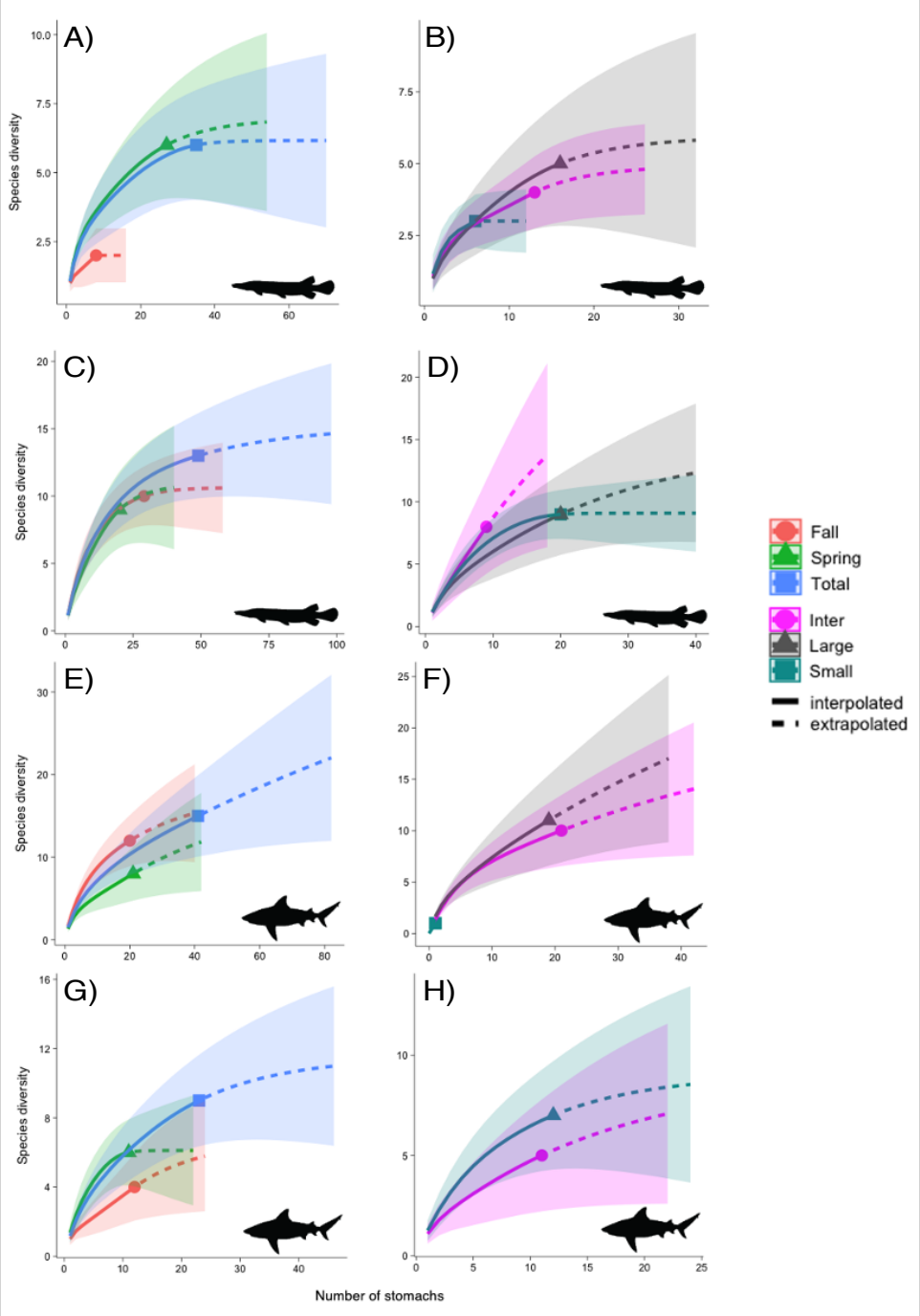

Fig. S1: Total, seasonal, and size-class cumulative trophic diversity curves for the overall diet of alligator gars and bull sharks in San Antonio Bay (A-B, E-F) and Sabine Lake (C-D, G-H).

Table S1. Prey groups and trophic position used to estimate trophic position of the alligator gar, *Atractosteus spatula*, and the bull shark, *Carcharhinus leucas*, based on their stomach contents composition (Matich et al. 2020).

