5.3.10 Gillnet Gear Requirements

The Council considered a requirement for heavier twine (0.90 mm) in sink gillnet fisheries to reduce the incidental catch of skates. This measure was rejected at this time for several reasons:

- No information is available to quantify the conservation benefits of this measure, and this measure would impose a significant cost for monkfish and groundfish gillnet vessels throughout the region.
- The impacts of this measure on other species caught in gillnet fisheries is unknown.
- Skate landings from gillnet vessels represent a relatively small proportion of total skate landings (less than 20%), so the costs of this measure may outweigh the benefits. In addition, similar measures for otter trawl vessels, which land more than 80% of all skates, are not being considered at this time.

6.0 ENVIRONMENTAL IMPACTS

6.1 BIOLOGICAL IMPACTS

6.1.1 Introduction

This section describes the biological impacts likely to result from the proposed action as well as the alternatives that the Council considered during the development of this FMP. This discussion focuses on the potential benefits of the proposed management measures on the species in the Northeast Region skate complex. The analyses below is severely limited by lack of information and is therefore primarily a qualitative assessment of the potential biological impacts of the measures proposed in this FMP.

As previously discussed, fishery information necessary to perform a quantitative biological analysis, including projections of future landings under a formal rebuilding program, is not available at this time. Moreover, it is currently not possible to estimate MSY for any of the species in the skate complex (see Section 4.3). There is no reliable time series of commercial fishery landings or discards for any of the individual species, and the time series for the complex as a whole is considered to be incomplete. In addition, very little reliable and current growth and maturity information is available for any of the species in the complex. Very little information is available on the length composition of the landings and discards. One of the primary objectives of this FMP is to collect information towards these ends so that the Council will be able to better monitor the effectiveness of skate management measures in the future.

6.1.2 Measures with No Direct Biological Impacts

As previously noted, not every measure proposed in this FMP is expected to have a direct biological impact on the skate resources. This is primarily because many measures proposed in this FMP are more administrative in nature and are designed to ensure effective implementation of the FMP, improve fishery information, and aid in the enforcement of the skate fishery regulations. To the extent that these measures achieve the above objectives, the indirect biological impacts on the skate resources will be positive, as the biological goals of this FMP are more likely to be achieved.

The measures proposed in this FMP that are not expected to have direct biological impacts are:

- Management Unit (Section 4.1);
- Fishing Year (Section 4.2);
- Identification of Essential Fish Habitat (Section 4.6);
- FMP Reviewing and Monitoring (Section 4.7);
- Framework Adjustment Process (Section 4.8);
- Federal Permit Program (Section 4.9);
- Catch Reporting Requirements (Section 4.10); and
- Letter of Authorization for Bait-Only Vessels (Section 4.15).

Because there are no direct biological impacts associated with the measures identified above, no specific biological analysis of these measures is provided in the following subsections of this document.

The biological impacts associated with MSY and OY specifications relate to the overfishing definitions proposed for the skate species. Biological considerations for MSY and OY are discussed in Section 4.3 of this document (p. 9). Biological considerations related to the proposed overfishing definitions are discussed in Section 4.4 (p. 19).

The long-term biological impacts of improved information and species-specific fishery data are significant and will ultimately improve the effectiveness of this FMP and the status of the skate resources. The measures proposed in this FMP to collect better species-specific and fishery information include the establishment of skate permits (Section 4.9) and proposed modifications to reporting requirements for skates (Section 4.10). Over the long-term, these measures may prove to be the most beneficial for the skate resources and their associated fisheries by providing more accurate information to monitor the FMP and make decisions about future management measures. While the long-term positive biological impacts of these measures cannot be quantified in this analysis, they must be acknowledged.

Positive impacts of management measures in other fisheries have already occurred (as evidenced by increasing trends in barndoor and other skate abundance) and will continue to occur in the future. The identification of baseline measures (Section 4.16.1) and the process to review changes to those measures (Section 4.16.2) that is proposed in this FMP establish a concrete link between management measures in other fisheries and the skate resources that they benefit. While the biological benefits of these baseline measures cannot be quantified, they are acknowledged. To provide some perspective on the biological impacts of the baseline measures, Section 6.1.6 of this document qualitatively illustrates the benefits of the groundfish year-round closed areas on the skate species.

In general, the measures proposed in this FMP that are likely to have the most direct biological impact on skates in the short-term are the proposed prohibitions for barndoor, thorny, and smooth skates (Sections 4.11-4.13) and the possession limit for the skate wing fishery (Section 4.14). The potential biological impacts of these measures as well as an assessment of the proposed rebuilding program are discussed in the subsections below.

6.1.3 Evaluation of Proposed Rebuilding Program for Overfished Species

6.1.3.1 Introduction

In the Draft Skate FMP/EIS, the Council considered four alternative rebuilding programs for overfished skate species (in addition to the no action alternative). The alternatives that the Council considered can be summarized as follows (see Section 5.2.2 of this document for a complete description of the rebuilding alternatives that the Council did not select):

1. **Rebuilding Option 1 –** action triggered if the survey three-year average declines by more than a specified percentage in any given year
2. **Rebuilding Option 2 –** action triggered if the survey three-year average does not increase annually
3. **Rebuilding Option 3 –** action triggered based on Skate PDT recommendations
4. **Rebuilding Option 4 –** action triggered if the survey three-year average does not increase by more than a specified percentage in any given year

Proposed Action (Rebuilding Option 2A)– Slightly modified version of Option 2; action triggered if survey three-year average does not increase in comparison to the most recent three-year average (see Section 4.5 for a complete description of the proposed rebuilding program).

Two issues are important to consider when determining the most appropriate rebuilding program for skates, given the limited information available:

1. survey variability and the *dynamic response problem* (see Section 4.5.5 for a discussion of the *dynamic response problem*); and
2. flexibility and discretion for reasonable and appropriate management responses during the rebuilding time period.

Related to the dynamic response problem is the potential to encounter false triggers. False triggers can occur when the rebuilding program triggers management action when the stock is actually increasing, or when the stock is not decreasing, but survey variability shows a short-term decline.

This section provides an assessment of the proposed rebuilding program for overfished species, including the rebuilding program options that the Council did not select. Two types of assessments are provided below: (1) a retrospective evaluation of the performance of the rebuilding options based on historical skate survey data – to consider how the rebuilding programs would have performed in the past; and (2) an evaluation of the performance of the rebuilding options using a hypothetical skate species in two scenarios – population declining at a rate of 5% per year, and population increasing at a rate of 5% per year – to consider the potential for false triggers during an assumed time of stock decline and an assumed time of stock rebuilding. **The proposed action is identified as Rebuilding Option 2A so as to differentiate it in the analysis from Rebuilding Option 2.**

6.1.3.2 Retrospective Performance Evaluation of Rebuilding Options

It is important to ensure that the selected rebuilding program performs well in that it triggers management action when management action may actually be required and not as a response to survey variability (i.e., a false trigger). To emphasize this important point, a retrospective evaluation was performed using historical time series for winter, little, barndoor, thorny, and smooth skates and the triggers for Rebuilding Options 1, 2, and 4. The proposed action represents a slightly modified version of Option 2, and results are expected to be similar for the proposed action as for Option 2. This evaluation provides some perspective on the practicality of the proposed rebuilding programs by illustrating how they would have performed in the past based on actual survey data for the skate species. Additional discussion is provided below.

Winter Skate

Winter skate is a species that exhibited low survey levels in the 1960s and 1970s (below the proposed biomass threshold), increased to record high levels in the 1980s (well above the proposed biomass target), decreased again to low levels in the 1990s (below the proposed biomass threshold), and recently increased to levels above the proposed threshold but below the target. It is useful to evaluate the performance of the proposed rebuilding programs based on the history of the winter skate trawl survey index, as this species essentially became overfished, completely rebuilt, became overfished again, and is now rebuilding again.

Table 16 and Figure 62 present a retrospective evaluation of how the rebuilding options that the Council considered during the development of this FMP would have performed in the past based on the winter skate autumn trawl survey index. From the time series shown in Table 16 and displayed in Figure 62, winter skate would have been considered overfished in 1975 and would have been considered rebuilt in 1982 (based on the proposed overfishing definition in Section 4.4). During this seven-year period, additional management action would have been required once under Rebuilding Option 1, twice under Rebuilding Option 2, and four times under Rebuilding Option 4. A strict interpretation of Rebuilding Option 4 means that management action would have been required in 1982, the year when the survey index actually increased to above the biomass target and the stock would have been considered rebuilt.

The early years of the time series (1975 and 1976) highlight problems with the time-lag that exists when using a three-year average of the survey index. From 1975 to 1976, the survey index increased more than 100%, but the three-year moving average actually decreased, necessitating management action under any of the rebuilding options under consideration. This contradictory pattern highlights the need for flexibility in interpreting the survey indices when making annual evaluations of management plans. The contradictions can work both ways (i.e., the survey can decrease before the three-year average decreases), so it is important that discretion be used when making determinations.

After 1982, the winter skate survey index increased considerably to almost twice the biomass target and then began to decline. In 1994, the index fell below the proposed biomass threshold, resulting in an overfished determination for winter skate. Since then, the stock has been rebuilding. The survey index increased above the threshold in 1999, but has not yet reached the target level. In the seven years since 1994, the three-year moving average from the survey has increased almost 75%; during this time, management action would have been required once under Rebuilding Options 1 and 2 and five times under Rebuilding Option 4. The survey three-year averages for 1998-2000 and 1999-2001 are the highest since the early 1990s, yet Option 4 would have triggered management action in both 2000 and 2001.

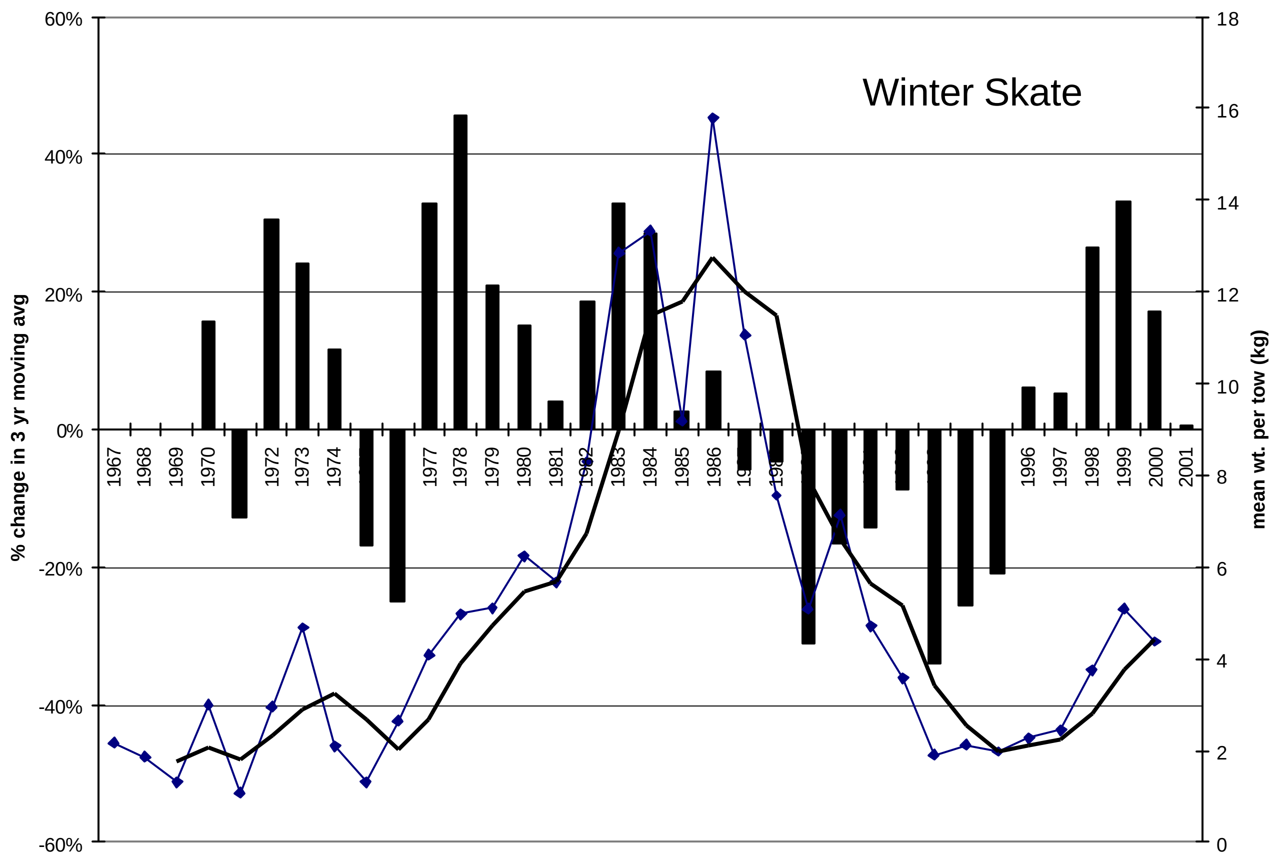
Table 16 Retrospective Performance Evaluation of Rebuilding Options 1, 2, and 4 Based on Historical Winter Skate Autumn Survey Index

WINTER SKATE Biomass threshold = 3.23 kg/tow; Biomass target = 6.46 kg/tow (3-yr. avg.)						
YEAR	**INDEX**	**3-YR. AVG.**	**3-YR. AVG. % CHANGE**	**RB Option 1 (20% decline)**	**RB Option 2 (no increase)**	**RB Option 4 (20% increase)**
1972	2.958					
1973	4.686					
1974	2.097	3.247				
1975	1.315	2.699	-16.9		**ACTION**	**ACTION**
1976	2.655	2.022	-25.1	**ACTION**	**ACTION**	**ACTION**
1977	4.095	2.688	32.9			
1978	4.989	3.913	45.6			
1979	5.121	4.735	21.0			
1980	6.233	5.448	15.1			**ACTION**
1981	5.668	5.674	4.2			**ACTION**
1982	8.306	6.736	18.7			**ACTION**
1983	12.852	8.942	32.8			
1984	13.323	11.494	28.5			
1985	9.182	11.786	2.5			**ACTION**
1986	15.800	12.768	8.3			**ACTION**
1987	11.063	12.015	-5.9		**ACTION**	**ACTION**
1988	7.564	11.476	-4.5		**ACTION**	**ACTION**
1989	5.081	7.903	-31.1	**ACTION**	**ACTION**	**ACTION**
1990	7.145	6.597	-16.5		**ACTION**	**ACTION**
1991	4.724	5.650	-14.4		**ACTION**	**ACTION**
1992	3.582	5.150	-8.8		**ACTION**	**ACTION**
1993	1.905	3.404	-33.9	**ACTION**	**ACTION**	**ACTION**
1994	2.120	2.536	-25.5	**ACTION**	**ACTION**	**ACTION**
1995	1.985	2.004	-21.0	**ACTION**	**ACTION**	**ACTION**
1996	2.276	2.127	6.2			**ACTION**
1997	2.455	2.239	5.3			**ACTION**
1998	3.753	2.828	26.3			
1999	5.089	3.766	33.2			
2000	4.378	4.407	17.0			**ACTION**
2001	3.819	4.429	0.5			**ACTION**

**Indices and averages are in kg/tow.*

***The proposed action represents a slightly modified version of Rebuilding Option 2 and is more thoroughly evaluated in Section 6.1.3.3.*

Figure 62 Retrospective Performance Evaluation of Rebuilding Options 1, 2, and 4 Based on Historical Winter Skate Autumn Survey Index



**The bars represent the annual percent change in the three-year moving average of the trawl survey (left axis), while the lines represent the actual survey point estimates and the smoothed three-year moving average (right axis).*
***The proposed action represents a slightly modified version of Rebuilding Option 2 and is more thoroughly evaluated in Section 6.1.3.3.*

Little Skate

Overall, the little skate resource is considered to be rebuilt and has remained above its biomass threshold and target for much of the survey time series (based on the proposed overfishing definition in Section 4.4).

Table 17 and Figure 63 present a retrospective evaluation of how the rebuilding options that the Council considered during the development of this FMP would have performed in the past based on the little skate spring trawl survey index. Little skate is interesting to consider because over the time series presented in Table 17 and illustrated in Figure 63, the moving average of the survey index never fell below the proposed biomass threshold, so the little skate resource would never have been considered overfished. From 1985-2001, the survey index slowly increased to levels above the proposed biomass target and have remained well above the biomass target since 1999. Currently, the three-year moving average of the survey index for little skate is 89% higher than it was in 1984. Assuming that a rebuilding program had applied during this 17-year period (although it would never have been necessary), management action would never have been required under Rebuilding Option 1. In contrast, management action would have been required in seven years under Option 2 and in 14 of the 17 years under Option 4.

Table 17 Retrospective Performance Evaluation of Rebuilding Options 1, 2, and 4 Based on Historical Little Skate Spring Survey Index

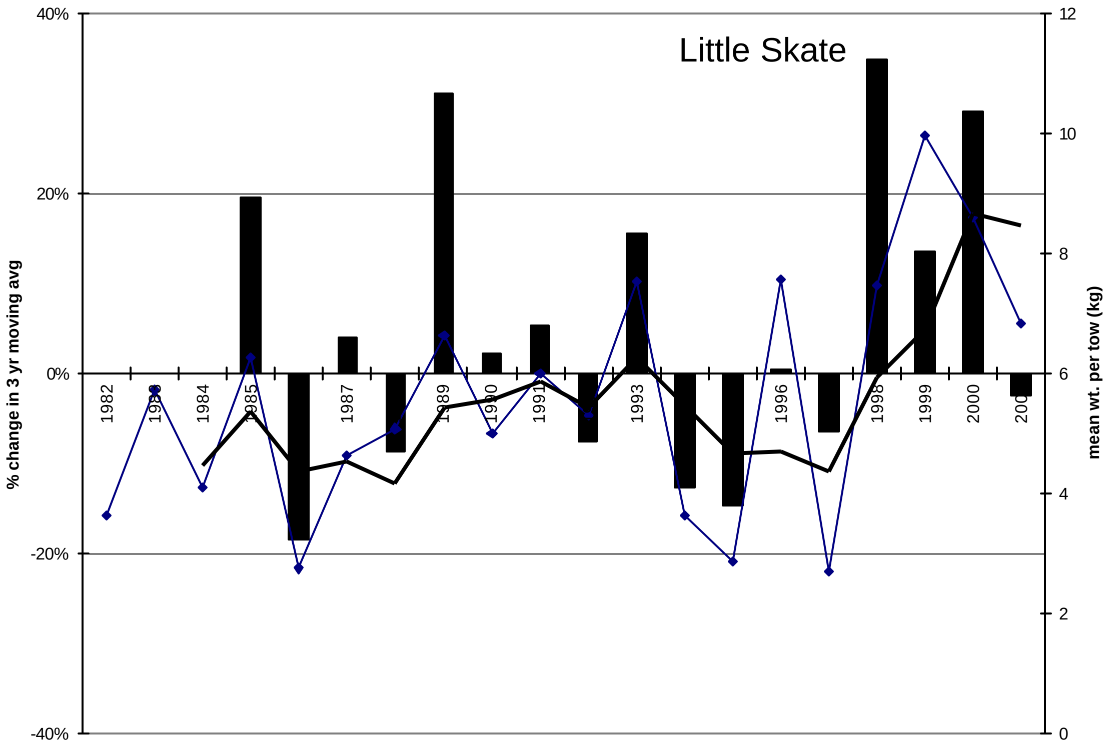
LITTLE SKATE
Biomass threshold = 3.27 kg/tow; Biomass target = 6.54 kg/tow (3-yr. avg.)

