SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

Dimock Lake, Hutchinson County
2102-F-21-R-47
2014

Figure 1. Dimock Lake, Hutchinson County

Legal Description: T100N-R60W-Sec. 15
Location from nearest town: 3 miles east of Dimock, SD

Surface Area: 148 acres
Meandered (Y/N): no
OHWM elevation: none set
Outlet elevation: none set
Max. depth at outlet elevation: 18 feet
Observed water level: full
Contour map available (Y/N): yes

Watershed area: 25,600 acres
Shoreline length: 5.3 miles
Date set: NA
Date set: NA
Mean depth at outlet elevation: 5.7 feet
Lake volume: 847 acre feet
Date mapped: 1994

DENR beneficial use classifications: (5) warmwater semi-permanent fish propagation, (7) immersion recreation, (8) limited-contact recreation and (9) fish and wildlife propagation and stock watering.

Introduction

General

Dimock Lake was named for the nearby town of Dimock, South Dakota. The original dam was built by the Works Progress Administration in 1936. The dam was washed out in 1984 following near record precipitation in the watershed. Construction on a new dam was finished in January 1993. The lake completely refilled in February 1993 and fish stocking started later that spring.

Ownership of Lake and Adjacent Lakeshore Properties

Dimock Lake is owned and managed by the South Dakota Department of Game, Fish and Parks (GFP). There is a 15-ft easement above the high water mark around the entire lake for public access.

Fishing Access

The Dimock Lake Access Area has a single lane boat ramp, boat dock, picnic shelter, public toilet and several spots suitable for shore fishing.

Water Quality and Aquatic Vegetation

The water temperature during this year's lake survey was 23^{o}C (73^{o}F) and the water clarity was 37 cm (14.5 in). The low water clarity was primarily caused by suspended sediments. Cattails and bulrushes were present but no submerged vegetation was noted.

Table 1. Water temperature, Secchi depth and observations/comments on water quality and aquatic vegetation in Dimock Lake, Hutchinson County, 2005-2014.

Year	*Water Temp ^{o}C (^{o}F)*	*Secchi Depth cm (in)*	*Observations/Comments (algae, aquatic vegetation, water quality, etc.)*
2014	23 (73)	36 (14)	Cattails and bulrushes
2013	25 (77)	51 (20)	No observations were recorded
2011	24 (75)	46 (18)	Small amount of sago pondweed
2010	29 (84)	36 (14)	Sago, cattails
2008	26 (78)	91 (36)	No observations were recorded
2006	26 (78)	38 (15)	Cattails

Fish Community

Dimock Lake contains a simple fish community consisting of species commonly found in small impoundments and large lakes (Table 1). Black bullheads and common carp are the only undesirable species present.

Table 2. Fish species commonly found in Dimock Lake, Hutchinson County.

Game Species	***Other Species***
Walleye	Common Carp
Yellow Perch	
Channel Catfish	
Black Crappie	
Black Bullhead	
Bluegill	

Fish Management

Poor water quality caused by excessive turbidity has made it difficult to maintain fishing opportunity in Dimock Lake. This has resulted in an increase of fish kills (Table 3) and a decline in abundance of aquatic vegetation. The lake is now managed primarily for walleye, yellow perch, black crappie and channel catfish, species better adapted to the habitat provided by the lake. These species are stocked as needed to maintain their populations (Table 4).

Table 3. Fish kill history for Dimock Lake, Hutchinson County.

Year	***Severity***	***Comments***
2007	Severe	Winterkill (carp, crappies, catfish, bullheads). Some survival.
2001	Light	Winterkill (catfish, carp, crappies, bass)

Table 4. Stocking history for Dimock Lake, Hutchinson County, 2005-2014.

Year	***Number***	***Species***	***Size***
2005	174	Channel Catfish	Adult
2006	150	Channel Catfish	Adult
2007	750	Black Crappie	Adult
	345	Walleye	Adult
	102	Walleye	Juvenile
2011	81	Channel Catfish	Adult
	638	Walleye	Large Fingerling
	319	Yellow Perch	Adult
2013	70	Black Crappie	Juvenile
	38	Northern Pike	Adult
	200,000	Walleye	Fry
	308	Walleye	Juvenile
	2,600	Yellow Perch	Juvenile
2014	75,000	Walleye	Fry

Methods

Dimock Lake was sampled on August 13-14, 2014 with three overnight gill nets and five overnight trap nets. The gill nets are 45.7 m long x 1.8 m deep (150 ft long x 6 ft deep) with one 7.6 m (25 ft) panel each of 13, 19, 25, 32, 38 and 51-mm-bar-mesh (½, ¾, 1, 1¼, 1½, and 2 in) monofilament netting. The trap nets are constructed with 19-mm-bar-mesh (¾ in) netting, 0.9 m high x 1.5 m wide (3 ft high x 5 ft wide) frames and 18.3 m (60 ft) long leads.

