

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

Opitz, Day County

UJA-Lake-866-002

2022

Lake Information

Name: Opitz **Maximum Depth:** 23 Feet
County: Day **Mean Depth:** 14 Feet
Surface Area: 1,452 Acres

Surveys and Investigations

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

Gear	Date	Effort
AFS std gill net	Jun 28, 2022	4 net-nights
AFS std gill net	Jun 29, 2022	4 net-nights
AFS std gill net	Jun 30, 2022	3 net-nights

Common Fish Species Present

Yellow Perch

Northern Pike

Walleye

Rock Bass

Black Bullhead

White Sucker

Common Carp

Black Crappie

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 Bullhead	5	0.5	0.3	60		60		88	7
	Black Crappie	1	0.1	0.1	100		0		98	
	Common Carp	4	0.3	0.2	0		0		110	5
	Rock Bass	35	3.2	0.9	40	8	11	6	115	2
	Walleye	26	1.5	0.4	69	13	0		82	1
	White Sucker	6	0.5	0.4	100		100		99	4
	Yellow Perch	38	3.4	0.8	65	8	59	8	108	2

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
		2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	
AFS std frame net	Black Bullhead					1.1						1.10
	Common Carp					0.3						0.30
	Northern Pike					0.1						0.10
	Orangespotted Sunfish					0.0						0.00
	Rock Bass					0.9						0.90
	Walleye					1.5						1.50
AFS std gill net	Black Bullhead				0.8	0.4	0.2	0.0		0.3	0.5	0.37
	Black Crappie				0.0	0.0	0.0	0.0		0.0	0.1	0.02
	Common Carp				0.1	0.3	0.2	0.3		0.5	0.3	0.28
	Northern Pike				0.4	0.1	0.1	0.0		0.2	0.0	0.13
	Rock Bass				1.8	2.8	2.2	2.1		3.4	3.2	2.58
	Smallmouth Bass				0.2	0.0	0.0	0.0		0.1	0.0	0.05
	Walleye				5.6	3.3	7.4	5.2		3.5	1.5	4.42
	White Bass				0.0	0.0	0.0	0.0		0.1	0.0	0.02
	White Sucker				0.0	0.0	0.2	0.3		0.1	0.5	0.18
	Yellow Perch				14.3	13.8	11.7	9.4		3.3	3.4	9.32
boat shocker (night)	Walleye*	144.0	75.0		360.0						193.00	
fall night EF-WAE*	Walleye						327.0	3.0		454.5	261.50	
frame net (std 3/4 in)	Black Bullhead	4.9	7.0									5.95
	Black Crappie	0.9	0.3									0.60
	Common Carp	0.1	0.1									0.10
	Northern Pike	0.1	0.3									0.20
	Orangespotted Sunfish	0.0	0.0									0.00
	Rock Bass	6.9	2.6									4.75
	Walleye	6.0	5.9									5.95
	White Sucker	0.0	0.0									0.00
Yellow Perch	0.1	0.0									0.05	
std exp gill net	Black Bullhead	0.5	0.3	0.7								0.50
	Common Carp	0.0	0.0	0.5								0.17
	Northern Pike	1.5	1.5	0.5								1.17
	Rock Bass	1.0	1.3	0.8								1.03
	Walleye	17.7	27.7	22.5								22.63
	Yellow Perch	18.2	34.2	33.8								28.73

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											
			2013	2014	2015	2016	2017	2018	2019	2020	2021	2022		
AFS std frame net	Black Bullhead	PSD					100							
		PSD-P					94							
		Wr					95							
	Common Carp	PSD					100							
		PSD-P					100							
		Wr					69							
	Northern Pike	PSD					100							
		PSD-P					0							
		Wr					81							
	Rock Bass	PSD					27							
		PSD-P					0							
		Wr					109							
	Walleye	PSD					85							
		PSD-P					8							
		Wr					69							
AFS std gill net	Black Bullhead	PSD				100	100	100				33	60	
		PSD-P				80	100	100				0	60	
		Wr				114	107	106				98	88	
	Black Crappie	PSD												100
		PSD-P												0
		Wr												98
	Common Carp	PSD				100	100	100	100				100	0
		PSD-P				100	100	100	100				100	0
		Wr				111	94	97	92				97	110
	Northern Pike	PSD				100	100	100					100	
		PSD-P				80	0	0					0	
		Wr				93	81	70					90	
	Rock Bass	PSD				100	91	69	88				83	40
		PSD-P				18	6	19	12				17	11
		Wr				111	107	110	108				111	115
	Walleye	PSD				27	55	11	6				40	69
		PSD-P				1	0	1	2				0	0
		Wr				82	80	82	83				85	82

Gear	Species	Index	Year									
			2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
AFS std gill net	White Sucker	PSD						100	100		100	100
		PSD-P						100	100		100	100
		Wr						94	103		99	99
	Yellow Perch	PSD				100	91	97	91		97	65
		PSD-P				93	84	59	66		90	59
		Wr				103	108	111	112		106	108
boat shocker (night)	Walleye	PSD	0	0		0						
		PSD-P	0	0		0						
		Wr	93	92		90						
frame net (std 3/4 in)	Black Bullhead	PSD	93	68								
		PSD-P	31	40								
		Wr	100	100								
	Black Crappie	PSD	59	100								
		PSD-P	41	80								
		Wr	110	97								
	Common Carp	PSD	100	100								
		PSD-P	100	100								
		Wr	90									
	Northern Pike	PSD	50	100								
		PSD-P	0	0								
		Wr	82	76								
	Rock Bass	PSD	85	74								
		PSD-P	3	6								
		Wr	115	112								
	Walleye	PSD	59	12								
		PSD-P	3	1								
		Wr	80	80								
	Yellow Perch	PSD	100									
		PSD-P	100									
		Wr	102									
std exp gill net	Black Bullhead	PSD	33	50	75							
		PSD-P	0	50	25							
		Wr	103	94	92							
	Common Carp	PSD			100							
		PSD-P			100							
		Wr			101							

Gear	Species	Index	Year									
			2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
std exp gill net	Northern Pike	PSD	89	100	100							
		PSD-P	0	44	67							
		Wr	80	81	81							
	Rock Bass	PSD	83	88	100							
		PSD-P	0	13	0							
		Wr	104	109	107							
	Walleye	PSD	28	6	5							
		PSD-P	0	0	0							
		Wr	83	82	80							
Yellow Perch	PSD	87	99	96								
	PSD-P	19	62	74								
	Wr	113	108	108								

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+
2022	26	194 (10)			384 (8)		422 (6)			336 (1)	447 (1)
2021	42			365 (29)		408 (12)					403 (1)
2019	63	221 (2)		329 (54)		373 (2)	376 (3)	548 (1)	391 (1)		
2018	89		293 (63)		365 (5)	372 (7)	398 (2)	386 (10)			630 (1)
2017	66	205 (26)	317 (1)	355 (2)	385 (19)	384 (3)	386 (15)		405 (1)		
2016	67		320 (6)	349 (21)	374 (10)	380 (30)		520 (1)			
2015	143	201 (7)	276 (24)	324 (24)	356 (88)	395 (2)					
2014	185	212 (17)	288 (23)	339 (136)		420 (8)			425 (1)		
2013	112	185 (3)	283 (74)	356 (1)	396 (31)			453 (2)		485 (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+
2022	38	142 (14)	240 (3)		298 (5)		315 (6)	333 (1)	323 (2)	327 (5)	328 (2)
2021	39	149 (1)		258 (9)	264 (2)	295 (13)			325 (10)	320 (2)	344 (2)
2019	114	138 (11)		244 (44)	273 (9)		300 (21)	299 (9)	307 (22)		
2018	140		220 (56)	267 (12)		294 (34)	297 (20)	303 (18)	342 (1)		
2017	166	141 (15)	231 (10)		272 (38)	289 (11)	298 (90)		325 (2)		
2016	171			254 (37)	277 (23)	300 (90)	309 (10)	305 (11)			
2015	203		197 (14)	229 (28)	274 (149)	278 (11)	325 (1)				
2014	205		213 (16)	254 (148)		278 (41)					
2013	109		211 (82)	249 (4)	265 (22)	257 (1)					

