

**APPENDIX 1. **REPORT FORMAT AND DESCRIPTION OF
METHODOLOGY FOR DETERMINING OVERFISHING
AND OVERFISHED STATUS****

The general format of this report remains the same as the 2004 report. The printed copy of the report provides an overview of status determinations made for stocks subject to overfishing, overfished, or approaching an overfished condition. Information related to necessary management actions to be taken and progress being made in rebuilding overfished stocks is provided in the supporting tables. This report differs from previous reports in that it incorporates the new Fish Stock Sustainability Index (see below), which replaces the major/minor distinction.

Overfishing determinations (the current fishing mortality rate compared to an identified threshold) and overfished determinations (the current biomass compared to an identified threshold) in the supporting tables are presented separately. Overfishing and overfished determinations should not be added, as this would result in double counting. Summaries should always be made of numbers of overfished stocks and numbers of stocks subject to overfishing, but not a combined status of the stocks. The categories not overfished and approaching an overfished condition are mutually exclusive. Any stock listed as approaching an overfished condition (estimated to become overfished within 2 years) is not included in the not overfished category, even though it is currently not overfished, to eliminate double counting. Overfishing and overfished definitions are provided in Appendix 2.

Fish Stock Sustainability Index

NMFS developed the Fish Stock Sustainability Index (FSSI) to track the outcome of building and maintaining fish stocks and complexes at productive levels and to incorporate the critical components of managing fish harvest rates and increasing knowledge about the status of fish stocks and complexes. The FSSI is based on a set of fish stocks and complexes selected for their importance to commercial and recreational fisheries. Stocks and complexes were selected for the FSSI using various criteria, including (1) the stock is a major stock (with landings greater than 200,000 pounds), (2) the stock was either overfished or subject to overfishing, (3) the stock was scheduled to be assessed within the next 5 years, and (4) the stock had been identified previously as important.¹ The FSSI will track 230 stocks and complexes over a 5-year period.

¹ *Some stocks identified in previous reports as “major” were excluded from the FSSI for one or more of the following: (1) they are managed under the Endangered Species Act; (2) they are managed on the basis of escapement rates, not biomass targets; (3) the overfishing and/or overfished status are unknown and are not likely to become known in the next 5 years; (4) determinations were made using pre-SFA status determination criteria and they are not likely to be reassessed in the next 5 years; (5) they are managed by state fisheries managers; or (6) no status determination criteria exist to assess the overfishing or overfished status nor will they likely exist in the next 5 years. Most of the minor stocks were not included in the FSSI because these species co-occur with other stocks but are not landed in large quantities, and they are not important to the targeted fishery.*

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The FSSI is calculated by assigning a score for each fish stock or complex based on the following rules:

Rule	Score
1. Stock has <i>known</i> status determinations	
a) <i>overfishing</i> status known	0.5
b) <i>overfished</i> status known	0.5
2. Fishing mortality rate is below the <i>overfishing</i> level defined for the stock (i.e., is not subject to overfishing)	1.0
3. Biomass is above the <i>overfished</i> level defined for the stock (i.e., is not overfished)	1.0
4. Biomass is at or above 80% of maximum sustainable yield (MSY) ² (this point is in addition to the point awarded for being above the <i>overfished level</i> .)	1.0
<i>Total possible score:</i>	<i>4</i>

The total score for each stock is obtained by adding the score from each rule, and the FSSI is computed by summing the individual stock scores. The maximum score a stock may have is 4, and the maximum value for the index is 920 (230 x 4). The information used to generate the FSSI score comes from the status determinations made in this report (i.e., overfishing/no overfishing, overfished/not overfished), as well as more detailed information on biomass levels (i.e., B relative to B_{MSY}). The biomass information is used to determine when stocks are managed at sustainable levels (for the purpose of FSSI, a stock with biomass at least 80 percent of B_{MSY} is considered “sustainably managed”), except for stocks that are rebuilding which must first achieve a biomass that is at least 100 percent of B_{MSY}.

