

EXHIBIT G

Commercial and Recreational Fishing

Appendix H

Exhibit G Commercial and Recreational Fishing Table of Contents

Commercial and Recreational Fishing.....	1
Figure G-1 Black Cod Red Rockfish.....	2
Figure G-2 Tow Boat Lanes	3
Figure G-3 Fisherman Navigation Routes	4
Figure G-4 Dungeness Crab Landings in Oregon in 1996 by Month.....	5
Figure G-5 Commercial Crab Fishing	7
Figure G-6 Percent Crab Fishing by Income	8
Figure G-7 Soft shell Crab Areas	9
Figure G-8 Salmon Fishing Areas	10
Figure G-9 Groundfish Trawl Areas.....	11
Figure G-10 Razor Clam Harvest Areas.....	12

Commercial and Recreational Fishing

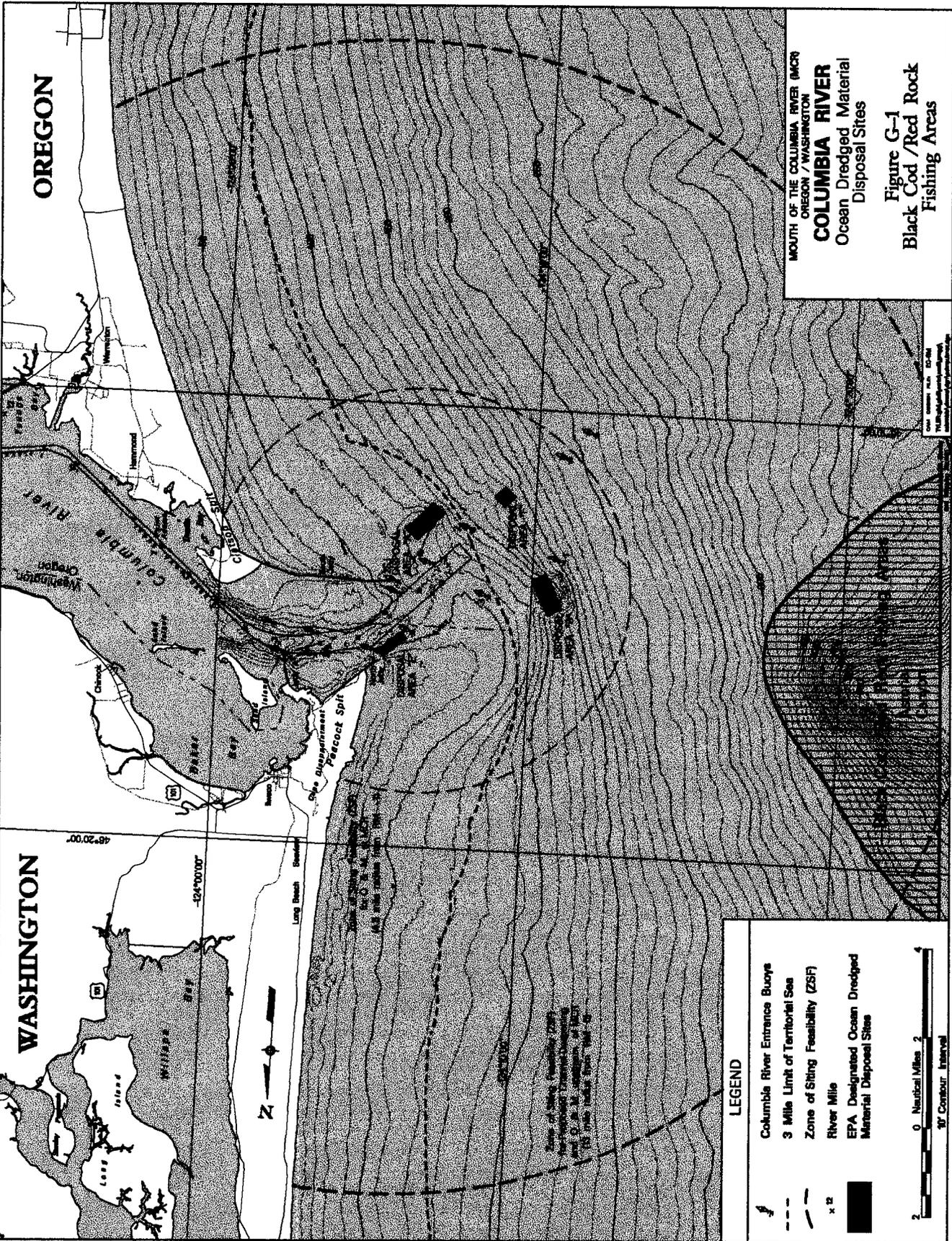
The offshore area of the Columbia River supports a number of valuable commercial fisheries. The major offshore fisheries include Dungeness crab, salmon and bottom fish. Fishing for salmon and bottom fish, however, has declined in the last several years because of declining stocks of these fish species. There has been a shift to other fisheries such as crabs, tuna, and halibut. Tuna and halibut fishing are predominately in the offshore area beyond the ZSF. A good halibut fishing area, however, occurs inshore in the vicinity of a shale pile area to the northwest at a depth of 300 + feet. Black cod and redrock fishing is done using longlines at the mouth of Astoria canyon (Figure G-1). A description of the major fisheries is provided below. Fishing occurs throughout the offshore area except in the towboat lanes. (Figure G-2). These areas are the result of a negotiated agreement between the fishermen and the towboat operators to avoid navigation and gear conflicts. In addition to fishing areas fishermen also have preferred to use navigation routes to and from major fishing areas. Figure G-3 was developed by fishermen from both Oregon and Washington.

