REGULATORY IMPACT REVIEW

FOR A RULE TO IMPLEMENT THE DECISIONS OF THE FIFTH REGULAR ANNUAL SESSION OF THE COMMISSION FOR THE CONSERVATION AND MANAGEMENT OF HIGHLY MIGRATORY FISH STOCKS IN THE WESTERN AND CENTRAL PACIFIC OCEAN:

BIGEYE TUNA CATCH LIMITS IN LONGLINE FISHERIES IN 2009, 2010, AND 2011

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Contents

1. Introduction 1

2. Objectives 1

3. Description of Affected Fisheries 3
3.1. Fleet characteristics 3
3.2. Management 5
3.3. Performance 6

4. Problem Statement 8

5. Alternatives 9

6. Analysis of Alternatives 11
6.1. Changes in net benefits 11
6.2. Distributional changes in net benefits 22
6.3. Changes in income and employment 23
6.4. Cumulative effects 23

7. Determination of Significance under Executive Order 12866 25

8. References 26

1. INTRODUCTION

This document is a regulatory impact review (RIR) prepared under Executive Order 12866, "Regulatory Planning and Review." An initial regulatory flexibility analysis (IRFA) prepared under the Regulatory Flexibility Act is included in the proposed rule published in the Federal Register.

Executive Order 12866 requires that the economic impacts of proposed government regulations on the national economy be assessed before implementation. In most instances, the measurement of changes to gross domestic product is an accurate measure of impact. "In deciding whether and how to regulate, agencies should assess all costs and benefits of available regulatory measures, including the alternative of not regulating" (EO 12866, Section 1). The emphasis of the analysis is on expected changes in net benefits that occur as a result of the proposed management measures. The government should choose only those sets of regulations that produce positive benefits while considering social and distributional effects. NMFS requires that this analysis be done through a regulatory impact review (RIR) for all regulatory actions that are of public interest. The RIR also includes analysis of distributive impacts and the costs of government administration and private compliance with the proposed measures. See the IRFA for further analysis of the expected economic effects on businesses, particularly small business entities.

This RIR is for a proposed regulatory action on the part of the National Marine Fisheries Service (NMFS) to implement a decision of the Commission for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean (WCPFC). That decision requires the members of the WCPFC, including the United States, to ensure that catches of bigeye tuna (*Thunnus obesus*) in their longline fisheries do not exceed specified levels in each of the years 2009, 2010, and 2011. The rule would be issued under authority of the Western and Central Pacific Fisheries Convention Implementation Act (Public Law 109-479, Sec 501, et seq., codified at 16 U.S.C. § 6901 et seq.) (WCPFC Implementation Act).

2. OBJECTIVES

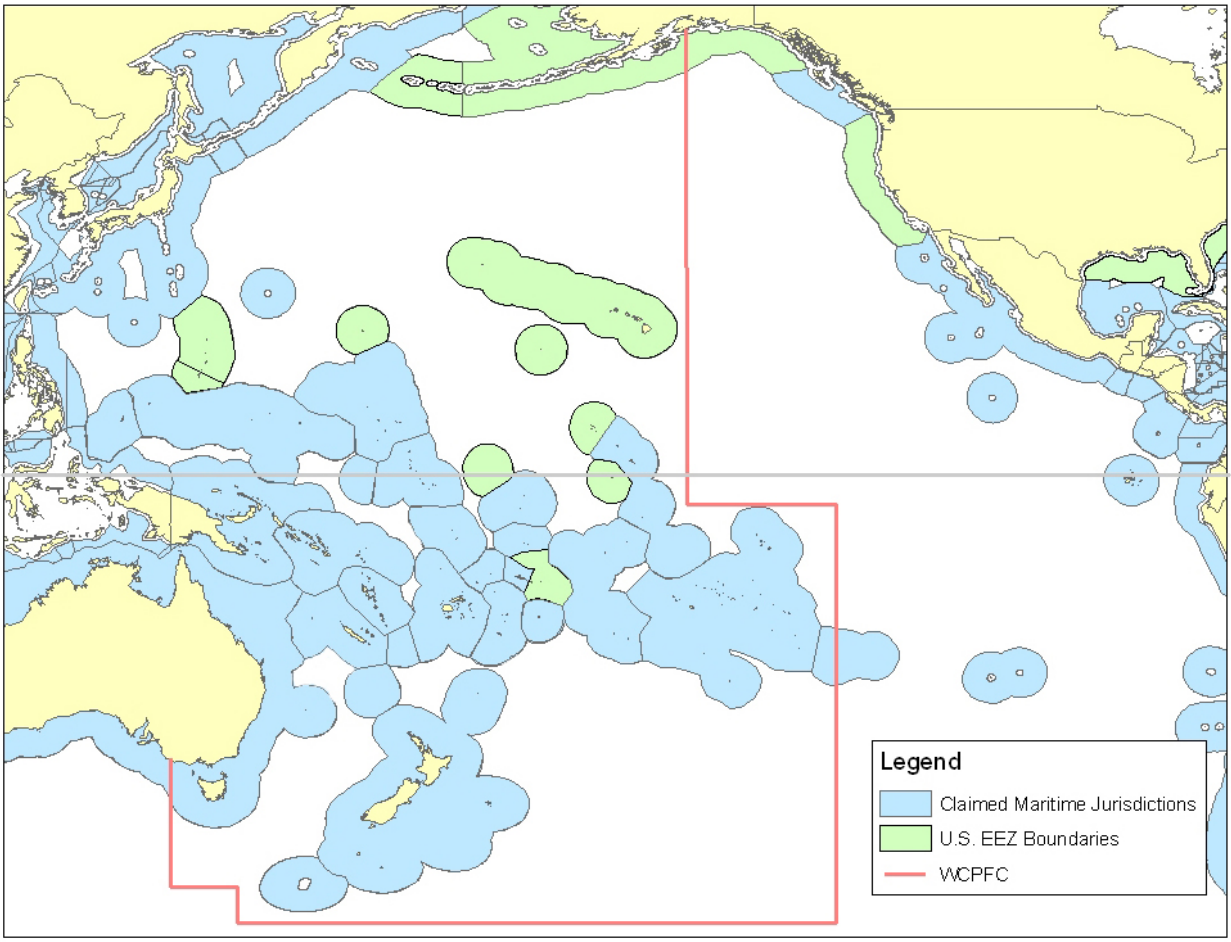
The objective of this proposed action is to satisfy the international obligations of the United States, as a Contracting Party to the Convention on the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean (Convention), with respect to the decision by the WCPFC that obligates its members to limit catches of bigeye tuna in their longline fisheries to specified levels in each of the years 2009, 2010, and 2011. That decision is premised on a principle in the Convention (Article 5) that states that stocks subject to the Convention shall managed such that they are maintained or restored to levels capable of producing maximum sustainable yield.

The WCPFC Implementation Act authorizes the Secretary of Commerce (Secretary) to promulgate regulations that are needed to carry out the international obligations of the United States under the Convention and the Act, including the decisions of the WCPFC. The Secretary is directed to consult with the Secretary of State and the agency in which the U.S. Coast Guard is operating in promulgating regulations. The authority to promulgate regulations has been

delegated to NMFS.

The Convention on the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean (Convention) was opened for signature in Honolulu on September 5, 2000, and entered into force in June 2004. The full text of the Convention can be obtained from the Commission's website at: *http://www.wcpfc.int/convention.htm*. The area of application of the Convention ("the Convention Area") is shown in Figure 1. The Convention is focused on highly migratory species and fish stocks within the Convention Area, except sauries. The Convention also provides for the conservation and management of non-target, associated and dependent species.

Figure 1. The Convention Area (the exclusive economic zone of the United States is depicted in green, and those of foreign jurisdictions are in blue)



The WCPFC, established under the Convention, is comprised of the Contracting Parties to the Convention and fishing entities that have agreed to be bound by the regime established by the Convention. Other entities that participate in the WCPFC include Participating Territories and

Cooperating Non-Members. Cooperating Non-Members are admitted on a yearly basis. The current Contracting Parties and Participating Territories to the Convention are: Australia, Canada, China, Cook Islands, European Community, Federated States of Micronesia, Fiji, France (extends to French Polynesia, New Caledonia and Wallis and Futuna), Japan, Kiribati, Korea, Marshall Islands, Nauru, New Zealand (extends to Tokelau), Niue, Palau, Papua New Guinea, Philippines, Samoa, Solomon Islands, Tonga, Tuvalu, United States (extends to the Territory of American Samoa, the Commonwealth of the Northern Mariana Islands and the Territory of Guam) and Vanuatu. Chinese Taipei (Taiwan), as a fishing entity, has agreed to be bound by the regime established by the Convention.

The Convention was ratified by, and came into force for, the United States in 2007. The United States thereby became a full Member of the WCPFC after having been a Cooperating Non-Member since the WCPFC's establishment in 2004.

3. DESCRIPTION OF AFFECTED FISHERIES

The proposed rule would primarily affect vessels in the Hawaii longline fleet. It would also apply to longline vessels based on the U.S. west coast, but there have been very few active west coast-based longline vessels and no activity by such vessels in the Convention Area during the last few years. Based on that history, the proposed rule is expected to have virtually no economic impacts on west coast-based vessels or the economic sectors associated with them (see footnote 4 for more detail). Nonetheless, a brief description of the west coast longline fishery is included here along with a description of the Hawaii longline fishery.