Fish Condition

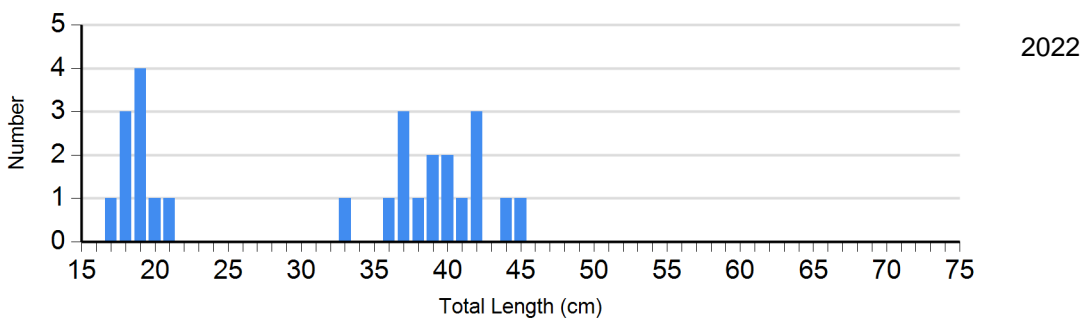
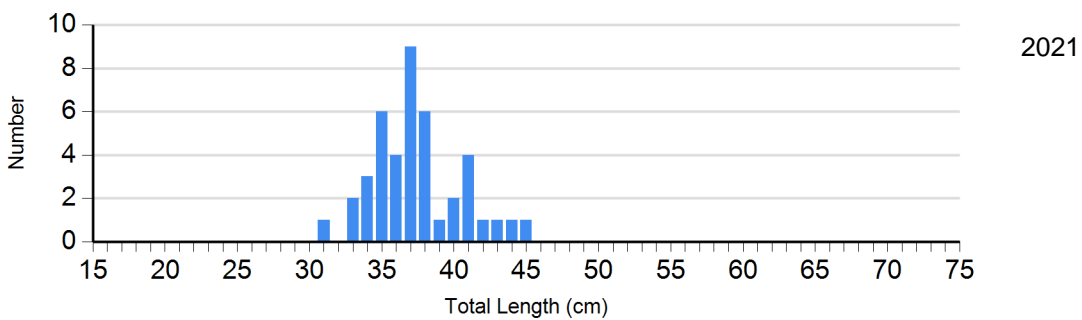
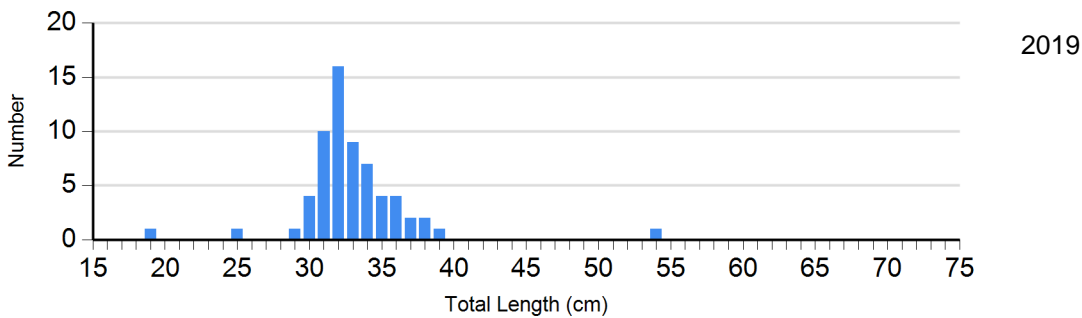
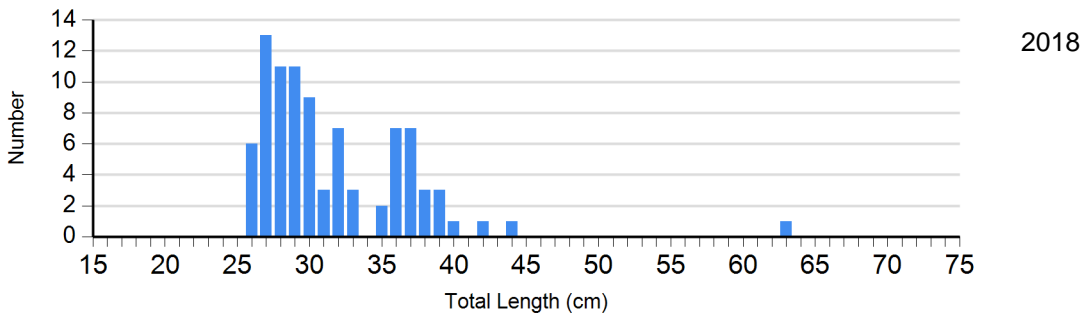
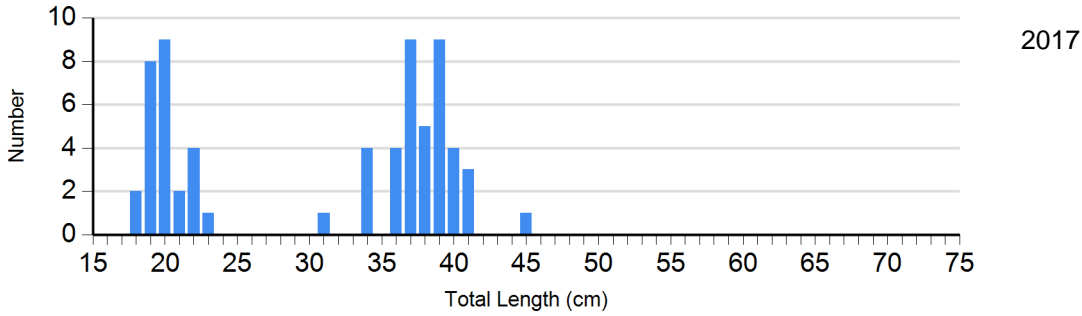
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

Species	Year	Length Groups							
		S-Q		Q-P		P-M		M	
		N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Black Bullhead Gill Net	2018	0		0		0		2	106 (11.0)
	2021	2	86 (4.1)	1	120	0		0	
	2022	2	83 (2.6)	0		3	91 (8.4)	0	
Common Carp Gill Net	2018	0		0		0		2	97 (7.3)
	2019	0		0		0		4	92 (6.1)
	2021	0		0		2	99 (3.7)	4	96 (3.8)
	2022	3	110 (3.6)	0		0		0	
Northern Pike Gill Net	2018	0		1	70	0		0	
	2021	0		2	90 (2.5)	0		0	
Walleye Gill Net	2018	79	82 (0.6)	9	78 (1.1)	0		1	82
	2019	58	83 (0.7)	3	82 (4.3)	1	97	0	
	2021	25	85 (0.8)	17	86 (0.9)	0		0	
	2022	5	83 (1.4)	11	82 (1.5)	0		0	
White Sucker Gill Net	2018	0		0		1	94	1	93
	2019	0		0		0		3	103 (5.7)
	2021	0		0		0		1	99
	2022	0		0		0		6	99 (3.0)
Yellow Perch Gill Net	2018	4	120 (4.2)	54	117 (1.1)	47	109 (1.0)	35	102 (1.0)
	2019	10	114 (1.5)	28	120 (1.1)	44	112 (1.1)	31	105 (1.3)
	2021	1	117	3	119 (4.7)	13	110 (2.9)	22	102 (1.7)
	2022	13	111 (1.9)	2	114 (9.1)	4	113 (1.6)	18	104 (2.2)