Dungeness crabs are fished commercially along the West Coast from Central California north to Alaska. Most fishing is done in boats less than 80' in length that go out on daily or up to several week trips. Crabs are fished using pots that are 3' to 4' in diameter and are individually buoyed to the surface. Only male crabs 6 ¼" or bigger are allowed to be commercially harvested in both Oregon and Washington and all pots are equipped with 4¼" escape ports to allow undersized crabs to leave the pots. Pots are laid out on the bottom in long strings and baited with dead fish, squid or clams. They are usually left for one to several days before being retrieved. Legal size male crabs are retained and sub-legal males and all females are released.

Crab season extends from Dec.1 to Aug.15 in Oregon and from Dec.1 to Sept. 15 in Washington. Both States can delay the opening of the season if the preseason sampling of the crab population by the states show to large a percentage of softshell crabs. Both states allow fisherman to set their gear 64 hours prior to the opening of the season. The pots can not be pulled, however, until the start of the season. Most crabs are harvested during the first few weeks of the season. Figure G-4 shows the landings for the State of Oregon by month for 1996 (Lukas and Carter 1998).

WASHINGTON

OREGON



MOUTH OF THE COLUMBIA RIVER (MCR)
 OREGON / WASHINGTON
COLUMBIA RIVER
 Ocean Dredged Material
 Disposal Sites

Figure G-1
 Black Cod / Red Rock
 Fishing Areas

LEGEND

- Columbian River Entrance Buoys
- 3 Mile Limit of Territorial Sea
- Zone of Stirling Feasibility (ZSF)
- River Mile
- EPA Designated Ocean Dredged Material Disposal Sites

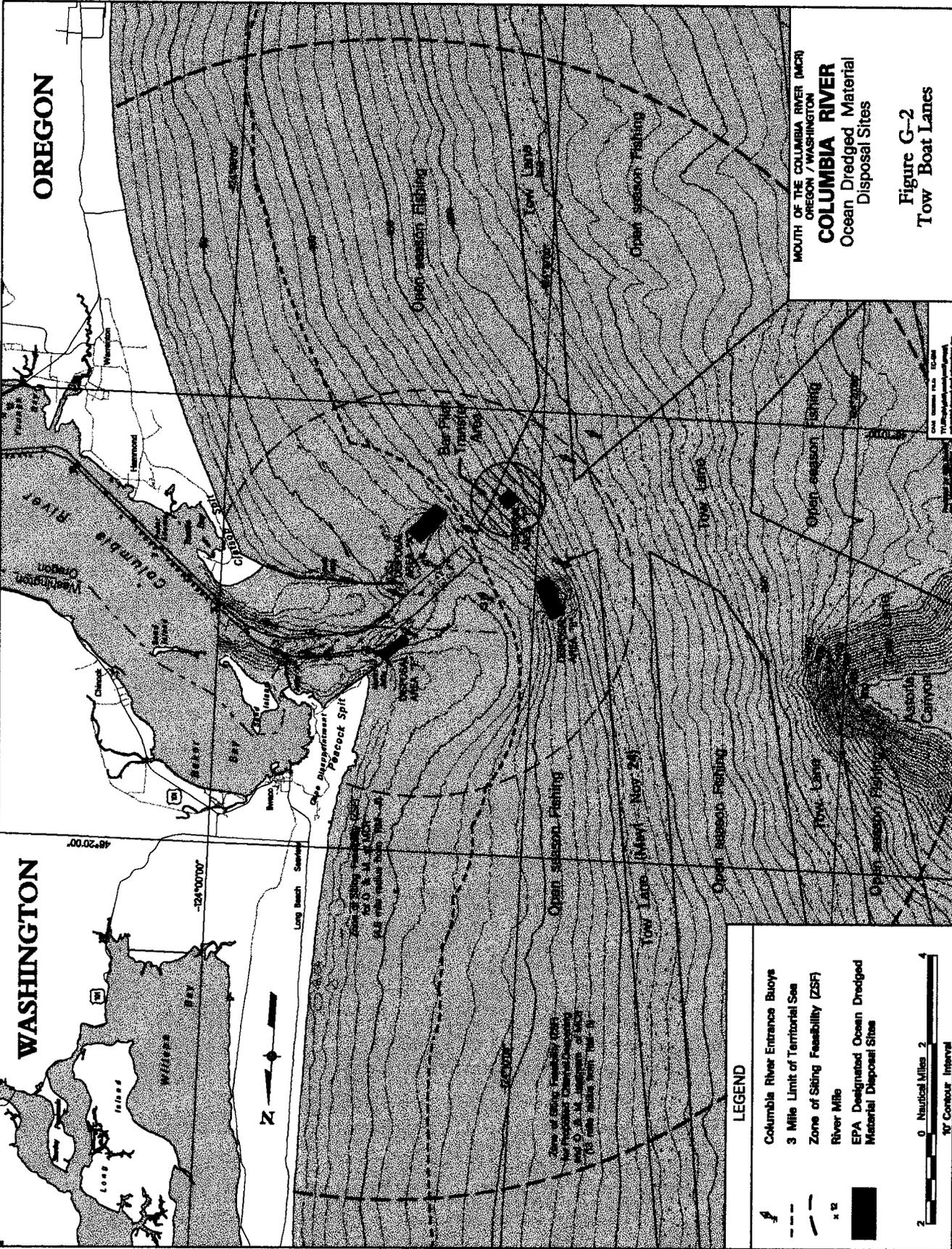


Zone of Stirling Feasibility (ZSF)
 Northwest Territorial Disposal
 Site (NWTDS) - 12.5 N. 125.0 W.
 (4.5 mile radius from 46° 20' N, 124° 00' W)