Prey group	Trophic position
Portunidae	2.1
Panopeidae	3.0
Panaeidae	2.0
Colubridae	3.5
Sphyrna tiburo	3.9
Rhizoprionodon terranovae	4.0
Myliobatiformes	3.8
Anguillidae	3.8
Ophichthidae	3.3
Clupeidae	2.1
Anchoa mitchilli	3.5
Elops saurus	3.7
Megalops atlanticus	4.5
Mugilidae	2.0
Lepomis gulosus	3.2
Micropogonias undulatus	3.2
Sciaenops ocellatus	3.2
Cynoscion spp.	3.2
Leiostomus xanthurus	3.2
Lagodon rhomboides	2.2
Archosargus probatocephalus	3.5
Paralichthys_lethostigma	3.2
Ariidae	3.4

Table S2: ANOVA results for the effect of salinity on $\delta^{15}N$ of baseline organisms in San Antonio Bay and Sabine Lake.

	df	Sum Sq	*F*	p
San Antonio Bay				
Salinity	1	403.23	46.842	**<0.001**
Residuals	70	8.61		
Sabine Lake				
Salinity	1	19.06	2.294	0.1348
Residuals	63	523.24		

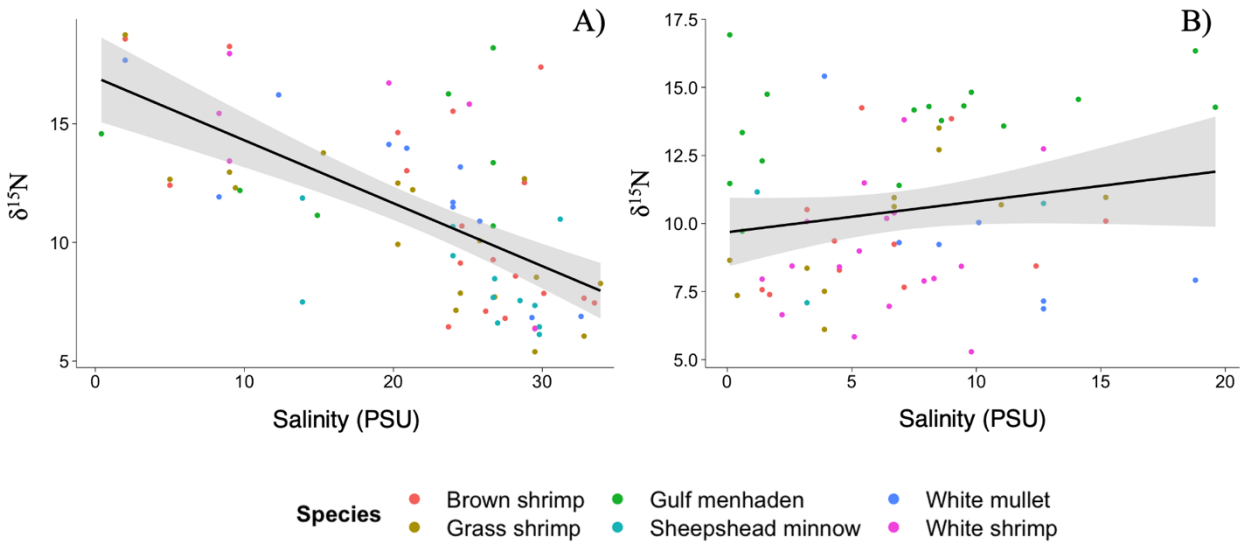

Fig. S2: Relationship between $\delta^{15}N$ values of baseline organisms and salinity in (A) San Antonio Bay and (B) Sabine Lake.

