Explicit Retrieval and Processing of PacFIN Data Used in Groundfish Mortality Estimation

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Somers, K.A., M. Bellman, J. Jannot, N. Riley, and J. McVeigh. 2014. Estimated discard and catch of groundfish species in the 2013 U.S. west coast fisheries. NOAA Fisheries, NWFSC Observer Program, 2725 Montlake Blvd E., Seattle, WA 98112.

The basic protocol we employ (using Oracle SQL Developer and R) is as follows:

- Using Oracle SQL developer, retrieve 2002 – year before present from View created from PacFIN Comprehensive Table.Output an initial data file (.csv file).
- Post-process the PacFIN data internally by WCGOP staff.
- Utilize post-processed PacFIN data files in WCGOP analyses/groundfish mortality (GM) reporting.

Prior to PacFIN fish ticket data retrieval (from PacFIN website):

Landings can be recorded within the PacFIN system in very general categories consisting of many species, and others not as general but consisting of two or more species. Within the fish-ticket tables, these are known as a fish-ticket market category, or "category" for short. Examples in the PacFIN system are names such as: "unspecified slope rockfish", "nominal yellowtail rockfish", and "unspecified small reds rockfish".

Market categories are sampled regularly resulting in proportions that describe the actual species composition and proportion of market categories . Market category sampling occurs in various ports and for distinct gear-types producing proportions of individual species by port (or port group), gear (or gear group), and month (or quarter). For some PacFIN data sources, area is also a sampling dimension.

The PacFIN system combines monthly summations of market categories with corresponding species composition proportions to produce the best estimate of catch for individual species where possible. If all possible combinations of market category, gear-type, port, month, and area (where applicable) were actually sampled, then the resulting PacFIN reports/data would contain catch for only individual scientifically defined species. As it is, there are situations that result in unsampled strata and thus, PacFIN reports/data potentially include both individual species as well as market categories.

Overview of PacFIN post-processing by WCGOP

Figure 1 (2002-2010 only). Fish ticket and logbook data post-processing by WCGOP for division into groundfish fishery sectors after retrieval of a full calendar year data set from the Pacific Coast Fisheries Information Network (PacFIN) database. Grey highlight indicates sectors for which federal observer data is available.

