

2005 Annual Report

Pallid Sturgeon Population Assessment and Associated Fish Community Monitoring for the Missouri River: Segment 7



**Prepared for the U.S. Army Corps of Engineers – Northwest Division
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EXECUTIVE SUMMARY

South Dakota Game, Fish, and Parks biologists sampled the 59-mile stretch of unchannelized Missouri River between Gavin's Point Dam and Ponca, Nebraska (Recovery Priority Management Area number 4 [RPMA]) to assess native fish populations. Pallid sturgeon *Scaphirhynchus albus* were the primary target of sampling efforts, however there was also a focus on other native species. Sampling began in the fall of 2004 and concluded in the fall of 2005. However, a full complement of gears was not available until July. Efforts led to the capture of 1 hatchery-reared pallid sturgeon. The fish was captured in a drifted trammel net at river mile 761. It was caught in a pool located immediately downstream from an island engineered to provide habitat for threatened and endangered species. The fish had a readable passive integrated transponder (PIT) tag that revealed its origin to be Garrison Dam National Fish Hatchery (spawn date: June 6/02). It was stocked at Mulberry Bend (9 miles upriver from the capture site) in July of 2003. The fish grew from 296 mm to 421 mm during the 25 months it had been in the river. No young-of-year sturgeon were sampled during 2005.

Nine other native fish species were targeted as part of this study. A total of 511 shovelnose sturgeon *S. platyrhynchus* were captured in 2005: 372 with 1" trammel nets, 68 with otter trawls, 67 with gillnets and 4 with bag seines. 192 blue suckers *Cycleptus elongates* were sampled. Most of them were captured in 1" trammel nets (n= 113). A total of 44 saugers were sampled, mostly with bag seines (n= 18). Otter trawls captured 1 speckled chub *Macrohybopsis aestivalis*, 1 sturgeon chub *M. gelida*, and 1 sicklefin chub *M. meeki*. Sand shiners *Notropis stramineus* were common in our shallow water gears (n=1251). Mini-fyke nets produced the most (n= 979) and bag seines captured 271. Three Western silvery minnow *Hybognathus argyritis* were captured in a bag seine. No plains minnows *H. placitus* were sampled.

A total of 53 fish species and one hybrid were caught in segment 7 during 2005. A total of 13,823 individual fish were sampled. Several Asian carp were captured during 2005 including 2 bighead *Hypophthalmichthys nobilis*, 1 silver *Hypophthalmichthys molitrix*, and 1 grass carp *Ctenopharyngodon idella*.

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Introduction

The pallid sturgeon *Scaphirhynchus albus* is a fish dependent on large, turbid river systems. It is a top-level predator considered to be an indicator of the ecological health of such rivers. Manipulations to the Missouri and Mississippi Rivers have negatively affected pallid sturgeon populations. This species now only inhabits a fraction of its historical range. Due to dramatic population declines, the pallid sturgeon was listed as an endangered species in 1990. It is believed that only hatchery-produced fish will be found in the wild beyond 2016 (Pallid Sturgeon Propagation Committee, 2004).

The Pallid Sturgeon Population Assessment Team was assembled to initiate a comprehensive monitoring plan designed to assess survival, movement, distribution, and habitat use, of wild and hatchery reared (stocked) juvenile pallid sturgeon (Drobish 2005a). The Population Assessment Team consists of field crews from several different state and federal agencies. The Missouri River was divided into 14 sampling segments for this project. These segments were designated by commonalities in habitat conditions. Each field crew is responsible for sampling one or two segments of the river using standardized methods. Habitat classification, gear deployment, and reporting are all guided by a set of standard operation procedures produced by the Team (Drobish 2005b).

All fish sampled are measured and recorded. In addition to the pallid sturgeon, more detailed information is collected from a set of 9 native Missouri River fishes (Appendix A). These include: sand shiner *Notropis stramineus*, sicklefin chub *Macrhybopsis meeki*, sauger *Zander canadense*, shovelnose sturgeon *Scaphirhynchus platyrhynchus*, plains minnow *Hybognathus placitus*, Western silvery minnow *Hybognathus argyritis*, speckled chub

Macrhybopsis aestivalis, sturgeon chub *Macrhybopsis gelid*, and blue sucker *Cycleptus elongatus*. Information on age, growth, and body condition of these species will be collected to further monitor the fish community of the Missouri River. Some of these species (e.g., chubs) are potential prey for the pallid sturgeon. Others may serve as a surrogate to detect native community responses to environmental changes.

This study utilizes river bends as study units. Each segment of the river is broken into many smaller parts based on river morphology. Each time the main channel crosses from one bank to the other; a new study unit (bend) is designated. A number of these bends (typically 12) are randomly selected to be thoroughly studied within each of the 14 River segments. The available habitats within each of the chosen bends are identified and sampled with appropriate gears as directed by the protocols (Drobish 2005b).

Each sampling year is broken into 2 seasons based on water temperature and sampling focus. These seasons include a Sturgeon Season that focuses on the assessment of sturgeon species, and a Fish Community Season that continues to assess sturgeon but places an additional emphasis on native Missouri River species. The Sturgeon Season encompasses the cool-water season (fall and spring) and the Fish Community season stretches from July 1 to October 31. Gillnets are unique to the Sturgeon season and shallow-water gears (bag seines and mini-fykes) are unique to the Community Season. Trammel nets and otter trawls are deployed in both seasons.