Results and Discussion

Net Catch Results

Black bullheads dominated the gill net and trap nets catch in 2014 (Tables 5, 7) and just over 45% of the fish sampled were shorter than stock length (15 cm, 6 in). No game fish CPUEs were high enough to suggest that good fishing opportunity was available.

Table 5. Total catch from three overnight gill nets set in Dimock Lake, Hutchinson County, August 13-14, 2014.

Species	*#*	*%*	*CPUE[1]*	*80% C.I.*	*Mean CPUE**	*PSD*	*RSD-P*	*Mean Wr*
Black Bullhead	439	86.9	146.3	±41.2		0	0	--
Common Carp	42	8.3	14.0	±2.7		63	0	--
Yellow Perch	13	2.6	4.3	±1.1		23	0	106
Walleye	6	1.2	2.0	±2.6		--	--	--
Channel Catfish	4	0.8	1.3	±1.7		--	--	--
Black Crappie	1	0.2	0.3	±0.4		--	--	--

*10 years (2005-2014)

Table 6. CPUE by length category for selected species sampled with gill nets in Dimock Lake, Hutchinson County, August 13-14, 2014.

Species	*Substock*	*Stock*	*S-Q*	*Q-P*	*P+*	*All sizes*	*80% C.I.*
Black Bullhead	66.0	80.3	80.3	--	--	146.3	±41.2
Common Carp	11.3	2.7	1.0	1.7	--	14.0	±2.7
Yellow Perch	--	4.3	3.3	1.0	--	4.3	±1.1
Walleye	--	2.0	0.7	1.3	--	2.0	±2.6
Channel Catfish	--	1.3	0.7	0.3	--	1.3	±1.7
Black Crappie	--	0.3	--	0.3	--	0.3	±0.4

Length categories can be found in Appendix A.

[1] See Appendix A for definitions of CPUE, PSD, RSD, RSD-P and mean Wr.

Table 7. Total catch from five overnight trap nets set in Dimock Lake, Hutchinson County, August 13-14, 2014.

Species	*#*	*%*	*CPUE*	*80% C.I.*	*Mean CPUE**	*PSD*	*RSD-P*	*Mean Wr*
Black Bullhead	3,961	99.1	792.2	±801.4	554.4	0	0	--
Black Crappie	10	0.3	2.0	±2.0	8.7	70	10	122
Channel Catfish	7	0.2	1.4	±1.0	2.1	--	--	--
Common Carp	6	0.2	1.2	±0.5	2.8	--	--	--
Green Sunfish	4	0.1	0.8	±0.7	--	--	--	--
Yellow Perch	4	0.1	0.8	±0.6	1.4	--	--	--
Bluegill	2	0.1	0.4	±0.5	2.9	--	--	--
Hybrid Sunfish	1	0.0	0.2	±0.3	--	--	--	--
O. S. Sunfish	1	0.0	0.2	±0.3	--	--	--	--
Walleye	1	0.0	0.2	±0.3	0.1	--	--	--

*10 years (2005-2014)

Table 8. CPUE by length category for selected species sampled with trap nets in Dimock Lake, Hutchinson County, August 13-14, 2014.

Species	*Substock*	*Stock*	*S-Q*	*Q-P*	*P+*	*All sizes*	*80% C.I.*
Black Bullhead	269.4	522.7	522.7	--	--	792.2	±801.4
Black Crappie	--	2.0	0.6	1.2	0.2	2.0	±2.0
Channel Catfish	--	1.4	0.2	1.2	--	1.4	±1.0
Common Carp	0.6	0.6	0.4	0.2	--	1.2	±0.5
Green Sunfish	--	0.8	0.8	--	--	0.8	±0.7
Yellow Perch	--	0.8	0.4	0.2	0.2	0.8	±0.6
Bluegill	--	0.4	0.4	--	--	0.4	±0.5
Hybrid Sunfish*	--	--	--	--	--	0.2	±0.3
O. S. Sunfish*	--	--	--	--	--	0.2	±0.3
Walleye	--	0.2	0.2	--	--	0.2	±0.3

*No length categories established. Length categories can be found in Appendix A.