3.1. Fleet characteristics

Longline fishing gear consists of a main line strung horizontally across 1-100 kilometers (< 1-62 miles) of ocean, supported at regular intervals by vertical float lines connected to surface floats. Descending from the main line are branch lines, each ending in a single, baited hook. The main line droops in a curve from one float line to the next and bears some number (2-25) of branch lines between floats. Fishing depth is determined by the length of the floatlines and branchlines and the amount of sag in the main line between floats. The depth of hooks affects their efficiency at catching different species. Retrieval requires seven to ten hours. Generally, longline gear targeting tuna is set in the morning at approximate depths ranging between 100-300 meters, and hauled in the evening. Longline gear targeting swordfish is set at sunset at depths less than 100 meters, and hauled at sunrise.

The Hawaii longline fleet has historically operated, and continues to operate, in two distinct modes based on gear deployment: deep-setting to target bigeye tuna and shallow-setting to target swordfish. One component of the fleet fishes for bigeye tuna year-round. Another component targets swordfish seasonally and switches to deep-setting when swordfish are not available or when the shallow-set fishery has been closed as a result of reaching regulatory limits on fishing effort or interactions with sea turtles.

Most fishing effort is exerted between the equator and 40° North latitude and between longitudes

140° West and 180° West. The majority of deep-set fishing occurs south of 20° North latitude. Most fishing occurs in the U.S. exclusive economic zone around Hawaii, Palmyra, Kingman, Johnston and Jarvis Islands, and in adjacent high seas waters.

The Hawaii longline fleet lands fresh fish. All fish are landed domestically and most landings are consumed domestically. None of the vessels have freezer systems. Some of the newer vessels have onboard ice systems, allowing for greater range than in the past. Fishing trips are typically about 10-12 days long for tuna-directed trips and 10-14 days for swordfish-directed trips. Trips rarely extend longer than three weeks. Almost all landings are made in Honolulu for direct sale through an auction. In addition to bigeye tuna and swordfish, the Hawaii longline fleet also lands yellowfin tuna, mahimahi, striped marlin, and other species incidental to the target species.

Vessel-to-vessel transshipments in the Hawaii longline fishery are relatively rare, although prior to the shark finning prohibition in 2000, transshipments of shark fins in the Hawaii-based longline fishery were fairly commonplace. Since then, transshipments have generally had bigeye tuna as the main component. Transshipments are made not to carrier vessels, per se, but rather to other longline catcher vessels that occasionally receive fish from other longline vessels.

The number of vessels in the Hawaii longline fleet is constrained by a limited access program that since 1994 has allowed a maximum of 164 permits in the fishery. The permits are transferable but the number of vessels in the fleet is not permitted to expand beyond 164. The number of vessels actually permitted varies over time but has always been less than 164. During the period 2006-2008, for example, the number of permitted vessels ranged from 121 to 140. The vessels range from 50 feet to 80 feet in length, and by law vessel sizes are limited to a maximum of 101 ft in length.

Vessels in the west coast longline fleet are used to fish primarily in the eastern Pacific Ocean (east of 150° West longitude). It is prohibited to use pelagic longlines to fish within the U.S. EEZ off the west coast, so fishing takes place in the adjacent high seas areas. Prior to 2005 virtually all the fleet's fishing effort was directed towards swordfish using shallow sets; since then, when shallow-setting was prohibited except for vessels in the Hawaii longline fishery, effort has been directed towards tuna, using deep sets (PFMC 2008). The size of the fleet has declined to very low numbers. Since 2005 the fleet size has been so small that much of its performance information is confidential and cannot be publicly disclosed.

The west coast longline fleet has not exerted any fishing effort in the Convention Area (i.e., west of 150° West longitude) since at least 2005 (NOAA/NMFS 2008 and NMFS unpublished data). Given the distance that vessel would have to travel from their home ports to reach the Convention Area, fishing trips to the Convention Area would be expected to be uncommon, but they could conceivably occur.

Like vessels in the Hawaii longline fleet, some vessels that have been part of the west coast fleet do not have built-in refrigeration equipment, limiting their trip length to about three weeks. Such vessels take on ice at the docks. Some vessels have ice-making equipment so that they can refresh ice supplies and maintain fish quality with iced brine for long periods (up to 60 days). The fish are iced, landed on the west coast, and sold fresh.

3.2. Management

The Hawaii longline fishery is primarily managed under the Fishery Management Plan for the Pelagic Fisheries of the Western Pacific Region (Pelagics FMP), developed by the Western Pacific Fishery Management Council (WPFMC) under authority of the Magnuson-Stevens Fishery Conservation and Management Act (MSA). The west coast longline fishery is primarily managed under the Fishery Management Plan for U.S. West Coast Fisheries for Highly Migratory Species (HMS FMP), developed by the Pacific Fishery Management Council (PFMC).

In addition to the limited entry program and the limit on vessel length, owners and operators of vessels in the Hawaii longline fleet are required to: carry position-fixing transmitters as part of a NMFS-administered vessel monitoring system (VMS); carry NMFS observers (100% coverage for swordfish-directed trips and a minimum of 20% for tuna-directed trips); maintain logbooks of catch and effort; employ special measures to protect sea turtles and seabirds; comply with time/area closures to protect smaller coastal fisheries and protected species; comply with restrictions on shark finning; mark their longline gear; and participate annually in U.S. government-conducted protected species workshops.

Longline vessels that land HMS on the west coast must have HMS permits with longline gear endorsements. The number of available permits is not limited. Pelagic longline fishing inside the U.S. EEZ is prohibited, and shallow-set longlining on the high seas west of 150° West longitude is prohibited except for vessels in the Hawaii longline fishery. Also, regulations issued under the Endangered Species Act prohibit shallow-setting by vessels other than those in the Hawaii longline fishery on the high seas east of 150° West longitude and north of the equator. In addition to those restrictions, participants in the fishery are required to: carry position-fixing transmitters as part of a NMFS-administered vessel monitoring system; carry NMFS observers; maintain logbooks of catch and effort; employ special measures to protect sea turtles and seabirds; comply with restrictions on shark finning; and participate annually in U.S. government-conducted protected species workshops.

Vessels in both the Hawaii and west coast longline fleets are also subject to the High Seas Fishing Compliance Act (HSFCA), which includes permitting and vessel marking requirements for U.S. vessels used to fish on the high seas.

In addition to the MSA, ESA, HSFCA, and other laws, the affected fisheries are governed by the WCPFC Implementation Act, under which authority this rule would be promulgated. The WCPFC Implementation Act, enacted in 2007, enables NMFS, on behalf of the Department of Commerce, to implement the provisions of the Convention and the decisions of the WCPFC. Through a rulemaking separate from this one, NMFS is implementing the basic provisions of the Convention, including requirements related to VMS, observers, boarding and inspection by inspection vessels of other WCPFC members. Those requirements would apply to Hawaii and west coast longline vessels insofar as they are used in the Convention Area, with most requirements triggered when a vessel is used on the high seas in the Convention Area.

3.3. Performance

Detailed descriptions of the recent performance of the Hawaii and west coast longline fisheries can be found in WPRFMC (2009) and PFMC (2008), respectively, and overviews of both are provided in the environmental assessment prepared for this proposed action (NMFS 2009), chapter 3 of which is incorporated here by reference.

The regulatory environment for the affected longline fisheries underwent substantial changes in the period 2001-2004. The swordfish-directed shallow-set longline fishery was closed in 2001 and reopened, for Hawaii-based vessels only, in 2004. It reopened with annual limits on fishing effort (2,120 sets) and turtle interactions (16 leatherbacks and 17 loggerheads). Because of those regulatory changes and their effects in terms of catches and fishery performance, the analysis in this RIR relies on fishery performance after 2004 for the purpose of projecting baseline conditions under no action.

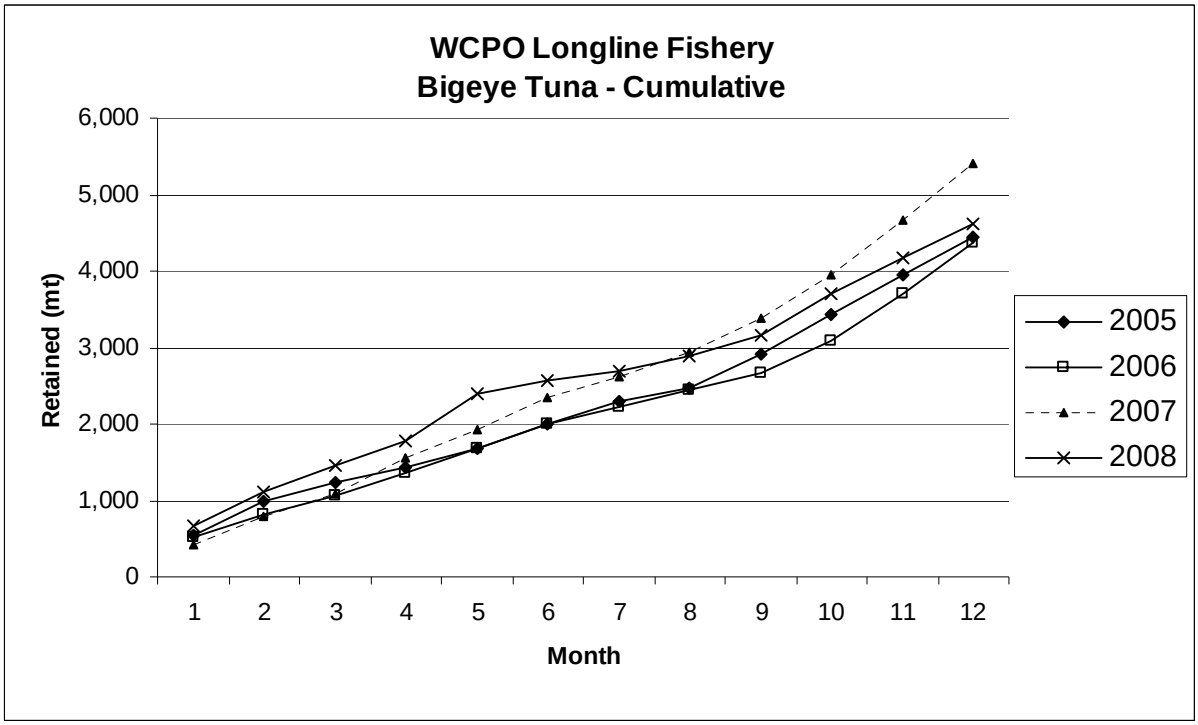
In the following table and figures are most of the data used in the analysis in section 6. Table 1 shows, for the years 2005-2008, the amounts of bigeye tuna and swordfish retained in the affected longline fisheries, broken down where relevant by ocean area (western and central Pacific Ocean, or WCPO, versus eastern Pacific Ocean, or EPO) and deep-set versus shallow-set. Figure 2, Figure 3, and Figure 4 are illustrations of the seasonality of bigeye tuna and swordfish catches in the affected fisheries.

