NEVADA DEPARTMENT OF WILDLIFE
STATEWIDE FISHERIES MANAGEMENT

FEDERAL AID JOB PROGRESS REPORT
F-20-49
2013

LAKE MOHAVE
SOUTHERN REGION

NEVADA DEPARTMENT OF WILDLIFE, FISHERIES DIVISION
JOB PROGRESS REPORT

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NEVADA DEPARTMENT OF WILDLIFE, FISHERIES DIVISION
ANNUAL PROGRESS REPORT

State: *Nevada*
Project Title: *Statewide Fisheries Program*
Job Title: *Lake Mohave*
Period Covered: *January 1, 2013 through December 31, 2013*

SUMMARY

Angler Use and Harvest

Two days of contact creel surveys were conducted at Cottonwood Cove, for a total of two contacts. Five days were spent conducting contact creel surveys at Willow Beach and 37 contacts were made.

Gill Netting

A cooperative effort between Nevada Department of Wildlife (NDOW), Arizona Game and Fish Department (AZGFD), and United States Bureau of Reclamation (USBR) completed 46 net-nights of gill netting effort in April 2013. This was the 10th year utilizing the AZGFD gill net and electroshocking protocols. Gill nets were set from Davis Dam north to mile 44. A total of 193 fish were sampled and species composition included channel catfish *Ictalurus punctatus* (35.23%; n=68), common carp *Cyprinus carpio* (33.68%; n=65), striped bass *Morone saxatilis* (8.29%; n=16), largemouth bass *Micropterus salmoides* (6.74%; n=13), smallmouth bass *Micropterus dolomieu* (6.74%; n=13), razorback suckers *Xyrauchen texanus* (5.18%; n=10), yellow bullhead *Ameiurus natalis* (2.59%; n=5), and green sunfish *Lepomis cyanellus* (1.55%; n=3). The striped bass catch rate was 0.35 fish per net-night (f/n-n), which was down slightly from recent years. This was the lowest catch rate since this striped bass fishery began emerging in the late 1980s.

Electroshocking

In April of 2013, 15 sites were sampled for 226 minutes (min) of electroshocking, averaging 15.08 min per site. Eight sites were sampled by NDOW and seven sites by AZGFD. The electroshocking survey was conducted in conjunction with the annual spring gill net survey. This year had the highest total catch rate of 1.82 fish/min compared to other spring surveys. This is the second consecutive year that no striped bass were captured during electroshocking surveys.

Habitat Improvement

Three types of artificial habitat structures were constructed and deployed into Prospect and Solicitor coves, which included 23 PVC units, five poly shrubs, and 24 brush bundles.

Thirteen SCUBA surveys were conducted in 2013 on habitat and no habitat coves. Electroshocking surveys were also used to evaluate the effectiveness of the habitat to attract fish. Survey results showed lower use in 2013, but this was because surveys were conducted in the spring. Past spring survey results showed that catch rates were lower than in the fall. Fish habitat appeared to peak in July and August as aquatic vegetation became abundant and high water levels flooded riparian vegetation. Fish reacted to this by dispersing amongst this seasonally created habitat.

BACKGROUND

Sixty-seven miles downstream from Hoover Dam, the USBR constructed Davis Dam on the Colorado River in 1951. By May of that year, the new reservoir had backed up to the tailrace of Hoover Dam and was considered full. The purpose of the impoundment is to meet irrigation requirements, regulate erratic water releases from Hoover Dam, and produce hydroelectric power. The reservoir is subject to fluctuating water levels and exchange flows. The upper 20 miles of the reservoir is confined within the narrow walls of the Black Canyon and is alternately a lotic or lentic environment depending on water elevations and Hoover Dam releases. The constant coldwater releases from Hoover Dam permit the upper regions of Lake Mohave to be managed as a year round coldwater fishery. This region was stocked year round with catchable rainbow trout *Oncorhynchus mykiss* until October 2013. Striped Bass were first documented in Lake Mohave in the early 1980s and have since become the major component of the sport fishery. Striped bass reproduce in the seasonally warm reaches of the reservoir and move into the coldwater areas as they become larger and eventually prey on stocked rainbow trout. The impact striped bass have on the stocked rainbow trout fishery has become significant in recent years and has resulted in some modifications of the trout stocking program. Largemouth bass, smallmouth bass (more recent), channel catfish, and sunfish provide the remaining portion of the Lake Mohave sport fishery. The major forage species present in Lake Mohave, other than rainbow trout, are threadfin shad, bluegill, green sunfish, and crayfish. Large striped bass are also known to prey on carp. Populations of all the forage species have remained fairly abundant with the exception of threadfin shad. Predation by striped bass, among other factors, has reduced the threadfin shad population to a point where they are now difficult to detect.

In January 2007, the invasive quagga mussel *Dreissena bugensis* was discovered in the Lower Colorado River system including Lake Mohave. Subsequently the Lake Mead Fish Hatchery was closed due to quagga mussel contamination and a lower Lake Mead elevation supplying warmer water to the hatchery. The Lake Mead Fish Hatchery provided a significant portion of the rainbow trout stocked into Lake Mohave. The changes this invasive species brings to the Lake Mohave fishery continue to evolve.

Native fish now present within Lake Mohave are the razorback sucker and bonytail chub *Gila elegans*. The razorback sucker population has most recently been estimated at less than 5,000 fish, which is a significant decline from previous estimates

of 60,000 in the late 1980s. Once abundant throughout the Colorado River basin, Lake Mohave now contains the largest remaining population of razorback sucker. It has been extirpated from much of its former range and is listed as endangered under the Endangered Species Act of 1973, as amended. The bonytail chub is also listed as an endangered species and presently exists in low numbers in Lake Mohave. Efforts to insure that these species do not disappear from Lake Mohave precipitated the formation of the Native Fish Work Group. The Native Fish Work Group is an association of private, state, and federal biologists who have responsibilities for the management of Lake Mohave and other main stem Colorado River reservoirs. The pikeminnow *Ptychocheilus lucius* is another endangered species native to the historic Colorado River, including the stretch now inundated by Lake Mohave, but is now considered extirpated from Lake Mohave.

Below Davis Dam, approximately 12 miles of the Colorado River forms the boundary between Arizona and Nevada. The river is characteristically swift, cool, and has a highly variable flow. The river bottom is composed of rubble, gravel, and sand. Several backwater lagoons were created on the Nevada side through the construction of training dikes. These dikes line almost the entire length of the river in Nevada. The Colorado River fishery is supported by striped bass, stocked rainbow trout, and, to a lesser extent, largemouth bass, bluegill, green sunfish, channel catfish, and yellow bullhead catfish. Threadfin shad and carp also exist in the river. The native razorback sucker and flannelmouth sucker *Catostomus latipinnis* (flannelmouth suckers are thought to have been introduced to this section of the Colorado River, but are known to be native to upstream sections of the Colorado River and its tributaries) can also be found here. The pikeminnow and bonytail chub are not known to exist in this section of the river at this time. Striped bass and rainbow trout are the most sought after species by anglers. In the spring and early summer, striped bass migrate upstream from Lake Havasu to spawn. Concentrations of striped bass can be found at that time of year in the tailrace of Davis Dam, where their upstream migration is stopped. Striped bass in excess of 20 pounds were common in the late 1970s, but are now rare. Rainbow trout were stocked by the Willow Beach National Fish Hatchery until October 2013.

OBJECTIVES and APPROACHES

General Management

Objectives: To monitor angler use and catch rates, fish population dynamics of the Lake Mohave and Colorado River Fisheries, and maximize the availability and return of stocked rainbow trout to anglers.

Approach:

- Measure angler use and harvest by conducting a contact creel survey one day a week at Willow Beach and two days a week at Cottonwood Cove.

- Install and maintain up to two volunteer angler survey boxes at access locations on the Colorado River below Davis Dam.
- Monitor fish population dynamics through a minimum of 50 net-nights of gill net surveys in the spring implemented cooperatively with AZGFD.
- Monitor fish population dynamics through a minimum of five days of electroshocking in the spring along with gill netting.
- Utilize creel survey and monitoring data to assess sport fishery performance and changes to estimate sport fish availability and condition.
- Coordinate with National Park Service (NPS), AZGFD, and other cooperators on sport fish management needs and cooperative monitoring activities.
- Develop recommendations and coordinate the number of rainbow trout stocked to meet management objectives.
- Monitor trout stocking locations to avoid conflict with razorback suckers during the late-winter/spring stocking period in conformance with the United State Fish and Wildlife Service's Biological Opinion.
- Cooperate with other agencies on implementing long-term monitoring of quagga mussel distribution.

Habitat Enhancement Study

Objectives: To increase fish abundance through the placement of constructed underwater habitat and to enhance angler success by providing areas of persistent underwater habitat that concentrate game fish species in locations accessible to anglers.

Approach:

- Construct and install up to 100 underwater habitat structures at selected locations on Lake Mohave, including brush bundles, PVC structures, and poly shrubs.
- Coordinate with NPS for harvest and use of shoreline invasive tamarisk *Tamarix* spp. used for the brush element of the habitat structures.
- Work with NPS, AZGFD and volunteers to assist with construction and placement of habitat structures.
- Utilize the NDOW fish habitat barge for habitat deployment.
- Survey habitat sites quarterly using underwater SCUBA dive transects with assistance from AZGFD.
- Survey habitat sites annually by gill netting and electroshocking.
- Evaluate angler success and use at habitat improvements sites through data and questionnaires collected through the established general fisheries creel survey program.

PROCEDURES

Angler Use and Harvest

Angler survey activities were conducted opportunistically at Cottonwood Cove and Willow Beach, and through volunteer angler boxes along the Colorado River below Davis Dam. Information collected included hours fished, total anglers per party, angler preference, angler license origin (Nevada or Arizona), species and number caught, length and weight of catch, and number of successful anglers in the party.

Gill Netting

Sampling was completed with 150 feet (ft) x 8 ft six panel experimental gill nets. Nets were set in April at random sites selected by AZGFD personnel following their reservoir survey protocols.

Electroshocking

Shoreline areas were selected by AZGFD's survey protocols and were sampled using boat electroshocking units. The boat was equipped with a Coffelt VVP-15B box with an electrode array. Fish captured were identified to species, counted, measured, weighed, and then released back to the lake. Total shocking time (actual time foot switch was depressed) was recorded.

Habitat Improvement

Several types of artificial habitat structures were constructed and deployed. They included structures constructed of brush and PVC pipe with snow fencing and plastic lattice. Tamarisk was used for the brush component of the habitat and was cut on site. The habitat units were constructed on the deck of the NDOW habitat barge or on shore, weighted with sand bags, and then deployed above the 620 ft contour. Agencies involved included the USBR, NPS, AZGFD, NDOW, and angler volunteers. Fish use of the habitat was monitored via SCUBA transects and electroshocking. SCUBA transects were conducted by circling habitat and counting all fish present. Divers recorded habitat type, survey time, depth, and species type.

FINDINGS

Angler Use and Harvest

Two days of creel surveys were conducted at Cottonwood Cove for two contacts. Five creel days were spent at Willow Beach and made 37 contacts. Both parties at Cottonwood Cove were targeting black bass for 9.75 hours (hrs) but only one had success, catching four largemouth bass, eight smallmouth bass, and one bluegill. The

37 contacts at Willow Beach had a total of 65 anglers (52 from NV and 13 from AZ). Fifty-seven of the anglers were male and eight were female. Seventy-five percent of the anglers were targeting rainbow trout, 17 % were targeting striped bass, 3 % were targeting channel catfish, and 5 % were unknown. Fifty-seven percent of the anglers were successful at catching at least one fish, but not necessarily the species they were targeting. These anglers fished for 124.25 hrs. Historic data is provided for reference in Figures 1 through 9. One volunteer angler drop-box and signage was placed at Big Bend State Park. There was no use of this drop-box during 2013.

