Description of the Gulf Shrimp System Database

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Gulf Shrimp System (GSS)

This provides an overview of procedures used to collect fishery statistics for the shrimp fisheries in the Gulf of Mexico.Information about the structure of the data in the ORACLE tables will assist users with accurate use of the Gulf shrimp statistics.

Procedures and Table Structure

The Southeast Fisheries Science Center's (SEFSC) data collection program for shrimp statistics only includes the commercial harvesting sector. The Gulf shrimp statistics do not include shrimp that are caught by recreational shrimpers for personal or family consumption. Similarly, the SEFSC program does not include the catches by small, part-time commercial fishermen that sell their catches along the roadside as a means of supplementing their personal income. In addition, this program does not include data on catches of illegal or small shrimp that are discarded at sea.

The Role of the Port Agent

Shrimp statistics are collected by port agents that are located in coastal ports along the Gulf of Mexico. Currently, there are 24 port agents employed by either state or Federal agencies that are participating in the SEFSC Gulf shrimp program.

Data Sources

Data for the Gulf shrimp program are collected from two sources, and as such can be generalized into two categories. Data on the amount and value of the shrimp are collected from seafood dealers and because these shrimp are the ones that are actually unloaded or landed at the dealers, they are referred to as "landings" data. The second type of data includes detailed information on fishing effort and location for an individual trip and is collected by interviewing either the captain or a member of the crew. Consequently, data in this category are referred to as "interview" data.

Because only one port agent is responsible for a specific geographical area, they collect the landings statistics, as well as interview the fishermen for effort and location information. Consequently, it is the port agent's responsibility to assure that the right effort and location information is associated with the landings data from the same trip. This procedure also guards against the possibility of double counting that could occur if more than one individual were collecting the data in the same geographical area.

Because the fishing trip is the basic data collection or sampling

unit, the fundamental principle of the data collection procedures is to collect both landings and interview data on a trip-by-trip basis. However, because the number of fishing trips that occur in the Gulf shrimp fishery is so large, it is impossible for a record to be made of every single fishing trip. Consequently, the data collection procedures include two modifications to this principle.

The first modification is that the port agents are only required to record landings statistics for individual fishing trip that are made by large vessels that fish offshore. In contrast, the port agents combine the landings statistics and record only monthly totals for the pounds, value and number of trips for trips that are in inshore areas by smaller boats. This consolidation is also used for trips that are made in offshore areas, but the vessel name or number was not available from the dealer's records.

The second modification is that the port agents only conduct interviews with a sample of the vessels that fish offshore. The intent of the sampling protocol is to select a few individuals that are representative of the total population and collect the needed information from the sample rather than the entire population. The logistics of fishing, however, make it impossible for the port agents to perform interviews that are selected representatively. Most of the time the port agents do not know where and when vessels are going to land, so specific vessels cannot be targeted in advance for selection. As a result, the port agents are instructed to regularly visit the docks in their assigned areas and interview vessel captains as the opportunity arises. If there are more vessels in port than can be interviewed, the agents are instructed to select the vessels by a "random" process, thus trying to avoid as much systematic bias as they can, i.e., always interviewing the same vessels, at the same port, etc.

In Summary

The port agents visit shrimp dealers in their assigned areas and collect landings statistics for individual fishing trips for all of the vessels that fish offshore, and can be identified. For a sample of these trips, the port agents interview a crew member to collect fishing effort and location information. For inshore fishing trips, the port agents combine the landings statistics for all of the trips that were made by the smaller, undocumented boats.

The Objective

The objective of the data collection program for Gulf shrimp statistics is to provide catch, value, area caught and effort data for individual commercial fishing trips. Although this objective is never totally achieved, the SEFSC's data do provide

the most comprehensive data on offshore, commercial catches, the majority of which are for individual trips.A discussion of the important aspects of the structure of the computer files in which these data are stored follows.

Types of Records

There are three different types of records in the Gulf shrimp database - dealer, interview and consolidated records.

The code that designates the type of record is located in the element labelled, RECORD_TYPE.

The types are:

•Dealer records
These records contain data collected from seafood dealers and are identified by a "T" in the record type field (a "0" is used in the 1961-1977 shrimp files).These data provide the amount of landings, the value paid to the fishermen (i.e., ex-vessel price), the official number of the vessel that landed the catch (if available), the type of grading, the species, size of shrimp, and type of gear. Port agents also include their opinion or the dealer's opinion of the location and depth where the shrimp were caught.