YEAR	INDEX	3-YR. AVG.	3-YR. AVG. % CHANGE	RB Option 1 (20% decline)	RB Option 2 (no increase)	RB Option 4 (20% increase)
1982	3.627					
1983	5.718					
1984	4.094	4.480				
1985	6.265	5.359	19.6			ACTION
1986	2.753	4.371	-18.4		ACTION	ACTION
1987	4.625	4.548	4.0			ACTION
1988	5.083	4.154	-8.7		ACTION	ACTION
1989	6.634	5.447	31.1			
1990	4.993	5.570	2.2			ACTION
1991	5.990	5.872	5.4			ACTION
1992	5.297	5.427	-7.6		ACTION	ACTION
1993	7.524	6.271	15.6			ACTION
1994	3.622	5.481	-12.6		ACTION	ACTION
1995	2.872	4.673	-14.8		ACTION	ACTION
1996	7.574	4.689	0.4			ACTION
1997	2.708	4.384	-6.5		ACTION	ACTION
1998	7.471	5.918	35.0			
1999	9.978	6.719	13.5			ACTION
2000	8.596	8.682	29.2			
2001	6.835	8.470	-2.4		ACTION	ACTION

**Indices and averages are in kg/tow.*

***The proposed action represents a slightly modified version of Rebuilding Option 2 and is more thoroughly evaluated in Section 6.1.3.3.*

Figure 63 Retrospective Performance Evaluation of Rebuilding Options 1, 2, and 4 Based on Historical Little Skate Spring Survey Index



**The bars represent the annual percent change in the three-year moving average of the trawl survey (left axis), while the lines represent the actual survey point estimates and the smoothed three-year moving average (right axis).*
***The proposed action represents a slightly modified version of Rebuilding Option 2 and is more thoroughly evaluated in Section 6.1.3.3.*

Barndoor Skate

Barndoor skate is a species that has exhibited very low survey indices for many years. It is currently considered to be in an overfished condition (based on the proposed overfishing definition in Section 4.4) and subject to a rebuilding program once this FMP is implemented.

Table 18 and Figure 64 present a retrospective evaluation of how the rebuilding options that the Council considered during the development of this FMP would have performed in the past based on the barndoor skate autumn trawl survey index. The moving average of the trawl survey index fell below the proposed biomass threshold in 1968, and barndoor skate has remained in an overfished condition since that time. Over the 33-year time period since 1968, management action would have been required eight times under Option 1, 17 times under Option 2, and 22 times under Option 4.

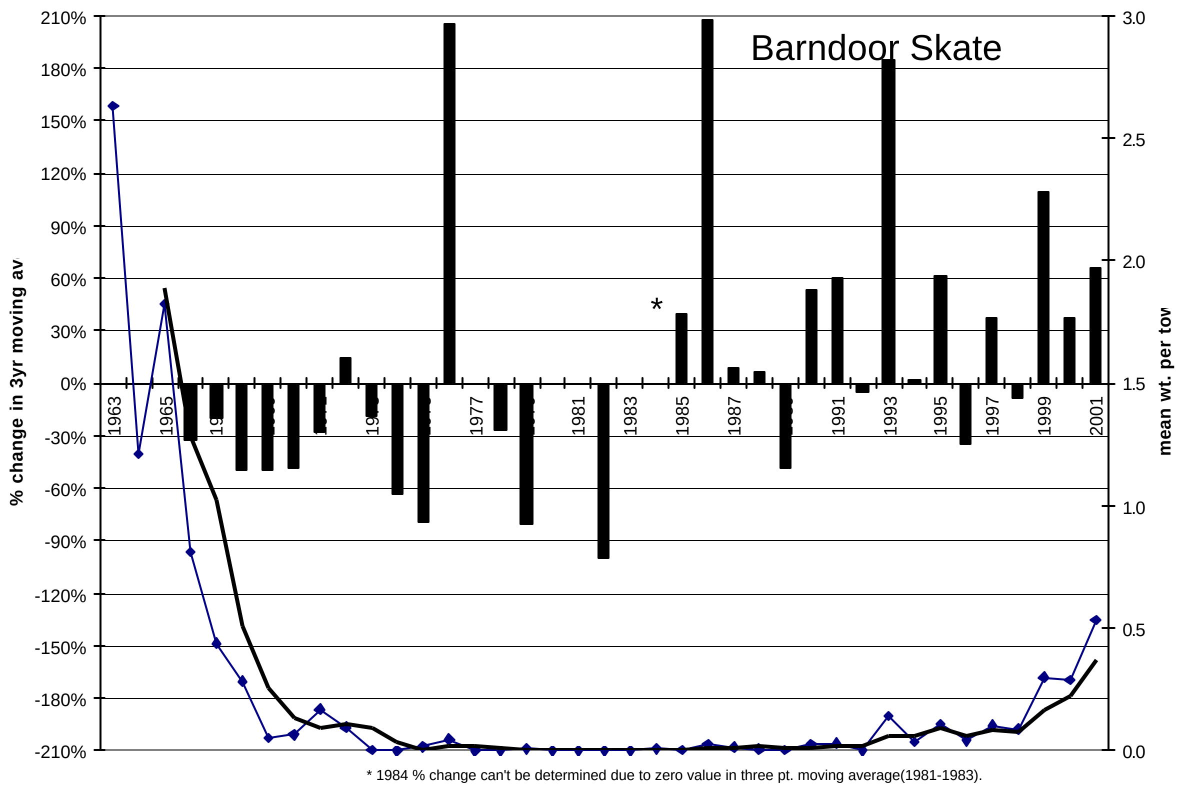
The survey time series for barndoor skate emphasizes problems with *dynamic response* associated with all of the rebuilding options under consideration. The survey index has been so close to zero for so long that annual variability becomes more extreme and problematic. Consider as an example the time period 1989-1999. Because the absolute values of the indices are so small, variability in the survey results in inconsistent advice about rebuilding in almost every year under Options 2 and 4. During this eleven-year time period, the three-year moving average of the trawl survey increased 1733%, indicating a significant increase. However, management action would have been triggered twice under Option 1, four times under Option 2, and five times under Option 4. Determinations and recommendations under Options 2 and 4 alternate on an almost annual basis, highlighting problems with inconsistency.

Table 18 Retrospective Performance Evaluation of Rebuilding Options 1, 2, and 4 Based on Historical Barndoor Skate Autumn Survey Index

BARNDOOR SKATE Biomass threshold = 0.81 kg/tow; Biomass target = 1.62 kg/tow (3-yr. avg.)						
YEAR	**INDEX**	**3-YR. AVG.**	**3-YR. AVG. % CHANGE**	**RB Option 1 (30% decline)**	**RB Option 2 (no increase)**	**RB Option 4 (30% increase)**
1963	2.633					
1964	1.212					
1965	1.822	1.889				
1966	0.811	1.281	-32.2	**ACTION**	**ACTION**	**ACTION**
1967	0.438	1.023	-20.1		**ACTION**	**ACTION**
1968	0.285	0.511	-50.1	**ACTION**	**ACTION**	**ACTION**
1969	0.054	0.259	-49.4	**ACTION**	**ACTION**	**ACTION**
1970	0.066	0.135	-47.8	**ACTION**	**ACTION**	**ACTION**
1971	0.170	0.097	-28.3		**ACTION**	**ACTION**
1972	0.096	0.111	14.4			**ACTION**
1973	0.004	0.090	-18.8		**ACTION**	**ACTION**
1974	0.000	0.033	-63.1	**ACTION**	**ACTION**	**ACTION**
1975	0.017	0.007	-79.5	**ACTION**	**ACTION**	**ACTION**
1976	0.047	0.021	210.7			
1977	0.000	0.021	0.0		**ACTION**	**ACTION**
1978	0.000	0.016	-26.2		**ACTION**	**ACTION**
1979	0.009	0.003	-81.3	**ACTION**	**ACTION**	**ACTION**
1980	0.000	0.003	0.0		**ACTION**	**ACTION**
1981	0.000	0.003	0.0		**ACTION**	**ACTION**
1982	0.000	0.000	-100.0	**ACTION**	**ACTION**	**ACTION**
1983	0.000	0.000	N/A		**ACTION**	**ACTION**
1984	0.010	0.003	N/A			**ACTION**
1985	0.004	0.005	39.7			
1986	0.029	0.014	210.7			
1987	0.014	0.016	8.9			**ACTION**
1988	0.007	0.017	7.4			**ACTION**
1989	0.005	0.009	-48.4	**ACTION**	**ACTION**	**ACTION**
1990	0.028	0.014	55.0			
1991	0.031	0.022	58.5			
1992	0.002	0.021	-3.8		**ACTION**	**ACTION**
1993	0.141	0.058	180.7			
1994	0.035	0.059	2.0			**ACTION**
1995	0.111	0.096	61.3			
1996	0.042	0.063	-34.3	**ACTION**	**ACTION**	**ACTION**
1997	0.105	0.086	37.3			
1998	0.089	0.079	-8.6		**ACTION**	**ACTION**
1999	0.300	0.165	109.2			
2000	0.288	0.226	37.1			
2001	0.536	0.375	66.0			

**Indices and averages are in kg/tow.*
***The proposed action represents a slightly modified version of Rebuilding Option 2 and is more thoroughly evaluated in Section 6.1.3.3.*

Figure 64 Retrospective Performance Evaluation of Rebuilding Options 1, 2, and 4 Based on Historical Barndoor Skate Autumn Survey Index



**The bars represent the annual percent change in the three-year moving average of the trawl survey (left axis), while the lines represent the actual survey point estimates and the smoothed three-year moving average (right axis).*
***The proposed action represents a slightly modified version of Rebuilding Option 2 and is more thoroughly evaluated in Section 6.1.3.3.*

Thorny Skate

Thorny skate is a species that has exhibited a relatively steady decline in the trawl survey index since about 1980. It is currently considered to be in an overfished condition (based on the overfishing definition proposed in Section 4.4) and subject to a rebuilding program once this FMP is implemented.

Table 19 and Figure 65 present a retrospective evaluation of how the rebuilding options that the Council considered during the development of this FMP would have performed in the past based on the thorny skate autumn trawl survey index. The thorny skate survey index was already above the biomass target in 1965 and increased another 30% from 1965 to 1971. Applying the rebuilding options to this six-year time period (although they would never have been necessary) triggers management action three times under Option 2 and four times under Option 4. There would not have been a trigger for management action under Rebuilding Option 1 during this time period.

From the time series of trawl survey data presented in Table 19 and illustrated in Figure 65, the thorny skate resource would have been considered to be in an overfished condition in 1983. In the 18 years since 1983, management action would have been triggered four times under Option 1, 14 times under Option 2, and 17 times under Option 4.

From 1987-1989, the survey index actually doubled, but the three-year moving average decreased, resulting in the need for action once under Options 1 and 2 and in both years under Option 4. This again underscores the importance of flexibility when evaluating the need for management action under any of these rebuilding options, as trends in the three-year moving average can contradict trends in the point estimates.

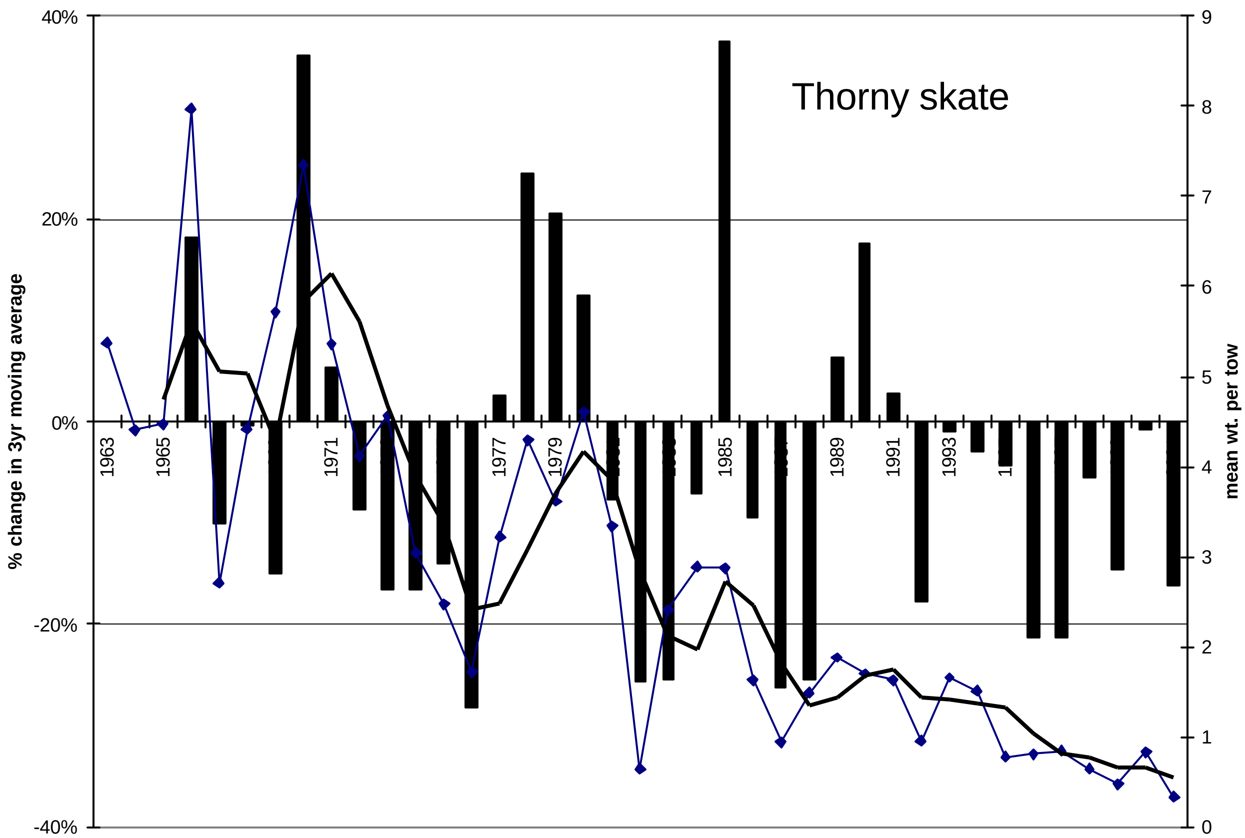
Table 19 Retrospective Performance Evaluation of Rebuilding Options 1, 2, and 4 Based on Historical Thorny Skate Autumn Survey Index

THORNY SKATE Biomass threshold = 2.20 kg/tow; Biomass target = 4.41 kg/tow (3-yr. avg.)						
YEAR	**INDEX**	**3-YR. AVG.**	**3-YR. AVG. % CHANGE**	**RB Option 1 (20% decline)**	**RB Option 2 (no increase)**	**RB Option 4 (20% increase)**
1963	5.371					
1964	4.403					
1965	4.474	4.750				
1966	7.971	5.616	18.2			**ACTION**
1967	2.712	5.053	-10.0		**ACTION**	**ACTION**
1968	4.421	5.035	-0.4		**ACTION**	**ACTION**
1969	5.715	4.283	-14.9		**ACTION**	**ACTION**
1970	7.347	5.828	36.1			
1971	5.357	6.140	5.4			**ACTION**
1972	4.119	5.608	-8.7		**ACTION**	**ACTION**
1973	4.564	4.680	-16.5		**ACTION**	**ACTION**
1974	3.038	3.907	-16.5		**ACTION**	**ACTION**
1975	2.474	3.359	-14.0		**ACTION**	**ACTION**
1976	1.720	2.411	-28.2	**ACTION**	**ACTION**	**ACTION**
1977	3.221	2.471	2.5			**ACTION**
1978	4.291	3.077	24.5			
1979	3.612	3.708	20.5			
1980	4.601	4.168	12.4			**ACTION**
1981	3.339	3.851	-7.6		**ACTION**	**ACTION**
1982	0.646	2.862	-25.7	**ACTION**	**ACTION**	**ACTION**
1983	2.409	2.132	-25.5	**ACTION**	**ACTION**	**ACTION**
1984	2.887	1.981	-7.1		**ACTION**	**ACTION**
1985	2.877	2.724	37.5			
1986	1.629	2.464	-9.6		**ACTION**	**ACTION**
1987	0.944	1.816	-26.3	**ACTION**	**ACTION**	**ACTION**
1988	1.488	1.354	-25.5	**ACTION**	**ACTION**	**ACTION**
1989	1.883	1.438	6.3			**ACTION**
1990	1.704	1.692	17.6			**ACTION**
1991	1.632	1.740	2.8			**ACTION**
1992	0.962	1.433	-17.6		**ACTION**	**ACTION**
1993	1.658	1.417	-1.1		**ACTION**	**ACTION**
1994	1.509	1.376	-2.9		**ACTION**	**ACTION**
1995	0.783	1.317	-4.3		**ACTION**	**ACTION**
1996	0.814	1.035	-21.4	**ACTION**	**ACTION**	**ACTION**
1997	0.849	0.815	-21.2	**ACTION**	**ACTION**	**ACTION**
1998	0.648	0.770	-5.5		**ACTION**	**ACTION**
1999	0.479	0.659	-14.5		**ACTION**	**ACTION**
2000	0.832	0.653	-0.9		**ACTION**	**ACTION**
2001	0.332	0.548	-16.1		**ACTION**	**ACTION**

**Indices and averages are in kg/tow.*

***The proposed action represents a slightly modified version of Rebuilding Option 2 and is more thoroughly evaluated in Section 6.1.3.3.*

Figure 65 Retrospective Performance Evaluation of Rebuilding Options 1, 2, and 4 Based on Historical Thorny Skate Autumn Survey Index



**The bars represent the annual percent change in the three-year moving average of the trawl survey (left axis), while the lines represent the actual survey point estimates and the smoothed three-year moving average (right axis).*
***The proposed action represents a slightly modified version of Rebuilding Option 2 and is more thoroughly evaluated in Section 6.1.3.3.*

Smooth Skate

The three-year moving average of the trawl survey index for smooth skate recently increased above the proposed biomass threshold, so smooth skate is no longer considered to be in an overfished condition. It has not yet rebuilt to its long-term target, however.