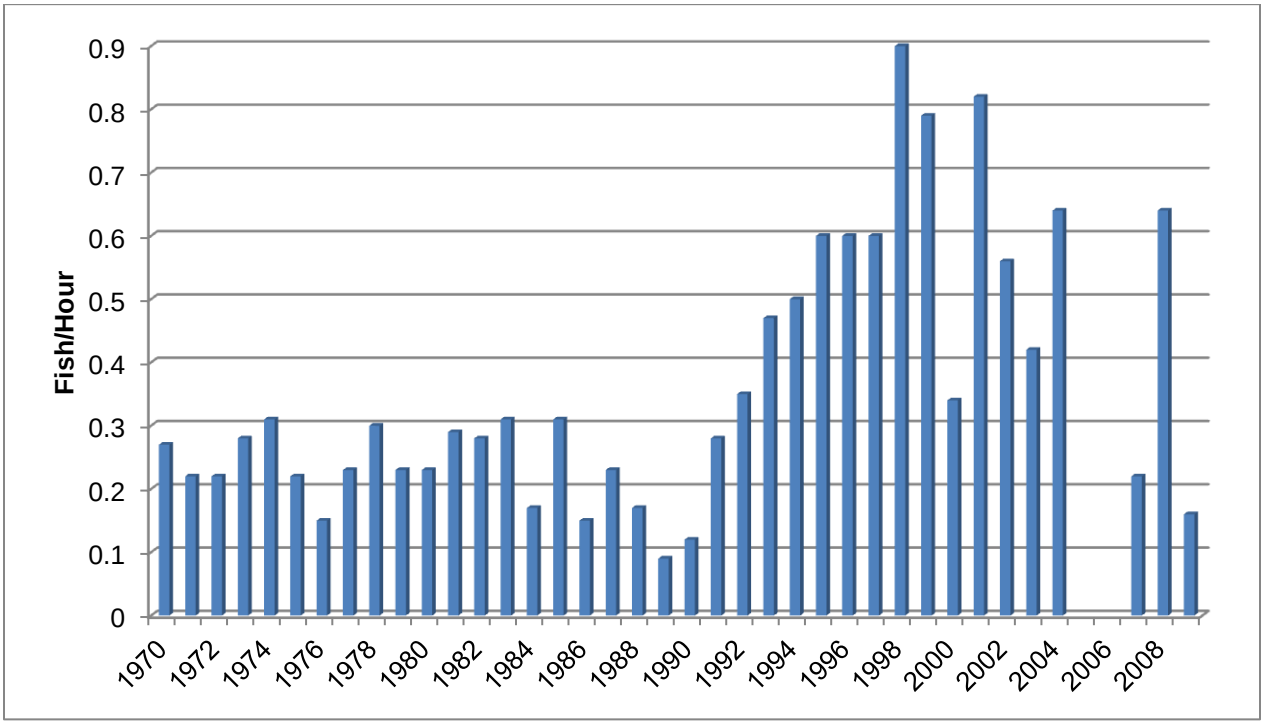


Figure 1. Cottonwood Cove angler catch rates, 1970-2009.

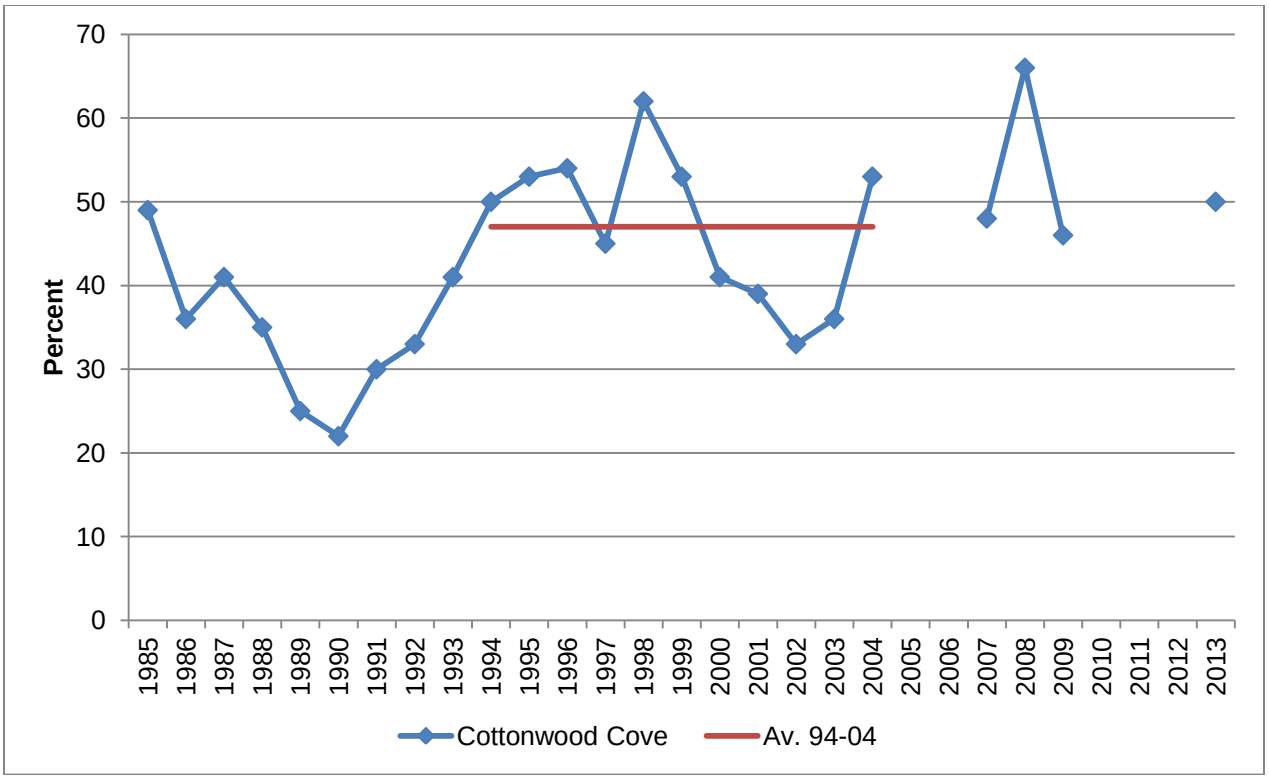
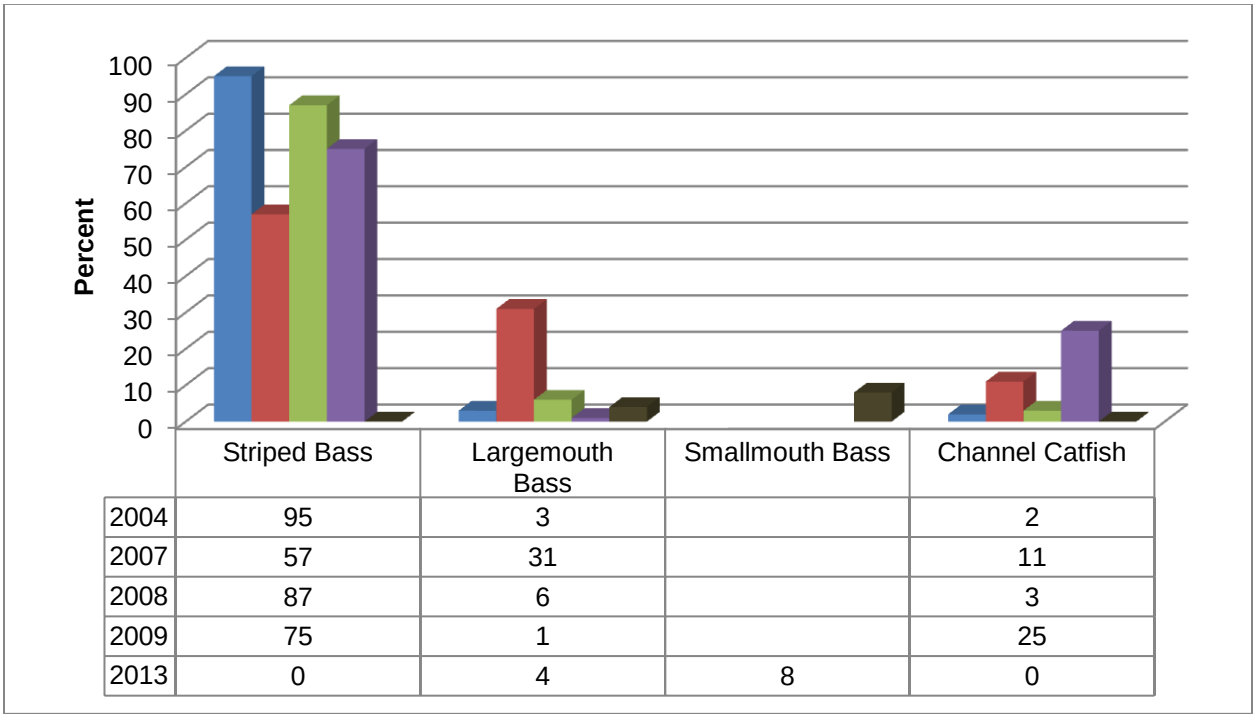


Figure 2. Cottonwood Cove successful anglers, 1985-2013.



	Striped Bass	Largemouth Bass	Smallmouth Bass	Channel Catfish
2004	95	3		2
2007	57	31		11
2008	87	6		3
2009	75	1		25
2013	0	4	8	0

Figure 3. Cottonwood Cove harvest composition, 2004-2013.

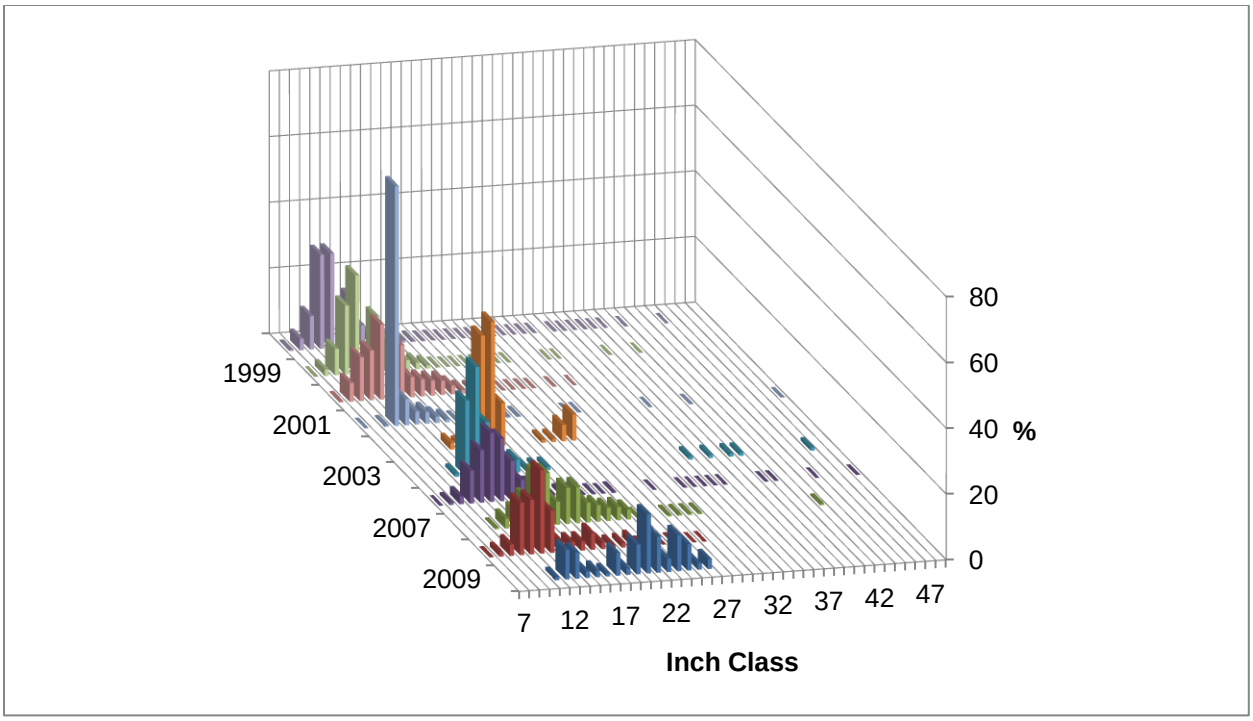


Figure 4. Cottonwood Cove striped bass length frequencies, 1999-2009.

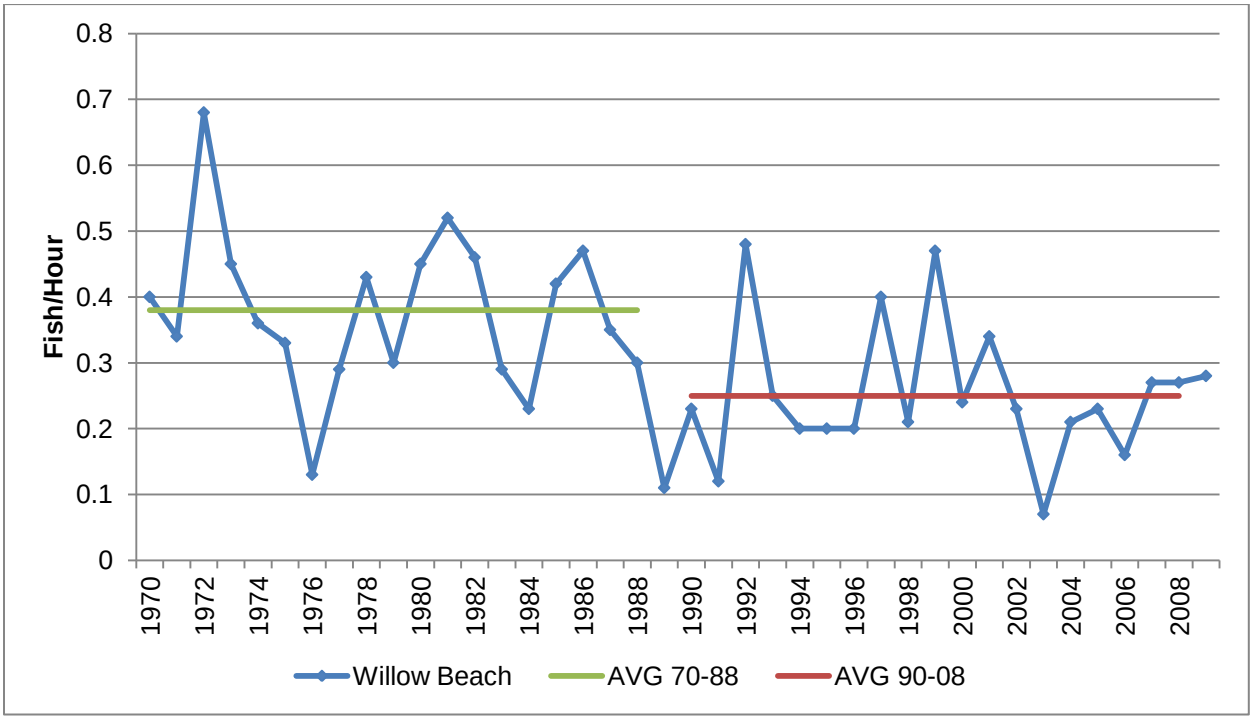


Figure 5. Willow Beach catch rates, 1970-2009.

