WESTERN
PACIFIC
REGIONAL
FISHERY
MANAGEMENT
COUNCIL

DRAFT

Framework Regulatory Measure Under the Fishery Management Plan for Crustaceans Fisheries of the Western Pacific Region

for

Temporary Closure of the Northwestern Hawaiian Islands (NWHI) Lobster Fishery

DRAFT 26 January 2001

Western Pacific Regional Fishery Management Council
1164 Bishop St, Suite 1400
Honolulu, HI 96813

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1.0 Introduction

The purpose of this regulatory measure is to establish a temporary closure of the Northwestern Hawaiian Islands (NWHI) lobster fishery under the framework regulatory procedure of Amendment 9 to the Crustaceans Fishery Management Plan. This action was recommended by the National Marine Fisheries Service (NMFS) Southwest Regional Administrator (SWRA), following closure of the fishery in 2000 by emergency action. The Council, at its last meeting in 2000, agreed to consider at its February 2001 meeting possible regulatory action for a temporary closure of the entire NWHI fishery through 2001 and Area 4 through 2002. This closure is proposed as a precautionary measure to reduce the risk of recruitment failure in the fishery and is expected to promote a sustainable and more stable fishery in the long-term. The motivation for the preferred course of action, together with other alternatives and related aspects, are discussed. An Environmental Assessment and a Regulatory Impact Review/Initial Regulatory Flexibility Analysis are appended.

1.1 Responsible agencies

The Western Pacific Regional Fishery Management Council (Council) was established by the Magnuson Fishery Conservation and Management Act to develop Fishery Management Plans (FMPs) for fisheries operating in the US Exclusive Economic Zone (EEZ) around American Samoa, Guam, Hawaii, the Northern Mariana Islands and the US possessions in the Pacific.[1] Once an FMP is approved by the Secretary of Commerce, it is implemented by federal regulations which are enforced by the National Marine Fisheries Service and the US Coast Guard, in cooperation with state, territorial and commonwealth agencies. For further information, contact:

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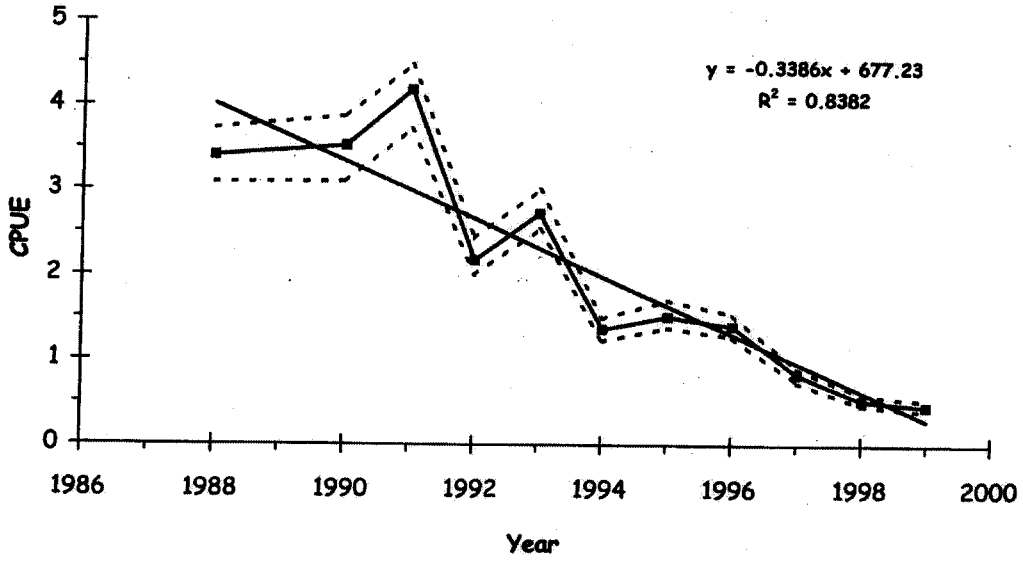
2.0 Background/Need for Action

In early 2000, while developing the estimate of the annual exploitable lobster population and harvest guideline for the NWHI commercial lobster fishery, NMFS scientists noted increasing uncertainty in model parameter estimates, as well as violations of model assumptions, and concluded that the estimates may not be accurate and should be viewed with extreme caution. The underlying concern with these population estimates revolves around the use of mixed species and spatially disaggregated data (i.e., under bank-specific harvest guidelines first implemented in 1998) in an algorithm designed to estimate aggregated, single species populations. Specific concerns surround the validity of the following assumptions of the model: that homogeneous population dynamics exist between banks; that there is constant recruitment throughout the NWHI; that the model's catchability estimates are correct; that natural mortality is constant irrespective of species, age, or sex; and that commercial catch-per-unit-effort (CPUE) is a reliable index of lobster abundance in the NWHI. Based on new information from research surveys, tagging data and recent advances in NMFS' understanding, these assumptions have been increasingly called into question. Insufficient biological data exist while there are known differences between the two species (spiny and slipper lobsters). There also appears to be a lack of rebuilding of lobster populations, as indicated by commercial CPUEs in recent years.