Table 20 and Figure 66 present a retrospective evaluation of how the rebuilding options that the Council considered during the development of this FMP would have performed in the past based on the smooth skate autumn trawl survey index. Over the time series shown in Table 20 and Figure 66, the smooth skate index has been somewhat variable, illustrating problems with *dynamic response* and underscoring the need for flexibility. For example, the three-year moving survey average fell below the proposed biomass threshold in 1976, suggesting that smooth skate was in an overfished condition. In 1979, just three years later, the average had increased above the proposed target, suggesting that the resource was rebuilt. Four years later, in 1983, the average fell below the threshold, and smooth skate was again considered to be in an overfished condition.

The trawl survey average for smooth skate has remained below the proposed biomass target since 1983, but has fluctuated around the proposed threshold considerably. After 1983, smooth skate also would have been designated overfished in 1984, 1994, 1996, 1998 – 2000. If smooth skate had been designated overfished in 1983, the Council would have initiated a management plan that included a rebuilding program for smooth skates. Hypothetically, in the 18 years since 1983, additional management action would have been triggered nine times under Rebuilding Option 2 and 16 times under Rebuilding Option 4. Management action would not have been triggered under Option 1 (except for the initial overfished determination).

Another interesting time period to examine for smooth skate is 1998-2000. From 1998-2000, the survey point estimates increased 450% from 0.028 to 0.154, but the three-year moving average actually declined. Management action would have been triggered in all three years under Rebuilding Options 2 and 4. This again underscores the importance of flexibility when evaluating the need for management action under any of these rebuilding options, as trends in the three-year moving average can contradict trends in the point estimates.

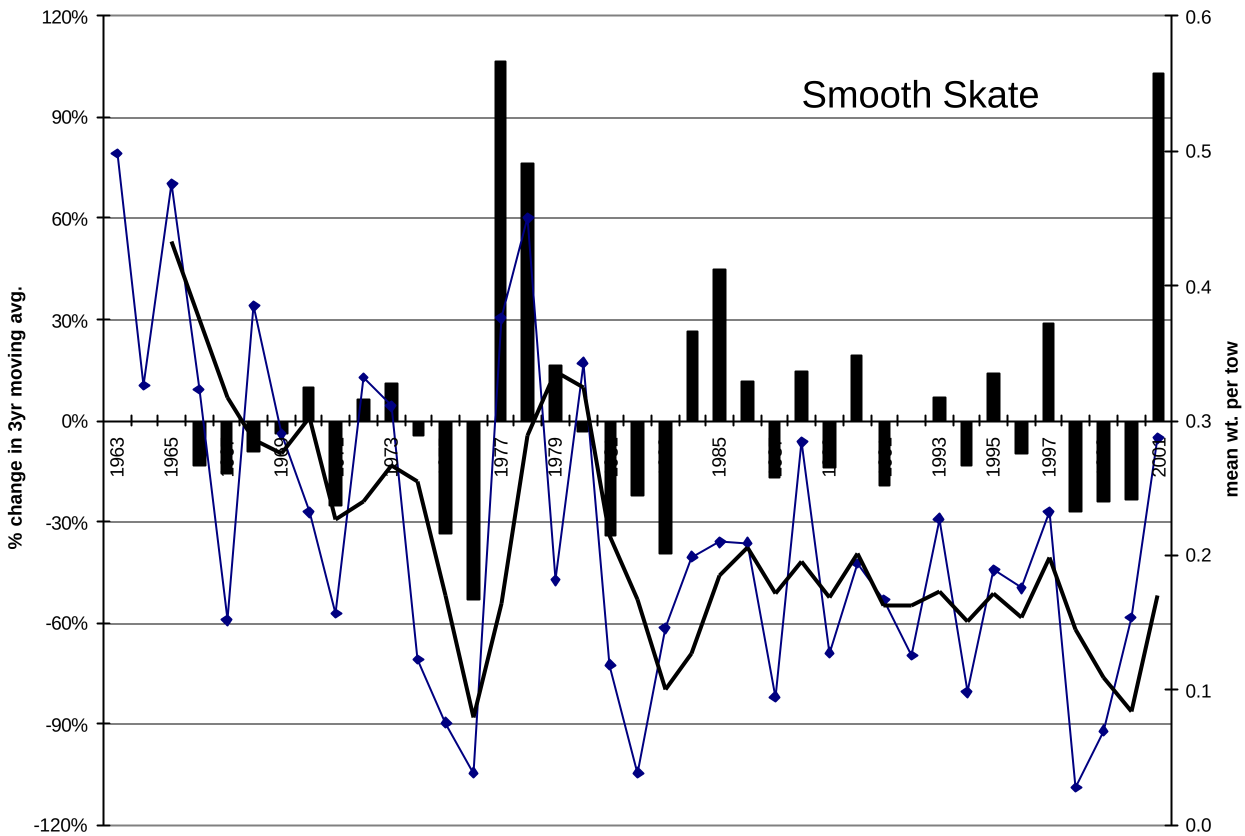
Table 20 Retrospective Performance Evaluation of Rebuilding Options 1, 2, and 4 Based on Historical Smooth Skate Autumn Survey Index

SMOOTH SKATE Biomass threshold = 0.16 kg/tow; Biomass target = 0.31 kg/tow (3-yr. avg.)						
YEAR	INDEX	3-YR. AVG.	3-YR. AVG. % CHANGE	RB Option 1 (30% decline)	RB Option 2 (no increase)	RB Option 4 (30% increase)
1963	0.498					
1964	0.326					
1965	0.475	0.433				
1966	0.323	0.375	-13.5		ACTION	ACTION
1967	0.152	0.317	-15.5		ACTION	ACTION
1968	0.385	0.287	-9.5		ACTION	ACTION
1969	0.290	0.276	-3.8		ACTION	ACTION
1970	0.232	0.302	9.6			ACTION
1971	0.157	0.227	-25.1		ACTION	ACTION
1972	0.332	0.240	6.1			ACTION
1973	0.311	0.267	10.9			ACTION
1974	0.123	0.255	-4.3		ACTION	ACTION
1975	0.076	0.170	-33.4	ACTION	ACTION	ACTION
1976	0.039	0.079	-53.3	ACTION	ACTION	ACTION
1977	0.376	0.163	106.1			
1978	0.450	0.288	76.4			
1979	0.182	0.336	16.5			ACTION
1980	0.343	0.325	-3.2		ACTION	ACTION
1981	0.119	0.215	-34.0	ACTION	ACTION	ACTION
1982	0.039	0.167	-22.2		ACTION	ACTION
1983	0.146	0.101	-39.3	ACTION	ACTION	ACTION
1984	0.199	0.128	26.2			ACTION
1985	0.210	0.185	44.6			
1986	0.209	0.206	11.3			ACTION
1987	0.095	0.172	-16.8		ACTION	ACTION
1988	0.284	0.196	14.5			ACTION
1989	0.128	0.169	-13.7		ACTION	ACTION
1990	0.194	0.202	19.4			ACTION
1991	0.167	0.163	-19.3		ACTION	ACTION
1992	0.126	0.162	-0.4		ACTION	ACTION
1993	0.227	0.173	6.7			ACTION
1994	0.099	0.151	-13.0		ACTION	ACTION
1995	0.189	0.172	13.8			ACTION
1996	0.176	0.155	-9.8		ACTION	ACTION
1997	0.232	0.199	28.6			ACTION
1998	0.028	0.146	-26.9		ACTION	ACTION
1999	0.070	0.110	-24.2		ACTION	ACTION
2000	0.154	0.084	-23.6		ACTION	ACTION
2001	0.287	0.170	102.3			

**Indices and averages are in kg/tow.*

***The proposed action represents a slightly modified version of Rebuilding Option 2 and is more thoroughly evaluated in Section 6.1.3.3.*

Figure 66 Retrospective Performance Evaluation of Rebuilding Options 1, 2, and 4 Based on Historical Smooth Skate Autumn Survey Index



**The bars represent the annual percent change in the three-year moving average of the trawl survey (left axis), while the lines represent the actual survey point estimates and the smoothed three-year moving average (right axis).*
***The proposed action represents a slightly modified version of Rebuilding Option 2 and is more thoroughly evaluated in Section 6.1.3.3.*

6.1.3.3 Evaluation of Rebuilding Options Using Hypothetical Skate Species

The retrospective evaluation presented in Section 6.1.3.2 of this document provides a clear indication of when Council action would have been required under each of the three criteria-based rebuilding options (Option 3 was not evaluated because it does not include any specific criteria or triggers). The drawback to this analysis is that it is not a simple matter to determine, from the actual survey data, how the various rebuilding options would perform in an assumed period of rebuilding compared to an assumed period of decline. This difficulty is due to the significant variability in the existing survey data for these species. In addition, management action that would have been required when the species would have been considered overfished did not occur, so it is difficult to determine whether or not additional action would have been triggered in following years.

The following assessment considers two very different scenarios. In the first scenario, the population of a hypothetical skate species is declining at a rate of 5% per year. In the second scenario, the population of a hypothetical skate species is increasing at the same rate of 5% per year. Similar to three of the seven species in the northeastern skate complex, the hypothetical survey index data for these skate species vary with a coefficient of variation (CV) equivalent to +/-20%.

Figure 67 provides a graphical representation of the hypothetical population declining at a rate of 5% per year, and Table 21 provides the data on which this graph is based. Figure 68 provides the graphical representation of the hypothetical skate population that is increasing at a rate of 5% annually, and Table 22 provides the data on which this graph is based. In both cases, the population change began with a baseline index value of 10.0 kg/tow in 1980. Also in both cases, the data for years 1981-2020 were generated by either decreasing (for Table 21) or increasing (for Table 22) the previous year's survey index value, offset by a randomly generated error factor of +/-20% of the previous year's index value to represent the survey variability. The time series for both examples arbitrarily runs through the year 2020 to provide for an extended time series against which to analyze the efficacy of the rebuilding options, and to reinforce the hypothetical nature of this exercise. The extended time series used in this analysis allows the population in example 1 to decline by more than 90% from the baseline, and the population in example 2 to increase by approximately 500%.

Figure 67 Representing a Hypothetical Skate Species with a Population Declining at an Annual Rate of 5% (on average), Subject to Survey Variability of +/- 20%

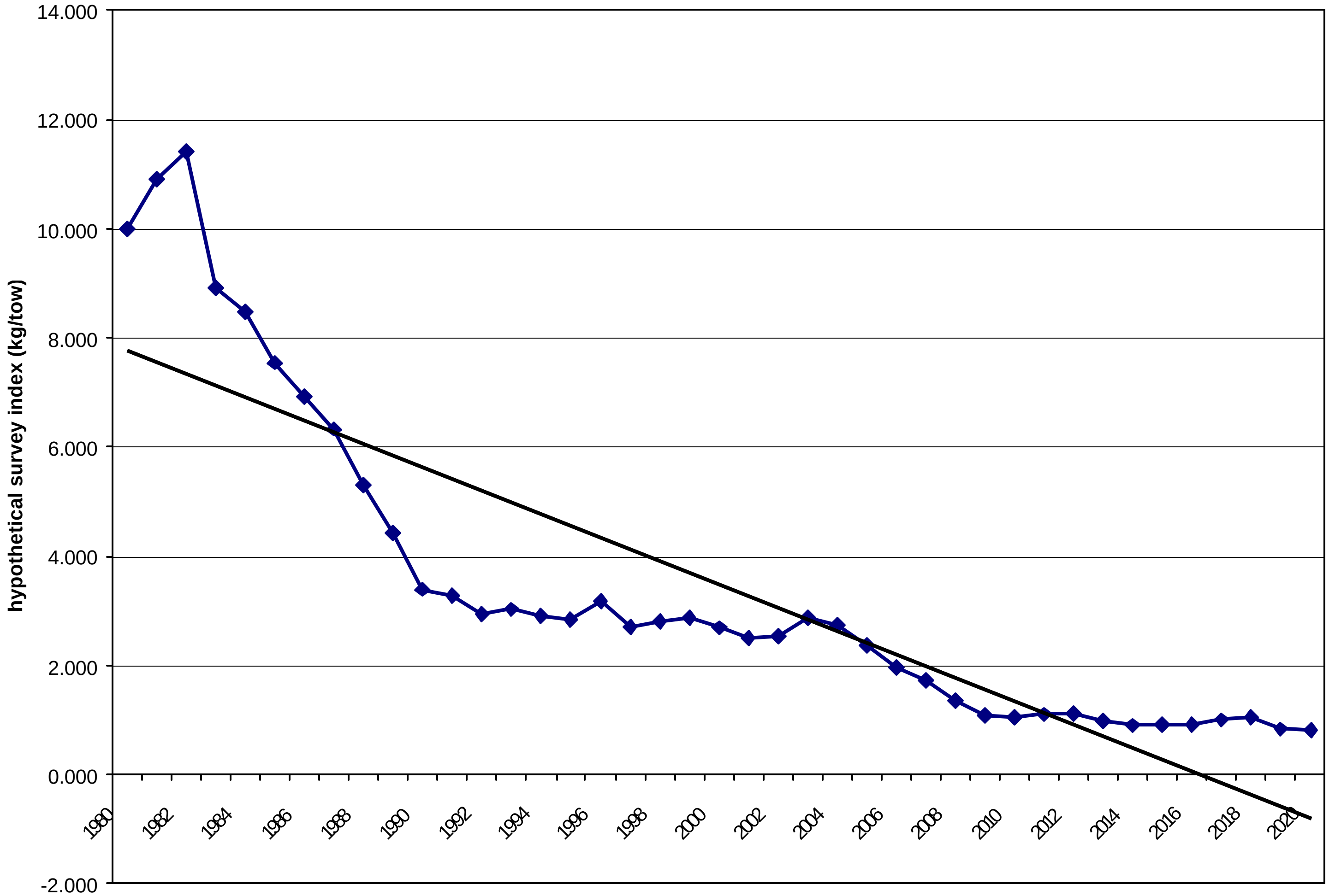


Figure 68 Representing a Hypothetical Skate Species with a Population Increasing at an Annual Rate of 5% (on average), Subject to Survey Variability of +/- 20%

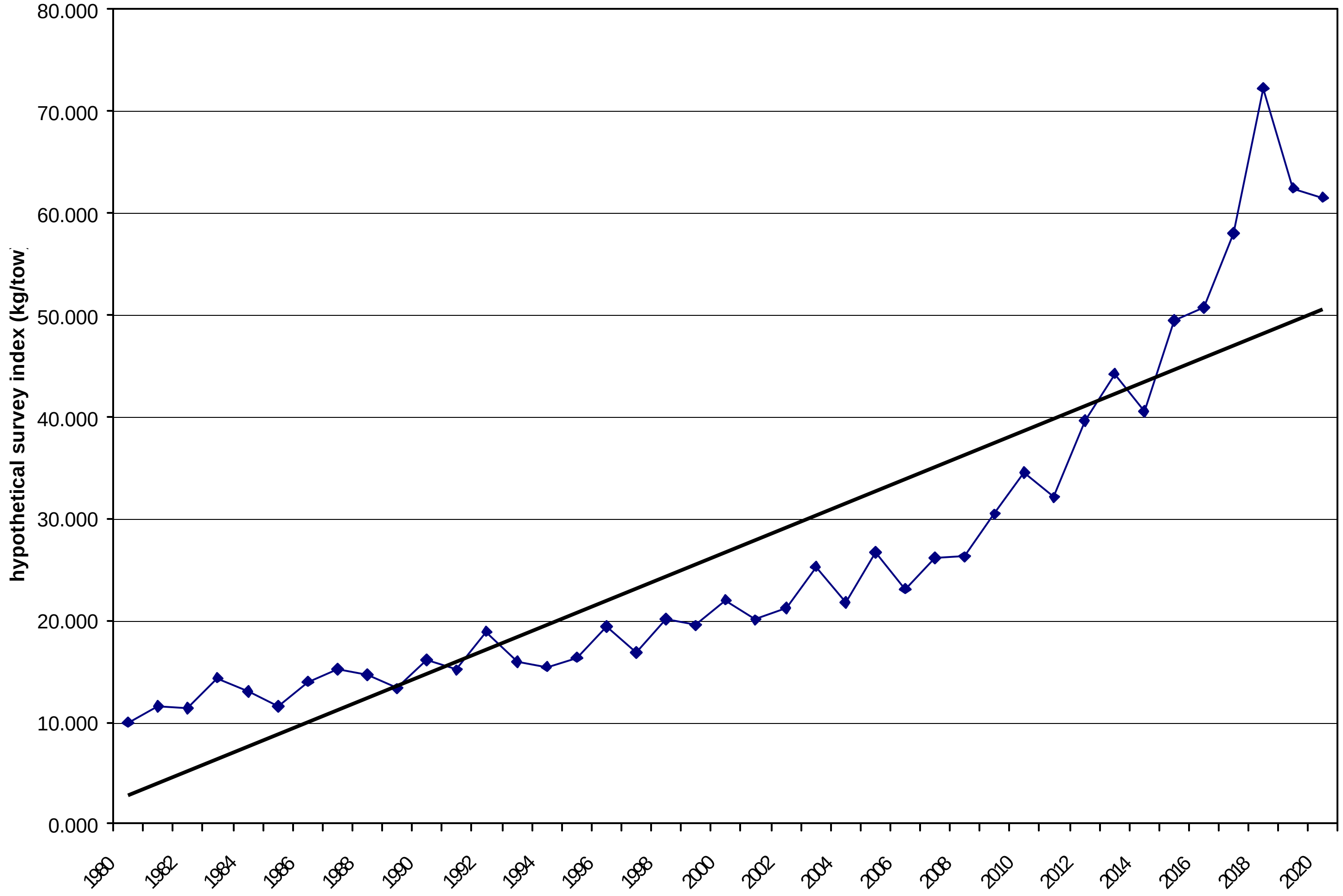


Table 21 Example of Effect of Rebuilding Program Options Using a Hypothetical Skate Species with a Population Declining at an Average Rate of 5% Per Year

