Appendix

The AFSC Groundfish Trophic Interactions Database is freely available to the public as text files (.csv) via the web at http://access.afsc.noaa.gov/REEM/WebDietData/DietDataIntro.php. Data are available through two tables; Predator-Prey (Stomach Content data) and Prey-Length (Prey Length data), each of which is described in detail below. Within these data tables, data are identified by region; Bering Sea (BS), Aleutians (AI) and Gulf of Alaska (GOA), and predator species. Data are selected by species and/or region on the web data portal. Once downloaded users may query the data using spatial, temporal, predator (species, size, sex, fullness) and prey (ID, digestion, life history state, size, number) parameters included in the tables as best fits their needs. A collection of useful links is included below providing access to REEM Trophic Interactions Lab's collection and analysis manuals, data visualization tools and code dictionaries.

Each region is defined as the following:

Aleutian islands data: On the north side of the chain, all hauls at bottom depths of 550m or less will get assigned to AI. On the south side of the chain, all hauls (regardless of bottom depth) westward of 170 W longitude get assigned to AI. INPFC areas 541, 542, 543.

Bering Sea data: All hauls on the shelf. INPFC areas 508, 509, 512, 513, 514, 516, 517, 518, 521, 524, 530, 550.

Gulf of Alaska data: All hauls eastward of 170 W longitude, south of the Aleutians or the Alaska Peninsula. INPFC areas 610, 620, 630, 640, 650, 690.

Data Verification and Validation: Error trapping and checking occur at two levels of the stomach analysis process. Stomach data are first checked as the data are generated and entered into an online data entry form. Here, values for predator and prey species codes, stomach weight as a percentage of body weight, prey counts, sizes, and life history codes are checked for consistency and validity. These data are then error checked again using error checking scripts prior to being loaded into the production Oracle database. Haul data come from outside sources and are generally loaded directly into our Oracle database from a published database and therefore assumed to have been error checked. However, we do check for missing values and mismatched data in our database.

Useful Links

Diet Data Overview: http://www.afsc.noaa.gov/REFM/REEM/Data/Default.htm

Diet Data Access: http://www.afsc.noaa.gov/REFM/REEM/DBDefault.htm

Trophic Interactions Manuals: http://www.afsc.noaa.gov/REFM/REEM/Manuals/Default.htm

Groundfish Survey Manuals: http://www.afsc.noaa.gov/RACE/groundfish/manuals.htm

Predator-Prey Table

Hauljoin
A 12-digit numeric field that does not allow null values. Each hauljoin uniquely identifies a given vessel, cruise and haul combination.

Pred_Nodc
A 10-digit numeric field that does not allow null values representing the NODC code for the predator from which the given data were collected. Consult REEM NODC code dictionary (http://access.afsc.noaa.gov/REEM/WebDietData/DietDataIntro.php) for definitions as some codes have been customized.

Pred_Specn
A 4-digit numeric field that does not allow null values. This is the predator specimen number assigned to the stomach when it was collected in the field.

Prey_Nodc
A 10-digit numeric field that does not allow null values representing the NODC code for the prey item. Consult REEM NODC code dictionary (http://access.afsc.noaa.gov/REEM/WebDietData/DietDataIntro.php) for definitions as some codes have been customized. A value of 0 indicates an empty stomach.

Prey_cnt
A 4-digit numeric field that allows null values representing the total count of a given prey. A null value indicates no count was recorded.

Prey_twt
A 10.5-digit numeric field that does not allow null values representing the total weight (g) of a given prey. A value of 0.0 indicates and empty stomach.

Pred_Stomwt
An 8.3-digit numeric field that does not allow null values representing the total content weight (g) of a given stomach. A value of 0 indicates an empty stomach.

Pred_Len
A 4.1-digit numeric field that does not allow null values representing the fork length (cm) of the predator.

Pred_Full

A 1-digit numeric field that allows null values representing predator stomach fullness at the time of analysis. Values are null, 1(empty stomach), 2(trace of prey), 3(25% fullness), 4(50% fullness), 5 (75% fullness), 6(100% fullness) and 7(distended stomach). New data should not include null values.

Pred_Wt

A 7.1 numeric field that allows null values representing the weight (g) of the predator calculated from established length-weight regressions. May be null if no established length-weight regression is available.

Year

A 4-digit numeric field that does not accept null values, acceptable values are any four,digit year.

Month

A 2-digit numeric field that does not allow null values representing the month from which the haul was collected.

Day

A 2-digit numeric field that does not allow null values representing the day of the month from which the haul was collected.