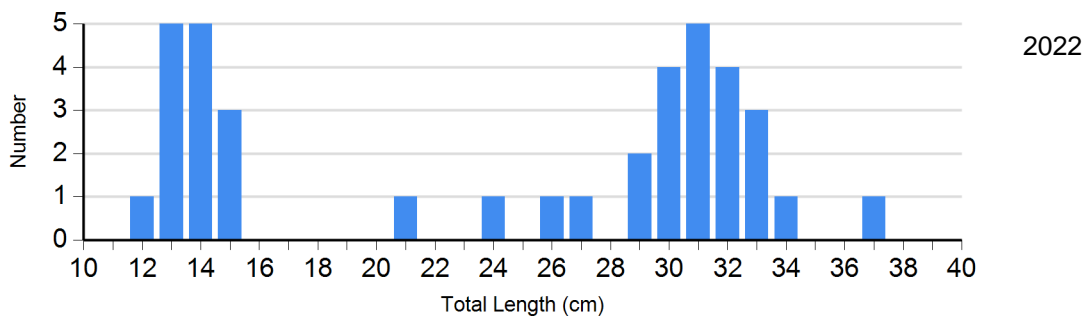
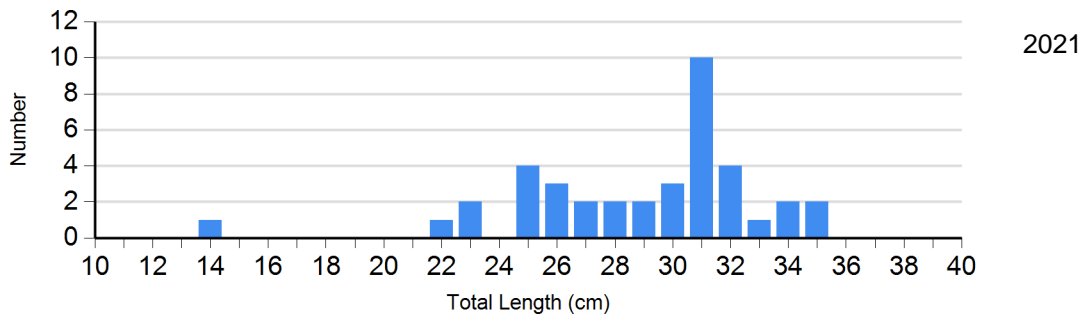
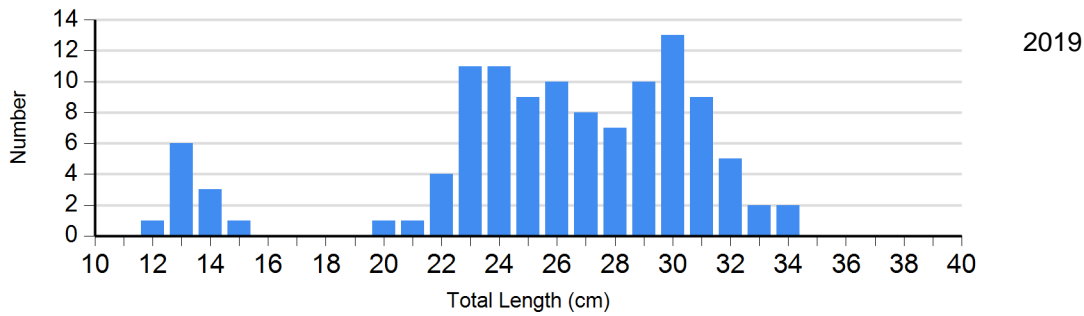
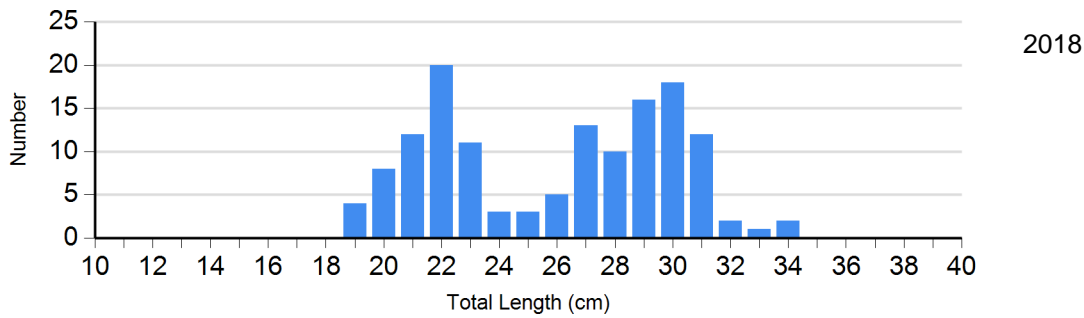
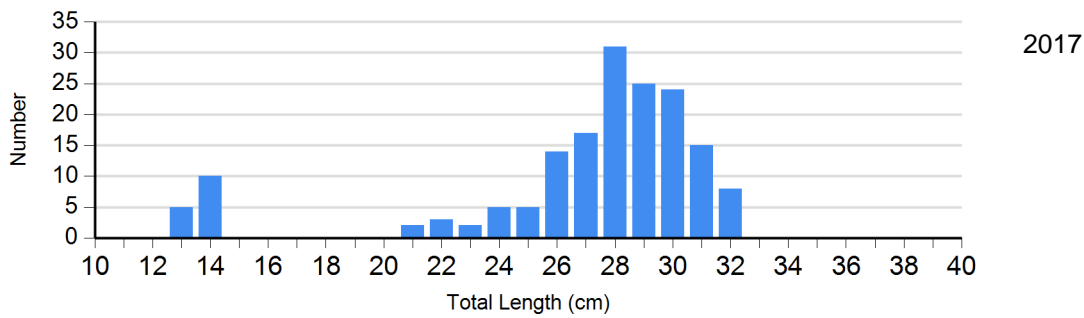
Length Frequency Distribution

Length frequency histogram of species sampled by year.

