

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

2102-F21-R-48

Name: Little White River Project

County: Bennett

Legal description: Sec 14 and 23, T 37N, R 36W

Location from nearest town: 2.5 mi W of Tuthill, SD

Dates of present survey: July 20-22, 28, October 6, 2015

Date last surveyed: July 1-2, 28, 2014

Management classification: Warmwater permanent

Primary Species: (game and forage)

1. Black bullhead
2. Black crappie
3. Northern pike
4. Walleye
5. Yellow perch
6. Gizzard shad

Secondary and other species:

1. Channel catfish
2. Common carp
3. White sucker
4. Shorthead redhorse
5. Tadpole madtom
6. Largemouth bass

PHYSICAL CHARACTERISTICS

Surface Area: 111 acres

Watershed: 130,000 acres

Maximum depth: 9 feet

Mean depth: 4 feet

Lake elevation at survey (from known benchmark): -2 feet below spillway

Ownership of lake and adjacent lakeshore property:

The land surrounding the Little White River Project is owned by the South Dakota Department of Game, Fish and Parks and the US Fish and Wildlife Service. The area is managed as a Game Production Area and a recreation area.

Fishing Access

Fishing access at Little White River Project is fairly good for shore and boat anglers alike. Two boat ramps are available, although neither drop-off quickly and can pose difficulty launching. The newly installed concrete ramp (on the south side of the dam) receives heavy wind and wave action at times and is usually covered with large amounts of sand and sediment making the ramp even shallower. Cattails cover a substantial portion of the shoreline limiting fishing access for shore anglers, but open areas still exist for shore angling. Shore angling access is best along the dam grade which contains some of the deepest water in this shallow lake.

Observations of Water Quality and Aquatic Vegetative:

Sedimentation and consequently high turbidity occurs due to agricultural run off. No other pollution problems were identified by departmental personnel during the 2015 survey. Cattails surround much of the lake especially on the east and west shoreline. Turbid water keeps submergent vegetation to a minimum.

Observations on condition of structures (i.e. spillway, boat ramps and docks, roads, etc)

The lake was drained in 2006-2007 and a new dam, road and boat ramp constructed. These structures appear in excellent condition at this time. Wind and wave action do cover the boat ramp with sand and silt, reducing the grade and depth of the ramp.

BIOLOGICAL DATA

Sampling Effort and Catch

Age-0 Fish Survey

Daytime boat electrofishing was used on July 28, 2015 to index gizzard shad reproduction. Electrofishing was done using a boat mounted Smith-Root unit with pulsed-DC. Sampling consisted of five stations totaling 0.42 hours of electrofishing. A total of 595 young of year gizzard shad were collected (Table 1). No other age-0 fish were collected during this survey.

Procedure for sampling age-0 gizzard shad consists of five 10 minute sampling stations unless age-0 gizzard shad are collected within the first five minutes, then sampling is discontinued after five minutes of collection effort has been completed. All five sites produced age-0 gizzard shad within the first five minutes and total sampling effort was 1,500 sec (0.42 hr; Table 1). Collection at all five sites indicates good reproduction occurred, and age-0 shad are located throughout the reservoir. Electrofishing will be completed annually for the next few years to determine if stocking gizzard shad continues to produce a forage source.

Table 1. Site number, number collected per site (No./Site), pedal time, and estimated number per hour of gizzard shad sampled using daytime electrofishing from Little White River Project, July 23, 2015.

Site	No./Site	Time (sec)	No./hr
1	84	300	1008
2	274	300	3288
3	17	300	204
4	160	300	1920
5	60	300	720
Total	595	0.42hr	1428

Adult Fish survey

Trap nets and experimental gill nets were used on July 20-22, 2015 to sample adult fish populations in the reservoir (Figure 1). The net sampling consisted of eight trap net nights and two gill net nights and catch data is displayed in Tables 2 and 3. Discussion on selected fish species follows and completes this report.

