Seasonal Food Habits and Prey Selectivity of Alligator Gar from Texoma Reservoir, Oklahoma

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Abstract: Alligator gar (*Atractosteus spatula*) were once viewed negatively by anglers and state agencies, but interest in reintroduction and trophy management of gar has increased in many states across their range, including Oklahoma. Therefore, the Oklahoma Department of Wildlife Conservation is planning to reintroduce alligator gar back into their native range. Thus, biologists decided to implement a food habits study to determine potential impacts of alligator gar to other fish populations in order to address angler concerns about possible reintroduction. The objectives of this study were to describe seasonal food habits and prey selection of alligator gar collected from Texoma Reservoir located on the Texas-Oklahoma border. Fish were mostly collected using gill nets but 36% were also donated by anglers. Diets were pooled into two seasonal groupings (winter-spring and summer-fall). Stomach contents were analyzed from a sample of 138 alligator gar (56 in winter-spring; 82 in summer-fall). Alligator gar were primarily piscivorous, with gizzard shad being the predominant prey item consumed across seasons. Although alligator gar primarily consumed nongame fish, striped bass (*Morone saxatilis*) occurred in 11% of diets with other sportfish representing a combined occurrence <4%. Prey selectivity was evaluated using a jug-line survey during summer 2017 and 2018. Each jug line was baited with a dead whole fish from one of six prey taxon (three sportfish: catfish [*Ictalurus* spp.], largemouth bass [*Micropterus salmoides*], and white crappie [*Pomoxis annularis*]), and three nongame species: buffalo [*Ictiobus* spp.], gizzard shad [*Dorosoma cepedianum*], and river carpsucker [*Carpiodes carpio*]). Of the 101 alligator gar caught with juglines, buffalo and river carpsucker were the only two prey items with positive selectivity values. Alligator gar selected neutrally for gizzard shad and selected against catfish, largemouth bass, and white crappie. This study provides fisheries managers with important information regarding alligator gar diets and prey selection, which can be valuable when addressing angler concerns about future reintroduction efforts.

Key words: piscivore, stomach contents, *Atractosteus spatula*, sportfish

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Evaluating the feeding ecology of fishes provides fisheries scientists with critical natural life-history information and an understanding of food web dynamics and trophic positioning in an aquatic ecosystem for the species of interest (Braga et al. 2012, Fincel et al. 2014). Dietary interactions among species affect recruitment, abundance, growth, and mortality of fishes (Gil et al. 2015). However, diets of a particular fish species may vary among populations due to differences in fish communities or habitats within a system (Bettoli et al. 1992, Shoup and Wahl 2009). Therefore, understanding population-specific diets is important for management of a species.

Information about the feeding ecology of adult alligator gar (*Atractosteus spatula*) is limited, but important for their management because this species is an apex predator in freshwater systems where they occur (Scarnecchia 1992, David et al. 2018). Historically, alligator gar diet studies were conducted to evaluate their impacts to sportfish populations through direct consumption or competition (Scarnecchia 1992, de León et al. 2001). However, most alligator gar diet evaluations found atherinids, clupeids, cyprinids, and fundulids composed a substantial proportion of alligator gar diets (Bonham 1941, Goodyear 1967, Seidensticker 1987, Winemiller et al. 2007, DiBenedetto 2009), suggesting that alligator gar are opportunistic piscivores that prey on highly abundant or readily available forage species (Robertson et al 2008).

Despite these findings, anglers and state agency personnel historically continued to have a negative opinion of this species, resulting in unrestricted harvest and targeted removal of alligator gar from aquatic systems (Scarnecchia 1992, O'Connell et al. 2007, Adams et al. 2019). Because these factors have occurred along with habitat alteration and loss, alligator gar have been extirpated from many parts of its historic range (David et al. 2018, Smith et al. 2020). As a result, the American Fisheries Society's Endangered Species Committee listed the alligator gar as "vulnerable" (Jelks et al. 2008). After many decades of being viewed as a nuisance, anglers and fisheries managers alike have recently developed a better appreciation of the fishery potential and need for conservation of alligator gar. This has resulted in increased research and outreach efforts by managing agencies coupled with considerable attention by recreational anglers because of the trophy potential of this species (Buckmeier et al. 2015, Smith et al. 2018). Growing commercial and recreational importance of alligator gar has resulted in state natural resource agencies instituting regulations to promote sustainable harvest of this species in its current range and initiating programs to reintroduce alligator gar into portions of its former range where they had been extirpated (Porta et al. 2019, Smith et al. 2020).