	Survey Index**	Annual % Change	% Change from Baseline	**3-Year Average**	Annual % Change	% Change from Baseline	**Option 1**	**Option 2**	**Option 2A-Proposed**	**Option 4**
1980	10.000	--	--	--	--	--				
1981	10.902	9.0%	9.0%	--	--	--				
1982	11.414	4.7%	14.1%	10.77	--	--				
1983	8.910	-21.9%	-10.9%	10.41	-3.4%	-3.4%		**ACTION**		**ACTION**
1984	8.483	-4.8%	-15.2%	9.60	-7.7%	-10.9%		**ACTION**		**ACTION**
1985	7.548	-11.0%	-24.5%	8.31	-13.4%	-22.8%		**ACTION**	**ACTION**	**ACTION**
1986	6.926	-8.2%	-30.7%	7.65	-8.0%	-29.0%		**ACTION**	**ACTION**	**ACTION**
1987	6.333	-8.6%	-36.7%	6.94	-9.4%	-35.6%		**ACTION**	**ACTION**	**ACTION**
1988	5.294	-16.4%	-47.1%	6.18	-10.8%	-42.6%		**ACTION**	**ACTION**	**ACTION**
1989	4.428	-16.4%	-55.7%	5.35	-13.5%	-50.3%		**ACTION**	**ACTION**	**ACTION**
1990	3.394	-23.4%	-66.1%	4.37	-18.3%	-59.4%		**ACTION**	**ACTION**	**ACTION**
1991	3.287	-3.1%	-67.1%	3.70	-15.3%	-65.6%		**ACTION**	**ACTION**	**ACTION**
1992	2.951	-10.2%	-70.5%	3.21	-13.3%	-70.2%		**ACTION**	**ACTION**	**ACTION**
1993	3.025	2.5%	-69.7%	3.09	-3.8%	-71.3%		**ACTION**	**ACTION**	**ACTION**
1994	2.902	-4.1%	-71.0%	2.96	-4.2%	-72.5%		**ACTION**	**ACTION**	**ACTION**
1995	2.841	-2.1%	-71.6%	2.92	-1.2%	-72.9%		**ACTION**	**ACTION**	**ACTION**
1996	3.183	12.0%	-68.2%	2.98	1.8%	-72.4%			**ACTION**	**ACTION**
1997	2.708	-14.9%	-72.9%	2.91	-2.2%	-73.0%		**ACTION**	**ACTION**	**ACTION**
1998	2.806	3.6%	-71.9%	2.90	-0.4%	-73.1%		**ACTION**	**ACTION**	**ACTION**
1999	2.871	2.3%	-71.3%	2.79	-3.6%	-74.1%		**ACTION**	**ACTION**	**ACTION**
2000	2.697	-6.1%	-73.0%	2.79	-0.1%	-74.1%		**ACTION**	**ACTION**	**ACTION**
2001	2.500	-7.3%	-75.0%	2.69	-3.6%	-75.0%		**ACTION**	**ACTION**	**ACTION**
2002	2.536	1.4%	-74.6%	2.58	-4.1%	-76.1%		**ACTION**	**ACTION**	**ACTION**
2003	2.882	13.6%	-71.2%	2.64	2.4%	-75.5%			**ACTION**	**ACTION**
2004	2.749	-4.6%	-72.5%	2.72	3.1%	-74.7%				**ACTION**
2005	2.379	-13.5%	-76.2%	2.67	-1.9%	-75.2%		**ACTION**		**ACTION**
2006	1.959	-17.7%	-80.4%	2.36	-11.5%	-78.1%		**ACTION**	**ACTION**	**ACTION**
2007	1.733	-11.5%	-82.7%	2.02	-14.3%	-81.2%		**ACTION**	**ACTION**	**ACTION**
2008	1.352	-22.0%	-86.5%	1.68	-16.9%	-84.4%		**ACTION**	**ACTION**	**ACTION**
2009	1.091	-19.3%	-89.1%	1.39	-17.2%	-87.1%		**ACTION**	**ACTION**	**ACTION**
2010	1.057	-3.2%	-89.4%	1.17	-16.2%	-89.2%		**ACTION**	**ACTION**	**ACTION**
2011	1.109	5.0%	-88.9%	1.09	-6.9%	-89.9%		**ACTION**	**ACTION**	**ACTION**
2012	1.130	1.9%	-88.7%	1.10	1.2%	-89.8%			**ACTION**	**ACTION**
2013	0.986	-12.8%	-90.1%	1.07	-2.2%	-90.0%		**ACTION**	**ACTION**	**ACTION**
2014	0.903	-8.4%	-91.0%	1.01	-6.4%	-90.7%		**ACTION**	**ACTION**	**ACTION**
2015	0.910	0.8%	-90.9%	0.93	-7.3%	-91.3%		**ACTION**	**ACTION**	**ACTION**
2016	0.915	0.5%	-90.9%	0.91	-2.5%	-91.6%		**ACTION**	**ACTION**	**ACTION**
2017	1.006	10.0%	-89.9%	0.94	3.8%	-91.2%			**ACTION**	**ACTION**
2018	1.052	4.6%	-89.5%	0.99	5.0%	-90.8%				**ACTION**
2019	0.838	-20.3%	-91.6%	0.97	-2.6%	-91.0%		**ACTION**		**ACTION**
2020	0.814	-3.0%	-91.9%	0.90	-6.6%	-91.6%		**ACTION**	**ACTION**	**ACTION**

*** The survey index is randomly generated starting with a "baseline" of 10.0 kg/tow in year 1980, a forced 5% annual decline to establish a non-varying trend, and natural variability of +/- 20% to account for the CV of the survey index (assumed in the hypothetical case to be 20%).*

Table 22 Example of Effect of Rebuilding Program Options Using a Hypothetical Skate Species with a Population Increasing at an Average Rate of 5% Per Year

	Survey Index**	Annual % Change	% Change from Baseline	**3-Year Average**	Annual % Change	% Change from Baseline	**Option 1**	**Option 2**	**Option 2A-Proposed**	**Option 4**
1980	10.000	--	--	--	--	--				
1981	11.601	16.0%	16.0%	--	--	--				
1982	11.400	-1.7%	14.0%	11.00	--	--				
1983	14.332	25.7%	43.3%	12.44	13.1%	13.1%				**ACTION**
1984	13.010	-9.2%	30.1%	12.91	3.8%	17.4%				**ACTION**
1985	11.549	-11.2%	15.5%	12.96	0.4%	17.9%				**ACTION**
1986	13.989	21.1%	39.9%	12.85	-0.9%	16.8%		**ACTION**		**ACTION**
1987	15.160	8.4%	51.6%	13.57	5.6%	23.3%				**ACTION**
1988	14.639	-3.4%	46.4%	14.60	7.6%	32.7%				**ACTION**
1989	13.298	-9.2%	33.0%	14.37	-1.6%	30.6%		**ACTION**		**ACTION**
1990	16.075	20.9%	60.7%	14.67	2.1%	33.4%				**ACTION**
1991	15.135	-5.8%	51.4%	14.84	1.1%	34.9%				**ACTION**
1992	18.903	24.9%	89.0%	16.70	12.6%	51.9%				**ACTION**
1993	15.935	-15.7%	59.3%	16.66	-0.3%	51.4%		**ACTION**		**ACTION**
1994	15.461	-3.0%	54.6%	16.77	0.7%	52.4%				**ACTION**
1995	16.376	5.9%	63.8%	15.92	-5.0%	44.8%		**ACTION**	**ACTION**	**ACTION**
1996	19.386	18.4%	93.9%	17.07	7.2%	55.2%				**ACTION**
1997	16.812	-13.3%	68.1%	17.52	2.6%	59.3%				**ACTION**
1998	20.109	19.6%	101.1%	18.77	7.1%	70.6%				**ACTION**
1999	19.473	-3.2%	94.7%	18.80	0.2%	70.9%				**ACTION**
2000	21.990	12.9%	119.9%	20.52	9.2%	86.6%				**ACTION**
2001	20.021	-9.0%	100.2%	20.49	-0.1%	86.3%		**ACTION**		**ACTION**
2002	21.225	6.0%	112.2%	21.08	2.8%	91.6%				**ACTION**
2003	25.265	19.0%	152.6%	22.17	5.2%	101.5%				**ACTION**
2004	21.758	-13.9%	117.6%	22.75	2.6%	106.8%				**ACTION**
2005	26.618	22.3%	166.2%	24.55	7.9%	123.1%				**ACTION**
2006	23.095	-13.2%	131.0%	23.82	-2.9%	116.6%		**ACTION**		**ACTION**
2007	26.081	12.9%	160.8%	25.26	6.0%	129.7%				**ACTION**
2008	26.232	0.6%	162.3%	25.14	-0.5%	128.5%		**ACTION**		**ACTION**
2009	30.426	16.0%	204.3%	27.58	9.7%	150.7%				**ACTION**
2010	34.471	13.3%	244.7%	30.38	10.1%	176.1%				**ACTION**
2011	32.064	-7.0%	220.6%	32.32	6.4%	193.8%				**ACTION**
2012	39.602	23.5%	296.0%	35.38	9.5%	221.6%				**ACTION**
2013	44.225	11.7%	342.3%	38.63	9.2%	251.2%				**ACTION**
2014	40.459	-8.5%	304.6%	41.43	7.2%	276.6%				**ACTION**
2015	49.412	22.1%	394.1%	44.70	7.9%	306.3%				**ACTION**
2016	50.672	2.5%	406.7%	46.85	4.8%	325.9%				**ACTION**
2017	57.989	14.4%	479.9%	52.69	12.5%	379.0%				**ACTION**
2018	72.260	24.6%	622.6%	60.31	14.5%	448.2%				**ACTION**
2019	62.417	-13.6%	524.2%	64.22	6.5%	483.8%				**ACTION**
2020	61.506	-1.5%	515.1%	65.39	1.8%	494.5%				**ACTION**

*** The survey index is randomly generated starting with a "baseline" of 10.0 kg/tow in year 1980, a forced 5% annual increase to establish a non-varying trend, and natural variability of +/- 20% to account for the CV of the survey index (assumed in the hypothetical case to be 20%).*

Although the skate population in example 1 declines more than 90% over the course of the time series, because this decline is spread out over many years and the survey index never declines more than 23.4% in any one year, Council action would never be triggered under Rebuilding Option 1. On the other hand, because Option 4 requires such a significant increase in the survey index for action to not be required, additional Council action would be required every year in example 1. For example 1, Options 2 and 2A (the proposed action) appear very similar. Both would trigger Council action in most, but not all, years. Option 2A (the proposed action) would require Council action slightly more often than Option 2. It may not be evident in Table 21, but because the proposed action requires comparison of the current 3-year average with the 3-year average calculated for the fourth, fifth, and sixth years prior to the assessment year rather than the second, third, and fourth, there is a two-year delay to when this approach can be used compared with Option 2.

The analysis provides interesting results for example 2, in which the population increases consistently over the time series. Because this increase is small compared to the survey variability (even though a 5% annual population increase would actually be quite robust for a skate species), the effects of this increase are generally masked by the survey variability, and action would be required in every year under Rebuilding Option 4. Under Option 1, which only responds to significant decreases in the survey index, action would never be required. Rebuilding Options 2 and 2A are much less extreme, but there are some apparent differences. Under Option 2, action would be required seven times; but under Option 2A (the proposed action), action would only be required once.

This analysis illustrates an interesting outcome of Rebuilding Options 1 and 4: neither option is sufficiently sensitive to appropriately respond to small, but consistent changes in population size. Both options require significant short-term changes in population size to provide the Council with meaningful advice on when additional action should be taken. The lack of sufficient sensitivity of these two options to provide appropriate information for the Council is evident when comparing the results of the two examples: the results for both options are the same whether the population were to decrease more than 90% or increase 500% over the course of the time series. Although Option 1 would not be expected to trigger action in example 2, the limitations of Option 1 are evident in example 1. Similarly, although it could be argued that action should be required in every year for example 1, as it is under Option 4, it clearly should not be required in every year as it is under this option in example 2. Thus, neither of these options appear to have sufficient sensitivity to provide useful information to the Council that accurately reflects what is happening to the population.

Options 2 and 2A appear to provide much more useful information and to be much more sensitive to changes in population size. The results of this analysis are quite different for example 1 than they are for example 2, with action being required much more often for a declining population than for an increasing one. Of these two options, Option 2A (the proposed action) may be the more sensitive: Option 2A would trigger action more often than Option 2 when a population is in decline, and less often than Option 2 when a population is on the rise. In other words, Option 2A appears to be more effective at avoiding false triggers.

The results of this analysis suggest that, of the four criteria-based rebuilding options that the Council considered, Option 2A, the proposed action, would most accurately indicate when additional Council action should or should not be required to ensure the continued rebuilding of the species in the northeast skate complex.

6.1.4 Impacts of Proposed Prohibitions for Barndoor, Thorny, and Smooth Skates

During the development of this FMP, the Council considered various kinds of prohibitions for the skate species in need of specific management attention. For barndoor, thorny, and smooth skates, the Council considered prohibitions on: (1) possession; (2) landing; and (3) sale. Ultimately, the Council chose to prohibit the possession of all of these species. The following assessment addresses all three kinds of prohibitions that were considered in this FMP. General differences between these prohibitions as well as the trade-offs between restrictiveness and flexibility are discussed below.

In general:

- A prohibition on the possession of a species means that ***no*** federally-permitted vessels or dealers will be allowed to possess the prohibited species. This includes all vessels and dealers with any federal permits, not just those permitted for the skate fishery. In the regulations, prohibitions on possession are comprehensive and refer to: fish for, harvest, possess, or land. Terms like catch, take, and retain may also be added to the regulatory language for a prohibition on possession. Similar to the prohibition on the possession of salmon, language may be added to the regulation that requires all of the prohibited species to be released in such a manner as to insure maximum probability of survival.
- A prohibition on the landing of a species means that ***no*** federally-permitted vessels will be allowed to land the prohibited species, and ***no*** federally-permitted dealers will be allowed to purchase the prohibited species. "Land" is defined in the regulations as to begin offloading fish, to offload fish, or to enter port with fish. Dealer prohibitions usually refer to: purchase, possess or receive for a commercial purpose, or attempt to purchase possess or receive for a commercial purpose.
- A prohibition on the sale of a species means that ***no*** federally-permitted dealers will be allowed to purchase the prohibited species, and no federally-permitted vessels will be allowed to sell the prohibited species. In the regulations, prohibitions on sale usually refer to: sell, barter, trade, or otherwise transfer; or attempt to sell, barter, trade, or otherwise transfer for a commercial purpose.

Specific to skates is the problem with species identification. The effectiveness of more restrictive measures – for example, a prohibition on the possession of barndoor skate – will depend on the ability of fishermen to identify the prohibited species. To the extent that some of the skate species may be singled out for prohibitions, the ability of vessels, dealers, and enforcement agents to quickly and accurately distinguish the seven species in the skate complex becomes critical. Identification may be especially problematic on high volume trips and trips on vessels that only fish for or catch skates on a seasonal or part-time basis. The concern is that more restrictive prohibitions (those on possession, for example) could result in violations for many fishermen who make an honest mistake by missing a prohibited skate on a high volume trip or by mis-identifying a prohibited species. Similarly, enforcement agents could mis-identify a species and mistakenly issue a violation. For this reason, other kinds of prohibitions were considered that may provide more time/opportunity/flexibility for vessels to correctly identify the species and ensure that they are in compliance with the regulations. The Council selected prohibitions on possession because of the biological needs of the resources, so it will be important for enforcement personnel to establish mechanisms (for example, tolerances) to avoid problems associated with species mis-identification.

It is essential to recognize the trade-offs associated with different kinds of prohibitions. The trade-offs are related to the prohibition's potential impacts on fishing mortality and vessel flexibility. Vessel flexibility tends to decrease as the restrictiveness of the prohibition increases, while the potential to reduce fishing mortality tends to increase as the restrictiveness of the prohibition increases. Ranking the prohibitions that were considered for skates from most restrictive to least restrictive produces the following:

- Possession (most restrictive)
- Landing
- Sale
- No Action (least restrictive)

A prohibition on the possession of a species is the most restrictive form of prohibition and is most likely to reduce fishing mortality and therefore have positive biological impacts. This leaves the vessel with little flexibility, however, as the prohibited species must be returned to the water as quickly as possible. This is a measure that can be enforced both at-sea and dockside. To avoid problems with enforcement and compliance, a prohibition on possession includes a prohibition on both landing and sale as part of the regulatory language. If one objective of the management measure is to reduce fishing mortality and/or to promote rebuilding, then a prohibition on possession is the most likely kind of prohibition to achieve this objective. Note that while it does increase the probability of impacting fishing mortality, a prohibition on possession does not address any concerns related to species identification problems. As discussed above, if these problems prove to be significant, it may be necessary to consider tolerances to ensure that honest mistakes do not result in violations.

A prohibition on the landing of a species differs from a prohibition on possession in that a vessel may possess the species for some period of time, but cannot land it. Landing is defined as entering port, beginning to offload fish, or offloading fish. To avoid some problems with enforcement and compliance, a prohibition on landing usually includes a prohibition on sale. This kind of prohibition provides vessels with more flexibility and opportunity for compliance. If species identification is problematic, fishermen can take the time to sort their catch, identify the species, and discard the prohibited species. This may be a more feasible approach from a compliance perspective, but it has shortcomings from both the enforcement and fishing mortality perspectives. A prohibition on landing completely eliminates opportunity for at-sea enforcement and can complicate dockside enforcement. In addition, discard mortality is likely to increase with increased time that the prohibited species spends on deck. Under such a prohibition, vessels that catch skates incidentally may choose to set their skate catch aside until other species have been sorted since there is no legal requirement for them to return any skates to the water as quickly as possible. This is an important trade-off to understand in terms of the potential biological impacts of this measure.

A prohibition on the sale of a species differs from prohibitions on possession and landing in that it shifts much of the compliance burden to dealers (although it includes prohibitions for both sellers and buyers). This kind of prohibition has even more enforcement problems associated with it than a prohibition on landing. In addition to eliminating at-sea enforcement, dockside enforcement can become extremely difficult. For example, skate wings are most often cut at sea with only the wing returning to port for sale to a dealer. It may become very difficult for dealers, enforcement agents, and even the selling fishermen to distinguish all of the skate species by their wings only. As another example, a scenario that could result from this prohibition is if a vessel gives some of the prohibited species to a dealer to hold and then transfers the skates to another vessel for use as bait. This technically may not be a sale because no money was exchanged. This could be especially problematic with skates since one of the primary uses of skates is for lobster bait. During the scoping process for this FMP, some fishermen reported that significant amounts of skates are transferred between vessels (both at-sea and shoreside) for use as bait without any monetary exchange (because of the low commercial value of skates for bait). In addition to the enforcement problems, a prohibition on sale is not likely to reduce fishing mortality and may not result in any positive biological impacts.

As mentioned above, both prohibitions on landing and sale may be especially problematic for skates because of the nature of the skate fisheries. Both of these kinds of prohibitions introduce the potential to transfer the prohibited species at-sea for use as lobster bait. While adult barndoor and thorny skates are generally too large for use as bait, juvenile barndoor and thorny skates as well as smooth skates (adults) may be marketable as bait. Even though these are not the traditional species sought after for lobster bait, the potential for this activity to occur still exists. It is not possible to predict how much of this activity will occur, but to the extent that it does, the objective of the prohibition could be compromised. This is in addition to the potential to compromise the biological benefits of the prohibition because the prohibited species may remain on deck for a longer period of time.