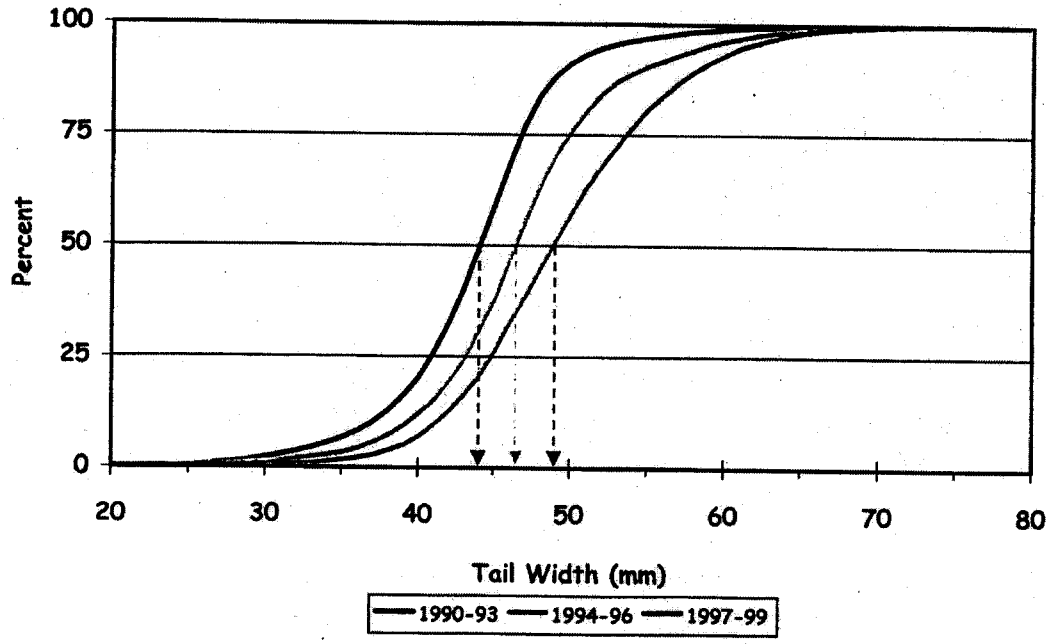
Other concerns also exist regarding the fishery. The model uses combined species'(spiny and slipper) CPUE to estimate exploitable populations, (while biological and behavioral differences between species exist, as seen in a switch in catch composition over the past decade). There also appears to be a lack of rebuilding of lobster populations, as indicated by commercial CPUEs (observed reductions in catches and catch rates in 1990s). Reductions in both catches and catch rates have been recorded, and recent data suggests low recruitment in the fishery.

The following figure shows a time-series of age-two recruitment of spiny lobster at Necker with 95% confidence intervals. Mean CPUE per year shows a declining trend since 1988 based on Townsend Cromwell research surveys. The second figure below shows cumulative frequency associated with the catch by size, by tail-width. From 1990-93 50% of the catch was 44 mm or less. This increased to about 49 mm from 1997-99. This implies there are less smaller lobsters due to lower recruitment.

RESEARCH SURVEY CPUE TIME SERIES AND 95% CI OF AGE 2 SPINY LOBSTER AT NECKER ISLAND



SPINY LOBSTER CUMULATIVE PERCENT FREQ. AT NECKER I.



Based on the above concerns, NMFS closed the NWHI commercial lobster fishery for the 2000 lobster season as a precautionary measure. This emergency closure was authorized under section 305(c) of the Magnuson-Stevens Fishery Conservation and Management Act based.

The fishery has also been closed by court order (15 November 2000) due to potential harm to the endangered Hawaiian monk seal, pending completion of an environmental impact statement and biological opinion on the fishery. While lobster have been recorded in the diet of monk seals, no conclusive evidence exists regarding the importance of lobsters as prey species in their diets. The Crustaceans FMP includes measures to mitigate and monitor fishery-monk seal interactions: 1) 20 nmi closed area around Laysan and 10 fm closure around all islands, 2) maximum size restriction for lobster trap opening to prevent seal entrapment, 3) authority for the NMFS RA to place observers or close the fishery if needed (e.g., to investigate seal mortality possibly caused by the fishery and recommend additional protective measures), 4) harvest guideline and mandatory trap escape vents reduce impacts on seal prey, 5) prohibitions on nets, explosives and poisons reduce potential harm to seals, and 6) "retain-all" harvest strategy reduces impacts from seals feeding on discarded lobsters.

No significant progress was made by NMFS scientists in 2000 to resolve their concerns for uncertainty. Additional time and research data are needed. NMFS scientists are continuing work to refine the model used to estimate exploitable populations, as well as to gather fishery independent data which can be used to reassess the model's assumptions and parameters. A charter tagging cruise is tentatively planned for the spring of 2001 and a research cruise for the summer. Scientific technicians assisted by fishing vessel crew members will conduct the catch-and-release research program. Objectives of this research are to collect life history and distributional data for spiny and slipper lobster, and to conduct spiny and slipper lobster tagging experiments. The protocol for collecting life history information will follow the guidelines implemented during the 1999 NWHI lobster fishery. Highest priority will be continuation of tagging spiny lobster at Necker and, if feasible, expand tagging and sampling at Maro Reef for slipper lobster, then at Gardner Pinnacles for spiny lobster. Mortality associated with this catch-and-release research program should be minimal as all captured lobsters will be released on the sea floor and in the general vicinity of their capture location. NMFS considers it is essential to obtain biological and fishery data under a controlled data collection regime (while the fishery is closed) to improve the ability to assess the lobster stock and understand the fishery. Improved stock assessment models will enable development of better estimates of exploitable populations and improve management. NMFS may conduct a lobster research fishery in Area 4 in 2002, possibly as an interagency collaborative initiative. NMFS proposed closing Area 4 for an additional year as recovery of the population is not apparent following years of very little fishing effort. At this time it is uncertain whether NMFS will conduct the planned chartered research cruise or if it has other funding priorities.

The Council, at its 107th meeting, agreed to consider a temporary closure of the entire NWHI lobster fishery through 2001, and Area 4 through 2002, as proposed by the NMFS SW RA in a Declaration dated 29 September 2000, while allowing research at the major banks, through a regulatory amendment.

3.0 Management Objectives

Management objectives of the Crustaceans FMP (1983) that are relevant to the proposed action of this framework regulatory measure are: 1) Assure the long-term productivity of the stocks and prevent overfishing; 2) Collect and analyze biological information about the lobster fishery and improve the basis for conservation and management in the future; and 3) Prevent unfavorable impacts of the fishery on the Hawaiian monk seal and other endangered and threatened species.

4.0 Alternatives Considered

The following four alternatives are considered in the appended environmental assessment:

Alternative 1 (Status Quo) - Open the fishery on 1 July 2001, using the 1999 harvest guideline (last year a fishery occurred) of 243,100 lobsters distributed among the four established lobster grounds

Alternative 2 - Open the fishery on 1 July 2001, with a harvest guideline of 88,270 lobsters as distributed among the four established lobster grounds

Alternative 3 - Open the fishery 1 July 2001, with a harvest guideline of 194,350 lobsters as distributed among the four established lobster grounds

Alternative 4 **(Preferred)** - Extend the closed season through 31 December 2001 (no 2001 NWHI commercial fishery) and through 31 December 2002 in Area 4

4.1 Preferred Alternative: (Temporary Closure)

Alternative 4 (Preferred) - Extend the closed season through 31 December 2001 (no 2001 NWHI commercial fishery) and through 31 December 2001 in Area 4 (due to above concerns)

This alternative is preferred based on the following known or anticipated benefits: 1) Should preserve and enhance the productivity of the fishery's target stocks and any incidentally caught species; 2) Expected to promote a sustainable fishery which should have greater positive long-term impacts; and 3) Will not adversely impact habitat, endangered or threatened species or marine mammals. The preferred alternative best meets the management objectives of the FMP.

