Mina Lake

Site Description

Location

Water designation number (WDN)	26-0003-00
Legal description	T123N-R66W-Sec.12-14, 23-26
County (ies)	Brown; Edmunds
Location from nearest town	14 miles east of Ipswich, South Dakota

Survey Dates and Sampling Information

Survey dates	July 28-30, 2009 (FN, GN) August 27, 2009 (EF-WAE)
Gill net sets (n)	6
Frame net sets (n)	18
Fall electrofishing (min)	60

Morphometry (Figure 1)

Watershed area (acres)	195,000
Surface area (acres)	806
Maximum depth (ft)	27
Mean depth (ft)	9

Ownership and Public Access

Mina Lake is an impoundment owned by the State of South Dakota and the fishery is managed by the SDGFP. SDGFP manages two access sites on Mina Lake, one within the state park and the other along the southeastern shore near the outlet structure (Figure 3). The Mina Lake shoreline has mixed ownership including the State of South Dakota and private parties.

Watershed and Land Use

Land use within the Mina Lake watershed is primarily agricultural, with approximately 47% being cropland (cultivated and non-cultivated) and 40% being range/pastureland (Smith 2002). Housing and small shelterbelts/farmsteads comprise the remaining portions.

Water Level Observations

SDGFP personnel indicated that Mina Lake was near full pool at the time of the 2009 netting survey.

Aquatic Nuisance Species Monitoring

Plant Survey

Emergent vegetation (e.g., cattails) is limited to upper portions of the impoundment and submersed vegetation is not abundant. Sago pondweed was the only submersed aquatic plant species sampled from Mina Lake during the 2009 survey. No aquatic nuisance plant species were encountered.

Macro-Invertebrate/Mussel Survey

No aquatic nuisance macro-invertebrate or mussel species were sampled in 2009.

Fish Community Survey

Common carp was the only aquatic nuisance fish species captured during the 2009 survey; however, a single rudd was captured during the 2002 survey.

Fish Management Information

Primary species	black crappie, bluegill, channel catfish, walleye,
Other species	black bullhead, common carp, fathead minnow, freshwater drum, golden shiner, green sunfish, largemouth bass, northern pike, orange spotted sunfish, rock bass, shortnose gar, smallmouth bass, hybrid sunfish , white bass, white sucker, yellow perch
Lake-Specific regulations	NE Panfish Management Area: 10 daily; 50 possession Walleye/Saugeye: Minimum length 14” Largemouth Bass: Minimum length 15”
Management classification	warm-water permanent
Fish Consumption Advisories	none

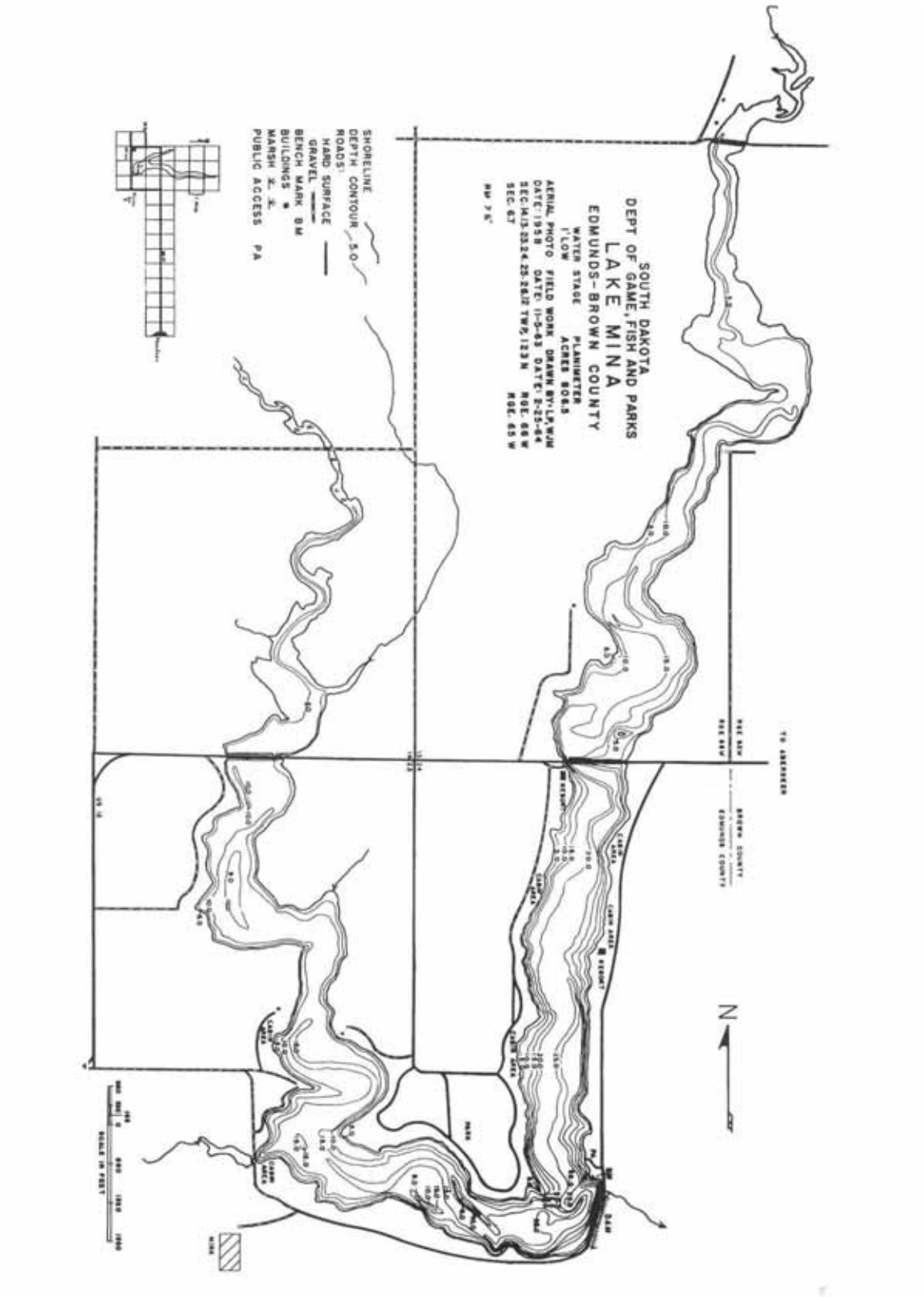

Figure 1. Map depicting depth contours of Mina Lake (Edmunds County), South Dakota.

