

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Hwy 81 West, Kingsbury County
MBS-Lake-233-800
2023

Lake Information

Name: Hwy 81 West
County: Kingsbury
Surface Area: 1,951 Acres

Surveys and Investigations

Survey methods used by gear type, date, and effort.

Gear	Date	Effort
AFS std gill net	Aug 01, 2023	10 net-nights
AFS std gill net	Aug 02, 2023	10 net-nights
frame net (std 3/4 in)	Aug 01, 2023	5 net-nights
frame net (std 3/4 in)	Aug 02, 2023	5 net-nights

Common Fish Species Present

Walleye

Muskellunge

Yellow Perch

Bluegill

White Bass

Northern Pike

Smallmouth Bass

Black Crappie

Pumpkinseed

Sunfish Hybrid

Terminology

Catch per unit effort (**CPUE**) refers to the relative abundance of a species. It is defined as the number of fish captured per unit of effort (i.e., number of fish captured per net-night or number of fish captured per hour electrofishing). In this report CPUE is typically given for only stock-length fish (see length categories table for stock lengths).

A statewide effort to help make netting efforts comparable to all waters sampled across the state, occurred in 2017, with a switch to American Fisheries Society gill nets. Past gill netting efforts were completed with different style/types of nets and are not comparable side by side.

- **AFS std gill net** – 80 ft experimental gill net containing eight panels (10 ft each) of varying monofilament meshes of 0.75, 1.00, 1.25, 1.50, 1.75, 2.00, 2.25 and 2.50 inches.
- **std experimental gill net for non-Missouri River waters** - 150 ft experimental gill net containing six panels (25 ft each) of varying monofilament meshes of 0.5, 0.75, 1.00, 1.25, 1.50 and 2.00 inches.
- **std experimental gill net for Missouri River reservoirs** – 300 ft experimental gill net containing six panels (50 ft each) of varying multifilament meshes of 0.5, 0.75, 1.00, 1.25, 1.50 and 2.00 inches.

$$CPUE = \frac{\text{number of fish}}{\text{effort}}$$

Population size structure is quantified using the indices proportional size distribution of quality-length fish (**PSD**) and proportional size distribution of preferred-length fish (**PSD-P**). These indices indicate the proportion of stock-length fish that are equal to or greater than a given length. Minimum lengths for stock, quality and preferred length fish are given in the length categories table.

$$PSD = \left(\frac{\text{number of fish} \geq \text{quality length}}{\text{number of fish} \geq \text{stock length}} \right) \times 100$$

$$PSD - P = \left(\frac{\text{number of fish} \geq \text{preferred length}}{\text{number of fish} \geq \text{stock length}} \right) \times 100$$

Relative weight (**Wr**) is used to quantify fish plumpness. Relative weight is the ratio of what a fish weighs (*W*) compared to a length-specific standard weight (*Ws*) multiplied by 100. Relative weight values of 95-105 are commonly cited as optimum values, but values in the 80s are common during summer sampling in South Dakota.

$$Wr = \left(\frac{W}{W_s} \right) \times 100$$

Confidence intervals (CI) are provided for many of the estimates calculated in this report. The confidence interval provides a range in which the true mean is expected to fall. For example, with an 80% CI we are 80% confident that the interval contains the true value.

Length categories include stock (S), quality (Q), preferred (P), memorable (M) and trophy (T). Length categories for most species have been defined based on a percentage of the world record length for that species. Some species mentioned in this report do not have defined length categories. Length categories for species used in this report are provided in the following table. Measurements are the minimum total length for each category and are reported in inches (in) and centimeters (cm).

Species Name	Stock		Quality		Preferred		Memorable		Trophy	
	(in)	(cm)	(in)	(cm)	(in)	(cm)	(in)	(cm)	(in)	(cm)
Black Bullhead	6	15	9	23	12	30	15	38	18	46
Black Crappie	5	13	8	20	10	25	12	30	15	38
Bluegill	3	8	6	15	8	20	10	25	12	30
Brown Trout	8	20	12	30	16	40	20	50	18	46
Channel Catfish	11	28	16	41	24	61	28	71	36	91
Freshwater Drum	8	20	12	30	15	38	20	51	25	63
Lake Trout	12	30	20	50	26	65	31	80	39	100
Largemouth Bass	8	20	12	30	15	38	20	51	25	63
Muskellunge	20	51	30	76	38	97	42	107	50	127
Northern Pike	14	35	21	53	28	71	34	86	44	112
Pumpkinseed	3	8	6	15	8	20	10	25	12	30
Rainbow Trout	10	25	16	40	20	50	26	65	31	80
Rudd	6	15	10	25	12	30	15	38	19	48
Sauger	8	20	12	30	15	38	20	51	25	63
Smallmouth Bass	7	18	11	28	14	35	17	43	20	51
Walleye	10	25	15	38	20	51	25	63	30	76
White Bass	6	15	9	23	12	30	15	38	18	46
White Crappie	5	13	8	20	10	25	12	30	15	38
Yellow Bullhead	4	10	7	18	9	23	11	28	14	36
Yellow Perch	5	13	8	20	10	25	12	30	15	38

Catch Summary of Stock Length Fish

Catch per unit effort (CPUE), proportional size distribution (PSD), proportional size distribution of preferred length fish (PSD-P), and relative weight (Wr) for species sampled in survey with 80% confidence interval (CI-80).

* **Methods/Species that ignore stock length**

Gear	Species	Sample Size (n)	Abundance		Stock Density Indices			Condition		
			CPUE	CI-80	PSD	CI-80	PSD-P	CI-80	Wr	CI-80
AFS std gill net	Black Crappie	1	0.1	0.1	0		0		138	
	Bluegill	3	0.2	0.2	0		0		128	18
	Common Carp	29	0.2	0.1	100		75			
	Northern Pike	22	1.1	0.3	95		23	15	92	10
	Smallmouth Bass	13	0.7	0.6	77		54	23	113	3
	Walleye	81	3.5	1.1	99		43	9	85	1
	White Bass	74	3.7	1.6	97		89	6	91	1
frame net (std 3/4 in)	Yellow Perch	168	8.4	2.6	35	5	1		108	1
	Black Crappie	4	0.4	0.3	0		0		99	15
	Bluegill	144	14.4	7.6	1		0		162	4
	Common Carp	16	0.1	0.1	100		100			
	Muskellunge	2	0.2	0.2	100		100			
	Northern Pike	33	3.2	0.8	94		34	13	81	2
	Pumpkinseed	3	0.3	0.3	0		0		172	55
	Smallmouth Bass	26	1.9	0.7	47	18	47	18	104	3
	Sunfish Hybrid	2	0.2	0.2	0		0		159	
	Walleye	12	1.2	0.7	92		67		80	3
	White Bass	5	0.5	0.4	100		100		84	3
	Yellow Bullhead	1	0.1	0.1	100		100		112	
	Yellow Perch	18	1.8	1.0	39	19	0		91	7

10-Year Catch Per Unit Effort by Gear and Species

Catch per unit effort (CPUE) and average (Avg) of species across 10 years using different gear types.

* Methods/Species that ignore stock length

Gear	Species	CPUE										Avg
		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	
AFS std gill net	Black Bullhead				6.9	2.5	0.0	0.2	0.0	0.0	0.0	1.37
	Black Crappie				0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.01
	Bluegill				0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.03
	Common Carp				0.3	0.2	2.6	0.9	0.4	0.1	0.2	0.67
	Northern Pike				0.0	0.0	0.1	0.4	0.5	0.4	1.1	0.36
	Smallmouth Bass				0.9	1.2	1.8	0.8	1.1	0.0	0.7	0.93
	Walleye				6.0	4.9	2.3	3.0	2.8	2.6	3.5	3.59
	White Bass				3.7	2.4	1.2	2.8	7.4	5.2	3.7	3.77
	Yellow Bullhead				0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.06
	Yellow Perch				14.4	17.7	2.1	4.9	13.4	10.7	8.4	10.23
frame net (std 3/4 in)	Black Bullhead	39.8	100.4	10.9		9.7	0.3	0.4	1.1	0.0	0.0	18.07
	Black Crappie	0.0	0.0	0.0		0.0	0.0	0.2	2.0	0.1	0.4	0.30
	Bluegill	0.0	0.0	0.0		0.2	3.2	0.5	11.8	3.9	14.4	3.78
	Common Carp	3.5	0.4	0.2		6.1	2.0	5.9	2.8	0.3	0.1	2.37
	Green Sunfish	0.0	0.2	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.02
	Largemouth Bass	0.0	0.1	0.0		0.1	0.0	0.0	0.0	0.0	0.0	0.02
	Muskellunge	0.0	0.0	0.0		0.0	0.0	0.0	0.2	0.0	0.2	0.04
	Northern Pike	0.1	0.0	0.5		0.1	0.0	1.0	2.9	1.1	3.2	0.99
	Orangespotted Sunfish	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.00
	Pumpkinseed	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.3	0.03
	Smallmouth Bass	1.0	0.4	1.0		2.2	0.7	4.6	2.6	0.9	1.9	1.70
	Sunfish Hybrid	0.1	0.0	0.0		0.0	0.0	0.0	0.0	0.1	0.2	0.04
	Walleye	0.6	0.7	1.6		2.2	0.7	4.7	0.9	0.3	1.2	1.43
	White Bass	0.1	0.1	5.8		2.1	0.3	13.7	8.8	0.3	0.5	3.52
	Yellow Bullhead	6.7	16.7	2.3		8.1	0.1	1.1	2.1	0.5	0.1	4.19
Yellow Perch	2.8	0.6	0.1		2.5	0.1	2.8	3.2	3.2	1.8	1.90	
std exp gill net	Black Bullhead	89.6	68.0	16.5								58.03
	Common Carp	0.4	0.3	0.3								0.33
	Largemouth Bass	0.0	0.0	0.0								0.00
	Muskellunge	0.0	0.0	0.0								0.00
	Northern Pike	0.4	0.7	0.3								0.47
	Smallmouth Bass	2.0	2.7	1.8								2.17
	Walleye	5.2	30.3	7.3								14.27
White Bass	0.6	10.3	9.0								6.63	

CPUE

Gear	Species	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Avg
std exp gill net	Yellow Bullhead	0.0	0.7	0.3								0.33
	Yellow Perch	15.8	50.3	75.8								47.30

10-Year Size Structure and Condition Statistics by Gear and Species

Species proportional size distribution (PSD), proportional size distribution of preferred length fish (PSD-P), and relative weight (Wr) collected by different gear types across 10 years.