Table 9. Gill-net (GN) and trap-net (TN) CPUE for selected fish species sampled in Dimock Lake, Hutchinson County, 2005-2014.

Species	*Gear*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*	*2014*
Black Bullhead	GN										146.3
	TN		97.6		597.5		528.0	736.0		574.9	792.2
Black Crappie	GN										0.3
	TN		38.8		8.9		0.9	1.3		0.4	2.0
Bluegill	GN										--
	TN		12.9		0.2		3.1	1.0		--	0.4
Channel Catfish	GN										1.3
	TN		6.9		0.1		--	1.4		2.6	1.4
Common Carp	GN										14.0
	TN		0.7		6.2		3.6	3.1		2.1	1.2
Walleye	GN										2.0
	TN		--		--		--	--		0.3	0.2
White Crappie	GN										--
	TN		8.0		18.8		4.2	2.6		--	--
Yellow Perch	GN										4.3
	TN		2.3		1.5		0.2	0.6		2.7	0.8

Walleye

Management Objective

- maintain a walleye population with a total gill-net CPUE of at least 10

Management Strategy

- stock small walleye fingerlings at the rate of 100/acre (14,800) as needed to achieve the management objective

Although walleye stocking was started in 2007 (Table 11), gill-net CPUE remains far below the management objective (Table 10). However, the presence of fish in two length categories (Figure 2) indicates the 2011 and 2013 stockings produced some fish.

Table 10. CPUE, PSD, RSD-P, and mean Wr for all walleyes sampled with gill nets in Dimock Lake, Hutchinson County, 2005-2014. Stocked years are shaded.

	2005	***2006***	***2007***	***2008***	***2009***	***2010***	***2011***	***2012***	***2013***	***2014***
CPUE										2.0
PSD										--
RSD-P										--
Mean Wr										--

Table 11. Walleyes stocked into Dimock Lake, Hutchinson County, 2005-2014.

Year	***Number***	***Size***
2007	345	Adult
	102	Juvenile
2011	638	Large Fingerling
2013	200,000	Fry
	308	Juvenile
2014	75,000	Fry

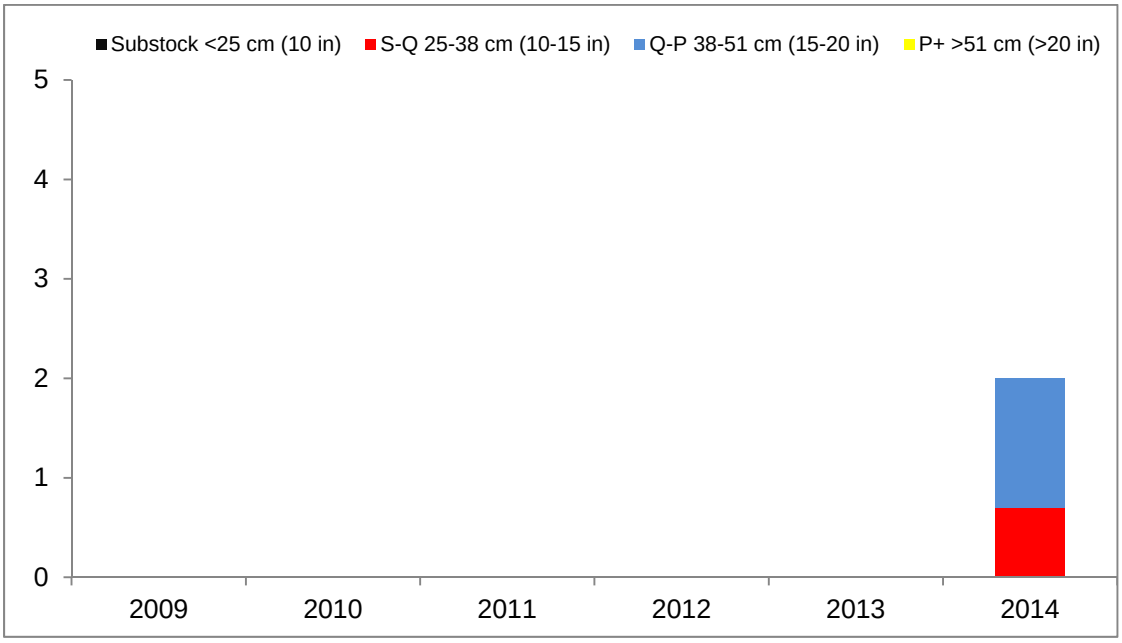

Figure 2. CPUE by length category for walleye sampled with gill nets in Dimock Lake, Hutchinson County, 2009-2014.