Negative impacts of the preferred alternative include: 1) Further economic impact on fishery participants (provides 25% to 33% of their annual gross revenues) from a two-year closure (three year closure of Area 4) ; 2) Fishery permit holders will be vulnerable to even further reductions in the value of their permits; and 3) Market connections will be negatively impacted and reestablishment of market channels may be difficult when the fishery reopens. NMFS scientists have also expressed concern over the lack of lobster stock data if research and

charter research cruises are not funded.

The closure of the fishery through 2001 will create major economic hardship for Hawaii lobster fishermen and their families, as well as to the extended seafood industry. In December 2000 the Council requested that the use of "Fisheries Disaster Relief" be considered for the affected lobster permit holders, as provided for in the Magnuson-Stevens Act, and that NMFS help develop the request for the Governor. Cost may be two-million dollars for the two year period.

5.0 Other Applicable Laws

5.1 Environmental Assessment — see Appendix A

5.2 Regulatory Flexibility Analysis — see Appendix B

5.3 Coastal Zone Management Act

Section 307(c)(1) of the Federal Coastal Zone Management Act of 1972 requires all Federal activities which directly affect the coastal zone be consistent with enforceable provisions of approved state coastal zone management programs to the maximum extent practicable. A copy of this document will be sent to the State of Hawaii Planning Office for review and concurrence that the preferred alternative is consistent to the maximum extent possible with the state's coastal management program.

5.4 Endangered Species Act

The preferred alternative for a temporary closure will not affect any listed endangered or threatened species, or habitat of those species in ways not previously analyzed. The court has required completion of a new biological opinion, in addition to the EIS, prior to re-opening of the fishery. A new informal consultation may be conducted for this temporary closure.

5.5 Marine Mammal Act

All fisheries in the Western Pacific region are designated as Category 3, meaning that fishermen must report interactions with marine mammals, but they are not required to obtain exemption certificates in order to fish. This management measure does not require a MMPA category redesignation.

5.5 Paperwork Reduction Act

The Paperwork Reduction Act requires federal agencies to minimize paperwork and reporting burdens whenever collecting information from the public. No additional record-keeping and reporting requirements are necessary to implement the management measure.

5.6 National Standards for Fishery Conservation and Management

National Standard 1 – *Prevent Overfishing, Achieve Optimum Yield – Conservation and Management Measures Shall Prevent Overfishing While Achieving, on a Continuing Basis, the Optimum Yield from Each Fishery for the United States Fishing Industry.*

National Standard 2 – *Best Scientific Information – Conservation and Management Measures Shall Be Based upon the Best Scientific Information Available.*

National Standard 3 – *Manage Stocks as a Unit – To the Extent Practicable, an Individual Stock of Fish Shall Be Managed as a Unit Throughout its Range, and Interrelated Stocks of Fish Shall Be Managed as a Unit or in Close Coordination.*

National Standard 4 – *Do Not Discriminate Between States – Conservation and Management Measures Shall Not Discriminate Between Residents of Different States. If it Becomes Necessary to Allocate or Assign Fishing Privileges among Various United States Fishermen, Such Allocation Shall Be (A) Fair and Equitable to All Such Fishermen; (B) Reasonably Calculated to Promote Conservation; and (C) Carried out in Such Manner That No Particular Individual, Corporation, or Other Entity Acquires an Excessive Share of Such Privileges.*

National Standard 5 – *Efficiency in Utilization – Conservation and Management Measures Shall, Where Practicable, Consider Efficiency in the Utilization of Fishery Resources; Except That No Such Measure Shall Have Economic Allocation as its Sole Purpose.*

National Standard 6 – *Allow for Variations – Conservation and Management Measures Shall Take into Account and Allow for Variations Among, and Contingencies In, Fisheries, Fishery Resources and Catches.*

National Standard 7 – *Management Measures Shall Minimize Costs – Conservation and Management Measures Shall, Where Practicable, Minimize Costs and Avoid Duplication.*

National Standard 8 – *Importance to Fishing Communities – Conservation and Management Measures Shall, Consistent with Conservation Requirements of this Act (Including the Prevention of Overfishing and Rebuilding of Overfished Stocks), Take into Account the Importance of Fishery Resources to Fishing Communities in Order to (A) Provide for the Sustained Participation of Such Communities; and (B) to the Extent Practicable, Minimize Adverse Economic Impacts on Such Communities.*

National Standard 9 – *Minimize Bycatch – Conservation and Management Measures Shall, to the Extent Practicable, (A) Minimize Bycatch and (B) to the Extent Bycatch Cannot Be Avoided, Minimize the Mortality of Such Bycatch.*

National Standard 10 – *Promote Safety – Conservation and Management Measures Shall, to the Extent Practicable, Promote the Safety of Human Life at Sea.*

The preferred alternative for a temporary closure of the NWHI lobster fishery is consistent with the above national standard guidelines for fishery conservation and management of the Crustaceans FMP. The primary focus of this measure is conservation of the lobster stocks, in the face of increasing uncertainty, and improvement of scientific information on the fishery upon which to estimate exploitable population size and improve management.

6.0 Draft Regulations

For the reasons set out in the preamble, 50 CFR part 660 is amended as follows:

PART 660 - FISHERIES OFF WEST COAST STATES AND IN THE WESTERN PACIFIC

1. The authority citation for part 660 continues to read as follows:

Authority: 16 U.S.C. 1801 et seq.

* * * * *

2. In Section 660.45, effective from July 1, 2001, through Deecmber 31, 2002, paragraph (a) is suspended, and a new paragraph (c) is added to read as follows:

§ 660.45 Closed seasons.

* * * * *

(c) Lobster fishing is prohibited in Permit Area 1 from July 1, 2001, through December 31, 2001, and in Area 4 (NWHI Lobster Fishing Grounds) from July 1, 2001, through December 31, 2002.