Other problems could emerge if one kind of prohibition is adopted for one species, and another kind is adopted for another species. Inconsistent prohibitions between different skate species will compound enforcement and compliance difficulties. Consider a vessel trying to comply with a prohibition on the possession of barndoor skate, a prohibition on the landing of thorny skate, and a prohibition on the sale of smooth skate. This may ultimately confuse the situation to the extent that all of the prohibitions become ineffective. In this FMP, the Council resolved this issue by proposing the same kinds of prohibitions for all three skate species.

As discussed above, the potential to affect fishing mortality decreases with increasing flexibility/opportunity associated with the prohibition. Ranking the prohibitions considered in this FMP from most effective to least effective in terms of potential to reduce fishing mortality produces the following:

- Possession (most effective)
- Landing
- Sale
- No Action (least effective)

The discussion below focuses on the potential biological impacts of a prohibition on possession for barndoor, thorny, and smooth skates. It can be assumed that any benefits would be diminished by a prohibition on landings and diminished even more by a prohibition on sale. The diminishing of the benefits relates to the increased opportunity for the prohibited species to remain on-deck longer and not returned to the water in the most expeditious manner.

Landings of smooth skates are considered to be negligible. Smooth skates are relatively small-bodied skates and are considered too small for cutting skate wings. They are not known presently to be a component of any directed bait fishery (see Skate SAFE Report, Volume II). The effects of a prohibition on possession of smooth skates would likely be minor at present, but would discourage development of any markets for this species and prevent retention from any previously unreported fishery.

Both barndoor and thorny skates are large enough to be harvested for the skate wing fishery. However, the magnitude of landings for each species is unknown because most skate wings are landed as “unclassified.” Information gathered for the Skate SAFE Report (Volume II) indicates that these species likely comprise a minor fraction of the skate wing landings, the majority being attributed to winter skate. The bait fishery reportedly favors small skates, and encounters with thorny or barndoor skates in the nearshore Southern New England waters where the bait fishery is most active are likely uncommon. The benefits of the prohibition can not be quantitatively analyzed because the magnitude of landings is not known. It is likely that neither species is currently targeted. Therefore, expected conservation benefits would be gained by the survival of discarded thorny and barndoor skates caught incidentally in mixed demersal or other targeted fisheries (which would have been opportunistically landed as skate wings).

In summary, the positive biological impacts resulting from the proposed prohibitions will be realized through discard survival and the preclusion of fishery and market expansion targeting these species. The short-term impacts are likely to be a product of discard survival, while the long-term impacts are likely to be a product of both discard survival and the preclusion of fishery and market expansion. The magnitude of the short-term positive impacts of any of these prohibitions will be directly related to the survival rates of discarded skates. While discard survival rates are not known for any of the skate species, they are generally thought to be higher than for finfish species. Therefore, it is assumed that at least some proportion of discarded skates will survive.

6.1.5 Impacts of Proposed Possession Limit for the Skate Wing Fishery

During the development of this FMP, the Council considered the following possession limits for the skate wing fishery (in addition to the no action alternative):

Option 1. 10,000 pounds of skate wings (22,700 pounds whole weight);

Option 2. 20,000 pounds of skate wings (45,400 pounds whole weight); and

Option 3. 30,000 pounds of skate wings (68,100 pounds whole weight).

The Council ultimately selected a combination of Options 1 and 2:

10,000 pounds per day (22,700 pounds whole weight) and 20,000 pounds per trip (45,400 pounds whole weight); a day is defined as any time period less than or equal to 24 hours, and a trip is defined as any time period greater than 24 hours.

The biological impacts of Options 1, 2, and 3 are discussed below. The impacts of the proposed action are assumed to fall within the range of expected impacts under Options 1 and 2.

The rationale supporting a possession limit on skate wings is to discourage a directed wing fishery at this time. The possession limit should reduce fishing mortality on winter skate, avoid an overfished situation for winter skate, and help improve the overfished status of thorny and barndoor skates. The conservation benefits discussed in this section and presented in Table 24 and Table 25 may be useful to roughly consider relative merits of the three possession limits considered during the development of this FMP.

Processors who contributed to the 2000 SAFE Report (Volume II) indicated that thorny and barndoor skates, as well as winter skates, are sufficiently large for the wing market. The relative contributions of these three species in the skate wing landings are unknown. The overfished status of thorny and barndoor skates and the geographic range of winter skate in relation to reported landings suggest that winter skate comprise the majority of skate wing landings at this time. The smaller species of skates (little skate, smooth skate, clearnose skate, and rosette skate) are not expected to be directly impacted by management strategies in the wing fishery.

Since it is not possible to separate out skate landings by species at this time, the following analysis is for aggregated "skate wings" only. Benefits to individual species cannot be analyzed. A retrospective analysis of potential conservation benefits from trip limits during the fishing years 1995-2000 is presented below, mirroring the trip limit analysis presented in the section describing the economic impacts of the possession limits (see Section 6.2). Trips landing skate wings were identified from dealer reports (see Section 6.5.4 for methodology). For this biological analysis, reported landings data have been converted from wing weight to live weight using a conversion factor of 2.27 (NEFSC).

In the 1995-2000 period, trips landing 10,000 pounds or more contributed nearly twice as much to total landings as did trips greater than 20,000 pounds and nearly four times the total contributions from trips greater than 30,000 pounds (Table 23). Trips landing 10,000 or more pounds of skate wings accounted for an average of 29% of total skate wing landings in the 1995-2000 period, with a maximum of 55% in 1996 and a minimum of 9% in 1995. The percentages for the same years that correspond to a 20,000-pound trip limit averaged 15% (range 3 - 39%).

Trips landing 30,000 pounds or more of skate wings contributed 8% of total wing landings on average (range 0 – 26%).

Table 23 Skate Landings and Estimated Conservation Gains in Skate Wing Fishery, 1995-2000 Calendar Years

Calendar Year	Total Reported Landings in Live Weight (lbs)	Landings from Trips Exceeding 10,000-lb Limit in Live Weight (lbs)	% of Reported Landings	Landings from Trips Exceeding 20,000-lb Limit in Live Weight (lbs)	% of Reported Landings	Landings from Trips Exceeding 30,000-lb Limit in Live Weight (lbs)	% of Reported Landings
1995	8,796,781	752,687	8.6%	258,428	2.9%	0	0.0%
1996	22,582,364	12,427,310	55.0%	8,697,519	38.5%	5,812,476	25.7%
1997	12,292,869	2,267,026	18.4%	863,031	7.0%	-	-
1998	18,606,389	4,867,913	26.2%	1,780,168	9.6%	560,088	3.0%
1999	14,671,773	2,758,899	18.8%	717,642	4.9%	-	-
2000	19,103,323	5,124,244	26.8%	2,046,757	10.7%	542,507	2.8%
Sum	96,053,500	28,198,078		14,363,545		7,284,684	
Average	16,008,917	4,699,680	29.4%	2,393,924	15.0%	*1,214,114	*7.6%

Data are from NMFS dealer reports converted to live weight. A dash indicates confidential information.
**1997 and 1999 values were included in calculation of series average.*

The economic analysis of trip limits (Section 6.5.4) describes how possession limits affect fishermen's decisions to continue or end a trip when a possession limit is reached. If the trip continues, any subsequent catches of wing skates would be discarded. If skate wings are necessary to cover trip costs, the trip is cut short. (See Table 26 in Section 6.2 for a breakdown of the number of vessels or number of trips that exceeded the proposed possession limits in 1995-2000. See Table 27 in the same section for a breakdown of how fishing trips were expected to respond to possession limits). In this analysis, the predicted response by fishermen to trip limits is used to estimate resulting conservation benefits.

The behaviors of fishermen in response to possession limits are simplified here and do not reflect other possible fishing strategies. For example, any trips that cease fishing operations when the skate trip limit is reached are credited with conservation benefits from reduced landings. An alternative change in fishing strategy such as more frequent but shorter trips could reduce those benefits assumed in this analysis.

The benefits accrued from trips that continue fishing and discarding skates once the trip limit is reached are analyzed under two assumptions of discard mortality: 100% mortality and 0% mortality of regulatory skate discards. Discard mortality rates are currently unknown for this complex of skate species.

In the most optimistic scenario (0% discard mortality), the assumptions are: (1) all discards survive (and therefore do not count as catch) on trips that continue fishing after reaching the possession limit, and (2) landings are reduced by shortened trips (those which end when the possession limit is reached). In this case, reductions in annual skate catches (based on reported catches from 1995-2000) between 276,000 and 7.2 million pounds of skates are projected by a 10,000-pound trip limit (Table 24). The average annual reduction is 2.2 million pounds or 14% of total observed landings. Under a 20,000-pound limit, catch reductions ranged from 31,000 to 3.6 million pounds annually, with an average reduction of 831,000 pounds or 5.2% of total landings. Expected reductions from a 30,000-pound possession limit ranged from 0 to 1.7 million pounds annually, with an average reduction of 329,000 pounds or 2.1% of total landings. The reduction from the proposed action can be expected to fall within the range of reductions under Options 1 and 2.

Table 24 Retrospective Estimates of Skate Conservation Gains from Shortened Trips and Assuming 100% Discard Survival on Continued Trips

Calendar Year	Total Reported Landings in Live Weight (lbs)	Gains from Trips Exceeding 10,000-lb Limit in Live Weight (lbs)	% of Reported Landings	Gains from Trips Exceeding 20,000-lb Limit in Live Weight (lbs)	% of Reported Landings	Gains from Trips Exceeding 30,000-lb Limit in Live Weight (lbs)	% of Reported Landings
1995	8,796,781	276,014	3.1%	31,390	0.4%	0	0.0%
1996	22,582,364	7,206,312	31.9%	3,612,714	16.0%	1,658,396	7.3%
1997	12,292,869	927,749	7.5%	227,418	1.8%	86,791	0.7%
1998	18,606,389	1,916,965	10.3%	418,207	2.2%	83,382	0.4%
1999	14,671,773	932,087	6.4%	127,440	0.9%	10,408	0.1%
2000	19,103,323	2,202,570	11.5%	566,313	3.0%	133,912	0.7%
Sum	96,053,500	13,461,697		4,983,481		1,972,889	
Average	16,008,917	2,243,616	14.0%	830,580	5.2%	328,815	2.1%

Alternatively, reductions are considered if the skates discarded by vessels continuing to fish after reaching the trip limit suffer 100% mortality; in this scenario, the only reductions that result are from shortened trips. Reductions in annual skate landings (based on reported catches from 1995-2000) between 188,000 and 4.8 million pounds are projected under a 10,000-pound trip limit (Table 25). The average annual reductions approach 1.4 million pounds live weight or nearly 9% of total landings. Analysis of the 20,000-pound possession limit projects an average annual reduction of 560,000 pounds of skates on shortened trips (3.5% of total landings), and 227,000 pounds are reduced under the 30,000-pound limit (1.4% of total landings). The reduction from the proposed action can be expected to fall within the range of reductions under Options 1 and 2.

Table 25 Retrospective Estimates of Skate Conservation Gains from Shortened Trips and Assuming 0% Discard Survival on Continued Trips

Calendar Year	Total Reported Landings in Live Weight (lbs)	Gains from Trips Exceeding 10,000-lb Limit in Live Weight (lbs)	% of Reported Landings	Gains from Trips Exceeding 20,000-lb Limit in Live Weight (lbs)	% of Reported Landings	Gains from Trips Exceeding 30,000-lb Limit in Live Weight (lbs)	% of Reported Landings
1995	8,796,781	188,435	2.1%	29,126	0.3%	0	0.0%
1996	22,582,364	4,831,139	21.4%	2,566,383	11.4%	1,228,672	5.4%
1997	12,292,869	267,510	2.2%	25,299	0.2%	0	0.0%
1998	18,606,389	1,430,888	7.7%	359,868	1.9%	83,382	0.4%
1999	14,671,773	569,765	3.9%	100,053	0.7%	10,408	0.1%
2000	19,103,323	1,088,408	5.7%	277,828	1.5%	39,257	0.2%
Sum	96,053,500	8,376,146		3,358,556		1,361,719	
Average	16,008,917	1,396,024	8.7%	559,759	3.5%	226,953	1.4%

6.1.6 Qualitative Assessment of Impacts of Year-Round Closed Areas

As discussed in Section 4.16 of this document, the Council will rely, in part, on management measures in other fisheries to continue to protect and help rebuild skates. In fact, one of the primary objectives of this FMP is to protect the overfished species of skates and rebuild their biomass to target levels through management measures in other FMPs (groundfish, monkfish, scallops, etc.), skate-specific management measures, or a combination of both as necessary.

While the impacts of the baseline management measures (Section 4.16.1) on the skate species cannot be specifically quantified at this time, it is acknowledged that these measures provide protection to skates and are likely to contribute to the rebuilding of the species in the skate complex. One of the baseline management measures identified in this FMP is the groundfish year-round closed areas (Section 4.16.1.1). The following assessment qualitatively characterizes the biological benefits of the year-round closed areas to provide some perspective on the benefits of the baseline measures identified in this FMP.

Because skates are relatively sedentary species, year-round closed areas in the Northeast Region are thought to be particularly beneficial for the skate resources. The Council acknowledges the protection already afforded to the skate complex by various year-round closed areas established through other FMPs, namely multispecies and scallops. Multispecies year-round closed areas were identified as an important baseline measure in Section 4.16 of this document.

The scallop closed areas are not included in the baseline in Section 4.16 because they are no longer closed year-round. They are currently "restricted access areas" with limitations and restrictions on the amount of scallop fishing allowed in the areas. The Council acknowledges the protection they provided for some skate species while they were closed as well as the benefits that restricted access may have for some skates in these areas. Qualitative discussion of the benefits of these areas (while they were closed) is included in the analysis below.

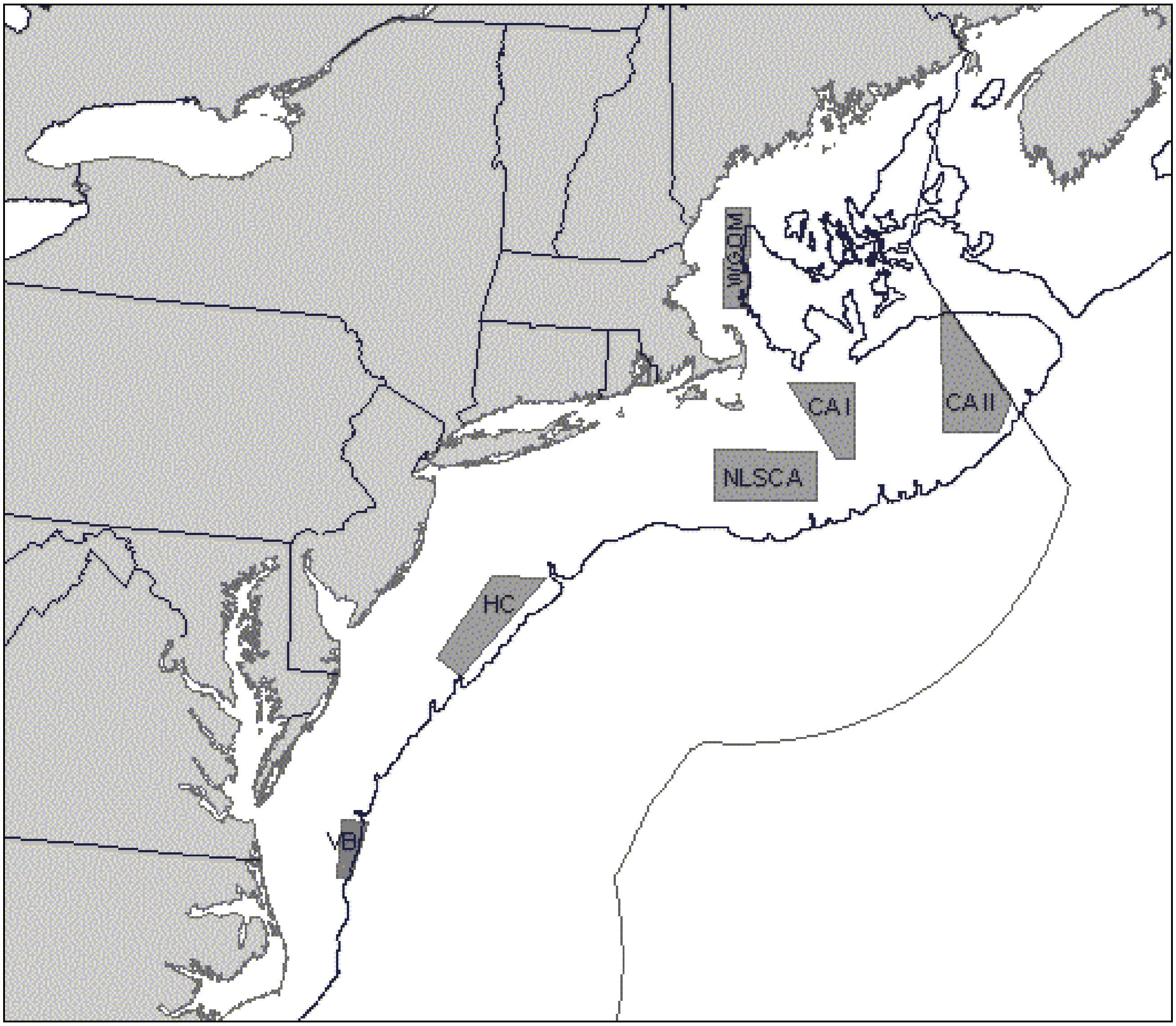
This assessment illustrates the benefits of the existing groundfish year-round closed areas and previous scallop closed areas on the species in the northeast skate complex through a series of figures. These benefits are in addition to any direct benefits resulting from the management measures proposed in this FMP. While this section focuses only on the year-round closed areas, it is important to recognize that additional benefits are likely to accrue from the numerous seasonal closures for groundfish, especially in the Gulf of Maine and on Georges Bank.

This section provides supplementary information relative to the year-round multispecies closed areas that were identified as baseline measures in Section 4.16 of this FMP. The Cashes Ledge year-round closure is not included in the following discussion because until very recently, it was only closed seasonally. However, the Cashes closure is identified and characterized as a baseline measure in Section 4.16.

As previously mentioned, the scallop year-round closed areas have recently re-opened under the area access program in Framework 14 to the Sea Scallop FMP. Both the Hudson Canyon (HC) and Virginia Beach (VB) closed areas opened on May 1, 2001. Although these areas are now open, they still provided protection during the time when overall fishing effort on scallops, skates, and other species was higher. Furthermore, there are additional restrictions placed on scallop vessels such as possession limits and an automatic charge of ten days-at-sea to enter these areas, which have reduced the incentive to make trips there.

