

GAO

Report to the Chairman, Committee on
Natural Resources, House of
Representatives

December 2008

**NATIONAL MARINE
FISHERIES SERVICE**

**Improvements Are
Needed in the Federal
Process Used to
Protect Marine
Mammals from
Commercial Fishing**



GAO

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Highlights of [GAO-09-78](#), a report to the Chairman, Committee on Natural Resources, House of Representatives

Why GAO Did This Study

Because marine mammals, such as whales and dolphins, often inhabit waters where commercial fishing occurs, they can become entangled in fishing gear, which may injure or kill them—this is referred to as “incidental take.” The 1994 amendments to the Marine Mammal Protection Act (MMPA) require the National Marine Fisheries Service (NMFS) to establish take reduction teams for certain marine mammals to develop measures to reduce their incidental takes. GAO was asked to determine the extent to which NMFS (1) can accurately identify the marine mammal stocks—generally a population of animals of the same species located in a common area—that meet the MMPA’s requirements for establishing such teams, (2) has established teams for those stocks that meet the requirements, (3) has met the MMPA’s deadlines for the teams subject to them, and (4) evaluates the effectiveness of take reduction regulations. GAO reviewed the MMPA, and NMFS data on marine mammals, and take reduction team documents and obtained the views of NMFS officials, scientists, and take reduction team members.

What GAO Recommends

GAO is proposing matters for congressional consideration, including requiring NMFS to report on the data, resource, and other limitations that prevent it from meeting the MMPA’s requirements for take reduction teams; and recommending that NMFS develop a comprehensive strategy for assessing plan effectiveness. The agency agreed with our recommendation to develop such a strategy.

To view the full product, including the scope and methodology, click on [GAO-09-78](#). For more information, contact Anu Mittal at (202) 512-3841 or mittala@gao.gov.

NATIONAL MARINE FISHERIES SERVICE

Improvements Are Needed in the Federal Process Used to Protect Marine Mammals from Commercial Fishing

What GAO Found

Significant limitations in available data make it difficult for NMFS to accurately determine which marine mammal stocks meet the statutory requirements for establishing take reduction teams. For most stocks, NMFS relies on incomplete, outdated, or imprecise data on stocks’ population size or mortality to calculate the extent of incidental take. As a result, the agency may overlook some marine mammal stocks that meet the MMPA’s requirements for establishing teams or inappropriately identify others as meeting them. NMFS officials told GAO they are aware of the data limitations but lack funding to implement their plans to improve the data.

On the basis of NMFS’s available information, GAO identified 30 marine mammal stocks that have met the MMPA’s requirements for establishing a take reduction team, and NMFS has established six teams that cover 16 of them. For the other 14 stocks, the agency has not complied with the MMPA’s requirements. For example, false killer whales, found off the Hawaiian Islands, have met the statutory requirements since 2004, but NMFS has not established a team for them because, according to NMFS officials, the agency lacks sufficient funds. NMFS officials told GAO that the agency has not established teams for the other stocks that meet the MMPA’s requirements for reasons such as the following: (1) data on these stocks are outdated or incomplete, and the agency lacks funds to obtain better information and (2) causes other than fishery-related incidental take, such as sonar used by the U.S. Navy, may contribute to their injury or death, therefore changes to fishing practices would not solve the problem.

For the five take reduction teams subject to the MMPA’s deadlines, the agency has had limited success in meeting the deadlines for establishing teams, developing draft take reduction plans, and publishing proposed and final plans and regulations to implement them. For example, NMFS established three of the five teams—the Atlantic Large Whale, Pelagic Longline, and Bottlenose Dolphin—from 3 months to over 5 years past the deadline. NMFS officials attributed the delays in establishing one of the teams to a lack of information about stock population size and mortality, which teams need to consider before developing draft take reduction plans.

NMFS does not have a comprehensive strategy for assessing the effectiveness of take reduction plans and implementing regulations that have been implemented. NMFS has taken some steps to define goals, monitor compliance, and assess whether the goals have been met, but shortcomings in its approach and limitations in its performance data weaken its ability to assess the success of its take reduction regulations. For example, without adequate information about compliance, if incidental takes continue once the regulations have been implemented, it will be difficult to determine whether the regulations were ineffective or whether the fisheries were not complying with them.

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Abbreviations

CV	coefficient of variation
ESA	Endangered Species Act
MMPA	Marine Mammal Protection Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
OMB	Office of Management and Budget

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United States Government Accountability Office
Washington, DC 20548

December 8, 2008

The Honorable Nick J. Rahall II
Chairman
Committee on Natural Resources
House of Representatives

Dear Mr. Chairman:

Marine mammals—such as whales, dolphins, and porpoises—often swim or feed in waters where commercial fishing occurs and can become entangled in fishing gear, which may seriously injure or kill them—this is referred to as “incidental take.” The National Oceanic and Atmospheric Administration’s (NOAA) National Marine Fisheries Service (NMFS) estimates that commercial fishing operations result in thousands of such incidental takes each year. For example, large whales, such as the North Atlantic right whale, may become entangled in the lines that connect lobster traps; smaller pilot whales may become entangled in longline fishing gear used to catch fish such as tuna or swordfish; and dolphins and porpoises may become entangled in commercial fishing nets used to catch sardines, salmon, or cod. For at least five marine mammals, incidental takes as a result of commercial fishing operations are occurring at unsustainable levels.¹

The 1994 amendments to the Marine Mammal Protection Act (MMPA) of 1972 require NMFS to establish take reduction teams to develop regulatory or voluntary measures for the reduction of incidental mortality and serious injury to marine mammals during the course of commercial fishing operations. Under the MMPA, NMFS, in general, must establish take reduction teams for each marine mammal strategic stock that interacts

¹These five marine mammals are (1) Western Atlantic stock of North Atlantic right whales, (2) Gulf of Maine stock of humpback whales, (3) Gulf of Maine/Bay of Fundy stock of harbor porpoises, (4) California stock of long-beaked common dolphins, and (5) Hawaii stock of false killer whales.

with a Category I or Category II commercial fishery.² These key terms are defined as follows:

- A commercial fishery is a group of fishermen who use similar gear to catch the same types of fish, in a common geographic area, and then sell them.
- A Category I fishery is a commercial fishery that has frequent incidental takes of marine mammals, while a Category II fishery has occasional incidental takes.
- A stock is a group of marine mammals of the same species located in a common spatial arrangement that interbreed when mature.

The MMPA defines a marine mammal stock as strategic, if it (1) is listed as threatened or endangered under the Endangered Species Act (ESA), (2) is declining and likely to be listed as a threatened species under the ESA within the foreseeable future, (3) is designated as depleted under the MMPA, or (4) has a level of direct human-caused mortality and serious injury that exceeds the stock's potential biological removal level. In this report we use the term "maximum removal level," rather than potential biological removal level; this term is defined as the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population.³

NMFS periodically surveys marine mammal populations to determine whether they are growing, remaining stable, or declining, so that it can calculate the maximum removal level. The results of this research are published in annual stock assessment reports for 156 stocks that fall under NMFS's jurisdiction. Additionally, NMFS annually publishes lists that

²Under 16 U.S.C. § 1387(f)(3), if there is insufficient funding available to develop and implement a take reduction plan for all stocks that meet the requirements, the Secretary of Commerce must establish teams according to the priorities listed in the statute. Further, under 16 U.S.C. § 1387(f)(3)(6)(A), the Secretary has the discretion to establish take reduction teams for any marine mammal stock that interacts with a Category I fishery and for which the Secretary has determined, after notice and opportunity for public comment, has a high level of mortality and serious injury across a number of such marine mammal stocks.

³Optimum sustainable population is defined by the MMPA as "with respect to any population stock, the number of animals which will result in the maximum productivity of the population or the species, keeping in mind the carrying capacity of the habitat and the health of the ecosystem of which they form a constituent element."

classify commercial fisheries as Category I, II, or III based on data such as those from observers who are placed on boats, logbooks that are kept by fishermen, and data gathered by scientists at universities and government agencies, among others, documenting instances where marine mammals are found stranded or dead as a result of fishing or other human causes.⁴

According to the MMPA, take reduction teams must include representatives from the commercial fishing industry, Regional Fishery Management Councils, interstate fisheries commissions, environmental groups, academic and scientific organizations, and state and federal governments. Once NMFS has established a team, the members meet, review the available information regarding marine mammal takes and fisheries interactions, and develop draft take reduction plans. The plans recommend regulatory and voluntary measures, such as modifications in fishing gear or practices that should reduce serious injury or mortality of marine mammals caused by commercial fishing. As specified in the MMPA, NMFS then translates these draft plans into final take reduction plans and implementing regulations.

The 1994 amendments to the MMPA set several deadlines for establishing take reduction teams, developing draft take reduction plans, and publishing proposed and final plans and implementing regulations. Specifically,

- NMFS must establish a take reduction team within 30 days after a final stock assessment report indicates that a stock is strategic and it is listed in the current list of fisheries as interacting with a Category I or II fishery.

⁴Specifically, a fishery is classified as Category I if it is by itself responsible for the annual removal of 50 percent or more of any stock's maximum removal level. A fishery is classified as Category II if it is one that, collectively with other fisheries, is responsible for the annual removal of more than 10 percent of any marine mammal stock's maximum removal level and that is by itself responsible for the annual removal of between 1 and 50 percent, exclusive, of any stock's maximum removal level. Category III fisheries have a remote likelihood of, or no known incidental mortality and serious injury of marine mammals. Specifically, Category III fisheries include, among others, those that collectively with other fisheries are responsible for the annual removal of 10 percent or less of any marine mammal stock's maximum removal level.

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- Take reduction team members must develop a draft plan and submit the plan to NMFS within 6 months after the take reduction team is established.⁵
 - NMFS must publish a proposed take reduction plan in the *Federal Register* within 60 days of receiving the team's draft plan.⁶
 - NMFS must hold a public comment period on the proposed take reduction plan for up to 90 days after its publication.
 - NMFS must publish a final take reduction plan in the *Federal Register* 60 days after the public comment period on the proposed plan ends.

As Congress prepares to consider the reauthorization of the MMPA, you asked us to determine the extent to which (1) available data allow NMFS to accurately identify the marine mammal stocks that meet the MMPA's requirements for establishing take reduction teams; (2) NMFS has established take reduction teams for those marine mammal stocks that meet the statutory requirements; (3) NMFS has met the statutory deadlines established in the MMPA for the take reduction teams subject to the deadlines, and the reasons for any delays; and (4) NMFS has developed a comprehensive strategy for evaluating the effectiveness of the take reduction plans that have been implemented.

To determine the extent to which available data allow NMFS to identify the marine mammal stocks that meet the MMPA's requirements for establishing take reduction teams, we identified several key data elements, such as human-caused mortality estimates and maximum removal levels, that NMFS uses to determine whether a marine mammal stock meets the statutory requirements for establishing a take reduction team, as well as the criteria NMFS uses to assess data quality for these key data elements.

⁵If a strategic stock has human-caused mortality and serious injury that is less than the maximum removal level and the stock interacts with Category I or II fisheries, this deadline is 11 months instead of 6 months. The deadline is also 11 months for nonstrategic stocks interacting with Category I fisheries that NMFS has found, after notice and public comment, to have a high level of mortality across a number of marine mammal stocks.

⁶If a take reduction team addressing a strategic stock whose human-caused mortality and serious injury is above the maximum removal level does not submit a draft plan to NMFS within 6 months, NMFS must publish a proposed plan within 8 months of the team's establishment. For strategic stocks whose human-caused mortality and serious injury is below the maximum removal level but that interact with Category I or II fisheries, NMFS's deadline is 13 months.

We then reviewed all of the 2007 marine mammal stock assessment reports and analyzed reports for the 113 stocks not currently covered by take reduction teams and not listed as threatened or endangered species or designated as depleted species. After removing those that lacked human-caused mortality estimates or maximum removal levels, we reviewed a sample of the remaining 74 stocks that did have these determinations to assess the reliability of the information used to determine human-caused mortality estimates and the maximum removal levels. We reviewed a sample of the reports for these stocks to identify any data uncertainties that may limit NMFS's ability to accurately identify stocks that meet the statutory requirements for establishing take reduction teams. To determine the extent to which NMFS has established take reduction teams, we analyzed stock assessment reports and lists of fisheries from 1995 through 2008 to identify marine mammal stocks that meet the statutory requirements but are not currently covered by a team. Additionally, we interviewed NMFS officials and obtained documentation on the stocks for which the agency has established take reduction teams. To identify the extent to which NMFS has met the deadlines established in the MMPA, we identified the deadlines listed in the MMPA for take reduction teams and obtained documentation, such as take reduction plans and implementing regulations, to determine whether NMFS met the statutory deadlines. To identify the reasons for any delays in meeting the statutory deadlines, we interviewed the NMFS staff members that coordinate the take reduction teams, staff from NOAA's Office of General Counsel, marine biologists in NMFS's Fishery Science Centers, and members of each of the five take reduction teams subject to the MMPA's deadlines.⁷ To identify the extent to which NMFS has developed a comprehensive strategy for evaluating the effectiveness of its take

⁷One team—the Atlantic Trawl Gear—is not subject to the statutory deadlines. NMFS established the Atlantic Trawl Gear take reduction team as a result of a settlement agreement ending the 2002 lawsuit brought by an environmental group. At the time of the settlement agreement, the stocks covered by the team were strategic and interacting with Category I fisheries. After conducting the research and surveys the settlement required, NMFS realized that the stocks were not strategic. NMFS chose to abide by the settlement agreement's requirement to establish the team despite this change in the strategic status because the stocks were interacting with a Category I fishery. The MMPA gives NMFS the discretion to establish teams for nonstrategic stocks interacting with Category I fisheries that NMFS has determined, after notice and public comment, to have a high level of mortality across a number of marine mammal stocks. However, at the present time, the fisheries involved are no longer Category I fisheries and NMFS has never made the required determination. The MMPA is silent on deadlines for teams, such as the Atlantic Trawl Gear team, that address nonstrategic stocks that do not interact with Category I fisheries. Therefore none of the deadlines apply to this team.

reduction plans, we reviewed data from stock assessment reports on the level of fishery-related mortality and serious injury as well as maximum removal levels before and after a plan's implementation. We also interviewed NMFS officials, including agency staff that coordinate take reduction teams, regarding how they assess the effectiveness of take reduction plans. We conducted this performance audit from September 2007 to December 2008 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives. Appendix I provides additional detail on our scope and methodology.

