Atlantic States Marine Fisheries Commission

ADDENDUM V TO THE INTERSTATE FISHERY MANAGEMENT PLAN FOR AMERICAN EEL

Commercial Yellow and Glass/Elver Eel Allocation and Management

Approved August 2018
Revised October 2019 (to include Appendix on Coastwide Cap Policy)

Sustainable and Cooperative Management of Atlantic Coastal Fisheries

Table of Contents

1.0 Introduction 1
2.0 Overview 1
2.1 Statement of Problem 1
2.2 Background 2
2.3 Description of the Fishery 3
2.3.1 Glass Eel/Elver Fishery 3
2.3.2 Yellow Eel Fishery 5
2.4 Status of the Stock 8
3.0 Management Program 8
3.1 Maine Glass Eel Quota 8
3.2 Glass Eel Aquaculture Plan Provisions 9
3.3 Yellow Eel Coastwide Cap, Management Trigger, and Allocation 10
3.3.1 Yellow Eel Coastwide Landings Cap 10
3.3.2 Yellow Eel Coastwide Cap Management Trigger 10
3.3.3 Allocation 11
3.4 Timeframe for Addendum Provisions 11
4.0 Compliance 11
References 12
Appendix 13

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.

This Addendum establishes a new commercial coastwide landings cap for the yellow eel fishery; new management triggers to evaluate the yellow eel coastwide cap; and a process for addressing overages and reductions if the coastwide cap is exceeded. Lastly, the Addendum outlines new criteria for evaluating glass eel aquaculture proposals.

2.0 Overview

2.1 Statement of Problem

The Commission's Interstate Fisheries Management Program Charter establishes fairness and equity as guiding principles for the conservation and management programs set forth in the Commission's FMPs. The American Eel Management Board (Board) has strived to achieve these principles through the commercial allocation program outlined in Addendum IV (2014) to the American Eel FMP. Addendum IV had set an annual commercial coastwide landings quota (referred to as the coastwide cap) of 907,671 pounds that included two management triggers:

1. The coastwide cap is exceeded by more than 10% in a given year (998,438 pounds); or
2. The coastwide cap is exceeded for two consecutive years, regardless of percent overage. Exceeding one of the two triggers would result in automatic implementation of state-by-state quotas.

Since the implementation of Addendum IV, states have raised several concerns about the current management structure, including the management trigger provision. A second-year overage, of any amount, is troublesome to some jurisdictions given the inherent uncertainty of the landings data. The FMP requires states to report commercial landings by life stage, gear type, month, and region; although not all states were able to provide this level of information for either the benchmark (2012) or updated (2017) stock assessment. In addition to not always having a complete data set to distinguish landings by life stage, there are other potential biases present in the commercial yellow eel data set including: 1. At least a portion of commercial American eel landings are from non-marine waters, and even with mandatory reporting, requirements do not always extend outside marine districts. 2. Misreporting between conger eel, hagfish, slime eel, and American eel has been known to occur. Despite these uncertainties, the commercial landings do represent the best data available and are indicative of the trend of total landings over time.

At the time of drafting the Addendum, estimated landings indicate the coastwide cap was exceeded by less than 10% in 2016. Many expressed concern that a small overage in 2017 could

result in significant economic consequences for multiple jurisdictions. States also expressed concern the current coastwide cap was set independent of any ability to quantify the amount of change in landings necessary to affect fishing mortality rates and spawning stock status. Neither of those stock status elements are currently calculated for American eel due to a lack of data. In addition, states expressed concern that moving to state-specific quotas for the American eel yellow life stage fishery would create a new administrative burden. Finally, equitable allocation of this resource is particularly difficult given the variation in availability and the market demand for eels up and down the Atlantic coast.

Lastly, Addendum IV specified an annual glass eel commercial quota for Maine of 9,688 pounds for the 2015-2017 fishing seasons, and that it be re-evaluated after 3 years (prior to the start of the 2018 fishing season). In October 2017, the Board specified a glass eel commercial quota for Maine of 9,688 pounds for the 2018 fishing season. The state of Maine has expressed interest in increasing it's their glass eel quota, which requires a new addendum.

2.2 Background

American eel inhabit fresh, brackish, and coastal waters along the Atlantic, from the southern tip of Greenland to Brazil. American eel eggs are spawned and hatch in the Sargasso Sea. After hatching, leptocephali (the larval stage) are transported to the coasts of North America and the upper portions of South America by ocean currents. Leptocephali then transform into glass eels via metamorphosis. In most areas, glass eel enter nearshore waters and begin to migrate up-river, although there have been reports of leptocephali found in freshwater in Florida. Glass eels settle in fresh, brackish, and marine waters, where they undergo pigmentation, reaching the elver life stage. Elvers subsequently mature into the yellow eel phase, most by the age of two years.