Scale: 1:50,000
 Date: 11/82
 Author: [illegible]

WASHINGTON

OREGON



MOUTH OF THE COLUMBIA RIVER (MCR)
 OREGON / WASHINGTON
COLUMBIA RIVER
 Ocean Dredged Material
 Disposal Sites

Figure G-2
 Tow Boat Lanes

LEGEND

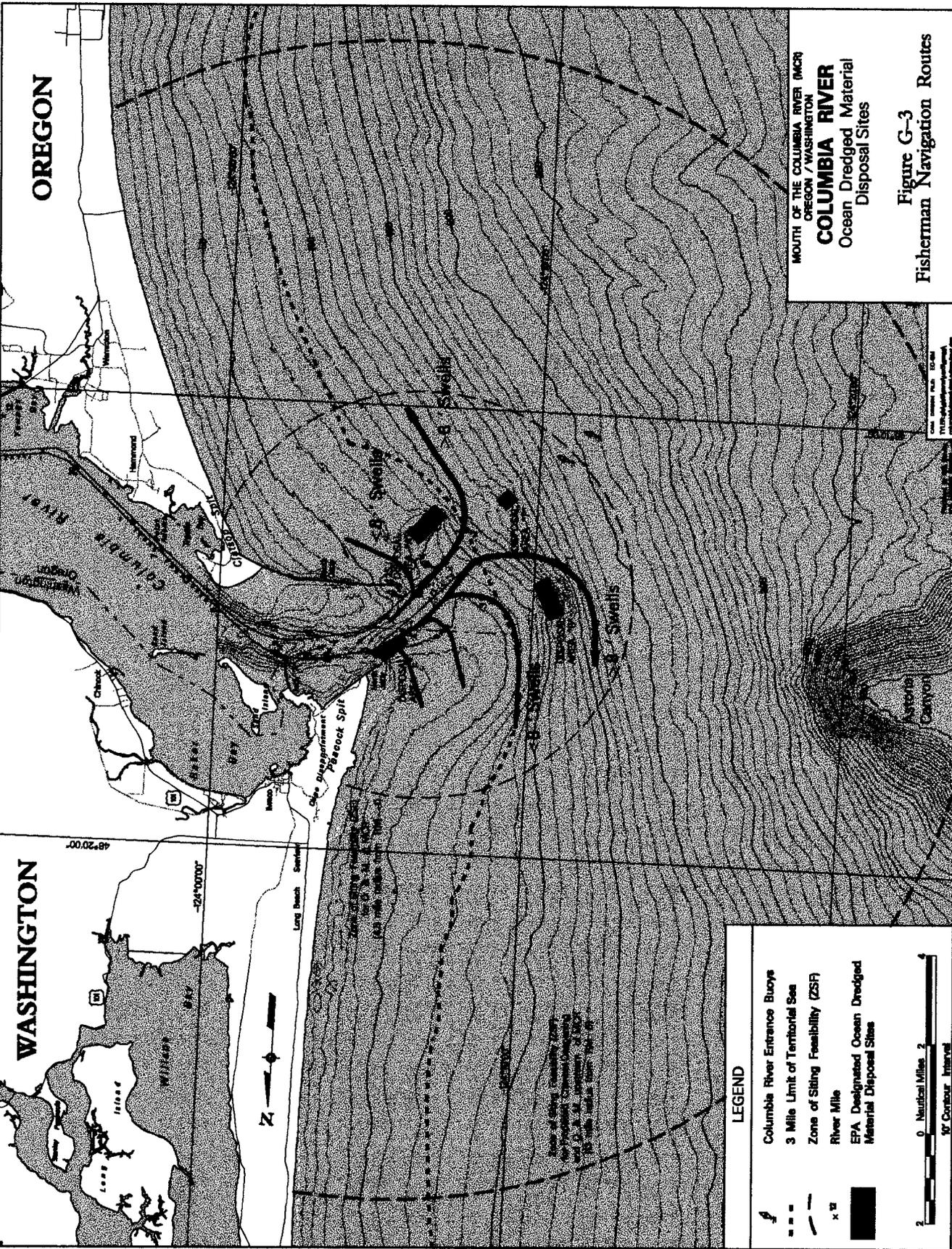
- Columbia River Entrance Buoy
- 3 Mile Limit of Territorial Sea
- Zone of Stinging Feasibility (ZSF)
- River Mile
- EPA Designated Ocean Dredged Material Disposal Sites



DATE: November 1982
 TITLE: Tow Boat Lanes
 DRAWN BY: [illegible]
 CHECKED BY: [illegible]

WASHINGTON

OREGON



MOUTH OF THE COLUMBIA RIVER (MCR)
 OREGON / WASHINGTON
COLUMBIA RIVER
 Ocean Dredged Material
 Disposal Sites

