ENVIRONMENTAL ASSESSMENT

on

ISSUING A QUOTA TO THE MAKAH INDIAN TRIBE FOR A SUBSISTENCE HUNT ON GRAY WHALES FOR THE YEARS 2001 AND 2002

Prepared by

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1. PURPOSE AND NEED FOR ACTION

In 1997, the International Whaling Commission (IWC) approved a quota of 620 gray whales for an aboriginal subsistence harvest during the years 1998 through 2002. The basis for the quota was a joint request by the Russian Federation (for a total of 600 whales) and the United States (for a total of 20 whales). The National Marine Fisheries Service (NMFS) in 1998 and 1999 granted an allocation of up to five gray whales a year to the Makah Indian Tribe, whose subsistence and ceremonial needs had been the foundation of the U.S. request to the IWC. In May 1999, Makah hunters killed one gray whale.

Now, as the result of an opinion by the U.S. Court of Appeals for the Ninth Circuit (*See* Section 2.5 of this Environmental Assessment (EA)), NMFS must reexamine the environmental consequences of allocating any of the IWC quota of up to five gray whales to the Makah Tribe for the years 2001 and 2002.

NMFS' objective is to accommodate Federal trust responsibilities and treaty whaling rights by fulfilling the Tribe's cultural and subsistence needs, to the fullest extent possible consistent with applicable law, while ensuring that any tribal whaling activity does not threaten the eastern North Pacific gray whale population.

A Draft EA was made available to the public for a 30 day comment period closing on February 15, 2001. A public hearing was held during the comment period on February 1, 2001. This Final EA incorporates public comments and additional information that has become available since the Draft EA was released. A summary of the public comments with responses is provided in Appendix 10.1 to this EA.

This EA considers four alternatives for issuance of the IWC quota to the Makah Tribe, including a no-action alternative that would not grant the Makah Tribe a quota. The proposed action will honor obligations contained in both the Treaty of Neah Bay and in the International Convention for the Regulation of Whaling (ICRW) by granting the Makah the IWC quota for gray whales for ceremonial and subsistence use, with limits that protect the gray whale and address public safety.

2. BACKGROUND

2.1. Makah Tradition of Whaling

The Makah Tribe's tradition of whale hunting extends at least 1500 years into the past. In addition to subsistence benefits from direct consumption and trading, whale hunting and its associated components fulfilled important ceremonial and social functions for the Makah. Whaling was so important to the Tribe that it explicitly secured its rights to continue whaling in the 1855 Treaty of Neah Bay, entered into with the U.S. Government. That Treaty is still the primary legal instrument defining the legal relationship between the U.S. Government and the Tribe.

The Tribe continued to whale until the 1920s, when a number of factors led to the decline of tribal whaling. The U.S. Government attempted to instill western values and practices on the Makah Tribe and failed to provide the assistance for whaling it had promised the Tribe during negotiation of the Treaty of Neah Bay. In addition, by the late 1800s, the demand for gray whale oil decreased (Henderson 1984) and sealing became more profitable than whaling (Kirk, 1986). At the same time, dramatic epidemics of smallpox and other infectious diseases plagued the Makah and other tribes, leading to economic and social dislocation (Kirk 1986). Families that had lost more people than survived lacked the ability to properly hand down rank and ceremonial privileges to their young people (Kirk 1986). This hindered the ability to pass on whaling traditions to future generations. In addition, commercial whaling led to a drastic decline in the eastern North Pacific gray whale population available to the Makah hunters. This decline led the Tribe to rely on other sources of food and trading commodities.

Tribal members learned other ways of making a living as contact with western civilizations increased; however, the whaling tradition remained central to the Tribe's culture (Renker 1997). On May 5, 1995, after the eastern North Pacific gray whale had been removed from the list of endangered species, the Makah Tribe formally notified NMFS that it wanted to resume ceremonial and subsistence whaling. While the Tribe believes it has the right under the Treaty of Neah Bay to conduct commercial whaling, it confined its request to NMFS to a ceremonial and subsistence harvest.

According to the Tribe, its cultural and subsistence needs include a harvest of up to five whales a year, the ability to hunt whales safely using traditional methods, and the ability to practice the ceremonial aspects of whaling. More information about the Makah Tribe's tradition of whaling can be found in Renker (1997), Renker and Gunter (1990), Kirk (1986), and in Section 4.4.1. of this EA.

2.2. IWC and Governance of Aboriginal Whaling

In 1946, the United States signed the ICRW. Each Contracting Government to the ICRW is represented on the IWC. The IWC recognizes aboriginal whaling as a category distinct from commercial whaling and exempt from the current moratorium on commercial whaling. The ICRW specifically states that the IWC may not allocate specific quotas to any particular nationality or group of whalers. Because of this prohibition, the IWC sets an overall aboriginal subsistence harvest for the relevant stock, based on the request of Contracting Governments on behalf of aboriginal hunters.

Quotas for aboriginal subsistence whaling are set based on cultural and subsistence need, provided that the quotas are either sustainable or low enough to allow stocks to recover if they had previously been depleted by commercial whaling. There is no formal IWC definition of aboriginal subsistence whaling, only working group guidelines that have never been formally adopted by the Commission.

2.3. IWC Action on Quota Requests

In 1996, NOAA and the Makah Tribal Council signed an agreement, in which the Makah Tribe undertook to prepare a needs statement for submission to the IWC, and NOAA agreed to present to the IWC a needs statement it deemed "adequate" as the foundation for a quota request. During the 1996 IWC annual meeting, because of objections to the proposal that affected the necessary three-quarters majority for adoption, NOAA and the Makah Tribe decided to withdraw the request and to revise and refine the proposal for submission to the IWC in 1997.

Before signing a second agreement with the Makah Tribal Council and submitting another request to the IWC the following year, NMFS prepared an EA (*See* Section 2.5. of this EA). At the 1997 annual meeting, the IWC set a quota for aboriginal subsistence use of gray whales from the eastern stock in the North Pacific. The gray whale quota was based upon a joint presentation by the Russian delegation on behalf of the Chukotka people and the U.S. delegation on behalf of the Makah Tribe. This joint request delineated the subsistence needs for gray whales by the Chukotka and the Makah Tribe. The total requested quota of 620 gray whales over a five-year period assumed an average annual harvest of 120 whales by the Chukotka people and an average annual harvest of four whales (not to exceed five in any year) by the Makah Tribe. The IWC approved the joint request for the aboriginal subsistence use of gray whales by consensus. Approval of the quota, in accordance with IWC procedure, is the only mechanism by which the Commission recognizes the needs of an aboriginal group and determines that a particular use of whales is consistent with the aboriginal subsistence whaling guidelines. Excerpts from the IWC Annual Reports from the years 1995-2000 are included in Appendix 10.2.

2.4. Makah Activities under IWC Quota

2.4.1. Makah Whaling in 1998 - 2000

NMFS granted the Makah Tribe a quota of up to five gray whales in 1998, but the Tribe did not take any whales that year. In 1999, NMFS again granted a quota of up to five whales. On the morning of May 17, 1999, in the Pacific Ocean south of Cape Flattery, Washington, Makah whalers struck and killed a gray whale. The whale was towed to the beach in Neah Bay, where, after tribal ceremonies, it was butchered by tribal members. The meat and blubber were consumed by members of the Makah Tribe and during tribal ceremonies. Details of this take are described in Section 4.4.4 of this EA. No whales were taken during the rest of 1999 or in 2000.

The U.S. Government reported the Makah take at the 1999 and 2000 annual meetings of the IWC. The IWC made no change to the gray whale quota nor took any other action as a result of these reports.

2.4.2. Revisions to Makah Management Plan for 2001-2002

The Tribe requested and subsequently reviewed copies of the public comments submitted on the

Draft EA. After considering these public comments and consulting with NMFS officials about their concerns, the Makah Tribal Council revised its Management Plan for 2001-2002 to address these concerns and to address circumstances that have changed since the Plan was first adopted in January 1998. Subsequently, NMFS refined an alternative from the Draft EA by incorporating the restrictions the Makah have adopted in their Plan. The revised Management Plan (*See* Appendix 10.3) constitutes the Tribe's regulations for the conduct of a gray whale hunt.

Many of the changes in the Plan address NMFS' and the public's concerns that a hunt conducted east of the Bonilla-Tatoosh line entails higher risk to public safety than a hunt restricted to open ocean waters. The Tribe consulted with Beattie Natural Resources Consulting, Inc. (Beattie 2001) in designing the revisions to its Plan that address firearm safety, discharge, and certification protocols for the large-caliber rifles used in the Makah hunt.

The Tribe will appoint a safety officer whose primary responsibility is to assess risk to human life or property as the hunt progresses. Both the safety officer and the rifleman will be in the chase boat. The rifleman may discharge his weapon only if the safety officer authorizes him to fire. The safety officer will give such authorization only if the barrel of the rifle is above and within 30 feet or less from the target area of the whale, and only if he determines that the rifleman's field of view is clear of all persons, vessels, buildings, vehicles, highways, and other objects or structures that, if hit by a rifle shot, could cause injury to human life or property. The hunt will be suspended if the safety officer determines that visibility is less than 500 yards in any direction. The rifleman's certification will include a demonstration of proficiency and accuracy under simulated hunting conditions. The Plan requires that whaling teams ensure that the hunt does not pose a risk to human life or property. All whaling will occur within the Coast Guard's Regulated Navigation Area (RNA) (*See* Section 4.1.4 of this EA).

The Draft EA contained an alternative (alternative 2) for a limited hunt on the Pacific coast feeding aggregation of gray whales. In the revised Management Plan, the Tribe will restrict the number of gray whales struck east of the Bonilla-Tatoosh line, or between June 1 and November 30 in the Pacific Ocean west of the line, to five over the two-year period (2001-2002). The Plan also revised the definition of "strike" to read as follows:

> "Strike" means any blow or blows delivered to a whale by a harpoon, lance, rifle, explosive device or other weapon. When used as a verb, "strike" means the act of delivering such a blow or blows to a whale. A harpoon blow is a strike only if the harpoon is embedded in the whale. Any rifle shot which hits a whale is a strike. For purposes of Part III.C and III.F, multiple strikes on a single whale shall count as a single strike.

The Plan includes a definition of "take" ("to flag, buoy or make fast to a whale catcher, including a canoe, chase boat or support boat") and specifies harvest quotas in terms of whales "taken" rather than "landed." The number of whales taken in any one calendar year cannot exceed five. The total number of whales struck over the two-year period cannot exceed 14, and the Tribe will

take measures to ensure that the ratio of struck whales to landed whales in any calendar year does not exceed 2:1. To address concerns about wildlife on islands in the area of the hunt, the Plan stipulates that initial strikes are not allowed within 200 yards of Tatoosh Island or White Rock between May and September.

2.5. Explanation of Legal Issues

Through domestic measures and international treaties, Congress and the Executive Branch have sought to ensure conservation of wildlife while recognizing the essential rights of Indians to hunt and fish to maintain their culture. Resolution of these issues is informed by the U.S. Government's trust responsibility to American Indian Tribes – pursuant to which the Government has certain fiduciary responsibilities, including a duty to protect certain natural resources. The United States is party to two treaties that are relevant to Makah whaling: the 1855 Treaty of Neah Bay and the 1946 ICRW. Both of these treaties have the force of law. Thus, NMFS must implement its trust responsibilities toward the Makah, while ensuring that any tribal whaling activity does not theaten the eastern North Pacific stock of gray whales. A brief discussion of the applicability of the Marine Mammal Protection Act (MMPA) and the Endangered Species Act (ESA) is included in Section 2.5.4 of this EA.

2.5.1. Federal Trust Responsibility

The concept of "trust responsibility" is derived from the special relationship between the Federal Government and Indians, first delineated by Supreme Court Chief Justice John Marshall in Cherokee Nation v. Georgia, 30 U.S. 1 (5 Pet.) (1831). Later, in Seminole Nation v. United States, 316 U.S. 286 (1942), the Court noted that the United States "has charged itself with moral obligations of the highest responsibility and trust" toward Indian Tribes. The scope of the Federal trust relationship is broad and incumbent upon all Federal agencies. The U.S. Government has an obligation to protect tribal land, assets, and resources, as well as a duty to carry out the mandates of Federal law with respect to American Indian and Alaska Native tribes. This unique relationship provides the Constitutional basis for legislation, treaties, and Executive Orders that grant unique rights or privileges to Native Americans. Morton v. Mancari, 417 U.S. 535, 551-53 (1974).

In furtherance of this trust responsibility and to demonstrate respect for sovereign tribal governments, the principles described above were incorporated into Secretarial Order No. 3206, dated June 5, 1997, and signed by the Secretaries of Commerce and Interior. This Order, entitled "American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act," directs both Departments to carry out their responsibilities under the ESA in a manner that harmonizes the Federal trust responsibility to tribes, tribal sovereignty, and statutory missions of the Departments, so as to avoid or minimize the potential for conflict and confrontation.

Executive Order (EO) 13084, issued May 14, 1998, requires each Federal agency to establish

meaningful consultation and collaboration with Indian tribal governments in formulating policies that significantly or uniquely affect their communities. Entitled "Consultation and Coordination with Indian Tribal Governments," the order requires agency policy making to be guided by principles of respect for tribal treaty rights and responsibilities that arise from the unique legal relationship between the Federal Government and Indian tribal governments. Furthermore, on issues relating to treaty rights, EO 13084 directs each agency to explore, and, where appropriate, use consensual mechanisms for developing regulations.

On November 6, 2000, EO 13175 replaced EO 13084. The order carries the same title and strengthens the government-to-government relationship between the U.S. Government and Indian tribes. It ensures that all Executive departments and agencies consult with Indian tribes and respect tribal sovereignty as they develop policy on issues that impact Indian communities.

2.5.2. Treaty of Neah Bay

In 1855, the U.S. Government entered into the Treaty of Neah Bay with the Makah Tribe. The treaty states: "The right of taking fish and of whaling or sealing at usual and accustomed grounds and stations is further secured...." The Treaty of Neah Bay is the only treaty between the U.S. Government and an Indian tribe that expressly provides for a tribe's right to whale.

Under the Constitution, Congress has the power to abrogate Indian treaties. However, the U.S. Supreme Court has stated that Congressional abrogation must be clear, either expressly in the legislation, or through unambiguous expression in the accompanying record that Congress examined the conflict with the Indian treaty and actively chose to resolve the conflict by abrogating the Indian treaty. (*See* Minnesota v. Mille Lacs Band of Chippewa Indians, 526 U.S. 172, 202-203 (1999). Nothing in the Whaling Convention Act (WCA) or MMPA, nor their legislative histories, appears to limit the Makah Tribe's reserved right to whale or even to mention the Treaty of Neah Bay. Congress, therefore, does not appear to have expressly limited the Tribe's right or considered that any conflict might exist between the WCA, the MMPA, or any other statute and the whaling provision in the Treaty of Neah Bay.

In dealing with whaling activity conducted under the Treaty of Neah Bay, Federal and state governments must comply with the large body of law addressing the regulation of fishing and hunting rights. Government agencies must show that regulation of the exercise of treaty fishing rights concerning the time and manner of fishing is "necessary for the conservation of fish." Tulee v. Washington, 315 U.S. 681, 684-85 (1942). This holding has become known as the "conservation necessity" standard. Courts have upheld regulations under the "conservation necessity" standard where the measure were essential to the perpetuation of a particular run or species of fish. (*See* United States v. Washington, 384 F.Supp. 312, 342 (W.D. Wash. 1974), aff'd, 502 F.2d 676, 685 (9th Cir. 1975), cert. denied, 423 U.S. 1086 (1976). Subsequent decisions have allowed a reasonable margin of safety against extinction, but have clarified that only the least restrictive means of achieving a conservation purpose are acceptable. Mille Lacs Band of Chippewa Indians v. Minnesota, 952 F.Supp. 1362, 1382 (D. Minn. 1997), aff'd, 124

F.3d 904 (8th Cir. 1997), aff'd, 526 U.S. 172 (1999); United States v. Washington, 384 F.Supp. at 342. Preventing the depletion of deer in local areas has been rejected as a justification for harvest regulation, where there was an overall quota and an acknowledgment that deer would reoccupy any depleted area. Mille Lacs, 952 F. Supp. at 1382.

2.5.3. International Convention for the Regulation of Whaling

The ICRW has as its objective the proper conservation of world whale stocks, thus making possible the orderly development of the whaling industry. The ICRW established the IWC to provide for a continuing status review of whale stocks and for such additions or modifications of the agreed conservation measures as might be desirable. Quotas for aboriginal subsistence whaling are set by the IWC based on cultural and subsistence need, provided that the quotas are either sustainable or low enough to allow stocks to recover if they have been depleted by commercial whaling. The ICRW is implemented domestically through the WCA, which governs U.S. participation in the IWC and management of whaling activities under U.S. jurisdiction. Although gray whales are also protected under the MMPA (*See* Section 2.5.4 of this EA), Section 113 of the MMPA specifically states that the provisions of the MMPA are in addition to, and not in contravention of, existing international treaties, conventions, or agreements (e.g., the ICRW).

To ensure consistency between its domestic and international obligations, the U.S. Government has taken the position that the U.S. Government should obtain IWC approval of an appropriate harvest quota before authorizing aboriginal subsistence whaling. (*See* 50 CFR 230) The Makah Tribe believes that the whaling provisions of the Treaty of Neah Bay have never been abrogated and that the U.S. obligation to the Tribe takes precedence over U.S. obligations under the ICRW. Although the Tribe does not believe that a Makah subsistence harvest requires IWC approval, the Tribe has worked cooperatively with NMFS to obtain that approval in order to provide its members with the certainty that they can take whales on a limited basis without legal impediment. Other groups have taken the position that the ICRW takes precedence, in part because it is the later treaty. These groups believe the Tribe's right to take whales has been superseded and, therefore, that the U.S. Government is under no obligation to allocate a quota to the Tribe for the harvest of gray whales.

NMFS has noted that it is possible to honor its conservation obligations as well as obligations contained in both the Treaty of Neah Bay and in the ICRW by granting the Makah a gray whale quota for ceremonial and subsistence within the range of the quota obtained from the IWC.

2.5.4. Marine Mammal Protection Act and Endangered Species Act

The MMPA is the principal federal law that guides marine mammal conservation. Section 2(6) of the MMPA provides, in part, that marine mammals are resources of great international significance, and that a mangement goal should be to obtain sustainable populations of marine mammals. Under the MMPA, NMFS is responsible for the conservation of 147 stocks of whales, dolphins, and porpoises as well as seals, sea lions, and fur seals. In particular, NMFS is

repsonsible for the conservation of the eastern North Pacific population of gray whales.

After careful analysis, the Departments of Commerce and Interior concluded that the MMPA does not abrogate Indian treaty rights to harvest marine mammals. Where there is no conservation obstacle to the harvest, NMFS has not objected to the taking of marine mammals by Indian tribes with reserved rights. For example, the Makah Tribe harvests Pacific harbor seals and California sea lions with the acquiescence of NMFS. In addition, for marine mammals taken under an IWC quota, the MMPA's exception for takes authorized under pre-MMPA treaties and statutes implementing them clearly applies (16 U.S.C. 1372(a)(2)).

On June 16, 1994, the eastern North Pacific gray whale was removed from the ESA's list of Endangered and Threatened Wildlife and Plants. As required under section 4(g) of the ESA, NMFS drafted a "5-year Plan for Research and Monitoring of the Eastern North Pacific Population of Gray Whales" to monitor the status of the stock for a period of at least five years following delisting. NMFS' Plan provided that the Gray Whale Monitoring Task Group would conduct the comprehensive status review. Completed in August 1999, this review recommended that the stock's classification continue as non-threatened.

On March 28, 2001, NMFS received a petition from D.J. Schubert for the listing of the eastern North Pacific gray whale as a threatened or endangered species under the ESA. NMFS found that the petition did not present substantial scientific or commercial information indicating that the petition may be warranted (66 FR 32305, June 14, 2001).

2.6. Other Environmental Assessments and Environmental Impact Statements

The Makah hunt is likely to occur in and/or adjacent to the Olympic Coast National Marine Sanctuary (Sanctuary). An Environmental Impact Statement (EIS) was prepared prior to designation of the Sanctuary (NOAA 1993). The EIS included discussion of the Makah Tribe, treaty rights, and the inter-relationship between the Tribe and the Sanctuary in more detail than are contained herein.

In preparation for the 1996 IWC meeting, NMFS revised its regulations pertaining to whaling (61 FR 29628, June 11, 1996). The revised regulations established the mechanism for managing aboriginal subsistence whaling in the United States and broadened the existing regulations to encompass the possibility of Makah whaling if the IWC were to grant the Makah a quota. The regulations did not authorize whaling of any kind nor did they address the specifics of the Makah interest in whaling. The purpose of the revision to the whaling regulations was solely to set up a mechanism to implement IWC decisions.

Prior to the 1997 IWC Annual Meeting, NMFS formally analyzed the environmental impacts of a decision to support or not support whaling, and to determine whether an annual subsistence quota of up to five eastern North Pacific gray whales would significantly affect the quality of the human environment. A Draft EA was distributed for public comment on August 22, 1997. After

reviewing and addressing the comments received, NMFS issued a Final EA and Finding of No Significant Impact on October 17, 1997.

Former U.S. Congressman Jack Metcalf, Breach Marine Protection, and several other plaintiffs brought a lawsuit, Metcalf v. Daley, in October 1997, alleging that the U.S. Government had violated the National Environmental Policy Act (NEPA), the WCA, and other statutes. In September 1998, the U.S. District Court for the Western District of Washington ruled in favor of the U.S. Government on all issues.

On June 9, 2000, the Ninth Circuit Court of Appeals overturned one aspect of that decision, ruling that the 1997 EA should have been completed before the U.S. Government and the Makah Tribe entered into a cooperative agreement. That agreement had provided that, if the Tribe prepared an adequate needs statement documenting a cultural and subsistence need to harvest gray whales, NOAA would request a quota of gray whales from the IWC. Two judges on a three-judge panel held that the timing of the EA, which was completed after the 1996 agreement was signed and before the 1997 annual meeting of the IWC, may have predisposed the preparers to find that the whaling proposal would not significantly affect the environment. The Court ordered NOAA to set aside that finding and comply with NEPA under circumstances that would ensure an objective evaluation of the environmental consequences of the gray whale harvest.

Following the Court action, NOAA rescinded its cooperative agreement with the Makah Tribe on August 11, 2000. The Makah Tribe responded on August 31, 2000, that it does not accept NOAA's rescission of the agreement. NMFS subsequently set the gray whale quota for 2000 (65 FR 75186, December 1, 2000) and for 2001 (66 FR 14862, March 14, 2001) at zero, pending completion of its NEPA analysis .

2.7. Federal Licenses Necessary to Implement the Proposed Action

A license is issued to whaling captains through the procedures set out in NMFS regulations (50 CFR 230.5) for aboriginal subsistence whaling allowed by the IWC. These procedures require that whaling may only be conducted in accordance with a cooperative agreement between the relevant Native American whaling organization and NMFS. NMFS must also publish aboriginal subsistence whaling quotas and any other limitations on such whaling in the Federal Register (50 CFR 230.6).

3. ALTERNATIVES, INCLUDING THE PROPOSED ACTION

3.1. Alternative 1 - Grant Makah Tribe the IWC Quota With Restrictions That Allow a Limited Hunt on the Pacific Coast Feeding Aggregation [Proposed Action][1]

Under the proposed action (the preferred alternative), NMFS will grant the Makah Tribe the IWC quota of five whales a year for ceremonial and subsistence purposes with restrictions that allow a limited hunt on the Pacific coast feeding aggregation.

