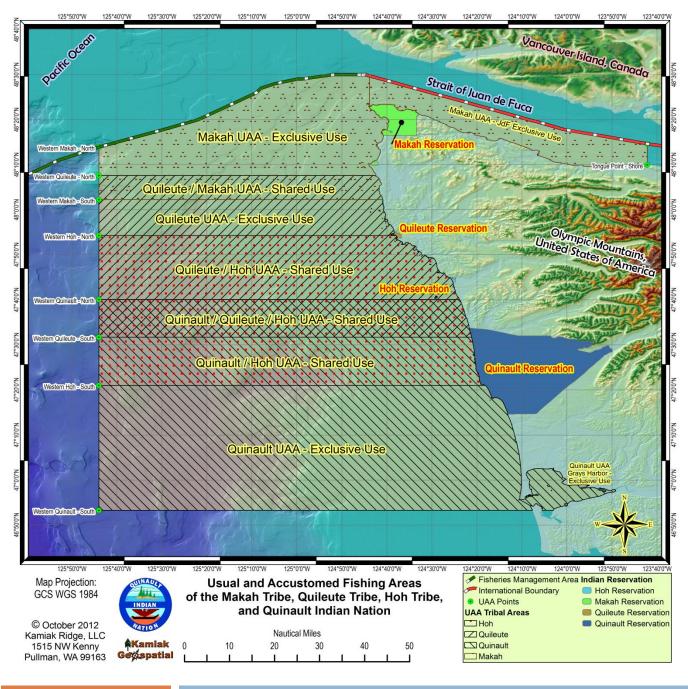
USUAL AND ACCUSTOMED FISHING AREAS



10/22/2012 Pacific Ocean Fishing Areas, Extent Determination

William E. Schlosser, Ph.D. Kamiak Ridge, LLC 1515 NW Kenny Dr. Pullman, WA 99163 Analysis of UAA Fishing Areas in the offshore Pacific Ocean.

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Abbreviations Used

Code of Federal Regulations
(CFR)1
Exclusive Economic Zone
(EEZ)1
Fishery Management Area
(FMA)1
Geographical Information Systems
(GIS) 1
International Terrestrial Reference System
(ITRF)2
National Geodetic Survey
(NGS)
National Marine Fisheries Service
(NMFS) 1
National Oceanic and Atmospheric Administration

(NOAA)	2
North American Datum 1983	
(NAD 1983)	2
North American Datum 1983, Universal Tro Mercator 10N	ansverse
(NAD83 UTM10N)	2
Square Nautical Miles	
(SNM)	4
U.S. Geological Survey	
(USGS)	2
Usual and Accustomed Areas	
(UAA)	1
World Geodetic System 1984	
(WGS 1984)	2

Authorship and Conveyance

Development of this analysis was completed by William E. Schlosser, Ph.D., Kamiak Ridge, LLC. William E. Schlosser is a Regional Planner and Environmental Scientist with training and experience in geospatial spatial analysis. Kamiak Ridge, LLC, operates a commercial GIS service Division: Kamiak Geospatial Analysis and Mapping Center.

The undersigned hereby attest and affirm that this analysis was completed using information available at the time of its writing. Furthermore, analysis techniques were implemented as appropriate to provide a clear and reasonable assessment of these Tribal Usual and Accustomed Areas. Findings reported herein have been stated clearly, given the assumptions and procedures stated. These findings provide accurate and honest details of the zones assessed.





By: William E. Schlosser, Ph.D. Kamiak Ridge, LLC Environmental Scientist & Regional Planner Geospatial Analyst

October 22, 2012 Date

Usual and Accustomed Fishing Areas

PACIFIC OCEAN FISHING AREAS, EXTENT DETERMINATION

REPORT SYNOPSIS

This report was initiated by a request from the Quinault Indian Nation to provide the professional Geographical Information Systems (GIS) services of determining the areas contained within the Usual and Accustomed Areas (UAA) for fishing offshore in the Pacific Ocean, by the Makah, Quileute, and Hoh Tribes, and the Quinault Indian Nation. These analyses were based on the information contained in Code of Federal Regulations (CFR), Title 50 – Wildlife and Fisheries, Volume 4, and the Fishery Management Area (FMA) defined by the National Marine Fisheries Service (NMFS) in "2012 Federal Regulations for West Coast Salmon Fisheries" (NMFS 2012).