Gear	Species	Index	Year											
			2014	2015	2016	2017	2018	2019	2020	2021	2022	2023		
AFS std gill net	Black Crappie	PSD												0
		PSD-P												0
		Wr												138
	Bluegill	PSD												0
		PSD-P												0
		Wr												128
	Northern Pike	PSD								100	0	20	100	95
		PSD-P								0	0	0	25	23
		Wr								92	84	91	79	92
	Smallmouth Bass	PSD					38	50	22	13	36			77
		PSD-P					38	25	22	0	9			54
		Wr					109	106	101	92	102			113
	Walleye	PSD					74	84	78	23	79	96	99	
		PSD-P					48	61	61	20	43	38	43	
		Wr					91	86	82	80	83	86	85	
	White Bass	PSD					100	100	100	100	92	100	97	
		PSD-P					100	100	100	68	70	100	89	
		Wr					97	93	89	88	94	95	91	
Yellow Perch	PSD					61	7	10	78	22	1	35		
	PSD-P					19	2	0	24	13	0	1		
	Wr					101	96	102	103	100	107	108		
frame net (std 3/4 in)	Black Crappie	PSD								50	90	100	0	
		PSD-P								0	45	100	0	
		Wr								134	108	107	99	
	Bluegill	PSD						0	3	80	3	0	1	
		PSD-P						0	0	0	1	0	0	
		Wr						109	123	192	138	165	162	
	Muskellunge	PSD									100		100	
		PSD-P									100		100	
	Northern Pike	PSD	100		100		100	0	40	83	91	94		
		PSD-P	0		80		100	0	20	7	9	34		
		Wr	81		98		80		87	84	81	81		
	Smallmouth Bass	PSD	90	100	70		77	86	78	73	67	47		

Gear	Species	Index	Year									
			2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
frame net (std 3/4 in)	Smallmouth Bass	PSD-P	70	100	50		68	57	52	58	67	47
		Wr	109	106	87		104	95	94	99	100	104
	Walleye	PSD	67	100	81		86	100	40	100	67	92
		PSD-P	17	71	75		68	43	34	67	33	67
		Wr	92	89	75		83	89	82	80	84	80
		White Bass	PSD	100	100	100		100	100	100	100	100
	PSD-P		100	0	86		95	100	91	99	100	100
	Wr		100	97	79		93	95	85	86	91	84
	Yellow Perch	PSD	11	83	0		8	0	100	81	0	39
		PSD-P	7	0	0		8	0	39	69	0	0
		Wr	105	96	83		95	106	111	97	115	91
	std exp gill net	Northern Pike	PSD	100	100	100						
PSD-P			100	50	100							
Wr			87	93	81							
Smallmouth Bass		PSD	0	63	57							
		PSD-P	0	25	57							
		Wr	110	109	114							
Walleye		PSD	77	44	76							
		PSD-P	31	29	31							
		Wr	90	92	88							
White Bass		PSD	100	97	100							
		PSD-P	67	81	72							
		Wr	91	100	94							
Yellow Perch		PSD	42	90	13							
		PSD-P	24	14	10							
		Wr	95	98	98							

Length at Capture

Mean length at capture by age across years sampled, sample size (N).

Species: Walleye

Mean Length (expanded sample number) at capture by age											
Year	N	1	2	3	4	5	6	7	8	9	10+
2023	81	235 (12)	263 (1)	421 (3)	449 (11)	465 (30)	553 (3)	556 (1)	564 (1)	635 (2)	645 (18)
2022	27	205 (1)		408 (6)	445 (10)		492 (1)		597 (1)	615 (2)	600 (6)
2021	35	212 (7)	403 (4)	400 (12)	463 (1)		524 (1)	524 (1)	538 (3)		612 (6)
2020	33	227 (3)	293 (23)		508 (2)						636 (5)
2019	35	216 (15)	338 (2)	417 (1)	445 (2)		516 (3)			589 (1)	634 (11)
2018	50	268 (4)	373 (6)	442 (7)	455 (1)	518 (2)			549 (2)	613 (18)	630 (10)
2017	54	280 (7)	382 (14)	443 (3)	462 (4)		511 (2)	616 (5)	613 (14)		650 (5)
2016	32	258 (10)	389 (3)	436 (10)		546 (1)	565 (1)	553 (5)		614 (1)	691 (1)
2015	94	260 (27)	361 (36)		471 (1)	536 (5)	546 (9)	603 (2)	542 (3)		622 (10)
2014	48	238 (27)	303 (1)	447 (3)	474 (4)	520 (11)	501 (1)		590 (1)		

Species: Yellow Perch

Mean Length (expanded sample number) at capture by age											
Year	N	1	2	3	4	5	6	7	8	9	10+
2023	168	162 (97)	217 (70)		307 (1)						
2021	131	163 (105)	239 (9)	272 (15)	315 (1)	333 (1)					
2015	151	160 (13)	235 (124)	264 (7)	276 (8)						
2014	79	166 (46)	227 (2)	257 (31)							

Fish Condition

Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

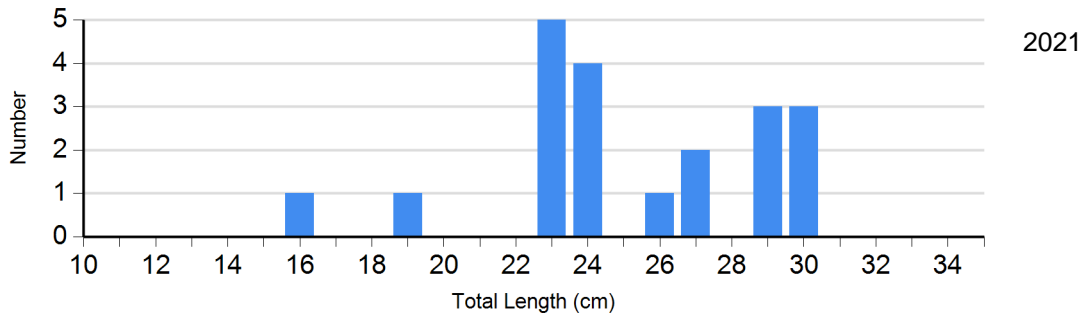
Species	Year	Length Groups							
		S-Q		Q-P		P-M		M	
		N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Black Crappie Frame Net	2020	1	151	1	117	0		0	
	2021	2	106 (1.6)	9	112 (1.8)	6	108 (2.8)	3	98 (3.2)
	2022	0		0		0		1	107
	2023	4	99 (11.9)	0		0		0	
Bluegill Frame Net	2019	31	123 (6.8)	1	125	0		0	
	2020	1	324	4	159 (3.4)	0		0	
	2021	114	139 (1.9)	3	124 (9.2)	1	123	0	
	2022	39	165 (4.6)	0		0		0	
	2023	142	162 (3.1)	2	164	0		0	
Northern Pike Gill Net	2019	0		1	92	0		0	
	2020	4	84 (4.2)	0		0		0	
	2021	4	92 (3.2)	1	86	0		0	
	2022	0		3	83 (4.3)	1	70	0	
	2023	1	249	16	86 (1.7)	4	78 (5.7)	1	86
Walleye Gill Net	2019	5	84 (2.5)	4	86 (3.4)	8	83 (2.3)	6	76 (3.1)
	2020	23	79 (1.1)	1	87	2	82 (3.2)	4	80 (3.1)
	2021	6	90 (3.1)	10	89 (1.6)	10	75 (2.4)	2	74 (0.5)
	2022	1	83	15	88 (1.4)	7	85 (4.8)	3	75 (7.2)
	2023	1	99	38	86 (0.7)	18	86 (2.9)	12	81 (1.7)
White Bass Gill Net	2019	0		0		1	94	11	89 (1.5)
	2020	0		9	95 (1.8)	3	91 (1.8)	16	83 (0.8)
	2021	6	98 (4.1)	16	94 (1.9)	34	96 (0.7)	18	86 (0.9)
	2022	0		0		38	97 (1.3)	14	90 (1.4)

Species	Year	Length Groups							
		S-Q		Q-P		P-M		M	
		N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
White Bass Gill Net	2023	2		6	91	27	92 (1.3)	39	91 (1.2)
Yellow Perch Gill Net	2019	19	104 (1.3)	2	88 (0.7)	0		0	
	2020	11	100 (3.6)	26	104 (1.1)	12	104 (2.0)	0	
	2021	105	100 (0.7)	12	103 (3.5)	15	98 (1.9)	2	91 (0.1)
	2022	106	107 (0.8)	1		0		0	
	2023	110	114 (1.2)	57	101 (0.8)	0		1	107

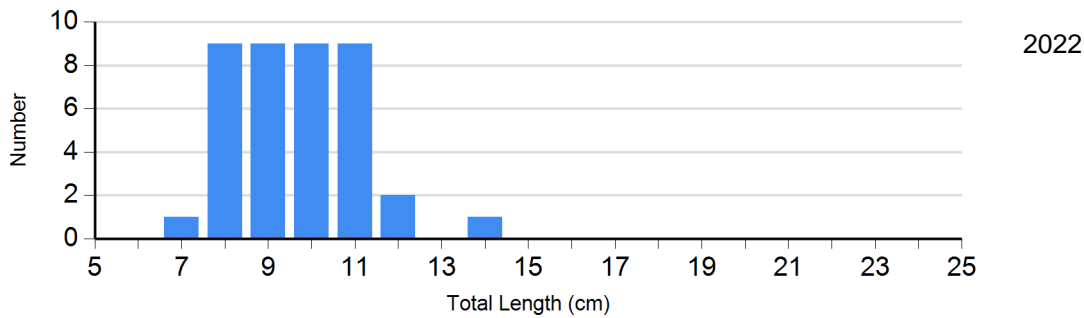
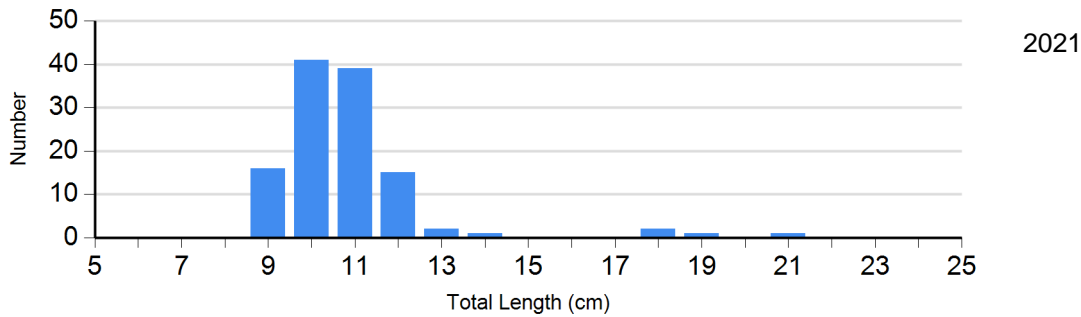
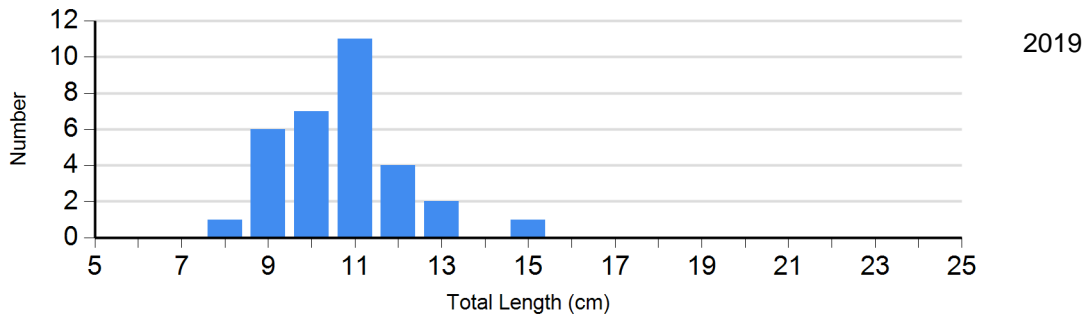
Length Frequency Distribution

