Changes from Kim’s Delta Management model

Groups deleted:

A/J largemouth bass

A/J sturgeon

A/J blue catfish

A/J grey snapper

A/J threadfin shad

A/J gizzard shad

A/J sunfish

Groups combined:

Sand and spotted seatrout- QB based on sand seatrout (more abundant), PB was already same, B summed

Croaker, spot, perch- QB, PB based on croaker, B summed

Anchovy, silverside- QB based on adult anchovy/silverside (same), PB based on silverside, B summed

Brown and white shrimp- QB, PB same. B summed.

Zoobenthos and benthic crustaceans- QB, PB were same. B summed

Diets are weighted by biomass but not consumption rate, because QB ratio was also taken from most abundant group.

New groups:

Gar

Stingray

Diving birds (gulls, terns, frigate birds)

(Piscivorous) Marsh birds

Carnivorous insects

Herbivorous insects

Other notes:

Mollusks were updated for PB, QB based on Patricio and Marques 2006, but diet based on DM model

Pelicans in new model = seabirds from DM model

Dolphin Diet: Taken loosely from 2 papers in McCann et al folder—a thesis and book chapter. Similar sample sizes (~25 dolphins). Sizes from thesis indicate dolphins targeting adults (>100 mm except anchovy), assume ~1/6 diet juveniles, ~5/6 adults. Book chapter data was closer to MS delta, base diet more on % of prey each species made up, loosely correcting for average biomass of each prey item (“small” vs. “large”).

Biomass from McDonald et al. (2017) (post spill, ugh, but specific to Barataria Bay), assume 360 kg dolphin, weight their strata densities by strata area. This might be high due to survey bias, but low due to oil spill mortality. It’s a wash? Ugh. This was 2 orders of magnitude higher than Kim’s biomass (.7 vs. .002), though that is B.S. Greer has .03.

Dolphins are eating too much pinfish. Diet % by mass (Bowen thesis) indicates a lot of pinfish. But that is in FL and the diet occurrence data indicates lots of pinfish farther east, but less so in N. Gulf of Mexico maybe?

Alternative: total abundance from McDonald (2306 individuals) / area from Lewis ecopath model of B.B. (6280 km^2) = 0.083 g/m^2. This is likely low because McDonald did not sample all of B.B. But probably sampled the highest density areas. But is higher than anyone else…

Gar diet: taken from Greer MS thesis (GoM menhaden EwE model), corroborated with paper in McCann et al. folder-- Goodyear (1967) from Biloxi Bay, Mississippi.

Pelican diet: Based mostly on Fogarty (1981), which reports % by mass, with additional diet items reported in other studies cited by Greer thesis, etc. Increased menhaden diet % because Fogarty disagreed with other studies on relative dominance.

QB ratio calculated based on body size of 7.6 lbs for brown pelican (google), and equation from Numbers, Food Consumption, and Fish Predation by Birds in Lake Möckeln, Southern Sweden Author(s): Sven G. Nilsson and Ingvar N. Nilsson

Log(daily consumption in g) = -0.293 + 0.85\*log(body mass in g)

Diving birds diet: Used mix of diet papers from Grier thesis and McCann et al. Can’t remember! I think it was mostly based on Greer thesis props?

QB calculated same as pelican, assume ~1 lb birds.

Wading birds diet: These diets are vague and based off papers cited by McCann et al.

Stingray diet: Based off Greer thesis

There is not enough killifish biomass to balance the model, due to the new consumption by marsh birds. According to CWC minnow and leonard trap data, non-fundulus “marsh fish” (species taken from McCann et al) are about as abundant as fundulus marsh fish. However, de Mutsert ecopath model only includes fundulus spp. abundance (sampled by seines). Tried doubling fundulus abundance. This worked!

Adult menhaden EE > 1: Reduced consumption by juvenile sharks, pelicans, gars, diving birds.