Overcapacity Assessment Project Summary

There is substantial overcapacity in many fisheries in the U.S. and elsewhere. That is, the existing fishing fleets are willing and able to catch substantially more than the target catch levels (TCLs) of many stocks of fish, where the TCLs are the catch levels that will sustain stocks at or allow the stocks to rebuild to levels that can support productive fisheries and ecosystems and viable fishing industries. The TAC is an example of a short-run TCL and MSY and MEY are examples of a long-run TCL. Addressing the problems of overcapacity is a high priority because excessive levels of fishing capacity can make it more difficult to meet conservation and management objectives, including the following seven broad objectives:

1. Sustainable levels of catch and the subsequent biological, ecological, social, and economic benefits;
2. Bycatch that is minimized to the extent practicable;
3. Efficient or economically viable harvesting and processing operations;
4. Stable/viable fishing communities;
5. Fishery management programs that are not unnecessarily costly, complex and intrusive;
6. Safe fishing operations; and
7. Habitat conservation.

In the U.S., the management of most federally managed fisheries is a shared responsibility of the Regional Fishery Management Councils (Councils) and NOAA's National Marine Fisheries Service (NOAA Fisheries Service or NMFS). With respect to addressing the problems of overcapacity, the responsibilities of NOAA Fisheries Service include its commitments to do the following:

1. Determine and conduct the types of assessments that will:
    a) Meet the commitment to prepare regular assessments of overcapacity in federally managed fisheries and
    b) Be useful to the Councils and NOAA Fisheries Service as they continue their efforts to address the problems of overcapacity.

2. Assist the Councils in obtaining additional information they can use to:
    a) Assess the need to decrease fishing capacity;
    b) Assess progress in addressing the problems of overcapacity; and
    c) Design and assess alternatives to address those problems more effectively.

To assist in meeting these two commitments, NOAA Fisheries Service held an overcapacity workshop last September in Washington DC and plans to hold a second workshop in early 2006. The objective of the workshops is to have productive discussions that will assist in determining the types of overcapacity assessments that will generate the most useful information for the Councils and NOAA Fisheries Service as they continue their efforts to assess and address the problems of overcapacity.

The first workshop focused on the fundamental assessment issues that need to be addressed before the most useful types of assessments of overcapacity can be identified and conducted. The discussions of those fundamental issues were used as a basis for identifying useful types of assessments. The workshop participants represented seven of the eight Councils, two Regional Offices (SERO & PIRO), three Science Centers (AKC, SWC & NEC), and four HQ Offices (IA, Policy, SF, & ST).

The analytical methods that can be used to conduct different types of assessments will be addressed at the second workshop, which will be held in La Jolla, March 28-30.

The attached draft report on the first workshop provides more specific information on this project.

D R A F T

Report on the First Overcapacity Workshop

September 7 – 9, 2005

Washington DC

Prepared

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Table of Contents

1. Introduction

There is substantial overcapacity in many fisheries in the U.S. and elsewhere. That is, the existing fishing fleets are willing and able to catch substantially more than the target catch levels (TCLs) of many stocks of fish, where the TCLs are the catch levels that will sustain stocks at or allow the stocks to rebuild to levels that can support productive fisheries and ecosystems and viable fishing industries. The total allowable catch (TAC) is an example of a short-run TCL and maximum sustainable yield (MSY) and maximum economic yield (MEY) are examples of a long-run TCL.

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In this report, a brief discussion of the United Nation Food and Agriculture Organization's (FAO) International Plan of Action for the Management of Fishing Capacity (International Plan) and the United States National Plan of Action for the Management of Fishing Capacity (National Plan), which were the basis for the assessment commitments listed above, is followed by brief summaries of the critical characteristics and points included in the case studies, highlights from the workshop

discussions of the fundamental issues, and a presentation of the directions for the next workshop that have been derived from those discussions. The recommendations prepared by Council staff who attended the workshop are presented in Appendix A.

Although this report includes information from the workshop materials that were prepared prior to the workshop, this report is an additional workshop document; it is not a substitute for any of the other workshop documents. The other workshop documents are as follows:

1. Defining and Assessing Overcapacity: A Background/Discussion Paper (August 30 Draft)
2. Overcapacity Workshop Description & Agenda (September 1 Draft)
3. Five Case Studies
    a) Thoughts Generated While Considering Overcapacity In The Surfclam And Ocean Quahog Fleet (Lee G. Anderson)
    b) The Atlantic Pelagic Longline Fishery (Chris Rogers)
    c) The International Bigeye Tuna Fishery (Chris Rogers)
    d) Federally Managed Fisheries Off Alaska: An Overview (Ron Felthoven)
    e) The Northeast Multispecies Fishery (John Walden)

2. The International and National Plans

NOAA Fisheries Service has been an active participant in domestic and international efforts to assess and address the problems of overcapacity. It was a key participant in the FAO technical and policy-level consultations of 1991-1999 that led to:

1. The Code of Conduct for Responsible Fisheries and
2. The International Plan of Action for the Management of Fishing Capacity.

2.1 The International Plan

The International Plan, which was adopted in 1999, is voluntary. Its immediate objective is for States (e.g., nations) and regional fisheries management organizations to achieve an efficient, equitable and transparent management of fishing capacity. It includes a call for each State to:

1. Conduct assessments of fishing capacity;
2. Improve its capability for monitoring fishing capacity; and
3. Develop, adopt and make public a national plan for the management of fishing capacity.

2.2 The National Plan

The National Plan of Action (NPOA or National Plan) was released August 2004. It includes:

1. A policy statement;
2. Goals; and
3. Five commitments.

2.2.1 Policy Statement

The four elements of the policy statement are presented below. The shared responsibility for addressing the problems of overcapacity is explicit in two of these elements.

1. It is the policy of NOAA Fisheries to use its authorities to help the Councils and industry manage capacity with the major objective of bringing about a reasonable balance between harvesting capacity and available resources.

2. Ultimately, levels of harvesting capacity should be sufficient to promote optimum use and resource sustainability.

3. Overcapacity in the harvesting sector should be addressed through one or more means with the goal of achieving significant and sustainable reductions in overcapacity.

4. A key element in this policy is the collaborative relationship between NOAA Fisheries and the Councils.

2.2.2 Goals

The three elements of the goals statement are presented below. As with the policy statement, the shared responsibility for addressing the problems of overcapacity is explicit in two of these elements.

1. The United States should eliminate or significantly reduce overcapacity in 25 percent of federally managed fisheries by the end of 2009 and in a substantial majority of fisheries in the following decade.

2. To meet this goal, NOAA Fisheries must determine and then periodically update the levels of overcapacity in managed fisheries, and that assessment requires the establishment of management targets, a responsibility of the Councils.

3. Decisions on which specific federally managed fisheries will require a capacity reduction program will be made pursuant to developments in the following two areas:
    a) completion of the national report on overcapacity, which NOAA Fisheries plans to finish in 2005/2006 and
    b) a process of detailed consultations with the Councils, the fishing industry, and other constituencies.

During the discussion of the goal statement, Council staff suggested using 2001 as the base year if that goal to "eliminate or significantly reduce overcapacity in 25 percent of federally managed fisheries by the end of 2009" is retained. NMFS staff noted that the goal can be changed and that they thought there is no reference to fishing capacity in the most recent NOAA Strategic Plan. After the workshop it was confirmed that:

1. There is no reference to fishing capacity or overcapacity in the NOAA Strategic Plan issued in September 2004;
2. There are limited references to fishing capacity and overcapacity in the NMFS Strategic Plan issued October 2004; and
3. Fishing capacity is not explicitly identified in the NMFS Performance Measures.

The limited references in the NMFS Strategic Plan were included in the following statements.

1. Over the next five years, NMFS will lead through NOAA's Ecosystem Goal Team the design and development of new programs and approaches to address longstanding barriers to reducing overcapacity and rebuilding overfished fisheries.

2. We work with the eight Regional Fishery Management Councils to end overfishing, reduce bycatch, conserve essential fish habitat, and rebuild depleted stocks through the development of fishery management plans and associated regulations. The Councils recommend management plans and amendments and we approve these management programs and implement and enforce needed regulations.

3. Toward this end, we seek improvements in fishing fleet and shoreside processing operations and reductions in overcapacity in fisheries.