DATA COMBINED IN ANALYSIS

Core Data

Core geospatial data were combined using the ESRI ArcMap version 9.3.1. Sources of core data for this analysis included:

- The spatial data coordinates of Usual and Accustomed Fishing Areas contained in CFR-2002- Title 50-Vol 4 § 660.324 Pacific Coast Treaty Indian Fisheries, of Usual and Accustomed Areas for the described Makah, Quileute, and Hoh Tribes, and the Quinault Indian Nation.
- 2. International Boundary contained in GIS dataset released by the Washington State Department of Natural Resources, Geology and Earth Resources Division, within a state boundary description coincident with the national boundary within the Strait of Juan de Fuca.
- 3. Fishery Management Area (FMA) means the Exclusive Economic Zone (EEZ) off the coasts of Washington, Oregon, and California, bounded on the north by the Provisional International Boundary between the United States and Canada, and bounded on the south by the International Boundary between the United States and Mexico (NMFS 2012). The northeastern, northern, and northwestern boundaries of the fishery management area are as follows:
 - (1) Northeastern boundary-that part of a line connecting the light on Tatoosh Island, WA, with the light on Bonilla Point on Vancouver Island, British Columbia, southerly of the International Boundary between the United States and Canada (at 48°29'37"N. lat., 124°43'33" W. long.), and northerly of the point where that line intersects with the boundary of the U.S. territorial sea.
 - (2) Northern and northwestern boundary is a line connecting the following coordinates (The line joining these coordinates is the provisional international boundary of the U.S. EEZ as shown on NOAA/NOS Charts #18480 and #18002.): (N. lat. ↔ W. long.)
 - i. 48°29′37.19″ ↔ 124°43′33.19″
 - ii. 48°30′11″ ↔ 124°47′13″
 - iii. 48°30′22″ ↔ 124°50′21″
 - iv. 48°30′14″ ↔ 124°52′52″

- v. $48^{\circ}29'57'' \leftrightarrow 124^{\circ}59'14''$ vi. $48^{\circ}29'44'' \leftrightarrow 125^{\circ}00'06''$ vii. $48^{\circ}28'09'' \leftrightarrow 125^{\circ}05'47''$ viii. $48^{\circ}27'10'' \leftrightarrow 125^{\circ}08'25''$ ix. $48^{\circ}26'47'' \leftrightarrow 125^{\circ}09'12''$ x. $48^{\circ}20'16'' \leftrightarrow 125^{\circ}22'48''$ xi. $48^{\circ}18'22'' \leftrightarrow 125^{\circ}29'58''$ xii. $48^{\circ}11'05'' \leftrightarrow 125^{\circ}53'48''$ xiii. $47^{\circ}49'15'' \leftrightarrow 126^{\circ}40'57'''$ xiv. $47^{\circ}36'47'' \leftrightarrow 127^{\circ}11'58'''$ xv. $47^{\circ}22'00'' \leftrightarrow 127^{\circ}41'23'''$ xvi. $46^{\circ}42'05'' \leftrightarrow 128^{\circ}51'56'''$ xvii. $46^{\circ}31'47'' \leftrightarrow 129^{\circ}07'39'''$
- 4. Terrestrial to Ocean boundary defined at mean sea level by the US Department of Agriculture, Natural Resource Conservation Service, National Cartography and Geospatial Center in 2009.

These core data were used to define the extent of the UAA boundaries for the listed Indian Tribes along the Olympic Peninsula boundaries to the Pacific Ocean and within the Strait of Juan de Fuca. These boundaries have been reduced to GIS layers, with geographic and projected transformations. These boundaries are included on maps referenced in this report.