Study Objectives (Drobish 2005a)

In response to the 2000 Missouri River Biological Opinion, the COE is developing monitoring and restoration projects to avoid jeopardizing pallid sturgeon populations. As part of their Implementation Plan, the COE is working with the U. S. Fish and Wildlife

Service (USFWS) and State Resource Agencies to develop and conduct a pallid sturgeon monitoring and assessment program. The objectives of this program are as follows:

1. Document annual results and long-term trends in pallid sturgeon population abundance and geographic distribution throughout the Missouri River System.
2. Document annual results and long-term trends of habitat use of wild pallid sturgeon and hatchery stocked pallid sturgeon by season and life stage.
3. Document population structure and dynamics of pallid sturgeon in the Missouri River System.
4. Evaluate annual results and long-term trends in native target species population abundance and geographic distribution throughout the Missouri River system.
5. Document annual results and long-term trends of habitat usage of the native target species by season and life stage.
6. Document annual results and long-term trends of all non-target species population abundance and geographic distribution throughout the Missouri River system, where sample size is greater than fifty individuals.

Study Area

The South Dakota Game, Fish, and Parks Sturgeon crew monitored segment 7 of 14 on the Missouri River. This segment is located between Gavins Point Dam and Ponca State Park (miles 811 to 752). Segment 7 coincides with the lower (59-mile) reach of Missouri National Recreational River. A multitude of habitats are found here, including sandbars, backwaters, secondary channels, and wooded islands. Bank stabilization is sporadic, allowing some erosion to occur as the channel meanders from bank to bank.

This reach of the River was isolated from upstream reaches when Gavins Point Dam was closed in 1955. Controlled releases from Gavins Point continue to influence the morphology and ecology of segment 7 today. The U.S. Army Corps of Engineers uses the dam to provide stable releases to downstream areas, thus allowing for reliable navigation and water supplies. The dam blocks natural sediment transport causing incision and decreased turbidity. These facts, combined with an altered hydrograph, have created conditions that are quite different from the pre-dam era.

Discharge from Gavins Point Dam typically peaks in late summer at about 30,000 cfs and declines to near 12,000 cfs during the winter (<http://www.nwd-mr.usace.army.mil/rcc/reports/pdfs/aopfinal2004.pdf>). Diel variations are not as significant as those found upriver (segments 5 and 6). Much of the river in segment 7 is less than 2 m deep, but holes deeper than 15 m exist. River width varies from over 1,400 m to less than 300 m. The James River (mile 798) and Vermillion River (mile 772) are major tributaries contributing to flows in this reach.

Methods

Sampling methods used in segment 7 are consistent with those used by all of the assessment teams. Methodology was developed by the Pallid Sturgeon Population Assessment Team and is detailed in Drobish 2005b.

Habitat Classification

River bends comprise sampling units in this study. Each bend is further broken down based on a three tiered hierarchical habitat classification system that was inspired by the Benthic Fishes Study (Berry and Young 2001). With this system, analysis is possible at the macro, meso, and microhabitat levels.

The meandering of the main channel defines a river bend. A standard bend consists of a relatively deep and swift outside bend, inside bend (shallower depositional zone), and channel crossover. These three bend components are classified as macrohabitats. Other macrohabitats include: braided channels, dendritic channels, deranged channels, secondary channels (large, small, and non-connected), tributary mouths (large and small), and confluence areas. For further habitat descriptions, reference Drobish 2005b. Macrohabitats are further subdivided into a set of mesohabitats. Channel borders, island tips, pools, and bars comprise the mesohabitats categories. In certain cases, mesohabitats are subdivided even further – into microhabitats. Classification at this level provides great detail about the sampling site. Using a set of 6 microhabitat coded digits, one can record (for example) a particular sandbar's state of submersion, its size, and where the particular sampling gear was deployed. Codes and definitions for all levels of habitat classification can be found in Appendix B.

Given the dynamic nature of the river in segment 7, habitat is in a constant state of flux. Entire river bends may change from one sampling season to the next. Habitat conditions were recorded as they appeared on the day of sampling.

Sampling effort and gears

Twelve of 30 bends in segment 7 were randomly selected for standardized sampling (Table 1). These bends were sampled with a package of gears (described below). Additional non-random bends were sampled with partial gear sets at the crew leader's discretion. Non-random sampling was done as time allowed. Sampling was based upon habitat. Each macro/meso habitat combination had sampling requirements (Appendix C). Each gear had to be deployed twice for each macro/meso combination in a given bend. Basic habitat data (turbidity, velocity, and substrate) was also typically recorded once per macro/meso combination. These measurements were also taken any time a pallid sturgeon was captured. Temperature and depth were measured at every gear deployment site. For more information on habitat analysis see Drobish (2005b).

A sampling year was broken into a warm and a cool-water season. Capturing pallid sturgeon and other large fishes was the primary objective of the cool-water season (Sturgeon Season). Gillnets and 1" trammel nets were used during the Sturgeon season. During the warmer months (Fish Community Season), effort was focused on catching young/smaller fishes in shallow water. Bag seines, mini-fyke nets, 1" trammel nets, and otter trawls were used during the Fish Community Season. The Sturgeon Season ran from November 1 to June 30, and the Fish Community season spanned from July 1 October 31.

Five standardized gears were deployed at each randomly selected bend: stationary gillnets, drifted trammel nets, otter trawls, bag seines, and mini-fyke nets. A large mesh (2.5") trammel net is also a standard gear but none were available in time for 2005 sampling. For detailed information about each gear, see Drobish (2005b). This package of gears allowed for the sampling of a variety of depths, and targeting various species.

Four-panel (3.81cm, 5.08 cm, 7.62 cm, and 10.16 cm) experimental gillnets were deployed during the sturgeon season. These 1.8 m deep by 30 m long, multifilament nets were set in a variety of habitats > 1.2 m deep. These nets have been standard since the population assessment started in 2003. A total of 63 net/nights of effort were expended in Segment 7 during 2005. Efforts were below required levels because no permanent crew was yet tasked with monitoring segment 7 during the fall of 2004 and early spring of 2005.