2.2.3 Commitments for NOAA Fisheries Service

The five commitments for NOAA Fisheries Service are as follows:

1. Establish and, when necessary and appropriate, revise the medium and long-term national capacity reduction targets;

2. Prepare regular assessments of overcapacity in federally managed fisheries;

3. Work with the Regional Fishery Management Councils to reduce overcapacity in fisheries under their jurisdiction;

4. Convene a national meeting in 2005 that addresses, among other things, the capacity issue, where NMFS and its constituents can review progress and focus on future priorities; and

5. Help the Councils develop/prioritize goals for capacity reduction in specific fisheries.

2.2.4 Councils' Roles

Based principally on the policy and goals statements in the National Plan, the roles for the Regional Fishery Management Councils are as follows:

1. Establish the management targets (i.e., target catch levels) that will be used as the reference points in the periodic assessments of the levels of overcapacity;

2. Determine the need, objectives and appropriate methods for addressing the problems of overcapacity;

3. In cooperation with NOAA Fisheries Service, determine what to include as "federally managed commercial fisheries";

4. Assist in providing background information that will be used in addressing fundamental issues and conducting the assessments; and

5. Be aware of the fundamental issues related to assessing fishing capacity and addressing the problems of overcapacity.

3. Five Case Studies

Five case studies were used to identify fishery characteristics that are important for a discussion of the types of overcapacity assessments that will generate the most useful information for the Councils and NOAA Fisheries Service as they continue their efforts to assess and address the problems of overcapacity. The case studies are not intended to be assessments of fishing capacity or overcapacity for these fisheries. Neither are they intended to provide all the background information that one would need to conduct an assessment. Some of the highlights of each case study are presented below.

3.1 Thoughts Generated While Considering Overcapacity In The Surfclam And Ocean Quahog Fleet (Lee G. Anderson)

The following points are made.

1. Fisheries managers carried the common logic of "too many boats chasing to few fish" to its logical extreme and called it the overcapacity problem.

2. Their real concern was the need to keep the ability of our fleets to harvest fish roughly commensurate with the productivity of the fish stocks taking into account the stochasticity of the system and that currently some stocks are overfished.

3. Less consideration was given to:
    a) Distributional effects;
    b) Other social goals; and
    c) Efficiency.

4. Based on the FAO definition of fishing capacity, no regulations should be included as constraints in defining and assessing fishing capacity. In that case, the only way to eliminate overcapacity is to change the fleet size and in general there will be overcapacity if there are regulations that decrease catch.

5. The real problem is that we need to change things such that the ability of our fleets to harvest fish is roughly commensurate with productivity of the fish stocks. This will likely involve regulations which affect the size of the fleet and the output per boat.

6. Part time boats or "tied up" boats should be in the picture with the understanding that their situation can change (e.g., the number of trips can change).

A simple model with two species [surfclams (sc) and ocean quahogs (q)] and two fleets [one that can catch both species (i.e., sc and q) and one that can only catch sc] is used to make the following points:

1. Perhaps capacity is best measured in days fished which can be transformed into a production possibilities curve for fish depending on a vector of fish stock

characteristics, a vector of economic and technological parameters, a vector pertaining to standard operating procedures, and a vector of regulations.

2. The proper focus is perhaps on a definable fleet not on a species of fish.

3. The capacity of a fleet is perhaps best thought of as a production possibilities curve and the location on that curve is ephemeral.

4. Overcapacity for q in terms of potential extra harvest for q is not Capacity for q minus TCL for q, it is less than that because the dual purpose boats will use some of the excess days to harvest sc.

3.2 The Atlantic Pelagic Longline Fishery (Chris Rogers)

The following are among the critical characteristics and points that were discussed in the case study for the Atlantic Pelagic Longline Fishery.

1. This is a multispecies fishery in which gear may be modified to preferentially target bigeye tuna, yellowfin tuna, or swordfish by choice of hook/bait, depth of set, use of lightsticks, and day/night soak time.

2. Regardless of the intended target, a variety of species will be represented in the catch; these species include swordfish, yellowfin, bigeye, bluefin, albacore, mahi-mahi, wahoo, billfish, sharks, and turtles.

3. Many of the larger vessels are dedicated full-time to this fishery and follow the swordfish on seasonal migrations from the Grand Banks to the Caribbean and/or Gulf of Mexico. Some U.S. vessels have even tried fishing off South America and Southwest Africa.

4. Smaller vessels may have only seasonal access to swordfish as they migrate through the fishing areas accessible to these vessels from their home ports (especially the mid-Atlantic and southern New England). Many of these vessels switch to other fisheries on a seasonal basis (e.g., snapper/grouper, reef fish or sharks).

5. The fishery is managed under the dual authority of Magnuson-Stevens Fishery Conservation and Management Act (MSA) and Atlantic Tuna Conservation Act. Fishing vessels are subject to a limited access program and must have a combination of 3 permits: tuna (longline), swordfish (directed or incidental) and sharks (directed or incidental).

6. Domestic issues related to bycatch and gear conflict have dominated management of the fishery for the last decade. In fact, no definitive action has been undertaken to implement dedicated access privilege (DAP) programs in this fishery in part because NMFS' focus has been on bycatch issues.

7. Spatial and temporal closures and gear restrictions have been used to reduce the bycatch of turtles and specific species of finfish. For example, the Grand Banks swordfish fishery was closed for three years due to turtle bycatch.

8. The severe constraints placed on the harvesting sector (e.g., spatial and temporal closures, gear restrictions and regulatory discards induced by retention limits) and reduced ex-vessel prices (possibly due to increased levels of imports) have reduced profitability; therefore, the number of active vessels has declined in recent years and the U.S. swordfish quota (allocation from the International commission for the Conservation of Atlantic Tunas (ICCAT)) has not been taken since 1998.

9. Many shoreside suppliers noted that the pelagic longline fleet was a critical component supporting an infrastructure that had implications for other fisheries.

10. Spatial and temporal closures have been cited by the harvesting sector as a concern with respect to vessel safety. The suite of bycatch reduction measures has been cited by harvesters as diminishing the time windows and areas accessible to the pelagic longline (PLL) fleet, thus causing vessels to fish during marginal weather conditions.

3.3 The International Bigeye Tuna Fishery (Chris Rogers)

The following are among the critical characteristics and points that were discussed in the case study for The International Bigeye Tuna (BET) Fishery.

1. Pelagic longline gear is used in Atlantic, Pacific and Indian Oceans – generally targeted fishery (when employing deep set techniques) with some bycatch of swordfish, bluefin, yellowfin (YFT), albacore (ALB), and billfish.

2. Purse Seine in Atlantic, South and Eastern Tropical Pacific and Indian Oceans – mixed species fishery targeting small tunas, for delivery to canneries. The smaller tunas are BET, YFT and skipjack (SKJ).

3. Baitboat fisheries in East Central Atlantic and western Indian Ocean - mixed species fishery targeting small tunas (ALB, BET, YFT, SKJ) for delivery to canneries and fresh local markets.

4. Distant water fleets are typically at sea most of the year with dependence on at-sea support vessels and/or coastal state port access agreements.

5. Coastal state vessels operate seasonally with trips lasting several days to several weeks depending on range from home port and availability of fish.

6. Fleets are mobile and may shift oceans depending on management regime in effect and monitoring and control schemes.

7. Bigeye tuna are highly migratory and occur in all oceans.

8. Illegal, unregulated and unreported (IUU) fishing is a problem in all ocean areas.

9. Worldwide, many small communities may be dependent on local employment in baitboat fisheries and at canneries supporting the purse seine fleet.

10. Highly capitalized PLL fleets operate in distant waters and dependent communities are more diffuse.

Atlantic Ocean

11. The Atlantic purse seine and baitboat fleets are comprised of EC-France EC-Spain, Ghana and other flag vessels managed by EC companies in the east, and the Venezuelan fleet operates in the west.

12. There are two major Atlantic longline fisheries operated by Japan and Chinese Taipei, they accounted for 45% of the total catch in weight in 2002. China and the Philippines started fishing in 1993 and 1998, respectively.

13. ICCAT sets a TAC, country specific allocations and country specific vessel limits for major harvesting nations.

14. ICCAT has a time-area closure in place in the Gulf of Guinea (to protect small YFT and BET) because the minimum size regulation was ineffective.

15. Limits on, and/or concerns about, longline bycatch of turtles, swordfish and or billfish have led to voluntary shifts in fishing location for some ICCAT parties.

16. ICCAT limits the number of large scale vessels to be deployed for BET fishing by PRC, Chinese Taipei, Philippines and Japan. Minor harvesting nations (<2,100 t) are not subject to vessel limits.

17. With respect to purse seine fisheries, IATTC has committed to: “review on a regular basis, and modify if necessary, the methods for estimating fishing capacity and the capacity target level of 158,000 cubic meters of well volume.