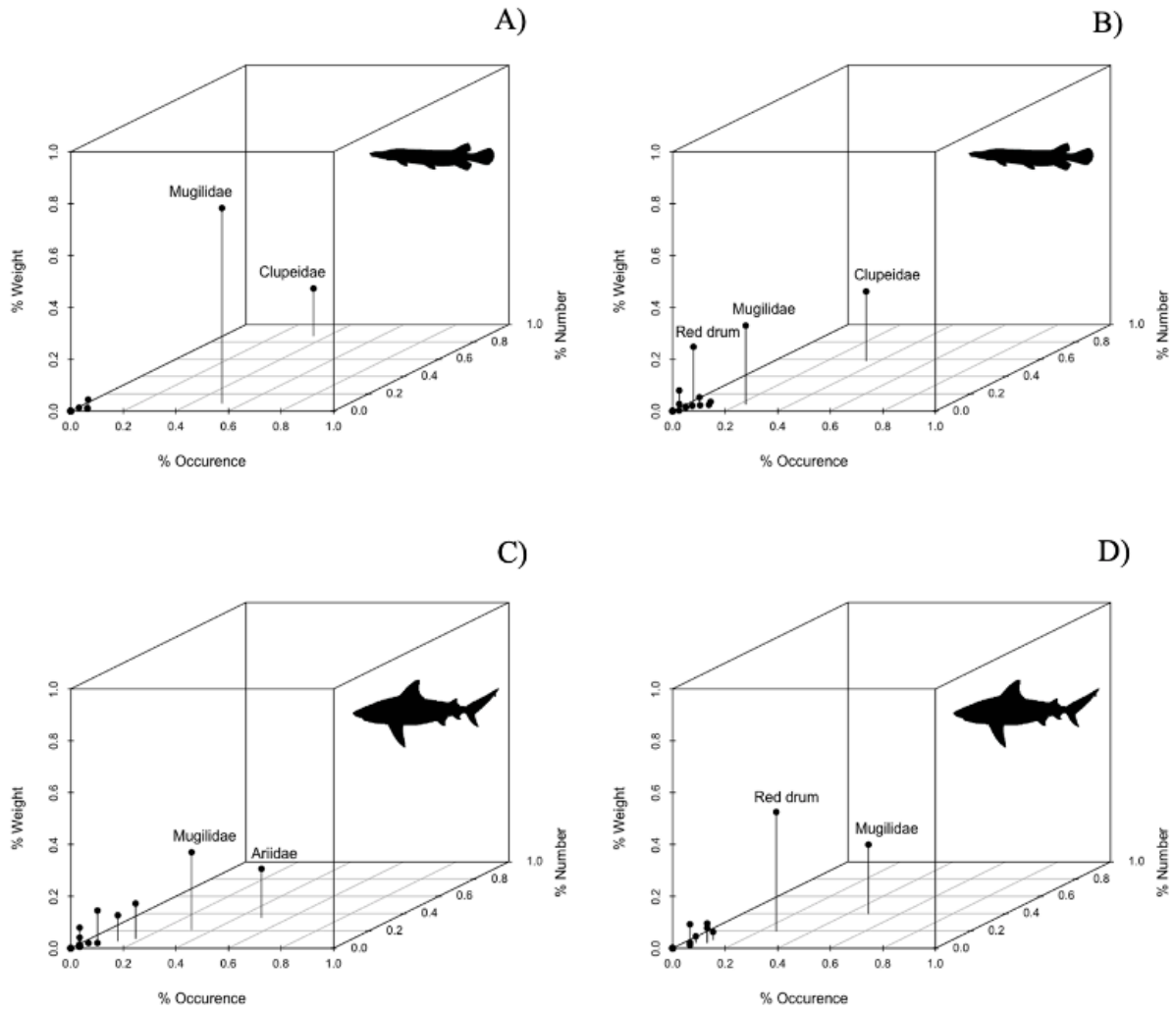

Fig. S3: 3D Costello diagrams of prey importance for alligator gars (A-B) and bull sharks (C-D) in San Antonio Bay (A,C) and Sabine Lake (B,D).

Table S3: Data summary of stable isotopes analyses.

	n	$\delta^{15}N$ (‰)		$\delta^{13}C$ (‰)		mean
		Range	mean ± sd	Range	mean ± sd	TP_{SIA}
San Antonio Bay	114					
Alligator gar	56	6.50, 17.66	11.14 ± 2.43	-25.24, -13.71	-19.27 ± 2.63	3.2
Bull shark	58	7.72, 15.60	12.11 ± 1.81	-21.75, -15.32	-18.18 ± 1.63	5.0
Sabine Lake	69					
Alligator gar	51	8.24, 16.79	12.37 ± 1.78	-25.72, -16.38	-19.83 ± 2.17	2.7
Bull shark	16	11.99, 16.26	13.95 ± 1.28	-22.33, -17.61	-19.48 ± 1.45	4.3

Table S4: Total and seasonal niche breadths (in ‰^{2}) for alligator gars and bull sharks reflecting 95% kernel utilization densities.

	San Antonio			Sabine		
	All	Spring	Fall	All	Spring	Fall
Alligator gar	112.50	116.50	96.11	74.83	78.57	59.78
Bull shark	57.33	43.80	38.06	31.60	-	19.45

Table S5: Total isotopic niche overlap between alligator gars and bull sharks reflecting 95% kernel utilization densities.

	San Antonio Bay	Sabine Lake
Alligator gar	37%	21%
Bull shark	73%	51%

Table S6: Seasonal isotopic niche overlap between alligator gars and bull sharks reflecting 95% kernel utilization densities.

	San Antonio		Sabine
	Spring	Fall	Fall
Alligator gar	28%	36%	25%
Bull shark	74%	90%	76%

Table S7: Within-species isotopic overlap across seasons for alligator gars and bull sharks reflecting 95% kernel utilization densities.

	San Antonio		Sabine
	Alligator gar	Bull shark	Alligator gar
Spring	69%	44%	48%
Fall	84%	38%	96%