Because the Makah Tribal Council has revised its Management Plan for 2001-2002, NMFS was able to refine Alternative 2 in the Draft EA by incorporating the restrictions the Makah have adopted in their Plan. The overall annual quota will be five whales taken or seven whales struck per calendar year, and the hunt would be terminated when five gray whales are taken or seven whales are struck, whichever occurs first in a given year. (Seven strikes is the limit for 2001 and 2002 that had been set in the 1997 agreement between NOAA and the Makah Tribal Council.) As described in Section 2.4.2. of this EA, there will be a limit, applicable to the time period 2001-2002, of five strikes between June 1 and November 30, or any time inside the Strait of Juan de Fuca eastward of a line from Bonilla Point in Canada to Tatoosh Island off northern Washington. Once the five-strike subquota is met, the hunters may only target on migrating whales between December 1 and May 31, west of the Bonilla-Tatoosh line. This alternative will accommodate the Makah Tribe's request to conduct a limited hunt in the summer in the Strait of Juan de Fuca and to hunt in the ocean in September and October when weather conditions provide for a safer hunt. To address concerns about wildlife on islands in the area of the hunt, the initial strikes are not allowed within 200 yards of Tatoosh Island or White Rock between May and September. The Makah Tribe will use the methods utilized in 1999, which include pursuit and harpooning from a canoe and immediate dispatch of a harpooned whale with a large caliber rifle discharged from a motorized vessel (*See* Section 4.4.1. of this EA).

Under this and the other quota alternatives (alternatives 2 and 3), utilization of the whale will be limited to ceremonial and subsistence use. Commercial use will be forbidden, consistent with the purpose and intent of the IWC subsistence quota. In accordance with IWC and NMFS regulations, takes of a calf or of a female accompanied by a calf (referred to as "mother-calf pairs") will be prohibited.

3.2. Alternative 2 - Grant Makah Tribe the IWC Quota With Restrictions to Target Hunt on Migrating Whales (similar to the 1999 regime)

Under this alternative, NMFS would grant the Makah Tribe the IWC quota of up to five whales a

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[1] In the Draft EA, Alternative 1 was a hunt targeted on migratory whales, while Alternative 2 allowed a limited hunt on the Pacific coast feeding aggregation. The preparers reversed the order of the two alternatives in this EA, to place the preferred alternative first and discuss its effects on the environment first throughout Section 5.

year for ceremonial and subsistence purposes, with restrictions on the time, place, and/or manner of the hunt similar to those in place during the Tribal hunt in 1999. The hunt would be structured with the intent of targeting migrating whales by limiting the area of the hunt to the ocean area of the Tribe's U&A west of the Bonilla-Tatoosh line, and by limiting the timing of the hunt to occur only when the northward or southward gray whale migrations are underway. This alternative would allow the Makah Tribe to determine when it conducts a hunt within a prescribed migration season in the ocean area of its U&A. The Makah Tribe would use the methods utilized in 1999, which include pursuit and harpooning from a canoe, followed by immediate dispatch of a harpooned whale with a large caliber rifle discharged from a motorized vessel. The hunt would be restricted to either five gray whales taken or seven whales struck, and the hunt would be terminated either when five gray whales are taken or seven whales are struck, whichever occurs first in a given year as under Alternative 1.

3.3. Alternative 3 - Grant Makah Tribe the IWC Quota Without Time-Area Restrictions

Under this alternative, NMFS would grant the Makah a quota of up to five whales a year for ceremonial and subsistence purposes, without any Federal restrictions on the time or place of the hunt. This alternative would allow the Makah Tribe to determine when and where to hunt gray whales in the Tribe's U&A. The overall annual quota of five whales taken or seven whales struck described in Alternative 1 would be retained.

3.4. Alternative 4 - (No Action) - Do Not Grant Makah Tribe the IWC Quota

Under this alternative, NMFS would deny the Makah Tribe a whaling quota for ceremonial and subsistence purposes. Whether this alternative would result in no take of gray whales during 2001-2002 depends on decisions the Tribe would make, and on many other variables that are discussed in Section 5 of this EA.

4. AFFECTED ENVIRONMENT

4.1. Geographic Location

4.1.1. Makah Tribe's Usual and Accustomed (U&A) Grounds

The Treaty of Neah Bay reserves the Makah's "right of taking fish and of whaling or sealing at usual and accustomed grounds and stations." The Makah Tribe is the only tribe in the United States with this specific whaling provision in a treaty. Makah whaling will occur in the Makah Tribe's U&A located off northern Washington in U.S. waters north of 48°02'15" N. latitude (at the Norwegian Memorial), east of 125°44'00" W. longitude, and west of 123°42'30" W. longitude (at Tongue Point just east of Crescent Bay in the Strait of Juan de Fuca) (*See* Figure 1). The Makah U&A is within the Olympic Coast National Marine Sanctuary in coastal waters (note the

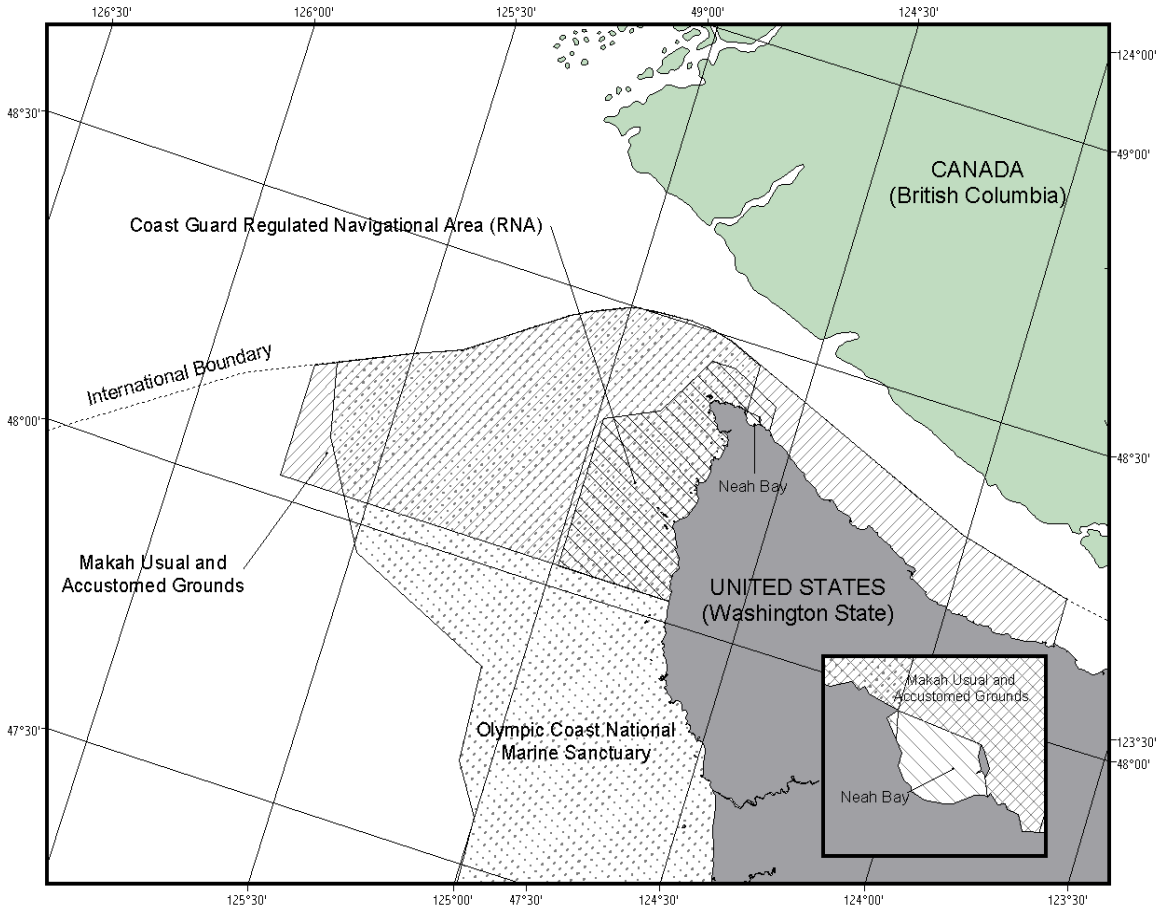

Figure 1. Geographic Boundaries Relevant to Makah Whaling

Sanctuary extends further south than the Makah U&A, but does not extend as far into the Strait of Juan de Fuca as the Makah U&A; it ends at Koitlah Point just inside the Strait of Juan de Fuca). The Makah U&A overlaps two of the National Wildlife Refuges (Flattery Rocks and Quillauyte Needles) in northern Washington.

4.1.2. Olympic Coast National Marine Sanctuary

NOAA designated the Sanctuary in 1994 under the National Marine Sanctuaries Act, on the basis that the site possesses a unique and nationally significant collection of flora and fauna and cultural/historical resources. It adjoins lands in the Olympic National Park and U.S. Fish and Wildlife Refuges. The area is managed as part of a network of 13 marine sanctuaries throughout the United States.

The Sanctuary encompasses approximately 2,500 square nautical miles of coastal and ocean

waters, and the submerged lands thereunder, off the central and northern coast of the State of Washington. The Sanctuary boundary extends from Koitlah Point due north to the United States/Canada boundary seaward to the 100-fathom isobath. The seaward boundary of the Sanctuary approximates the 100-fathom isobath in a southerly direction from the United States/Canada boundary to a point due west of the Copalis River, transecting the heads of Juan de Fuca and Quinault Canyons and touching the edge of Nitinat Canyon. The shoreward boundary of the Sanctuary is the mean low water line when adjacent to Indian reservations and state and county lands *(See* Figure 1). When adjacent to Federally managed lands, the coastal boundary extends to the mean high water line. The coastal boundary cuts across the mouths of all rivers and streams.

The Sanctuary is a highly productive, nearly pristine ocean and coastal environment that is important to the continued survival of several ecologically and commercially important species of fish, shellfish, and marine birds and mammals. The region's high biological productivity is fueled by seasonal enhanced upwelling along the edge of the continental shelf, especially at submarine canyons, during periods of high solar radiation and northwesterly winds.

The diversity of habitats that make up the Sanctuary supports a great variety of biological communities. The unusually large range of habitat types include: offshore islands and rocks (most within the three National Wildlife Refuges: Flattery Rocks, Quillayute Needles, and Copalis); kelp beds; intertidal communities; erosional features such as rocky headlands, sea stacks, and arches; interspersed exposed beaches and protected bays; submarine canyons; the continental shelf, including a broad shallow plateau extending from the mouth of the Juan de Fuca canyon; and continental slope environments. The numerous sea stacks and rocky outcrops along the Sanctuary's high energy coastline, coupled with a large tidal range and wave splash zone, support some of the most diverse and complex intertidal and subtidal zones in the United States.

In addition to the Sanctuary's value with respect to its biological resources, the region encompasses significant historical and cultural resources including Indian village sites, ancient canoe runs, petroglyphs, Indian artifacts, and numerous shipwrecks. An important feature of the Sanctuary is its proximity to four Native American reservations and the U&A's of the Makah, Quileute, Hoh, and Quinault Indian Tribes.

The management goal of the Sanctuary is to protect the marine environment and other resources and qualities of the Sanctuary while allowing for compatible and sustainable resource uses. The Sanctuary accomplishes this mandate through a combination of regulations, research, education, and resource protection programs. Within the Sanctuary, regulations prevent or reduce the most common and potentially devastating threats to populations of marine mammals and birds, critical habitats, and fundamental ecological processes. Bans on offshore oil and mineral exploration, drilling, seabed disturbance, pollution discharge, and restrictions on low flying aircraft provide critical protection to the marine environment of the Olympic Coast. These protections would be diminished or simply not exist without marine sanctuary designation.

While some activities are prohibited, sanctuaries do not impose a total prohibition on human use. Activities such as fishing, shipping, and recreational use are allowed as long as they are compatible with the primary objective of protecting marine resources. The nature and extent of allowed activities are defined through regulation and in a detailed management plan based on the unique qualities of each sanctuary. Research and monitoring evaluate the effectiveness of sanctuary programs and regulations. Each sanctuary's management plan is periodically updated to reflect new information and in consideration of program effectiveness. As a result of this review, changes in regulations can be proposed.

Through its regulations, the Sanctuary recognizes the pre-existing Treaty rights of the Native American tribes that share the Sanctuary's coastal border, including the Makah Tribe along the northern portion of the Sanctuary. Throughout the designation process for the Sanctuary, NOAA consistently affirmed that the Sanctuary would operate with full recognition of treaties and the legal opinions, including U.S. v. Washington, which upheld those treaty rights.

Sanctuary regulations prohibit the taking of marine mammals and birds in or above the Sanctuary, except as authorized by NMFS or the U.S. Fish and Wildlife Service (USFWS) under the authority of the MMPA and the Migratory Bird Treaty Act, or pursuant to any treaty with an Indian tribe to which the United States is a party, provided that the treaty right is exercised in compliance with applicable U.S. law. In this case, the Makah Tribe has a pre-existing treaty right to take whales as defined in the Treaty of Neah Bay.

4.1.3. Wildlife Refuge

The two National Wildlife Refuges within the Makah Tribe U&A off the coast of northern Washington, Flattery Rocks and Quillauyte Needles, are part of a complex of 870 islands, rocks, and reefs extending for more than 100 miles along Washington's Pacific coast from Cape Flattery to Copalis Beach. These islands are protected from human disturbance and predators, yet are close to abundant ocean food sources. They are a vital refuge where 14 species of seabirds nest and raise their young. The total population of seabirds, waterfowl, and shorebirds may exceed a million birds. Sea lions, harbor seals, sea otters, porpoise and whales are common around the islands. Most of the coastal islands are designated as wilderness. These islands are closed to the public in order to protect seabird nesting sites, but can be viewed from the coastal highway or ocean beaches.

The refuges on the Washington coast are managed under the USFWS National Wildlife Refuge System to preserve and protect habitat for seabirds and other wildlife. Collectively the refuges total over 430 acres. Surveys and monitoring are a significant part of the biological program. The refuges are within the boundaries of the Sanctuary and the Olympic National Park.

4.1.4. Coast Guard's Regulated Navigation Area

On November 10, 1999 (64 FR 61209), the Coast Guard issued final regulations at 33 CFR

165.1310 that establish a permanent RNA along the northwest Washington coast and in a portion of the entrance of the Strait of Juan de Fuca. The establishment of a RNA allows the Coast Guard to impose restrictions on vessel activities in a specified area for specified purposes. In this case, the RNA was established to reduce the danger of loss of life and property in the vicinity of Makah whale hunting activities. Within this RNA, a moving exclusionary zone (MEZ) around the Makah hunting vessel is created for the duration of each hunt.

The Coast Guard first published a notice of proposed rulemaking on this RNA on July 22, 1998 (63 FR 39256), and requested public comments. On October 1, 1998 (63 FR 52603), the Coast Guard published an interim final rule entitled "Regulated Navigation Area, Strait of Juan de Fuca and Adjacent Coastal Waters of Washington; Makah Whale Hunting" and allowed for further public comments.

The RNA extends out 12 nautical miles from shore along the Washington coast from the southward end of the Makah Tribe's U&A at 48°02'25"N latitude, then north to Cape Flattery, and then east to 124°34'W longitude (*See* Figure 1). The regulation does not affect normal transit or navigation in the RNA except during, and in the immediate vicinity of, a hunt. Within the RNA, an MEZ will surround one Makah whale hunt vessel engaged in whale hunting. For the duration of each hunt, vessels and persons are excluded from the column of water from the surface to the seabed within a radius of 500 yards centered on a Makah whale hunt vessel. Except for Makah whaling vessels, a media pool vessel, and vessels with Coast Guard authority to navigate within the MEZ, vessels operating in the RNA during a Makah whale hunt may not enter, and must avoid being overtaken by, the MEZ. The regulation imposes no other restrictions on navigation.

The activation of the MEZ is signaled by the flying of the international numeral pennant 5 from a Makah whale hunt vessel. Only one Makah vessel actually engaged in whale hunt operations is authorized to fly the international numeral pennant 5 within the RNA at any one time. The MEZ is only active while whaling operations are ongoing and the international numeral pennant 5 is flown.

The Coast Guard, in implementing this rule, acknowledged that the Makah's intended use of harpoons and a .50 caliber rifle, the unpredictable actions of a whale once struck, and the unforgiving nature of a cold ocean environment called for carefully tailored safety measures. The RNA was implemented in order to reduce dangers to nearby vessels and persons during Makah whale hunting operations by minimizing the risks from the uncertain movements of a pursued, wounded, or towed whale and from the dangers of high powered rifle fire.

The Coast Guard recognized that there is a public interest in the media's recording and documenting this event. The rule allows a single press pool vessel within the MEZ subject to certain restrictions. Requiring other members of the public, including potential protesters, to remain 500 yards away from the hunt was deemed by the Coast Guard to be a reasonable restriction, considering the serious safety concerns presented by a whale hunt.

There were several violations of the MEZ during 1999 and 2000 by those protesting the hunt, some of which resulted in injury to violaters.

4.2. Eastern North Pacific Gray Whale

There are two populations of gray whales (*Eschrichtius robustus*) in the North Pacific: the eastern North Pacific population that migrates along the west coast of North America between Mexico and Alaska, and the western North Pacific (or "Korean") population that migrates along the coast of eastern Asia (Rice et al. 1984). Gray whales were historically found in the North Atlantic Ocean, but are currently found only in the North Pacific (Rice et al. 1984). The most recent summary of population structure in gray whales, prepared for the 52nd meeting of the IWC in June/July 2000, found sufficient evidence, including geographic separation and the rise in abundance of one stock but not the other, that the eastern and western North Pacific populations of gray whales should continue to be managed as separate stocks (Swartz et al. 2000).

The gray whale is readily recognized by a mottled gray color and lack of a dorsal fin. Instead of a dorsal fin, it has a low hump, followed by a series of 10 or 12 knobs along the dorsal ridge of the tail stock, which are easily seen when the animal arches to dive. The adult gray whale is 36 to 50 feet long and weighs between 16 and 45 tons. Both male and female gray whales reach sexual maturity when they are between five and 11 years old, with the average being eight years (Rice 1986).

Female gray whales usually breed once every two years. The gray whale breeding season is limited primarily to a three-week period in late November and early December near the start of their southward migrations. However, if no conception occurs at that time, a second oestrus cycle can occur within 40 days (Rice and Wolman 1971), such that a few females may breed as late as the end of January on the winter grounds (Jones and Swartz 1984). During the following summer, the pregnant females put on 25% more weight than the non-pregnant females. Females ready to give birth often, but not always, resort to certain shallow, protected lagoons in Baja California. Gray whale calves are born in the winter after a gestation period of about 13.5 months. At birth, the calves are 15 feet long and weigh close to 1,000 pounds. The mothers' rich milk, containing more than 50% fat, nourishes the calves for several weeks on the winter grounds and during the long migration to the summer grounds. The calves grow rapidly and, by August, when they are weaned, they are approximately 28 feet long. During the remaining two or three months on the summer grounds, calves feed heavily, and by the time they head south in late autumn, they are approximately 30 feet long (Rice 1986). Additional information on the life history of gray whales can be found in Rugh et al. (1999a), Jones et al. (1984), Rice (1986), Rice et al. (1984), and Rice and Wolman (1971).

The eastern North Pacific gray whale population has made a remarkable recovery since its depletion in the early 1900s caused by commercial whaling. This population originally received protection from commercial whaling in 1937 with the International Agreement for the Regulation of Whaling. Protection continued under the 1946 ICRW (Reeves 1984).

Gray whales were listed as endangered under the ESA on June 2, 1970 (35 FR 8495). Then, following a comprehensive evaluation of their status (Breiwick and Braham 1984), NMFS concluded on November 9, 1984 (49 FR 44774), that this population should be listed as threatened, instead of endangered, under the ESA. However, no further action was taken until 1991 when a subsequent review was completed and made available to the public on June 27, 1991 (56 FR 29471). The latter review showed the best available abundance estimate (in 1987/88) was 21,296 whales with an average annual rate of increase of 3.29% (Buckland et al. 1993). Calculations indicated that this population was approaching carrying capacity (Reilly 1992). Therefore, NMFS proposed, on November 22, 1991 (56 FR 58869), that this population be removed from the list of endangered and threatened wildlife under the ESA. The Makah Indian Tribe supported removal of the gray whale from the ESA list. After an extensive review period, NMFS published a final notice of determination (58 FR 3121, January 7, 1993) that this population should be removed from the list because the population had recovered to near its estimated original population size and was neither in danger of extinction throughout all or a significant portion of its range, nor likely to again become endangered within the foreseeable future. On June 16, 1994 (59 FR 31094), the eastern North Pacific gray whale population was formally removed from the list of endangered and threatened wildlife under the ESA.

As required under section 4(g) of the ESA, NMFS drafted a five-year plan to monitor the status of the stock for a period of at least five years following the delisting. In accordance with this draft plan, a workshop was convened by NMFS on March 16-17, 1999, in Seattle, Washington, to review the status of the stock based on research conducted during the five-year period following delisting. Results of the workshop indicated that there was no apparent reason to reverse the previous decision to delist this stock and that it was currently neither endangered nor threatened (Rugh et al. 1999a).

4.2.1. Current Abundance, Trends, and Status

Recent estimates of the size of the entire population come from the analyses of systematic shore counts of southward migrating gray whales initiated in 1967/68 at Yankee Point near Monterey, California, where the majority of the population pass within two to three kilometers of shore. These shore counts moved to Granite Canyon (seven kilometers south of Yankee Point) in 1974/75 and continued there for most years up to 1997/98. Analysis of these shore-based counts indicate that in 1997/98 the eastern North Pacific gray whale population was 26,635 whales (95% CI = 21,878 to 32,427) (Hobbs and Rugh 1999).

A more recent survey of gray whales was conducted by NMFS during the southbound migration in the winter of 2000/2001. As with most of the past 20 years, the survey was initiated in mid-December. However, unlike previous years, when the migration ended by mid-February, the 2001 southbound migration continued for another three weeks. Therefore, the systematic counts were extended until March 5, 2001. The survey protocol, consistent with previous efforts, was designed to provide estimates of: 1) the number of whales migrating past the survey site at Granite Canyon, California , during on-effort hours of search; 2) the probability of an observer's

detecting a group of whales as it moved through the study area; 3) the onshore/offshore distribution of migratory whales; 4) the average group size of migratory whales; and 5) the number of new calves seen at the survey site during the southbound migration. These sighting data provide the basis of estimates of absolute abundance for the eastern North Pacific population of gray whales that migrate past the survey site.

A new abundance estimate has not yet been derived from the 2000/2001 winter survey data. However, preliminary results indicate that the encounter rate of whales (i.e., the average number of whales seen per hour during the on-effort survey period) was lower than the estimate for the survey conducted during the winter of 1997/98. Estimates of the correction factors, which are needed to calculate absolute abundance, are currently being analyzed. A preliminary estimate of abundance should be available by summer 2001. The results of the 2000/2001 survey will be presented to the IWC Scientific Committee at its annual meeting in 2002 during a comprehensive assessment of the eastern North Pacific gray whale population.

An analysis of abundance estimates from shore-based counts indicates that the population increased by approximately 2.5% per year (SE=0.3%) between 1967/68 and 1995/96 (Buckland and Breiwick *In press*). A Bayesian analysis of gray whale population dynamics for the same period suggested the rate of increase of the population could have been 3.4% (95% CI=2.5-4.2%), if the Russian natives had not continued a harvest of roughly 40-80 whales per year conducted a harvest (Wade and DeMaster 1996).

Shore-based sighting surveys were conducted to estimate the number of northward migrating gray whale calves passing Piedras Blancas, California, for seven consecutive years (1994-2000). Additional research included: (1) aerial surveys to determine offshore distribution in 1994 and 1995; (2) the use of thermal sensors in 1994-1996 to measure day/night migration rates (Perryman et al. 1999a); and (3) concurrent replicate watches near the peak of each migration to estimate sightings missed by the standard watch team. During good conditions, calf counts were 325 in 1994, 194 in 1995, 407 in 1996, 501 in 1997, 442 in 1998, 141 in 1999, and 96 in 2000. Correcting these counts for periods not on watch and for calves missed produced final estimates of 927 calves (SE = 88.85) for 1994, 614 calves (SE =65.72) for 1995, 1,132 calves (SE = 65.98) for 1996, 1,520 calves (SE = 83.07) for 1997, 1,323 calves (SE = 77.84) for 1998, 428 calves (SE = 55.53) for 1999, and a preliminary estimate of 282 calves (SE = 28.93) for 2000. Calf production indices (calf estimate/total population estimate) are 4.0%, 2.7%, 5.1%, 6.8%, 5.0%, 1.6% and 1.0% for the years 1994-2000 respectively. Fluctuations in calf production over this time period were positively correlated with the length of time that primary feeding habitat was free of pack ice during the previous year.