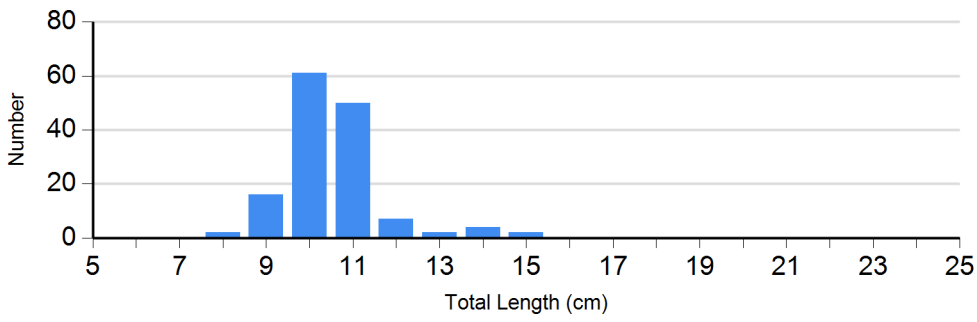
Length frequency histogram of species sampled by year.

Species: Black Crappie
Gear: frame net (std 3/4 in)



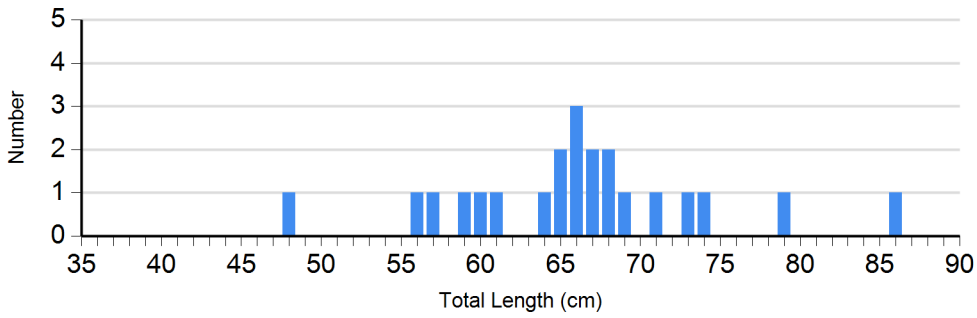
Species: Bluegill
Gear: frame net (std 3/4 in)