Channel Catfish

Management Objective

- maintain a channel catfish population with a total trap-net CPUE of at least 5

Management Strategy

- stock juvenile catfish at the rate of 10/acre (1,480) as needed to achieve the management objective

Trap-net CPUE for channel catfish declined in 2014 and remains under the management objective (Table 12). There are a few quality fish in the lake (Figure 3), but their abundance is probably too low to provide any reasonable fishing opportunity.

Table 12. CPUE, PSD, RSD-P, and mean Wr for all channel catfish sampled with trap nets in Dimock Lake, Hutchinson County, 2005-2014. Stocked years are shaded.

	2005	***2006***	***2007***	***2008***	***2009***	***2010***	***2011***	***2012***	***2013***	***2014***
CPUE		6.9		0.1		--	1.4		2.6	1.3
PSD		35		--		--	--		0	--
RSD-P		0		--		--	--		0	--
Mean Wr		88		--		--	--		72	--

Table 13. Channel catfish stocked into Dimock Lake, Hutchinson County, 2005-2014.

Year	***Number***	***Size***
2005	174	Adult
2006	150	Adult
2011	81	Adult

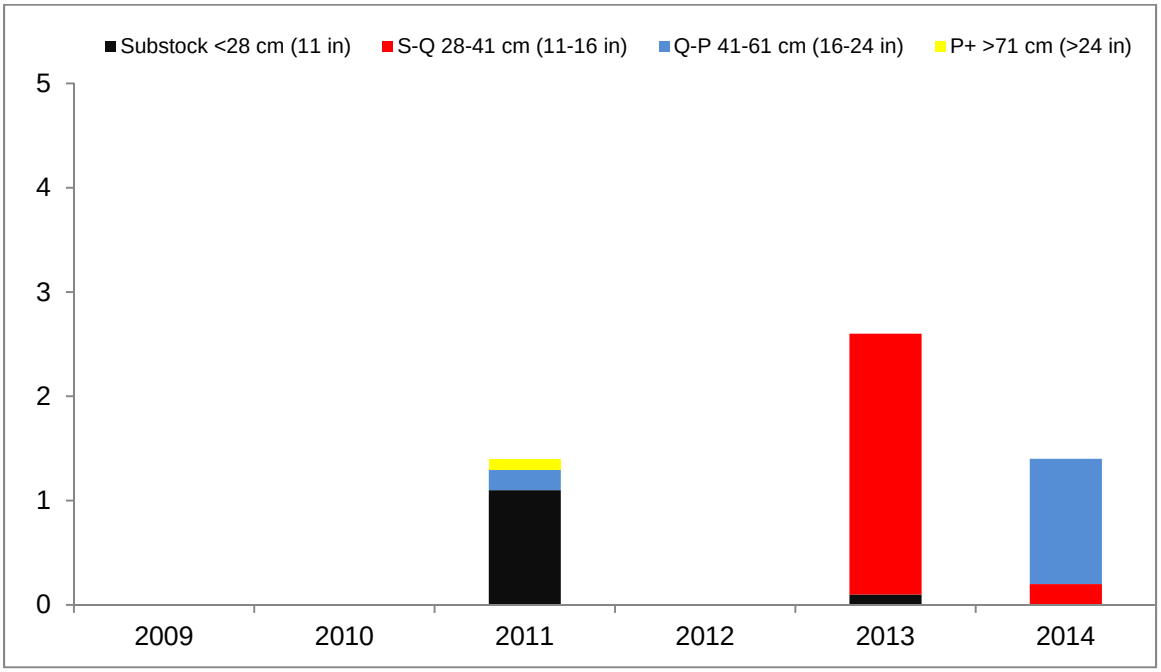

Figure 3. CPUE by length category for channel catfish sampled with trap nets in Dimock Lake, Hutchinson County, 2009-2014.

Black Crappie

Management Objective

- maintain a black crappie population with at total trap-net CPUE of at least 20 and a PSD of least 40

Management Strategies

- stock black crappie fingerlings at the rate of 500/acre (74,000) as needed to achieve the management objective
- stock adult gizzard shad in an attempt to improve forage abundance and survival of game fish populations

Since the 2007 winterkill, black crappie trap-net CPUE has not increased to the levels measured in the late 1990s and early 2000s (Table 14). Due to a history of good black crappie abundance and population size structure, Dimock may be a good candidate for fingerling stocking if they can be obtained.