Table 1. Estimates of bigeye tuna and swordfish kept in the Hawaii and west coast longline fisheries, 2005-2008.

Year	Bigeye tuna retained from WCPO (mt)	Bigeye tuna retained from EPO (mt)	Bigeye tuna retained – EPO as % of total	Bigeye tuna retained from WCPO – deep-set (mt)	Bigeye tuna retained from WCPO – shallow-set (mt)	Swordfish retained from WCPO – shallow-set (mt)
2005	4,448	544	11	4,385	63	1,313
2006	4,376	79	2	4,319	56	971
2007	5,399	417	7	5,356	43	1,245
2008	4,624	1,275	22	4,568	56	923
2005-08 ave	4,712	579		4,657	55	1,113

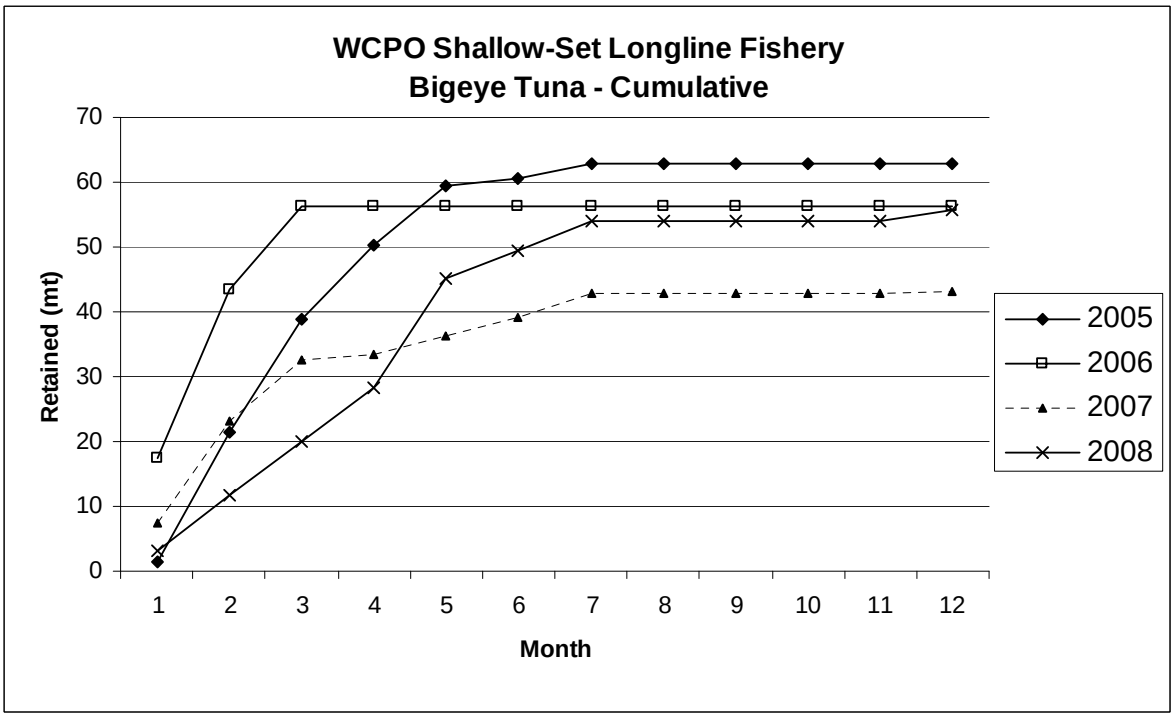
Source: NMFS unpublished estimates, provided by the Pacific Islands Fisheries Science Center based on numbers of fish caught by date of capture from vessel logbook data, and average fish weights derived from landings data; weight estimates are subject to change as estimation methods are improved to better account for average weight variations by area, season, and fisheries sector.

Figure 2. Estimates of bigeye tuna kept in Hawaii and west coast longline fisheries, WCPO only, cumulative by month, 2005-2008.



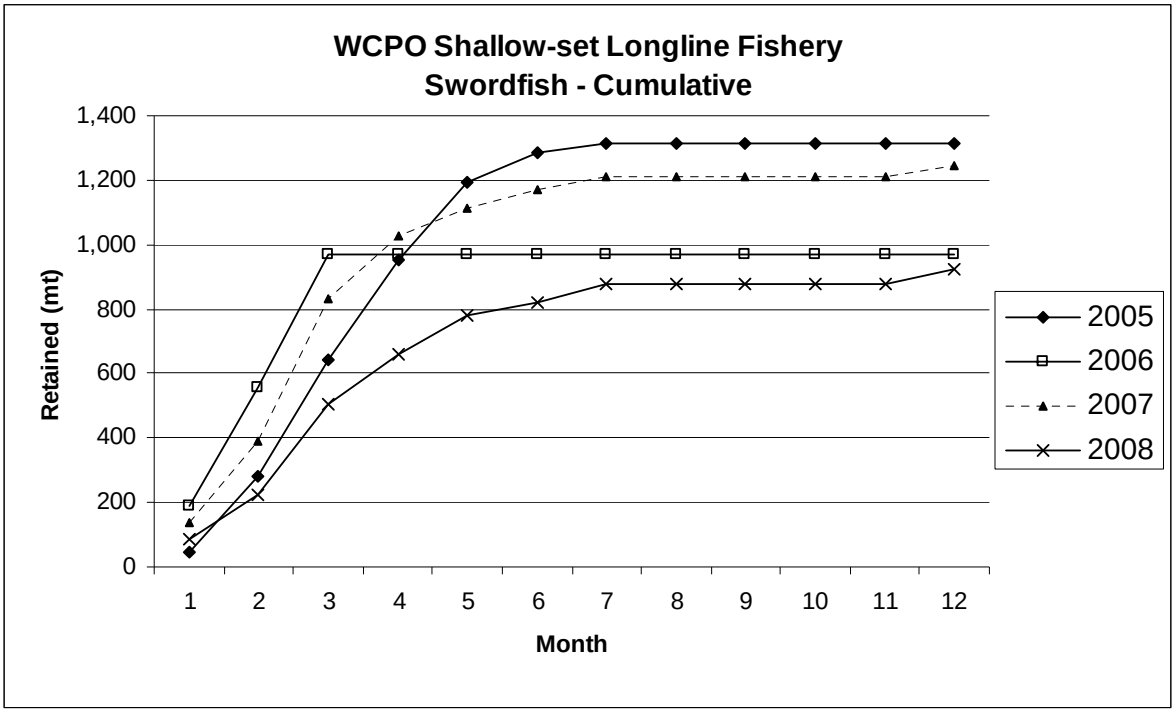
Source: NMFS unpublished data, compiled by the Pacific Islands Fisheries Science Center.

Figure 3. Estimates of bigeye tuna kept in Hawaii and west coast shallow-set longline fisheries, WCPO only, cumulative by month, 2005-2008.



Source: NMFS unpublished data, compiled by the Pacific Islands Fisheries Science Center.

Figure 4. Estimates of swordfish kept in Hawaii and west coast shallow-set longline fisheries, WCPO only, cumulative by month, 2005-2008.



Source: NMFS unpublished data, compiled by the Pacific Islands Fisheries Science Center.

4. PROBLEM STATEMENT

At its Fifth Regular Session, in December 2008, the WCPFC adopted Conservation and Management Measure (CMM) 2008-01, "Conservation and Management Measure for Bigeye and Yellowfin Tuna in the Western and Central Pacific Ocean." The CMM, available with other decisions of the WCPFC at *http://www.wcpfc.int/decisions.htm*, places certain obligations on the WCPFC's Members, Participating Territories, and Cooperating Non-members (collectively, CCMs) for the management of bigeye tuna and yellowfin tuna (*Thunnus albacares*) in the western and central Pacific Ocean (WCPO). It includes a provision that establishes specific catch limits for bigeye tuna captured in CCMs' longline fisheries for the years 2009, 2010, and 2011. The catch limits are part of a package of provisions that seek to reduce, over the period 2009-2011, the fishing mortality rate for bigeye tuna in the WCPO by at least 30 percent relative to the 2004 level or the annual average level during 2001-2004. The WCPFC found that such reductions were needed to maintain the WCPO bigeye tuna stock at a level capable of producing maximum sustainable yield, as called for by the Convention. The bigeye tuna longline limits do not apply to Participating Territories that are undertaking responsible development of their domestic fisheries.