In 2017, the Oklahoma Department of Wildlife Conservation (ODWC) implemented research to better understand the existing alligator gar population in Texoma Reservoir (Snow et al. 2018a) and began considering stocking them into other systems within their native range in Oklahoma. Although the majority of diet studies have shown that alligator gar are opportunistic piscivores that predominately forage on nongame species (Smith et al. 2020), no directed diet evaluations of alligator gar >600 mm have been conducted in Oklahoma. Possibly alligator gar diets in Oklahoma differ from those in other geographical regions due to differing fish abundances and local fish community structure. Also, anglers are more likely to accept research from local systems than those from other areas, even adjacent states (Churchill et al. 2002). Therefore, before alligator gars are stocked into other aquatic systems in Oklahoma, we quantified food habits and prey selectivity of adult alligator gar in Texoma Reservoir. Specifically, we wanted to document whether nongame species or sportfish were consumed more frequently. Our objectives were to describe seasonal diets of adult alligator gar and to evaluate alligator gar prey selectivity.

Methods

Study Area

Texoma Reservoir is a 35,612-ha impoundment located in southcentral Oklahoma on the Oklahoma-Texas border (33º 53′ 12.1″ N, 96º 36′ 20.8″ W). Texoma Reservoir was formed in 1944 by impounding the Red and Washita rivers with Denison Dam to provide hydro-electric power and flood control. At full pool, Texoma Reservoir has 953.9 km of shoreline, a maximum depth of 26 m, and a mean depth of 8.7 m. The river-reservoir interface of both river arms (Red and Washita rivers) are shallow due to years of siltation which has created floodplains where terrestrial vegetation colonizes and creates important spawning and nursey habitat for fishes (Patton and Lyday 2008). The lower portions of the reservoir consist of large expanses of open water with offshore humps and limited areas of submerged standing timber, rock, coarse gravel, and mud or sand flats (Sager et al. 2011). The reservoir provides habitat for more than 50 fish species, many of which are recreationally important (Matthews et al. 2004, Sager et al. 2011). Further, Texoma Reservoir supports one of the few self-sustaining inland striped bass (*Morone saxatilis*) populations in the United States, which is highly important economically and recreationally (Matthews et al. 1989, Sager et al. 2011).

Fish Collection and Diet Evaluation

ODWC initiated a monitoring program in 2017 to estimate the abundance of adult alligator gar in Texoma Reservoir using mark-recapture methods (see also Bodine et al. 2015, Schlechte et al. 2016). When incidental netting mortalities occurred in the summer and fall, these fish were measured for TL (mm) and fish were dissected to remove stomachs (start of esophagus to sphincter at beginning of intestine). Stomachs were placed into individually numbered plastic bags and stored on ice until returned to the Oklahoma Fishery Research Laboratory in Norman, Oklahoma, where they were frozen. Additionally, alligator gar stomachs were collected from angler-harvested fish. Most angler-provided fish were harvested by bowfishing, but five were caught using jug lines or rod and reel. To ensure diets of hook-and-line caught fish were accurately described, anglers were asked to identify bait type they were using and if found, that item was removed from the stomach sample.

During winter and spring 2019, sampling alligator gar for age and growth and diet analysis was conducted using gill nets deployed in the upper third of the reservoir in deep pools (<9 m). Nets were 61 m long and 3 m deep and consisted of a 19-mm foam-core float line and 9-kg lead line. Each net consisted of six panels, including three 88.9-mm, one 114.3-mm, and two 139.7-mm bar measure mesh constructed with #21 black-twine mesh (Schlechte et al. 2016). Before setting nets, side-scan sonar was used to locate individuals within the sampling area (Fleming et al. 2018). Five fish per 100 mm TL length groups were collected for processing. Once captured, each fish was placed in a 1:1 ice to water slurry to be euthanized (Blessing et al. 2010). When euthanasia was complete, the specimens were transported to Oklahoma Fishery Research Laboratory and processed for diet analysis using the aforementioned methods.