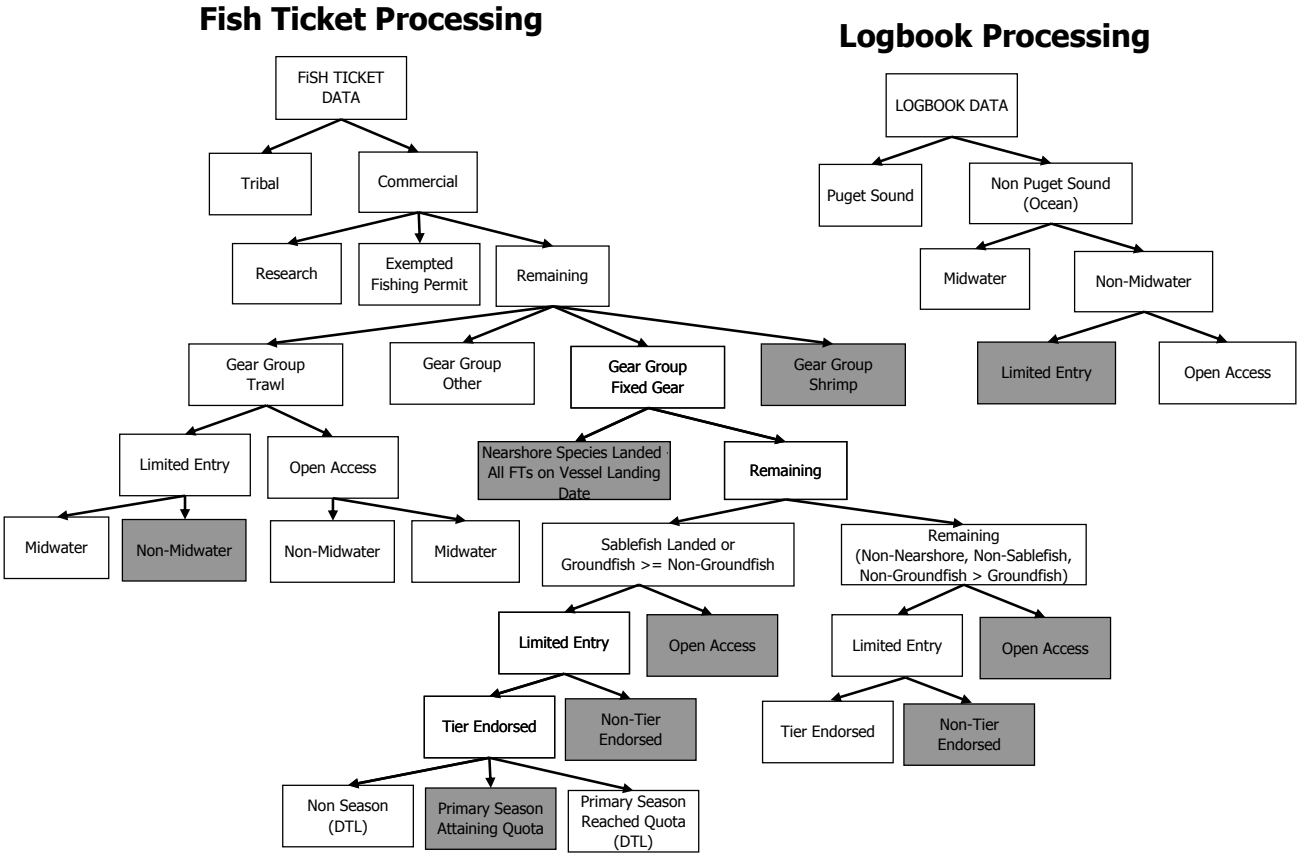
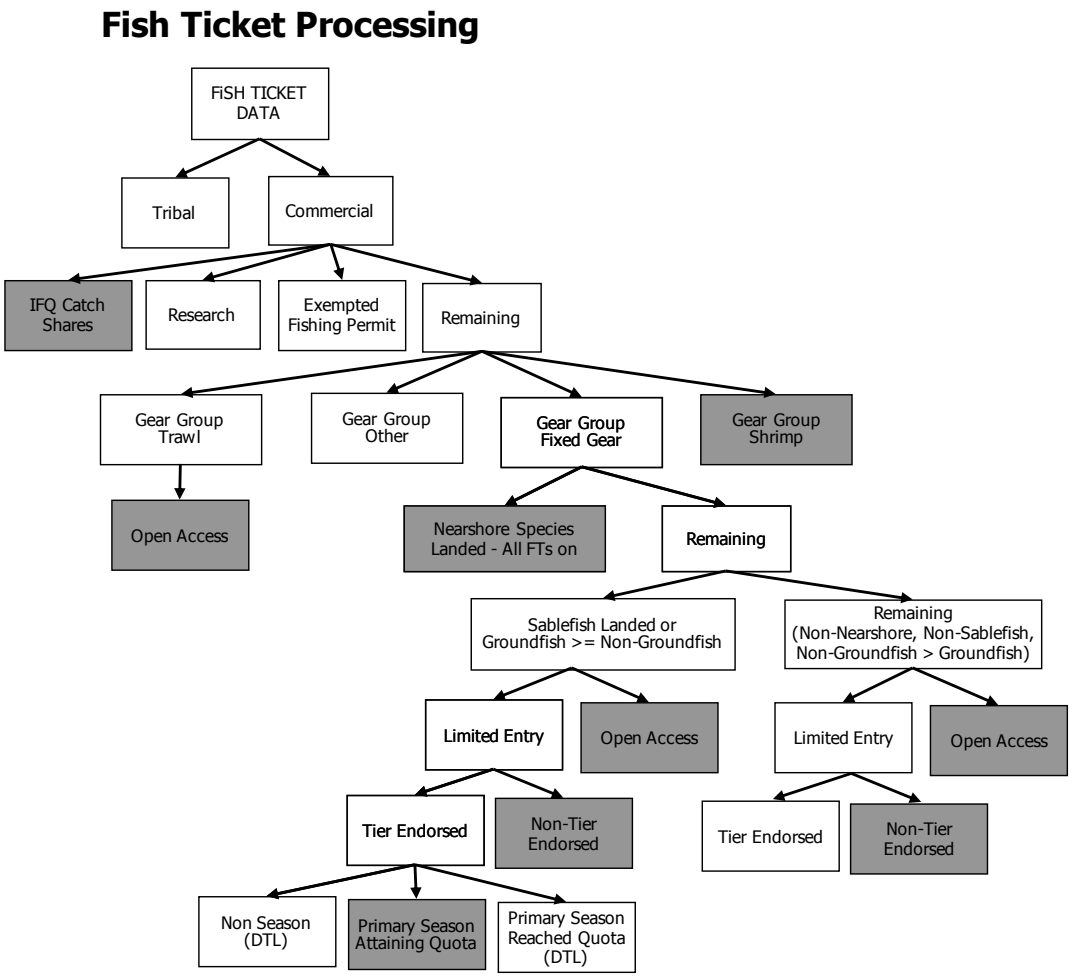