§ 660.48 [Amended]

3. In § 660.48, paragraph (a)(9) is suspended effective from July 1, 2001, through December 31, 2001, and in Area 4 (NWHI Lobster Fishing Grounds) from July 1, 2001, through December 31, 2002.

§ 660.50 [Suspended]

4. Section 660.50 is suspended effective from July 1 2001, through December 31, 2001, and in Area 4 (NWHI Lobster Fishing Grounds) from July 1, 2001, through December 31, 2002.

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Appendix A. Environmental Assessment

TEMPORARY CLOSURE OF THE NORTHWESTERN HAWAIIAN ISLANDS LOBSTER FISHERY

Environmental Assessment
&
Regulatory Impact Review/Initial Regulatory Flexibility Analysis

Pacific Islands Area Office
Southwest Region
National Marine Fisheries Service

January 2001

I. Overview of the Northwestern Hawaiian Islands Crustacean Fishery

The Northwestern Hawaiian Islands (NWHI) crustacean fishery, which has operated for nearly 20 years, is a distant-water trap fishery with the red spiny lobster (*Panulirus marginatus*) and common slipper lobster (*Scyllarides squammosus*) as the primary target species. Other lobster species: ridgeback slipper lobster, Chinese slipper lobster, and even the green spiny lobster are caught in relatively small numbers. Most of the NWHI lobster fishery occurs in federal waters of the U.S. exclusive economic zone (3 to 200 nm offshore).

This fishery is primarily a frozen lobster tail fishery concentrating on export markets, although live lobsters have been landed by boats specially outfitted with circulating seawater holding tanks. In 1999, the NWHI lobster fishery produced a total of about 236,000 lobsters generating a revenue of little more than $1.2 million. The maximum sustainable yield for this fishery has been estimated to be between 236,000 - 435,000 spiny lobsters per year. The fishery was closed in 2000 by NMFS emergency action.

As authorized under the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), the fishery is managed under the Fishery Management Plan for Crustacean Fisheries of the Western Pacific Region (FMP) developed by the Western Pacific Fishery Management Council and approved by the Secretary of Commerce. As specified by Amendment 7 (1991) to the FMP, the National Marine Fisheries Service (NMFS) annually determines the harvest guidelines for the fishery. The harvest guidelines are expressed as the maximum number of lobsters (spiny and slipper lobsters combined) that may be harvested by permit holders from each of the four established fishing grounds: Necker Island, Maro Reef, Gardner Pinnacles, and all other NWHI areas combined or Area 4. The harvest guidelines are based on NMFS estimates of the exploitable (harvestable) lobster population at the beginning of each fishing season (July 1). In 1999, the NWHI exploitable lobster population was estimated to be 1,870,000 lobsters and the harvest guideline for the entire fishery was determined to be 243,100 lobsters (spiny and slipper lobsters combined). This total NWHI harvest guideline was allocated among the four established lobster fishing grounds as follows: Necker Island, 54,600 lobsters; Gardner Pinnacles,

27,690 lobsters; Maro Reef, 89,570 lobsters; and Area 4 (all other areas combined), 71,240 lobsters. During the 1999 lobster season, six boats participated in the fishery, which is limited to a maximum of 15 permits (i.e. 15 vessels). The harvest guideline is derived by using a constant harvest rate (13% of the estimated exploitable lobster population) which is associated with a 10% risk of overfishing, as specified by the FMP. NMFS scientists used a risk-based simulation model to compute harvest rates for a variety of risk levels of overfishing.

During the fishing season, the boat captains report to NMFS the amount of lobsters and number of traps deployed on the lobster grounds each day via a satellite-based vessel monitoring system. When the harvest guideline of a lobster ground is reached, NMFS closes that ground until the next season. The fishery automatically closes on December 31 each year unless all the individual (bank-specific) harvest guidelines are reached earlier. Federal regulations also specify the number of traps that are allowed on a lobster boat, the number and dimensions of escape vents required for each trap, areas prohibited to lobster fishing, etc. In 1996, FMP Amendment 9 removed the minimum size requirements for harvesting lobster and prohibition on the harvest of reproductive (berried) lobster females resulting in an optional "retain-all" fishery. As a result, fishermen are not required to return decked undersized lobsters and berried females to the ocean, as was the case prior to Amendment 9. The basis for this retain-all fishery was an apparently high discard mortality rate caused by handling techniques on board the vessel, predation by sharks, and displacement of lobsters. Under the amendment every lobster brought on board the vessel, whether kept or discarded, must be counted against the harvest guideline. The Council approved the retain-all fishery which is believed to be the most effective management regime for the NWHI lobster fishery at this time.

II. Purpose and Need for Action

On February 3, 2000, NMFS scientists calculated preliminary year 2000 estimates of the NWHI exploitable lobster population. Their calculations yielded an estimated exploitable population of 1,495,000 lobsters, which would result in a harvest guideline of 194,350 lobsters for the entire NWHI archipelago (calculated as 13% of the exploitable population, which corresponds to a 10% risk of overfishing as specified in Amendment 9 to the FMP).

However NMFS scientists noted increasing uncertainty in model parameter estimates, as well as violations of model assumptions, and concluded that the estimates of exploitable populations for the year 2000 lobster fishery may not be accurate and should be viewed with extreme caution. These results were presented to the Scientific and Statistical Committee of the Western Pacific Fishery Management Council (SSC) and, based on preliminary results from tagging conducted in 1998-1999, the SSC recommended that a bias-adjustment factor be incorporated into the calculation. NMFS scientists reviewed and agreed with the rationale behind this adjustment and subsequently refined their calculation, which resulted in an estimated exploitable population of 679,000 lobsters (leading to a harvest guideline of 88,270 lobsters).

The underlying concern with these population estimates revolves around the use of mixed species, spatially disaggregated data in an algorithm designed to estimate aggregated, single species populations. When this model was developed, the FMP called for one harvest guideline for the entire NWHI archipelago. In 1998, a regulatory amendment to the FMP was implemented in response to a pattern of intense fishing effort at several well-known and productive banks (Necker Island and Maro Reef). Under this regime, the archipelago's harvest guideline is distributed among four fishing areas (Necker, Maro, Gardner Pinnacles and All Other), with each area closing when its harvest guideline is taken. However, the accuracy of the model's estimates of spatially disaggregated exploitable populations is now under question.