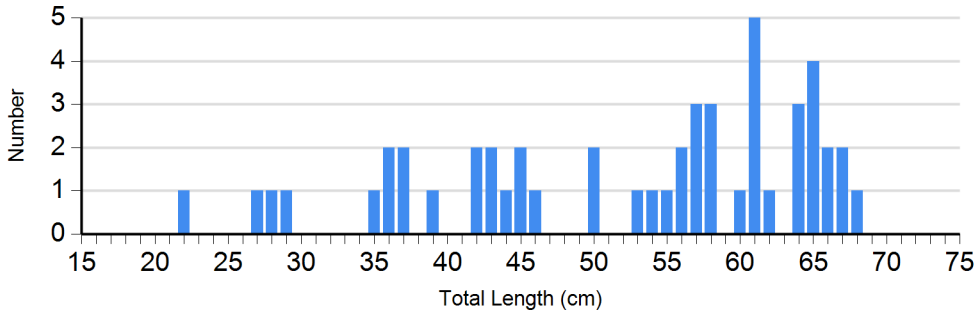
2023

Species: Northern Pike
Gear: AFS std gill net

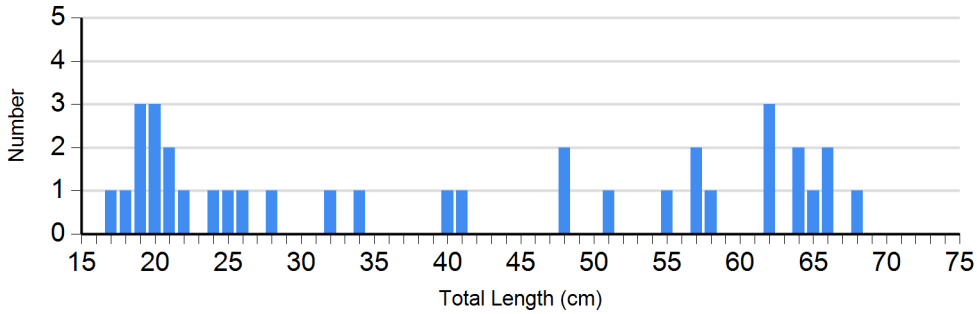


2023

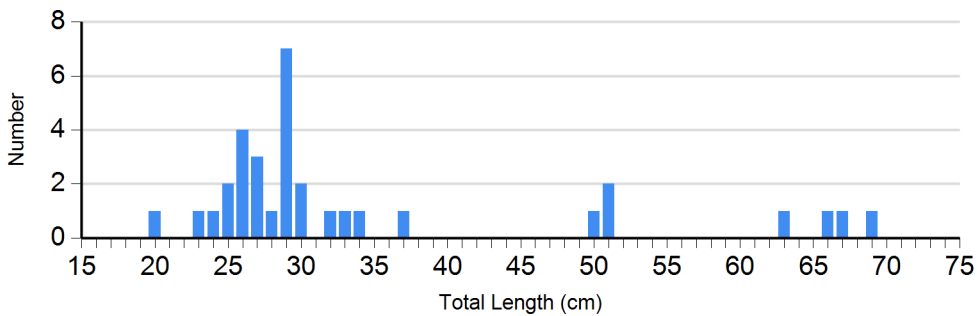
Species: Walleye
Gear: AFS std gill net



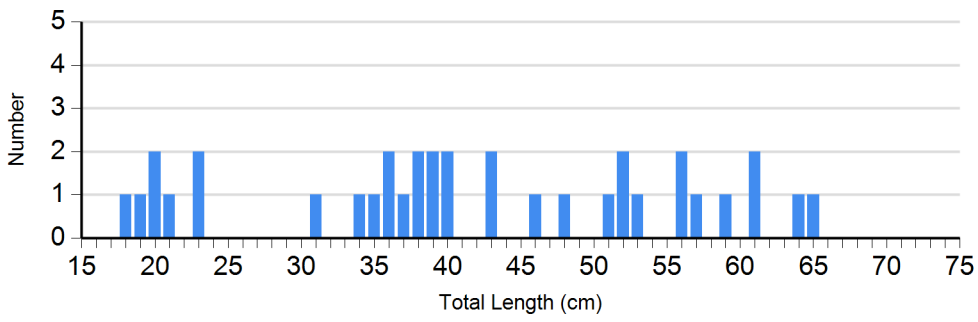
2018



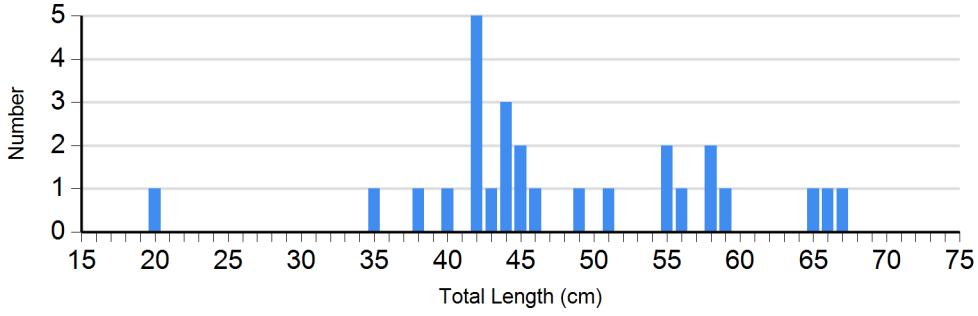
2019



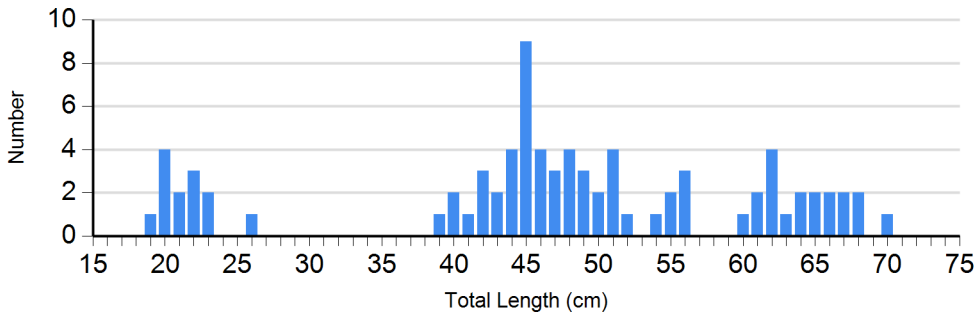
2020



2021

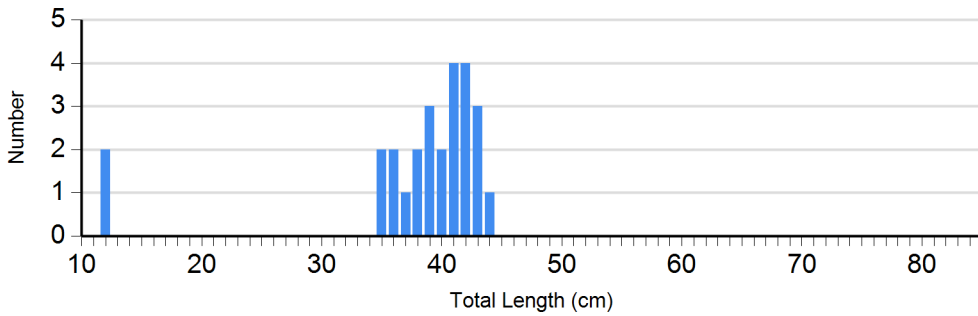


2022

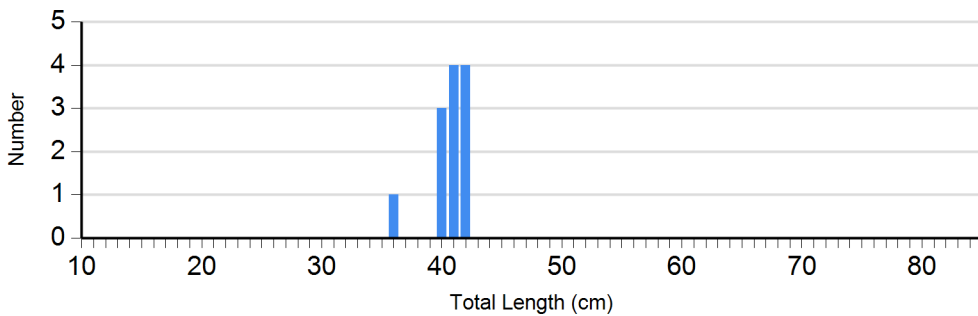


2023

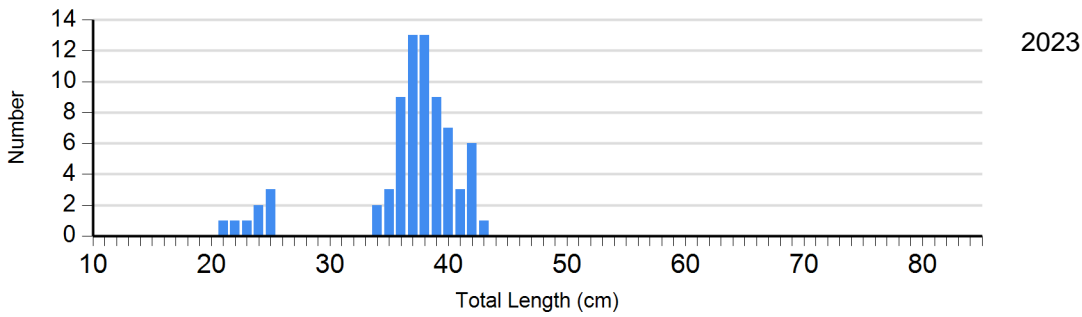
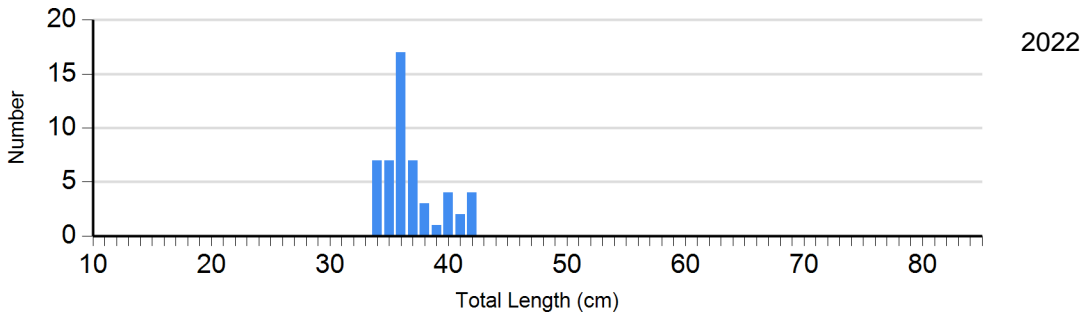
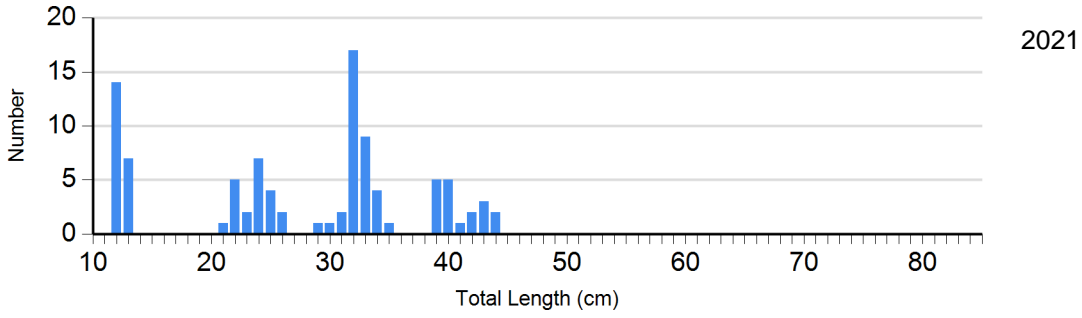
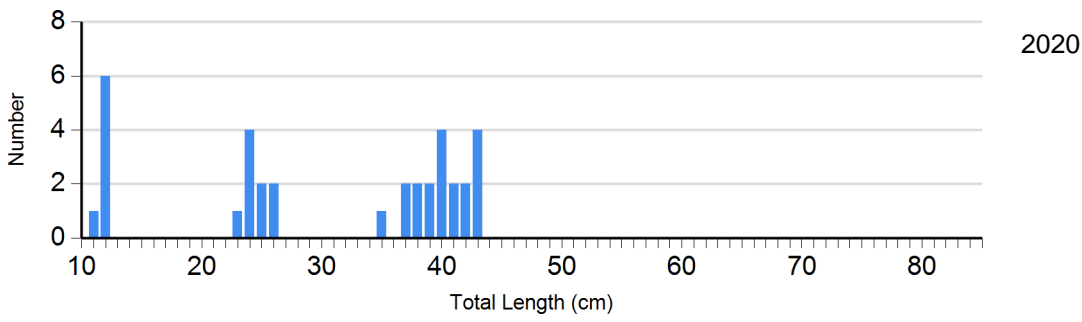
Species: White Bass
Gear: AFS std gill net



