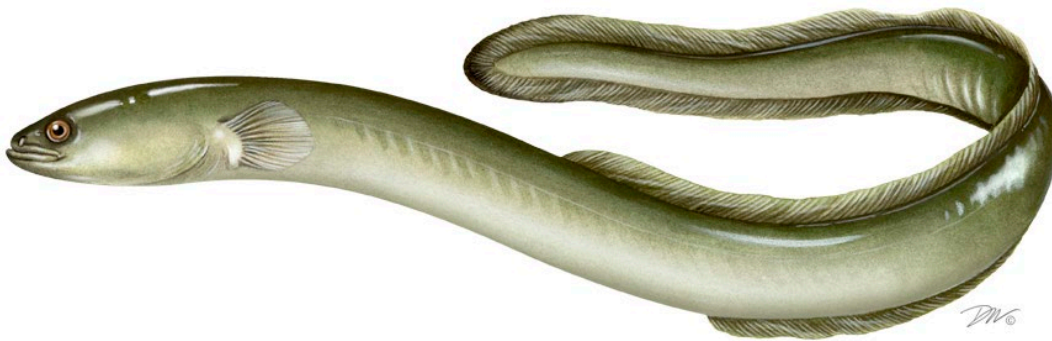


***Atlantic States Marine Fisheries Commission***

**DRAFT ADDENDUM VII TO THE AMERICAN EEL INTERSTATE  
FISHERY MANAGEMENT PLAN FOR PUBLIC COMMENT**

***Commercial Yellow Eel Management and Monitoring Requirements***



**February 2024**



Sustainable and Cooperative Management of Atlantic Coastal Fisheries

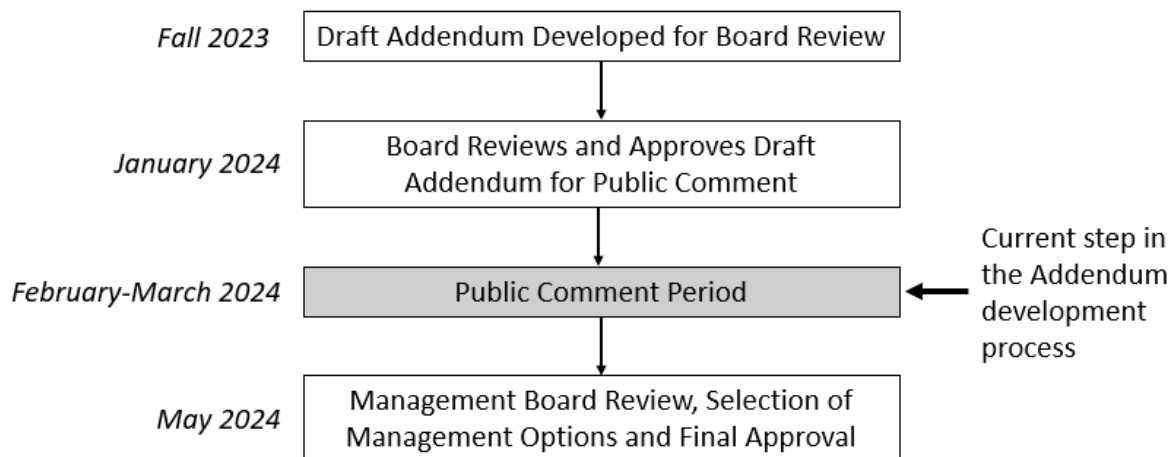
## Public Comment Process and Proposed Timeline

In August 2023, the American Eel Management Board initiated the development of an addendum to the Interstate Fishery Management Plan (FMP) to consider changes to the coastwide yellow eel harvest cap. The results of the recent benchmark stock assessment indicate the stock is at or near historically low levels due to a combination of historical overfishing, habitat loss, food web alterations, predation, turbine mortality, environmental changes, and toxins, contaminants, and disease. The benchmark assessment proposed a new tool for setting the coastwide cap based on abundance indices and catch. This Draft Addendum presents background on the Atlantic States Marine Fisheries Commission's (Commission) management of American eel, the addendum process and timeline, and a statement of the problem. This document also provides management options for public consideration and comment.

The public is encouraged to submit comments regarding this document at any time during the public comment period. The final date comments will be accepted is **March 24, 2024 at 11:59 p.m.** Comments may be submitted at state public hearings or by mail or email. If you have any questions or would like to submit comments, please use the contact information below.

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(Subject: Yellow Eel Harvest Cap Draft Addendum)  
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## 1.0 Introduction

The Atlantic States Marine Fisheries Commission (Commission) has coordinated interstate management of American eel (*Anguilla rostrata*) from 0-3 miles offshore since 2000. American eel is currently managed under the Interstate Fishery Management Plan (FMP) and Addenda I-V to the FMP. Management authority in the exclusive economic zone (EEZ) from 3-200 miles from shore lies with NOAA Fisheries. The management unit is defined as the portion of the American eel population occurring in the territorial seas and inland waters along the Atlantic coast from Maine to Florida.

The Commission's American Eel Management Board (Board) approved the following motions on August 1, 2023:

*Move to draft an addendum to consider using  $I_{TARGET}$  to recommend various catch caps, but not use  $I_{TARGET}$  to set biological reference points or stock status.*

This Draft Addendum proposes options for coastwide commercial landings caps for yellow eel, and alternative management responses if the coastwide cap is exceeded. The objective of Addendum VII is to recommend a coastwide cap using the  $I_{TARGET}$  tool from the stock assessment based on abundance indices and catch to reduce coastwide landings of yellow eel. The Draft Addendum also considers options to modify the biological sampling requirements of the annual young-of-the-year (YOY) survey, the harvester catch per unit effort (CPUE) reporting requirements, and the *de minimis* policy.

## 2.0 Overview

### 2.1 Statement of Problem

The Commission established the FMP for American Eel in November 1999, which has since been modified through five addenda. The FMP goal and objectives highlight the conservation, protection, and enhancement of American eel abundance in its current range as priorities for management. In response to the 2012 American Eel Benchmark Stock Assessment recommendation to reduce mortality on all life stages, the Board adopted Addendum IV. Addendum IV (2014) established a coastwide harvest cap of 907,671 pounds of yellow eel, reduced Maine's glass eel quota to 9,688 pounds, and allowed for the continuation of New York's silver eel weir fishery in the Delaware River. Addendum V was approved in 2018, which increased the yellow eel coastwide cap to 916,473 pounds starting in 2019 to reflect a correction in the historical harvest data. It also adjusted the process for reducing total landings to the coastwide cap when the cap has been exceeded.

The coastwide cap was intended to control fishing mortality on the coastwide population of eel at the yellow eel life stage. Because the assessment could not establish biological reference points for American eel, historical harvest was used as the basis for setting the coastwide cap. The cap was set at a level equivalent to the average annual harvest between 1998 and 2010. The selected cap was greater than the Technical Committee's recommendation at the time, which was to establish a cap equivalent to a 12% reduction from the 1998-2010 average landings.

Despite these management changes, the 2023 benchmark stock assessment found that the yellow eel population remains depleted, and was at lower levels than the previous assessment. The assessment and peer review recommend reducing fishing mortality on the yellow eel life stage, while also recognizing that stock status is affected by other factors including historical overfishing, habitat loss due to damming mainstems and tributaries of rivers, mortality from passing through hydroelectric turbines, pollution, possibly parasites and disease, climate change, and other unexplained factors at sea. Similar to previous assessments, a statistical model could not be developed for the species to determine stock status or give management advice. However, the assessment explored several index-based methods and recommended a new tool called  $I_{TARGET}$  for management use to provide advice on coastwide catch.  $I_{TARGET}$  is an index-based method that needs only catch and abundance data to provide management advice on coastwide landings.

## **2.2 Background**

Since its implementation in 2000, the Commission's FMP for American Eel has aimed to conserve and protect the American eel resource to ensure its continued role in its ecosystems while providing the opportunity for commercial, recreational, scientific, and educational uses. The FMP requires all states and jurisdictions to implement an annual young-of-year (YOY) abundance survey to monitor annual recruitment of each year's cohort. In addition, the FMP requires a minimum recreational size and possession limit and a state license for recreational harvesters to sell eels. The FMP requires that states and jurisdictions maintain existing or more conservative American eel commercial fishery regulations for all life stages, including minimum size limits. Each state is responsible for implementing management measures within its jurisdiction to ensure the sustainability of its American eel population.

Because of the unique life history of American eel, separate management measures have been developed to address fisheries targeting each life state (i.e., glass eel, yellow eel, and silver eel). Management measures for yellow eel, which is the primary life stage harvested by commercial and recreational fishermen, have been modified through Addendum I (2006), Addendum III (2013), Addendum IV (2013), and Addendum V (2018). Addendum I established a mandatory catch and effort monitoring program for American eel, requiring trip-level landing and effort data by state. Addendum III made changes to the commercial yellow eel fishery, specifically increasing the yellow eel size limit from 6 to 9 inches, and requiring a  $\frac{1}{2}$ -by- $\frac{1}{2}$  minimum mesh size in commercial yellow eel pots. Responding to the 2012 Benchmark American Eel Stock Assessment, which found the American eel population in U.S. waters to be depleted, Addendum IV set goals of reducing overall mortality and maximizing the conservation benefit for American eel stocks (ASMFC 2014). The Addendum established a coastwide commercial harvest cap for yellow eel of 907,671 pounds to limit fishing mortality. The coastwide cap was implemented starting in the 2015 fishing year and established two management triggers: (1) if the coastwide cap is exceeded by more than 10% in a given year, or (2) the coastwide cap is exceeded for two consecutive years regardless of the percent overage. If either trigger were met, states would implement state-specific allocations based on average landings from 1998-2010 with allocation percentages derived from 2011-2013.

Following the implementation of Addendum IV states expressed some concerns about the management program, including 1) the lack of information available to determine what changes in landings would be necessary to affect fishing mortality rates and spawning stock status, 2) the administrative burden on the states associated with moving to state-specific quotas, and 3) the difficulty of achieving an equitable allocation of this resource given the variation in availability and market demand for eels along the Atlantic coast. To address concerns about state allocations the Board approved Addendum V, which established a new commercial coastwide landings cap for the yellow eel fishery based on corrected landings data, developed new management triggers, and modified the allocation process that would occur if the coastwide cap were exceeded by more than 10% of the coastwide cap for two consecutive years (ASMFC 2018).