In order to ensure that the United States, as a Contracting Party to the Convention, satisfies its international obligations under WCPFC CMM 2008-01, regulations are needed to establish the applicable catch limits for the years 2009, 2010, and 2011, and to give NMFS the authority to impose appropriate restrictions in any of those years if and when the limit is reached.

5. ALTERNATIVES

With the exception of the no-action alternative, the proposed action would implement the specific bigeye tuna longline catch limit for the longline fisheries of the United States for the years 2009, 2010, and 2011. Three action alternatives are being considered, all of which share the following elements:

The annual limit for the United States would be established as the amount of bigeye tuna captured by the Hawaii and west coast longline fleets in the Convention Area in 2004 and retained, less 10 percent.[1] The amount caught and retained in 2004, which is specified in CMM 2008-01 based on information provided by the United States to the WCPFC, was 4,181 mt. Therefore, the annual limit would be 3,763 mt. Bigeye tuna landed in the Territory of American Samoa, the Territory of Guam, or the Commonwealth of the Northern Mariana Islands would not be counted against the limit. However, to ensure consistency with CMM 2008-01, for such bigeye tuna not to be counted against the limit, there would be the additional provisos that they must not have been caught in the portion of the U.S. exclusive economic zone (EEZ) surrounding the Hawaiian Archipelago, and they must be landed by a U.S. fishing vessel operated in compliance with one of the permits required under the regulations implementing the WP Pelagics FMP and the West Coast HMS FMP; specifically, a permit issued under 50 CFR 660.707 or 665.21.

Once NMFS determines in any of the years 2009, 2010, or 2011 that the limit is expected to be reached by a specific future date in that year, NMFS would publish a notice in the *Federal Register* announcing that specific restrictions will be effective on that particular date until the end of the calendar year. NMFS would publish the notice at least seven calendar days before the effective date of the restrictions to provide fishermen advance notice of the restrictions. NMFS would also endeavor to make publicly available, such as on a web site, regularly updated estimates and/or projections of bigeye tuna catches in order to help fishermen plan for the possibility of the limit being reached.

Starting on the announced date and extending through the last day of that calendar year, it would be prohibited to use a U.S. fishing vessel to engage in particular activities related to catching bigeye tuna by longline gear in the Convention Area. The activities that would be prohibited vary among the three action alternatives, as described further below. Under all three action alternatives, any bigeye tuna (and in the case of Alternative 2, any yellowfin tuna) already on board a fishing vessel upon the effective date of the restrictions may be retained on board, transshipped, and landed, provided that they are landed within 14 days after the restrictions become effective. In the case of a vessel that has declared to NMFS pursuant to 50 CFR

[1] The bigeye tuna limits established in CMM 2008-01 are termed “catch” limits. However, the baseline amount of bigeye tuna specified for the United States in the CMM, which is based on information reported by the United States to the WCPFC and from which the limit is to be derived, is actually an estimate of bigeye tuna that are retained on board. Accordingly, the proposed rule would establish a limit on retained catches (as a proxy for catches) of bigeye tuna. The limit would have the purpose, consistent with the stated objectives of the CMM, of reducing fishing mortality of WCPO bigeye tuna.

665.23(a) that the current trip type is shallow-setting, the 14-day limit would be waived, but the number of bigeye tuna retained on board, transshipped, or landed must not exceed the number on board the vessel upon the effective date of the restrictions, as recorded by the NMFS observer on board the vessel. Furthermore, the prohibitions would not apply to bigeye tuna that are landed in the Territory of American Samoa, the Territory of Guam, or the Commonwealth of the Northern Mariana Islands, provided that they were not caught in the portion of the U.S. EEZ surrounding the Hawaiian Archipelago, and that they are landed by a U.S. fishing vessel operated in compliance with a valid permit issued under 50 CFR 660.707 or 665.21 (and in the case of Alternative 2, yellowfin tuna that meet these criteria would not be subject to the restrictions). Starting on the announced date and extending through the last day of that calendar year, it would also be prohibited to transship bigeye tuna (and in the case of Alternative 2, yellowfin tuna) caught in the Convention Area by longline gear to any vessel other than a U.S. fishing vessel operated in compliance with a valid permit issued under 50 CFR 660.707 or 665.21.

The restrictions triggered by the limit being reached would not apply to fish caught by longline gear outside the Convention Area, such as in the eastern Pacific Ocean. However, to help ensure compliance with the restrictions for the Convention Area, all three action alternatives would include two additional, related, prohibitions once the limit has been reached. First, it would be prohibited to fish with longline gear both inside and outside the Convention Area during the same fishing trip, with the exception of a fishing trip that is in progress at the time the announced restrictions go into effect (this does not apply to Alternative 4). In that exceptional case, the vessel, unless on a declared shallow-setting trip, would still be required to land any bigeye tuna taken within the Convention Area within 14 days of the effective date of the restrictions, as described above. Second, if a vessel is used to fish using longline gear outside the Convention Area and the vessel enters the Convention Area at any time during the same fishing trip, the longline gear on the fishing vessel would have to be stowed in a manner so as not to be readily available for fishing while the vessel is in the Convention Area.

Alternative 1 (no action):

Under Alternative 1, the catch limit for WCPO bigeye tuna established by the WCPFC for the U.S. longline fishery would not be implemented and U.S. longline fleets operating in the Convention Area could continue targeting and landing bigeye tuna after the amount specified in CMM 2008-01 has been landed in any of the years 2009-2011.

Alternative 2:

Under Alternative 2, the bigeye tuna catch limit established by the WCPFC would be implemented via regulations applicable to U.S. longline vessels. Once the limit is reached in any of the calendar years 2009 through 2011, the deep-set longline fishery in the Convention Area would be closed for the remainder of the calendar year. Shallow-setting (which generally targets swordfish) in the Convention Area would be allowed to continue, provided no bigeye tuna and no yellowfin tuna are retained, landed, or transshipped. The purpose of the prohibitions with respect to yellowfin tuna would be to prevent vessels from targeting yellowfin tuna during the closure, which could result in bigeye tuna mortalities.

Alternative 3 (proposed action):

Alternative 3 would be identical to Alternative 2 except that once the limit is reached, instead of prohibiting deep-set longlining, U.S. fishing vessels could continue to deep-set as well as shallow-set in the Convention Area, provided that no Convention Area-caught bigeye tuna are retained, landed, or transshipped (except as described in the introductory paragraphs to this section).

Alternative 4:

Alternative 4 would be identical to Alternative 2 except that once the limit is reached, it would be prohibited to deploy longline gear in any manner in the Convention Area, including a shallow-set manner (except as described in the introductory paragraphs to this section).

6. ANALYSIS OF ALTERNATIVES

Four types of economic effects are analyzed: changes in net benefits, distributional changes in net benefits, changes in income and employment, and cumulative effects. The analysis focuses on the effects of the proposed action (Alternative 3) relative to the baseline (i.e., the no-action scenario). At the end of each of the four subsections, the effects of the other two action alternatives (Alternatives 2 and 4) are examined and compared with those of the proposed action.

6.1. Changes in net benefits

Analytical approach:

The emphasis of the RIR is on identifying changes in revenues as a proxy (in the absence of detailed and up-to-date cost data) for changes in net benefits. For the purpose of estimating future benefits and costs, U.S. government guidance for benefit-cost analysis (OMB 1992; OMB 2003) calls for the use of an annual discount rate of seven percent for a base-case analysis, and to apply alternative rates, including three percent, for the purpose of sensitivity analyses. The discount rate is applied to the expected stream of net benefits over an appropriate time horizon, which in the case of this proposed rule is three years, the duration of the rule. The duration of this proposed rule would be limited to three years, so the discount rate and time horizon are not very relevant. Because of that, along with the fact that any quantitative estimates provided here are very rough, only nominal values are examined.

It is emphasized that the proposed rule would be effective only in the years 2009-2011, so its direct effects on the conduct of fishing vessels would be largely limited to that period and its economic impacts would be accordingly short-lived (but see section 6.4 regarding the cumulative impacts of this proposed action with those of other foreseeable future actions).

The analysis is limited to examining changes in net benefits to U.S. gross domestic product; changes in net benefits that occur to foreign interests are not relevant in the context of this RIR.

Changes in benefits and costs in both the private and public sectors are important with respect to net benefits; effects in both sectors are accounted for in this analysis to the extent possible. In the private sector, benefits may accrue as surpluses to consumers and producers. In the case of fish harvesting operations, producer surplus is reflected in the difference between gross revenues and operating costs. Expected changes in benefits and costs are quantified where possible, but in some instances only qualitative projections can be made.

For the purpose of projecting likely fishing patterns under the no-action scenario, the period 2005-2008 is used as a baseline and as a reasonable indicator of future fishing patterns. Previous years are probably not good indications of future conditions because of substantial changes to the regulatory regime that have been made. Most important was the closure of the swordfish-directed shallow-set fishery in 2001, and its reopening, with a new set of regulations, in 2004.