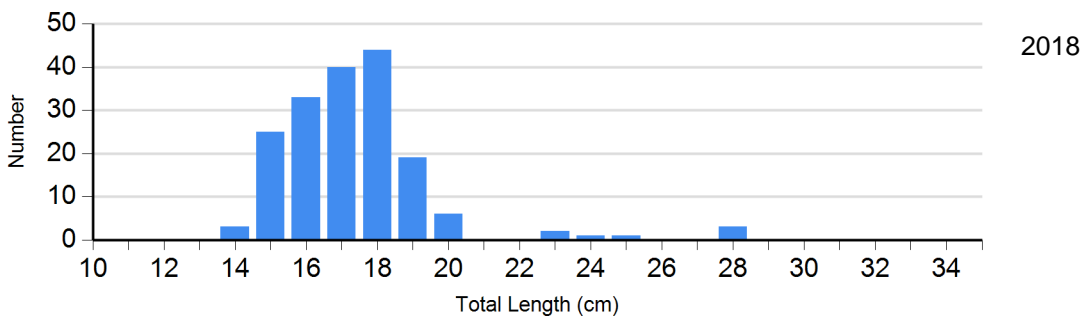
2018

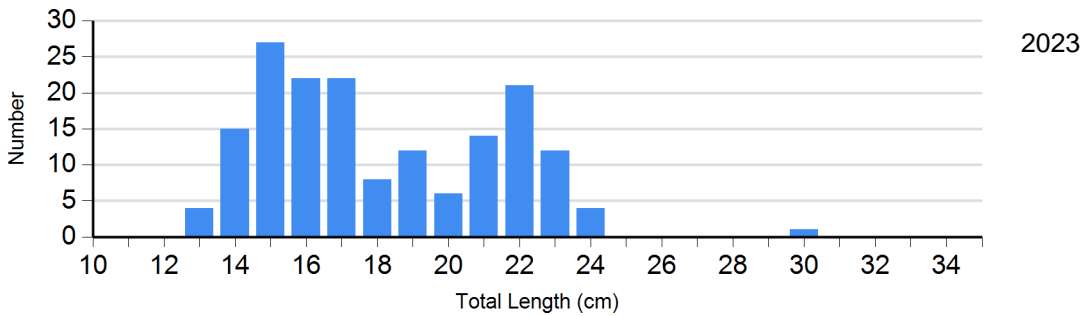
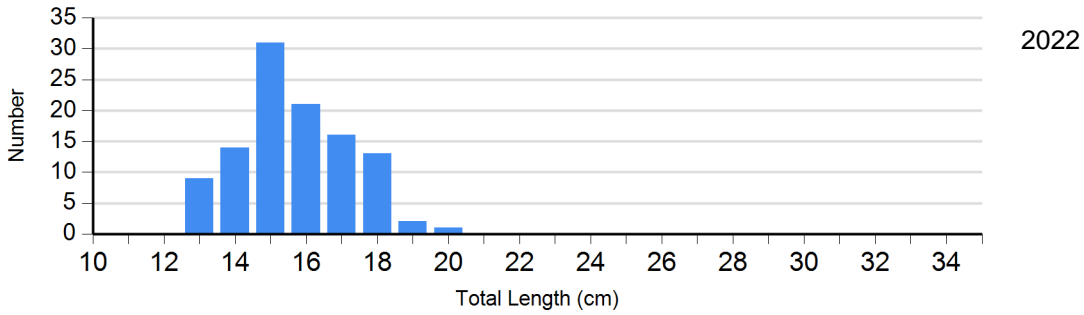
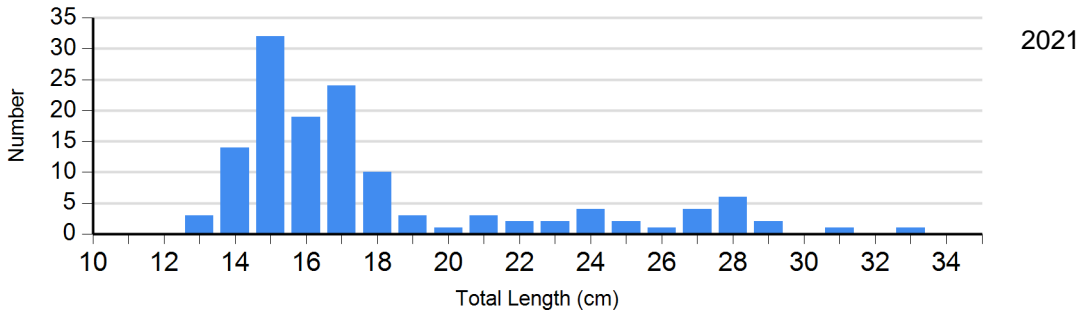
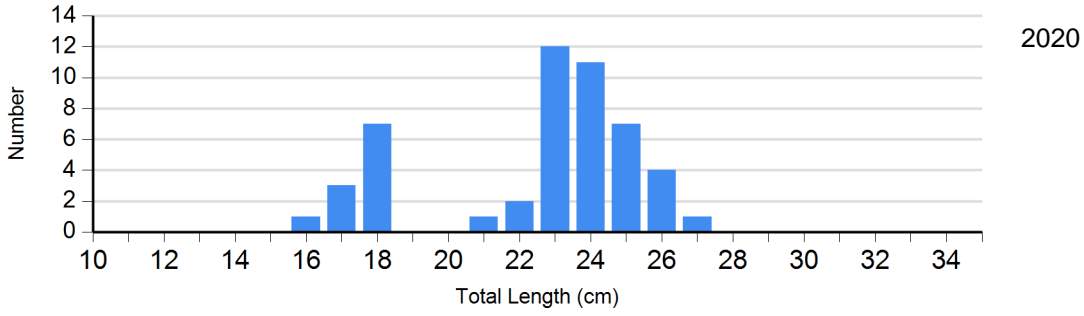
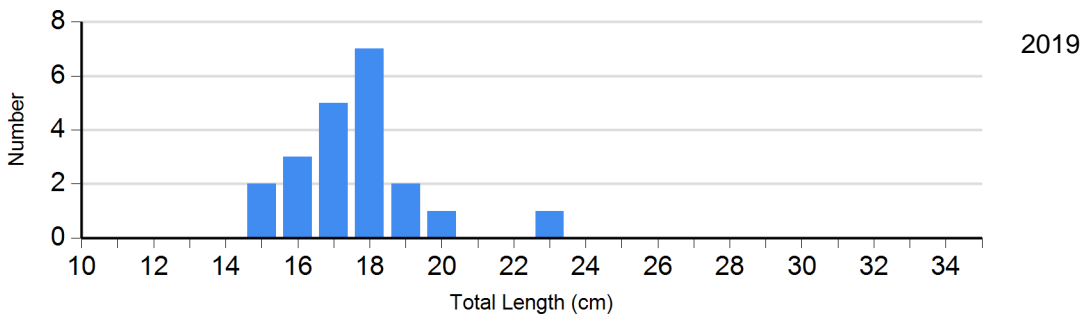


2019



Species: Yellow Perch
 Gear: AFS std gill net

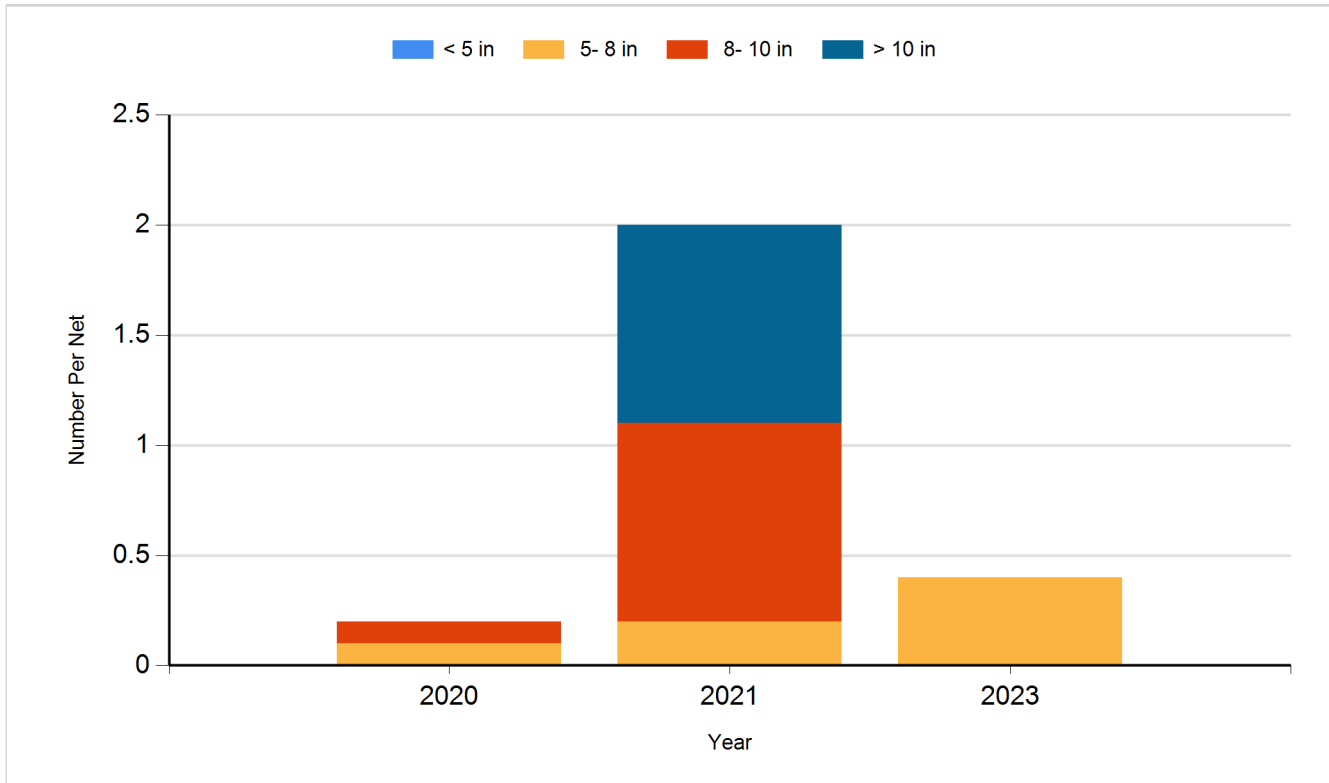




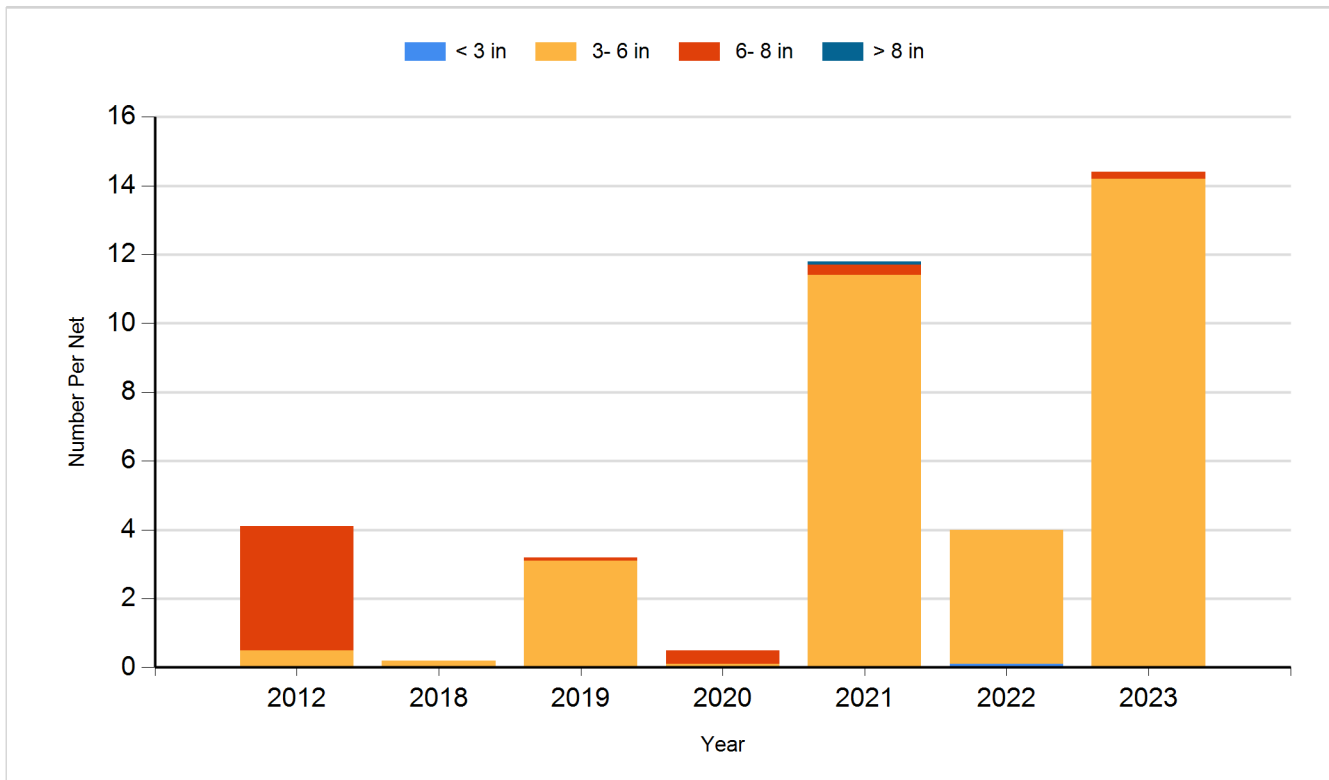
Historic Fish Sizes and Relative Abundance

Size distribution per net by color for species sampled by year.