Figure 1 (2011-2014 only). Fish ticket data post-processing by WCGOP for division into groundfish fishery sectors after retrieval of a full calendar year data set from the Pacific Coast Fisheries Information Network (PacFIN) database. Grey highlight indicates sectors for which federal observer data is available.



Explicit WCGOP post- processing of PacFIN fish ticket data output from query above, as in Figure 1 –

Text highlighted in grey is summarized in groundfish mortality report tables (e.g. Table 15, 2013).

Add field YMD and calculate:
(([YEAR]) *10000) +([MONTH] *100) + [DAY]

Add field VIDYMD and calculate:
[DRVID] & [YMD]

Select fish tickets not identified to an entity/vessel:
DRVID == 'NONE'
Assign sector “Non-Identified Vessel/Entity.”

Select fish tickets identified to an entity/vessel:
DRVID != 'NONE'

Select Tribal landings:
PARGRP == 'I'
Assigned sector "Tribal Commercial."
Summarized with "WA tribal landings"

Select Commercial landings:
PARGRP == 'C'

Select Research landings from Commercial:
REMOVAL_TYPE == 'R'
Assigned sector "Commercial Research."
(Note: Commercial research data are provided by the NWR Office for GM reports, and thus the data from this step is omitted.)

Select Non-Research landings from Commercial:
REMOVAL_TYPE != 'R'

Select EFP landings from Non-Research:
REMOVAL_TYPE == 'E'
Assigned sector "Commercial EFP."
2002-2010
If ADJ_GRID = MDT, summarized with "Non-tribal shoreside hake"
If ADJ_GRID ≠ MDT, summarized with "Incidental fisheries"

Select Non-EFP landings from Non-Research:
REMOVAL_TYPE != 'E'

Select Individual Fishing Quota (IFQ) landings from Non-Research/EFP Commercial:
IFQ_LANDING == 'Y'
Assign sector "Individual Fishing Quota – LE trawl permit."

Assign IFQ landings to either shorebased groundfish or shoreside hake:
Join to West Coast Groundfish Observer Program data by FTID & AGID
Fill SubSector field with fishery noted by OB program = "Shoreside hake" or "Catch Shares"
2011-Present
If "Shoreside hake", summarize with "Non-tribal shoreside hake"
If "Catch Shares", summarize with "Non-hake IFQ"

Select Gear Group Shrimp trawl landings from Non-Research/EFP Commercial:
GRGROUP == 'TWS'
Assign sector "Commercial Shrimp Trawl."
2002-2010
If PCID is north of 40°10' N lat., summarized with "Pink Shrimp"
If PCID is south of 40°10' N lat., summarized with "Incidental fisheries"
2011-Present

All coastwide summarized with “Pink Shrimp”

Select Gear Group Other landings from Non-Research/EFP Commercial:
(GRGROUP != 'HKL') & (GRGROUP != 'POT') & (GRGROUP != 'TWL') & (GRGROUP != 'TWS')
Assign sector “Commercial Grgroup Others.”
Summarized with “Incidental fisheries”

Select Gear Group Trawl landings from Non-Research/EFP Commercial/Non-IFQ:
GRGROUP== 'TWL'

Select Limited Entry permitted:
PERM1 != ' '

Select Midwater:
ADJ_GRID == 'MDT'
Assign sector “Commercial LE Trawl Midwater.”
2002-2010
Summarized with “Non-tribal shoreside hake”

Select Non-Midwater:
ADJ_GRID != 'MDT'
Assign sector “Commercial LE Trawl Non-midwater.”

Select CA halibut:
2002-2007 based on CA halibut weight > 150lb:
(SPID %in% c('CHLB', 'CHL1')) & (LWT_LBS > 150)
2008-Present based on CA halibut on ticket and vessel carrying a year specific CA halibut permit and CA halibut weight > 150lb:
(SPID %in% c('CHLB', 'CHL1')) & (LWT_LBS > 150) & (DRVID %in% unique(FT.perm$DRVID))
Overwrite “Commercial LE Trawl Non-midwater.” sector to “LE CA Halibut.”