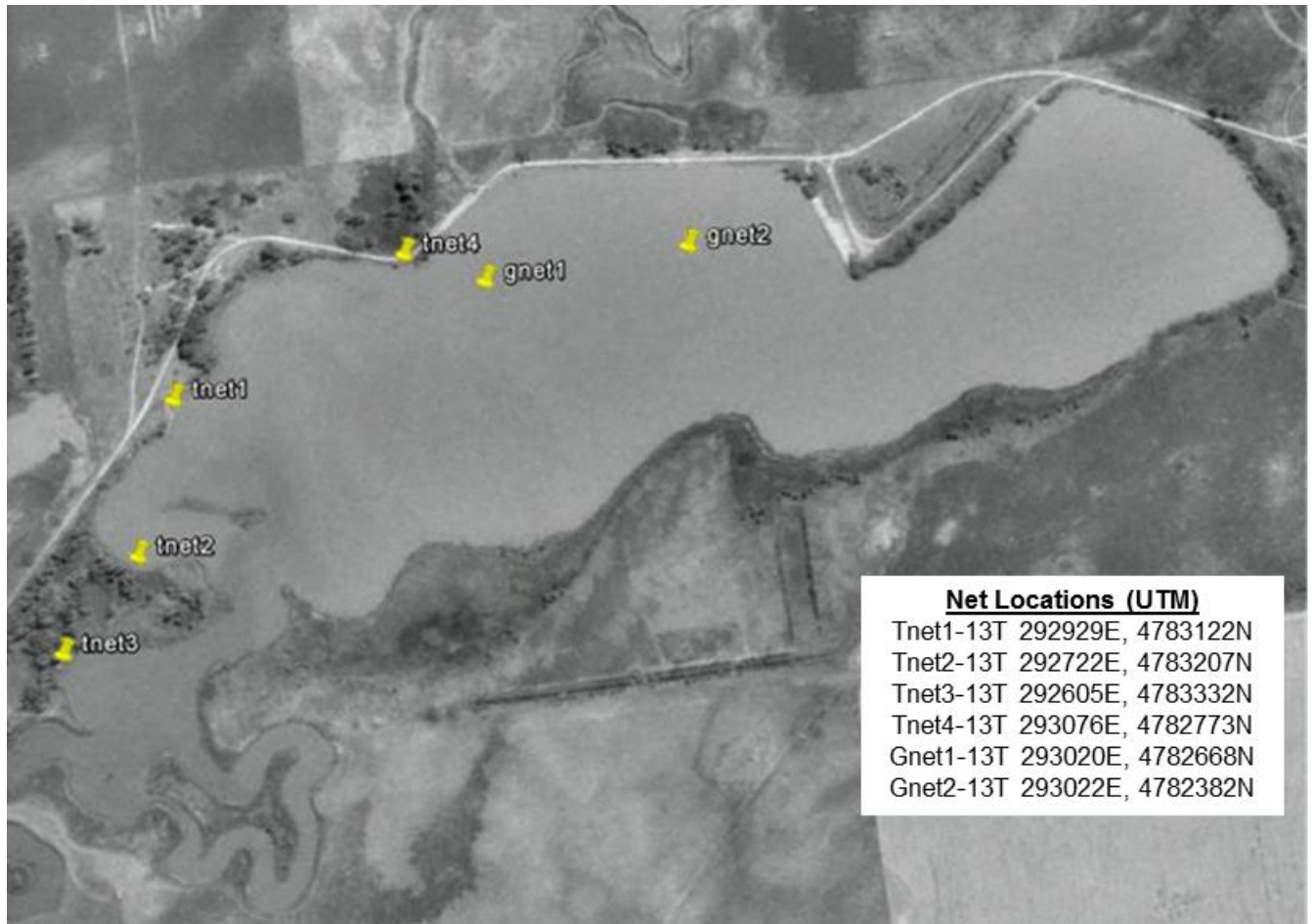


Figure 1. Trap and experimental gill net locations, with GPS coordinates, from the fisheries population survey of Little White River Project, Bennett County, 2015.

Table 2. Catch data from all species collected in six trap nets in Little White River Project, Bennett County, July 20-22, 2015. CPUE's with 80% confidence intervals in parentheses. PSD, PSD-P and *Wr* with 90% confidence intervals in parentheses.

Species	N	CPUE	CPUE-S	PSD	PSD-P	<i>Wr</i> >S
Black bullhead	44	7.3 (4.0)	6.9 (4.0)	10 (6)	0	87.8 (1.5)
Black crappie	345	57.5 (20.6)	24.0 (10.3)	66 (6)	43 (7)	97.7 (1.0)
Bluegill	3	0.4 (0.5)	0.4 (0.5)	--	--	121.9 (3.9)
Channel catfish	1	0.2 (0.2)	0.2 (0.2)	--	--	123.4 (--)
Common carp	3	0.4 (0.3)	0.2 (0.2)	--	--	82.6 (--)
Gizzard shad	2	0.3 (0.5)	0.3 (0.5)	--	--	98.0 (--)
Largemouth bass	2	0.3 (0.5)	0.3 (0.5)	--	--	117.1 (--)
Northern pike	9	1.4 (0.9)	1.3 (0.7)	67 (31)	11 (21)	90.3 (4.0)
Shorthead redhorse	8	1.3 (1.0)	1.3 (1.0)	--	--	90.3 (2.1)
Walleye	1	0.2 (0.2)	0.2 (0.2)	--	--	96.4 (--)
Yellow perch	1	0.2 (0.2)	0.2 (0.2)	--	--	91.7 (--)

Table 3. Catch data from species collected in two gill nets in Little White River Project, Bennett County, July 20-22, 2015. CPUE with 80%, and PSD, PSD-P and Wr with 90% confidence intervals in parentheses.