The Commission's American Eel Board first convened in November 1995 and finalized the FMP for American Eel in November 1999. The goal of the FMP is 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.

Since the FMP was approved in 1999, it has been modified four times. Addendum I (approved in February 2006) established a mandatory catch and effort monitoring program for American eel. Addendum II (approved in October 2008) made recommendations for improving upstream and downstream passage for American eels. Most recently, Addendum III (approved in August 2013) made changes to the commercial fishery, specifically implementing restrictions on pigmented eels, increasing the yellow eel size limit from 6 to 9 inches, and reducing the

recreational creel limit from 50 fish to 25 fish per day. In October 2014, the Board approved Addendum IV which set goals of reducing overall mortality and maximizing the conservation benefit to American eel stocks (ASMFC 2014). The Addendum established a coastwide cap of 907,671 pounds of yellow eel, reduced Maine's glass eel quota to 9,688 pounds (2014 landings), and allowed for the continuation of New York's silver eel weir fishery in the Delaware River. For yellow eel fisheries, 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 one of the triggers are met then states would implement state-specific allocations based on average landings from 1998-2010 with allocation percentages derived from 2011-2013.

The following objectives were addressed through Addendum V:

1. Examined Maine's glass/elver eel quota based on updated information but made no changes to the state's quota;
2. Revised the yellow eel coastwide cap and management triggers based on recent fishery performance and updated landings data, and to ensure the overarching goal of the FMP - *to conserve and protect the American eel resource to ensure its continued role in the ecosystems while providing the opportunity for its commercial, recreational, scientific, and educational use* - is met; and
3. Resolved potential inequities in allocation by removing state-by-state quotas for the yellow eel fishery.

2.3 Description of the Fishery

2.3.1 Glass Eel/Elver Fishery

Life stage glass and elver eel harvest along the Atlantic coast is prohibited in all states except Maine and South Carolina. Prior to the implementation of the FMP, Maine was the only state compiling glass eel and elver fishery catch statistics. Under the FMP, all states are now required to submit fishery-dependent information. In recent years, Maine was the only state reporting substantial glass eel or elver harvest.

Maine Glass Eel/Elver Fishery

Since the implementation of the 9,688 pound glass eel quota for Maine in 2015 through Addendum IV, landings have tracked close to the quota. In both 2016 and 2017, landings were 97% and 96% of the quota, respectively, after being much lower in 2015 (5,260 pounds).

Table 1. Maine's Glass/Elver Eel Landings 2007-2017 (Source: ACCSP)

Year	Landings	Value
2007	**3,714**	**$1,287,479**
2008	**6,951**	**$1,486,353**
2009	**5,199**	**$514,629**
2010	**3,158**	**$592,405**
2011	**8,585**	**$7,656,345**
2012	**21,610**	**$38,791,627**
2013	**18,081**	**$32,926,991**
2014	**9,688**	**$8,440,333**
2015	**5,260**	**$11,389,891**
****2016**	**9,399**	**$13,388,040**
****2017**	**9,282**	**>$12,000,000**

**Preliminary landings

In 2012, Maine's glass eel landings hit an all-time high of 21,610 pounds with a landed value of over $38 million. This huge spike in price per pound created a gold rush mentality that brought with it poaching problems that most thought Maine could not overcome, and there was a call to close the fishery all together. Over the next two years, the Maine Department of Marine Resources (ME DMR) responded by instituting a voluntary reduction in harvest of 35% from the 18,076 pounds that was landed in 2013. This established the first glass eel quota for Maine at 11,749 pounds. Maine instituted individual fishing quotas, and penalties were moved from civil to criminal and included a "two-strike" provision where a harvester license would be permanently revoked. Also in 2013, ME DMR developed a swipe card program that allow dealers to enter daily landings data and allow ME DMR to analyze that data within 24 hours of receipt, as well as serve as a fishery management tool to implement an individual fishing quota (IFQ) for harvesters. The Program was expanded in 2015 to include dealer-to-dealer transactions. With the implementation of Addendum IV, the elver quota was cut another 11%, reducing Maine's glass eel quota to 9,688 pounds. Since the implementation of the 9,688 pound glass eel quota, landings have tracked close to the quota with the exception of 2015 where a late spring with ice and high water contributed to a drop in landings down to 5,260 pounds.