Results in Brief

Significant limitations in available information make it difficult for NMFS to accurately determine which marine mammal stocks meet the statutory requirements for establishing take reduction teams. For most stocks, NMFS relies on incomplete, outdated, or imprecise information about human-caused mortality or the maximum removal level to calculate whether incidental take is above acceptable levels and thereby determine if the stocks meet the MMPA's definition of "strategic"—one of two triggers for establishing a take reduction team. For example, our review of stock assessment reports found that NMFS did not have a human-caused mortality estimate or a maximum removal level for 39 of 113 marine mammal stocks, making it impossible to determine their strategic status in accordance with the MMPA's requirements. For the remaining 74 stocks, NMFS has some data to determine whether incidental takes exceeded acceptable levels, but these data have significant limitations that call into question their accuracy. Specifically, for an estimated 11 of the 74 stocks, the maximum removal levels were based on information that was 8 years old or older. Marine mammal research has shown that using such outdated data increases the possibility that significant population declines could have occurred of which NMFS is unaware. In addition, our review of a sample of stock assessment reports from 2007 frequently found that NMFS used population size and fishery-related mortality estimates that were less precise than recommended by the agency's own guidance, decreasing the likelihood that strategic status determinations based on this information are accurate. Relying on incomplete, outdated, or imprecise information about human-caused mortality and maximum removal levels may lead NMFS to overlook some marine mammal stocks that meet the statutory requirements for establishing take reduction teams or inappropriately identify others as meeting them. NMFS officials told us that funding

constraints limit their ability to gather sufficient data, although the agency has taken some steps to identify its data needs. For example, in a 2004 study, NMFS identified the actions and resources needed to improve the marine mammal stock assessment data that support MMPA decisions; however, officials told us that they have not received the resources necessary to complete the actions identified in the report.

On the basis of NMFS's available information, we identified 30 marine mammal stocks that met the MMPA's requirement for establishing a take reduction team, and NMFS has established six teams that cover 16 of them. For the 14 other marine mammal stocks for which the agency's available information shows them to be strategic and interacting with Category I or II fisheries, NMFS has not complied with the MMPA's requirement to establish take reduction teams and, in some cases, has not been in compliance for several years. NMFS officials told us that the agency has not established teams for these 14 marine mammal stocks for various reasons. First, the agency lacked sufficient funds to establish a team for one marine mammal stock—the Hawaiian stock of false killer whales—that has met the statutory requirements since 2004. Second, for 8 of the 14 stocks, NMFS information about the stocks' population size or mortality is outdated or incomplete, and the agency lacks funds to obtain better information. Third, for 4 of the 14 stocks, commercial fisheries account for few or no incidental takes, and other causes, such as acoustic activities, for example, sonar used by the U.S. Navy, may contribute to the serious injury and mortality of some of these stocks, so establishing teams for them would not be appropriate. Finally, the population size of one marine mammal stock—the Central North Pacific stock of humpback whales—is increasing; therefore establishing a team for this stock is a low priority.

For the five take reduction teams subject to the MMPA's deadlines, NMFS has had limited success in meeting them for various reasons. Specifically,

- NMFS missed statutory deadlines for establishing three of the five teams—the Atlantic Large Whale, Pelagic Longline, and Bottlenose Dolphin—by 3 months to more than 5 years. According to NMFS officials, the reason for delays in establishing one of these three teams was a lack of information, such as information on stocks' population size and mortality, that team members need to consider before developing draft take reduction plans.
- Two of the five teams did not submit their draft take reduction plans to NMFS within the statutory deadlines. In one case the team missed the deadline because it had difficulty reaching consensus on a plan, and in the

other case there was an unexpected death of a key team member 1 week before the plan was due.

- NMFS did not publish proposed take reduction plans in accordance with the statutory deadlines for the five teams. According to agency officials, these deadlines were missed because of the time needed to complete the federal rulemaking process, among other things. However, NMFS complied with the statutory deadline for the public comment periods for the five teams that have reached this stage of the process.
- NMFS missed the statutory deadline for publishing final take reduction plans and implementing regulations for four of the five teams—the Atlantic Large Whale, Pacific Offshore Cetacean, Bottlenose Dolphin, and the Pelagic Longline—by 8 days to over a year. NMFS attributed the delays to the time necessary to respond to the public comments it received on the proposed plan before it could publish the final plan, among other things.

NMFS does not have a comprehensive strategy for assessing the effectiveness of take reduction plans and implementing regulations once they have been implemented. The Government Performance and Results Act of 1993 provides a foundation for examining agency performance goals and results. Our work related to the act and the experience of leading organizations have shown the importance of developing a strategy for assessing performance that includes, among other things, program performance goals that identify the desired results of program activities and reliable information that can be used to assess results. In the context of NMFS's efforts to measure the success of the regulations that result from take reduction plans, we believe such a strategy would include, at a minimum, (1) performance goals that identify the desired outcomes of the take reduction regulations; (2) steps for assessing the effectiveness of potential take reduction regulations, such as fishing gear modifications, in achieving the goals; (3) a process for monitoring the fishing industry's compliance with the requirements of the take reduction regulations; and (4) reliable data assessing the regulations' effect on achieving the goals. Instead of such a comprehensive strategy, we found that although NMFS uses short- and long-term goals established by the MMPA to evaluate the success of take reduction regulations, these goals and the data that NMFS uses to measure the impact of the take reduction regulations have a number of limitations. For example, according to officials we spoke with, it is difficult to assess the impact of the regulations in a 6-month period, as required by the MMPA's short-term goal. In addition, while NMFS has taken steps to identify the impact of proposed take reduction regulations prior to their implementation, the agency has limited information about

the fishing industry's compliance with the regulations once they have been implemented. As a result, when incidental takes occur in fisheries covered by take reduction regulations, it is difficult for NMFS to determine whether the regulations were not effective in meeting the MMPA's goals or whether the fisheries were not complying with the regulations.

To facilitate the oversight of NMFS's progress and capacity to meet the statutory requirements under the MMPA for take reduction teams, Congress may wish to consider (1) directing NMFS to report on the key factors that affect its ability to meet the MMPA's requirements for establishing teams and meeting statutory deadlines, including data, resources, or other limitations; (2) amending the statutory requirements in the MMPA for establishing a take reduction team to stipulate that not only must a marine mammal stock be strategic and interacting with a Category I or II fishery but that the fishery with which the marine mammal stock interacts causes at least occasional incidental mortality or serious injury of that particular marine mammal stock; and, (3) amending the MMPA to ensure that the statutory deadlines give NMFS adequate time to complete take reduction plans and implementing regulations. We are also recommending that NMFS develop a comprehensive strategy for assessing the effectiveness of each take reduction plan and implementing regulations. In its comments on a draft of this report NOAA agreed with our recommendation to develop such a comprehensive strategy.

Background

The MMPA was enacted in 1972 to ensure that marine mammals are maintained at or restored to healthy population levels. Among other things, this act established the Marine Mammal Commission, which must continually review the condition of marine mammal stocks and recommend to the appropriate federal officials and Congress any steps it deems necessary or desirable for the protection and conservation of marine mammals.⁸ In 1994, the MMPA was amended to create a process for establishing take reduction teams to manage incidental takes—serious injury or death—in the course of commercial fishing operations. Commercial fishing in areas where marine mammals swim, feed, or breed is considered one of the main human causes of incidental take. Marine mammals can become entangled in fishing equipment such as nets or

⁸The Marine Mammal Commission is composed of three presidential appointees who are knowledgeable in the fields of marine ecology and resource management and are not in a position to profit from the taking of marine mammals.

hooks, although specific threats vary by the fishing techniques used. Appendix II provides details on commercial fishing techniques that can result in incidental take, including gillnetting, longlining, trap/pot fishing, and trawling, as well as examples of the marine mammals affected.

Under the 1994 amendments to the MMPA, NMFS must establish take reduction teams when two requirements are satisfied: (1) NMFS designates the stock as strategic in a final stock assessment report, and (2) the stock interacts with a commercial fishery listed as Category I or II in the current list of fisheries.⁹ According to the MMPA, if there is insufficient funding to develop and implement take reduction plans for all stocks that meet the requirements, NMFS should establish teams based on specified priorities.¹⁰ For the majority of stocks, NMFS determines strategic status by comparing whether human-caused mortality exceeds the maximum removal level (see fig. 1).¹¹ Human-caused mortality and serious injury (hereafter known as human-caused mortality) is estimated by adding fishery-related mortality estimates to mortality caused by other human sources, as follows:

- Fishery-related mortality and serious injury estimates (hereafter known as fishery-related mortality estimates) are generated based on data from NMFS's fishery observer programs, whereby individuals board commercial fishing vessels and document instances of incidental take. NMFS also uses anecdotal information from scientists, fishermen, and others about additional incidental take to make these estimates.

⁹The MMPA divides jurisdiction over marine mammals between the U.S. Fish and Wildlife Service and NMFS but gives NMFS the exclusive authority to establish take reduction teams and implement take reduction plans for all marine mammals. NMFS has not established take reduction teams for any of the marine mammals under the Fish and Wildlife Service's jurisdiction (sea otters, polar bears, manatees, dugongs, and walrus). This report focuses on marine mammals under NMFS's jurisdiction.

¹⁰Under 16 U.S.C. § 1387(f)(3), highest priority must be given to the development and implementation of take reduction plans for species or stocks whose level of incidental mortality and serious injury exceeds the maximum removal level, those that have a small population size, and those that are declining most rapidly.

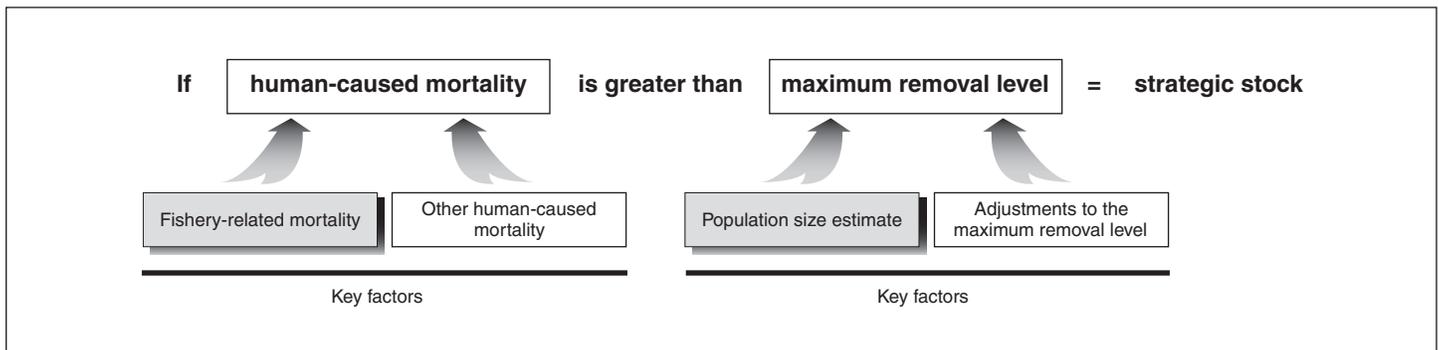
¹¹A stock is also considered strategic if it is designated as depleted under the MMPA or if it is listed or likely to be listed as endangered or threatened under the Endangered Species Act. For these stocks, human-caused mortality does not necessarily have to exceed the maximum removal level.

- Mortality and serious injury caused by other human sources such as collisions with large ships or authorized subsistence hunting of marine mammals by Alaska natives.

The maximum removal level—technically known as the potential biological removal level—is calculated for each marine mammal stock by multiplying three factors:

- The minimum population estimate (hereafter known as the population size estimate) for the specific stock of marine mammals.¹²
- Two adjustments designed to (1) factor in the expected rate of natural growth for a stock and (2) reduce the risks associated with data uncertainties, especially for stocks listed as endangered or threatened or designated as depleted. By altering the values of these adjustments, NMFS can make the maximum removal level more conservative—meaning that fewer incidental takes will be allowed—in cases of uncertain data, and therefore make it less likely that they will identify a stock as nonstrategic.

Figure 1: Determining Strategic Status by Comparing Human-Caused Mortality to the Maximum Removal Level



Source: GAO analysis of NMF's guidelines for assessing marine mammal stocks.

The MMPA requires NMFS to assess the status of each stock under its jurisdiction and determine whether it is strategic or not. NMFS publishes

¹²The minimum population estimate is an estimate of the number of animals in a stock that (1) is based on the best available scientific information on abundance, incorporating the precision and variability associated with such information, and (2) provides reasonable assurance that the stock size is equal to or greater than the estimate.

annual stock assessment reports that include, among other things, the strategic status of each marine mammal stock and the information used to make these strategic status determinations. Information contained in the reports must be based on the best scientific information available. NMFS's Fishery Science Centers are responsible for publishing the stock assessment reports, and the Office of Protected Resources, along with NMFS regional offices, is responsible for using the data from the reports to decide whether to establish a take reduction team. Regional Scientific Review Groups—composed of individuals with expertise in marine mammal biology, commercial fishing technology and practices, and other areas—review all stock assessment reports prior to publication.¹³ NMFS also uses fishery-related mortality estimates and maximum removal levels in the stock assessment reports to categorize fisheries in its annual list of fisheries.¹⁴ Under the amended MMPA, commercial fisheries are classified as Category I if they have frequent incidental take of marine mammals and as Category II if they have occasional take.¹⁵

Once a stock is identified as requiring a take reduction team—because it is strategic and interacts with a Category I or II fishery—the MMPA requires NMFS to establish a team and appoint take reduction team members. The MMPA requires the take reduction team members to develop and submit a draft take reduction plan designed to reduce the incidental take of marine mammals by commercial fishing operations. If NMFS lacks sufficient funding to develop and implement a take reduction plan for all stocks that satisfy the MMPA's requirements, the MMPA directs NMFS to give highest priority to take reduction plans for those stocks (1) for which incidental mortality and serious injury exceed the maximum removal level, (2) with a small population size, and (3) that are declining most rapidly. The MMPA requires that draft take reduction plans be developed by consensus among take reduction team members. If take reduction team members cannot

¹³Regional Scientific Review Groups were established by the 1994 amendments to the MMPA. The MMPA directs NMFS to identify members of these groups in consultation with the Marine Mammal Commission, among others.

