Fishery Management Plan
Lake Washington
January 2015

Lake Washington is a 3,090 acre oxbow lake located in Washington County about 20 miles south of Greenville, MS and near the towns of Glen Allen and Chatham. It is one of Mississippi's largest natural lakes with scenic cypress forests in both ends and most of the western shore. Water levels normally fluctuate around 2-3 feet with average and maximum depths of 6 feet and 20 feet, respectively. The main line levee prevents a direct hydrological connection with the Mississippi River. A low head dam on Washington Bayou, the outlet of Lake Washington, elevates lake level four feet and permits boat navigation through much of the cypress forest. The dam has two culverts used mainly to drain excess water after heavy rains. The eastern shore and a section of the western shore are mostly residential development and fishing camps. There are two public boat ramps; one in Glen Allen which is maintained by Washington County and another in Paul Love Park on the Washington Bayou dam. There are six privately-operated, public fee ramps along with a marina, two fishing piers, bait shops, rental cabins, and trailer hook-ups.

The watershed of Lake Washington is approximately 27,860 acres. The watershed is generally flat and composed of around 45% cropland, 22% pasture land, 32% bottomland hardwood forest/swamp, and < 1% residential areas. Agriculture activities on the watershed greatly influence Lake Washington water quality, and problems with poor water quality have plagued the lake for over 30 years. The lake was closed to commercial fishing between 1973 and 1977 due to the pesticide contamination. There have also been problems with high nutrient levels and organic enrichment leading to extensive algal blooms, low DO levels, and partial fish kills (Lucas 1988). Lake Washington and two of its tributaries were listed on the 303(d) list in 1996 as impaired water bodies due to sediment/siltation, and TMDLs have been developed by MDEQ and approved by the USEPA to reduce sedimentation and to increase DO levels (Tetra Tech 2003).

Historically, Lake Washington has had a valuable multifaceted fishery that receives substantial fishing pressure and has positively influenced the local economy by attracting out-of-state anglers. Fish surveys show that sportfish populations were high in the 1990s with over 100 pounds of game fish per shoreline acre in 1992 (Lucas and Vyles 1998). Catfish are abundant in Lake Washington and have been since at least the 1950s when a fish community survey found a high percentage of the fish population to be catfish (Smith 1950). Recent surveys reveal that catfish are still abundant, and angler catch rates of catfish have increased dramatically since the early 1990s. In addition to traditional pole fisheries, yo-yo's and limblines are used extensively for crappie and catfish during certain times of the year. Trotlines and hand grabbling are also used for catfish. Sport fishing effort is usually the highest when high water in the Mississippi River makes it difficult to fish oxbow lakes directly connected to the river.

In the 1990s, fisheries management efforts focused on biomanipulation (Jones 1986) as a means to address the eutrophic status of Lake Washington (Lucas 1988). This top-down approach to water quality management contends that water quality in highly eutrophic lakes can be improved

by increasing the abundance of predator fish that will consume large numbers of zooplanktivorous and bottom-feeding fish. This will in turn lead to greater numbers of large-bodied zooplankton which will be able to control the abundance of phytoplankton. Past management objectives included predator fish stocking, increased sport harvest of channel catfish, and commercial harvest of catfish, buffalo and carp. Since 1988, catfish harvest has been encouraged due to their high abundance.

In 2007, the Lake Washington Watershed Implementation Team was established with a stated mission of 'improving and maintaining Lake Washington as a beautiful resource through better environmental stewardship, including conservation and restoration practices to ensure that the forestry, water quality, and water quantity in the watershed are balanced and protected (FTN Associates 2007).' MDWFP is actively involved with this team and is responsible for the management of the fishery of Lake Washington. Concerns voiced by stakeholders in recent years include a decline in the number of crappie being caught, low water levels, and an increase in undesirable species such as freshwater drum, large gizzard shad, and small catfish. Also of concern to many residents around the lake is the large alligator population. Asian carp are present in Lake Washington and were first caught in the summer of 2010 by commercial fishermen. At least 5 adult Asian carp were caught in commercial gill nets in 2010, but currently they are low in abundance and no evidence of reproduction in the lake has been documented.

Alligator weed and other mixed vegetation is present in small amounts in the lake along the eastern shoreline and in the cypress forests at the southern end of the lake. To date, it does not pose a threat to navigation or accessibility except for a small area near Paul Love Park at the south end of the lake. This area has been treated with herbicide multiple times since 2009.

A creel survey was conducted from March – June 2011 to determine angler catch rates, and a crappie angler questionnaire was used to gather opinions concerning current crappie regulations. Of the 287 anglers interviewed, approximately 80% were residents of Mississippi and 20% were from out of state. Most anglers targeted crappie (38%), followed by catfish (28%), bass (23%), and bream (5%). Target percentages for bream were low due to undesirable weather conditions during peak spawning activity as well as low water levels throughout the majority of the survey period. Bass target percentages were high due to two bass tournaments held during the survey period. Harvest rates were high for crappie (88%), bream (85%), and catfish (94%) but low for bass (16%). White crappie comprised 92% of the total angler harvest of crappie by number during the creel.

Angler catch rates and average weights for crappie increased on Lake Washington since 2008. The catch rates for crappie were similar to the historic averages for oxbow lakes, while average weights were higher than historic averages. Crappie harvest rates were the same as in the early 1990's, but the average weight of harvested fish has nearly doubled in size.

