15.0 DATA METHODS

The Council has decided that only owners of vessels using the following groundfish gears would participate in the proposed limited entry program: groundfish trawls (bottom, roller and midwater trawls), fishpots and longline. These gears are defined under Section 663.2 of the regulations implementing the groundfish FMP. Under the current proposals, owners of vessels using all other gear types would be exempted from the groundfish limited entry program. Additionally, owners of vessels using longline or fishpot gear would be allowed to make small landings without a permit.

15.1 Limited Entry Gear Analysis

At the time permits are initially issued, vessel owners which meet MLRs with a limited entry gear would receive a LE permit endorsed for that gear. To evaluate the effects of alternative landings criteria, the set of vessels which landed Council-managed groundfish species with limited entry gears during the qualifying window (July 11, 1984 through August 1, 1988) was identified.[1/]

The data used to determine whether a vessel landed at least one pound of groundfish with limited entry gear originated from the PacFIN RDB, currently maintained at the NMFS, Southwest Region office and Southwest Fisheries Science Center. The RDB is a three-state integrated landings receipt (fish ticket) file which is used primarily by West Coast researchers to monitor the fishing activity of vessels making marine fish landings into Washington, Oregon and California. Because of its comprehensive design, scope and structure, the RDB aggregates all marine fish landing receipts by unique vessel identification number to facilitate analyses of each West Coast fishing vessel's species, gear and port landing combinations during a year. Fish tickets for vessels which used limited entry gear to land groundfish during the window were selected based upon the species, gear and port codes currently stored in the RDB. However, in many instances, it should be recognized that the RDB does not retain many of the species, gear and port codes that are stored in the original state agency fish ticket data files. Rather, the RDB was designed to map unique state codes into broader, more generalized market, gear and port categories; resulting in some loss of detailed landing information in the RDB. Moreover, a full accounting of the market categories landed and/or types of gear a vessel actually uses is not always possible because many fish tickets have "unspecified" or "other" codes associated with them, or simply may be miscoded with incorrectly specified gear and market categories. For these reasons, and because landing receipts which cannot be linked to a valid vessel identification number are eventually discarded from the "final" landings data file, the RDB should not be considered the definitive data base for establishing whether a vessel meets the minimum qualification criteria.

The universe of vessels potentially eligible to participate in a limited entry program were identified for each of the respective limited entry gear fleets (trawl, fishpot and longline). Fish tickets for each vessel were subsequently reformatted into a data file structure that researchers on the LEADOC agreed would facilitate analysis of alternative MLRs. For this purpose, each vessel's fish tickets were first organized and screened by date of delivery. A summary trip data file was created by aggregating the following trip variables over six month time periods: landing date; delivery port; gear types used; landed weight and exvessel value of groundfish landings by gear; and landed weight and value of

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[1/] Those groundfish species currently managed by regulations governing the Council's groundfish FMP are shown in Table 5-3.

non-groundfish market categories. These aggregated summary trip data files were created to facilitate analyses of a vessel's semiannual trip and landings activity in order to evaluate alternative MLRs.

The task from initially selecting the limited entry gear window fleet (all vessels with at least one landing during the qualifying period with limited entry gear) to developing the semiannual summary trip files (Table 15-1) involved several steps. The summarization procedure was particularly complex since it involved screening all fish tickets on a per trip basis and then checking for possible coding errors and anomalies based upon conditional tests of different market category/gear combinations. When it was determined that market or gear category codes were clearly incorrect, the trip was reclassified and assigned to the appropriate mode in the trip summary file. These reclassification decisions were based upon known linkages between gear types and market category compositions, knowledge of West Coast fishery interactions and landings criteria recommended by the LEADOC. The specific steps executed to develop the final summary trip files analyzed for this limited entry study are discussed for each of the respective limited entry gear fleets.

Two data sets were produced using different sets of gear classification criteria; the results from the first run were presented to the Council at its April 1990 meeting. After reviewing the results of this first data run and receiving comments on the results and methodology from the LEADOC, the classification method was revised for generation of the final data set. The philosophy which guided the development of the final data set was: (1) any vessel that has a fish ticket which shows a code for a limited entry gear should be included in the window fleet unless the landing would be illegal or physically very difficult; e.g., landing of salmon with longline gear, or shrimp caught with groundfish trawl and (2) the objective of the analysis is not to identify vessels which will qualify, but to estimate the number of vessel that have different likelihoods of qualifying. This second data set was used for a July 1990 presentation to the Council and to produce this document. The following is a description of the classification method used for the final data set.

Gear Identification Criteria for Final Data Set.