¹⁴For the purposes of categorizing fisheries, NMFS uses only estimates for fishery-related mortality rather than the estimates for total human-caused mortality.

¹⁵Fisheries are classified as Category I if the fishery by itself is responsible for the annual removal of 50 percent or more of any stock's maximum removal level. A Category II fishery is one that, collectively with other fisheries, is responsible for the annual removal of more than 10 percent of any marine mammal stock's maximum removal level, and by itself is responsible for the annual removal of between 1 and 50 percent, exclusive, of any stock's maximum removal level.

reach consensus, the members must submit the range of possibilities they considered and the views of both the majority and minority to NMFS. These draft plans may include regulatory measures (known as take reduction regulations) such as gear modifications or geographical area closures that fisheries would be required to follow and voluntary measures such as research plans for identifying the primary causes and solutions for incidental take or education and outreach for commercial fishermen.

After the take reduction team members develop and submit a draft take reduction plan to NMFS, the agency must publish a proposed plan in the *Federal Register*. The MMPA requires NMFS to take the team's draft plan into consideration when it develops a proposed plan but does not require adoption of the draft plan.¹⁶ If the team fails to meet its deadline for submitting a draft plan to NMFS, the MMPA requires NMFS to develop and propose a plan on its own. For strategic stocks, the proposed plan must include measures NMFS expects will reduce incidental take below the maximum removal level within 6 months of the plan's implementation. Once the proposed plan is published in the *Federal Register*, NMFS must solicit public comments on the plan before the agency finalizes and implements it by publishing a final plan in the *Federal Register*. NMFS's development and publication of proposed and final plans are subject to several laws, including the following:

- **Endangered Species Act:** The act requires consultation among federal agencies including NMFS and the U.S. Fish and Wildlife Service to ensure that any take reduction plan is not likely to jeopardize the continued existence of any endangered or threatened species.
- **National Environmental Policy Act:** The act requires NMFS to evaluate the likely environmental effects of any take reduction plan using an environmental assessment or, if the plans will likely have significant environmental effects, a more detailed environmental impact statement.
- **Regulatory Flexibility Act:** The act requires NMFS to assess the economic impact of any take reduction plan on small entities.¹⁷

¹⁶Specifically, the MMPA requires the Secretary to publish the take reduction plan proposed by the team, any changes proposed by the Secretary with an explanation of the reasons for the changes, and proposed regulations to implement such a plan.

¹⁷"Small entities" includes businesses, small governmental jurisdictions, and certain not-for-profit organizations.

The proposed and final take reduction plans are also subject to the requirements of the Coastal Zone Management Act, Information Quality Act, Magnuson-Stevens Act, and the Paperwork Reduction Act, among others. In addition to these laws, the proposed and final take reduction plans are subject to the requirements of four executive orders.¹⁸ For example, one executive order requires NMFS to submit the proposed and final take reduction plans to the Office of Management and Budget (OMB) for review if NMFS or OMB determines that the plan is a significant regulatory action.

The 1994 amendments to the MMPA provide deadlines to establish take reduction teams and develop and publish proposed and final plans. Table 1 outlines these statutory requirements and deadlines.

Table 1: MMPA's Take Reduction Team Requirements and Deadlines

Requirement	Deadline
NMFS establishes take reduction team	30 days after a final stock assessment report indicates that a stock is strategic and the current list of fisheries lists the stock as interacting with a Category I or II fishery
Take reduction team members develop a draft plan and submit the draft plan to NMFS	6 months after take reduction team is established ^a
NMFS translates draft plan into a proposed take reduction plan and implementing regulations and publishes them in the <i>Federal Register</i>	60 days after draft plan is submitted ^p
NMFS holds a public comment period on the proposed take reduction plan and implementing regulations	Up to 90 days after proposed plan's publication
NMFS publishes a final take reduction plan and implementing regulations in the <i>Federal Register</i>	60 days after closure of the public comment period on the proposed plan

Source: GAO analysis of the 1994 amendments to the MMPA.

^aIf the team's stocks have human-caused mortality and serious injury below the maximum removal level and interact with a Category I or II fishery, this deadline is 11 months instead of 6 months.

¹⁸Exec. Order No. 12866, 58 Fed. Reg. 51735 (Sept. 30, 1993); Exec. Order No. 13,132, 64 Fed. Reg. 43255 (Aug. 4, 1999); Exec. Order No. 12898, 59 Fed. Reg. 7629 (Feb. 11, 1994); Exec. Order No. 13158, 65 Fed. Reg. 34909 (May 26, 2000).

⁹If the team does not meet its submission deadline for the draft plan, NMFS must publish a proposed plan 8 months after the team's establishment for strategic stocks whose human-caused mortality and serious injury are above the maximum removal level. For strategic stocks whose human-caused mortality and serious injury are below the maximum removal level, the deadline is 13 months after the team's establishment.

NMFS Faces Significant Challenges in Accurately Identifying Marine Mammal Stocks That Meet the Statutory Requirements for Establishing Take Reduction Teams because of Data Limitations

Significant limitations in available information make it difficult for NMFS to accurately determine which marine mammal stocks meet the statutory requirements for establishing take reduction teams. The MMPA states that stocks are strategic—one of two triggers for establishing a take reduction team—if their human-caused mortality exceeds maximum removal levels. However, the information NMFS uses to calculate human-caused mortality or the maximum removal level for most stocks is incomplete, outdated, or imprecise, a fact that may lead NMFS to overlook some marine mammal stocks that meet the statutory requirements for establishing take reduction teams and inappropriately identify others as meeting them. NMFS officials said that funding constraints limit their ability to gather sufficient data, although the agency has taken steps to identify its data needs.

Incomplete Information Reduces the Reliability of NMFS's Strategic Status Determinations

Our review of stock assessment reports from 2007 found that NMFS was missing key information to make well-informed strategic status determinations for a significant number of marine mammal stocks. According to the MMPA, a stock is designated strategic—one of two triggers for establishing a take reduction team—if the human-caused mortality estimate exceeds the maximum removal level.¹⁹ Our review of stock assessment reports from 2007 found that 39 of 113 stocks are either missing human-caused mortality estimates or maximum removal levels, making it impossible to determine strategic status in accordance with the

¹⁹The MMPA directs NMFS to establish take reduction teams for stocks designated as strategic that interact with Category I or II fisheries.

MMPA requirements.²⁰ As a result, for these 39 stocks, NMFS is determining strategic status without key information and therefore might not accurately determine whether a stock requires a take reduction team. According to NMFS officials, maximum removal level and human-caused mortality estimates are often missing because scientists have been unable to gather the necessary data to make these determinations.

In the absence of human-caused mortality estimates or maximum removal levels, NMFS must make more subjective—and potentially inaccurate—strategic status determinations for some marine mammal stocks. In these cases, NMFS guidance directs scientists to use professional judgment to determine whether a stock is strategic. According to NMFS officials, scientists may use a variety of sources to make these decisions, including scientists' field observations of the marine mammals. However, Marine Mammal Commission officials we spoke with stated that decisions based on professional judgment are less certain than those based on data about human-caused mortality and maximum removal levels and could result in some marine mammal stocks that should be identified as strategic not being identified as such.

Even in cases where the stock assessment reports include human-caused mortality estimates and maximum removal levels for a stock, the human-caused mortality estimates may be inaccurate because the information on which they are based is incomplete. Human-caused mortality estimates are based in part on fishery-related mortality. However, according to Marine Mammal Commission officials, in some cases, mortality may be occurring in fisheries where NMFS does not systematically collect mortality information. Specifically, NMFS's observer programs—a key source of data NMFS uses to calculate fishery-related mortality estimates—gather information for only half of the total fisheries, but incidental take may also be occurring in some fisheries that are not observed, especially those that are classified as Category I or II. Observer program officials told us that funding limitations prohibit coverage of all Category I or II fisheries.

²⁰NMFS has identified a total of 156 marine mammal stocks in United States waters that are under its jurisdiction. However, a NMFS scientist told us that additional marine mammals exist in the waters off the Pacific islands under NMFS's jurisdiction that have not been identified and defined as stocks because the agency does not have the necessary data for these marine mammals. Our analysis of the stock assessment reports focused on 113 of the 156 stocks that NMFS has identified, excluding from our analysis the 19 stocks that are currently addressed by take reduction teams and the 24 that are designated as strategic because of ESA listing or MMPA designation and therefore do not rely on human-caused mortality estimates and maximum removal levels to determine strategic status.

In addition, our review of 2007 stock assessment reports found instances where fishery-related mortality estimates were missing important information. For example, NMFS scientists identified spinner and bottlenose dolphins in Hawaii as nonstrategic, but raised concerns about these decisions because the estimates of fishery-related mortality for the stocks were likely to be incomplete. Specifically, they stated that while the agency has observer program data showing that incidental take from a longline fishery was below the maximum removal level, it did not have observer programs in gillnet fisheries that were also likely to incidentally take the stocks, and therefore might have increased the fishery-related mortality estimate if these fisheries had been observed.

Furthermore, NMFS, Marine Mammal Commission, and Scientific Review Group scientists expressed concern that strategic status decisions for some stocks may not be accurate because NMFS does not have all of the information needed to define the stocks accurately. Under the MMPA, marine mammal species are treated as stocks—populations located in a common area that interbreed when mature. However, a 2004 NMFS report found that the stock definitions for 61 percent of marine mammal stocks were potentially not accurate.²¹ For example, a stock definition would not be accurate if NMFS defined two distinct populations of a marine mammal species incorrectly as one stock. If one of these two populations has a high level of incidental take and the other does not, the combined human-caused mortality estimate might not be high enough to result in a strategic status determination. However, if the two distinct populations were defined as two stocks, the high incidental take of one stock could result in it being considered strategic and triggering one of the requirements for take reduction team establishment. The Alaska Scientific Review Group has raised concerns that inaccurate stock definitions may be leading to incorrect strategic status designations. Specifically, in a 2007 letter to NMFS, the review group said that recent scientific information indicates that the current stock definitions might inappropriately consolidate harbor seal populations in Alaska. The review group chair said that this consolidation may lead to some harbor seal populations being incorrectly categorized as nonstrategic.

²¹NOAA Fisheries National Task Force for Improving Marine Mammal and Turtle Stock Assessments, *A Requirements Plan for Improving the Understanding of the Status of U.S. Protected Marine Species*. National Marine Fisheries Service, NOAA Technical Memorandum NMFS-F/SPO-63 (Silver Spring, Maryland: September 2004).

Outdated Information Reduces the Reliability of NMFS's Strategic Status Determinations

Our review of a sample of stock assessment reports found that approximately 11 of the 74 stocks used outdated information—information that is 8 years old or older—to calculate the maximum removal level, thereby reducing the reliability of the strategic status determinations for these stocks.²² According to NMFS guidelines, information that is 8 years old or older is generally unreliable for estimating the current stock population. NMFS scientists estimate the size of a stock's population to determine its maximum removal level. If human-caused mortality exceeds maximum removal levels, the stock is considered strategic. However, when the data are 8 years old or older, scientific research has shown that marine mammal stocks could have declined significantly since the data were collected.²³ This could lead NMFS to inaccurately designate a stock as nonstrategic and therefore not establish a take reduction team when one might be needed. In addition, if a stock's population has increased significantly during the time period since the last estimate was made, NMFS may inaccurately designate the stock as strategic. Furthermore, our review found that for approximately 21 of the 74 stocks, the population size information was between 5 and 8 years old, a situation that is less of a concern than data that are 8 years old or older, but could also lead NMFS to make an inaccurate strategic stock determination. NMFS and Marine Mammal Commission scientists stated that scientists' confidence in the accuracy of the information used to estimate population size begins to decrease even before 8 years. Also, a 2004 NMFS report to Congress stated that estimates for population size based on information 5 years old or older may not accurately represent a marine mammal stock's current population size.²⁴

²²We analyzed a stratified random sample of 28 stocks out of the 74 stocks that had both mortality estimates and maximum removal levels and used the results from this sample to estimate the results for all 74 stocks. For this reason, numbers in the report about these 74 stocks are described as approximations. We calculated 95 percent confidence intervals for each of the estimates made from our sample. The confidence intervals for these estimates are presented in appendix I, table 8.

²³NMFS guidelines identified data that are 8 years old or older as unreliable because a population that declines at 10 percent per year from a sustainable level would be reduced to less than 50 percent of its original abundance in 8 years.

²⁴National Marine Fisheries Service, Office of Protected Resources, *Review of Commercial Fisheries' Progress Toward Reducing Mortality and Serious Injury of Marine Mammals Incidental to Commercial Fishing Operations*. United States Department of Commerce, National Oceanic and Atmospheric Administration (Silver Spring, Maryland: 2004).