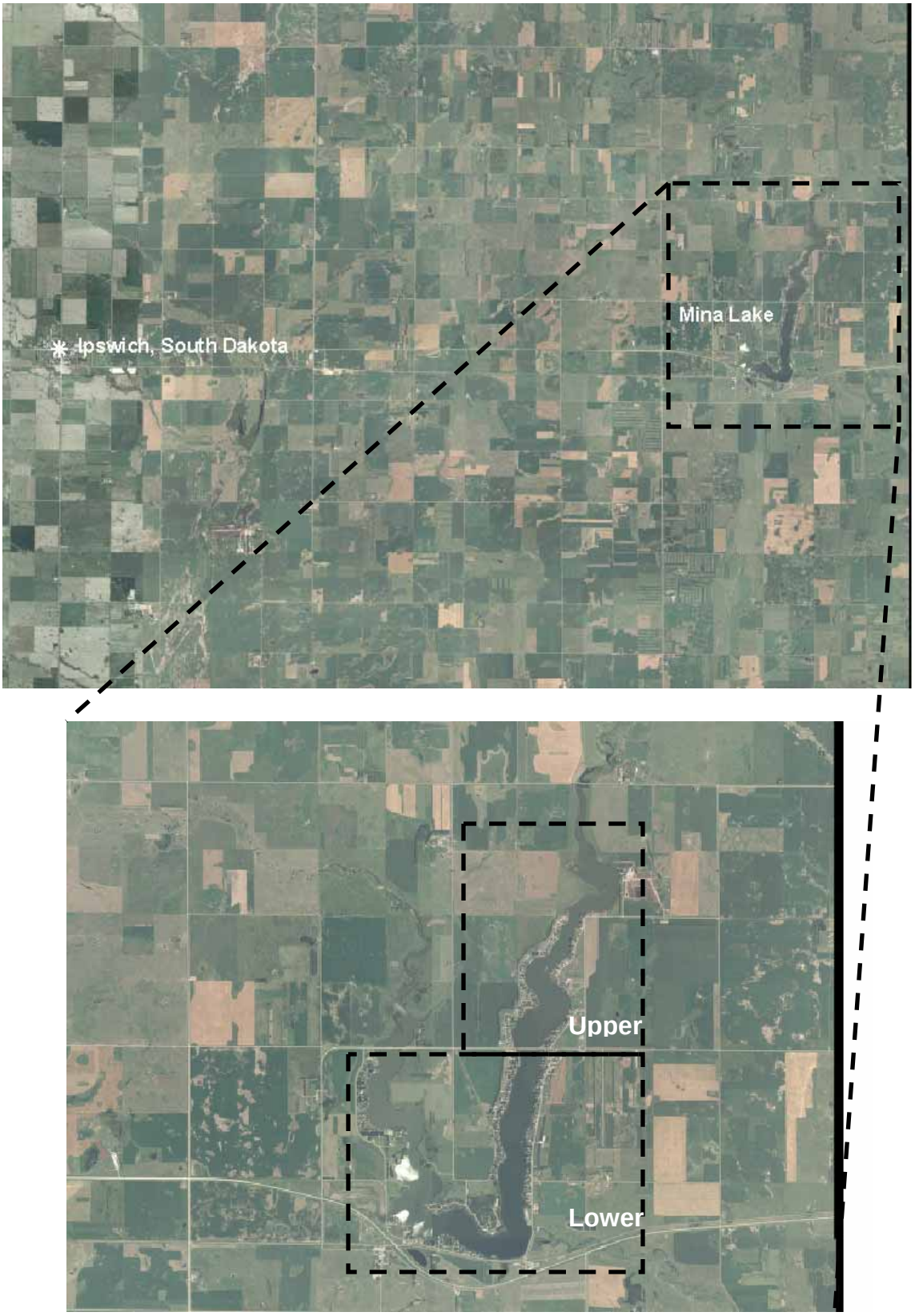

Figure 2. Map depicting location of Mina Lake from Ipswich, Edmunds County, South Dakota and upper and lower divisions.

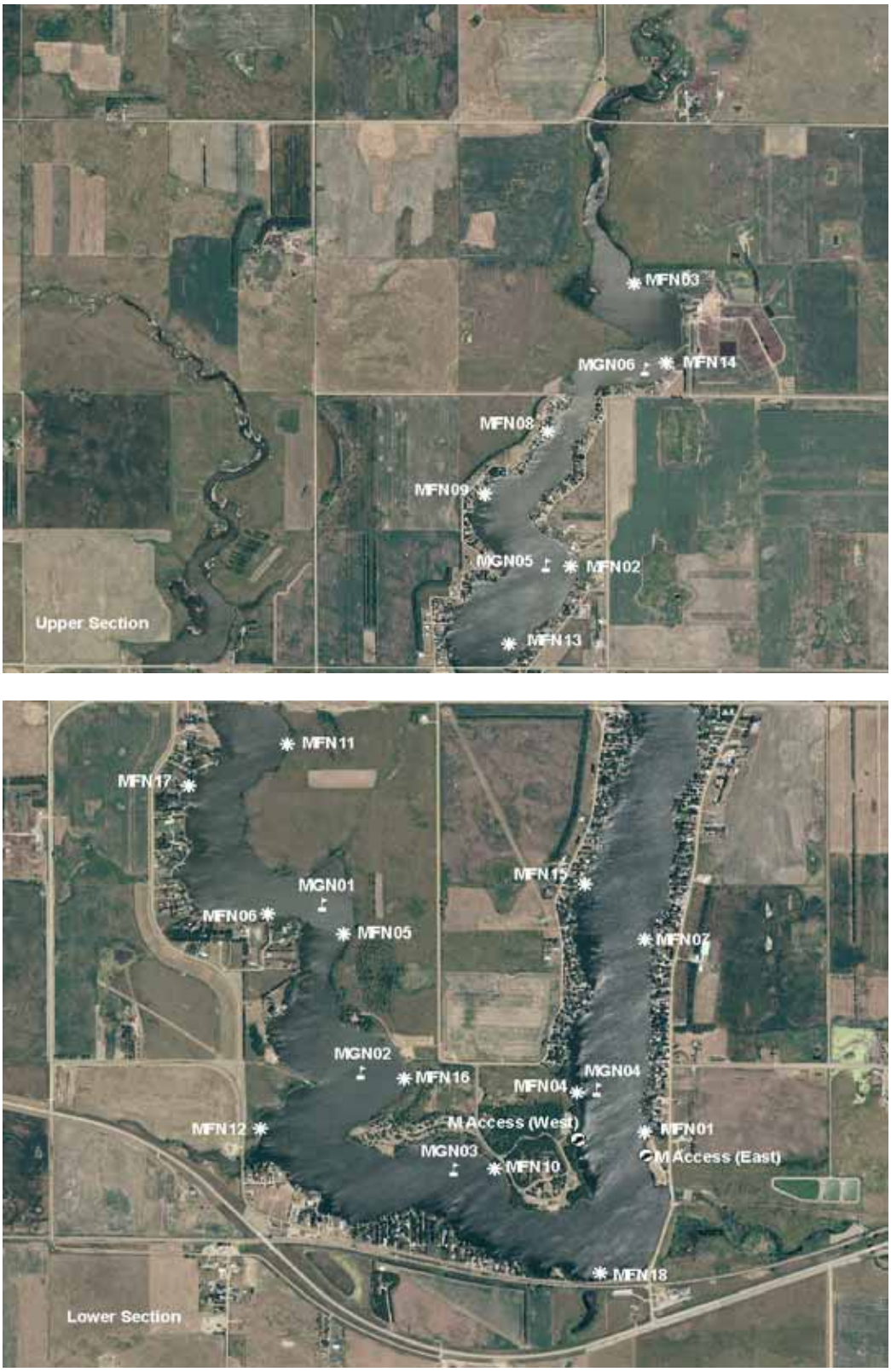

Figure 3. Map depicting access points and standardized net locations for Mina Lake, Edmunds County, South Dakota. MFN= frame nets, MGN= gill nets

Management Objectives

1) Maintain a mean frame net CPUE of stock-length black crappie ≥ 10, a PSD of 30-60, and a PSD-P of 5-10.

2) Maintain a mean frame net CPUE of stock-length bluegill ≥ 25, a PSD of 30-60, and a PSD-P of 5-10.

3) Supplement the channel catfish population to diversify sport fishing opportunity in Mina Lake.

4) Maintain a mean gill net CPUE of stock-length walleye ≥ 10, a PSD of 30-60, and a PSD-P of 5-10.

5) Maintain a mean frame net CPUE of stock-length bullhead ≤ 100.

Results and Discussion

Mina Lake is an impoundment constructed in the 1930's on Snake Creek approximately 12 miles west of Aberdeen, South Dakota. Snake Creek drains portions of McPherson, Edmunds, and Brown counties in South Dakota (Smith 2002). Mina Lake is primarily managed as a bluegill, black crappie, channel catfish and walleye fishery.