Figure G-3
 Fisherman Navigation Routes

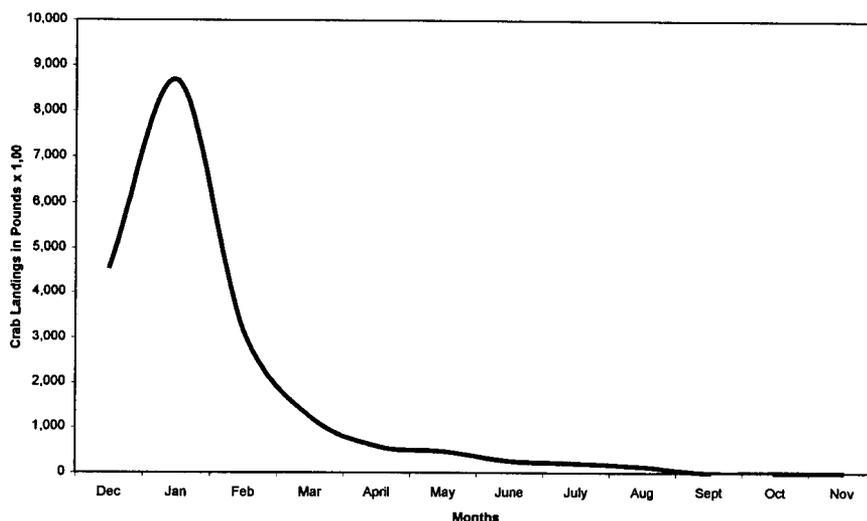
LEGEND

- Columbian River Entrance Buoys
- 3 Mile Limit of Territorial Sea
- Zone of Siting Feasibility (ZSF)
- River Mile
- EPA Designated Ocean Dredged Material Disposal Sites



DATE: 11/19/84
 BY: [illegible]
 [illegible]

Figure G-4 Dungeness Crab Landings in Oregon in 1996 by Month



The State of Washington issued 232 permanent and 16 temporary Dungeness crab commercial fishing licenses for coastal Washington in 1995. The State of Oregon issued 441 Dungeness crab permits in 1995 and 461 in 1996 for the entire coastal Oregon area. The landed value of crabs to fishermen was \$10,387,617 in Astoria for 1996 and \$36,318,000 for coastal Washington 1995. The Washington landings value was the highest ex-vessel value to date.

Landings normally decline in the summer months because as crabs start molting the percentage of softshell crabs increase in the catch and the market value of the crab's decrease. The season is timed so that it will end before the sub-legal crabs molt into legal size crabs and can be harvested. In some cases molting occurs earlier than the closing of the season and some fishermen continue harvesting crabs during this period despite the decrease in marketable catch and the impact on next years recruitment to the fishery. This is a major concern to State fishery biologists and in the past they have had to close the season early to protect the crabs.

Crab fishing occurs throughout the offshore area (figure G-5) but the areas of maximum effort change with the season. In winter most crab fishing is further offshore in water approximately 30 to 60 fathoms deep. The effort then moves inshore to water less than 30 fathoms deep in the early spring and summer until fishing occurs near the shore. Crab fishing also occurs in the river mouth and in the estuary.

In October 1997, the Corps surveyed local crabbers concerning their fishing areas offshore of the Columbia River. Based on the information obtained, figure G-6 depicts the percentage of crab fishing by area. In Washington, crabbers fish primarily in Area D, and in area H in Oregon. Crab fisherman also identified what they considered to be areas of greatest soft shell Dungeness crab and these are shown in Figure G-7.

Commercial salmon fishing also occurs over much of the offshore area. Chinook, coho, and to a lesser extent pink salmon, are fished commercially using troll boats. Trolling is done by pulling large strings of baited hooks that are spaced apart through the water at various depths. The lines are reeled in periodically and the fish removed. Troll fishing has declined dramatically in the less several years with the reduction in salmon population. Seasons and catch limits are negotiated each year based on predicted salmon returns. The season is normally closed when the limit is reached. Salmon sport fishing also occurs throughout the offshore area (figure G-8).