Imprecise Information Reduces the Reliability of NMFS's Strategic Status Determinations

Our review of a sample of stock assessment reports from 2007 frequently found that NMFS used population size or fishery-related mortality estimates that were less precise than NMFS's guidelines recommend, decreasing the likelihood that strategic status determinations based on this information are accurate. Furthermore, we also found that NMFS could often not identify the level of precision for fishery-related mortality estimates. Specifically, we found that

- Approximately 48 of 74 stocks had population size estimates—used to determine maximum removal levels—that were less precise than NMFS guidelines recommend.²⁵ According to NMFS officials, one reason for the lack of precision is that the agency did not have adequate funding to conduct thorough population surveys. When conducting a marine mammal population survey, scientists document how frequently they observe marine mammals during a set period of time and use this information to estimate total population size. The duration of the survey and the number of scientists observing different areas within the stock's natural habitat affect the extent to which the survey is thorough and the population estimate is precise.
- Scientists could not calculate the precision of fishery-related mortality estimates—used to determine human-caused mortality estimates—for approximately 48 of the 74 stocks. In addition, the estimates for approximately 24 of the remaining 26 stocks were less precise than NMFS guidance recommends. Specifically, precision cannot be calculated when the sources of mortality data are anecdotal or the fishery-related mortality estimate is zero.²⁶ For these cases, NMFS does not have a systematic way of determining how precise the estimates are and therefore how much certainty it should have in their accuracy. NMFS and Marine Mammal Commission officials identified inadequate observer coverage as one of the main reasons for imprecise mortality estimates. According to National

²⁵NMFS calculates precision by identifying a coefficient of variation (CV) for each estimate. The lower the CV percentage, the more precise the estimate. NMFS's publications state that CVs of 30 percent or lower are considered to have a desirable level of precision appropriate for determining strategic status. Therefore, estimates with CVs greater than 30 percent are less precise than NMFS guidelines recommend.

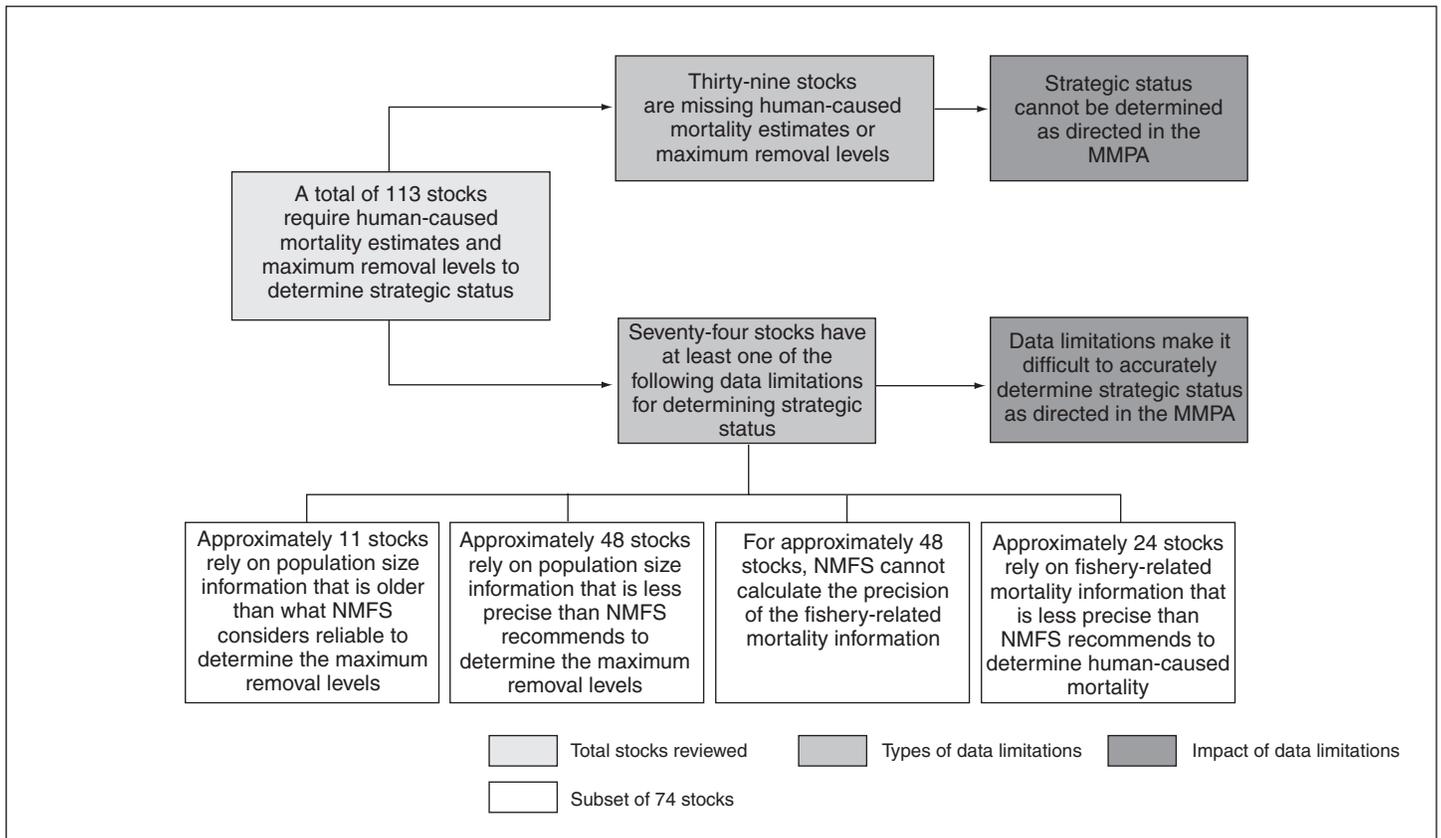
²⁶Scientists may use data sources—such as stranding data—that do not allow them to make statistically based estimates of total fishery-related mortality. A stranded marine mammal is either dead and on the beach or shore, or in the water, or is alive and on the beach or shore but unable to return to the water under its own power. Information from such sources is anecdotal because it is not based on scientific sampling techniques that are used to make generalizable estimates.

Observer Program officials, 52 percent of Category I or II fisheries have observer coverage; however, only 27 percent of Category I or II fisheries have adequate or near-adequate coverage levels.²⁷ Without adequate observer coverage in fisheries likely to cause incidental take of marine mammals, estimates will be less precise because they will be based on fewer data. NMFS and Marine Mammal Commission officials also stated that current funding levels for the observer program are inadequate to gather enough data on fishery-related mortality.

For the stocks for which we found that NMFS could calculate the level of precision for population size or fishery-related mortality estimates but these estimates were less precise than NMFS's guidance recommends, NMFS policy guidelines directed scientists to make adjustments to these estimates that increased the likelihood that the stocks were categorized as strategic. By doing this, the imprecision in these estimates is less likely to lead NMFS to overlook a stock that should be covered by a take reduction team, but NMFS officials told us that it is possible these stocks would not be designated as strategic if more precise estimates had been available and therefore these adjustments had not been necessary. However, in the approximately 48 of 74 stocks where NMFS cannot calculate the precision of a fishery-related mortality estimate—even though high levels of imprecision may exist—it cannot make these adjustments and therefore may either overlook some stocks that should be designated as strategic or inaccurately designate others as nonstrategic. Figure 2 summarizes key data limitations identified earlier in this report.

²⁷ According to NMFS officials, the National Observer Program uses the following categories to characterize the observer coverage level for fisheries: none, pilot, baseline, near-adequate, or adequate coverage. NMFS officials stated that the agency often chooses not to observe trap/pot fisheries because the nature of marine mammal interactions with this type of fishing gear make it unlikely that an observer would see any instances of incidental take.

Figure 2: Information Limitations Make It Difficult to Accurately Determine Strategic Status



Source: GAO analysis of NMFS data.

Funding Constraints Limit NMFS’s Ability to Gather Sufficient Data, but the Agency Has Taken Some Steps to Identify Data Needs

NMFS officials acknowledged limitations in the information available to determine strategic status and the potential consequences, but identified the funding constraints as an impediment to addressing these limitations. Specifically, a NMFS official stated that the agency has insufficient data to make informed management decisions regarding marine mammals in most instances, and said that a stock with sufficient data is an exception. However, while NMFS officials acknowledged these significant data limitations and their potential consequences, they also stated that they use the best scientific information available to make these determinations, as required by the MMPA. In addition, NMFS and Marine Mammal Commission officials stated that funding constraints have limited the agency’s ability to gather the data that it needs to make accurate decisions

about which stocks meet the statutory requirements for establishing take reduction teams.

NMFS has taken some steps to identify data limitations and proposed some actions to alleviate them. For example, a 2004 NMFS study found that the agency must significantly enhance the quantity and quality of its stock assessment data and analyses to meet MMPA mandates and outlined the actions and resource increases necessary to achieve these enhancements.²⁸ According to NMFS officials, the agency received funding to begin implementing the study's recommendations in fiscal year 2008 but the program lost other funding sources, so the new funding did not result in an overall increase in resources to improve these data. In addition, NMFS is currently completing a study to assess its sources of fishery-related mortality information. According to agency documents, this report will include an evaluation of the adequacy of the scientific techniques and existing observer coverage levels used to collect these data.

Nonetheless, marine mammal scientists expressed interest in having more information about the quality of the data used to determine the strategic status for each stock. Specifically, Marine Mammal Commission officials supported implementing a process to identify stocks where the scientists have low confidence in the quality of the data. According to these officials, if this occurred, interested parties would gain a better understanding of the data underlying strategic status determinations and therefore would have more information to judge the usefulness of the conclusions made from those data. Also, marine mammal scientists said that a process to identify stocks with poor data could make it easier to highlight stocks in need of additional data collection efforts.

²⁸NOAA Fisheries National Task Force for Improving Marine Mammal and Turtle Stock Assessments, *A Requirements Plan for Improving the Understanding of the Status of U.S. Protected Marine Species*.

NMFS Has Not Established Teams for Many Marine Mammals That Have Met the Statutory Requirements of the MMPA for a Variety of Reasons

On the basis of NMFS's available information, we identified 30 marine mammal stocks that met the MMPA's requirements for establishing a team, and NMFS has established six teams that cover 16 of them. NMFS has not established teams for the 14 other marine mammals that have met the MMPA's requirements for establishing a team for several reasons: (1) the agency lacked sufficient funds to establish a team, (2) information about the stock's population size or mortality is outdated or incomplete and the agency lacks funds to obtain better information, (3) commercial fisheries account for little or no incidental take, or (4) the population size is increasing; therefore establishing a team for the stock is a lower priority.

NMFS Has Established Teams for 16 Marine Mammals That Have Met the Requirements of the MMPA

Since 1994, NMFS has established eight take reduction teams, six of which are still in existence—the Atlantic Large Whale, Atlantic Trawl Gear, Bottlenose Dolphin, Harbor Porpoise, Pacific Offshore Cetacean, and Pelagic Longline.²⁹ These six teams cover 16 marine mammal stocks that have met the MMPA's requirements for establishing a take reduction team. The MMPA gives NMFS discretion to determine how teams can be structured. For example, NMFS can establish a take reduction team for (1) one stock that interacts with multiple fisheries, such as the Bottlenose Dolphin take reduction team; (2) multiple stocks within a region, such as the Atlantic Large Whale take reduction team; or (3) multiple stocks that interact with one fishery, such as the Pacific Offshore Cetacean take reduction team. The existing take reduction teams—five of which are located in the Atlantic region and one in the Pacific—are described in table 2.

²⁹The two take reduction teams no longer in existence were the Atlantic Offshore Cetacean and Mid-Atlantic take reduction teams. Some of the stocks covered by the Atlantic Offshore Cetacean team are now covered by the Pelagic Longline and Atlantic Trawl Gear teams. The Mid-Atlantic take reduction team merged with the Gulf of Maine Harbor Porpoise team, and both teams covered the same stock of harbor porpoises. The merged team is now referred to by NMFS as the Harbor Porpoise team.

Table 2: Marine Mammals That Have Met the MMPA’s Requirements for Establishing a Take Reduction Team and for Which NMFS Has Established a Team

Take reduction team name	Marine mammals	Types of fisheries affected
Atlantic Large Whale	Fin whale	Multiple trap/pot fisheries
	Humpback whale	Multiple gillnet fisheries
	North Atlantic right whale	
Atlantic Trawl Gear	Short-finned pilot whale	Multiple trawl fisheries
	Long-finned pilot whale	
Bottlenose Dolphin	Bottlenose dolphin	Multiple gillnet fisheries
		One trap/pot fishery
		Two seine fisheries
		Two stop/pound net fisheries
Harbor Porpoise ^a	Harbor porpoise	Multiple gillnet fisheries
Pacific Offshore Cetacean	Mesoplodont beaked whale	One gillnet fishery
	Baird’s beaked whale	
	Cuvier’s beaked whale	
	Sperm whale	
	Pygmy sperm whale	
	Humpback whale	
	Short-finned pilot whale	
	Fin whale	
	Long-beaked common dolphin	
	Pelagic Longline	
Long-finned pilot whale ^b		

Source: GAO analysis of *Federal Register* and NMFS documents.

^aNMFS has established two take reductions teams for harbor porpoises. According to the *Federal Register*, the first team was established on February 12, 1996, to address harbor porpoises in the Gulf of Maine (known as the Gulf of Maine Harbor Porpoise take reduction team). The second team, established on February 25, 1997, focused on the same stock of harbor porpoises in the mid-Atlantic (known as the Mid-Atlantic take reduction team). NMFS decided to combine the two teams into one team in December 2007. For the purposes of this report, we refer to the combined teams as the Harbor Porpoise team.

^bThese marine mammal stocks are covered by both the Atlantic Trawl Gear and Pelagic Longline take reduction teams. Since we are reporting on the number of marine mammals that met the MMPA’s requirements for establishing a team, we accordingly did not double-count this marine mammal.

NMFS Has Not Established Teams for 14 Other Marine Mammals That Have Also Met the Requirements of the MMPA

NMFS has not established take reduction teams for 14 other marine mammals that have also met the MMPA’s requirements for the establishment of a take reduction team. Table 3 lists these 14 marine mammals.

Table 3: Marine Mammals Stocks That Have Met the MMPA's Requirements for Establishing a Take Reduction Team, but NMFS Has Not Established a Team

Marine mammal	Stock
Bottlenose dolphin	Gulf of Mexico bay, sound, and estuarine
Bottlenose dolphin	Northern Gulf of Mexico coastal
Cuvier's beaked whale	Western North Atlantic
False killer whale	Hawaii
Harbor porpoise	Bering Sea
Harbor porpoise	Gulf of Alaska
Harbor porpoise	South East Alaska
Humpback whale	Central North Pacific
Humpback whale	Western North Pacific
Mesoplodont beaked whale	Western North Atlantic
Sperm whale	Hawaii
Northern fur seal	East North Pacific
Steller sea lion	Eastern United States
Steller sea lion	Western United States

Source: GAO analysis of *Federal Register* and NMFS data.