•Interview records
These records are identified by an "S" in the record type field (a "1" is used in the 1961- 1977 shrimp files) and contain the same information as the dealer records, except that information on fishing effort is included. Port agents interview the vessel captain or someone on board who is knowledgeable about the fishing trip to determine the fishing location or locations and the amount of fishing effort expended on the trip. Fishing effort is measured as the hours that the trawls are in the water fishing. The hours of reported fishing time are divided by 24 and this quotient to the tenth is stored in the DAYS_FISHED field.

•Consolidated records
Port agents sometimes combine information from more than one fishing trip into a single 'consolidated' schedule. Consolidated records are used for inshore fishing trips made by small boats that are not documented (i.e., less than 5 net tons) or for trips offshore where the vessel identification number was not recorded by the dealer. Consolidated records are coded as a Dealer record ("T" or "0") and are also identified by the following coding scheme in the Official Number field. The first four characters of the official number are 9s, i.e., the VESSEL_NUMBER field. The fifth character is coded with an 8 if the trip was made by a vessel or a 9 if the trip was made by a boat. The last character is used to identify the state in which the trip was landed (i.e.,

Florida west coast, 5; Alabama, 6; Mississippi, 7; Louisiana, 9; and Texas, 8). Shrimp statistics, in computerized form, are available beginning with 1956. Data from 1956 to the present are kept online in an ORACLE database as part of the Southeast Fisheries Information Network (SEFIN). The table structure for the main GSS data table is presented in table 1.

Historical Data Collection Procedures

The shrimp data collection procedures were changed in 1978 in several ways. The vessel identification number (i.e., the Coast Guard documentation number) was not included in dealer records. All dealer records were coded with 9's in the vessel identification field. The vessel identification number was recorded when an interview was conducted, and it was also included on the interview records. Another change that was implemented at this time was to record only the month in which the trip occurred, instead of the month and day.

In 1981, these procedures were discontinued and the pre-1978 procedures were re-implemented, i.e., the former method of recording the vessel identification number and the month and day when the trip was unloaded for both dealer and interview records.

Pounds and value for the shrimp catches are collected by size, although the data collection procedures have changed over the years. Prior to 1984, all landings were grouped into a standard set of eight market or size categories (i.e., <15, 15-20, 21-25, 26-30, 31-40, 41-50, 51-67, and >68 shrimp count per pound). In 1984, port agents began recording the landings data in the size ranges in which the shrimp were purchased by dealers.

In addition to changes in size ranges, more detailed information on fishing effort were collected beginning in 1984. This change included the addition of data on the number of trawls, the size of trawls, the period of the day that the shrimping occurred (i.e., day or night), and the actual number of hours fished.

As a result of the changes that were made in the data collection procedures over the years, the file structures had to be changed as well. Fortunately, all of the various file structures are accounted for in the ORACLE database management system for SEFIN. All of the data in SEFIN have the same format and are stored in a single table starting with data from 1984. Earlier data from 1961 through 1983 will be added at a later time.

Because the original shrimp files were maintained in a fixed record format, multiple computer records for a single fishing trip usually occur. For example, if fishing occurred only in one area, only one species of shrimp were caught, and the shrimp were all the same size (i.e., in the same market category), then only one record would be required. However, where there are different species or sizes of shrimp caught, in different areas, etc.,

multiple records were required for each trip. Thus, if the shrimp data are used in a fixed record format, it is essential that all records associated with a single trip be identified and used properly.

There are several fields that should be used to identify the records associated with a fishing trip. A number is recorded on each shrimp schedule that port agents prepare; however, this number is not unique for the entire Gulf of Mexico. The schedule number is only unique for a given port and month (the month in the date of landing field. A suggested means of associating all of the records with a single fishing trip is to sort the data by port, month and schedule number, and as an additional assurance the official number can be used in the sort.

Because the data on pounds and value are disaggregated for each record, totals for pounds and value for a specific species, port, area of fishing, etc. can be accomplished by simply adding all of the data in the respective fields. However, determining the number of fishing trips and the amount of fishing effort (i.e., days fished) is more complicated.

Data on the number of trips are provided in the NUMBER_OF_TRIPS field and is always 1 for unconsolidated records. As discussed above, port agents may combine the information for several trips into a consolidated record. In this case, the value entered in the Trip field would be the number of trips combined by the port agents in the respective schedule. The number of trips is not provided on every computer record; it is only provided on one of the records for each trip. Thus, the user must be careful to associate all of the computer records for a specific trip in order to assure that the correct numbers of trips for the desired analysis are counted.