“Commercial LE Trawl Non-midwater”:
2002-2010
Summarized with “LE bottom trawl”
2011-Present
Summarized with “Non-hake IFQ”

Select Non-LE permitted (Open Access):
PERM1 == ' '

Select Midwater:
ADJ_GRID == 'MDT'
Assign sector “Commercial OA Trawl Midwater.”
Summarized with “Incidental fisheries”

Select Non-Midwater:

ADJ_GRID != 'MDT'
Assign sector “Commercial OA Trawl Non-midwater.”
Select CA halibut:
2002-2006 based on CA halibut weight > 150lb:
(SPID %in% c('CHLB', 'CHL1')) & (LWT_LBS > 150)
2007-Present based on CA halibut on ticket and vessel carrying a year specific CA halibut permit
(SPID %in% c('CHLB', 'CHL1')) & (DRVID %in% unique(FT.perm$DRVID))
Overwrite “Commercial OA Trawl Non-midwater.” sector to “OA CA Halibut.”

“OA CA Halibut.”: Summarized with “OA CA halibut”
“Commercial OA Trawl Non-midwater.”: Summarized with “Incidental fisheries”

Select Gear Group Fixed Gear landings from Non-IFQ/Research/EFP Commercial:
(GRGROUP == 'HKL') | (GRGROUP == 'POT')

Select Nearshore Species on FT:
SPID %in% c('BLCK', 'BLK1', 'RCK9', 'RCK7', 'RCK2', 'BYEL', 'BYL1', 'BLU1', 'BLUR', 'BRW1', 'BRWN', 'CLC1', 'CLCO', 'SCOR', 'SCR1', 'CHN1', 'CHNA', 'COP1', 'COPP', 'GPH1', 'GPHR', 'GRAS', 'GRS1', 'KLP1', 'KLPR', 'OLV1', 'OLVE', 'QLB1', 'QLBK', 'TRE1', 'TREE', 'NSHR', 'NUSR', 'SSHR', 'SUSR', 'USHR', 'CBZ1', 'CBZN', 'KGL1', 'KLPG', 'SHPD', 'SHP1', 'UDNR', 'SSRS', 'SSRD', 'BISC', 'BSCL', 'RSCL', 'UGLG')

Compile unique vessel-landing date (VIDYMD) values for those FTs with Nearshore Species.

Retrieve all FTs (and all FT line items) for those VIDYMD values (so obtaining **all** fish tickets for a vessel’s landing date if one or more of the vessels fish tickets on that date had a nearshore species recorded on it).
Assign sector “Commercial Fixed-Gear Nearshore.”
Summarized with “Nearshore fixed gear”

Of the Remaining Non-Nearshore Fixed Gear landings:

1. Create a catch variable for Groundfish (based on a GF_ID in a separate file maintained by WCGOP), and summarize RWT_LBS of groundfish and non-groundfish for each unique VIDYMD.

   If groundfish weight is greater than non-groundfish weight in a unique fishing day for a vessel (VIDYMD) that landed sablefish, include in Fixed Gear Sablefish Landings
   GFLB.Sum >= NonGFLB.Sum

2. Select all VIDYMD if Sablefish is a line item of catch on a FT:
   SPID == 'SABL'

3. Compile unique VIDYMDs that fit either criteria of 2. Sablefish landings or 1. groundfish greater than non-groundfish.

Retrieve all FT line items for those VIDYMD values.
(See next section for more processing of these Fixed Gear Sablefish Landings).

Remaining not identified in Step 3. are Non-Nearshore, Non-Sablefish Fixed Gear landings:

Select Limited Entry permitted:
PERM1 != ' '

Select if Tier Endorsed:
SABL1 != 0 | SABL2 != 0 | SABL3 != 0 | SABL4 != 0
Assign sector "Commercial Fixed-Gear Non-Nearshore Non-Sablefish LE Tier"

Select if Not Tier Endorsed:
SABL1 == 0 & SABL2 == 0 & SABL3 == 0 & SABL4 == 0
Assign sector "Commercial Fixed-Gear Non-Nearshore Non-Sablefish LE 0Tier"

Select Non-LE permitted (Open Access):
PERM1 == ' '
Assign sector "Commercial Fixed-Gear Non-Nearshore Non-Sablefish OA"

Summarize with "Incidental fisheries"

Fixed Gear Sablefish landing FTs (see above for initial Steps 1-3 to identify):

Select Limited Entry permitted:
PERM1 != ' '
Assign sector "Commercial Fixed-Gear LE Sablefish."

