Pacific Fisheries Information Network

West Coast At-sea Whiting Fishery: Comprehensive NPAC Table

Date	Author	Change Comments	Version
12/03/2012	Ames		1.0
05/20/2013	Ames	Changed ex-vessel value estimation process and updated sections and column descriptions	1.1
05/23/2013	Ames	Excluded all marine mammal data and expansion estimates of seabirds.	1.2
10/13/2014	Ames	Transformed the NPAC4900_SPCOMP table into the new COMPREHENSIVE_NPAC. This includes additional value-added fields, logic, and PacFIN translations.	2.0

Subject

The goal of this project is to have one standardized data set for reporting landings of all species and hauls in the West Coast at-sea whiting fishery for analyses including inseason management. Further, the goal is to include value-added fields, such as ex-vessel value, for retained catch of Pacific whiting along with translations of NORPAC species, areas, and vessels to corresponding West Coast codes and fishery sectors.

Background

PacFIN's new database table called "COMPREHENSIVE_NPAC" combines (1) the "current" tables from NORPAC which include raw catch data, and (2) the "debriefed" tables which include the edited, but delayed catch data. There are slight differences between these tables since one table is the raw data and the other is the edited data. In addition the COMPREHENSIVE_NPAC table, provides a standard approach is used to estimate species composition of catch from unsampled hauls. The data set is refreshed daily and partitioned on year (i.e., PACFIN_YEAR) with indexes local to each partition to increase the performance of data queries. Furthermore, this data set will replace all other at-sea whiting sources and will be the source for all future analyses and reporting. This data set is available to confidential users through SQL developer/Toad/Putty, Oracle R, and soon through Answers (Table 1). For non-confidential users these data will be available through interactive web-based summaries on PacFIN's website.

This table should not be used to estimate marine mammal and seabird catches. Therefore all marine mammal catches have been excluded. However, seabird sample data are available, but are explicitly excluded from the expansion calculations.

Methodology

Unsampled Hauls: Species Catch Weights

Species catch weights are estimated for unsampled hauls by multiplying the "official total catch" (OTC) from the unsampled hauls by species proportions derived from sampled hauls. To do this, sampled hauls for each vessel are aggregated at different levels, (1) daily, (2) weekly, and (3) monthly. Additionally, sampled hauls for all vessels are aggregated at the (4) monthly level, which is the highest level of aggregation (i.e., fleet-level aggregation).

Next, species proportions are calculated from the combined sampled hauls at each level of aggregation (e.g., daily, weekly, etc.). Finally, for each vessel, the date of a given unsampled haul is matched to the day, week, or month in each aggregation. The matching begins at the lowest level of aggregation (i.e., day) and is completed when the aggregation contains five or more sampled hauls. The estimation approach attempts to balance the need for using an adequate sample size (n ≥ 5) along with data from similar times and areas.

For example, a vessel had 1 unsampled haul on a given day, 4 sampled hauls during that same day, 10 sampled hauls during that same week, and 25 sampled hauls during that month. The species catch weights from the unsampled haul would be estimated from the weekly data since the daily aggregation did not met the minimum sample size of 5. The species proportions from the sampled hauls would be applied to the unsampled OTC to derive the species catch weights.

Additional rules were applied for hauls in the 1990s to reduce the matches at the lower aggregations for years when observer coverage was low. These rules were introduced to prevent the effect of a small number of sampled hauls impacting estimates of species composition for a large number of unsampled hauls. Only monthly aggregated levels were matched for unsampled hauls in 1990 through 1997, and weekly and monthly for 1998 through 2000. Only after 2000 are daily aggregated levels matched to unsampled hauls when the above criteria are met.

Unsampled Hauls: Species Catch Numbers

The process to estimate species catch numbers for unsampled hauls relies on the method listed above except for a few additional steps. Once the species composition catch weights are estimated for unsampled hauls then those weights are divided by an average weight in order to calculate the number of species. An average weight for each species caught is calculated for all the aggregated levels listed above, which is accomplished by dividing the observers' sampled weights by the observers' sampled number for each species.