### **2.3 Status of the Stock**

The 2023 Benchmark Stock Assessment and Peer Review indicates the American eel stock remains depleted at or near historically low levels due to a combination of historical overfishing, habitat loss, food web alterations, predation, turbine mortality, environmental changes, toxins and contaminants, and disease (ASMFC 2023), consistent with the results of the 2012 and 2017 stock assessments. Despite the large number of surveys and studies available for use, the American eel stock is still considered data-poor. Additionally, eels have an extremely complex life history that is difficult to describe using traditional stock assessment models. The 2023 assessment explored additional approaches for assessing American eel that were suggested in past stock assessments including a delay-difference model, traffic light analysis and surplus production models, and developing an egg-per-recruit model, but overfished and overfishing determinations still could not be made due to data limitations. However, the 2023 stock assessment found that the yellow eel population has declined since the previous assessment (2017), and recommended reducing yellow eel harvest. Unlike previous assessments, the 2023 assessment and peer review identified an index-based tool to provide management advice without requiring an assessment model, which is being considered for management use through this draft addendum.

The Commission's assessments only consider the portion of the stock residing in US coastal waters, but there have been efforts to characterize the stock in other regions. In 2003, declarations from the International Eel Symposium (AFS 2003, Quebec City, Quebec, Canada) and the Great Lakes Fisheries Commission (GLFC) highlighted concerns regarding the health of eel stocks worldwide. In 2010, Fisheries and Oceans Canada (DFO) conducted a stock assessment on American eels in Canadian waters and found that region-specific status indices showed abundance is very low in comparison to levels in the 1980s for the Lake Ontario and upper St. Lawrence River stock, and is either unchanged or increasing in the Atlantic Provinces.

### **2.4 Description of the Yellow Eel Fishery**

#### **2.4.1 Coastwide Description**

Yellow eel fisheries exist in all Atlantic Coast states and jurisdictions with the exception of Pennsylvania and the District of Columbia. American eels are harvested for food, bait, and export markets. Yellow eel landings have varied considerably over the years due to a

combination of market trends and availability. These fluctuations are evident both within states and jurisdictions, as well as at a regional level. American eel landings ranged from over 3 million pounds in the 1970s to early 1980s to around 1 million pounds or less since the late 1990s (Figure 1). Since 2014, when the coastwide cap for yellow eel was adopted under Addendum IV, total coastwide landings have generally experienced a steady decline to a time series low of 263,892 pounds in 2020. Landings in 2021 and 2022 increased slightly, but still remain near all-time low levels.

Fishery participants have noted that recent declines in landings have primarily been related to market demand; demand for wild-caught American eel from the US for European food markets has decreased in recent years due to increased aquaculture in Europe. Additionally, demand for domestic bait in 2020 was negatively impacted by COVID-19 restrictions. A smaller proportion of US yellow eel landings typically goes to the domestic bait market, and landings are not expected to increase significantly from current levels in the near future.

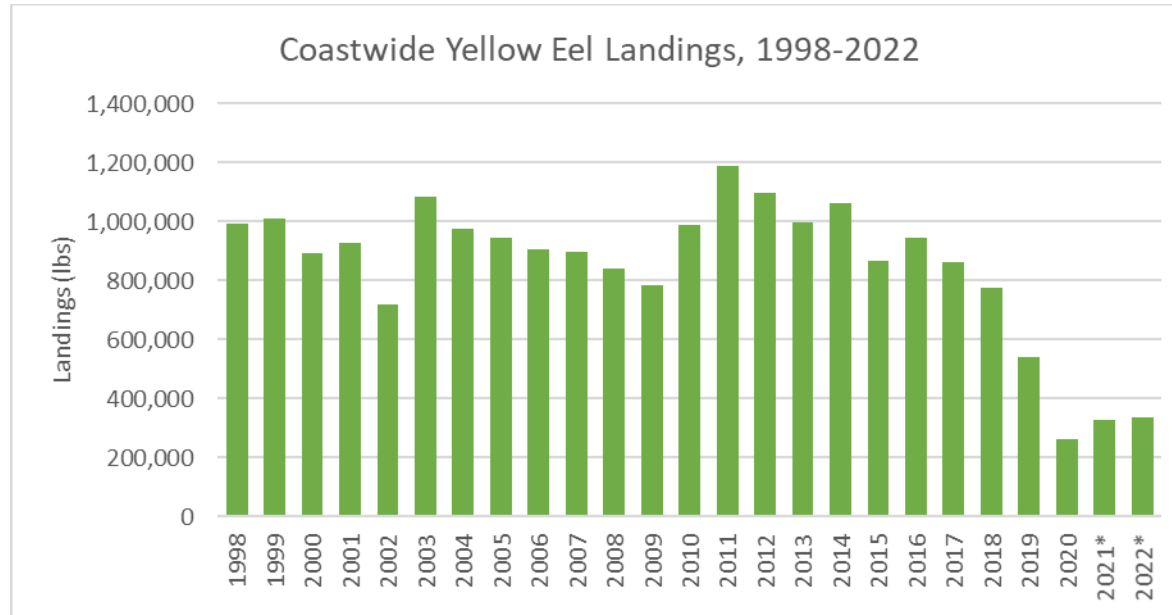


Figure 1. Yellow Eel Coastwide Landings 1998-2022. \*2021 and 2022 data are considered preliminary.

Table 1. State-by-state Yellow Eel Landings: 2014-2023. Source: Atlantic Coastal Cooperative Statistics Program, 2023, and state compliance reports. \*2021 and 2022 data are considered preliminary.

| Year  | ME    | NH                               | MA    | RI    | CT    | NY     | NJ     | DE     | MD      | PRFC   | VA      | NC     | SC                               | GA                               | FL     | Total     |
|-------|-------|----------------------------------|-------|-------|-------|--------|--------|--------|---------|--------|---------|--------|----------------------------------|----------------------------------|--------|-----------|
| 2014  | 7,578 | Time series average < 400 pounds | 3,903 | 2,353 | 1,390 | 38,143 | 91,225 | 62,388 | 619,935 | 49,293 | 109,537 | 60,755 | Time series average < 400 pounds | Time series average < 400 pounds | 14,092 | 1,060,725 |
| 2015  | 4,142 |                                  | 2,213 | 1,538 | 2,271 | 50,194 | 88,828 | 44,708 | 493,043 | 31,588 | 86,715  | 57,791 |                                  |                                  | 5,632  | 868,663   |
| 2016  | 6,811 |                                  | 1,705 | 2,651 | 2,445 | 36,371 | 67,422 | 44,558 | 583,578 | 58,223 | 96,336  | 39,911 |                                  |                                  | 6,034  | 946,045   |
| 2017  | 6,358 |                                  | 592   | 2,968 | 905   | 41,732 | 77,499 | 29,945 | 541,270 | 33,555 | 97,328  | 24,752 |                                  |                                  | 7,456  | 864,360   |
| 2018  | 2,832 |                                  | 375   | 3,988 | 3,268 | 39,218 | 69,679 | 31,378 | 514,226 | 31,151 | 57,281  | 18,058 |                                  |                                  | 4,659  | 776,112   |
| 2019  | 2,567 |                                  | 1,577 | 4,056 | 5,275 | 33,039 | 76,241 | 13,628 | 331,878 | 27,111 | 34,247  | 8,140  |                                  |                                  | 1,542  | 539,301   |
| 2020  | 7,012 |                                  | 84    | 1,425 | 2,783 | 16,411 | 23,742 | 1,942  | 159,816 | 24,971 | 21,916  | 3,291  |                                  |                                  | 499    | 263,892   |
| 2021* | 457   |                                  | C     | 1,863 | 3,255 | 16,097 | 26,273 | 4,433  | 204,701 | 10,439 | 46,345  | 5,705  |                                  |                                  | 9,050  | 328,618   |
| 2022* | 877   |                                  | 0     | 605   | 3,755 | 16,570 | 52,585 | 2,967  | 187,810 | 12,814 | 36,525  | 4,202  |                                  |                                  | 6,073  | 317,456   |



### 2.4.2 State-by-state Descriptions

All states are subject to the FMP requirements for a yellow eel minimum size limit of 9 inches and a ½-by-½ inch minimum mesh size in commercial yellow eel pots. The yellow eel fishery in Maine occurs in both inland and tidal waters. Yellow eel fisheries in southern Maine are primarily coastal pot fisheries managed under a license requirement, minimum size limit, and gear and mesh size restrictions. Yellow eels are taken by a very small number of harvesters (four to five annually) for use as bait. Reported landings have been under 10,000 pounds annually since 2013, and were below 1,000 pounds in 2022.

The New Hampshire fishery has diminished significantly since the early 2000s. Commercial harvest of yellow eel in Massachusetts occurs only in coastal waters; commercial permitting for inland harvest was eliminated in 2013. Massachusetts allows eel harvest by nets, pots, spears, or angling. The commercial fishery is now mainly conducted using baited pots with over 200 permits issued and reported harvest under 2,000 pounds since 2015. Reporting of activity under commercial permits is mandatory, however, underreporting of eels harvested for commercial striped bass fishing bait is expected.

Small-scale, commercial eel fisheries occur in Rhode Island and are mainly conducted in coastal rivers and embayments with pots during May through November. Connecticut has a similar small-scale, seasonal pot fishery for yellow eel in the tidal portions of the Connecticut and Housatonic rivers. All New England states presently require commercial fishing licenses to harvest eels and maintain trip-level reporting.

Licensed eel fishing in New York occurs primarily in the Hudson River, the upper Delaware River (Blake 1982), and in the coastal marine district. A slot limit (greater than 9 inches and less than 14 inches to limit PCB exposure) exists for eels fished in the tidal Hudson River, strictly for use as bait or for sale as bait only. Due to PCB contamination of the main stem, commercial fisheries have been closed on the freshwater portions of the Hudson River and its tributaries since 1976. The fishery in the New York portion of the Delaware River consists primarily of silver eels collected in a weir fishery. New Jersey fishery regulations require a commercial license when using more than two pots or selling catch. Mandatory trip level reporting is required for every month of the year a license is possessed, even if no fishing occurs. Eel pot diameter may not exceed 16 inches if cylindrical or 201 square inches in cross section if any other configuration.

The Delaware eel commercial fishery exclusively uses baited pots equipped with ½-by-½ inch mesh. Delaware mandated catch reporting in 1999 and more detailed effort reporting in 2007. The fishery occurs primarily in the tidal tributaries of Delaware Bay although a small proportion of annual harvest may occur in the Atlantic coastal or “Inland Bays” in some years. American eels are sold for both food and bait, dependent upon market demand. Historically, total annual landings in Delaware were consistently greater than 100,000 pounds and ranked in the top three in value for the State among all Delaware commercial fisheries. A suite of variables (bait supply, market demand, aging out of the most knowledgeable eel fishers) has contributed to recent low annual landings for Delaware.

Maryland, Virginia, and Potomac River Fisheries Commission primarily have pot fisheries for American eels in the Chesapeake Bay. Maryland required eel fisherman to be licensed in 1981 and effort reporting began in 1990. Over 99% of all eel harvest in Maryland occurs with the use of eel pots, and all harvest occurs in tidal waters. Average annual landings and effort have declined 50% and 60%, respectively, from 2018 levels. However, catch per unit effort (CPUE, pounds per pot) in recent years is at the highest levels since effort reporting began in 1990.