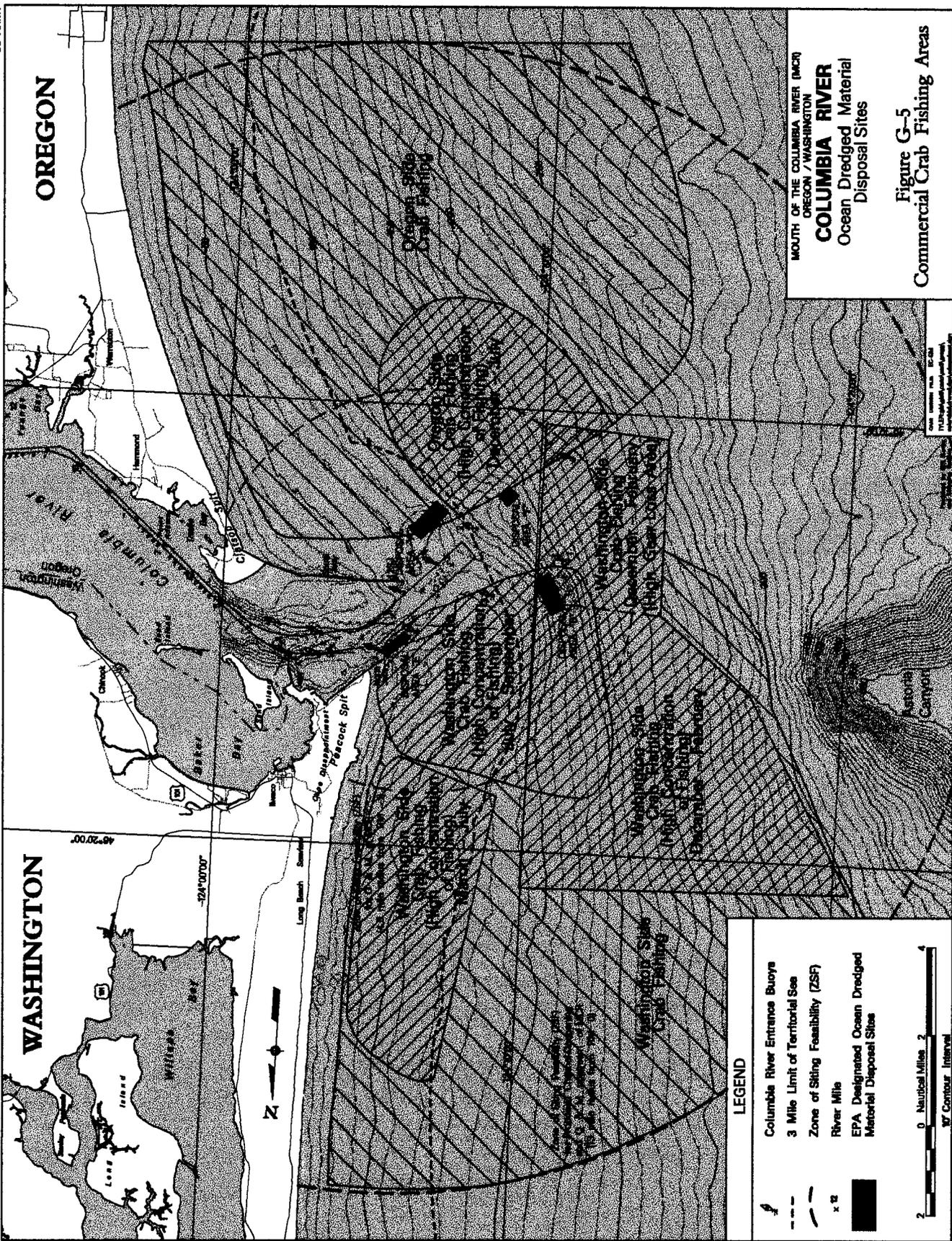
Groundfish trawling occurs year around throughout the area offshore of the MCR . Trawling is done predominantly for various flatfish and rockfish species as well as pink shrimp. Boats used in the fishery range up to a couple of hundred feet in length. They use large trawl nets that are dragged along the bottom. Some of the nets have large doors that are rigged on either side of the net and help hold the net open. The nets may also have rollers along the leading edge that help the nets move over rough bottoms. They may also have chains along the leading edge that cause bottom dwelling organisms to move up into the water column so they can be more easily caught by the net. Predominate trawling areas off the MCR are shown in Figure G-9. This figure was developed using fishermen logbook information on trawl start locations that ODFW requires them to keep. The high concentration areas are the highest densities of trawl start locations that produced landings in excess of 200lbs. Trawling in different locations is seasonal and depends upon the species that the fishermen are targeting. The inshore are usually fished in the summer months, which unfortunately is also when large concentration of juvenile flatfish and soft shell crabs are present. Mortality rates of the nontarget species can be high especially for the soft shell crabs. Estimates of up to 57% mortality have been determined in several studies (PFMC, 1979).

In addition to by catch mortalities there has also considerable concerns in recent years that bottom trawling can have devastating affects on the bottom habitat and community structure. A symposium was held in June 1996 to discuss the problem. The conclusion reached was that bottom trawling was akin to clear cutting forest and had a devistating impact on habitat community structure, and species abundance. Recovery times ranged from 2 to 14 months in some of the studies (Watling and Norse, 1998).

Commercial shellfish fishing is for clams and scallops. Scallops are dredged off the bottom in deeper water near the offshore limits of the area. Clams are harvested by hand along the beaches north and south of the estuary (figure G-10). Subtidal beds generally are not harvested but provide recruitment to inshore areas.