Limited Entry Trawl Fleet. For the past several years, NMFS, Southwest Region, has maintained an inventory of fishing vessels that made one or more landings of groundfish with legal groundfish trawl gear (i.e., bottom, roller, midwater, but not shrimp trawls). This inventory list of groundfish trawl vessels has been supplied to NMFS by the state fishery agencies in Washington, Oregon and California. It was decided to use this inventory set of groundfish trawlers as the best estimate of the limited entry groundfish trawl fleet, since each state relies on its own landing records and adjustment procedures to compile these annual vessel lists. The accuracy of this state supplied trawl inventory list was then cross-checked with these vessels' annual landing records in the RDB. As expected, most of the state inventory list of vessels had verified landings of groundfish (one or more pounds) associated with limited entry trawl gear codes during the window period; this set of vessels comprised the limited entry groundfish trawl fleet for the analytical phase.

The window limited entry groundfish trawl fleet was identified by selecting all vessels on the state trawl lists which had valid landings of any legal groundfish species with the following trawl gear codes: groundfish trawls ('GFT'), bottom trawls ('BTT'), roller trawls ('RLT'), flatfish trawls ('FLT'), otter trawls ('OTW') and midwater trawls ('MDT'). This selection procedure defined the universe of trawl vessels potentially eligible to participate in the proposed limited entry program, based on RDB gear and market category codes. Some inconsistencies between state agency reported landings and verifiable landing receipts in the RDB were revealed. For example, some state inventory trawlers did

Table 15–1. Limited entry summary file data elements.

Record 1

Vessel ID

Six Month Period

Vessel Length Type

Vessel Length

Vessel Weight Type

Vessel Weight

Principal Port

Dependence on Principal Port

Principal Groundfish Gear

Gear Dummies (11 Variables)

1. Trawl
2. Trawl Whiting Shoreside
3. Trawl Whiting JV
4. Fishpot
5. Longline
6. Criteria–line (Pole Landings Meeting Criteria)
7. Other Line (Pole and Oregon Setline Landings Not Meeting Criteria)
8. Unspecified Gear
9. Other Groundfish Gear
10. Non–groundfish Gear
11. Puget Sound Gear Catch

Trip Modes (Frequency by Gear – 15 Variables)

1. Trawl
2. Trawl Whiting
3. Fishpot
4. Longline
5. Criteria–line (Pole Landings Meeting Criteria)
6. Other Line
7. Unspecified Gear
8. Other Groundfish Gear
9. Salmon
10. Crab
11. Shrimp
12. Tuna
13. Halibut
14. Other Species
15. Puget Sound Groundfish

Table 15-1. Limited entry summary file data elements (continued).

Record 2

Landings (By 9 Species by 8 Gear Groups - 72 Variables)

Species Groups

1. All Other Groundfish
2. Pacific Whiting
3. Sablefish
4. Thornyhead/Arrowtooth
5. Sebastes Complex
6. Widow Rockfish
7. Unspecified Rockfish
8. English, Petrale, Rex and Sand Soles
9. Dover Sole

Gear Groups

1. Trawl
2. Trawl Whiting
3. Fishpot
4. Longline
5. Criteria-line (Pole Landings Meeting Criteria)
6. Other Line
7. Unspecified Gear
8. Other Groundfish Gear

Record 3

Exvessel Revenue (By 9 Species by 8 Gear Groups - 72 Variables)

Record 4

Landings (By 8 Non-groundfish and Groundfish not Managed by the Council Species)

1. Salmon
2. Crab
3. Shrimp
4. Tuna
5. Halibut
6. Other Non-groundfish
7. Groundfish not Caught with Limited Entry Gear
8. Puget Sound Groundfish

Table 15-1. Limited entry summary file data elements (continued).

Record 5

Exvessel Value (By 8 Non-groundfish and Groundfish not Managed by the Council Species)

Record 6

Landings by Regions (By 6 Regions and 8 Gears - 48 Variables)

Regions

1. Washington
2. Oregon
3. California (Eureka INPFC area)
4. North Monterey INPFC area
5. South Monterey INPFC area
6. Conception INPFC area

Gear Groups

1. Trawl
2. Trawl Whiting
3. Fishpot
4. Longline
5. Criteria-line (Pole Landings Meeting Criteria)
6. Other Line
7. Unspecified Gear
8. Other Groundfish Gear

Record 7

Value by Regions (By 6 Regions and 8 Gears - 48 Variables)

not have "valid" landing records in the RDB, or had RDB landing records but registered no groundfish landings in association with legal trawl gear codes. Moreover, because the State of California's current practice is to code trawl as well as other kinds of net gear landings under the pneumonic 'OTW' (otter trawl), the RDB yields a considerably larger number of vessels that "appear" to have landed groundfish with legal trawl gear when compared to the state supplied inventory. In those instances, where it is unclear exactly what the vessel is doing because of coding problems inherent in the RDB, vessels not on the state lists or vessels on the state trawl lists not landing groundfish with trawl gear were not included as part of the limited entry groundfish trawl fleet.