Figure 69 below depicts four of the five year-round groundfish closures as well as the two recently-opened scallop closed areas. The combined total area within these year-round closures (not including Cashes Ledge) is approximately 10,263 square miles.

Figure 69 Year-Round Groundfish Closed Areas (not including Cashes Ledge) and Recently-Opened Scallop Closed Areas

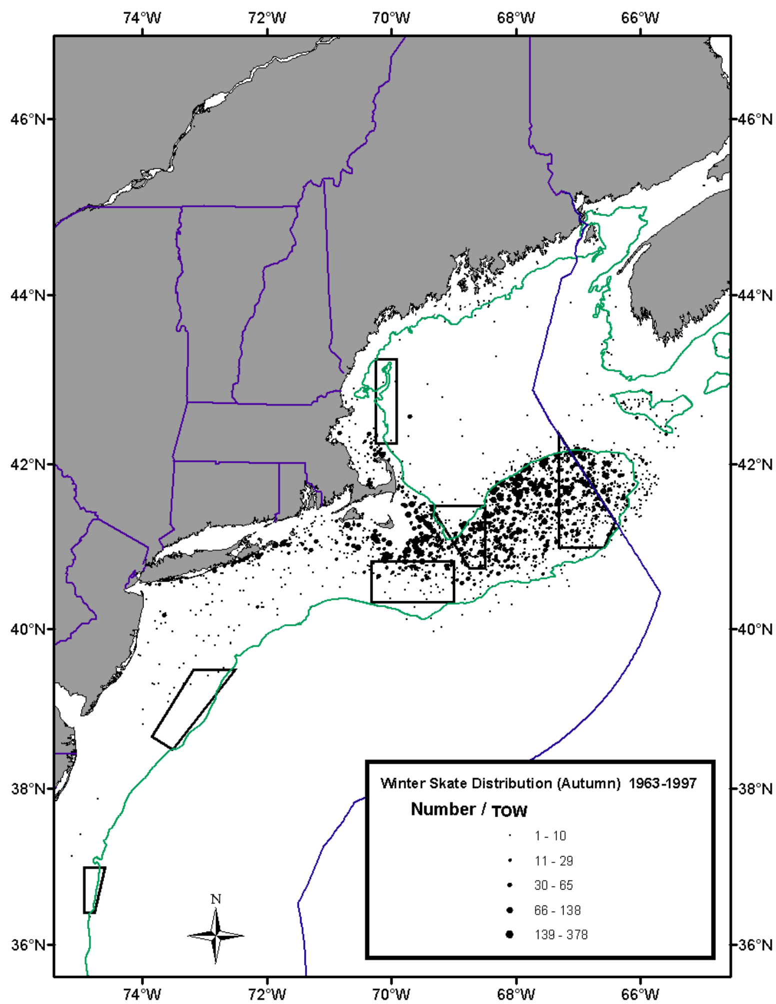


**WGOM represents the Western Gulf of Maine closed area; CAI represents Closed Area I; CAII represents Closed Area II; NLSCA represents the Nantucket Lightship Closed Area; HC represents the (now open) Hudson Canyon Closed Area for scallops; VB represents the (now open) Virginia Beach Closed Area for scallops.*

6.1.6.1 Winter Skate

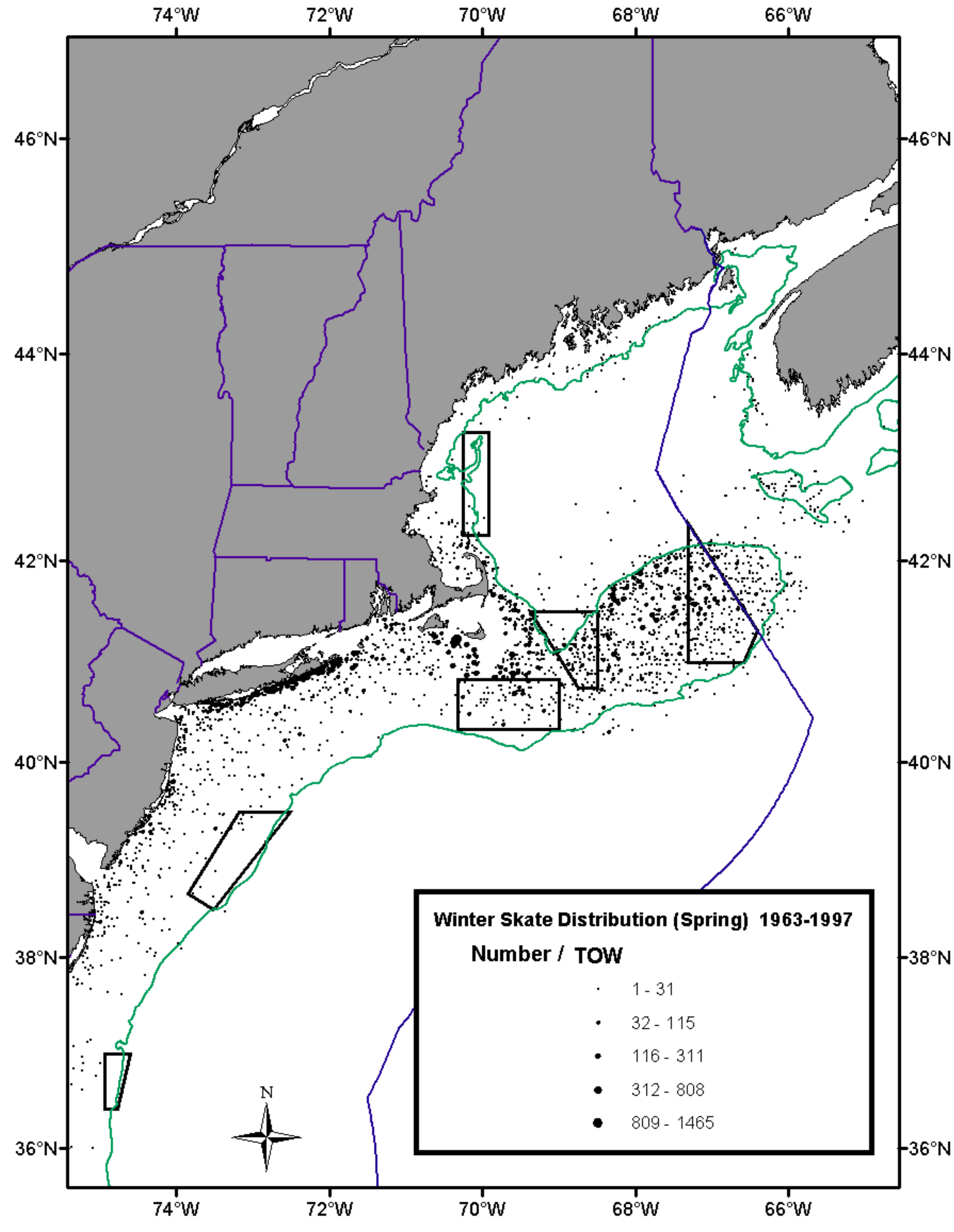
Figure 70 and Figure 71 indicate that the southern portion of Closed Area I and Closed Area II as well as the Nantucket Lightship Closed Area are located in regions of abundance of winter skates, while the Hudson Canyon Closed Area and Western Gulf of Maine Closed Area cover regions of relative scarcity of winter skates. Abundances of winter skate are sampled in the Georges Bank closed areas during both surveys, although there appears to be larger concentrations of winter skates in the closed areas during the autumn survey. Reduction of fishing effort in closed areas can be expected to provide a reduction in fishing mortality to the winter skate population within their bounds. In fact, it was noted at SAW 30 that the closed areas provide protection for winter skate that should reduce fishing mortality and help rebuild the resource. Because of its location relative to the survey distribution of winter skate, the Cashes Ledge closed area (not depicted in the figures) is not likely to provide additional protection for winter skate.

Figure 70 NEFSC Autumn Survey Distribution of Winter Skates and Overlap with Groundfish and Scallop Year-Round Closed Areas



**Note that the scallop areas recently re-opened to limited fishing under Framework 14 to the Scallop FMP.*

Figure 71 NEFSC Spring Survey Distribution of Winter Skates and Overlap with Groundfish and Scallop Year-Round Closed Areas

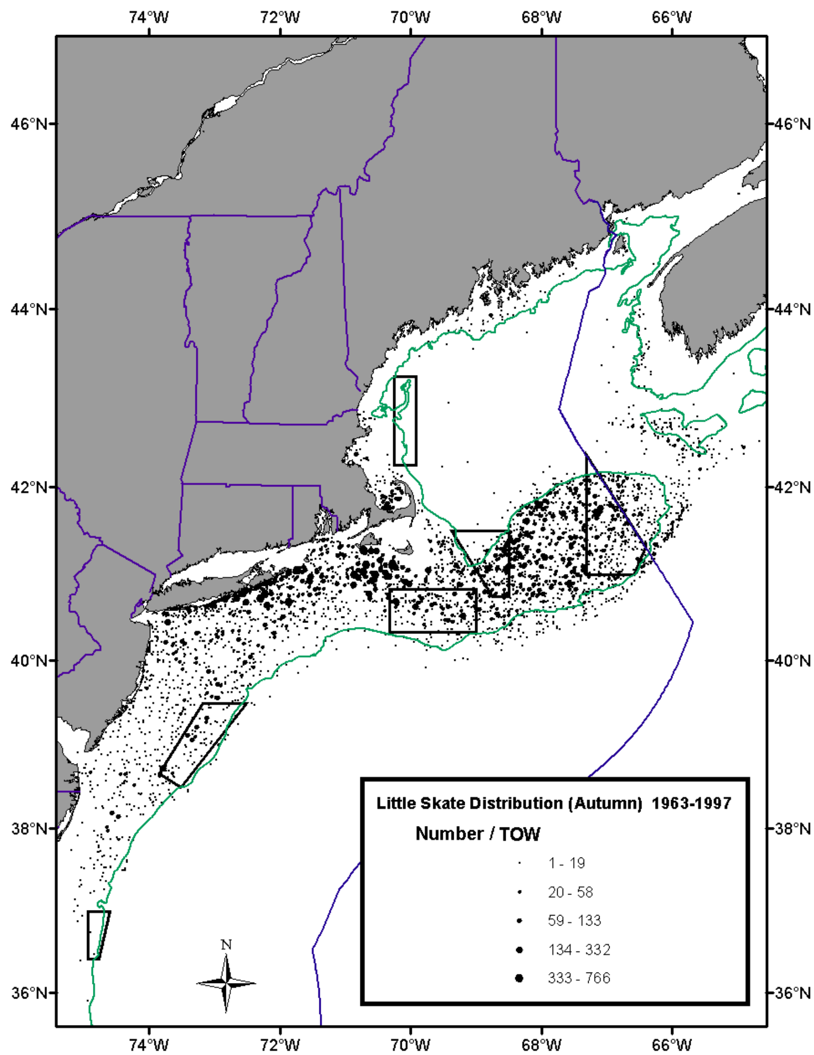


**Note that the scallop areas recently re-opened to limited fishing under Framework 14 to the Scallop FMP.*

6.1.6.2 Little Skate

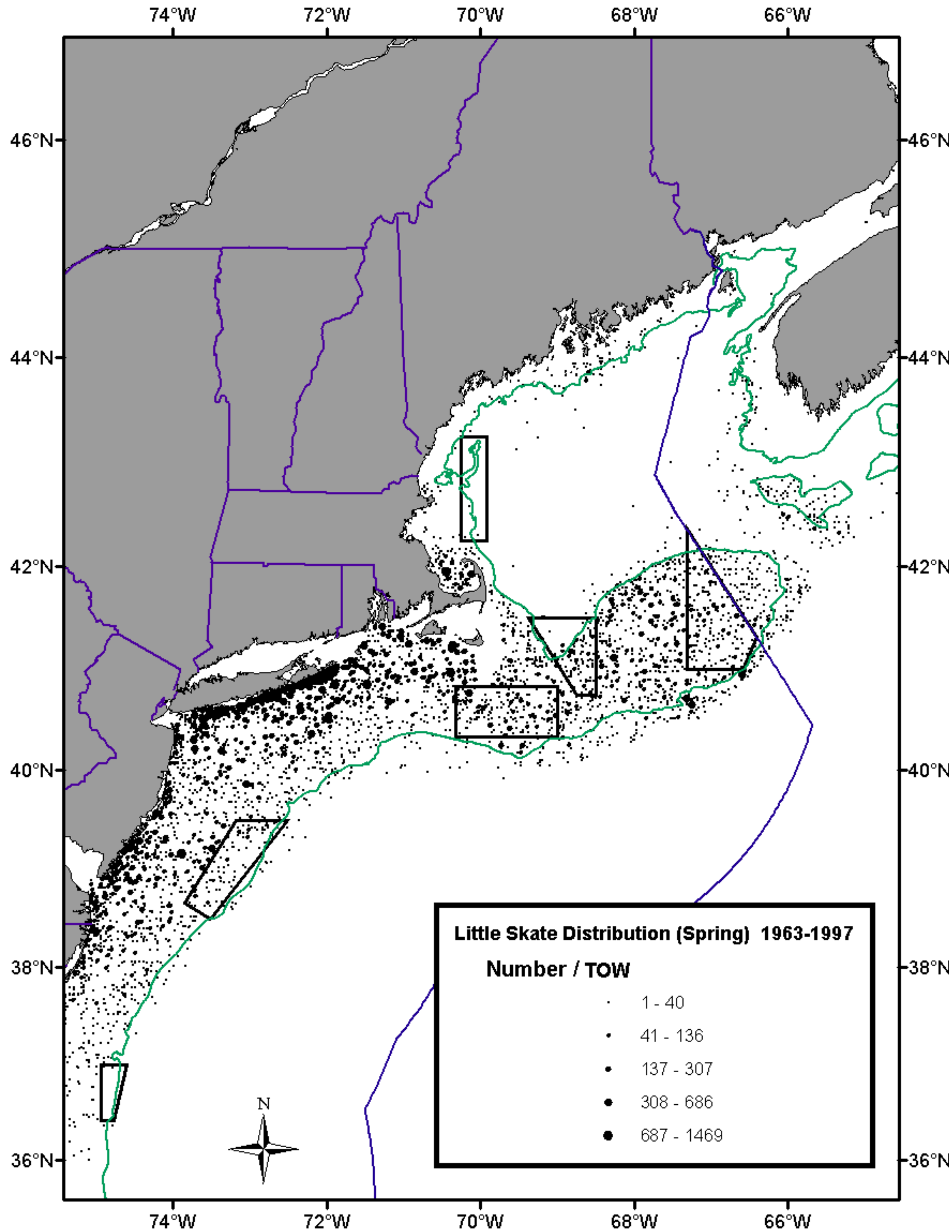
According to the NEFSC survey data, the majority of little skates are distributed within the 50-fathom line in the Gulf of Maine and along the Mid-Atlantic coast (Figure 72). Figure 72 and Figure 73 indicate that the southern portion of Closed Areas I as well as Closed Area II, the Nantucket Lightship Closed Area, and recently-opened Hudson Canyon Closed Area are located in regions of abundance of little skates, while the Western Gulf of Maine and Virginia Beach Closed Areas cover regions of relative scarcity of little skates. Reduction of fishing effort in can be expected to provide a reduction in fishing mortality to the little skate population within their bounds. Because of its location relative to the survey distribution of little skate, the Cashes Ledge closed area (not depicted in the figures) is not likely to provide additional protection for little skate.

Figure 72 NEFSC Autumn Survey Distribution of Little Skates and Overlap with Groundfish and Scallop Year-Round Closed Areas



**Note that the scallop areas recently re-opened to limited fishing under Framework 14 to the Scallop FMP.*

Figure 73 NEFSC Spring Survey Distribution of Little Skates and Overlap with Groundfish and Scallop Year-Round Closed Areas