Since 2014, ME DMR has effectively track the IFQs of approximately 900 harvesters, as well as the overall quota. In a two-year period, over 23,000 daily landings reports did not need to be key-entered by ME DMR staff due to the Swipe Card System, and only two card failures were reported. In addition, the number of fishery-related infractions reported by the Marine Patrol

dropped from over 200 in 2013 to under 20 in 2014 through 2016. The addition of the dealer-to-dealer swipe card program resulted in a difference of just over 120 pounds (approximately 2%) between what dealers reported purchasing directly from harvesters to what was exported from Maine dealers in 2015. These 120 pounds is likely attributed to shrinkage (die off between initial purchases to final shipment) and did not raise concerns.

Given the high market value, poaching of glass eels and elvers is known to be a serious problem in several states. Enforcement of the regulations is challenging due to the nature of the fishery (very mobile, nighttime operation, and high value for product). However, the recent cooperation between the State's enforcement agencies and the U.S. Fish and Wildlife Service remains a high priority and has resulted in several convictions for violation of the Lacey Act.

Aquaculture

Addendum IV to the FMP also allows approved Aquaculture Plans from states and jurisdictions to harvest up to 200 pounds of glass/elver eel annually from within their state waters for use in domestic aquaculture activities. Aquaculture Plans have been approved for North Carolina since 2016 and Maine starting in 2018 (2019 fishing season).

2.3.2 Yellow Eel Fishery

Coastwide Description

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. Such fluctuations pose significant management challenges with regard to balancing sustainable landings and access to the resource with economic considerations. Over the last 19 years, total coastwide landings have ranged from a low of approximately 717,698 pounds in 2002 to a high of approximately 1,189,455 pounds in 2011. State reported landings of yellow/silver eels in 2016 totaled 943,808 pounds (Table 2), which represent an 9% increase in landings from 2015 (868,122 pounds). 2016 yellow eel landings increased in Maine, Rhode Island, Connecticut, Maryland through Virginia, and Florida but decreased in all other states and jurisdictions.

Table 2. State-by-state Yellow Eel Landings: 1998-2016. Source: Personal Communication from State and Jurisdictions, January 2018.

Year	ME	NH	MA	RI	CT	NY	NJ	DE	MD	PRFC	VA	NC	SC	GA	FL	Total
1998	0	Time series average of less than 400 pounds	3,456	967	5,606	16,867	94,327	131,478	301,833	209,008	123,837	91,084	Time series average of less than 400 pounds	Time series average of less than 400 pounds	13,819	992,741
1999	0		3,456	140	10,250	7,882	90,252	128,978	305,812	163,351	183,255	99,939			17,533	1,011,093
2000	0		2,976	25	4,643	5,824	45,393	119,180	259,552	208,549	114,972	127,099			6,054	894,577
2001	9,007		3,867	14,357	1,724	18,192	57,700	121,515	271,178	213,440	97,032	107,070			14,218	929,523
2002	11,617		3,949	22,965	3,710	30,930	64,600	99,529	208,659	128,595	75,549	59,940			7,587	717,698
2003	15,312		4,047	24,883	1,868	8,296	100,701	155,516	346,412	123,450	121,091	172,065			8,486	1,082,614
2004	29,646		5,328	19,858	1,374	5,354	120,607	137,489	273,142	116,263	123,812	128,875			7,330	969,318
2005	17,189		3,073	22,001	337	27,726	148,127	111,200	378,659	103,628	66,956	49,278			3,913	932,087
2006	27,489		3,676	1,034	3,443	10,601	158,917	123,994	362,966	83,622	82,756	33,581			1,248	894,192
2007	14,251		2,853	1,230	935	14,881	169,902	139,647	343,141	97,361	56,512	37,937			7,379	886,470
2008	3,882		3,297	8,866	6,046	15,025	137,687	80,002	381,993	71,655	84,031	23,833			15,624	832,475
2009	2,285		1,217	4,855	435	12,676	118,533	59,619	335,575	58,863	117,974	65,481			6,824	784,420
2010	2,605		322	3,860	167	12,179	105,089	69,355	524,768	57,755	77,263	122,104			11,287	986,937
2011	2,666		368	2,038	60	36,451	120,576	92,181	715,162	29,010	103,222	61,960			25,601	1,189,455
2012	12,775		462	1,484	2,228	35,603	113,806	54,304	590,412	90,037	121,605	64,110			11,845	1,100,881
2013	4,596		2,499	2,244	546	42,845	90,244	82,991	587,872	32,290	100,379	33,980			15,059	997,052
2014	4,320		3,903	2,353	1,390	38,143	91,225	62,388	619,935	49,293	109,537	60,755			14,092	1,057,467
2015	3,559		2,255	1,538	2,271	50,194	88,828	44,708	493,043	31,588	86,715	57,791			5,632	868,122
2016	4,509		1,705	2,651	2,445	36,371	67,422	44,558	583,578	58,223	96,336	39,911			6,034	943,808

Note: Due to data confidentiality rules, annual landings for New Hampshire, South Carolina, and Georgia are not shown rather the time series landings average of less than 400 pounds.