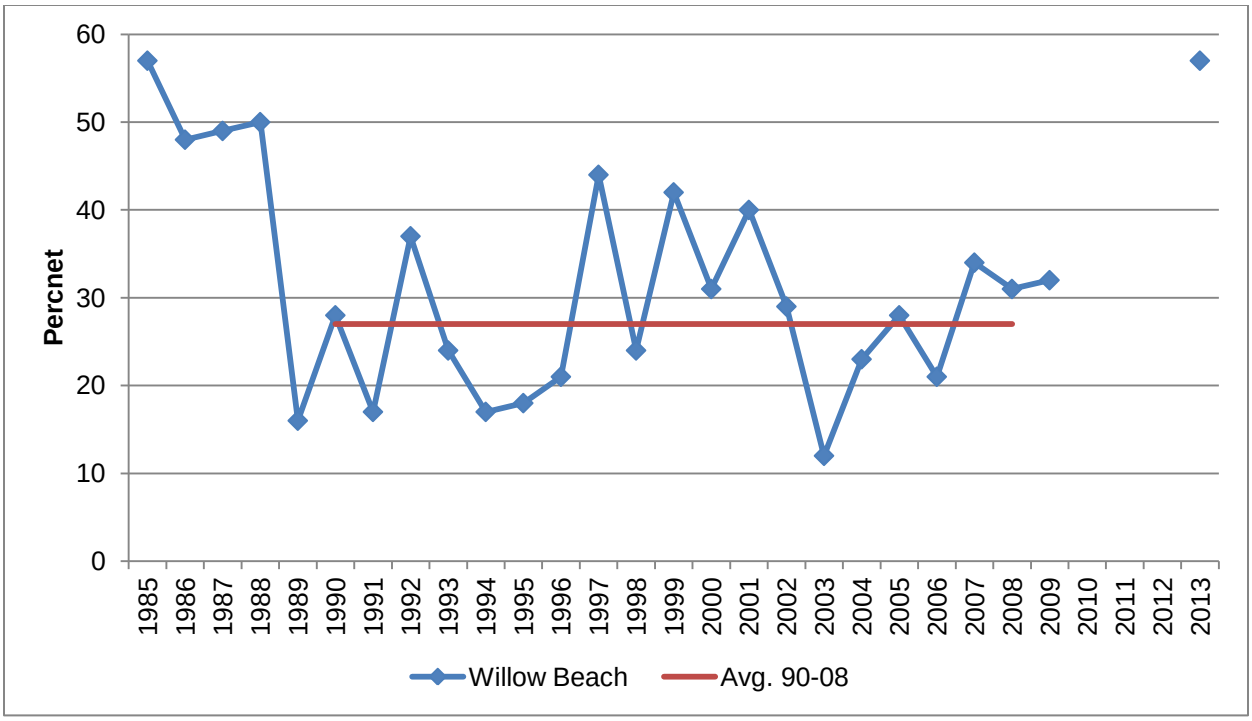
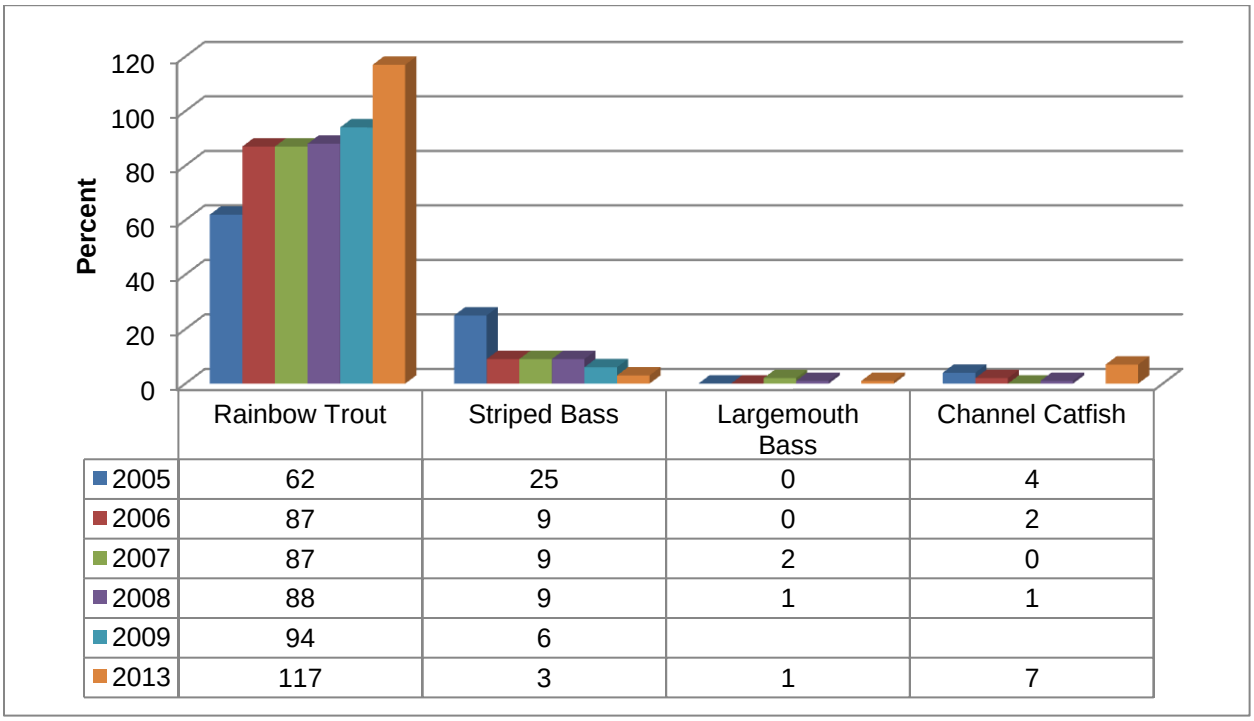


Figure 6. Willow Beach percent successful anglers, 1985-2013.



	Rainbow Trout	Striped Bass	Largemouth Bass	Channel Catfish
2005	62	25	0	4
2006	87	9	0	2
2007	87	9	2	0
2008	88	9	1	1
2009	94	6		
2013	117	3	1	7

Figure 7. Willow Beach harvest composition, 2005-2013.

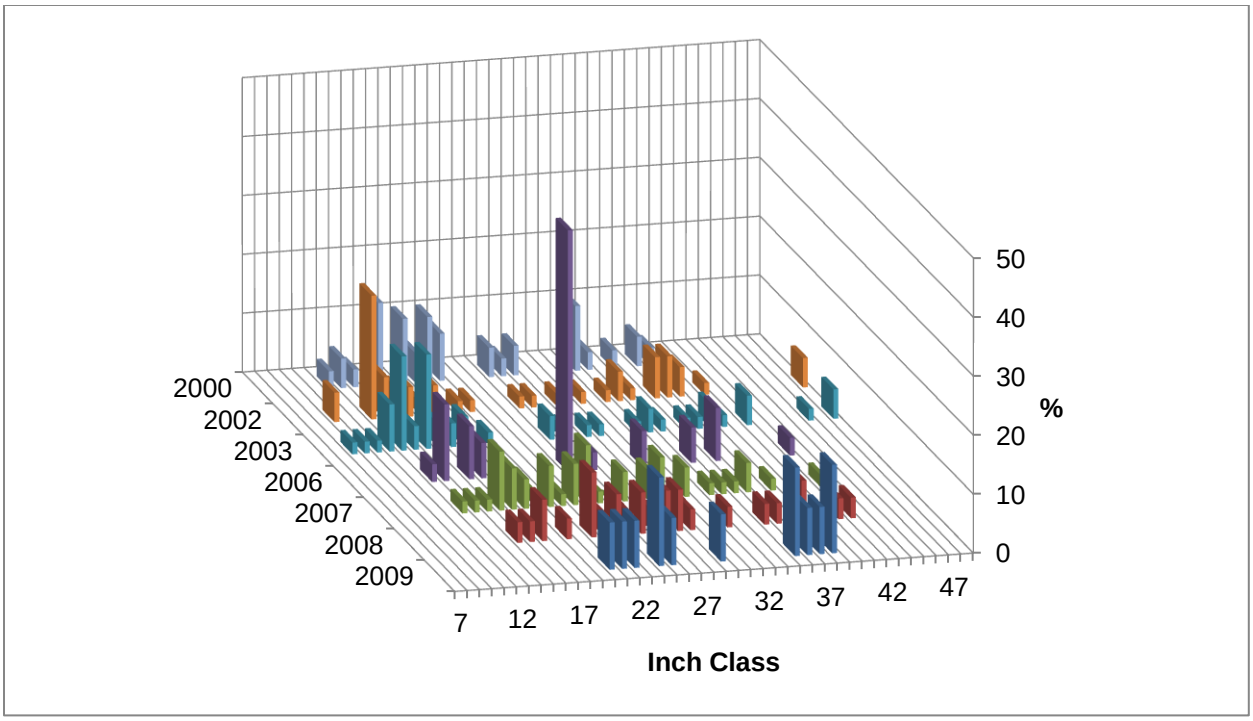


Figure 8. Willow Beach striped bass length frequencies, 2000-2009.

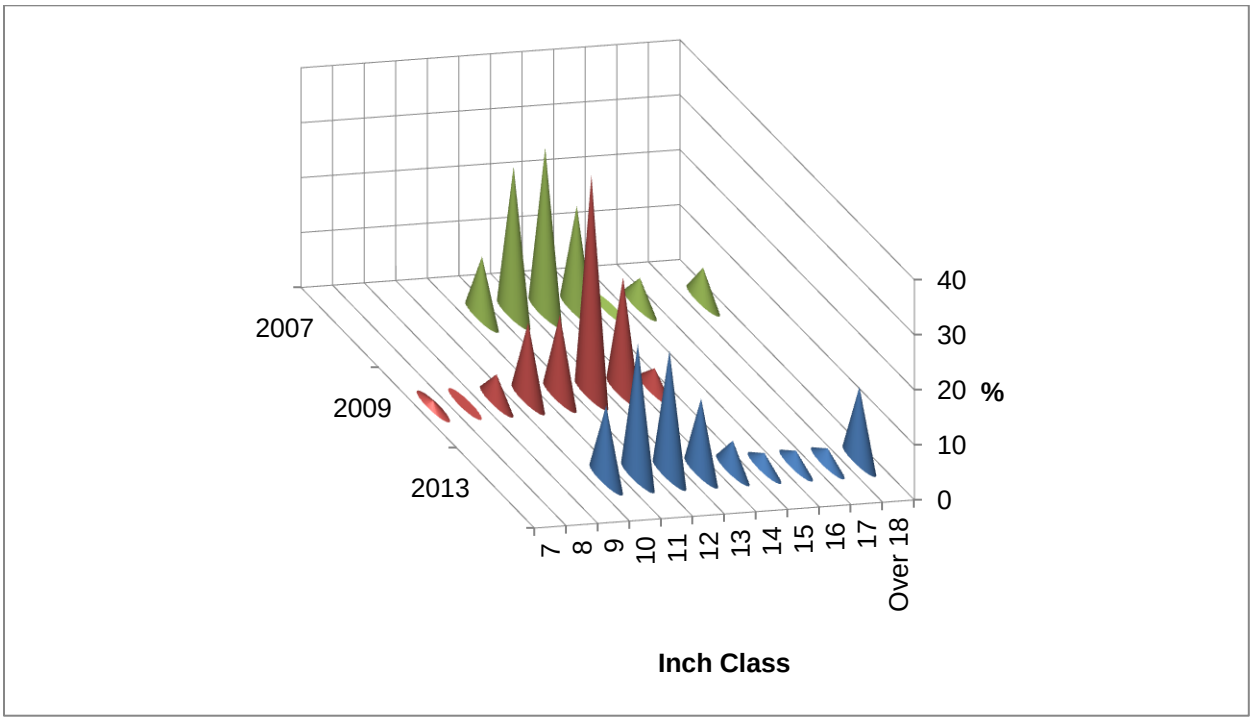


Figure 9. Willow Beach rainbow trout harvest length frequencies, 2007-2013.