Wade (1994) reported that, based on a Bayesian analysis of the census data between 1967/68 and 1993/94, the eastern North Pacific stock of gray whales was between 0.51 and 0.97 of its carrying capacity, and that the rate of net production at the maximum net productivity level was 0.033 (95% CI: 0.023-0.044). However, this conclusion was regarded as questionable at the 1994 IWC Scientific Committee meetings, because the analysis may have been unduly influenced by the 1992

census and because the variance of the abundance estimate was likely underestimated (i.e., negatively biased). When incorporating the 1995/96 abundance estimate, Wade and DeMaster (1996) estimated the maximum net productivity rate (R_{max}) from the period between 1967/68 and 1995/96 at 0.053 (95% CI: 0.031-0.113). This estimate is not significantly different from the default rate for R_{max} of 0.04 for cetaceans (Wade and Angliss 1997).

Under the MMPA, all human-caused mortalities are evaluated relative to the species' Potential Biological Removal level (PBR), which is the NMFS management strategy for achieving the primary goal of the MMPA to prevent any marine mammal stock from being reduced below its optimum sustainable population level (OSP), and to restore stocks that have been reduced below that level. The PBR is defined as the product of the minimum population estimate, one-half the maximum theoretical net productivity rate, and a recovery factor: $PBR = N_{min} \times 0.5R_{max} \times F_r$. The PBR for all marine mammal stocks are provided in marine mammal stock assessment reports prepared by NMFS; the current PBR for the eastern North Pacific gray whale population is found in Ferrero et al. (2000), the "Alaska Marine Mammal Stock Assessments, 2000." The N_{MIN} for the eastern North Pacific gray whale stock is 24,477 and was estimated by Ferrero et al. (2000) as the 20th percentile from the log-normal distribution for the estimates of abundance based on the most recent survey (1997/98). Ferrero et al. (2000) used an R_{max} value of 0.047 in calculating a PBR for this stock. This R_{max} value is different from the value used in the "Draft Alaska Marine Mammal Stock Assessments, 2000" and, accordingly, different from that used in the Draft EA. The new estimate of R_{max} of 0.047 used in the final Alaska stock assessment report and in this Final EA reflects the results of a new age- and sex-structured model which accounts for the bias in the harvest towards females. Lastly, Ferrero et al. (2000) used 1.0 as the recovery factor (F_r) for this stock, which is the upper limit of the range of values for non-listed stocks that are increasing while undergoing removals due to subsistence hunters (Wade and Angliss 1997). Thus, for the eastern North Pacific stock of gray whales, the PBR is 575 animals (24,477 x 0.5 x 0.047 x 1.0) (Ferrero et al. 2000). Ferrero et al. 2000 can be viewed at http://www.afsc.noaa.gov/assessments.htm.

PBR calculations (Wade and Angliss 1997) and performance simulations (Wade 1998) have been based on the concept of averaging mortality over a given time period. In the simulations by Wade (1998), true mortality was allowed to vary annually around the PBR with a coefficient of variation as high as 0.8. The performance of the management scheme was deemed adequate under these circumstances. In many fisheries, estimates of mortality are subject to error and are often not conducted annually; these estimates are typically averaged over several years (Wade and Angliss 1997). Therefore, in assessment of impacts on the population, NMFS does not restrict its assessments of quotas to annual values. As long as the average over the three-year period is less than the PBR, the take should be considered sustainable within the framework of the PBR management strategy (Wade and Angliss 1997).

The eastern North Pacific stock of gray whales has been increasing in recent years despite known harvests and other human caused mortalities. Based on available data, Ferrero et al. (2000) determined that the estimated annual level of human-caused mortality and serious injury (83),

which includes a recent annual average of mortalities from commercial fisheries (6), subsistence harvest (76), and ship strikes (1), does not exceed the PBR (575) for the eastern North Pacific stock of gray whales. This estimate is based on a 5-year average (1993-1998) of human-caused mortality and serious injury (see above for internet link to Ferrero et al. 2000).

4.2.2. Migration

Gray whales migrate south out of the Bering Sea through Unimak Pass, Alaska, from late October to early January, with peak numbers of whales (when 50% of the sightings have been recorded at a shore station) going through Unimak Pass on or about December 12 (Rugh 1984, Rugh et al. 1999a). The peak of the southward migration observed in the 1970s was the last two weeks of November and first three weeks of December, but a one-week shift in migration dates has occurred since the 1970s (Rugh et al. 1999a). The estimated time of migration through Unimak Pass in recent years is consistent with observations made in central California at Granite Canyon, where NMFS has a counting station that operated in 1993/94, 1995/96, and 1997/98 (Hobbs and Rugh 1999). Using an estimated travel speed of 144 km/day (Swartz et al. 1987), southbound gray whales should be able to travel the estimated 5,000 km from Unimak Pass to Granite Canyon in 35 days (Rugh et al. 1999a). Sighting rates are very low in mid-December at Granite Canyon, peaking on January 15 (plus or minus three days), and ending in mid-February. The southward migration generally ends in mid-February just as the northward migration begins. This migration timing appears to be consistent from Oregon to Mexico and through all the years for which data are available (Rugh et al. 1999a). In California, the last of the southbound animals sometimes overlap with the first northbound migrants. This overlap suggests that only a portion of the migrating population is in the waters of Mexico during the winter, while the remainder is distributed in the coastal waters of southern and central California (Swartz 1986).

The southward migration is segregated by age, sex, and reproductive status (Rice and Wolman 1971); the vanguard is led by near-term pregnant females, followed by oestrus females and mature males. The last phase includes immature animals of both sexes. Gray whales begin to arrive in the coastal lagoons of Guerrero Negro, Ojo de Liebre (Scammon's Lagoon), San Ignacio, and Bahia Magdalena in late December and early January, and reach maximum densities there by mid-February (Jones and Swartz 1984). While the majority of the calves are believed to be born within or near these coastal lagoons, sightings of newborn calves migrating south past central and southern California in January and February have increased over the recent past (Shelden et al. 1995). Assuming calving dates have been consistent over the years, the change in observations of calves well north of Mexican waters may be related to the delayed onset of the migration (Buckland and Breiwick *In press*), resulting in females not migrating as far south as Mexico by the time parturition occurs. Delays in the migration may be a function of increased competition for food among this stock, which results in more extensive foraging for food in northern latitudes and requires whales to travel farther when they start to migrate south (Rugh et al. 1999a).

The northward migration from the southern range occurs in two distinct phases segregated according to age, sex, and reproductive condition (Poole 1984, Swartz 1986). In central

California, the first phase begins in mid- to late-February and includes newly pregnant females. They are followed by adult males, anestrous females and immature whales of both sexes. These northbound migrants pass central California and Oregon in February and March and are observed entering the Bering Sea through Unimak Pass from late March through May each year (Braham 1984). The northward migration is slower than the southward migration (Pike 1962). The last group of whales to leave the wintering grounds are the females with calves of the year, departing one to one-and-a-half months after the others. Their protracted departure from the winter range begins in late March and continues until May in some years. Females with calves migrate more slowly than whales without calves, presumably to accommodate nursing and the slow swimming speed of calves. Females with calves are observed passing through central California to Oregon from late March through June (Herzing and Mate 1984, Perryman et al. 1999b) and are seen entering the Bering Sea from May through June (Braham 1984).

There has been relatively little effort off Washington to document the timing of the migration because: 1) during their southward migration, gray whales travel well offshore through this area (Pike 1962; Green et al. 1995; Shelden et al. 2000); 2) access to strategic observation sites is poor, and there is a lack of appropriate facilities; and 3) winter weather in the Pacific Northwest is typified by strong winds, high seas, rain, and fog, making it unlikely that the entire migration could be documented annually.

In 1998, NMFS attempted to document the southward migration off northern Washington by placing an observer in the Tatoosh Island lighthouse (Jones 1999). During 12 days of observation from November 30 to December 16, gray whales were sighted on only three occasions (December 2, 4, and 14). The low number of sightings was attributed by Jones (1999) to the possibility that whales were migrating farther offshore out of sighting range or that the study period possibly represented the early stages of migration, thus few whales were in the vicinity. NMFS also conducted six aerial surveys off northern Washington in November and December 1998 and in January 1999 to assess migration timing and distance from shore (Shelden et al. 1999). Only six pods of gray whales were sighted during aerial surveys: none during two surveys in November; three pods during two surveys in December; and three pods during two surveys in January. The pods sighted ranged from 5.5 to 47 km offshore during these surveys. Because of the low number of sightings and limited survey effort (due to poor surveying conditions from inclement weather), Shelden et al. (1999) drew no conclusions on migratory timing.

Pike (1962) reported that the southward migration off Washington and British Columbia began in late September and October, peaked in late December, and ended in late January, based on observations by lighthouse and light-ship operators in the late 1950s. He noted, however, that few southbound migrants are seen off Washington and British Columbia because of reduced visibility in winter months. Studies just north of Washington, along Vancouver Island from November 15 to May 1 from 1972 to 1977 found that the southward migration in this area occurred from November to mid-January with a peak in the last two weeks in December (Darling 1984). This study showed northward migration in this area begins in February, peaks in late March and early April, and continues through May or early June. Studies to the south of

Washington, off central Oregon from 1978-1981, found the southward migration in this area was from early December to mid-February with a peak in the first week of January (Herzing and Mate 1984).

NMFS funded a more recent study on southward migration timing off Oregon from December 5, 1998, to February 15, 1999, which showed the start of the migration was three weeks later and the peak was six days later than the 1978-91 study (Mate and Poff 1999). However, there has been a one-week delay in the migration since the 1970s, so the timing of the migration in 1998/99 was on schedule relative to dates observed in California through the 1980s and 1990s (Rugh et al. 1999a). There are anecdotal reports of southbound gray whales as early as mid-November in central California, but these and Pike's (1962) report of gray whales in September in Washington may represent movements of whales in the Pacific coast feeding aggregation rather than migrants from the northern feeding grounds in western Alaska.

Some studies suggest that gray whales migrate farther offshore of Washington during the southward migration. Pike (1962) observed many gray whales migrating off Washington between 8-28 km offshore, with a single sighting of three gray whales 37 km west of Cape Flattery. Green et al. (1995) reported that gray whales occur significantly farther offshore in Washington during the southward migration versus the northward migration. The mean distance offshore for southbound migrants off Washington was 25.2 km compared to 11.8 km offshore during the northward migration (Green et al. 1995). Shelden et al. (2000) reported southward migrating gray whales as far as 47 km offshore of Washington.

Although past scientific literature (Pike 1962, Darling 1984, Herzing and Mate 1984) indicates the southward migration can occur off Washington in November, an analysis of recorded travel speeds, estimated distances, and known dates from recent studies in Alaska, Oregon, and California (Rugh et al. 1999b) indicates southward migrating gray whales would be expected to begin occurring off Washington in early December, peaking on or about January 5, and ending in the first week of February. Most of the southward migration (between the 10^{th} and 90^{th} percentile sighting dates) occurs across a period of 43 days, but the entire migration may take more than 70 days to pass through an area (Rugh et al. 1999a). The northward migration would be expected to occur from late February to the end of June, with adult females and calves dominating the migration in June off Washington.

4.2.3. Pacific Coast Feeding Aggregation

Most eastern North Pacific gray whales spend the summer in the shallow waters of the northern and western Bering Sea and in the adjacent waters of the Arctic Ocean; however, some remain throughout the summer and fall along the Pacific coast as far south as southern California. Observations of gray whales in summer months in locations well south of Alaska are not recent occurrences; they have been documented during periods of low and high population abundance (Gilmore 1960, Pike 1962, Rice 1963, Gilmore 1976, Patten and Samaras 1977, Nerini 1984, Mallonee 1991, Avery and Hawkinson 1992, Clapham et al. 1997, Sanchez-Pacheco et al. *In*

press). These animals have been referred to as "summer residents," a term first used by Pike (1962) to describe gray whales that occurred off British Columbia during June through September. However, photo-identification studies show that these whales 1) move widely within and between areas on the Pacific coast to feed in the summer and fall, 2) are not always observed in the same area each year, and 3) may have several year gaps between resightings in studied areas (Calambokidis and Quan 1999, Quan 2000), so the term "summer resident" or "seasonal resident" is a misnomer. This EA uses the term "Pacific coast feeding aggregation" to distinguish these gray whales from those that feed in the northern and western Bering Sea/adjacent waters of the Arctic Ocean.

Gray whales have distinctive natural markings (pigmentation and scars) on their dorsal area that can be used to distinguish individual animals. Researchers began taking photographs of the dorsal area of gray whales in the 1970s off Vancouver Island. They found that individual gray whales could be distinguished by comparing photographs, and the movements and occurrence of individual animals within and between years could be monitored (Darling 1984).

Studies on the behavior and movements of gray whales along the Vancouver Island coast during the summer (Darling 1984) found that most of the gray whales were within one kilometer of the coast, and that their most common behavior was feeding. Darling (1984) used photo-identification to identify individual whales. He found that many gray whales traveled throughout the summer to various feeding sites separated by as much as 77 km, while other whales spent the entire summer in a single bay. He also documented whales using different feeding sites (separated by as much as 150 km) in different years. Not every whale was seen each year, suggesting that some whales spent the summer outside of his study area. Variation in prey availability and foraging success by whales is likely to complicate any pattern of habitat usage and the length of fidelity to a particular area. In discussing the variation in annual turnover patterns of gray whales (i.e., frequency and pattern of sightings), Darling (1984) proposed two plausible explanations: 1) a single "northwest coast" group of whales that mixed and was not completely observed between years because of varying effort and a limited spatial scale for observation; and 2) a Vancouver Island group of whales, some of which return annually for a series of years (from two to at least eight) and then go elsewhere, probably on full migration, while others spend only one summer in the area. Both of these explanations are plausible, but they are not necessarily mutually exclusive; both may be true to some degree. The interpretation of movement patterns and fidelity of gray whales during the summer and fall depends on the spatial and temporal scales of the observations.

Photo-identification of individual gray whales in Washington began in 1984 by Cascadia Research Collective (CRC) (Calambokidis et al. 1994). Calambokidis et al. (1994) developed a catalog of these individual whales and had 76 individual whales in the catalog by 1993. Resights of these whales indicated that some whales returned over several years to the same areas to feed in the summer, while others were seen only once or twice and during only one year. Of the 76 whales referred to in the 1993 CRC catalog, only 17 (22.3%) had been observed during more than one year from 1984-1993 (Calambokidis et al. 1994). Only eight of the 17 whales (10.5%) were seen in the same area during a subsequent year, indicating that overall site fidelity may have been low.

Calambokidis et al. (1994) also discussed seasonal residency or tenure of individual whales and defined this parameter as the "minimum estimate of time present between the first and last sighting." The longest tenure recorded was 112 days for one whale; the average tenure was 47 days. This method, however, assumes that whales were in the area during the full extent between sightings, even during periods of long gaps between sightings when they could have traveled out of the region.

In 1996, NMFS began annual vessel surveys for gray whales in the summer and fall in northwestern Washington waters and off southern Vancouver Island. Gosho et al. (1999) documented within-year movements between the northwest Washington outer coast and both sides of the Strait of Juan de Fuca (southern Vancouver Island and Washington), and a between-year shift in whale concentration from northern Washington in 1996 to the Strait of Juan de Fuca in 1997. In 1997 and 1998, the whales occurred more frequently off southern Vancouver Island than in Washington waters. Although a relatively large number of whale sightings were made, the photo-identification of the whales showed that only 18 individuals were present in 1996 and 28 individuals in 1997. Most of the whales identified in 1996 and 1997 had been sighted in previous years: 78% (14 of 18 whales) of the individuals in 1996 had been observed in previous years, and 82% (23 of 28) of the whales in 1997 (Gosho et al. 1999). The percentage of whales in this area observed in previous years dropped in 1998 to 56% (32 of 57) -- 44% were newly identified whales (Calambokidis et al. 1999). The gray whales moved between areas along the Washington coast, in the Strait of Juan de Fuca, and off the coast of Vancouver Island. Despite intensive survey effort, the absence of identified animals suggests that they had moved out of the study area during the season and later returned. Of the 28 whales identified in 1997, 62% were observed in 1996. Of the whales identified in 1996, 65% were re-sighted in 1997 (Gosho et al. 1999).

In 1998, NMFS photo-identification studies were expanded in collaboration with other researchers to survey suitable habitat (at varying levels of effort) from northern California to southeast Alaska. By expanding the spatial coverage, the observed range of within-season movements likewise expanded, and a better understanding of between-year movements was achieved. Within-year movements of 57 whales were documented between various regions along the coast, with the most frequent movements between northern Washington, the Strait of Juan de Fuca, and southern and central Vancouver Island (Calambokidis et al. 2000a). Larger scale movements were also documented from northern California and Oregon to southern and central Vancouver Island.

Of the whales identified in all areas in 1998, 55% had previously been seen in another year in Washington and were already part of the CRC photo-catalog (Calambokidis et al. 2000a). Gray whales that have been seen in northern Washington and the Strait of Juan de Fuca have also been seen in other years in all other regions along the coast (Calambokidis et al. 2000a). Although it is not possible to quantify the amount of movement between regions without several more years of range-wide surveys, the following examples illustrate the range of movements. A whale (CRC #68) that was seen in 1996 and 1997 by Gosho et al. (1999) in the Strait of Juan de Fuca was not seen in that same area in 1998 but was seen in southeast Alaska. Likewise, another whale (CRC

#127) that had been seen in the Strait of Juan de Fuca in 1997 was only seen in northern California in 1998. A third whale (CRC #145), with a tenure of 99 days near southern Vancouver Island and northern Washington in 1996, was seen only in the central Vancouver Island and Oregon regions during 1998. Such occurrences may be the result of range expansion in an increasing population, or reflect the gray whales' predilection to forage widely for suitable prey species.

Photo-identification studies off northern Washington, Vancouver Island, Oregon and California continued in 1999. Calambokidis et al. (2000b) reported 216 different gray whales in these study areas. Only 39% (84) were known from previous years. Very few gray whales were observed off the coast of Washington in 1999, but there were unusually high numbers of gray whales in Puget Sound with only 18% (6 of 33 different whales) identified from prior years in any area. Of the 216 gray whales reported in Calambokidis et al. (2000b), 45 different whales were observed by CRC on one day (May 20, 1999) in coastal waters just north of La Push of which 6 (13%) were identified in prior years. Since this observation occurred 3 days after and about 10 miles south of the site of the Makah hunt, Calambokidis et al. (2000b) noted that the findings indicate that seasonal resident whales are present during the time and area of the Makah whale hunt, but are a relatively small proportion of the animals. Calambokidis et al. (2000b) noted that these results should be treated cautiously since 1999 appeared to have been an anomalous year for gray whale sightings, and also noted that there does not appear to be any clear way to distinguish between whales that remain in Washington and those that move out of the area.

Gosho et al. (2001) compared the results of the NMFS survey efforts across three areas by year and month, thus providing a more detailed analysis of movements and distribution of gray whales by month, area, and year for the years 1996-1999. The three survey areas were: the Strait of Juan de Fuca, the northern Washington coast, and the southwest coast of Vancouver Island. Survey effort for the three areas in nautical miles surveyed was 816, 1821, 2594, and 1383 nm in 1996 through 1999 respectively (Gosho et al. 2001). In 1996, of the 101 gray whales sighted, 88% were observed on the outer Washington coast. In 1997, however, the area of concentration changed when 70% of 162 whales were observed in the Strait of Juan de Fuca. In 1998, the distribution of gray whales was mixed between southern Vancouver Island (44%), the northern Washington coast (30%), and the Strait of Juan de Fuca (25%). The distribution of 82 gray whale sightings in 1999 was mixed with most (58%) from southwest Vancouver Island, 24% from the Strait of Juan de Fuca, and 17% from the northern Washington coast. The sighting rates of gray whales as a function of nautical miles surveyed varied widely between area, by year and month for the four years surveyed, making it difficult to predict whale abundance or distribution for any given strata. For example, for the Strait of Juan de Fuca, the sighting rate increased seven-fold from 1996 to 1997 from .018 to .123 whales per nm surveyed. In 1998, the sighting rate declined dramatically to .034 whales per nm. In 1999 the rate was .043 or about 20% higher than in 1998. The northern Washington area showed similar variability in gray whale sighting rates. In 1996, the highest sighting rate (.277 per nm) of all areas was observed on the northern Washington coast. In 1997 and 1998 though the sighting rate declined to .063 and .067 respectively. By 1999, the rate had declined by almost an order of magnitude (.021) from that

observed in 1996. The southern Vancouver Island area showed similar variability in sighting rates, with relatively low rates in 1996 and 1997 and high rates in 1998 and 1999. Overall, the rates off southern Vancouver Island ranged from .091 to 0.416 whales per nm from 1996 to 1999. These data suggest a general shift in distribution of gray whales from northern Washington in 1996 to the Strait of Juan de Fuca in 1997, and to southern Vancouver Island in 1998 and 1999.

Gosho et al. (2001) also examined the sighting frequency of gray whales by month and area for the years 1996 through 1999. Although there were some major differences in survey effort between years and areas, comparisons can be made based on sighting frequency per unit of survey effort. In 1996, the highest overall sighting rates for all three areas combined was in September. In 1997, the highest rates were in August; in 1998 the highest rates were in July. In 1999, the highest rates were again observed in August. In general, the sighting rates of gray whales tended to be lower in June than in other months, except for 1997 when high sighting rates in June were observed primarily from the Strait of Juan de Fuca. These data do not indicate any predictable pattern in gray whale distribution or abundance by month, area, or year for the three main areas surveyed. Darling et al. (1998) found that gray whale prey distribution influenced gray whale distribution and habitat usage off Vancouver Island. Since the primary behavior of gray whales in the Pacific northwest during the non-migratory period is feeding, it is likely that most whales will simply occur where prey is most available. Use of these forage areas changes frequently from month to month and year to year, making it difficult to predict where the whales will occur in the future.

For the four years of NMFS surveys (1996-1999), Gosho et al. (2001) identified 18, 28, 54, and 24 different gray whales respectively in the three survey areas. In 1996, 50% of the individually identified whales were observed only on the northern Washington coast, 22% only on southern Vancouver Island, and 17% were observed in both the Strait of Juan de Fuca and the northern Washington coast. In 1997, a shift in distribution occurred; only 21% were observed only on the northern Washington coast, while 35% were observed only in the Strait of Juan de Fuca and 35% were observed in both the Strait of Juan de Fuca and the northern Washington coast. In the summer of 1998, about 62% of identified whales occurred off southern Vancouver Island, 26% off northern Washington and 10% of the whales moved between the two areas (Gosho et al. 2001). Observations of individual whales in both 1998 and 1999 indicated that many whales that occurred in southern Vancouver Island moved in the fall to the northern Washington coast or Strait of Juan de Fuca.

NMFS continued gray whales surveys in the Pacific northwest from June through October of 2000. Although the final identifications have not been completed for whales photographed, the survey effort was similar to previous years. In 2000, a total of 1147 nm were surveyed in the 3 survey areas and 70 gray whales were sighted (NMFS-NMML unpublished data). Sighting rates were lower in both the Strait of Juan de Fuca (.0358 per nm) and northern Washington Coast (.0447) than in southern Vancouver Island (.198). In general, the sighting rates and distribution of gray whales during 2000 was similar to 1998 and 1999 for the 3 survey areas with rates 3-4 times lower in Washington than in southern Vancouver Island.