The FSSI measures the outputs of NMFS’ efforts in several ways. First, it captures increased knowledge of our stocks. When assessments are conducted on stocks with a previously unknown status, the change from an unknown to a known determination ensures that management actions are based on a better scientific understanding of the stocks. Second, it emphasizes management goals that have been met where F has been reduced and maintained within target levels. Third, although more indirectly, the FSSI captures increasing abundance of the stocks, reflected in biomass levels. Restricting fishing effort (F) should result in increasing biomass levels. Over time, the increasing stock should (1) no longer be overfished, and (2) reach its target biomass level. Thus, both positive outputs and outcomes are reflected in the score of a stock.

Determining Status of Stocks

If the fishing mortality rate (F) is above the minimum fishing threshold, then overfishing is occurring. If the stock size is below the minimum stock size threshold, then the stock is

² A stock rebuilding from a previously overfished condition is not awarded the fourth point until it reaches MSY -- the largest potential long-term average catch or yield that can be taken from a core stock or stock assemblage under prevailing conditions -- as mandated by the Magnuson-Stevens Act. After a stock has been fully rebuilt, it may fluctuate within the 80% parameter and retain the score of 4 like the other non-rebuilding stocks.

overfished. As noted above, overfishing and overfished categories are separate determinations and should not be added together, as this may result in double counting for the stocks that are positive under both criteria.

In addition, if a stock size is expected to fall below the minimum stock size threshold within 2 years, then it is listed as approaching an overfished condition. Determinations are based on the criterion in the FMP or other official document for the overfished (biomass or B) component and trends in various indicators relative to that criterion. For some stocks, pre-SFA definitions, including proxy Maximum Sustainable Yield (MSY) and minimum stock size threshold, were used as a basis in determining whether a stock was approaching an overfished condition.

For salmon stocks contained in the West Coast Salmon FMP, determining whether a stock is approaching a condition of being overfished is based on a different, albeit analogous, set of criteria. A conservation alert is triggered during the annual preseason process if a natural stock or stock complex is projected to fall short of its conservation objective (MSY, MSY proxy, Maximum Sustainable Production (MSP₂), or floor, in the case of some harvest rate objectives) for 1 year. The criteria used by the PFMFC is more conservative than recommended under the National Standard Guidelines, and a 1-year departure from the MSY/MSP₂ spawner objectives does not necessarily mean the stock will be unable to produce MSY in the long term.

Status determinations may be based on fully approved status determination criteria (SDC) specifying both a maximum fishing mortality rate (F) threshold and a minimum stock size threshold, or determinations may be based on partially approved or fully disapproved definitions. If a partially approved definition exists in the FMP, the determinations were made using the approved portion of the definition and the pre-SFA definition in the FMP for the disapproved portion of the definition, if available. Many of these pre-SFA definitions have been contained in their respective FMPs for years, were approved prior to the SFA amendments, and remain the operative definition if the proposed SFA definition was disapproved. In some cases, a pre-SFA definition is not available on which to base a determination, resulting in a listing of *undefined*. For fully disapproved definitions, this year's report again uses the pre-SFA definition. If neither post- nor pre-SFA overfishing and overfished definitions are contained in the FMP, the stock will be listed as *undefined* in both categories.

Pre-SFA and Post-SFA Definitions

This report again divides the overfishing and overfished columns of the supporting tables into pre- and post-SFA overfishing definitions to make the basis for the determinations as clear as possible. The *approaching an overfished condition* column does not make a distinction between pre- and post-SFA. Because a stock is considered to be approaching an overfished condition if it is likely to become overfished in two years, the determination is generally based on stock level indicators and trends in fishing effort. The type of overfishing definition (pre- or post-SFA) used to determine if a stock is approaching an overfished condition is based on the criteria associated with the B

(overfished) component of the definition and trends in fishing effort. The printed copy does not distinguish between pre- and post-SFA determinations.

