

discaRd steps for CAMS

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Discard Rate Current Method Summary (J. Michael Lanning summary)

1. Rates determine by observer reported values (gear, area, etc)
2. Incomplete observed trips have missing 'hauls' prorated by observed information from that trip
3. Trips with observer get reported/calculated observed discards of that specific trip
4. Unobserved trips get discards from the rate calculated from 1)
5. QM is only interested in the summary total of discards for each trip, not subtrips. Often the interested number is a summary of trips, ie. the herring total of bycatch for an area/season or a sector's season's total of GB Cod.
6. Other others are driven by regs. Here I would place transition rates and EM methods.

discaRd Base and Support tables

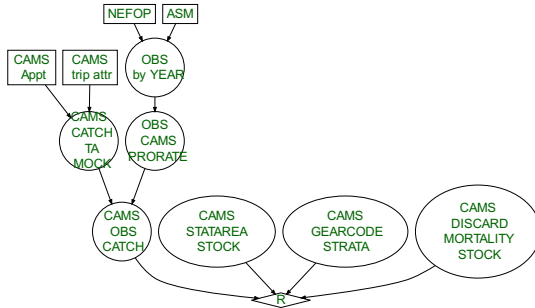


Figure 1: Base tables (rectangle), Intermediary (circle), and Support tables (Oval)

Tables created and steps to date

Rates determine by observer reported values (gear, area, etc)

Observed discards

`make_obdbs_table_cams_v2.sql`

created:

- `apsd.bg_obdbs_cams_mock2018`
- `apsd.bg_obdbs_cams_mock2019`
- `apsd.bg_obdbs_cams_mock2020`

Prorated discards

Incomplete observed trips have missing 'hauls' prorated by observed information from that trip

Prorate observed discards on unobserved hauls within a subtrip. This is done by applying a ratio of kept all on the entire trip to kept all on the unobserved hauls only

$$d_{total} = d_{observedhauls} * (1 + KALL_{unobservedhauls} / KALL_{subtrip})$$

`make_obdbs_prorate.sql`

created:

- `apsd.obs_cams_prorate`
 - this table was made using `apsd.bg_obdbs_cams_mock2018` and `apsd.bg_obdbs_cams_mock2019`

Use prorated observed discard values

Trips with observer get reported/calculated observed discards of that specific trip

Match observed hauls to subtrips

`explore_link3_mesh_match.sql`

This step matches on AREA, GEAR and MESHGROUP (sm, lg, xlg).

This is a hard match and will go awry if there is a mismatch in the data.

Use prorated observed discard values (cont.)

tables created:

- `apspd.bg_cams_catch_mock`
 - follows the steps layed out for mid-Atlantic discard estimation. Gear, mesh, region, half of year CASE statements should be replaced at some point with table driven code.
 - Utilizes the current apportionment table:
`apspd.cams_apport_20201230`
- `apspd.bg_obs_cams_tmp1`
 - links to `dmis.d_match_obs_link` and `apspd.bg_cams_catch_mock`; **multiple** subtrips only.
- `apspd.bg_obs_cams_tmp2` is used in the squid example and include all trips.

R functions

- `get_obs_disc_vals`
- `make_assumed_rate`
- `make_bdat_focal`
- `run_discard`

Running it

- refresh Oracle tables?
- define species
 - generates SQL
- import to R
 - apply CAMS_GEAR_GROUP according to SPECIES
 - apply STOCK STAT AREA according to SPECIES and stock (if needed)
- run_discard
 - STRATA is assigned dynamically by species/stock using elements of the imported data
 - If using transition rates, two time periods are defined
 - Assumed (fallback rates) are defined as a subset of STRATA
- Apply Discard Mortality
 - Match by CAMS_GEAR_GROUP at the subtrip level

output

```
> dest_strata %>% slice(grep('Otter Trawl_sm*', dest_strata$STRATA))
```

	STRATA	N	n	orate	drate	KALL	disc_est	CV
1	Otter Trawl_sm_N_1	1307	122	0.09	0.007531621	21959570	165391	0.41
2	Otter Trawl_sm_N_2	1943	212	0.11	0.004653792	29085106	135356	0.67
3	Otter Trawl_sm_S_1	2023	373	0.18	0.054646780	25624532	1400298	0.23
4	Otter Trawl_sm_S_2	1930	432	0.22	0.005260938	33174274	174528	0.44

\$res

A tibble: 111,024 x 24

	VTRSERNO	DISCARD	DMIS_TRIP_ID	YEAR	MONTH	REGION	HALFOFYEAR	GEARNM	GEARCODE	GEARTYPE	NEGEAR	MESHGROUP	CAREA
	<chr>	<dbl>	<chr>	<dbl>	<dbl>	<chr>	<dbl>	<chr>	<chr>	<chr>	<chr>	<chr>	<chr>
1	10258111	0	410416_1905~	2019	5	N		1	DREDG~	DRS	Scallop~	132	NA
2	10761479	0	410571_1905~	2019	5	S		1	DREDG~	DTC	Scallop~	132	NA
3	10765215	1	330672_1908~	2019	8	N		2	OTTER~	OTF	Otter T~	050	lg
4	11177077	0	250547_1902~	2019	2	N		1	OTTER~	OTF	Otter T~	050	lg
5	11177654	0	330167_1912~	2019	12	S		2	DREDG~	DRS	Scallop~	132	NA
6	11179863	0	410019_1905~	2019	5	N		1	DREDG~	DRS	Scallop~	132	NA
7	11198443	1	410195_1906~	2019	6	N		1	DREDG~	DTC	Scallop~	132	NA
8	11498925	0	320422_1901~	2019	1	S		1	DREDG~	DRS	Scallop~	132	NA
9	11498942	0	320422_1908~	2019	8	S		2	DREDG~	DTC	Scallop~	132	NA
10	11540799	0	310915_1905~	2019	5	S		1	DREDG~	DRS	Scallop~	132	NA

... with 111,014 more rows, and 11 more variables: LIVE_POUNDS <dbl>, DOCID <chr>, STRATA <chr>, SEADAYS <dbl>, DISC_RATE <dbl>, CV <dbl>, STRATA_ASSUMED <chr>, ARATE_IDX <int>, ARATE <dbl>, CRATE <dbl>, EST_DISCARD <dbl>

compare to ACL summary

	NESPP3	SPPNM	`discaRd CAMS`	`ACL Discard`
	<chr>	<chr>	<dbl>	<dbl>
1	011	ANGLER	<u>239114</u>	NA
2	012	ANGLER	88454364.	NA
3	051	BUTTERFISH	<u>2638784.</u>	3025979
4	125	SAND-DAB FLOUNDER	<u>2492716.</u>	NA
5	212	ATLANTIC MACKEREL	<u>607012.</u>	490416
6	801	LONGFIN SQUID	<u>1077751.</u>	870063
7	802	ILLEX SQUID	<u>2349929.</u>	2715331

TO DO

- utilize support tables
 - CAMS_GEAR_GROUP **DONE**
 - STAT_AREAS **DONE**
- add SECTOR for multispecies (see above) **DONE**
- utilize discard mortality table (species/gear/mesh) **imminent..**
- decide on time periods **Determined by STOCK/SPECIES**
 - Species with the same time period, e.g. Calendar year, can be imported at once.
- decide on criteria for assumed (fallback) rates: how simplified must this be?
- implement transitions (if using fixed time period) **DONE**
- refine exact operational process