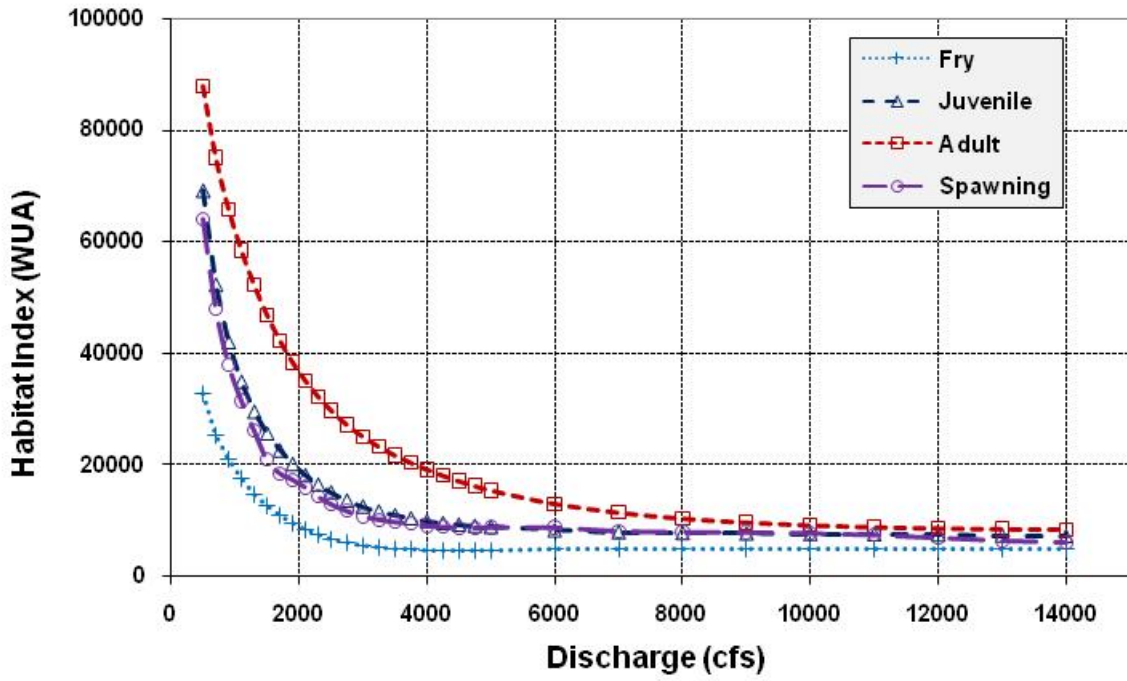


**APPALACHIAN POWER COMPANY
CLAYTOR HYDROELECTRIC PROJECT NO. 793-018
INSTREAM FLOW NEEDS STUDY**

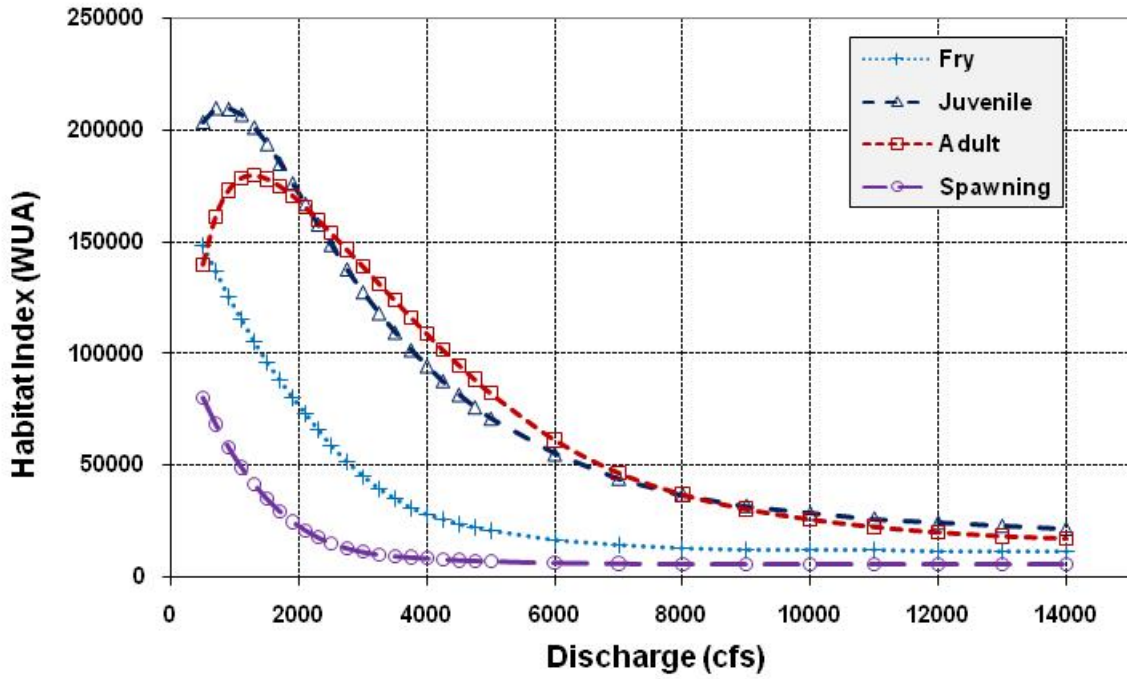
APPENDIX D

**WEIGHTED USABLE AREA TABLES
AND GRAPHS**

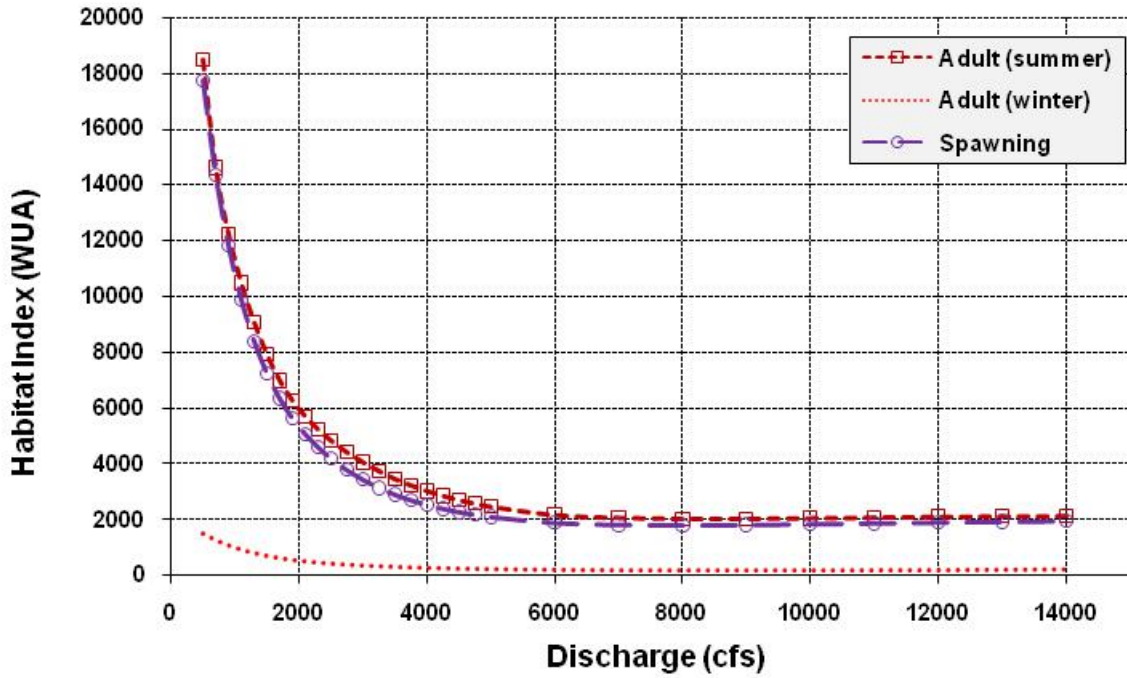
Rock Bass



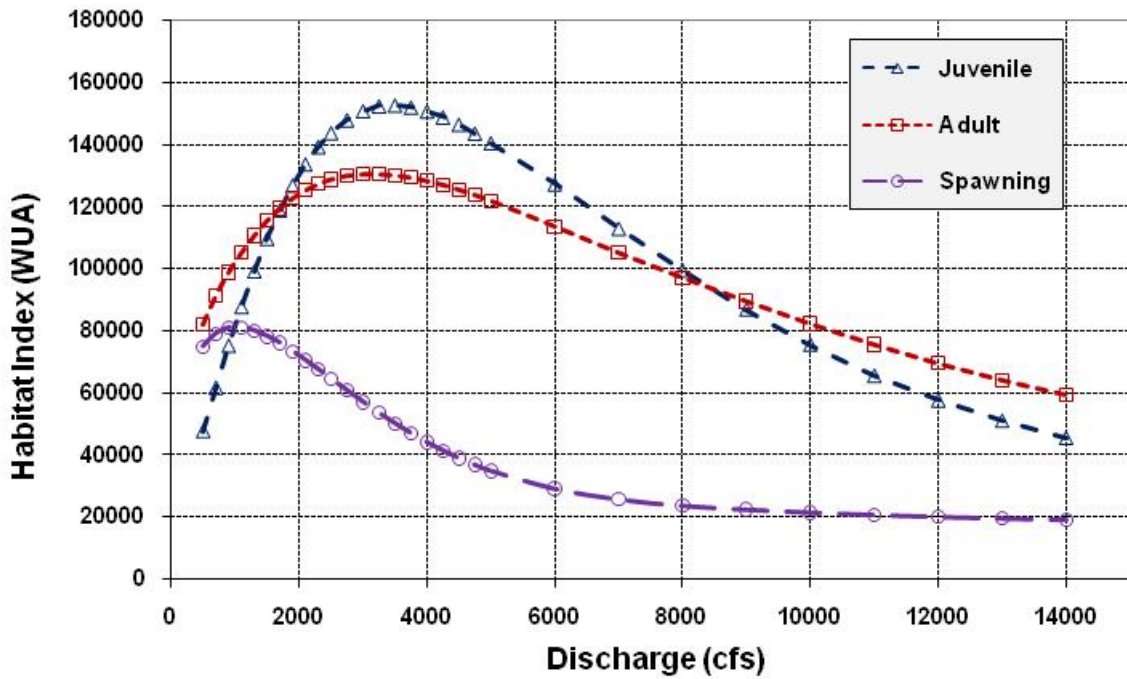
Smallmouth Bass



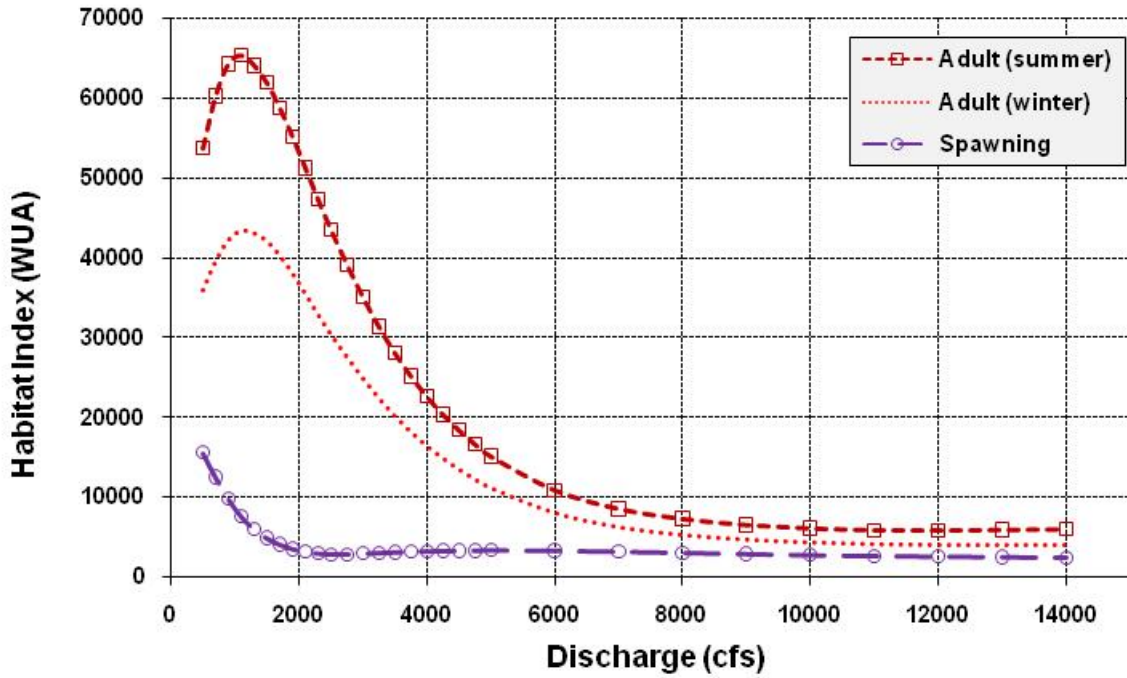
Flathead Catfish



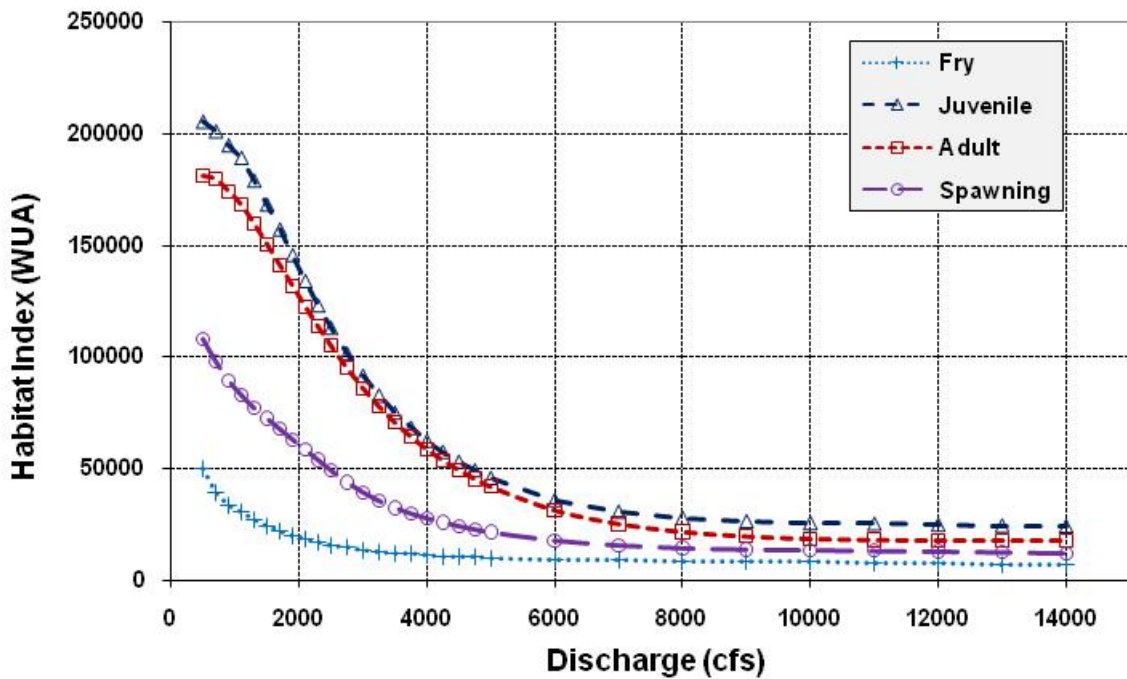
Channel Catfish



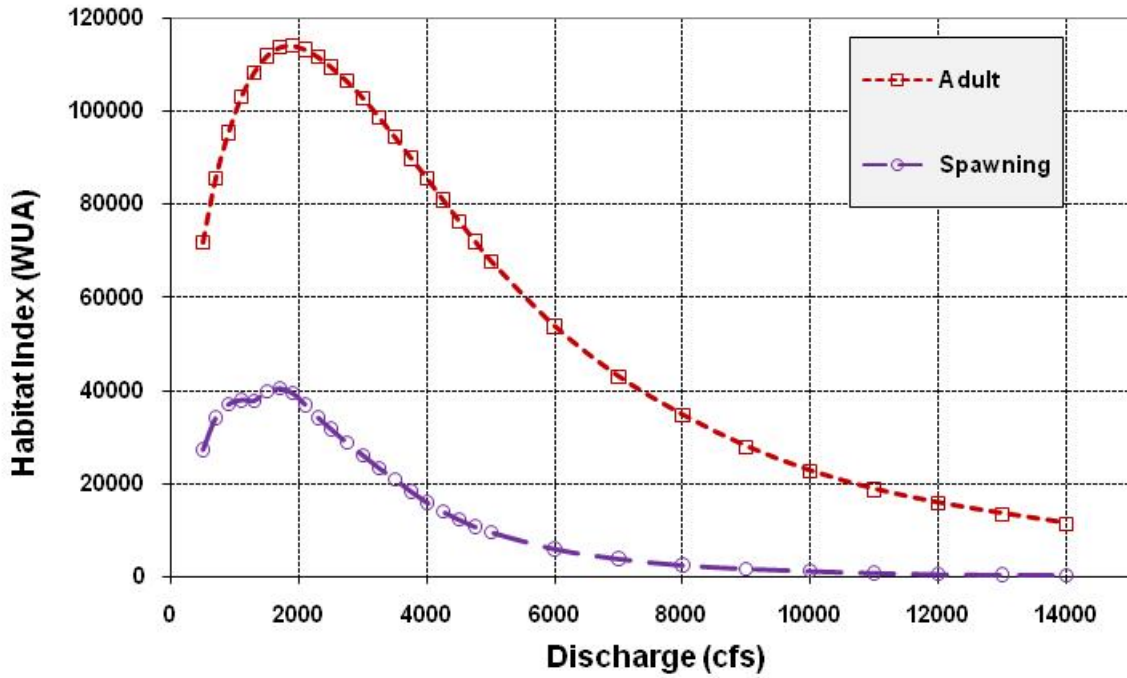
Muskellunge



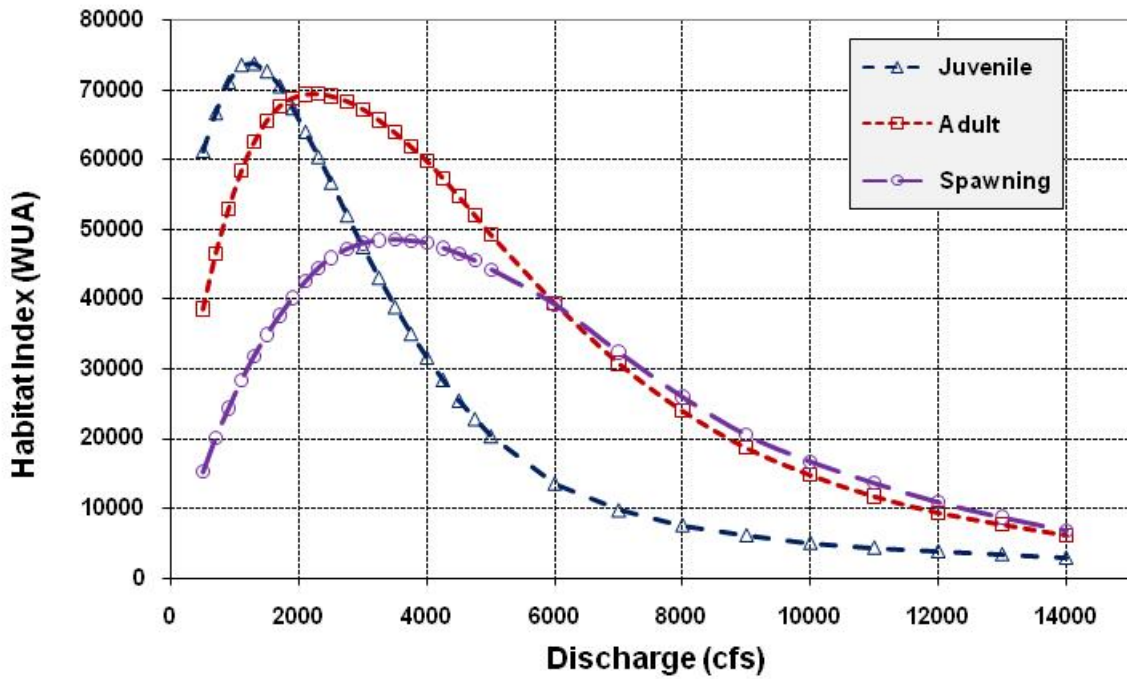
Redbreast Sunfish



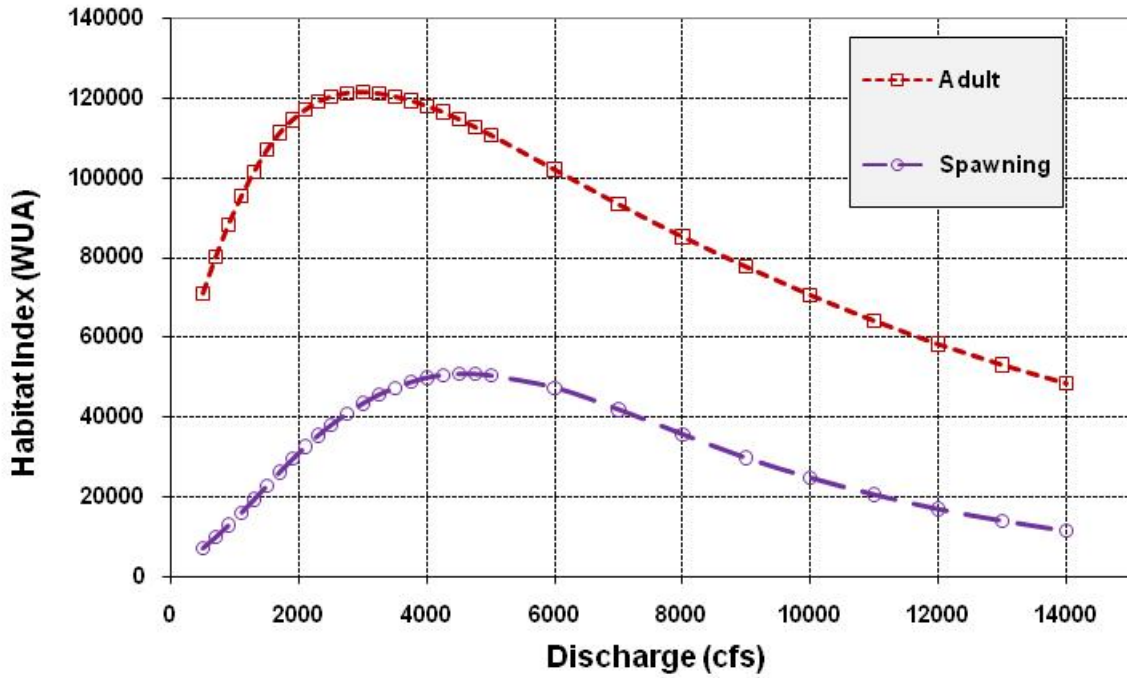
Bigmouth Chub



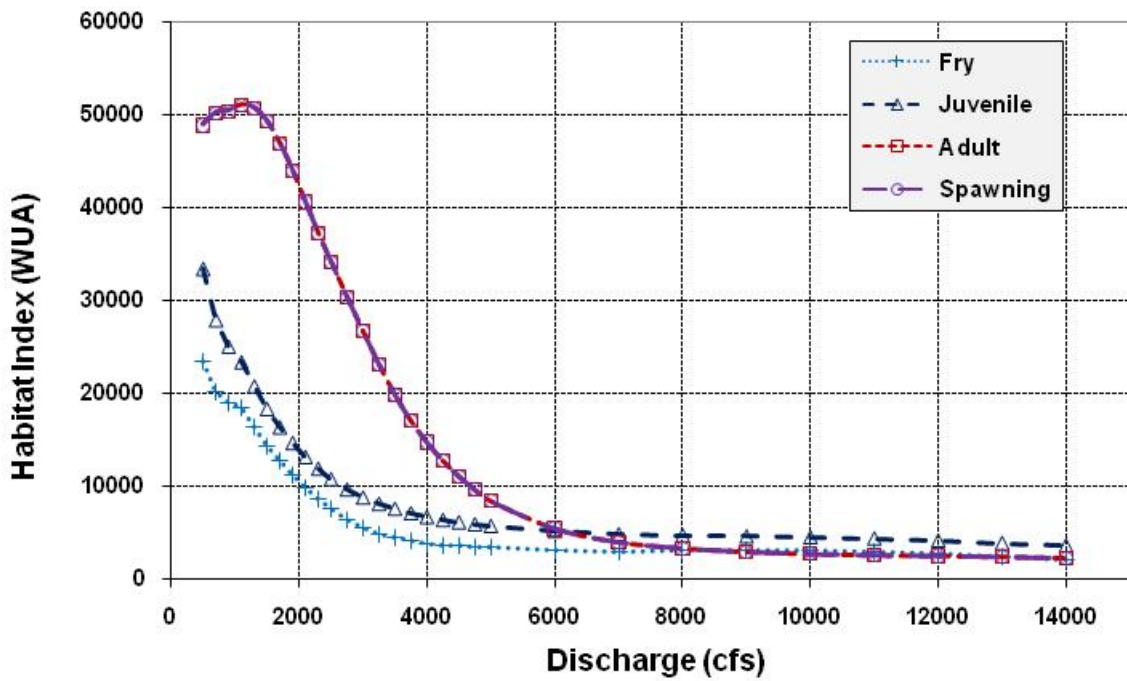
Greenside Darter



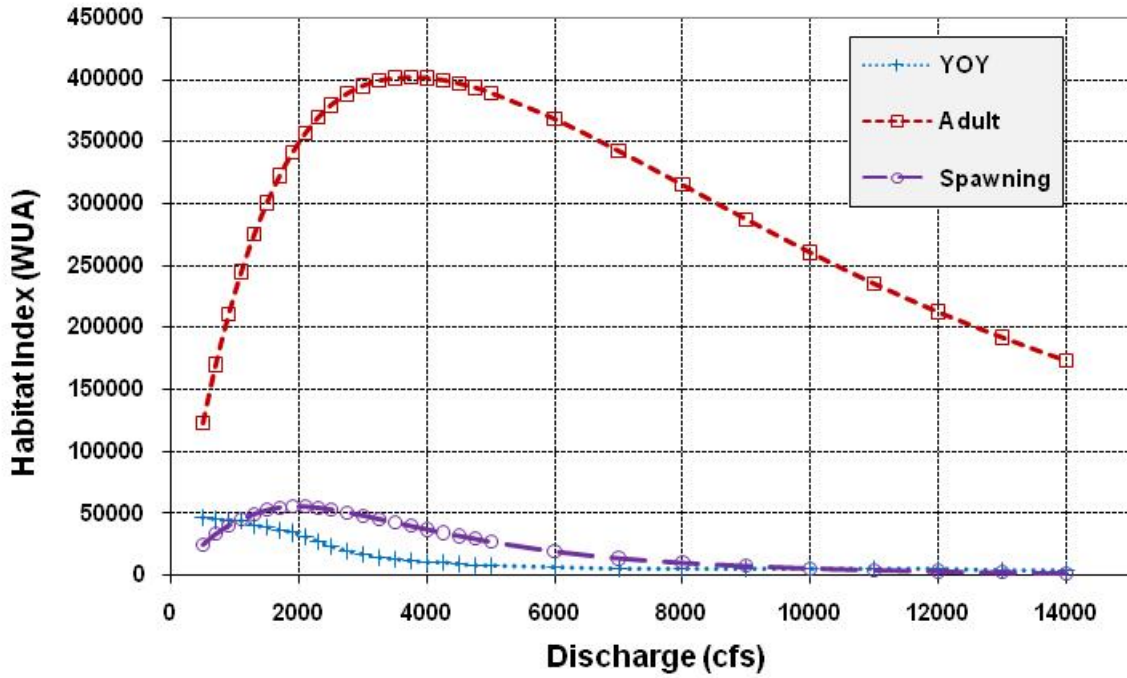
Logperch



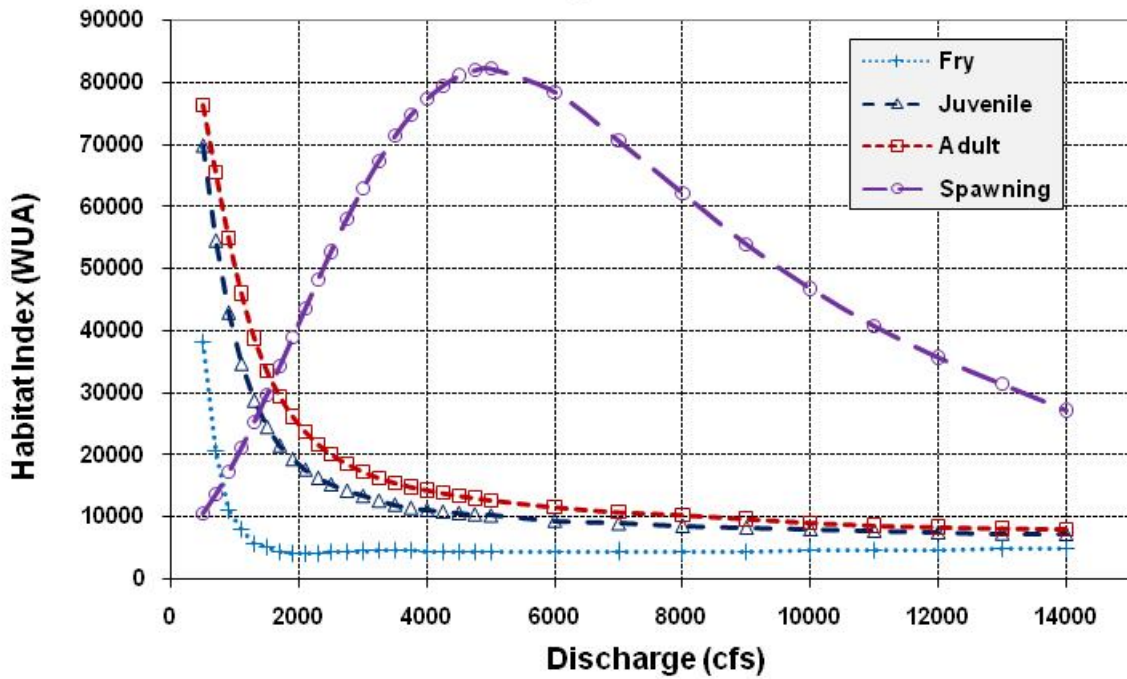
Common Shiner



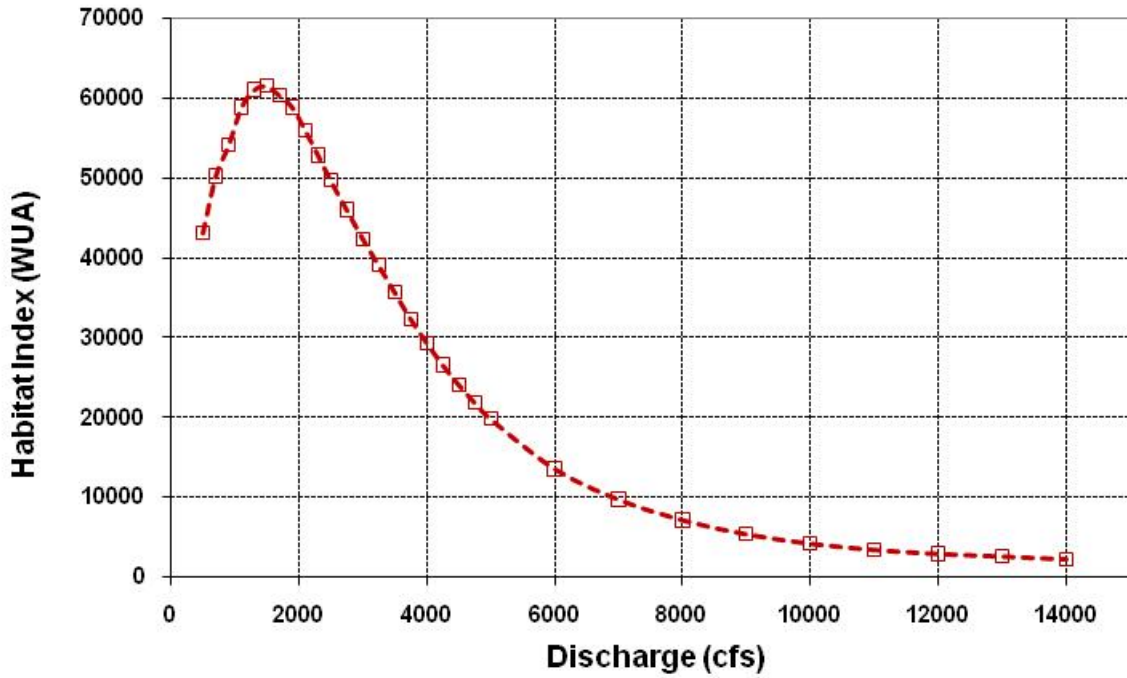
Northern Hogsucker



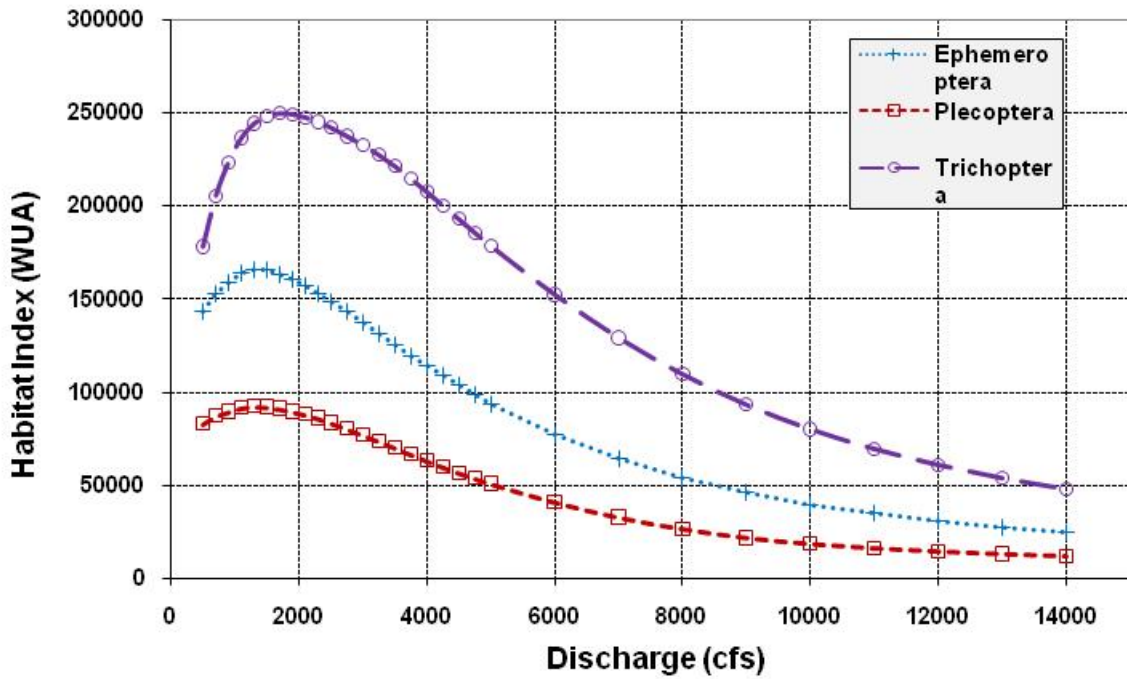
Walleye

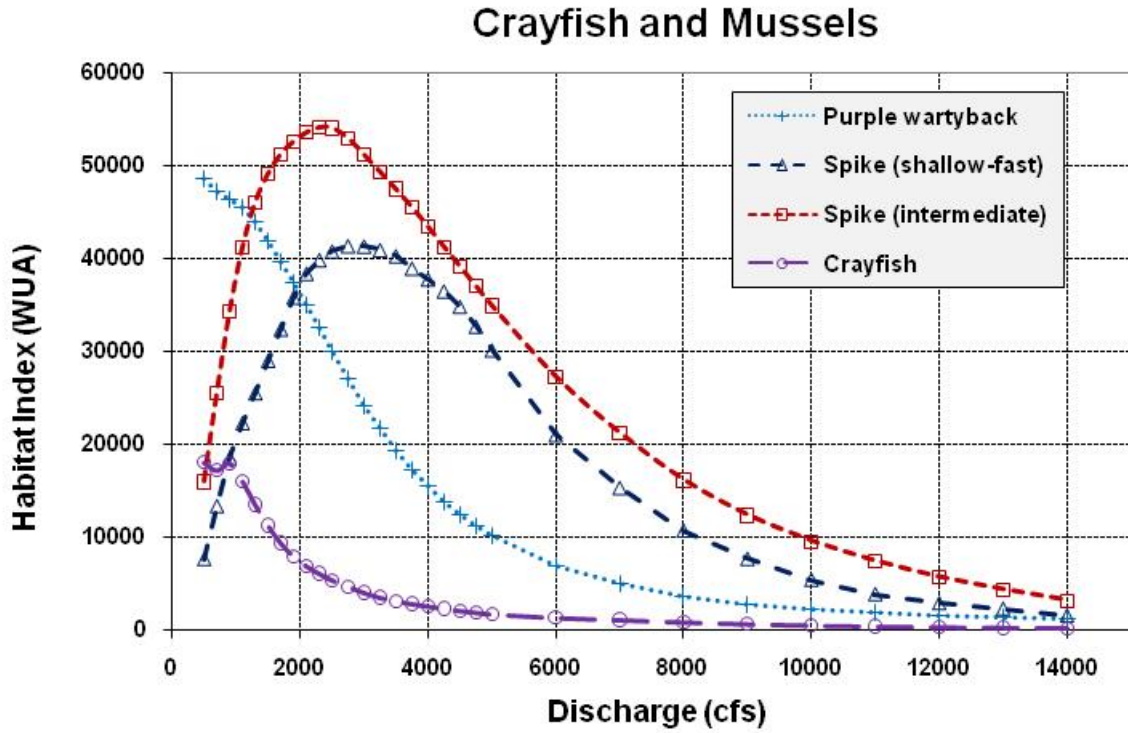


Shallow-Fast Guild



Macroinvertebrates





<u>Discharge</u>	<u>ROCK BASS</u>					<u>SMALLMOUTH BASS</u>			<u>Gross Area</u>