Overall benefit of the proposed action:

The proposed rule is a conservation action in that it would serve to reduce the fishing mortality rate of a stock (bigeye tuna in the WCPO) that has been found to be subject to a fishing mortality rate greater than the rate associated with maximum sustainable yield (MSY). Although the stock size of WCPO bigeye tuna is still greater than the size associated with MSY, if the fishing mortality rate continues at a rate greater than the rate associated with MSY, the stock size would be expected to decline to a size smaller than the size associated with MSY. In that event, catch-per-unit-of-fishing-effort, and consequently, revenues-per-unit-of-fishing-effort, would decline accordingly. Therefore, any reduction in fishing mortality on the stock would enhance the stock's potential productivity and enhance its continued ability to produce MSY. That, in turn, would enhance the ability of the United States to benefit from the stock, be it through producer surplus generated in the Hawaii longline fishery or consumer surplus generated by both domestically produced and imported WCPO bigeye tuna.

Two no-action scenarios are used for the purpose of this analysis. In the more conservative scenario, it is assumed that fishing patterns in 2009-2011 would not depart from recent patterns; specifically, annual catches in 2009-2011 would be equal to the averages observed during 2005-2008. In the less conservative no-action scenario, it is assumed that the increasing trend in bigeye tuna catches in 2005-2008 would continue in 2009-2011 (there might be factors that inhibit continuation of the trend, such as the limit on vessel numbers, or the possibility of the size of the exploitable stock decreasing; nonetheless, continuation of the trend appears to be plausible).

Average annual retained catches of bigeye tuna from the affected longline fisheries in the Convention Area in 2005-2008, as estimated by NMFS, were 4,712 mt (Table 1). The upward trend in bigeye tuna catches in 2005-2008 (for the entire fishery, not limited to catches in the Convention Area), was an average annual increase of about 8 percent. If this rate continued, retained catches of bigeye tuna from the Convention Area in 2009, 2010, and 2011 would be about 5,300, 5,700, and 6,200 mt, respectively.

Thus, with respect to the first no-action scenario, imposition of a catch limit of 3,763 mt would be expected (if the fleet does not continue to land bigeye tuna, such as from the EPO) to result in 20 percent less bigeye tuna being caught and retained in 2009-2011 than under no action.

With respect to the second no-action scenario, the limit would be expected (if the fleet does not continue to catch bigeye tuna, such as from the EPO) to result in 29, 34, and 39 percent less bigeye tuna being caught in 2009, 2010, and 2011, respectively, than under no action (and over the entire 2009-2011 period, 34% less).

Assuming for the moment that the fleet would cease catching bigeye tuna once the limit is reached, the proposed rule could result in, under the more conservative no-action scenario, a reduction of about 20 percent (relative to the no-action scenario) in the Hawaii longline fishery's contribution to the stock's fishing mortality rate during 2009-2011. Under the other no-action scenario, it could result in a reduction of about 34 percent.

These estimates assume that the Hawaii longline fleet would cease causing bigeye tuna mortality once the limit is reached. Under the proposed rule, vessels would be allowed to continue catching bigeye tuna in the EPO, where there currently is no limit (but where, as discussed further below, there could be a limit in the future), and landing it in Hawaii after the limit is reached. They would also be allowed to continue targeting species other than bigeye tuna (and catching bigeye tuna incidentally) in the Convention Area, provided they do not retain, land, or transship bigeye tuna. It is not possible to project whether or to what degree these fishing activities would occur.

The WCPFC has assessed bigeye tuna as a stock with an eastern boundary that coincides with the eastern boundary of the Convention Area. This approach has been based primarily on the boundaries of the areas of competence of management institutions such as the WCPFC and Inter-American Tropical Tuna Commission (IATTC) rather than on the stock's structure, which is not well known.[2] In any case, to the extent that the Hawaii longline fleets shifts, in response to reaching the limit, its bigeye tuna-directed fishing effort to the EPO or catches bigeye tuna incidentally to other species in the WCPO, it would diminish – to some unknown extent – the expected beneficial effect in terms of the future productivity of bigeye tuna in the fleet's fishing grounds.

The contribution of the affected longline fisheries to WCPO bigeye tuna's total fishing mortality rate is relatively small: the average annual amount of WCPO bigeye tuna retained in the Hawaii and west coast longline fisheries – about 4,700 mt during 2005-2007 (Table 1), is about three percent of the roughly 140,000 mt caught per year in the WCPO by all nations and all gear types during 2005-2007 (Lawson 2008). Thus, given the maximum likely reduction in bigeye tuna fishing mortality in the Hawaii longline fishery (20% under the no-action scenario in which the increasing trend in bigeye tuna catches does not continue), the proposed rule would have the potential to reduce the stock's total fishing mortality rate by about one half of one percent.[3] This

[2] NMFS, which is responsible for making regular stock status determinations for stocks managed under fishery management plans developed under the MSA, has, to date, made its determinations for bigeye tuna on a Pacific-wide basis, acknowledging that the stock structure is not well known and that most assessments have been done on WCPO versus EPO basis. NMFS' current determinations for bigeye tuna in the Pacific Ocean are that it is experiencing overfishing (i.e., the fishing mortality rate is greater than the rate associated with MSY) but is not overfished (i.e., the stock size is greater than 60% of the size associated with MSY). See *www.nmfs.noaa.gov/sfa/statusoffisheries/SOSmain.htm* for further details.

[3] That is, 3 percent of the 20-percent reduction in bigeye tuna catches in the Hawaii longline fishery, assuming that

amount can be compared to the estimated 30 percent reduction that is needed to reach the level associated with MSY. Moreover, the proposed rule would be in effect for only three years, after which the fishing mortality rate would be expected to rebound to roughly the same level as expected under no action.

Only in concert with similar actions by other members of the WCPFC, and only if similar or more restrictive actions are taken after 2011 would the proposed rule result in a reduction in WCPO bigeye tuna's fishing mortality rate that is great enough to be beneficial to the United States. Those possible actions and their cumulative beneficial effects are addressed further in section 6.4.

The effects of the action on stocks of species other than bigeye tuna cannot be predicted. If, after the limit is reached, vessel operators do not find it economical to fish for species other than bigeye tuna, such as yellowfin tuna or albacore, catches of species other than bigeye tuna would be effectively limited like those of bigeye tuna. But if such fishing is economical, catches of species other than bigeye tuna could be unaffected, or possibly greater under the action than under the no-action scenario.

To gauge the net benefits of the proposed action, the (uncertain and unquantifiable) benefits identified here and in section 6.4 would have to be weighed against the costs of the proposed action. Those costs are estimated to the extent possible in the paragraphs that follow, specifically in terms of consumer surplus, producer surplus, and public sector costs.

Consumer surplus:

Consumer surplus is the difference between what consumers would be willing to pay and what they must pay for a given good or service.

Bigeye tuna caught in the Hawaii longline fishery constitute the vast majority of fresh bigeye tuna in the Hawaii market, and other species caught in the fishery made similar contributions to the local market. If the supply of bigeye tuna from the Hawaii longline fleet is substantially constrained as a result of the limit being reached, it would likely be felt by the Hawaii market. One possible market response would be to obtain bigeye tuna from alternative sources, such as the countries that currently supply the Hawaii market with relatively small amounts of fresh bigeye tuna. According to data submitted to U.S. Customs and Border Protection, in the period 2005-2008, an average of 250 mt of fresh bigeye tuna was imported into Honolulu each year, predominantly from countries in the Asia-Pacific region (see *www.st.nmfs.noaa.gov/st1/trade/*). That can be compared to the thousands of tons supplied by the Hawaii longline fishery.

Although some consumers in Hawaii probably prefer locally caught bigeye tuna over bigeye tuna from other sources, the market overall might not have a strong preference, in which case substantial price differences among sources would not be expected. Thus, if a gap in local supply is made up by alternative sources, consumer surplus would probably not be substantially affected. If, on the other hand, there are constraints to switching sources – for example, if the short duration of a fishery closure makes it impractical for buyers to establish connections with

the Hawaii fleet's contribution to total fishing mortality remains constant.

alternative suppliers, then a fishery closure could result in more limited choices about product sources and higher prices, with consequent adverse impacts on consumer surplus.

In the event of the limit being reached, the Hawaii longline fleet or portions of it might continue fishing for bigeye tuna in the EPO. To the extent this occurs, the Hawaii market would be that much less likely to turn to alternative sources. However, because it might be costly for vessels to shift to the EPO (e.g., revenue-per-unit-effort might be lower there than in the Convention Area during that time of the year), prices of bigeye tuna could still be affected and consumer surplus adversely impacted.

It is not possible to predict the likelihood or magnitude of these effects on consumer surplus. It seems reasonable to conclude, however, that the degree to which the market would shift to alternative sources is positively correlated with the length of the period during which bigeye tuna landings would be prohibited. As described below in the context of producer surplus, that period is a function of both the size of the limit (relative to the amount expected to be caught under no action) and the magnitude of any race to fish effect that might occur as a result of the proposed rule (i.e., if imposition of the limit causes fishing to occur earlier in the year than it otherwise would, the limit would be reached that much faster).

Producer surplus:

Producer surplus is the difference between producers' (e.g., fishing businesses') revenues and their costs.

The direct effect of the proposed rule is that it would potentially foreclose fishing opportunities for vessels in the Hawaii longline fishery:[4] Owners and operators of such vessels would have to cease retaining, landing, and transshipping Convention Area-caught bigeye tuna if and when the limit is reached in any of the years 2009-2011, for the remainder of the calendar year (except that these activities would be permissible if the bigeye tuna is landed in one of the territories and meets the other criteria described in section 5).