Primary Species

Black crappie: The 2009 mean frame net CPUE of stock-length black crappie was 3.2 (Table 1) and below the minimum objective (≥10 stock-length black crappie/net; Table 3). Length-frequency analysis of the 2006 and 2007 frame net catch indicated that a single year class dominated the population (Kaufman et al. 2008). In 2008, length-frequency analysis suggested that black crappie recruitment had been consistent in recent years as several year classes appeared to be present (Figure 4). However, in 2009 no sub-stock or stock-length black crappies were caught indicating poor recruitment. Black crappie recruitment appears to be sporadic and of low magnitude in recent years resulting in their low relative abundance. Since 2002, the mean frame net CPUE has ranged from 0.9 (2005) to 67.4 (2002), with the 2002-2009 average being 15.2 (Table 2).

Black crappie captured in frame nets during 2009 ranged in total length from 20 to 34 cm (7.9 to 13.4 in), had a PSD of 100 and a PSD-P of 26 (Figure 2). Both PSD and PSD-P were above the objective ranges (30-60 and 5-10, respectively; Table 3). Poor recruitment in 2009 resulted in high PSD and PSD-P values.

Otoliths were taken from a sub-sample of frame net captured black crappie in 2009. Two year-classes were identified in the sub-sample (Table 4). The oldest black crappies aged using otoliths from 2008-2009 and scales in 2002 were age-4 indicating that there is high mortality after age-4. Growth was good with weighted mean total

length at capture of age-2 and age-4 black crappie of 231 and 294 mm (9.1 and 11.6 in), respectively (Table 4). Mean Wr values ranged from 98 to 121 for all length categories sampled, with the mean Wr of stock-length fish being 117 (Table 1). A slight decreasing trend in Wr values was apparent as black crappie total length increased in 2009.

Bluegill: The 2009 mean frame net CPUE of stock-length bluegill of 0.6 was below the minimum objective (≥ 25 stock-length bluegill/net: Table 3) and the lowest reported from 2002-2009 (Table 2). Bluegill caught in 2009 appeared to represent several year-classes all of which are of low magnitude (Figure 5). Bluegill ranged in total length from 8 to 21 cm (3.1 to 8.3 in) resulting in a PSD of 40 and a PSD-P of 30 (Table 3; Figure 5).

No growth information was available for bluegill in Mina Lake; however, mean Wr values exceeded 117 for all length categories sampled. The mean Wr for stock-length bluegill was 124 (Table 1).

Channel catfish: From 2002-2006 relative abundance of channel catfish was low with mean frame net CPUE values commonly less than one stock-length channel catfish/net (Table 2). In 2007, the mean frame net CPUE of stock-length (≥ 280 mm) channel catfish increased to 4.8 (Table 1) and the mean frame net CPUE of sub-stock channel catfish was 16.3. The increase in channel catfish relative abundance can likely be attributed to the 2006 stocking of 42,350 fingerlings (Table 5). In 2009, the mean frame net CPUE of stock-length channel catfish remained higher at 3.6 (Table 1).

Channel catfish captured in the frame nets ranged in total length from 27 to 42 cm (10.6 to 16.5 in; Figure 6). It appears that channel catfish from the 2006 year-class have begun to reach quality-length resulting in a PSD of 5 and PSD-P of 0 (Table 1; Figure 6).

No growth information was available. The majority of channel catfish captured in the 2009 frame net catch were in the stock- to quality-length category which had a mean Wr of 101.

Walleye: The mean gill net CPUE of stock-length walleye during 2009 was 0.2 (Table 1) and below the minimum objective (≥ 10 stock length walleye/net) for Mina Lake (Table 3). Since 2002, relative abundance of walleye has remained low with mean gill net CPUE values ranging from 0.2 to 1.3 (Table 2). The gill net CPUE of stock-length walleye during 2009 indicated low relative abundance (<4 stock-length walleye/net).

Recruitment of both naturally-produced and stocked walleye has been extremely poor. Walleye of various sizes have been stocked annually since 2002 with limited success (Table 5). In 2004 and 2006, walleye fry were stocked in the spring, but no age-0 walleye were sampled during fall electrofishing; therefore large fingerlings were also stocked (Table 2; Table 5). In 2005, 33,310 large fingerling walleyes were stocked and many of these were large (≈ 0.25 pound fish) when stocked. Walleye large fingerlings of this size are not commonly available for stocking and this unique opportunity should have provided a product with a high probability of survival. However, few walleye from this stocking have been present in the gill net catch (Table 6). In 2007 and 2008, small fingerling walleye were stocked in the spring; however, fall

electrofishing resulted in no age-0 walleye being captured indicating poor survival (Table 2; Table 5). Fall night electrofishing in 2009 resulted in CPUE of 54.9, the highest since 2002 (Table 2). The age-0 walleye sampled in the fall of 2009 coincide with a small fingerling stocking and represent the first time since 2002 that age-0 walleye were sampled by fall electrofishing in Mina Lake. Recent history indicates that although age-0 walleye were sampled the likelihood of their survival past age-0 is poor. At this time, the cause of poor walleye survival in Mina Lake has been a topic of discussion by fisheries personnel and constituents. Unfortunately, the underlying cause of the poor survival experienced in Mina Lake is uncertain; however, it should be noted that all efforts available have been utilized in attempts to produce a walleye year-class.

Few inferences can made concerning the size structure, growth, and condition due to low sample size, as only two walleye were captured in gill nets during 2009.

Other Species

Black bullhead: The 2009 mean frame net CPUE of stock-length black bullhead was 0.9 (Table 2). Since 2001, mean frame net CPUE values have ranged from 0.9 (2009) to 49.1 (2002) but remained within the objective range (≤ 100 stock-length black bullhead/net; Table 3).

Black bullhead in the 2009 frame net catch ranged in total length from 16 to 25 cm (6.3 to 9.8 in), had a PSD of 56 and a PSD-P of 0. The majority of black bullhead in the 2009 frame net catch appeared to be from a single year class with most individuals ranging in total length from 19 to 25 cm (7.5 to 9.8 in; Figure 7).

No growth information was collected in 2009. Mean Wr of stock-length black bullheads was 88 (Table 1). No length-related trends in Wr were apparent during 2009.

Largemouth bass: Largemouth bass are present at a low density in Mina Lake. McKibbin (2002) reported a spring night electrofishing CPUE of stock-length largemouth bass of 3.9 in 2001. Given the low abundance, annual spring night electrofishing has not been implemented on Mina Lake. Largemouth bass populations in eastern South Dakota glacial lakes and large impoundments generally are of low density, high size structure, high condition, and have fast growth due to inconsistent recruitment patterns (McKibbin 2002).

Occasionally, largemouth bass have been sampled during annual fall electrofishing used to assess young-of-the-year walleye production. In 2006, fall electrofishing resulted in 37 largemouth bass being sampled, with 34 being from the recently-produced 2005 year-class. These fish should be recruited and available for anglers to catch. However, no largemouth bass were captured during fall electrofishing from 2007-2009.

Freshwater Drum: Freshwater drum were the most abundant fish species sampled in gill nets during 2009 (Table 1). The mean gill net CPUE of freshwater drum from Mina Lake was 12.8, a decrease from the 30.2 in 2007 and 19.0 in 2008 (Table 2).

Freshwater drum captured in the 2009 gill net catch ranged in total length from 11 to 40 cm (4.3 to 15.7 in), had a PSD of 61, and a PSD-P of 17 (Figure 9). The

majority of freshwater drum in the 2009 gill net catch, were likely from the 2005 year-class and ranged in total length from 26 to 33 cm (10.2 to 13.0 in; Figure 9).