	<u>Fry</u>	<u>Juvenile</u>	<u>Adult</u>	<u>Spawning</u>	<u>Fry</u>	<u>Juvenile</u>	<u>Adult</u>	<u>Spawning</u>	
500	32782.42	69183.20	87779.21	64093.90	148700.58	204009.17	140077.40	80307.17	433694.91
700	25369.12	52299.86	75082.89	48076.08	137300.62	210154.42	161544.05	68533.74	453169.66
900	20923.11	41958.63	65792.99	38053.30	125645.53	209805.39	173221.17	58168.84	478637.30
1100	17494.10	34854.98	58425.03	31526.63	115351.06	207320.46	178682.31	49242.60	491214.12
1300	14773.91	29488.00	52210.45	26139.14	105503.69	201556.19	179903.20	41599.06	500221.89
1500	12710.83	25558.58	46928.21	20956.64	96320.62	194145.96	178292.39	35063.95	507362.72
1700	10940.18	22511.41	42340.75	18529.96	88148.39	185473.37	175064.07	29604.60	511189.07
1900	9533.18	20072.42	38434.58	17393.17	80218.27	176475.95	170801.76	24897.75	514528.77
2100	8389.93	18051.86	35127.49	15995.26	72833.75	167295.95	165765.49	21029.42	517058.98
2300	7477.35	16391.70	32286.09	14327.89	65658.76	158146.23	160124.78	17829.54	519124.80