Species	N	CPUE	CPUE-S	PSD	PSD-P	$Wr > S$
Black bullhead	223	111.5 (44.6)	111.5 (44.6)	20 (5)	0 (--)	91.4 (1.6)
Black crappie	10	5.0 (9.2)	4.0 (6.2)	75 (31)	50 (36)	102.9 (6.3)
Channel catfish	18	9.0 (0.0)	7.5 (4.6)	40 (23)	20 (19)	99.7 (3.9)
Common carp	9	4.5 (10.8)	4.5 (10.8)	--	--	86.3 (3.5)
Gizzard shad	6	3.0 (6.2)	2.0 (6.2)	--	--	104.9 (--)
Golden shiner	1	0.5 (1.5)	0.5 (1.5)	--	--	--
Northern pike	1	0.5 (1.5)	0.5 (1.5)	--	--	91.4 (--)
Walleye	12	6.0 (6.2)	6.0 (6.2)	17 (20)	8 (15)	94.9 (1.6)
Yellow perch	3	1.5 (1.5)	1.5 (1.5)	--	--	93.6 (8.5)

Table 4. Catch data for largemouth bass collected from 60 minutes of daytime electrofishing in Little White River Project, Bennett County, October 6, 2015. CPUE's with 80% confidence intervals in parentheses. PSD, PSD-P and $Wr \geq S$ values with 90% confidence intervals in parentheses

Species	N	CPUE	CPUE-S	PSD	PSD-P	$Wr \geq S$
Largemouth bass	22	22.0 (9.9)	18.0 (11.0)	72 (19)	22 (18)	110.1 (2.0)

Black bullhead

Little White River Project continues to have a moderate density black bullhead population. Trap net CPUE was 7.3 (Table 2 and 5), compared to 17.4 in 2014. Gill nets show the opposite trend with a CPUE of 111.5, compared to 11.5 last year. Size structure shows a population dominated by small fish with a PSD of 10. Length frequencies show a size structure very similar to last year's survey, indicating slow growth (Figure 2).

Table 5. Composite listing of data for black bullhead collected by trap nets in Little White River Project, 2009, 2011, 2013-2015. CPUE's with 80% confidence intervals in parentheses. PSD, PSD-P and Wr with 90% confidence intervals in parentheses.

Year	N	CPUE	CPUE-S	PSD	PSD-P	$Wr \geq S$
2009	251	62.8 (31.0)	11.8 (5.8)	0 (--)	0 (--)	--
2011	185	30.8 (23.7)	23.3 (17.1)	2 (2)	1 (1)	81.9 (1.4)
2013	106	15.1 (7.7)	9.1 (3.5)	2 (2)	0	83.5 (1.9)
2014	139	17.4 (7.9)	16.8 (7.8)	3 (2)	0	83.5 (1.6)
2015	44	7.3 (4.0)	6.9 (4.0)	10 (6)	0	87.8 (1.5)