NMFS has not established teams for these 14 marine mammal stocks for the following reasons:

Lack of funding. Specifically, NMFS officials told us they did not establish a take reduction team for one marine mammal—the false killer whale—due to lack of funding. False killer whales found in the waters off the Hawaiian Islands have met the MMPA's requirements for establishing a team since 2004 because the stock has been strategic and interacts with a Category I longline fishery. Furthermore, since 2004, estimates of fishery-related mortality of false killer whales are at levels greater than their maximum removal level, according to stock assessment reports. According to the most recently available information, the false killer whale is the only marine mammal for which incidental take by commercial fisheries is known to be above its maximum removal level that is not covered by a take reduction team.³⁰ Since 2003, the Pacific Scientific Review Group has recommended that NMFS establish a team for these

³⁰According to NMFS's 2007 stock assessment reports.

whales. Although NMFS officials told us that in accordance with the MMPA, the false killer whales are their highest priority for establishing a team, they said the agency does not have the funds to do so. NMFS officials told us the agency instead decided to focus what they characterized as their very limited funding on the already established take reduction teams. However, in the absence of a take reduction team, the Hawaii longline fishery continues to operate without a take reduction plan designed to reduce incidental take of false killer whales.

Outdated or incomplete data. NMFS has not established take reduction teams for eight marine mammals that interact with commercial fisheries in the Gulf of Mexico and the waters off of Alaska's coast because the information the agency has on them is too outdated or incomplete for agency officials to determine whether these marine mammals should be considered a high priority for establishing a take reduction team. Also, take reduction team members need better information about mortality before they can propose changes to fishing practices in a draft take reduction plan. However, because take reduction teams have not been established for these eight marine mammal stocks, fisheries continue to operate without take reduction plans that could decrease incidental take of these stocks.

Specifically, NMFS has not established teams for two stocks of bottlenose dolphins found in the Gulf of Mexico and six stocks in the waters off Alaska's coast, including three stocks of harbor porpoises, two stocks of Steller sea lions, and one stock of humpback whales.³¹ Two stocks of bottlenose dolphins found in the Gulf of Mexico have met the MMPA's requirements for establishing a team since 2005 because they have been strategic and interact with two Category II fisheries.³² According to stock assessment reports, the best scientific information available about population size for these two stocks is 8 years old or older. According to NMFS documents, using such outdated information increases the possibility that significant population changes of which NMFS is unaware could have occurred. Agency officials told us that the 2008 survey to

³¹In the Gulf of Mexico, the two strategic stocks are the Northern Gulf of Mexico coastal stock and the Gulf of Mexico bay, sound, and estuarine stock of bottlenose dolphins. In the waters off Alaska's coast, the six strategic stocks are the Gulf of Alaska, Bering Sea, and Southeast Alaska stocks of harbor porpoises; the Western and Eastern U.S. stocks of Steller sea lions; and the Western North Pacific stock of humpback whales.

³²The Gulf of Mexico Gillnet fishery and the Gulf of Mexico Menhaden Purse Seine fishery.

collect new population size estimates was canceled due to insufficient funding. Furthermore, according to stock assessment reports, the available mortality estimates are incomplete because they are based on anecdotal information. Consequently, scientists can use this information only to make a minimum estimate of the number of marine mammals being killed or injured. Agency officials told us they would like to begin observing the two Gulf of Mexico fisheries, but are currently unable to do so due to funding constraints.

Similarly, NMFS has not established take reduction teams due to outdated information for three stocks of harbor porpoises found in the waters off Alaska's coast that have met the MMPA's statutory requirements for establishing a team since 2006 because they have been strategic and interact with multiple Category II fisheries. According to stock assessment reports, the best scientific information available about population size for harbor porpoises is outdated because the estimates are 8 years old or older. NMFS officials told us harbor porpoises are a major conservation concern for the agency, but they said funding constraints have limited their ability to collect new population size estimates for these marine mammals.

In addition, NMFS has not established take reduction teams due to incomplete information for two stocks of Steller sea lions that have met the MMPA's requirements for establishing a team since 1996 because they have been strategic and interact with multiple Category II fisheries. NMFS officials told us the fishery-related mortality information for these stocks is incomplete because they are uncertain whether incidental take is occurring in commercial fisheries not covered by observer programs. According to these same officials, lack of funding has limited the agency from obtaining more complete fishery-related mortality information for Steller sea lions.

Last, NMFS has not established a take reduction team due to outdated information for the Western North Pacific stock of humpback whales, which has met the MMPA's requirements for establishing a team since 2006, because it has been strategic and interacts with two Category II fisheries. According to the stock assessment report, the best scientific information available about population size for these humpback whales is outdated because it is 8 years old or older, but agency officials told us funding constraints limit their ability to collect new information.

Commercial fisheries account for little or no incidental take. NMFS has not established teams for four marine mammals—the Hawaii stock of

sperm whales, Western North Atlantic stocks of Cuvier's beaked whales and Mesoplodont beaked whales, and East North Pacific stock of northern fur seals—that have met the MMPA requirements for establishing a team because, according to agency officials, commercial fisheries account for little or no incidental take of these stocks. According to our analysis, these sperm whales meet the statutory requirements for a team because they are listed as an endangered species under the ESA, and therefore are a strategic stock, and they interact with a Category I fishery. However, NMFS officials told us that the commercial fishery with which these sperm whales interact accounts for little or no incidental take, and therefore it would be inappropriate to establish a team for them.³³ Similarly, NMFS's 2007 stock assessment reports state that acoustic activities, such as sonar used by the U.S. Navy, may contribute to the mortality and serious injury of Cuvier's and Mesoplodont beaked whales, and non-human-related causes of death that are unknown to scientists are contributing to the population decline of northern fur seals. NMFS officials told us it would be inappropriate to establish take reduction teams for these marine mammal stocks because mortality and serious injuries are not being caused by interaction with a commercial fishery. According to NMFS officials, they proposed amending the MMPA in 2005 to require that take reduction teams be established only for strategic stocks that interact with Category I or II fisheries and that have some level of fishery-related incidental take of those stocks, but Congress took no action on the proposal at that time.

Population size is increasing. NMFS officials said they have not established a take reduction team for one marine mammal stock that meets the statutory requirements—the Central North Pacific stock of humpback whales—because of insufficient funding; however, this stock would be a low priority because the stock's population size is increasing. This stock is strategic because it is listed as an endangered species under the ESA and it interacts with a Category I fishery off the coast of Hawaii and multiple Category II commercial fisheries in the waters off Alaska's coast. However, because its population size is increasing, NMFS officials consider the stock to be a lower priority for establishing a team than stocks with declining populations.

³³Sperm whales meet the statutory requirements for establishing a team because they are strategic and interact with a Category I fishery, but this fishery is a Category I fishery because of its incidental take of other marine mammal stocks.

NMFS Has Had Limited Success in Meeting the Statutory Deadlines for Take Reduction Teams for a Variety of Reasons

For the five take reduction teams subject to the MMPA’s deadlines, NMFS has had limited success in meeting the deadlines for a variety of reasons.³⁴ NMFS did not meet the statutory deadlines to establish take reduction teams for three of the five teams, in one case due to a lack of information about population size or mortality. In addition, two of the five teams did not submit their draft take reduction plans to NMFS within the statutory deadlines, in one case because the team could not reach consensus on a plan. NMFS did not publish proposed take reduction plans within the statutory deadlines for any of the five teams because of the time needed to complete the federal rulemaking process, among other things. However, NMFS has complied with the statutory deadlines for the public comment periods on the proposed plans for all five teams. Finally, NMFS did not publish final take reduction plans within the statutory deadlines for four of the five teams because of the time associated with analyzing public comments, among other things.

NMFS Did Not Establish Three of the Five Teams within the Statutory Deadlines

According to the MMPA, NMFS has 30 days to establish a take reduction team after a stock is listed as strategic in a final stock assessment report and is listed as interacting with a Category I or II fishery in the current list of fisheries. NMFS established two teams within this statutory deadline: the Harbor Porpoise and Pacific Offshore Cetacean. However, NMFS did not meet the statutory deadlines for establishing three teams—the Atlantic Large Whale, Pelagic Longline, and Bottlenose Dolphin. These teams were established from 3 months to more than 5 years after their statutory deadlines (see table 4).

Table 4: Delays in Establishing Take Reduction Teams

Take reduction team	Date of statutory deadline for team establishment	Date take reduction team was established	Delay
Atlantic Large Whale	May 1, 1996 ^a	August 6, 1996	97 days (3 months)
Pelagic Longline	January 2002 ^b	June 22, 2005 ^c	1,268 days (over 3 years)
Bottlenose Dolphin	May 1, 1996 ^a	October 24, 2001 ^d	2,001 days (over 5 years)

Source: GAO analysis of information published in *Federal Register* notices.

³⁴As explained in footnote 7, the Atlantic Trawl Gear team is not subject to the MMPA’s deadlines.

^aThe stocks covered by this team were designated as strategic in the July 1995 stock assessment reports. The effective date of the list of fisheries that identified these stocks as interacting with Category I or II fisheries was April 1, 1996. Accordingly, the deadline for team establishment is 30 days after the list of fisheries' effective date.

^bThe stock assessment reports for the relevant marine mammal stocks covered by the Pelagic Longline were published in December 2001. However the reports did not include a specific date in December. The stocks covered by this team were listed as strategic in the December 2001 stock assessment reports. Also, the list of fisheries that was in effect at that time listed the stocks as interacting with Category I or II fisheries. Accordingly, the deadline for team establishment is 30 days after publication of the stock assessment reports. We determined the number of days of delay based on the date January 1, 2002, because the December 2001 stock assessment reports did not indicate a specific date.

^cThis team was established pursuant to an agreement settling a lawsuit.

^dThe Bottlenose Dolphin team was originally established on August 31, 2001; however, due to the events of September 11, 2001, the first meeting was canceled and NMFS subsequently reestablished the team on October 24, 2001.

According to NMFS officials, the reasons for delays in establishing these take reduction teams include the following:

- **Atlantic Large Whale:** It took NMFS officials more than 30 days to identify sufficient take reduction team members to represent the stocks' large habitat, which stretches from Maine to Florida.
- **Pelagic Longline:** After 2001, NMFS officials were waiting to see if modifications to the longline fishery, intended to reduce the incidental take of billfish and sea turtles, would also reduce incidental take of pilot whales, which would eliminate the need for this team.³⁵ However, in 2002, an environmental group sued NMFS because of the agency's alleged failure to establish take reduction teams for marine mammals that met the statutory requirements. According to an agreement settling the lawsuit, NMFS had to conduct surveys and develop new population size estimates for pilot whales. In addition, it had to establish a take reduction team for the Atlantic portion of a large pelagic longline fishery by June 30, 2005.
- **Bottlenose Dolphin:** NMFS lacked information about population size and mortality for bottlenose dolphins that take reduction team members need to consider before they can propose changes to fishing practices in a draft take reduction plan, and NMFS scientists recommended that the agency

³⁵From 1996 to 2001, these whales were covered by a former take reduction team known as the Atlantic Offshore Cetacean team, but this team was disbanded in 2001 without the publication of a final take reduction plan.

obtain better information before establishing a team.³⁶ According to a NMFS official, mortality information for bottlenose dolphins collected between 1995 and 1998 was published in the 2000 stock assessment report. As a result of this new information, NMFS established a team in 2001.

Two Teams Did Not Develop and Submit Draft Take Reduction Plans within the Statutory Deadlines

According to the MMPA, after NMFS establishes a take reduction team, the team must develop a draft take reduction plan and submit it to NMFS within 6 months if it covers strategic stocks whose level of human-caused mortality exceeds the maximum removal level. However, if the level of human-caused mortality for strategic stocks covered by the plan is below the maximum removal level, as it is for the Pelagic Longline team, then the team has 11 months to develop a draft plan and submit the draft plan to NMFS. Three of the five teams submitted their draft plans within the statutory deadlines.³⁷ However, two teams—the Pelagic Longline and Bottlenose Dolphin—submitted their draft take reduction plans to NMFS, 17 and 23 days respectively, after their statutory deadlines (see table 5). Table 5 shows the delays in developing and submitting draft plans for the two take reduction teams that missed the statutory deadline.

Table 5: Delays in Developing and Submitting Draft Take Reduction Plans

Take reduction team	Date of statutory deadline for submission of draft plan	Date draft plan submitted to NMFS	Delay
Pelagic Longline	May 22, 2006	June 8, 2006	17 days
Bottlenose Dolphin	April 24, 2002	May 17, 2002 ^a	23 days

Source: GAO analysis of information published in *Federal Register* proposed rules.

³⁶According to the *Federal Register* notice announcing the establishment of the Mid-Atlantic take reduction team, the team was not established to address bottlenose dolphins. At preestablishment meetings, NMFS and the team determined that there was not enough information available about the bottlenose dolphins to implement a take reduction plan at that time and agreed to delay establishing a take reduction team and developing a take reduction plan specific to bottlenose dolphins until more information was obtained. However, the team provided NMFS with research and data recommendations that addressed bottlenose dolphins in its 1997 draft take reduction plan.

³⁷The three teams are the Atlantic Large Whale, Harbor Porpoise, and Pacific Offshore Cetacean.

^aThe *Federal Register* notice states that the draft plan was submitted on May 17, 2002; NMFS's records indicate that the team's facilitator submitted a draft plan to NMFS on May 6, 2002; however, the date on the draft plan is May 7, 2002. Due to discrepancies in the various records, we relied on the date in the *Federal Register* notice to determine the deadlines. An addendum to the plan was submitted to NMFS on May 3, 2003, after the team reconvened on April 1-3, 2003, to discuss new scientific information. We used the date of the original submission because NMFS was not obligated to reconvene the team to address the new information. Under the MMPA, NMFS has the statutory authority to issue a proposed plan that departs from a team's draft plan.