Small mesh trammel nets (1.8 m deep X 38 m wide with a 6" outer mesh and 1" inner mesh) were used during both the Sturgeon and Fish Community season. These nets were drifted in habitats >1.2 m deep. Trammel net drifts ranged from 75 m to 300 m, depending on prevalence of snags. Very few drifts exceeded 200 m, before ending in a snag. A total of 236 small-mesh drifts were completed in 2005, resulting in over 25,000 m of sampling. Large-mesh trammel nets were not utilized in 2005 because of timing issues regarding hiring and outfitting a new crew. Small mesh trammel nets have been a standard gear since 2003 and large mesh nets were added as a new standard gear in 2005.

An otter trawl (4.8 m wide X 0.91 m deep) was used to sample for all sizes of fish in deeper water (> 1.2 m). The trawl was 7.6 m long with 38 mm chafing mesh and size 110 mesh around the cod end. A flat bottom boat was used to pull the trawl (bow trawling) downstream. Trawling runs ranged in length from 75 m to 300 m. Trawling was done during both sampling seasons. The 16' otter trawl has been utilized since project inception in 2003. A total of 100 otter trawl samples were collected in 2005, resulting in 22,600 m of sampling. No trawls were completed during the sturgeon season because of timing issues regarding hiring and outfitting a new crew.

A 9.1 m bag seine was used for shallow water (<1.2 m) sampling. The 1.8 m high seine was constructed out of 6.4 mm "ACE" type mesh and it had a 1.8 m x 1.8 m x 1.8 m bag. Seines were deployed in either rectangular, half-arc, or quarter arc pulls.

Mini-fyke nets were also used in shallow water. The 4.5 m long x 0.6 m high lead was staked to the bankline. The rest of the net consisted of 2 1.2 m wide x 0.6 m high steel frames (cab) and two 0.6 m diameter hoops with 3 mm "ACE" type mesh. Both seines and mini-fyke were only used during the Fish Community Season.

Passive gears (mini-fykes and gillnets) were set for a maximum of 24 hours and catch-per-unit-effort (CPUE) was calculated as the number of fish per net night. CPUE was calculated as number of fish per 100 m deployed for trammel nets and the otter trawl. Distances were measured using a Garmin GPS unit. Bag seine CPUE was based on numbers of fish per square meter. Both seines and mini-fykes have been standard gears since 2003. Mini-Fykes were set for a total of 104 net/nights and 100 seine hauls covered were completed.

Calculations

Relative abundance was assessed using CPUE. This was done at several levels. An overall segment 7 CPUE was calculated for each species (by gear). This was derived by figuring the CPUE for all sub-samples within the 12 random bends. That provided a mean CPUE for each of the bends. These “bend means” were then averaged to calculate the overall segment 7 CPUE. Catches within each habitat type were also analyzed to calculate a CPUE (for each gear). To assess CPUE variability, we calculated standard errors (SE). Two SE approximate a 95% confidence interval around the mean.

Fish condition was assessed for shovelnose sturgeon. The relative weight (W_r) index was the metric used for condition assessment. The equation for calculating W_r is found in Anderson and Newman (1996). Condition was not calculated for pallid sturgeon because of low sample size.

Population size structure for shovelnose sturgeon and sauger is described using incremental relative stock density (RSD). This method (proposed by Gabelhouse 1984), allows us to express whether the population consists of mostly large fish, small fish, or something in between. Because of the low sample size ($n=1$), RSD was not calculated for pallid sturgeon. Length categories have been proposed for pallid sturgeon (Shuman 2006), shovelnose sturgeon (Quist et al. 1998), and sauger (Gabelhouse 1984). For these species we calculated the percent of fish that were < stock length, stock length, and > stock length. RSD equations can be found in Anderson and Newman (1996).