Sampled and Unsampled Hauls: Species Retained Weights

For sampled hauls, the species retained weights are calculated by multiplying the observers' percent retained value by the observers' species catch weights for each haul. However, for unsampled hauls, the percent retained is unknown because there is no sample data. For unsampled hauls, the process to estimate retained weights relies on the method listed above except for a few additional steps. First, an estimated percent retained value is derived by calculating a weighted average of all percent retained values for each species from the sampled hauls at each of the aggregation levels described above. The percent retained weighted average is multiplied by the species catch weight for the unsampled hauls, which provides an estimated retained weight.

Ex-vessel Value estimates for Pacific Whiting

Ex-vessel value estimates for retained catch of Pacific whiting in the at-sea sectors are calculated from the COMPREHENSIVE_FT table (i.e., shoreside landings). To do this, fish tickets are first filtered on disposition equal to "H", and Dahl groundfish code = "03" (i.e., shoreside whiting trawl sector), which includes these filters: (a) removal type not equal to "R" (research), (b) whiting catch that is greater or equal to 50% of total catch, (c) trawl gear, and (d) trawl vessels with a valid trawl endorsement.

Next, Pacific whiting price per pound values from these landings are aggregated by (1) species (PACFIN_SPECIES_CODE), area (PACFIN_CATCH_AREA_CODE), month (LANDING_MONTH), and year (PACFIN_YEAR), (2) species, month, and year, (3) species, quarter, and year, and finally (4) species and year. Then, shoreside price per pound values in each aggregation level are matched to at-sea whiting catches. The matching begins at the lowest level of aggregation (i.e., species, area, month, and year) and is completed when an aggregation level contains > 2 fish tickets. Once the match is made, the price per pound (converted to price per metric ton) is multiplied by the retained weight of Pacific whiting, providing an estimated ex-vessel value. Incidental catches (i.e., non-whiting species) are not priced.

Table 1. NPAC4900_SPCOMP table columns and descriptions

Column	Column Description
LANDING_YEAR	Year is extracted from the haul rettrv_date_time field.
LANDING_MONTH	Month is extracted from the haul rettrv_date_time field.
LANDING_DAY	Day is extracted from the haul rettrv_date_time field.
HAUL_DATE	Date of haul retrieval.
ALASKA_PERMIT	Unique Code identifying a Vessel or Processor - inherited from the NORPAC data set and created by the RAM division in Juneau.
HARVEST_SECTOR	This field marks if the processor is a federal catcher processor "CP", or a federal mothership "MS". Logic: CASE WHEN CATCHER_NUM IS NULL THEN 'CP' ELSE 'MS' END
SECTOR	Fishery sector derived from the following logic: CASE WHEN SECTOR IN ('MAKAH TRIBE', 'QUILEUTE TRIBE') THEN 'TRIBAL' ELSE SECTOR END
TRIBAL_GROUP	This field marks the associated tribal group. Logic: CASE WHEN SECTOR IN ('MAKAH TRIBE', 'QUILEUTE TRIBE') THEN SECTOR ELSE NULL END
PARTICIPATION_GROUP_CODE	The Participation group. Logic: CASE WHEN SECTOR IN ('MAKAH TRIBE', 'QUILEUTE TRIBE') THEN 'I' ELSE 'C' END
PARTICIPATION_GROUP_NAME	The Participation group description. Logic: CASE WHEN SECTOR IN ('MAKAH TRIBE', 'QUILEUTE TRIBE') THEN 'TREATY INDIAN COMMERCIAL FISHER' ELSE 'NON-INDIAN COMMERCIAL FISHER' END
PROCESSOR_REGISTRATION_ID	Vessel identifier that links processors from the vessel registrations table to COMPREHENSIVE_NPAC table.
PROCESSOR_ADFG_NUM	A unique number assigned to vessels that have be registered with Alaska Commercial Fisheries Entry Commission (CFEC). This field is obtained from the NORPAC.VESSEL_CODES table and is the ADFG number of the Processor.
PROCESSOR_NUM	This attribute records the Coast Guard documentation number of the processor which was obtained from the NORPAC.VESSEL_CODES table and was validated by PacFIN using AKFIN's vessel translation table "AKFIN_VESSEL".