Species: Walleye
Gear: AFS std gill net



Species: Yellow Perch
Gear: AFS std gill net

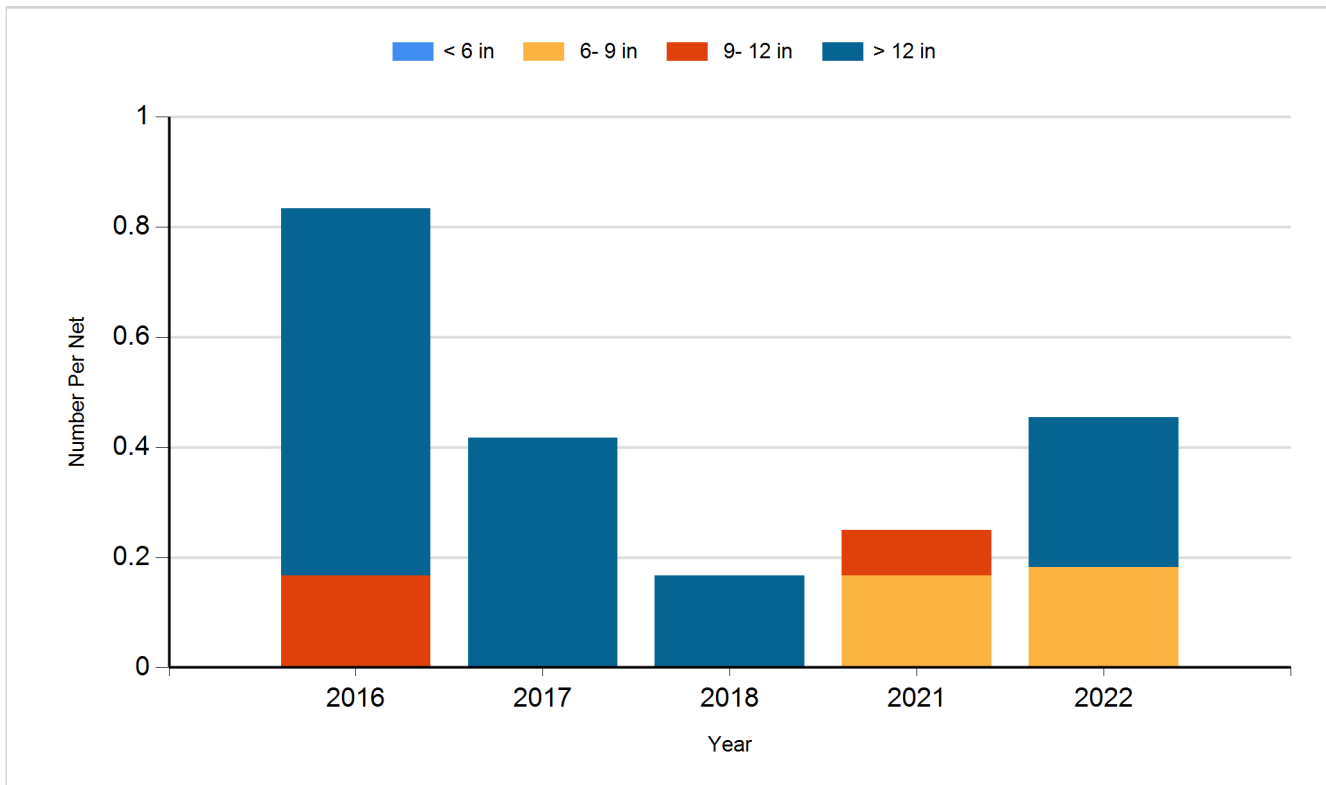


Historic Fish Sizes and Relative Abundance

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

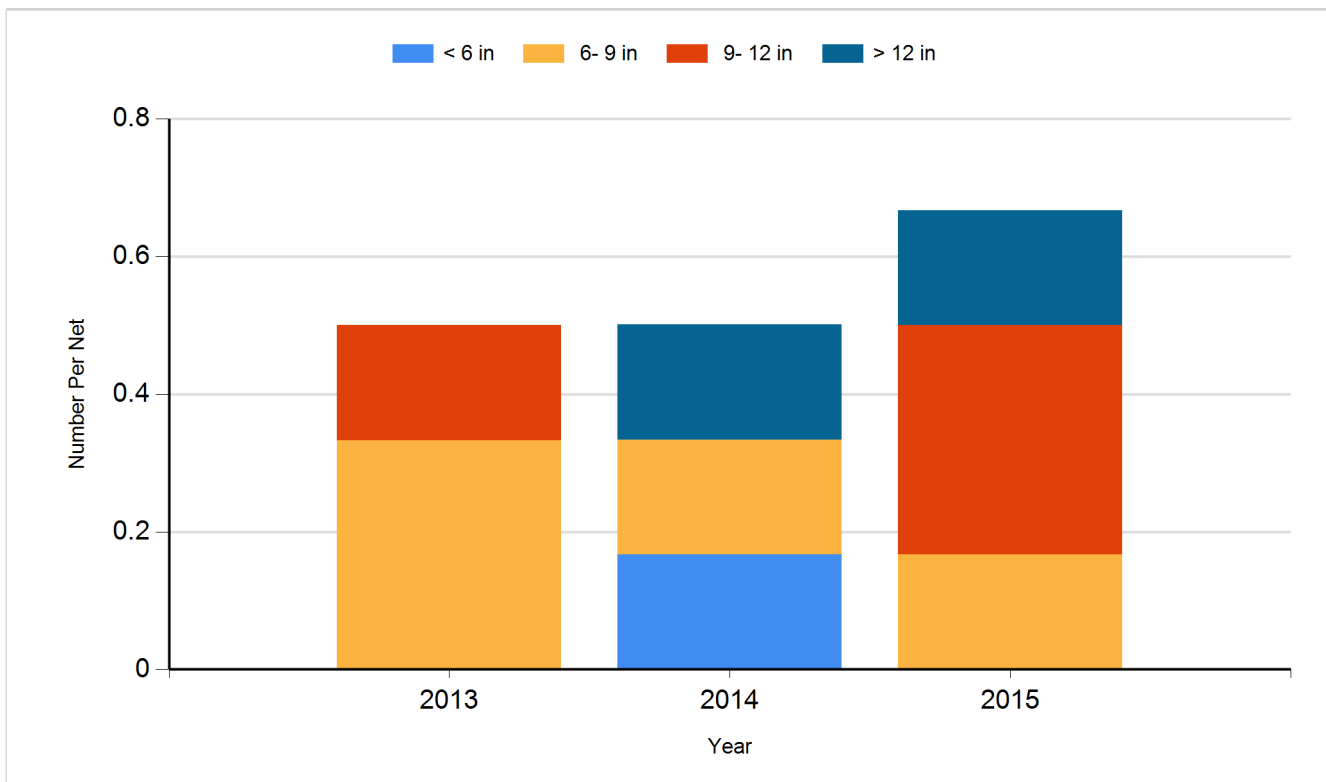