Auxiliary Data

Auxiliary data used in this analysis to display associated features, but not included in the determination of UAA sizes include:

- 1. Indian Reservation Boundaries identified by the US Geological Survey GAP Analysis Program revised in 2011.
- 2. Offshore bathometric data (raster data) provided by National Oceanic and Atmospheric Administration (NOAA) at 75 meter resolution.
- 3. Terrestrial topographic data (raster data) provided by U.S. Geological Survey (USGS), EROS Data Center at 10 meter resolution.

GEOSPATIAL PROCESSING TECHNIQUES

The mapping in GIS has projected the "round Earth" coordinate data on flat maps using the North American Datum 1983, Universal Transverse Mercator 10N (NAD83 UTM10N). The UTM system is not a single map projection. The system instead divides the Earth into sixty zones, each a six-degree band of longitude, and uses a secant Transverse Mercator projection in each zone (Karney 2011). The subject area is located within Zone 10 of this system. It serves as a uniform coordinate system that all geographic data is converted to for analysis purposes. In this way, physical area can be calculated within the NAD83UTM10N projection system using these assumptions of the conversion of the round-Earth into a flat map projection.

When originally defined, North American Datum 1983 (NAD 1983) and World Geodetic System 1984 (WGS 1984) were equivalent. In order to minimize coordinate changes, NAD 1983 is tied to the North American and Pacific tectonic plates. WGS 1984 is tied to the International Terrestrial Reference System (ITRF), which is independent of the tectonic plates. Over time, the two coordinate systems became increasingly

different. Instructions are maintained by ESRI to help in determining the correct datum transformation to use when transforming data between the NAD 1983 and the WGS 1984 datums (ESRI 2011).

Transformation parameters are calculated by the U.S. National Geodetic Survey (NGS) using CORS stations, and ties WGS 1984 to ITRF96. This transformation method is used for the 48 contiguous states and for the state of Alaska, as well, effective with version 9.3 of ArcGIS Desktop.

WGS 1984 provided the coordinate system to display the longitude and latitude coordinates provided in the UAA territories described in CFR-2002- Title 50- Vol 4. The NAD83UTM10N geographic projection cannot be used directly to determine the location of the longitude and latitude coordinates. Coordinates were recorded in WGS 1984 and used to map the extent of the UAA boundaries. Once established, the GIS layer projections were converted to NAD83UTM10N for area calculations. These layers are displayed in WGS 1984 on all maps in this document and one wall-map (36" x 36") herein referenced.

Extents of the UAA zones are defined within NAD83UTM10N. The ESRI program in ArcMAP 9.3.1 determined the area of each zone in square meters. These areas were converted to SNM with this conversion:

1 square meter = 2.915533496e-7 square mile [nautical] (Fogt 2010).

Projection conversions used the setting "NAD_1983_To_WGS_1984_5" for all projection conversions (specific to the ESRI program) (ESRI 2011).

FINDINGS

The Pacific Coast treaty Indian tribes' usual and accustomed fishing areas within each FMA are described:

- Makah—That portion of the FMA north of 48°02'15" N. lat. (Norwegian Memorial) and east of 125°44' 00" W. long.
- (2) Quileute—That portion of the FMA between 48°07'36" N. lat. (Sand Point) and 47°31'42" N. lat. (Queets River) and east of 125°44'00" W. long.
- (3) Hoh—That portion of the FMA between 47°54'18" N. lat. (Quillayute River) and 47°21'00"
 N. lat. (Quinault River) and east of 125°44'00" W. long.
- (4) Quinault—That portion of the FMA between 47°40'06" N. lat. (Destruction Island) and 46°53'18" N. lat. (Point Chehalis) and east of 125°44'00" W. long.

Referenced coordinates (Longitude & Latitude) of the points were used over the 'place name' locations in these references to give the precise points for spatial references. The place names were used only for reference purposes.

Maps referenced in this section refer to two nearly identical images of the subject area (Figure 1 & Figure 2). Figure 1 displays the mapped images using the Geographic Coordinate System: GCS_WGS_1984. This is a projection that facilitates the mapping of specific Longitude and Latitude points used in this document, and by several references. Figure 2 displays the data within the Projected Coordinate System: NAD_1983_UTM_Zone_10N. This is a projection that facilitates the area calculations for each zone created and referenced here. The mapping layers are projected as needed to conduct analyses consistent with each projection system. Within the Geographic Coordinate System (Figure 1) the reader will recognize that all Longitude lines are displayed parallel to each other. Within the NAD_1983_UTM_Zone_10N (Figure 2) the reader will recognize that all Longitude lines give the perspective of converging lines moving to the north, and diverging lines to the south. Each projection system performs the required analysis element.