According to NMFS officials, the reasons for delays in submitting draft take reduction plans to NMFS include the following:

- **Pelagic Longline:** The unexpected death of a take reduction team member 1 week before the plan's due date delayed the team's submission to NMFS. This team member was a key liaison to the fishing industry, working with commercial fishermen to obtain agreement on potential take reduction plan measures.
- **Bottlenose Dolphin:** The take reduction team found it difficult to reach consensus about modifications to fishing practices to help reduce incidental take because of the large number of team members involved (44) representing multiple types of fisheries. For example, the Bottlenose Dolphin team includes four gillnet, one trap/pot, two seine, and two stop/pound net fisheries, making it difficult to agree on modifications to fishing practices. See appendix II for a description of these fishing techniques.

NMFS Did Not Publish Proposed Take Reduction Plans for Five Teams within the Statutory Deadlines for a Variety of Reasons

According to the MMPA, once NMFS receives a draft take reduction plan, it must publish a proposed plan and implementing regulations in the *Federal Register* within 60 days. NMFS missed the statutory deadline for publishing proposed plans and implementing regulations for all five teams by 5 days to more than 2 years after the statutory deadlines (see table 6).

Table 6: Delays in Publishing Proposed Take Reduction Plans

Take reduction team	Date of statutory deadline for publication ^a	Date NMFS published the proposed plan in Federal Register	Delay
Atlantic Large Whale	April 2, 1997	April 7, 1997	5 days
Pacific Offshore Cetacean	October 14, 1996	February 14, 1997	123 days (4 months)
Harbor Porpoise	March 15, 1998 ^b	September 11, 1998	180 days (6 months)
Pelagic Longline	August 7, 2006	June 24, 2008	686 days (almost 2 years)
Bottlenose Dolphin	July 16, 2002	November 10, 2004	847 days (over 2 years)

Source: GAO analysis of information published in *Federal Register* proposed rules.

^aThis deadline was calculated based on 60 days after the team members submitted a draft plan to NMFS. Two teams, the Pelagic Longline and Bottlenose Dolphin, submitted their draft plans to NMFS late, but we calculated this deadline based on 60 days after the team submitted a draft plan to NMFS, not based on 60 days after the prescribed deadline.

^bNMFS established the Gulf of Maine take reduction team on February 12, 1996, and the Mid-Atlantic take reduction team on February 25, 1997. The current Harbor Porpoise take reduction team is a combination of these two prior teams that focused on harbor porpoises in distinct geographic areas, the Gulf of Maine and the mid-Atlantic. The original draft plan for the Gulf of Maine take reduction team was submitted to NMFS on August 8, 1996. Then the Mid-Atlantic team submitted its draft plan to NMFS on August 25, 1997. The Gulf of Maine take reduction team developed and submitted a second draft take reduction plan on January 14, 1998. The Mid-Atlantic take reduction team recommendations were then incorporated into this January 14, 1998, draft plan as a combined plan. We consider this last date, January 14, 1998, as the submission date for a draft plan because at that point both teams had concluded their deliberations.

According to NMFS officials, the reasons for delays in publishing proposed plans and implementing regulations include the following:

- **Atlantic Large Whale:** Agency officials submitted the proposed plan for publication within the statutory deadline but told us that the *Federal Register* did not print the notice containing the proposed take reduction plan until 5 days after the statutory deadline.
- **Pacific Offshore Cetacean:** The former team coordinator for this team said that the proposed plan was delayed because of the time it took to comply with various applicable laws. For example, NMFS is required to review the proposed plan and consider its effects on small businesses and other small entities under the Regulatory Flexibility Act and prepare an

environmental assessment under the National Environmental Policy Act, among other requirements. Developing and drafting an environmental assessment is a labor-intensive process requiring coordination among scientists, economists, and policymakers.

- **Harbor Porpoise:** According to NMFS officials, they delayed preparing the proposed plan for publication in the *Federal Register* because they were waiting to see if closures of some fishing areas to protect fish would also reduce incidental take of harbor porpoises. In addition, NMFS scientists determined that this stock of harbor porpoises was migratory and interacting not only with the Gulf of Maine fisheries but with mid-Atlantic fisheries as well. As a result of this finding, NMFS established another team, the Mid-Atlantic take reduction team, for the mid-Atlantic fisheries. NMFS delayed the publication of the proposed take reduction plan for the Gulf of Maine fisheries until the Mid-Atlantic team developed and submitted a draft plan. Ultimately, the two plans were combined and published as a single plan for both the Gulf of Maine and mid-Atlantic fisheries.
- **Pelagic Longline:** According to NMFS officials, a combination of factors caused the proposed plan to be published in the *Federal Register* almost 2 years after the deadline. Take reduction team coordinators are responsible for coordinating NMFS's internal review and approval for take reduction plans, crafting the regulatory language for the plan, and submitting the proposed plans for publication in the *Federal Register*. Because the team coordinator position was vacant for approximately 16 months, completion of these tasks was delayed.
- **Bottlenose Dolphin:** A combination of factors caused this proposed plan to be published in the *Federal Register* 2 years after the deadline, according to NMFS officials. The publication of the proposed plan was delayed because NMFS asked team members to reconvene when it became clear that the recommended regulatory measures would not reduce incidental take to levels below the maximum removal level, as required by the MMPA. Although NMFS can propose a plan of its own that deviates from the team's draft plan, officials from NOAA's Office of General Counsel told us NMFS prefers to wait until the team completes its work and submits a draft plan. After they reconvened, the take reduction team members developed and submitted a revised draft plan; however, because the team coordinator position was vacant for about 8 months, preparing the proposed plan for publication was delayed. Additionally, because NMFS combined two rules—to benefit both sea turtles and bottlenose dolphins—into one, the proposed plan was delayed due to the time needed to update an environmental assessment required under the

National Environmental Policy Act and other associated documents. Also, the proposed plan was delayed because of the time it took to comply with various laws and executive orders. Finally, the Office of Management and Budget took 90 days to review the proposed plan—the maximum time allowed for such a review. This review by itself exceeded the MMPA’s 60-day deadline.

NMFS officials told us it is extremely difficult for the agency to meet the MMPA’s deadline for this step in the process. As the examples above demonstrate, NMFS officials provided us with a variety of reasons for delays in meeting the statutory deadlines for publishing proposed plans in the *Federal Register*; however, the agency has not conducted a comprehensive analysis that would identify all of the tasks that must be completed during this stage in the process, along with the total time needed to complete them. NMFS stated that it has not conducted such an analysis because, in some cases, the documents needed are 10 years old and are not available electronically.

NMFS Has Complied with the Statutory Deadlines for Public Comment Periods

According to the MMPA, NMFS must hold a public notice and comment period on the proposed plan and implementing regulations for up to 90 days after the proposed plan’s publication in the *Federal Register*. The public comment period is an opportunity for interested persons to participate in the development of a take reduction plan by submitting their views and concerns about the proposed plan. For all five teams—the Atlantic Large Whale, Bottlenose Dolphin, Harbor Porpoise, Pacific Offshore Cetacean, and Pelagic Longline—NMFS has complied with the statutory deadline each time.

NMFS Did Not Publish Final Take Reduction Plans for Four of the Five Teams within the Statutory Deadlines

According to the MMPA, once the public comment period ends, NMFS must publish the final plan and implementing regulations in the *Federal Register* within 60 days. NMFS missed the statutory deadline for four teams but met it for the Harbor Porpoise team. According to our analysis, the delays ranged from 8 days to just over 1 year (see table 7).

Table 7: Delays in Publishing Final Take Reduction Plans

Take reduction team	Date of statutory deadline for publication	Date NMFS published the final plan in Federal Register	Delay
Atlantic Large Whale	July 14, 1997	July 22, 1997 ^a	8 days
Pacific Offshore Cetacean	May 30, 1997	October 3, 1997	136 days (4 months)
Bottlenose Dolphin	April 9, 2005	April 26, 2006	382 days (over 1 year)
Pelagic Longline	November 21, 2008	To be determined ^b	To be determined

Source: GAO analysis of information published in *Federal Register* final rules.

^aNMFS published an “interim final plan” for the Atlantic Large Whale team. Although the MMPA is silent on interim final plans, we consider it the final plan because it was in force and had the same effect as a final plan.

^bNMFS had not published the final plan in the *Federal Register* as of the publication date of our report, December 8, 2008.

According to NMFS officials, the reasons for delays in publishing final plans and implementing regulations in the *Federal Register* include the following:³⁸

- **Atlantic Large Whale:** The delay was due, in part, to NMFS’s efforts in responding to the large number of public comments received on the proposed plan.
- **Pacific Offshore Cetacean:** Because the plan included a fishing gear modification, NMFS waited until the preliminary results of a gear research experiment indicated that the modification reduced incidental take before publishing the final plan. The experiment tested the effectiveness of acoustic devices, known as pingers, that are attached to fishing nets and emit high-pitched sounds so that marine mammals would avoid the nets.
- **Bottlenose Dolphin:** According to NMFS officials, the delay was the result of the time needed to review and analyze over 4,000 comments the agency received during the public comment period and the 90 days the

³⁸Because the deadline for publication of the Pelagic Longline final plan occurred after we had concluded our audit work, we did not interview NMFS to ascertain the reasons for the delay.

Office of Management and Budget took to review the final take reduction plan before NMFS could publish it in the *Federal Register*.

NMFS Does Not Have a Comprehensive Strategy for Evaluating the Effectiveness of Take Reduction Regulations

NMFS does not have a comprehensive strategy—identified as a key principle by the Government Performance and Results Act of 1993—for assessing the effectiveness of take reduction regulations once they have been implemented. The Government Performance and Results Act of 1993 provides a foundation for examining agency performance goals and results. Our work related to the act and the experience of leading organizations have shown the importance of developing a comprehensive strategy for assessing program effectiveness that includes, among other things, program performance goals that identify the desired results of program activities and reliable information that can be used to assess results.³⁹ In the context of NMFS’s efforts to measure the success of take reduction plans and implementing regulations, such a strategy would include, at a minimum, (1) performance goals that identify the desired outcomes of the take reduction regulations; (2) steps for assessing the effectiveness of potential take reduction regulations, such as fishing gear modifications, in achieving the goals; (3) a process for monitoring the fishing industry’s compliance with the requirements of the take reduction regulations; and (4) reliable data assessing the regulation’s effect on achieving the goals. Instead of such a comprehensive strategy, we found that although NMFS uses short- and long-term goals established by the MMPA to evaluate the success of take reduction regulations, these goals and the data that NMFS uses to measure the impact of the take reduction regulations have a number of limitations. In addition, while NMFS has taken steps to identify the impact of proposed take reduction regulations prior to their implementation, the agency has limited information about the fishing industry’s compliance with the regulations once they have been implemented. As a result, when incidental takes occur in fisheries covered by take reduction regulations, it is difficult for NMFS to determine whether the regulations were not effective in meeting the MMPA’s goals or whether the fisheries were not complying with the regulations.

³⁹For example, see GAO, *The Results Act: An Evaluator’s Guide to Assessing Agency Annual Performance Plans*, [GAO/GGD-10.1.20](#) (Washington, D.C.: April 1998).

Limitations in the Goals
and Data That NMFS
Currently Uses to Evaluate
the Success of Take
Reduction Regulations
Impede Effective Program
Evaluations

The MMPA identifies, and NMFS further defines, short- and long-term goals for reducing incidental take of marine mammals that take reduction regulations should achieve. Specifically, the MMPA set a short-term goal of reducing incidental take—also known as fishery-related mortality—for strategic stocks below the maximum removal level within 6 months of a plan’s implementation and set a long-term goal of reducing fishery-related mortality to insignificant levels approaching a zero mortality and serious injury rate within 5 years of a plan’s implementation, which NMFS generally defines as 10 percent of the maximum removal level.⁴⁰ NMFS officials told us that NMFS staff and take reduction team members review whether or not the goals have been met for the stocks covered by their teams.

However, NMFS officials, Marine Mammal Commission officials, and a Scientific Review Group chair all considered the 6-month time frame for meeting the short-term goal to be unrealistic. Specifically, some noted that due to the extensive time needed to gather and publish data on the maximum removal level and fishery-related mortality estimates, NMFS does not have the necessary information to assess the goal within the 6-month time frame. A NMFS official also noted that fishing changes over the year; therefore, assessing whether fishery-related mortality is below the maximum removal level during a 6-month time frame may not consider mortality that may occur during both the busiest and the slowest fishing seasons. While the MMPA sets this 6-month goal, it does not impose consequences on NMFS or the regulated fisheries if the goal is not met.

Furthermore, these goals may not help NMFS assess the success of the regulations because we found that there was not always greater success in meeting the goals after take reduction regulations were implemented than

⁴⁰The long-term goal is also known as the zero mortality rate goal (ZMRG) or reducing incidental take to an insignificant level approaching a zero mortality and serious injury rate. The goal of commercial fisheries reducing mortality and serious injuries to insignificant levels approaching a zero mortality rate goal within 5 years of a take reduction plan’s implementation must take “into account the economics of the fishery, the availability of existing technology, and existing state or regional fishery management plans.” The MMPA also has a deadline of April 30, 2001, for “commercial fisheries to reduce mortality and serious injuries to insignificant levels approaching a zero mortality rate goal.” The MMPA does not define ZMRG, but NMFS has defined “insignificance threshold” as the default target level of mortality and serious injury for all marine mammal stocks. Under NMFS’s regulation, take reduction plans and implementing regulations are the mechanisms that help Category I and II fisheries meet the insignificance threshold but these take reduction plans and regulations must take into account the fishery’s economics, availability of existing technology, and existing fishery management plans.

before they were implemented. Also, if the goals had been met for a stock in a given year, in some cases the goals did not continue to be met in the following years. Specifically, we found that for two stocks,⁴¹ the short-term goal had been met prior to the regulations being implemented but was no longer being met in 2007.⁴² In addition, for two other stocks, the long-term goal had been met prior to implementation of the regulations,⁴³ but was no longer being met in 2007.⁴⁴ Furthermore, for two stocks, the short-term goal had been met and for two stocks, the long-term goal had been met in 2007, but these goals had already been met prior to implementation of the take reduction regulations.⁴⁵ In cases where the goals were met prior to the implementation of take reduction regulations, the goals cannot be used to determine the regulations' impact on reducing take.