For the crappie angler questionnaire, anglers targeting crappie were asked several questions pertaining to the current regulations, their opinion of the crappie fishery, and their thoughts on a possible regulation change. Over 80% of anglers questioned prefer to catch a few large crappie rather than several small crappie. Even though the creel results show that catch rates and average weights have increased, almost 50% of the anglers felt as though the crappie fishery has gotten

worse, while only 5% feel that it had improved. Approximately 60% of anglers surveyed felt that Lake Washington was being overfished. The majority of anglers (61%) support a change from the existing 30 fish/day creel limit to a reduced limit of 20 fish/day, and 67% of anglers also supported an increase in size restrictions from a 10" MLL to a 12" MLL. Roughly 50% of anglers surveyed in the 2011 questionnaire feel strongly about placing a ban on yo-yo and limbline fishing at Lake Washington. Many anglers have complained in the past of yo-yo fishermen harvesting too many small fish and have advocated greater regulation and/or banning of yo-yo's and limblines in Lake Washington. Discarded or abandoned limblines are abundant at the lake and pose a threat to native wildlife and anglers fishing in shallow water areas. The use of limblines was banned at Lake Washington in 2014.

A 2014 fall electrofishing survey collected 21 species, including spotted gar, bowfin, common carp, grass carp, gizzard and threadfin shad, smallmouth and bigmouth buffalo, yellow bullhead, channel catfish, flathead catfish, yellow bass, green sunfish, warmouth, bluegill, longear, redear, largemouth bass, white and black crappie, and freshwater drum. Bass catch rates fell compared to the last electrofishing survey, but catch rates for bream, crappie, and catfish all rose. PSD and Wr values remained very high for all sport fish species and catfish.

Trap nets were set during the fall of 2012 to collect crappie for age and growth analysis. A total of 462 black crappie and 275 white crappie were collected, and otoliths were pulled from 194 fish for age and growth analysis. An age length key was developed for black and white crappie to extrapolate age data to all crappie collected, and since both species of crappie are managed as a single group in terms of regulations, the data was combined for computations of growth and mortality. We found a relatively fast growing population of crappie with individuals up to age 6.5. Crappie in Lake Washington reach stock length (5") at age 1.4, quality length (8") at age 1.7, and preferred length (10") at age 2.1. Annual mortality was estimated by catch curve analysis and was found to be 66%.

Fisheries Analysis Simulation Tools (FAST) software was used to model population responses to the following scenarios: no length limit, a 10" MLL, and a 12" MLL. We chose the model with cm = 0.3 and cf = 0.5 because this combination gave a total annual mortality of 0.65 which was similar to our annual mortality estimate, and the results showed that a 10" MLL would provide for the maximum yield of crappie. However, a more precise estimate of fishing mortality and natural mortality was needed to further refine the model parameters and provide more confidence in this data.

In 2014, as part of Darrin Hardesty's work towards a master's degree, we began a research project to determine current exploitation levels of the crappie fishery at Lake Washington. Trap nets and lead nets were set in April 2014, and a total of 655 white crappie and 104 black crappie were collected. From these fish we tagged 399 crappie over 10" in total length with pink Floy tags at the base of their dorsal fin and released them back into the lake. Each tag was labeled with the phrase "REWARD" as well as a contact phone number.

A reward system was set up to encourage anglers to return tags. All tags were to be returned to the angler's choice of 1 of 3 different bait shops along Lake Washington. As an incentive, a fishing hand towel was awarded to all anglers that returned a tag and additionally 3 tags will be

randomly drawn for prizes valued at 100 dollars each. Posters that explained the research study, the tag return process and reward system were displayed at all the local bait shops and boat ramps. A voicemail was set up at the local district office so that anglers who caught a tagged crappie could call the number on the tag and receive information about the study.

The study is ongoing, and we will continue receiving tag until March 31, 2015 to get an entire year's worth of tag returns. Through the end of September 2014 (the first six months after tagging) a total of 65 tags were returned. Rough initial estimates using this data gave an annual exploitation rate of 44%, but this number will be re-evaluated in 2015 after the close of the tag return period.

To determine current annual mortality rates, trap nets and lead nets were set at Lake Washington during the fall of 2014. 181 crappie were collected, and otoliths were pulled from 160 crappie for aging. Catch curve analysis predicted the total annual mortality to be 67%, which was very similar to estimates from 2012 when it was estimated to by 66%. We found a relatively fast growing population of crappie with individuals up to age 6.5. Crappie in Lake Washington reach stock length (5") at age 0.5, quality length (8") at age 1.25, and preferred length (10") at age 2.0.

Largemouth bass harvest in Lake Washington is restricted by a creel limit of 5 fish per day and a minimum length limit of 15", with 2 fish under 15" allowed to be harvested. In 2001, a 10" MLL on crappie and mandatory attendance of yo-yo's were established (Lucas and Ellis 2001). Since incidental kill of undersized crappie sometimes occur on yo-yos, the regulation allows harvest of five crappies less than 10 inches. Bream harvest is not restricted beyond the statewide creel limit of 100 per day, and there are no restrictions on catfish harvest. As mentioned previously, fishing with limb lines is banned at Lake Washington.

The long term goal for the fishery of Lake Washington has been stated clearly in the Watershed Implementation plan as 'having a healthy, balanced sport fishery that attracts non-local anglers who contribute to the local economy (FTN Associates 2007).' Additionally, we envision Lake Washington as primarily a crappie fishery but with sustainable and desirable populations of bream, bass, and catfish.