Some of the identifiable individual gray whales in the Pacific coast feeding aggregation periodically returned to the same areas of the Pacific Northwest coast over multiple years (Darling 1984, Darling et al. 1998, Calambokidis et al. 1994). Studies off the west coast of Vancouver Island, British Columbia (Darling et al. 1998), revealed that some gray whales exhibited seasonal site fidelity in response to seasonal abundance of a variety of prey types. Recent photographic re-identifications suggest, however, that these whales also range widely within other coastal areas as far south as northern California and as far north as southeast Alaska from spring to fall (Calambokidis and Quan 1999). This could account for gaps in year-to-year resightings at specific locations, but the whales could also have migrated into the Bering Sea to feed in the intervening years. There have been no photo-identification studies in the northern feeding areas (northern and western Bering Sea and adjacent waters of Arctic Ocean) to determine if any of these whales occur in northern waters between and within years that they are sighted in study areas on the west coast. The wide ranging movements and lack of annual continuity in sightings argues against views that a significant number of these whales show localized site fidelity (Calambokidis et al. 1999). However, several gray whales that have been identified in northern Puget Sound near Everett, Washington for several consecutive years in the spring do appear to show a strong site fidelity to this area; but, it is only for the early part of the feeding season, after which they move to other areas yet to be determined (Calambokidis and Quan 1999).

Site fidelity (i.e., returning to the same site year after year to feed) does not appear to be strong in the Pacific coast feeding aggregation; repeat occurrences of whales at certain sites appears to be more related to availability of food (Darling 1998). Individual whales have been observed at particular sites over multiple years, but they have also had within-year and between-year gaps in presence that prevent predicting an animal's duration of stay per season or probability of returning to a site in future years for most areas. Site fidelity does appear to occur with several whales that feed near Whidbey Island in Washington; studies through 1999 indicate they have occurred at this site, and no others, each year from March to May since 1991 (Calambokidis et al. 1999). In other areas, though, considerable interannual variation occurs in the presence of individual whales, as shown from studies in the northern Washington coast area that has been surveyed consistently from 1996-1999. For example, of the 28 individual whales identified in 1997 in northern Washington and southern Vancouver Island, only 16 (57%) were observed the following year in 1998 (Calambokidis et al. 1999). These data indicate that many whales (35-43%) do not return to the same foraging sites in successive years. In 1998, 57 unique whales were identified by NMFS and CRC in the northern Washington/southern Vancouver Island region. Only 32 (56%) of these whales were identified in a previous year, thus indicating that immigration or recruitment of new whales into this local feeding area may be high.

Our knowledge about the whales in the Pacific coast feeding aggregation is complicated by the overlap between the migration period and the period of summer/fall feeding. Although the primary migration period is relatively well-defined, discriminating the late northbound migrants and the early southbound migrants from the Pacific coast feeding aggregation is difficult, especially since whales are known to feed during the migration. As an example, 17 whales were identified in the Strait of Juan de Fuca in 1998. Of those, seven whales were first seen before

September 1. They had all been seen in a previous year, and they had all been seen in other regions. Of the remaining 10 whales seen for the first time after September 1, none had been seen in a previous year, and only one had been seen in another region during 1998. These 10 whales were either early migrants or part of the west coast Pacific coast feeding aggregation occurring in areas that have not been surveyed.

The total number of gray whales that feed along the Pacific coast has not been well documented until recently. During the summer of 1998, the first range-wide photographic identification survey of this feeding aggregation was conducted from northern California to northern Vancouver Island. A total of 155 unique whales were identified in 1998, of which 134 were seen after June 1 in areas other than Puget Sound (Calambokidis et al. 2000a). The number of whales photographed represents a minimum size for the aggregation because it does not incorporate whales in the area that were missed, nor does it include whales that are part of the aggregation that may have fed in Pacific coast areas outside the area that was surveyed. Calambokidis et al. (2000a) developed an initial estimate for the size of the Pacific coast feeding aggregation (seen after June 1 on the outer coast) in 1998 using a mark-recapture Petersen estimator, with 1996 and 1997 as initial capture samples and the 1998 survey as a recapture survey. Their estimates were 169 (CV=0.09) and 175 (CV=0.09) whales. A higher abundance estimate for the Pacific coast feeding aggregation was made for 1999 by Calambokidis et al. (2000b) using the 1998 and 1999 results. The mark-recapture estimate of abundance based on 1998 and 1999 samples was 269 whales (CV=0.06). Calambokidis et al. (2000b) also had a separate estimate of 222 whales (CV=0.06) by excluding the California samples because they appeared different. Using a log-based confidence interval, the 222 and 269 estimates yield N_{min} values (minimum abundance estimates) of 211 and 256 for the purpose of calculating PBRs (Wade and Angliss 1997) for the Pacific coast feeding aggregation. Calambokidis et al. (2000a) considered possible violations of the mark-recapture assumptions and concluded that the estimates were most likely to be biased low.

The best available scientific information does not indicate that this feeding aggregation constitutes a separate sub-group of the eastern North Pacific population similar to genetically distinct groups of humpback whales that return to specific feeding areas in the North Atlantic (Clapham and Palsboll 1999, Palsboll et al. 1995). In North Atlantic humpback whales, strong maternally directed fidelity to specific feeding areas has been shown to persist on an evolutionary time scale, as reflected in the distribution of mtDNA haplotypes (Palsboll et al. 1995, Larsen et al. 1996). However, such a study cannot be conducted on the gray whale population until tissue samples have been obtained from the full summer range. A preliminary study examined a small number of samples and compared animals from Clayoquot Sound to the overall eastern North Pacific population (Steeves 1998). No significant genetic differences were found, but the study noted the limitation of its small sample size.

Both NMFS and the IWC currently consider the eastern North Pacific gray whale population to be a single stock; to date, there has been no evidence to suggest that the Pacific coast feeding aggregation should be treated as a separate stock. Swartz et al. (2000) reported that genetic analyses of biopsy samples collected from gray whales feeding in the Pacific Northwest by Steeves

(1998) indicated that these animals do not form a separate, genetically distinct population from other portions of the eastern North Pacific population. However, it was noted that the sample size used in the analysis was small (18 samples from British Columbia) and may not be representative of animals that typically feed in the Pacific Northwest. Nonetheless, the whales in this Pacific coast feeding aggregation are not a random assortment of the total population and the whales do show some fidelity to feeding off the west coast rather than northern Alaska.

As noted in the report of the IWC Scientific Committee to the Commission (IWC 2000): "1) there are two clearly separate stocks, in the eastern and western North Pacific, with a large distribution gap and no reason to expect significant interchange nowadays; 2) the gray whale's promiscuous breeding behavior leaves little opportunity for evolutionary differences, but there is nevertheless detectable site fidelity at various times of year; 3) some of these animals [Pacific-coast-summering whales] are 'residents' that return annually to the same areas, with some 'residents' using several areas within a single year and others staying in one area; 4) appropriate photo ID data has only been collected from a few areas to date, so the ratio of 'transient' to 'resident' animals is unknown; 5) a small-sample-size genetic study from a single summering area found no evidence of genetic differentiation between local residents and transients; 6) the [Scientific] Committee agreed that there are important issues of management objectives to be addressed, concerning the size of the unit to be conserved and the appropriate level of precaution; and 7) the Committee agreed that there is a need for a better understanding of site fidelity and potential stock substructure in eastern gray whales, to improve advice on management."

4.2.4. Whaling

Eskimos hunted gray whales near the shores of the northern Bering and Chukchi Seas for thousands of years. Natives of the Chukotka Peninsula selected young gray whales and killed them by using toggle-headed harpoons attached to seal and walrus skin floats (Krupnick 1984). Up until 1928, several Indian tribes between the Aleutian Islands and California hunted gray whales as a part of their cultural and religious traditions. These included the Aleuts, Koniag, Chugash, Tlingit, Haida, Tsimshian, Nootka, Makah, Ozette, Quileute, Klallam, and Chumash (O'Leary 1984). They hunted from boats made of skin or wood and used hand-held harpoons, often with poison-enhanced tips. Stranded whales were also utilized by some of these tribes.

In northeastern Asia, aboriginal whaling diminished early in the mid-nineteenth century. This resulted from a decline in the aboriginal populations as well as from changes in cultural traditions following contact with westerners, particularly Yankee whalers. Commercial shore whaling took gray whales along the coast of the California from the mid-1850s to the early 1900s (Sayers 1984). Shore whaling was defined by Scammon (1874) as the pursuit of a whale from a boat launched from the shore. When the whale was captured, it was towed back to shore where it was flensed and its oil and other byproducts were processed for market. The first station was established in Monterey Bay in 1854 and, over the next 45 years, 15 stations were operated at various times from Crescent City, California, to Punta Eugenia, Baja California. The industry was profitable for approximately 40 years but, by the turn of the century, whales had become scarce

along the coast, and shore whaling became obsolete.

From 1845 to about 1900, American whalers hunted gray whales on their winter grounds in Baja California, as well as along their coastal migration routes and on their summer grounds in the subarctic (Scammon 1874, Henderson 1984). After whalers discovered the wintering areas in lagoons along the Pacific coast of Baja California, they took whales by the hundreds outside the entrances and within the lagoon interiors (Henderson 1984). The gray whale earned the names of "devil fish" and "hard head" from its habit of attacking whaling skiffs when harpooned. Skiffs were frequently overturned and stoved in, with loss of human life. Thus, the whalers preferred hunting gray whales from shallow waters along the edges of the lagoon channels where they were relatively safe from attacks by injured whales. Because females congregated within the lagoon interiors in winter to rear their calves, these catches comprised mostly females and their calves. This whaling strategy drastically reduced the reproductive capacity of the population. By the turn of the century, whaling for gray whales was no longer commercially viable. Henderson (1984) estimated that between 1845 and 1874 approximately 11,300 gray whales were harvested throughout the eastern North Pacific, including approximately 3,200 from the lagoons and bays of Baja California.

Modern whaling for eastern North Pacific gray whales began around 1914 and was pursued by the United States, Japan, Norway, and the Soviet Union (Reeves 1984). Modern whaling refers to the catching of whales through the use of deck-mounted cannons, explosive grenades, direct fastening to the whales, and diesel-, gas-, or steam-powered boats and ships (Mitchell and Reeves 1983). From 1914-46, an estimated 940 gray whales were taken by factory ships and/or fleet whalers working from the North Pacific to Baja California (Reeves 1984). The catch of gray whales off the Chukotka Peninsula increased in the 1930s after commercial overharvesting caused the decline of the bowhead whale and whalers shifted to gray whales (Yablokov and Bogoslovskaya 1984). From 1933-46, the Soviet whaling fleet took a total of 623 gray whales in the Bering and Chukchi seas (Blokhin 1997b). In 1940, the Japanese factory ship *Tonan Maru* took 58 gray whales in the North Pacific. After 1937, gray whales were protected from commercial whaling by Norway and the United States and, after 1938, they were protected from commercial whaling by Canada.

Commercial whaling for gray whales was banned by the 1946 ICRW. That agreement included provisions for aboriginal harvests and scientific investigations, provisions which continue under IWC management. Between 1948 and 1954, Chukchi subsistence hunters took a total of 182 whales, and from 1956-68, the catches increased to more than 100 animals annually (Zimushko and Ivashin 1980). Between 1959 and 1969, 316 gray whales were killed under Special Permits off central California during the fall southward and spring northward migrations. This take was for scientific investigations to establish the status of the population (Rice and Wolman 1971). From 1967-97, aboriginals harvested an average of 150 gray whales annually for subsistence, during which time the population size increased (Table 1). Almost all of the subsistence hunts were by Russian natives; the only reported take by subsistence hunters elsewhere during the last decade occurred in 1995 when two gray whales were taken by Alaska natives (IWC 1997).

Table 1. Gray whale abundance and harvests: 1967-1997				
Year	Population Estimate		Year	Harvest
1967/68	13,012		1967	250
1968/69	12,244		1968	201
1969/70	12,777		1969	214
1970/71	11,170		1970	151
1971/72	9,841		1971	153
1972/73	16,962		1972	182
1973/74	14,817		1973	178
1974/75	13,134		1974	184
1975/76	14,811		1975	171
1976/77	15,950		1976	165
1977/78	17,127		1977	187
1978/79	13,300		1978	184
1979/80	16,581		1979	183
1980/81			1980	181
1981/82			1981	136
1982/83			1982	168
1983/84			1983	171
1984/85	21,942		1984	169
1985/86	20,450		1985	170
1986/87			1986	171
1987/88	21,113		1987	159
1988/89			1988	151
1989/90			1989	180
1990/91			1990	163
1991/92			1991	170
1992/93	17,674		1992	0
1993/94	23,109		1993	0
1994/95			1994	44
1995/96	22,571		1995	85
1996/97			1996	43
1997/98	26,635		1997	79

In 1997, the IWC approved a five-year (1998-2002) aboriginal subsistence quota of 620 gray whales, with an annual cap of 140, based on the aboriginal needs statements from the Russian

Federation and the United States (IWC 1998). The United States and Russia agreed that the quota would be shared, with an average annual harvest of 120 whales by the Russian Chukotka people and four whales by the Makah Tribe (not to exceed 135 whales per year by the Russians and five per year by the Makah Tribe). In 1998, Russian aboriginals landed 122 gray whales; none was harvested by the Makah Tribe. In 1999, Russian subsistence hunters landed 121 gray whales and struck and lost two whales, while Makah subsistence hunters landed one whale (IWC 2000). In 2000, Russian subsistence hunters landed 113 whales, and the Makah Tribe took none. More details on Makah whaling are in Section 4.4.1. of this EA.

4.2.5. Natural Mortality

Gray whales are heavily infested with ectoparasites and epizoites including the host-specific barnacle, *Cryptolepas rhachianecti*, and three species of whale louse - *Cyamus scammoni*, *C. ceti* and *C. kessleri*. These infestations are favored by the gray whales' habit of swimming slowly through shallow coastal waters rich in nutrients. In contrast, Rice and Wolman (1971) found infrequent infestations of endoparasites and attributed this to the whales' long period of fasting each year.

The most dramatic and perhaps most significant cause of natural mortality among gray whales is predation by killer whales. Although it is difficult to quantify the proportion of the gray whale stock that is killed or approached by killer whales each year, there are many anecdotal reports of such events (Rice and Wolman 1971, Jones and Swartz 1984, Poole 1984, Goley and Straley 1994, George and Suydam 1998). In fact, Corkeron and Connor (1999) suggest that killer whale predation may be the primary motivation for the annual migration of gray whales. This migration covers 8,000 - 10,000 km each way (Rugh et al. 1999a), perhaps the longest migration of any mammalian species. Although humans have had a large impact on the abundance of eastern North Pacific stock of gray whales in the past, it has been severe only in the last two centuries. In contrast, killer whales have likely had a consistent presence throughout much of the evolution of gray whales and may have played a significant role in the evolution of their behavior and biology.

4.2.6. Contaminants

Gray whales are a coastal migratory species that are benthic feeders. The method of feeding results in the ingestion of bottom materials, thus the potential exists for the uptake of contaminants in areas where the sediment and benthic prey are contaminated by anthropogenic compounds. Gray whales also have a long migration which may result in a negative energy balance. This negative energy balance may alter the distribution of or exposure to toxic chemicals within the animals due to mobilization and utilization of fats. This may result in higher tissue residue levels in remaining lipid in blubber or increased circulating residue levels in blood.

In addition, gray whales have been observed feeding in coastal waters, which may present an increased risk of exposure to toxic chemicals in some regions.

Organochlorine (OC) pollutants include some of the most widespread and persistent anthropogenic contaminants present in marine ecosystems. These compounds bioaccumulate in lipid-rich tissues of aquatic organisms including marine mammals. Tilbury et al. (in preparation) measured concentrations of organochlorines (OCs) and trace elements in tissues and stomach contents of juvenile gray whales taken during a Russian subsistence harvest in the western Bering Sea and Krahn et al. 2001 summarized tissue residue levels and lipid profiles in blubber for 101 gray whales from the eastern North pacific stock, including the Russian subsistence animals, biopsies from live animals in Washington, and samples from stranded animals (1994 and 1999). There were no differences in the concentrations (based on wet or lipid weight) of contaminants between female and male juvenile animals taken in the subsistence hunt. Concentrations of the sum of polychlorinated biphenyls (∑PCBs; lipid weight) in the juvenile stranded whales and the juvenile whales taken in the subsistence hunt were significantly different [stranded: 30,000 ± 14,000 (1988-1991); 9,800 ± 1,900 (1999) and subsistence: 1,400 ± 130 ng/g lipid weight]. The mean concentration of the ∑PCBs for the biopsy samples was 2,100 ± 190 ng/g lipid weight. In addition, lipid weight concentration of sum chlordanes, dieldrin, and mirex were significantly higher for the 1988-1991 stranded whales compared to the 1994 subsistence animals (Krahn et al 2001). The authors hypothesized that the higher concentrations of ∑PCBs, sum chlordanes, mirex and dieldrin in the stranded animals may be due to the retention of OCs in blubber during fat mobilization rather than to increased external exposure to these contaminants. Lipid concentrations in the blubber of the 1988-1991 and 1999 stranded animals were quite low as compared to the 1994 subsistence animals, as well as in blubber of other stranded cetaceans. The low lipid content of stranded whales can be attributed to one or more of the following factors: (1) leaching of lipid from tissues (sampling error) or (2) low lipid stores due to negative energy balance and mobilization in stranded gray whales. Krahn et al 2001 reported that the age- and sex-specific pattern of contaminants indicates that reproductive females presumably transfer their contaminant burdens to their calves. A similar phenomenon has been reported for other marine mammal species. The effect of observed contaminant levels on fetal development and the overall health of the calf has yet to be determined. The samples of blubber (n=38) analyzed from gray whales biopsied off the Northwest Washington coast during the late summer and fall had mean lipid values of 10% (Krahn et al. 2001). Blubber biopsies are difficult to compare to samples taken from carcasses, since biopsies contain unknown depth (layer) of blubber. In some species, blubber is stratified and contain different amounts of lipids depending on vertical depth.

Tilbury et al (in preparation) examined the concentrations of certain trace elements in key organs. They found that the concentrations of elements were generally low in liver, kidney, and brain tissues of the subsistence whales. As expected, the concentrations of aluminum, arsenic, chromium, iron, manganese, nickel, and vanadium were higher in the stomach contents than in the tissues. The relatively high concentrations of aluminum in liver, kidney, and brain are likely a result of the benthic feeding behavior of gray whales. In contrast, aluminum concentrations in bowhead whale liver (< 600 ng/g, wet weight) (Krone et al, 1999) were considerably less than the

concentrations in the subsistence gray whale liver (4,200 ± 2,700 ng/g, wet weight) and the stranded gray whale liver (32,000 ± 15,000) (Varanasi et al., 1994). The mean concentrations of mercury in liver (160 ± (61) ng/g, wet weight) and kidney (34 ± (1.0) ng/g, wet weight) of subsistence gray whales were relatively low compared to other toothed cetaceans and comparable with other mysticetes. The concentrations of cadmium (210 ± 40) ng/g, wet weight) in livers of these subsistence gray whales were about 40 times lower than subsistence bowhead whales taken in Alaska (Krone et al, 1999).

Contaminant concentrations were measured in tissues from a gray whale caught in a gillnet at Neah Bay in 1995 and from the whale harvested by the Makah Tribe in May 1999 (Ylitalo et al. 1999). Total PCB and DDT concentrations were measured for three types of tissue from the two whales: blubber, muscle, and liver. None of the tissues examined had contaminant concentrations that exceeded the U.S. Food and Drug Administration's regulatory tolerance limits for human consumption of PCBs (2,000 ng/g wet weight) and DDTs (5,000 ng/g wet weight) based on fish and shellfish guidelines (Boyer 1991).

4.2.7. Fishery Interactions

Ferrero et al. (2000) report on eight different commercial fisheries within the range of the eastern North Pacific gray whale stock that were monitored for incidental take by NMFS observers during the 1990s: Bering Sea (and Aleutian Islands) groundfish trawl, longline and pot fisheries; Gulf of Alaska groundfish trawl, longline and pot fisheries; California/Oregon thresher shark/swordfish drift gillnet fishery; and the Makah Tribal set-net fishery. No gray whale mortalities were observed for any of the Alaska fisheries. One gray whale mortality was observed in the thresher shark/swordfish fishery between 1993 and 1998. Two gray whale mortalities were observed in the Makah Tribal set-net fishery between 1990 and 1998, one in 1990 and one in 1995. One gray whale was entangled in this fishery and released alive in 1996. The mean annual mortality rate from these monitored fisheries was 1.2 (CV=0.85) gray whales per year. Ferrero et al. (2000) also reported annual fishery mortality data from fisher logbooks (0.5) and from stranding reports (4.2) for a total estimated minimum annual mortality rate in commercial fisheries of 6.0. Although there may be other unreported mortalities in commercial fisheries, Ferrero et al. (2000) concluded that fishery mortalities can be considered insignificant.

4.2.8. Ship Strikes

The nearshore migration route used by gray whales makes ship strikes a potential source of mortality. Ferrero et al. (2000) reported five gray whale mortalities off California from ship strikes from 1993 to 1995, and one ship strike mortality off Alaska in 1997. Additional mortality from ship strikes probably goes unreported because the carcasses sink at sea or the beached carcasses do not show obvious signs of ship strikes. Therefore, it is not possible to quantify the actual mortality of gray whales from this source, and the annual mortality rate of one to two gray whales per year due to collisions with vessels represents a minimum estimate from this source.

4.2.9. Strandings

The number of dead beached gray whales in the Northwest (Washington and Oregon) has varied from two to 16 annually from 1977 to 1998, with a high of 14 and 16 in 1983 and 1984 (Scordino 1991, NMFS unpub. data 1988-98). The majority of the dead whales examined by biologists died of unknown causes. In a few cases, biologists found evidence of ship strikes (propeller cuts) or entanglement in fishing gear.

In 1999, the number of gray whale strandings in the Northwest increased to 30. An unusually high number of gray whales strandings was documented along the west coast of North America from mainland Mexico to Alaska, with a total of 273 stranded gray whales (Norman et al. 2000). This was a substantial increase in coastwide strandings which totaled 35, 21, 43, and 54 for 1995, 1996, 1997, and 1998 respectively (Norman et al. 2000). In 2000, preliminary reports from Stranding Networks indicate that approximately 352 gray whales washed ashore from Mexico to Alaska. Early reports received in the first four months of 2001, however, indicate that gray whale stranding numbers may be returning to stranding levels observed prior to the 1999/2000 increases.

The IWC Scientific Committee (IWC 2000) noted that the 1999 strandings are "5-13 times higher than annual counts from 1995-1998. Most stranded whales were reported along remote shorelines of Mexico (n=118; 43%) and Alaska (n=73; 27%) and so were difficult to reach for examination."

Norman et al. (2000) considered several factors as possible contributors to the high number of gray whale strandings in 1999: starvation, chemical contaminants, bio-toxins, fishery interactions, ship strikes, and wind and current effects. Of these, the emaciated condition of many of the whales examined that year suggested that starvation may have been the most significant contributing cause for the elevated number of dead whales found. LeBoeuf et al. (2000) offered the hypothesis that gray whales were undernourished in 1999 owing to reduced prey availability in the prime feeding areas of the Bering and Chukchi Seas in summer 1998. Moore et al. (2000) reported that the link between the nutritional condition of the gray whale population and prey availability in the historic feeding areas of the Bering and Chukchi Seas is likely to be complex, because gray whales are opportunistic feeders. Moore et al. (2000) noted that productivity of the oceanic systems "feeding" these areas is largely determined by the Pacific Decadal Oscillation (PDO), and that overall a decline in seabird and marine mammal populations in the North Pacific has also been found to correlate with PDO.