To evaluate alligator gar diets, stomachs were thawed, prey items were removed, identified, and enumerated; individual prey items were measured for TL if lightly digested, and all prey items were weighed (g). All prey items were identified to species using scientific taxonomic keys (Oats et al. 1993, Miller and Robison 2004, Traynor et al. 2010). Because few fish were collected in any one month, fish were grouped into two seasonal groupings; winter-spring (December–May) and summer-fall (June–November) for analysis. Following methodology from Bowen (1996), alligator gar diets were described using percent occurrence (calculated using fish with and without diet items), percent composition by number, and percent weight. Additionally, once identified, prey were separated into sportfish, nongame fish, and invertebrate groupings. Differences in percent occurrence between sportfish and nongame fish was evaluated using a Chi-square test at $P < 0.05$ significance level. The relationship between alligator gar TL and prey size was evaluated using linear regression of prey length (Overton et al. 2009, McGrath et al. 2013).

Prey Selectivity

A prey selectivity study was conducted on alligator gar during June through September in 2017 and 2018. The study was conducted using jug lines because they have been shown to be useful for sampling alligator gar (DiBenedetto 2009, Buckmeier et al. 2015) and they allowed all prey types to be presented identically within areas containing alligator gar. Jug-line design consisted of a 19.05-mm diameter PVC pipe that was 1.36 m in length inserted through a 88.9-mm diameter swimming pool noodle that was 1.26 m long capped with 19.05-mm PVC caps. Holes (4.8 mm) were drilled through each cap and 33.5 m of 114-kg-test jug line was run through the holes in the PVC caps and pipe, so it could slide freely on the line. Once the line was fed through the PVC, a snap swivel was tied to one end and a 0.45-kg weight and 91.4-cm length of steel leader (84 kg test) with a snap swivel to the opposite side for attachment of the hook. Each jug line was individually numbered and baited with whole dead fish, which were randomly selected from one of six different prey types: largemouth bass (*Micropterus salmoides*), white crappie (*Pomoxis annularis*), catfish (*Ictalurus* spp.), gizzard shad (*Dorosoma cepedianum*), buffalo (*Ictiobus* spp.), and river carpsucker (*Carpiodes carpio*). Prey was added to each jug line by running a 6-mm diameter steel metal rod laterally through the body of a fish from the mouth through the caudal fin. Then, the snap swivel connected to the leader was pulled through the body and out of the mouth of the fish. A size 3/0 treble hook was then attached to the swivel and the hook was pulled against the snout of the fish (Figure 1).

Sampling was conducted in the upper third of both river arms of Texoma Reservoir and further upstream into the Red and Washita rivers. Side-scan sonar was used to locate schools of alligator gar. Once alligator gars were located, six jug lines, one having each of the six prey types, were set randomly in that location, constituting one trial. A total of 92 trials were conducted to evaluate prey selectivity. Jug lines were set to allow the prey to rest on the bottom of the reservoir. Jug lines were deployed before sunset and lifted at sunrise the following morning to constitute one jug night (DiBenedetto 2009). Alligator gar caught on jug lines were retrieved by hand, brought boat-side, noosed behind the pectoral fins with a rope, and lifted onto the boat where they were placed into a holding tank. Alligator gar that escaped from the jug lines before being brought onto the boat were counted to have chosen that prey type. Before release each alligator gar was measured for TL and released.

Figure 1. Example of an assembled jug (A) with how bait types were threaded on the hook (B) for jug lines used in the selectivity portion of the study. The bait type seen in the photographs is a gizzard shad measuring 374 mm TL.

Fish used as bait were measured for TL (mm) prior to being placed on a jug line. Mean TL of prey offered was compared to mean TL of those prey consumed by alligator gar using a two-sample *t*-test for each prey grouping. All statistical analyses were conducted using XLSTST 2020 (Addinsoft Inc., New York, New York) and significance was evaluated at $P \leq 0.05$.

Prey selectivity was determined for each prey type and by sportfish and nongame groupings using Chesson's electivity (Chesson 1983), which is preferred when the assumption of no replacement of consumed prey during the trial can be met. Any trials where no prey types were consumed were removed from analyses. Mean Chesson's alpha values and 95% confidence intervals were calculated for each prey type and by sportfish (catfish, largemouth bass, and white crappie) and nongame groupings (buffalo, gizzard shad, and river carpsucker). Confidence intervals for Chesson's alpha values were compared against random feeding (1 divided by the number of prey types) to assess selectivity. When graphed, the horizontal line at a Chesson's alpha value 0.16 (all prey types) and 0.50 (sportfish and nongame fish) represented random (neutral) prey selection. Confidence intervals entirely above the random feeding line were interpreted as positive selection for a particular prey, overlapping intervals were interpreted as neutral selection, and intervals entirely below the random feeding line were interpreted as negative selection (Rudershausen et al. 2005, Carter et al. 2010, Snow et al. 2018b).