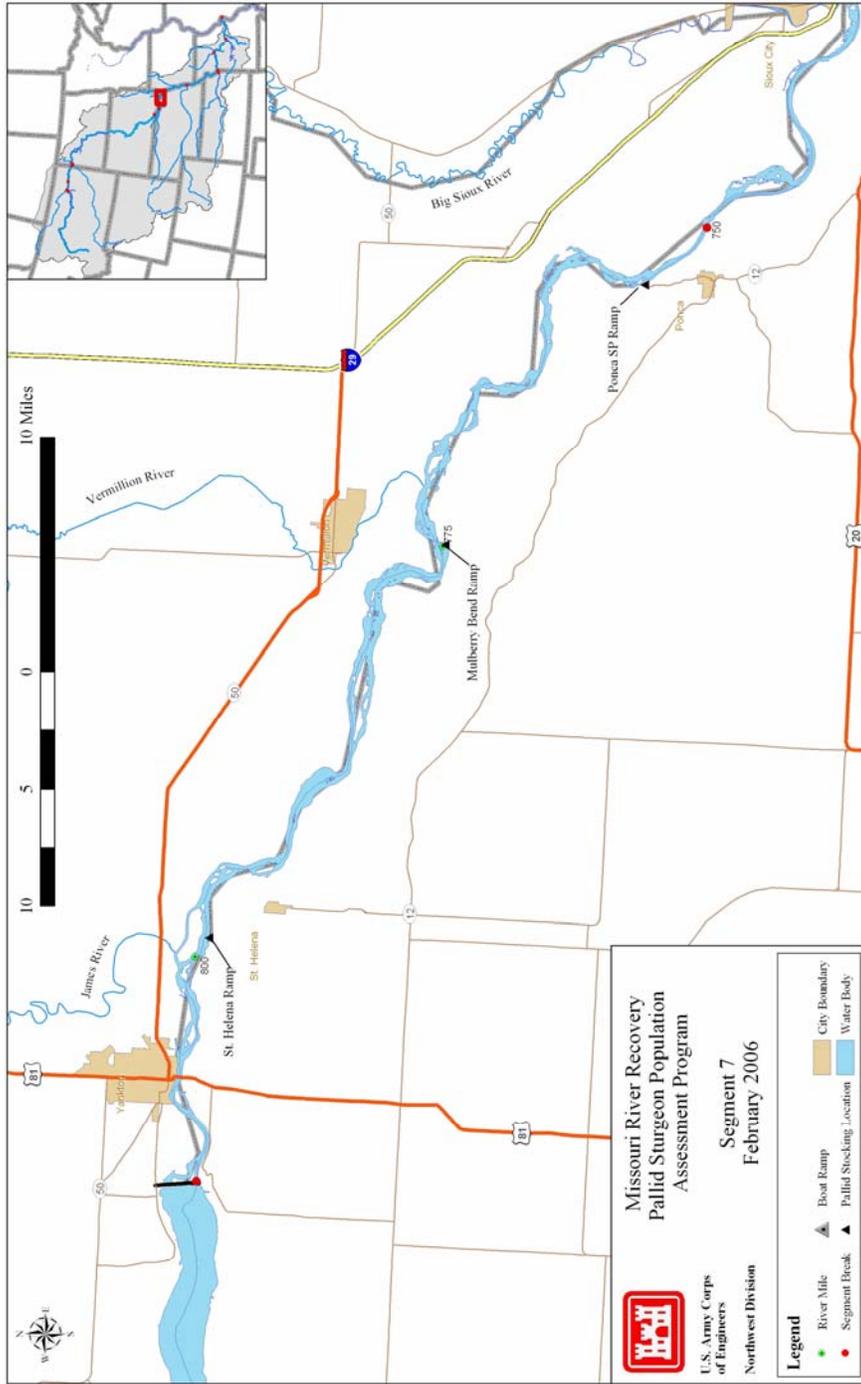


Figure 1a. Map of segment 7 of the Missouri River with major tributaries, common landmarks, and historic stocking locations for pallid sturgeon. Segment 7 encompasses the Missouri River from Gavins Point Dam to Ponca State Park NE.

Results

Pallid Sturgeon

A single pallid sturgeon was captured during the 2005 season. It was captured on August 9th in a drifted 1" (inner mesh) trammel net. The net was drifted through a pool located at the downstream tip of an island (ITIP meso habitat). A small (<1.2m) secondary channel (SCCS macro habitat) ran between the island and the left bank. The secondary channel, and the large sandbar associated with it, had been engineered as part of a Corps of Engineers habitat project. This complex is located at river mile 761.5. The depths along the 160 m net drift ranged from 1.2 m (above the pool) to 3.8 m (within the pool). The turbidity was 22 NTU and the water temperature was 26.6. Water velocity was 0.83 m/s at the bottom and 1.02 near the surface.

The pallid sturgeon had a fork length of 421 mm and a weight of 239 g. It had previously been PIT tagged and was stocked at Mulberry Bend (RM 776) in July 2003. This fish was 296 mm long (fork length) at the time of password stocking:

Table 1. Number of bends sampled, mean effort per bend, and total effort by macrohabitat for segments 5 and 6 on the Missouri River during fall through spring (sturgeon season) and summer (fish community season) in 2005. Effort is defined as net nights for gill and mini-fyke nets, 100 m drifted for trammel nets and trawls, and 100 m squared for bag seines.

Gear	Number of Bends	Mean Effort /Bend	Macrohabitat													
			BRAD	CHXO	CONF	DEND	DRNG	ISB	OSB	SCCL	SCCS	SCN	TRIB	TRML	TRMS	WILD
Fall through Spring - Sturgeon Season																
1 Inch Trammel Net	14	9.5	6.05	32.00	0	3.95	6.10	27.14	36.3	8.55	6.41	0		0	0	6.35
2.5 Inch Trammel Net	0	0.0	0	0	0	0	0	0	0	0	0	0		0	0	0
Gill Net	7	9.0	0	16	0	0	0	22	19	6	0	0		0	0	0
Otter Trawl	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0
Summer – Fish Community Season																
1 Inch Trammel Net	14	7.9	14.45	20.60	1.55	2.30	6.15	22.42	21.3	9.85	7.95	0		0	0	3.45
Bag Seine	12	5.7	3.05	0	1.40	0	0	22.85	3.96	7.18	24.96	3.02		0	2.01	0
Mini-Fyke Net	12	8.5	15	0	2	2	0	22	13	13	24	5		2	4	0
Otter Trawl	12	18.9	32.10	48.95	6.00	0	6.00	66.78	51.9	4.00	10.50	0		0	0	0

Table 2. Number of bends sampled, mean effort per bend, and total effort by mesohabitat for segment 7 on the Missouri River during fall through spring (sturgeon season) and summer (fish community season) in 2004 – 2005. Effort is defined as net nights for gill and mini-fyke nets, 100 m drifted for trammel nets and trawls, and 100 m squared for bag seines. N-E indicates the habitat is non-existent in the segment.