Perryman et al. (2000) reported that gray whale recruitment (calf production) varies significantly between years and that there is a significant correlation between ice conditions in the Chirikov Basin. These results are consistent with a hypothesis that a reduction in feeding time, and the consequent reduction in nutritive condition, may reduce recruitment for gray whales. The number of calves born in 1999 and 2000 was found to be low following two feeding seasons (1998 and 1999) that were shortened by anomalously cold winters with extensive ice coverage. The shortened feeding season reported in Perryman et al. (2000) may have contributed to the

poor nutritional condition of the whales that stranded in 1999 and 2000 as well.

Poor nutritive condition was also indicated by very low lipid levels and organochlorine (OC) reported during contaminant analysis. A comparison of lipid levels and contaminants between stranded animals sampled in 1988-92 and 1999 with whales taken in a Russian subsistence harvest in 1994 showed that lipid levels were significantly lower in the stranded whales from both periods, than in the harvested whales. Results of the contaminant analysis indicated that OC levels were higher in stranded whales than in harvested whales, but the differences are thought to result from retention of OC's in the blubber of stranded animals as lipid stores are used up and lipid levels decrease, rather than dietary differences (Krahn et al. 2001).

Norman et al. (2000) found no definitive evidence that biotoxins contributed to the increased number of strandings in 1999. Similarly, disease is thought to be an unlikely cause of the increased number of gray whale mortalities in 1999, although only limited results of disease testing were available. Fishery interactions and ship strikes did not significantly contribute to gray whale stranding numbers in 1999. Comparisons of wind and current conditions alone did not appear to explain the increase in the number of carcasses found during the peak stranding period along the Washington coast.

In addition to elevated numbers of beach cast carcasses, observations of atypical spatial and temporal whale distribution were also noted in 1999 (Norman et al. 2000, LeBoeuf et al. 2000). Unusually high numbers of live whale sightings were reported in Puget Sound and San Francisco Bay (Norman et al. 2000), and the distribution of whales shifted farther south to mainland Mexico (Urban et al. 1999). The differences in distribution provide the most probable explanation for the increased number of stranded gray whales in the inland waters of Washington and in San Francisco Bay.

The IWC Scientific Committee (IWC 2000) concluded that "the combination of increases in the number of stranded animals reported in 1999 and 2000, which may indicate an increase in the per capita mortality rate, and decreases in calf production in 1999 and 2000, could have caused an overall decrease in the abundance of this population. However, without new survey data to directly assess abundance, it is not possible to make conclusions regarding any changes in the status of this stock relative to the last assessment." As described in Section 4.2.1. of this EA, NMFS did conduct a new survey during the southbound migration in the winter of 2000/2001 off California. However, a new abundance assessment from that survey has not yet been completed.

4.2.10. Offshore Activities

Gray whale reactions to offshore activities have been relatively well studied compared to those of other whales. Studies of short-term behavioral responses to underwater noise associated with aircraft, ships, and seismic explorations indicate a 0.5 probability that whales will respond to continuous broadband noise when sound levels exceed *ca.* 120dB[2] and to intermittent noise when levels exceed *ca.* 170dB, usually by changing their swimming course to avoid the source. Gray

whales "startled" at the sudden onset of noise during playback studies, but demonstrated a flexibility in swimming and calling behavior that may allow them to circumvent increased noise levels. Whales may be "harassed" by noise from large commercial vessels, especially in shipping lanes or near busy ports. Gray whales sometimes change course and alter their swimming speed and respiratory patterns when followed by whale watching boats. Conversely, some whales swim toward small skiffs deployed from whale watching boats in breeding lagoons, seemingly attracted by the noise of idling outboard engines. Reported gray whale reactions to aircraft are varied and seem related to ongoing whale behavior and aircraft altitude. Whale response to research involving tagging and biopsy sampling appears to be short term. Gray whales were seen swimming through surface oil from the *Exxon Valdez* oil spill along the Alaskan coast and showed only partial avoidance to natural oil seeps off the California coast. Laboratory tests suggest that gray whale baleen, and possibly skin, may be resistant to damage by oil, but spilled oil or oil dispersant in a primary feeding area could negatively affect gray whales by contaminating benthic prey. Concern about the cumulative long-term impact of offshore human activities is particularly acute in the Southern California Bight, where many activities are often concurrent.

4.2.11. Activities in the Wintering Areas

At the 52nd meeting of the IWC, Urban (2000) reported the results of a study on the proposed saltworks project in San Ignacio Lagoon, Mexico. In particular, the study evaluated potential impacts on the gray whales that utilize this wintering area for breeding, calving, and calf rearing. According to this study, the salt facility in San Ignacio would not harm gray whales. Nonetheless, the Government of Mexico has decided to leave the San Ignacio landscape unaltered and has suspended the saltworks project.

The growth of gray whale tourism in the North Zone of Bahía Magdalena has led to a proposed Japanese-owned and -financed tourist resort development at Bahía Magdalena (Dedina and Young 1995). Although this represents a potential threat to the whales and their habitat, at this time there are no plans to proceed with this development (Rugh et al. 1999a). Whale watching is allowed in every lagoon in Baja California Sur except in the southern part of Bahía Magdalena.

Since 1997, the Mexican Government has applied whale watching regulations to commercial operators. There are currently four specific whale watching areas in the lagoons where the numbers of boats and methods of approach are regulated. There are no minimum approach distances, but whales cannot be chased.

4.3. Other Wildlife

A wide variety of marine mammals, birds, and other marine organisms (including marine turtles and diverse populations of invertebrates and fish) occur in the Makah U&A. These species are described and discussed below and in the EIS prepared for designation of the Olympic Coast National Marine Sanctuary (NOAA 1993).

4.3.1. Other Marine Mammals

Marine mammals are protected under the Marine Mammal Protection Act of 1972 (MMPA). The MMPA assigns responsibility for these animals to the Secretary of Commerce or the Secretary of the Interior. Under the MMPA, marine mammals are protected by a prohibition on take-"to harass, hunt, capture, kill, or attempt to harass, hunt, capture, or kill." The term harassment was defined in 1994 to mean, "any act of pursuit, torment, or annoyance which, 1. (Level A Harassment) has the potential to injure a marine mammal or marine mammal stock in the wild; or 2 (Level B Harassment) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering." Provisions within the MMPA allow ceremonial and subsistence harvest. Take may also be permitted under special circumstances, such as protecting human life, and scientific research.

Thirty-one species of marine mammals breed, rest within, or migrate through the waters of Washington (NMFS 1992). Table 2 lists the marine mammal species that have been documented off Washington.

Table 2. Marine Mammals in Washington.

1. Harbor seal	Phoca vitulina
2. California sea lion	Zalophus californianus
3. Steller sea lion	Eumetopias jubatus
4. Northern elephant seal	Mirounga angustirostris
5. Northern fur seal	Callorhinus ursinus
6. Dall's porpoise	Phocoenoides dalli
7. Harbor porpoise	Phocoena phocoena
8. Pacific white-sided dolphin	Lagenorhynchus obliquidens
9. Northern right whale dolphin	Lissodelphis borealis
10. Common dolphin	Delphinus delphis
11. Striped dolphin	Stenella coeruleoalba
12. Bottlenose dolphin	Tursiops truncatus
13. Risso's dolphin	Grampus griseus
14. Killer whale	Orcinus orca
15. False killer whale	Pseudorca crassidens
16. Pilot whale	Globicephala macrorhynchus
17. Pygmy sperm whale	Kogia breviceps
18. Gray whale	Eschrichtius robustus
19. Humpback whale	Megaptera novaeangliae
20. Sperm whale	Physeter catodon
21. Minke whale	Balaenoptera acutorostrata
22. Fin whale	Balaenoptera physalus
23. Blue whale	Balaenoptera musculus
24. Sei whale	Balaenoptera borealis
25. Right whale	Balaena glacialis
26. Baird's beaked whale	Berardius bairdii
27. Cuvier's beaked whale	Ziphius cavirostris
28. Hubb's beaked whale	Mesoplodon carlhubbsi
29. Stejneger's beaked whale	Mesoplodon stejnegeri
30. Sea otter (Alaska stock)	Enhydra lutris kenyoni
31. Rough-toothed dolphin	Steno bredanensis

Harbor seals, California sea lions, and Steller sea lions are common in the area. Northern sea otters, which were re-introduced in Washington in 1969 and 1970, have expanded their population and range to include the entire north coast of Washington and into the Strait of Juan de Fuca. The gray whale is the most frequently sighted cetacean off Washington, while other large whales are observed occasionally. The status of the ESA-listed great whales (Humpback, Sperm, Fin, Sei, Blue, and Right whale) can be found in Perry et al. (1999). Dall's porpoise, harbor porpoise and Pacific white-sided dolphins are the most common of the porpoise/dolphins off Washington. More detailed information on the 31 marine mammal species, can be found in Forney et al. (2000), NMFS (1992), Ferrero et al. (2000), and Haley (1986). A short description of the most common species that have some involvement with the Makah Tribe follows.

The harbor seal, *Phoca vitulina*, is the most common marine mammal in Washington (NMFS 1992). It occurs year-round in Washington. Harbor seals give birth on shore and nurse their pups for four to five weeks. After the pups are weaned, they disperse widely in search of food. Pupping within the Makah U&A occurs in June and July on the outer Washington coast and in June, July, and August in the Strait of Juan de Fuca. Breeding occurs in the water shortly after the pups are weaned. The Makah U&A contains at least 32 harbor seal haul-out sites (Gearin and Scordino 1995). Densities of harbor seals vary considerably among areas within the Makah U&A. The area with the lowest densities (number of seals per nautical mile) is along the western Strait of Juan de Fuca; the area with the highest densities and numbers of pups is the Cape Alava area. Harbor seals are taken by Makah tribal members for ceremonial and subsistence purposes each year. Tribal subsistence regulations impose maximum levels of take each year.

The California sea lion, *Zalophus californianus*, occurs seasonally in Washington waters (NMFS 1992). Males migrate northward along the coast following the summer breeding season in California. Beginning in August, California sea lions begin appearing along the outer Washington coast. Some move into Puget Sound and into British Columbia. California sea lions remain in Washington waters through the winter and early spring before returning to California in May and June. This migration can be characterized as a feeding migration consisting primarily of adult and subadult males. California sea lion females and younger animals less than four to five years old tend to remain near the home rookeries throughout the year, or only move as far north as central California. California sea lions are common around Neah Bay during the fall, winter, and spring months. California sea lions are common inside Neah Bay in April and May, with a group of five to ten feeding on fish scraps around the harbor, and on the west end of Tatoosh Island in groups numbering as many as 50-100. California sea lions are also sighted in Makah Bay in small numbers, and to the south at Cape Alava where larger numbers haul-out at west Bodelteh Islands during the migration (Gearin and Scordino 1995). As many as 4,000-5,000 California sea lions have been observed on the Bodelteh Islands during the fall months. Further to the south on Carroll Island, 200-300 may haul out during the peak of the migration. Makah subsistence regulations allow small numbers of California sea lions to be taken each year.

The Steller sea lion, *Eumetopias jubatus*, occurs year-round in Washington State, with peak numbers in late summer, fall, and winter (NMFS 1992). They do not breed in Washington; the closest rookeries are in northern British Columbia and central Oregon, where pupping occurs in May and June. Steller sea lions from California to Southeast Alaska (including Washington) are listed as threatened under the ESA. Within Washington they occur primarily along the outer coast, with smaller numbers in the inside waters of the Strait of Juan de Fuca and Puget Sound. There are several commonly used haul-out sites in the Makah U&A (Gearin and Scordino 1995). They occur around Neah Bay in all months of the year, but are more common during late August through April. The west end of Tatoosh Island is a year-round haul-out site with numbers peaking during fall and winter. To the south at Cape Alava, large numbers exceeding 1,000 have been observed hauled-out on the Bodelteh Islands and on Guano Rock. Farther to the south, large numbers also haul-out on Carroll Island along with California sea lions, and at the Split

Rock complex north of Taholah. Due to their ESA-listed status, Steller sea lions are not taken by Makah tribal members; tribal regulations explicitly advise subsistence hunters to take care in hunting California sea lions in order to avoid Steller sea lions.

The northern fur seal, *Callorhinus ursinus*, is a seasonal migrant off Washington. It does not breed in Washington; the closest rookeries are in the Bering Sea and the Channel Islands of California. During the breeding season in the summer months, most of the population is found on the Pribilof Islands in the southern Bering Sea. Females and juveniles of both sexes migrate south into waters over the continental shelf and slope of the eastern North Pacific Ocean, while adult males stay in Alaska waters. The migration ranges as far south as 30-32 degrees north latitude off southern California and northern Baja, Mexico. Fur seals begin their return migration northward in mid-spring, and by early summer, most have returned to their breeding islands. In Washington, northern fur seals are distributed primarily along the outer continental shelf and slope waters an average of ten miles and beyond offshore (Kajimura 1980). Sightings of northern fur seals in the Strait of Juan de Fuca or Puget Sound are rare, but do occur occasionally (Gearin and Scordino 1995). Fur seals were taken by Makah Tribe hunters from canoes in the open ocean in the late 1800's and into the 1900's (Swan 1883, Swan 1887).

Harbor porpoise, *Phocoena Phocoena*, are widespread throughout the inland and coastal waters of Washington with the exception of southern Puget Sound (NMFS 1992). Scheffer and Slipp (1948) provide an historical account of this species in Washington. Harbor porpoise are known to calf and breed in Washington. Harbor porpoise generally give birth in the summer from May through July and calves remain dependant for at least six months (Leatherwood et al. 1982). Harbor porpoise are usually shy and avoid vessels, so they are difficult to approach. They frequent inshore areas, shallow bays, estuaries, and harbors. They are found almost exclusively shoreward of the 100-fathom contour line along the outer Pacific coast, with the vast majority found inside the 25-fathom curve (Green et al. 1992). Harbor porpoise have been taken incidentally to Makah set net fisheries, but mortalities have been reduced to insignificant levels as a result of a NMFS-Makah cooperative study demonstrating that net pingers minimized porpoise entanglement in nets (Gearin et al. 2000).

Nothern sea otters, *Enhydra lutris kenyoni*, in Washington were transplanted from Alaska. Although sea otters occurred historically along the outer coast of Washington, the Pacific Northwest population was severely reduced by overhunting in the late 1800s and extirpated by 1920 (NMFS 1992). The last known native sea otters in Washington were taken in Willapa Bay in 1910 (Scheffer 1940). Sea otters were historically distributed in nearshore coastal waters from the northern Islands of Japan to the Commander Islands east along the Aleutian Islands, and from Prince William Sound south to central Baja California (Kenyon 1969). The USFWS has conducted cooperative surveys with Washington Department of Fish and Wildlife on the transplanted sea otter population since 1985. A total of 65 sea otters were counted in 1985, increasing to 276 in 1991 (NMFS 1992). More recent counts are around 500-600 otters. Most of the sea otter population growth has occurred north of La Push. To the south, only the Destruction Island area has shown any significant increase. The population is well established on

the outer coast of the Olympic Peninsula, and the range is starting to expand slowly northward. Breeding and pupping sea otters generally occur from Point of Arches to the south, with a large concentration of sea otters near Cape Alava (Jameson, pers comm). In addition, sea otters are generally concentrated in areas with large quantities of kelp and generally stay in water that is quite shallow, usually 20 feet or less (Jameson, pers comm).. However, sea otters are seen in near-shore open water in the area between Point of Arches and Cape Alava, as there is no rocky substrate and therefore little kelp (Jameson, pers comm). Sea otters pup in late winter and early spring, and wean the pups in late summer and early fall (Jameson, pers comm). The Makah Tribe has expressed concerns about the effects of the expanding sea otter population on the Tribe's sea urchin fishery, but to date no actions have been taken.

4.3.2. Marine Birds

The seabird colonies of Washington's outer coast, mostly breeding on the seastacks and islands of the National Wildlife Refuges, are among the largest in the continental United States. Common murre populations in Washington are of particular concern. A precipitous decline in colony attendance throughout Washington occurred during the 1983 El Niño, principally at the southern colonies around Pt. Grenville, and at Split and Willoughby Rocks, and attendance remained depressed through at least the 1996 breeding season. During this same time period, two major oil spills occurred off the coast of Washington, causing significant mortality in common murres. Common murre colonies on Tatoosh Island, the only stable colony in Washington, have been further impacted by bald eagles and predation by gulls (Parrish 1997).

A list of most of the marine birds found in Washington marine waters is shown in Table 3. Most of the marine birds are protected under the Migratory Bird Treaty Act. ESA-listed birds in Washington marine waters are the marbled murrelet, bald eagle, brown pelican, short-tailed albatross, and western snowy plover. A short description of each of the ESA-listed marine birds is provided below, except for the western snowy plover, a shorebird that does not occur in the area of whaling activities. More complete and detailed descriptions of all of the marine birds off northern Washington, are in NOAA (1993), Nysewander et al. (1994), Nysewander et al. (2001), Pacific Seabird Group (1993), Speich and Wahl (1989), Speich et al. (1992), and Wahl et al. (1981).

In Washington the marbled murrelet is found in all nearshore marine areas (within 1.2 miles of shore), with the greatest concentrations in northern Puget Sound (Washington Department of Wildlife). The average distance from shore, 464 meters, is less than other seabirds such as the common murre, with an average distance from shore of 2,214 meters (Pierce et al. 1996). Marbled murrelets spend most of their lives on salt water feeding on fish or invertebrates, but fly inland to nest (Washington Department of Wildlife). The main causes of the population decline of the marbled murrelet is loss of older forests as a result of timber harvesting, but other threats include oil pollution, entanglement in gill nets, and the species' low reproductive rate (Washington Department of Wildlife). The population is estimated at no more than 5,000 animals (Washington Department of Wildlife). Murrelet populations are higher along the coasts of northern

Washington than southern Washington, thought to be a result of the nearshore substrate being more conducive to the fish they are feeding on and the limited amount of mature forests south of Grays Harbor (Thompson, personal communication).

The numbers of bald eagles in Washington has increased steadily since 1980, and the number of nests is now more than 550. The nesting population accounts for 12% of the nesting population across the contiguous United States (Watson and Pierce 2001). In addition, the Skagit River is one of the key wintering areas for bald eagles in the Pacific Northwest. In a recent study of the bald eagle population on this river, the most insidious effect of human activity was not from active disturbances of perched or feeding birds by boats or rafts, but by human presence on feeding bars, which actively displaced eagles for up to a few days (Watson and Pierce 2001).

Brown pelicans nest in colonies mostly on small coastal islands. However, this species is rarely sighted as far north as the Makah U&A. There are no nesting sites in Washington; however, during the summer brown pelicans roost in large numbers near the Columbia river, East Sand Island, and near the Grenville rocks by the town of Tahola (Thompson, personal communication).

Short-tailed albatross populations are estimated at 1,200 birds worldwide (65 FR 46643; July 31, 2000). Breeding sites for this species are restricted to remote Torishima and Mimami-kojima Islands in Japan, with unconfirmed breeding in the Midway Atoll in the Hawaiian Islands (65 FR 46643; July 31, 2000). The greatest threat to the short-tailed albatross is mortalities caused by longline fishing. In Washington state sightings are extremely rare, with only three or four recent sightings, all occurring 20 to 30 miles offshore (Thompson, personal communication).

Table 3. Marine birds occurring off northern Washington

Common Name	**Scientific Name**
LOONS AND GREBES	*GAVIIDAE and PODICIPEDIDAE*
Common loon	*Gavia immer*
Pacific loon	*Gavia pacifica*
Red-throated loon	*Gavia stellata*
Horned grebe	*Podiceps auritus*
Red-necked grebe	*Podiceps grisegena*
Western grebe	*Aechmophorus occidentalis*
TUBENOSES	*PROCELLARIIFORMES (Diomedeidae, Procellariidae and Hydrobatidae)*
Black-footed albatross	*Diomedea nigripes*
Short -tailed albatross	*Phoebastria albatrus*
Laysan albatross	*Diomedea immutabilis*
Buller's shearwater	*Puffinus bulleri*
Flesh-footed shearwater	*Puffinus carneipes*
Pink-footed shearwater	*Puffinus creatopus*
Short-tailed shearwater	*Puffinus tenuirostris*

Sooty shearwater	*Puffinus griseus*
Northern fulmar	*Fulmaris glacialis*
Fork-tailed storm petrel	*Oceanodroma furcata*
Leach's storm petrel	*Oceanodroma leucorhoa*
PELICANS and CORMORANTS	*PELECANIDAE and PHALOCROCORACIDAE*
Brown pelican	*Pelecanus occidentalis*
Brandt's cormorant	*Phalacrocorax penicillatus*
Double-crested cormorant	*Phalacrocorax auritis*
Pelagic cormorant	*Phalacrocorax pelagicus*
GEESE and DUCKS	*ANATIDAE*
Aleutian Canada goose	*Branta canadensis leucopareia*
Brant	*Branta bernicla*
Black scoter	*Melanitta nigra*
Surf scoter	*Melanitta perspicillata*
White-winged scoter	*Melanitta fusca*
Harlequin duck	*Histrionicus histrionicus*
Oldsquaw	*Clangula hyemalis*
Bufflehead	*Bucephala albeola*
Common goldeneye	*Bucephala clangula*
Greater scaup	*Aythya marila*
Red-breasted merganser	*Mergus serrator*
Common merganser	*Mergus merganser*
EAGLES, OSPREYS AND FALCONS	*FALCONIFORMES*
Bald eagle	*Haliaeetus leucocephalus*
Osprey	*Pandion haliaetus*
Peregrine falcon	*Falco peregrinus*
OYSTERCATCHERS	*HAEMATOPODIDAE*
Black oystercatcher	*Haematopus bachmani*
PLOVERS	*CHARADRIIDAE*
Killdeer	*Charadrius vociferus*
Semipalmated plover	*Charadrius semipalmatus*
Snowy plover	*Charadrius alexandrinus*
American golden plover	*Pluvialis dominicus*
Black-bellied plover	*Pluvialis squatarola*
SANDPIPERS, TURNSTONES, SURFBIRDS AND PHALAROPES	*SCOLOPACIDAE*
Black turnstone	*Arenaria melanocephala*
Ruddy turnstone	*Arenaria interpres*
Surfbird	*Aphriza virgata*
Marbled godwit	*Limosa fedoa*
Greater yellowlegs	*Tringa melanoleuca*
Lesser yellowlegs	*Tringa flavipes*

Spotted sandpiper	*Actitis macularia*
Whimbrel	*Numenius phaeopus*
Wandering tattler	*Heteroscelus incanus*
Long-billed dowitcher	*Limnodromus scolopaceus*
Short-billed dowitcher	*Limnodromus griseus*
Rock sandpiper	*Calidris ptilocnemis*
Baird's sandpiper	*Calidris bairdii*
Dunlin	*Calidris alpina*
Least sandpiper	*Calidris minutilla*
Sanderling	*Calidris alba*
Western sandpiper	*Calidris mauri*
Red phalarope	*Phalaropus fulicaria*
Northern phalarope	*Lobipes lobatus*
JAEGERS and SKUAS	*STERCORARIINAE*
Long-tailed jaeger	*Stercorarius longicaudus*
Parasitic jaeger	*Stercorarius parasiticus*
Pomarine jaeger	*Stercorarius pomarinus*
South polar skua	*Catharacta mccormicki*
GULLS AND TERNS	*LARIDAE*
Bonaparte's gull	*Larus philadelphia*
California gull	*Larus californicus*
Glaucous-winged gull	*Larus glaucescens*
Heerman's gull	*Larus heermanni*
Herring gull	*Larus argentatus*
Mew gull	*Larus brachyrhynchos*
Ring-billed gull	*Larus delawarensis*
Sabine's gull	*Xema sabini*
Thayer's gull	*Larus thayeri*
Western gull	*Larus occidentalis*
Black-legged kittiwake	*Rissa tridactyla*
Caspian tern	*Sterna caspia*
Common tern	*Sterna hirundo*
Forster's tern	*Sterna forsteri*
Arctic tern	*Sterna paradisaea*
ALCIDS	*ALCIDAE*
Ancient murrelet	*Synthliboramphus antiquum*
Cassin's auklet	*Ptychoramphus aleutica*
Common murre	*Uria aalge*
Marbled murrelet	*Brachyramphus marmoratum*
Pigeon guillemot	*Cepphus columba*
Rhinoceros auklet	*Cerorhinca monocerata*
Tufted puffin	*Lunda cirrhata*
KINGFISHERS and HERONS	*ALCEDINIDAE and ARDEIDAE*
Belted kingfisher	*Ceryle alcyon*

Great blue heron	*Ardea herodias*

4.3.3. Other Species

The high biological productivity of the coastal and offshore waters of northern Washington support a diverse and rich plankton and marine fish populations. These populations attract foraging marine wildlife and valuable fisheries that contribute significantly to the state and tribal economies. The commercially important species of fish include groundfish, shellfish, and five species of salmon. Several salmonid populations are listed under the ESA. Descriptions of ESA-listed salmonids can be found in NMFS status reviews, available on the NMFS website (http://www.nwr.noaa.gov/1salmon/salmesa/pubs.htm#Status Reviews).