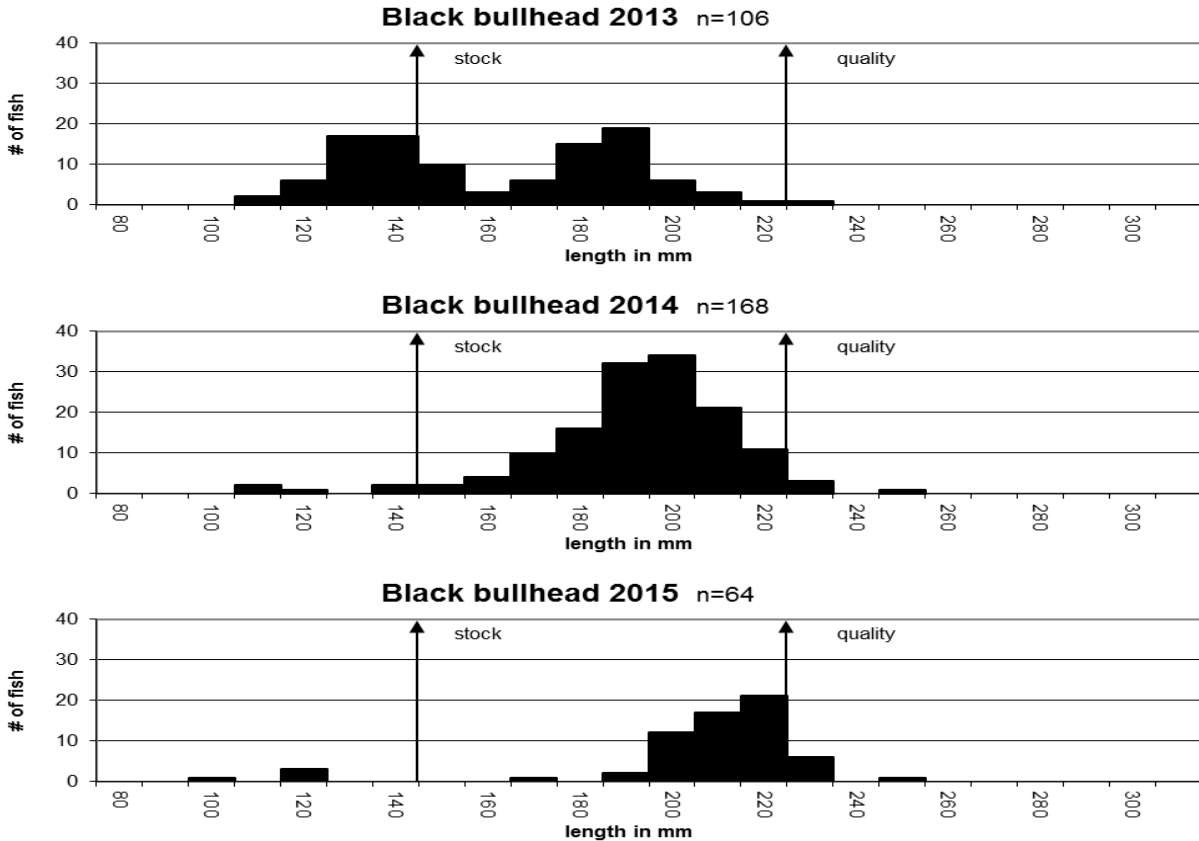


Figure 2. Length frequency histograms of black bullhead from trap nets at Little White River Project, Bennett County, 2013-2015.

Black crappie

Three-hundred-eighty-five black crappie were stocked in 2008 to re-establish the species after the lake refilled. Black crappie density has steadily increased with a CPUE of 57.5 from trap nets in 2015 (Table 2 and 6). Size structure indicates a balanced population with a PSD of 66 and a PSD-P of 43. The length frequency histogram also resembles a balanced population with good recruitment (Figure 3). Black crappie condition was excellent with a *Wr* for stock length and larger of 97.7. Growth was excellent with black crappie reaching 10 inches at age 5 (Table 7).

Table 6. Composite listing of data for black crappie collected by trap nets in Little White River Project, Bennett County, 2009, 2011, 2013-2015. CPUE's with 80% confidence intervals in parentheses. PSD, PSD-P and *Wr* with 90% confidence intervals in parentheses.

Year	N	CPUE	CPUE-S	PSD	PSD-P	<i>Wr</i> ≥S
2009	11	2.8 (2.4)	2.3 (1.6)	33 (31)	33 (31)	--
2011	72	12.0 (8.3)	9.8 (5.4)	7 (6)	0 (--)	110.2 (0.9)
2013	121	17.3 (5.0)	14.9 (4.9)	53 (8)	4 (3)	104.8 (1.3)
2014	138	17.3 (2.8)	11.0 (3.3)	59 (9)	20 (8)	93.1 (0.2)
2015	345	57.5 (20.6)	24.0 (10.3)	66 (6)	43 (7)	97.7 (1.0)