Gear	Number of bends	Mean effort/bend	Mesohabitat				
			BARS	CHNB	DTWT	ITIP	POOL
Fall through Spring – Sturgeon Season							
1 Inch Trammel Net	14	9.5	0.80	114.81	6.35	9.00	1.91
2.5 Inch Trammel Net							
Gill Net	7	9.0	0	50	0	2	11
Otter Trawl							
Summer – Fish Community Season							
1 Inch Trammel Net	14	7.9	1.65	95.22	3.45	9.70	0
Bag Seine	12	5.7	65.41	0	0	0	0
Mini-Fyke Net	12	8.5	88	9	0	0	0
Otter Trawl	12	18.9	0	215.72	0	10.50	0

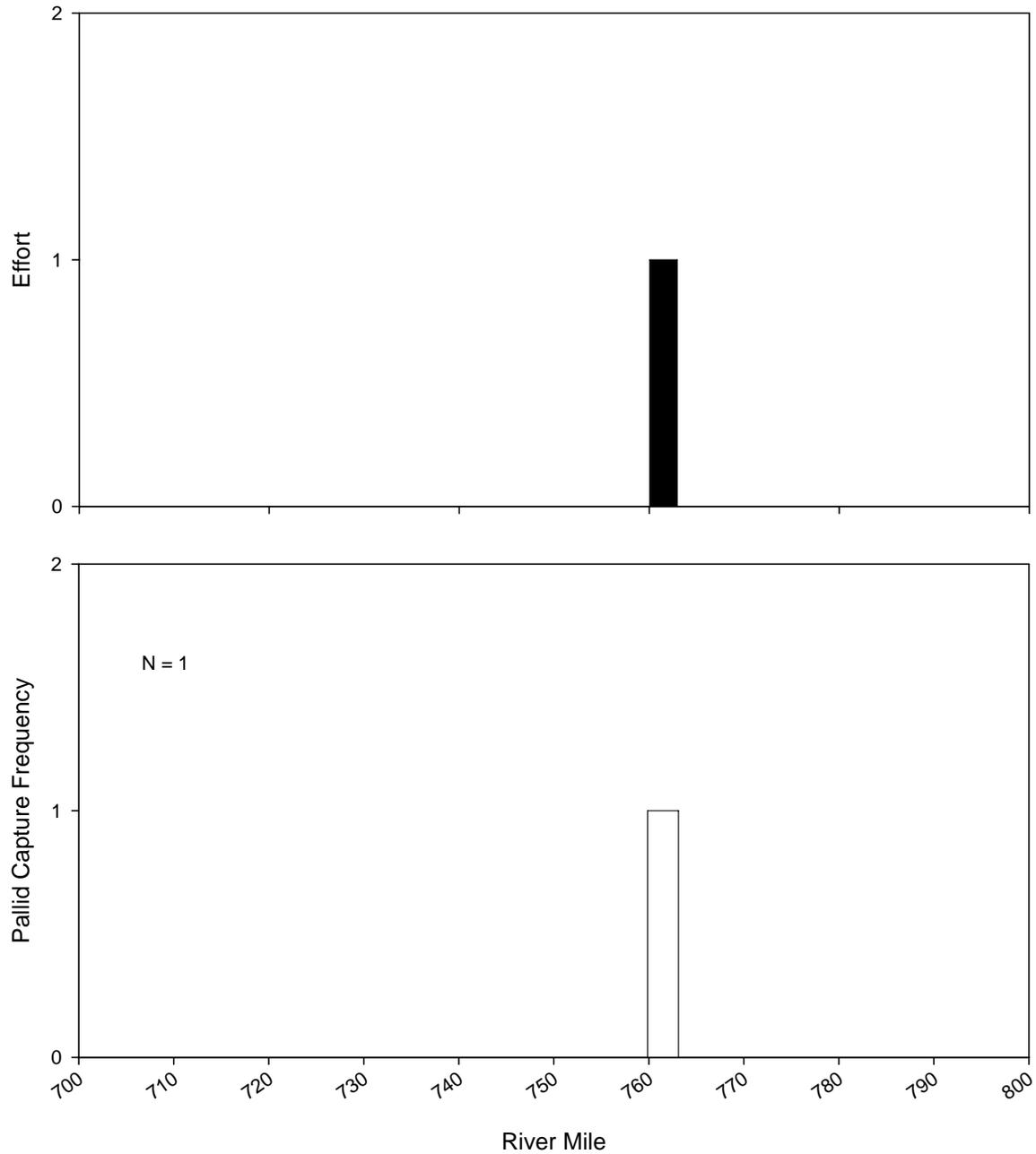


Figure 1b. Distribution of: A) seasonal sampling effort and B) pallid sturgeon captures by river mile for segments 7 in randomly selected bends of the Missouri River during 2004-2005. Sampling effort of 2 indicates bend sampled in both sturgeon and fish community seasons. Sampling effort of 1 indicates bend sampled in only one season. Black bars represent pallid captures during sturgeon season and white bars during fish community season.

Table 3. Pallid sturgeon (PDSG) capture summaries relative to habitat type and environmental variables on the Missouri River during 2004-2005. Means (minimum and maximum) are presented. Habitat definitions and codes presented in Appendix B. N-E indicates the habitat is non-existent in the segment.