No growth information was collected in 2009. Mean Wr values exceeded 89 for all length categories sampled. The mean Wr for stock-length freshwater drum captured in gill nets was 96 (Table 1). A decreasing trend in Wr was observed as total length increased for freshwater drum in Mina Lake.

Northern Pike: Northern pike typically are not sampled effectively using standard lake survey methods and gill nets have not consistently sampled northern pike in Mina Lake. Therefore, relative abundance of northern pike in Mina Lake has generally been considered low with the mean gill net CPUE commonly less than 1.0 stock-length northern pike/net from 2001-2007 (Table 2). In 2007, sub-stock northern pike ranging in total length from 22 to 30 cm (8.7 to 11.8 in) were captured in both gill nets and frame nets indicating recent successful natural reproduction. In 2009, the mean gill net CPUE of stock-length northern pike was 1.5 (Table 1).

Northern pike in the 2009 gill net catch from Mina Lake ranged in total length from 47 to 61 cm (18.5 to 24.0 in; Figure 8). The PSD increased from 0 in 2008 to 44 in 2009 due to the recruitment of a large year-class to quality-length (Table 2). The PSD-P has remained at 0 due to the absence of larger fish (Table 1; Figure 8).

No growth information was collected in 2009. Stock-length northern pike had a mean Wr of 91 (Table 1). No length-related trends in Wr were apparent in 2009.

Yellow Perch: Mina Lake has a low to moderate density yellow perch population that is likely inhibited by habitat characteristics similar to other large impoundments in Region IV (i.e., Richmond Lake and Elm Lake). The 2009 mean gill net CPUE of stock-length yellow perch was 4.3 (Table 1). Since 2002, the mean gill net CPUE of stock-length yellow perch has fluctuated from 1.7 (2008) to 12.8 (2003) with the 2002-2009 average being 6.3 (Table 2).

Three year-classes were identified in 2009 with 92% of the yellow perch representing the 2007 year-class (Table 10). The absence of several year-classes indicates sporadic recruitment and coupled with the history of low to moderate CPUE will likely result in continued low abundance.

During 2009, yellow perch captured in gill nets ranged in total length from 16 to 23 cm (6.3 to 9.1 in), had a PSD of 38, and a PSD-P of 0 (Table 1). Growth was good with weighted mean length at capture for age-2 male and female yellow perch of 186 and 207 mm (7.3 and 8.1 in), respectively (Table 9). Mean Wr values of yellow perch in the 2009 gill net catch ranged from 90 to 96 for all length categories with the mean Wr of stock-length yellow perch being 94 (Table 1). A slight decreasing trend in Wr was observed as total length increased.

Other: Common carp, hybrid sunfish, orangespotted sunfish, and whiter suckers were captured in low numbers during the 2009 survey (Table 1).

Management Recommendations

1) Conduct fish community assessment surveys on an annual basis (next survey scheduled in summer 2010) to monitor fish relative abundance, fish population size structure, fish growth and stocking success.

2) Conduct fall night electrofishing on an annual basis to monitor walleye young-of-the-year abundance and to assess black bass (primarily largemouth) populations in Mina Lake.

3) Collect otoliths from black crappie and walleye; scales from largemouth and smallmouth bass to assess the age structure and growth rates of each population.

4) Stock walleye small fingerlings on an annual basis (100 fingerlings/acre) in an effort to establish a walleye year-class. If the fall night electrofishing CPUE of young-of-the-year walleye exceeds 75 fish/hour than walleye should not be stocked the following spring.

5) Remove minimum length restriction for walleye and apply statewide harvest limits based on tool box recommendations.

6) Conduct research to explore poor walleye survival.

7) Stock channel catfish fingerlings (≈50 fingerlings/acre) every third year (when available) to bolster the channel catfish fishery in Mina Lake.

Table 1. Mean catch rate (CPUE; gill/frame nets= catch/net night, electrofishing= catch/hour) of stock-length fish, proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish, and mean relative weight (Wr) of stock-length fish for various fish species captured in gill nets, frame nets, and electrofishing in Mina Lake, 2009. Confidence intervals include 80 percent (± CI-80) or 90 percent (± CI-90). BLB= black bullhead; BLC= black crappie; BLG= bluegill; CCF= channel catfish; COC= common carp; FRD= freshwater drum; HYB= hybrid sunfish; NOP= northern pike; OSF= orangespotted sunfish; WAE= walleye; WHS= white sucker; YEP= yellow perch

	Abundance		Stock Density Indices				Condition	
Species	CPUE	CI-80	PSD	CI-90	PSD-P	CI-90	Wr	CI-90
Frame nets								
BLB	0.9	0.3	56	23	0	---	88	1
BLC	3.2	1.4	100	0	26	10	117	3
BLG	0.6	0.2	40	30	30	28	124	6
CCF	3.6	1.1	5	4	0	---	101	<1
COC	2.1	0.7	41	13	22	11	88	5
FRD	2.1	0.6	82	10	34	13	89	5
HYB[1]	0.2	0.3	---	---	---	---	---	---
NOP	2.2	0.5	69	13	8	7	87	1
WAE	0.3	0.2	60	40	40	52	94	10
WHS	0.3	0.3	100	0	100	0	95	3
YEP	1.9	0.8	83	11	3	5	91	1
Gill nets								
BLB	12.2	5.1	36	9	1	3	97	1
CCF	1.8	1.9	9	17	0	---	101	4
COC	1.2	0.6	29	35	0	---	89	1
FRD	12.8	5.0	61	9	17	7	96	1
NOP	1.5	1.1	44	33	0	---	91	2
OSF[1]	0.5	1.0	---	---	---	---	---	---
WAE	0.2	0.2	100	---	0	---	92	<1
YEP	4.3	1.3	38	17	0	---	94	2
Electrofishing								
WAE[2]	54.9	---	---	---	---	---	---	---

[1] All fish sizes.

[2] Fall electrofishing-WAE; catch rate (CPUE) represents age-0 walleye/hour, not stock-length walleye/hour.

Table 2. Historic mean catch rate (CPUE; gill/frame nets= catch/net night, electrofishing= catch/hour) of stock-length fish for various fish species captured in gill nets, frame nets, and by electrofishing in Mina Lake, 2002-2009. BLB= black bullhead; BLC= black crappie; BLG= bluegill; CCF= channel catfish; COC= common carp; COS= common shiner; EMS= emerald shiner; RUD= Rudd; FRD= freshwater drum; GSF= green sunfish; GOS= golden shiner; LMB= largemouth bass; NOP= northern pike; OSF= orangespotted sunfish; HYB= hybrid sunfish; WAE= walleye; WHB= white bass; WHS= white sucker; YEP= yellow perch