GOAL

Improve/maintain the sportfish and catfish populations at Lake Washington to contain desirable, sustainable fisheries and to attract local and out-of-state anglers.

Objective 1. Maintain aquatic vegetation coverage at < 5% of surface area.
Action 1: Chemically treat alligator weed annually with herbicide as necessary in the spring and summer at Paul Love Park.
Action 2: Conduct a vegetation survey annually in the summer to look for expanding or newly established aquatic vegetation.

Action 3: Educate owners of private boat ramps as to what alligator weed looks like and encourage them to report the presence of alligator weed if encountered.
Action 4: Distribute MDWFP 'Stop Aquatic Hitchhikers' flyer to bait shops and local businesses around the lake.
Action 5: If exotic vegetation becomes a nuisance at the lake, develop an aquatic vegetation management plan and submit to the vegetation management team.
Expected Results: Aquatic vegetation will be maintained at low levels that do not restrict access or cause other problems.
Evaluation: Annual vegetation survey each spring to determine species present in the lake, relative abundance of each species, and total percent coverage.

Objective 2: Improve angler catch rates for crappie to ≥ 1.5 fish/hr; maintain average weight of harvested crappie at ≥ 0.75 lb.
Action 1: Maintain current regulations on crappie population for now.
Action 2: Complete tag return study in 2015 and determine exploitation rate. Use this value and current total annual mortality rates to also determine natural mortality rates.
Action 3: Use population modeling software to evaluate the effects of more stringent length limits at current exploitation rates once natural mortality is determined. Consider changing length limits and/or creel limits if necessary to protect the fishery and maximize yield.
Action 4: Work with the Lake Washington Watershed Implementation Team to protect/enhance adjacent wetlands and backwaters important as crappie nursery areas
Expected Results: A better understanding of crappie population dynamics in Lake Washington; a sustainable, premier crappie fishery rivaling the fisheries in the FCR's.
Evaluation: Spring creel surveys at least every 5 years to determine angler catch rates, average weights, and angler preferences. Age crappie collected with trap nets at least every 7 years to monitor changes in growth rates and mortality.

Objective 3: Protect the natural beauty and biotic integrity of Lake Washington, its adjacent wetlands, and the surrounding watershed.
Action 1: Partner with MDEQ and other agencies in water quality monitoring, encouraging the implementation of agricultural BMP's, and promoting wise land use practices with the goal of removing Lake Washington from the 303(d) list of impaired water bodies.
Action 2: Maintain ban on limb lines at Lake Washington and encourage local law enforcement officers to enforce regulation.
Action 3: Partner with local angler groups and concerned citizens to host lake clean up days to remove abandoned limb lines and other dangerous debris in the lake.
Expected Results: Lake Washington water quality will improve and anthropogenic impacts on the lake will reduced.
Evaluation: Monitor MDEQ documents to determine when Lake Washington is removed from list of impaired water bodies.

Objective 4: Maintain at least 20% of total springtime anglers being from out-of-state.

Action 1: Update weekly fishing reports for Lake Washington on the MDWFP website from February to November.
Action 2: Create a depth map of Lake Washington and add to MDWFP website.
Action 3: Post pictures and advertise the excellent fishing opportunities on Lake Washington on other fishing websites and forums, such as www.crappie.com.
Action 4: Partner with bait shop owners and other concerned citizens in public relations and advertising ventures.
Expected Results: Out-of-state anglers will continue to contribute to the local economy and promote development in Washington County.
Evaluation: Spring creel surveys at least every 5 years to determine angler's residency; communication with local motels/cabin owners catering to out-of-state anglers to determine changes in occupancy.

Objective 5: Minimize conflict between sports fishing anglers and commercial anglers on the lake.
Action 1: During the creel survey in 2015, ask all anglers interviewed about their views on commercial fishing on the lake, especially in terms of their impact on the catfish population and their impact on access to good fishing areas.
Action 2: Document the abundance and location of gill nets in the lake during the spring of 2015.
Action 3: Continue to dialogue with bait shop and boat ramp owners about their concerns regarding gill netting on the lake.
Action 4: If conflict continues to increase, consider implementing more stringent rules on commercial fishermen on the lake.
Expected Results: All user groups will be able to enjoy fishing at Lake Washington with minimal impact to other groups.
Evaluation: Generally monitor the amount of calls and complaints we receive regarding this issue.

Table 1. Sampling and management history of Lake Washington since 1988.

	Spring Creel	Fall Electrofishing	Age Crappie Otoliths	Vegetation Management	Trap Nets
2014		X	X		X
2013			X		
2012		X			X
2011	X				
2010		X		X	
2009		X	X	X	X
2008	X		X		
2007					
2006		X			
2005	X	X			

2004		X			
2003					
2002		X			
2001	X				
2000		X			
1999					
1998	X	X			
1997					
1996	X	X	X		
1995					
1994					
1993	X				
1992		X	X		
1991					
1990	X				
1989		X			
1988		X			

Table 2. Fish stocking history of Lake Washington.