Results

Alligator Gar Diets

A total of 138 alligator gar were analyzed for stomach contents, 56 (49 from gillnets and 7 angler donated) during winter-spring and 82 (45 from gillnets and 37 angler donated) during summer-fall. Size structure of alligator gar collected for diet analysis were relativity similar between seasons, winter-spring ranging from 590 to 2201 mm TL (mean = 1654 mm, SE = 69 mm) and summer-fall ranging from 689 to 2311 mm TL (mean = 1679 mm TL, SE = 41 mm). The majority of the fish collected in winter-spring (51 of 56; 91%) had empty stomachs, but most of the fish collected in summer-fall (68 of 82; 83%) had at least one identifiable prey item. Additionally, alligator gar stomach contents contained an average of 1.2 prey items per stomach (ranging from 1–3 prey items). Alligator gars were primarily piscivorous and diets were composed of 13 different prey types across both seasons (Table 1).

Only 5 of 56 stomachs of alligator gar collected during the winter-spring season contained diets items. Only gizzard shad and smallmouth buffalo (*Ictiobus bubalus*) were observed in alligator gar stomachs during these months, and gizzard shad composed the highest percentages of prey by occurrence, number, and weight (Table 1). No sportfish were found in alligator gar stomachs in the winter-spring season, so no significance test between prey types could be conducted.

Gizzard shad contributed most (22%) to the summer-fall diets of alligator gar by percent occurrence, followed by common carp (*Cyprinus carpio*; 17.1%), river carpsucker (*Carpiodes carpio*; 14.6%), striped bass (*Morone saxatilis*; 11%), grass carp (*Ctenopharyngodon idella*; 9.8%), smallmouth buffalo (9.8%), and bigmouth buffalo (*I. cyprinellus*; 7.3%). All other diet items contributed <10% by occurrence (Table 1). Gizzard shad was the most numerous species in alligator gar diets (20.3%), but when considered by family, catostomids (buffalo and river carpsucker; 31.2%) and cyprinids (common carp and grass carp; 29.7%) composed more than 60% of all diet items. *Morone* spp. (striped bass and white bass) contributed 9.5% by number to alligator gar diets. All other fish species represented <10% by number. Similar to percent number, cyprinids contributed the most to alligator gar diets by weight (48.3%), followed by catostomids (25.7%), moronids (11.7%), gizzard shad (7.4%), and catfish (4.1%). All other fishes combined contributed 3.2% of the total prey weight. Most diet items consumed by alligator gar during summer-fall were nongame species, dominating their diets by occurrence (85.5%), number (86.7%), and weight (84.5%). Sportfish were consumed by alligator gar, but at low levels (14.6% by occurrence, 14.6%, by number, and 12.3% by weight). Percent occurrence of nongame fish was higher than sportfish in diets of alligator gar ($\chi^2 = 97.03$, df = 1, $P = 0.01$).

Table 1. Diets of 138 alligator gar collected during winter-spring and summer-fall from 2017– 2019 in Texoma Reservoir, Oklahoma. Alligator gar diets were described in three ways: percent occurrence ($\%O_i$), percent composition by number ($\%N_i$), and percent weight ($\%W_i$).

Season	Prey	$\%O_i$	$\%N_i$	$\%W_i$
Winter-spring	Nongame fish			
	Gizzard shad	7.1	80.0	96.0
	Smallmouth buffalo	1.8	20.0	4.0
Summer-fall	Nongame fish			
	Bigmouth buffalo	7.3	6.8	2.5
	Common carp	17.1	18.9	15.8
	Freshwater drum	3.7	4.1	3.1
	Gizzard shad	22.0	20.3	7.4
	Grass carp	9.8	10.8	32.5
	Longnose gar	1.2	1.4	0.1
	River carpsucker	14.6	14.9	7.8
	Smallmouth buffalo	9.8	9.5	15.4
	Sportfish			
	Channel catfish	1.2	1.4	0.8
	Flathead catfish	1.2	1.4	4.4
	Striped bass	11.0	8.1	11.5
	White bass	1.2	1.4	0.0
	Invertebrate			
	Crayfish	1.2	1.4	0.0

Alligator gar used in the linear regression analysis ranged from 689 to 2286 mm TL and the 44 prey items consumed ranged from 217 to 1066 mm TL. Regression analysis showed a significant relationship between TL of alligator gar and TL of prey consumed (Figure 2). Prey TL generally increased with TL of alligator gar (prey TL = –154.38 + 0.3484*alligator gar TL). Further, the upper and lower 95% CL paralleled the trend line, indicating the breadth of prey sizes in their diet was consistent as alligator gar TL increased.