State-by-State Descriptions

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. New Hampshire has monitored its yellow eel fishery since 1980; reporting effort in the form of trap haul set-over days for pots or hours for other gears has been mandatory since 1990. Small-scale, commercial eel fisheries occur in Massachusetts and 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 eels 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; prior to a closure starting fishing also occurred in Lake Ontario. 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 (from the Battery to Troy and all tributaries upstream to the first barrier), 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. In 1995, New York approved a size limit in marine waters. New Jersey fishery regulations require a commercial license, a minimum mesh, and a minimum size limit. A minimum size limit was set in Delaware in 1995. Delaware mandated catch reporting in 1999 and more detailed effort reporting in 2007.

Maryland, Virginia, and Potomac River Fisheries Commission have primarily pot fisheries for American eels in Chesapeake Bay. Large eels are exported whereas small eels are used for bait in the crab trotline fishery, except in Virginia. Ninety-five percent of all American eel harvest in Virginia is by pots, and eel pots are the major pot gear. Virginia implemented a voluntary buyer reporting system in 1973 and a mandatory harvester reporting system, for all seafood species began in 1993. Since 1991, it has been mandatory that eel pots are equipped with mesh that cannot be less than one-half inch (1/2") by one-half inch (1/2"), with at least one unrestricted 4-inch by 4-inch square escape panels consisting of 1/2-inch by 1-inch mesh, regardless of pot shape. Maryland did not require licenses until 1981. Effort reporting was not required in Maryland until 1990. The Potomac River Fisheries Commission has had harvester reporting since 1964, and has collected eel pot effort since 1988.

North Carolina has a small, primarily coastal pot fishery that fluctuates with market demands. The majority of landings come from the Albemarle Sound area, with additional landings reported from the Pamlico Sound and “other areas.” No catch records are maintained for freshwater inland waters, and no sale of eels harvested from these waters is permitted. Landings for “other areas” reported by the state come from southern waterbodies under the jurisdiction of North Carolina Department of Marine Fisheries. South Carolina instituted a permitting system over ten years ago to document total eel gear and commercial landings. Pots

and traps are permitted in coastal waters for the yellow eel life stage fishery; fyke nets and dip nets are permitted for glass eels.

American eel fishing in Georgia was restricted to coastal waters prior to 1980 when inland fishing was permitted (Helfman et al. 1984). Landings data are available for the state, but effort data is currently not. The state implemented a new specific license endorsement to fish eels in 2017. The Florida pot fishery has a minimum mesh size requirement in the fishery and it is operated under a permit system.

2.4 Status of the Stock

The last peer reviewed and accepted benchmark stock assessment was approved for management use in 2012. Analyses and results indicated the American eel stock had declined and there were significant downward trends in multiple surveys across the coast. It was determined the stock was depleted but no overfishing determination could be made based on the analyses performed.

The 2012 benchmark stock assessment was updated in 2017 with data through 2016. All three trend analysis methods (Mann-Kendall, Manly, and ARIMA) detected significant downward trends in some indices. The Mann-Kendall test detected a significant downward trend in six of the 22 YOY indices, 5 of the 15 yellow eel indices, 3 of the 9 regional indices, and the 30-year and 40-year yellow-phase abundance indices. The remaining surveys tested had no trend, except for two which had positive trends. The Manly meta-analysis showed a decline in at least one of the indices for both yellow and YOY life stages. For the ARIMA results, the probabilities of being less than the 25th percentile reference points in the terminal year for each of the surveys were similar to those in the 2012 benchmark assessment and currently three of the 14 surveys in the analysis have a greater than 50% probability of the terminal year of each survey being less than the 25th percentile reference point. Overall, the occurrence of some significant downward trends in surveys across the coast remains a cause for concern and the assessment maintained the stock remains depleted.

3.0 Management Program

3.1 Maine Glass Eel Quota

The Maine glass eel quota is set at 9,688 pounds. This quota level was specified based on the state's 2014 landings. The following components of Addendum IV's commercial glass/elver eel fishery management program remain unchanged:

- **Quota Overages**: For any state or jurisdiction managed with a commercial glass/elver eel quota, if an overage occurs in a fishing year, that state or jurisdiction will be required to deduct their entire overage from their quota the following year, on a pound for pound basis.

- **Reporting Requirements**: Any state or jurisdiction with a commercial glass eel fishery is required to implement daily trip-level reporting with daily electronic accounting to the

state for both harvesters and dealers in order to ensure accurate reporting of commercial glass eel harvest. The State of Maine's swipe card system is used by the state as a dealer report. Harvesters in Maine are currently reporting monthly via paper report submission. States or jurisdictions commercially harvesting less than 750 pounds of glass eels are exempt from this requirement.