2500	6729.62	14984.63	29826.11	13008.75	58870.99	149053.35	154186.92	15373.47	521097.89
2750	6029.87	13542.81	27235.83	11754.41	51193.55	138043.87	146623.80	13004.24	523664.28
3000	5543.89	12438.92	25102.65	10795.53	44680.49	127764.47	139117.15	11312.02	525556.43
3250	5218.07	11558.56	23293.09	10209.75	39214.95	118320.27	131496.41	10155.00	527071.88
3500	5023.39	10872.76	21763.68	9800.12	34614.96	109718.58	123903.29	9434.49	528305.28
3750	4898.58	10309.55	20431.59	9492.93	30918.38	101805.39	116370.90	8960.01	529462.62
4000	4817.08	9847.04	19230.27	9150.99	27971.57	94620.68	108933.77	8472.58	530747.56
4250	4764.31	9479.15	18151.73	8918.82	25552.98	87962.62	101799.35	8042.60	531749.51
4500	4713.41	9189.85	17158.61	8765.04	23585.51	81849.33	94960.78	7703.86	532654.89
4750	4682.50	8960.48	16277.95	8732.90	21968.91	76231.60	88525.79	7415.18	533486.20
5000	4693.92	8762.85	15494.34	8809.08	20514.59	71126.41	82340.98	7174.32	534342.37
6000	4849.10	8193.11	13075.41	8798.92	16575.66	55200.68	61504.57	6511.91	537380.38
7000	4939.62	7861.76	11520.75	8152.68	14263.58	44306.40	46812.63	6163.63	539929.42