Large eels are generally exported whereas small eels are used for bait in the crab trotline fishery, except in Virginia. Almost all of the eel harvest in Virginia is done using eel pots as the main gear. Virginia formerly had a voluntary buyer reporting system that was replaced by a mandatory harvester reporting system for all species in 1993. Most of Virginia's American eel are sold locally for bait with no harvest being exported for sale in recent years. Eel harvesters can sell their eels directly to consumers or to businesses with a VMRC issued eel self-market permit. Some eel harvesters also buy and sell eels from other harvesters and are required to have a seafood buyer permit and an eel buyer permit; monthly reporting of the weights of any purchased eels is required. The Potomac River Fisheries Commission has had harvester reporting since 1964, and has collected eel pot effort since 1988.

North Carolina has a coastal pot fishery with fluctuating effort depending on market demands. While a standard commercial fishing license is required for participation in the commercial eel pot fishery, a permit is not, but a notification letter must be provided as part of the mandatory reporting system. Most commercial yellow eel landings in North Carolina occur in October and November, but there is also a small fishery in the spring. Most landings come from the Albemarle Sound area, with additional landings reported from the Pamlico Sound and southern waterbodies under the jurisdiction of North Carolina Division of Marine Fisheries. No catch records are maintained for freshwater inland waters, and the sale of eels harvested from these waters is prohibited. Trip-level commercial landings are required to document all transfers of fish sold from coastal waters from the fishermen to the dealer. Data reported on these forms include transaction date, area fished, gear used, species landed, and fishermen and dealer information. In 2007, to comply with Addendum I, an eel pot logbook program was implemented at the individual commercial fisherman level to collect additional information not reported on trip tickets including pot soak time, the number of pots fished, and landings (pounds) per pot. Annual yellow eel landings in North Carolina historically were greater than 100,000 pounds; however, market demand and attrition of the most knowledgeable eel fishers has contributed to recent low annual landings.

South Carolina instituted a permitting system in 1998 to document total eel gear and commercial landings. Traps or pots used to capture yellow or silver eels must be permitted by water area fished. Restrictions include specific water designations, possession and size limits. Permit conditions outline fishing closure from September 1 through December 31 and immediate bycatch release. Mandatory reporting of effort and catch is required by the 10th of each month. Since 1999, a total of 583.80 pounds of eels were reported.

American eel fishing in Georgia was restricted to coastal waters prior to 1980 but has since expanded to approved inland waters, including portions of the following rivers: Savannah River, Ogeechee River, Altamaha River, Oconee River, Ocmulgee River, Satilla River, and St. Marys River. Landings data are available for Georgia, and as of April 1, 2018, effort data are available due to commercial eel fishermen being required to possess an eel endorsement stamp in addition to a commercial fishing license. Florida's commercial eel pot fishery is operated under a permit system; the recreational fishery has a 25 fish/angler/day bag limit.

### **2.4.3 Catch per Unit Effort**

CPUE can be used as an index to estimate relative abundance for a population. These indices are often used in stock assessments to inform decisions for how to manage a fishery using options such as quotas, catch limitations, or gear restrictions. For American eel, fishery-dependent CPUE data are available for some states prior to the Addendum I requirement for mandatory catch and effort reporting, but CPUE data were not considered indicative of trends in the stock as a whole in the 2023 stock assessment (ASMFC 2023). Fishery-dependent CPUE is almost exclusively composed of positive trips only; trip reports with zero eels caught are rare because most agencies do not require reports of zero catches. While the CPUE indices provided by individual states do not tend to agree and are not useful for assessing trends in the coastwide stock, they may be useful for understanding fishery trends within each state.

The Connecticut commercial CPUE index was calculated for yellow eels from the pot fishery (Figure 2). The index has fluctuated up and down with no clear trend.

The New York commercial CPUE is an arithmetic mean of pounds per pot per hour fished, based on data from VTR monthly harvester reports (Figure 3). With only five years of data, there is no clear trend in the index.

The New Jersey index generally declined until 2015 then exhibited an upward trend (Figure 4), though it is possible it overestimates CPUE since there were very few trips reported with zero catch.

Delaware considers its American eel catch and effort records since 1999 fairly accurate, and the CPUE in the Delaware fishery has remained fairly stable since 2003 (Figure 5).

Maryland has calculated a commercial CPUE index for the pot fishery since 1992 (Figure 6). The CPUE index was relatively flat from 1992–2002 and then generally increased until hitting the time series high CPUE in the terminal year.

Virginia's commercial eel pot fishery CPUE has shown a general decline since the beginning of the time series (Figure 7). Only data associated with positive effort are included in the calculations as commercial harvesters only report positive catches to the VMRC.

North Carolina logbook data (which began in 2007) was used for calculating a fishery-dependent index of abundance, which has been fairly stable over time (Figure 8).

South Carolina Department of Natural Resources has calculated CPUE for the commercial fishery using monthly dealer reports but the data are confidential.

Commercial catch and effort data collection for American eel in Florida began in 2006, and the CPUE index is available for 2007-2019 but shows no clear trend (Figure 9).

The state CPUE data have not been used in the stock assessment as originally intended when the reporting requirement was established under Addendum I. In the 2012 and 2023 benchmark stock assessments, these data were considered but the assessment team decided against their inclusion because they were not considered indicative of trends in the stock as a whole, and differences in baiting practices and bait preference vary geographically which can confound the accuracy and analysis of fishery-dependent CPUE data. The 2023 stock assessment peer review panel also noted that given the variety of fishing gears and fishing areas, the analysis of fishing effort would not be straightforward. The 2023 stock assessment and peer review reports indicate that there is no plan to use the fishery-dependent CPUE data moving forward. As such, this Draft Addendum includes options to make it voluntary for states to collect these CPUE data for American eel.

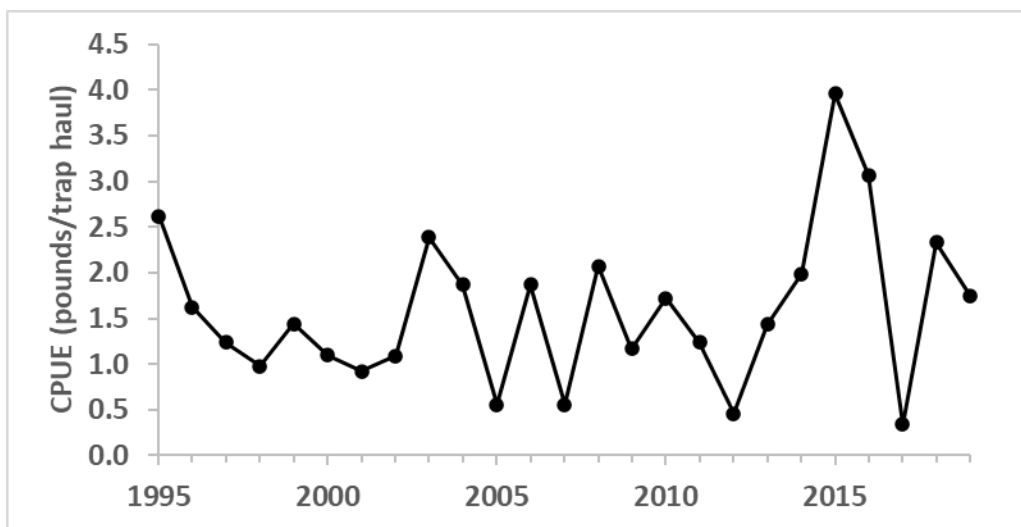


Figure 2. Fishery-dependent catch-per-unit-effort for Connecticut's yellow eel pot fishery. Estimated errors associated with the index were not provided.

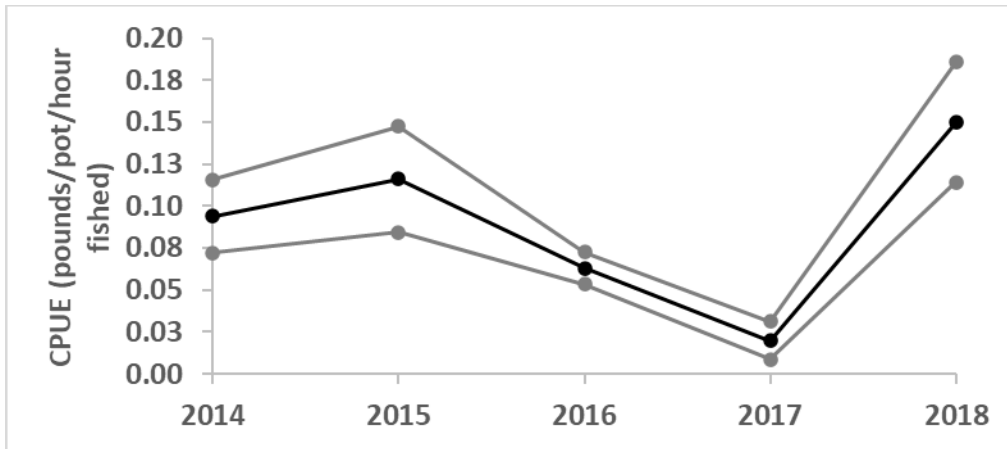


Figure 3. Fishery-dependent catch-per-unit-effort for New York's yellow eel pot fishery. The black line indicates the CPUE and the grey lines indicate 95% confidence intervals.

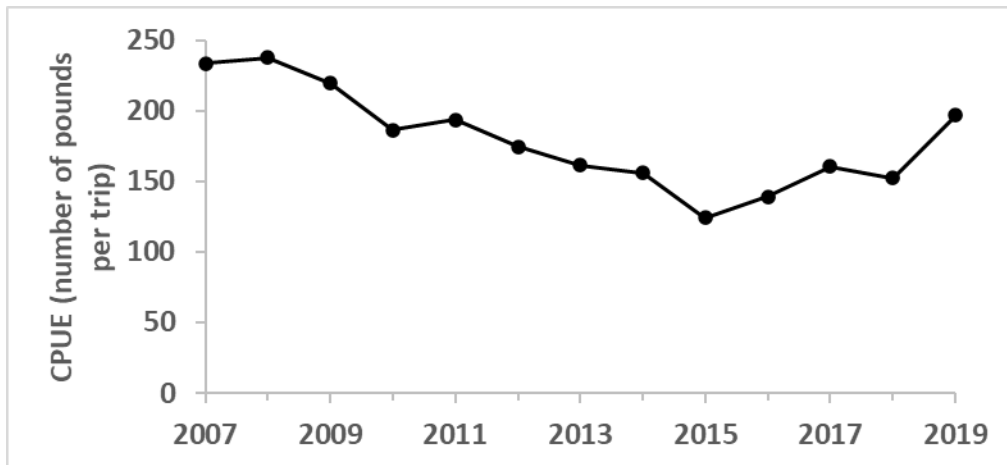


Figure 4. Fishery-dependent catch-per-unit-effort for New Jersey's yellow eel fyke net fishery. Estimated errors associated with the index were not provided.