Select if Tier Endorsed:
SABL1 != 0 | SABL2 != 0 | SABL3 != 0 | SABL4 != 0
(See below for additional steps)

Select if Not Tier Endorsed:
SABL1 == 0 & SABL2 == 0 & SABL3 == 0 & SABL4 == 0

Select if Pot gear (LE 0 tier cannot fish pot gear, so thus OA) :
GRGROUP == 'POT'
Assign sub-sector " Sable OA."
Summarize with "Non-nearshore fixed gear" (and "OA Fixed Gear" prior)

GRGROUP != 'POT'
Assign sub-sector "LE 0 Tier."
Summarize with "Non-nearshore fixed gear" (and "LE Non-primary" prior)

Select Non-LE permitted (Open Access):
PERM1 == ' '
Assign sector “Commercial Fixed-Gear OA Sablefish.”
Assign sub-sector “ Sable OA.”
Summarize with “Non-nearshore fixed gear” (and “OA Fixed Gear” prior)

For LE Tier Endorsed FTs, to determine if
a.) landings are assigned to the primary fishery (Primary Season Attaining Quota),
b.) landings were made in the non-season fishery (Non-season DTL), or
c.) if the vessel fished in the primary season but had already reached their tier limit and landings should be assigned to the DTL fishery (Primary Season Reached Quota DTL).

Select if definitely non-primary season (with 5 days buffer at end of the season to evaluate those FTs at the “borderline” which could fall into either primary or non-season):
(MONTH < 4) | (MD > 1105)
Note: MD is a concatenated field with Month and Day

Assign sub-sector “LE SAB NonPSeason.”
Summarize with “Non-nearshore fixed gear” (and “LE Non-primary” prior)

Select if primary season (with 5 days buffer at end of the season to evaluate those FTs at the “borderline” which could fall into either primary or non-season):
(MONTH >= 4) & (MD <= 1105)

Year	Tier 1 Quota (lbs)	Tier 2 Quota (lbs)	Tier 3 Quota (lbs)	DTL Max Landing (lbs)	Federal Register Reference
2002	36000	16500	9500	1050	67FR10490
2003	53000	24000	14000	1050	68FR11182
2004	64300	29200	16700	1050	69FR11064
2005	64000	29100	16600	1050	69FR77012
2006	62700	28500	16300	1050	69FR77012
2007	48500	22000	12500	1050	71FR78638
2008	48500	22000	12500	1050	71FR78638
2009	61296	27862	15921	1000	73FR80516
2010	56081	25492	14567	3000	73FR80516
2011.1	41379	18809	10748	2000	76FR11381
2011.2	47697	21680	12389	2000	76FR34910
2012	46238	21017	12010	1800	76FR77415
2013	34513	15688	8964	1880	78FR49190
2014	37441	17019	9725	2000	79FR43272

Add field SABL1_Lim, SABL2_Lim, SABL3_Lim and calculate using year-specific tier limits:

For 2002-2010, 2012-Present (repeated for each sabletier undelimited data field; SABL1, etc.):

SABL1_Lim [which(SABL == 1)] = Tier1Quota
SABL2_Lim [which(SABL == 2)] = Tier2Quota
SABL3_Lim [which(SABL == 3)] = Tier3Quota

For 2011 – tier limits were increased mid-season, taking effect on June 11th:

SABL1_Lim [which((SABL == 1) & (MD < 0611))] = Tier1Quota for 2011a
SABL2_Lim [which((SABL == 2) & (MD < 0611))] = Tier2Quota for 2011a
SABL3_Lim [which((SABL == 3) & (MD < 0611))] = Tier3Quota for 2011a

SABL1_Lim [which((SABL == 1) & (MD >= 0611))] = Tier1Quota for 2011b
SABL2_Lim [which((SABL == 2) & (MD >= 0611))] = Tier2Quota for 2011b
SABL3_Lim [which((SABL == 3) & (MD >= 0611))] = Tier3Quota for 2011b

Add field QUOTA and calculate:
[SABL1_Lim] + [SABL2_Lim] + [SABL3_Lim]

Add field SABL_LND and for weight of sablefish landings for each line:
SABL_LND = 0
SABL_LND [which(SPID == 'SABL')] = RWT_LBS[which(SPID == 'SABL')]

Select out just those FT line items with Sablefish:
SPID = 'SABL'

Add field CUMSABL and calculate the cumulative sablefish weight landed by a vessel (each fish ticket line item of sablefish weight gets added up over time to see how the vessel's sablefish landings move toward attaining their total quota limit).