Specific concerns include the assumption that homogeneous population dynamics exist between banks; the assumption that there is constant recruitment throughout the NWHI; the assumption that the model's catchability estimates are correct; the assumption that natural mortality is constant and equal to 0.456, irrespective of species, age, or sex; and the assumption that commercial CPUE is a reliable index of lobster abundance in the NWHI.

Questions surrounding the first assumption have arisen from recent advances in NMFS' understanding of the spatial structure of NWHI lobster populations and the dynamics of larval transport, which indicate that lobster populations in the NWHI constitute a metapopulation. A metapopulation is a group of populations inhabiting discrete patches of suitable habitat whose dynamics are linked by the dispersal of individuals

between patches. These dynamics cannot be adequately modeled either by treating the system as a single homogeneous population, or by treating it as a set of totally homogenous subpopulations.

The second assumption has been called into question by recent research surveys done at Necker. The data from these surveys has revealed a more than 80% drop in mature spiny lobster CPUE, from 4.2 to 0.5 between 1988 and 1999. These data imply that recruitment at Necker is not constant and may be declining. Clearly this assumption is invalid for Necker and consequently its use throughout the model is a second area of concern.

Concerns over catchability estimates (q) have arisen as a result of conflicting information among data from the commercial fishery, recent tagging data, and a 1997 Leslie depletion experiment. While the model estimates catchability at Necker (based on commercial fishery data) to be 2.79×10^{-6}, 1998/1999 tagging data gives a catchability estimate of 4.6×10^{-6} for this site, and a 1997 Leslie depletion experiment data yielded a result of 4.9×10^{-6}. There are significant differences between these results and because estimates of exploitable populations are based on an assumed relationship between population size and relative abundance (N=CPUE/q), the possibility of errors in this term is disturbing.

The assumption that natural mortality is constant for all areas, species, ages and sexes is believed to be incorrect given that there are biological differences between spiny and slipper lobsters. However, there is insufficient biological data on slipper lobsters to estimate demographic parameters for this species. Nor is there sufficient information on variations in mortality rates between areas, sizes and sexes of lobsters.

The assumption that commercial CPUEs are reliable indicators of lobster abundance in the NWHI is particularly troubling. The distribution of lobsters is patchy and fishermen are known to exploit and move between these patches to achieve the highest catch rates possible. Relying on this data to estimate exploitable populations will likely result in biased estimates.

Concerns also exist over the model's use of a combined species' (spiny and slipper) commercial CPUE to estimate exploitable populations, data despite biological and behavioral differences between the species, and a switch in catch composition seen in this fishery. For the period 1990-1996,

slipper lobsters comprised an average of 19% of the NWHI catch, while for the period 1997-1999 slipper lobsters averaged 56% of the catch.

Finally, despite generally reduced harvests from Area 4 (All Other) in the 1990s as compared to the 1980s, there appears to be a lack of rebuilding of lobster populations, as indicated by commercial CPUEs. For example, the 1986 combined CPUE for Raita Bank was 1.32 lobsters per trap, while the 1998 combined CPUE for this bank was 0.26 lobsters per trap, despite the fact that only 25,000 lobsters were harvested from this bank in the intervening 11 years. A similar lack of rebuilding is observed across the NWHI when catch rates from the 1980s are compared to those from the 1990s (Table 1). The average annual NWHI catch for the years 1983-1989 was 1.8 million lobsters, with a CPUE of 2.59. For the years 1990-1999 the average annual catch was 323,000 lobsters, and by 1999 the NWHI CPUE had declined to 1 lobster per trap haul. Harvest guidelines which limit total harvests were implemented in 1991, however these have failed to maintain catch rates at levels comparable to earlier years.

Table 1. Reported catches for the NWHI lobster fishery.

Year	Number of active vessels	Number of lobsters caught	Average CPUE (spiny and slipper lobsters combined)
1983	4	243,700	3.77
1984	11	1,279,000	3.44
1985	16	2,739,100	2.63
1986	16	2,475,500	1.91
1987	11	1,216,200	1.51
1988	9	1,566,400	1.86
1989	11	1,821,100	1.71
1990	14	1,546,300	1.31
1991	9	402,500	1.35
1992	12	850,400	1.24
1993	0 (season closed)	0	NA
1994	5	270,100	1.60

1995	1 (experimental fishing only)	101,200	1.58
1996	5	187,600	1.63
1997	9	310,200	1.75
1998	5	224,500	1.31
1999	6	236,115	1.00
2000	0 (season closed)	0	NA

Based on the above problems, and the reductions in both catches and catch rates in the NWHI, NMFS closed the NWHI commercial lobster fishery for the 2000 lobster season as a precautionary measure. NMFS scientists are continuing work to refine the model used to estimate exploitable populations, as well as to gather fishery independent data which can be used to reassess the model's assumptions and parameters. A charter tagging cruise is planned for the spring and a research cruise for the summer. Last year's emergency closure of the fishery was authorized under section 305(c) of the Magnuson-Stevens Fishery Conservation and Management Act based on recent data suggesting low recruitment in the fishery.

Upon recommendation by NMFS, the Council, at its 107th meeting 28 November-1 December 2000, agreed to keep the NWHI lobster fishery closed through 2001, and Area 4 closed through 2002. This was due to increasing uncertainty in its ability to estimate the exploitable population and an apparent lack of rebuilding of the lobster population.

III. Alternatives

Four alternatives for the year 2001 NWHI lobster fishery have been considered. These alternatives range from an open fishery with a harvest guideline of 243,100 lobsters to a fishery closed to all commercial lobster fishing, and are presented below.

Alternative 1 (Status Quo) - Open the fishery on 1 July 2001, using the 1999 harvest guideline (last year a fishery occurred)of 243,100 lobsters distributed among the four established lobster grounds as in 1999: Necker Island = 54,600; Gardner Pinnacles = 27,690; Maro Reef = 89,570; all other NWHI areas combined (Area 4) = 71,240.

Alternative 2 - Open the fishery on 1 July 2001, with a harvest guideline of 88,270 lobsters distributed among the four established lobster grounds as follows: Necker Island = 35,230; Gardner Pinnacles = 17,550; Maro Reef = 35,490; Area 4 = 0.