Region

A 6-place VarChar2 field that does not allow null values for region. Current values are BS (Bering Sea), GOA (Gulf Of Alaska), AI (Aleutian Islands).

Pred_name

Predator scientific and common name.

Prey_name

Prey scientific and/or common name. In order to facilitate presentation of diet data, prey have been grouped into categories based upon their ecological similarities, importance and consistency of ID level. Raw prey codes are left intact for those interested in that level of detail.

Pred_Dig

A 1-digit numeric field that does not allow null values representing the state of digestion of a given prey item. Values are 1(empty stomach), 2(traces of prey) 3(75% digested), 4(50% digested), 5(25% digested) and 6(fresh prey).

Prey_Lh

A 1-digit character field that allows null values representing the life history stage of the prey item. Acceptable values for this field are shown in the life history table (Table A.2) below.

Pred_Sex

A 1-digit numeric field that allows null values representing the sex of the predator. Acceptable values are null, 1(male), 2(female) or 3(unsexed/unknown/juvenile).

Prey_Parts

A 1-digit character field that allows null values representing the parts code, if any, of the prey item. In addition to a null value, indicating no parts code used, acceptable values for this field are shown in the prey parts table (Table A.1) below.

Vessel

A 4-digit numeric field that does not accept null values, acceptable values are any vessel code.

Cruise

A 6-digit numeric field that does not accept null values, acceptable values are any cruise code. Survey cruise numbers are generally formatted as YEARXX (201501).

Haul

A 4-digit numeric field that does not allow null values representing the haul number from which the associated stomach data were collected.

Rlat

An 8.2 numeric field that does not allow null values representing the latitude (decimal degrees) from which the haul was collected. This represents the haul back location.

Rlong

A 9.2 numeric field that does not allow null values representing the longitude (decimal degrees) from which the haul was collected. This represents the haul back location. Eastern longitudes are represented by negative values, western by postitive.

Gear_Depth
A 4-digit numeric field that allows null values representing the average gear depth (m).

Bottom_Depth
A 4-digit numeric field that allows null values representing the average bottom depth (m).

Start_Hour
A 4-digit numeric field that allows null values representing the 24 hour (hhmm) start time of a given haul.

Surface_Temp
A 4.2-digit numeric field that allows null values representing the surface water temperature (deg C).

Gear_Temp
A 4.2-digit numeric field that allows null values representing the gear water temperature (deg C).

INPFC_Area
A 3-digit numeric field that allows null values representing the INPFC/Management area from which the sample was collected.

StationID
A 9-digit alphanumeric field that allows null values representing the RACE station ID number

Start_Date
A date string that allows null values representing the start date (mm/dd/yyyy) of the haul.

Prey Length Table

Hauljoin

A 12-digit numeric field that does not allow null values. Each hauljoin uniquely identifies a given vessel, cruise and haul combination.

Pred_Nodc

A 10-digit numeric field that does not allow null values representing the NODC code for the predator from which the given data were collected. Consult REEM NODC code dictionary (http://access.afsc.noaa.gov/REEM/WebDietData/DietDataIntro.php) for definitions as some codes have been customized.

Pred_Specn

A 4-digit numeric field that does not allow null values. This is the predator specimen number assigned to the stomach when it was collected in the field.

Prey_Nodc

A 10-digit numeric field that does not allow null values representing the NODC code for the prey item. Consult REEM NODC code dictionary (http://access.afsc.noaa.gov/REEM/WebDietData/DietDataIntro.php) for definitions as some codes have been customized.

 A value of 0 indicates an empty stomach.

Pred_Len

A 4.1-digit numeric field that does not allow null values representing the fork length (cm) of the predator.

Year

A 4-digit numeric field that does not accept null values, acceptable values are any four,digit year.

Month

A 2-digit numeric field that does not allow null values representing the month from which the haul was collected.

Day

A 2-digit numeric field that does not allow null values representing the day of the month from which the haul was collected.

Region

A 6-place VarChar2 field that does not allow null values for region. Current values are BS (Bering Sea), GOA (Gulf Of Alaska), AI (Aleutian Islands).

Pred_name
Predator scientific and common name.

Prey_name

Prey scientific and/or common name. In order to facilitate presentation of diet data, prey have been grouped into categories based upon their ecological similarities, importance and consistency of ID level. Raw prey codes are left intact for those interested in that level of detail.

Vessel
A 4-digit numeric field that does not accept null values, acceptable values are any vessel code.

Cruise
A 6-digit numeric field that does not accept null values, acceptable values are any cruise code. Survey cruise numbers are generally formatted as YEARXX (201501).