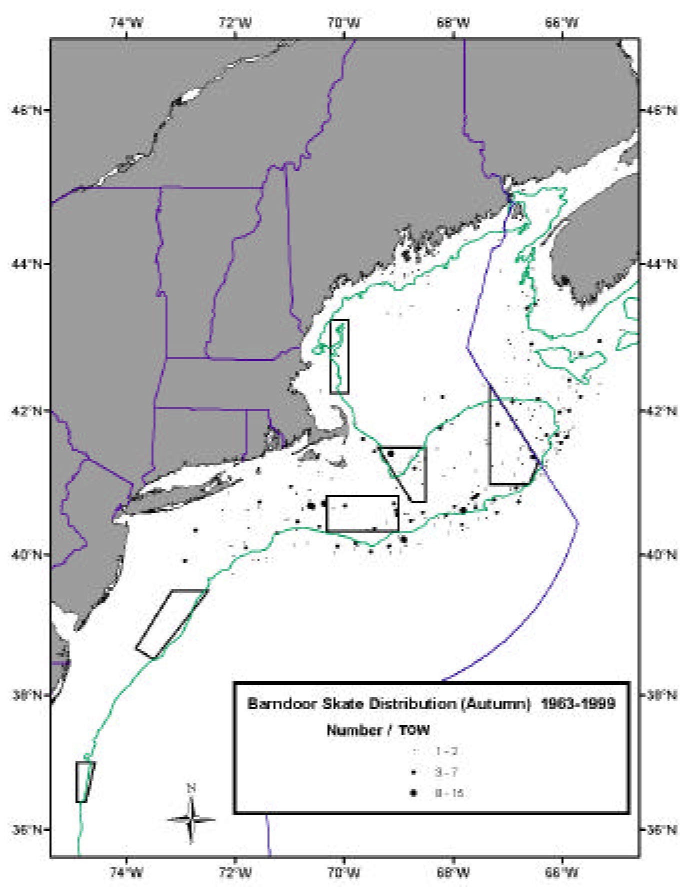


**Note that the scallop areas recently re-opened to limited fishing under Framework 14 to the Scallop FMP.*

6.1.6.3 Barndoor Skate

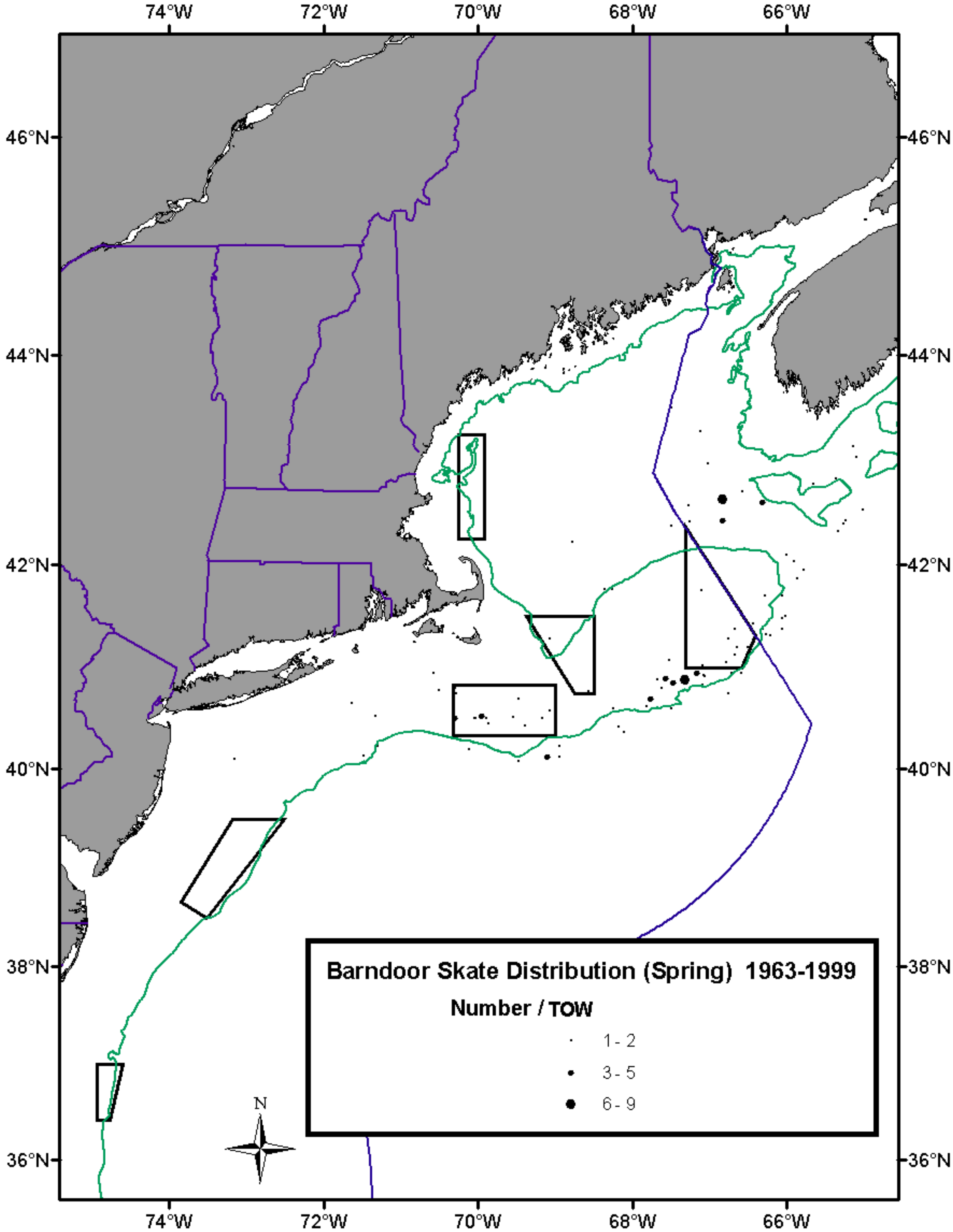
More barndoor skates were sampled in the autumn survey and seem to be most abundant around the 50-fathom line along Georges Bank. Figure 74 and Figure 75 indicate that Closed Areas I and II as well as the Nantucket Lightship Closed Area are located in regions of relative abundance of barndoor skates, while the Western Gulf of Maine Closed Area covers a region of relative scarcity of barndoor skates. Barndoor skates do not inhabit either of the recently-opened scallop closed areas in the Mid-Atlantic region. Reductions in fishing effort from the closed areas can be expected to provide a reduction in fishing mortality to the barndoor skate population within their bounds. In fact, it was noted at SAW 30 that protection by the year-round closed areas are one reason why recent abundance indices for barndoor skates have increased considerably. Because of its location relative to the survey distribution of barndoor skate, the Cashes Ledge closed area (not depicted in the figures) is not likely to provide additional protection for barndoor skate.

Figure 74 NEFSC Autumn Survey Distribution of Barndoor Skates and Overlap with Groundfish and Scallop Year-Round Closed Areas



**Note that the scallop areas recently re-opened to limited fishing under Framework 14 to the Scallop FMP.*

Figure 75 NEFSC Spring Survey Distribution of Barndoor Skates and Overlap with Groundfish and Scallop Year-Round Closed Areas

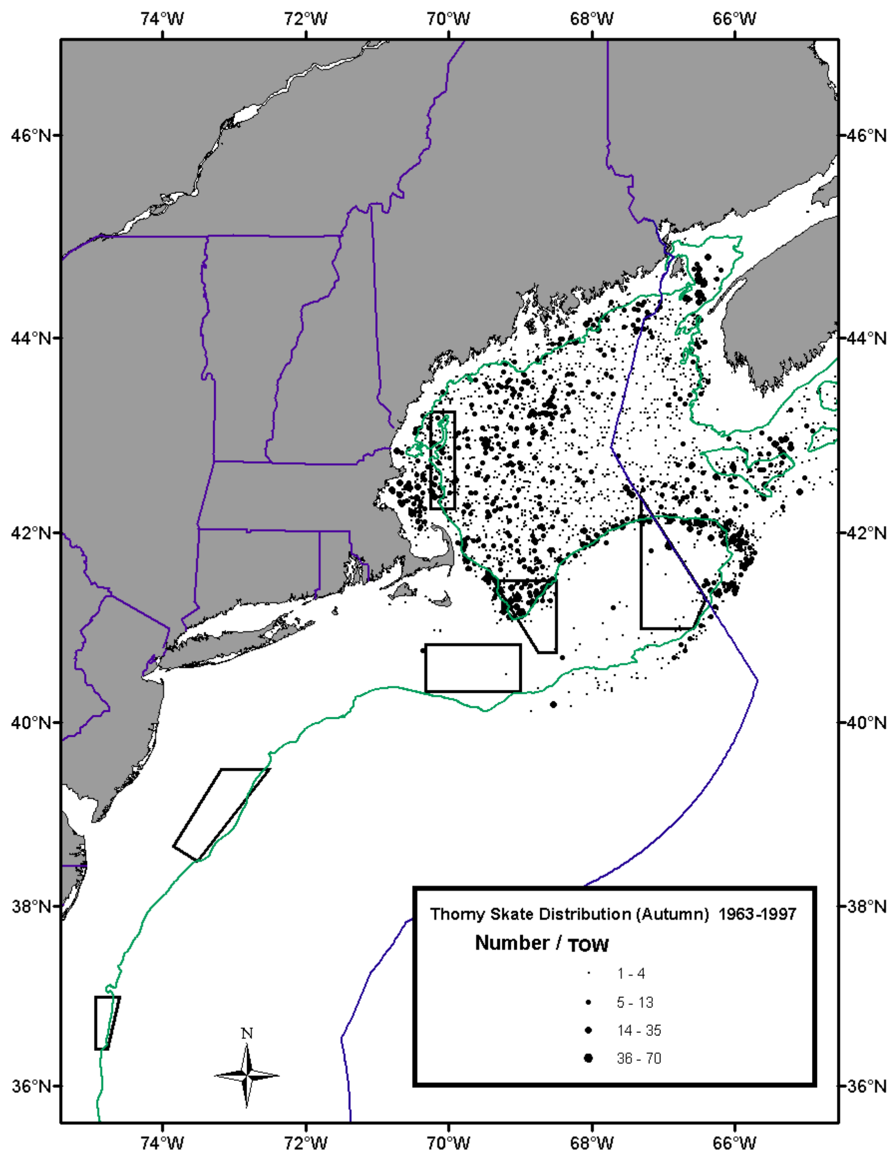


**Note that the scallop areas recently re-opened to limited fishing under Framework 14 to the Scallop FMP.*

6.1.6.4 Thorny Skate

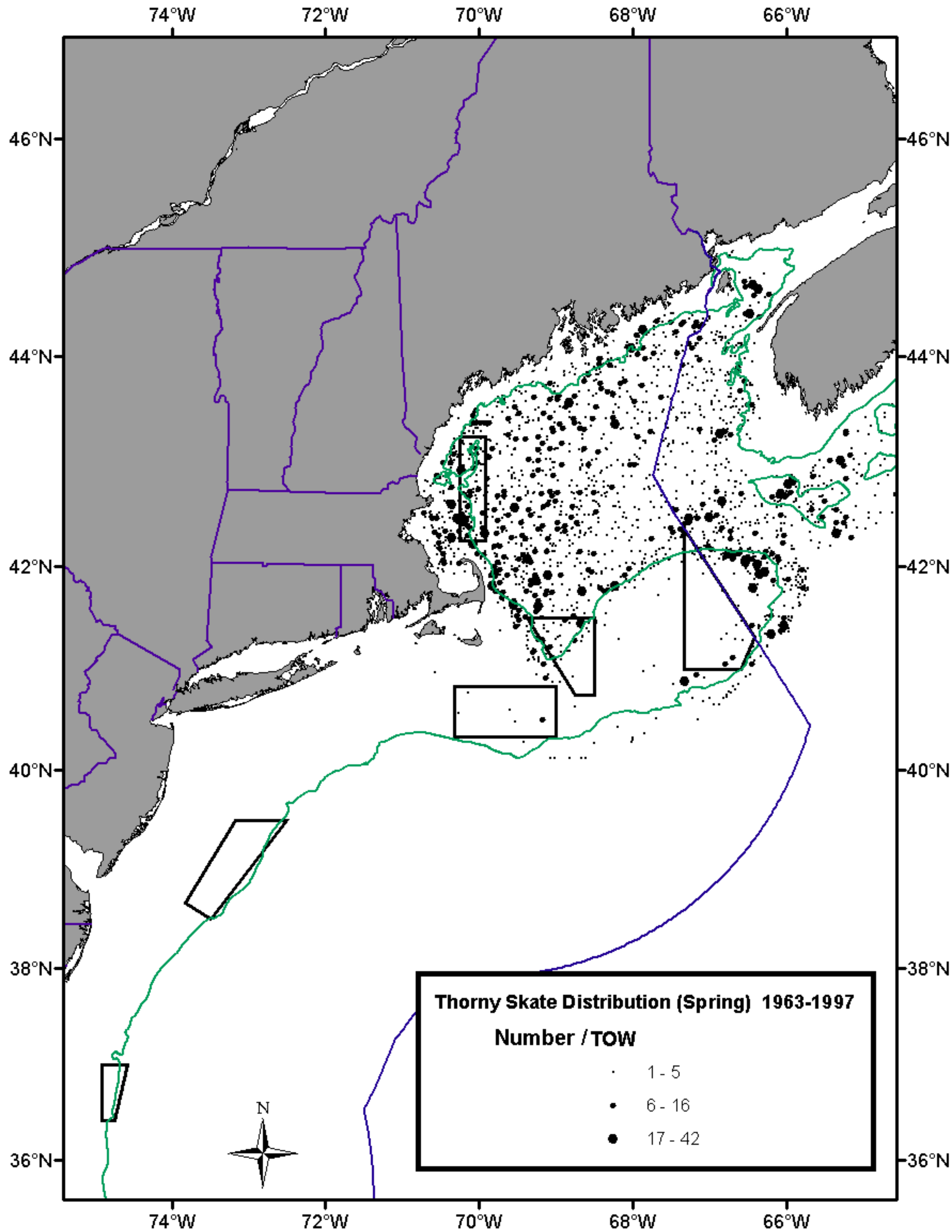
Figure 76 and Figure 77 indicate that the northern portion of Closed Area I as well as the Western Gulf of Maine Closed Area are located in regions of abundance of thorny skates, while Closed Area II and the Nantucket Lightship Closed Area cover regions of relative scarcity of thorny skates. Thorny skates do not inhabit either of the recently-opened scallop closed areas in the Mid-Atlantic region. Reduction of fishing effort in can be expected to provide a reduction in fishing mortality to the thorny skate population within their bounds. Because of its location relative to the survey distribution of thorny skate, the Cashes Ledge closed area (not depicted in the figures) is likely to provide additional protection for thorny skate.

Figure 76 NEFSC Autumn Survey Distribution of Thorny Skates and Overlap with Groundfish and Scallop Year-Round Closed Areas



**Note that the scallop areas recently re-opened to limited fishing under Framework 14 to the Scallop FMP.*

Figure 77 NEFSC Spring Survey Distribution of Thorny Skates and Overlap with Groundfish and Scallop Year-Round Closed Areas

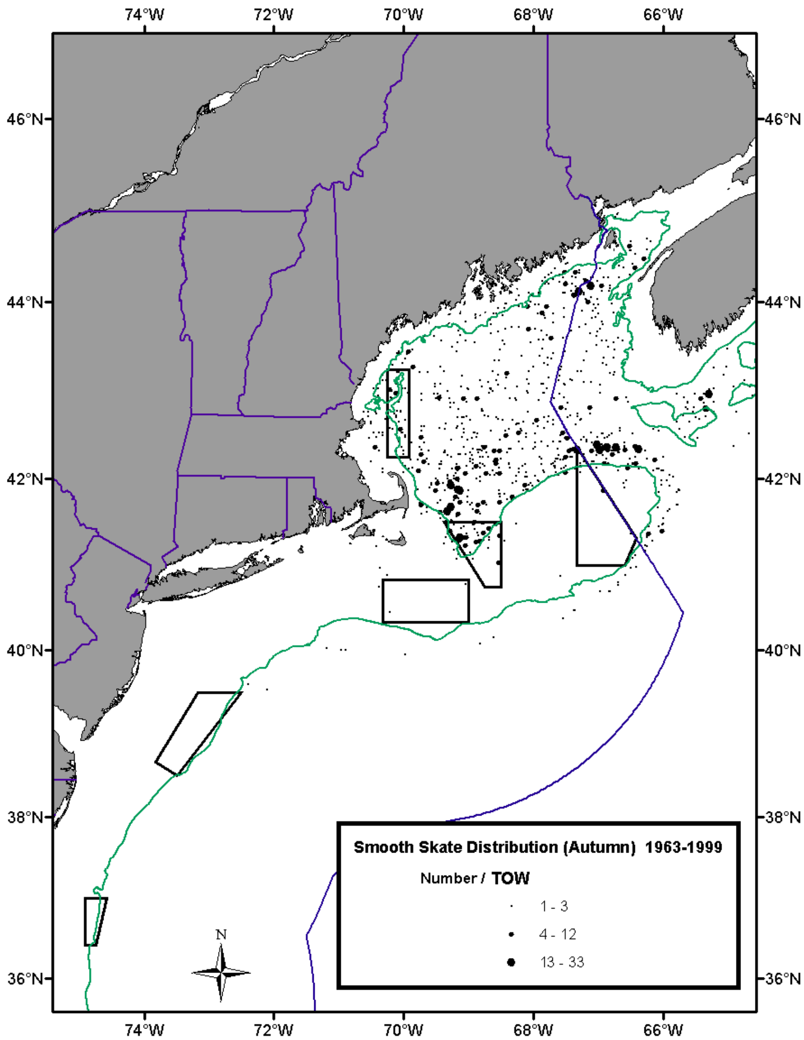


**Note that the scallop areas recently re-opened to limited fishing under Framework 14 to the Scallop FMP.*

6.1.6.5 Smooth Skate

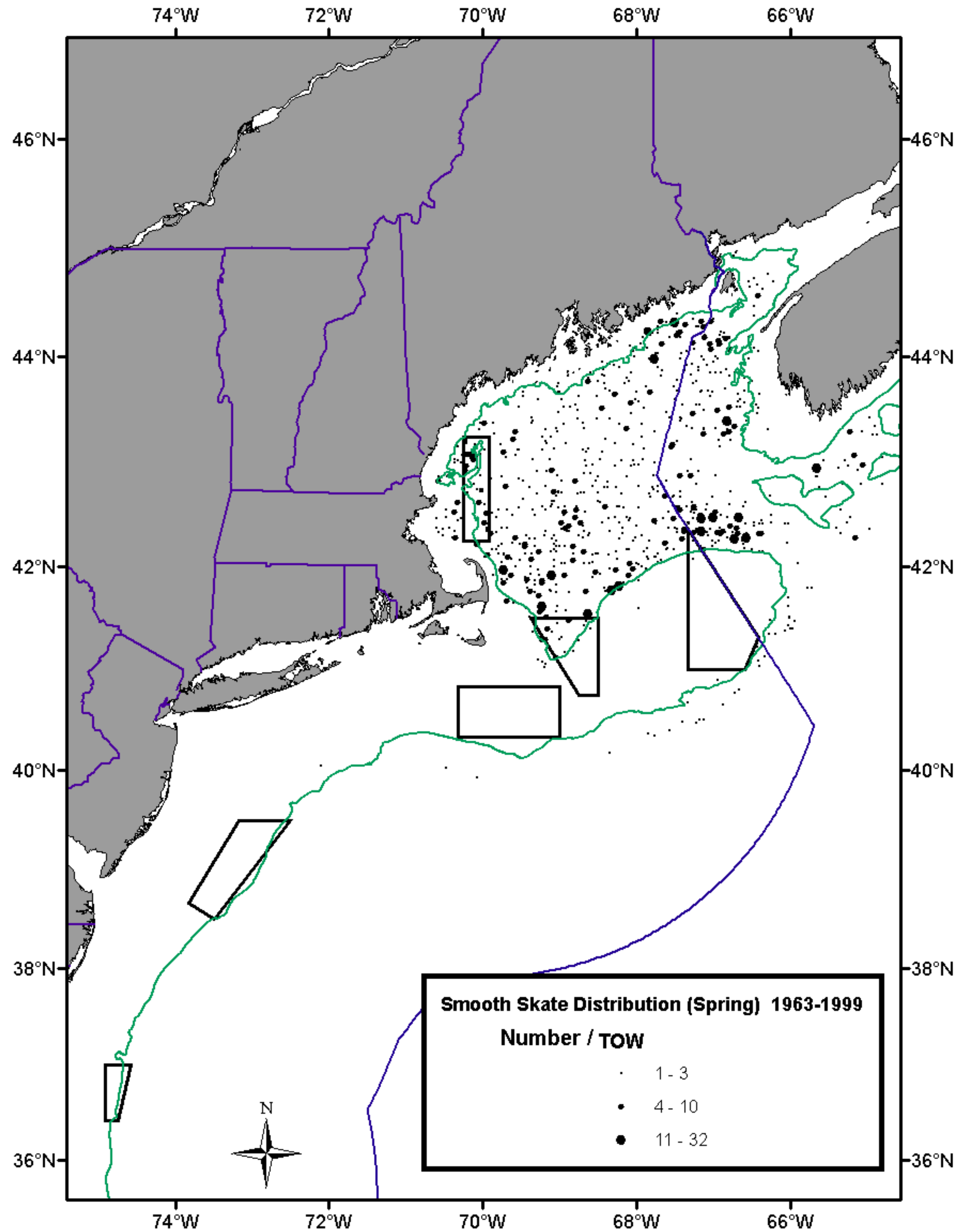
Figure 78 and Figure 79 indicate that the northern portion of Closed Area I as well as the Western Gulf of Maine Closed Area are located in regions of abundance of smooth skates, while Closed Area II and the Nantucket Lightship Closed Area cover regions of relative scarcity of smooth skates. Smooth skates do not inhabit either of the recently-opened scallop closed areas in the Mid-Atlantic region. Reductions in fishing effort from the closed areas can be expected to provide a reduction in fishing mortality to the smooth skate population within their bounds. Because of its location relative to the survey distribution of smooth skate, the Cashes Ledge closed area (not depicted in the figures) is likely to provide additional protection for smooth skate.