18. To rebuild/protect bigeye tuna, ICCAT adopted a 4 year catch limit with country allocations in 2004.

Pacific Ocean

19. In the Pacific, longline vessels, particularly the larger ones, direct their effort primarily at bigeye, yellowfin, and albacore tunas.

20. With the expansion of the purse seine fishery in the EPO, the average percent of total retained annual catch of bigeye tuna taken by the longline fishery decreased from about 93% for 1970-1993 to 58% for 1994-2002.

21. In the eastern Pacific, IATTC implemented: (1) country specific PLL catch limits for bigeye tuna in 2004 and (2) country specific capacity limits on purse seine vessels in the mixed species tuna fishery.

22. Dolphin protection measures for the purse seine fleet that resulted in the use of fish aggregation devises (FADs) rather than setting on dolphins have affected the proportion of bigeye taken in purse seine fisheries.

23. There are no management measures yet in place in the western Pacific under Western and Central Pacific Fisheries Commission (WCPFC).

24. The average weight of fish in the catch of all fisheries combined has been below the critical weight (about 49.8 kg) since 1993, suggesting that the recent age-specific pattern of fishing mortality is not satisfactory from a yield-per-recruit standpoint.

25. The average weight of purse-seine-caught fish is currently about 10 kg, while the average weight of longline-caught fish is about 60 kg.

26. Recent catches are estimated to have been about 26% above the AMSY level.

27. Restrictions on both longline and purse-seine fisheries are necessary to rebuild the stock to the AMSY level in 10 years.

Indian Ocean

28. In the Indian Ocean, bigeye tuna is predominantly caught by industrial fisheries and appears only occasionally in the catches of artisanal fisheries.

29. Bigeye tuna is a target species for the main industrial longline fleets.

30. Japan, Indonesia and Taiwan, China have the major longline fleets fishing for bigeye tuna.

31. In 2003 the world-wide longline catch of bigeye tuna was 115,000 t.

32. Total catch of bigeye by purse seiners in the Indian Ocean in 2003 was 23,000 t.

33. Most of the bigeye catches reported under purse seiners are juveniles (under 10 kg), and this results in purse seiners taking larger numbers of individual fish than longliners.

34. Large bigeye tuna (above 30 kg) are primarily caught by longlines, and in particular deep longliners.

35. There are no management measures yet in place under Indian Ocean Tuna Commission (IOTC).

36. It is likely that current catches are still above MSY and it is possible that fishing effort has exceeded the effort that would produce MSY.

37. The current level in catch in numbers of juvenile bigeye tuna by purse seiners fishing on floating objects is likely to be detrimental to the stock if it continues.

3.4 Federally Managed Fisheries Off Alaska: An Overview (Ron Felthoven)

The following are among the critical characteristics and points that were discussed in the case study for the federally managed fisheries off Alaska.

1. Most vessels target multiple species during the year.

2. Around 20 different major species groupings of groundfish and shellfish are prosecuted.

3. Fisheries have wide variations in bycatch and species composition.

4. A majority of fisheries are geographically and temporally distinct.

5. Regulations limit fishers' options on entry into various fisheries.

6. Assumptions about constant catch composition required for some models may hold in aggregate.

7. There are wide ranges of vessel sizes, vessel types, gear types, and targeting strategies.

8. It is hard to argue that the entire fleet shares a similar "technology", as often required of production models.

9. We need to account for different modes of operation when estimating capacity.

10. All major fisheries are subject to a TAC, and typically bycatch limits for certain species.

11. Spatial and temporal closures are being used increasingly to spread out fishing to avoid localized depletion and to protect critical areas from trawl damage.

12. There are many complex, interlinked constraints underlying the existing catch levels.

13. Options for changing fishing gear/strategies are more limited than one might think.

14. Observed species compositions for a particular gear group may not be too flexible given the various license limitation programs, sideboard restrictions, and temporal and spatial restrictions.

15. DAP programs are used in some fisheries and are being considered for addition fisheries.

16. There are a variety of different incentives in different fisheries that should be considered in model specification and capacity estimation.

17. Fishing strategies and resulting product quality have changed in rationalized fisheries.

18. It can be important to distinguish changes in fishing strategies that may arise with changes in regulatory structure because customary and usual operating levels will likely differ, and in turn lead to different capacity estimates.

19. Alaskan fisheries are diverse and represent a broad range of fishing technologies, incentives, regulatory regimes, market conditions, species, and data availability.

20. To most accurately estimate the capacity for Alaskan fisheries, one may need to specify different models that incorporate the elements unique to each group. That can be a daunting and time consuming task.

3.5 The Northeast Multispecies Fishery (John Walden)

The following are among the critical characteristics and points that were discussed in the case study for the Northeast Multispecies Fishery.

1. The fishery includes 12 species.

2. It includes four management areas.

3. There are 19 species/stock combinations.

4. There are 11 stocks with biomass estimates and 6 stocks without them. (2 are missing)

5. There is a rebuilding plan through 2023 for one stock and rebuilding plans through 2013 for ten stocks.

6. There are seven stocks that do not need a formal rebuilding plan and there is one stock for which there is insufficient information to determine if a plan is required.

7. The regulations include:
    a) Days at Sea Regulations
    b) Area Restrictions
    c) Trip Limits
    d) Mesh Regulations
    e) Eastern Georges Bank Yellowtail Sharing Agreement
    f) Regulatory Relief Provided Through:
        i. Days-At-Sea Leasing
        ii. Sector Allocations.

8. There are 915 vessels with days at sea allocation.

9. There are 339 vessels that do not have a days at sea allocation, but do have a multispecies permit.

10. Trawl, gillnet and hook gear, respectively, accounted for 83%, 15% and 2% of the groundfish landings in 2003.

11. Vessel length, tonnage, horsepower, and crew size varied substantially within each gear group.

12. In 2004, groundfish accounted for a relatively small percent of the total catch of each of three vessels size classes (30-50', 50-75' and $\geq$75').

13. The top non-groundfish species landed by groundfish vessels were Atlantic herring, Atlantic mackerel, sea scallops, squids, monkfish, summer flounder, silver hake, Atlantic croaker, and stakes.

14. For each of the three vessel size classes, 80% of the groundfish landings were made by substantially less than 50% of the vessels in that size class.

15. For the vessels that accounted for 80% of the groundfish landings for each of the three size classes, groundfish landings accounted for a much larger percentage of their total landings than they did for each size class as a whole.

16. The top five species and the species composition of the landings of the groundfish vessels that accounted for 80% of the groundfish landings for each of the three size classes differed by vessel size class.

17. The following data are available to estimate fishing capacity:
    a) Outputs – Landings by Species by Trip
        i. Output Prices by Trip
        ii. Sea Sampled Trips also have Discards.
    b) Vessel Physical Characteristics
        i. Length, Gross Registered Tons, Horsepower, Hull Type
        ii. Mesh Size used on a Trip Basis
        iii. For Sea Sampled Trips, detailed information on vessel electronics.
    c) Variable Inputs
        i. Crew Size and Days at Sea on a Trip Basis
        ii. Area Fished.

18. Assessing capacity for the Northeast Multispecies Fishery is challenging.

19. Data are adequate for current assessments of excess capacity and overcapacity.

20. Estimates of future levels of capacity when stocks are rebuilt have also been completed.

21. We need input from the Councils on their goals and objectives. What type of fleet do they want to see? A small efficient fleet, or a large number of vessels that are highly restricted, or some other configuration?

3.6 Case Study Conclusions

The case studies identified characteristics of the fisheries that can affect what is assessed and how it is assessed. They demonstrated that: (1) many of our fisheries and fleets are multispecies in nature; (2) it is common for fishing vessels to participate in two or more fisheries, where fisheries are defined by area, gear and target species and where the fisheries can be managed under different fishery management plans (FMPs) and different Councils or different regional fishery management organizations; (3) a variety of regulations are used for many conservation and management purposes; and (4) the availability and quality of the data that can be used to estimate fishing capacity and overcapacity varies substantially by fishery.

4. Fundamental Issues

In the Workshop Agenda, the fundamental issues were identified in terms of 12 questions. Those issue statements/questions as modified during and after the September workshop are the topics of the following 17 subsection.

The lack of clarity and agreement concerning the definitions of fishing capacity, overcapacity and related concepts has hindered progress in assessing and addressing the problems of overcapacity. Specifically, it has led to both confusion and misunderstandings. Therefore, the definitions of fishing capacity and related terms that have evolved to date were reviewed prior to the discussions of most of those 17 fundamental issues. That review was based principally on FAO and NMFS reports.