Macro-	Meso-	Depth (m) (Effort)	Depth (m) (Catch)	Velocity (m/s) (Effort)	Velocity (m/s) (Catch)	Temp. °C (Effort)	Temp. °C (Catch)	Turbidity (ntu) (Effort)	Turbidity (ntu) (Catch)	Total Pallids caught
BRAD	BAR	0.5 (0.0-0.9)				24.7(19.7-28.5)		23 (15-35)		
	CHNB	1.7 (1.1-3.1)				22.0 (16.0-24.1)		17 (11-48)		
	ITIP	1.7 (1.1-1.9)				21.5 (21.4-21.9)		53 (53-53)		
CHXO	POOL	1.9 (1.8-1.9)		0.37 (0.37-0.37)		4.0 (4.0-4.0)				
	CHNB	2.6 (1.0-5.7)		0.56 (0.13-0.84)		19.5 (4.0-27.7)		21 (5-128)		
CONF	BAR	0.4 (0.3-0.5)				26.5 (26.2-27.1)		122 (89-135)		
	CHNB	2.3 (1.0-3.5)		0.73 (0.65-0.75)		25.4 (24.7-25.8)		41 (16-47)		
DEND	BAR	0.9 (0.6-1.0)				20.2 (20.0-20.5)		19 (18-21)		
	CHNB	2.2 (1.2-4.3)		0.53 (0.53-0.53)		19.8 (15.8-21.2)		45 (23-51)		
DRNG	CHNB	1.7 (1.2-3.9)		0.51 (0.27-0.75)		21.7 (17.1-24.3)		22 (18-47)		
ISB	BAR	0.5 (0.2-1.0)		0.20 (0.20-0.20)		23.8 (19.4-28.5)		21 (8-43)		
	POOL	2.3 (1.3-2.6)		0.19 (0.18-0.25)		4.0 (4.0-4.0)		6 (6-6)		
	CHNB	1.9 (0.5-4.0)		0.56 (0.06-0.90)		18.3 (4.0-26.4)		20 (6-128)		
OSB	BAR	0.6 (0.2-1.0)		0.40 (0.40-0.40)		22.3 (20.1-26.5)		20 (14-31)		
	POOL	2.5 (2.2-2.7)		0.20 (0.20-0.20)		4.0 (4.0-4.0)		9 (9-9)		
	CHNB	2.9 (0.6-7.7)		0.60 (0.07-0.96)		16.8(4.0-26.1)		17 (5-145)		

SCCL	BAR	0.6 (0.1-1.5)		0.64 (0.64-0.64)		22.1 (19.2-26.9)		26 (13-49)		
	POOL	3.0 (3.0-3.0)		0.09 (0.09-0.09)		4.0 (4.0-4.0)		5(5-5)		
	CHNB	2.3 (1.2-3.6)		0.35 (0.02-0.93)		10.4 (4.0-26.6)		28 (11-235)		
	ITIP	1.5 (1.2-2.2)		0.11 (0.02-0.20)		13.6 (4.0-21.8)		24 (6-190)		
SCCS	BAR	0.4 (0.2-1.1)				24.8 (19.4-30.5)		32 (11-92)		
	POOL	1.5 (1.4-2.1)		0.11 (0.1-0.1)		18.2 (17.2-18.4)		12 (12-12)		
	CHNB	0.6 (0.5-0.6)				21.8 (21.6-22.0)		14 (14-14)		
	ITIP	2.5 (1.4-5.0)	3.8 (3.8-3.8)	0.38 (0.09-0.83)	0.83 (0.83-0.83)	19.4 (13.8-26.6)	26.6 (26.6-26.6)	18 (12-73)	22 (22-22)	1
TRML	BAR	0.5 (0.4-0.6)				25.3 (24.4-26.9)		47 (42-48)		
TRMS	BAR	0.5 (0.2-1.1)				20.3 (15.6-23.6)		27 (13-601)		
WILD	DTWT	4.3 (2.9-5.8)		0.73 (0.73-0.73)		21.3 (20.7-23.3)		10 (9-11)		

Table 4. Individual pallid sturgeon fork length (mm), weights (g), morphometric character index (CI) (Sheehan et al. 1999), status (H = Hatchery, W = Wild^d), tags found, elastomer tags (color, position, orientation), if tags were inserted in field, stocking locations, and hatchery information on the Missouri River during 2004-2005.

ID	Recapture Data							Stocking Data				
	FL (mm)	Wt (g)	CI	Status	Tags found ^a	Elastomer ^b	Marked in field?	Year class	FL (mm)	Wt (g)	Site	Source ^c
SD-1-7-267-2	421	239		H	PIT			2002	296	none	Mulberry Bend	Garrison

^a Tag types include: coded wire tag (C), elastomer tag (E) and passive induced transponder tag, i.e. PIT tag (P).

^b Positions and orientations listed after each color can include: fish's right (R), fish's left (L), center of rostrum (C), vertical (V), and horizontal (H).

^c Hatchery sources: source abbreviations reported in Appendix G.

^d All pallids that were captured with no evidence of previously being tagged were deemed wild pending genetic verification.

Table 5. Pallid sturgeon (PDSG) and hybrid pallid X shovelnose sturgeon (SNPD) capture locations and habitat characteristics for segment 7 of the Missouri River during 2004 - 2005. ID number links pallid sturgeon habitat information with individual fish length, weight, and tagging data in Table 4. Gear codes presented in Appendix C. Habitat definitions and codes presented in Appendix B.

Species	ID#	Date	Gear	River mile	Habitat			Water Temp (°C)	Turb ^a (NTU)	Depth ^b (m)	Bottom velocity (m/s)	Substrate ^c (silt/sand/gravel)
					Macro-	Meso-	Micro-					
PDSG	SD-1-7-267-2	8/9/2005	TNS		SCCS	ITIP		26.6	22	3.8	0.83	0 / 100 / 0

^aTurb = turbidity.

^bDepths presented are the average of the starting, middle, and ending depths measured during gear deployment.

^cSubstrates are percents determined visually and by feel in the field.

Table 6. Mean fork length, weight, relative condition factor (Kn), and growth rates of hatchery-reared pallid sturgeon by year class at the time of stocking and recapture in 2001-2005 in the Missouri River. Relative condition factor was calculated using the equation in Keenlyne and Evanson (1993). Standard error (+/- 2SE) was calculated where N>1 and is represented on second line of each year.

Year class	N	Stocking Data			Recapture Data			Growth Data	
		Length (mm)	Weight (g)	Kn	Length (mm)	Weight (g)	Kn	Length (mm/d)	Weight (g/d)
2001									
2002	1	296			421	239	.884	.166	
2003									
2004									
2005									

Table 7. Relative stock density (RSD)^a by a length category for wild and stocked pallid sturgeon in the Missouri River captured during 2004-2005. Length categories^b determined using the methods proposed by Shuman et al. (2006).