Alternative 3 - Open the fishery 1 July 2001, with a harvest guideline of 194,350 lobsters distributed among the four established lobster grounds as follows: Necker Island = 58,110, Gardner Pinnacles = 28,860, Maro Reef = 85,150 and Area 4 = 22,230.

Alternative 4 (Preferred) - Extend the closed season through 31 December 2001 (no 2001 NWHI commercial fishery) and through 31 December 2002 in Area 4.

IV. Affected Environment

The NWHI consist of a string of islets, banks, and reefs extending 1,500 nautical miles northwest of the main Hawaiian Islands, from Nihoa Island to Kure Atoll. The NWHI crustacean fishery, which has operated for nearly 20 years, is a distant-water trap fishery with the red spiny lobster (*Panulirus marginatus*) and common slipper lobster (*Scyllarides squammosus*) as the primary target species. Other lobster species: ridgeback slipper lobster, Chinese slipper lobster, and even the green spiny lobster are caught in relatively small numbers. Much of the NWHI lobster fishery occurs in federal waters of the U.S. exclusive economic zone (3 to 200 nm offshore). The maximum sustainable yield for this fishery has been determined to be in the range of 236,000 to 435,000 spiny lobsters per year. There are a maximum of 15 transferable limited access permits issued for this fishery; in 1998 and 1999 five and six vessels fished, respectively (only one of those participated in both seasons). The participants in this fishery have realized ex-vessel revenues averaging $1.1 million during the last two seasons (approximately $200,000 per vessel).

The current FMP defines overfishing based on the use of a Spawning Potential Ratio, which is the ratio of the equilibrium spawning biomass per recruit for a given value of F (fishing mortality) to the equilibrium of spawning biomass per recruit in the absence of fishing. The lobster stocks in the NWHI would be considered overfished if this ratio was equal to or below 0.20; however, current estimates of SPR is near 0.70. Nevertheless, the productivity of lobster stocks does appear to have

substantially decreased from the level when the fishery began. Whereas the stocks were once thought to be capable of producing an annual harvest of about 1 million lobsters with an adult biomass of about 1.4 million lobsters, the current level of productivity is much lower. Changes in environmental conditions are believed to have caused this decline. Research indicates that lobster abundance around Laysan Island, which is a refugium and closed to lobster fishing, has decreased to the same degree as elsewhere in the NWHI. There has also been reduced productivity in other populations, e.g., reduced reproductive success of seabirds and Hawaiian monk seals. It has been hypothesized that decadal scale oceanographic processes may affect the recruitment of lobster in the northwestern portion of the NWHI more than the southwestern portion. Much uncertainty remains regarding the relationship between spawning and recruitment of lobsters for some banks. Further, the inter-annual variations in the strength and locations of the subtropical countercurrent (one of the measures of these decadal fluctuations) may affect lobster larval transport at many locations in and around the NWHI.

Preferred Alternative: The Preferred Alternative is anticipated to preserve and enhance the productive capability of the fishery's target lobster stocks as well as any incidentally caught species that include Kona crab, eels, octopus, hermit crabs, and reef fish. This alternative is not expected to have any impact on ocean or coastal habitat, and will assuage perceptions of potential prey interactions with endangered or threatened species and marine mammals. The NMFS Regional Administrator has determined that continued closure of the NWHI lobster commercial fishery will have no effect on Federally-listed species or modify critical habitat designated under the Endangered Species Act.

However, continuing the fishery closure into a second year (and Area 4 into a third year) will have negative economic impacts on fishery participants who rely on this fishery for a portion of their annual income. Although all participants also engage in other fisheries, the NWHI lobster fishery occurs during a comparatively slow season for their alternate fisheries and as such represents an important component of their annual activities. Although the relative importance of this fishery to participants is undetermined, it may be roughly considered to be equal to 25% to 33% (three to four months) of their annual gross revenues. This is based on analysis of a representative Hawaii-based longliner, which is estimated to gross $649,000

annually (inflation adjusted from 1993 data, the latest complete information available). Of the 15 permit holders in this fishery, seven also hold Hawaii longline permits and three have West Coast crab permits. The remainder participate in high seas albacore fisheries, or do not have vessels at this time. It is likely that vessel owners will recoup some of these potential losses through continued fishing in their present locales; however, the extent to which lost lobster income will be recovered is unknown. This fishery has not been a consistently profitable undertaking, but it represents an important revenue source to fishery participants. The opportunity to participate in the 2001 NWHI lobster fishery and derive associated revenues will be lost to fishery participants for a second consecutive year under the Preferred Alternative. The number of fishery participants directly impacted is likely to be less than the 15 permit holders as only 10 vessels have participated in the fishery during the past two seasons, five in 1998 and six in 1999 (one of these vessels participated in both seasons). However, all permit holders will be vulnerable to even further reductions in the value of their permits. Seasonal markets for NWHI lobster will also be adversely affected due to an interruption in supply under the Preferred Alternative. Because this is a relatively small fishery, marketing of its product has been challenging as wholesalers and retailers prefer predictable and reliable supply sources. However, a reputation for a locally produced quality product has been established and buyers willing to participate on a seasonal basis have been found. The Preferred Alternative will have a negative impact on these connections and reestablishment of market channels may be difficult when the fishery reopens. Despite these negative impacts, the Preferred Alternative is expected to promote a sustainable fishery which will have greater positive impacts on fishery revenues and participants in the long term, and which will be less prone to disruptive fishery closures.

The Preferred Alternative has raised a concern by NMFS scientists over the lack of lobster stock data. They recommend that an charter research tagging program occur during the spring, prior to the summer lobster research cruise.

Alternatives not Selected: Alternatives that include commercial fishing were rejected as not addressing the concerns raised by NMFS scientists in a sufficiently precautionary manner. These concerns include the reliance on a single species model despite a shift in catch composition to include a mixed harvest, significant drops in catch-per-unit effort (CPUE) in some banks

of the Area 4 NWHI lobster ground, a more than 80% drop in CPUE of mature lobsters at Necker Island which implies low recruitment, and preliminary analysis of new tagging data indicating a possible underestimation of catchability coefficients. In addition, despite significant reductions in fishing effort throughout the NWHI, a lack of appreciable rebuilding of lobster populations has been observed.