With the umbrella definition it developed, NMFS defined "fishing capacity" as the maximum amount of fish a fishing vessel or fleet is able or willing and able to catch over a period of time (e.g., a year or a fishing season) given specified constraints and objectives. The term Aable@ refers to the amount of fish a fishing vessel or fleet is physically capable of catching, limited only by the following:

1. its fixed inputs (i.e., the physical characteristics of each vessel in the fleet including engine horsepower and various measures of vessel size, and, in some cases, the quantity and size of its gear);
2. readily available variable inputs (e.g., labor and fuel);
3. resource conditions (i.e., the status of stock conditions for the target and non-target species);
4. the state of the technology;
5. customary and usual operating procedures; and
6. as appropriate, other constraints including market conditions and some fishery regulations that may limit total catch. (Some of these constraints are reflected in "customary and usual operating procedures".)

The term Awilling and able@ refers to the choice by fishermen to catch fish subject to the constraints listed above and some objective such as output, profit, or revenue maximization or cost minimization subject to an output constraint.

This is referred to as the umbrella definition because depending on the choices made concerning the constraints and objectives to use and whether fishing capacity is defined in terms of what fishermen are able to catch or what they are willing and able to catch, different types of fishing capacity are defined.

NMFS has made a distinction between excess capacity and overcapacity in the National Plan and in other reports. In the National Plan, Aexcess capacity@ is defined as the difference between fishing capacity and actual harvest, and Aovercapacity@ is defined as the difference between fishing capacity and a management TCL given the stock conditions associated with that TCL. Therefore, either a change in fishing capacity or the TCL will change the level of overcapacity. Examples of management targets (i.e., TCLs)

are the TAC (total allowable catch), MSY (maximum sustainable yield) and MEY (maximum economic yield).

The related concepts that were reviewed include the following:

1. Engineering and Technical Capacity
2. Constrained Technological Capacity
3. Economic Capacity
4. Full Production Capability and National Emergency Production
5. Input Concepts of Capacity
6. Excess Fishing Capacity
7. Target Capacity
8. Technical Efficiency
9. Capacity Utilization
10. Capital Utilization

It was noted that although many of the concepts listed above are simpler to understand and apply either in a single species fishery or for a fleet that participates in only a single fishery, they have been extended to multispecies fisheries and multi-fishery vessels, but this has made the use of some of these concepts more tenuous (i.e., more difficult to apply or less relevant).

4.1 Why is addressing the problems of overcapacity a high priority?

In the materials prepared for the September workshop and during the workshop, the high priority that has been placed on addressing the problems of overcapacity was explained in terms of the ability of excessive levels of fishing capacity to contribute to six or more fishery management problems. A related and probably better explanation is that excessive levels of fishing capacity can make it more difficult to meet conservation and management objectives, including the following seven broad objectives:

1. Sustainable levels of catch and the subsequent biological, ecological, social, and economic benefits;
2. Bycatch that is minimized to the extent practicable;
3. Efficient or economically viable harvesting and processing operations;
4. Stable/viable fishing communities;
5. Fishery management programs that are not unnecessarily costly, complex and intrusive;
6. Safe fishing operations; and
7. Habitat conservation.

The following demonstrate that addressing the problems of overcapacity is recognized to be a high priority.

1. The preparation of the International and National Plans and subsequent national and international efforts to improve our ability to assess and address the problems of overcapacity.

2. The introductory comments made at the September workshop by three members of the NOAA Fisheries Senior Management Team:
    a) Bill Hogarth, Director;
    b) Jim Balsiger, Acting Deputy Assistant Administrator for Regulatory Programs; and
    c) Steve Murawski, Director of Scientific Programs and Chief Science Advisor.

3. The workshop participants represented:
    a) Seven of the eight Councils;
    b) Two Regional Offices (SERO & PIRO);
    c) Three Science Centers (AKC, SWC & NEC); and
    d) Four HQ Offices (IA, Policy, SF, & ST).

The list of workshop participants is in Appendix B.

4.2 What do we mean by "federally managed" fisheries?

The following three options were included in the background paper for the September workshop:

1. FMP fisheries;
2. FMP fisheries and other fisheries under federal fishery regulations; and
3. Domestic and international fisheries for which a federal fishing permit is required.

It was noted at the workshop that the differences among these definitions are a few special case fisheries and that it probably is appropriate to have each Council and Region determine the fisheries to be included. The discussion of this issue made it clear that there are few simple issues and that regional differences may occur for many issues.

4.3 Why will we initially focus on commercial fisheries?

Excess demand in recreational fisheries or overcapacity in the commercial fisheries can make it more difficult to meet the conservation and management objectives for the management of living marine resources. However, there are important differences in the motivations of commercial and recreational fishermen. Therefore, more research is required to determine what concepts and analytical methods should be used to assess the recreational fisheries' counterparts to fishing capacity, excess capacity and overcapacity in the commercial fisheries. The need for additional research should not prevent the Councils and NOAA Fisheries Service from improving the management of recreational fisheries in a variety of ways when it is appropriate to do so.

4.4 What are the roles for assessments of fishing capacity and overcapacity?

A discussion of the roles for assessments of fishing capacity and overcapacity was included in the Background/Discussion paper prepared for the workshop. There appeared to be general support for the two assessment commitments/roles for NOAA Fisheries Service that are identified above in the Introduction.

4.5 Is it feasible to prevent overfishing by just decreasing fishing capacity?

In most cases, it is possible but not feasible to prevent overfishing by only controlling the level of fishing capacity. This is the result of a combination of the following factors:

1. There are multiple objective for fishery management;
2. There are multispecies fisheries and multi-fishery vessels;
3. There are part-time vessels;
4. There is latent capacity;
5. There can be a difference between what a vessel is able to catch and what it is willing and able to catch;
6. There are fluctuations in the TCLs and fishing capacity; and
7. There is uncertainty concerning the actual level of fishing capacity.

Basically, if reducing fishing capacity is the only method used to prevent overfishing, the cost of preventing overfishing will be unnecessarily high and our ability to meet the other management objectives will be decreased.

There appeared to be general agreement that the degree to which it is feasible to prevent overfishing by only controlling the level of fishing capacity will depend on fishery and fleet-specific characteristics.

4.6 Should we use a single species approach to assess and address the problems of overcapacity?

During the workshop, the basis for, characteristics of and problems with a single species approach were discussed. The principal basis for this approach has two elements, they are:

1. The basic biological concern that in some cases overcapacity can make it extremely difficult to set the TCL at the appropriate level for each stock and to ensure that it is not exceeded and

2. The basic idea that if the fishing vessels are physically not capable of catching more than the true TCL, they cannot and will not catch too much fish.

The following statements were used to characterize this approach.

1. It is a species or stock-specific approach.

2. It includes assessing fishing capacity by species/stock.

3. It includes attempting to control fishing capacity by species/stock.

4. It includes defining overcapacity as the difference between fishing capacity and the TCL for a species or stock.

With respect to the problems of a single-species approach the following points were made.

1. Like a single species approach to fishery management, as apposed to an ecosystem approach, it has severe limitations because it ignores important ecological or economic interactions among species.

2. The most fundamental problem with this approach is that fishing vessels can change the species/stocks they target and the distribution of effort among species/stocks and fisheries.

3. If a fishing vessel or fleet catches more than one species and can vary the species composition of its catch, the maximum amount of fish it can catch given the relevant constraints is not defined by a single level of catch for each species. It is defined by its fishing capacity (i.e. production possibility) frontier, which depicts the combinations of maximum catch by species that are possible given the relevant constraints. A two dimensional representation of a fishing capacity frontier would depict the maximum amount of species A that it can catch for each level of catch for all other species combined. A point on or below that frontier (i.e., curve) can be used to depict the amounts of species A and all other species combined it caught or would have been expected to catch.

This was one of the most controversial issues at the workshop. There was no general agreement concerning the answers to the following three questions.

1. Should we assess fishing capacity by species/stock?

2. Should we attempt to control fishing capacity by species/stock?

3. Should we define “overcapacity” as the difference between fishing capacity and the TCL for a species or stock, as is done in the National Plan?

Among the workshop participants, the answers to each of the questions were yes, no and it depends. A focus on either the basic biological concern or a desire to use the definition of overcapacity included in the National Plan generally resulted in stronger support for the single species approach. Conversely, a focus on a broader range of concerns (i.e., objectives) and the ability and propensity of fishing vessels to change the species composition of their annual catch resulted in more opposition to this approach. Other

reasons for supporting or opposing this approach were not well articulated and, therefore, were less obvious.