Area Determination

Based on the analyses of this area, it is seen that the UAA contained in CFR-2002- Title 50- Vol 4 § 660.324 Pacific Coast Treaty Indian Fisheries, for the Makah, Quileute, and Hoh Tribes, and the Quinault Indian Nation encompass an area of approximately 5,071 Square Nautical Miles (SNM) including areas within the Pacific Ocean (open ocean), Strait of Juan de Fuca (Makah Tribe only), and Grays Harbor (Quinault Indian Nation only) (Table 1). Several of these areas are exclusive use UAA zones, such as the northern extent of the UAA zone and the UAA in the Strait of Juan de Fuca of the Makah Tribe, and the southern extent of the UAA zone, and Grays Harbor of the Quinault Indian Nation (Figure 1 & Figure 2). Other areas of the UAA are shared between certain tribes and are defined in the referenced CFR documentation. Zones for these exclusive use areas and the shared areas are described in Table 1 and displayed in Figure 1.

Review of Table 1 gives the reader insights to several specific characteristics of this zone. Three distinct identifications of UAA zones are defined to reveal the total UAA including the open ocean, Strait of Juan de Fuca, and Grays Harbor totaling 5,071 SNM. By excluding the interior waters of Strait of Juan de Fuca, and Grays Harbor, the total "open ocean" area is approximately 4,745 SNM.

Of this open ocean area, approximately 37% is exclusive use UAA (1,742 SNM) of the Quinault Indian Nation, with the addition of approximately 23% of the open ocean area (1,072 SNM) available through shared use within distinct areas by the Hoh and Quileute Tribes (Figure 1 & Figure 2). The total offshore fishing area available to the Quinault Indian Nation is approximately 2,814 SNM (Table 2).

Approximately 14% of the total open ocean UAA (652 SNM) is exclusive use of the Makah Tribe, with roughly an additional 5% of the open ocean area (224 SNM) available through shared use with the Quileute Tribe (Figure 1 & Figure 2). The total offshore fishing area available to the Makah Tribe is approximately 876 SNM (Table 2).

The Quileute Tribe has exclusive use of about 7% of the open ocean UAA (342 SNM) and shares access to another 29.5% of the open ocean area (1,401 SNM) with the Hoh and Makah Tribes, and the Quinault Indian Nation (Figure 1 & Figure 2). The total offshore fishing area available to the Quileute Tribe is approximately 1,743 SNM (Table 2).

The Hoh Tribe has no identified exclusive use UAA open ocean zone, but has shared access to approximately 1,785 SNM, totaling about 38% of the total open ocean area with the Quileute Tribe and the Quinault Indian Nation (Table 2, Figure 1 & Figure 2).

Tribal UAA	Square Nautical Miles (SNM)	Percent of Total SNM	Open Ocean SNM	Percent of Open Ocean SNM	Exclusive Use Open Ocean SNM	Percent of Open Ocean Exclusive Use
Makah UAA - Exclusive Use	651.61	12.9%	651.61	13.7%	651.61	23.8%
Makah UAA Strait of Juan de Fuca - Exclusive Use	262.53	5.2%				
Quileute / Makah UAA - Shared Use	223.95	4.4%	223.95	4.7%		
Quileute UAA - Exclusive Use	342.26	6.7%	342.26	7.2%	342.26	12.5%
Quileute / Hoh UAA - Shared Use	712.82	14.1%	712.82	15.0%		
Quinault / Quileute / Hoh UAA - Shared Use	463.74	9.1%	463.74	9.8%		
Quinault / Hoh UAA - Shared Use	607.99	12.0%	607.99	12.8%		
Quinault UAA - Exclusive Use	1,742.38	34.4%	1,742.38	36.7%	1,742.38	63.7%
Quinault UAA Grays Harbor - Exclusive Use	63.46	1.3%				
Total	5,070.75		4,744.75		2,736.25	

Table 1 Area of UAA adjacent to the Pacific Coastline.