Avoid Double Counting

Care must be taken when trip information is needed that requires records for a single trip to be split. For example, if an analysis of white shrimp is being done and the number of fishing trips on which white shrimp were caught is needed, the analyst has to make sure that the trips on which fishermen caught both brown and white shrimp are counted. It is possible that the number of trips is recorded on a brown shrimp record and not a white shrimp record and unless special provisions are made, the number of trips on which white shrimp were caught could be under-counted. Furthermore, care must be taken, because double counting of trips can occur if the number of trips is calculated separately for several species and then added together without an accurate accounting of the number of trips on which more than one species were caught.

Calculating the number of days fished has a different type of problem associated with it. As described above, information on

the number of days fished is only provided on "Interview" records.Because interviews are conducted for only a sample of the fishing trips, the number of days fished must be estimated by expanding the sample information to the total universe that is desired. For example, if the total number of days fished is needed for shrimp caught off the coast of Texas, this number would have to be estimated by expanding the days fished information on the interview records to the total records for all shrimp caught in areas off the coast of Texas.

Because different assumptions can be made to accomplish whatever expansions are needed, it is possible that different analysts could calculate different estimates of days fished for essentially the same research question. It is important that users understand the structure of this file and utilize well-conceived assumptions when estimating days fished. A method of estimating directed fishing effort for individual species of shrimp is presented in Nichols,1984.

Literature Cited

Nichols, S. 1984. Updated assessment of brown, white, and pink shrimp in the U.S. Gulf of Mexico. Southeast Fisheries Center, Miami, Florida. 21 p.

Table 1. Format and variables in the GSS.GULF_SHRIMP_YY_YY tables, where YY_YY is a range of years.

COLUMN_NAME	DATA_TYPE	NULLABLE	COLUMN_ID	COMMENTS
PORT	NUMBER(2,0)	Yes	1	Port of landing.
VESSEL_NUMBER	NUMBER(7,0)	Yes	2	Official Coast Guard Vessel Number. This column may also contain a number other than a vessel id, in which case the record represents consolidated trips. For consolidated trips, the first four characters of the VESSEL_NUMBER are 9s, the fifth character
STATE_VESSEL_ID	VARCHAR2(10 BYTE)	Yes	3	Official State Boat Registration Number for boats that are registered as a state boat
DEPARTURE_MONTH	NUMBER(2,0)	Yes	4	Trip Departure Month
DEPARTURE_DAY	NUMBER(2,0)	Yes	5	Trip Departure Day
DEPARTURE_YEAR	NUMBER(4,0)	Yes	6	Trip Departure Year. (4 character)
DEPARTURE_DATE_CONV	DATE	Yes	7	Departure Date as a Date value when it is possible to contsruct the date value.
UNLOAD_MONTH	NUMBER(2,0)	Yes	8	Trip Unload Month
UNLOAD_DAY	NUMBER(2,0)	Yes	9	Trip Unload Day
UNLOAD_YEAR	NUMBER(4,0)	Yes	10	Trip Unload Year. (4 character)
UNLOAD_DATE_CONV	DATE	Yes	11	UNLOAD_DATE converted to DATE type. See DEPARTURE_DATE_CONV for retrieval suggestions.
RIVER_CODE	NUMBER(1,0)	Yes	12	Corresponds to first digit of the Water Body Code

GRID_CODE	NUMBER(2,0)	Yes	13	Corresponds to the second and third positions of the Water Body Code
SHORE_CODE	NUMBER(1,0)	Yes	14	Corresponds to the fourth position of the Water Body Code
DEPTH	NUMBER(2,0)	Yes	15	Code that represents depths in 5 fathom increments. Valid codes for this column can be found in the table GSS_DEPTH.
DAYS_FISHED	NUMBER(6,1)	Yes	16	Number of days fished measured in 24 hours of fishing.
NUMBER_OF_TRIPS	NUMBER(3,0)	Yes	17	Number of trips associated with the shrimp catch.
TYPE_OF_GRADING	NUMBER(1,0)	Yes	18	Type of grading, whether done by box or machine.
SPECIES_CODE	NUMBER(1,0)	Yes	19	Species of shrimp caught. Valid codes for this column can be found in the table SPECIES_CODE_GSS.
SIZE_CLASS_RANGE_BEGIN	NUMBER(3,0)	Yes	20	Beginning of the size range.
SIZE_CLASS_RANGE_END	NUMBER(3,0)	Yes	21	Ending of the size range.
POUNDS	NUMBER(8,0)	Yes	22	Pounds of shrimp landed.
VALUE	NUMBER(8,0)	Yes	23	Dollar value of shrimp landed.
AVERAGE_PRICE_PER_POUND	NUMBER(6,2)	Yes	24	Average price per pound of shrimp.
CONDITION_OF_LANDING	NUMBER(1,0)	Yes	25	Indicates whether the shrimp were landed with their heads on, off or a combination of the two.
RECORD_TYPE	VARCHAR2(1 BYTE)	Yes	26	Indicates whether the information was provided by a dealer (T) or whether it was an interview (S)
SCHEDULE_NUMBER	NUMBER(4,0)	Yes	27	Number appearing on the GSS form.