8000	5002.99	7713.52	10465.77	7994.06	12862.90	37124.71	37098.16	5986.26	542314.30
9000	4989.81	7604.77	9752.53	7949.37	12188.66	32117.03	30536.00	5947.42	544485.66
10000	4963.27	7525.76	9259.97	7775.79	11811.38	28739.65	25987.90	5928.72	546627.14
11000	4915.65	7468.25	8920.29	7484.08	11623.01	26421.24	22649.44	5924.82	548394.03
12000	4893.76	7389.19	8715.78	6965.55	11486.73	24659.54	20228.44	5965.23	549842.14
13000	4872.04	7262.85	8573.55	6458.83	11335.57	23137.96	18506.00	5951.31	551171.75
14000	4847.39	7144.78	8493.14	6134.96	11179.33	21817.99	17441.96	5997.78	433694.91

Discharge	<u>FLATHEAD CATFISH</u>			<u>CHANNEL CATFISH</u>			<u>MUSKELLUNGE</u>		
	Adult (summer)	Adult (winter)	Spawning	Juvenile	Adult	Spawning	Adult (summer)	Adult (winter)	Spawning
500	18482.95	1500.77	17714.86	47756.91	82092.74	75053.16	53802.61	36015.72	15548.91
700	14617.10	1262.82	14339.28	61690.72	91321.80	79181.52	60400.80	39665.11	12476.95
900	12232.45	1076.84	11814.22	75194.24	98882.42	81106.86	64423.11	42323.49	9759.39
1100	10477.06	922.89	9879.03	87652.92	105246.99	81189.99	65470.40	43471.02	7571.78