Table 2 Exclusive Use and Shared Use Open Ocean UAA Zones.

Tribe	Exclusive Use SNM	Shared Use SNM	Total Available Use SNM
Quinault Indian Nation	1,742.38	1,071.73	2,814.11
Quileute Tribe	342.26	1,400.51	1,742.77
Makah Tribe	651.61	223.95	875.56
Hoh Tribe	-	1,784.55	1,784.55

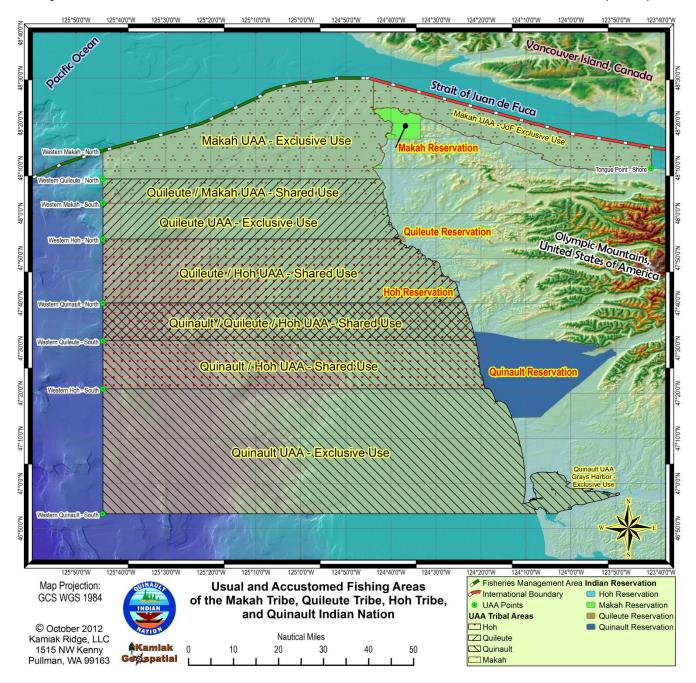


Figure 1. USUAL AND ACCUSTOMED FISHING AREAS OF PACIFIC COAST AND INTERIOR WATERS (WGS).

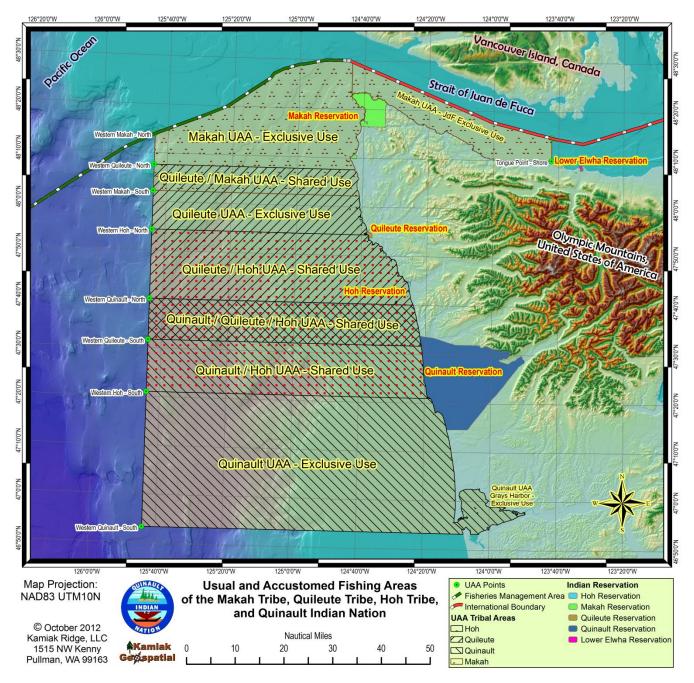


Figure 2. USUAL AND ACCUSTOMED FISHING AREAS OF PACIFIC COAST AND INTERIOR WATERS (UTM).

