	3,148	4,700
Recreational landings	5,527	4,536	6,143	5,887	6,403	5,863	7,540	7,875	5,403	4,989
Recreational discards	581	862	1,079	644	560	541	653	762	609	741
Removals for Assessment	15,551	15,323	18,961	15,888	15,994	15,259	16,090	16,454	15,066	16,997
Model Results										
Spawning Stock Biomass	214,630	244,250	274,030	279,610	269,790	263,320	232,620	206,410	193,820	162,980
F_{Full}	0.101	0.079	0.082	0.065	0.07	0.07	0.092	0.117	0.127	0.168
Recruits (age 0)	694,830	318,080	159,280	173,540	87,955	126,970	152,100	140,390	39,724	15,706

Table 2: Comparison of reference points estimated in the 2023 assessment and from the current assessment update. An $F_{40\%}$ proxy was used for the overfishing threshold and SSB and MSY proxies were based on long-term stochastic projections.

	2023	2025
F_{MSY} *proxy*	0.190	0.177
SSB_{MSY} mt	78,593	72,783 (51,238 - 106,208)
MSY mt	11,959	11,527 (7,977 - 17,460)
Median recruits (age 0) 000s	129,293	135,400
Overfishing	No	No
Overfished	No	No

Projections: Short term projections of catch (OFL) and spawning stock biomass (SSB) were derived by sampling from an empirical cumulative distribution function of the time series of recruitment estimates from the ASAP model results for 1984-2024. The annual fishery selectivity, maturity ogive, and mean weights at age used in projections are the most recent 5 year averages; retrospective adjustments were applied in the projections.

Table 3: Short term projections of total fishery catch and spawning stock biomass for scup based on a harvest scenario of fishing at F_{MSY} *proxy* between 2026 and 2027. Catch in 2025 was assumed to be 18,740 mt, the 2025 ABC.

Year	Catch mt	SSB mt	F_{Full}
2025	18,740	223,222 (176,429 - 282,775)	0.141

Year	Catch mt	SSB mt	F_{Full}
2026	19,547	185,792 (146,054 - 236,451)	0.177
2027	17,146	154,281 (120,812 - 197,520)	0.177

Special Comments:

- What are the most important sources of uncertainty in this stock assessment? Explain, and describe qualitatively how they affect the assessment results (such as estimates of biomass, F, recruitment, and population projections).

  Growth and maturity schedules have declined in recent years, possibly changing stock productivity and possibly impacting perception of the stock relative to reference levels. The retrospective pattern also presents a source of uncertainty.

- Does this assessment model have a retrospective pattern? If so, is the pattern minor, or major? (A major retrospective pattern occurs when the adjusted SSB or F_{Full} lies outside of the approximate joint confidence region for SSB and F_{Full}).

  The 7-year Mohn's ρ, relative to SSB, was -0.21 in the 2023 assessment and was -0.31 in 2024. The 7-year Mohn's ρ, relative to F, was 0.42 in the 2023 assessment and was 0.7 in 2024. There was a major retrospective pattern for this assessment because the ρ adjusted estimates of 2024 SSB (SSB$_\rho$=234,593) and 2024 F (F$_\rho$=0.099) were outside the 90% confidence regions around SSB (144,238 - 194,144) and F (0.128 - 0.225). A retrospective adjustment was made for both the determination of stock status and for projections of catch in 2026 and 2027. The retrospective adjustment changed the 2024 SSB from 162,980 to 234,593 and the 2024 F_{Full} from 0.168 to 0.099.

- Based on this stock assessment, are population projections well determined or uncertain? If this stock is in a rebuilding plan, how do the projections compare to the rebuilding schedule?

  Population projections for scup are reasonably well determined given the retrospective adjustments that needed to be made.

- Describe any changes that were made to the current stock assessment, beyond incorporating additional years of data and the effect these changes had on the assessment and stock status.

  No major changes, other than the incorporation of two new years of data were made to the scup assessment for this update. Minor changes included updating some historical values in the weight-at-age matrices, modifying plus group numbers-at-age during 1984-1988 to be 0 rather than missing, and modifying the NEFSC fall survey CV during 1972-1983 to be consistent with the rest of the time series rather than missing. These changes had only minor impacts on the model results.

- If the stock status has changed a lot since the previous assessment, explain why this occurred.

  As in recent assessments for scup the stock status remains as not overfished and overfishing not occurring.