WASHINGTON

OREGON



MOUTH OF THE COLUMBIA RIVER (MCR)
OREGON / WASHINGTON

COLUMBIA RIVER
Ocean Dredged Material
Disposal Sites

Figure G-5
Commercial Crab Fishing Areas

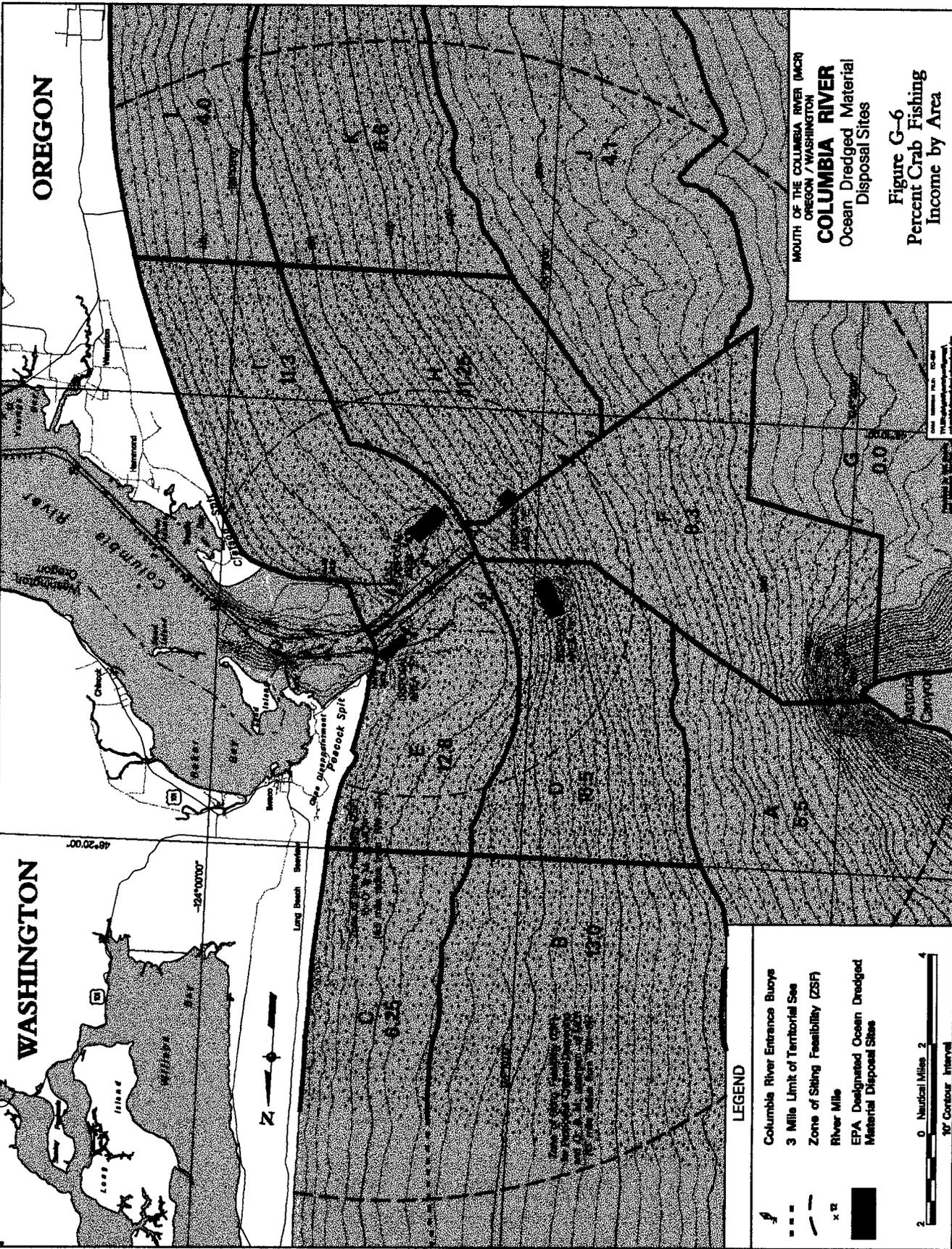
LEGEND

- Columbia River Entrance Buoys
- 3 Mile Limit of Territorial Sea
- Zone of Siting Feasibility (ZSF)
- River Mile
- EPA Designated Ocean Dredged Material Disposal Sites



WASHINGTON

OREGON

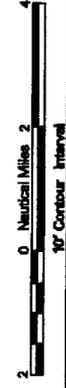


MOUTH OF THE COLUMBIA RIVER (MCR)
 OREGON / WASHINGTON
COLUMBIA RIVER
 Ocean Dredged Material
 Disposal Sites

Figure G-6
 Percent Crab Fishing
 Income by Area

LEGEND

- Columbia River Entrance Buoy
- 3 Mile Limit of Territorial Sea
- Zone of Stinging Feasibility (ZSF)
- River Mile
- EPA Designated Ocean Dredged Material Disposal Site



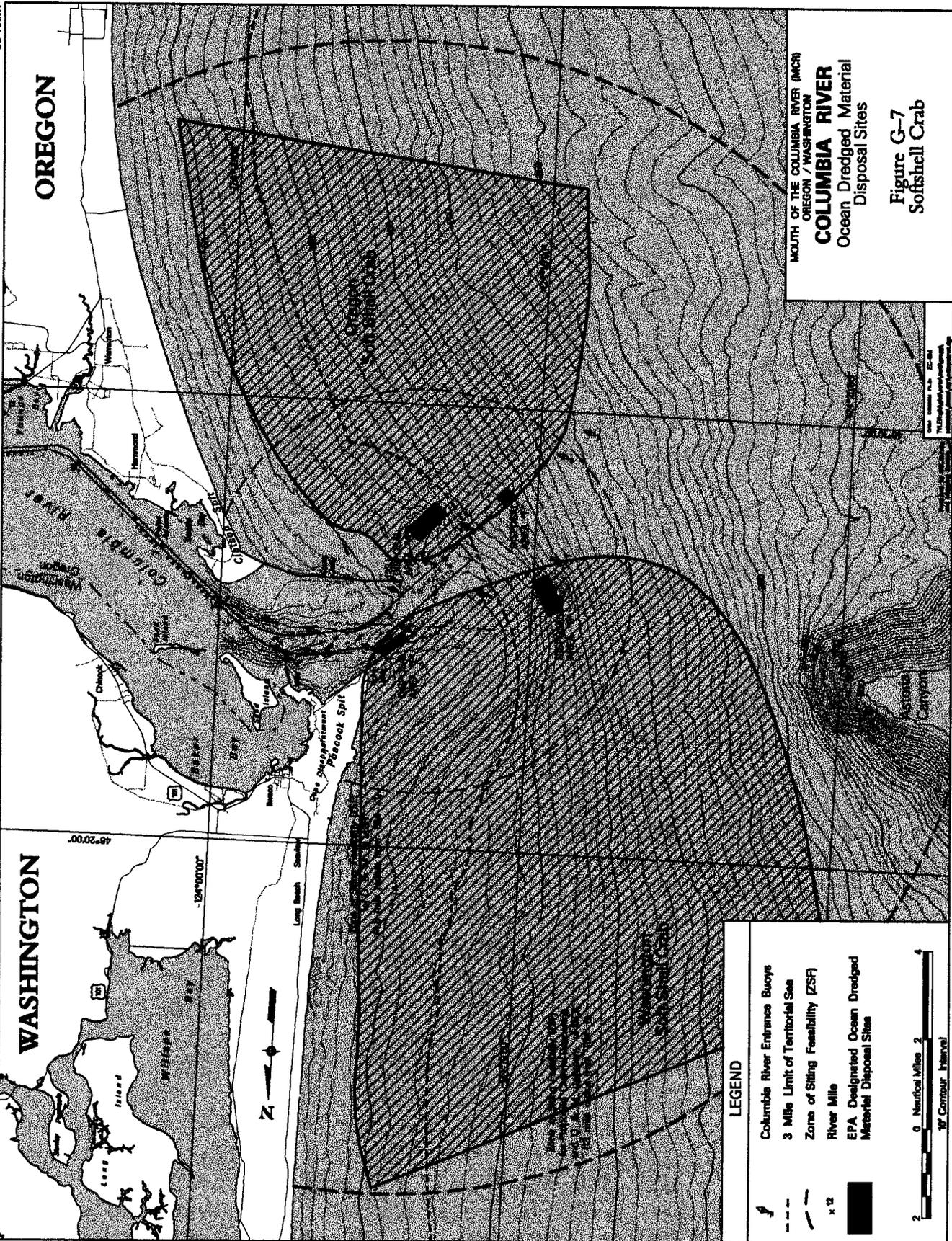
Scale: 1:50,000
 Date: 10/1/88
 Project: Columbia River Mouth
 Drawing: G-6