Year-to-year Comparisons

Because the SDC used to assess stocks contained in this report have changed over the years, it is difficult to make year-to-year comparisons of stocks. Removal of the third column (*overfished*) used in reports prior to 2000 also makes direct comparisons difficult. Nevertheless, the determinations in the fishing mortality rate column in previous years' reports can be compared to the determinations in the overfishing column this year. Likewise, the determinations in previous years' biomass column can be compared to the overfished column in this year's report.

Rebuilding Progress

Information is provided in the supporting tables on those stocks for which rebuilding programs are required. By identifying the type of management action required when overfishing is occurring or when a stock is overfished, it is possible to correctly note which stocks require reduction of the fishing mortality rate and which stocks actually require rebuilding plans. The progress of each rebuilding plan is indicated in the last column of the table, giving information about the number of years the program has been in place and the total number of years the program is expected to exist. Some plans were approved prior to the SFA amendments and are footnoted accordingly, and those for which there is no defined time line are also noted. For purposes of this report, December 2005 is used as the cutoff date for determining in what year the rebuilding plan is.

Any stock that has previously been listed, or is currently listed, as overfished is required to have a rebuilding program until the stock has been rebuilt to levels consistent with supporting MSY on a sustainable basis. Overfished stocks that do not have a rebuilding program are listed as *rebuilding program* in the Management Action Required column, which indicates that a rebuilding program is required for this stock. Overfished stocks that are listed as *continue rebuilding* in the Management Action Required column are currently rebuilding under an approved rebuilding program. Stocks listed as *not overfished - rebuilding* were previously below the minimum stock size threshold, are now above that level, but have not been rebuilt to the target levels specified in their rebuilding plans. These stocks are currently rebuilding under an approved rebuilding plan, and are listed as *continue rebuilding* in the Management Action Required column. It is important to note that the status of rebuilding stocks should not be considered as healthy until they have been fully rebuilt. Stocks listed as *to be developed* are stocks that have recently been declared overfished. These stocks are footnoted to indicate when the Council was notified of their overfished status, and the Council has one year from that date to submit a rebuilding plan.

METHODOLOGY FOR STATUS DETERMINATIONS

Basis for Determining Status of Overfishing

As required by section 304(e)(1) of the Magnuson-Stevens Act, the status determination for those stocks managed under an FMP or international agreement was based on the SDC (i.e., the overfishing definition) specified in the FMP or agreement, whenever possible (see Appendices 2 through 5). Prior to requirements under the SFA, most existing overfishing definitions were based wholly or in part on either a fishing mortality rate (F) or stock biomass (B), but not both. The SFA requires status determination criteria to specify both a maximum fishing mortality threshold or reasonable proxy thereof, and a minimum stock size threshold or reasonable proxy thereof. Thus, stocks must be assessed according to whether the maximum fishing mortality threshold is being exceeded and whether the stock is below the minimum stock size threshold. National Standard 1 guidelines (600.310 (d)(1)) specify that overfishing and overfished criteria should relate to the stock's ability to produce Maximum Sustainable Yield (MSY). Overfishing occurs whenever a stock or stock complex is subjected to a rate or level of fishing mortality that jeopardizes that capacity of a stock or stock complex to produce MSY on a continuing basis. An Overfished stock or stock complex is one whose size is sufficiently small that a change in management practices is required in order to achieve an appropriate level and rate of rebuilding.

In conformance with SFA requirements, this report identifies the status determination of stocks based on both the fishing mortality rate and stock biomass, wherever possible. The National Standard Guidelines require NMFS to determine whether the fishing mortality rate threshold is being exceeded or the biomass is below the established threshold for each stock. If either overfishing is occurring or a stock is being overfished, management action is required. For stocks in which overfishing is occurring, fishing mortality must be reduced so stocks can produce MSY on a continuing basis; for overfished stocks, rebuilding plans must be implemented so stocks can be rebuilt to the level necessary to produce MSY on a continuing basis. The following is a description of the basis for status determinations under a variety of scenarios associated with fully approved, partially approved, or fully disapproved definitions.