Length Category	Wild ^c		Stocked	
	N	RSD	N	RSD
Sturgeon Season				
Sub-stock (0-199)				
Sub-stock (200-329)				
Stock				
Quality				
Preferred				
Memorable				
Trophy				
Fish Community Season				
Sub-stock (0-199)				
Sub-stock (200-329)				
Stock			1	
Quality				
Preferred				
Memorable				
Trophy				

^a RSD = number of fish of a specified length ÷ number minimum stock length fish x 100.

^b Length categories based on the percentage of the largest known pallid sturgeon: Sub-stock FL < 330 mm (20 %), Stock FL = 330 - 629 mm (20 – 36 %), Quality FL = 630 – 839 mm (36 – 45 %), Preferred FL = 840 – 1039 mm (45 – 59 %), Memorable FL = 1040 – 1269 mm (59 – 74 %), Trophy FL > 1270 mm (>74 %).

^c All pallids that were captured with no evidence of previously being tagged were deemed wild pending genetic verification.

Table 8. Ratios of wild pallid sturgeon to shovelnose sturgeon, wild pallid sturgeon to hybrid sturgeon (pallid X shovelnose), and stocked pallid sturgeon to wild pallid sturgeon River during 2004-2005 including non-random and wild samples captured in the Missouri

Year	All Pallids : Shovelnose	Wild* Pallids: Shovelnose	Wild* Pallids: Hybrids	Stocked Pallids: Wild* Pallids
2005	1 : 511	0 : 511	0 : 0	1 : 0

* All pallids that were captured with no evidence of previously being tagged were deemed wild pending genetic verification.

Year comparisons, Gear evaluation and Habitat associations

Sampling in Segment 7 was initiated at the opening of the 2005 sampling season. Therefore, no comparisons can be made to previous sampling seasons.

Due to the low pallid sturgeon catch, gear and habitat evaluations are not applicable. A single pallid sturgeon was captured in a drifted 1" trammel net. The fish was caught on 8/9/05 at river mile 761 in an island tip pool located below an engineered sandbar (Macro habitat: SCCS, Meso habitat: ITIP). Turbidity at the capture located measured 22 NTU and the bottom velocity was 0.83 m/s. The water temperature was 22 C. No other pallid sturgeon were captured during the 2005 season.

Segment 7 - Pallid Sturgeon / Sturgeon Season

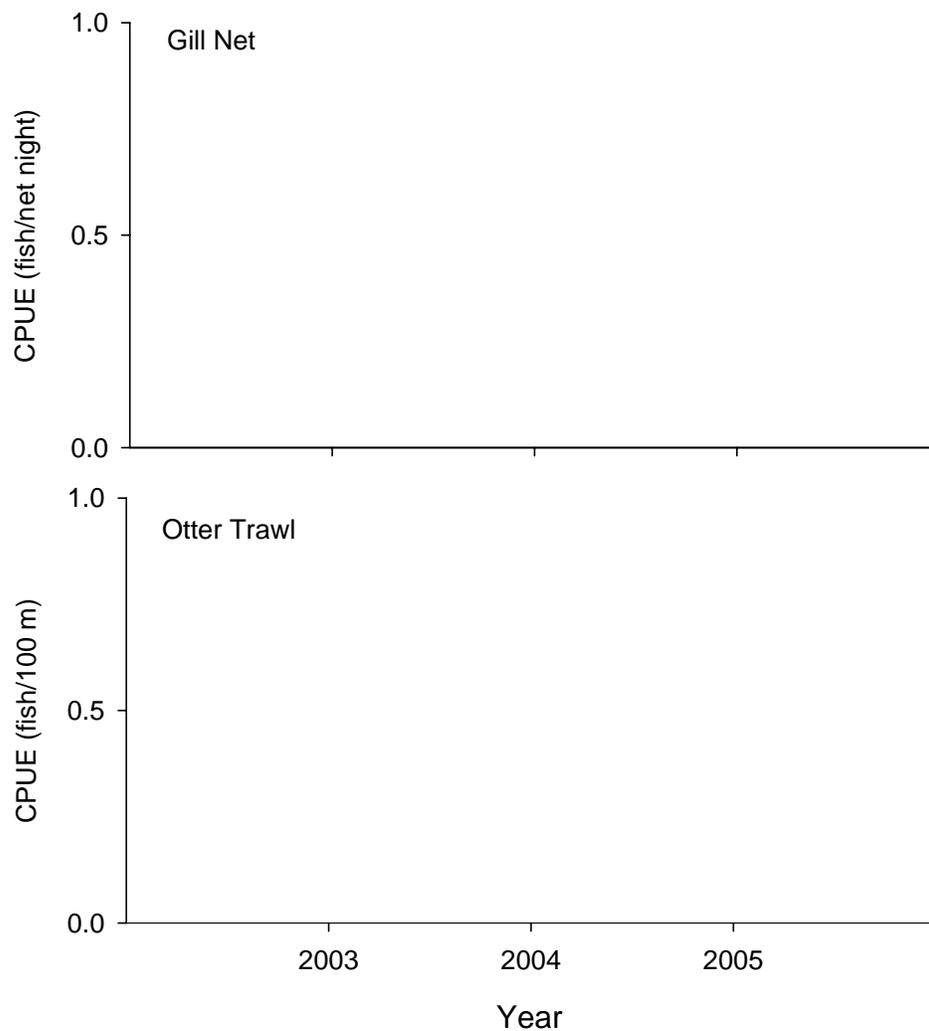


Figure 2. Mean annual catch-per-unit-effort (± 2 SE) of wild (black bars) and stocked (white bars) pallid sturgeon in segment 7 of the Missouri River during sturgeon season 2003-2005. All pallids that were captured with no evidence of previously being tagged were deemed wild pending genetic verification.

