

# Arizona Game and Fish Department

Region III Fisheries Program

## Topock Marsh Fish Survey Report February 2014

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**I. Summary-** On February 11-13, 2014 Region III Fisheries Program personnel surveyed Topock Marsh. A total of 385 fish were sampled using experimental gillnets with 10 net sets (200 net hours). Gizzard shad were the most abundant species caught gillnetting with 43% of the total catch followed by channel catfish with 21%. Striped bass (15%) and largemouth bass (6%) sampled, indicated healthy relative weights at 76 and 89 respectively. Fourteen razorback suckers were sampled and released without any mortality.

**II. Introduction-** Topock Marsh is a 4000 acre impounded backwater created from a historical meander of the Colorado River. Topock Marsh is in the Havasu National Wildlife Refuge which was created by congress in 1941; in 1966 South Dike and North Dike were completed creating Topock Marsh. The Fish and Wildlife Service manages the refuge primarily for waterfowl and secondarily as a sportfish fishery. This annual survey is conducted to serve as a means to monitor the fishery over time and provide necessary information for biologist to devise and implement effective management plans as defined in the Standard Fish sampling Protocol for State of Arizona Waters (2004). The warmwater sport fisheries of the marsh include self-sustaining populations of largemouth bass (*Micropterus salmoides*), channel catfish (*Ictalurus punctatus*), black crappie (*Pomoxis nigromaculatus*), striped bass (*Morone saxatilis*), yellow bullhead catfish (*Ameiurus natalis*) and common carp (*Cyprinus carpio*). All three *Lepomis* species (bluegill, green sunfish, and redear sunfish) exist in the marsh but are not sampled every year. Gizzard shad (*Dorosoma cepedianum*) is the most abundant species currently after the first detection in 2012. Razorback suckers (*Xyrauchen texanus*) were stocked in 2010.

**III. Methods-** Topock Marsh sample sites consisted of 7 random and 3 fixed experimental gillnet sites. The random sites were chosen while navigating through the marsh incorporating a variety of different habitat types (i.e. depth, channelized, vegetation). Fixed sites are derived from historical sample sites that were sampled each year after the Standard Fish Sampling Protocol for State of Arizona Waters was adopted in 2004.

One hundred fifty feet experimental monofilament gillnets set horizontally from shore and orientated perpendicular to the nearest shoreline. Randomization of mesh size towards shore (i.e. small or large mesh near shore) was achieved by how the nets were placed in the containers before deployment. Five nets were deployed from the South Dike area and the other five nets were deployed from the North Dike area. Nets were set during late afternoon, fished all night and pulled the next day in the same order as deployment. All fish were weighed, measured and recorded after each net was pulled. Razorbacks were scanned for PIT tags.

**IV. Results-** The fish species collected in the highest abundance in the winter survey of Topock Marsh were gizzard shad and comprised 43% of the catch followed by channel catfish 21% (Table 1). Striped bass (15%) caught in 2014 were the greatest number caught in the marsh since the Standard Fish Sampling Protocol for State of Arizona Waters in 2004. Largemouth bass, 23 sampled at 6% of the total catch, were

comparable to numbers caught in 2012 (23) and 2013 (22). The sunfishes (bluegill, redear, and green sunfish) were represented by 1 green sunfish. The lack of *Lepomis* genus fishes may be attributed to the timing of the survey in February when movement is minimal. Fourteen razorback suckers were sampled and scanned for PIT tags. Information on the razorbacks was reported to the Native Fish Lab Data Base.

**Table 1.** Species composition, total number, percent of total, catch per unit effort (fish/hr), standard error, of fish sampled using experimental gillnets at Topock Marsh during the winter survey 2014.

Species	Number Sampled	Percent of Total (%)	CPUE	Standard Error
Yellow bullhead	11	3	0.06	0.3
Common carp	21	5	0.11	0.64
Gizzard shad	166	43	0.83	3.7
Channel catfish	81	21	0.41	2.2
Green sunfish	1	0	0	0.09
Largemouth bass	23	6	0.12	0.59
Striped bass	59	15	0.3	3.3
Black crappie	9	2	0.05	0.3
Razorback sucker	14	4	0.07	0.45

Largemouth bass lengths ranged from 208mm to 397mm and weights ranged from 94g to 889g (Table 2). No trophy sized largemouth bass were caught but the mean length of all the largemouth bass were in the Quality range according to Gablehouse (1984).

**Table 2.** Total length (mm) and weight (g) by minimum, maximum, and mean, and standard error, of fish sampled using experimental gillnets at Topock Marsh during the winter survey 2014.