Gill Netting

A total of 193 fish were sampled and species composition included channel catfish (35.23%; n=68), common carp (33.68%; n=65), striped bass (8.29%; n=16), largemouth bass (6.74%; n=13), smallmouth bass (6.74%; n=13), razorback sucker (5.18%; n=10), yellow bullhead (2.59%; n=5), and green sunfish (1.55%; n=3).

Total catch rates were down from 2012 (Figure 10). Despite this decline, catch rates have shown an upward trend since 2009 when the lowest catch rate of 2.3 f/n-n was recorded. However, this is well below the high catch rates of 1998 and 2002. Figure 10 also shows that when striped bass were abundant, catch rates of other species were low. With the recent decline in striped bass catch rates, other species are experiencing higher catch rates.

The striped bass catch rate was 0.35 f/n-n, down slightly from previous years (Figure 11). This is well below the long-term (1990-2005) mean of 4.84 f/n-n and is the lowest rate since this fishery began emerging in the late 1980s. In January 2007, invasive quagga mussels were discovered in Lake Mohave and the lower Colorado River system. The invasion of quagga mussels is coincidental to the observed declining striped bass numbers; although this relationship is not fully understood, additional investigations are ongoing to identify if the mussel infestation is contributing to the decline.

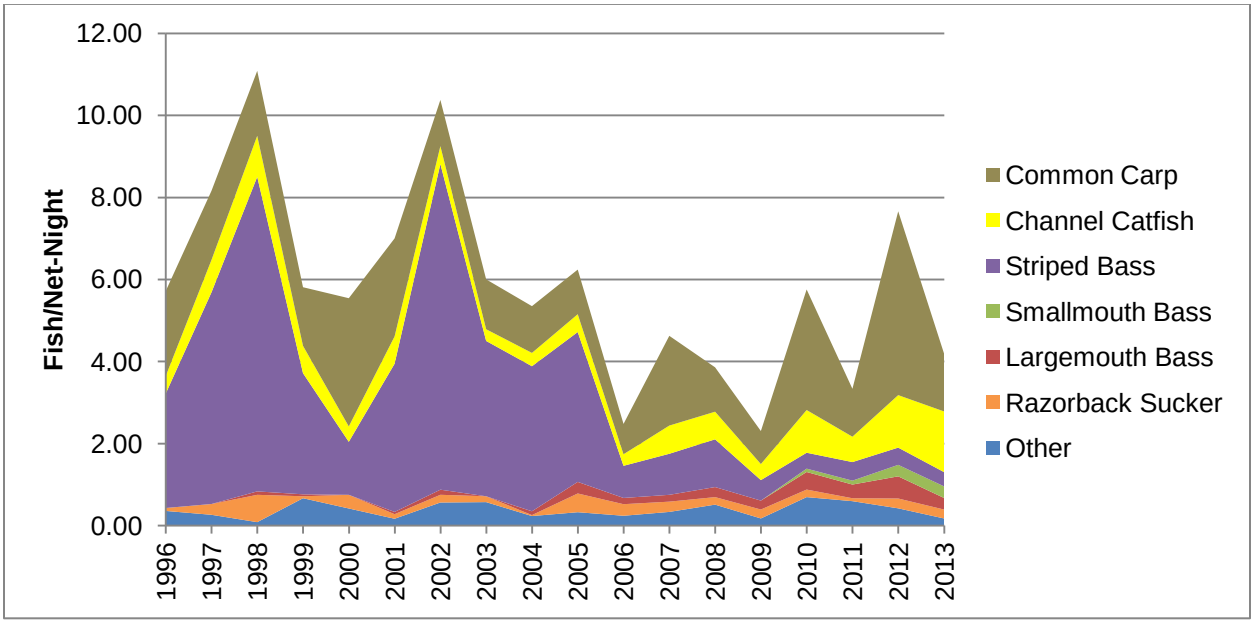


Figure 10. Total catch rates from gill netting, 1996-2013.

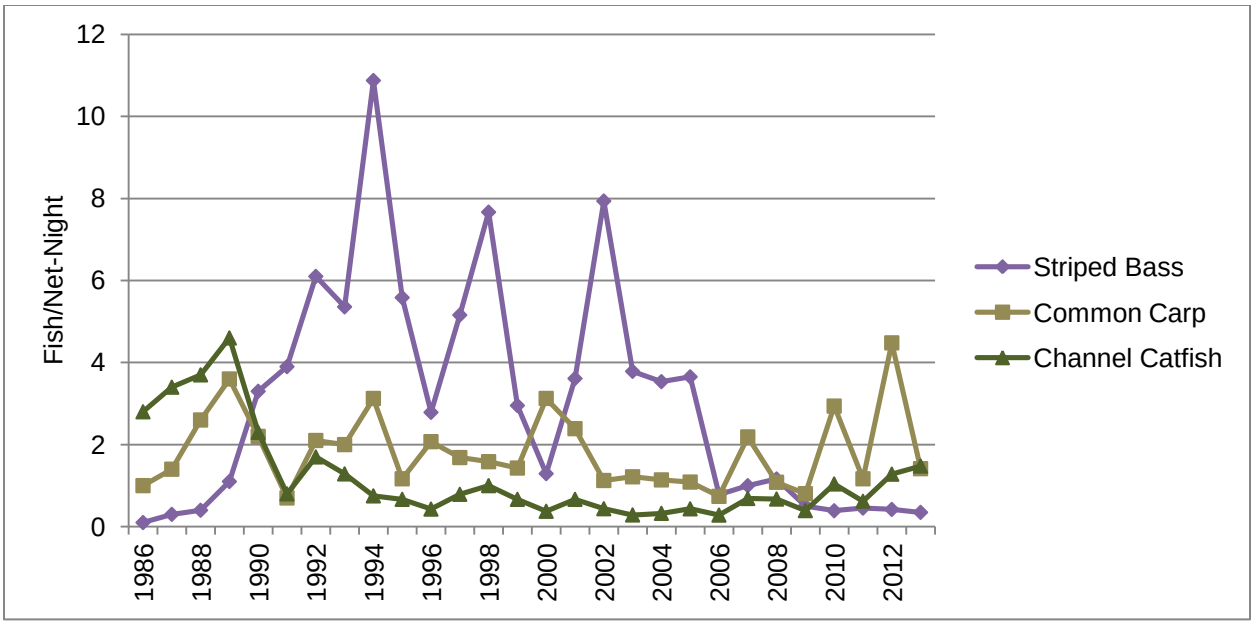


Figure 11. Gill netting catch rates for striped bass, common carp, and channel catfish, 1986-2013.

The most abundant species sampled in 2013 was channel catfish at 1.48 f/n-n. This is the highest catch rate since the early 1990s, but still lower than the catch rates from the 1980s. Since the mid 2000s, channel catfish catch rates have slowly been increasing. Common carp catch rates were down from 2012, but their trend since the mid-2000s is still generally increasing. With the decline in striped bass, common carp catch rates are having a boom and bust cycle every other year, whereas before there was not as much fluctuation in the catch rates.

Black bass catch rates (Figure 12) were the same (0.28 f/n-n) for 2013 as they were in 2012. Largemouth bass declined from 2012, but were almost twice that of the long-term mean (0.157 f/n-n). The smallmouth bass catch rate was the same in 2013 as it was in 2012. While they are still fairly new to Lake Mohave, initially showing up in surveys in 2010, it is too early to say that they are not increasing anymore. More data from future years will tell us if they reached the peak or if they will continue to increase. Razorback sucker catch rates were 0.22 f/n-n, which is below the long-term mean of 0.32 f/n-n. Sunfish numbers continued to drop, but have had low catch rates in the past and appear to fluctuate naturally.

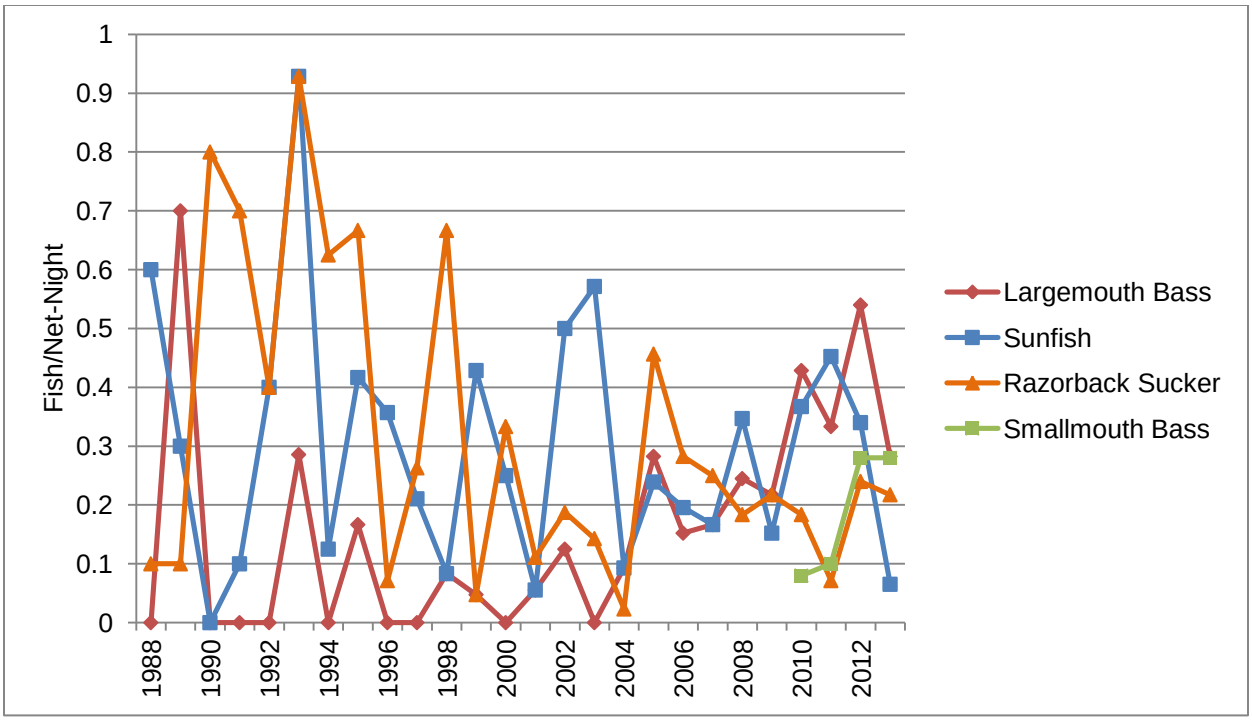


Figure 12. Gill netting catch rates for largemouth bass, smallmouth bass, razorback sucker, and sunfish, 1988-2013.

Figure 13 summarizes percent biomass for striped bass, common carp, channel catfish, and razorback sucker since 1986. Striped bass comprised 10% of the biomass, up from 3.7% in 2012. This is well below the long-term striped bass mean biomass (1990 through 2005) of 32%. Common carp formed the largest portion of the biomass at 52.4%, which is down from 77.5% of last year's biomass. Channel catfish accounted for 25.5% of the biomass, which is below the long-term mean of 17.9%. Razorback sucker biomass remained low at 4.3%, which is below the recent 10-20 % range.

The percentage of striped bass greater than or equal to 15 inches (in) [381 millimeters (mm)] total length (TL) was 100% in 2013 (Figure 14). Striped bass caught greater than 15 in increased in 2006, and has stayed high ever since. This is the first year that all striped bass caught were greater than or equal to 15 in.

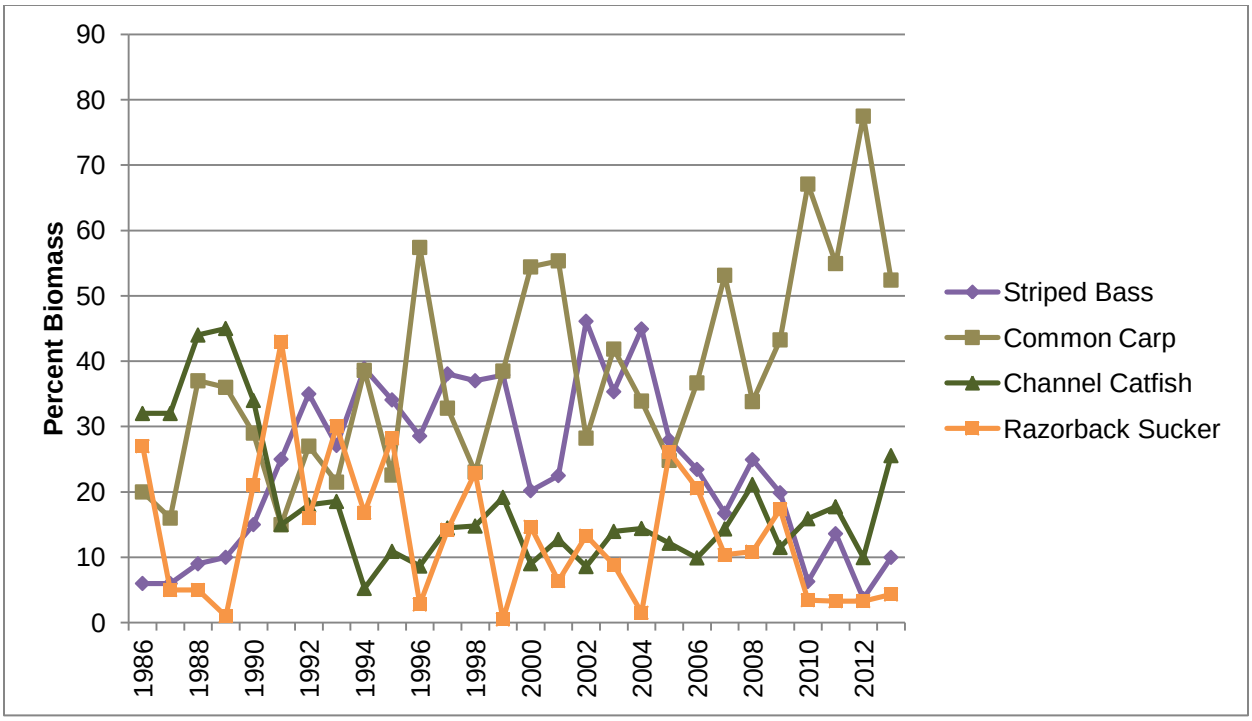


Figure 13. Gill netting biomass, 1986-2013.