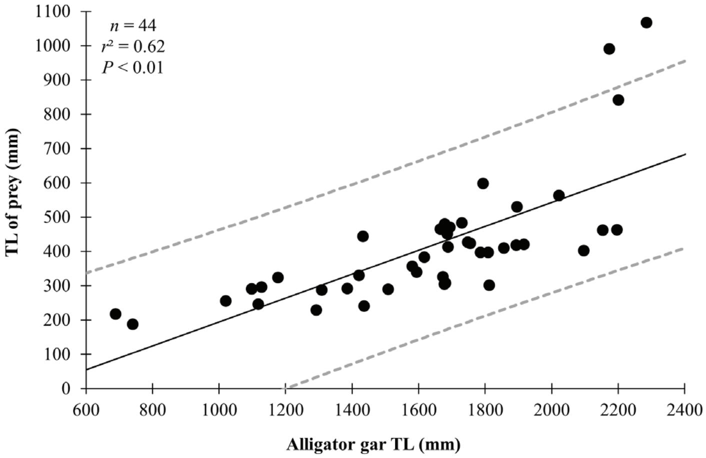

Figure 2. Linear regression describing the relationship between TL of alligator gar and prey taxa consumed. Upper and lower 95% CL are represented the by the grey dashed lines.

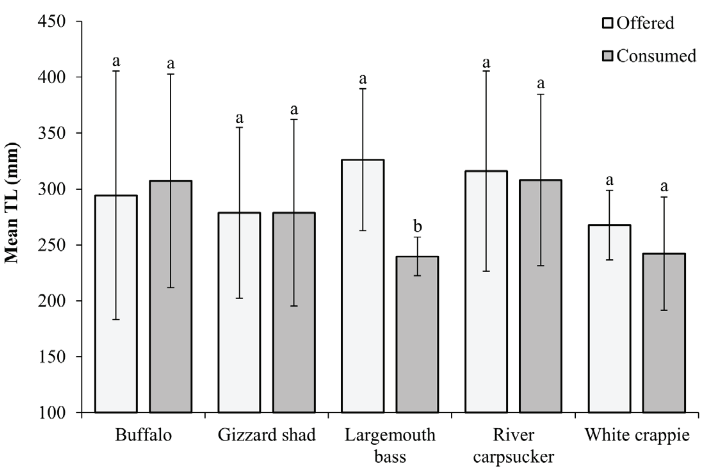

Figure 3. Mean TL (mm, ±SD) of prey taxa offered on jug lines compared to mean TL of prey taxa consumed by alligator gar. Differing letters indicate statistical significance.