In addition, according to NMFS officials, changes to the marine environment that happen during the same time period as the implementation of take reduction regulations make it difficult to assess

⁴¹These are the California/Oregon/Washington stock of long-beaked common dolphins and what is now called the Gulf of Maine stock of humpback whales.

⁴²In some cases, strategic stocks could be meeting the goal of reducing fishery-related mortality to below the maximum removal level prior to implementation. Specifically, this might be the case for stocks that receive their strategic status determination through an ESA listing or designation as depleted under the MMPA.

⁴³While NMFS's guidance provides that the long-term goal must take into account the economics of the fishery, the availability of existing technology, and existing state or regional fishery management plans, the agency has not specified how it considers these factors in establishing long-term goals for the current take reduction plans. Therefore we examined whether or not the long-term goals had been met by assessing whether fishery-related mortality was less than 10 percent of the maximum removal level. We used data from 2007 to measure whether the goals had been met rather than measuring 5 years after the implementation of each plan's regulations in order to make general determinations about whether these goals are adequate measures of success.

⁴⁴These are the Western North Atlantic stock of fin whales and the Canadian East Coast stock of minke whales. NMFS told us that because minke whales are not a strategic stock, they are not relevant in assessing NMFS's achievement of the long-term goal. However, the Atlantic Large Whale take reduction plan states that a goal of the plan is to reduce entanglement-related serious injury of minke whales to insignificant levels approaching zero mortality and serious injury rate. Thus, NMFS has stated its intent in the plan to achieve the long-term goal for the minke whales.

⁴⁵The two stocks that had already met the short-term goal were the Western North Atlantic stock of fin whales and the California/Oregon/Washington stock of fin whales. The two stocks that had already met the long-term goal were the California/Oregon/Washington stock of fin whales and the California/Oregon/Washington stock of short-beaked common dolphins.

whether the regulations are the reason that the short- and long-term goals for a stock have been achieved or whether it was other changes. Specifically, state or federal fishing regulations unrelated to the take reduction team process may result in less fishing in the fisheries covered by the take reduction team. In such a scenario, fishery-related mortality may decrease because there are fewer opportunities for fishing vessels to interact with marine mammals. Therefore, a lower level of fishery-related mortality may lead to achievement of the MMPA's goals for a stock even if the take reduction regulations themselves were not the primary reason for the lower level of incidental take.

Moreover, limitations in some of the data used to determine whether the MMPA's short- and long-term goals for reducing incidental take by commercial fisheries have been met may lead to inaccurate conclusions about the effectiveness of the take reduction regulations.⁴⁶ We reviewed the stock assessment reports for 9 of the 10 strategic stocks and all 3 of the nonstrategic stocks covered by take reduction regulations and found that for 2007, the short-term goal for 4 of the 9 strategic stocks had been achieved and the long-term goal had been achieved for 3 of the 12 strategic and nonstrategic stocks.⁴⁷ However, we also found that the information used to determine the maximum removal level or the fishery-related mortality estimate for 6 of the 9 strategic stocks covered by these regulations was less precise than NMFS guidelines recommend. Because these are the two key sources of information for determining whether the MMPA's short- and long-term goals have been met, this imprecision may cause NMFS to incorrectly assess whether the take reduction regulations have been successful.

⁴⁶There are currently 13 stocks—10 strategic and 3 nonstrategic—covered by take reduction regulations. According to the MMPA, as amended, the short-term goal is applicable only to strategic stocks. Under authority granted by the MMPA, NMFS may choose to establish teams for nonstrategic stocks, but these stocks are subject only to the long-term goal of reducing fishery-related mortality to 10 percent of the maximum removal level. However, by definition, these stocks have already met the short-term goal.

⁴⁷Western North Atlantic coastal bottlenose dolphins are also strategic. We chose not to assess progress by the Bottlenose Dolphin take reduction team in meeting the goals due to the unique data collection system that NMFS uses for this team. Specifically, due to concerns about the stock definition for the Western North Atlantic coastal bottlenose dolphins covered by the Bottlenose Dolphin take reduction team, NMFS further divides this population into management units. NMFS identifies different fishery-related mortality estimates for each of these management units, but not for the Western North Atlantic coastal bottlenose dolphins as a whole, making it difficult to determine whether the total population met the short- and long-term goals.

NMFS officials stated that limitations in the data make it difficult to know the reason for changes in meeting the goals from one year to another. For example, we found that the short-term goal for the Gulf of Maine stock of humpback whales covered by the Atlantic Large Whale take reduction team had been met prior to implementation of the take reduction regulations; however, according to the stock assessment report, it did not meet the goal in 2007.⁴⁸ Meanwhile, between the year prior to when the regulations were implemented and 2007, NMFS altered its stock definition for these marine mammals in a way that decreased the number of animals included in the population size estimate—a key aspect of determining the maximum removal level. This change made the maximum removal level much lower than it had been before the regulations were implemented, making it more difficult to achieve the goals. Because of this change in NMFS’s approach to calculating the maximum removal level, it is difficult to determine whether ineffectiveness of the take reduction regulations or the change in the maximum removal level led to the short-term goal no longer being met for this stock.

NMFS Studies the Impact of Proposed Take Reduction Regulations prior to Their Implementation, but Has Limited Information about Industry Compliance

NMFS has assessed the likelihood that proposed take reduction regulations would achieve the short- and long-term goals of reducing incidental take for all four teams with final take reduction plans and regulations. Specifically, for all four plans, scientists evaluated whether key proposed measures for modifying fishing gear or changing the times or areas where fishing could occur were likely to decrease incidental take. For example, NMFS scientists analyzed data from previous incidental take in the gillnet fisheries of concern for bottlenose dolphins and found that incidental take had occurred at a higher rate on the vessels that used nets with larger mesh openings. Because this type of gear would be restricted under the proposed regulations, NMFS had reason to believe that these gear restrictions would result in reduced incidental take of bottlenose dolphins.⁴⁹ Similarly, according to the environmental assessment report for the Harbor Porpoise take reduction team, a controlled experiment tested the effectiveness of acoustic devices—often called pingers—attached to

⁴⁸The humpback whale is listed as an endangered species under the ESA and therefore is designated as strategic even though human-caused mortality was lower than the maximum removal level when the take reduction team was established.

⁴⁹Marjorie C. Rossman and Debra L. Palka, “A Review of Coastal Bottlenose Dolphin Bycatch Mortality Estimates in Relation to the Potential Effectiveness of the Proposed CBDTRP.” Northeast Fisheries Science Center Protected Species Branch (Woods Hole, Massachusetts: 2004).

fishing nets. Pingers emit a high-pitched sound that harbor porpoises can hear, which results in them avoiding fishing nets. This experiment allowed NMFS scientists to predict that proposed regulations to implement pingers would likely result in a decline of incidental take.⁵⁰

Although NMFS has conducted some assessments of the likelihood that proposed take reduction regulations will achieve the goals of reducing incidental take, they have limited information about the extent to which fisheries comply with take reduction regulations once they have been implemented. As a result, when incidental takes occur in fisheries covered by take reduction regulations, it is difficult for NMFS to determine whether the regulations were not effective in meeting the MMPA's goals or whether the fisheries were not complying with the regulations. Specifically, we determined that NMFS does not have comprehensive approaches to measure the extent to which fisheries comply with the regulations for the four take reduction plans that it has implemented. However, for all of these implemented regulations, NMFS has some—albeit limited—information from fisheries observer or enforcement programs that provide an indication of whether fisheries are complying with the regulations.⁵¹ For example, when incidental take of harbor porpoises in the fisheries covered by the Harbor Porpoise take reduction team recently increased, NMFS scientists used observer information about incidental take to determine whether or not these takes occurred when vessels were complying with the requirement to use pingers on their nets.⁵² However, according to the scientists, the usefulness of this information in determining actual compliance was limited because observers could only identify whether the pingers were attached to the net, not whether these pingers functioned properly. On the Pacific Offshore Cetacean team, the team coordinator stated that in the past, NMFS has received information from the observer program about fishing vessels monitored by observers that were not in compliance with the take reduction regulations. However, she stated that NMFS does not routinely review the observer information

⁵⁰Office of Protected Resources, National Marine Fisheries Service, *Harbor Porpoise Take Reduction Plan (HPTRP) Final Environmental Assessment and Final Regulatory Flexibility Analysis* (Silver Spring, Maryland: 1998).

⁵¹Fishery observer programs place individuals on commercial fishing vessels to observe operations, including documenting any instances of incidental take of marine mammals.

⁵²Debra Palka, "Effect of Pingers on Harbor Porpoise and Seal Bycatch." Northeast Fisheries Science Center (Woods Hole, Massachusetts: 2007).

to identify or document the extent of these instances or estimate the extent of overall compliance with the take reduction regulations.

In addition to the information that it receives from the observer programs, NMFS receives some information about compliance from NOAA's Office of Law Enforcement, the U.S. Coast Guard, or state enforcement agencies. Specifically, team coordinators told us that officials from the U.S. Coast Guard attend take reduction team meetings to discuss instances where the agencies found vessels out of compliance with take reduction regulations during the course of their enforcement work. However this information is not generally extensive enough to provide overall assessments of the extent to which fisheries are complying with the regulations.

In 2007, we reported that NMFS lacked a strategy for assessing industry compliance with the Atlantic Large Whale team's take reduction plan, and we recommended that it develop one.⁵³ In response to our report, the team is beginning to develop a comprehensive approach to monitoring compliance. NMFS staff members are currently developing a plan for take reduction team members to review during their next meeting, which is planned for early 2009. No other take reduction teams are developing comprehensive approaches for monitoring compliance at this time.

Conclusions

NMFS faces a very large, complex, and difficult task in trying to protect marine mammals from incidental mortality and serious injury during the course of commercial fishing operations, as the MMPA requires. Without comprehensive, timely, and accurate population and mortality data for the 156 marine mammal stocks that NMFS is charged with protecting, NMFS may be unable to accurately identify stocks that meet the legal requirements for establishing take reduction teams, thereby depriving them of the protection they need to help recover or maintain healthy populations. Conversely, unreliable data may lead NMFS to erroneously establish teams for stocks that do not need them, wasting NMFS's limited resources.

⁵³GAO, *National Marine Fisheries Service: Improved Economic Analysis and Evaluation Strategies Needed for Proposed Changes to Atlantic Large Whale Protection Plan*, [GAO-07-881](#) (Washington, D.C.: July 20, 2007).

For those stocks that meet the requirements for establishing take reduction teams, it is important that NMFS adhere to the deadlines in the MMPA, as delays in establishing teams and developing and finalizing take reduction plans could result in continued harm to already dwindling marine mammal populations. However, we recognize that it may not be useful to establish take reduction teams for those stocks that meet the MMPA requirements but whose population declines are not being caused by commercial fisheries. We also acknowledge it may not be possible for NMFS to meet some of the MMPA's deadlines given the requirements of other laws that NMFS must comply with in developing take reduction plans and the need for various levels of review and approval. Nonetheless, the MMPA's deadlines are clear, and unless the law is amended to address these situations, NMFS has a legal obligation to comply with them.

Finally, for stocks for which NMFS has developed take reduction regulations, it is important for NMFS to assess their effectiveness in reducing serious injury and mortality to acceptable levels. Doing so will require more comprehensive information about the fishing industry's compliance with take reduction regulations so that if the short- and long-term goals are not met, NMFS knows whether to attribute the failure to a flaw in the regulations or to noncompliance with them. Without a comprehensive strategy for assessing the effectiveness of its take reduction plans and implementing regulations and industry's compliance with them, NMFS may be missing opportunities to better protect marine mammals.

Matters for Congressional Consideration

To facilitate the oversight of NMFS's progress and capacity to meet the statutory requirements for take reduction teams, Congress may wish to consider taking the following three actions:

- direct the Assistant Administrator of NMFS to report on major data, resource, or other limitations that make it difficult for NMFS to accurately determine which marine mammals meet the statutory requirements for establishing take reduction teams; establish teams for stocks that meet these requirements; and meet the statutory deadlines for take reduction teams;
- amend the statutory requirements for establishing a take reduction team to stipulate that not only must a marine mammal stock be strategic and interacting with a Category I or II fishery, but that the fishery with which the marine mammal stock interacts causes at least occasional incidental mortality or serious injury of that particular marine mammal stock; and

-
- amend the MMPA to ensure that its deadlines give NMFS adequate time to publish proposed and final take reduction plans and implementing regulations while meeting all the requirements of the federal rulemaking process.

Recommendation for Executive Action

We recommend that the Assistant Administrator of NMFS develop a comprehensive strategy for assessing the effectiveness of each take reduction plan and implementing regulations, including, among other things, establishing appropriate goals and steps for comprehensively monitoring and analyzing rates of compliance with take reduction measures.

Agency Comments and Our Evaluation

We provided a draft copy of this report to the Secretary of Commerce for review and comment. In response to our request, we received general, technical, and editorial comments from NOAA by email, which stated that the agency agreed with our recommendation that NMFS should develop a comprehensive strategy for assessing the effectiveness of each take reduction plan and the implementing regulations. We have incorporated the technical and editorial comments provided by the agency, as appropriate.

As we agreed with your office, unless you publicly announce the contents of this report earlier, we plan no further distribution until 30 days from the report date. At that time, we will send copies to the Secretary of Commerce, the Administrator of NOAA, and appropriate congressional committees, and other interested parties. In addition, the report will be available at no charge on the GAO Web site at <http://www.gao.gov>.