The 2013 mean total length for striped bass was 610 mm (24 in), which was 97 mm (3.8 in) longer than 2012. Striped bass ranged from 427 mm (16.8 in) to 720 mm (28.3 in). Graphic representation of the striped bass length frequencies from 2007 through 2013 are shown in Figure 15.

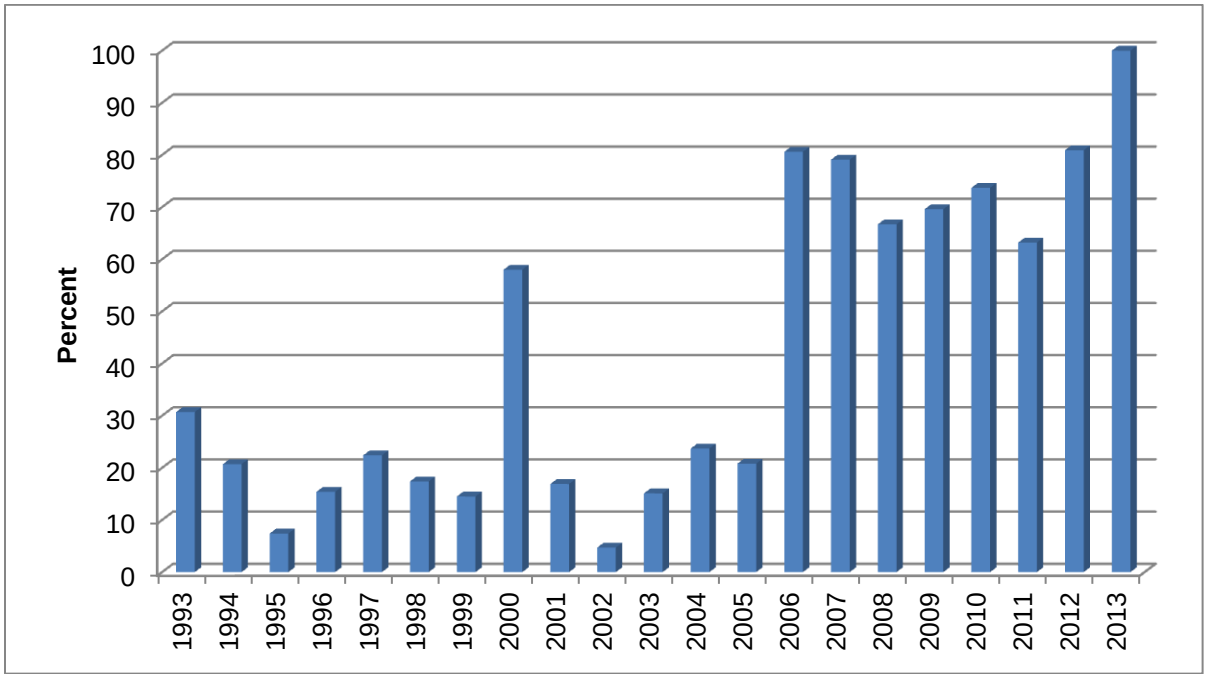


Figure 14. Percent striped bass that are 15 inches or larger, 1993-2013.

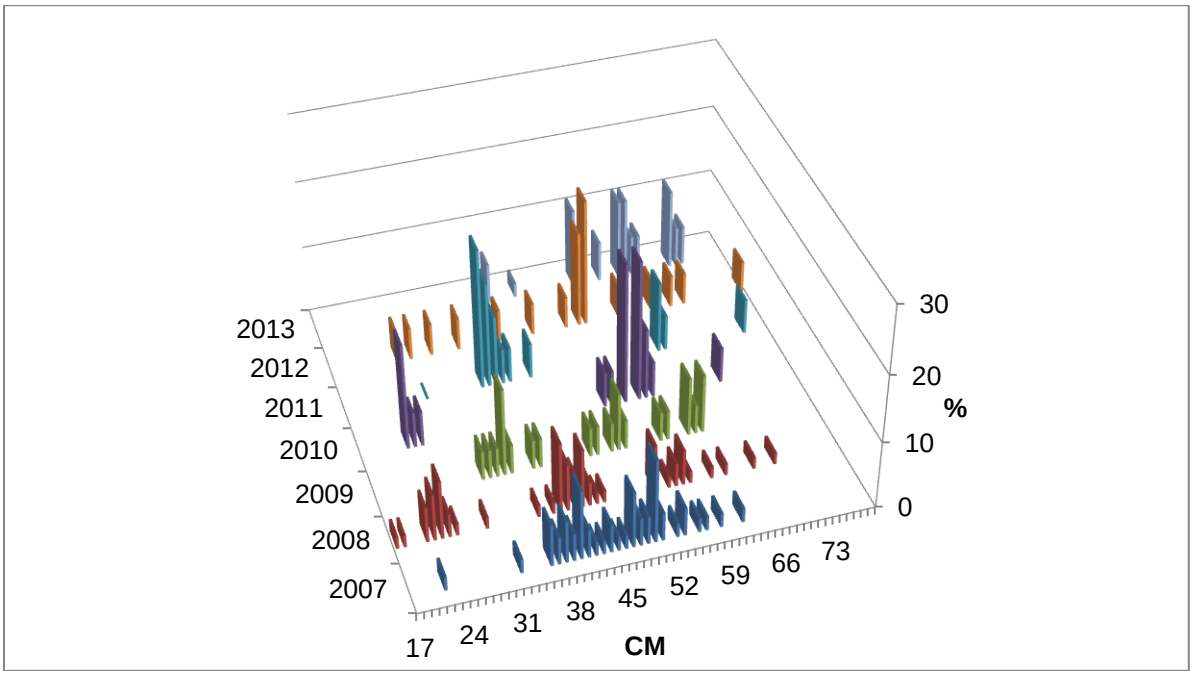


Figure 15. Striped bass percent length frequency, 2007-2013.

The proportional stock density (PSD) trend for striped bass (Figure 16) showed an increase in 2007 to 15, in 2008 to 38, and in 2009 to 43. In 2010, the PSD reached the maximum of 100. In 2011, the PSD dropped back to 37, which was more in line with the values from 2008 and 2009. In 2012, the PSD jumped back up to 77 and in 2013 increased slightly to 88. The increasing striped bass PSD is indicative of a population with a growing percentage of larger fish in the population and declining recruitment.

Largemouth bass mean total length was 406 mm (16 in) and ranged between 200 mm (7.9 in) and 510 mm (20 in). Smallmouth bass mean total length was 407 mm (16 in) and ranged between 340 mm (13.4 in) and 478 mm (18.9 in). Channel catfish mean total length was 494 mm (19.2 in) and ranged between 320 mm (12.6 in) and 669 mm (26.3 in). The carp mean total length was 576 mm (22.7 in), which is similar to 2012, but almost 127 mm (5 in) more than 2011.

Electroshocking

There were 15 sites (eight conducted by NDOW and seven conducted by AZGFD) electroshocked in April 2013, which coincided with the spring gill net survey as dictated by AZGFD's sampling protocols. Years 1998 to 2002 and 2009 to 2011 were fall shocking surveys, while 2004-2007 and 2012-2013 were spring surveys. Figures 17 and 18 show the 2013 catch rates in fish per minute for several species and compares them to previous years. The 2013 catch rates were similar to other spring sampling years for largemouth bass. Smallmouth bass have only been captured in surveys that

are more recent starting in 2009. The first three years that they were detected were fall surveys conducted on coves with and without artificial habitat. Fall surveys are also conducted when water levels are lower and closer to aquatic vegetation and habitat. Compared to other spring surveys (2012), catch rates did increase, but not by very much. Striped bass were not caught during the electroshocking survey. Bluegill and common carp catch rates are very similar to other spring surveys, while green sunfish catch rates are higher than most years except 2006. A total of 226 min of electroshocking time was expended, averaging 15.1 min per site.

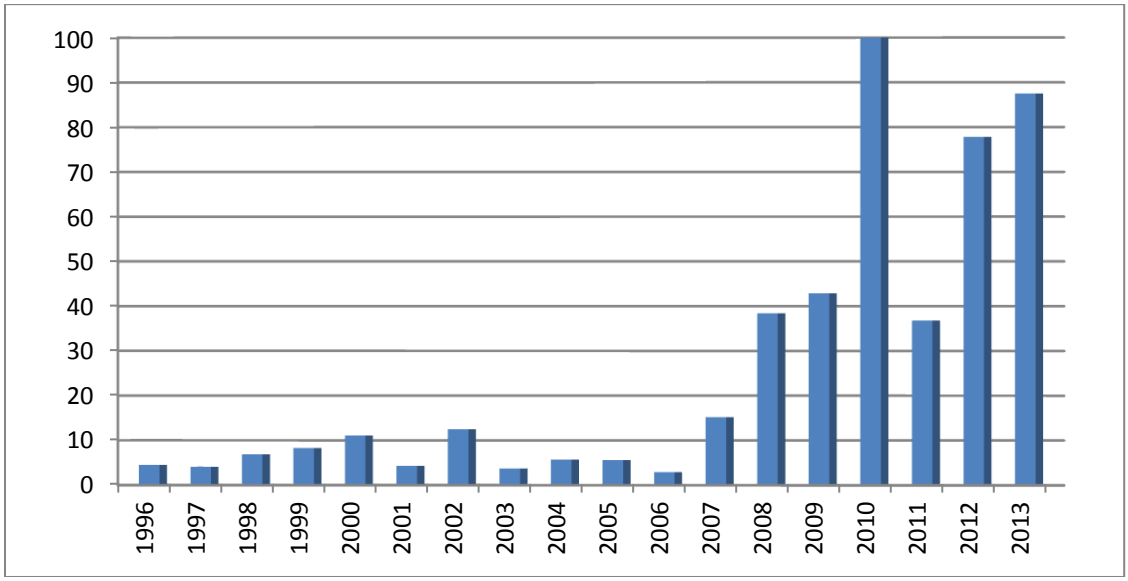


Figure 16. Striped bass PSD from gill netting, 1996-2013 (S-13 inches, Q-20 inches).

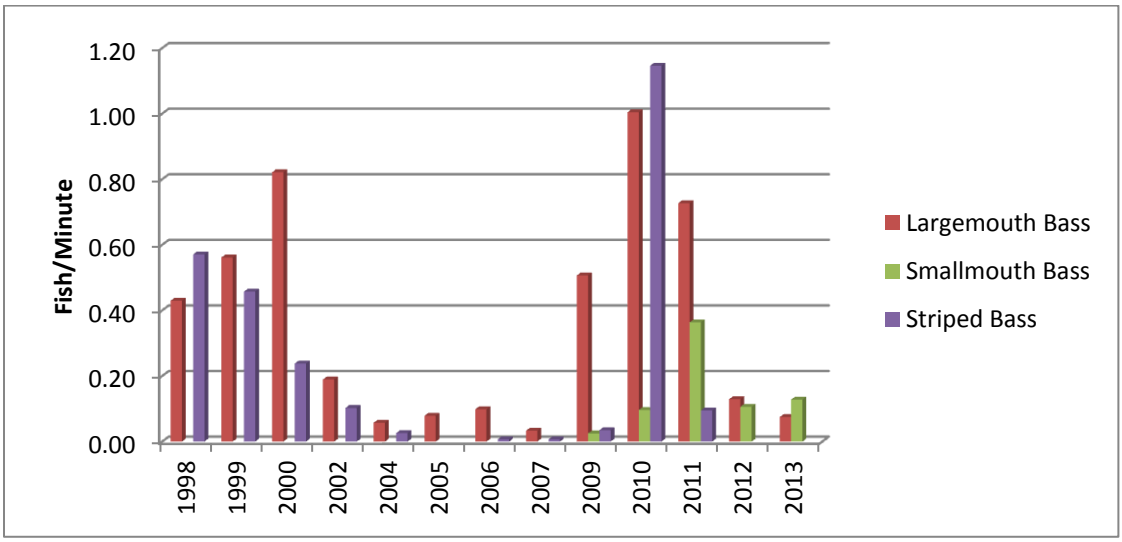


Figure 17. Electroshocking catch rates for largemouth bass, striped bass, and smallmouth bass.(2004-2007, 2012-2013 in spring, other years in fall).