Figure 78 NEFSC Autumn Survey Distribution of Smooth Skates and Overlap with Groundfish and Scallop Year-Round Closed Areas



**Note that the scallop areas recently re-opened to limited fishing under Framework 14 to the Scallop FMP.*

Figure 79 NEFSC Spring Survey Distribution of Smooth Skates and Overlap with Groundfish and Scallop Year-Round Closed Areas

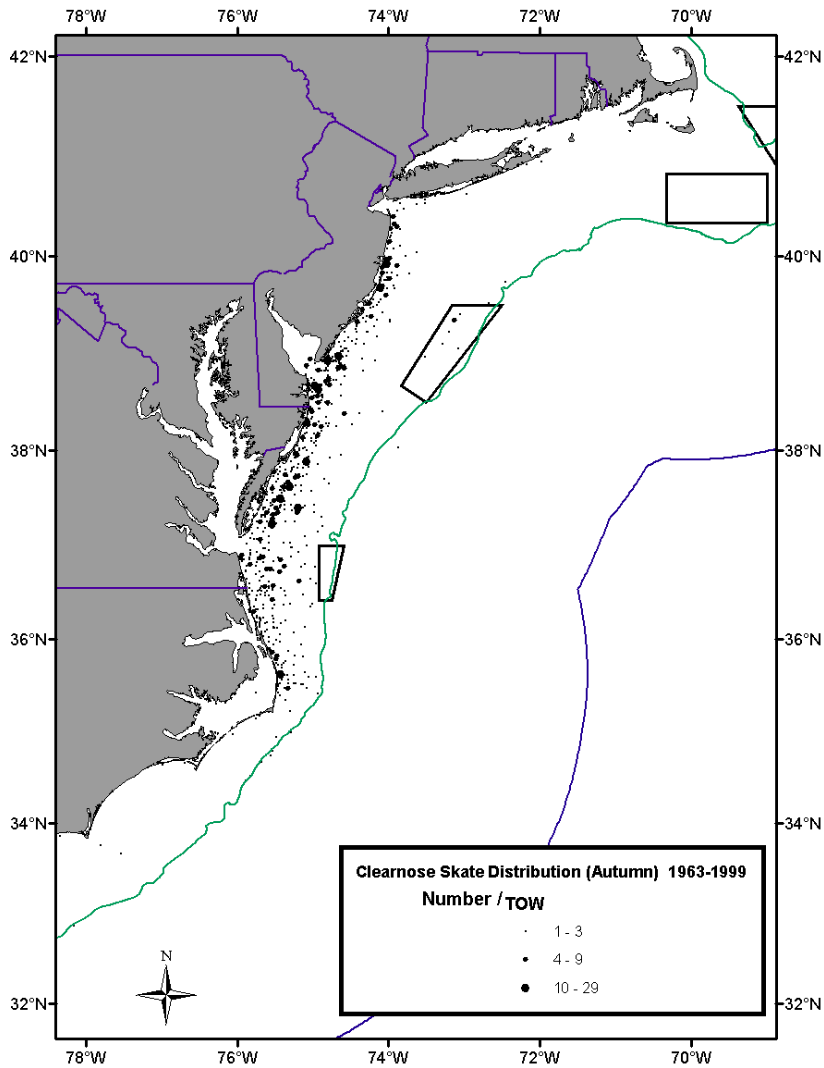


**Note that the scallop areas recently re-opened to limited fishing under Framework 14 to the Scallop FMP.*

6.1.6.6 Clearnose Skate

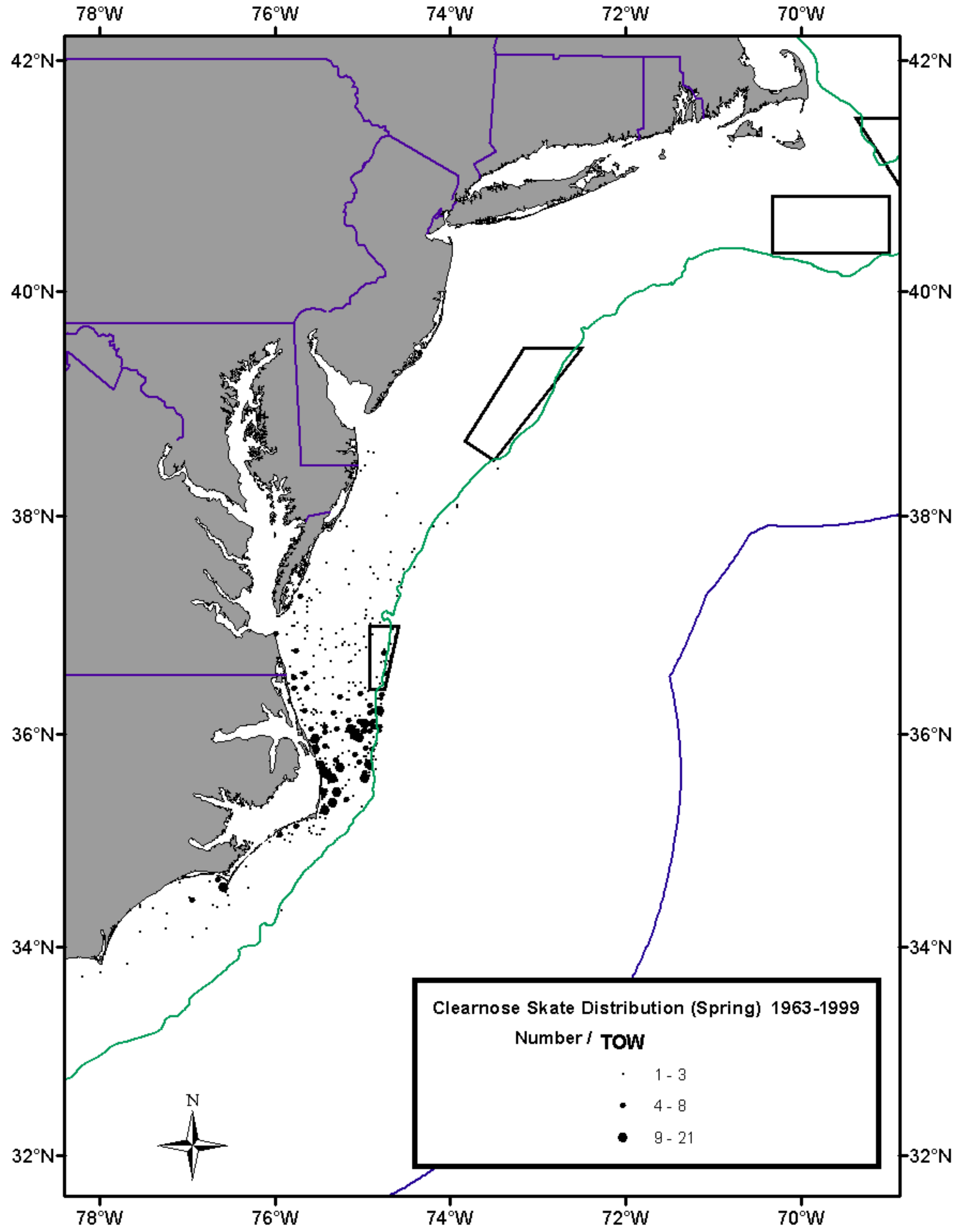
Figure 80 and Figure 81 indicate that clearnose skates do not inhabit any of the four year-round groundfish closures. Both of the recently-opened Mid-Atlantic scallop closures are located in regions of relative scarcity of clearnose skates. The distribution patterns of clearnose skate in relation to year-round closed areas would indicate that current closures could be expected to provide a minimal reduction in fishing mortality to clearnose skates. Because of its location relative to the survey distribution of clearnose skate, the Cashes Ledge closed area (not depicted in the figures) is not likely to provide additional protection for clearnose skate. Note that clearnose skate is not considered to be in an overfished condition and is, in fact, considered to be rebuilt.

Figure 80 NEFSC Autumn Survey Distribution of Clearnose Skates and Overlap with Groundfish and Scallop Year-Round Closed Areas



**Note that the scallop areas recently re-opened to limited fishing under Framework 14 to the Scallop FMP.*

Figure 81 NEFSC Spring Survey Distribution of Clearnose Skates and Overlap with Groundfish and Scallop Year-Round Closed Areas

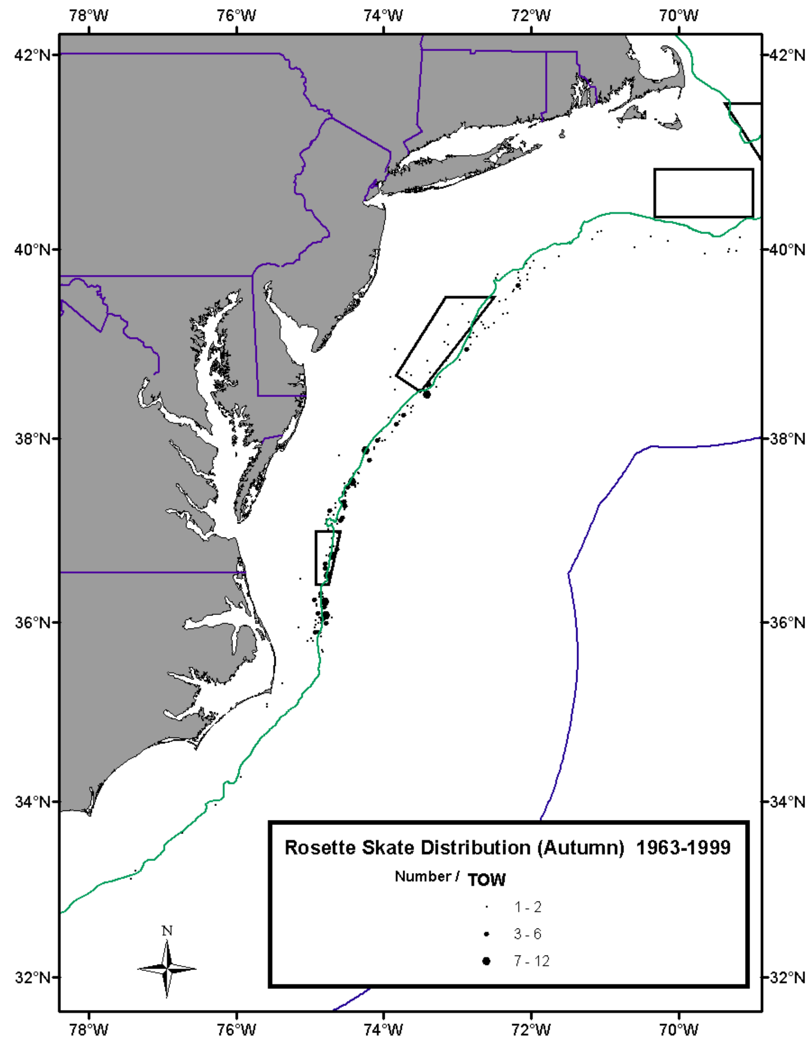


**Note that the scallop areas recently re-opened to limited fishing under Framework 14 to the Scallop FMP.*

6.1.6.7 Rosette Skate

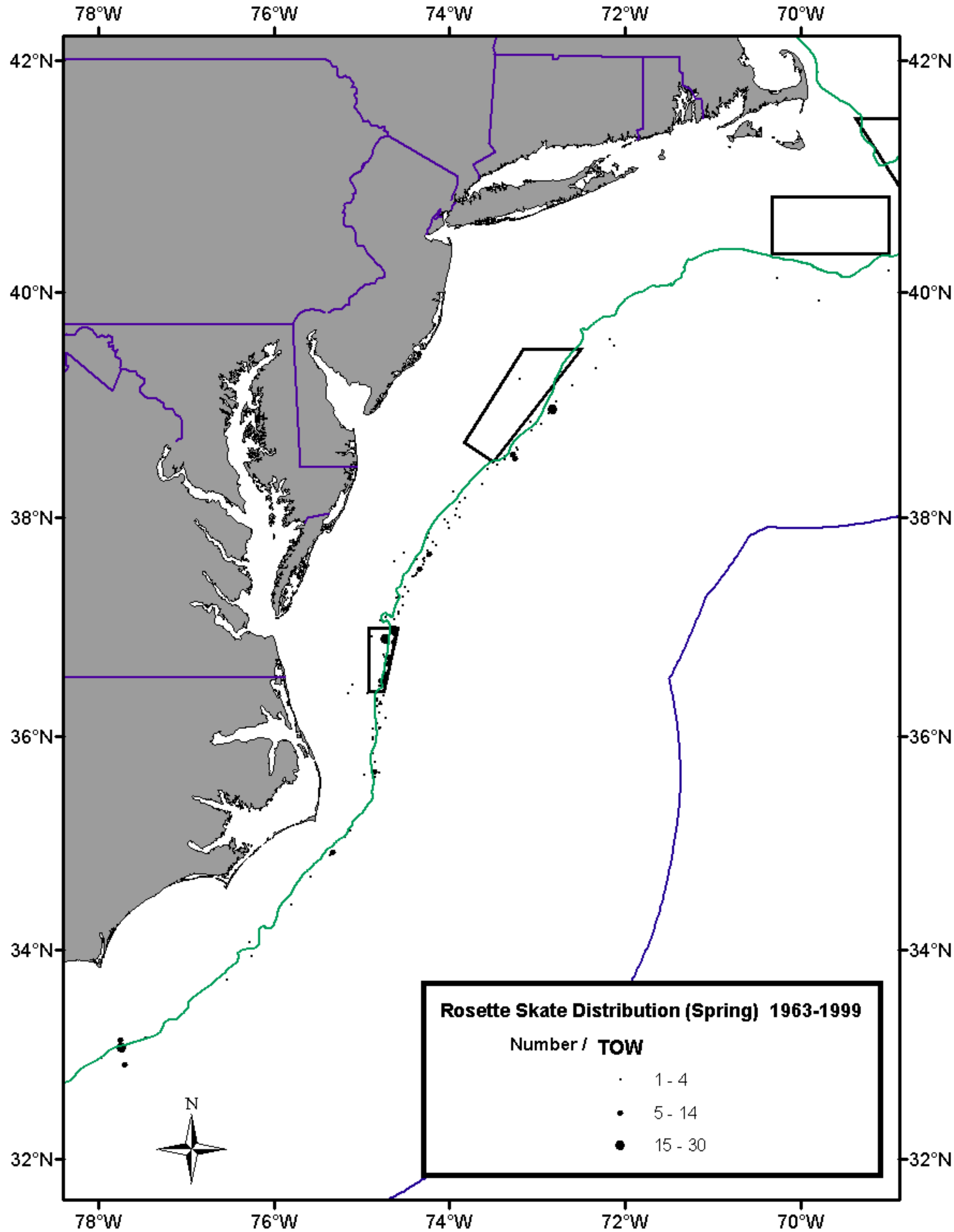
Figure 82 and Figure 83 indicate that rosette skates do not inhabit any of the four year round groundfish closures. The recently-opened Hudson Canyon scallop closure is located in a region of relative scarcity of rosette skates, but the Virginia Beach area is located in an area that includes some abundance of rosettes. The distribution patterns of rosette skate in relation to the scallop restricted access areas would indicate that when closed, these areas could be expected to provide a little reduction in fishing mortality on rosette skates. Because of its location relative to the survey distribution of rosette skate, the Cashes Ledge closed area (not depicted in the figures) is not likely to provide additional protection for rosette skate. Note that rosette skate is not considered to be in an overfished condition and is, in fact, considered to be rebuilt.

Figure 82 NEFSC Autumn Survey Distribution of Rosette Skates and Overlap with Groundfish and Scallop Year-Round Closed Areas



**Note that the scallop areas recently re-opened to limited fishing under Framework 14 to the Scallop FMP.*

Figure 83 NEFSC Spring Survey Distribution of Rosette Skates and Overlap with Groundfish and Scallop Year-Round Closed Areas



**Note that the scallop areas recently re-opened to limited fishing under Framework 14 to the Scallop FMP.*

6.1.7 Impacts of Other Groundfish Management Measures

Although it is not possible to predict at this time what management measures will be implemented in the groundfish fishery within the next few months and years, it is likely that these measures will target significant effort and possibly capacity reductions. It is important to remember that any reductions in multispecies fishing effort should directly reduce effort on skates.

Because the majority of skate fishing occurs on Multispecies DAS, reductions in Multispecies DAS should proportionately reduce opportunities for skate fishing. Moreover, significant reductions in Multispecies DAS could reduce skate effort more than expected. If significant reductions are taken, vessels will likely try to maximize their remaining opportunities in the multispecies fishery and may decide not to target skates at all since skates are low-value species compared to groundfish. This could impact the skate bait fishery more than the wing fishery because the bait fishery is a directed skate fishery that occurs under Multispecies DAS and because bait is even lower in value than wings. Anecdotal information suggests that this is already occurring as a result of the Interim Action implemented by NMFS to respond to the Court Order in the Framework 33 lawsuit (CLF et al. v. Daley).

6.2 IMPACTS ON HABITAT – EFH ASSESSMENT

A description of the physical environment in which skates live and an assessment of the impacts to this habitat from fishing practices is provided in Section 7.2 of this document (p. 296), the description of the resource and affected environment. All the alternatives and actions proposed in this FMP are intended to control and, in some cases, reduce the amount of fishing effort for skates. Except for the directed bait fishery off Rhode Island, most skate landings come from bycatch and incidental catch in the groundfish fishery managed under the Northeast Multispecies FMP. The actions proposed in this FMP, therefore, are unlikely to increase any adverse impacts to the EFH of any managed species that may be associated with the skate fishery.

6.2.1 Federal Permit Program

This measure requires vessels that land skates to obtain a federal permit. This measure is purely administrative; therefore, implementation of this measure is not be expected to have any effect on the habitat of the region.

6.2.2 Catch Reporting Requirements

This measure requires vessels that land skates to report their landings via a formal reporting system. This measure is purely administrative; therefore, implementation of this measure is not be expected to have any effect on the habitat of the region.