	CPUE								
Species	2002	2003	2004	2005	2006[3]	2007[3]	2008	2009	Mean
Frame nets									
BLB	49.1	26.0	15.8	11.6	6.0	16.2	5.8	0.9	16.4
BLC	67.4	11.0	1.3	0.9	25.9	9.0	2.5	3.2	15.2
BLG	9.0	9.1	6.8	6.4	5.9	10.8	1.8	0.6	6.3
CCF	0.7	0.0	0.2	0.4	0.6	4.8	2.4	3.6	1.6
COC	1.3	0.1	1.0	2.4	1.7	6.0	1.9	2.1	2.1
RUD [1]	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
FRD	0.4	0.4	0.7	1.2	2.3	3.7	2.3	2.1	1.6
GSF	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.0
HYB[1]	0.0	0.0	0.0	0.0	2.0	0.3	0.0	0.2	0.3
LMB	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NOP	2.2	1.4	0.8	0.6	0.3	0.2	3.2	2.2	1.4
OSF[1]	0.0	0.0	0.0	0.0	0.4	11.9	0.0	0.0	1.5
ROB	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
SHG[1]	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
WAE	0.7	0.3	0.1	0.3	0.5	0.2	0.3	0.3	0.3
WHB	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.0	0.1
WHS	0.7	0.2	0.2	0.1	0.7	1.2	0.3	0.3	0.5
YEP	0.4	0.6	3.1	1.4	2.3	1.1	1.7	1.9	1.6
Gill nets									
BLB	16.7	7.5	5.5	1.0	6.0	10.3	8.2	12.2	8.4
BLC	2.8	0.5	0.0	0.0	0.7	0.0	0.0	0.0	0.5
CCF	0.8	0.3	0.0	0.0	0.7	1.0	1.7	1.8	0.8
COC	2.0	2.5	2.3	0.8	5.2	15.5	8.7	1.2	4.8
COS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EMS [1]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
FRD	4.0	2.7	4.0	8.2	17.0	30.2	19.0	12.8	12.2
GOS [1]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NOP	0.0	0.2	0.5	0.5	0.0	0.0	3.5	1.5	0.8
OSF [1]	0.0	0.0	0.2	0.0	0.0	0.0	0.5	0.5	0.2
WAE	1.0	1.3	1.3	0.3	0.5	0.3	1.0	0.2	0.7
WHB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WHS	0.3	0.2	0.0	0.2	0.0	0.0	0.0	0.0	0.1
YEP	3.5	12.8	5.3	9.3	9.2	4.2	1.7	4.3	6.3
Electrofishing									
WAE[2]	53.9[4]	0.0	0.0	0.0	0.0	0.0	0.0	54.9	7.9

[1] All fish sizes.
[2] Fall electrofishing-WAE; catch rate (CPUE) represents age-0 walleye/hour, not stock-length walleye/hour.
[3] Monofilament gill net mesh size (.75", 1", 1.25", 1.5", 2" and 2.5")
[4] Fall night electrofishing conducted following large fingerling stockings.

Table 3. Mean catch rate (CPUE; gill/frame nets= catch/net night), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish, and mean relative weight (Wr) of stock-length fish for selected species captured by frame nets and gill nets in Mina Lake, 2002-2009. BLB= black bullhead; BLC= black crappie; BLG= bluegill; CCF= channel catfish; FRD= freshwater drum; WAE= walleye

Species	2002	2003	2004	2005	2006[1]	2007[1]	2008	2009	Average	Objective
Frame nets										
BLB										
CPUE	49	26	16	12	6	16	6	1	17	≤ 100
PSD	99	96	99	100	90	23	45	56	76	---
PSD-P	1	4	12	25	47	6	1	0	12	---
Wr	80	84	87	89	87	87	89	88	86	---
BLC										
CPUE	67	11	1	1	26	9	3	3	15	≥ 10
PSD	96	92	100	59	6	100	58	100	76	30-60
PSD-P	1	17	74	59	5	21	44	26	31	5-10
Wr	96	106	103	117	122	113	118	117	112	---
BLG										
CPUE	9	9	7	6	6	11	2	1	6	≥ 25
PSD	96	88	38	71	72	41	94	40	68	30-60
PSD-P	46	31	20	10	7	9	3	30	20	5-10
Wr	112	122	114	119	124	122	124	124	120	---
CCF										
CPUE	1	0	<1	<1	1	5	2	4	2	---
PSD	62	---	100	100	73	0	0	5	49	---
PSD-P	0	---	0	25	36	0	0	0	9	---
Wr	100	---	119	120	109	92	88	101	104	---
Gill nets										
FRD										
CPUE	4	3	4	8	17	30	19	13	12	---
PSD	96	88	100	100	46	12	18	61	65	---
PSD-P	17	19	8	4	27	5	7	17	13	---
Wr	92	89	92	96	101	97	98	96	95	---
WAE										
CPUE	1	1	1	<1	1	<1	1	<1	1	≥ 10
PSD	67	63	100	100	67	100	83	100	85	30-60
PSD-P	33	25	13	50	67	50	33	0	34	5-10
Wr	84	89	96	105	105	100	107	115	100	---

[1] Monofilament gill net mesh size (.75", 1", 1.25", 1.5", 2" and 2.5")

Table 4. Weighted mean total length (mm) at capture for black crappie sampled in frame nets (expanded sample size) from Mina Lake, 2008-2009.

	Age				
Year	1	2	3	4	5
2009	---	231(44)	---	294(12)	---
2008	167 (18)	204 (1)	259 (24)	295 (1)	---

Table 5. Year class distribution based on the expanded age/length summary for black crappie sampled in frame nets from Mina Lake, 2008-2009.

	Year Class						
Survey Year	2009	2008	2007	2006	2005	2004	2003
2009			44		12		
2008	---		18	1	24	1	

Table 6. Weighted mean total length at capture (mm) for walleye age-0 through age-10 sampled in experimental gill nets (expanded sample size) from Mina Lake, 2005-2009. Note: sampling was conducted at approximately the same time during each year allowing comparisons among years to monitor growth trends.

	Age									
Year	1	2	3	4	5	6	7	8	9	10
2009	---	---	---	489 (1)	---	---	---	---	---	---
2008	---	364 (1)	---	---	---	501 (2)	493 (2)	551 (1)	---	---
2007	---	---	429 (1)	---	---	514 (1)	---	---	---	---
2006	330 (1)	---	---	---	520 (1)	520 (1)	---	---	---	---
2005	---	---	---	---	---	510 (2)	---	---	---	---

Table 7. Stocking history including size and number for fishes stocked into Mina Lake, 1996-2008.

Year	Species	Size	Number
1998	SXW	fingerling	6,093
2000	CCF	fingerling	16,569
	CCF	adult	144
2002	WAE	fingerling	8,246
2003	WAE	large fingerling	42,812
2004	WAE	fry	1,500,000
	WAE	large fingerling	57,703
2005	WAE	large fingerling	33,310
2006	WAE	fry	800,000
	WAE	large fingerling	23,110
	CCF	fingerling	42,350
2007	WAE	small fingerling	80,780
2008	WAE	small fingerling	80,000
2009	WAE	small fingerling	80,115

Table 8. Year class distribution based on the expanded age/length summary for walleye sampled in gill nets and associated stocking history (Number stocked x 1,000) from Mina Lake, 2005-2009.

	Year Class											
Survey Year	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998
2009	1				1							
2008	---			1				1	2	1		
2007[1]	---	---	1			1			1			
2006[1]	---	---	---		1				1	1		
2005	---	---	---	---							1	
# stocked												
fry				800		1,500						
sm. fingerling	80	80	81									
lg. fingerling				23	33	58	43	8				6

[1] Monofilament gill net mesh size (.75", 1", 1.25", 1.5", 2" and 2.5").

Table 9. Weighted mean total length (mm) at capture by gender for yellow perch captured in experimental gill nets (expanded sample size) from Mina Lake, 2009.

	Age					
Year	0	1	2	3	4	5
2009						
Male	---	---	186 (13)	---	---	234 (1)
Female	---	---	207 (11)	231 (1)	---	---
Combined	---	---	196 (24)	231 (1)	---	234 (1)

Table 10. Year class distribution based on the age/length summary for yellow perch sampled in gill nets from Mina Lake, 2009.