Table 14. CPUE, PSD, RSD-P, and mean Wr for all black crappies sampled with trap nets in Dimock Lake, Hutchinson County, 2005-2014. Stocked years are shaded.

	2005	***2006***	***2007***	***2008***	***2009***	***2010***	***2011***	***2012***	***2013***	***2014***
CPUE		38.8		8.9		0.9	1.3		0.4	2.0
PSD		13		64		--	15		--	70
RSD-P		0		36		--	0		--	10
Mean Wr		93		116		--	92		--	122

Table 15. Black crappies stocked into Dimock Lake, Hutchinson County, 2005-2014.

Year	***Number***	***Size***
2007	750	Adult
2013	70	Juvenile

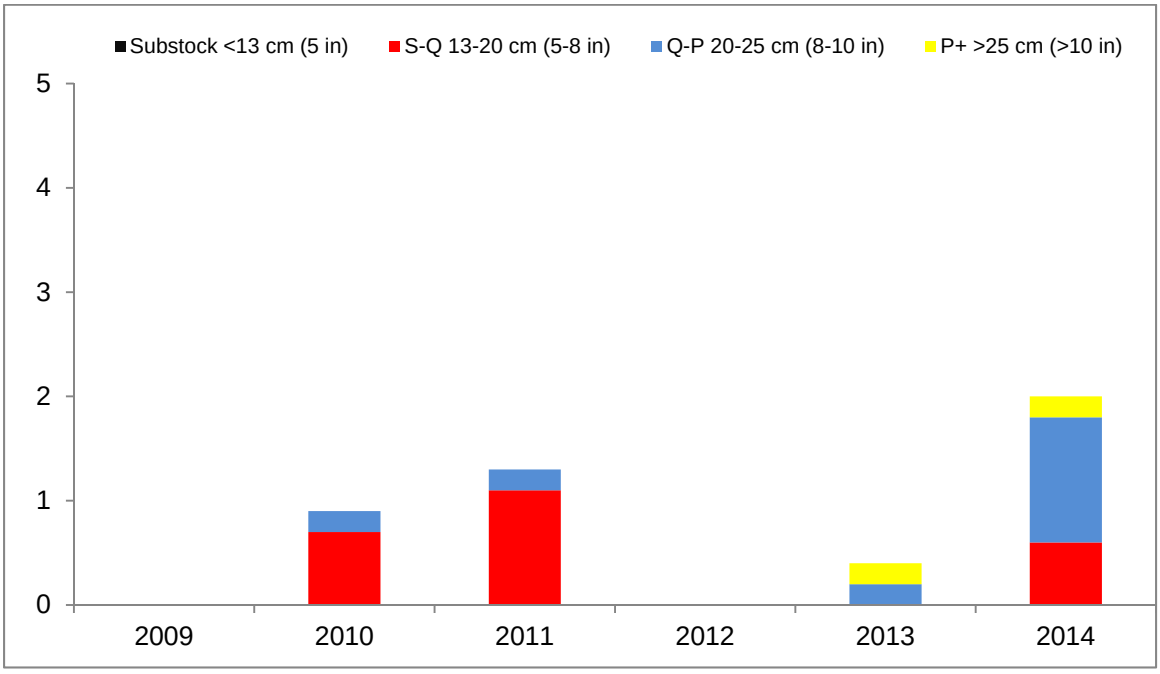

Figure 4. CPUE by length category for black crappie sampled with trap nets in Dimock Lake, Hutchinson County, 2009-2014.