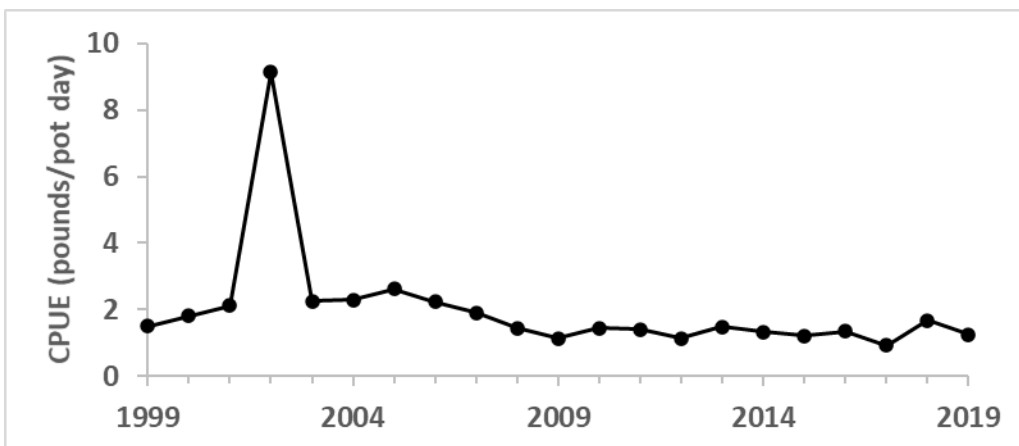


Figure 5. Fishery-dependent catch-per-unit-effort for Delaware's yellow eel pot fishery. Estimated errors associated with the index were not provided.

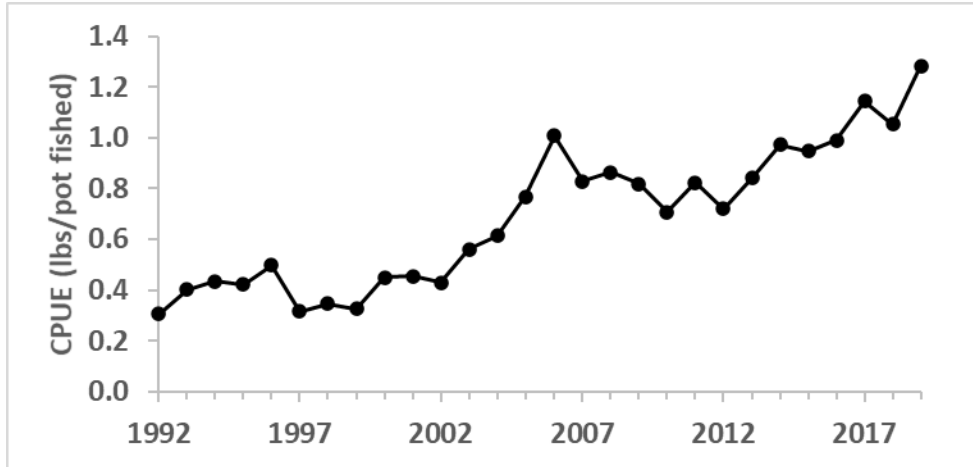


Figure 6. Fishery-dependent catch-per-unit-effort for Maryland's yellow eel pot fishery. Estimated errors associated with the index were not provided.

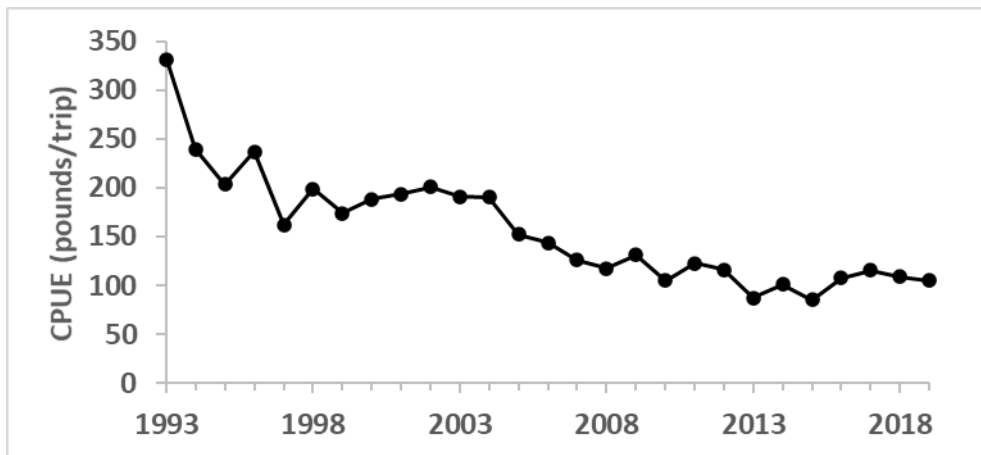


Figure 7. Fishery-dependent catch-per-unit-effort for Virginia's yellow eel pot fishery. Estimated errors associated with the index were not provided.

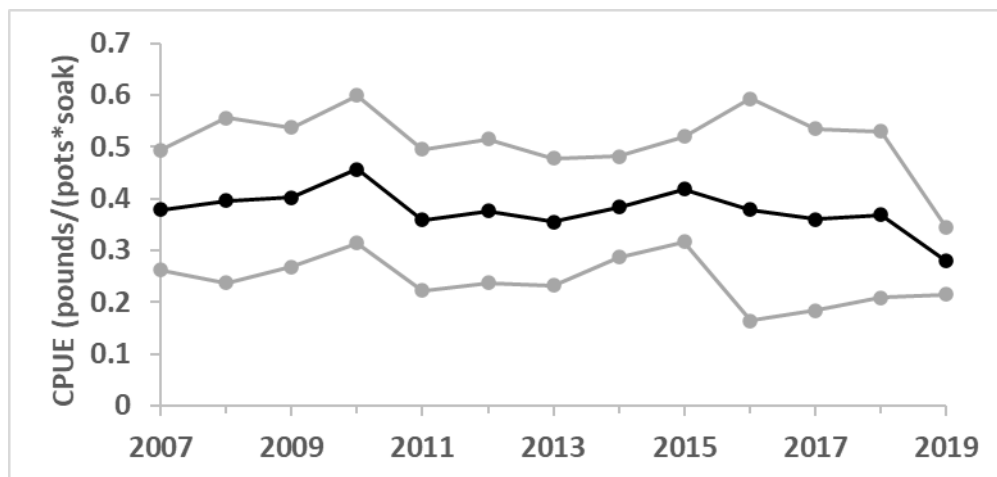


Figure 8. Fishery-dependent catch-per-unit-effort for North Carolina's yellow eel pot fishery. The black line indicates the CPUE and the grey lines indicate 95% confidence intervals.

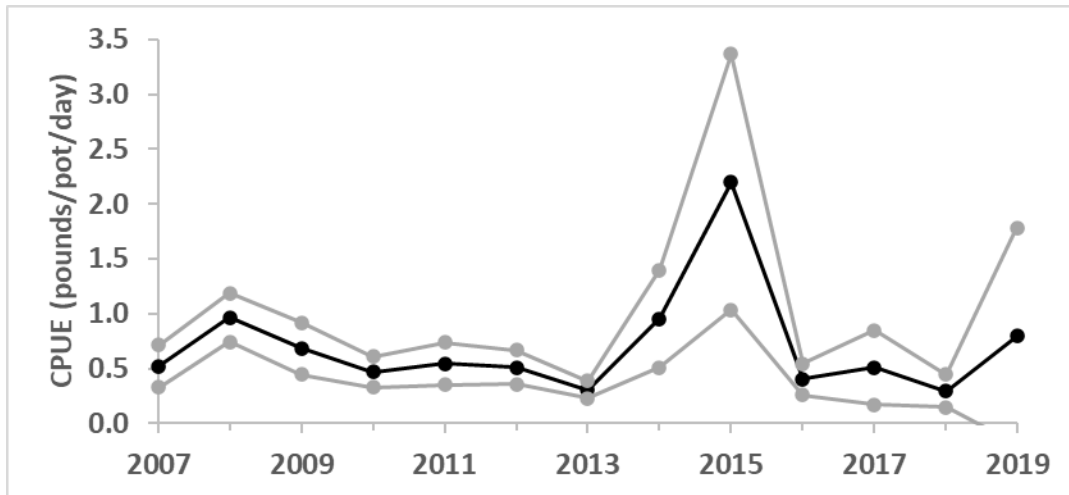


Figure 9. Fishery-dependent catch-per-unit-effort for Florida’s yellow eel pot fishery. The black line indicates the CPUE and the grey lines indicate 95% confidence intervals.

### 3.0 Proposed Management Program

The following options were developed in response to the Board motion from August 2023<sup>1</sup>. The options are organized by issue item.

When the Board takes final action on the addendum, there is the opportunity to select any measure within the range of options that went out for public comment, including combining options across issues. This means when selecting final management measures, the Board may select a coastwide cap that falls within the range of options, i.e., between 202,453 and 916,473 pounds.

### 3.1 Yellow Eel Coastwide Cap and Management Response to Exceeding the Coastwide Cap

#### Issue 1: Coastwide Cap

Addendum V established a coastwide cap of 916,473 pounds, which is the coastwide average landings during the years of 1998 through 2010 (based on revised landings information through 2016 as of January 2018). This timeframe was also the period covered by the 2012 benchmark stock assessment.

Alternative options for coastwide caps were developed using  $I_{TARGET}$ , an index-based method that provides management advice based on abundance indices and catch information, as well as management goals specified by the Board.