Map Labels

Labels included on Figure 1 and Figure 2 can be described to demonstrate how they graphically display the information provided in CFR-2002- Title 50- Vol 4 § 660.324. The UAA lines displayed are expressed through the presentation of Longitude and Latitude coordinates (Section: Findings, pg 3) extrapolated from the point of origin, easterly until open ocean waters were passed. The western points are displayed (Figure 1 & Figure 2) to indicate the significance of each point. All of these point labels begin with "Western" to indicate they represent the western-most point of the indicated UAA zone.

The reader can observe the southern-most point to see the label "Western Quinault – South". This particular point is the southwestern-most point to define the Quinault Indian Nation's UAA.

The next northerly point label is "Western Hoh – South" and displays the Longitude and Latitude point defining the southern boundary line of the Hoh Tribe's UAA zone.

In a similar way, the southern point defining the boundary of the Quileute Tribe's UAA is labeled "Western Quileute – South" to graphically show the southern extent of the Quileute Tribe's UAA.

Continuing northerly along this Longitude line, the point labeled "Western Quinault – North" is identified. The total area from the "Western Quinault – South" to the "Western Quinault – North" displays the western extent of the Quinault Indian Nation's UAA. Latitude parallels extending from these 'control points' (north and south) are projected easterly to show the intersection with the Olympic Peninsula terrain where the Open Ocean UAA expires. The Quinault Indian Nation's UAA includes parts of Grays Harbor located north of the parallel 46°53'18" N. lat. The UAA was segmented between the inland waters of Grays Harbor and the Open Ocean by dissecting the UAA zone along a line extending from Point Chehalis (south) and Point Brown (north).

The Makah Tribe's UAA zone was mapped through the Strait of Juan de Fuca to Tongue Point (48° 9' 59" N. lat. and 123° 42' 10.34" W. long.) where an extension was projected northerly until intersecting the International Border of the United States and Canada (48° 14' 39.99" N. lat. and 123° 42' 10.34" W. long.). The Makah Tribe's UAA extended from the shoreline (south) to the International Border (north), until the International Border line intersected the FMA line. The FMA line follows the connection of points given by NMFS (and reproduced in this document; Section 3 pg 1) in a general southwestern arc (NMFS 2012). The northwestern boundary of the Makah Tribe's UAA arcing from the International Border to the longitude and latitude point (48°02'15" N. lat. and east of 125°44' 00" W. long.) matches the FMA boundary. The Makah Tribe's UAA zone was divided into two parts as the open ocean and the Juan de Fuca zones. The separation was made at Cape Flattery and extended north to the intersection of the International Border.

All UAA boundaries parallel the Latitude lines showing the southern and northern extents as labeled.

Tribal Reservation polygons, place names, and labels are displayed here are for reference purposes only.

Makah Tribe Use Areas

The Makah Tribe UAA includes exclusive use of the Open Ocean Area of approximately 652 SNM, exclusive use of the Strait of Juan de Fuca UAA zone of approximately 263 SNM, and shared use (with the Quileute Tribe) of about 224 SNM (Table 1). Taken together, these three zones total about 1,138 SNM, for a total of about 22% of the total UAA for all four tribal UAA fishing areas (Figure 1 & Figure 2).

Excluding the UAA areas in the Strait of Juan de Fuca exclusively used by the Makah Tribe, and the area in Grays Harbor exclusively used by the Quinault Indian Nation, a total of 4,745 SNM in the Open Ocean is identified (Table 1). Within that area, the Makah Tribe has use of 876 SNM, a total of about 18.5% of the total Open Ocean UAA (Table 1). The remaining 3,869 SNM (81.5%) of the Open Ocean UAA (Table 1) is not available for exclusive use or shared use by the Makah Tribe (Figure 1 & Figure 2).

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Code of Federal Regulations

Title 50 - Wildlife and Fisheries

Volume: 4 Date: 2002-10-01 Original Date: 2002-10-01 Title: Section 660.324 - Pacific Coast treaty Indian fisheries. Context: Title 50 - Wildlife and Fisheries. CHAPTER VI - FISHERY CONSERVATION AND MANAGEMENT, NATIONAL OCEANICAND ATMOSPHERIC ADMINISTRATION, DEPARTMENT OF COMMERCE. PART 660 - FISHERIES OFF WEST COAST STATES AND IN THE WESTERN PACIFIC. Subpart G - West Coast Groundfish Fisheries.