Four species of sea turtles occur off Washington: leatherback sea turtle (*Dermochelys coriacea*), green sea turtle (*Chelonia mydas*), loggerhead sea turtle (*Caretta caretta*), and the Pacific olive ridley sea turtle (*Lepidochelys olivacea*). These turtles, which are listed as threatened or endangered under the ESA, are described in the EIS prepared for the Olympic National Marine Sanctuary (NOAA 1993). Sea turtles are warmer water species whose occurrence off Washington is uncommon; higher occurrences coincide with El Niño years with warmer currents off the Northwest.

4.4. Makah Tribe

The Makah Tribe has a centuries-old tradition of whaling that was the focal point of the Makah culture and social structure. Whaling was so important to the Tribe that it insisted that its rights to continue whaling be written into the treaty signed in 1855; it is the only Indian tribe with a treaty that explicitly reserves the right of an Indian tribe to whale.

The Tribe believes that continuing its whaling tradition will provide important subsistence and ceremonial benefits to the Makah community and will help the Tribe to reaffirm its traditions and cultural identity. The large tribal ceremonies and celebrations involving most members of the Tribe after the successful hunt on May 17, 1999, are indicative of the benefits of whaling to the Makah Tribe.

4.4.1. Makah Whaling

Makah Tribal members were well known whalers of the northern Washington coast (Swan 1870, Scammon 1874, Waterman 1920, Reagen 1925, Singh 1966, Rice and Wolman 1971, Taylor and Bosch 1980, Fisken 1980, O'Leary 1984, Huelsbeck 1988, Renker 1997). Gray whales were undoubtedly one of the primary whales hunted by Makah whalers due to their close proximity to villages and local abundance (Fisken 1980). Humpback whales, though not as readily available, also were heavily hunted by the Makah, as evidenced by the number of faunal remains recovered from the Ozette Village site (Huelsbeck 1988). Gray whale and humpback whale bones were almost equally represented from Ozette, indicating that humpback whales may have been selected by whalers for their large oil reserves (O'Leary 1984). Some sources suggest that gray whales

were not pursued by Makah whalers in the fall during the southward migration due to generally stormy and risky weather, but were taken primarily during the spring when gray whales are moving north (O'Leary 1984). The remains of six young gray whale calves in the faunal remains at Ozette also indicate that these whales were taken when the young were going north for the first time (O'Leary 1984). Other sources indicate that gray whales were taken during the spring, summer, and fall (Renker 1997).

Prior to European contact, the Makah traded whale oil and parts to other tribes along the coast, and subsequently engaged in commercial whaling with both Yankee whalers and Europeans (Swan 1870, Singh 1966, Taylor and Bosch 1979). Swan estimated that, by 1850, the Makah were producing 30,000 gallons of whale oil annually, most of it sold to European vessels. The onslaught of the Yankee whalers and the discovery of the Baja breeding lagoons quickly depleted the gray whale population. The Makah took their last gray whale in the pre-modern era in 1928, according to Rice and Wolman (1971).

The Tribe's renewed interest in its cultural heritage stemmed in part from a remarkable archeological excavation. During the 1970s, Ozette, a whaling village that had been covered 400 years ago by a mud slide, was uncovered. The artifacts from Ozette testify to the central role of whaling in the Tribe before contact with westerners. The excavation of the village re-awakened the Tribe's interest in, and appreciation for, its heritage, especially for the role that whaling played in its society (Renker 1997).

In 1995, after the gray whale population had recovered and was delisted under the ESA, the Makah Tribe approached the U.S. Government and expressed an interest in seeking to continue its 1,500 year tradition of hunting gray whales. The Makah request to take up to five gray whales per year was based on the number of traditional whaling villages. An account of the joint effort by the Tribe and the U.S. Government to obtain a quota at the IWC is in Section 2.3. of this EA. After issuance of the IWC quota in 1997, the Makah Tribe developed a "Management Plan for Makah Treaty Gray Whale Hunting for the years 1998-2002" (Plan) that stipulated how tribal members would conduct ceremonial and subsistence whaling activities. In accordance with the 1997 agreement between NOAA and the Makah Tribal Council, the Plan contained requirements regarding harvest and strike limits, targeting on migrating whales, inspection and reporting, management, utilization of whale products, and enforcement. In addition, the Plan included requirements regarding issuance of whaling permits, training of whalers, whaling equipment and hunting methods, and penalties for non-compliance. The Plan required use of a canoe, paddlers, and a harpooner to approach and take gray whales to maintain tribal tradition in hunting gray whales. In accordance with the ICRW, NMFS regulations, and the 1997 agreement between NOAA and the Makah Tribal Council, the Plan strictly prohibited the commercial sale of whale products except for traditional handicraft (including artwork) made from non-edible parts of the whale. The Plan also followed U.S. law by prohibiting international trade of whale products. To ensure that whales were killed as humanely as possible, the Plan required that any whale that was harpooned was to be immediately shot with a large caliber rifle. As described in Section 2.4.2. of this EA, the Makah Tribe recently revised the Management Plan.

The Makah Tribe has conducted its whaling and preparations for whaling in a manner that is as consistent as possible with its traditional manner of whale hunting and with as much safety as possible for whaling crews. But, in order to conduct the hunt in a manner that is as humane as possible, the Makah Tribe has departed from their tradition and is using a high-powered rifle to dispatch harpooned whales (*See* Section 4.4.2. of this EA). The hunt consists of one or two traditional seagoing canoes, manned by crews of eight to nine whalers in each canoe. The seagoing canoe is about 36 feet in length and is carved from a single cedar log. The harpooner, stationed in the canoe, uses a stainless steel harpoon mounted on a wooden shaft approximately seven feet long, connected by ropes to buoys and to the canoe. The harpooner will attempt to harpoon target whales when the canoe approaches close enough, usually within four to eight feet. Once a whale is harpooned and secured, a small motorized vessel will approach the harpooned whale; the rifleman in that boat will dispatch the whale with one or more shots from a large-caliber rifle to the head area of the whale. Once the whale is taken, it is secured and a larger vessel is used to tow it back to the beach.

4.4.2. Use of a Large-Caliber Rifle in Makah Whaling

At the request of NOAA, the Makah Tribe evaluated and tested non-traditional methods of dispatching a harpooned whale to enhance the efficiency and humaneness of a gray whale hunt. The Makah Tribe considered the bomb lance and dart gun used by Alaska Eskimos to hunt bowhead whales, but found them to be inappropriate and unsafe for use on the smaller gray whale. Through advice from a consultant with expertise in whaling methods, the Makah Tribe settled on use of a high-caliber rifle. The objective for using a high- powered rifle is to deliver a projectile into the whale that creates sufficient damage to either kill the animal immediately or disable it to the point that it can be approached quickly and killed by a bullet to the head or brain stem (base of the brain and upper spinal cord).

A modified .50BMG rifle was tested on gray whale carcasses and found to be a potentially effective and humane weapon for quickly dispatching a harpooned gray whale (Ingling 1997). Further testing showed that an A-Square .557, the Winchester .458 Mag., and the Weatherby .460 Mag. also could be potentially effective as back-up or replacement weapons to humanely dispatch gray whales during the Makah Tribe's ceremonial and subsistence hunt (Ingling 1999). Table 4 shows the specifications for the rifles and cartridges (from Ingling 1999) available to the Makah Tribe for hunting gray whales. The performance and penetration into water are discussed in Ingling (1999).

Table 4. Specifications of rifles and cartridges for the Makah hunt

Rifle	Barrel Length in. (cm)	Rifling Twist	Cartridge	Caliber in. (mm)	Length in. (mm)	Weight gr. (gm.)	Velocity ft/sec (m/sec)	Energy ft-lbs (joules)
Winchester .458	26 (66)	14	Spitzer	.458 (11.63)	1.43 (35.5)	465 (30)	2250 (685)	5200 (7000)
Weatherby .460	26 (66)	16	Round Mono	.458 (11.63)	1.43 (35.5)	510 (33)	2550 (777)	7400 (10000)
LAR .50BMG	30 (76)	15	Spitzer	.50 (12.7)	2.31 (58.7)	650 (42)	2700 (823)	10000 (13600)
State Arms .50BMG	30 (76)	9.5	Round Mono	.50 (12.7)	1.87 (47.6)	750 (48)	2700 (823)	12000 (16300)
State Arms .50BMG	30 (76)	9.5	Woodleigh	.50 (12.7)	1.31 (33.3)	570 (37)	3200 (975)	13000 (17625)
A-Square .577	26 (66)	12	Round Mono	.58 (14.7)	1.44 (3.65)	750 (48)	2460 (750)	10000 (13600)

According to the U.S. Army Field Manual (U.S. Army 1991), the maximum range of the Browning Machine Gun Caliber .50 HB, M2 (from which the .50BMG is derived) is 7,440 yards (6,764 meters). The maximum effective range, which is the maximum distance that the average gunner is capable of hitting a target (i.e., see and effectively engage with the ammunition) utilizing the standard iron sights is 2,000 yards (1,830 meters). There are no data in the Army's .50BMG Field Manual (U.S. Army 1991) on whether the military's .50BMG is more powerful/effective than the civilian counterparts or a modified .50BMG. The military version is heavier; it is 84 pounds (U.S. Army 1991) as compared to 30 pounds for the LAR .50BMG (Ingling 1997). The military .50BMG is mounted on a stabilized tripod that will greatly increase accuracy, whereas the LAR .50BMG is held to the shoulder. The military .50BMG has a 45-inch barrel (U.S. Army 1991), whereas the LAR and State Arms .50BMGs have a 30- inch barrel (Table 4). The ammunition used will also affect the maximum range.

According to Dr. Al Ingling (personal communication, 2001), who was the Makah Tribe's consultant on selecting an appropriate weapon for dispatching whales, the Makah's .50BMG varies from the military's version in many ways. It is single-loaded. It must be reloaded after every fire. The ammunition used is custom-designed. Its projectile has a flatter, rounder shape than the military's pointy version. The projectile is made from solid brass, not steel. It cannot penetrate armor like the military's armor-piercing version. The grain is 750 as opposed to 650 grain that the military uses. The ammunition is heavier and more air resistant, causing it to be much slower than the military's .50BMG. Dr. Ingling estimated that the maximum range and maximum effective range of the Makah's .50BMG is less than half that of the military .50BMG.

In regard to the A-Square .577 caliber rifle, Dr. Al Ingling (personal communication, 2001), advised that the A-Square Company, which manufactured the Makah Tribe's .577 caliber rifle, is no longer in existence. It was the only company to manufacture this rifle and its ammunition. It is similar to the .460 produced by Winchester or Remington. However, the A-Square .577 is not the same as the .577 caliber British Enfield rifle musket used in the Civil War era. The A-Square .577 is a large-game sporting rifle that was designed to hunt elephants. It is used for close-range hunting with an approximate maximum distance of 100 yards. It is not used for distance targeting. It is lighter than the .50BMG weighing approximately 14 pounds. Similar to the LAR and State Arms .50BMG, it is fired from the shoulder. Because it has a three-round capacity, similar power to the .50BMG with less recoil, it is preferred by the Makah whalers. The .577 rifle was used by the Makah on the gray whale taken in 1999.

There are no data in the Army's .50BMG Field Manual (U.S. Army 1991) on ricochet. Kline (2001) provided data showing that two different projectiles from a .50 caliber M2 had ricochet potential of 1,659 and 1,652 meters off earth/water with 41- and 38-degree angles respectively. There are a number of variables that affect ricochet including the angle of the ricochet, bullet velocity, type of surface, type of bullet. The probability of ricochet decreases as the impact angle increases. The Makah Tribe's revised Management Plan establishes rifle discharge protocols to address safety concerns with large-caliber rifles (*See* Appendix 10.3).

4.4.3. 1998 Makah Tribe Hunt

Makah tribal whalers conducted a number of practice exercises during 1998. In the fall of 1998, several whaling permits were issued by the Makah Tribal Council, but no actual whaling occurred.

4.4.4. 1999 Makah Tribe Spring Hunt

The Makah Tribal Council issued the first whaling permit of 1999 on May 10, 1999, based on the recommendation of the Makah Whaling Commission in accordance with the Makah Tribe's Management Plan. This permit was issued during the spring northward migration of gray whales off Washington State. On May 17, the crew struck and landed one gray whale under this permit; no further whaling permits were issued. All whaling was conducted in the ocean area off the Washington coast south of Cape Flattery. The tribal whale hunts occurred on May 10, 11, 15, and 17, all monitored by a NMFS observer and a tribal observer. The whaling canoe approached gray whales on May 10, 15, and 17. Three attempted strikes (harpoon attempt missed) occurred as follows: May 10 at 15:55 Pacific Daylight Time (PDT), when a harpoon attempt missed; May 15 at 11:19 PDT, when a harpoon throw appeared to come into contact with a gray whale, but did not attach since the harpoon line and float came back to the surface immediately with the harpoon head intact; and May 15 at 12:21 PDT, when another harpoon attempt missed. Protest vessels were present during the hunt and disrupted hunting activities on the first day of the hunt.

On May 17, 1999, the fourth day of whaling activity, the crew successfully struck and landed a gray whale. At 06:55 PDT, the gray whale was struck with the harpoon, which remained affixed to the whale as it pulled the harpoon line and floats into the water. The whaling crew in the canoe

held onto the harpoon line, while the chaser boat approached the whale to dispatch it with a .577 caliber rifle. A total of four shots were fired with the first two shots missing the whale, and the second two shots hitting it in the head area. The last shot left the whale motionless underwater at 07:03 PDT. Two additional harpoons with float lines were also affixed to the whale. Total time from the initial harpoon strike to the last shot that dispatched the whale was eight minutes. After dispatch, the whale was towed to the beach in Neah Bay, and butchering began shortly after tribal ceremonies.

The whale taken on May 17, 1999, was a non-lactating female that measured 30 feet 5 inches (9.27 meters) total length. Fluke width was 7 feet 4 inches (2.2 m). The whale could not be weighed, but based on gray whales taken in the Russian harvest of similar length and condition, it was estimated to be about five to seven metric tons. Age also could not be determined, but based on similar lengths of whales taken in the Russian harvest, it was estimated to be over two years old. An examination of the skull during butchering revealed that the third shot struck the ridge of the skull, shattering it, and proceeded back into the muscle near the left flipper where whalers found the bullet (bullet was intact with no deformation). The fourth shot struck the skull above the occipital condyle and entered the braincase; it likely caused instantaneous loss of consciousness and death due to massive brain trauma.

Almost all edible portions of the meat and blubber were removed from the whale by tribal members on May 17, 1999. NMFS biologists collected samples from internal organs after tribal members had removed the meat and brought it home or to the community freezer. Tribal members flensed small portions of meat the next day to prepare the skeleton for a museum display. The meat and blubber were consumed by Makah Tribal members and during tribal ceremonies.

For an analysis of tissues for chemical contaminants, see Section 4.2.6 of this EA.

4.4.5. 1999 Makah Tribe Fall/Winter Hunt

No whaling permits were issued by the Makah Tribal Council during the southward migration in 1999. Tribal whaling families intended to hunt whales during the southward migration in November and December, but weather conditions were not suitable.

4.4.6. 2000 Makah Tribe Spring Hunt

The 2000 spring hunt commenced on April 17, 2000, and continued through May 29, 2000 (Gearin and Gosho 2000). The Makah Tribal whalers actively hunted gray whales on a total of seven days, during which no whales were struck or taken. Protest activities disrupted the hunt on several occasions. All whaling occurred in the ocean area south of Cape Flattery. Except for a few approaches near Makah Bay, the vast majority of hunting occurred south of Point of Arches near Father and Son Rocks. Makah whalers threw harpoons on three occasions, but the harpoons did not attach to a gray whale on any of these attempts. The first two throws appeared to be complete misses. The third throw may have grazed the whale; however, the harpoon did not

implant or detach. Most of the whales in the area during the hunt were large single individuals. The whales appeared to be migrating in that the average dive time was about eight minutes, which is four or five minutes longer than for whales that are seen feeding or resting locally. None of the whales exhibited the characteristics of whales in the Pacific coast feeding aggregation (e.g., remaining in the same general area for long periods of time and milling or feeding). The gray whales observed during the hunts were farther offshore and in deeper water (80-100 feet) than whales in the Pacific coast feeding aggregation, which are generally in water 30-60 feet deep.

Makah whalers had intended to continue whaling into June, but the Makah Tribal Council did not issue any permits due to the June 9, 2000, ruling by the Ninth Circuit Court of Appeals on Metcalf v. Daley.

4.4.7. 2000 Makah Tribe Fall/Winter Hunt

No whaling permits were issued by the Makah Tribal Council during the southward migration in 2000.

4.4.8. Planned Makah Hunt in 2001 and 2002

As described in Section 2.4.2. of this EA, the Makah Tribal Council adopted a revised Management Plan for tribal whaling in 2001 and 2002 (*See* Appendix 10.3). The Plan limits the 2001/2002 gray whale hunt to five takes or seven strikes, whichever occurs first, in each of the two years. The revised Plan also allows whaling, with a limit of five strikes over the two years, during the period outside the gray whale migration timeframe and east of the Bonilla-Tatoosh line to the eastern extent of the Coast Guard's RNA at 124° 34' W. longitude. Whaling could occur eastward to about the middle of Third Beach, and would not occur in the area of Seal and Sail Rocks nor the Snow Creek marina. In the Strait of Juan de Fuca, the lands adjacent to the RNA are part of the tribal reservation, which extends eastward to 124° 32'.738 W. longitude. Thus, all whaling in the Strait of Juan de Fuca will occur off tribal lands and not offshore of public lands or communities. The revised Plan also prohibits whaling in areas immediately surrounding the port of Neah Bay (specifically whaling is prohibited in the area bounded on the south and west by the Olympic Peninsula shoreline, on the north by the breakwater, and on the east by a line from South Waadah Point to Baada Point) (*See* insert in Figure 1). Thus, whaling activity would not occur near marinas or docks.

The revised Plan incorporates firearm safety and certification protocols recommended by a consulting firm with expertise in hunting and use of rifles that have long-range potential (Beattie 2001). One recommendation by Beattie (2001) incorporated into the Plan is having a safety officer on the whaling crew whose primary responsibility is to assess risk to human life or property as the hunt progresses. The safety officer will not authorize the discharge of the rifle unless: the barrel of the rifle is above and within 30 feet or less from the target area of the whale, and the safety officer determines that the rifleman's field of view is clear of all persons, vessels, buildings, vehicles, highways, and other objects or structures that, if hit by a rifle shot, could cause injury to human life or property. The hunt will be suspended if the safety officer determines

that visibility is less than 500 yards in any direction.

All the other provisions of the prior Plan were retained or strengthened (inspection and reporting, management, use of whale products, enforcement and penalties, issuance of permits, training, and certification) (*See* Appendix 10.3). The Plan continues the prohibition on the commercial sale of whale products.

4.5. Other Tribes

The Makah Tribe is one of four tribes located on the outer coast of Washington State. The other tribes are the Quileute, located at La Push; the Hoh, located at the mouth of the Hoh River; and the Quinault, located between Queets and Moclips. All four tribes are Federally recognized Indian tribes and appear on the Secretary of Interior's List of Indian Entities Recognized and Eligible to Receive Services from the U.S. Bureau of Indian Affairs (65 FR 13299, March 13, 2000), the annual publication that is mandated by Congress in the Federally Recognized Indian Tribe List Act of 1994. In addition, these tribes are signatories to the Stevens treaties, which include the Treaty of Neah Bay and the Treaty of Olympia. The four tribes, all of which have hunted whales in the past, have reserved treaty rights for hunting and fishing, but only the Makah Tribe has explicit treaty language reserving the right to sealing and whaling. Nearby Canadian Tribes such as the Nuu-chah-nulth of British Columbia also were involved with whaling.

4.6. Whale Watching Industry

In the Northwest, more than 130 commercial operators advertise whale watching or marine wildlife viewing tours in Oregon, Washington, and British Columbia on the Internet. Whale watching activities are roughly divided into two major areas and target species. In the coastal waters of Washington and Oregon, the primary focus is on seasonally migrating gray whales, while killer whales are the principal target of whale watchers during summer months in the inland waters of Washington and British Columbia, Canada. The most popular and well-known whale watching industry is focused on killer whales in the area of the San Juan Islands in northern Puget Sound. Many charterboat operators also actively promote wildlife and bird watching as "added attractions."

In Washington, gray whale watching trips begin in March during the northward migration and taper off in May, as many of the charterboat operators shift their offerings to sport fishing during the summer months. Most of the operators that offer gray whale watching trips are concentrated in the port of Westport on the central Washington coast. Some operators advertise trips from the ports of Nahcotta, Sekiu, and Neah Bay. Whale watching vessels depart daily in Westport in the spring, whereas in Neah Bay sightseeing and whale watch/wildlife charters are available only by reservation in the summer.

In Neah Bay, several attempts have been made in past years to establish scheduled whale watching excursions on salmon and halibut charter vessels during the spring gray whale migration, but they were not successful. Wildlife or whale watching trips can be arranged directly with

charterboat operators in Neah Bay. But, because of the remote location of Neah Bay and unpredictable whale sighting conditions, few whale watching trips occur in northern coastal Washington and the western Strait of Juan de Fuca. For 2000, the charterboat bookings office and the marina operators advised that as many as a dozen charter vessels may have been involved with whale watching and/or nature tours, but no specific records were kept. One employee believed that each vessel may have conducted about one or two such tours during 2000. The charterboat booking office records from May through September indicated that eight whale watching trips were booked, including four in July and four in August, on five different vessels. However, several operators that spent portions of the season at Neah Bay did their own bookings and could have had more trips. Of about 12 charter boats that operated at Neah Bay during 2000, about half were there only during May and June during the halibut season (Big Salmon Charters, pers. comm., Sept. 2000). When the halibut season ended, the vessels returned either to Westport, or at least three vessels traveled to Alaska to conduct fishing charters.

At least 34 companies advertise killer whale watching/wildlife tours in the inland waters of Washington, primarily in the Haro Strait near San Juan Island. Many operators offer tours aboard multi-passenger charter vessels, while a number of operators specialize in guided tours for groups of individuals in single or double kayaks. There are also private charters available aboard sailing yachts and luxury cruisers. Wildlife/sightseeing tours are offered year around, but the main viewing season for killer whales is from May through September. During the summer months, killer whales return to traditional feeding areas with some degree of regularity; operators have established an elaborate whale tracking network that allows them to locate whales along their travel routes and to improve sighting success for whale watching clients. This level of sighting success enables operators to offer several trip options daily throughout the summer. Killer whale tours originate from San Juan and Orcas Islands as well as mainland ports (Port Townsend, Everett, LaConner, Anacortes, Bellingham).

In Oregon, gray whale watching trips begin in early March during the spring or northward migration and continue until May, when recreational fishing charters begin. A few charterboats in central Oregon continue whale watching trips through the summer months and into September, targeting on local feeding gray whales. At least 27 operators advertise whale watching tours originating from ports all along the coast from Brookings to Astoria. Nearly half of these companies are concentrated along the central coast in the ports of Depoe Bay and Newport. Eight flying services in Oregon offer whale watching sightseeing flights, but the majority of the whale watching operators offer tours aboard multi-passenger charter vessels.