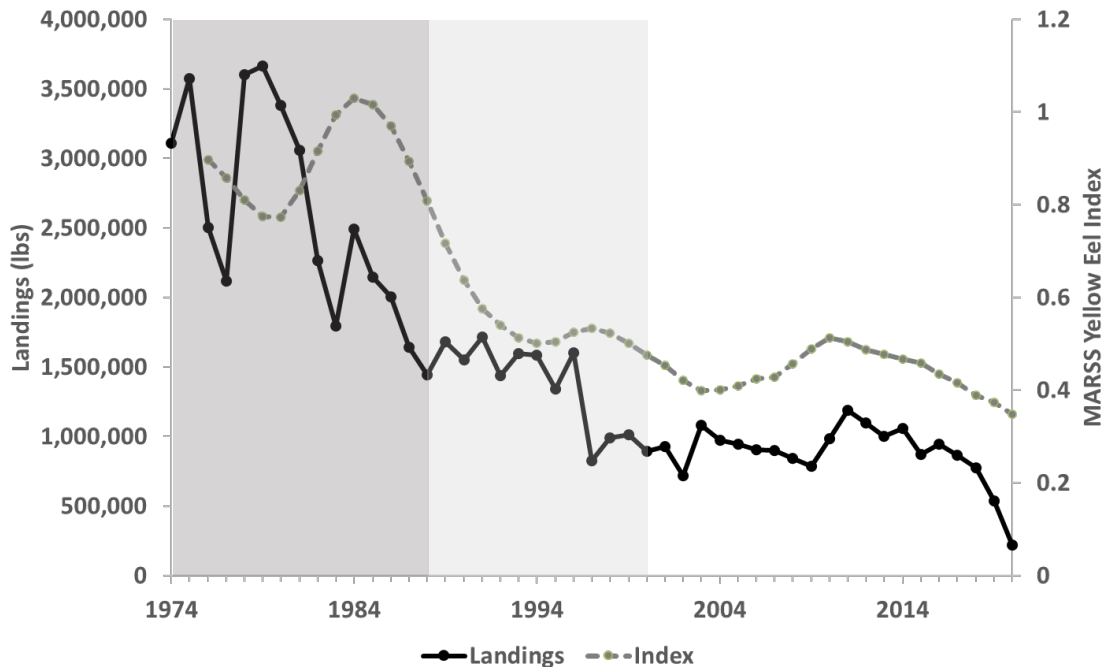
When using  $I_{TARGET}$  to recommend a catch cap, there are three parameters that must be specified: the reference period, multiplier, and threshold. The reference period should be a time period where the population is stable or at a desirable abundance level. The multiplier

<sup>1</sup> Move to draft an addendum to consider using  $I_{TARGET}$  to recommend various catch caps, but not use  $I_{TARGET}$  to set biological reference points or stock status.

represents the target level of abundance that management is aiming to achieve, and can range from 1 to 1.5. A multiplier of 1 indicates that the target abundance level is equal to the abundance over the reference period, and a multiplier equal to 1.5 indicates that the target is 1.5 times the average index value over the reference period. The threshold value reflects goals of the fishery. If landings exceed the threshold, then future landings are reduced. A threshold of 0.5 is less conservative, whereas a threshold of 0.8 is more conservative. Adjusting these three parameters affects the resulting coastwide catch cap recommendation.

The stock assessment included analyses that identified regimes in the American eel abundance index data. Regimes are time periods where the abundance index data are more similar compared to other time periods. There were three regimes detected in the yellow eel index: a high yellow eel abundance regime in 1974-1987, a low regime in 1988-1999, and an even lower regime in 2000-2020. The first two regimes are included as reference period options in this addendum. A stable period of relative high abundance (1974-1987) was recommended in the stock assessment as an appropriate reference period. The Management Board requested a reference period when more surveys were available (1988-1999) also be evaluated. This reference period reflects lower relative abundance levels, but relative abundance during this period was higher than in recent years (2000-2020).

Figure 10 shows the relative abundance index and catch time series, with the two reference periods considered in this document identified by the shaded areas.



**Figure 10. Yellow eel landings and abundance index, 1974-2020. The high abundance regime (1974-1987) is represented by the dark gray shaded area. The lower abundance regime (1988-1999) is represented by the light gray shaded area.**



The assessment recommended using  $I_{TARGET}$  with a reference period of 1974-1987, which represents a stable period of relative high abundance of yellow eel. The stock assessment used a multiplier of 1.25 rather than 1.5, because it recognizes that more factors beyond fishing have influenced the stock and may have changed the maximum population size for American eel that can be supported by the environment, therefore higher abundance levels (e.g., 1.5 times the abundance during the higher abundance regime) might not be achievable under current conditions. The Stock Assessment Subcommittee (SAS) recommended that if the Board elects to use the  $I_{TARGET}$  tool to establish the yellow eel coastwide cap, it should use the recommended reference period (1974-1987) and multiplier (1.25) and adjust the tool by choosing the threshold value.

*Option 1: Status Quo*

Under this option, the coastwide cap for yellow eel of 916,473 pounds would be maintained. Based on the 2023 stock assessment advice, this option is not recommended by the Plan Development Team.

*Option 2: Coastwide Cap set at **202,453 pounds** using  $I_{TARGET}$  configuration recommended in the 2023 benchmark stock assessment*

The coastwide cap for yellow eel would be set at 202,453 pounds, using the following configuration of  $I_{TARGET}$ , which was recommended in the 2023 Benchmark Assessment and Peer Review Report with catch and abundance index data through 2020:

Reference Period: 1974-1987  
Multiplier: 1.25  
Threshold: 0.8

This option aims to achieve a relative abundance level that is 1.25 times the average index value from 1974-1987, meaning a 25% larger population than the average population during that time period.

The assessment used a threshold value of 0.8 because it reflects a more conservative approach, and was recommended in the recent research track assessment conducted by the Northeast Fisheries Science Center (NEFSC) that examined methods for providing catch advice in data-limited fisheries.

*Option 3: Coastwide Cap set at **518,281 pounds** using  $I_{TARGET}$*

Under this option, the catch cap is set at 518,281 pounds, which is based on the following configuration of  $I_{TARGET}$  with catch and abundance index data through 2020:

Reference Period: 1974-1987  
Multiplier: 1.25  
Threshold: 0.5

This option uses a reference period of 1974-1987 and multiplier of 1.25, as recommended in the stock assessment. It aims to achieve a relative abundance level that is 1.25 times the average index value from 1974-1987, which is the same target abundance in Option 2. The threshold value of 0.5 reflects a less conservative approach to managing the fishery to achieve the target abundance than the previous option. This would likely increase the amount of time needed to achieve the target index compared to Option 2.

**Option 4: Coastwide Cap set at 509,780 pounds using  $I_{TARGET}$**

Under this option, the catch cap is set at 509,780 pounds, which is based on the following configuration of  $I_{TARGET}$  with catch and abundance index data through 2020:

Reference Period: 1988-1999

Multiplier: 1.5

Threshold: 0.5

This option uses a reference period of 1988-1999, which represents a period of lower abundance, and a multiplier of 1.5. Thus, this option aims to achieve a relative abundance level that is 1.5 times the average index value from 1988-1999, meaning a 50% larger population than the average population during that time period. The abundance target in this option is slightly lower than the abundance target in Options 2 and 3. The threshold value of 0.5 reflects a less conservative approach to managing the fishery to achieve the target abundance.

**Option 5: Coastwide Cap set at 716,497 pounds using  $I_{TARGET}$**

Under this option, the catch cap is set at 716,497 pounds, which is based on the following configuration of  $I_{TARGET}$  with catch and abundance index data through 2020:

Reference Period: 1988-1999

Multiplier: 1.25

Threshold: 0.5

This option uses a reference period of 1988-1999, which represents a period of lower abundance, and a multiplier of 1.25. Thus, this option aims to achieve a relative abundance level that is 1.25 times the average index value from 1988-1999, meaning a 25% larger population than the average population during that time period. The abundance target for this option is 39% lower than the target recommended in the stock assessment. The threshold value of 0.5 reflects a less conservative approach to managing the fishery to achieve the target abundance.

The PDT does not recommend consideration of this option. The catch cap recommended when using this configuration is more than three times the catch cap that was recommended in the stock assessment (Option 2).

Figure 11 illustrates the difference in the catch caps produced by each of the above configurations of  $I_{TARGET}$ , where each colored line consists of annual data points representing the catch cap that would have been produced with each year as the terminal year of data. This demonstrates that coastwide caps recommended using  $I_{TARGET}$  change based on the time series of catch and abundance data that are used in the model. The assessment used 2020 as the terminal year; therefore, the catch caps considered in this draft addendum are based on landings and index data through 2020. If the Board selects any of the options that base the coastwide cap on  $I_{TARGET}$ , additional years of catch and abundance index data could be used to update the recommended catch level in the future based on changes in yellow eel catch and abundance (see Section 3.2).

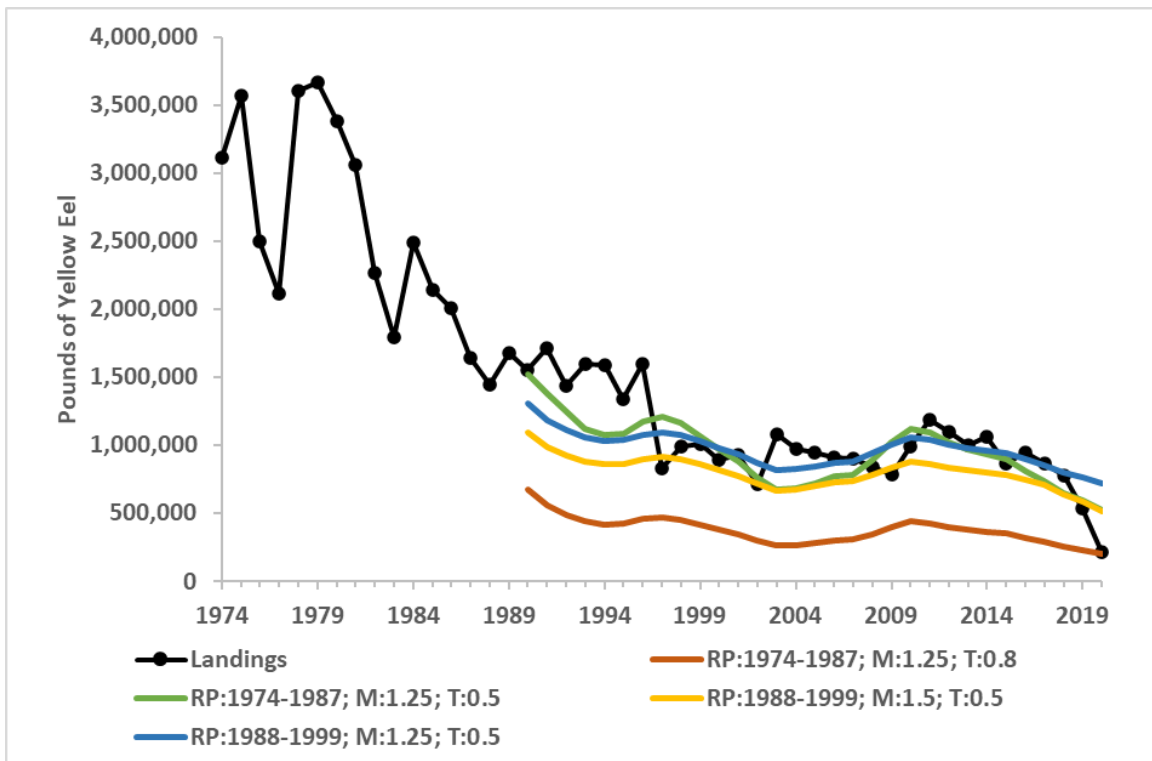
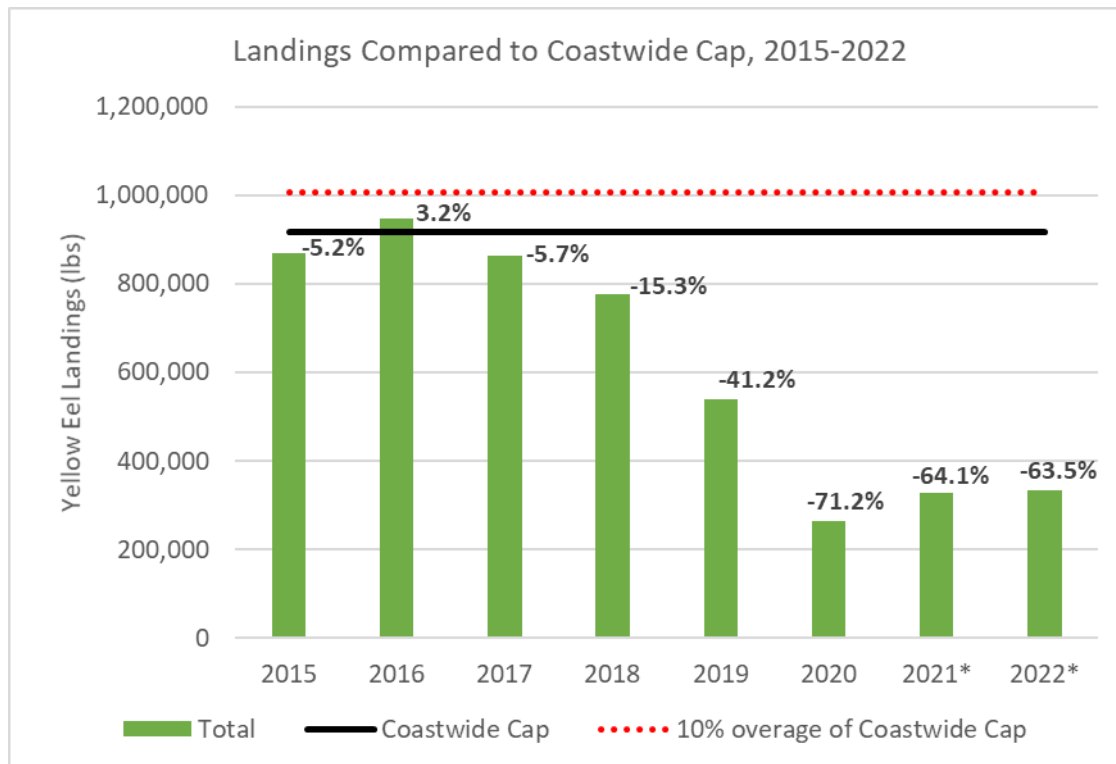