- **Monitoring Requirements**: Any state or jurisdiction with a commercial glass eel fishery must implement a fishery-independent life cycle survey covering glass/elver, yellow, and silver eels within at least one river system. If possible and appropriate, the survey should be implemented in the river system where the glass eel survey (as required under Addendum III) is being conducted to take advantage of the long-term glass eel survey data collection. At a minimum the survey must collect the following information: fishery-independent index of abundance, age of entry into the fishery/survey, biomass and mortality of glass and yellow eels, sex composition, age structure, prevalence of *Anguillicoloides crassus (*invasive nematode*)*, and average length and weight of eels in the fishery/survey. Survey proposals will be subject to Technical Committee (TC) review and Board approval. States or jurisdictions commercially harvesting less than 750 pounds of glass eels are exempt from this requirement.

- **Glass Eel Harvest Allowance Based on Stock Enhancement Programs**: Any state or jurisdiction can request an allowance for commercial harvest of glass eels based on stock enhancement programs implemented after January 1, 2011, subject to TC review and Board approval. Provisions of the stock enhancement program include: demonstration that the program has resulted in a measurable increase in glass eel passage and/or survival; harvest shall not be restricted to the basin of restoration (i.e. harvest may occur at any approved location within the state or jurisdiction); and harvest requests shall not exceed 25% of the quantified contribution provided by the stock enhancement program. See Addendum IV for more detail on specific stock enhancement program examples.

3.2 Glass Eel Aquaculture Plan Provisions

The Aquaculture Plan proposal requirements have been modified based on the following criteria (as recommended by the TC):

States and jurisdictions may develop a Plan for aquaculture purposes. Under an approved Aquaculture Plan, states and jurisdictions may harvest a maximum of 200 pounds of glass eels annually from within their waters for use in domestic aquaculture facilities. Site selection for harvest will be an important consideration for applicants and reviewers. Suitable harvest locations will be evaluated with a preference to locations that have:

1. Established or proposed glass eel monitoring;
2. Are favorable to law enforcement; and
3. Watershed characteristics that are prone to relatively high mortality rates.

Watersheds known to have features (ex. impassible dams, limited area of upstream habitat, limited water quality of upstream habitat, and hydropower mortality) that would be expected to cause lower eel productivity and/or higher glass eel mortality will be preferred targets for glass eel harvest. This is not an exclusive requirement, because there will be coastal regions with interest in eel aquaculture where preferred watershed features do not occur or are not easily demonstrated. In all cases, the applicant should demonstrate the above three interests were prioritized and considered.

The following components of Addendum IV's Aquaculture Plan provisions remain unchanged:

- Approval of a request does not guarantee approval of a request in future years. Eels harvested under an approved Aquaculture Plan may not be sold until they reach the legal size in the jurisdiction of operations, unless otherwise specified.

- All Plans are subject to TC and Law Enforcement Committee review and Board approval. The Fishing Mortality Based Plan must be submitted by June 1st of the preceding fishing year in order to provide enough time for review for the upcoming fishing season. Transfer and Aquaculture Plans must be submitted by June 1st of the preceding fishing year and approval will be determined by the Board by September 1st. Plans will initially be valid for only one year. After the first year of implementation the TC will evaluate the program and provide recommendations to the Board on the overall impact of and adherence to the plan. If the proposed regulatory changes, habitat improvements, or harvest impact cannot be assessed one year post-implementation, then a secondary review must occur within three to five years post-implementation if the action is still ongoing. If states use habitat improvements and changes to that habitat occurs in subsequent years, the Commission must be notified through the annual compliance report and a review of the Plan may be initiated. Any requests that include a stocking provision would have to ensure stocked eels were certified disease free according to standards developed by the TC and approved by the Board.

3.3 Yellow Eel Coastwide Cap, Management Trigger, and Allocation

3.3.1 Yellow Eel Coastwide Landings Cap

The coastwide yellow eel landings cap is 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.

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 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 Appendix I.

3.4 Timeframe for Addendum Provisions

Specific to the Maine glass eel quota of 9,688 pounds, the quota level will be set for three years moving forward (starting in the 2019; from 2019-2021), and can be revisited before year four (2022). If the Board decides to maintain Maine's glass eel quota at 9,688 pounds, the quota can be extended for an additional three years (2022-2024) without requiring a new addendum. If there is a desire to increase Maine's glass eel quota from the specified level above, a new addendum will be required.

All other management provisions will remain in place until a new or different management program implemented through the Commission management process.