2009	Largemouth Bass	87,500	1-2”
2007	Largemouth Bass	100,000	1.5”
2006	Largemouth Bass	100,000	1-3"
2005	Hybrid Striped Bass	189,000	1"
2004	Largemouth Bass	101,075	1.5"
2003	Hybrid Striped Bass	115,434	1”
2003	Largemouth Bass	101,000	2"
2002	Largemouth Bass	113,999	1"
2001	Largemouth Bass	114,438	1-3"
2000	Largemouth Bass	126,500	1-2"
1999	Largemouth Bass	86,052	2"
1998	Largemouth Bass	107,325	1-2"
1997	Largemouth Bass	49,830	2-3"
1996	Florida Bass	99,800	3"
1993	Florida Bass	103,190	1"
1992	Florida Bass	120,000	
1990	Florida Bass	100,000	

1990	Hybrid Striped Bass	39,373	2-3"
1989	Hybrid Striped Bass	25,000	1-2"
1987	Largemouth Bass	30,000	
1986	Florida Bass	59,000	
1985	Florida Bass	75,000	
1982	Hybrid Striped Bass	24,000	
1982	Largemouth Bass	75,000	
1981	Largemouth Bass	75,000	
1980	Largemouth Bass	75,000	
1978	Largemouth Bass	83,020	
1978	Bluegill/Redear	100,000	
1973	Largemouth Bass	75,000	

Table 3. Electrofishing catch per mile and size structure for fish from Lake Washington, 1984 - 2012. Bream = bluegill + longear + redear. Data from 2005 and earlier were converted from CPH.

	Bass					Bream			
	CPM ≥stock	CPM <stock	PSD	RSDp	Wr ≥stock	CPM ≥stock	PSD	RSDp	Wr ≥stock
2014	19	7	83	43	101	181	56	10	114
2012	39	13	81	16	102	60	78	22	126
2010	27	0	100	67	105	114	86	32	120
2009	33	2	91	59	106	90	57	22	116
2005	17	0	88	41	106	46	93	69	119
2002	6	0	67	50	106	61	29	0	109
2000	16	.	91	55	102	46	67	30	128
1998	13	.	81	54	.	18	61	3	.
1996	13	.	73	52	.	63	49	9	.
1992	4	.	79	53	.	66	56	10	.
1989	4	.	67	.	.	58	54	.	.
1986	1	.	67	.	.	42	54	.	.
1985	1	.	67	.	.	17	88	.	.
1984	1	.	100	.	.	15	67	.	.

	Crappie				Catfish			
	CPM ≥stock	PSD	RSDp	Wr ≥stock	CPM ≥stock	PSD	RSDp	Wr ≥stock

2014	25	78	56	91	40	54	0	99
2012	13	42	23	104	27	75	0	103
2010	9	94	52	97	43	62	1	102
2009	41	93	73	97	51	40	0	98
2005	4	100	25	97	59	75	0	.
2002	5	50	17	88	43	22	0	.
2000	1	.	.	.	35	21	0	.
1998	1	.	.	.	20	16	0	.
1996	5	86	43	.	13	20	0	.
1992	3	72	22	.	4	75	0	.
1989	.	.	.	.	9	42	.	.
1986	.	.	.	.	23	13	.	.
1985	.	.	.	.	21	19	.	.
1984	.	.	.	.	21	17	.	.

	Buffalo CPM $\geq$ stock	Rough Fish CPM $\geq$ stock
2014		
2010	14	25
2009	14	83
2005	44	105

Table 4. Creel data results from Lake Washington, 1990-2011.

	Crappie			
Year	CPH (kept)	CPH (released)	CPH (total)	Average weight
2011	1.2	0.2	1.4	1.0
2008	0.8	0.3	1.1	0.9
2005	1.0	0.4	1.4	0.9
1996	1.1	0.3	1.4	0.9
1993	1.2	0.7	1.9	0.6
1990	1.2	2.4	3.6	0.6

	Bass			
Year	CPH (kept)	CPH (released)	CPH (total)	Average weight
2011	0.09	0.46	0.55	2.6
2008	0.06	0.09	0.15	NA
2005	0.05	1.07	1.12	NA
1996	0.05	0.16	0.21	NA
1993	0.01	0.48	0.49	NA
1990	NA	NA	NA	NA

	Bream			
Year	CPH (kept)	CPH (released)	CPH (total)	Average weight
2011	0.5	0.1	0.6	0.5
2008	1.3	0.1	1.4	0.5
2005	1.1	0.2	1.3	0.6
1996	1.1	0.4	1.5	0.4
1993	NA	NA	NA	NA
1990	2.3	0.5	2.8	0.4

	Catfish			
Year	CPH (kept)	CPH (released)	CPH (total)	Average weight
2011	1.8	0.1	1.9	1.6
2008	1.0	0.2	1.2	1.1
2005	3.0	0.4	3.4	1.1
1996	1.5	0.2	1.7	1.3
1993	0.6	0.1	0.7	2.6
1990	0.3	0.03	0.3	1.4

	Percent Targeted				
Year	Crappie	Bass	Bream	Catfish	Anything
2011	38	23	5	28	6
2008	55	5	21	19	0
2005	52	9	24	15	0
1996	54	4	34	8	0
1993	52	10	29	5	4
1990	75	2	16	7	0

	Percent Harvested			
Year	Crappie	Bass	Bream	Catfish
2011	88	16	85	94
2008	71	40	92	86
2005	73	5	88	89
1996	77	24	74	88
1993	63	1	NA	85
1990	34	NA	84	91

Table 5. Response from crappie angler questionnaire on Lake Washington, March-June 2011.