The groundfish trawl gear codes (particularly 'OTW') posed difficult coding problems because it is known they may include other kinds of fishing nets (i.e., shrimp trawls, gill nets, seines) on California fish tickets. For example, pink shrimp landings often appear in conjunction with groundfish under the gear code 'OTW'. It is clear these are actually shrimp trawl landings with groundfish occurring as a by-catch while target fishing for pink shrimp; it would be incorrect to call this trip a groundfish trawl delivery. Thus, these (and related) cases were reclassified as non-groundfish trips when (1) certain non-groundfish (i.e., pink shrimp) and groundfish species were landed jointly and the gear code is groundfish trawl and (2) any non-groundfish species were landed with groundfish trawls when groundfish was not present on the same trip. More troublesome, however, is the possibility that a trip occurs when groundfish is landed exclusively and the gear is **incorrectly** coded as groundfish trawl. These trips would, of course, be classified as trawl deliveries without further a priori information about the type of vessel involved. Thus, the size of the eligible limited entry groundfish fleet could be over or underestimated to some degree due to the uncertainty of existing gear and market category codes in the RDB.

Limited Entry Fishpot Fleet. The window limited entry fishpot fleet was identified by selecting all vessels from the RDB that landed any legal groundfish with fishpot ('FPT') or other pot ('OPT') gear. Moreover, it was discovered that in the 1986 RDB, three California fishpot vessels had large sablefish landings linked with the unspecified ('USP') gear code; therefore, these vessels were subsequently added to the 1986 limited entry fishpot fleet after they were confirmed to be sablefish fishpot vessels.

Those trips which showed groundfish associated with the 'OPT' gear code required testing to distinguish true groundfish trips from those in which groundfish are caught incidentally to Dungeness crab. In these cases, when Dungeness crab and groundfish were landed jointly and more than 50 percent of the total trip poundage was groundfish, the trip was classified as a fishpot delivery. Apparently, vessels occasionally set crab pots and then fish for groundfish with fishpots on the same trip (Robert Demory, personal communication, Oregon Department of Fish and Wildlife).

Limited Entry Longline Fleet. The window limited entry longline fleet was selected by isolating all vessels which recorded groundfish landings with the following longline/setline/pole gear codes: longlines ('LGL'), setlines ('STL') and commercial poles ('POL'). The 'POL' gear code was required to identify the California longline fleet, which are generally coded as landing groundfish with 'POL' gear in that states' fish ticket file.

Because of variability in capability for identifying trips made with longline gear, three classes of longline trips were established:

1. Longline Trips — Any PacFIN 'LGL' coded trip (or in Washington and California 'STL' coded trip) excluding those in which salmon were landed.

2. Criteria–line Trips — Any PacFIN 'POL' coded or Oregon 'STL' coded trips in which more than 300 pounds of the catch is groundfish, or more than 225 pounds are sablefish, or more than 100 pounds are rockfish, excluding those trips in which salmon were landed.

3. Other Line Trips — Any PacFIN 'POL' coded or Oregon 'STL' coded trips in which 300 pounds or less of the catch is groundfish, and 225 pounds or less is sablefish, and 100 pounds or less is rockfish, excluding those trips in which salmon were landed.

Individual trips needed to be tested and reclassified when it was clear that longline gear was miscoded on fish tickets. First, when a trip showed salmon and groundfish landed together, regardless of the gear type, it was classified as a non–groundfish delivery. Second, those 'STL' trips which were landed in California and Washington were classified as longline. In Oregon, a 'STL' trip was classified as probable longline trips (criteria–line) when any one of the following "species criteria" conditions were satisfied: total groundfish exceeded 300 pounds, total sablefish exceeded 225 pounds, total rockfish exceeded 100 pounds; if none of the trip landing conditions were met, the trip was classified as other hook–and–line. Third, in the case of a 'POL' landing, the same species criteria test was applied. 'POL' trips were coded as criteria–line if they met the criteria and were otherwise coded as other line.