PROCESSOR_VESSEL_ID	Vessel identifier created by PacFIN. These are unique numbers assigned to vessels and come from PACFIN_FOUNDATION.VESSEL_REGISTRATIONS table
CATCHER_REGISTRATION_ID	Vessel identifier that links catcher vessels from the vessel registrations table to COMPREHENSIVE_NPAC table.
CATCHER_ADFG_NUM	If this haul was delivered to a mothership or catcher processor, this attribute records the unique number assigned to vessels that have be registered with Alaska Commercial Fisheries Entry Commission (CFEC).
CATCHER_NUM	If this haul was delivered to a mothership or catcher processor, this attribute records the Coast Guard documentation number of the catcher vessel which was obtained from the NORPAC.VESSEL_CODES table and was validated by PacFIN using AKFIN's vessel translation table "AKFIN_VESSEL".
CATCHER_VESSEL_ID	If this haul was delivered to a mothership or catcher processor, this attribute records the vessel identifier created by PacFIN. These are unique numbers assigned to vessels and come from PACFIN_FOUNDATION.VESSEL_REGISTRATIONS table
OBS_CRUISE	Sequence generated by Norpac and supplied to the observer as an unique identifier for an observer cruise record.
OBS_HAUL	Number which is entered by the observer identifying a unique haul within a trip.
UNIQUE_HAUL_ID	This identifies all unique hauls. Logic: TRIM(PROCESSOR_OBS_NUM || OBS_CRUISE || OBS_HAUL || LANDING_YEAR || LANDING_MONTH || LANDING_DAY)
NORPAC_SPECIES_CODE	Unique identifier for a species imported from Norpac
NORPAC_SPECIES_COMMON_NAME	Species common name, which was translated using PacFIN's NORPAC_PACFIN_SP table.
PACFIN_SPECIES_CODE	PacFIN species identifier translated using PacFIN's NORPAC_PACFIN_SP table and
PACFIN_SPECIES_COMMON_NAME	PacFIN Species common name, which was translated using PacFIN's NORPAC_PACFIN_SP table and PACFIN_FOUNDATION.PACFIN_SPECIES_CODES
PACFIN_SPECIES_SCIENTIFIC_NAME	PacFIN Species scientific name, which was translated using PacFIN's NORPAC_PACFIN_SP table and PACFIN_FOUNDATION.PACFIN_SPECIES_CODES

MANAGEMENT_GROUP_CODE	PacFIN Species management group code, which was translated using PacFIN's NORPAC_PACFIN_SP table and PACFIN_FOUNDATION.PACFIN_SPECIES_CODES
COMPLEX	PacFIN Species management group code, which was translated using PacFIN's NORPAC_PACFIN_SP table and PACFIN_FOUNDATION.PACFIN_COMPLEX_CODES
COMPLEX2	PacFIN Species management group code, which was translated using PacFIN's NORPAC_PACFIN_SP, PACFIN_FOUNDATION.PACFIN_SPECIES_CODES, and PACFIN_FOUNDATION.SPECIES_COMPLEXES tables.
COMPLEX3	PacFIN Species management group code, which was translated using PacFIN's NORPAC_PACFIN_SP, PACFIN_FOUNDATION.PACFIN_SPECIES_CODES, and PACFIN_FOUNDATION.SPECIES_COMPLEXES tables.
COMPLEX4	PacFIN Species management group code, which was translated using PacFIN's NORPAC_PACFIN_SP, PACFIN_FOUNDATION.PACFIN_SPECIES_CODES, and PACFIN_FOUNDATION.SPECIES_COMPLEXES tables.