4.0 Compliance

The implementation deadline for this Addendum is January 1, 2019. Starting January 1, the yellow eel coastwide cap will be 916,473 pounds and the management trigger will be two years of exceeding coastwide cap by 10% (1,008,120 pounds).

References

Atlantic States Marine Fisheries Commission (ASMFC). 2000. Interstate Fishery Management Plan for American Eel (*Anguilla 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.

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

Clark, J. 2009.The American Eel Fishery in Delaware. Pages 229-240 *in* J. M. Casselman and D. K. Cairns, editors. Eels at the edge: science, status and conservation concerns. American Fisheries Society Symposium 58, Bethesda, Maryland.

COSEWIC. 2012. COSEWIC assessment and status report on the American Eel, *Anguilla rostrata*, in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xii + 109 pp. (www.registrelep-sararegistry.gc.ca/default_e.cfm).

Helfman, G.S., D.L. Stoneburner, E.L. Bozeman, P.A. Christian, and R. Whalen. 1983. Ultrasonic telemetry of American eel movements in a tidal creek. Transactions of the American Fisheries Society 112:105–110.

Appendix

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

This appendix is intended to provide guidance to the Board 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[1].

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

[1] 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.

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 indicate 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.

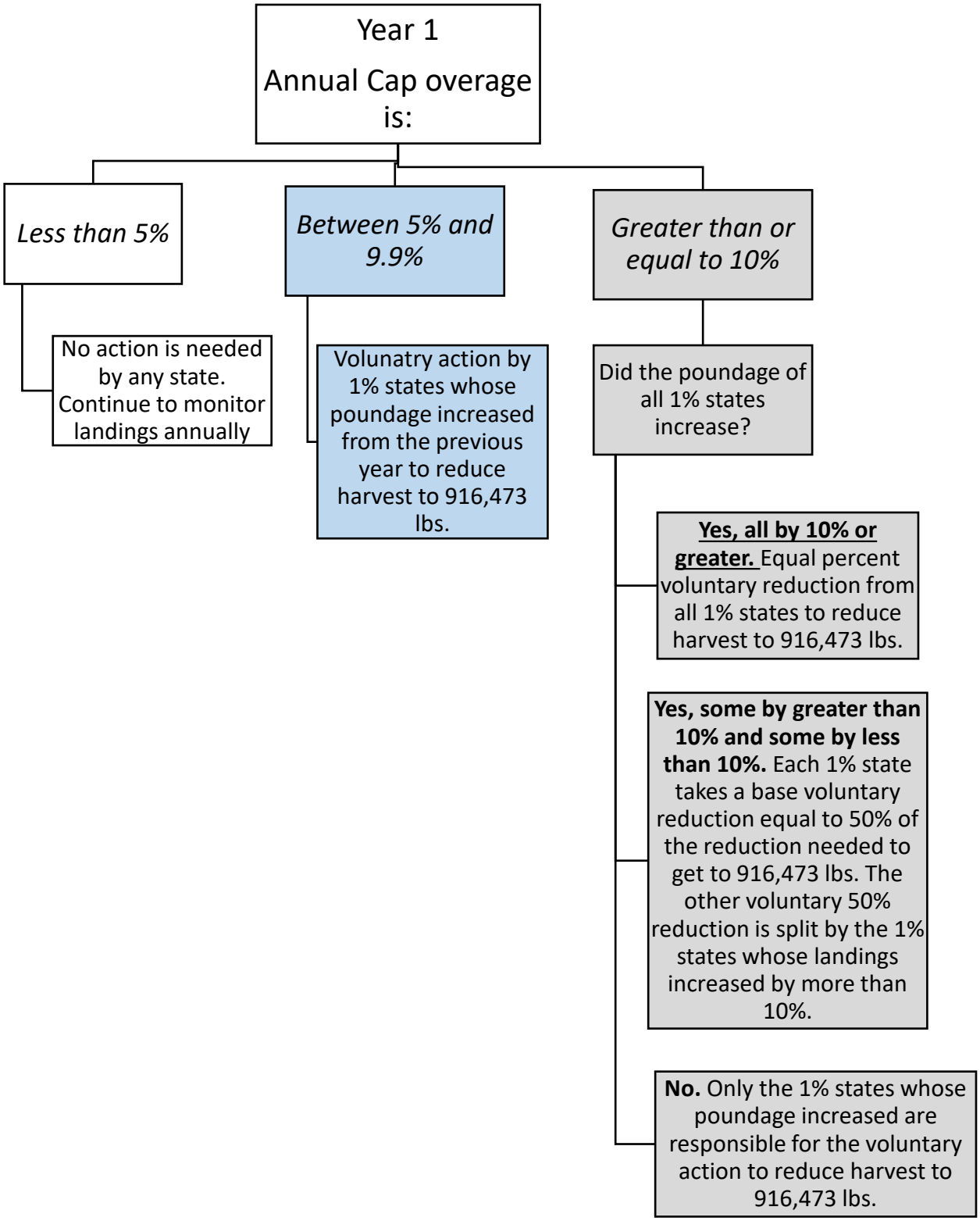

Figure 1. Decision Tree for Management Response to Cap Overage in Year 1

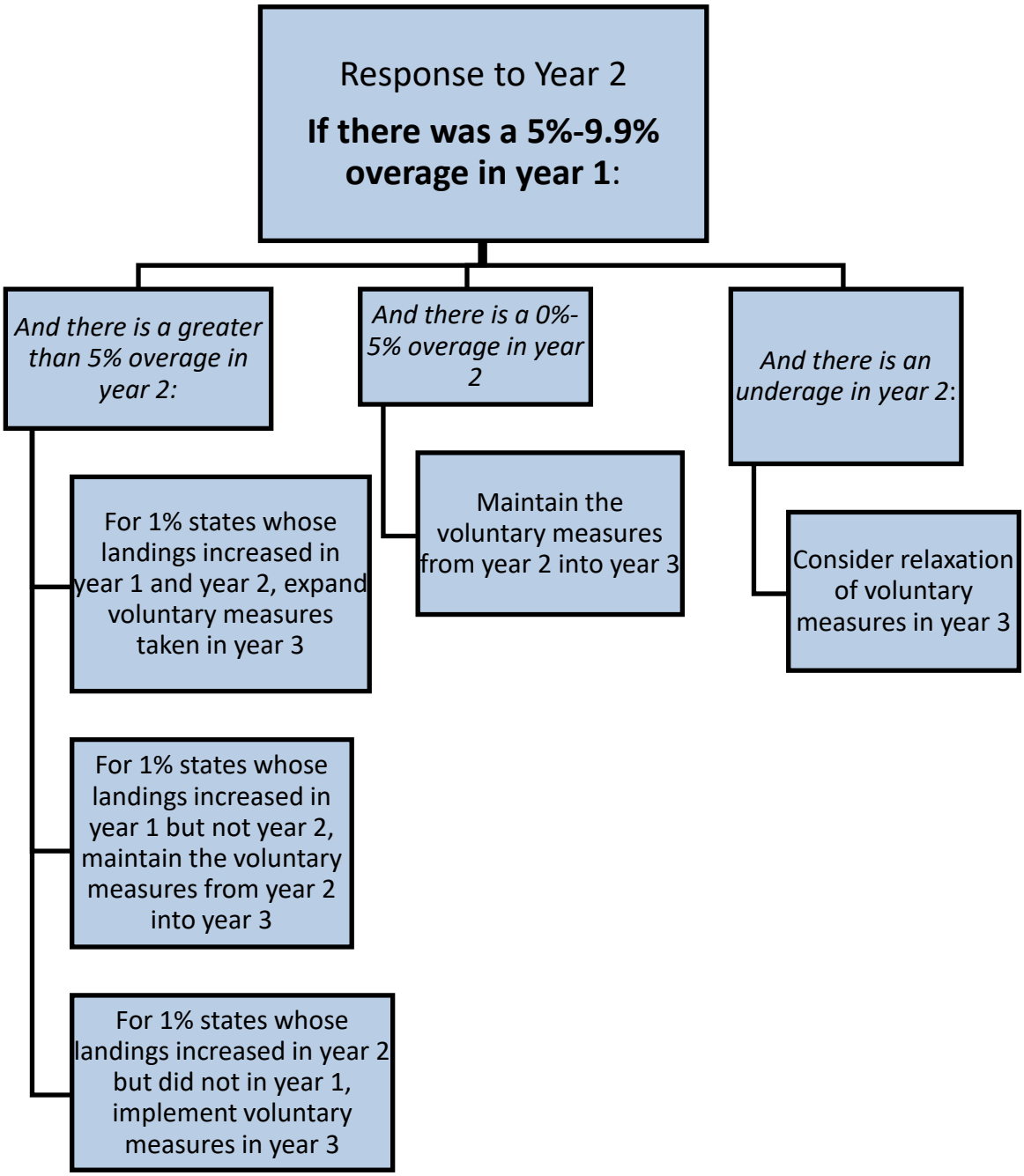

Figure 2. Decision Tree for Management Response in Year 3 if Overage is less than 10% in Year 1