Fully Approved Definitions under the SFA: For those stocks contained in FMPs for which overfishing definitions were fully approved, status determinations were based on assessments using both the fishing mortality rate and biomass definitions, wherever possible. If the fishing mortality rate exceeded the established fishing mortality rate threshold, the stock was listed as *overfishing* occurring. If the biomass was below the established biomass threshold, the stock was listed as *overfished*. Stocks listed as *unknown* are those for which there is an approved overfishing definition, but for which no determination can be made because of insufficient information.

Partially Approved Definitions under the SFA: For those stocks contained in FMPs for which overfishing definitions were partially approved (i.e., for which only one of the two necessary criteria was approved), status determinations were based on the definitions currently in the FMP. For some stocks, determinations were made using a combination of the SFA approved definition, such as the fishing mortality rate, and the pre-SFA definition, such as stock level size. For other stocks, the only overfishing definition

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contained in the FMP is one component (fishing mortality or biomass) that meets SFA requirements. For these stocks, determinations were made using the SFA approved criterion, and the other component was listed as *undefined*. Stocks listed as undefined are those for which there is no status criterion by which to make a determination.

Definitions under the SFA That Are Fully Disapproved or Still under Review: For those stocks contained in FMPs for which the overfishing definitions were fully disapproved or are still under review, status determinations were based on previously existing definitions, and were assessed under pre-SFA guidelines. Similar to partially approved definitions, the overfishing or overfished determination was based solely on the status criterion available. When a status criterion is not available the stock is listed as *undefined*.

Stocks Contained in Federal FMPs for Which Definitions Do Not Apply: Some stocks contained in federal FMPs have never had an overfishing or overfished definition. Such stocks are usually minor and are contained in federal FMPs in which overfishing definitions exist, but the definitions do not apply to these stocks. The status of such stocks is listed as *undefined*.

Fully or Partially Approved Definitions Contained in Non-Federal FMPs Managed by Interstate Fishery Management Commissions: Although there are no SFA requirements for stocks contained in non-federal FMPs to have both a fishing mortality rate and biomass definition, some may contain one or both of these components. For stocks in which both components were approved, the status determination is based on these definitions. For stocks in which there is only one component to make a determination (either overfishing or overfished criteria), the status determination is based on the approved criteria, and the other component is listed as *undefined*. Pacific halibut, which is managed through an international treaty between the United States and Canada, is listed according to these same guidelines. Management measures are coordinated jointly by the PFMC and NPFMC in U.S. waters, and this regime is likely to continue.

Stocks Not Contained in Federal FMPs, Stocks Contained in Federal FMPs under Development, and Stocks Contained in Non-Federal FMPs Managed by Interstate Fishery Management Commissions for Which There Are No Definitions: For these cases, if overfishing definitions are available for either component, they will be used to make the status determinations. If definitions are not available the stock will be listed as *undefined*. If there is no basis for making a determination, the stock is listed as *unknown*.

Many of the stocks listed as overfished in this report have experienced excessive levels of fishing effort in recent years, and appropriate measures have been taken to reduce fishing mortality on these stocks. Other stocks may be listed as *overfished* because of prevailing environmental conditions, habitat degradation, or natural fluctuations in the stocks. These factors may have reduced the stock biomass to levels below that necessary to produce MSY on a continuing basis. Sometimes, management measures have little impact on the status of the stocks. For example, many of the Pacific salmon stocks under the PFMC jurisdiction are not significantly impacted in fisheries within the Council's jurisdiction. Other stocks are listed as threatened or endangered under the ESA, and management for

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these stocks is conducted under the ESA. Fishing effort has been appropriately reduced or eliminated, but the stocks remain overfished due to factors beyond the Council's control. Although the Councils, NMFS, and any management regime will make every effort to implement appropriate management measures, rebuilding programs may not necessarily restore some stocks to a healthy level, until these other factors are effectively handled.

Information regarding the status of stocks is continually evolving, and additional information has become available for some stocks. For those stocks for which there is updated information in a citable form, that information was used to determine the status of that stock in this report. It is recognized this approach does not include all "preliminary" information for each stock. However, this approach has been taken to minimize potential confusion as conclusions about stock conditions change with changes in "preliminary" information.