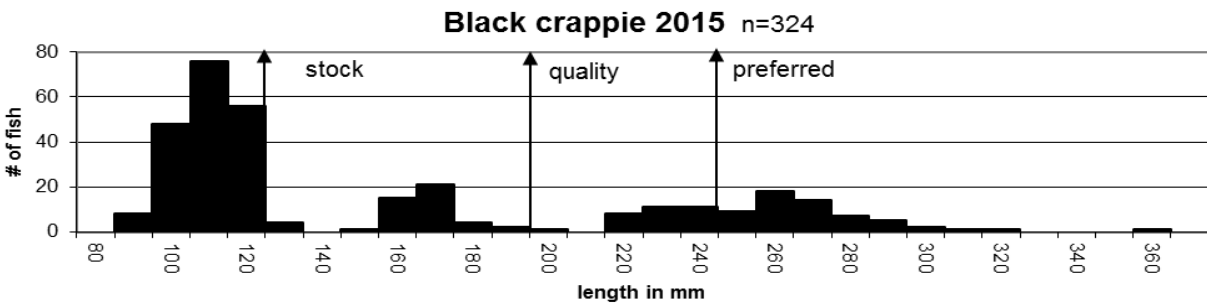
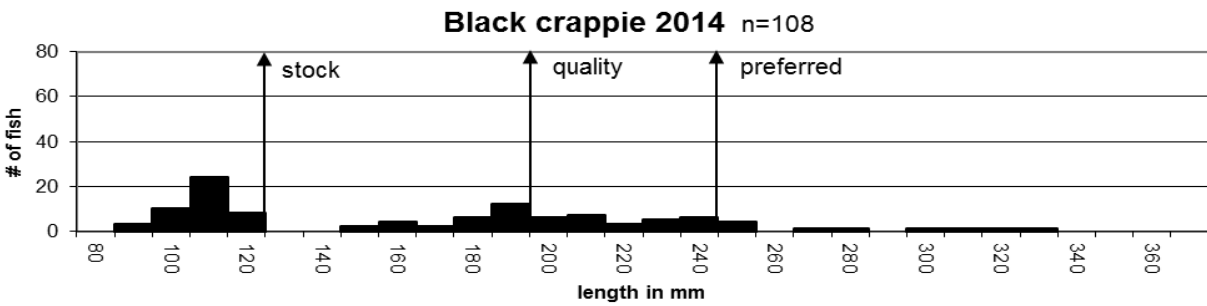
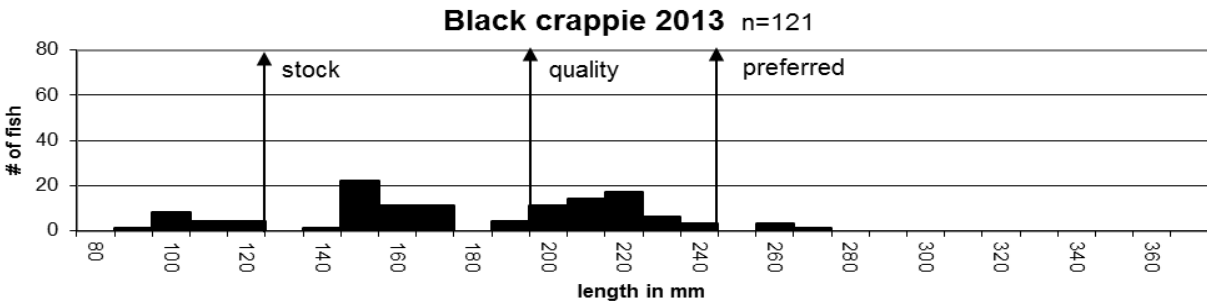
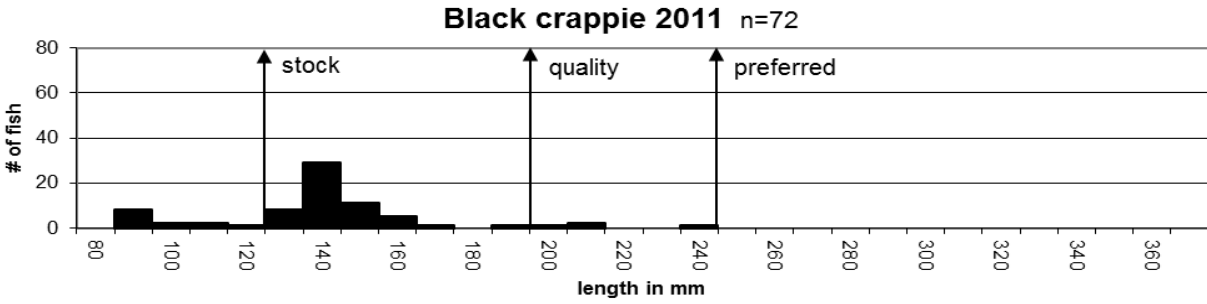
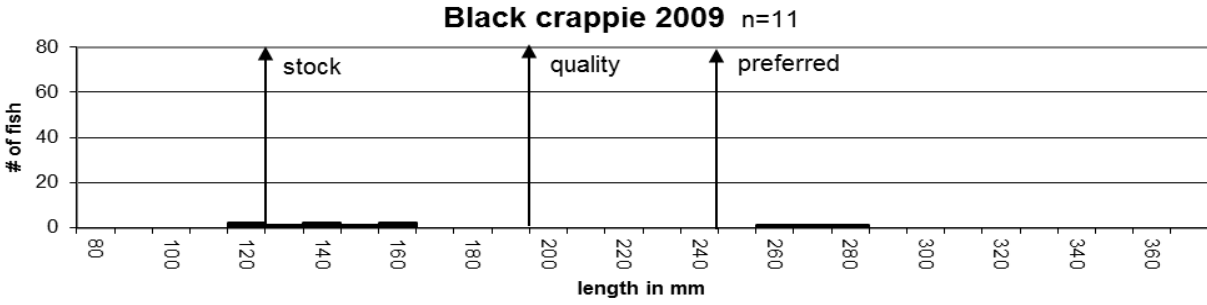


Figure 3. Length frequency histograms of black crappie from trap nets at Little White River Project, Bennett County, 2009, 2011, 2013-2015.