Species: Black Bullhead

Gear: AFS std gill net

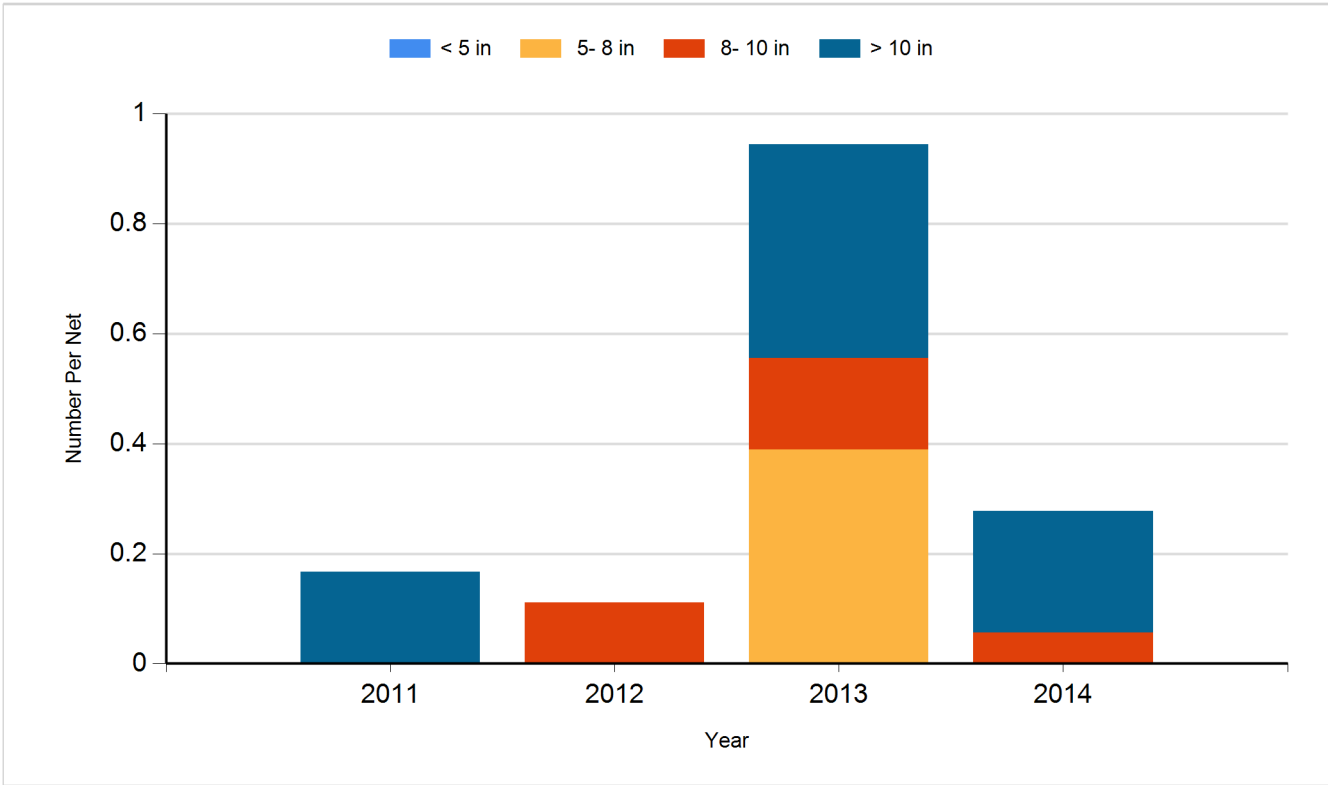


Species: Black Bullhead

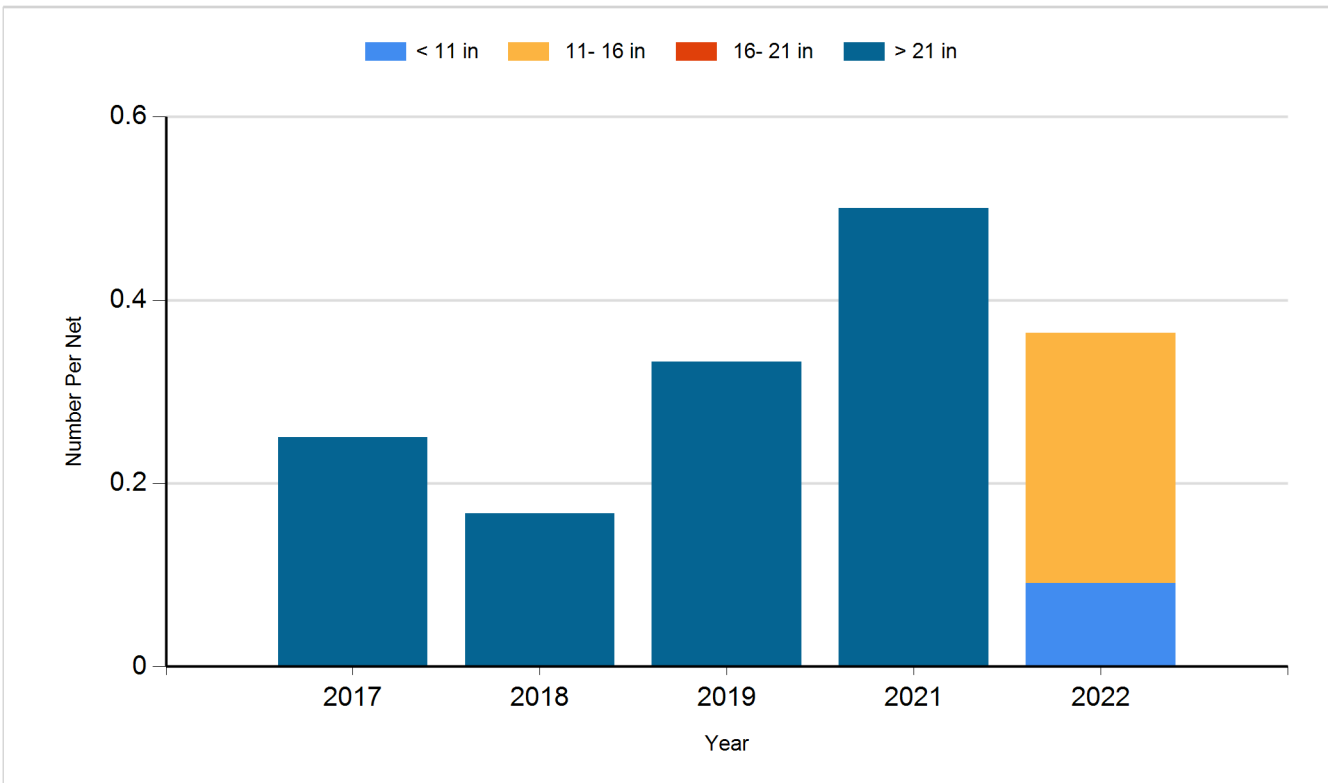
Gear: std exp gill net



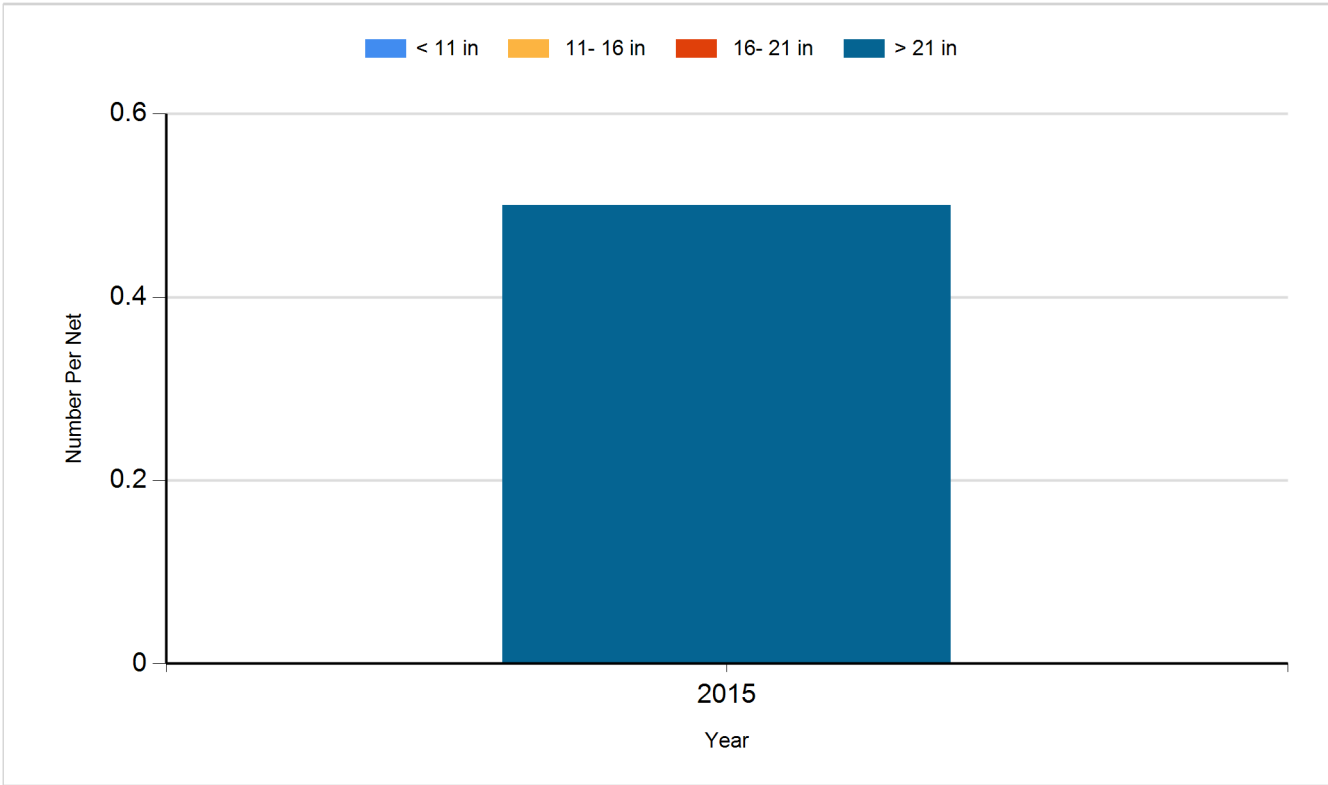
Species: Black Crappie
Gear: frame net (std 3/4 in)