As discussed above, bigeye tuna catches from 2005 through 2008 suggest a high likelihood of the limit being reached in any of the years 2009-2011. If bigeye tuna catch patterns during 2005-2008 (Figure 2) are a good indicator of catches in 2009-2011 under no-action, October and November appear to be the most likely months in which the proposed limit of 3,763 mt of retained bigeye tuna catches would be reached.[5] In 2005-2008, that amount was reached twice

[4] The limit would apply to longline vessels based on the U.S. west coast just as it would to vessels based in Hawaii. However, there have been very few active west coast-based longline vessels and no activity by such vessels in the Convention Area during the last few years. Based on that history, the proposed rule is expected to have virtually no economic impacts on west coast-based vessels or the businesses associated with them, including any forward and backward linkages from and to the fishing sector, such as businesses that supply fishing vessels and businesses that market the fish they catch. Even if a west coast-based vessel desires to fish in the Convention Area but is prevented from doing so under this proposed rule, its principal fishing grounds, which have traditionally been in the eastern Pacific Ocean, would be unaffected. Any fishing opportunities foregone as a result of the rule would consequently be minor, and the economic impacts on the west coast fishing, economic sectors would be minor. For that reason, the remainder of this RIR is limited to the effects on the Hawaii longline fleet and associated economic sectors.
[5] The cumulative landings shown in Figure 2 are accumulated by month, and available catch and landings data are

during November (2005 and 2008), once in October (2007), and once in December (2006). If, however, the increasing trend in bigeye tuna catch during 2005-2008 continues (about 8% annually), the limit would be reached that much earlier in each successive year during 2009-2011. The proposed action could further accelerate the rate at which 3,763 mt of bigeye tuna are caught because the competitive nature of the limit would give fishing businesses an incentive to fish earlier in the year and "harder" than they otherwise would. For example, they might spend less time at port or make more sets per unit time than they otherwise would. The degree to which this "race to fish" would occur cannot be predicted. To the degree it does occur, the limit would be reached that much earlier in a given calendar year.

If the limit is reached in a given year, it can be expected that affected vessels would shift to the next most profitable fishing opportunity (which might be not fishing at all). Revenues from that alternative activity reflect the opportunity costs associated with longline fishing for bigeye tuna in the Convention Area. Therefore, the economic cost of the proposed rule is assumed to be less than the nominal losses incurred by the bigeye tuna limit and associated restrictions.

Upper bounds on potential economic losses can be approximated by the projected value of longline catches from the Convention Area that would not be made as a result of reaching the limit. As described above, two no-action scenarios are used for the purpose of this analysis: under one, the limit of 3,763 mt would be 20 percent less than annual catches in 2009-2011 under no action, and under the other, the limit would be 34 percent less, on average, than annual catches in 2009-2011 under no action. In the deep-set fishery, catches of marketable species other than bigeye tuna would likely be affected in a similar way.

It was noted in the description of effects on consumer surplus that an interruption in supply of bigeye tuna from the Hawaii longline fleet as a result of a fishery closure could result in the Hawaii market shifting to alternative sources of bigeye tuna. If such a shift were temporary – that is; limited to the duration of the prohibition on bigeye tuna landings, which would likely be a matter of weeks or months, then losses to producer surplus would likely be temporary. If, on the other hand, it leads to a more permanent change in the market (e.g., as a result of buyers wanting to mitigate the uncertainty in the continuity of supply from the Hawaii longline fishery), then locally caught bigeye tuna could face stiffer competition with bigeye tuna sourced elsewhere and fetch lower prices than it would under no action. In that event, producer surplus would be reduced indefinitely. It is not possible to predict the likelihood of this occurring or predict the magnitude of the impacts. It seems reasonable to conclude, however, that the likelihood is positively correlated with the length of a closure. As described above, the duration would be a function of both the size of the limit and the magnitude of any race-to-fish effect.

The action could also have the opposite effect on prices. After the limit is reached and landings are restricted, prices of locally sourced bigeye tuna (e.g., that are caught in the EPO), as well as of other species landed by the fleet, could increase and thereby mitigate (to the extent vessels continue to fish and make landings) economic losses.

Ignoring possible effects on prices, over the years 2009-2011, revenues to entities that participate exclusively in the deep-set fishery under the proposed rule would be, under the first no-action

broken down no further than that.

scenario, about 20 percent less than under no action, and under the second no-action scenario, about 34 percent less. If, under the more conservative no-action scenario, average annual ex-vessel revenues for the fleet during 2005-2007 – about $61 million (WPRFMC 2009) – are a good indicator of future revenues under no action, lost annual revenues would be about $12 million. Under the less conservative no-action scenario, if ex-vessel revenues under no-action were to increase in proportion to bigeye tuna catches (8% annually), lost annual revenues would be about $21 million. Again, these estimates are for the purpose of estimating upper bounds on potential economic losses and do not account for revenues from alternative activities, some of which are discussed further below.

Economic losses could be exacerbated by any acceleration in fishing brought about by the competitive nature of the limit. An accelerated fishing year would not impact the amount of fish landed or sold, but if the acceleration is pronounced, the "excessive" supply early in the year could lead to lower prices than would otherwise be realized by a normal functioning market, resulting in a market failure that could produce lower revenues and lower producer surplus. A race to fish could also bring costs if it causes vessel operators to forego vessel maintenance or to fish in weather or ocean conditions that it otherwise would not. This could bring costs in terms of human safety as well as the performance of the vessel and its fishing gear and crew. By lengthening the duration of the landings prohibition, a race to fish could also exacerbate the potential economic impacts caused by disruptions in the Hawaii market for bigeye tuna, as discussed above.

Estimating the net present value (i.e., present value of the benefits less costs) of the proposed action's impact on producer surplus would require estimation of the impact on operating costs in the fleet. Unfortunately, the information available on operating costs in the Hawaii longline fleet is not detailed enough or updated enough for this purpose, so the net present value cannot be estimated. It can be noted, however, that the proposed action would likely have the effect of reducing only variable costs (e.g., costs of fuel and ice, which are incurred only when fishing takes place), not fixed costs, in the fleet. The variable costs incurred by businesses in the fleet can be expected to be affected roughly in proportion to revenues, as both can be presumed to be tightly correlated with fishing effort, which is what would be effectively checked as a result of a fishery closure. But a fishing business's fixed costs, which are by definition fixed regardless of the amount of fishing effort exerted, would be largely unaffected. Thus, revenues would be dampened proportionately more than costs. For example, if revenues under the proposed action are 20 percent less than under no action, profits under the proposed action would be somewhat more than 20 percent less than under no action. How much more is not difficult to predict because of the relative dearth of information about operating costs in the fishery.

As stated above, actual economic losses might be less than the upper bounds described above because they consider opportunity costs associated with the next best profitable activity. For example, ceasing fishing would not necessarily be the most profitable opportunity in the event of the limit being reached. If affected businesses take other available opportunities, their losses could be substantially mitigated. Alternative opportunities that would appear to be relatively attractive to affected fishing businesses include: (1) deep-set longline fishing for bigeye tuna and other species to the east of 150° W longitude boundary line of the Convention Area (the EPO), where there is currently no limit on bigeye tuna catches; (2) shallow-set longline fishing for

swordfish in the Convention Area or the EPO; and (3) deep-set longline fishing in the Convention Area for species other than bigeye tuna. A fourth opportunity is also identified, but because its economic viability appears marginal at this time, it is discussed only briefly. This is deep-set longline fishing for bigeye tuna in the Convention Area and landing the bigeye tuna in American Samoa, the Northern Mariana Islands, or the Territory of Guam (instead of Hawaii, the traditional landing point and main market). This would be permissible provided that the bigeye tuna were not caught in the portion of the U.S. EEZ around the Hawaiian Islands and they are landed by a U.S. vessel operated in compliance with a permit issued under the WP Pelagics FMP or the West Coast HMS FMP.

Before examining each of these potential opportunities in detail, it is important to note that under the proposed action, it would be prohibited to fish with longline gear both inside and outside the Convention Area during the same trip (with the exception of a fishing trip that is in progress when the limit is reached and the restrictions go into effect). For example, after the restrictions go into effect, during a given fishing trip, a vessel could be used for longline fishing for bigeye tuna in the EPO or longline fishing for species other than bigeye tuna in the Convention Area, but not both. This reduced operational flexibility would bring costs, since it would constrain the potential profits from alternative opportunities collectively. Those costs cannot be quantified.

(1) With respect to deep-set fishing in the EPO, the proportion of the fishery's annual bigeye tuna catches that were captured in the EPO from 2005 through 2008 ranged from 2 percent to 22 percent, and averaged 11 percent (Table 1). In 2005-2007, that proportion, which ranged from 2 percent to 11 percent, may have been constrained by the bigeye tuna catch limits established by NMFS to implement the decisions of the IATTC, the counterpart of the WCPFC in the EPO. By far most of the U.S. annual EPO bigeye tuna catch has typically been made in the second and third quarters of the year: in the period 2005-2008 the percentages caught in the first, second, third, and fourth quarters were 9, 25, 62, and 4 percent, respectively (NMFS unpublished data). These two historical patterns – that relatively little of the bigeye tuna catch in the longline fishery has typically been made in the EPO (2-22 percent in 2005-2008) and that most EPO bigeye tuna catches have been made in the second and third quarters, with relatively few catches in the fourth quarter, when the limit would most likely be reached, suggest it would be relatively costly for at least some affected entities to shift to deep-set fishing in the EPO in the event of the limit being reached in the Convention Area. Furthermore, if the IATTC adopts, and the United States implements, bigeye tuna catch limits for the EPO for any of the years 2009-2011, the ability of business entities affected by this proposed rule to shift fishing effort to the EPO would, of course, be constrained accordingly.