The workshop discussions of this and other issues were the basis of the following list of criteria for useful regular assessments of overcapacity in federally managed fisheries. These criteria can be used to identify ways to address several of the fundamental issues. The criteria are listed below.

1. The assessments should be in terms of overcapacity as defined in the National Plan.

2. A standard output measure of capacity should be used.

3. Disaggregated, vessel level data should be used in our assessment models. Once this is done, we can then assess capacity for relevant groups (fleets, FMPs, etc.).

4. The assessment of capacity should reflect the fact that many fishing vessels participate in multispecies fisheries or multiple fisheries and account for all of the fishing activities of the fishing vessels that participate in federally managed commercial fisheries.

5. The assessments should recognize the ability and propensity of vessels to change the species composition of their annual catch. Therefore, if our models assume a constant catch composition, we should make the appropriate caveats or present auxiliary information.

6. Latent capacity should be addressed.

7. The assessments should be feasible given the data and resources that are expected to be available and it should be clear that data deficiencies (availability and quality) are a major limitation on our ability to assess fishing capacity and overcapacity.

These criteria suggest that a mixture of single-species and multispecies approaches should be used. Specifically, Criterion 1 (i.e., the use of the definition of overcapacity in the National Plan) is a single-species approach with respect to assessing and reporting overcapacity. However, Criteria 4 and 5 account for the multispecies nature of fishing operations, fisheries and fishing capacity. The proposal that was developed based on these criteria allows for species/stock specific estimates of fishing capacity and overcapacity without ignoring the multispecies issues. The proposal is presented in Appendix C.

4.7 Should we consider all of the fishing activities of a vessel when assessing its fishing capacity?

There was general agreement that the importance of considering all the fishing activity of a vessel depends on fishery and fleet-specific characteristics. Both the importance and difficulty of considering all fishing activities were discussed. Criterion 4 (i.e., account for all of the fishing activities) is included because when a vessel participates in multiple fisheries: (1) you cannot assess its fishing capacity accurately without considering all of its fishing activities and the interdependence of capacity among the fisheries in which it participates; and (2) the capacity utilization of a vessel with respect to a single fishery does not reflect the overall economic performance of the vessel and does not indicate whether there is economic waste.

The proposal discussed in Appendix C includes using the definition of capacity that is used by the U.S. Census Bureau, the Federal Reserve Board, and the Defense Logistics Agency in assessing full production capability (i.e., capacity) for many industries in the U.S. With that definition, capacity is defined in terms of the potential aggregate output of a plant. For a fishery, the counterpart of a plant is a fishing vessel. Therefore, with this proposal, the aggregate capacity of each fishing vessel would be estimated and all of its fishing activities would be accounted for.

4.8 What types of comparability of assessments are desirable and what levels of aggregation are useful?

The reasons that comparability across fisheries, regions or fleets will be limited were discussed. The following reasons were discussed.

1. The appropriate assessments for a fishery depend on fishery regulations and other fishery-specific characteristics.

2. The assessments that can be conducted depend on the data available for a fishery.

3. The estimates will depend on the quality of the data used in the assessments, and that will vary by fishery/region/fleet.

4. The results of a specific type of assessment will depend on the type and details of the assessment method used.

The following points were made.

1. The requirements for comparability depend on the purpose of the assessments. For example, inter-temporal comparability is important for tracking progress in decreasing overcapacity and intra-temporal comparability is important for setting priorities if the principal determinant of the prioritization is the level of overcapacity.

2. The level of overcapacity will not necessarily be the only or principal determinant of priorities for addressing the problems of overcapacity.

3. The degree of comparability can be evaluated and if necessary adjusted for only if there is sufficient information on the estimation processes that were used. That would include information on how most of the fundamental assessments issues being discussed are addressed in specific assessments.

4. We can address the tradeoffs between having comparable assessments of overcapacity and having more useful assessments for individual fisheries or fleets by assessing overcapacity in more than one way or by augmenting the estimates of overcapacity with additional information.

The use of a well established definition with a set of instructions will tend to increase comparability, but it will not eliminate all the factors that make it difficult to have comparable estimates across fisheries, regions and fleets. The proposal discussed in Appendix C includes the use of such a definition.

The need to have estimates at various levels of aggregation was discussed. For example, it was noted that a Council manages fishing capacity by FMP or for a group of FMPs; therefore, estimates by FMP are useful for many management purposes. However, the usefulness of estimates for fleets that operate across FMPs was also recognized. There was general agreement that the assessment of fishing capacity should begin at the vessel level. With the proposal discussed in Appendix C, estimates of fishing capacity can be provided from the most disaggregated level (by vessel and specie/stock) to a very high level of aggregation (i.e., total catch for all vessels on which the estimates are based).

4.9 Should fishing capacity be defined in terms of the amount of fish a fleet is able to catch or the amount it is willing and able to catch?

The discussion of this issue focused on the following questions.

1. When would it be useful to know what a vessel or fleet is able to catch?

2. When would it be useful to know what a vessel or fleet is willing and able to catch?

3. Which can we estimate given the data available for most fisheries?

4. How are the two likely to differ?

5. What are the implications of this dilemma (i.e., the two differ and it is more difficult to estimate the more useful of the two)?

It was noted and there was general agreement that:

1. Unless a precautionary approach is taken with respect to preventing overfishing that ignores many other objectives for managing fisheries and that ignores the alternative methods for preventing overfishing, it is generally more useful to

know what fishermen are willing and able to catch. That is, for a given set of constraints, it is generally more useful to know what they would have caught than what they could have caught.

2. The economic data and understanding of fisherman behavior required to assess what they would have caught are available for relatively few commercial fisheries in the U.S. or elsewhere.

3. With the data that are available for many fishing vessels, it is possible to either generate at least a rough approximation of what those vessels could have caught or determine if those vessels were fully utilized given normal operating conditions.

4. In some cases, what a fleet could have caught is greater than what it would have caught, and, perhaps, substantially greater.

5. In those cases, one implication of this dilemma is that the assessments of fishing capacity and overcapacity will at best provide rough approximations of what we want to estimate.

With the proposal discussed in Appendix C, the estimates are of the maximum level of catch that the vessel(s) could have been reasonably expected to catch under **normal** and **realistic** operating conditions fully utilizing the machinery and equipment in place. Therefore, they are estimates of what a vessel could have caught (i.e., what it was capable of catching).

4.10 Should we include latent capacity?

Latent capacity reflects the potential for non-participating fishing vessels and fishing vessels with relatively low levels of participation to participate more fully in a specific fishery. There was general agreement that latent capacity should be addressed. For example, it was suggested that capacity could be estimated with and without latent capacity to account for the potential of greater uncertainly with respect to the level and expected use of latent capacity. With the proposal discussed in Appendix C, capacity would be estimated for the vessels and equipment in place and ready to operate and the estimates are based on the actual species mix of each fishing vessel. Therefore, the estimates would not account for the latent capacity of vessels that could have either entered a fishery or redistributed their fishing effort to increase the proportion of catch accounted for by a specific species/stock. However, for a fishery with a limited access program, a comparison between the number of vessels that participated in the fishery in a recent year and the number of vessels that were permitted to participate in that fishery that year, taking into account the physical characteristics of both sets of vessels if feasible, would provide useful information concerning the latent capacity of permitted fishing vessels that did not participate in the fishery for which fishing capacity and overcapacity are assessed.

4.11 Which fishery regulations should be included in defining and assessing fishing capacity?

It was noted that it is necessary to clarify what regulations are included as constraints in defining and assessing fishing capacity because fishery regulations are critical in determining how much fish fishermen are able or willing and able to catch. The discussion of this issue focused on the following questions.

1. What is desirable?

2. What is possible?

3. What to do when it is very difficult to determine what is desirable and it is very difficult or impossible to accomplish what is desired?

There was not agreement on what is desirable. The options discussed were as follows:

1. Exclude the regulations that are used principally to control catch and

2. Exclude all regulations.

The difficulty of identifying the former and the questionable usefulness of the latter were noted.

There was general agreement that determining what fishery regulations to include as constraints in defining and estimating fishing capacity and then estimating what fishing capacity would have been without the other fishing regulations will be among the major challenges for implementing any proposal for assessing fishing capacity and overcapacity. For example, if TACs, days at sea limits or other fishing regulations have decreased the operating days for a fleet from 150 days per year to 50 days, it probably would be inappropriate to assume that 50 days reflect "normal and realistic operating conditions"; however, determining what a normal and realistic number of operating days is and what the associated catch would be will be a challenge. This problem is exacerbated when the "normal and realistic operating conditions" are not the same for all the vessels with similar physical characteristics in a fleet.