§ 660.324 Pacific Coast treaty Indian fisheries.

(a) Pacific Coast treaty Indian tribes have treaty rights to harvest groundfish in their usual and accustomed fishing areas in U.S. waters.

(b) For the purposes of this part, Pacific Coast treaty Indian tribes means the Hoh, Makah, and Quileute Indian Tribes and the Quinault Indian Nation.

(c) The Pacific Coast treaty Indian tribes' usual and accustomed fishing areas within the fishery management area (FMA) are set out below in paragraphs (c)(1) through (c)(4) of this section. Boundaries of a tribe's fishing area may be revised as ordered by a Federal court.

(1) *Makah*—That portion of the FMA north of 48°02′15″ N. lat. (Norwegian Memorial) and east of 125°44′ 00″ W. long.

(2) *Quileute*—That portion of the FMA between 48°07'36" N. lat. (Sand Point) and 47°31'42" N. lat. (Queets River) and east of 125°44'00" W. long.

(3) *Hoh*—That portion of the FMA between 47°54′18″ N. lat. (Quillayute River) and 47°21′00″ N. lat. (Quinault River) and east of 125°44′00″ W. long.

(4) *Quinault*—That portion of the FMA between 47°40′06″ N. lat. (Destruction Island) and 46°53′18″ N. lat. (Point Chehalis) and east of 125°44′00″ W. long.

(d) *Procedures.* The rights referred to in paragraph (a) of this section will be implemented by the Secretary, after consideration of the tribal request, the recommendation of the Council, and the comments of the public. The rights will be implemented either through an allocation of fish that will be managed by the tribes, or through regulations in this section that will apply specifically to the tribal fisheries. An allocation or a regulation specific to the tribes shall be initiated by a written request from a Pacific Coast treaty Indian tribe to the Regional Director, prior to the first of the Council's two annual groundfish meetings. The Secretary generally will announce the annual tribal allocation at the same time as the annual specifications. The Secretary recognizes the sovereign status and co-manager role of Indian tribes over shared Federal and tribal fishery resources. Accordingly, the Secretary will develop tribal allocations and regulations under this paragraph in consultation with the affected tribe(s) and, insofar as possible, with tribal consensus.

(e) *Identification.* A valid treaty Indian identification card issued pursuant to 25 CFR part 249, subpart A, is *prima facie* evidence that the holder is a member of the Pacific Coast treaty Indian tribe named on the card.

(f) A limited entry permit under subpart C is not required for participation in a tribal fishery described in paragraph (d) of this section.

(g) Fishing under this section by a member of a Pacific Coast treaty Indian tribe within their usual and

accustomed fishing area is not subject to the provisions of other sections of this part.

(h) Any member of a Pacific Coast treaty Indian tribe must comply with this section, and with any applicable tribal law and regulation, when participating in a tribal groundfish fishery described in paragraph (d) of this section.

(i) Fishing by a member of a Pacific Coast treaty Indian tribe outside the applicable Indian tribe's usual and accustomed fishing area, or for a species of groundfish not covered by an allocation or regulation under this section, is subject to the regulations in the other sections of this part.

(j) *Black rockfish.* Harvest guidelines for commercial harvests of black rockfish by members of the Pacific Coast Indian tribes using hook and line gear will be established annually for the areas between the U.S.-Canadian border and Cape Alava (48°09'30" N. lat.) and between Destruction Island (47°40'00" N. lat.) and Leadbetter Point (46°38'10" N. lat.), in accordance with the procedures for implementing annual specifications. Pacific Coast treaty Indians fishing for black rockfish in these areas under these harvest guidelines are subject to the provisions in this section, and not to the restrictions in other sections of this part.

(k) *Groundfish without a tribal allocation*. Makah tribal members may use midwater trawl gear to take and retain groundfish for which there is no tribal allocation and will be subject to the trip landing and frequency and size limits applicable to the limited entry fishery.