1300	9067.52	804.32	8402.40	99114.11	110740.21	80150.73	64203.59	43150.24	5973.85
1500	7924.09	706.70	7255.94	109576.83	115589.43	78423.80	62028.53	42184.04	4862.90
1700	6984.58	624.44	6354.77	118707.76	119606.15	76259.34	58885.52	40367.49	4066.09
1900	6259.73	558.57	5637.07	126699.16	122850.17	73540.90	55270.46	38096.16	3511.05
2100	5697.81	508.28	5076.05	133547.74	125453.75	70659.44	51350.22	35534.53	3161.93
2300	5232.09	466.26	4612.93	139176.47	127490.13	67695.64	47400.16	32932.63	2949.18
2500	4833.98	428.56	4216.99	143616.26	128951.92	64675.37	43613.94	30455.12	2852.36
2750	4411.09	389.09	3796.46	147787.40	130117.49	60876.21	39243.58	27610.03	2855.13
3000	4054.38	358.56	3453.19	150692.65	130642.04	57148.38	35137.15	24910.26	2932.07
3250	3742.01	331.89	3165.34	152278.06	130645.28	53573.55	31443.54	22438.19	3027.93
3500	3455.48	312.64	2917.74	152533.58	130256.81	50201.03	28115.87	20175.93	3108.37
3750	3223.28	295.61	2719.32	151833.80	129534.61	47031.20	25210.38	18189.46	3179.19
4000	3022.40	280.22	2553.35	150585.89	128493.90	44091.65	22653.68	16427.15	3228.50