OREGON

WASHINGTON

MOUTH OF THE COLUMBIA RIVER (MCR)
OREGON / WASHINGTON
COLUMBIA RIVER
Ocean Dredged Material
Disposal Sites

Figure G-7
Softshell Crab



LEGEND

- Columbian River Entrance Buoys
- 3 Miles Limit of Territorial Sea
- Zone of Stilling Feasibility (ZSF)
- River Mile
- EPA Designated Ocean Dredged Material Disposal Sites

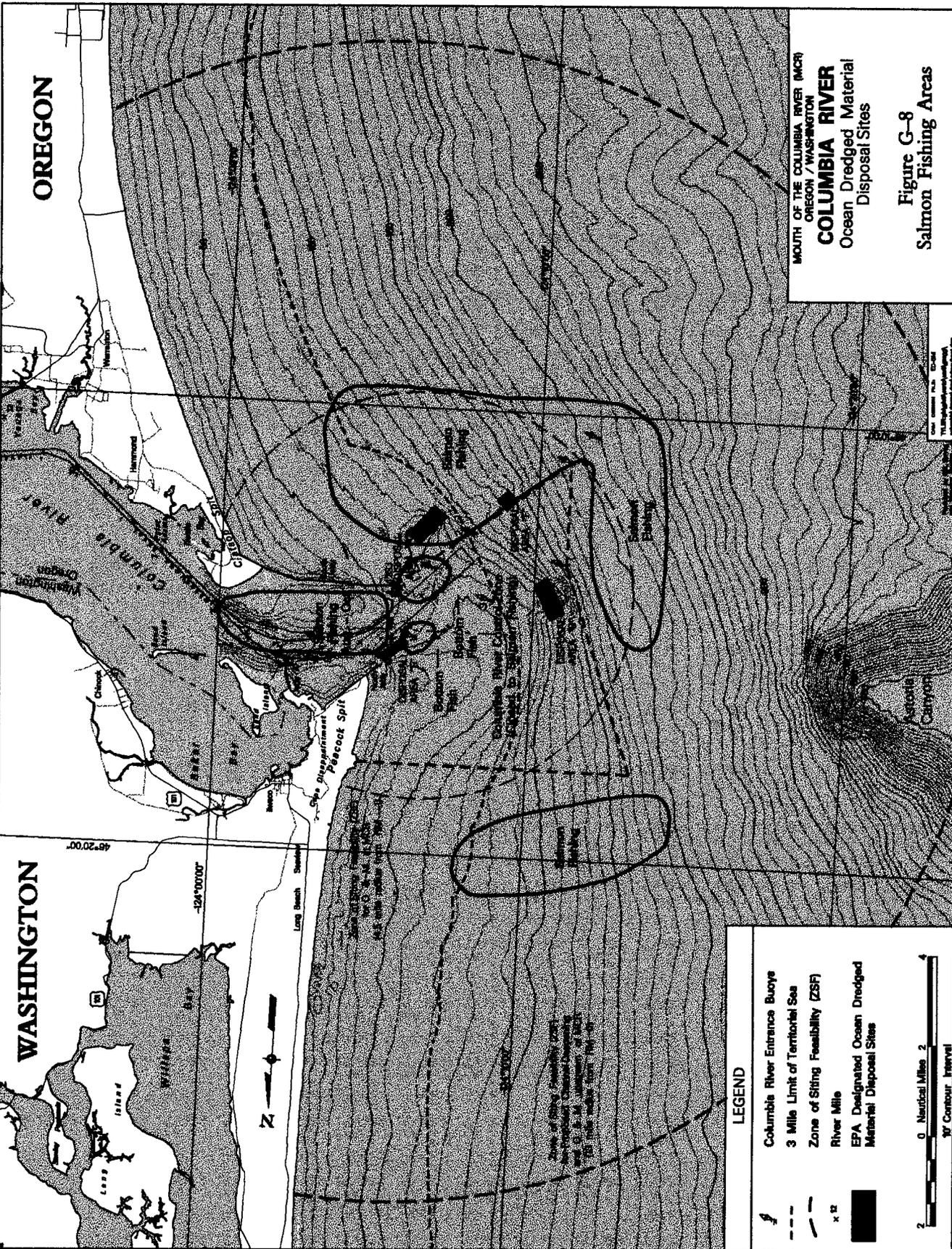


OREGON

WASHINGTON

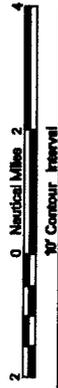
MOUTH OF THE COLUMBIA RIVER (MCR)
OREGON / WASHINGTON
COLUMBIA RIVER
Ocean Dredged Material
Disposal Sites