The species criteria test was developed by examining 1985–1987 trip records for vessels generally considered to be longline vessels; vessels with more than 1,000 pounds of sablefish or 1,000 pounds of rockfish during any 1 of the 3 years. Frequency distributions of numbers of trips by pounds per landing (where the species of interest was a major component of the catch––the catch was comprised of more than 50 percent of the species of interest) were examined for break points. A clear break was found only for sablefish. Since the break point for rockfish was not as clear, a less stringent criteria was used. For groundfish, the only meaningful break point would be above that set for rockfish or sablefish; therefore, a break point was sought in a lower part of the frequency distribution. The results showed that about:

- 95 percent of the trips where sablefish comprised more than half of the groundfish onboard, the amount of sablefish landed was greater than the 225 pound criterion;

- 75 percent of the trips where rockfish comprised more than half of the groundfish on board, the amount of rockfish landed exceeded the 100 pound criterion; and

- 85 percent of the trips where groundfish comprised more than half of the total catch, the amount of groundfish landed was greater than the 300 pound criterion.

Later analysis showed that the methodology for developing the numbers of days of landing requirement for the high and adopted MLR was not sensitive to the different groupings of line vessels (i.e., the same number of days requirement for longline vessels resulted regardless of whether the data included other line and criteria–line trips).

The gear and species criteria classification procedures used for all gears were arrived at after several LEADOC meetings. They were developed to allow for maximum flexibility in estimating who might qualify for a proposed limited entry program. The summarized trip data files reflect these decisions as accurately as possible.

Two extracts of the database were run. The first was carried out in the spring of 1990 and was the basis for development of the high MLR. After a change in personnel providing PacFIN database services, a second extract was carried out in the spring of 1991, reconstructing the procedures followed for the first extract. There were some differences between the two extracts. While the reasons for the differences between the two extracts are not clear, the differences do not result in significant changes in the analysis of impacts or the conclusions reached. Only Tables 4–17 through 4–19 in the final SEIS use the results from the first extract. The most important result of the differences between the extracts is in the MLR which would be derived if the MLR were based only on the second extract; and these differences are small. If the high MLR had been developed using the second extract, the high MLRs for whiting trawl and fishpot gear would have been somewhat higher, and hence fewer vessels would have qualified. The net effect of continuing to rely on the initial extract as the basis for the high MLRs is that it is expected that two more vessels may qualify on the basis of the whiting trawl MLR and eight vessels may qualify on the basis of the fishpot MLR than would be the case if the MLR were redeveloped on the basis of the second extract. Moreover, it is possible that the two trawl vessels which qualified on the basis of the whiting MLR may have already qualified on the basis of the non–whiting trawl MLR, so there may be no net difference in the number of trawl vessels qualifying.

15.2 Exempted Gear Analysis

An analysis of the effects of various trip limits on exempted gear vessels was carried out. Exempted gears were divided into four groups for analysis: shrimp trawl, salmon troll, all other net (other than groundfish trawl, shrimp trawl and dip net), and all other hook–and–line (other than longline and salmon troll). It is likely that many vessels making landings with a gear code of pole ('POL') will turn out to be exempted gear. Therefore, while these vessels were included under the limited entry analysis in the criteria–line and all line categories, they were also analyzed under the open access analysis under the other hook–and–line category.

Shrimp trawl was identified as all landings coded as shrimp trawl ('SHT', 'SST', 'DST'). Additionally, in California, many pink shrimp landings were coded as other trawl ('OTW'). Therefore, when there was pink shrimp landed on a day coded as 'OTW', it was assumed that all other species landed under the 'OTW' code on that day were landed with shrimp gear. A similar situation arose with California salmon landings, which are generally coded as 'POL', so a similar assumption was made; i.e., that all species landed under the 'POL' code on a day in which there was a salmon landing would count as being landed with troll ('TRL') gear. The following is a summary of the PacFIN gear codes used to identify exempted gear vessels.

Shrimp Trawl:	SHT, SST, and DST together with OTW on a day in which shrimp are landed.
Salmon Troll:	TRL together with POL on a day in which salmon are landed.
Other Net:	GLN (gillnet), TML (trammel net), ONT (other net) and SEN (seine)

Other Hook-and-Line: HDL (handline), DRL (drop line), JIG (jig), and OHL (other hook-and-line) together with POL (except POL on a day in which salmon are landed).

All records for every vessel with landings from the codes indicated above were extracted to form the dataset for the analysis of the exempted gear fishery.

In analyzing the effects of hypothetical trip limits on the income of exempted gear trips, it was assumed that all of a vessel's records for a given day were generated from a single trip and the per pound value of any amount of fish discarded as a result of the hypothesized trip limit would be equal to the average per pound value of the vessel's catch for that day. In reality, if a vessel were to accidently go over a trip limit, it is likely that the average price of those fish discarded would be somewhat lower than the average price of those landed (i.e., faced with discarding dead fish to meet a trip limit, a fisherman would likely discard the less valuable individual fish). Thus, the reduction in trip income from a trip limit would be somewhat less than indicated by the analysis.