Figure 11. Comparison of catch advice produced by each of the proposed configurations of  $I_{TARGET}$  relative to annual coastwide catch. RP=reference period; M=multiplier; T=threshold value. The orange line represents Option 2, the green line represents Option 3, the yellow line represents Option 4, and the blue line represents Option 5. Each year represents the terminal year of data used in the model.

### Issue 2: Management Response to Exceeding the Coastwide Cap

Addendum V established that the coastwide landings are annually evaluated against a two-year management trigger. If the coastwide cap is exceeded by 10% (10% of the coastwide cap = 91,647 pounds; coastwide cap + 10% = 1,008,120 pounds) for two consecutive years, then only states with landings greater than 1% of the coastwide landings, in the year(s) when the management trigger is tripped, will be responsible for reducing their landings to achieve the coastwide cap in the subsequent year. States with landings greater than 1% of the coastwide landings will work collectively to achieve an equitable reduction to the coastwide cap. For

states with landings less than 1% of the coastwide landings, if in subsequent years a state’s landings exceeds 1% of the coastwide landings after reductions have been applied, that state must reduce their individual state landings in the subsequent year to return to the less than 1% level. More details on the process the Management Board will undertake to respond to overages of the coastwide cap are outlined in the Appendix.



**Figure 12. Coastwide yellow eel landings from 2015-2022 compared to the Addendum V coastwide cap and a 10% overage of the cap (the Management Trigger). Percentages above each bar indicate percent above or below the coastwide cap.**

**Option 1: Status Quo**

The management trigger, landings evaluation process, and management response established in Addendum V would remain in place (see Appendix).

**Option 2: States with 5% or greater of coastwide landings**

This option would modify the management response that would take place if the coastwide cap is exceeded by 10% under the addendum V guidelines. Under this option, only states with landings greater than 5% of the coastwide landings in the year(s) when the management trigger is tripped will be responsible for reducing their landings to achieve the Coastwide Cap in the subsequent year. Those states with landings greater than 5% of the coastwide landings will work collectively to achieve an equitable reduction to the Coastwide Cap. For those states with landings less than 5% of the coastwide landings, if in subsequent years a state’s landings exceeds 5% of the coastwide landings after reductions have been applied, that state must reduce their individual state landings in the subsequent year to return to the <5% level.

For reference, Table 2 shows the percent of the coastwide landings contributed by each state in recent years.

**Table 2. Percent of total coastwide yellow eel landings contributed by each state. Shaded cells represent > 5% of the annual coastwide landings.**

| Year  | ME   | NH                         | MA   | RI   | CT   | NY   | NJ    | DE   | MD    | PRFC | VA    | NC   | SC                         | GA                         | FL   |
|-------|------|----------------------------|------|------|------|------|-------|------|-------|------|-------|------|----------------------------|----------------------------|------|
| 2014  | 0.7% | Time series average < 0.1% | 0.4% | 0.2% | 0.1% | 3.6% | 8.6%  | 5.9% | 58.4% | 4.6% | 10.3% | 5.7% | Time series average < 0.1% | Time series average < 0.1% | 1.3% |
| 2015  | 0.5% |                            | 0.3% | 0.2% | 0.3% | 5.8% | 10.2% | 5.1% | 56.8% | 3.6% | 10.0% | 6.7% |                            |                            | 0.6% |
| 2016  | 0.7% |                            | 0.2% | 0.3% | 0.3% | 3.8% | 7.1%  | 4.7% | 61.7% | 6.2% | 10.2% | 4.2% |                            |                            | 0.6% |
| 2017  | 0.7% |                            | 0.1% | 0.3% | 0.1% | 4.8% | 9.0%  | 3.5% | 62.6% | 3.9% | 11.3% | 2.9% |                            |                            | 0.9% |
| 2018  | 0.4% |                            | 0.0% | 0.5% | 0.4% | 5.1% | 9.0%  | 4.0% | 66.3% | 4.0% | 7.4%  | 2.3% |                            |                            | 0.6% |
| 2019  | 0.5% |                            | 0.3% | 0.8% | 1.0% | 6.1% | 14.1% | 2.5% | 61.5% | 5.0% | 6.4%  | 1.5% |                            |                            | 0.3% |
| 2020  | 2.7% |                            | 0.0% | 0.5% | 1.1% | 6.2% | 9.0%  | 0.7% | 60.6% | 9.5% | 8.3%  | 1.2% |                            |                            | 0.2% |
| 2021* | 0.1% |                            | C    | 0.6% | 1.0% | 4.9% | 8.0%  | 1.3% | 62.3% | 3.2% | 14.1% | 1.7% |                            |                            | 2.8% |
| 2022* | 0.3% |                            | C    | 0.2% | 1.1% | 8.1% | 15.7% | 0.9% | 56.4% | 3.8% | 10.6% | 1.1% |                            |                            | 1.8% |

### 3.2 Timeframe for Yellow Eel Provisions

The following options would determine how long the selected coastwide cap would remain in place before any changes are considered.

#### Option 1: No sunset date, cap can be updated after three years

Under this option there would be no sunset date for this Addendum. The selected coastwide landings cap for yellow eel would remain in place for three years (2025-2027). After three years, the Board may choose whether to update the coastwide cap with additional years of catch and abundance data, or maintain the same coastwide cap. If the Board chooses to update the cap using the selected  $I_{TARGET}$  configuration established in this addendum, this could be done via Board action and a new addendum would not be required. The additional years of data available at that time would be included in the  $I_{TARGET}$  model to provide an updated coastwide cap.

The PDT recommends three years as the minimum amount of time that the cap should remain static before being updated. This is because less than three years of additional data from the yellow eel abundance index and the coastwide landings would not be sufficient to evaluate the performance of the cap and provide an updated catch limit.

If a new or different management program is desired than what is specified in the prior sections (e.g., a different configuration of  $I_{TARGET}$ ), a new addendum would be required.

#### Option 2: No sunset date, cap can be updated after five years

Under this option there would be no sunset date for this Addendum. The selected coastwide landings cap for yellow eel would remain in place for five years (2025-2029). After five years, the Board may choose whether to update the coastwide cap with additional years of data, or

maintain the same coastwide cap. If the Board chooses to update the cap using the selected  $I_{TARGET}$  configuration established in this addendum, this could be done via Board action and a new addendum would not be required. The additional years of data available at that time would be included in the  $I_{TARGET}$  model to provide an updated coastwide cap.

A time period of five years is provided as an alternative to three years. Five years of additional data from the yellow eel abundance index and the coastwide landings would be more robust for providing an updated catch limit.

If a new or different management program is desired than what is specified in the prior sections (e.g., a different configuration of  $I_{TARGET}$ ), a new addendum would be required.

### **3.3 Annual Young-of-Year Abundance Survey**

The following options consider modifying the biological sampling requirements of the annual YOY abundance survey established in the FMP.

#### *Option 1: Status Quo*

Under this option all requirements for the annual YOY abundance survey established in Section 3.1.1 of the FMP would remain in place. This means states must continue to collect individual lengths and pigment stage of the entire survey catch, or a statistical subsample where the catch of young-of-year is too large.

#### *Option 2: Voluntary biological sampling in the YOY survey*

Under this option the requirements of the annual YOY abundance survey established in Section 3.1.1 of the FMP would be modified such that the states would no longer be required to collect individual lengths and pigment stage of the YOY catch. All other survey requirements would remain in place. States may continue to collect biological data voluntarily.

This option is proposed in response to a recommendation from the SAS and Technical Committee (TC). The SAS and TC recommend that the biological sampling requirement for YOY surveys be made optional, given the lack of trends in pigment, length, and weight within and among sampling sites (ASMFC 2023).

### **3.4 Catch and Effort Monitoring Program**

Addendum I established fishery-dependent monitoring requirements for commercial eel fisheries. Specifically, since 2007 states have been required to implement mandatory reporting of eel catch and effort by either harvesters or dealers as a condition of their permit. The following options consider changing the Addendum I fishery-dependent monitoring requirements.

#### *Option 1: Status Quo*

Under this option there would be no change to the current fishery-dependent reporting requirements. Harvesters or dealers would still be required to report trip-level data including soak time, number of units of gear fished, and pounds landed by life stage.