4250	2847.16	266.52	2414.97	148705.62	127214.08	41418.70	20399.71	14860.87	3272.59
4500	2694.44	252.99	2297.02	146287.64	125681.08	38962.67	18424.32	13486.69	3303.17
4750	2570.13	241.86	2205.63	143468.89	123938.80	36765.41	16678.29	12253.01	3326.41
5000	2456.63	232.67	2123.39	140378.29	122082.92	34801.45	15145.16	11162.23	3351.49
6000	2159.13	206.52	1911.83	127150.05	113799.61	28965.94	10901.65	8027.12	3308.78
7000	2059.97	191.81	1840.89	112839.10	105259.94	25496.40	8559.97	6222.90	3190.07
8000	2020.97	186.48	1821.31	99461.50	97221.87	23456.71	7299.42	5248.99	3053.24
9000	2021.94	185.58	1837.04	86901.80	89581.91	22228.83	6546.50	4664.90	2889.14
10000	2043.35	188.13	1867.77	75521.50	82280.41	21271.98	6108.77	4321.37	2748.06
11000	2068.36	191.29	1896.30	65529.30	75550.77	20522.25	5887.91	4098.11	2646.68
12000	2094.06	195.61	1926.10	57590.29	69445.48	19868.66	5857.14	4003.62	2569.05
13000	2110.26	207.21	1952.41	51039.05	64065.08	19361.86	5928.34	3993.22	2510.40
14000	2121.27	221.39	1975.68	45491.90	59329.26	18957.41	6015.02	4007.04	2429.71