Haul
A 4-digit numeric field that does not allow null values representing the haul number from which the associated stomach data were collected.

Rlat
An 8.2 numeric field that does not allow null values representing the latitude (decimal degrees) from which the haul was collected. This represents the haul back location.

Rlong
A 9.2 numeric field that does not allow null values representing the longitude (decimal degrees) from which the haul was collected. This represents the haul back location. Eastern longitudes are represented by negative values, western by positive.

Gear_Depth
A 4-digit numeric field that allows null values representing the average gear depth (m).

Bottom_Depth
A 4-digit numeric field that allows null values representing the average bottom depth (m).

Start_Hour
A 4-digit numeric field that allows null values representing the 24 hour (hhmm) start time of a given haul.

Surface_Temp
A 4.2-digit numeric field that allows null values representing the surface water temperature (deg C).

Gear_Temp
A 4.2-digit numeric field that allows null values representing the gear water temperature (deg C).

INPFC_Area
A 3-digit numeric field that allows null values representing the INPFC/Management area from which the sample was collected.

StationID
A 9-digit alphanumeric field that allows null values representing the RACE station ID number

Start_Date
A date string that allows null values representing the start date (mm/dd/yyyy) of the haul.

Prey_Sz1
An 8.3-digit numeric field that does not allow null values representing the standard length (mm) of fish prey, carapace width (mm) of Majid crabs, or carapace length of Lithodid crabs. This is the primary prey size measurement

Prey_Sex
A 1-digit numeric field that allows null values representing the sex of the prey. Acceptable values are null, 1 indicating male, 2 indicating female or 3 indicating unsexed or juvenile. A prey sex code of 5 may be used to indicate a fish length that was estimated with a method other than the Pollock otolith measurements as noted below. Values of 6-8 are used indicating the condition of walleye pollock otoliths used for estimating the length of the prey fish they were removed from. 6 indicating fair, 7 indicating good, and 8 indicating excellent. See the lab manual for a description of the protocol for using walleye pollock otoliths for estimating prey length.

Table A.1 --Prey Parts Codes

Code	Description
blank	whole prey found or empty stomach
1	parts (different but from same taxon)
2	siphon
3	shells
4	legs
5	setae
6	chelae
9	bones
A	heads
B	eyes
C	beaks
D	tails
P	proboscis
L	leg or chelae

Table A2 -- Prey Life History Code

Code	Description
1	egg
2	nauplius
3	zoea
4	megalops larva
5	veliger larva
6	larva
7	juvenile
8	adults
9	comb. of larvae, juv. and adults
A	combo of juv. & adults
B	combo of larvae & juv.
C	life history stage unknown
D	Polyp
E	Cypris
F	Copepodid
G	Pupa
H	Nymph
K	Medusa
L	Egg carrying female
M	egg case
Q	immature
R	subadult
S	trochophore larva
T	subadult and
U	mating pair
V	mysis
W	colony
Y	soft shell

Table A.3 – Prey categories used in the Prey_name fields of the database. A given prey will only occur in one category. For example, walleye pollock is only found in the walleye pollock category, it is not found in Misc. Gadidae, Misc. Teleost, etc.

Category	Prey Items
Agonidae	Fish prey of the family Agonidae- poacher, alligatorfish, starsnout
Alaska plaice	*Pleuronectes quadrituberculatus*
Ammodytidae	Fish prey of the family Ammodytidae - sandlance
Arrowtooth flounder	*Atheresthes stomias*
Atka Mackeral	*Pleurogrammus monopterygius*
Bathylagid	Fish prey of the family Bathylagidae – deepsea smelt, smoothtongue
Bering Flounder	*Hippoglossoides robustus*
Bivalvia	Clams
Blue King Crab	*Paralithodes platypus*
Brittle Star	Prey of the order Ophiurida – brittle stars
Cancridea	Cancrid crabs
Caprellidea	Caprellid amphipods
Chaetognatha	Prey of the order Chaetognatha – arrow worms
Chionoecetes spp.	Prey of the genus Chionoecetes not identified to species
Clupeoidei	Fish prey of the order Clupeoidei – shad, anchovy, herring
Cnidaria	Prey of the order Cnidaria –anemone, hydroid, jelly fish, sea pen
Copepoda	Prey of the order copepod - copepods
Cottid	Fish prey of the order Cottid? – sculpin, Irish lord
Crangonidae (shrimp)	Prey of the family crangonidae – crangon, argid, spinyhead
Ctenophora	Comb jelly
Cumacea	Cumacean
Cyclopteridae	Fish prey of the family cylopteridae – snailfish, lumpsucker
Euphausiacea	Euphausiids
Fish Eggs	Fish eggs
Flathead sole	*Hippoglossoides elassodon*
Gammaridea	Gammarid amphipods
Gastropod	Snails
Greenland turbot	*Reinhardtius hippoglossoides*
Hippoglossoides spp	Fish prey of the genus Hippoglossoides not identified to species
Hippolytidae (shrimp)	Prey of the family Hippolytidae – Eualus, Lebbeus, Spirontocaris, Heptacarpus
Hyperiidea	Hyperiid amphipods
Isopoda	Isopods
Kamchatka flounder	*Atheresthes evermanni*
Larvacea	Larvacean
Lepidopsetta sp	Fish prey of the genus Lepidopsetta not identified to species
Macrouridae	Fish prey of the genus macrouridae - grenadiers