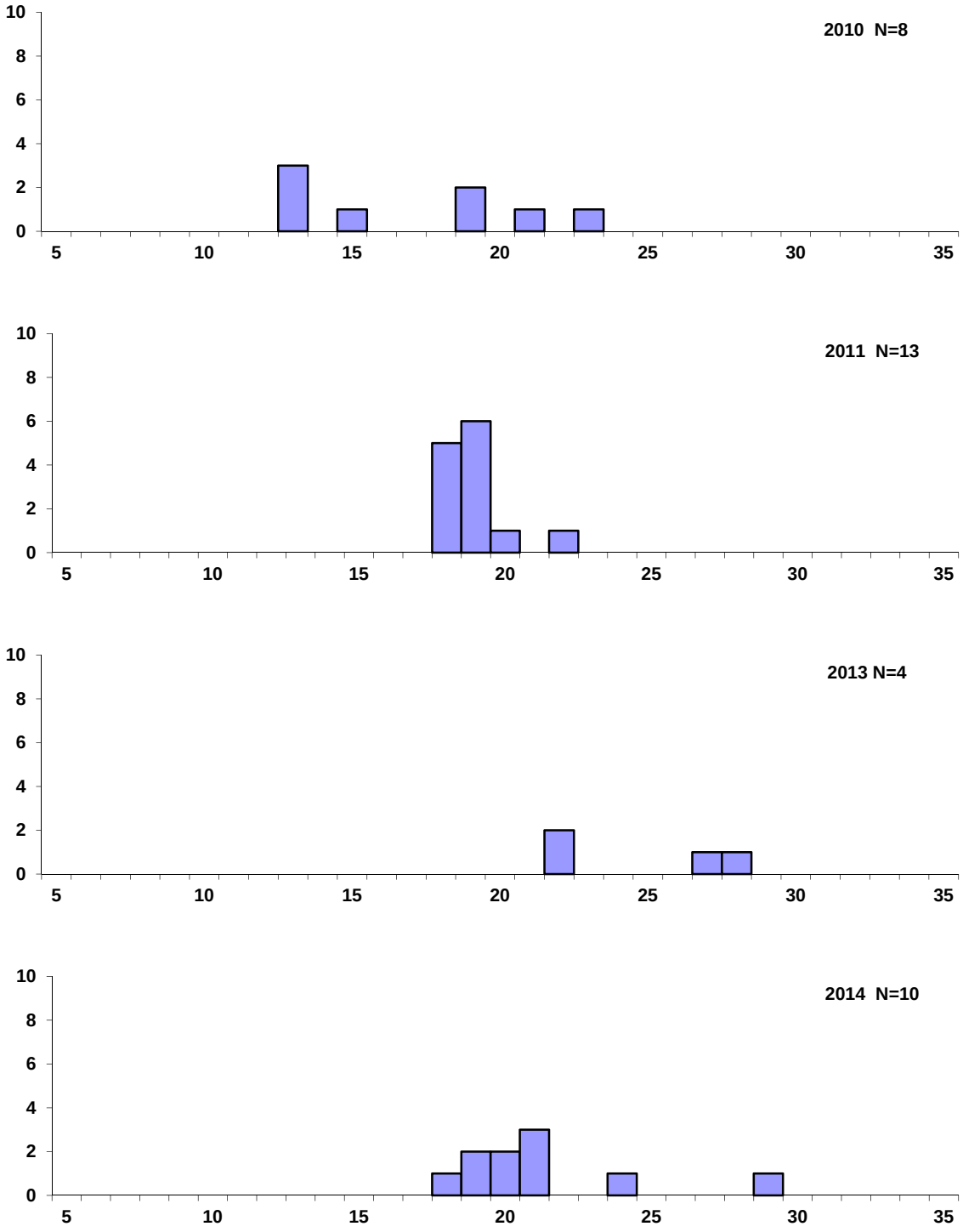

Figure 5. Length frequency histograms for black crappie sampled with trap nets in Dimock Lake, Hutchinson County, 2010, 2011, 2013 and 2014.

Yellow Perch

Management Objective

- maintain a yellow perch population with a total gill-net CPUE of at least 10

Management Strategy

- stock yellow perch fingerlings at the rate of 500/acre (74,000) as needed to achieve the management objective

The 2011 and 2013 stockings (Table 17) were likely responsible for producing the population currently present in the lake (Figure 6). Additional stockings of small fingerlings should be made in an attempt to achieve the management objective.

Table 16. CPUE, PSD, RSD-P, and mean Wr for all yellow perch sampled with gill nets in Dimock Lake, Hutchinson County, 2005-2014. Stocked years are shaded.

	2005	***2006***	***2007***	***2008***	***2009***	***2010***	***2011***	***2012***	***2013***	***2014***
CPUE										4.3
PSD										23
RSD-P										0
Mean Wr										106

Table 17. Yellow perch stocked into Dimock Lake, Hutchinson County, 2005-2014.