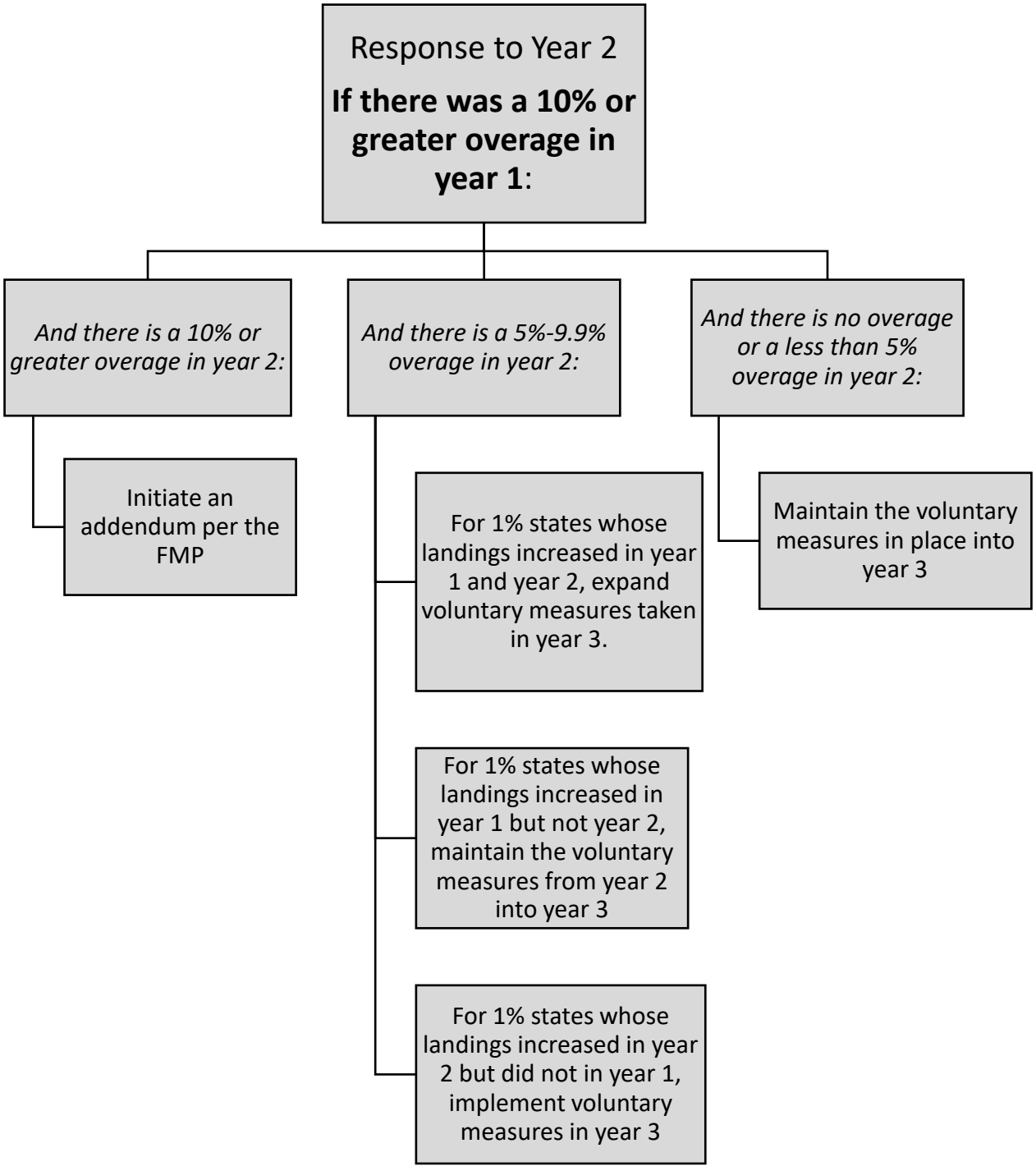

Figure 3. Decision Tree for Management Response in Year 3 if Overage is more than 10% in Year 1

Appendix Table 1. Example Timeline if Two Year Management Trigger is Tripped Based on Decision Trees

Date	Action
Spring 2020	Board review 2019 landings. It is determined an overage => 10% of the cap occurred. Board convenes workgroup (WG).
Summer 2020	WG reviews the overage relative to decision trees and develops report with recommended action for Board consideration.
August 2020	Board considers WG report and recommends states take voluntary action as soon as possible. Voluntary measures are implemented as soon as possible for 2020 fishing year.
Spring 2021	Board reviews 2020 landings. It is determined an overage =>10% of the cap occurred. **Management trigger tripped**. Board initiates Addendum.
Summer 2021	Staff and PDT develop Draft Addendum.
August 2021	Board approves Draft Addendum for public comment.
Fall 2021	Public comment period for Draft Addendum.
October 2021	Board finalizes and approves Addendum.
January 2022	Addendum implemented.