Misc	Any prey not found in any other category
Misc Amphipoda	Amphipods not identified as caprellid, hyperiid, or gammarid
Misc Anomura	Anomuran crabs not otherwise listed
Misc Bird	Miscellaneous bird prey
Misc Brachyura	Brachyuran crab not otherwise listed
Misc Cephalopoda	Cephalopods not otherwise listed
Misc Crab	Crab prey not otherwise listed – Porcellanidae, Reptantia
Misc Crustacea	Crustacea prey not otherwise listed – leptostraca, barnacle, Ostracoda, Cladocera
Misc Decapoda	Decapod crustacean not otherwise listed – Sergestidae, Panaidae
Misc Echinoderm	Echinoderms not otherwise listed – unidentified starfish, urchins and basket stars
Misc Flatfish	Flatfish not otherwise listed
Misc Gadidae	Gadids not otherwise listed – Arctic cod, Pacific tomcod, saffron cod
Misc Hexagrammidae	Hexagrammids other than Atka Mackerel - greenlings
Misc Invert	Invertebrate prey not otherwise listed
Misc Lithodidae	Lithodid crabs not otherwise listed – box crab, golden king crab, scarlet king crab
Misc Majidae	Majid crabs not otherwise listed – lyre crabs, decorator crabs
Misc Mollusca	Molluscs not otherwise listed – nudibranchs, scaphopods
Misc Non-teleost fish	Non-teleost fish not otherwise listed – lampreys, ratfish
Misc Org	Unidentified organic materials – wood, algae, sand, etc
Misc Shrimp	Shrimp prey not otherwise listed - Pasaphiphaedae
Misc Teleost	Teleost prey not otherwise listed
Misc Worm	Worm like prey not otherwise lised – echiura, Sipuncula, priapula
Myctophidae	Fish prey of the family myctophidae - lanternfish
Mysidacea	Mysids
Northern rock sole	*Lepidopsetta polyxystra*
Octopoda	Octopus
Offal	Fishery offal
Opilio Crab	*Chionoecetes opilio*
Osmerid	Fish prey of the family Osmeridae - smelt, capelin, eulachon
Pacific Cod	*Gadus macrocephalus*
Pacific halibut	*Hippoglossus stenolepis*
Pacific sandfish	*Trichodon trichodon*
Paguridae	Crab prey of the family Paguridae – hermit crabs
Pandalidae (shrimp)	Shrimp prey of the family Pandalidae
Pholidae	Fish prey of the family Pholidae - gunnels
Polychaeta	Marine polychaete worms
Pteropoda	Prey of the order Pteropoda
Rajadae	Fish prey of the family Rajidae - skates

Red King Crab	*Paralithodes camtschaticus*
Sablefish	*Anoplopoma fimbria*
Salmonidae	Fish prey of the family Salmonidae - salmon
Sand Dollar	Sand dollars
Sea Cucumber	Sea cucumbers
Sea Urchin	Sea urchins
Sebastelobus	Fish prey of the genus Sebastelobus - thornyheads
Sebastes	Fish prey of the genus Sebastes - rockfish
Southern rock sole	*Lepidopsetta bilineata*
Stichaeidae	Fish prey of the family Stichaeidae - pricklebacks
Tanner Crab	*Chionoecetes bairdi*
Teuthida	Squid
Tunicate	Tunicates and salps
Unid Eggs	Unidentified eggs – generally invertebrate
Unid Rockfish	Unidentified rockfish
Walleye pollock	*Gadus chalcogrammus*
Yellowfin sole	*Limanda aspera*
Zoarcoidae	Fish prey of the family Zoarcidae - eelpouts