Sort by unique vessel-landing date (VIDYMD) and, within the same unique VIDYMD, from largest sablefish landing to smallest.

Add field PROPORTION and calculate the proportion of sablefish weight caught relative to their total tier quota weight:
[CUMSABL] / [QUOTA]

Select if the vessel is over their tier quota:
PROPORTION >1

Select by criteria (for the DTL sectors) – (see Notes):
(PROPORTION >1.15 AND SABL_LND <2000"DTL Max from above") OR YMD >20141105

Notes: To place fish tickets into the DTL sector (either as Primary Season Reached Quota DTL or Non-season DTL) vs. Primary Season Attaining Quota sector.

There is a "cushion" of sablefish quota overage weight (proportion > 1.15) allowed when the vessel has supposedly reached their quota, but in addition, the landed weight is reviewed in the context of the maximum DTL landing limit per week allowable for sablefish in the LE DTL sector during the entire year. The additional fish tickets that were included in this review for the month of November, after Nov 5th are all considered part of the Non-season DTL fishery.

http://www.ecfr.gov/cgi-bin/retrieveECFR?gp=1&SID=bb88f96b71fbed29bd5bf1f7091a385c&h=L&n=50y13.0.1.1.1&r=PART&ty=HTML#50:13.0.1.1.1.5.1.10

- **"A vessel's primary season cumulative limit(s) are considered to be taken when the total amount remaining is less than the daily trip limit for sablefish north of 36° N. lat., if one is specified, in Table 2 (North) and Table 2 (South) to this subpart."**

Compile unique FTID values for the FTs selected in the "Select by criteria" step above.

Retrieve all FT line items for those FTID values (for the DTL sectors).
Assign sub-sector "LE SAB DTL."
Summarize with "Non-nearshore fixed gear" (and "LE Non-primary" prior)

Remaining are Sablefish Primary Season Attaining Quota landings.
One more step is used to place these into season vs. non-season landings.

Select if in Primary Season:
"YMD" < 20141101
Assign sub-sector "LE SAB Primary."
Summarize with "Non-nearshore fixed gear" (and "LE Sablefish Primary" prior)

Select if outside Primary Season (non-season):
"YMD" >= 20141101
Assign sub-sector "LE SAB NonPSeason."
Summarize with "Non-nearshore fixed gear" (and "LE Non-primary" prior)

All data segments are combined together to re-produce the original dataset. If a SubSector value was not designated in the processing above, it is given the value from the SECTOR field.

All additional data processing steps that were applied during the discard estimation process are described in the methods section of the groundfish mortality report. Of these, specific identification and removal of commercial directed Pacific Halibut fixed gear landings is as follows:

If SubSector equals 'Sable OA', 'LE 0 Tier', 'LE SAB NonPSeason', 'LE SAB DTL', 'LE SAB Primary':
If FTID had recorded PHLB catch landed on one of the specific calendar year 10 hour openings, plus two days post (to allow for any subsequent deliveries)
Summarize with "Incidental fisheries"