### Option 2: Voluntary collection of fishery-dependent catch-per-unit-effort (CPUE) for yellow eel harvest

Under this option states would no longer be required to mandate that harvesters or dealers report trip-level CPUE data (i.e., soak time, number of units of gear fished, and pounds landed per unit) for yellow eel harvest. If a state wishes to maintain this reporting requirement it may do so voluntarily. All states would continue to be required to collect estimates of directed harvest by month, life stage, and gear type, to be provided in the annual compliance report. This option would not modify any fishery-dependent reporting requirements for the glass eel life stage.

### **3.5 De Minimis Status**

The Commission defines *de minimis* as "a situation in which, under existing condition of the stock and scope of the fishery, conservation, and enforcement actions taken by an individual state would be expected to contribute insignificantly to a coast-wide conservation program required by a Fishery Management Plan or amendment." Under the American Eel FMP, *de minimis* status exempts a state from having to adopt the commercial and recreational fishery regulations for a particular life stage, and any fishery-dependent monitoring elements for that life-stage listed in Section 3.4.1. of the FMP. States may apply for *de minimis* status for each life stage if (given the availability of data), for the preceding two years, their average commercial landings (by weight) of that life stage constitute less than one percent of coast wide commercial landings for that life stage for the same two-year period.

The Commission updated its *De minimis* Policy in November 2022. The Policy outlines *de minimis* standards for FMPs. A species management board may deviate from these standards to address unique characteristics of a fishery. If a board deviates from the Policy's standards, a rationale must be provided within the FMP. This Policy does not automatically change the provisions of current FMPs. In order to change *de minimis* standards, an addendum or amendment process must be completed, unless the FMP specifies a different process. Therefore, this Draft Addendum considers options to modify the American Eel *de minimis* criteria to align with the updated Commission Policy.

### Option 1: Status Quo

If this option is selected, the *de minimis* threshold for American eel will continue to be based on the average landings from the previous two years of landings. A state can be considered *de minimis* if the average landings for the last two years are less than 1% of the coastwide landings for the same two years.

### Option 2: Modify de minimis policy for eel to apply the Commission policy

If this option is selected, the *de minimis* threshold for American eel will be based on the average landings from the previous three years of landings. The averaging of multiple years of data prevents a state from taking action as a result of a rare event. A state can be considered *de minimis* if the average landings for the last three years are less than 1% of the coastwide landings for the last three years.

#### **4.0 Compliance**

If the existing American Eel FMP is revised by approval of this draft addendum, the American Eel Management Board will establish dates by which states will be required to implement the addendum provisions.

#### **5.0 References**

Atlantic States Marine Fisheries Commission (ASMFC). 2000. [Interstate Fishery Management Plan for American Eel \(\*Anquilla rostrata\*\)](#). Washington D.C. NOAA Oceanic and Atmospheric Administration Award No. NA97 FGO 0034 and NA07 FGO 024.

ASMFC. 2012. [American Eel Benchmark Stock Assessment](#). Arlington, VA.

ASMFC. 2014. [Addendum IV to the Interstate Management Plan for American Eel](#). Arlington, VA.

ASMFC. 2017. [American Eel Stock Assessment Update](#). Arlington, VA.

ASMFC. 2018. [Addendum V to the Interstate Management Plan for American Eel](#). Arlington, VA.

ASMFC. 2023. [American Eel Benchmark Stock Assessment and Peer Review Reports](#). Arlington, VA.

Blake, L. M. 1982. Commercial fishing for eel in New York State. In K. H. Loftus (ed). Proceedings of the 1980 North American eel conference. Ont. Fish. Tech. Rep. Ser. No. 4. 97pp



## Appendix

### Policy to Address Coastwide Cap Overages for the Yellow Eel Commercial Fishery

This appendix describes the Board response that was established under Addendum V for in the event that the coastwide cap of 916,473 pounds of American eel is exceeded in a given year. Sections 3.3.2 and 3.3.3 of this Addendum state the following regarding the management trigger and the response:

#### 3.3.2 Yellow Eel Coastwide Cap Management Trigger

*Starting in 2019, the coastwide landings are annually evaluated against a two-year management trigger. If the coastwide cap is exceeded by 10% (10% of the coastwide cap = 91,647 pounds; coastwide cap + 10% = 1,008,120 pounds) for two consecutive years, the Board is required to alter the management program as specified below to ensure the objectives of the management program are achieved.*

#### 3.3.3 Allocation

*The yellow eel fishery is managed without state-specific quotas through adaptive management. If the management trigger is tripped. Only states with landings greater than 1% of the coastwide landings, in the year(s) when the management trigger is tripped, will be responsible for reducing their landings to achieve the coastwide cap in the subsequent year. States with landings greater than 1% of the coastwide landings will work collectively to achieve an equitable reduction to the coastwide cap. For states with landings less than 1% of the coastwide landings, if in subsequent years a state's landings exceeds 1% of the coastwide landings after reductions have been applied, that state must reduce their individual state landings in the following year to return to the less than 1% level<sup>2</sup>.*

A management objective under this Addendum is to manage landings to the coastwide cap (cap). Annual landings are not finalized until the spring of the following fishing year. Therefore, if an overage occurs, a year lag time will likely occur before full action is taken to reduce harvest to the cap. For example, a cap overage in 2019 would not be determined until 2020, and action would likely be delayed until 2021 since some states do not have authority to act within the same fishing year when the overage is determined.

One way to proactively manage the yellow eel fishery is to closely monitor landings and encourage states to take voluntary action when it is clear an overage has occurred in the previous year. By engaging with states before the management trigger is tripped, but after landings have exceeded the cap, a lengthy addendum process can be avoided and more immediate action can be taken to ensure the fishery is managed to the cap. This proactive approach encourages vigilance and voluntary action in the first year of an overage, and provides opportunity for collaborative, rapid action to prevent an overage in the second

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<sup>2</sup> To clarify, reduction measures apply when the management trigger is tripped. States are not held to a landings level until coastwide landings have exceeded the coastwide cap.

consecutive year, thereby preventing the triggering of mandatory management action through an addendum.

Thus, to improve the expediency in reacting to an overage, it is recommended that preliminary commercial yellow eel landings from the ACCSP Data Warehouse be made available for the Board's consideration prior to the ASMFC Spring Meeting, annually. Based on the preliminary data review, if it's determined the cap has likely been exceeded in one year the Board will convene a work group (WG) consisting (at a minimum) of one representative from each state/jurisdiction that harvested more than 1% of the coastwide landings in the year of the overage. The charge of the WG is to consider the overage relative to the decision trees (Figure 1) and determine if and how the Board should recommend voluntary action by those states that harvested more than 1% of the coastwide landings (1% states).

### ***Response Strategy When Cap is exceeded in One Year***

Once convened by the Board, the WG will review the magnitude and the pattern of the overage relative to the decision trees (Figures 1-3) to determine the need for voluntary action. "Pattern" refers to whether landings of American eel increased in all states or in some states while harvest decreased in others. "Magnitude" refers to the extent of the overage and, for individual states, the amount of harvest increase relative to the previous year. It will be important for the WG to examine potential reasons for increasing harvest, such as increased effort, increased availability of eels, improved market conditions, etc. Once the Board recommends states decrease landings it will be up to the states to take action.

States may utilize (but are not restricted to) the following voluntary methods to reduce eel harvest as considered by the Board in Draft Addendum II (2007):

- Seasonal restrictions,
- Gear limits, and
- Size limits.

**Note:** Harvest reductions were not approved by the Board and were not included in Addendum II (2008).

Seasonal restrictions are the simplest method of reducing harvest, but there was strong opposition to the seasonal restrictions from the Advisory Panel when proposed in Draft Addendum II. However, those seasonal closures were designed to increase escapement of silver eels and occurred in the fall during times of maximal fishing effort, so it is conceivable that a seasonal closure could be designed that would reduce harvest without imposing a severe hardship on the fishery. The Board considered a maximum size limit as a method to allow more escapement of silver eels and increase eggs-per-recruit (EPR). A range of size limits were presented in the Draft Addendum ranging from a 19" maximum size limit, which was estimated to increase EPR by 138%, but at a reduction of 40% to the harvest, to a 23" maximum size, which only increased EPR by 3.8% and reduced harvest by less than 10%. A larger minimum size also will reduce harvest if harvest reduction is the sole goal. Size limits could either be enforced by gear modifications or by grading the eels on the water. Gear modifications can impose a

large financial burden on harvesters, depending on the number of pots fished and length limit. If a minimum length is used, eel pots can be modified by installing an escape panel of a mesh size that would only retain eels above the minimum length. If a maximum eel length is used, the funnel(s) on the eel pots can be modified by restricting the circumference. A grader can also be used to comply with length limits at a lower cost to the harvesters than gear modification. Grader bars can be set to pass all eels below a minimum length or to hold all eels above a maximum length. Although the Advisory Panel favored grading for complying with a maximum length limit during the Draft Addendum II deliberations, the Law Enforcement Committee thought on-water enforcement of the length limit by grading would be difficult.

***Response Strategy if the Two-Year Management Trigger is Tripped***

If a review of landings at the Commission's Spring Meeting indicates the two-year management trigger has been met, the Board will initiate an addendum to reduce landings to or below the cap. A Plan Development Team (PDT) will be convened to draft the addendum (Table 1). The PDT will consider a variety of actions to reduce harvest back to the cap, including but not limited to: (1) an equal percent reduction taken only from the 1% states whose harvest increased in the overage year(s); (2) an equal percent reduction taken from all 1% states regardless of whether their harvest increased or decreased; (3) each 1% state takes a base reduction that is less than the total reduction needed, and the remainder of the reduction is taken only by those 1% states who had substantially increased harvest leading up to the overage year. The PDT should consider the impacts of calculating a reduction in harvest from a single overage year, the 2 years over which the trigger was reached or from a baseline within the last 5 years using a maximum of 3 years that ensures equitable reductions.

Once action is taken to reduce harvest to the cap (either voluntary after the first year of an overage or required after the management trigger is tripped), actions will remain in place until the coastwide harvest returns to a level that is at or below the cap. At this point, states may propose adjustments to the Board recognizing the process will begin again if another year's overage occurs or a management action is enacted.