(2) With respect to the opportunity of shallow-set longline fishing for swordfish, entities that already engage in this component of the fishery and that would do so under the no-action scenario would bear little cost in the event of the limit being reached. The cost would be approximately equal to the revenues lost from not being able to retain or land bigeye tuna captured while shallow-setting in the Convention Area, or the cost, taking into account opportunity costs, of shifting to shallow-setting in the EPO, whichever is less. In the fourth quarters of 2005-2008, almost all shallow-setting effort took place in the EPO, and 96 percent of bigeye tuna catches were made there (NMFS unpublished data), so the opportunity cost would appear to be very little. Nevertheless, potential losses of bigeye tuna revenue in the WCPO

shallow-set fishery are estimated here. During 2005-2008, the shallow-set fishery caught and retained an annual average of 55 mt of bigeye tuna from the Convention Area (Table 1). If the bigeye tuna limit is reached on September 30 (or even as early as July 31) in a given year, the WCPO shallow-set fishery at that point would be, on average, based on 2005-2008 data, 99 percent through its average annual bigeye tuna catches (Figure 3). Thus, imposition of the retention and landings prohibition on September 30 could result in the loss of revenues from approximately 0.6 mt (1% of 55 mt) of bigeye tuna, which, based on recent ex-vessel prices (about $7.50/kg in 2006-2007; WPRFMC 2009), would be worth about $4,500.

These potential losses are relatively small, but one additional effect could lead to greater costs to entities that engage in the shallow-set fishery. Vessels that have not historically participated in the shallow-set fishery would, in the event of the limit being reached, have a greater incentive to engage in shallow-setting than they otherwise would, so participation in the shallow-set fishery could be greater as a result of the limit being reached. Participation and fishing effort would be constrained, however, by the existing annual limits on the number of sets that may be made (2,120) and on the number of interactions that may occur with loggerhead (17) and leatherback (16) turtles. In the four full years that these limits have been in place, the fishery has been closed once (2006) as a result of reaching one of the turtle interaction limits. In the remaining three years (2005, 2007, and 2008), 76 percent, 76 percent, and 77 percent, respectively, of the 2,120-set limit on fishing effort was used (NMFS unpublished data). To the extent that participation and fishing effort in the shallow-set fishery are greater as a result of this proposed rule, traditional participants would bear costs associated with the greater competition for the available fishing effort. Those costs cannot be projected, but they are likely to be reflected in the price of shallow-set certificates, which each year are distributed free of charge and in equal shares to all holders of Hawaii Longline Limited Access Permits and subsequently traded among fishery participants. Increased competition in the shallow-set fishery could also lead lower prices for swordfish as a result of greater supply, and consequently lower returns to entities engaged in the shallow-set fishery. The costs could also be reflected in a higher likelihood of the turtle interaction limits being reached and the shallow-set fishery being closed (at all or earlier in the year than it otherwise would). It should be noted that the WPFMC has recommended that the shallow-set effort limit be removed and that the loggerhead interaction limit be increased. NMFS, which is responsible for approving and implementing (in this case, via rulemaking) recommendations of the WPFMC, has not yet acted on the WPFMC recommendations. If the recommendations are approved and implemented, there would be more potential for fishing effort to shift to the shallow-set fishery.

(3) The opportunity of deep-setting in the Convention Area for species other than bigeye tuna would seem, based on the lack of such fishing activity in the past, to be the least attractive and costliest of the three alternative opportunities examined here. Nonetheless, it is possible that affected fishing businesses could find it economically viable to place greater emphasis on targeting yellowfin tuna, albacore and other species that have in the past contributed relatively little to ex-vessel revenues in the fishery. Next to bigeye tuna, yellowfin tuna has been the most valuable species in the deep-set fishery, but the catch per unit of effort (CPUE) for yellowfin tuna has been considerably less than for bigeye tuna. The average annual CPUE for yellowfin tuna during 2005-2007 was 0.84 fish per 1,000 hooks, as compared to 3.73 fish per 1,000 hooks for bigeye tuna (NMFS unpublished data). Thus, unless fishing methods can be adjusted in ways

to substantially increase catch rates of species other than bigeye tuna, revenues per unit of effort would be substantially less during a bigeye tuna landings prohibition period. The extent to which such adjustments could be made is not known. Even if deep-set fishing is not an economically attractive opportunity without the ability to land bigeye tuna, it might be worthwhile for trips during which the limit is reached. In other words, after bigeye tuna restrictions become effective, it would allow vessels at sea to continue fishing to top off their holds with species other than bigeye tuna and thereby have the potential to lessen the economic losses resulting from the restrictions.

Finally, with respect to deep-set longline fishing for bigeye tuna in the Convention Area and landing the fish in American Samoa, the Northern Mariana Islands, or the Territory of Guam, there are three potentially critical constraints to this opportunity. First, whether the fish are landed by the vessel that caught the fish or by a vessel to which the fish were transshipped, the costs of a vessel steaming from the traditional fishing grounds in the vicinity of Hawaii to one of the territories would be substantial. Second, none of these three locales has large markets to absorb additional fresh sashimi-grade bigeye tuna. Third, transporting the bigeye tuna from these locales to larger markets, such as in Hawaii or Japan, would bring substantial costs. These cost constraints suggest that this opportunity has little potential to mitigate the economic impacts of the proposed action on producers.

Public sector costs:

Implementation of the catch limit and fishery closure scheme established by the proposed rule would result in federal government costs.

First, NMFS would need to monitor bigeye tuna catches with respect to the limit. The basic data collection systems needed to do so are already in place. These include catch reporting done through the mandatory use of vessel logbooks and data collected by NMFS from fish distributors at points of landing. However, NMFS would likely have to process those data more quickly than it otherwise would in order to ensure that NMFS' determination of the limit being reached occurs no later than the limit actually being reached. The data needed to accomplish this are already collected, but NMFS would have to process the data and produce running catch estimates, which it does not currently do. NMFS would not necessarily have to engage in any of these new activities year-round; it could focus on those portions of each year when there is an appropriately high likelihood of the limit being reached within a certain period.

Second, using the catch estimates as described above, NMFS would have to make determinations as to whether the limit is likely to be reached within a particular period, and once such a determination is made, prepare and publish a notice in the *Federal Register* that announces the effective date of the bigeye tuna retention, landing, and transshipment prohibitions.

Third, enforcement authorities, such as NMFS and the U.S. Coast Guard, would likely invest resources into enforcing the rule. The costs of the on-the-water and on-the-ground aspects of such enforcement would probably be minimal, as they would be largely conducted in the course of routine patrols and surveillance activities used to enforce a variety of laws.

The costs of these new activities are not possible to predict, but as described above, the activities would constitute relatively minor add-ons to existing NMFS and U.S. Coast Guard programs. On their own, the new activities would probably not require investment of any new funds into those existing programs (but collectively with new mandates generated elsewhere, they could lead to such investment). Instead, it is likely that existing resources would be diverted from other activities to meet these new needs. In that case, the costs would be borne in terms of lost productivity in other areas rather than "cash" costs.

Summary of effects on net benefits:

As described above, the proposed action can be expected to have a positive effect on net benefits that the United States can potentially enjoy through the maintenance of a productive WCPO bigeye tuna stock. Those effects, however, cannot be quantified and they would occur only if the other fishing nations in the WCPO implement similar actions and if all the fishing nations in the WCPO implement similar or more conservation actions beyond the three-year duration of this WCPFC-mandated action (see discussion of cumulative effects in section 6.4).

Those positive effects would be countered by costs to the nation in terms of producer surplus, consumer surplus, and public sector costs. The sum of those costs cannot be quantified, but because the benefits would not accrue immediately, during the three-year duration of the proposed rule, the costs would almost certainly outweigh the benefits. It is not possible to determine whether the benefits of the proposed rule would outweigh the costs in the long term.

Comparisons among alternatives:

Alternative 1 (no-action) would bring no economic costs. It would also not bring the benefits that the action alternatives would bring (which, as described above and in section 6.4, would accrue from the action's cumulative effects with other present and future actions rather than from the direct or indirect of the action itself).

Alternative 2 (prohibiting deep-setting but allowing shallow-setting once the limit is reached) would likely bring greater losses in terms of producer surplus relative to the proposed action (Alternative 3), as it would narrow the available fishing opportunities in the event the limit is reached. Specifically, unlike the proposed action, it would not allow deep-setting for species other than bigeye tuna. However, if deep-setting for species other than bigeye tuna is not economically viable, then Alternative 2 and the proposed action would result in similar economic losses to producers.

The effects of Alternative 2 with respect to consumer surplus and public sector costs would be similar to those of the proposed action.

The benefits of Alternative 2 (in terms of the future productivity of WCPO bigeye tuna) could be slightly greater than those of the proposed action, as Alternative 2 would bring a lower risk of bigeye tuna being caught (and by law, discarded) and killed after the limit is reached. The fate of discarded bigeye tuna cannot be predicted, but the percentage of deep-set-caught bigeye tuna that are dead upon being retrieved (26 percent, according to observer data from the Hawaii longline

fishery collected over 12 years, as compiled by the NMFS Pacific Islands Fisheries Science Center) provides a lower limit to the likely mortality rate.