Year	***Number***	***Size***
2011	319	Adult
2013	2,600	Juvenile

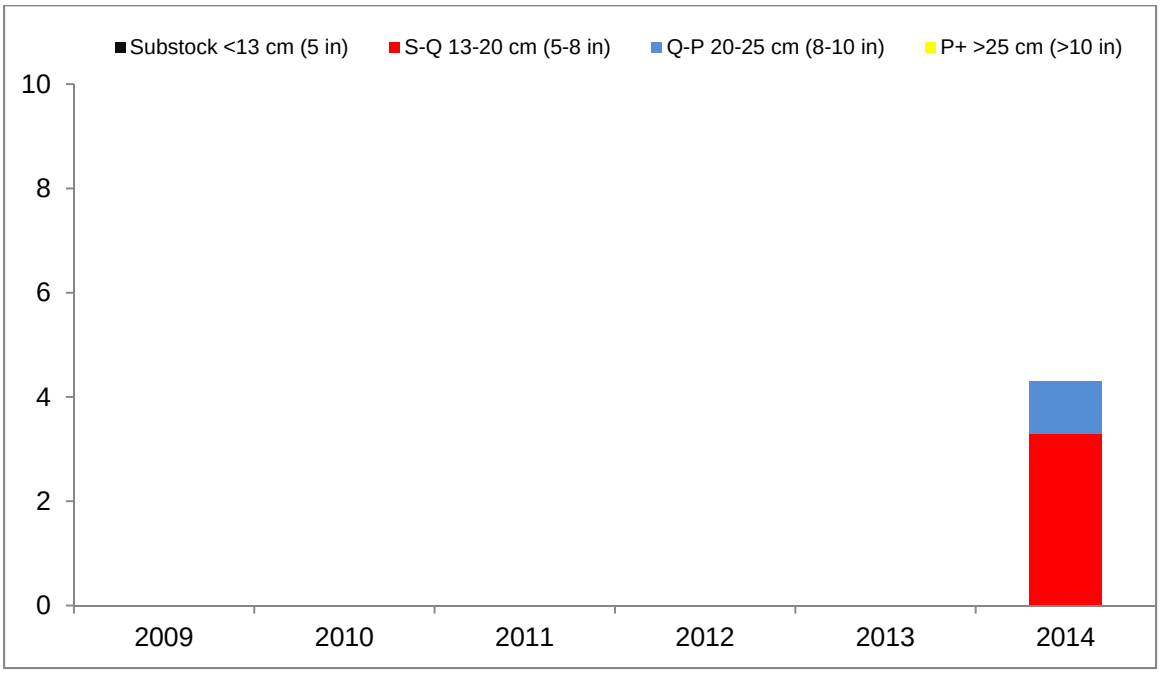

Figure 6. CPUE by length category for yellow perch sampled with gill nets in Dimock Lake, Hutchinson County, 2009-2014.

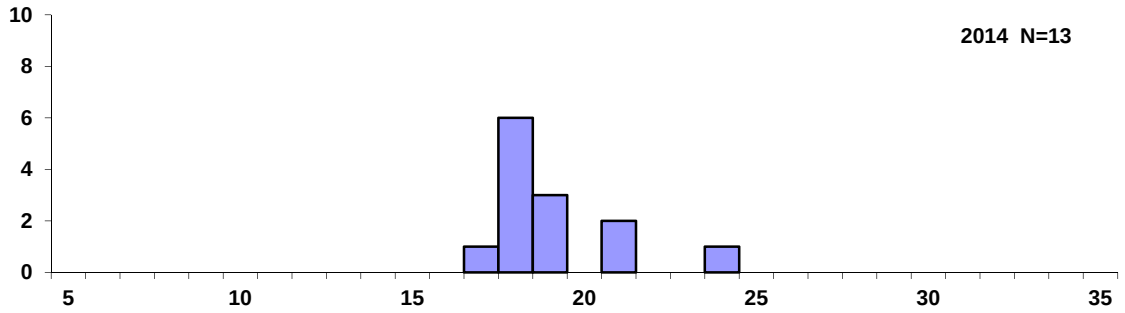

Figure 7. Length frequency histogram for yellow perch sampled with gill nets in Dimock Lake, Hutchinson County, 2014.