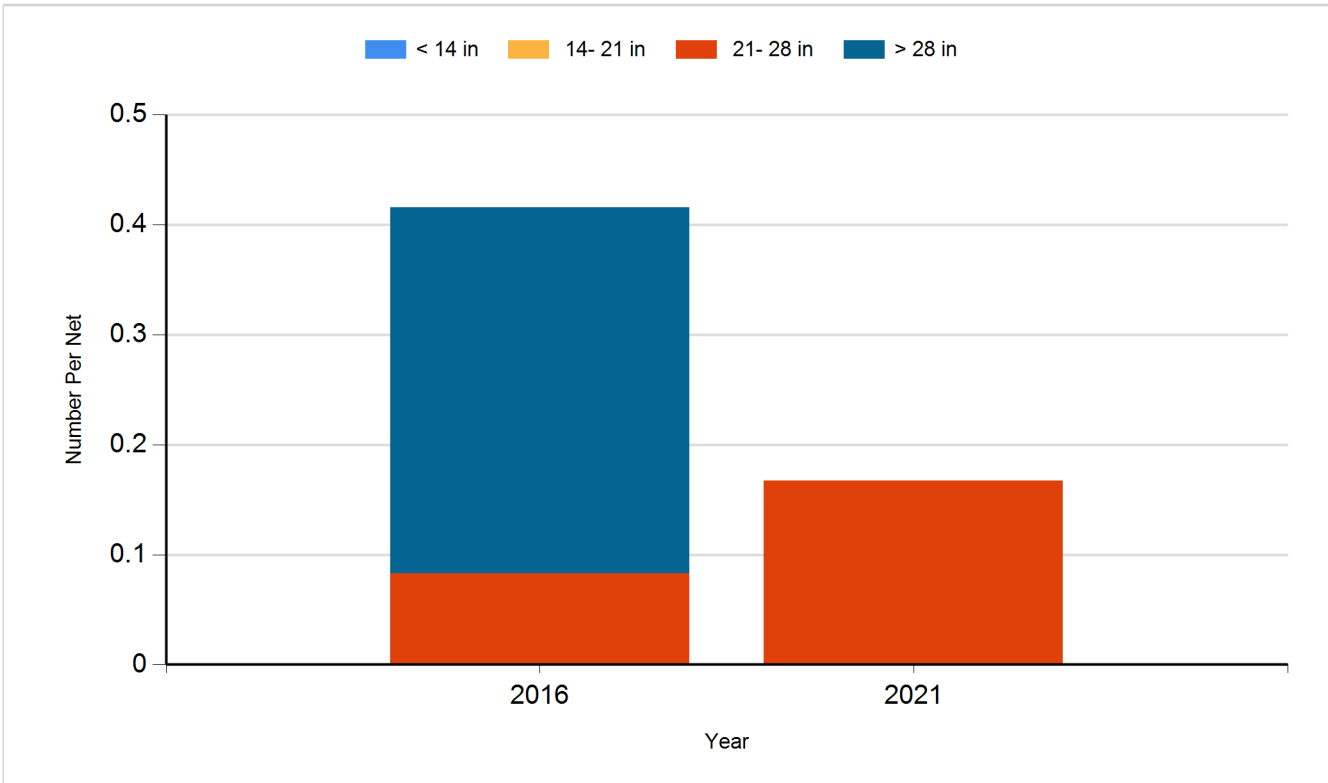
Species: Common Carp
Gear: AFS std gill net



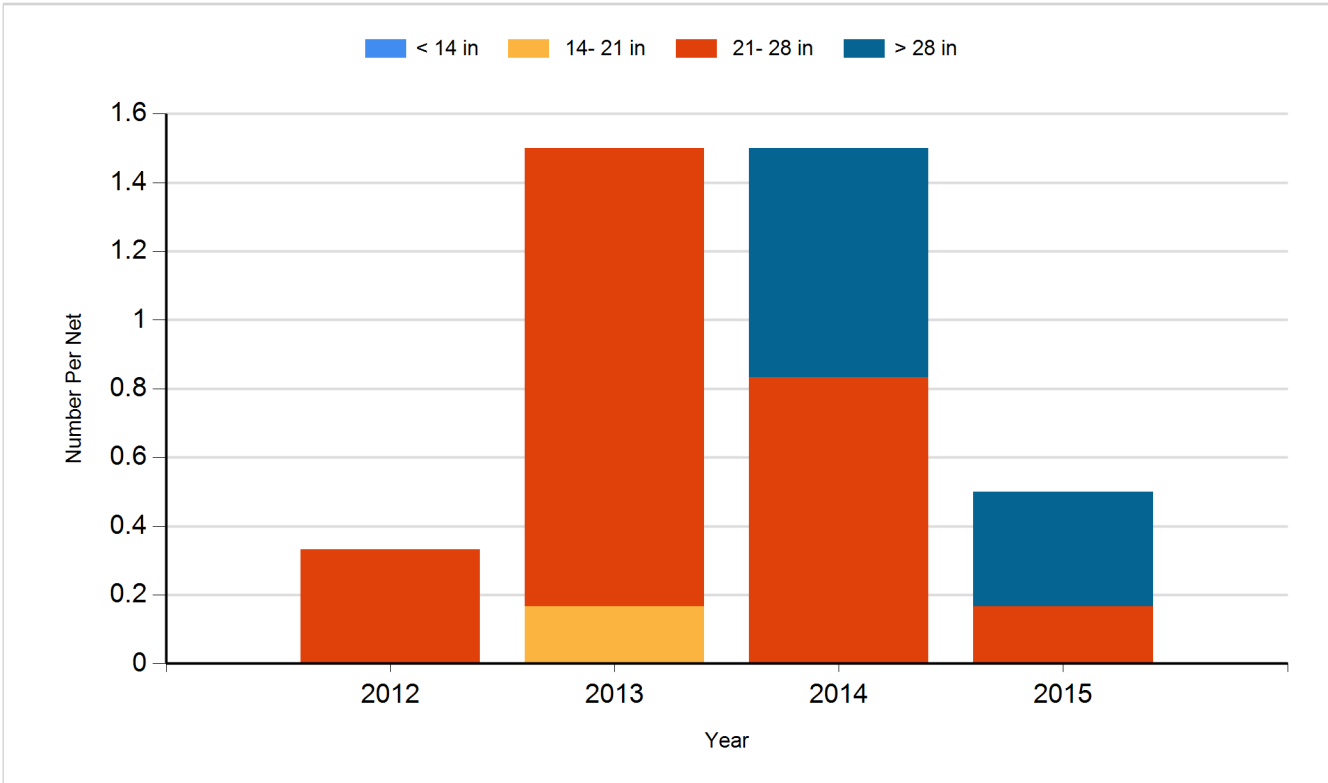
Species: Common Carp
Gear: std exp gill net