PACFIN_CATCH_AREA_CODE	PacFIN area codes. This was derived from the following logic:
	
	`CASE WHEN TRIM(hl.retrv_latitude) BETWEEN 3230 AND 3600 THEN '1A'`
	`     WHEN TRIM(hl.retrv_latitude) BETWEEN 3601 AND 4030 THEN '1B'`
	`     WHEN TRIM(hl.retrv_latitude) BETWEEN 4031 AND 4200 THEN '1C'`
	`     WHEN TRIM(hl.retrv_latitude) BETWEEN 4201 AND 4250 THEN '2A'`
	`     WHEN TRIM(hl.retrv_latitude) BETWEEN 4251 AND 4418 THEN '2B'`
	`     WHEN TRIM(hl.retrv_latitude) BETWEEN 4419 AND 4520 THEN '2F'`
	`     WHEN TRIM(hl.retrv_latitude) BETWEEN 4521 AND 4546 THEN '2E'`
	`     WHEN TRIM(hl.retrv_latitude) BETWEEN 4547 AND 4720 THEN '3A'`
	`     WHEN TRIM(hl.retrv_latitude) BETWEEN 4721 AND 4900 THEN '3B'`
	`  ELSE NULL END`

PACFIN_CATCH_AREA_DESCRIPTION	PacFIN area description was obtained from the PACFIN_FOUNDATION.PACFIN_CATCH_AREA_CODES table after the PacFIN catch area code was derived.

INPFC_SUBAREA_TYPES	PacFIN area code. This was derived from the following logic:
	
	`  CASE WHEN hl.retrv_latitude BETWEEN 3230 AND 3600 THEN 'CONCEPTION'`
	`       WHEN hl.retrv_latitude BETWEEN 3601 AND 4030 THEN 'MONTEREY'`
	`       WHEN hl.retrv_latitude BETWEEN 4031 AND 4300 THEN 'EUREKA'`
	`       WHEN hl.retrv_latitude BETWEEN 4301 AND 4730 THEN 'COLUMBIA'`
	`       WHEN hl.retrv_latitude BETWEEN 4731 AND 4900 THEN 'VANCOUVER'`
	`   ELSE NULL END`

COUNCIL_CODE	PacFIN council code was obtained from the PACFIN_FOUNDATION.PACFIN_CATCH_AREA_CODES table after the PacFIN catch area code was derived.

LOCATION	Identifies whether the information in a haul is based on retrieval or delivery (as in a mothership).
LATDD_START	Latitude decimal degrees is computed from the deployment latitude.
LONDD_START	Longitude decimal degrees is computed from the deployment longitude.
LATDD_END	Latitude decimal degrees is computed from the retrieval latitude.
LONDD_END	Longitude decimal degrees is computed from the retrieval longitude.
LATDD_AVERAGE	The average latitude decimal degrees is computed from the deployment and retrieval latitude. Logic: NVL((spc.latdd_start + spc.latdd_end)/2, spc.latdd_end)
LONDD_AVERAGE	The average longitude decimal degrees is computed from the deployment and retrieval longitude. Logic: NVL((spc.londd_start + spc.londd_end)/2, spc.londd_end) AS
FISHING_DEPTH_FATHOMS	Average fishing depth recorded by the observer from the vessel log.
BOTTOM_DEPTH_FATHOMS	Average bottom depth recorded by the observer from the vessel log.
DEPLOYMENT_DATE	Date and time of gear deployment
RETRIEVAL_DATE	Date and time of gear retrieval.
HAUL_DURATION	Duration of a haul.
PACFIN_GEAR_CODE	PacFIN gear code
PACFIN_GEAR_DESCRIPTION	PacFIN gear description obtained from the PACFIN_FOUNDATION.PACFIN_GEAR_CODES table.