Table 7. Little White River, Bennett County, black crappie year class, age in 2015, sample size (N), mean back-calculated total length-at-age, the Region 1 mean length-at-age, and the South Dakota state-wide black crappie mean length-at-age (Willis et al 2001). Standard errors are in parentheses.

Year Class	Age	N	1	2	3	4	5	6
2014	1	236	73					
2013	2	55	73	129				
2012	3	4	82	130	185			
2011	4	43	79	129	187	224		
2010	5	6	77	147	206	231	256	
2009	6	47	69	132	182	213	245	270
2015 Pop. mean (SE)		391	75 (2)	133 (3)	190 (6)	223 (5)	251 (5)	270 (0)
Region 1			74 (3)	122 (7)	158 (9)	197 (13)	217 (16)	
South Dakota			83 (2)	147 (4)	195 (5)	229 (6)	249 (6)	

Largemouth bass

Daytime electrofishing was completed on October 6, 2015. This was the first largemouth bass sampling completed since the lake refilled in 2008. Twenty-two largemouth bass were sampled in one hour of electrofishing (Table 4). Stock density indicated a balanced population with a PSD of 72 and an RSD-P of 22. Fish condition was excellent with a *Wr* for stock length and larger fish of 110.1. The last fingerling stockings were in 2012, indicating natural reproduction is occurring as the age data shows year classes hatched in 2013 and 2014 (Figure 4). Growth was excellent with age 3 largemouth bass exceeding the statewide average (Table 8).

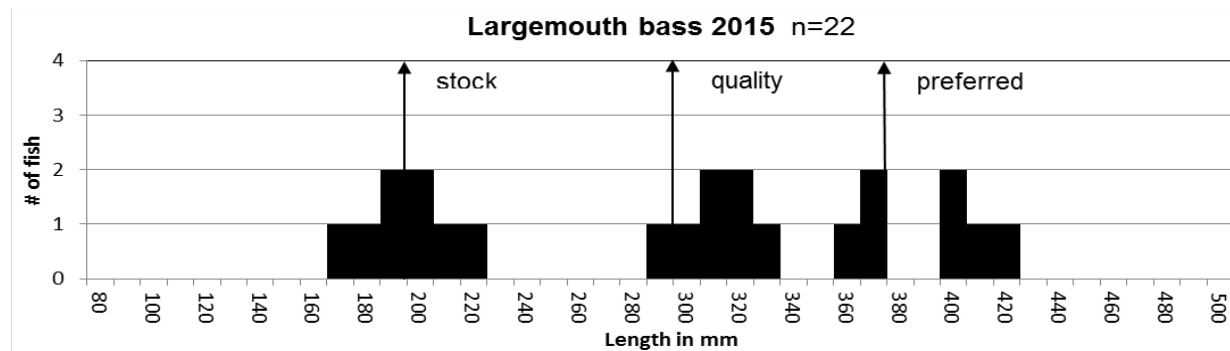


Figure 4. Length frequency histogram of largemouth bass from daytime electrofishing at Little White River Project, Bennett County, October 6, 2015.

Table 8. Little White River, Bennett County, largemouth bass year class, age in 2015, sample size (N), mean back-calculated total length-at-age, the Region 1 mean length-at-age, and the South Dakota state-wide largemouth bass mean length-at-age (Willis et al 2001). Standard errors are in parentheses.

Year Class	Age	N	1	2	3	4
2014	1	8	90			
2013	2	6	102	202		
2012	3	5	98	236	320	
2011	4	3	92	188	280	370
2015 Pop. mean (SE)		22	96 (3)	209 (14)	300 (20)	370 (0)
Region 1			78 (4)	154 (10)	214 (11)	272 (13)
South Dakota			96 (3)	182 (6)	250 (7)	305 (8)

Northern pike

Northern pike density remains low to moderate with a trap net CPUE of 1.4 (Table 2). Stock density shows a balanced population with a PSD of 67 and a PSD-P of 11. The length frequency histograms also show balance with a large size distribution of northern pike (Figure 5).