Size anglers prefer to catch	**%**	**Is Lake Washington being overfished?**	**%**

Big crappie	83	Yes	61
A lot of crappie	12	No	16
Don't care	5	Don't know	23
Gear type used for harvesting crappie	**%**	**Crappie fishing is getting…**	**%**
Rod/Reel	92	Better	5
Yo-yos	1.5	Worse	48
Limb line	1.5	Same	44
All	5	Don't know	3
Opinion on current 10" MLL	**%**	**Opinion on change to 12" MLL**	**%**
Helped	66	Support	67
Hurt	5	Oppose	22
No effect	16	No opinion	11
Don't know	13		
Opinion on reducing creel limit to 20 fish/day	**%**		
Support	61		
Oppose	25		
No opinion	14		

Table 6. Fish species collected during trap net sampling on Lake Washington during the fall of 2012. Total length (TL) is in millimeters.

Species	Number	Average TL	TL range	% of total catch
White Crappie	462	139	69 - 358	42
Black Crappie	275	202	77 - 365	25
Freshwater Drum	183	180	142 - 366	17
Yellow Bass	47	146	78 - 235	4
Bluegill Sunfish	45	133	45 - 230	4
Channel Catfish	38	333	101 - 741	3
Threadfin Shad	15	80	70 - 122	1
Gizzard Shad	9	258	90 - 380	1
Orangespotted Sunfish	8	76	54 - 172	1
Warmouth	6	193	179 - 205	1
Spotted Gar	4	502	395 - 635	>1
Yellow Bullhead	4	255	108 – 322	>1
Longear Sunfish	2	83	79 - 87	>1
Alligator Gar	1	720	.	>1

Table 7. White and Black Crappie total length (mm) by age collected in the fall of 2012 from Lake Washington. YOY were excluded from data analysis

		White Crappie				Black Crappie			
Year class	Age	N	Min	Max	Avg	N	Min	Max	Avg
2011	1.5	330	103	308	172	228	101	254	171
2010	2.5	6	290	325	314	29	246	305	279
2009	3.5	0	.	.	.	4	305	333	323
2008	4.5	0	.	.	.	16	301	365	324
2007	5.5	0	.	.	.	6	295	353	329
2006	6.5	1	358	358	358	1	340	340	340

Table 8. Population parameters entered into FAST model for Lake Washington crappie. No, the theoretical number of fish in the population, was set to 100 so that output values represent percentages. The parameters a and b are derived from a weight-length regression. Max age is derived from mortality calculations. $L\infty$, k, and to, are parameters from the von Bertalanffy growth equation. $W\infty$ = the maximum theoretical weight of a fish in the population, cf = conditional fishing mortality, and cm = conditional natural mortality.

Parameter	Input
No	100
b	3.482
a	-5.96
Max age	7.0
$L\infty$	344.02
k	1.245
t0	0.979
$W\infty$ (g)	672.63
cf	0.3 – 0.5
cm	0.2 – 0.5

Table 9. Results from a population simulation model of potential harvest restrictions for crappie at Lake Washington, assuming cf = 0.5 and cm = 0.3. 203 mm (8”) was used in the model to represent no harvest restriction.

Harvest Restriction	Mean length at harvest (in)	Mean weight at harvest (lb)	Yield (kg)	% surviving to 10 inches	% surviving to 12 inches
None	11.0	0.8	13.0	36	15
10” MLL	11.8	1.0	14.2	47	20
12” MLL	12.6	1.3	13.5	47	35

Table 10. White and Black Crappie total length (mm) by age collected in the fall of 2014 from Lake Washington. YOY were excluded from data analysis

		White Crappie				Black Crappie			
Year class	Age	N	Min	Max	Avg	N	Min	Max	Avg
2013	1.5	27	159	226	183	60	133	226	176
2012	2.5	3	225	266	241	43	204	289	253
2011	3.5	3	319	338	330	21	255	320	283
2010	4.5	0				0			
2009	5.5	0				0			
2006	6.5	0				1	345	345	345

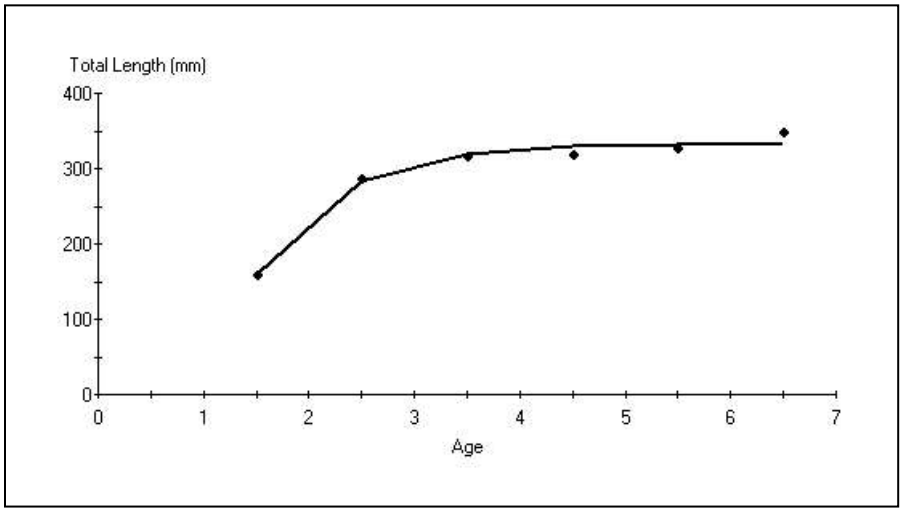

Figure 1. Von Bertalanffy growth curve for crappie (both species combined) at Lake Washington, 2012.