DEALER_CODE	VARCHAR2(9 BYTE)	Yes	28	Dealer code.
DEPARTURE_PORT	NUMBER(2,0)	Yes	29	Port of departure. Valid codes for this column can be found in the table GSS_PORTS_SE.
TRAWL_SIZE	NUMBER(2,0)	Yes	30	Size of trawl head rope in feet.
NUMBER_OF_TRAWLS	NUMBER(1,0)	Yes	31	Number of trawls pulled by vessel.
RETURN_DATE	VARCHAR2(8 BYTE)	Yes	32	Date on which the vessel returned in character type, format MMDDYY.
RETURN_DATE_CONV	DATE	Yes	33	Date on which the vessel returned in DATE format.
NIGHT_EFFORT_HOURS	NUMBER(3,0)	Yes	34	Hours of fishing effort at night (1830-0630)
NIGHT_EFFORT_BROWN	NUMBER(1,0)	Yes	35	Night effort for brown shrimp.
NIGHT_EFFORT_PINK	NUMBER(1,0)	Yes	36	Night effort for pink shrimp.
NIGHT_EFFORT_WHITE	NUMBER(1,0)	Yes	37	Night effort for white shrimp.
NIGHT_EFFORT_OTHER	NUMBER(1,0)	Yes	38	Night effort for all other species.
DAY_EFFORT_HOURS	NUMBER(3,0)	Yes	39	Hours of fishing effort during the day (0630 - 1830.)
DAY_EFFORT_BROWN	NUMBER(1,0)	Yes	40	Day effort for brown shrimp.
DAY_EFFORT_PINK	NUMBER(1,0)	Yes	41	Day effort for pink shrimp.
DAY_EFFORT_WHITE	NUMBER(1,0)	Yes	42	Day effort for white shrimp.

DAY_EFFORT_OTHER	NUMBER(1,0)	Yes	43	Night effort for all other species.
NIGHT_DAY_EFFORT_HOURS	NUMBER(3,0)	Yes	44	Fishing effort during night and day.
NIGHT_DAY_EFFORT_BROWN	NUMBER(1,0)	Yes	45	Fishing effort during night and day for brown shrimp.
NIGHT_DAY_EFFORT_PINK	NUMBER(1,0)	Yes	46	Fishing effort during night and day for pink shrimp.
NIGHT_DAY_EFFORT_WHITE	NUMBER(1,0)	Yes	47	Fishing effort during night and day for white shrimp.
NIGHT_DAY_EFFORT_OTHER	NUMBER(1,0)	Yes	48	Fishing effort during night and day for other species.
GEAR_CODE	NUMBER(1,0)	Yes	49	Type of gear used during fishing trip. A list of valid gear codes can be found in GEAR_CODE_GSS (GSS_GEARS.)
ADD_DELETE_CODE	VARCHAR2(1 BYTE)	Yes	50	Code used to indicate whether rows should be added or deleted. This column is no longer used and is being kept for historical reasons. It will be removed in the future.
CREW	NUMBER(1,0)	Yes	51	Number of crew members reported for the trip.
TEDS	NUMBER(1,0)	Yes	52	Used to indicate whether TEDs where observed. This column is currently not used.
BLANK	VARCHAR2(2 BYTE)	Yes	53	A column that represents a blank space in the historical records. These "blank" columns will be kept until the historical data have been reviewed because there have been cases were unidentified information were found.
SOURCE_FILE	VARCHAR2(20 BYTE)	Yes	54	The data file containing this record that was loaded
TRIP_TICKET_NUMBER	VARCHAR2(10 BYTE)	Yes	55	The state trip ticket number associated with this record. This was added in 2004
OLD_DEALER_CODE	VARCHAR2(9 BYTE)	Yes	56	Keeps The old Dealer Code that was on the record prior to the changing of Dealer Codes which was done in 2001

FORM_VERSION	VARCHAR2(8 BYTE)	Yes	57	needed for trip identification (added 9/15/06)