Figure G-8
Salmon Fishing Areas



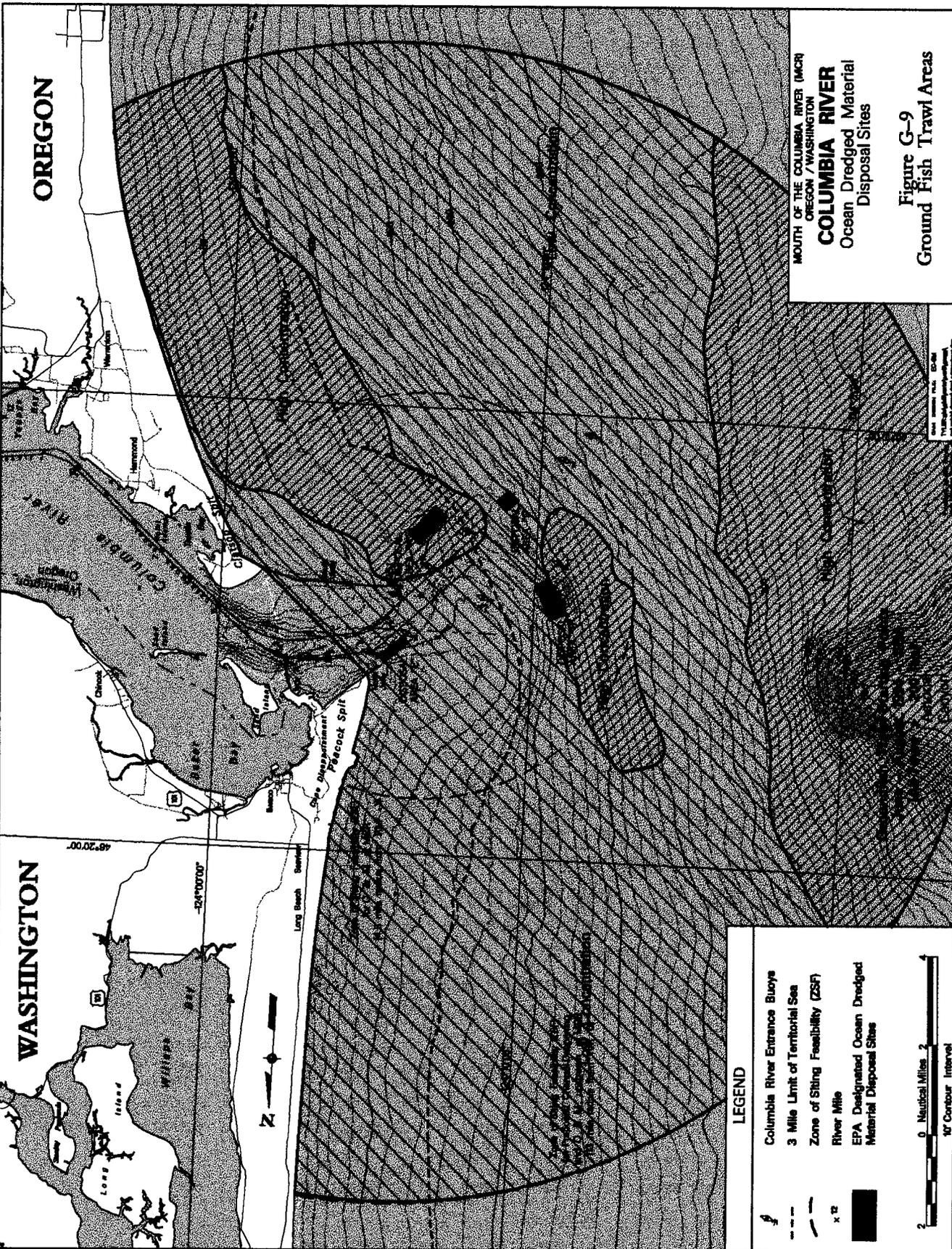
LEGEND

- Columbia River Entrance Buoys
- 3 Mile Limit of Territorial Sea
- Zone of Siting Feasibility (ZSF)
- River Mile
- EPA Designated Ocean Dredged Material Disposal Sites



WASHINGTON

OREGON



LEGEND

- Columbia River Entrance Buoys
- 3 Mile Limit of Territorial Sea
- Zone of Siting Feasibility (ZSF)
- River Mile
- EPA Designated Ocean Dredged Material Disposal Sites



MOUTH OF THE COLUMBIA RIVER (MCR)
 OREGON / WASHINGTON
COLUMBIA RIVER
 Ocean Dredged Material
 Disposal Sites

Figure G-9
 Ground Fish Trawl Areas

DATE: 1988
 BY: [illegible]
 [illegible]