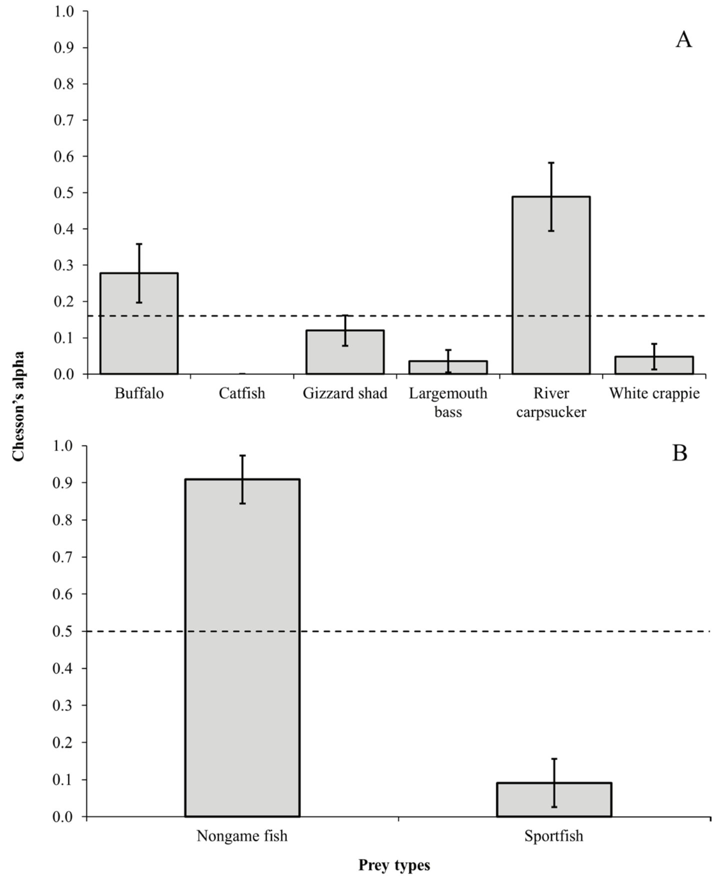

Figure 4. Prey selectivity (Chesson's alpha; mean ± 95% confidence interval) by alligator gar on (A) various prey taxa used to bait jug lines and (B) prey taxa combined into nongame fish and sportfish prey groupings. Values above the horizontal line indicate selection for the prey item, and values below the horizontal line indicate selection against that prey item.

Prey Selectivity

In 552 jug line nights, 101 alligator gar were captured (or hooked and identified to be alligator gar before snapping the line [3%] or spitting the hook [8.9%]). No fish were caught in 15 trials and fish other than alligator gar were caught in another 11 trials; these trials were removed from further analyses. Mean TL of prey offered as bait was similar to mean TL of bait consumed by alligator gar for buffalo ($t = -0.59$, df = 116, $P = 0.28$), gizzard shad ($t = 0.004$, df = 100, $P = 0.49$), river carpsucker ($t = 0.56$, df = 143, $P = 0.29$), and white crappie ($t = 1.31$, df = 97, $P = 0.12$; Figure 3). However, alligator gar consumed smaller largemouth bass (mean TL = 239) than those offered on jug lines (326 mm TL), but low sample size ($n = 5$) could have driven this result.

Alligator gar consumed all prey species offered on jug lines except catfish, but selection varied by prey type (Figure 4). Alligator gar exhibited positive selectivity for river carpsucker and buffalo but negative selectivity towards catfish, largemouth bass, and white crappie. Alligator gar selected neutrally for gizzard shad. Overall, alligator gar exhibited positive selectivity for nongame fish species and negative selectivity for sportfish species (Figure 4).

Discussion

Alligator gar in this study were primarily piscivorous, consuming 12 different fish species; however, most were nongame species, similar to results from previous studies (Bonham 1941, Goodyear 1967, Seidensticker 1987, DiBenedetto 2009). Gizzard shad composed the majority of alligator gar diets from Sam Rayburn Reservoir, Texas, (Seidensticker 1987) and Clarks River, Kentucky (Richardson 2015). Likewise, striped mullet (*Mugil cephalus*) dominated the diets of alligator gar in two Gulf Coast populations (Winemiller et al. 2007, DiBenedetto 2009). In all these cases the predominant prey fish found in alligator gar stomachs were among the most abundant in those respective systems. Therefore, alligator gar predation is likely a function of prey abundance (Seidensticker 1987, Winemiller et al. 2007, Robertson et al 2008). This suggests that nongame fish will likely dominate alligator gar diets in most systems, as those species usually occupy lower trophic levels than sportfish and thus comprise the majority of fish communities in terms of density and biomass (Hambright 1994, Diana 1995, Tronstad et al. 2010). We found that as alligator gar size increased, they consumed larger and a wider range of prey (from small gizzard shad to very large grass carp), which further demonstrates their opportunistic foraging strategy.

Although alligator gar diets were dominated by nongame species, sportfish were still found in their diets at low levels. We found moronids (primarily striped bass) were the most frequently consumed sportfish by alligator gar in Texoma Reservoir, similar to what Richardson (2015) observed in alligator gar diets from the Clark River, Kentucky. Striped bass in Texoma Reservoir are impacted seasonally with high temperature and low dissolved oxygen conditions that can result in fish mortality (Sager et al. 2011). It appears that alligator gar may take advantage of this seasonally available foraging opportunity, because striped bass were only observed in diets of alligator gar when striped bass die offs were occurring. Despite the fact that we observed no catfish consumed during the selectivity study, the food habits study found that alligator gar consumed low numbers of channel catfish and flathead catfish (*Pylodictis olivaris*). Catfishes were found to be minor components of alligator gar diets by some authors (de León et al. 2001, DiBenedetto 2009) but were commonly found in alligator gar diets in other aquatic systems (Goodyear 1967, Seidensticker 1987). De León et al. 2001 found alligator gar primarily consumed largemouth bass in Vicente Guerrero Reservoir; however, largemouth bass were not found in stomachs examined in our study and alligator gar negatively selected for them. We hypothesize that similar to nongame species, sportfish may occur more often in alligator gar diets when they are in higher abundance, either generally or locally.