In British Columbia, commercial whale watching is divided between the outer coast of Vancouver Island, where gray whales dominate the offerings, and inside waters where killer whales are the primary attraction. The inside waters are further subdivided into northern and southern areas. The southern area includes the boundary waters between Vancouver Island and the San Juan archipelago. More than 50 companies advertise whale watching/wildlife tours in British Columbia, with a full range of whale watching platforms offered. The dominant whale watching platforms in British Columbia are multi-passenger vessels, including high-speed inflatable boats and larger charter vessels with enclosed seating, while some companies offer guided kayak tours

as well.

On the outer coast of Vancouver Island, whale watching is concentrated in the protected waters of Barkley Sound and Clayoquot Sound, with most operators offering trips originating in the ports of Ucluelet and Tofino. At least 13 companies are advertising trips in these coastal bays. Gray whale watching begins in March with the arrival of the first spring migrants and continues through November with the departure of the southern migrants. During the summer, trips focus on feeding whales that remain in the coastal bays. Transient killer whales and humpback whales are also present in the area during the summer.

About 12 companies advertise killer whale excursions in the inside waters north of Nanaimo, British Columbia. Trips originate from a number of ports including Alert Bay, Cambell River, Prince Rupert and Sayward. The area includes the Robson Bight, where underwater acoustic monitoring of killer whale calls is conducted by the Vancouver Aquarium and the sounds are broadcast to listeners via a local FM radio station. Approximately 20 companies advertise killer whale watching and wildlife tours in the southern inside waters. Most of the operators are based in and around Victoria with access to the Haro Strait and eastern Strait of Juan de Fuca. Some trips are offered from Nanaimo to the north and from mainland Vancouver.

5. ENVIRONMENTAL CONSEQUENCES

5.1. Effects on gray whale population

The issuance of a quota of five gray whales taken or seven strikes with the restrictions described under Alternative 1 will have no significant impact on the eastern North Pacific gray whale population, which is estimated at more than 26,600 whales. The current PBR for the eastern North Pacific gray whale stock is 575 whales (Ferrero et al. 2000). A total level of human-caused mortality that is less than PBR is considered sustainable. As described in Section 4.2.1. of this EA, there are an estimated average of 83 human-caused mortalities of gray whales per year from the entire eastern North Pacific stock of gray whales (Ferrero et al. 2000). Given a PBR of 575 gray whales, an additional take of 492 gray whales per year could occur without the PBR for this stock being exceeded. With the restriction of the quota of five gray whales per year with a maximum of seven strikes per year, the PBR will not be exceeded. This is consistent with advice from the IWC Scientific Committee that there is "no reason to change the advice given previously that a take of up to 482 eastern North Pacific gray whales per year [based on the 1999 PBR] is sustainable, and is likely to allow the population to stabilize above the maximum sustainable yield level" (IWC 2000). Thus, this alternative will have no negative impacts on the gray whale population.

Even if the gray whale population has declined below the estimated population of more than 26,635 whales, it would not have declined enough to cause any concerns for the minimal level of takes or strikes (five takes or seven strikes per year) by Makah whalers. Applying the PBR calculation to a gray whale population that is about 3/4 of the 26,635 estimate (as a worst-case

scenario for purposes of calculating effects), would result in a PBR that exceeds 400 takes annually -- still well above the level of estimated human-caused mortalities. Therefore, even if the reduced encounters of gray whales during the 2000/2001 survey described in Section 4.2.1. of this EA equate to a lower population abundance, the takes of gray whales resulting from Makah whaling are insignificant.

Segregation by age and sex during the migration suggests that harvesting could have a bias toward certain age and/or sex classes, if removals occurred at specific times and/or within specific areas. The segregation between the first and second phases of northward migrating gray whales indicates that females alternate between two migration timetables, depending on whether they have a calf or were recently impregnated. The consequences of this migratory segregation suggest that, if gray whales were harvested during the early southbound and early northbound portions of the migration, the catches could be composed predominantly of females with near-term fetuses and those that are newly pregnant. Such removals could selectively remove the mature breeding females from the population. The preferential killing of breeding females by 19th century whalers within the lagoons was cited as a possible factor in the rapid depletion of this population (Henderson 1984). However, the Makah hunt of only five whales per year, with as many as seven strikes, is not likely to affect the reproductive capacity of the gray whale population.

Section 4 of this EA includes discussion of the various factors that could impact the gray whale population, including fisheries interactions, natural mortality, ship strikes, strandings, subsistence whaling, contaminants, and other activities. NMFS has determined that the cumulative effects of these impacts are not significant.

The effects of Alternatives 2 and 3 on the overall population are the same as the proposed action. If the Makah Tribe decided to harvest whales without issuance of a quota (one scenario under Alternative 4), the direct environmental consequences on the gray whale population are likely the same as those in Alternative 3, assuming the Tribe limits the hunt to the IWC quota. If the Makah declined to hunt gray whales under Alternative 4, obviously there would be no removals from the total population.

5.2. Effects on Pacific coast feeding aggregation

As discussed in Section 4.2.3 of this EA, both NMFS and the IWC currently consider the eastern North Pacific gray whale to be a single stock. The best available scientific information does not indicate that the Pacific coast feeding aggregation is a biologically distinct group of animals. However, in order to evaluate the potential effects of Makah whaling on the Pacific coast feeding aggregation, this EA takes a very conservative approach and treats the Pacific coast feeding aggregation as a separate management unit so that the effects of takes can be evaluated using the PBR framework. This approach is consistent with that used by Quan (2000). An alternate approach would be to analyze recruitment into the feeding aggregation; but, with the recent information on the expanded range of the Pacific coast feeding aggregation from California to Alaska in areas that have not been routinely surveyed, such analysis would require assumptions on

non-surveyed areas resulting in high levels of error; therefore, this approach was not used in this EA. An assumed PBR for the Pacific coast feeding aggregation, following the PBR framework, is defined as the product of the minimum population estimate, one-half the maximum theoretical net productivity rate, and a recovery factor: PBR = N_{min} x $0.5R_{max}$ x F_r (Wade and Angliss 1997). As described in Section 4.2.3. of this EA, there are two different abundance estimates for the Pacific coast feeding aggregation in 1999 by Calambokidis et al. (2000b): a mark-recapture estimate (269) based on 1999 resights including California, and an estimate (222) that excludes California. There is also a range of recovery factors that could be applied. Thus, a range of assumed PBRs for the Pacific coast feeding aggregation was calculated. The low end of the assumed PBR range is an average of 2.5 whales per year calculated based on 1) a conservative approach using the lower 1999 estimate that excludes California (222), which results in an N_{min} of 211 as described in Section 4.2.3. of this EA; 2) an R_{max} of 0.047 for the gray whale population from Ferrero et al. (2000); and 3) a recovery factor of 0.5 based on a conservative approach of treating the feeding aggregation as a separate management unit (Wade and Angliss 1997). The high end of the assumed PBR range is an average of 6.0 whales per year calculated based on 1) a minimum population estimate (269) based on the 1999 resights that includes California, resulting in an N_{min} of 256 as described in Section 4.2.3. of this EA; 2) an R_{max} of 0.047 for the gray whale population from Ferrero et al. (2000); and 3) a recovery factor of 1.0 based on the feeding aggregation having the same population dynamics as the larger stock.

This analysis assumes that conducting the hunt during the migration effectively removes whales from the entire stock. If whales are taken outside of the primary migration period, they can be presumed to be from the Pacific coast feeding aggregation. Based on an analysis of the timing of migrations past central California and offset to account for travel to and from Washington, the expected period for the migration off Washington is the beginning of December to the end of June. This does not mean that migrating whales are never present in October or November off Washington, as they have been reported in some studies (Pike 1962, Darling 1984), but it does mean that whales taken prior to December 1 have a higher probability of being part of the Pacific coast feeding aggregation than those taken later.

The proposed action places an additional limit on the hunt of five strikes over the two years years between June 1 and November 30 or inside the Strait of Juan de Fuca (east of the Bonilla-Tatoosh line) at any time. The July 1 to November 30 component of the limitation accounts for the timeframe outside the migration period when any whales taken off Washington are more likely to be from the Pacific coast feeding aggregation. The migration is still underway from June 1 to June 30, but off Washington it consists primarily of female whales and calves. Since the Makah Tribe will adhere to the IWC restriction on taking calves or accompanying females, any other whales taken in June are likely to be from the Pacific coast feeding aggregation and will be counted against the five-strike subquota. The limit for whaling inside the Strait of Juan de Fuca acknowledges the higher probability of whales in inside waters being part of the Pacific coast feeding aggregation.

This level of take is within the assumed PBR range of five to 12 for two years for the Pacific coast feeding aggregation that is used for this NEPA analysis. With the extensive movements of whales

in the Pacific feeding aggregation both within and between seasons (*See* Section 4.2.3. of this EA), a limit of five strikes over two years should also alleviate any potential local depletion issues. Therefore, the proposed action will have no significant effects on the Pacific coast feeding aggregation.

Under Alternative 2, the hunt would be structured with the intent of targeting migrating whales by limiting the area of the hunt to the ocean area of the Makah U&A (outside the Strait of Juan de Fuca westward of the Bonilla-Tatoosh line) and by limiting the timing of the hunt to occur when the northward or southward gray whale migrations are underway. As described in Section 4.2.2. of this EA, the southbound migration off Washington occurs mostly after December 1, thus any hunts prior to December are more likely to be on whales in the Pacific coast feeding aggregation. Also, migrating whales off Washington in June are primarily females with calves that cannot be harvested; thus, those that are not mother-calf pairs have a higher probability of being part of the Pacific coast feeding aggregation. Thus, under Alternative 2 whaling would need to occur from December 1 to June 1 to target on migrating whales and avoid the Pacific coast feeding aggregation. Although it is possible that a whale from the Pacific coast feeding aggregation may be taken during whaling in the ocean in May, the probability is very low; any such takes that might occur would be well within the assumed PBR of the Pacific coastal feeding aggregation described above.

Under Alternative 3, the Makah Tribe would be allowed to take up to five whales per year, including animals from the Pacific coast feeding aggregation, without any time or area limits. If the risk-averse approach of setting an assumed PBR for the Pacific coast feeding aggregation is used to assess Alternative 3, then this alternative may exceed the assumed annual average PBR range of 2.5 to 6.0 for the Pacific coast feeding aggregation.

The effects of Alternative 4 on the Pacific coast feeding aggregation would range from no removals at all, if the Makah decided not to hunt, to exceeding the assumed PBR range as under Alternative 3 if the Tribe hunted without time/area limits.

5.3. Effects on individual whales

During the Tribal hunt, whalers will approach and attempt to strike gray whales; but not all of these whales will be taken or struck. Based on NMFS observations of the Makah whaling operations that occurred in 1999 and 2000 (Gosho 1999, Gearin and Gosho 2000), it is unlikely that any more than an average of three to nine whales may be approached in any one day of Makah whaling activities. Because of the limited timeframe of the hunt, Makah whaling likely will not occur on most days when whales are present in the Makah U&A. Of the population of 26,600, only a very small fraction of gray whales will ever be approached by Makah whaling canoes. Because gray whales share their migratory corridor and feeding grounds with a large number of vessels, the few instances of approach by the Makah whaling canoe are unlikely to affect whale behavior. Potential glancing blows from a Makah harpoon (without striking the whale) could occur. However, the number of attempted strikes is likely to be very low based on NMFS observations of the Makah hunt in 1999 and 2000 (three during the spring hunt in 1999,

and three during the spring hunt in 2000). Of the six attempted strikes in the two years, four were complete misses and two were instances where the harpoon came into contact with the whale, but did not attach. Those instances where the harpoon did not attach are not likely to have seriously injured the whales, because the harpoon would most likely need to penetrate deeply into the skin and attach to the whale to cause serious injury. Attempted harpoon strikes resulting in glancing blows are unlikely to affect whale behavior based on NMFS experience with biopsy darting research, whereby most of the darted whales will react to the dart penetrating their skin, but will immediately thereafter proceed with normal swimming and behavior patterns.

Under Alternative 2 there would be fewer approaches to whales in the Pacific coast feeding aggregation. There is likely no appreciable difference between Alternatives 1, 2, and 3 in numbers of animals that may be taken or struck, except that Alternative 2 avoids such takes/strikes on the Pacific coast feeding aggregation. The effects of Alternative 4 would range from no takes or approaches at all, if the Makah decided not to hunt, to takes and approaches as under Alternative 3 if the Tribe hunted without time/area limits.

5.4. Effects on other wildlife

The potential effects on wildlife of Makah whaling activity, other than on the gray whales targeted for harvest, are limited to the disturbance caused by the Makah whaling vessels, the dispatch of the firearm, and secondary effects from protest, media, and other vessels present during the hunt. The rifle will be fired downwards into the water, and in very close vicinity to a harpooned gray whale, so no other wildlife species is likely to be hit by the shots. The rifle will be used only after a whale is struck by the harpoon and secured, so the number of times the rifle is be used is extremely low given the quota of seven strikes per year.

The noise of the firearm or vessels may disturb wildlife in the immediate vicinity of the whaling activity, possibly causing a startle-fleeing reaction. This is a common reaction of wildlife exposed to vessel noise, fog horns, and other noises that occur in the marine environment and may result in temporary displacement of marine birds. The discharge of the rifle will only occur after a gray whale is harpooned and is unlikely to be repeated more than four times in one day (based on the Makah hunt as conducted in 1999) nor more than five days in the year (based on a quota of five whales taken), so any effects from startle-fleeing reaction by wildlife will be extremely limited both in space (within the immediate area of a harpooned whale) and time. Temporary displacement of wildlife due to vessel activity associated with the Makah hunt is not likely to significantly disrupt normal wildlife feeding behavior, because the affected wildlife can readily move short distances away from vessels to less disturbed areas and continue feeding. Such temporary displacement in marine waters, especially by seabirds, is a common occurrence throughout Washington waters whenever vessel activity occurs. Also, since the tribal hunt will occur in a relatively very small area off the coast and only for short periods of time, the frequency of wildlife disturbances and numbers of animals temporarily displaced by the vessels involved with the whaling activity is expected to be minimal.

If whaling is conducted in close proximity to rocky outcrops or islands where birds nest, it could

have effects on the involved birds. The common murre is a seabird that nests on Tatoosh Island, which is located just offshore of the tip of the coast (Cape Flattery). Common murres also nest on White Rock, located at 48°08'N latitude, which is at the southern end of the Makah U&A. Although common murre numbers in Washington have declined, the species (which ranges from California to Alaska) is not listed or proposed for listing under the ESA. Makah whaling activities conducted in 1999 and 2000 occurred well offshore and south of Tatoosh Island and north of White Rock and therefore had no known effect on the common murre rookeries. Most vessels avoid close approach to rocky outcrops to ensure vessel safety. During the common murre nesting period (May through September), the Makah whaling activity (other than normal transit through the navigation corridor near Tatoosh Island) will occur no closer than 200 yards of Tatoosh Island and White Rock to avoid any effects on nesting seabirds.

The marbled murrelet is the only seabird off northern Washington that is listed under the ESA; it is listed as a threatened species. The marbled murrelet nests in old-growth forest as far as 50 miles inland (Hamer and Cummins 1991). The marbled murrelet occupies the nearshore coastal waters and inland bays and feeds in shallow areas (Pacific Seabird Group 1993). The Makah whaling activity is unlikely to adversely affect marbled murrelets because, similar to other wildlife as described above, temporary displacement of marbled murrelets due to vessel activity associated with the Makah hunt is not likely to significantly disrupt normal feeding or resting behavior; murrelets can readily move short distances away from vessels to less disturbed areas and continue feeding.

Other ESA-listed birds that occur off northern Washington are the bald eagle, brown pelican, and snowy plover. As stated in Section 4.3.2, the snowy plover is a shorebird that occurs inland and along the shore; it will not be affected by the whaling activity. The short-tailed albatross infrequently occurs off northern Washington, and generally much farther offshore of the area where the Makah will conduct their hunt. The brown pelican may occur off northern Washington coastal waters in the summer, and may be temporarily displaced if they occur in the area of whaling activity (as described above), but otherwise are not adversely affected. The bald eagle will not be affected by the whaling activity because it forages primarily over land and islands, and is unlikely to be foraging offshore in the area of the whaling activity. Other non-listed birds that may occur in the immediate vicinity of the whaling activity may be temporarily displaced as a result of the noise from the whaling activity (as described above), but will not otherwise be affected.

ESA-listed marine mammals off northern Washington include the large whales and the Steller sea lion. Makah whaling will not affect any ESA-listed whales or non-listed whales (e.g., minke whales) other than gray whales; no whales other than gray whales will be approached or pursued. Gray whales can be easily identified at the close approach distances necessary for harvest, negating any possibility that another whale species might be accidentally taken. Steller sea lions, California sea lions, and harbor seals hauled-out on nearshore rocky outcrops are unlikely to be affected other than normal startle-fleeing behavior described for wildlife above if the whaling activity occurs in close proximity to rocky outcrops (which is unlikely based on observations of the 1999 Makah hunt). Pinnipeds that may occur in the water in the area of the whaling activity

are likely to avoid the immediate area of the hunt. ESA-listed salmonids occur below the water's surface and will not be affected by Makah whaling activities.

While not listed under the ESA, sea otters are considered a species of concern and classified as an endangered species by the Washington Department of Fish and Wildlife. According to the Washington Department of Fish and Wildlife Draft Sea Otter Recovery Plan, direct and indirect effects of human activity on sea otters have not been well studied (Richardson and Allen 2000). Sea otters in some areas of Alaska and California frequent human environments and appear to have habituated to human activities. However, sea otters can be sensitive to human disturbance and are frequently described as being "shy" (Richardson and Allen 2000). The Washington sea otter population is geographically remote, so it has had little opportunity to habituate to humans (Richardson and Allen 2000). As noted in section 4.3.1, sea otters are generally found in very shallow waters (20 feet or less) in areas of high kelp concentrations, so are therefore less likely to be in the immediate vicinity of a Makah hunt. The preferred alternative is not expected to have any impact on the sea otter population in the hunt area as the animals are unlikely to be affected other than normal startle-fleeing behavior described for wildlife above or temporary disruption of feeding activities. In addition, since the population is remote and not habituated to human activities, sea otters would be likely to avoid the immediate area of the hunt. Whaling is also unlikely to impact mothers or pups which occur at near shore rocky pupping areas such as Point of Arches or Point Alava, as boats would be unlikely to approach these rocky, shallow areas due to safety concerns. As with all of the marine mammals discussed in this section, the possibility of a boat strike from chase, media, or protest boats exists, but is unlikely, similar to other areas used by recreational or commercial boat traffic.

Secondary effects of the Makah whaling activity on wildlife also include potential disturbance from media or protest overflights. Sanctuary regulations include a 2,000-foot ceiling for aircraft flying within one mile of the shoreline or Refuge islands within the Sanctuary, which will prevent disturbance from aircraft except when such regulations are violated. Experience from the hunt in 1999 indicates that media craft can and do operate at distances more than 2,000 feet above the water, and the only problem with aircraft occurred on one day in 1998 when a seaplane operated by protest groups made several passes over the area of the hunt at less than 2,000 feet. Operators of the aircraft were subsequently contacted by the Coast Guard and the activity did not recur in 1999.

Alternatives 2 and 3 are likely to have similar effects on wildlife as the proposed action. If no whaling occurs under Alternative 4, then no wildlife will be effected.

5.5. Effects on the Sanctuary

Whaling under the proposed action within or adjacent to the Sanctuary may adversely affect the public perception of the intent and purposes of this and other federally protected marine sanctuaries, especially if such activities occur in a manner that impacts other Sanctuary resources. Sanctuaries are managed under multiple objectives, including maintaining natural biological communities, enhancing public awareness, and the wise and sustainable use of the marine

environment, but the primary objective is resource protection. At the time the Sanctuary was designated, an EIS was prepared (NOAA 1993) on the present and potential uses of the area including Makah Tribe exercise of treaty rights, as well as commercial and recreational fishing, research and education, subsistence uses, and other commercial, governmental, and recreational uses. The range of allowed and prohibited activities is guided by regulations. The EIS and Sanctuary regulations specifically acknowledge the treaty rights of those tribes whose U&A areas are in the Sanctuary. Sanctuary regulations do not preclude the exercise of tribal treaty rights as long as they are conducted in compliance with Federal laws. Activities authorized by Federal treaties, including hunting of whales and seals, are allowed. Sanctuary regulations do not prevent the Makah Tribe from whaling within the Sanctuary, but require that conservation objectives for the species and impacts to other Sanctuary resources be addressed.

Under Alternative 2, all whaling would occur within the Sanctuary. The effects on the Sanctuary are primarily issues of public perception as described above. The effects of Alternative 3 on the Sanctuary could be less than those for Alternative 1 and 2 since all whaling could occur in the Strait of Juan de Fuca under this alternative, and thus outside the Sanctuary. Under Alternative 4, if the Tribe conducted its hunt without an IWC quota, the conduct of a non-sanctioned hunt would likely adversely affect the public perception of the Sanctuary. If there were no hunt, the public perception of the Sanctuary as an area protective of natural resources would be maintained.

5.6. Effects on the Makah Tribe

The proposed action is more favorable to the Makah Tribe than the status quo (Alternative 2) because it provides the Tribe flexibility in determining seasons and allows avoidance of hunting during the southward migration in the winter when personal safety of whalers is more at risk. The proposed action also acknowledges the Makah Tribe's desire to conduct a limited hunt in the summer in the Strait of Juan de Fuca, when weather conditions are not adverse and whales can be accessed nearby.

Alternative 3 might be considered more favorable to the Tribe than the proposed action, because it would allow the Tribe to conduct whaling activities throughout its U&A throughout the year. However, this alternative may result in additional public resistance to the hunt which could be counter to the Tribe's interests.

Alternative 4 would be viewed by the Makah as a failure by the U.S. Government to uphold treaty-secured rights of the Makah Tribe. Since no act of Congress has explicitly abrogated the Treaty of Neah Bay, and since there is no conservation-based rationale for denying a quota, a denial opposed by the Tribe would not comport with NMFS' objective to accommodate Federal trust responsibilities and treaty rights to the fullest extent possible consistent with applicable law.

A U.S. Government decision not to grant the Makah Tribe a quota would almost inevitably lead to litigation. The nature of the suit would depend on the circumstances, and on decisions taken by the Makah Tribe and the U.S. Government. If the Tribe decides to resume whaling without issuance of a quota, the U.S. Government would then need to decide whether to prosecute this

activity as a violation of the Whaling Convention Act or any other applicable law. If it did, the Makah Tribe could defend its action on the basis that the rights conferred in the Treaty of Neah Bay are not superseded by that or any other relevant statute. If it chose not to prosecute, the U.S. Government might be challenged by anti-whaling groups, and the same issues might be argued in a different court from a different perspective.

In addition to provoking litigation, the no-action alternative could also provoke confrontation between the Makah Tribe and NMFS. Cooperative research and management efforts between the Tribe and NMFS that benefit marine mammals as well as ESA-listed salmonids could be jeopardized.

Under Alternative 4, one scenario would be for the U.S. Government to encourage tribal whale watching ventures. NMFS discussed the possibility of developing ecotourism in Neah Bay in lieu of whaling with the Tribal Council and the Makah Whaling Commission in 1997. While recognizing that ecotourism might be a beneficial activity from an economic point of view and might help the Tribe celebrate its history, the Tribe does not believe that whale watching is a direct substitute for whaling. The Tribe advised that it preferred an active, participatory continuation of Makah traditions over a preservation of them for their anthropological and educational value.

Another scenario under Alternative 4 is to compensate the Tribe not to exercise its treaty right. This suggestion met resistance in the Tribe with a common sentiment that treaty rights are not for sale. While it may be appropriate for the Tribe to receive compensation for economic harm due to a prohibition of a commercial fishery, in this case the Tribe is requesting a quota for ceremonial and subsistence purposes, something that cannot be compensated with money.