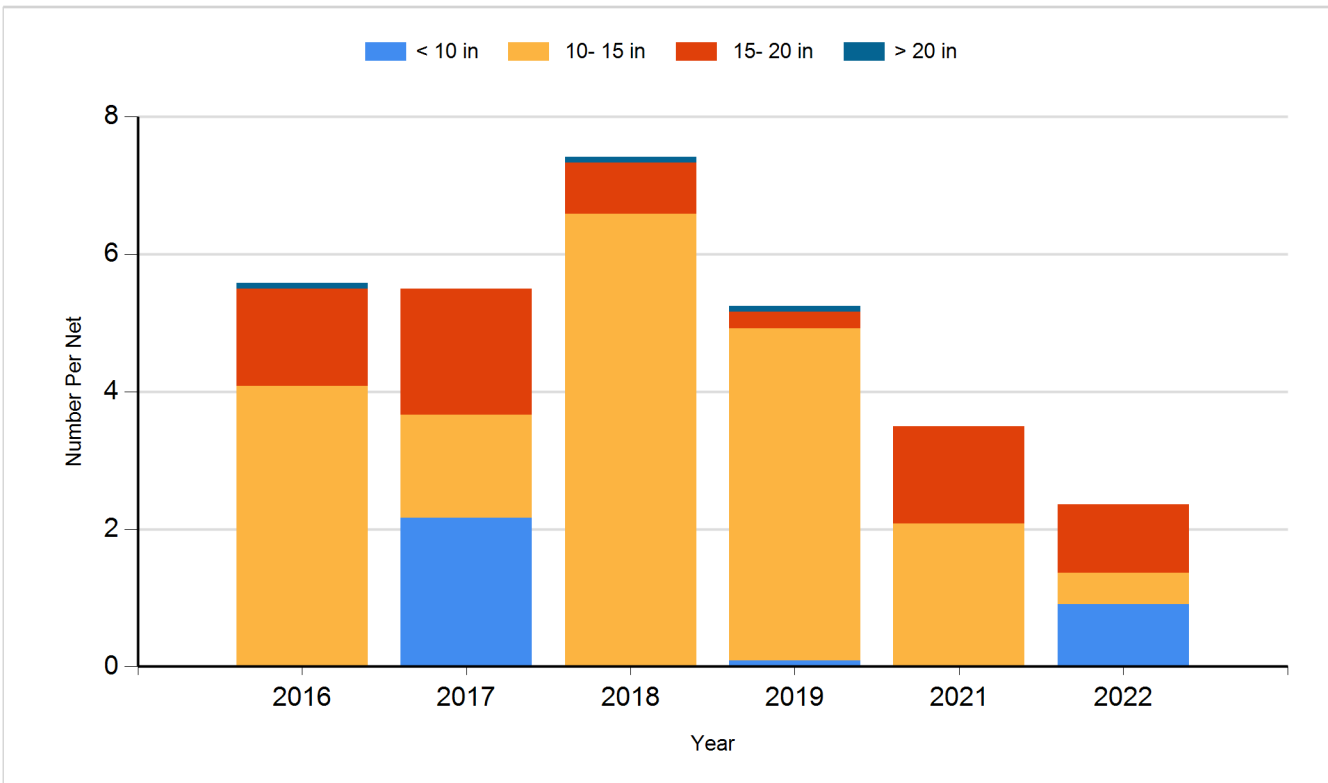
Species: Northern Pike
Gear: AFS std gill net



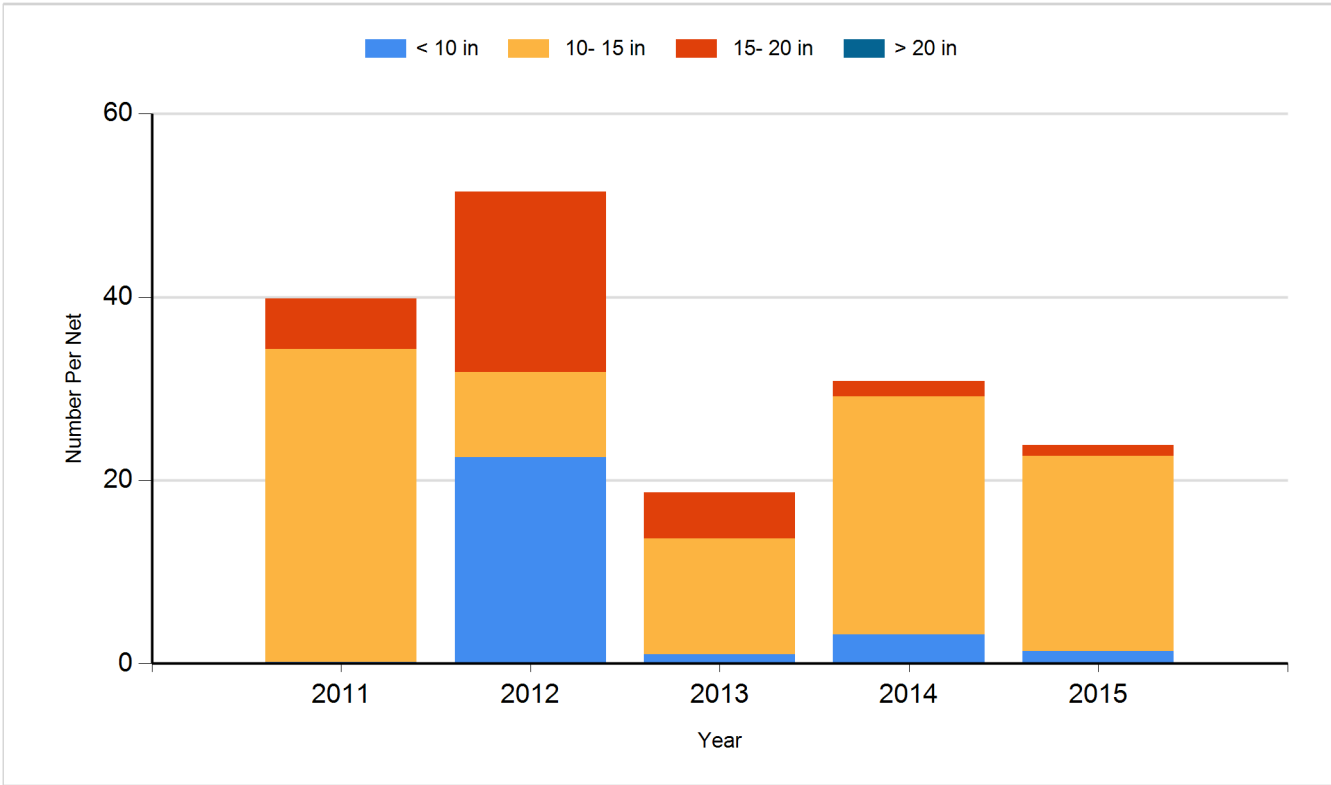
Species: Northern Pike
Gear: std exp gill net