Comparisons of the catch rates for largemouth, smallmouth, and striped bass greater than 200 mm (7.9 in) TL can be seen in Figure 19. The 2013 catch rate for

largemouth bass that size or larger was comparable to other spring surveys. Smallmouth bass of this size have been increasing since first captured in 2009. Striped bass of this size were not collected during the 2013 survey, which also occurred in 2004 and 2009.

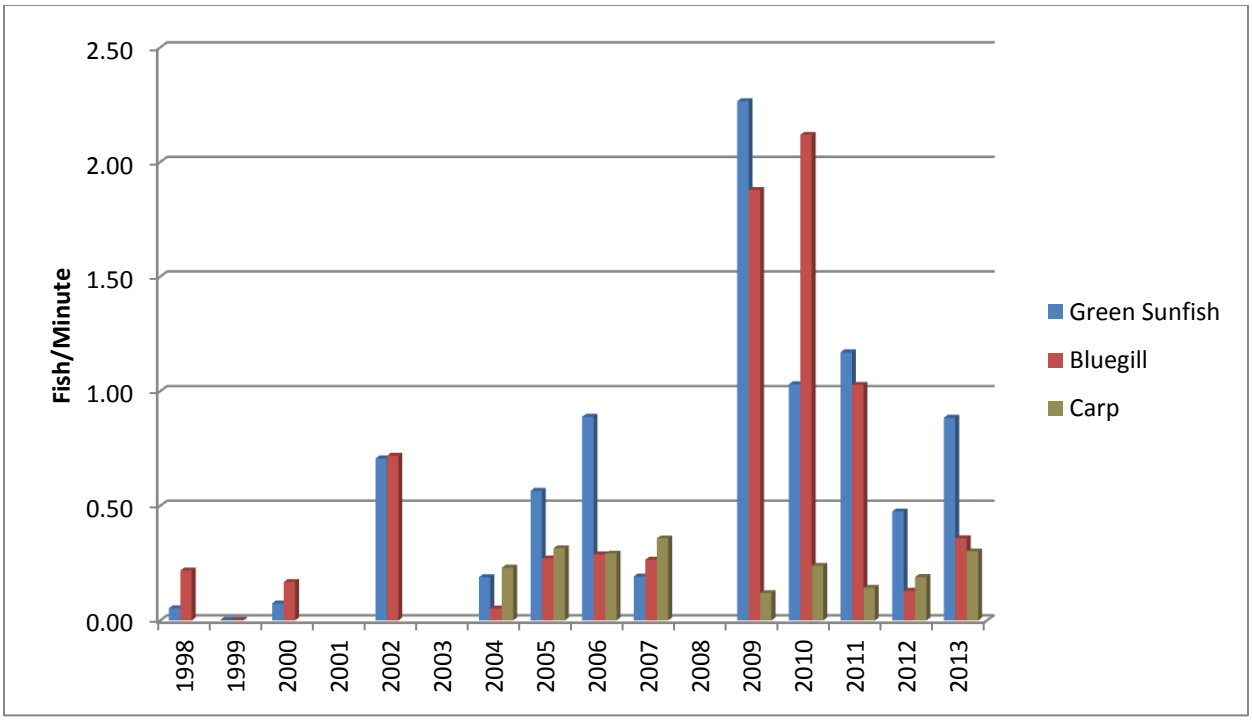


Figure 18. Electroshocking catch rates for common carp, bluegill, and green sunfish, 1998-2013.

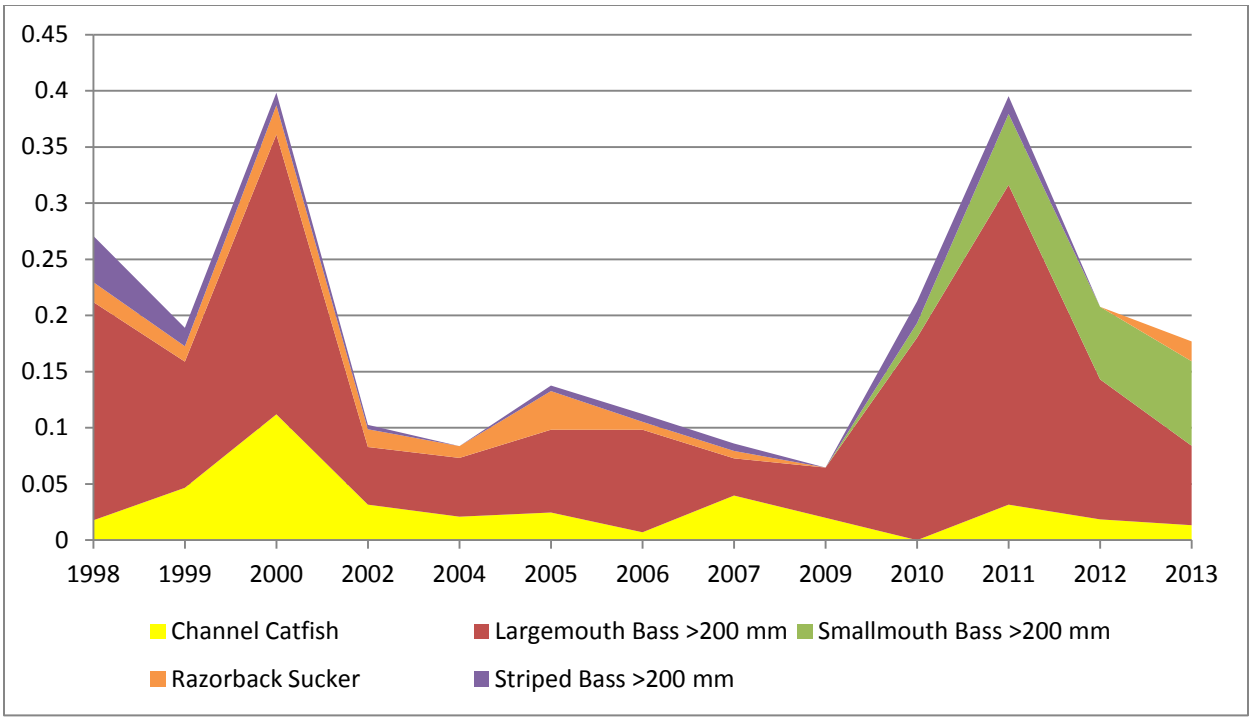


Figure 19. Electroshocking catch rates for fish larger than 200 mm (7.9 in) TL (2004-2007, 2012-2013 spring surveys, other years in fall).

Habitat Improvement

Three types of habitat were constructed and deployed into Solicitor and Prospect coves, which included 23 PVC structures, five poly shrubs, and 24 brush bundles in 2013. Pallets and Christmas trees are no longer permitted and will not be used in the future. The PVC structures were constructed from 1.5 in PVC. The basic unit was a 5 ft x 5 ft cube. The cubes were then attached together with heavy-duty (175 pound test) zip ties. Most of the PVC units deployed were 4 cube units. Snow fencing, plastic lattice, and brush were attached to each unit. Brush bundles were constructed of brush, weighted with sand bags (six to eight bags, depending on the size of the bundle) and bound with natural fiber rope. The structures were placed between the 620 ft and 630 ft elevation. Tamarisk was cut on site by NPS crews or NDOW, and used as the brush component of the structures. By the end of 2013, the total amount of habitat placed included:

- 80 PVC and snow fence structures;
- 153 assorted brush bundles;
- 5 poly shrubs;
- 88 pallet and brush A-frames;
- 24 pallet structures; and
- 25 barge loads of Christmas trees, approximately 625 trees

Habitat Effectiveness Evaluation – SCUBA Monitoring

Thirteen SCUBA surveys were completed in 2013. SCUBA surveys are used to evaluate the effectiveness of the habitat and compare habitat sites with untreated sites. Figure 20 compares species abundance in habitat coves and no habitat coves. In 2013, no-habitat coves had higher fish use than habitat coves. However, this is because one survey without habitat had a threadfin shad ball of approximately 5,000 fish. When the threadfin shad are removed from the data (Figure 21), 2013 then becomes like past years where there is more fish use at habitat sites than those coves without habitat.

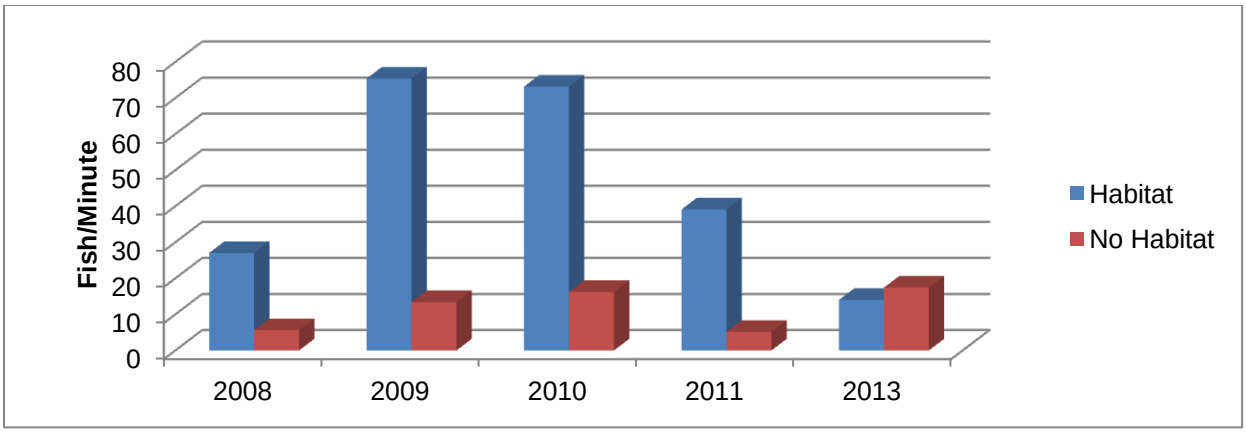


Figure 20. Comparison of habitat vs. no habitat coves from SCUBA surveys including all species.

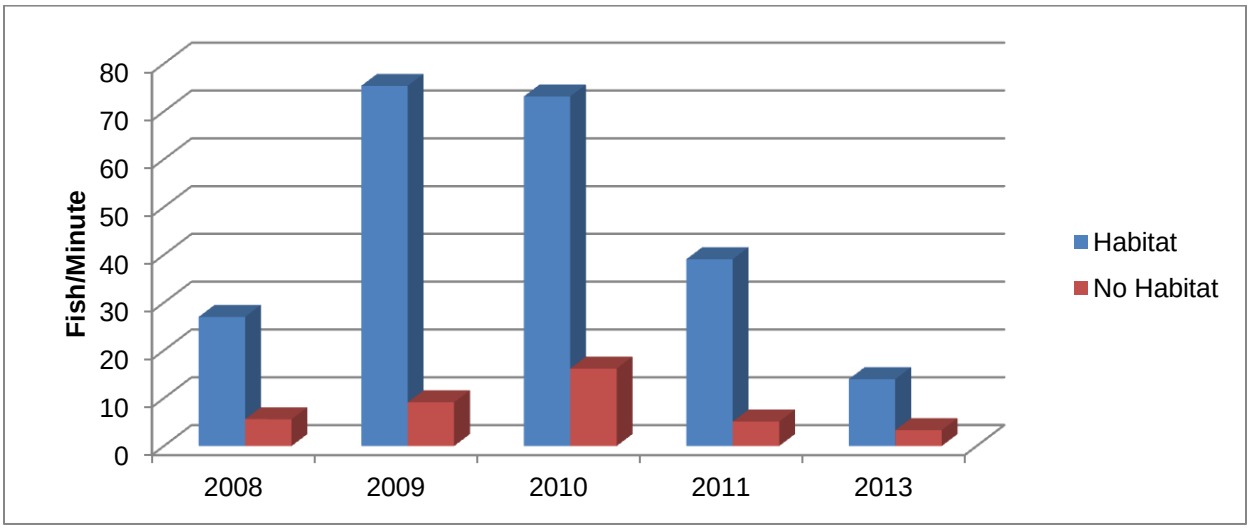


Figure 21. Comparison of habitat vs. no habitat coves from SCUBA surveys including all species except threadfin shad.

Figure 22 compares fish use by individual species in habitat versus no-habitat coves. Sunfish have the highest use followed by largemouth bass. Bluegill is the most common sunfish species seen using the habitat. In 2013 all species numbers were lower than previous years. This could be a result of changes in staff or because overall fish numbers were down this year, as shown in gill netting and electroshocking.