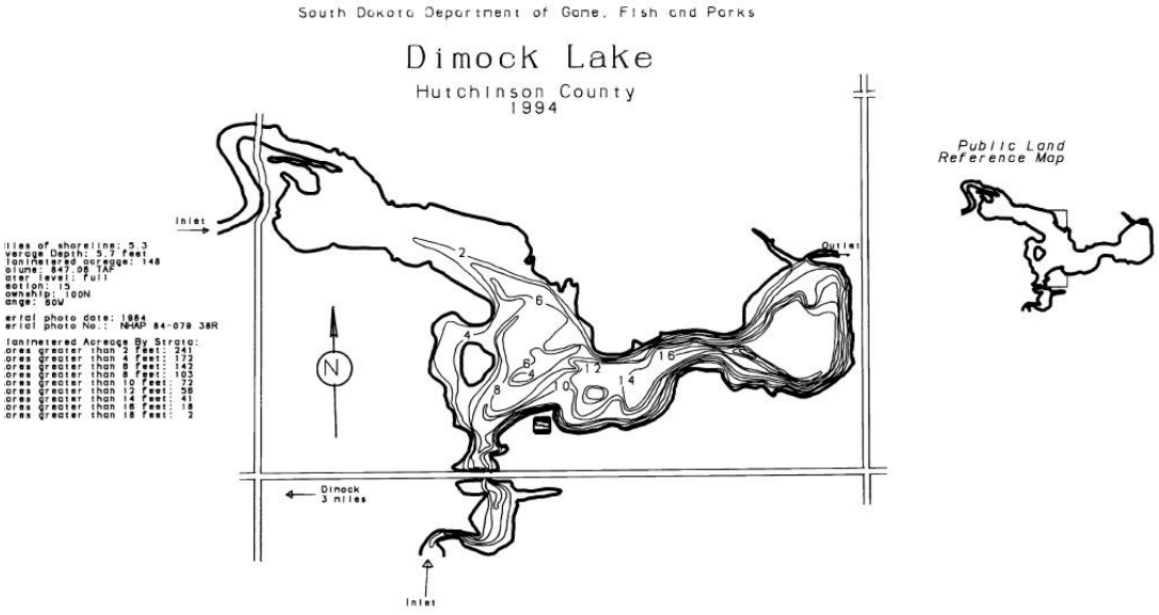

Figure 8. Contour map of Dimock Lake, Hutchinson County.

Appendix A. A brief explanation of catch per unit effort (CPUE), proportional stock density (PSD), relative stock density (RSD) and relative weight (Wr).

Catch Per Unit Effort (CPUE) is the catch of animals in numbers or in weight taken by a defined period of effort. Can refer to trap-net nights of effort, gill-net nights of effort, catch per hour of electrofishing, etc.

Proportional Stock Density (PSD) is calculated by the following formula:

$$PSD = \frac{\text{Number of fish} > \text{quality length}}{\text{Number of fish} \geq \text{stock length}} \times 100$$

Relative Stock Density (RSD-P) is calculated by the following formula:

$$RSD\text{-}P = \frac{\text{Number of fish} > \text{preferred length}}{\text{Number of fish} \geq \text{stock length}} \times 100$$

PSD and RSD-P are unitless and usually calculated to the nearest whole digit.

Size categories for selected species found in Region 3 lake surveys, in centimeters (inches in parenthesis).

Species	Stock	Quality	Preferred	Memorable	Trophy
Walleye	25 (10)	38 (15)	51 (20)	63 (25)	76 (30)
Yellow perch	13 (5)	20 (8)	25 (10)	30 (12)	38 (15)
Black crappie	13 (5)	20 (8)	25(10)	30 (12)	38 (15)
White crappie	13 (5)	20 (8)	25(10)	30 (12)	38 (15)
Bluegill	8 (3)	15 (6)	20 (8)	25 (10)	30 (12)
Largemouth bass	20 (8)	30 (12)	38 (15)	51 (20)	63 (25)
Smallmouth bass	18 (7)	28 (11)	35(14)	43 (17)	51 (20)
Northern pike	35 (14)	53 (21)	71 (28)	86 (34)	112 (44)
Channel catfish	28 (11)	41 (16)	61 (24)	71 (28)	91 (36)
Black bullhead	15 (6)	23 (9)	30 (12)	38 (15)	46 (18)
Common carp	28 (11)	41 (16)	53 (21)	66 (26)	84 (33)
Bigmouth buffalo	28 (11)	41 (16)	53 (21)	66 (26)	84 (33)

For most fish, 30-60 or 40-70 are typical objective ranges for “balanced” populations. Values less than the objective range indicate a population dominated by small fish while values greater than the objective range indicate a population comprised mainly of large fish.

Relative weight (Wr) is a condition index that quantifies fish condition (i.e., how much does a fish weigh for its length). A Wr range of 90-100 is a typical objective for most fish species. When mean Wr values are well below 100 for a size group, problems may exist in food and feeding relationships. When mean Wr values are well above 100 for a size group, fish may not be making the best use of available prey.