No significant progress was made by NMFS scientists in 2000 to resolve their concerns for uncertainty. Additional time and research data is needed.

V. Conclusions and Determination

a. The Preferred Alternative will not jeopardize the productive capability of the target species or any related stocks that may be affected by the action.

b. The Preferred Alternative will not cause damage to ocean or coastal habitat.

c. The Preferred Alternative will not have an adverse impact on public health or safety.

d. The Preferred Alternative will not have an adverse effect on endangered or threatened species or any marine mammal population.

e. The Preferred Alternative will not result in cumulative adverse impacts that could have a substantial effect on the target species or any related stocks that may be affected by the action.

f. The Preferred Alternative will not have any effect upon flood plains or wetlands, nor upon any trails and rivers listed, or eligible for listing, on the National Trails and Nationwide Inventory of Rivers.

Finding of No Significant Impact

Based on the information contained in this environmental assessment, I have determined that the Preferred Alternative, for continued closure of the Northwestern Hawaiian Islands crustaceans fishery through 2001 (Area 4 through 2002), would not significantly affect the quality of the human environment, and therefore, preparation of an environmental impact statement

is not required under the National Environmental Policy Act or its implementing regulations. Therefore, a finding of no significant impact is appropriate.

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William Hogarth Dated
Acting Assistant Administrator for Fisheries

Appendix B. Regulatory Impact Review/Initial Regulatory Flexibility Analysis

I. Summary

The National Marine Fisheries Service (NMFS) has prepared this Regulatory Impact Review and Initial Regulatory Flexibility Act Analysis (RIR/FRFA) on the continued temporary closure of the Northwestern Hawaiian Islands (NWHI) Crustaceans Fishery as part of the regulatory review of this action.

In 2000, an emergency closure of the fishery was authorized under section 305(c) of the Magnuson-Stevens Fishery Conservation and Management Act as a result of recent data suggesting low recruitment in the fishery. As the same reasons for the emergency closure still apply, a continued temporary closure is being proposed through framework action. Executive Order 12866 (E.O. 12866) requires that a Regulatory Impact Review be prepared for all regulatory actions that are of public interest. This review provides an overview of the problem, policy objectives, and anticipated impacts of the action, and ensures that management alternatives are systematically and comprehensively evaluated such that the public welfare can be enhanced in the most efficient and cost effective way. In accordance with E.O. 12866, the following is set forth: (1) 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; (2) This rule is not likely to create any serious inconsistencies or otherwise interfere with any action taken or planned by another agency; (3) 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; (4) This rule is not likely to raise novel or policy issues arising out of legal mandates, or the principles set forth in the Executive Order. Based on these findings, this rule is determined not be significant under E.O. 12866.

The Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*) (RFA) requires that agencies assess and present the impacts of their proposed actions on small business entities. In accordance with the RFA, the following is set forth: (1) The need for, and objective of, the rule are outlined in the Environmental

Assessment which accompanies this document; (2) The proposed rule applies to the individuals who own the 15 permits in the NWHI limited entry crustacean fishery; (3) All 12 individuals in this fishery are small business entities; (4) No new reporting requirements are required by this rule; and (5) No Federal rules are known to duplicate, overlap, or conflict with this rule.

Based on the fact that vessel owners normally use their vessels in other fisheries when not engaged in the NWHI lobster fishery, and not every permit holder participates in the NWHI lobster fishery, it is anticipated that under this action, individuals will either not come to Hawaii (for non-Hawaii based participants) or will not gear up for the year 2001 NWHI lobster fishery (for Hawaii-based participants), instead choosing to remain in their current locales and fisheries. However, although loss of revenues expected to accrue from the 2001 NWHI lobster fishery may be partially or fully recouped in other fisheries, these losses are anticipated to average $200,000 per vessel and as such represent a considerable portion of their annual revenues. The relative magnitude of this fishery to these vessels' annual performance is not clear as vessels participate in a suite of other fisheries, including other Hawaii fisheries, high-seas fisheries, and U.S. west coast and north Pacific fisheries.

II. Purpose and Need for Action

This information is provided in the Environmental Assessment which accompanies this document.

III. Alternatives

Four alternatives for the year 2001 NWHI lobster fishery have been considered. These alternatives range from an open fishery with a harvest guideline of 243,100 lobsters to a fishery closed to all commercial lobster fishing, and are presented below.

Alternative 1 (Status Quo) - Open the fishery on 1 July 2001, using the 1999 harvest guideline (last year a fishery occurred)of 243,100 lobsters distributed among the four established lobster grounds as in 1999: Necker Island = 54,600; Gardner Pinnacles = 27,690; Maro Reef = 89,570; all other NWHI areas combined (Area 4) = 71,240.

Alternative 2 - Open the fishery on 1 July 2001, with a harvest guideline of 88,270 lobsters distributed among the four established lobster grounds as follows: Necker Island = 35,230; Gardner Pinnacles = 17,550; Maro Reef = 35,490; Area 4 = 0.

Alternative 3 - Open the fishery 1 July 2001, with a harvest guideline of 194,350 lobsters distributed among the four established lobster grounds as follows: Necker Island = 58,110, Gardner Pinnacles = 28,860, Maro Reef = 85,150 and Area 4 = 22,230.

Alternative 4 (Preferred) - Extend the closed season through 31 December 2001 (no 2001 NWHI commercial fishery) and through 31 December 2002 in Area 4.

IV. Economic Impacts of Alternatives on Vessel Operators

The participants in this fishery have realized average ex-vessel revenues of $1.1 million (approximately $200,000 per vessel) during the last two seasons that the fishery was open (1998-99). A continued fishery closure, will deepen the negative economic impacts on fishery participants who rely on this fishery for a portion of their annual income. Although all the participants engage in other fisheries, the NWHI lobster fishery occurs during a comparatively slow season for their alternate fisheries and as such represents an important component of their annual activities. Although the relative importance of this fishery to participants is undetermined, it may be roughly considered to be equal to 25% to 33% (three to four months) of their annual gross revenues. This is based on analysis of a representative Hawaii-based longliner, which is estimated to gross $649,000 annually (inflation adjusted from 1993 data, the latest complete information available). Of the 15 permit holders in this fishery, seven also hold Hawaii longline permits and three have West Coast crab permits. The remainder participate in high seas albacore fisheries, or do not have vessels at this time. It is likely that vessel owners will recoup some of these potential losses through continued fishing in their present locales; however, the extent to which lost lobster income will be recovered is unknown, and likely to be less than that realized from lobster fishing. Necessary data to precisely calculate the percentage of income derived from this fishery include information on participation in other fisheries (costs and revenues) as well as costs associated with this fishery. Lacking these data, this analysis focuses on impacts to average

annual ex-vessel revenues yielded by the NWHI lobster fishery. Although this fishery has not been a consistently profitable undertaking due to variations in revenues derived from allowable harvests and numbers of participants (Table 1), it represents an important revenue source to fishery participants.