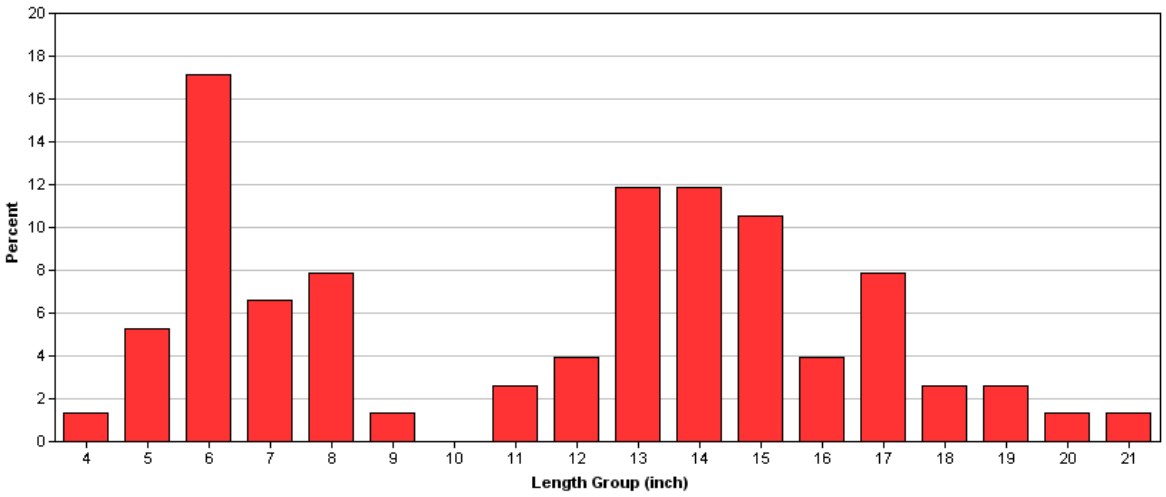

Figure 2. Length frequency distribution for largemouth bass from 2014 electrofishing survey.

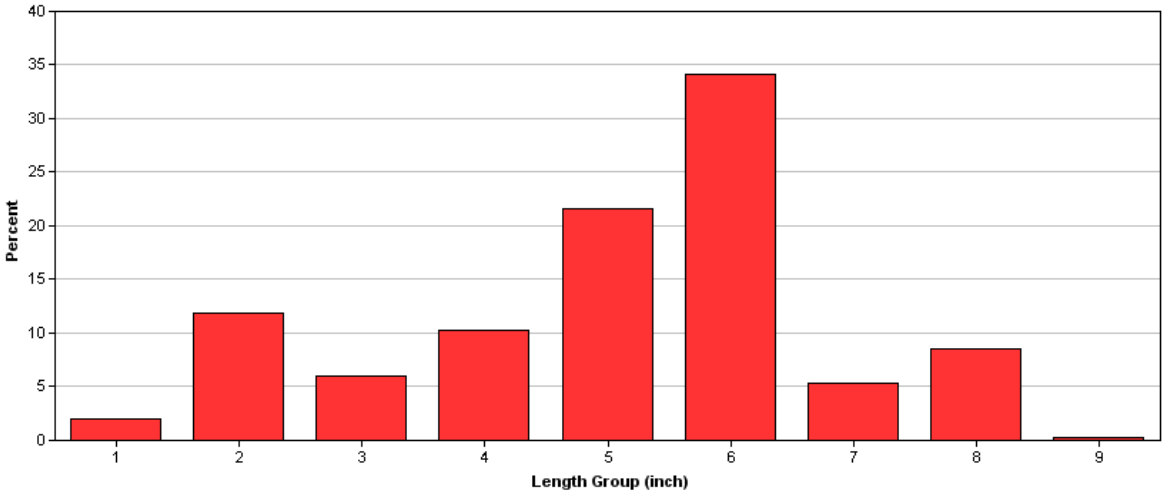

Figure 3. Length frequency distribution for bluegill from 2014 electrofishing survey.

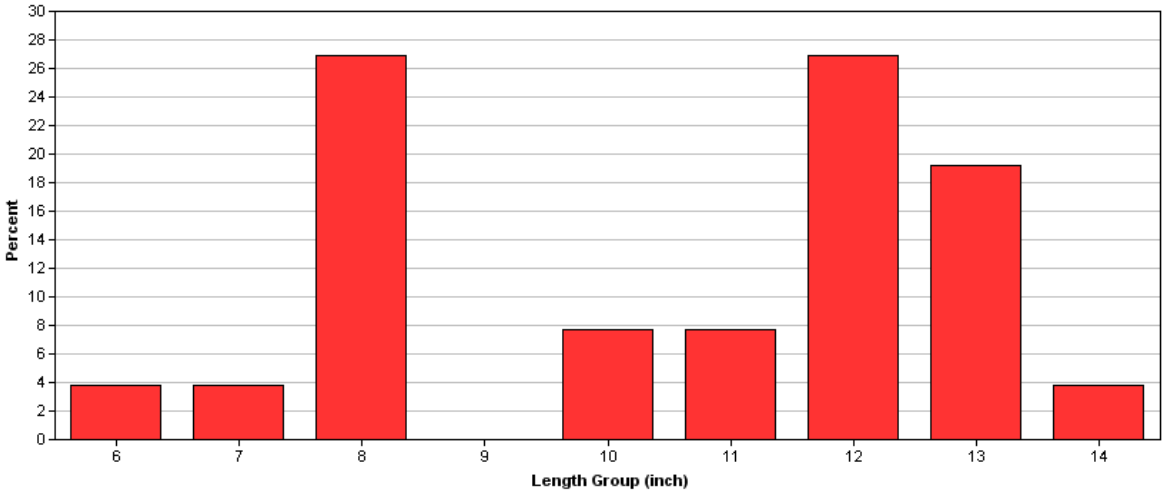

Figure 4. Length frequency distribution for white crappie from 2014 electrofishing survey.