Results from our prey selectivity study suggested that nongame species dominate alligator gar diets because gar are selecting for some of these species over sportfish. Conversely, Richardson (2015) found alligator gar from the Clarks River, Kentucky, slightly selected against clupeids, although they occurred most frequently in alligator gar diets. We found that alligator gar negatively selected for sportfish, which mirrored the results of the diet study. Alligator gar in our study rarely consumed largemouth bass and white crappie, and catfish were never consumed during prey selectivity trials, despite being important to alligator gar diets in other aquatic systems (Goodyear 1967, Seidensticker 1987, de León et al. 2001, Richardson 2015). Richardson (2015) commonly found centrarchids (mainly sunfish) in alligator gar diets (second highest occurrence) but also found that alligator gar negatively selected for these species. The selection for nongame species and negative selection towards sportfish may explain why these species occur infrequently in alligator gar diets. It is possible that other variables, such as habitat (Carter et al. 2010, Weber et al. 2011, McGrath et al. 2013), turbidity (Shoup and Lane 2015, Snow et al. 2018b), season (Scharf and Schlight 2000, Michaletz 2006), and fish size (Rudershausen et al. 2005, Christensen and Moore 2007) influenced alligator gar prey selectivity in our study. However, most previous studies were conducted in laboratory settings where these variables could be evaluated. Our evaluation was conducted in a natural environment, so we could not determine how these variables affected prey selectivity. Due to the large size of alligator gar, captivity trials to evaluate factors affecting prey selectivity are not practical. The selectivity portion of study was limited to the summer and fall time frame, because previous diet studies and our own data suggested that gar eat little during winter and spring (McGrath et al. 2013, Smylie et al. 2015).

The description of alligator gar diets in this study relied mostly on fish collected during the summer-fall season, which is when most other diet evaluations have been conducted (Bonham 1941, Goodyear 1967, Seidensticker 1987, de León et al. 2001, Winemiller et al. 2007, DiBenedetto 2009, Richardson 2015). Few alligator gars collected during winter-spring contained diet items. Alligator gar movements are greatly reduced during winter (Buckmeier et al. 2013, Wegener et al. 2017) and they are often found congregated in deeper habitats (Kluender 2011). This seasonal reduction in movement may also be associated with reduced foraging during the coldest times of year, as diet studies have found high proportions of empty stomachs during winter sampling in other gar species (McGrath et al. 2013, ODWC, unpublished data). Additionally, Smylie et al. (2015) determined that longnose gar (*Lepisosteus osseus*) fed the least during spring when fish were spawning. These results suggest that studies evaluating the impact of alligator gar predation on fish communities should increase sampling effort in winter and spring in order to collect enough fish having stomach contents to describe diets in those seasons.

Results from our study found that alligator gar mostly consumed nongame species, similar to findings of other studies (Bonham 1941, Goodyear 1967, Seidensticker 1987, DiBenedetto 2009).

Regardless, it is likely that reintroduction efforts will be viewed negatively by some angling groups and management biologists based on the perception that alligator gar consume sport fishes. For example, anglers commonly believe that striped bass introductions into southern U.S. reservoirs reduced sport fish abundances, despite findings of several studies that did not detect an adverse effect of striped bass stocked on resident fish populations (Churchill et al. 2002, Raborn et al. 2002, Shepherd and Maceina 2009). Results of our study used in conjunction with sport fish trend data can be useful for defusing concerns regarding alligator gar reintroductions. Ahead of reintroduction efforts, management biologists can implement a social media campaign to gauge the public perception of alligator gar introductions in Oklahoma (e.g., Adams et al. 2019). However, because alligator gar appear to consume mostly nongame fish, it is important for fisheries managers to consider rare or at-risk nongame fish species prior to implementing reintroduction efforts in other parts of its range.

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