2014:
((MONTH == 6) & (DAY %in% 25:27)) |

```
    ((MONTH == 7) & (DAY %in% 9:11))  |
2013:
    ((MONTH == 6) & (DAY %in% 26:28))  |
    ((MONTH == 7) & (DAY %in% 10:12))  |
2012:
    ((MONTH == 6) & (DAY %in% 27:29))  |
    ((MONTH == 7) & (DAY %in% 11:13))  |
2011:
    ((MONTH == 6) & (DAY %in% 29:30))  |
    ((MONTH == 7) & (DAY == 1))            |
    ((MONTH == 7) & (DAY %in% 13:15))  |
    ((MONTH == 7) & (DAY %in% 27:29))  |
    ((MONTH == 8) & (DAY %in% 10:12))  |
    ((MONTH == 8) & (DAY %in% 24:26))  |
    ((MONTH == 9) & (DAY %in% 7:9))     |
    ((MONTH == 9) & (DAY %in% 21:23))  |
2010:
    ((MONTH == 6) & (DAY %in% 30:31))  |
    ((MONTH == 7) & (DAY %in% 1:2))     |
2009:
    ((MONTH == 6) & (DAY %in% 24:26))  |
    ((MONTH == 7) & (DAY %in% 8:10))    |
2008:
    ((MONTH == 6) & (DAY %in% 11:13))  |
    ((MONTH == 6) & (DAY %in% 25:27))  |
    ((MONTH == 7) & (DAY %in% 9:11))    |
    ((MONTH == 7) & (DAY %in% 23:25))  |
2007:
    ((MONTH == 6) & (DAY %in% 27:29)) |
    ((MONTH == 7) & (DAY %in% 11:13)) |
    ((MONTH == 7) & (DAY %in% 25:27)) |
    ((MONTH == 8) & (DAY %in% 8:10))   |
2006:
    ((MONTH == 6) & (DAY %in% 28:30)) |
    ((MONTH == 7) & (DAY %in% 12:14)) |
    ((MONTH == 7) & (DAY %in% 26:28)) |
2005:
    ((MONTH == 6) & (DAY %in% 29:30)) |
    ((MONTH == 7) & (DAY == 1))           |
    ((MONTH == 7) & (DAY %in% 13:15)) |
    ((MONTH == 7) & (DAY %in% 27:29)) |
    ((MONTH == 8) & (DAY %in% 10:12)) |
2004:
    ((MONTH == 6) & (DAY %in% 23:25)) |
    ((MONTH == 7) & (DAY %in% 14:16)) |
    ((MONTH == 7) & (DAY %in% 28:30)) |
    ((MONTH == 8) & (DAY %in% 11:13)) |
2003:
```

```
        ((MONTH == 6) & (DAY %in% 25:27)) |
        ((MONTH == 7) & (DAY %in% 9:11))  |
        ((MONTH == 7) & (DAY %in% 23:25)) |
        ((MONTH == 8) & (DAY %in% 6:8))   |
    2002:
        ((MONTH == 6) & (DAY %in% 26:28)) |
        ((MONTH == 7) & (DAY %in% 10:12)) |
        ((MONTH == 7) & (DAY %in% 24:26))
```

Further Detail: Trawl Logbook Processing

Text highlighted in yellow is updated annually (2002-2010), no longer used in discard estimation process from 2011-Present.

Trawl logbook: PacFIN SQL query for a full calendar year –

```
select  tr.trip_id,
    tr.agid,
    to_char(tr.dday,'DD-MON-YYYY') DDate,
    tr.dtime,
    to_char(tr.dday, 'DD') DDay,
    dmonth,
    dyear,
    dport,
    p2.pcid dpcid,
    to_char(tr.rday,'DD-MON-YYYY') RDate,
    tr.rtime,
    to_char(tr.rday, 'DD') RDay,
    tr.rmonth,
    tr.ryear,
    pfutil.bimon_period(tr.rday) bimon_period,
    rport,
    p1.pcid rpcid,
    tr.drvid,
    to_char(tow_date,'DD-MON-YYYY') towdate,
    tw.townum,
    area,
    arid_psmfc,
    block,
    block_or,
    latlong_type,
    ch_lat,
    ch_long,
    msec_lat,
    msec_long,
    set_lat,
    set_long,
```

```
set_time,
up_time,
duration,
up_area,
up_arid_psmfc,
up_block,
up_block_or,
up_ch_lat,
up_ch_long,
up_msec_lat,
up_msec_long,
up_lat,
up_long,
tw.net_type,
grid,
depth_type1,
depth1,
depth_type2,
depth2,
target,
pacfin_target,
ps_grnd_code,
spid,
hpounds,
apounds,
apounds_calculated,
apounds_wdfw,
adj_towtime,
c.source catchsource,
c.spcode,
ft_match_flag,
lbkutil.lbk_ftid_list(tr.trip_id) ftid,
pfutil.undelimit(lbkutil.lbk_ftid_list(tr.trip_id),':',1) ftid1,
pfutil.undelimit(lbkutil.lbk_ftid_list(tr.trip_id),':',2) ftid2,
pfutil.undelimit(lbkutil.lbk_ftid_list(tr.trip_id),':',3) ftid3,
pfutil.undelimit(lbkutil.lbk_ftid_list(tr.trip_id),':',4) ftid4,
pfutil.undelimit(lbkutil.lbk_ftid_list(tr.trip_id),':',5) ftid5,
pfutil.undelimit(lbkutil.lbk_ftid_list(tr.trip_id),':',6) ftid6,
NULL ticket_date,
NULL ftsource,
tr.warning tripwarning,
tw.warning towwarning,
c.warning catchwarning,
permid_1,
permid_2,
permid_3,
permid_4,
permid_5,
```

```
    case when gr_endor_1||gr_endor_2||gr_endor_3||gr_endor_4||gr_endor_5 like '%T%'
          and gr_endor_1||gr_endor_2||gr_endor_3||gr_endor_4||gr_endor_5 not like '%L%'
          and gr_endor_1||gr_endor_2||gr_endor_3||gr_endor_4||gr_endor_5 not like '%P%'
         then 'TRAWL'
         when (gr_endor_1||gr_endor_2||gr_endor_3||gr_endor_4||gr_endor_5 like '%L%'
           or gr_endor_1||gr_endor_2||gr_endor_3||gr_endor_4||gr_endor_5 like '%P%')
          and gr_endor_1||gr_endor_2||gr_endor_3||gr_endor_4||gr_endor_5 not like '%T%' then 'FIXED'
         else decode(prmt.permid_1,null,null,'BOTH')
         end gr_sector,
    gr_endor_1,
    gr_endor_2,
    gr_endor_3,
    gr_endor_4,
    gr_endor_5,
    sable_tier_1,
    sable_tier_2,
    sable_tier_3,
    sable_tier_4,
    sable_tier_5,
    len_endor_1,
    len_endor_2,
    len_endor_3,
    len_endor_4,
    len_endor_5
 from pacfin.lbk_trip tr, pacfin.lbk_tow tw, pacfin.lbk_catch c, pacfin.lbk_sp s,
    pacfin.asp, pacfin.lbk_gr g, pacfin.lbk_pr p1, pacfin.lbk_pr p2,
    pacfin.lbkprmtlst prmt
 where tr.ryear = '2010'
   and p1.agid(+) = tr.agid
   and p1.lbk_port(+) = tr.rport
   and p2.agid(+) = tr.agid
   and p2.lbk_port(+) = tr.dport
   and tr.trip_id = tw.trip_id
   and tw.agid = g.agid(+)
   and tw.net_type = g.net_type(+)
   and tw.trip_id = c.trip_id
   and tw.townum = c.townum
   and c.spcode = s.lbk_spcode(+)
   and c.agid = s.agid(+)
   and s.agid = asp.agid(+)
   and s.category = asp.category(+)
   and nvl(prmt.ryear,2010) = 2010
   and tw.trip_id = prmt.trip_id(+)
order by tow_date, drvid, tr.trip_id, tw.townum, spid
```