	Year Class					
Survey Year	2009	2008	2007	2006	2005	2004
2009			24	1		1

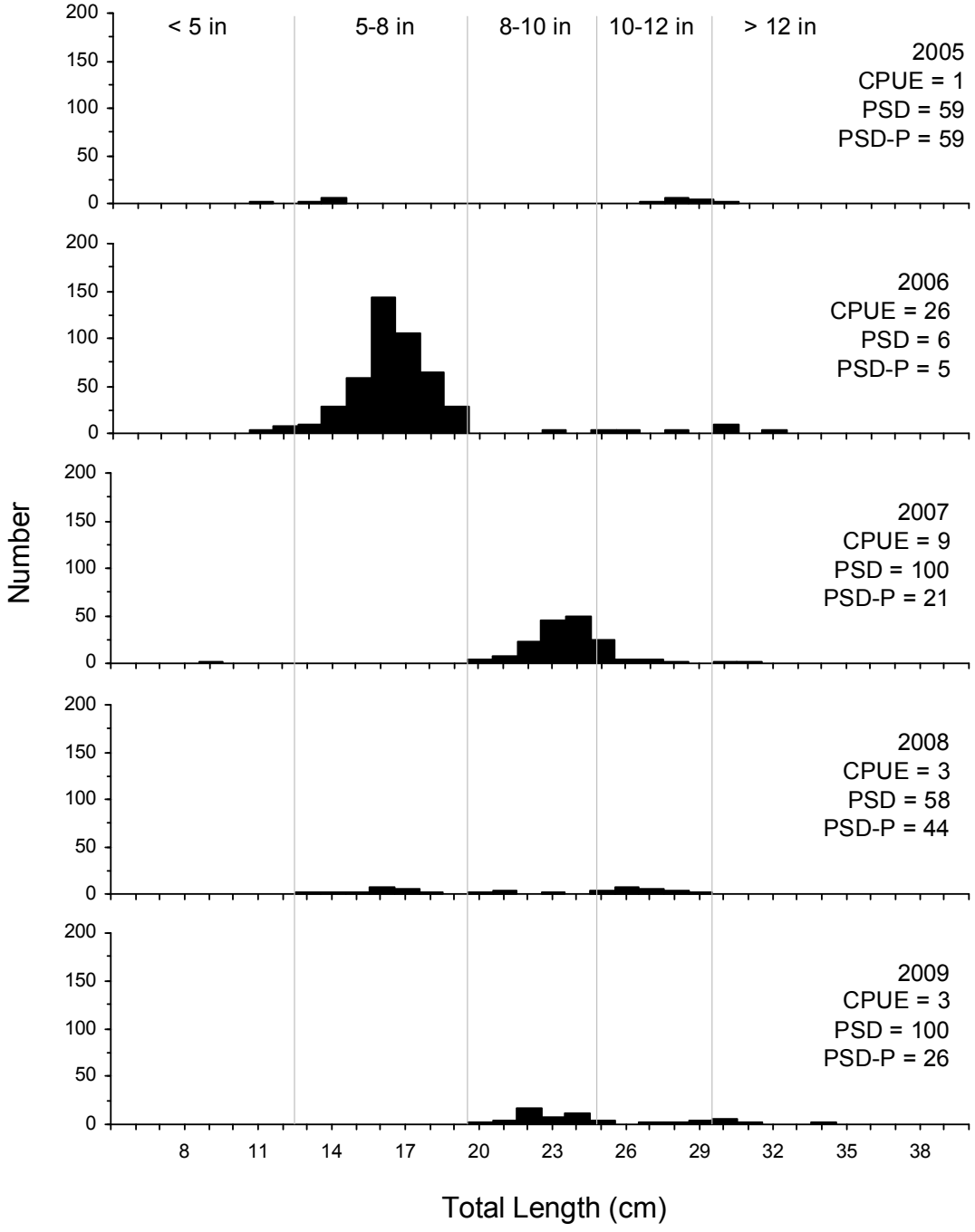

Figure 4. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for black crappie captured using frame nets in Mina Lake, 2005-2009.

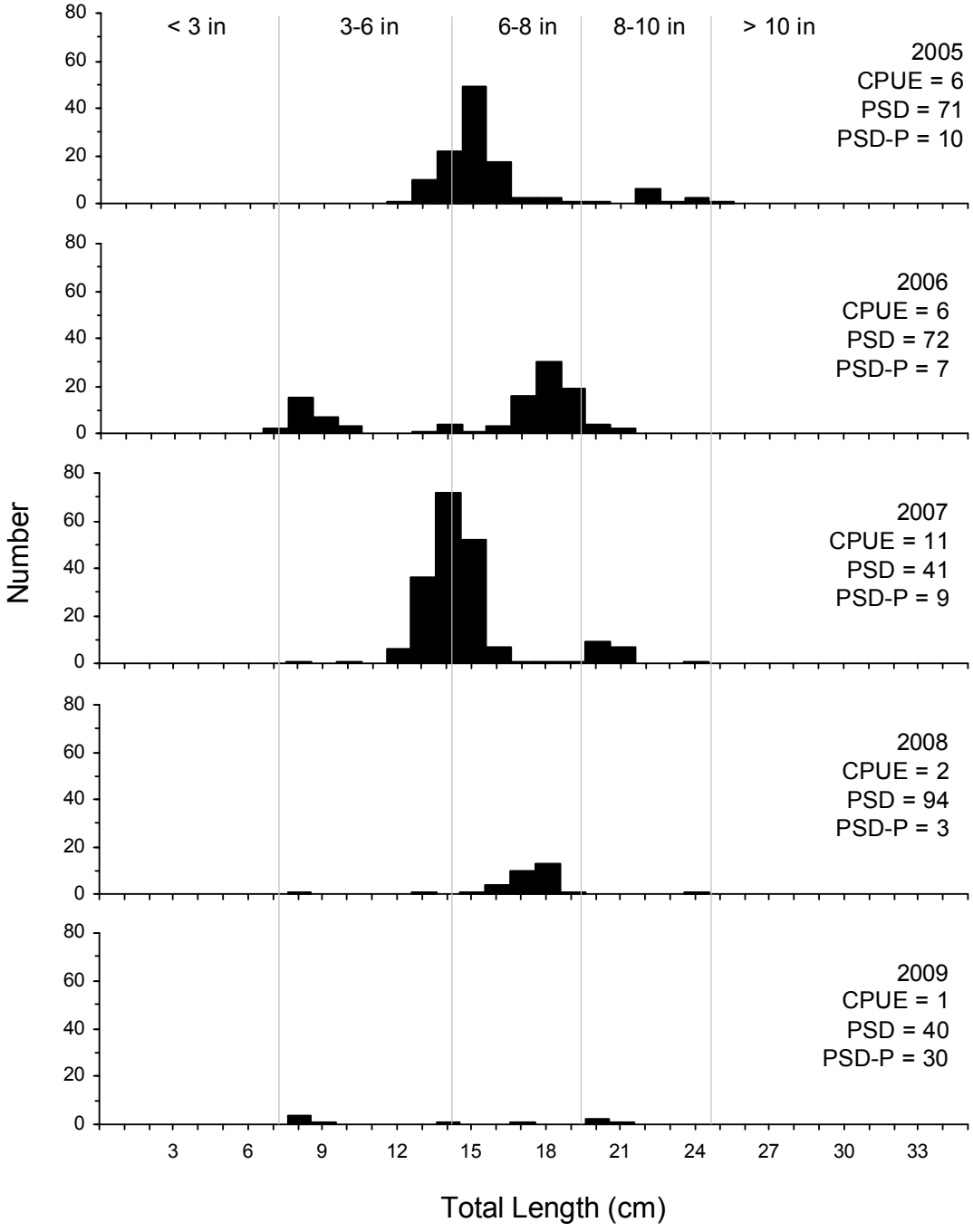

Figure 5. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for bluegill captured using frame nets in Mina Lake, 2005-2009.