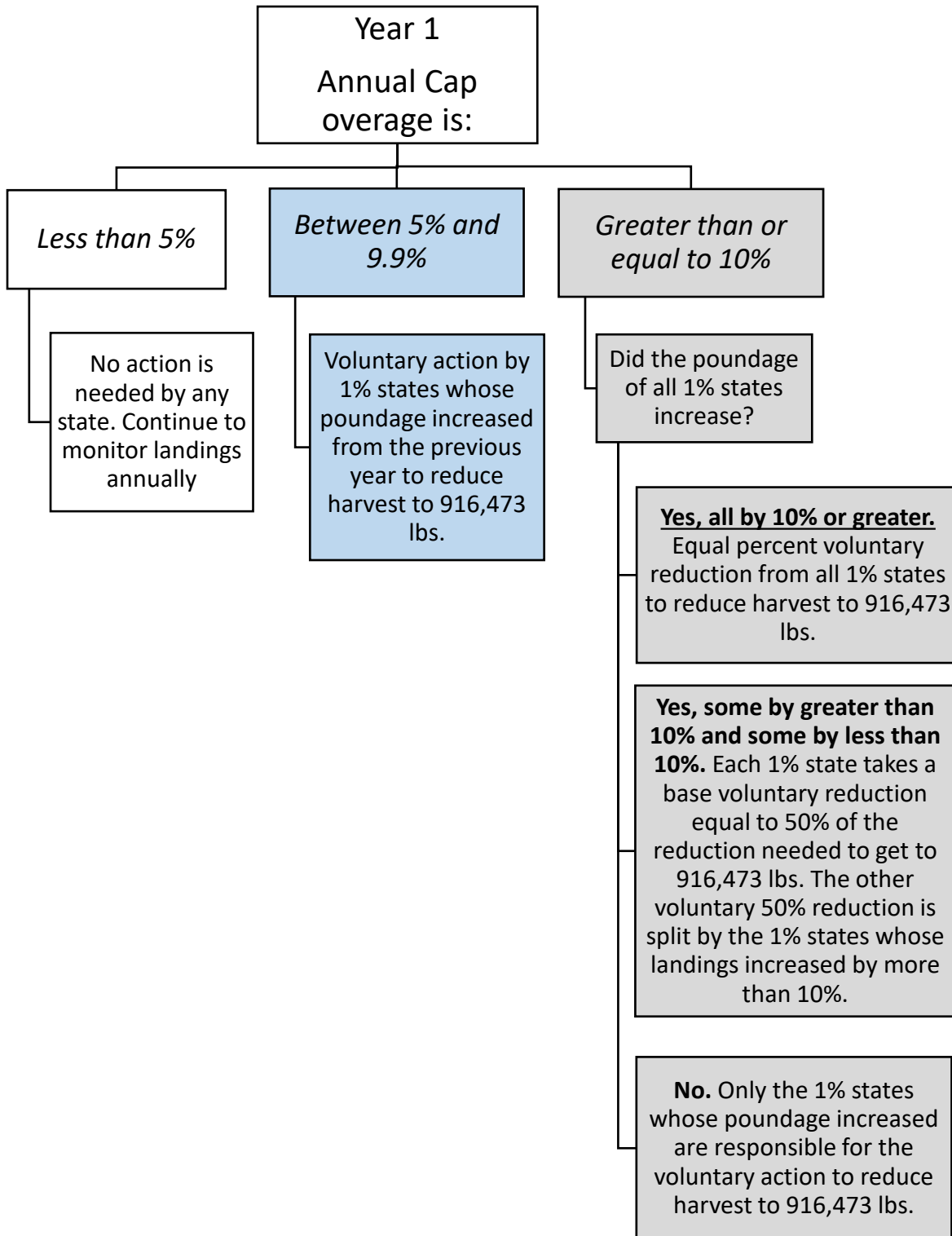


Figure A1. Decision tree for management response to cap overage in Year 1.

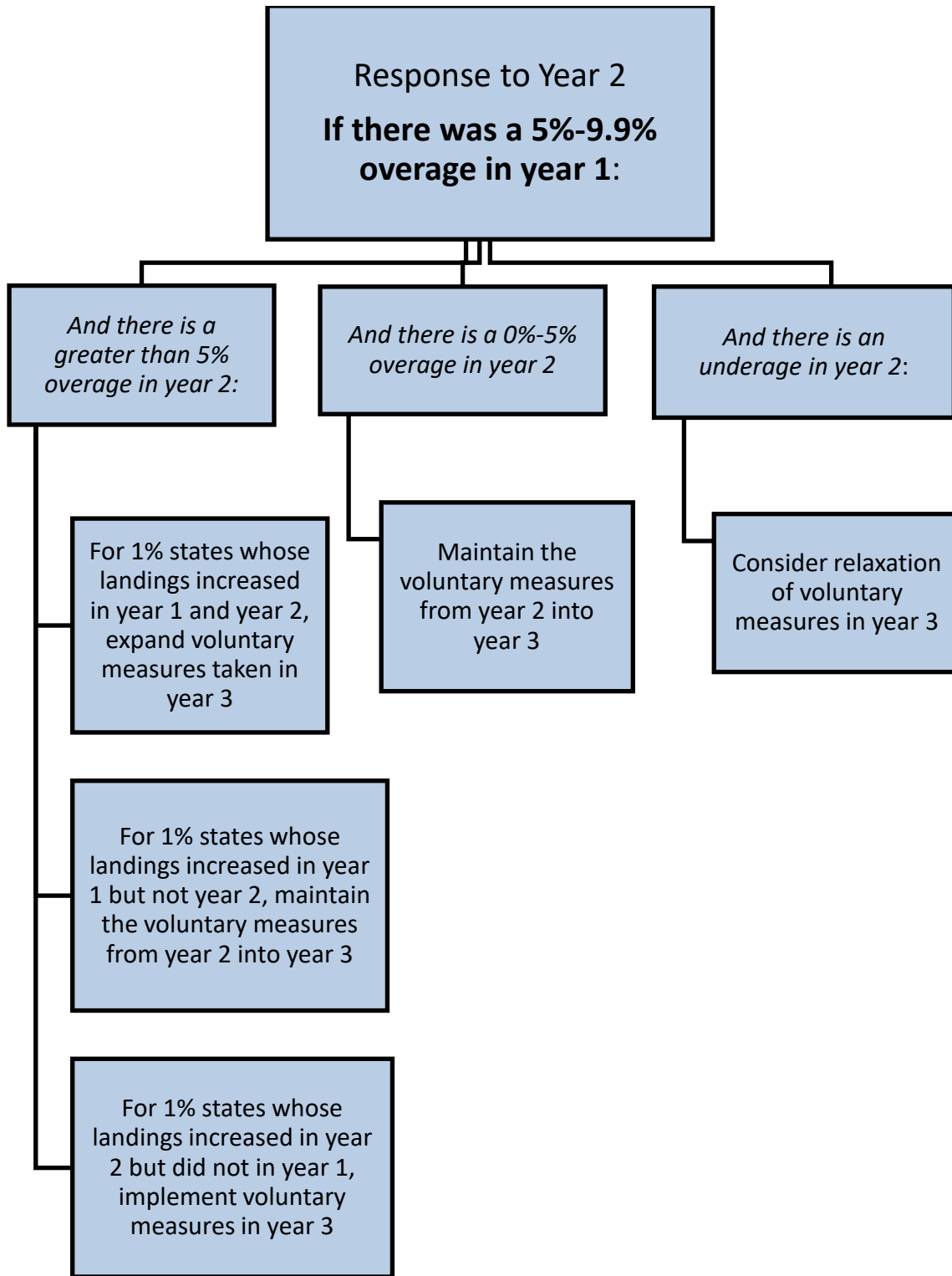


Figure A2. Decision tree for management response in Year 3 if overage is less than 10% in Year 1.

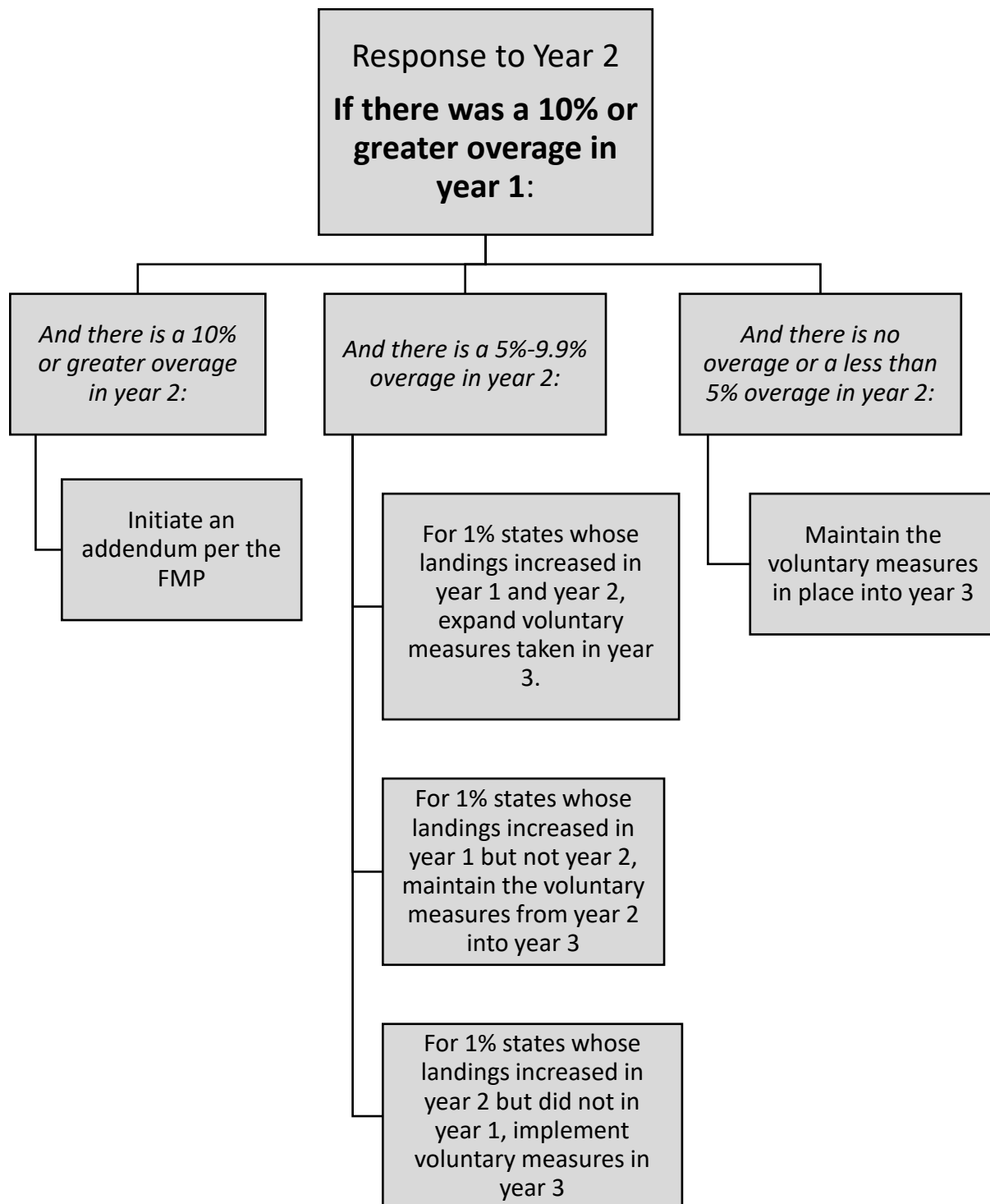


Figure A3. Decision tree for management response in Year 3 if overage is more than 10% in Year 1.