GEAR_PERFORMANCE	Unique performance code for a gear type. See ATL_LOV_gear_perfomrance. This was translated for PacFIN users using the following logic:
	
	CASE WHEN TO_CHAR(hl.performance) = '1' THEN 'NO PROBLEM'
	        WHEN TO_CHAR(hl.performance) = '2' THEN 'CRAB POT IN HAUL'
	        WHEN TO_CHAR(hl.performance) = '3' THEN 'NET HUNG (BACKED DOWN)'
	        WHEN TO_CHAR(hl.performance) = '4' THEN 'NET RIPPED'
	        WHEN TO_CHAR(hl.performance) = '5' THEN 'OTHER PROBLEM'
	        WHEN TO_CHAR(hl.performance) = '6' THEN 'GEAR LOST'

	WHEN TO_CHAR(hl.performance) = '9' THEN 'FISHING DURNATION AFFECTED' ELSE TO_CHAR(hl.performance) END
PERCENT_RETAINED	Percent of this species that was retained from the total catch. This is an observer estimate for the sampled hauls, but for unsampled hauls this is derived by calculating a weighted average of all percent retained values for this species from the sampled hauls at the given aggregation level, which is shown in the "ACCUMULATED_BY" field.
CATCH_WEIGHT_MTONS	Weight of a species extrapolated to the haul and converted to MT. This is an observer estimate for the sampled hauls, but for unsampled hauls this is derived by multiplying the "official total catch" (OTC) from the unsampled hauls by species proportions derived from sampled hauls at the given aggregation level, which is shown in the "ACCUMULATED_BY" field.
RETAINED_WEIGHT_MTONS	This is derived by multiplying the "PERCENT_RETAINED" field by the "CATCH_WEIGHT" field.
CATCH_WEIGHT_LBS	Weight of a species extrapolated to the haul and converted to lbs. This is an observer estimate for the sampled hauls, but for unsampled hauls this is derived by multiplying the "official total catch" (OTC) from the unsampled hauls by species proportions derived from sampled hauls at the given aggregation level, which is shown in the "ACCUMULATED_BY" field. Logic: (CATCH_WEIGHT_MTONS * 2204.62262)
RETAINED_WEIGHT_LBS	This is derived by multiplying the "PERCENT_RETAINED" field by the "CATCH_WEIGHT" field, and converting to lbs. (RETAINED_WEIGHT_MTONS * 2204.62262)
CATCH_NUMBER	Number of a species extrapolated to the haul. For unsampled hauls the species number is estimate by the derived catch weights divided by an average weight. The average weight is obtained by dividing the Observers' sampled weights by the Observers' sampled number for this species at the given aggregation level, which is shown in the "ACCUMULATED_BY" field.
EXVESSEL_REVENUE	The estimated ex-vessel value of Pacific whiting. These estimates are based on shoreside landings from dahl groundfish code = "03".
PRICE_PER_POUND	The estimated ex-vessel price per pound based on shoreside landings from dahl groundfish code = "03".
EXVESSEL_REVENUE_CODE	This field shows the level of aggregation that was needed to estimate the ex-vessel value of Pacific whiting.

PACFIN_YEAR	Year is extracted from the haul rettrv_date_time field. The table is partitioned on this field.
DAHL_GROUNDFISH_CODE	This field contains numeric codes identifying groundfish "sectors." These sectors are meant to identify landings according to fishery components, or sectors, used in management. Sectors are defined through a combination of species composition of landings, gear type, and permit status, among other factors.
ACCUMULATED_BY	Identifies whether the haul was sampled or not. If the haul was not sampled this field would show the level of aggregation that was used to calculate the species composition metrics.
PACFIN_VDATE	Version date. What date the PL/SQL package was executed.
NPAC4900_UID	Matching ID code, which is used in the PL/SQL package for matching at-sea catches to shoreside prices.