One option suggested for dealing with this problem was to: (1) use historic data or an engineering approach to identify the maximum number of days a vessel of a particular type could operate during a year under normal and realistic operating conditions; (2) use that estimate and each vessel's physical characteristics (e.g., net tonnage and engine power) to estimate the potential fishing effort each vessel could produce; (3) use the ratio of the estimate of potential effort to actual effort for a fleet to calculate the potential percentage increase in fishing effort; and (4) use that as a rough estimate of the potential percentage increase in aggregate catch for the fleet. There was not general acceptance of this option and no other options for dealing with this problem were proposed.

With the proposal discussed in Appendix C, the estimates are of the maximum level of catch that the vessel(s) could have been reasonably expected to catch under **normal** and **realistic** operating conditions fully utilizing the machinery and equipment in place. Therefore, the determination of **normal** and **realistic** operating conditions will include a determination of the regulations that will be included as constraints. This determination will be one of the topics for the second overcapacity workshop.

4.12 Is it relevant to assess the overcapacity of the current fleet for resource conditions that will not be attained for many years?

The following points were made during the discussions.

1. The fixed inputs of a fleet would be expected to change over time due to:
   a) entry;
   b) exit; and
   c) changes to vessels that remain in the fishery.

2. The estimates of fishing capacity would be subject to substantially more uncertainty than estimates for a current period.

3. The estimates would be potentially less relevant than related projections if the fleet is expected to change substantially by the time that stock condition is attained.

4. Capacity is a short-run concept; therefore, the use of this concept to address future conditions is questioned in the capacity literature.

5. As a stock recovers and as other determinants of fishing capacity change over time, the disparity between fishing capacity and the TCL can change.

6. The appropriate management actions will depend in part on the expected change in that disparity: therefore, estimates of the expected changes are useful for fishery management.

7. To estimate the expected change, we would need information concerning:

   a) The expected percentage changes in fishing capacity and the TCL from their current/recent levels to those associated with the rebuilt stock conditions;
   b) The expected rate of technical progress that would occur while the stock rebuilds;
   c) The species mix(s) that should be used; and
   d) Other expected changes to the fleet while the stock rebuilds.

8. Obtaining that information will require additional stock and fleet-specific research.

The proposal discussed in Appendix C eliminates the need to address this issue until the types of research mentioned above have been completed.

4.13 Can fishing capacity be controlled effectively by controlling the physical characteristics of the fleet?

The following points were made during the discussions.

1. The distribution of the aggregate levels of fixed inputs affects fishing capacity; therefore, restrictions on the aggregate levels of fixed inputs (e.g., the total engine power of the fleet) will tend to be less effective than restrictions on the numbers of vessels and the physical characteristics (e.g., engine power) of each fishing vessel.

2. As long as vessel owners and operators have sufficient incentives to increase fishing capacity, they will tend to do so by increasing the inputs that are not regulated.

3. Technological progress occurs and increases fishing capacity.

4. Changes in other factors, such as market and stock conditions, can increase or decrease fishing capacity.

5. Therefore, if limits on fixed inputs are used to control fishing capacity and if the incentives that lead to excessive levels of fishing capacity are not eliminated, more restrictive limits typically will need to be implemented periodically to prevent undesired increases in fishing capacity.

4.14 How should we resolve the other potential problems of using the definition of overcapacity in the National Plan?

In the National Plan, overcapacity is defined as the difference between fishing capacity and a management target catch level (TCL) given the stock conditions associated with that TCL. Therefore, an estimate of fishing capacity for the commercial fisheries and the specification of a TCL for the commercial fisheries are required to estimate overfishing for a specific stock or group of stocks. These requirements will not be met if any of the following circumstances occurs.

1. An aggregate TCL has not been specified.

2. The percentage of the aggregate TCL that may be taken by the commercial fisheries is not specified and a significant part of the TCL is taken in recreational or subsistence fisheries.

3. The TCL is in terms of total catch but the estimate of fishing capacity is in

terms of landed catch and there is a significant difference between the two.

4. Incomplete or inaccurate data for some fishing vessels preclude estimates of fishing capacity for a significant part of the fleet.

The proposal discussed in Appendix C does not address these potential problems for estimating overcapacity as defined in the National Plan. However, the auxiliary information that would be provided with this proposal (e.g., the estimates of capacity utilization and the estimates of the fishing effort that would have been required to take the capacity level of catch) would be even more useful when an estimate of overcapacity cannot be generated. That auxiliary information would not be affected by the four circumstances listed above because: (1) they are not dependent on a TCL or its apportionment among fisheries; (2) they can be reported in terms of landed catch if discard data are not available; and (3) they can be reported for the subsets of vessels for which there are adequate data to estimate fishing capacity.

4.15 What is the source of overcapacity?

There is general agreement that the source of the problem is that in most fisheries the current management regimes provide incentives for vessels owners to maintain or increase fishing capacity even when there is excess fishing capacity or overcapacity. Such incentives occur when individual vessel owners do not bear the full cost of their investment decisions, for example when they do not pay for the fishery resources (e.g., the fish) they use.

4.16 Should fishing capacity be reduced if there is overcapacity?

The answer depends on a variety of things such as:

1. The objectives for fishery management;

2. How a specific capacity reduction measure will affect the attainment of those objectives; and

3. The availability of better methods for addressing specific fishery management problems and attaining the management objectives.

Determining the answer to this question is principally a Council responsibility.

4.17 What is the measure of overcapacity and what are the other quantitative and qualitative indicators of excessive levels of fishing capacity and of success in addressing the problems of overcapacity?

There was substantial support for using the definition of overcapacity in the National Plan and for using a standard definition of capacity output. This is reflected in Criteria 1 and 2 (see Section 4.6). However, various quantitative and qualitative indicators of the

fishing capacity levels or the existence of overcapacity and of success in addressing the problems of overcapacity were discussed. For example, the following were proposed as possible real time indicators of potential changes in fishing capacity or capacity utilization.

1. Number of fishing vessels
2. Engine power
3. Gross tonnage
4. Vessel length
5. Vessel hold or well volume
6. Winch size
7. Electronics (e.g., GPS and fish finders)
8. Days at sea
9. Crew size

Such data are required to estimate fishing capacity and tracking these indictors over time provides information on some of the principal determinants of fishing capacity and capacity utilization. Items 2 – 6 could be measured as aggregates or averages for a fleet or sub fleet.

The following qualitative indicators of the presence of overcapacity are mentioned in the National Plan.

1. The biological status of the fishery (Is there overfishing or is the stock depleted?)

2. Management category (Has the source of the problem been addressed, that is, is the fishery open access, limited access, or are DAP programs used?)

3. Harvest-TAC relationship (Do catches exceed the quotas?)

4. TAC-season length (How is season length changing relative to the change in TAC?)

5. Total catch levels and their allocations (How contentious is the quota-setting/allocation process?)

6. Latent permits (What is the ratio of active to total permits?)

7. Catch-per-unit-of-effort in commercial fisheries (Are catch rates increasing or declining?).

The other identified indicators of progress in addressing the problems of overcapacity are:

1. The elimination of the source of the problem and

2. Progress with respect to meeting one or more of the seven broad conservation and management objectives discussed earlier.

The usefulness of assessments that would answer the following three questions was addressed briefly.

1. How tightly is fishing capacity constrained by existing regulations?

2. How much can it be increased within those constrains?

3. Are there likely to be incentives for individuals to increase their fishing capacity?

4.18 Other Issues

Both the capacity of foreign fishing vessels in the U.S. EEZ and the additional challenges for addressing the problems of overcapacity in international fisheries were discussed briefly and it was noted that the difficulties in assessing overcapacity need not prevent actions to decrease fishing capacity. The focus can be on management actions that will decrease the problems associated with overcapacity compared either to what they were or to what they would have been in the absence of those management actions.

5. Progress to Date

There has been substantial progress to date with respect to meeting the two assessment commitments identified in the Introduction.

1. NOAA Fisheries Service has conducted qualitative assessments of overcapacity and quantitative assessments of excess fishing capacity for many commercial fisheries and these assessments have been useful in preparing us to assess overcapacity.

2. We had productive discussions of a variety of fundamental issues/questions at the first workshop and many of those issues have been resolved.