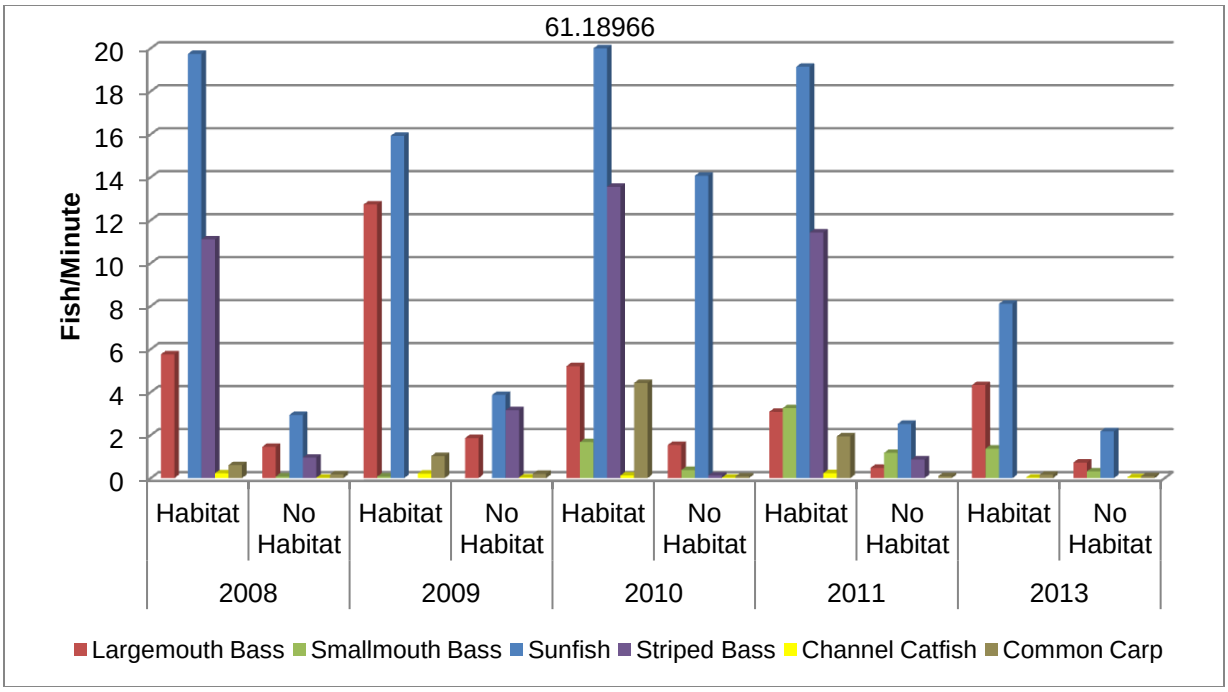


Figure 22. Comparison of fish use by species with habitat vs. no habitat coves from SCUBA surveys.

Figures 23 and 24 show use by habitat type for largemouth bass, smallmouth bass, and sunfish. Largemouth and smallmouth bass do not have a major preference over one habitat type or another (Figure 23). Largemouth bass were seen more on PVC than pallets or brush in 2013 but other years they seen more on pallets or brush. Smallmouth bass were seen more on pallet structures in 2013. Sunfish seem to prefer PVC and brush bundles over pallet structures (Figure 24).

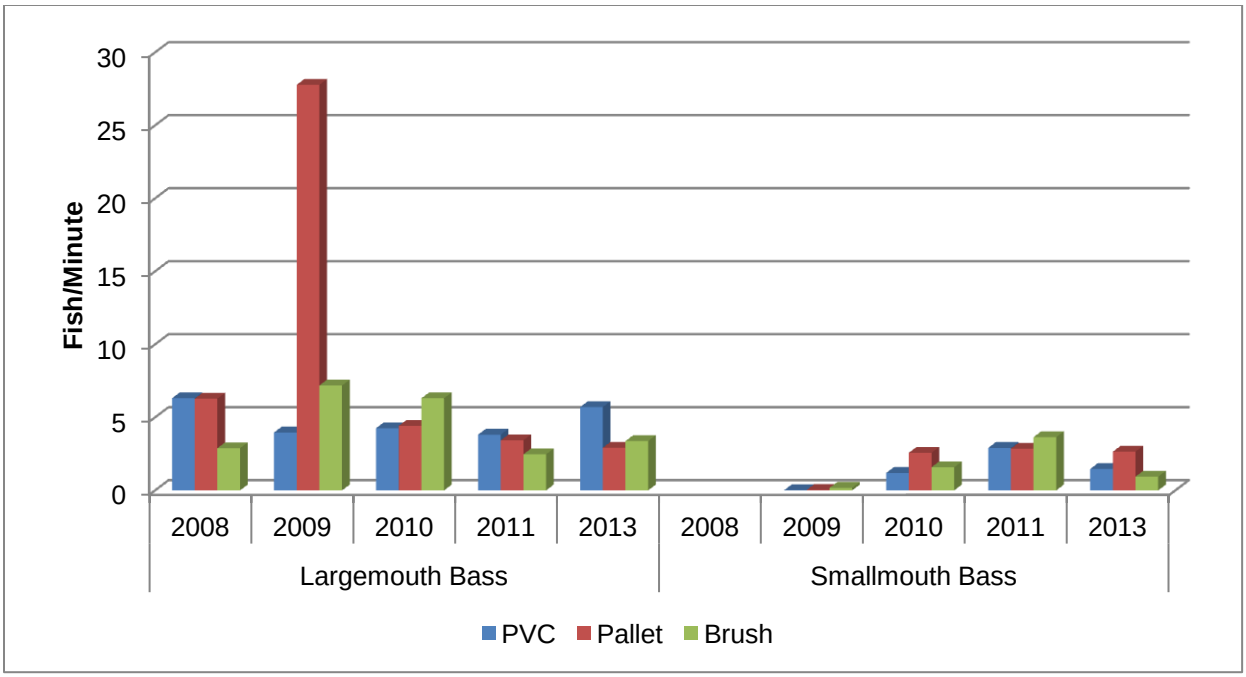


Figure 23. Largemouth and smallmouth bass use by habitat type from SCUBA surveys, 2008-2013.

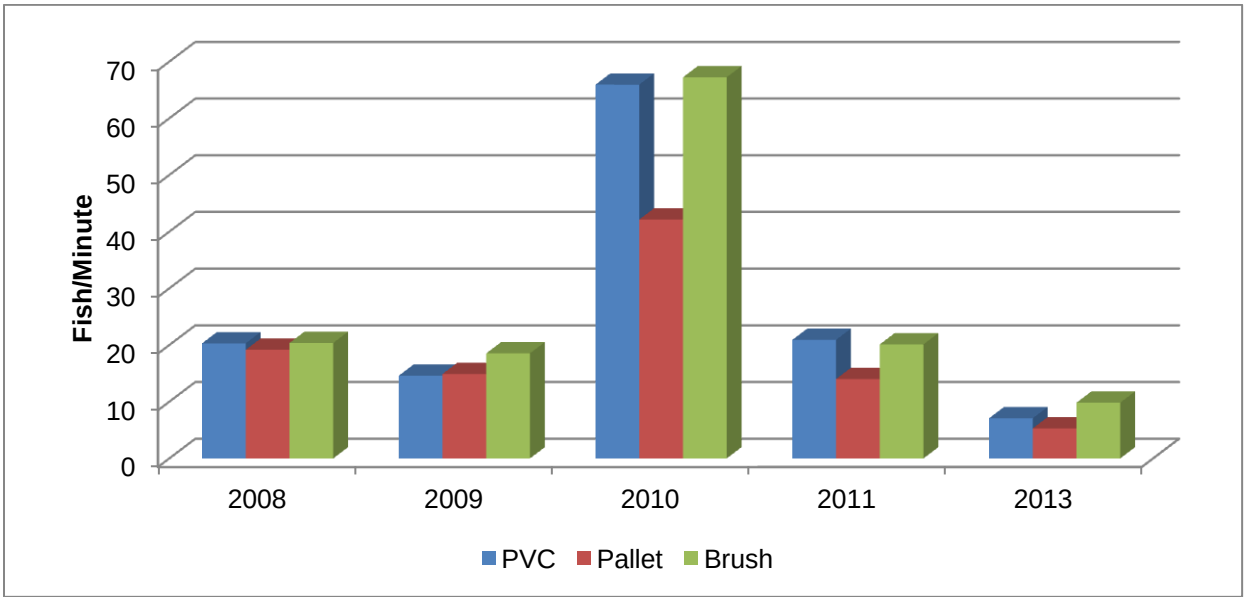


Figure 24. Sunfish use by habitat type from SCUBA surveys.

Figure 25 shows that fingerling largemouth bass prefer PVC structures over other habitat types, whereas the juveniles and adults do not have as much of a preference. Smallmouth bass of all age classes prefer pallet structures. There are also more fingerling size black bass seen using habitat than the larger size classes.

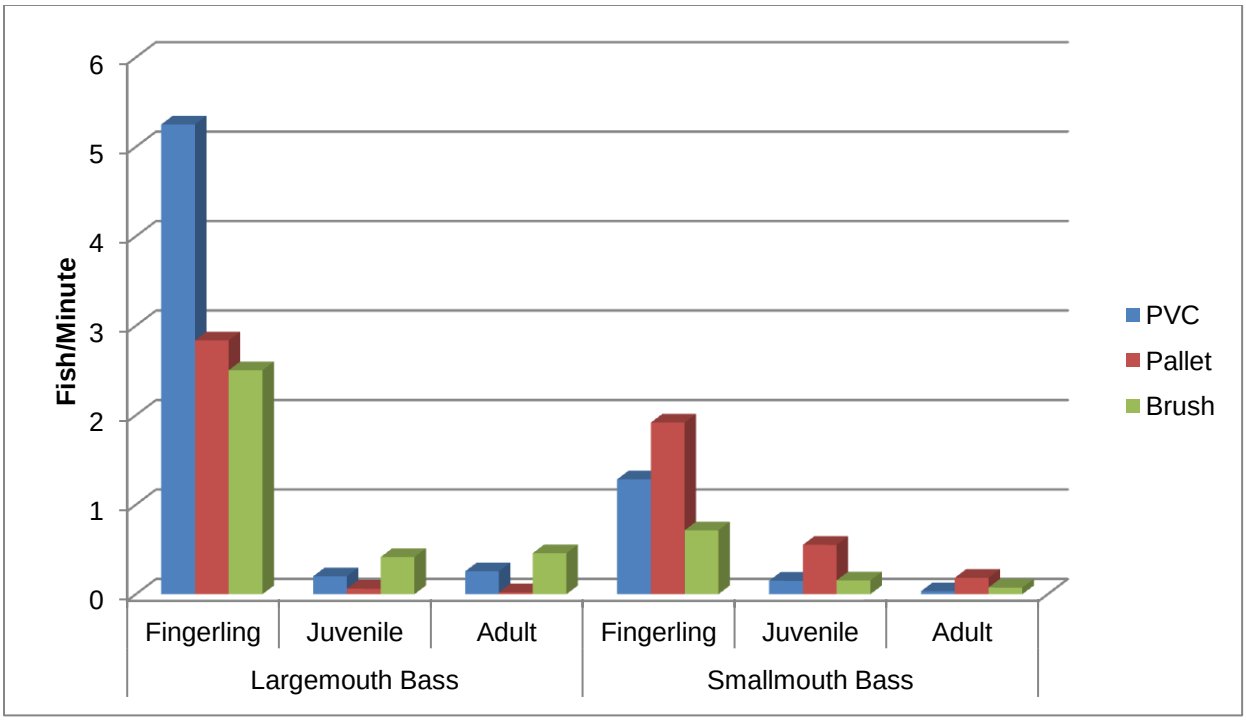


Figure 25. 2013 smallmouth and largemouth bass habitat use by size class.

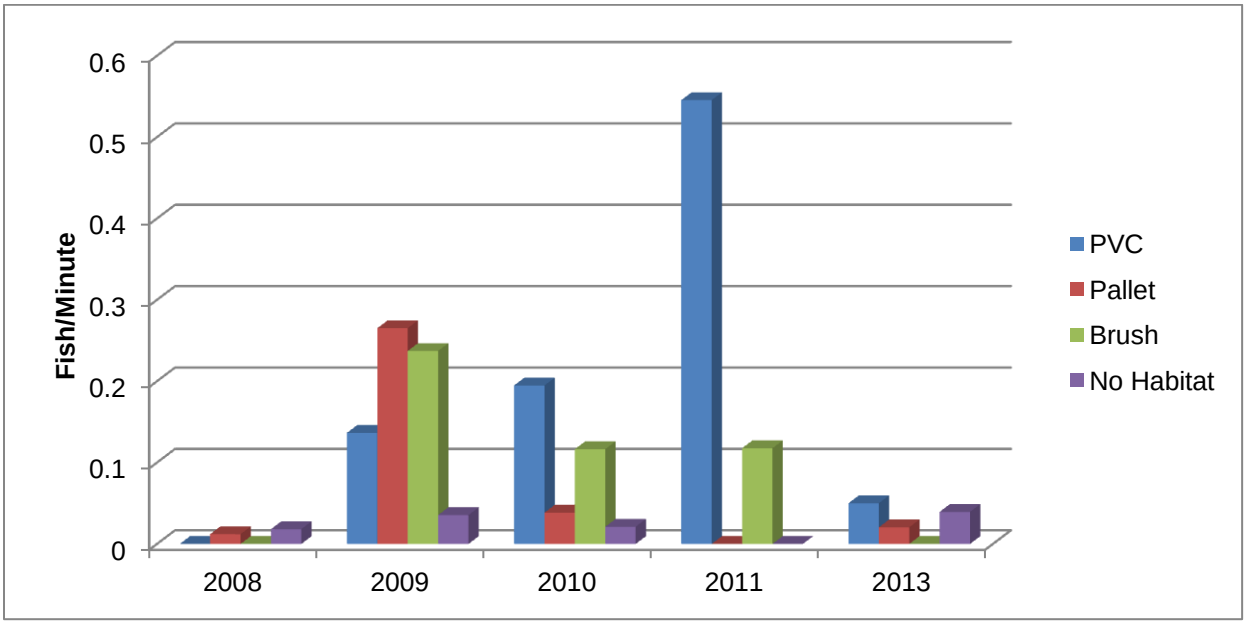


Figure 26. Channel catfish use by habitat type from SCUBA survey.