Alternative 4 (prohibiting both deep-setting and shallow-setting once the limit is reached) would likely bring greater losses in terms of producer surplus relative to both the proposed action (Alternative 3) and Alternative 2, as it would further narrow the available fishing opportunities in the event the limit is reached. Specifically, unlike the proposed action, it would not allow deep-setting for species other than bigeye tuna, and unlike both the proposed action and Alternative 2, it would not allow shallow-setting (e.g., for swordfish). Based on shallow-set fishing patterns during 2005-2008 (Figure 4), if the bigeye tuna limit is reached at the end of October (or even as early as the end of July), the WCPO shallow-set longline fishery would be about 98 percent of its way through its typical annual swordfish catches. Based on recent catches of swordfish (annual average of 1,113 mt in 2005-2008; Table 1) and prices (about $4.70/kg in 2006-2007; WPRFMC 2009), that would mean about 22 mt fewer swordfish landings and $0.1 million less in ex-vessel revenues than under no-action and the proposed action.

The effects of Alternative 4 with respect to consumer surplus would be similar to those of the proposed action, because although it would likely result in less swordfish being landed by the Hawaii longline fleet, the difference, as indicated above, would be only about 2 percent. Furthermore, the market for swordfish is primarily on the U.S. mainland, where Hawaii-caught swordfish is not the only source.

The effects of Alternative 4 with respect to public sector costs would be similar to those of the proposed action and Alternative 2.

Like Alternative 2, the benefits of Alternative 4 (in terms of the future productivity of WCPO bigeye tuna) could be slightly greater than those of the proposed action, as it would bring a lower risk of bigeye tuna being caught (and by law, discarded) after the limit is reached. The benefits of Alternatives 2 and 4 would be very similar, as Alternative 2 would likely result in only slightly greater bigeye tuna mortality (e.g., the roughly 0.6 mt of bigeye tuna that would be caught in the shallow-set fishery after the limit is reached).

6.2. Distributional changes in net benefits

Examples of distributional effects include differential economic impacts according to geographical region and businesses of differing sizes.

The proposed action would apply only to the Hawaii longline fishery (and to a very limited extent, the west coast-based longline fishery, as described in footnote 4). Fisheries in other areas of the United States would be unaffected. To the extent that the action results in the stock of WCPO bigeye tuna being larger than it otherwise would be, other U.S. fisheries in the Pacific Ocean that exploit the stock would benefit without bearing any costs.

As indicated in section 6.1, it is possible that as a result of a closure, the Hawaii market could switch to alternative sources of bigeye tuna. Because such alternative sources would likely be foreign, not domestic, there would be no distributional changes (within the United States) in net

benefits.

It is possible that the proposed action would lead to a shift towards the EPO (i.e., east of 150° West longitude) of fishing effort in the Hawaii longline fishery. However, the operation of the vessels involved in such shifts is not expected to change in terms of where the vessels are based or where they land their catch, so no distributional economic effects are expected as a result of such shifts.

As described in section 6.1, the proposed rule could have different impacts on vessels that engage in the shallow-set fishery relative to those that participate in the deep-set fishery. While virtually all affected vessels engage at least part of the year in the latter, only 20-30 vessels have engaged in the shallow-set component of the fishery in recent years (NMFS unpublished data).

The proposed rule would not appear to have distributional impacts in terms of the sizes of affected businesses.

All three action alternatives would be similar in terms of distributional effects except, as described in section 6.1, for some differences in their impacts on vessels that engage in the shallow-set fishery versus those that do not.

6.3. Changes in income and employment

To the extent that the proposed rule would cause the landing of less bigeye tuna from the Hawaii longline fleet in 2009-2011 than under the no-action scenario and consequent adverse economic impacts to the producers (fishing businesses), it would also bring adverse impacts to business sectors with backward linkages to the producers, such as businesses that supply the fishing vessels. This would also be true for business sectors with forward linkages to the producers, such as businesses that market the fish they land, but only if those businesses do not fill the gap in local product with bigeye tuna sourced elsewhere (see section 6.1). Furthermore, if such substitution does occur, it might not occur at the point of ex-vessel sales. For example, the businesses that buy from the vessels (the United Fishing Agency's fish auction in Honolulu being the primary one currently) might not seek alternative supplies, while the subsequent buyers do. In that case, the proposed rule would result in impacts to only that first level of forward-linked businesses.

It is not possible to quantify these types of impacts, but the information in section 6.1 provides an indication of their potential magnitude.

Changes in income and employment would generally occur in proportion to losses to producers, so the three action alternatives would differ in terms of income and employment much as they would in terms of net effects.

6.4. Cumulative effects

Cumulative effects are the additive effects of this action and other existing and reasonably foreseeable actions (e.g., other fishery regulations). The cumulative effects of the proposed

action can be described only qualitatively.

Benefits:

As described in section 6.1, the proposed action would have the potential to reduce the total fishing mortality rate of WCPO bigeye tuna by only about one half of one percent, which is small compared to the estimated 30 percent reduction that is needed to reach the level associated with MSY. Moreover, that reduction would be attained for only the three years during which the proposed rule would be in effect. Other reasonably foreseeable actions, however, could result in more substantial and durable beneficial impacts on the WCPO bigeye tuna stock.

First, if the IATTC adopts bigeye tuna catch limits for the EPO for any of the years 2009-2011 and the United States implements those limits, the ability of vessels affected by this proposed rule to shift fishing effort to the EPO would be constrained accordingly. It is not possible to predict the likelihood of the IATTC adopting a limit for any of those years. It is similarly not possible to predict the amount of any such limit, but as a possible indicator, the IATTC's last decision set an annual limit of 500 mt of bigeye tuna for U.S. longline fisheries. This can be compared to recent retained catches made in the EPO, which in the years 2005-2008 were 544, 79, 417, and 1,275 mt, respectively (Table 1).

Second, the other members of the WCPFC are, like the United States, obligated to limit catches of bigeye tuna in their longline fisheries during 2009-2011. They are also obligated under CMM 2008-01 to implement during the same period a number of management measures in their purse seine fisheries, which are the second largest source of WCPO bigeye tuna fishing mortality next to longline fisheries. The purse seine measures include limits on fishing effort, restrictions on fishing on fish aggregating devices, and restrictions against discarding unwanted catch. As stated in CMM 2008-01, those measures are intended, together with the longline-directed measures, to achieve the desired 30 percent reduction in fishing mortality. However, given a number of compromises and exemptions available in CMM 2008-01, it is clear that the collective longline and purse seine measures are unlikely, even if fully implemented by all the WCPFC members, to result in the desired 30 percent reduction in the fishing mortality rate. The likely cumulative effect is not possible to predict, but it is not nil, and any fisheries exploiting WCPO bigeye tuna, including the Hawaii longline fleet, would benefit from that effect.

Third, the WCPFC is in the future likely to adopt conservation and management measures for WCPO bigeye tuna that apply past 2011. It is not possible to predict what those measures would be, when they would apply, or what their effects on WCPO bigeye tuna would be. In any case, any fisheries exploiting WCPO bigeye tuna, including the Hawaii longline fleet, would benefit from the conservative effects of such future measures.

Costs:

If in the future the WCPFC or IATTC adopts conservation and management measures that the United States implements with respect to the Hawaii longline fishery, the businesses involved in the fishery would bear costs. Neither those future measures nor their associated costs can be predicted.

Apart from the possibility of implementing the decisions of international bodies like the WCPFC and the IATTC, NMFS could take any number of management actions with respect to the Hawaii longline fishery or bigeye tuna under domestic mandates such as the MSA. Such actions have the potential to mitigate some of the adverse economic effects identified in sections 6.1 and 6.3. For example, the Western Pacific Fishery Management Council is considering management actions that might be appropriate in light of the WCPFC-imposed bigeye catch limit. Such actions could serve to, for example, keep (the limited) bigeye tuna landings evenly distributed through the year, reducing the likelihood of the fishery being closed and helping to ensure a continuous supply of locally caught bigeye tuna to the Hawaii market. Management actions recommended by the Council are subject to the approval of, and are implemented by, NMFS. Given the timing of the processes under the MSA, the implementation of any Council recommendations is likely to occur no earlier than 2010.

Net effects:

As described above, neither the cumulative benefits nor cumulative costs of the proposed rule can be estimated quantitatively. It is consequently not possible to determine whether the cumulative benefits to the United States would outweigh the cumulative costs.

Comparison among alternatives:

All the other present and potential future management actions identified above would be expected in association with any of the action alternatives, so the cumulative effects of the three alternatives would be different only insofar as their direct and indirect effects are different, as described in the previous subsections.

7. DETERMINATION OF SIGNIFICANCE UNDER EXECUTIVE ORDER 12866

In accordance with E.O. 12866, NMFS has made the following determinations:

- This rule is not likely to have an annual effect on the economy of more than $100 million or to adversely affect in a material way the economy, a sector of the economy, productivity, jobs, the environment, public health or safety, or state, local, or tribal governments or communities.
- This rule is not likely to create any serious inconsistencies or otherwise interfere with any action taken or planned by another agency.
- This rule is not likely to materially alter the budgetary impact of entitlements, grants, user fees or loan programs or the rights or obligations of recipients thereof.
- This rule is not likely to raise novel or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in E.O. 12866.

Based on these determinations, the rule considered in this RIR is not a "significant regulatory action" for the purposes of E.O. 12866. Furthermore, the rule is not controversial.

8. REFERENCES

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