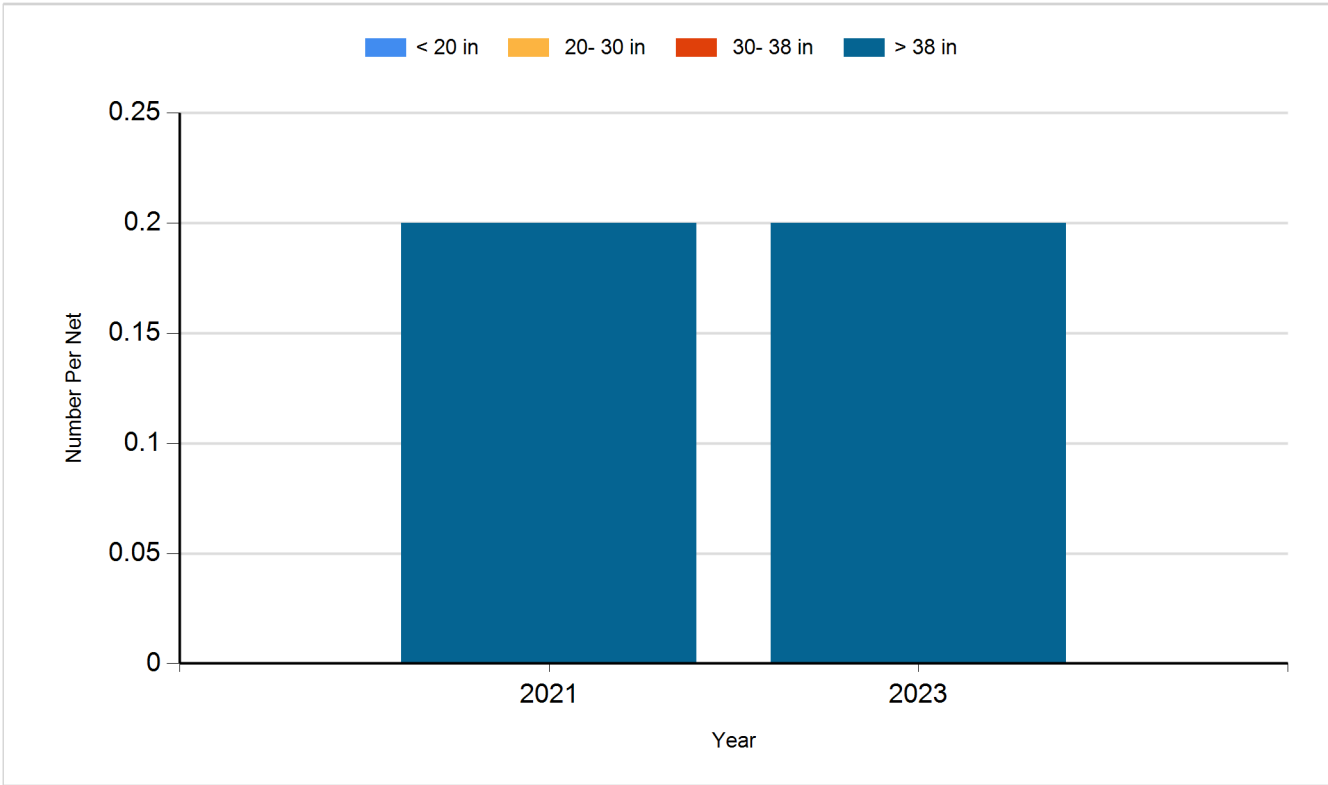
Species: Black Crappie
Gear: frame net (std 3/4 in)



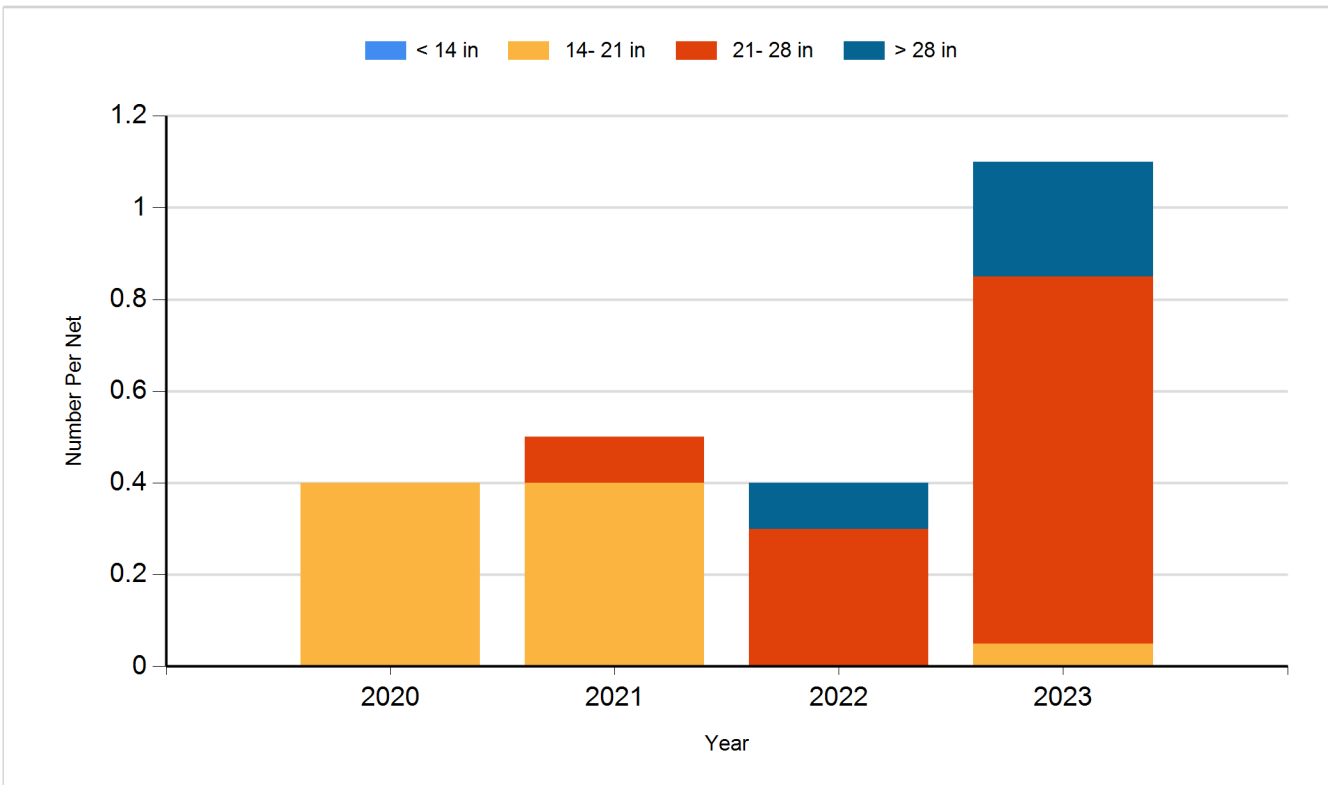
Species: Bluegill
Gear: frame net (std 3/4 in)



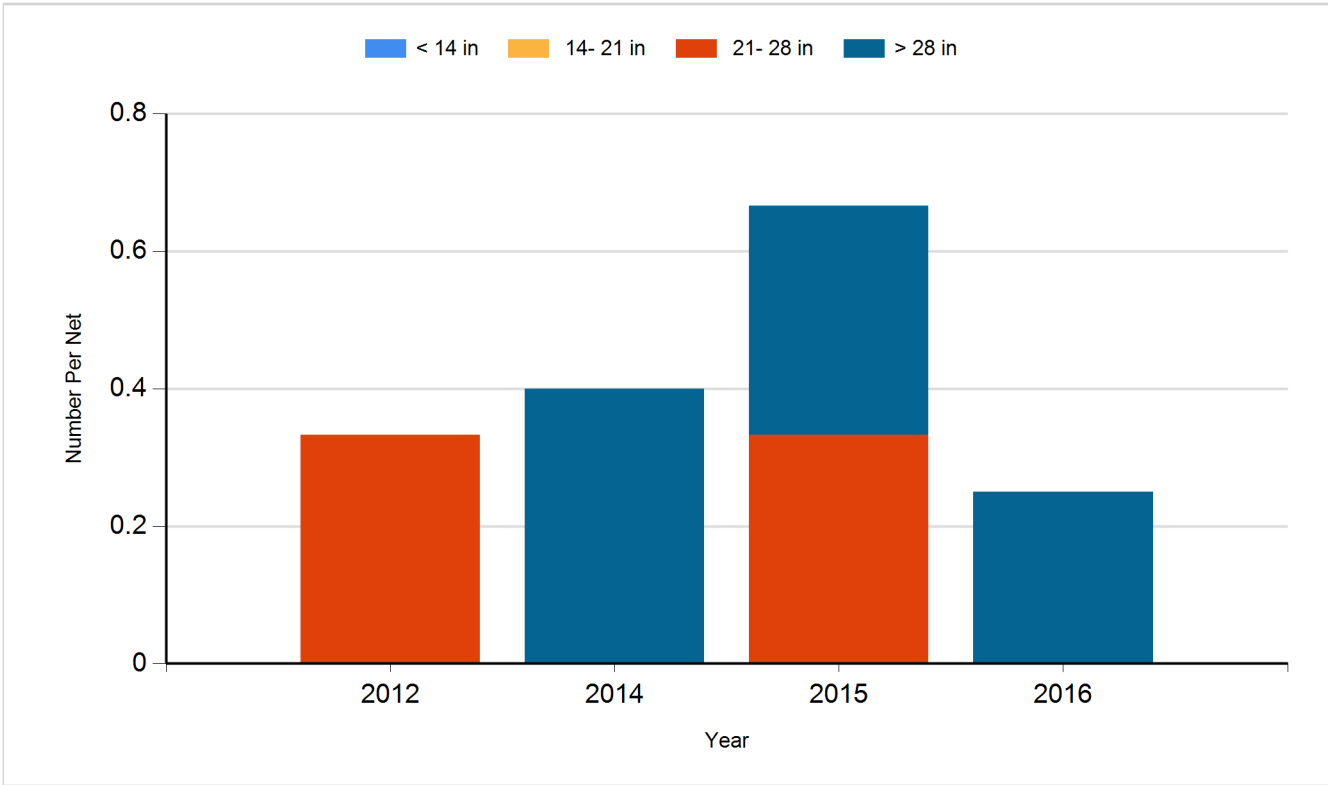
Species: Muskellunge
Gear: frame net (std 3/4 in)