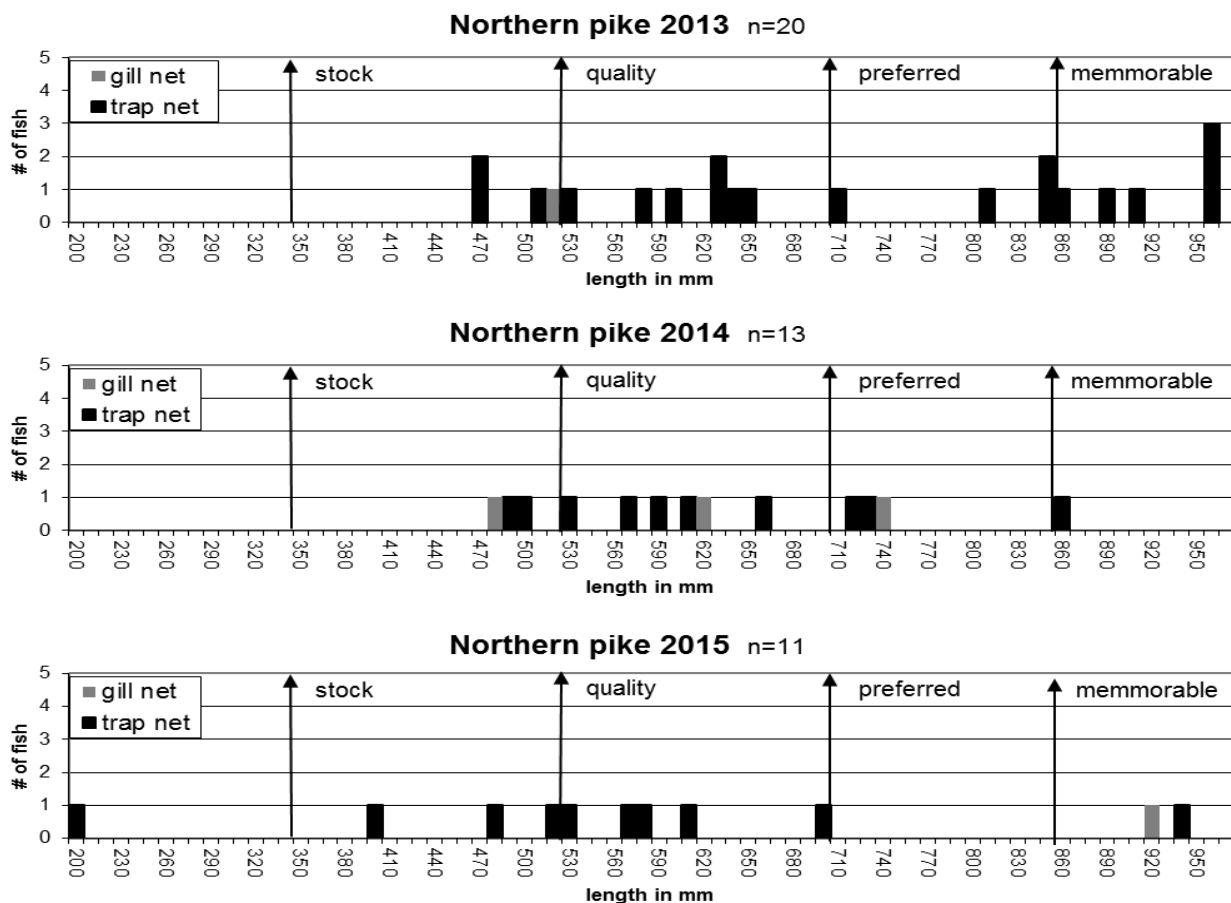


Figure 5. Length frequencies of northern pike from trap nets and gill nets at Little White River Project, Bennett County, 2013-2015.

Walleye

Walleye abundance remains low, but higher than recent years, with a gill net CPUE of 6.0 (Table 3). In 2014, CPUE was 5.5. In 2013, it was 2.0. Walleye growth was excellent with the average age-2 fish measuring between 14 and 15 inches (Table 9). The length frequency histogram and growth data shows most of the fish present are age-2 (Figure 6). Fish condition was good with a *Wr* for stock length and larger fish of 94.9.