In R software after initial retrieval:
Create a unique identifier (CONSNUM) for each tow, based on a concatenation of Trip_ID and Townum.

Also change several field data types to avoid later problems as follows:
TICKET_DATE<-as.character
UP_AREA<-as.character
UP_ARID_PSMFC<-as.character
FTSOURCE<-as.character
CONSNUM<-as.numeric
TOWNUM<-as.numeric
FT_MATCH_FLAG<-as.character
GR_ENDOR_4<-as.character
AREA<-as.character
DEPTH_TYPE2<-as.character

Also create data fields for negative longitude values to use in GIS
(from the positive values in set_long and up_long):
-([SET_LONG]) and -([UP_LONG])

Note: An initial check is made to determine that vessel identification is complete for all records ("DRVID" <>' '). In earlier years this was not always complete. Also, often line items from Washington are included in the dataset with all trip/haul fields blank, but values in apounds_wdfw and adjtowtime; thus these are removed from this dataset as these fields are not used in our analyses.

Explicit WCGOP post- processing of PacFIN logbook data output from query above, as in Figure 1 -

Select Puget Sound landings:
"PSGRNDCODE" <> 0

Select Non-Puget Sound (Ocean) landings:
"PSGRNDCODE" =0

Select Midwater:
"GRID" = 'MDT'

Select Non-Midwater:
"GRID" <> 'MDT'

Select Limited Entry permitted:
"PERMID_1" <> ' '

Select Non-LE permitted (Open Access):
"PERMID_1" = ' '

Note: LE Non-midwater logbook data is further delineated into the state California halibut trawl fishery for each individual tow/haul as follows –
a.) if tow target is California halibut (PACFIN_TARGET = CHLB or CHL1) or
b.) tow target PACFIN_TARGET = (NSM or OFLT or SSOL or SSO1) AND DEPTH1 < 30 (fm) AND SET_LAT < 40.16667.

The remaining LE non-midwater logbook data tows are considered part of the LE groundfish trawl fishery.

All additional data processing steps that were applied during the discard estimation process are described in the methods section of the groundfish mortality report.