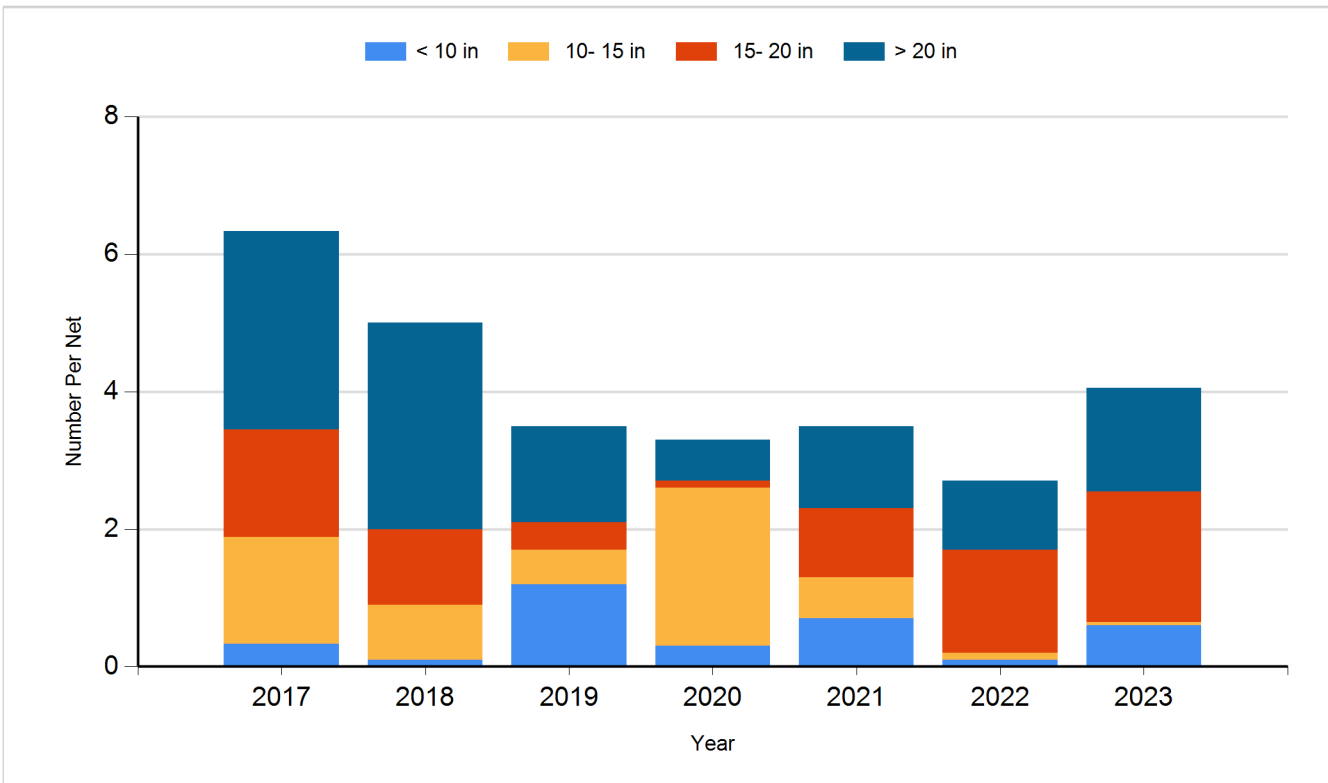
Species: Northern Pike
Gear: AFS std gill net



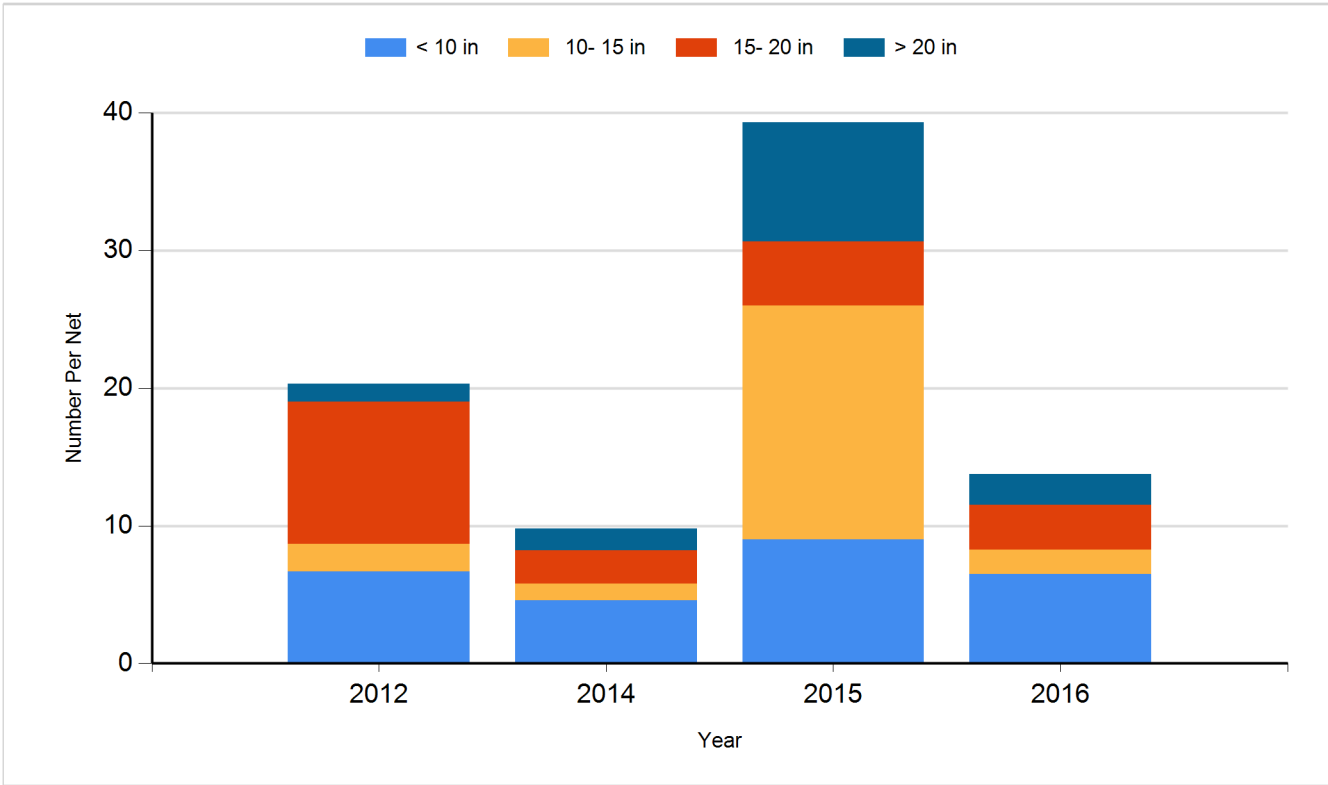
Species: Northern Pike
Gear: std exp gill net