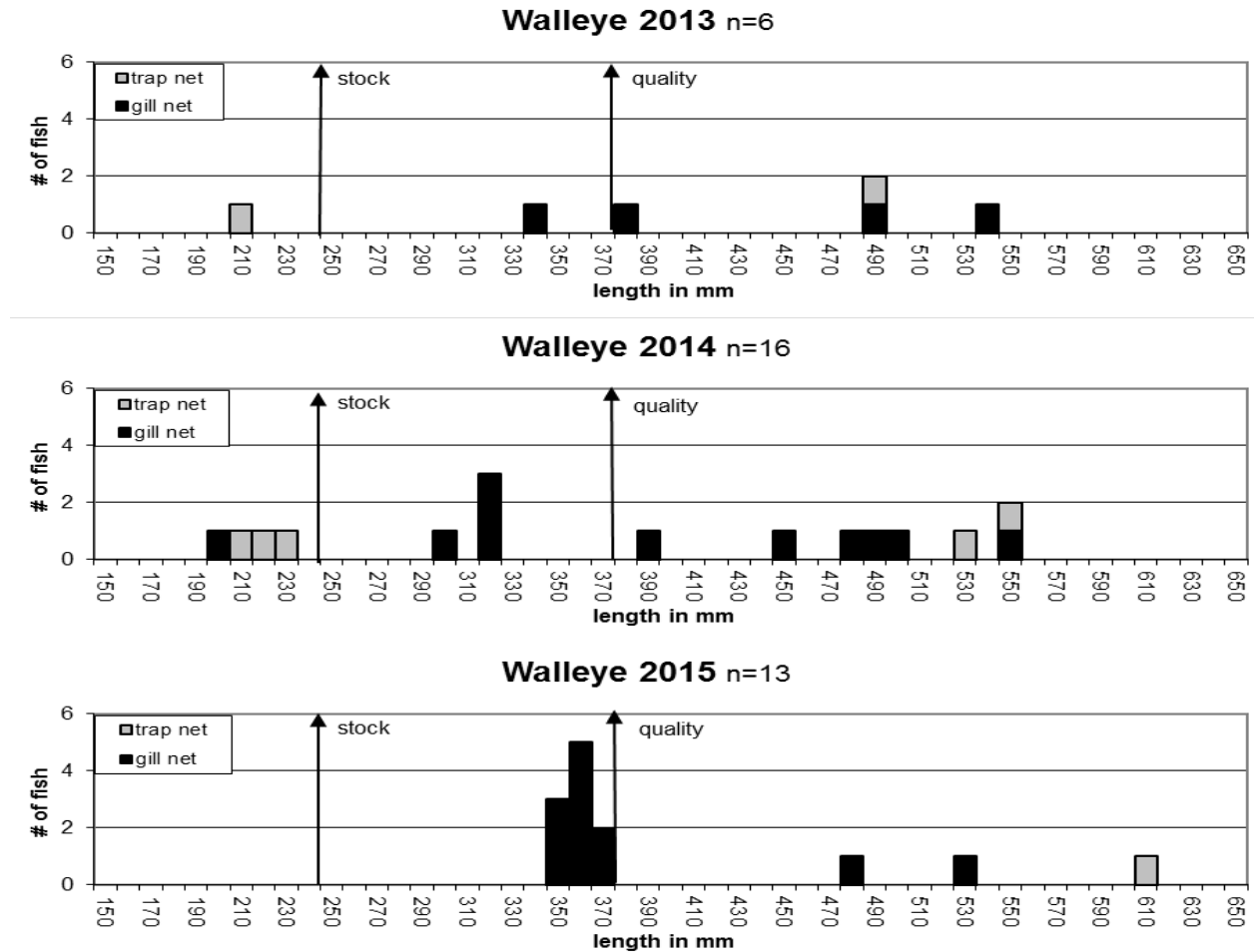


Figure 6. Length frequency histograms for walleye from gill nets and trap nets at Little White River Project, Bennett County 2013-2015.

Table 9. Little White River Project, Bennett County, walleye length range and weighted mean length (mm) at capture by otolith ages from gill net sample, July 20-22, 2015.

Age	Minimum length range @ capture	Weighted mean length @ capture	Maximum length range @ capture	Number of fish in survey
2	351	364	378	10
3	486	486	486	1
7	530	530	530	1

RECOMMENDATIONS

1. Double the stocking rate of small walleye fingerlings in Little White River Project.
2. Keep stocking adult gizzard shad as a forage species for walleye and other game fish in Little White River Project if no survival is observed during spring electrofishing.

LITERATURE CITED

Willis, D.W., D.A. Isermann, M.J. Hubers, B.A. Johnson, W.H. Miller, T.R. St. Sauver, J.S. Sorenson, E.G. Unkenholz, and G.A. Wickstrom. 2001. Growth of South Dakota Fishes: A Statewide Summary with means by region and Water Type. Special Report. South Dakota Department of Game, Fish and Parks. Pierre, South Dakota.

APPENDIX

Appendix A. Stocking record for Little White River Project, Bennett County, 2003-2015.

Year	Number	Species	Size
2003	20,540	Walleye	Fingerling
2004	334	Northern pike	Adult
2008	800	Channel catfish	Adult
	1,710	Yellow perch	Adult
	385	Black crappie	Adult
	420,000	Northern pike	Fry
	20,800	Walleye	Fingerling
	3,000	Largemouth bass	Fingerling
2009	20,000	Largemouth bass	Fingerling
2012	25	Gizzard shad	Adult
	20,304	Walleye	Fingerling
	4,500	Largemouth bass	Fingerling
2013	32	Gizzard shad	Adult
	22,626	Walleye	Fingerling
2014	20,000	Walleye	Fingerling
	30	Gizzard shad	Adult