<u>Discharge</u>	<u>REDBREAST SUNFISH</u>				<u>BIGMOUTH CHUB</u>			<u>GREENSIDE DARTER</u>		
	<u>Fry</u>	<u>Juvenile</u>	<u>Adult</u>	<u>Spawning</u>	<u>Adult</u>	<u>Spawning</u>	<u>Juvenile</u>	<u>Adult</u>	<u>Spawning</u>	
500	49824.58	205681.77	181123.57	107747.42	71792.96	27348.06	61191.77	38505.96	15083.27	
700	38805.65	201350.89	179626.21	97718.93	85646.12	34223.44	66653.29	46456.28	20009.74	
900	33107.77	195084.44	174286.86	89178.47	95421.04	37109.75	71089.37	52861.51	24229.55	
1100	30792.69	189407.31	168166.41	82673.32	103041.32	38064.73	73519.45	58304.90	28235.39	
1300	26782.74	179195.25	159653.96	76841.15	108335.81	37905.39	73714.14	62446.03	31758.28	
1500	24011.08	168421.33	150529.51	72307.31	111871.16	39880.04	72628.31	65503.63	34817.16	
1700	21777.24	157329.10	141232.82	67557.58	113722.90	40529.03	70498.18	67593.26	37550.68	
1900	19841.41	145810.35	131925.12	62875.41	114057.49	39505.51	67343.73	68743.54	40077.25	
2100	18170.91	134201.00	122585.23	58349.15	113229.86	37010.64	63936.81	69269.58	42405.99	
2300	16843.09	123190.09	113567.27	53793.11	111638.37	34252.21	60369.86	69346.54	44293.75	
2500	15657.04	113162.29	105094.23	49140.60	109528.21	31816.89	56652.67	69051.69	45797.57	
2750	14458.49	101695.32	95033.05	43823.08	106450.57	28833.19	51984.75	68306.39	47063.65	
3000	13473.70	91669.73	85989.83	39287.63	102836.84	26173.56	47463.38	67154.55	47878.49	
3250	12653.06	82901.54	77855.42	35496.12	98756.48	23443.62	43030.53	65593.03	48301.62	
3500	12056.70	75093.23	70602.89	32339.19	94459.39	21017.22	38834.40	63802.06	48400.26	
3750	11519.71	68420.76	64236.88	29807.74	89954.74	18396.81	34991.35	61767.61	48215.72	
4000	11096.37	62625.24	58594.75	27702.34	85614.30	16046.52	31631.91	59753.92	47931.86	
4250	10669.85	57602.48	53640.33	25853.46	81017.80	14052.16	28415.76	57271.35	47213.40	
4500	10347.46	53179.11	49246.44	24220.65	76441.63	12352.83	25442.87	54636.50	46380.68	
4750	10130.30	49322.48	45370.58	22733.73	72106.80	10822.87	22792.25	51979.48	45405.39	
5000	9945.65	45865.52	41834.73	21424.48	67847.57	9655.09	20326.67	49190.22	44151.28	
6000	9271.00	36006.01	31292.90	17741.98	53816.13	6032.31	13578.88	39364.08	39124.92	
7000	8769.72	30728.33	25169.85	15596.38	43004.17	3907.67	9727.06	30724.44	32272.26	
8000	8468.65	27983.27	21612.77	14271.47	34754.10	2542.12	7615.06	23884.06	25835.98	
9000	8180.82	26513.61	19600.28	13694.37	27971.27	1785.65	6159.85	18587.28	20390.57	
10000	8038.56	25694.09	18501.07	13376.99	22736.98	1266.84	5079.04	14677.02	16581.38	
11000	7795.28	25381.67	18008.79	13088.98	18800.48	861.71	4386.56	11625.56	13507.18	
12000	7554.83	24956.08	17785.14	12833.03	15877.97	589.32	3897.25	9291.01	10763.31	
13000	7103.15	24567.91	17772.30	12479.32	13580.68	462.01	3458.06	7595.22	8584.32	
14000	6851.55	24278.67	17798.31	11990.61	11494.93	403.78	2938.10	6054.68	6705.00	