3. Those discussions will help in developing the focus of the second workshop and in ensuring its success.

4. Criteria and a proposal for useful regular assessments of overcapacity have been developed.

APPENDIX A

COMMENTS AND RECOMMENDATIONS OF COUNCIL STAFFS REGARDING THE SEPTEMBER 7-9, 2005 MEETING ON FISHING CAPACITY

September 23, 2005

The Councils very much appreciated the opportunity for their staff to attend this meeting where many important issues were discussed. The staff in attendance also appreciated the opportunity that was provided for them to have a break-out group to develop and discuss their joint recommendations with Joe Terry and Rita Curtis for inclusion in reports on the workshop.

1. It will be problematic if the FAO assessment is later contradicted by the Council assessments and for that reason the staff in attendance recommend that the FAO assessment be nationally aggregated (not broken down by region, species or fleet). Regardless of how it is presented, we also recommend that it focus on the potential for overfishing rather than economic or other issues. This is consistent with the current definition as well as the FAO background on overcapacity issues and it does not weigh in on or constrict the consideration of efficiency and other issues that may be of specific interest to Councils. In addition, indicating that domestic fisheries could maintain current (or target) landings with less vessels or effort (and less inputs) could conceivably result in ESA and MMPA calls to reduce fishing even though that is not the focus of this exercise.

2. Any report made to the FAO (or elsewhere) should discuss the context, objectives, data, methodology (including shortcomings), assumptions and any caveats and other relevant information necessary for readers to fully understand the analysis and resultant conclusions.

3. The further commitment in the National Plan of Action to Aeliminate or significantly reduce overcapacity in 25 percent of federally managed fisheries by the end of 2009" may be hard to achieve depending on the benchmark year. In setting an achievable target, consideration needs to be given to the likely controversy and time required for Council processes as well as the lengthy NEPA and NMFS processing requirements. The goal may be reasonable if the benchmark year is 2001, but would be unrealistic if the benchmark is a more recent year, such as 2004 or 2005. For this reason we recommend that 2001 or the next earliest year appropriate be used as the baseline to gauge whether we meet this goal. It is likely that the FAO assessment will be regarded as the baseline and thus it should use the earliest appropriate year.

4. If NMFS has truly dropped this goal (e.g. it is not in NMFS= strategic plan or other goal setting documents) the NPOA should be revised to reflect this or else NMFS and the Councils will continue to be held responsible for it by the public and non governmental organizations (NGOs), whether it is subject to litigation or not.

5. If Atarget levels@ are to be used in any capacity assessments, they must be set by the Council that manages each fishery.

6. Similarly, any recommendations or assumptions about allocations between fisheries must be made by the Councils.

7. Councils should be given the opportunity to review and comment on the proposed objectives, data, methodologies (including the strengths and weaknesses of each) and assumptions (including their implications) before any assessments are conducted. Preferably these items would be presented at Council meetings by NMFS specialists who can answer the Council=s questions. Councils have a wealth of experience, information and in-depth understanding of their fisheries and can provide important insights that will allow the analysts to better understand the fisheries and to avoid erroneous assumptions. It will also increase the likelihood of acceptance of the output by the Councils. At a minimum Councils need to be provided an opportunity to review a write up of the proposed objectives, assumptions and methodologies as well as the pros and cons, and data needs for each.

8. Councils should also be given the opportunity to comment on the 12 Afundamental issues@ discussed at the meeting and the proposed means for resolving each issue before any assessments are conducted. As indicated, these form the foundation for any assessment and are thus very important. Although they were discussed at the meeting, Council staffs did not have adequate time to review or discuss them prior to or at the meeting and feel that these issues remain unresolved.

9. Frontier analysis can be useful for some objectives/management questions but the assumption that all vessels in a given group can potentially operate at the same levels as highliners may not be realistic. This should also be discussed with Councils before any assumptions are finalized.

10. The issue of latent effort should be carefully considered and discussed (e.g. latent effort is not always bad). This should also be discussed with Councils before any assumptions are finalized or assessments are conducted. Analysis of when and where latent effort might be activated would also be useful.

11. Councils should be included in the anticipated email to be sent to the regions and science centers that will give everyone a Aheads up@ to start thinking about which fisheries to include in the baseline assessment of capacity and outline a proposed schedule.

12. Council staff should be invited to attend subsequent capacity workshops and meetings as many issues remain unresolved. In addition, even a technical discussion about methodologies will have management implications which Council staffs can highlight.

13. The objectives of any assessment (i.e. what management question is being answered) should be clearly stated prior to deciding on a methodology or conducting analysis.

14. In order to be useful for Council management purposes, assessments should be done on (or within) an FMP basis while at the same time taking into account all activities of vessels fishing under the regulations of the FMP. In addition, fleet or regional basis assessments that cross FMPs may be needed in special circumstances. However, these latter assessments by themselves would not be sufficient to guide regional managers to make specific changes to address regional needs. Regional assessments by themselves could leave managers in the dark as to where changes need to be made. If capacity control measures are being considered via non-Council vehicles, that should be clearly stated and explained.

15. It would be useful to have a Atoolbox@ of methods available to analyze overcapacity as available data and specific objectives will often be important factors in determining the most appropriate method. Clear identification of the data needed to utilize each tool will help the Councils identify data needs, as required under the MSA, and set data collection priorities.

16. It would be ideal if all the assessments made for a particular objective/management question used the same methods and output units; however, leeway needs to be provided for regional differences in the types of data available and the contexts in which the questions are posed. Such differences may lead to variation among regions in the tools employed to address a particular objective or management question.

17. Any assessments should be accompanied by sensitivity analyses to provide additional information to Councils regarding which variables are key.

18. Assessments or other analyses that provide Awhat if@ scenarios would be extremely useful for Councils as they consider if and how to address capacity issues.

19. The umbrella definition of capacity needs to be explicitly clarified with respect to the differences between Acustomary and usual operating procedures@ one of the constraints referenced under the definition of the term Aable,@ and the additional constraint which distinguishes Aable@ from Awilling and able.@ The later constraint being choices fishermen make in response to Aobjectives such as output, profit, or revenue maximization applied or cost minimization subject to an output constraint.@ Such clarification will be useful in avoiding confusion in the dialog on this already fuzzy and complex issue.

APPENDIX B

WORKSHOP PARTICIPANTS

Name	Affiliation	Name	Affiliation
Lee Anderson	NMFS/Policy	Dan Holland	GMRI
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Erika Carlsen	NMFS/OIA	Vishwanie Mahara	SAFMC
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APPENDIX C

A Proposal to Meet the NOAA Fisheries Service Commitment to Prepare Regular Assessments of Overcapacity in Federally Managed Fisheries

The following two assessment commitments or roles for NOAA Fisheries Service were discussed during the Overcapacity Workshop last September.

1. Determine and conduct the types of assessments that will:
    a) Meet the commitment to prepare regular assessments of overcapacity in federally managed fisheries and
    b) Be useful to the Councils and NOAA Fisheries Service as they continue their efforts to address the problems of overcapacity.

2. Assist the Councils in obtaining additional information they can use to:
    a) Assess the need to decrease fishing capacity;
    b) Assess progress in addressing the problems of overcapacity; and
    c) Design and assess alternatives to address those problems more effectively.

Although this is a proposal for meeting the first commitment, using this proposal will provide: (1) part of the conceptual and analytical foundation for meeting the second commitment and (2) data sets that can be used in conducting some of the assessments that will be useful for meeting the second commitment. The latter is particularly important given that data deficiencies (availability and quality) were identified as a major limitation on our ability to assess fishing capacity and overcapacity.

This proposal is intended to meet the following criteria for useful regular assessments of overcapacity. The criteria are based on discussions during the September workshop.

8. The assessments should be in terms of overcapacity as defined in the National Plan.

9. A standard output measure of capacity should be used.

10. Disaggregated, vessel level data should be used in our assessment models. Once this is done, we can then assess capacity for relevant groups (fleets, FMPs, etc.).

11. The assessment of capacity should reflect the fact that many fishing vessels participate in multispecies fisheries or multiple fisheries and account for all of the fishing activities of the fishing vessels that participate in federally managed commercial fisheries.

12. The assessments should recognize the ability and propensity of vessels to change the species composition of their annual catch. Therefore, if our models

assume a constant catch composition, we should make the appropriate caveats or present auxiliary information.

13. Latent capacity should be addressed.

14. The assessments should be feasible given the data and resources that are expected to be available and it should be clear that data deficiencies (availability and quality) are a major limitation on our ability to assess fishing capacity and overcapacity.

The six elements of the proposal are listed below.

1. Use the definition of capacity that is used by the U.S. Census Bureau, the Federal Reserve Board, and the Defense Logistics Agency in assessing full production capability (i.e., capacity) for many industries in the U.S. (see the discussion of Full Production Capability at the end of this appendix).