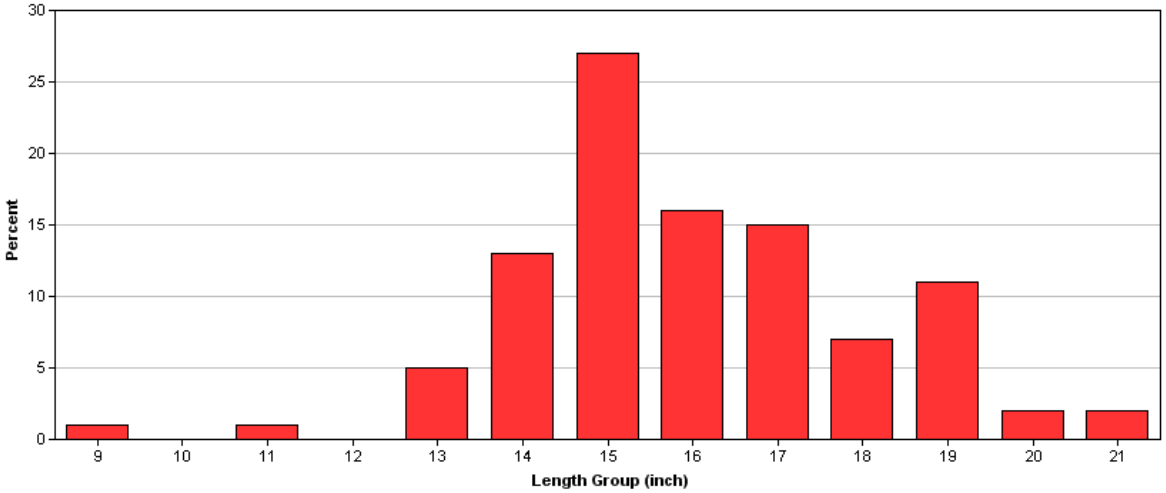

Figure 5. Length frequency distribution for channel catfish from 2014 electrofishing survey.

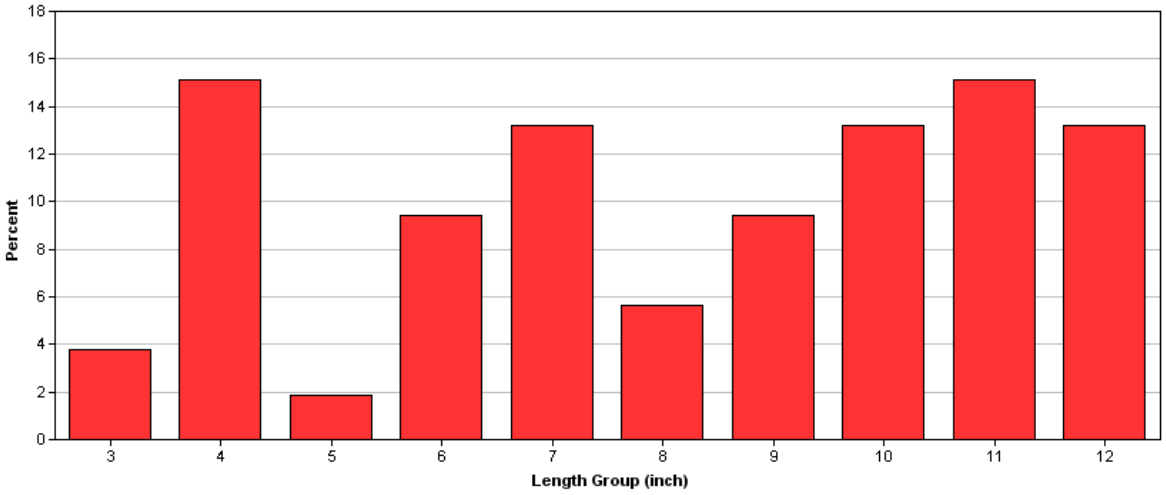

Figure 6. Length frequency distribution for black crappie from 2014 electrofishing survey.