5.7. Effects on public safety

As discussed in Section 4.1.4. of this EA, the Coast Guard has established an RNA to address public safety and to provide the Coast Guard enforcement authority to keep non-whaling vessels at least 500 yards away from the whaling activity.

Under Alternatives 1, 2, and 3, the Makah Tribe will use a large-caliber rifle to dispatch the whale. The use of a large-caliber rifle is necessary to ensure that the taking of harpooned whales is as efficient and humane as possible, but it does raise safety concerns due to the long range of these rifles. As described in Section 2.4.2. of this EA, the Makah Tribe revised its Management Plan (*See* Appendix 10.3) to incorporate consultant recommendations from Beattie (2001) on firearm safety, discharge, and certification protocols to address safety concerns with large-caliber rifles. Kline (2001) recommended that the .50 caliber rifle not be used within 6,100 meters of shore, based on its maximum range. Kline (2001) further opined that firing away from the shoreline is not a solution, because a ricochet can travel 1,700 meters off the line of fire. However, it appears that Kline (2000) based his recommendations and opinions on data from the military's .50BMG; as noted in Section 4.4.2. of this EA, the Tribe's .50 caliber rifle may not be as powerful/effective as the military's .50BMG. Beattie (2001) reviewed the information and

recommendations by Kline (2001) and disagreed with his conclusions. Beattie (2001) provided several safety protocols that, if implemented by the Makah Tribe in its whaling regulations, would prevent public safety from being unnecessarily compromised. Beattie's (2001) recommended protocols include using the .50 or .577 caliber rifles as the primary rifle; not shooting at distances greater than 30 feet away from the target whale; firing only at a downward angle; having trained, proficient shooters; pointing the rifle away from shoreline if within 500 yards of the highway; and, having a safety officer on the chaser boat whose responsibility it is to ensure a clear line of fire exists for the rifleman.

The proposed action will allow whaling to occur inside the Strait of Juan de Fuca, thus raising additional concerns about public safety. As described in Section 4.4.7. of this EA, all Makah whaling will occur inside the RNA, which only extends a short distance inside the Strait of Juan de Fuca (just beyond the entrance to Neah Bay) west of the shoreside extent of the Makah reservation. Thus, all whaling in the Strait of Juan de Fuca will occur off tribal lands and not offshore of public lands or communities. The revised Plan also restricts whaling to areas outside Neah Bay east of a line from South Waadah Point to Baada Point. Thus, whaling activity would not occur near marinas, docks, or the entrance to Neah Bay. Any potential changes by the Coast Guard to the RNA extending it farther eastward beyond the Makah reservation would be subject to further NEPA analysis. Lastly, the Makah Tribe's Management Plan is a tribal commitment to having its whaling crews well prepared prior to issuing a whaling permit; a well-trained whaling crew ensures a safer whaling operation.

A tribal hunt in the Strait of Juan de Fuca is likely to be more accessible for protest vessels than hunting in the ocean. The Coast Guard would most likely face greater challenges in enforcing the 500-yard MEZ because of easier public access to the areas where the Makah whale hunt would be occurring and increased animal rights groups' concern over the take of individuals from the Pacific coast feeding aggregation. A hunt in the Strait of Juan de Fuca may also result in increased protest activity from local citizens opposed to whaling.

The Makah Tribe is committed to landing any whale that is struck. The Tribe's Management Plan terminates a whaling permit if a whale is struck and not taken, thus ensuring that tribal whalers focus all their attention on killing and retrieving a struck whale. The Coast Guard's RNA, which acknowledges the dangers of an injured whale, requires vessels to stay 500 yards away from the Makah whaling operation.

Alternative 2 would limit the Tribe to whaling only during the gray whale migration and in the offshore migratory corridor. This creates safety risks to tribal whalers and makes access to whales more difficult. Conversely, whaling in the offshore area may but might present fewer safety concerns to the general public.

Under Alternative 3, some or all of the Makah whaling activity could theoretically occur outside the RNA. However, it is very likely that the Tribe would restrict itself to whaling inside the RNA (as in Alternative 1) to address safety issues.

If whaling does not occur under Alternative 4, there are no public safety issues for the whalers and others observing or attempting to disrupt the hunt. The Coast Guard's RNA for the Makah whale hunt would not be necessary and could be eliminated. If whaling does occur without issuance of a quota, the Coast Guard could be placed in a difficult position of protecting public safety during a non-sanctioned tribal hunt. Under Alternative 4, there may be increased protest vessel activity if the Tribe hunted whales without a NMFS-issued quota.

5.8. Effects on public health

NMFS has considered the potential that gray whale tissues might have higher levels of pollutants than would be allowable under standards set by the U.S. Department of Agriculture or the Food and Drug Administration (FDA). However, analysis of tissue samples from the whale harvested by the Makah in 1999 (*See* Section 4.2.6. of this EA), as well as biopsy samples from gray whales off Washington in recent years (*See* Section 4.2.6. of this EA), have not shown high levels of PCBs and DDTs; they were well below the FDA regulatory limits. Thus tribal members and others participating in tribal ceremonies would not be exposed to high pollutant levels from eating gray whale meat. This does not eliminate the potential effects to tribal members' health from pollutants due to long-term exposure, but this is true of consumption of all fish and wildlife species. Nonetheless, the Tribe is aware of the risks, and information on pollutants has been made available to the Tribe for its use in assessing risks to tribal members.

Many stranded whales are not likely to be healthy animals fit for human consumption; thus, Tribal members may be exposed to contaminants or toxins if they chose to consume these stranded animals.

Under Alternative 4, the Tribe would not be subject to any risks from consumption of harvested whales

5.9. Effects on general public

There is a large segment of the U.S. population that is opposed to whaling, particularly commercial whaling (according to letters and environmental group communications to the U.S. Government). Many U.S. citizens specifically oppose Makah subsistence whaling and are offended by a U.S. Government-sanctioned hunt on gray whales. Organized opposition to Makah whaling is primarily from national or international animal rights groups and Washington-based groups, rather than from major environmental groups.

Several of the Washington-based anti-whaling groups have asserted that Makah whaling creates a negative public perception of Washington State and Clallam County (where Neah Bay is located). Several commenters on the Draft EA asserted that tourism and local economies have declined because of Makah whaling, but no statistics or references for such assertions were provided. NMFS accessed information from 1996 (the year before the U.S. Government indicated it would grant the IWC quota to the Makah Tribe) and 1999/2000 (the year of/after the Makah took their first whale under the quota) from the "Washington State 1991-2000P Travel Impacts and Visitor

Volume," dated December 20, 2000, prepared by Dean Runyan Associates for Washington State Tourism, Department of Community, Trade and Economic Development, and from the "Washington State County Travel Impact 1993-1999," dated September 2000, prepared by Dean Runyan Associates for Washington State Tourism, Office of Trade and Economic Development. The Clallam County information was limited to 1999, whereas the state level included preliminary estimates for 2000. Information from these sources on destination spending, employment generated by travel spending, and state and local tax revenues generated by travel spending in 1996 and 1999/2000 are shown in Table 5. These economic impact measurements represent only direct economic impacts. Indirect, or "multiplier," effects are not included. Dollar amounts are rounded to the nearest $100,000. Jobs are rounded to the nearest ten. The report recommends that destination spending, which excludes air transportation, is more appropriate to use when comparing different time periods.

Table. 5. Washington State and Clallam County Travel Impacts.

	Destination Spending	Employment Generated	State and Local Tax Revenues
Washington State, 1996	$6,608,000,000	140,300	$567,000,000
Washington State, 2000	$8,633,000,000	153,900	$745,000,000
Washington State, changes 1996-2000	+$2,025,000,000	+13,600	+$178,000,000
Clallam County, 1996	$102,800,000	2,150	$7,700,000
Clallam County, 1999	$114,000,000	2,270	$8,900,000
Clallam County, changes 1996-1999	+$11,200,000	+120	+$1,200,000

As shown in Table 5, all travel impacts for Washington State and Clallam County increased over the period of Makah whaling. Thus, using these data, no negative impacts on tourism from Makah whaling are apparent.

Public opposition to the proposed action may be greater than that in 1998-2000, because the proposed action will allow hunting of whales from the Pacific coast feeding aggregation, which frequent nearshore waters and are sometimes more approachable by vessels. Greater opposition could result in more protest involvement with the Makah hunt, especially if the hunt occurs in the Strait of Juan de Fuca during favorable weather (when the hunt is more easily accessed and observed). The Makah hunt could possibly be observed from shore at several sites if it occurs in the Strait of Juan de Fuca.

Alternative 2 would limit the hunt to takes from the population during the migration period, thus public opposition to hunting the Pacific coast feeding aggregation

would be minimized. However, the views of citizens opposed to Makah whaling at any time or place would not change. Animal rights groups may view Alternative 2 as less offensive since it would avoid hunts on whales from the Pacific coast feeding aggregation.

Alternative 3 would be the least acceptable to the many citizens who are opposed to the Makah whale hunt. Since granting the Makah Tribe a quota without restrictions on the area or time of the hunt is more likely to result in the taking of gray whales from the Pacific coast feeding aggregation, this alternative would be especially intolerable to those citizens who are concerned about taking gray whales from the Pacific coast feeding aggregation. This might result in increased protest activity in the area of the Makah hunt, particularly because the hunting area would now be more easily accessible by land.

Alternative 4 would be supported by citizens opposed to whaling. By taking no action, NMFS may avoid further legal challenges from animal protection groups.

5.10. Effects on other Tribes and aboriginal groups

Opponents of Makah whaling have argued that granting an allocation to the Tribe, after a 70-year hiatus in subsistence whaling, sets a new precedent that will encourage other aboriginal groups, in the United States, Canada, or elsewhere, to begin whaling. The Makah Tribe is the only U.S. tribe with a treaty that expressly refers to whaling. Several other Pacific coast tribes once hunted whales, and entered into treaties reserving traditional hunting and fishing rights; but, whether those reserved rights might encompass whaling is an issue that has not been adjudicated. In any event, U.S. support for the Treaty of Neah Bay in no way implies that it would support whaling by other tribes that do not have such a reference in a treaty; the U.S. Government has not taken a position on the question.

There have been reports in the media, particularly in the years before the IWC set the gray whale quota, that other tribes were focusing on the Makah request as a possible prelude to their own proposals to resume whaling; however, no other U.S. tribe has expressed to NMFS any interest in resuming whaling in the five years since the U.S. Government first supported the Makah Tribe's interest. If any other U.S. tribe were to seek a quota, and if the U.S. Government were to support such an effort, the IWC could not consider its request until 2002 at the earliest, when the current gray whale quota for aboriginal subsistence whaling expires.

The IWC set the precedent for allowing aboriginal groups to hunt whales, even when commercial harvest was prohibited, in the original Schedule of Regulations adopted in 1946; this exception carried forward a provision of the 1931 Convention. The Commission began regulating aboriginal subsistence whaling two decades ago, when it first set a quota for bowhead whales based on a request by the U.S. Government on behalf of Alaska Eskimos. Granting the Makah Tribe an IWC quota for gray whales sets no new precedent.

The media has reported that Canadian Tribes are also interested conducting whaling. Canada is not a member of the IWC, and the U.S. Government opposes any whaling by Canadian natives

unless Canada seeks and receives authorization from the IWC. The U.S. Government considers that all whaling must be done under the auspices of the IWC and in accordance with the provisions of that organization. Nevertheless, Canada has, since 1991, allowed its natives to take bowhead whales regularly from Davis Strait/Hudson Bay, for reasons having nothing to do with the Makah hunt. Despite frequent discussions with Canadian officials about that hunt, there has been no indication that Canada has had any occasion to consider allowing Pacific Coast tribes to take gray whales. If the Canadian government unilaterally allowed any aboriginal take of eastern North Pacific gray whales, the U.S. Government would respond with any limitations on U.S. take necessary for conservation of the population or of the Pacific coast feeding aggregation.

The District Court judge in Metcalf v. Daley addressed the question of precedent in a passage of his opinion that was not disturbed by the appellate court. After criticizing the EA for glossing over these "thorny issues," he wrote (Order at p. 11):

> ...it is important to keep the larger picture in view; there are ultimately few people who are in a position to take advantage of this precedent. The number of tribes that might conceivably be expected to qualify for subsistence whaling is minimal.

The judge described as reasonable the EA's conclusion, in light of the IWC Scientific Committee's estimate that hundreds of gray whales can be taken sustainably, that the effect of increased aboriginal harvest on this stock is likely to be minimal.

The proposed action will make it possible for the Tribe to carry on traditional whaling that is sanctioned by the IWC. Official recognition that traditional activities such as whaling are culturally valuable, despite their controversial nature, will be reassuring to Native Americans in general.

Alternatives 2 and 3 would also promote cultural diversity and recognize the importance of maintaining traditions for the coherence of Native American groups.

Alternative 4 could affect working relationships with other treaty tribes that would view NMFS' action under this alternative as a breach of faith by the U.S. Government in upholding any treaty right. Most Indian tribes throughout the United States would likely view Alternative 4 as a failure on the part of NMFS to exercise its trust responsibility with respect to the Treaty of Neah Bay, and possibly as insensitivity to the cultural diversity of Native Americans in general.

5.11. Effects on whale watching

Makah whaling is unlikely to affect whale watchers, the whale watching industry, or the numbers of gray whales available to be watched. Most whale watching operations in Washington State focus on killer whales in Puget Sound and the eastern portion of the Strait of Juan de Fuca (an area outside the Makah U&A), thus the tribal hunt for gray whales off Neah Bay would have no effect on killer whale watching trips. When gray whales are observed in the area of killer whale watching trips, they are typically individual animals that are in the area for only short periods of

time and are unlikely to be affected by whaling off the northern coast of Washington. The gray whale watching operations out of Westport, Washington, which is on the Pacific coast, are also not likely to be affected. This operation takes place during spring migration, chiefly in March and April. The gray whales are moving northward at the time and will go past Westport before reaching the area of the Makah hunt in northern Washington. Gray whale watching off the northern coast of Washington, near where the whaling will take place, is limited. There are no regularly scheduled whale watching operations, and NMFS is unaware that any are actively being organized. Nonetheless, given the limited geographic area of a hunt and an annual quota of only five whales, it is unlikely that gray whale movements through the area where whale watching may occur will be affected. In regard to whether Makah whaling may affect public participation in whale watching in general, there is no information to demonstrate that Makah whaling activity will reduce public participation. None of the commercial whale watching operators in Washington provided comments on the Draft EA that substantiated concerns that whale watching may be affected by Makah whaling.

It is unlikely that the Makah hunt, which is limited to seven strikes annually, will change the behavior of gray whales, making them more wary of boats or less approachable. While the behavior of individual whales near boats might be affected if they are wounded but not killed by Makah hunting, it is unlikely that this will change the behavior of other gray whales. This population is already hunted by Russian natives each summer in the Bering Sea. The ongoing Russian hunt has not translated into a general avoidance of boats by gray whales. NMFS is unaware of any reason why the much lower level hunt by the Makah Tribe should cause a broader impact on the general behavior of the population than the Russian hunt has caused. Approaches and attempted strikes by Makah whalers also are unlikely to affect gray whales behavior near whalewatching vessels (see individual whale effects description above). These whales migrate through waters occupied by vessels; the few instances of approach by the Makah whaling canoe will have no effect on whale behavior.

It is acknowledged that a wounded whale could be dangerous to whale watching operations. However, as described in Section 4.6. of this EA, little or no commercial whale watching activity occurs in the Neah Bay area. Further, Makah whalers are committed to landing any whale that is struck, consistent with the Tribe's Management Plan; thus, the chances of a free-ranging wounded whale are remote. The Coast Guard's RNA, which acknowledges the dangers of a struck whale, requires vessels to stay 500 yards away from the Makah whaling operation. In any case, gray whales are large, wild animals, and all vessels should exercise caution in approaching any whale, regardless of its condition.

Under Alternative 2, the hunt would be limited to open ocean waters and avoid the inside waters where private boaters may watch whales if and when the opportunity presents itself. Thus, private boaters may favor this alternative over Alternative 1. The potential effects of Alternatives 2 and 3 on commercial whale watching operators are the same as those described in Alternative 1.

6. FINDING OF NO SIGNIFICANT IMPACT

This EA considers the environmental consequences of four alternatives regarding issuance of the IWC quota to the Makah Tribe for a subsistence hunt on gray whales in 2001 and 2002. The proposed action will give the Makah Tribe a quota of five takes or seven strikes per year, and a subquota of five strikes over the two-year period on whales from the Pacific coast feeding aggregation.

To determine the significance of the action analyzed in this EA, NMFS is required by NEPA and 40 CFR 1508.27 to consider the context and intensity of the proposed action. In this EA the action was analyzed as a whole, upon the affected region, by affected interests, and the locality for both long and short term effects. Additionally, the severity of the impacts were analyzed. The following text summarizes this analysis of the proposed action with consideration to both context and intensity.

The proposed action will not significantly affect the eastern North Pacific gray whale population. The numbers of gray whales that may be involved in Makah whaling is extremely small in comparison to the overall gray whale population; the harvest will have no detectable effect on the size or status of the eastern North Pacific gray whale population. There is no scientific controversy over the effect of the proposed action on the overall gray whale population. The proposed action was developed from a large body of scientific information, recent research, and scientific advice. The take is well within the Potential Biological Removal level. The proposed action will not jeopardize the long-term productive capability of the gray whale population. The proposed action is well within the IWC quota for gray whales, which is set to ensure that the risks of extinction to individual stocks are not seriously increased by subsistence whaling, and to enable aboriginal people to harvest whales in perpetuity. The IWC Scientific Committee has concluded that a take of up to 482 eastern North Pacific gray whales per year is sustainable, and is likely to allow the population to stabilize above the maximum sustainable yield level. As described in Section 5.1. of this EA, the small level of takes would have no significant effects even if the overall population has declined.

The IWC recognizes only one eastern North Pacific gray whale population. Nonetheless, to ensure a conservative approach to the issue of a potential subpopulation, the proposed action limits the taking of gray whales from the Pacific coast feeding aggregation to a level that is at the bottom of the range of an assumed PBR for this group of whales (*See* Section 5.2. of this EA). Accordingly, the action is unlikely to have unique or unknown risks. The U.S. Government and the IWC continue to monitor the status of whales subject to aboriginal subsistence whaling, so that any long-term decline in the status can be detected before damage to the stocks occurs. The eastern North Pacific stock of gray whales is considered the best studied whale stock in the world.

The proposed action will not have a significant impact on public health or safety. As described in detail in Sections 2.4.2. and 5.7. of this EA, the Makah Tribe has modified its Management Plan to address public safety issues including requirements for weapons training and appointment of a safety officer. Vessels will be kept away from the immediate vicinity of the hunt through Coast Guard regulations. Based on pollutant testing of samples from the gray whale harvested in 1999

as well as other whales in Washington, tribal members and others eating gray whale meat should not be at risk.

The proposed action is consistent with Federal law and treaties signed by the U.S. Government. The proposed action upholds the Makah Tribe's treaty right to whaling within the context of the International Convention for the Regulation of Whaling. A full description of these legal relationships is provided in Section 2.5 of this EA.

The proposed action will have no effect on the physical characteristics of the geographic area, nor will it cause the loss or destruction of significant scientific, cultural, or historic resources. Indian tribes have exercised their treaty rights to fishing, sealing, and now whaling in northwest Washington with no significant effects on other resources or lands. The proposed action does help preserve the culture of the Makah Indian Tribe. The proposed action might affect public perception of national marine sanctuaries, but it will not affect the foundation on which the Sanctuary was designated. As described in Sections 4.1.2. and 5.5. of this EA, the Olympic Coast National Marine Sanctuary was implemented with full acknowledgment that preexisting rights of treaty Indian tribes would not be altered by Sanctuary designation. The Olympic Coast Marine Sanctuary, as a federal agency has a dual obligation to respect treaty rights and to ensure the overall conservation of the Olympic Coast's marine species and environment. The proposed action is consistent with Sanctuary management regulations and policies.

The proposed action is not directly related to any other actions by the U.S. Government concerning harvest of gray whales, whaling activities, or other marine mammal activities in northwest Washington that would, together with the other actions, result in cumulatively significant impacts. The cumulative effect of all takings of gray whales is taken into account in the evaluation of the PBR, as described in Sections 4.2.1. and 5.1. of this EA. Any takes of gray whales will be taken into account in future stock assessments and quota setting by the IWC. Provided that harvests remain at the same general magnitude in the future, aboriginal whaling should have the same or less effect on the stock as it has for the past thousand years.

No endangered or threatened species or their critical habitat will be significantly affected by the proposed action. The proposed action is very unlikely to result in any mortalities or serious injury of ESA-listed species or other marine mammals, marine birds, or other wildlife.

The proposed action is unlikely to establish a precedent for future actions with significant effects, nor does it represent a decision in principle about future considerations. Concerns have been expressed that Makah whaling would lead to additional takes of gray whales by other native groups. As described in Section 5.9. of this EA, opponents of Makah whaling have argued that granting an allocation to the Tribe, after a 70-year hiatus in subsistence whaling, sets a new precedent that will encourage other aboriginal groups, in the United States, Canada, or elsewhere, to begin whaling. The Makah Tribe is the only U.S. tribe with a treaty that expressly refers to whaling. Although some other U.S. tribes consumed whales at treaty times, none has expressed any interest to NMFS on whaling in the five years since the U.S. Government first supported the Makah Tribe's interest. There have been reports in the media that a Canadian tribe has expressed

an interest in whaling. The U.S. Government opposes any whaling by Canadian natives unless Canada seeks and receives authorization from the IWC.

There is no causal connection between U.S. support of the Makah harvest and decisions by other governments or international organizations. The U.S. Government has long supported aboriginal subsistence whaling, and has submitted requests for bowhead quotas for use by the Alaska Eskimo Whaling Commission for more than two decades. The addition of a second aboriginal group has not affected the U.S. delegation's positions on research whaling, commercial whaling, or international trade in whale products, CITES downlistings, whale sanctuaries, or any other issue.

The proposed action will not cause substantial damage to the ocean or coastal habitats. Whaling on an aboriginal subsistence scale has minimal impacts on the ocean or coastal habitats. There is no incidental take of other species; the level of subsistence harvests authorized by the IWC allows the continued increase in whale populations.

The potential effects on local and State tourism and related employment were considered, but no negative trends during the period of Makah whaling were discernible (*See* Section 5.9. of this EA). The potential effects of Makah whaling on commercial whale watching were assessed in Section 5.11. of this EA, with no adverse effects found. Acknowledgment and respect for treaty Indian rights in Washington has changed since the 1980s. Many citizens of Washington now support the exercise of treaty rights so long as they do not cause conservation issues for the involved resource. In this instance, the Makah's subsistence taking of a small number of gray whales from a robust population does not raise conservation concerns. Nonetheless, there is a strong view by some against any whaling for any purpose. The social effects of Makah whaling will be important, but mixed. On the positive side, the Tribe expects to benefit from practicing a traditional activity that has been the focal point of its culture for centuries. On the negative side, opponents of whaling will feel that their quality of life has been diminished.

For these reasons and those described in more detail in this EA, it is hereby determined that neither the granting nor the take of the IWC quota for five gray whales in 2000 and 2001 will significantly affect the quality of the human environment, and that preparation of an environmental impact statement on this action is not required by Section 102(2) of the National Environmental Policy Act or its implementing regulations.

_____ _____

William T. Hogarth, Ph.D. Date
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8. COORDINATION AND CONSULTATION

Preparation of this EA included extensive consultation and coordination with various programs and offices of NOAA, NMFS, NOS, DOS, USFWS, and BIA.

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10. APPENDICES

10.1. Responses to Comments on the January 12, 2001 Draft EA

10.2. Excerpts from the IWC Annual Reports for 1995-2000

10.3. Makah Tribe Management Plan for 2001-2002