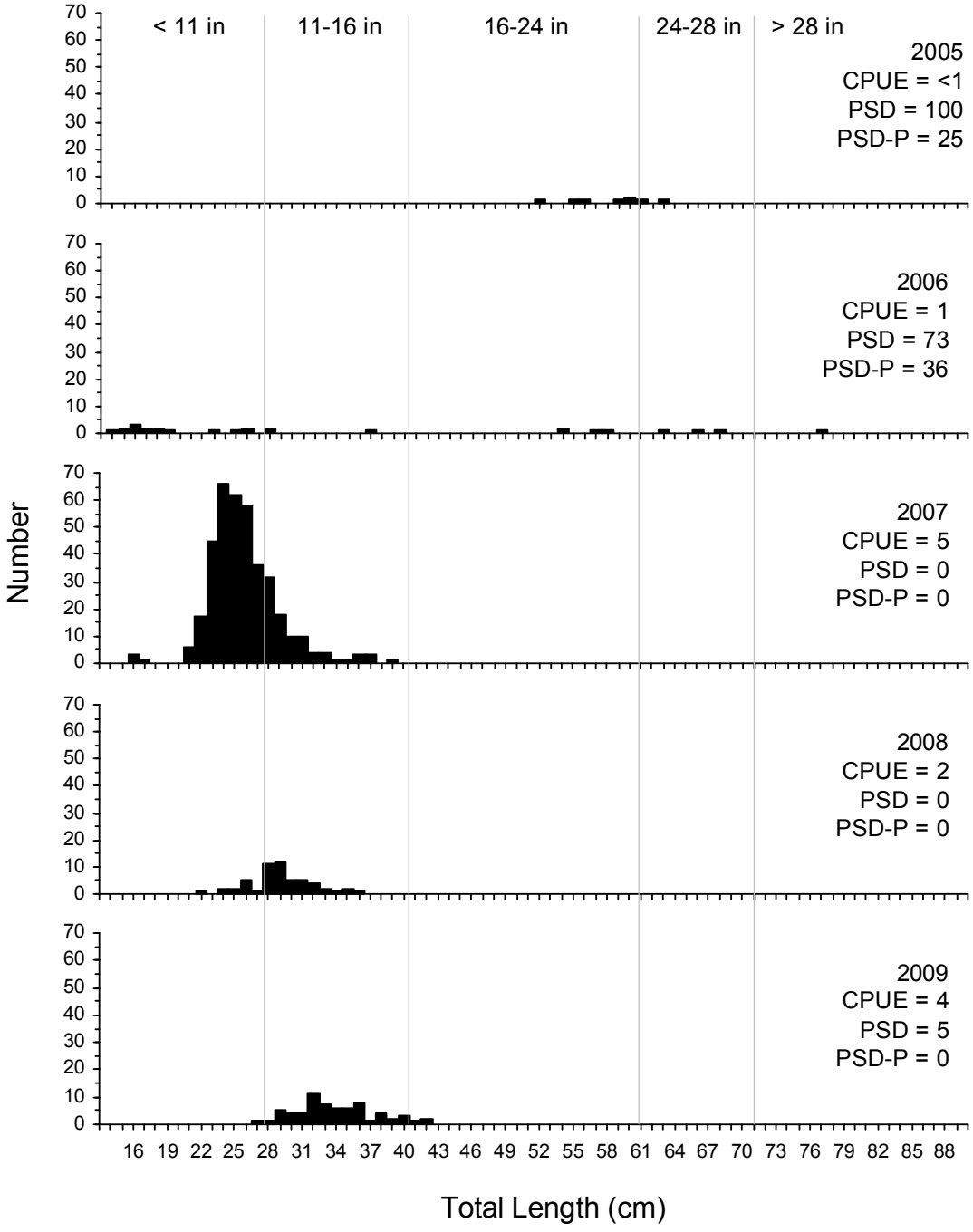

Figure 6. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for channel catfish captured using frame nets in Mina Lake, 2005-2009.

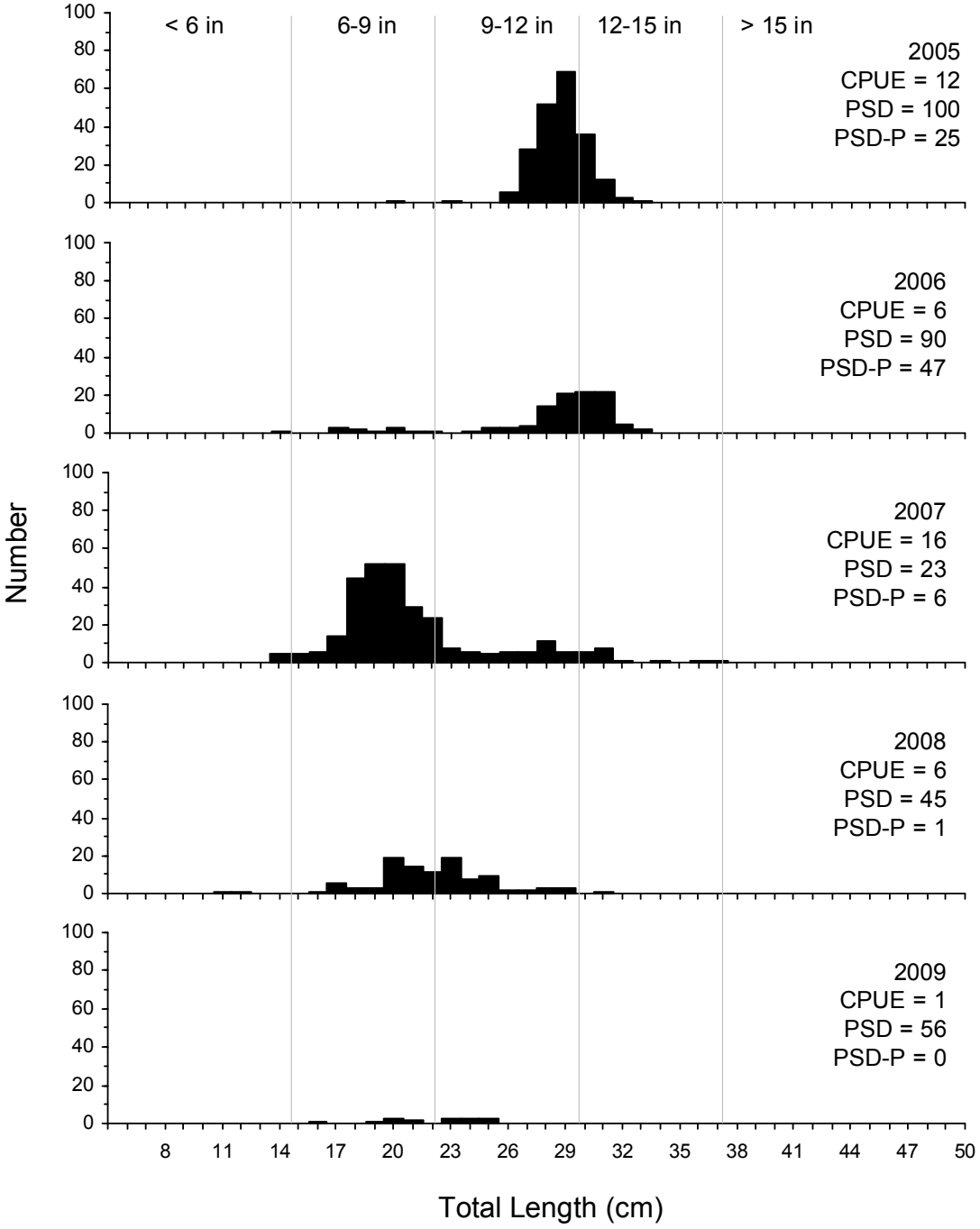

Figure 7. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for black bullhead captured using frame nets in Mina Lake, 2005-2009.