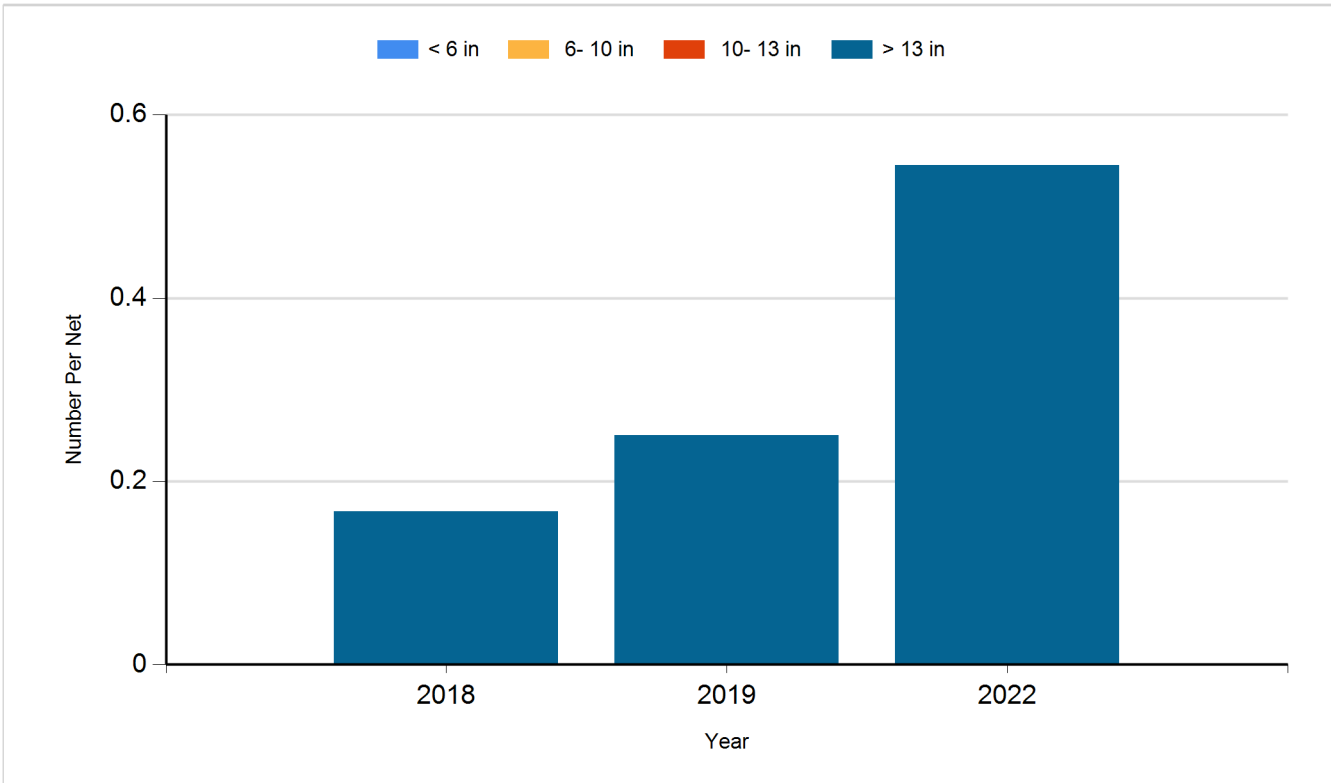
Species: Walleye
Gear: AFS std gill net



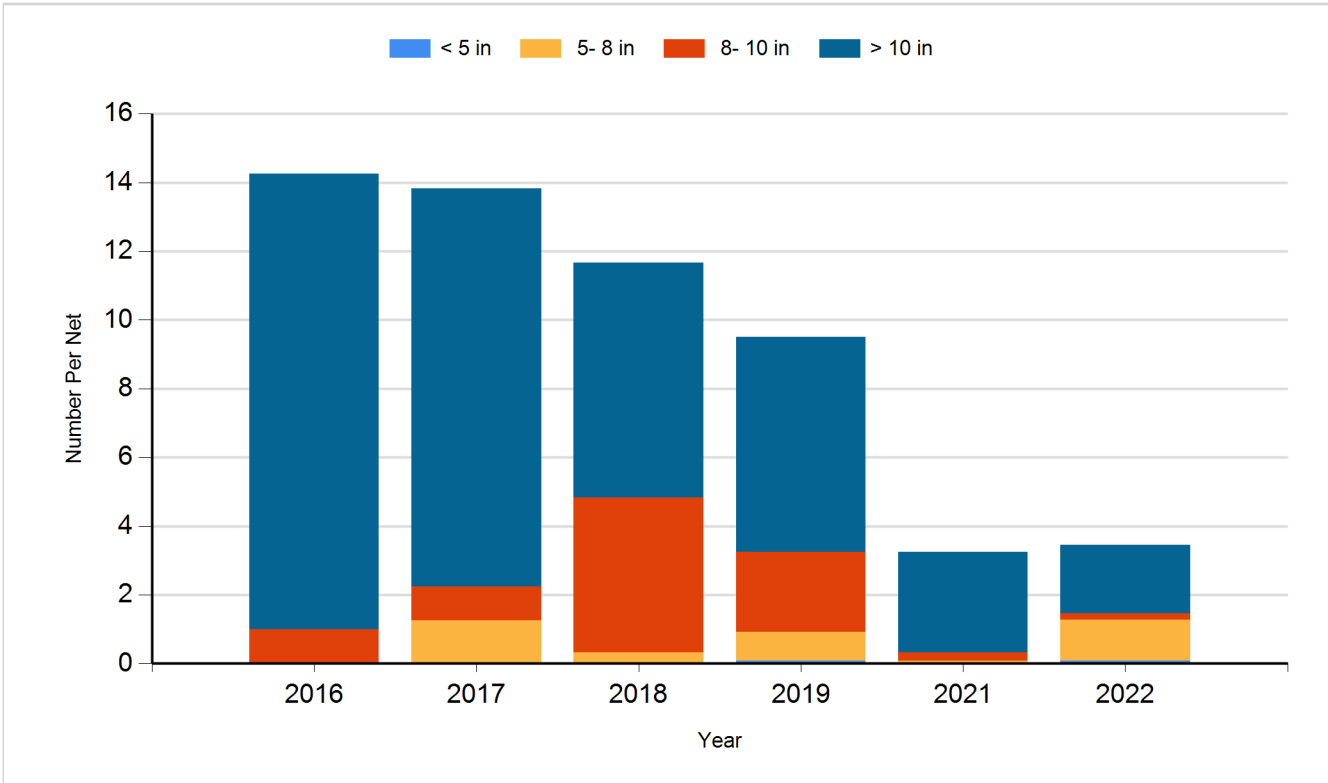
Species: Walleye
Gear: std exp gill net



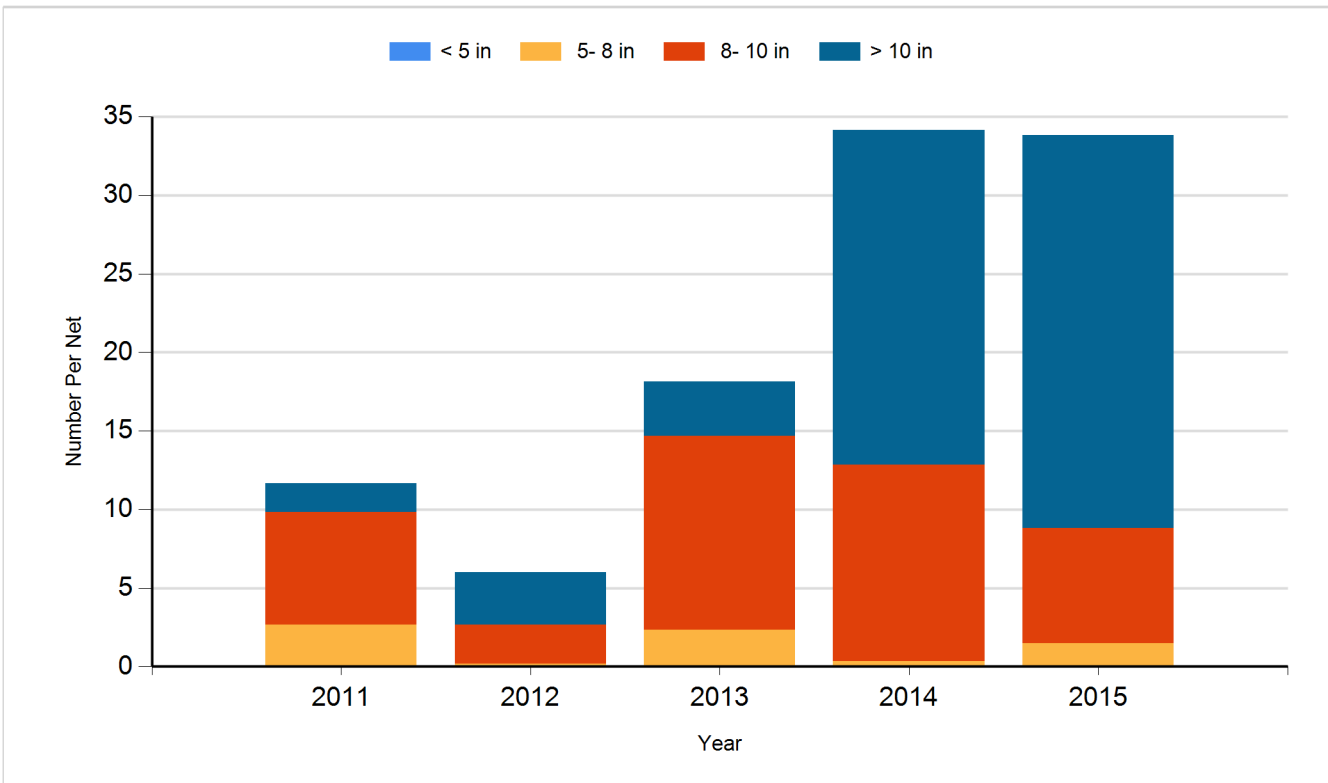
Species: White Sucker
Gear: AFS std gill net



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
2011	Walleye	Fry	900,000
2016	Walleye	Fry	700,000
2018	Walleye	Fry	710,000
2021	Walleye	Fry	800,000