- Provide qualitative statements describing the condition of the stock that relate to stock status.

  Age structure in fishery catch and surveys has expanded relative to the early 1990s. High stock biomass has sustained relatively high catches since around 2010. Weight at age and maturity schedules have declined relative to the early 2000s. The large recruitment event in 2015 contributed to a time series high in SSB; there have been fewer recruits since then, especially in 2023 and 2024.

- Indicate what data or studies are currently lacking and which would be needed most to improve this stock assessment in the future.

  The scup assessment could be improved with a comprehensive evaluation of fishery and survey data in the time series. In addition, transitioning the modeling framework from ASAP to WHAM would allow for the inclusion of random effects which could help with retrospective issues.

- Are there other important issues?

  Sufficient length and age sampling of the fishery catch needs to be maintained. Updated historical MRIP estimates are expected to have a substantial impact on scale and should be available in time for the 2027 managment track assessment.

References:

Northeast Fisheries Science Center. 2023. Management Track Assessments Spring 2023. US Dept Commer Northeast Fish Sci Cent Tech Memo 308. 80 p. <https://repository.library.noaa.gov/view/noaa/55439>.
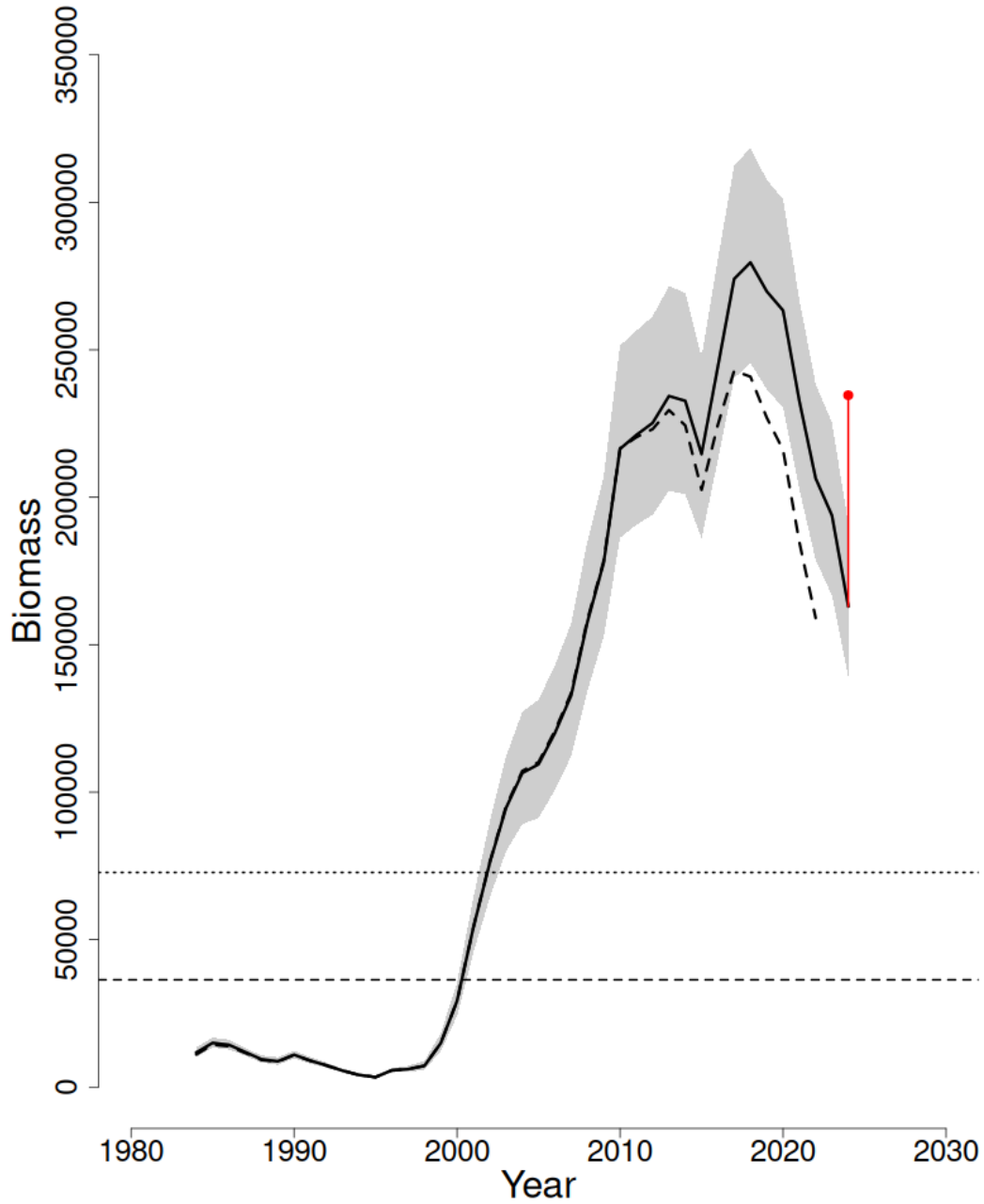
Figure 1: Trends in spawning stock biomass of scup between 1984 and 2024 from the current (solid line) and previous (dashed line) assessment and the corresponding $SSB_{Threshold}$ ($\frac{1}{2}$ SSB_{MSY} proxy; horizontal dashed line) as well as SSB_{Target} (SSB_{MSY} proxy; horizontal dotted line) based on the 2025 assessment. Biomass was adjusted for a retrospective pattern and the adjustment is shown in red. The approximate 90% lognormal confidence intervals are shown.
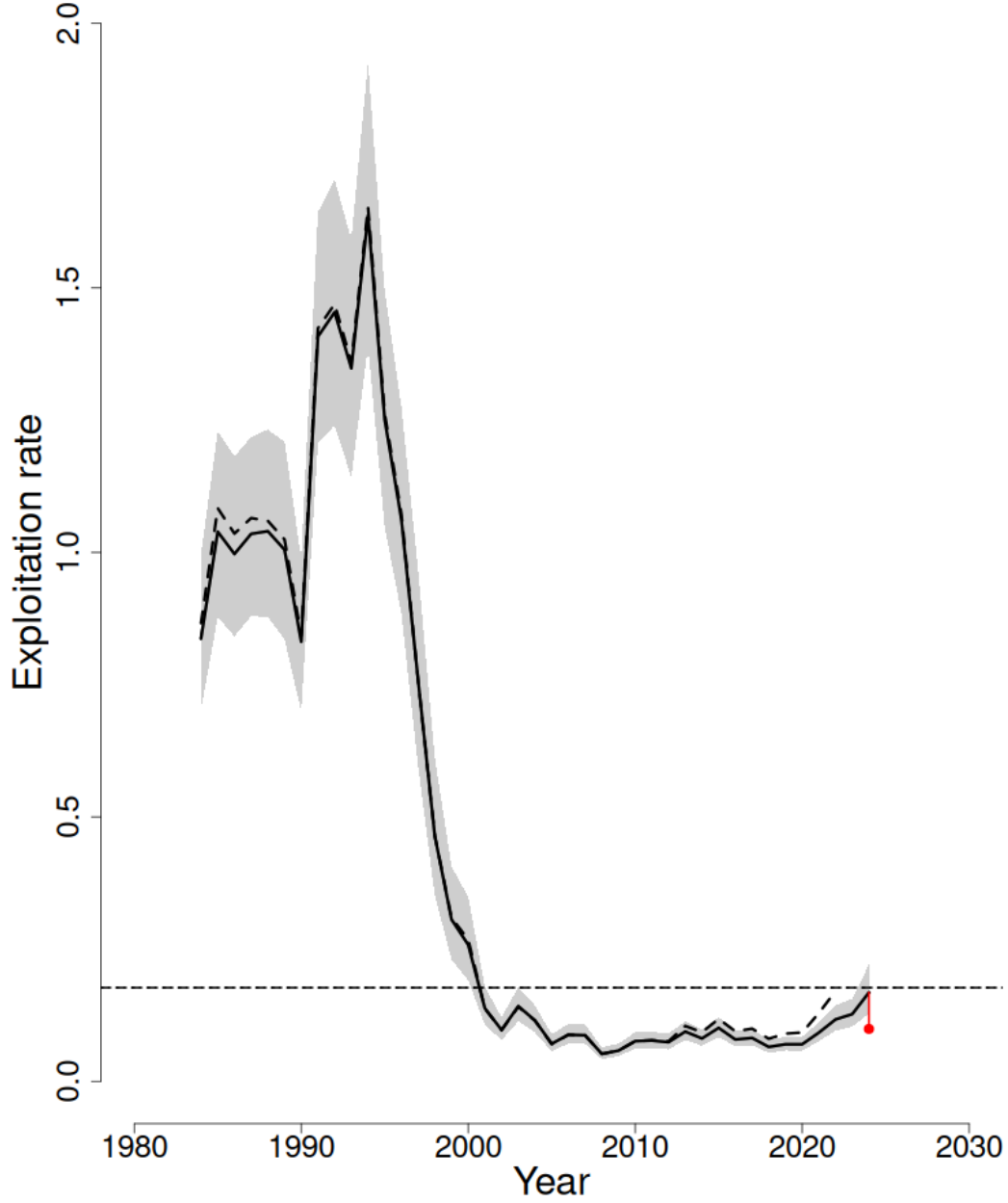