2. Provide estimates of fishing capacity based on that definition but with capacity measured by weight or weight and value, not just value, and with capacity being measured for a recent year, not just a quarter. Ideally, weight would be of total catch and not just landed catch.

3. Use the definition of overcapacity presented in the National Plan.

4. Provide auxiliary information including the following:

    a) Estimates of capacity utilization.

    b) Estimates of the fishing effort that would have been required to take the capacity level of catch, where fishing effort is defined using days fished and the physical characteristics of a fishing vessel that best explain its fishing capacity. For example, it could be the product of the number of days fished and gross tonnage or engine power or a combination of the two.

    c) Fishery-specific comparisons between the number of fishing vessels that participated in a fishery the year for which fishing capacity is estimated and the number of vessels that were permitted to participate in that fishery that year, where the physical characteristics of a fishing vessel that best explain its fishing capacity are taken into account to the extent appropriate for a fishery. This is one method for addressing latent capacity.

5. Limit the initial assessment of overcapacity to comparisons of the recent level of fishing capacity to both the TCL (e.g., TAC) for the same year and the TCL for the rebuilt stock conditions, if these two TCLs differ. Note that for the purposes of this proposal, TCL refers to the TAC or its equivalent; therefore, the term TAC, which is more widely used will be used instead of TCL.

6. Postpone an assessment of overcapacity in terms of fishing capacity and a TAC, where both are for a preferred, long-run set of stock conditions that differs from the current set of conditions, until the types of research mentioned below have been completed.

By meeting the criteria listed above, this proposal would eliminate or substantially decrease some of the reasons for the lack of agreement at the workshop. Specifically, it uses an output measure of capacity that is both well defined and broadly used and accepted, it uses the definition of overcapacity in the National Plan and due to three characteristics of that definition of capacity the proposal decreases the concerns of some with the problems of applying that definition of overcapacity. Those three characteristics are as follows:

1. Capacity is estimated at the plant or vessel level; therefore, Criterion 3 is met.

2. All the production of a plant or vessel is accounted for; therefore, Criterion 4 is met.

3. The product mix of a plant or the species composition of a fishing vessel is held constant (i.e., a common expansion factor is applied to the actual level of production of all products in a period to estimate capacity output for that period); therefore, Criterion 5 is partially met because it is explicit that the estimates of fishing capacity by species are based on the actual species mix for that period and not on alternative feasible product mixes.

Criterion 5 is also addressed by the auxiliary information that would be provided (see elements 4 a - b) and Criterion 6 is addressed by element 4 c.

Another characteristic of that definition is that the resulting estimate of capacity can be less than, equal to or greater than actual output (e.g., catch). Typically, actual output would exceed capacity output if the plant or fishing vessel had been operating at the national emergency level of output.

The methods for estimating the catch expansion factor for each fishing vessel, the measure(s) of effort that will be used and the research that will be required to assess overcapacity for future stock conditions will be three of the main topics for the next workshop. Methods for ensuring adequate comparability of estimates across fisheries and regions will be another main topic.

With this proposal, an assessment of fishing capacity by species/stock would be generated based on both the expansion factor that is estimated for each fishing vessel and its actual species mix for that year. For each species/stock, the estimate of fishing capacity for all fishing vessels combined can be compared to the TAC to calculate overcapacity. The TAC, estimate of fishing capacity and the resulting estimate of overcapacity would be for the most recent year for which the required data are available.

This would address the issue of estimating overcapacity in terms of the TAC and fishing capacity for the stock conditions of a recent year. If the current TAC is less than the TAC for the preferred (e.g., rebuilt) long-run stock condition, the estimate of recent fishing capacity also could be compared to the latter TAC to determine if the current/recent fishing capacity exceeded that long-run TAC. If it did, it is clear that the fishing capacity of the current fleet would exceed the TAC once the stock is rebuilt and, even if the fleet did not change, there would be overcapacity after the stock recovers. However, if current/recent fishing capacity is less than the long-run TAC, we would need more information to determine if there would be overcapacity after the stock recovers to the desired long-run level. Specifically we would need information concerning the expected percentage changes in fishing capacity and the TAC from their current/recent levels to those associated with the rebuilt stock conditions. We also would want to address: (1) the expected rate of technical progress that would occur while the stock rebuilds; (2) what species mix(s) should be used; and (3) other expected changes to the fleet while the stock rebuilds. Determining the relative rates of change in fishing capacity and a TAC that would result from rebuilding a stock and addressing the other three issues listed above will require additional stock and fleet-specific research. Therefore, the initial assessment of overcapacity would be limited to comparisons of recent levels of fishing capacity to the TAC for the same year and the TAC for the rebuilt stock conditions. An assessment in terms of fishing capacity and a TAC, where both are for a future set of stock conditions, would not made until the types of research mentioned above have been completed.

The September workshop focused on the fundamental assessment issues/questions that need to be addressed before the most useful types of assessments of overcapacity can be identified and conducted. As noted in Section 4, the workshop discussions and this proposal resolve many of the fundamental questions.

Conclusion

It is clear that there are tradeoffs among the various types of assessments of overcapacity that were discussed at the workshop or that have been discussed since then. However, for the purpose of meeting the National Plan commitment to prepare regular assessments of overcapacity in federally managed fisheries, this proposal is intended to: (1) provide single-species/stock, FMP-based estimates of fishing capacity and overcapacity that account for all of the fishing activities of the fishing vessels that participated in federally managed commercial fisheries that year and (2) do that without ignoring the capacity literature and production modeling in which multi-species models are preferred for proper specification of the technology of a fishing vessel.

In implementing this proposal, it is critical that those who use the resulting species/stock-specific estimates of fishing capacity and overcapacity understand that the estimates are based on the actual species mix of catch in the year for which fishing capacity is being estimated. Therefore, they only reflect the catch by species that would have occurred if each fishing vessel fully utilized the machinery and equipment in place and if the species

mix did not change. The estimates both of capacity utilization and of the fishing effort that would have been required to take the capacity level of catch provide measures of the unused fishing capacity and fishing effort that could have been used in a variety of ways.

FULL PRODUCTION CAPABILITY

The proposal includes the use of the definition of capacity that is used by the U.S. Census Bureau, the Federal Reserve Board, and the Defense Logistics Agency in assessing full production capability (i.e., capacity) for many industries in the U.S. The following information concerning that definition was obtained from the U.S. Census Bureau web site: http://www.census.gov/cir/www/mqc1pag2.html. The indented text is taken directly from that web site.

> The Survey of Plant Capacity Utilization is conducted jointly by the U.S. Census Bureau, the Federal Reserve Board (FRB), and the Defense Logistics Agency (DLA). The survey collects data for the fourth quarter and includes number of days and hours worked; estimated value of production at full production capability; and estimated value of production achievable under national emergency conditions.

Recently, the term "full production capability" replaced the term "full production capacity". The following explanation of that term was taken from the instructions for the survey for 2004. The highlighting of certain text using **bold** type is as it appears in those instructions.

> This survey form primarily asks for 3 levels of operating capability of this plant in the fourth quarter of 2004:
>
> the market value of actual goods produced;
> the value of products that could have been produced if the plant was operating at full capacity in the fourth quarter; and
> the value of products that could have been produced if required in a national emergency.
>
> **Full Production Capability –** The maximum level of production that this establishment could reasonably expect to attain under **normal** and **realistic** operating conditions fully utilizing the machinery and equipment in place. In estimating market value at full production capability, consider the following:
>
> - Assume **only** the machinery and equipment in place and ready to operate will be utilized. Do not include facilities or equipment that would require extensive reconditioning before they can be made operable.
> - Assume **normal** downtime, maintenance, repair, and cleanup. If full production requires additional shifts or hours of operation, then appropriate downtime should be considered in the estimate.
> - Assume number of shifts, hours of plant operations, and overtime pay that can be sustained under **normal** conditions and a **realistic** work schedule.
> - Assume labor, materials, utilities, etc. are fully available.
> - Assume a product mix that was **typical** or representative of your production during the fourth quarter. If your plant is subject to short-run

variation, assume the product mix of the current period.

- Do not assume increased use of productive facilities outside the plant for services (such as contracting out subassembly work) in excess of the proportion that would be normal during the fourth quarter.

If producing **more than one product, sum** the market values of production at full production estimated for each product (assuming the same product mix) for a **total** value of full production for the plant.

SPECIAL NOTE: Your value of production at national emergency levels should be **greater than or equal to** your value of full production capability. If it is less than your full production capability, please review your computations.