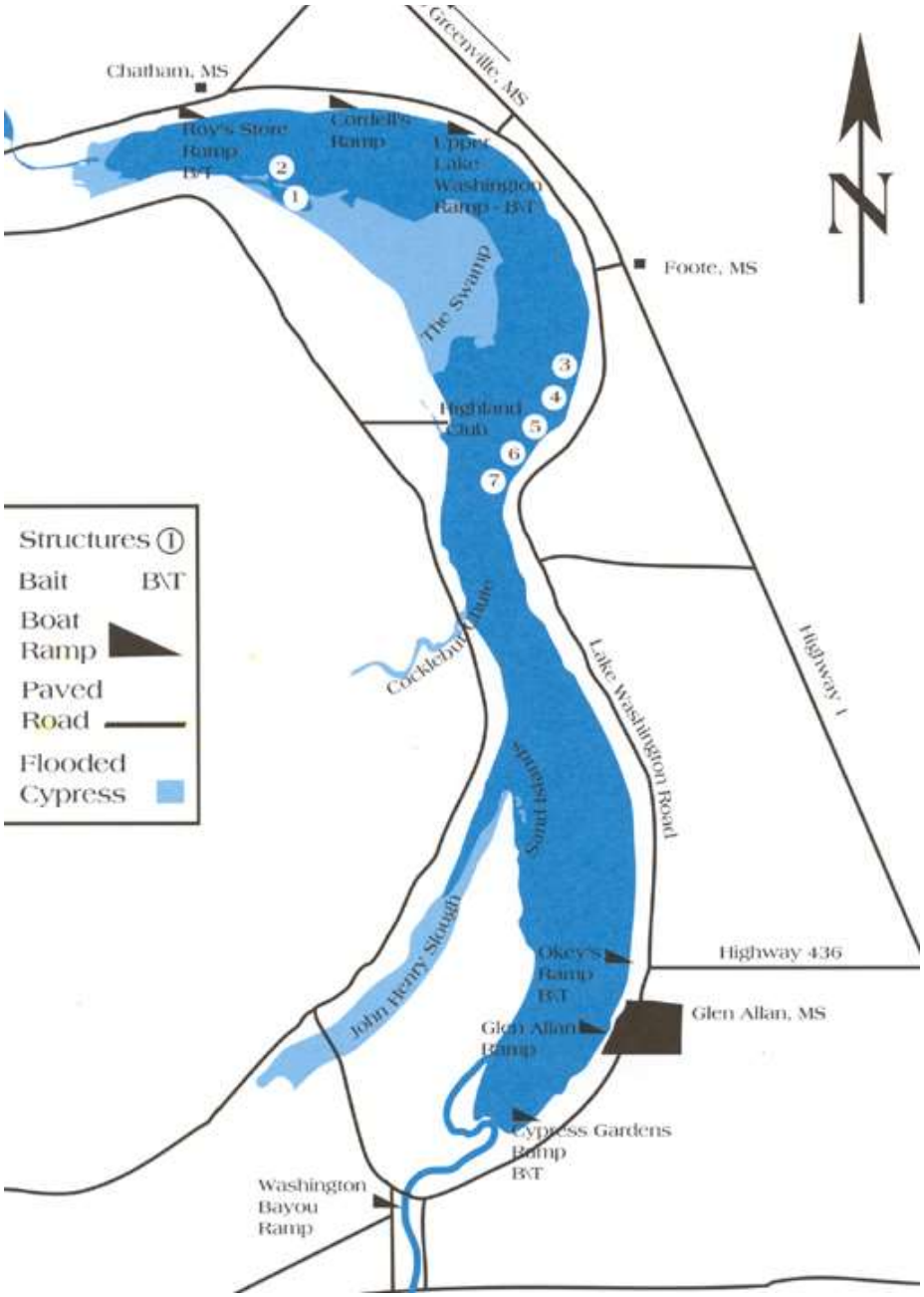

Figure 6. Lake Washington map.

Figure 7. Arial image of Lake Washington.

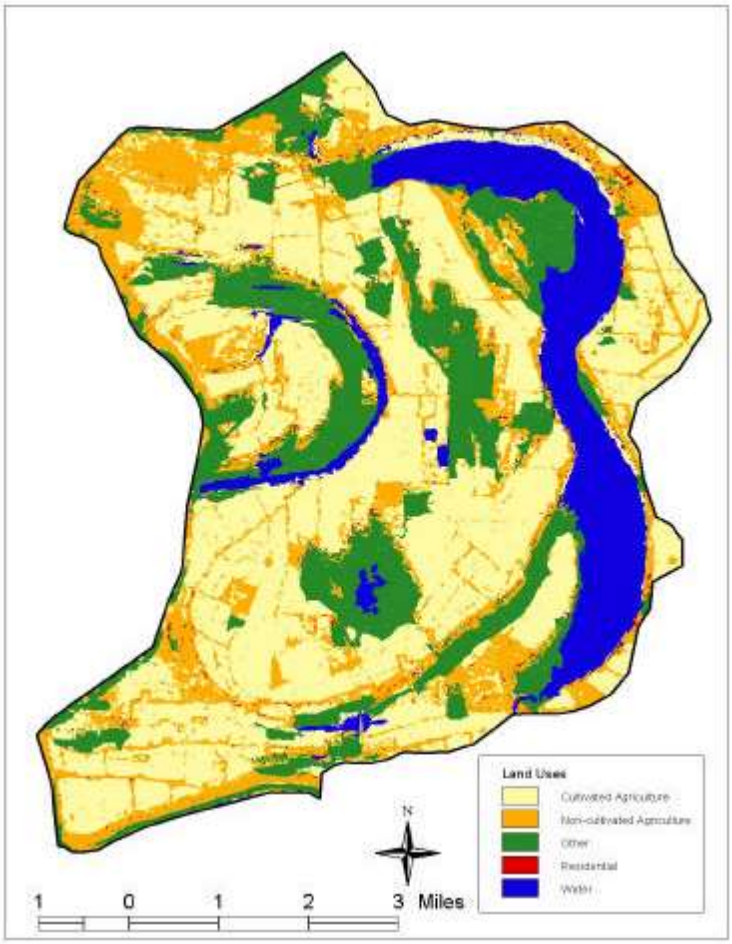

Figure 7. Lake Washington watershed land use, 2001.

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