Even though gill netting catch rates for channel catfish increased in 2013, their use on habitat dropped from the previous three years and use on no-habitat stayed the same (Figure 26). Common carp use of habitat declined this year (Figure 27). This could be because the previous two years had a lot of young-of-year fish seen on the habitat and that Solicitor Cove was a new cove for habitat this year resulting in carp not finding the habitat yet.

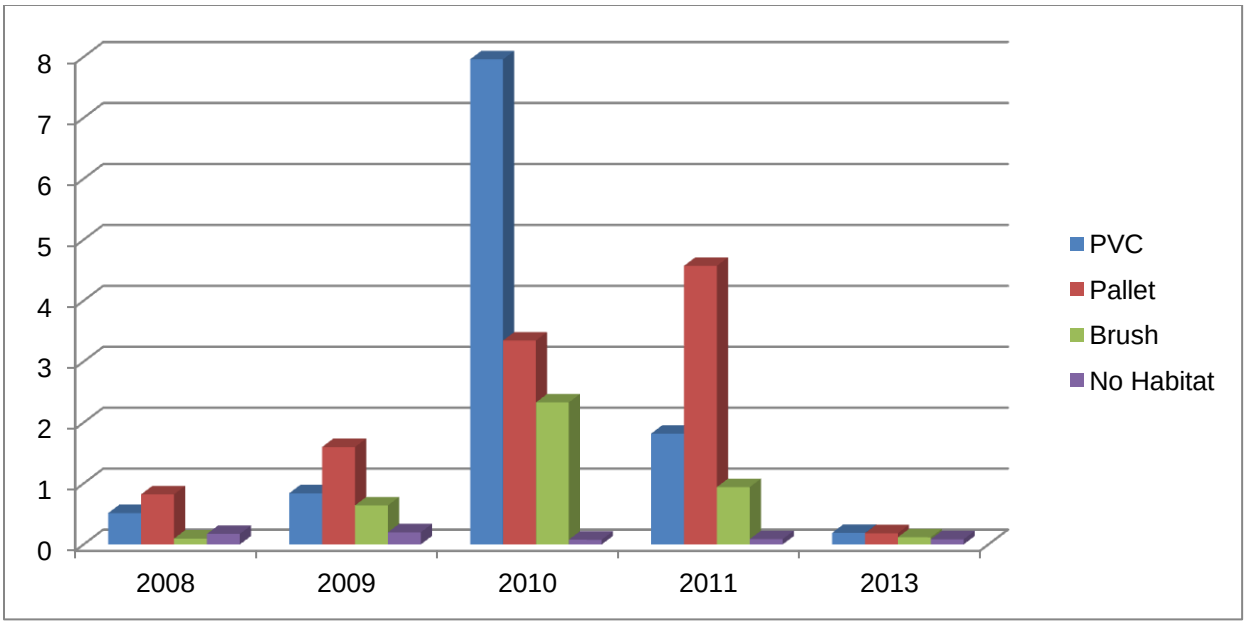


Figure 27. Common carp use of habitat types from SCUBA surveys, 2008-2013.

Habitat Effectiveness Evaluation - Electroshocking Comparison

Additional assessment of constructed habitat use by sport fish was completed with an electroshocking survey to provide more quantitative data regarding use by species. Electroshocking was only completed on two of the habitat sites, Solicitor and Box coves. Water levels of the lake normally drop throughout October and hit the lowest sometime at the end of October and beginning of November. The water then stays low for a couple of weeks and then begins to rise slowly. This year, the drawdown of the lake occurred two weeks later and then began to rise rapidly to fill back up. With the timing of schedules and weather, the surveys were completed in December, a month later than normal and at a water level three feet higher than past years. Since there were no surveys completed in no-habitat coves, Figure 28 compares 2013 catch rates of species with past fall sampling of habitat coves. All species catch rates declined from other years, except for smallmouth bass which stayed almost the same. No striped bass were captured through electroshocking on habitat in 2013. This could be because of higher water levels making sampling farther away from habitat and later surveys when fish may not be present.

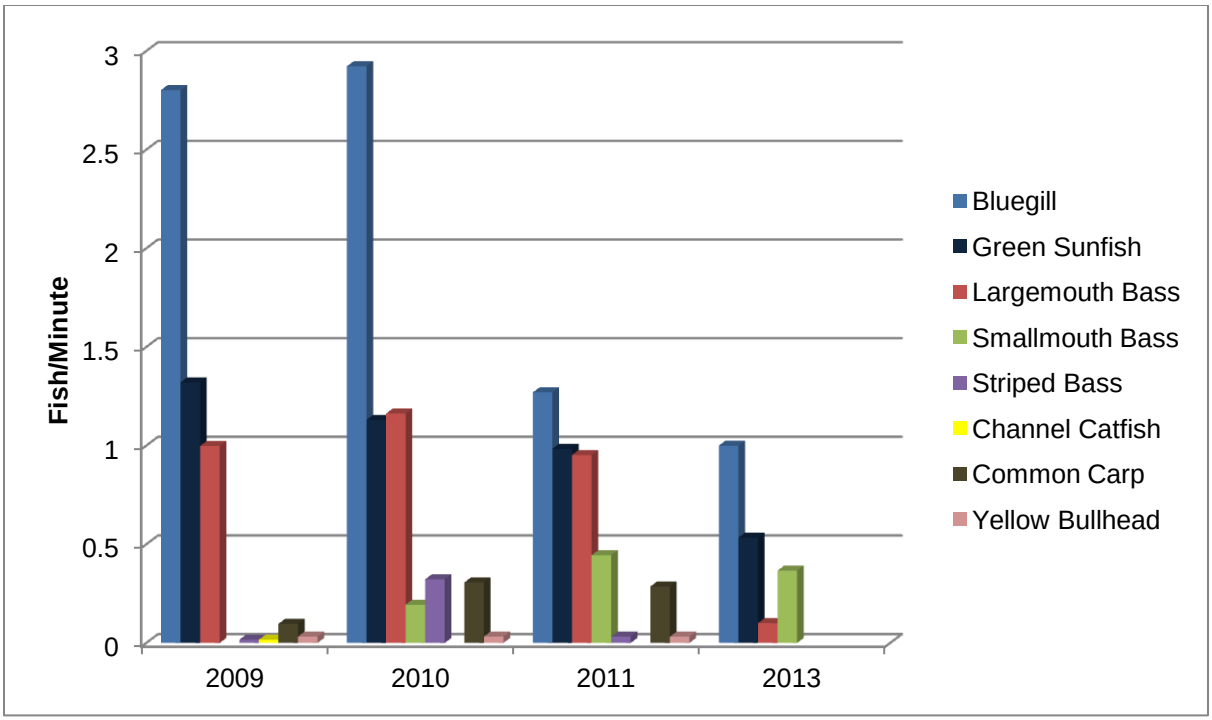


Figure 28. Electroshocking catch rates for habitat coves from fall sampling, 2009-2013.

Box Cove was the only cove that was surveyed that had past data. Figure 29 compares catch rates from Box Cove by individual species. Compared to previous years, all species catch rates increased from 2011, but are lower than 2009 and 2010 catch rates.

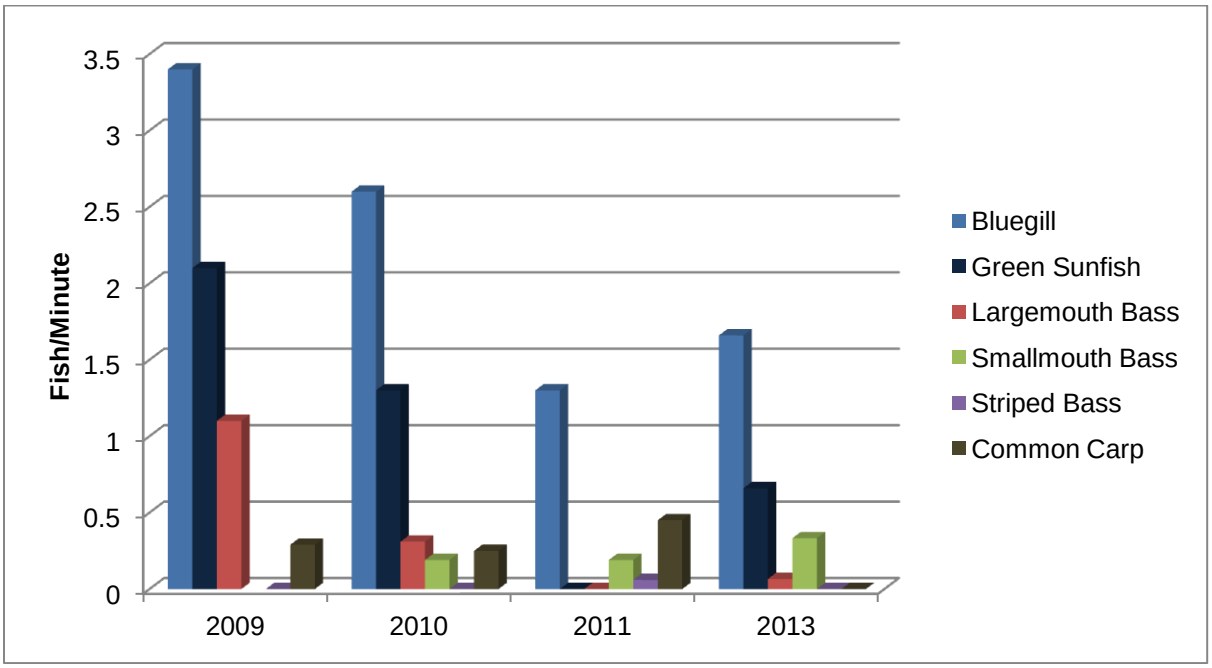


Figure 29. Comparison of catch rates by species for Box Cove from fall electroshocking, 2009-2013.

The habitat enhancement project will be continued in 2014 and permits with the Army Corp. of Engineers will need to be renewed.

MANAGEMENT REVIEW

The decline in the Lake Mohave striped bass fishery continued in 2013. Data from fish population surveys have indicated poor year class recruitment since 2006. The cause is not fully understood; however, the change is coincidental to the infestation of quagga mussels into Lake Mohave. As agencies collect more water quality data, a better understanding of Lake Mohave may bring answers to why there is a decline in the striped bass fishery. Rainbow trout stockings stopped in October, which could affect the striped bass population. One positive note is that threadfin shad were documented this year and there have been reports of others seeing more shad. This could have a positive effect on striped bass fishery with more forage available to them. This may only have a short-term benefit if threadfin shad are wiped out again. Threadfin shad also may not entirely solve the problems with the striped bass fishery, including low young-of-year recruitment, since this early life stage does not completely rely on threadfin shad for forage.

Lake Mohave remains a reservoir known for trophy striped bass. The trophy fishery was built on limited striped bass abundance at younger life stages, permitting recruitment into the larger size classes. Abundant recruitment would quickly eliminate the limited forage base resulting in even fewer, if any, trophy fish.

The habitat project continues in Lake Mohave. Largemouth bass, smallmouth bass, bluegill, channel catfish, common carp, and, to date, one razorback sucker utilize these structures. Densities of most fish species are generally higher on the constructed habitat compared to untreated sites.

RECOMMENDATIONS

- Maintain present regulations.
- Consider revamping the present creel survey system so that the Willow Beach creel position is included in the present Lake Mead full and part time positions. This will alleviate the problem with trying to find a person willing to work just one day a week. Installing volunteer creel boxes, with the approval of the NPS, would also provide additional creel data.
- Continue fish population surveys through gill netting, electroshocking, snorkel transects, and SCUBA. Conduct SCUBA surveys utilizing stop watches to get accurate survey times, not just estimates. Conduct electroshocking surveys in the fall when water levels are lower and fish concentrations are denser near constructed habitat.
- Continue participation with the Lake Mead National Recreation Area Fisheries Management Team.
- Continue developing and implementing the Lake Mohave Habitat Enhancement project.

- Continue to participate as a member of the Lake Mohave Native Fish Work Group and associated native fish restoration projects.

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