Figure 2: Trends in the fully selected fishing mortality (F_{Full}) of scup between 1984 and 2024 from the current (solid line) and previous (dashed line) assessment and the corresponding $F_{Threshold}$ (F_{MSY} *proxy*=0.177; horizontal dashed line) based on the 2025 assessment. F_{Full} was adjusted for a retrospective pattern and the adjustment is shown in red. The approximate 90% lognormal confidence intervals are shown.
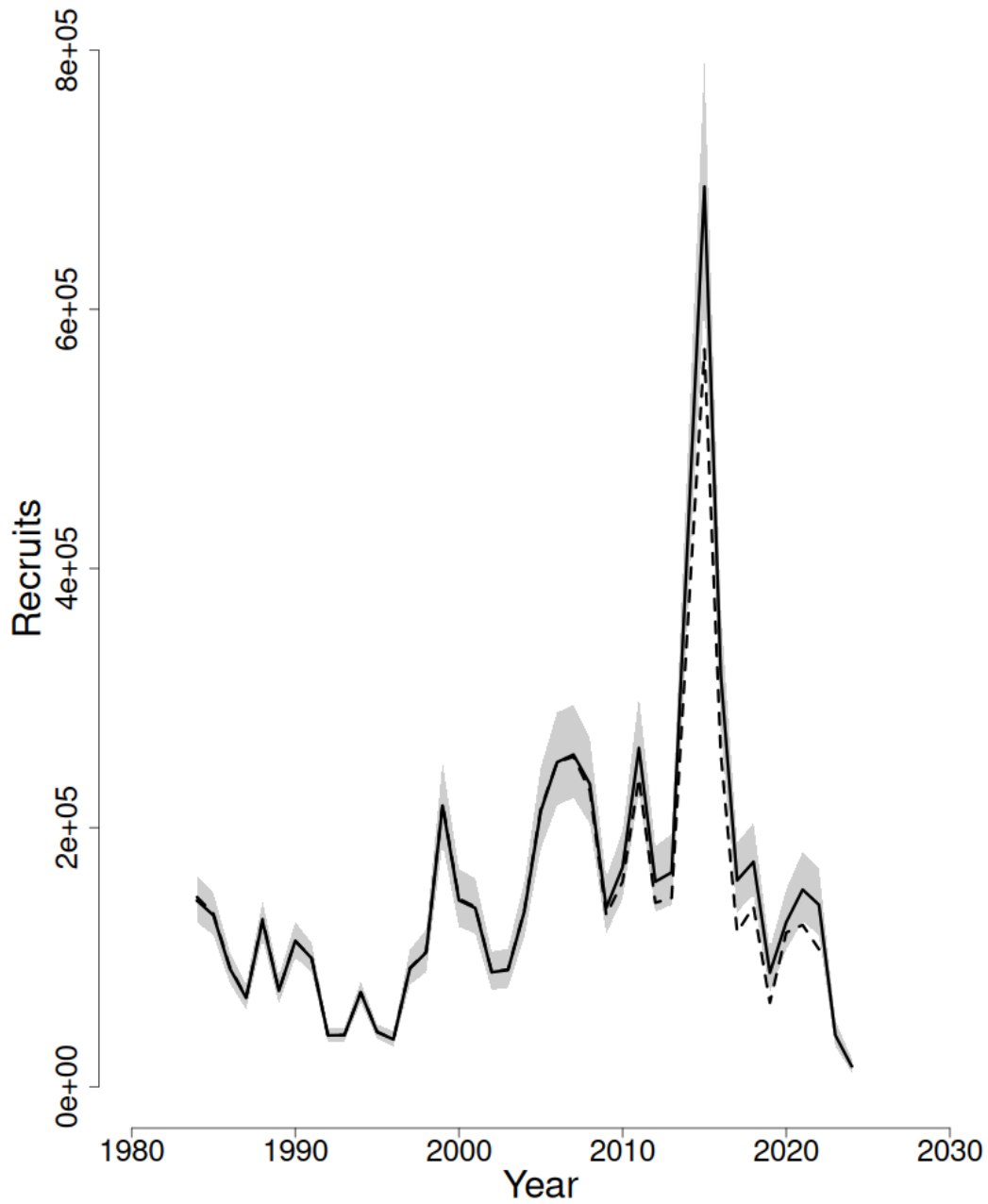
Figure 3: Trends in recruits (age 0) 000s of scup between 1984 and 2024 from the current (solid line) and previous (dashed line) assessment. The approximate 90% lognormal confidence intervals are shown.