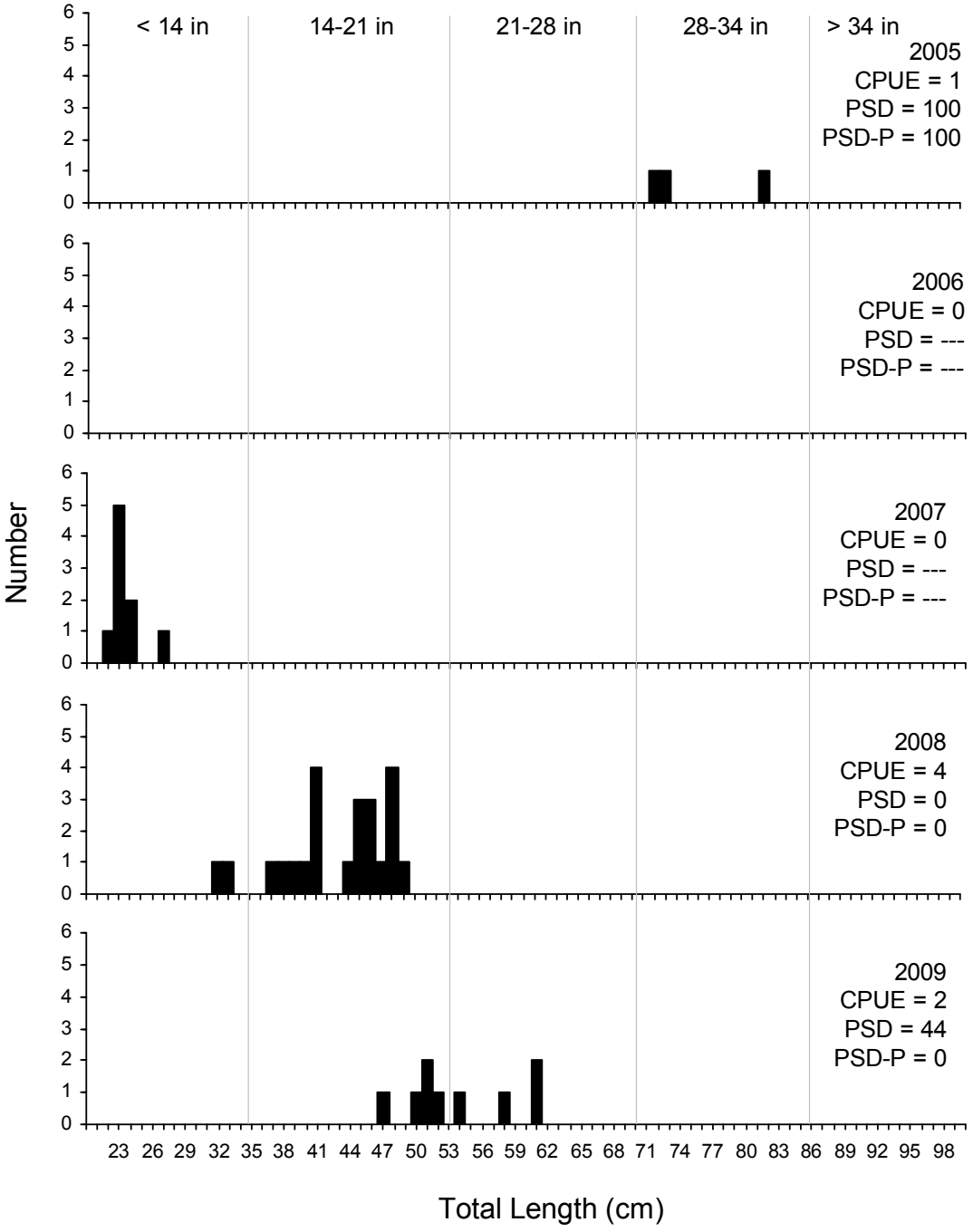

Figure 8. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for northern pike captured using gill nets in Mina Lake, 2005-2009.

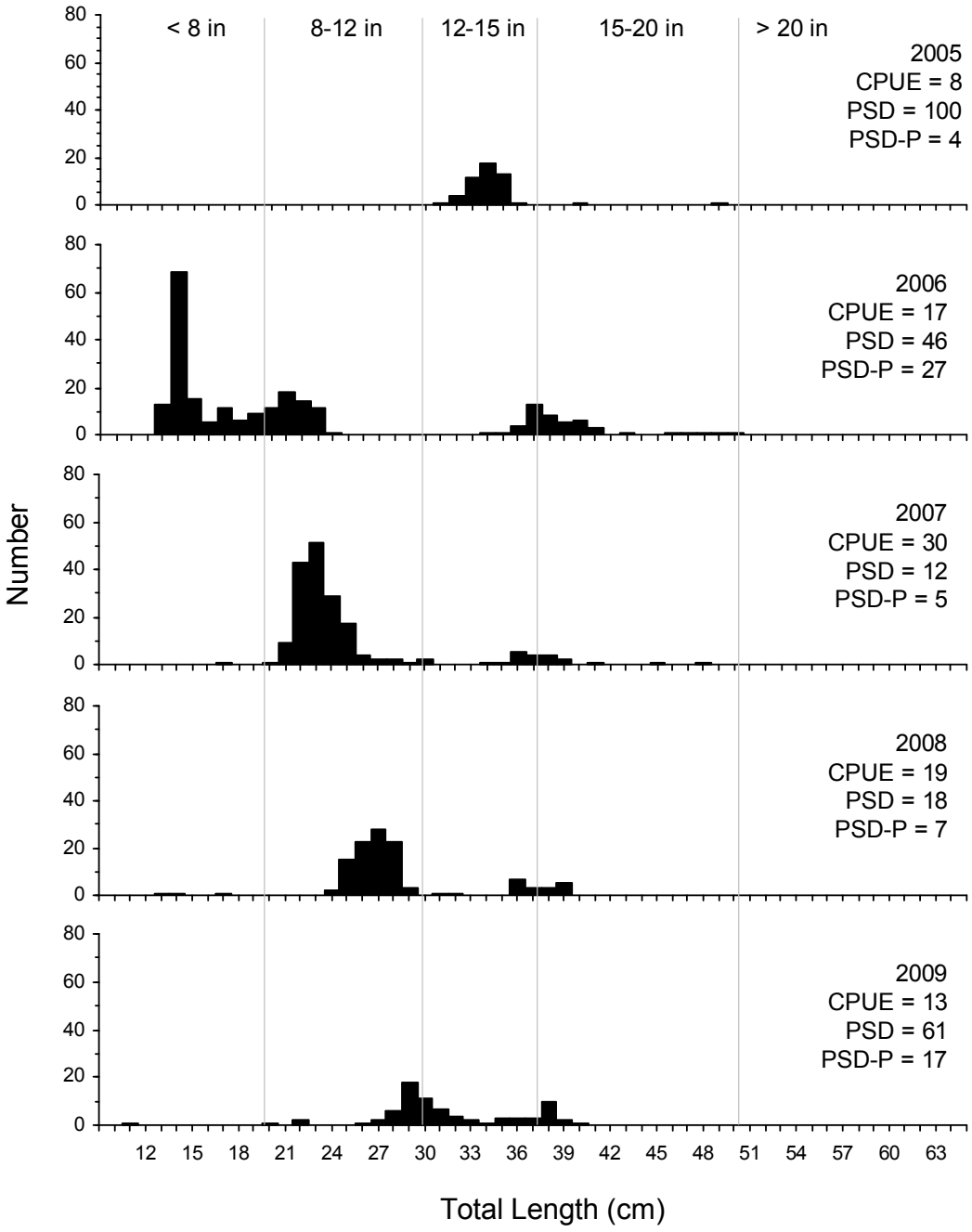

Figure 9. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for freshwater drum captured using gill nets in Mina Lake, 2005-2009.