If you or your staff have any questions about this report or need additional information, please contact me at (202) 512-3841 or mittala@gao.gov. Contact points for our Offices of Congressional Relations and Public

Affairs may be found on the last page of this report. GAO staff who made major contributions to this report are listed in appendix III.

Sincerely yours,

A handwritten signature in black ink that reads "Anu K. Mittal". The signature is written in a cursive, flowing style.

Anu K. Mittal
Director, Natural Resources
and Environment

Appendix I: Objectives, Scope, and Methodology

The objectives of this review were to determine the extent to which (1) available data allow the National Marine Fisheries Service (NMFS) to accurately identify the marine mammal stocks that meet the Marine Mammal Protection Act's (MMPA) requirements for establishing take reduction teams, (2) NMFS has established take reduction teams for those marine mammal stocks that meet the statutory requirements, (3) NMFS has met the statutory deadlines established in the MMPA for the take reduction teams subject to the deadlines and the reasons for any delays, and (4) NMFS has developed a comprehensive strategy for evaluating the effectiveness of the take reduction plans that have been implemented.

To determine the extent to which available data allowed NMFS to accurately identify marine mammal stocks that meet the MMPA's requirements for establishing take reduction teams, we identified stocks for which NMFS lacked data on either the human-caused mortality and serious injury estimate (hereafter referred to as human-caused mortality estimate) or the potential biological removal levels (hereafter referred to as maximum removal levels).¹ To do this, we first reviewed all 156 stocks identified in NMFS's 2007 stock assessment reports and removed 19 stocks currently covered by take reduction teams. Then we removed 24 stocks that are listed as endangered or threatened under the Endangered Species Act (ESA) or designated as depleted under the MMPA because NMFS does not use information about human-caused mortality and the maximum removal level to make strategic status decisions for these stocks. We then reviewed the remaining 113 stocks to identify those that lacked either a human-caused mortality estimate or a maximum removal level. After identifying those that lacked human-caused mortality or maximum removal levels, we reviewed a sample of the remaining 74 stocks that did have these determinations to assess the reliability of the information used to determine human-caused mortality estimates and maximum removal levels.

We identified several key data elements in NMFS's stock assessment reports that the agency uses to determine human-caused mortality estimates and maximum removal levels:

¹Maximum removal level is defined as the maximum number of animals—not including natural mortalities—that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population.

- abundance estimates (population size estimates) and NMFS calculation of the estimates' precision,
- the age of data used to calculate population size estimates,
- fishery-related mortality and serious injury estimates (hereafter known as fishery-related mortality estimates) and NMFS calculation of the estimates' precision,
- adjustments made to the maximum removal level in order to account for fishery-related mortality estimate imprecision,
- information sources such as observer data used to calculate fishery-related mortality estimates, and
- qualitative information identified in the stock assessment reports about scientists' concerns regarding data strengths or limitations.

We also identified criteria for assessing the quality of these data elements using information from the MMPA and publications such as NMFS's guidelines for preparing stock assessment reports and stock assessment improvement plan and confirmed the criteria with NMFS officials.² While scientists and publications also identified bias in population size and mortality estimates as a potential data reliability problem, we did not assess the extent to which existing data sources included bias because data and accompanying criteria to make such an assessment were not available.

We then analyzed the key data elements for a sample of stocks to determine the extent to which the data met the criteria we identified. We chose our sample of stocks to review by conducting a stratified random sample of the 74 stocks that were not currently covered by take reduction teams, did not receive strategic status due to MMPA designations or listings under the ESA, and had both human-caused mortality and serious injury estimates and maximum removal levels. The sample of 28 stocks

²National Marine Fisheries Service, *Guidelines for Preparing Stock Assessment Reports Pursuant to Section 117 of the Marine Mammal Protection Act: SAR Guidelines, June 2005 Revision*. (Silver Spring, Maryland: June 2005), and NOAA Fisheries National Task Force for Improving Marine Mammal and Turtle Stock Assessments, *A Requirements Plan for Improving the Understanding of the Status of U.S. Protected Marine Species*. National Marine Fisheries Service, NOAA Technical Memorandum NMFS-F/SPO-63 (Silver Spring, Maryland: September 2004).

included all strategic stocks that met these criteria as well as a representative sample of stocks from each of the three NMFS Fishery Science Centers responsible for publishing the stock assessment reports. We then extrapolated the results of our review for this sample to all 74 stocks that met the criteria listed above. We calculated 95 percent confidence intervals for each of the estimates made from this sample. The confidence intervals for these estimates are presented in table 8.

Table 8: Confidence Intervals for Estimates Based on GAO’s Review of Selected Stock Assessment Reports

Characteristics	Estimated population total with this characteristic	95 percent confidence interval of the total estimate
Population estimates used information that was 8 years old or older	11	5 - 18
Population size estimates used information that was between 5 and 8 years old	21	12 - 29
Population size estimates were less precise than NMFS guidelines recommend	48	41 - 56
Scientists could not calculate the precision of fishery-related mortality estimates	48	38 - 58
Mortality estimates were less precise than NMFS guidance recommends	24	14 - 34

Source: GAO analysis.

We also spoke with NMFS and Marine Mammal Commission officials to identify the potential impacts of using unreliable information to determine human-caused mortality or maximum removal levels.

In some cases, we found potentially conflicting information within individual stock assessment reports about whether fishery-related mortality was unknown or estimated as zero. In these cases, we used the information that NMFS provided in stock assessment report summary tables to resolve the inconsistencies within the individual stock assessment reports because we considered these estimates to be the agency’s final decision. In all cases, these summary tables identified the fishery-related mortality estimates for these stocks as zero rather than unknown.

To determine the extent to which NMFS has established take reduction teams for those marine mammal stocks that meet the statutory

requirements, we analyzed stock assessment reports for 1995 through 2007 and lists of fisheries for 1996 through 2008 and identified marine mammal stocks that met the statutory requirements for establishing take reduction teams. To do this, we reviewed the MMPA and identified the statutory requirements for establishing take reduction teams, then interviewed officials from the National Oceanic and Atmospheric Administration's (NOAA) Office of General Counsel to verify that we had identified the correct requirements. We also analyzed the stock assessment reports and list of fisheries and identified all of the stocks that have met the statutory requirements, which include marine mammal stocks that (1) were listed as strategic according to a final stock assessment report and (2) interacted with a Category I or II fishery according to a current list of fisheries. We developed a database and used it to analyze this information. Once we identified the marine mammal stocks that met the statutory requirements, we verified with NMFS officials the stocks for which the agency has already established take reduction teams. On the basis of this information, we determined which stocks met the statutory requirements but are not covered by a team. We met with NMFS officials to review and verify our findings, and interviewed NMFS officials to obtain reasons why the agency has not established take reduction teams for these stocks. We also met with representatives of the Marine Mammal Commission to review our findings.

To determine the extent to which NMFS has met the MMPA's deadlines for the five take reduction teams subject to the deadlines and the reasons for any delays, we

- identified five key deadlines listed in the MMPA for NMFS and take reduction teams and interviewed officials from NOAA's Office of General Counsel to confirm the deadlines;
- obtained and reviewed documentation, such as take reduction plans, *Federal Register* notices announcing the establishment of teams, and NMFS's proposed and final take reduction plans and implementing regulations published in the *Federal Register*;
- analyzed the dates published in the *Federal Register* documents to determine whether each of the five take reduction teams had met their statutory deadlines; and,
- met with NMFS officials to confirm the accuracy of our analysis of information published in *Federal Register* notices.

To determine the reasons for any delays in meeting the statutory deadlines, we interviewed take reduction team coordinators from NMFS's Office of Protected Resources, officials from NOAA's Office of General Counsel, marine biologists in NMFS's Fishery Science Centers, and members of each of the five teams subject to the deadlines. We also obtained and reviewed NMFS documentation about various laws and executive orders that the agency must comply with when publishing proposed and final take reduction plans in the *Federal Register*.

To determine the extent to which NMFS has developed a comprehensive strategy for evaluating the effectiveness of the take reduction plans that have been implemented, we reviewed the MMPA and relevant NMFS documentation and spoke with NMFS officials and Scientific Review Group chairs regarding the (1) performance goals used by NMFS to assess the success of take reduction regulations, (2) actions taken prior to implementing proposed regulations to increase the likelihood that the regulations will achieve these performance goals, and (3) extent to which NMFS has information about fisheries' compliance with implemented take reduction regulations. We also reviewed stock assessment reports from 1995 through 2007 for stocks covered by three of the four take reduction teams with final regulations in place to determine whether the stocks met the short- and long-term goals in each of those years.³ To calculate whether the goals were met prior to implementation of the take reduction regulations, we used the last year for which the fishery-related mortality estimates in the stock assessment reports did not include any information about incidental take that was collected after the regulations were implemented. We excluded the strategic bottlenose dolphins from our review due to methodological differences between the way NMFS reports on fishery-related mortality and maximum removal levels for them versus for the other stocks. Specifically, due to concerns about the stock definition for the Western North Atlantic coastal bottlenose dolphins covered by the Bottlenose Dolphin take reduction team, NMFS further divides this population into management units. NMFS identifies different fishery-related mortality estimates for each of these management units, but not for the Western North Atlantic coastal bottlenose dolphins as a

³Three stocks, the Canadian East Coast stock of minke whales, the California/Oregon/Washington stock of northern right whale dolphins, and the California/Oregon/Washington stock of short-beaked common dolphins, were included in the teams even though they were not strategic when the teams were established. In accordance with the MMPA, only the long-term goal applies to these stocks, so we did not analyze whether these stocks had met the short-term goal.

whole, making it difficult to determine whether the total population met the short- and long-term goals. In addition, we assessed the reliability of the data used to determine whether NMFS has met the goals for the strategic stocks covered by three of the four take reduction teams with final regulations. To do this, we analyzed the extent to which key data elements met data quality criteria identified by the MMPA and NMFS. We reviewed strategic stocks because they are most likely to be at continued risk of fishery-related take leading to unsustainable population declines. We also compared the data for the year prior to when the regulations were first implemented with the data from 2007 to identify any changes that occurred in meeting the goals before and after the take reduction regulations went into effect.

We conducted this performance audit from September 2007 to December 2008 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Appendix II: Commercial Fishing Techniques and How Marine Mammals Are Affected

The table below presents information about select commercial fishing techniques, including the type of gear, how the injury or death occurs, and examples of marine mammals affected.

Table 9: Commercial Fishing Techniques and How Marine Mammals Are Affected

Type of fishery	Type of gear	How injury or death occurs	Examples of marine mammals affected
Gillnet	A gillnet is a curtain of netting that hangs in the water at various depths, suspended by a system of floats and weights. Gillnets may sometimes be anchored. The mesh spaces are large enough for a fish's head to pass through, but not its body. As fish, such as sardines, salmon, or cod try to back out, their gills are entangled in the net or buoy lines.	Marine mammals get entangled in the nets or fishing lines associated with the gear.	Dolphins (bottlenose and common) Large whales (right, humpback, and sperm) Harbor porpoises
Longline	Longline fishing is conducted by extending a central fishing line behind a fishing boat that ranges from 1 to more than 50 miles long. This central line is strung with smaller lines of baited hooks, which hang at spaced intervals. After leaving the line to soak for a time to attract fish, fishermen return to haul in their catch, such as tuna or swordfish.	Marine mammals are attracted to the baited hooks or the catch and become caught on the hooks or the catch on the hooks. They might also come into accidental contact with gear and become entangled in the fishing gear.	Dolphins (Risso's) Small whales (pilot and false killer)
Long-haul and beach-seine	Long-haul seine fishing uses very large nets (approximately 3,000 to 6,000 feet) pulled by two boats that encircle fish, such as bluefish and croaker, and are then gathered together around a fixed stake. Beach-seine fishing involves setting large nets in the water near a beach with the top floating on the surface and bottom falling deeper in the water. The nets are then pulled up onto the beach, entrapping fish in their path.	Marine mammals can get entangled in the large nets that encircle fish.	Dolphins (bottlenose)
Stop/pound nets	Stop net fishing uses a stationary, anchored net extended perpendicular to the beach. Once the catch accumulates near the end of the stop net, a beach haul seine is used to capture fish and bring them ashore. The stop net is traditionally left in the water for 1–5 days, but can be left as long as 15 days. Stop nets are used to catch mullet. Pound nets are stationary gear in nearshore coastal and estuarine waters. Pound net gear includes a large mesh lead posted perpendicular to the shoreline and extending outward to the corral, or "heart," where the catch accumulates. Pound nets typically catch weakfish, spot, and croaker.	Marine mammals can get entangled in the stationary nets along with the fish the nets intend to catch.	Dolphins (bottlenose)

**Appendix II: Commercial Fishing Techniques
and How Marine Mammals Are Affected**

Type of fishery	Type of gear	How injury or death occurs	Examples of marine mammals affected
Traps/ pots	Traps and pots are submerged cages that usually lie on the ocean floor, attract fish or shellfish, and hold them alive until fishermen return to haul in the gear. Ropes run between the cages along the ocean floor and to a buoy floating at the surface, so fishermen can locate their gear.	Marine mammals get entangled in the rope connecting the cages to each other and the floating buoy. Specifically, right whales feed with their mouths open for extended periods of time and can become entangled in ropes and other gear.	Large whales (right, humpback, and fin) Dolphins (bottlenose)
Trawl	Trawlers tow a cone-shaped net behind a fishing boat. They tow nets at various depths, ranging from just below the surface to along the ocean floor, depending on the type of fish they are trying to catch.	Marine mammals become entangled or caught within the nets.	Dolphins (common and white-sided) Small whales (pilot)

Source: GAO analysis of data from the National Marine Fisheries Service and the Monterey Bay Aquarium.

Appendix III: GAO Contact and Staff Acknowledgments

GAO Contact

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Staff Acknowledgments

In addition to the individual named above, Stephen D. Secrist, Assistant Director; Leo G. Acosta; Mark Braza; Carmen Donohue; Beth Faraguna; Rich Johnson; Alison O'Neill; Dae Park; Kim Raheb; Bruce Skud; Jeanette Soares; and Barbara Steel-Lowney made significant contributions to this report.

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