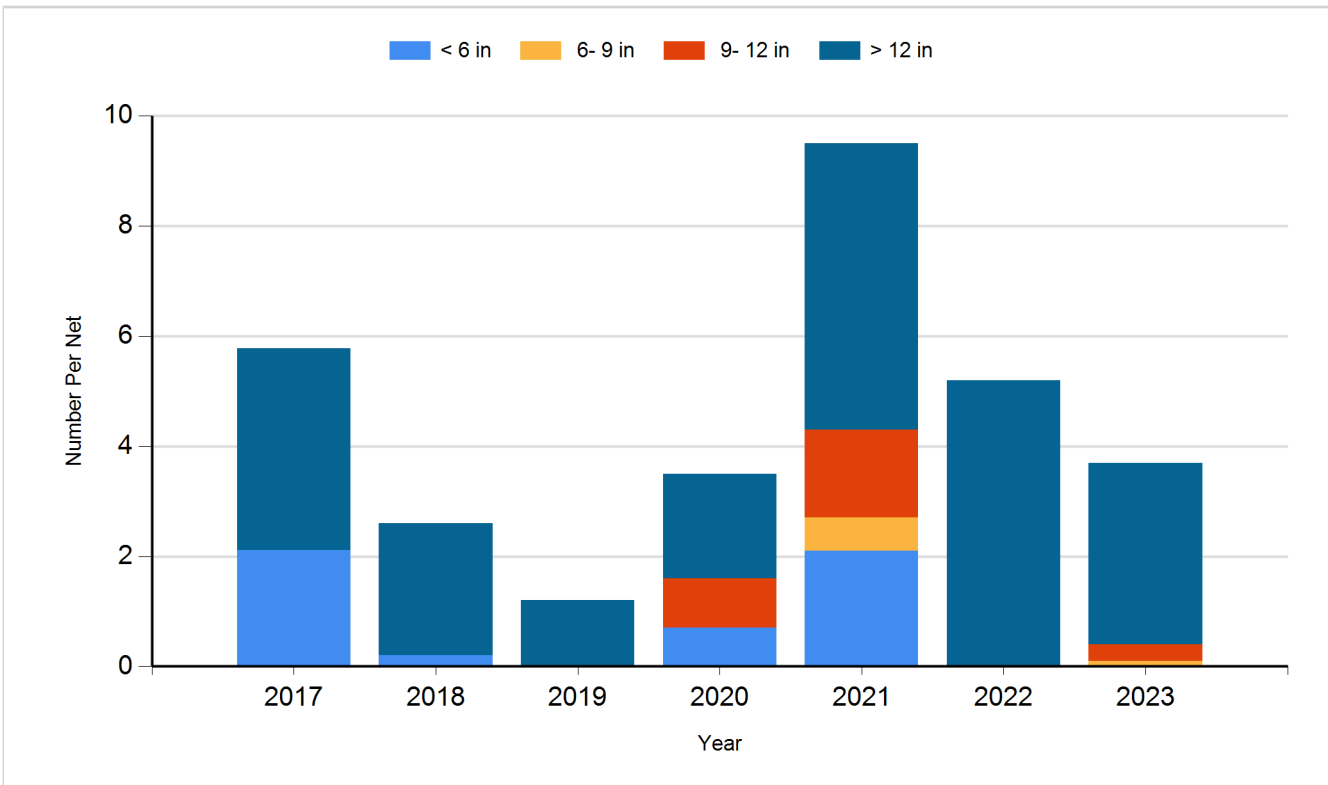
Species: Walleye
Gear: AFS std gill net



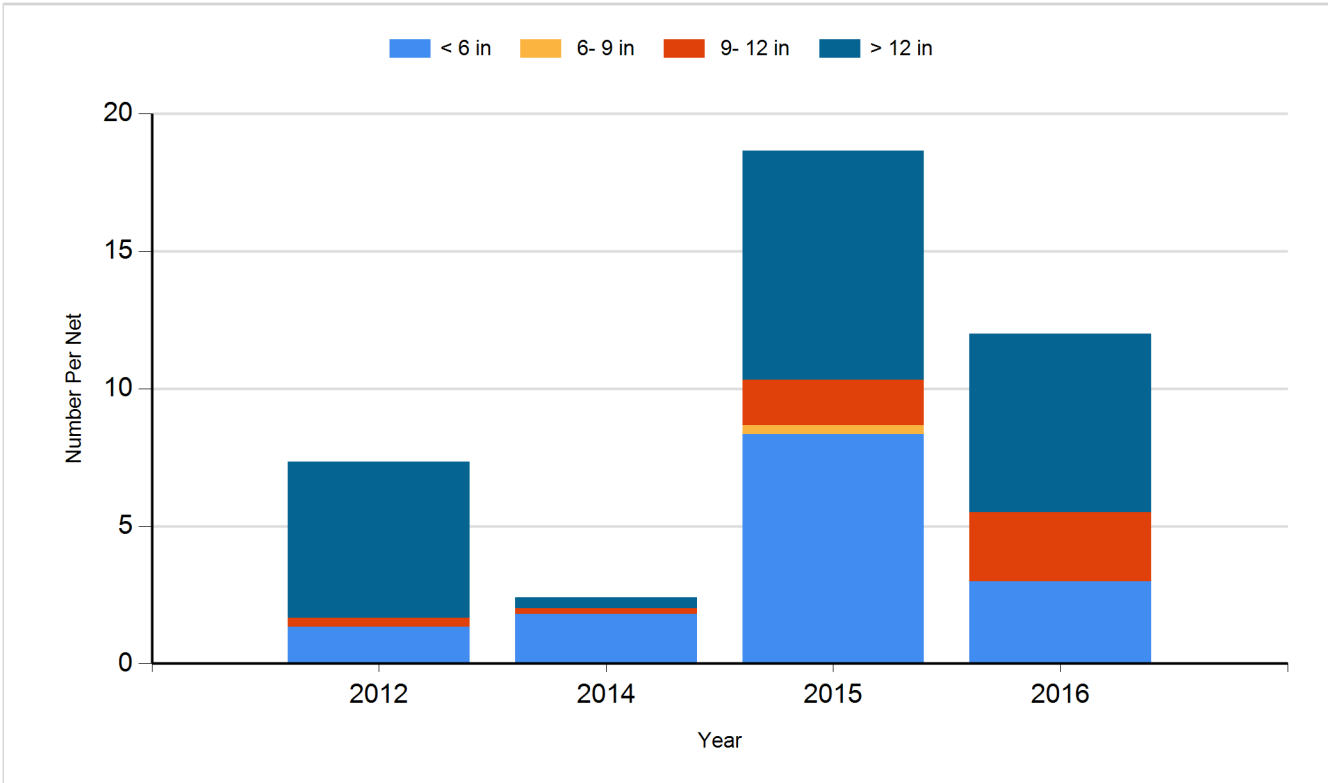
Species: Walleye
Gear: std exp gill net



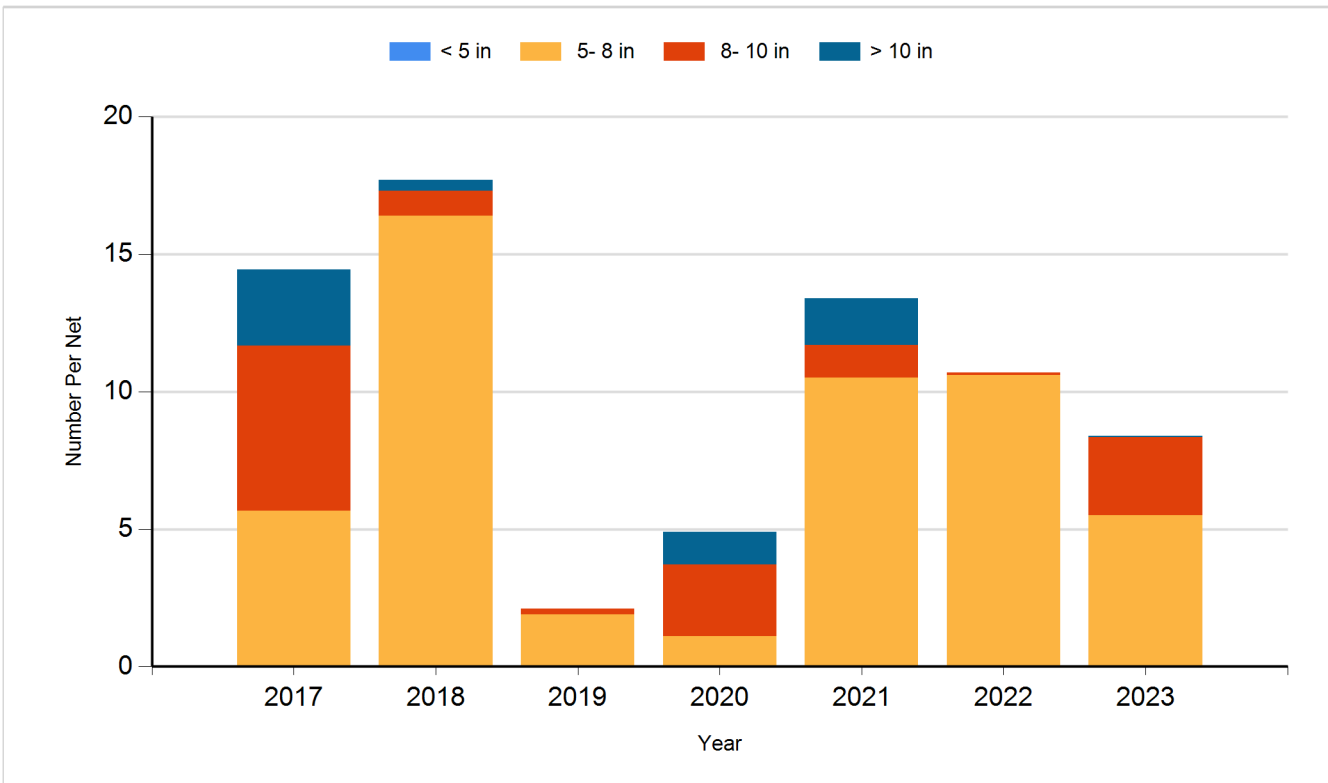
Species: White Bass
Gear: AFS std gill net



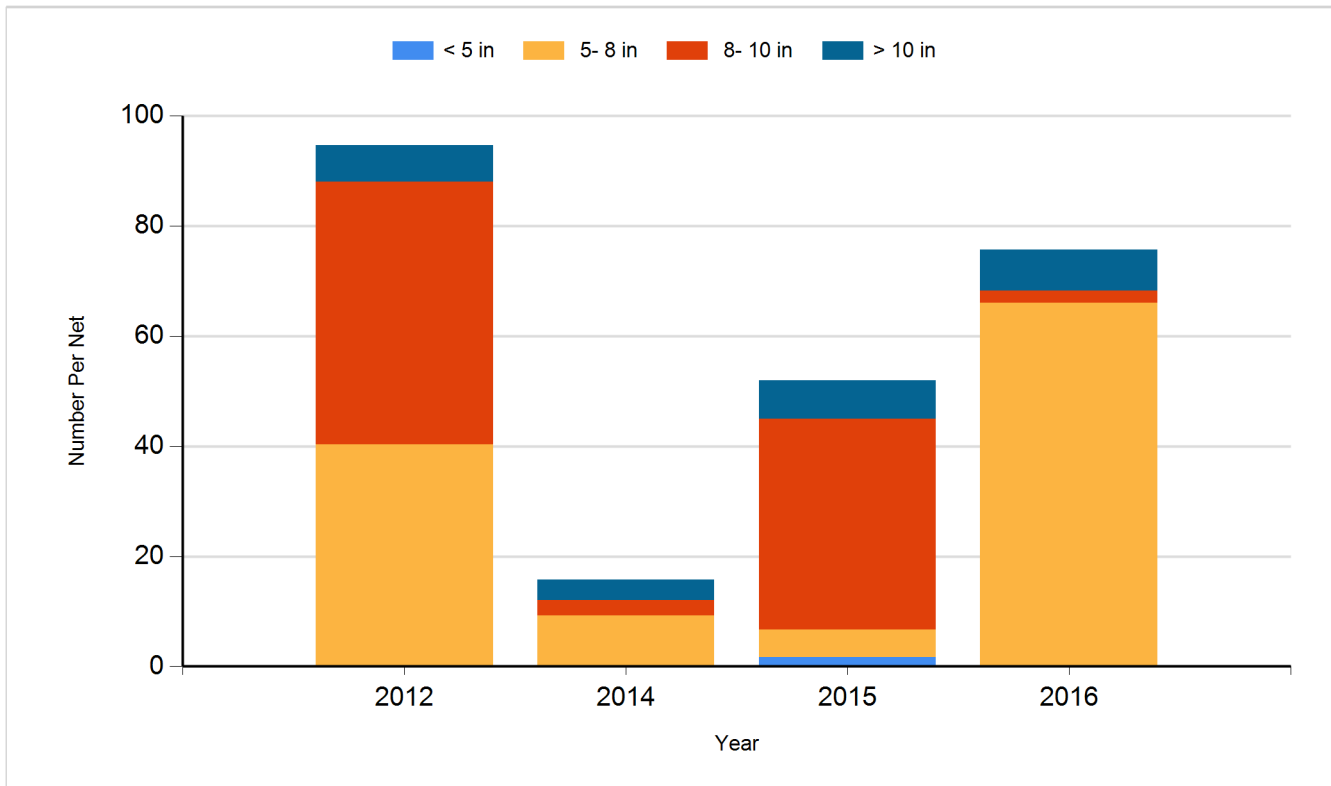
Species: White Bass
Gear: std exp gill net



Species: Yellow Perch
Gear: AFS std gill net



Species: Yellow Perch
Gear: std exp gill net



Fish Stocking

Number of fish stocked by year, species, and size.

Year	Species	Size	Number
2012	Muskellunge	Large Fingerling	1,150
2014	Muskellunge	Large Fingerling	1,063
2015	Walleye	Small Fingerling	108,300
2016	Muskellunge	Large Fingerling	1,387
2017	Walleye	Fingerling	113,760
2019	Walleye	Small Fingerling	108,900
2020	Muskellunge		25
2021	Walleye	Juvenile	119,700