Species	Length (mm)				Weight (g)			
	Min	Max	Mean	SE	Min	Max	Mean	SE
Yellow bullhead	180	284	226	13	77	326	178	33
Common carp	326	570	477	13	526	2547	1521	116
Gizzard shad	180	471	350	4	50	1386	527	20
Channel catfish	261	690	450	12	119	4401	934	89
Green sunfish	197	198	198		151	151	151	
Largemouth bass	208	397	312	9	94	889	420	39
Striped bass	204	500	315	13	92	1245	395	49
Black crappie	158	318	232	21	62	528	253	59
Razorback sucker	490	560	536	5.71	1390	2185	1859	68

The stock density indices represented in Table 3 describe predatory/prey community that is balanced. Gablehouse (1984), recommended largemouth bass PSD's values range from 40-70. Striped bass' PSD is zero because there were not any striped bass that measured above the stock range.

**Table 3.** . Proportional and relative (S=stock, Q=quality, P=preferred, M=memorable, T=trophy) stock densities, including standard error, of selected species collected during winter survey at Topock Marsh in 2014 using experimental gillnets.

Species	PSD	RSD S-Q	RSD Q-P	RSD P-M	RSD M-T
Black crappie	56 ±-	44	11	22	22
Striped bass	0 ±-	37	0	0	0
Largemouth bass	65 ±24	35	61	4	0
Channel catfish	59 ±12	40	48	9	0
Common carp	95 ±-	5	95	0	0

The average overall relative weight was below the typical objective ( $W_r$  of 90-100) for all species except black crappie (Table 4). When mean  $W_r$  values fall below 90 for a size group problems may exist with the relationships between predator and prey (Anderson and Neumann 1996).

**Table 4.** Overall average and structural indices categories (S=stock, Q=quality, P=preferred, M=memorable, T=trophy) of relative weight ( $W_r$ ), and standard error, of selected species collected during winter survey at Topock Marsh in 2014 using experimental gillnets.

Species	$W_r$ Overall	$W_r$ S-Q	$W_r$ Q-P	$W_r$ P-M	$W_r$ M-T
Black crappie	112 ±10.2	127 ±20.0	108 ±	106 ±1.4	91 ±7.7
Striped bass	76 ±2.6	76 ±2.6	-	-	-
Largemouth bass	89 ±1.3	87 ±1.7	90 ±1.7	94 ±	-
Channel catfish	83 ±1.2	75 ±.83	87 ±1.4	99 ±4.6	-
Common carp	84 ±1.7	90 ±	83 ±2.2	87 ±1.7	-

Note: - indicates no fish were sampled in this size class.

The relative weight of the striped bass was lower compared to the remainder of the sportfish popular with fishermen. The striper's overall  $W_r$  of 76 describe fish that are underweight for their length. All stripers sampled were  $\leq$  to stock length which made the PSD calculation equal 0. The stripers were not extremely underweight but considering the depth and turbidity, of Topock Marsh, it would be unusual for 510 mm or bigger stripers. Largemouth bass length classes were very close to the ideal relative weight ranging from 87 to 94. Channel catfish's relative weight increased with each size class ending at the preferred length class  $W_r$  of 99.

**V. Discussion-** Topock Marsh remains a destination for fishing, waterfowl hunting and watchable wildlife. The 2014 survey sampled more gizzard shad than in any previous year and continued monitoring will help quantifying the affect the gizzard shad have on the fishery. The marsh continues to be an excellent channel catfish fishery. Largemouth bass are doing well and continue to draw fishermen to the marsh. Razorback suckers continue to thrive in the marsh. The razorback suckers in the marsh are primarily from the 2010 stocking and have reached and exceeded 500mm in length. The new inflow for the marsh does allow some movement between the river and the marsh. At least one razorback sucker stocked into the marsh in 2010 has been sampled in the river and back in the marsh. The Fish and Wildlife Service is considering deploying remote pit tag scanners in the inflow channel in an attempt to monitor this movement.

## **VI. Literature cited-**

- Anderson, R. O., and R. M. Neumann. 1996. Length, weight, and associated structural indices. pp. 447-482. In B. R. Murphy and D. W. Willis (eds.). Fisheries Techniques. American Fisheries Society, Bethesda, Maryland
- Bryan, S., K. Young, M. Lopez, C. Benedict, A. Clark, B. Jacobson, D. Mitchell, D. Weedman, C. Hiser, T. Robinson, S. Gurtin, and T. Pringle. 2004. Standard fish sampling protocol for state of Arizona waters. Statewide Fisheries Investigations, Federal Aid. Arizona Game and Fish Department, Phoenix, Arizona.
- Gablehouse, D. W., Jr. 1984. A length categorization system to assess fish stocks. North American Journal of Fisheries Management 4:273-285.

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