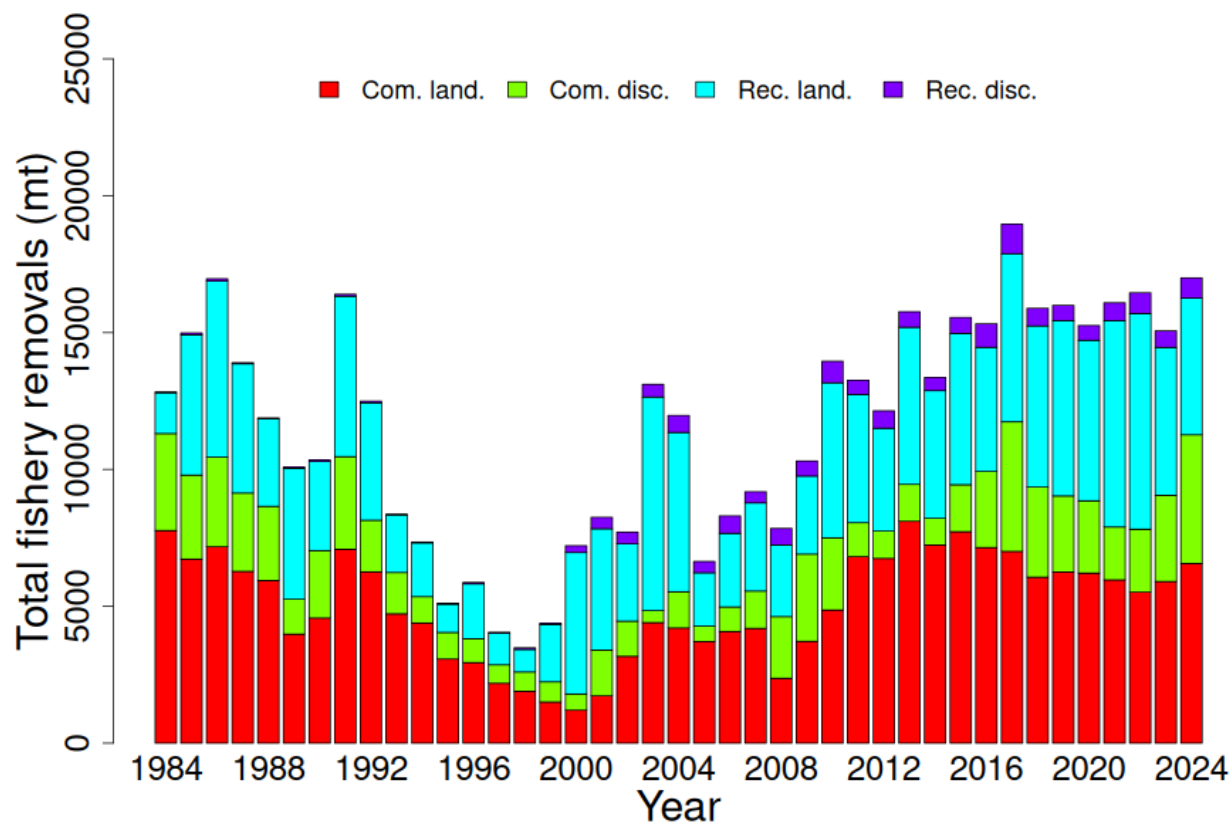
Figure 4: Total catch of scup between 1984 and 2024 by fleet (commercial, recreational) and disposition (landings, discards).
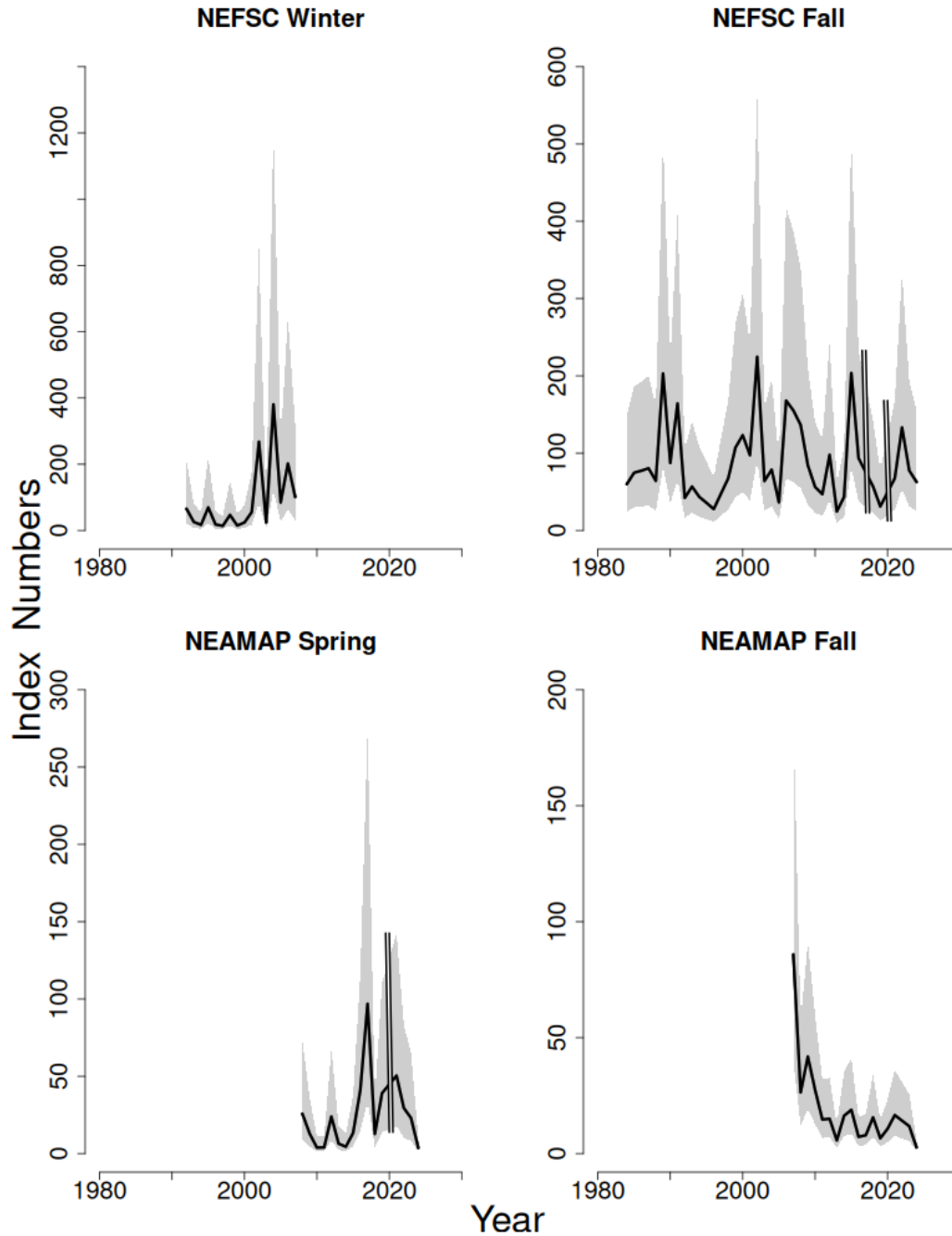
Figure 5: Indices of abundance for scup between 1984 and 2024 for the Northeast Fisheries Science Center (NEFSC) winter and fall bottom trawl surveys and the NEAMAP spring and fall surveys (these indices were broadest in scale). The approximate 90% lognormal confidence intervals are shown. Survey results were not available for use in 2017 and 2020 for the NEFSC fall trawl survey and in 2020 spring for the NEAMAP survey; these are shown as breaks in the figure.