<u>Discharge</u>	<u>LOGPERCH</u>			<u>COMMON SHINER</u>			<u>NORTHERN HOGSUCKER</u>		
	<u>Adult</u>	<u>Spawning</u>	<u>Fry</u>	<u>Juvenile</u>	<u>Adult</u>	<u>Spawning</u>	<u>YoY</u>	<u>Adult</u>	<u>Spawning</u>
500	70960.57	7217.96	23465.14	33445.19	137028.08	48926.14	46820.18	122957.40	25492.03
700	80110.88	9979.17	20223.42	27917.67	139880.20	50190.32	44912.19	170103.11	34019.16
900	88188.14	12901.17	18998.61	25045.80	139159.86	50397.64	44018.54	210292.45	40800.55
1100	95306.93	16024.83	18442.81	23365.02	137190.02	51025.04	43691.44	244937.21	45896.16
1300	101451.81	19361.58	16371.36	20779.19	133197.58	50683.98	40984.52	274936.13	50049.84
1500	106854.13	22771.70	14331.46	18339.26	128486.97	49292.34	38842.56	300540.32	53244.57
1700	111140.02	26155.16	12740.29	16350.04	123493.78	46918.13	36922.53	322505.96	55225.27
1900	114423.58	29403.69	11237.06	14642.15	118045.59	44001.50	34611.92	341187.66	56043.18
2100	116971.62	32442.19	9884.85	13154.69	112262.48	40619.65	31405.15	356755.67	55937.11
2300	118903.28	35258.32	8698.88	11895.28	106146.79	37306.40	27775.82	369364.51	55044.73
2500	120224.43	37832.65	7595.88	10770.84	99839.96	34208.48	23933.20	379301.47	53643.95
2750	121134.54	40721.68	6450.61	9651.46	92057.11	30420.87	19952.95	388608.99	51417.32
3000	121342.91	43295.76	5539.87	8771.17	84768.16	26725.20	16905.53	395025.84	48834.62
3250	120991.47	45441.94	4911.86	8092.42	78522.92	23158.46	14936.95	399057.25	46011.40
3500	120255.88	47188.68	4517.77	7556.74	72902.95	19900.84	13485.25	401257.39	43148.37
3750	119215.81	48578.56	4177.80	7074.24	67631.16	17091.27	12060.00	401796.85	40380.13
4000	117898.65	49695.07	3899.85	6678.44	62772.19	14790.46	10973.75	401288.01	37712.75
4250	116364.52	50321.72	3692.26	6355.13	58129.41	12810.86	10173.39	399609.89	35088.38
4500	114592.95	50604.94	3585.46	6102.37	53764.70	11129.63	9343.62	396957.03	32556.81
4750	112633.00	50573.63	3502.20	5898.46	49695.08	9688.60	8551.07	393543.16	30115.86
5000	110594.39	50177.05	3425.25	5714.19	45882.13	8479.73	7930.50	389283.82	27731.99
6000	101918.88	47203.37	3194.44	5142.04	33957.05	5529.37	6853.71	368207.28	19958.67
7000	93230.83	41757.03	2956.72	4795.57	26030.35	4073.90	6144.60	342360.31	14488.90
8000	85097.73	35593.25	3051.59	4709.80	20670.12	3413.42	6187.75	314999.73	10811.51
9000	77550.47	29657.49	3139.17	4592.44	16963.54	3036.24	6001.45	287211.84	8191.18
10000	70496.80	24767.89	3103.58	4483.30	14533.68	2792.63	5818.35	260361.31	6308.29
11000	64049.08	20540.04	2980.61	4366.35	12849.20	2677.21	5577.99	235216.76	4945.89
12000	58198.75	16942.28	2734.30	4141.00	11639.07	2598.99	5282.83	212405.78	3877.18
13000	53018.13	14040.38	2405.50	3872.96	10748.93	2510.63	4834.21	192017.62	3010.63
14000	48414.19	11513.92	2101.51	3616.79	10006.50	2352.79	4368.81	173172.68	2234.90

<u>Discharge</u>	<u>Fry</u>	<u>WALLEYE</u>		<u>Spawning</u>	<u>SHALLOW-</u>	<u>MACROINVERTEBRATES</u>		
		<u>Juvenile</u>	<u>Adult</u>		<u>FAST GUILD</u>	<u>Ephemeroptera</u>	<u>Plecoptera</u>	<u>Trichoptera</u>
500	38125.48	69977.40	76421.32	10498.60	43182.93	143896.36	82840.96	178182.63
700	20697.07	54661.06	65588.89	13542.72	50278.03	153126.70	86933.40	205332.95
900	11121.91	43057.01	55082.91	17123.10	54144.87	159566.15	89382.61	223554.58
1100	8124.35	34784.20	46146.68	21056.77	58888.04	164543.05	91484.61	236608.90
1300	5723.36	28867.36	38940.15	25235.58	61136.86	166227.29	92160.73	244374.14
1500	5078.33	24585.01	33600.29	29631.21	61594.62	165852.42	91796.81	248304.74
1700	4466.67	21592.87	29537.66	34230.08	60382.24	164018.03	90952.59	249906.35
1900	4248.15	19392.63	26290.75	38845.19	58908.99	161045.96	89451.47	249295.96
2100	4201.39	17718.10	23789.85	43557.24	56030.67	157396.70	87799.93	247635.52
2300	4151.84	16386.73	21783.14	48204.91	52908.13	153423.81	85795.84	245268.16
2500	4325.67	15328.11	20192.35	52698.01	49712.85	149085.49	83361.78	242123.20
2750	4491.62	14293.31	18601.23	58081.05	46053.53	143407.78	80147.99	237549.80
3000	4536.14	13453.63	17329.04	62982.47	42398.80	137604.09	76838.28	232741.69
3250	4623.73	12699.94	16344.24	67383.67	39059.37	131695.04	73478.45	227432.03
3500	4602.95	12059.26	15538.36	71379.31	35662.49	125822.89	69984.44	221394.96
3750	4564.79	11557.00	14901.59	74814.49	32308.76	119986.51	66377.45	214664.70
4000	4526.23	11213.70	14382.58	77378.75	29337.07	114403.73	62928.96	207587.93
4250	4451.81	10940.86	13900.00	79530.12	26558.13	109020.53	59625.19	200249.71
4500	4411.67	10717.78	13471.43	81116.61	24077.38	103827.72	56452.25	192940.03
4750	4393.08	10507.94	13096.47	82000.10	21810.90	98899.82	53500.61	185680.51
5000	4448.74	10293.40	12753.91	82274.38	19780.49	94147.73	50660.59	178542.03
6000	4390.34	9507.07	11643.59	78509.75	13528.92	77637.80	40727.48	152424.31
7000	4534.28	9028.38	10824.23	70619.60	9678.53	64339.35	32540.79	129127.56
8000	4516.58	8655.50	10382.58	62201.30	7084.60	54035.59	26387.92	109587.01
9000	4528.31	8354.70	9748.95	53913.65	5321.94	45947.80	21632.03	93166.71
10000	4614.01	8096.67	9117.97	46791.80	4145.86	39659.65	18415.35	80012.68
11000	4617.49	7858.37	8663.08	40710.97	3366.27	34734.67	16087.28	69425.56
12000	4770.55	7613.60	8396.80	35648.42	2861.77	30770.04	14343.16	60850.01
13000	4889.48	7438.09	8204.66	31323.79	2529.91	27531.80	12970.56	53747.36
14000	5023.02	7317.54	8090.21	27112.09	2177.01	24724.18	11780.28	47857.05

<u>Discharge</u>	<u>PURPLE WARTYBACK</u>	<u>SPIKE MUSSEL SHALLOW- SLOW</u>	<u>SPIKE MUSSEL INTERMEDIATE</u>	<u>CRAYFISH</u>
500	48567.18	7630.09	16004.22	17995.62
700	47246.81	13341.32	25473.93	17150.53
900	46353.03	18536.55	34233.95	17897.63
1100	45420.67	22296.01	41105.62	16013.22
1300	43850.92	25506.58	45969.72	13499.64
1500	41922.45	29009.44	49015.52	11280.05
1700	39663.54	32402.51	51148.39	9405.14
1900	37396.04	35835.47	52486.66	7969.88
2100	34984.44	38399.99	53460.34	6931.45
2300	32489.54	39867.85	53994.08	6136.34
2500	30053.92	40806.13	53965.22	5437.47
2750	27056.87	41379.40	52861.82	4753.65
3000	24223.04	41335.00	51096.47	4087.33
3250	21686.61	40948.28	49257.56	3567.41
3500	19352.45	40297.84	47389.81	3185.83
3750	17309.88	38959.65	45434.54	2890.55
4000	15526.42	37764.93	43375.19	2631.66
4250	13911.44	36488.99	41198.18	2378.15
4500	12480.95	34837.47	39085.18	2154.28
4750	11268.36	32700.50	36985.26	1965.61
5000	10164.79	30122.03	34884.76	1793.01
6000	7009.33	20981.94	27250.16	1408.26
7000	4973.97	15287.64	21228.61	1170.48
8000	3702.19	10697.19	16174.29	933.28
9000	2849.43	7660.02	12414.01	733.80
10000	2295.61	5394.06	9608.40	589.66
11000	1915.61	3843.90	7465.63	485.95
12000	1647.75	2880.66	5733.78	407.42
13000	1454.99	2277.67	4403.71	346.51
14000	1272.45	1535.22	3232.49	296.80