Table 1. Participation and ex-vessel revenues from the NWHI lobster fishery.

Year	Number of active vessels	Total fleet revenue	Average revenue per vessel
1983	4	$621,000	$155,250
1984	11	$2,943,000	$267,545
1985	16	$5,888,000	$368,000
1986	16	$6,006,000	$375,375
1987	11	$3,972,000	$361,091
1988	9	$5,034,000	$559,333
1989	11	$6,295,000	$572,273
1990	14	$4,889,000	$349,214
1991	9	$1,028,000	$114,222
1992	12	$2,116,000	$176,333
1993	0 (season closed)	NA	NA
1994	5	$835,000	$167,000
1995	1 (experimental fishing only)	$300,000	$300,000
1996	5	$1,268,000	$253,600
1997	9	$1,881,000	$209,000
1998	5	$1,039,000	$207,800
1999	6	$1,208,000	$201,333
2000	0 (season closed)	NA	NA

Levels of participation fluctuate as permit holders make decisions about the expected value of each upcoming season as compared to alternate opportunities available to their vessels.

The 1999 season (average ex-vessel revenues of $200,000 per vessel, with an average ex-vessel price of $5.12 per lobster) is used as a baseline, however the actual number of participants under any scenario is difficult to predict and would affect the percent of total fishery revenues accruing to any one participant.

Alternative 1 (Status Quo) - Under this alternative it is estimated that active participants would realize ex-vessel revenues of $200,000 per vessel.

Alternative 2 - Under this alternative it is estimated that active participants would realize ex-vessel revenues of $75,324 per vessel. This represents a reduction of $124,674 (62%) in average ex-vessel revenue as compared to the 1999 season.

Alternative 3 - Under this alternative it is estimated that active participants would realize ex-vessel revenues of $199,014 per vessel. This represents a reduction of $986 (0.5%) in average ex-vessel revenue as compared to the 1999 season.

Alternative 4 (Preferred) - Under this alternative the opportunity to participate in the 2001 NWHI lobster fishery, and its associated revenues will be lost to all 12 permit holders. This represents a loss of $200,000 in ex-vessel revenues per vessel as compared to the 1999 season. Some of these losses may be recouped by participation in other available fisheries, however the extent to which this will happen is unknown.

V. Description of Small Businesses to Which the Rule will Apply

The number of fishery participants directly impacted is likely to be less than the 12 permit holders as only 10 vessels have participated in the fishery in the past two seasons when the fishery was open, five in 1998 and six in 1999 (only one vessel participated in both seasons), however all permit holders will be vulnerable to reductions in the value of their permits. All permit holders are considered to be small business entities.

This fishery is primarily a frozen lobster tail fishery concentrating on export markets, although live lobsters have been landed by boats specially outfitted with circulating seawater holding tanks. In 1999,the NWHI lobster fishery produced a total of about 236,000 lobsters generating a revenue

of little more than $1.2 million. The maximum sustainable yield for this fishery has been estimated to be between 236,000 - 435,000 spiny lobsters per year. This is a seasonal fishery, with fishing activities usually lasting approximately two months and associated gearing up and gearing down taking an additional two months. Vessels normally take one to two trips per season, each carrying four to five crew members in addition to the captain. A 1988 survey found the average vessel length to be 90' overall and the average capital investment in fishing vessels and gear to range from $370,000 to $1.2 million per vessel.

VI. Other Effects

Seasonal markets for NWHI lobster will be affected by a continued interruption to supply under the Preferred Alternative. Because this is a relatively small fishery, marketing of its product has been challenging as wholesalers and retailers prefer predictable and reliable supply sources. However a reputation for a locally produced quality product has been established and buyers willing to participate on a seasonal basis have been found. The Preferred Alternative will have a continued negative impact on these connections and reestablishment of market channels may be difficult when the fishery does reopen, following a two-year closure. Other impacts include a potential loss of seasonal jobs for the 30-40 crew members as well as a loss of product (and associated profits) for shoreside processors and wholesalers. The value of lost fishing employment is included in the ex-vessel revenues, however the loss to shoreside processors and wholesalers is unknown as they do not reveal their profit margins. If this margin is assumed to be 10%, a fishery closure with a loss of $1.2 million in ex-vessel product would represent a loss of $120,000 to these businesses. Vessel suppliers of gear, fuel and bait would also be impacted by a fishery closure. The cost to this group is uncertain however a seasonal fishery of five to six vessels is likely to represent a small portion of these businesses' total annual revenues. Despite these negative impacts, the Preferred Alternative is expected to promote a sustainable fishery which will have greater positive impacts on fishery revenues and participants in the long term, and which will be less prone to disruptive fishery closures. Further, alternatives which include commercial fishing were rejected as not addressing continued concerns for the status of the lobster resources in a sufficiently precautionary manner given the

concerns raised by NMFS scientists. These concerns, that have yet to be resolved by NMFS, include the reliance on a single species model despite a shift in catch composition to include a mixed harvest, significant drops in catch-per-unit effort (CPUE) in some banks of the Area 4 NWHI lobster ground, a more than 80% drop in CPUE of mature lobsters at Necker Island which implies low recruitment, and preliminary analysis of new tagging data indicating a possible underestimation of catchability coefficients. In addition, despite significant reductions in fishing effort throughout the NWHI, a lack of appreciable rebuilding of lobster populations has been observed.

However, NMFS scientists are also concerned over the loss of data if there is a complete closure of the fishery, under the preferred alternative. They recommend that an charter research tagging program occur during the spring of 2001, prior to the summer lobster research cruise.

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