Segment 7 - Pallid Sturgeon / Sturgeon Season

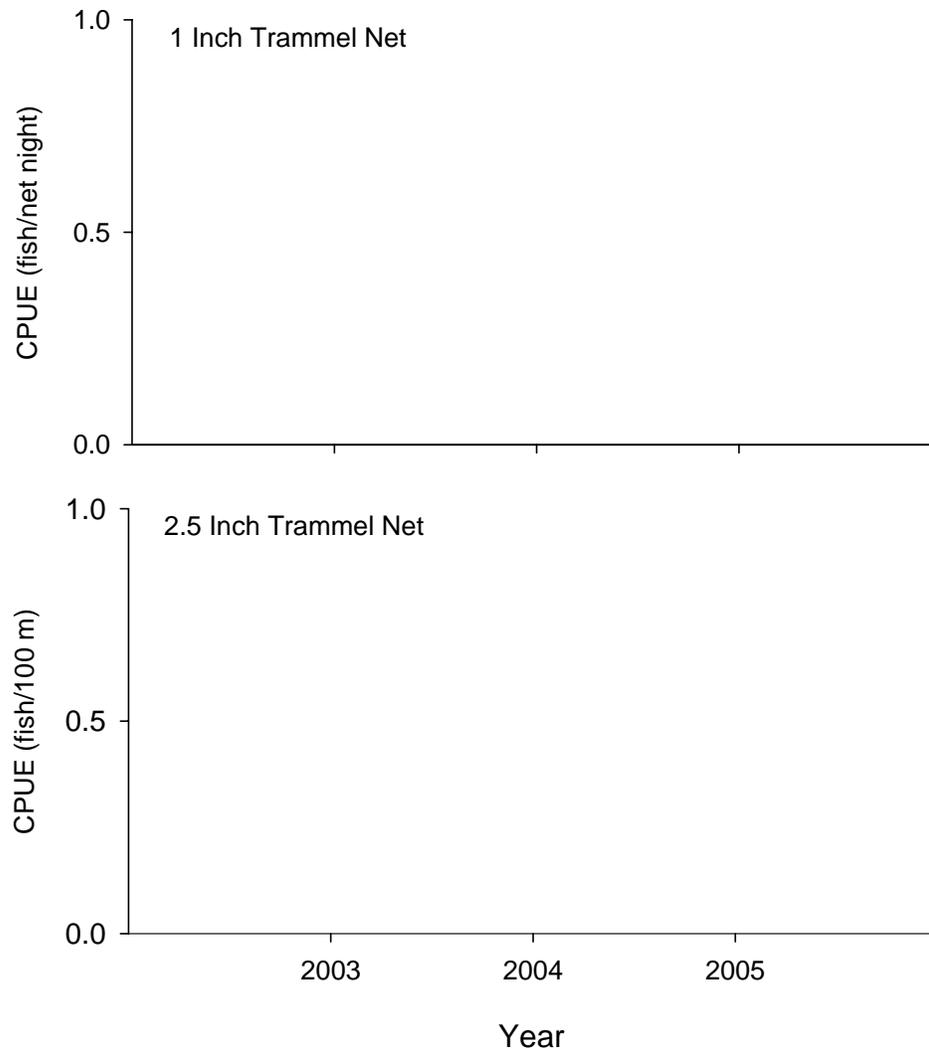


Figure 3. Mean annual catch-per-unit-effort (± 2 SE) of wild (black bars) and stocked (white bars) pallid sturgeon in segment 7 of the Missouri River during sturgeon season 2003-2005. All pallids that were captured with no evidence of previously being tagged were deemed wild pending genetic verification.

Segment 7 - Pallid Sturgeon / Sturgeon Season

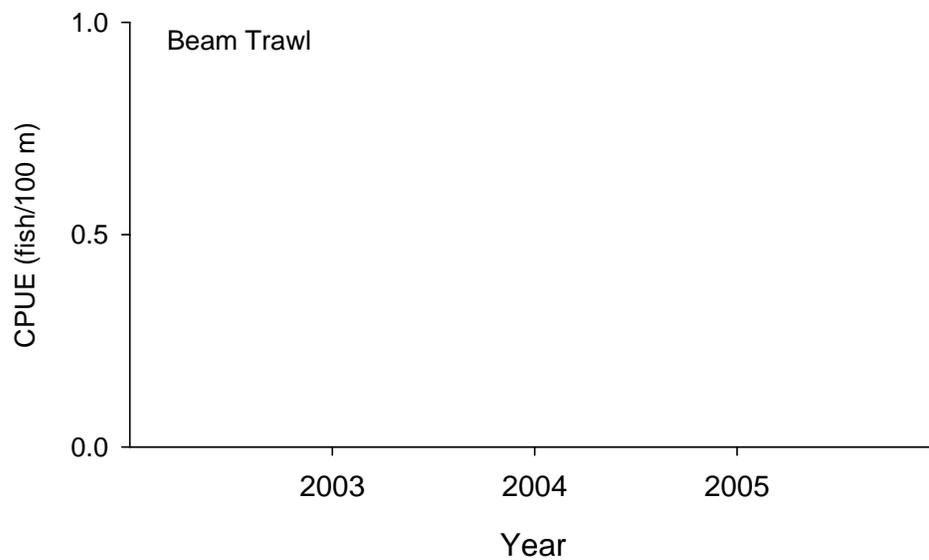


Figure 4. Mean annual catch-per-unit-effort (± 2 SE) of wild (black bars) and stocked (white bars) pallid sturgeon in segment 7 of the Missouri River during sturgeon season 2003-2005. All pallids that were captured with no evidence of previously being tagged were deemed wild pending genetic verification.

Segment 7 - Pallid Sturgeon / Fish Community Season

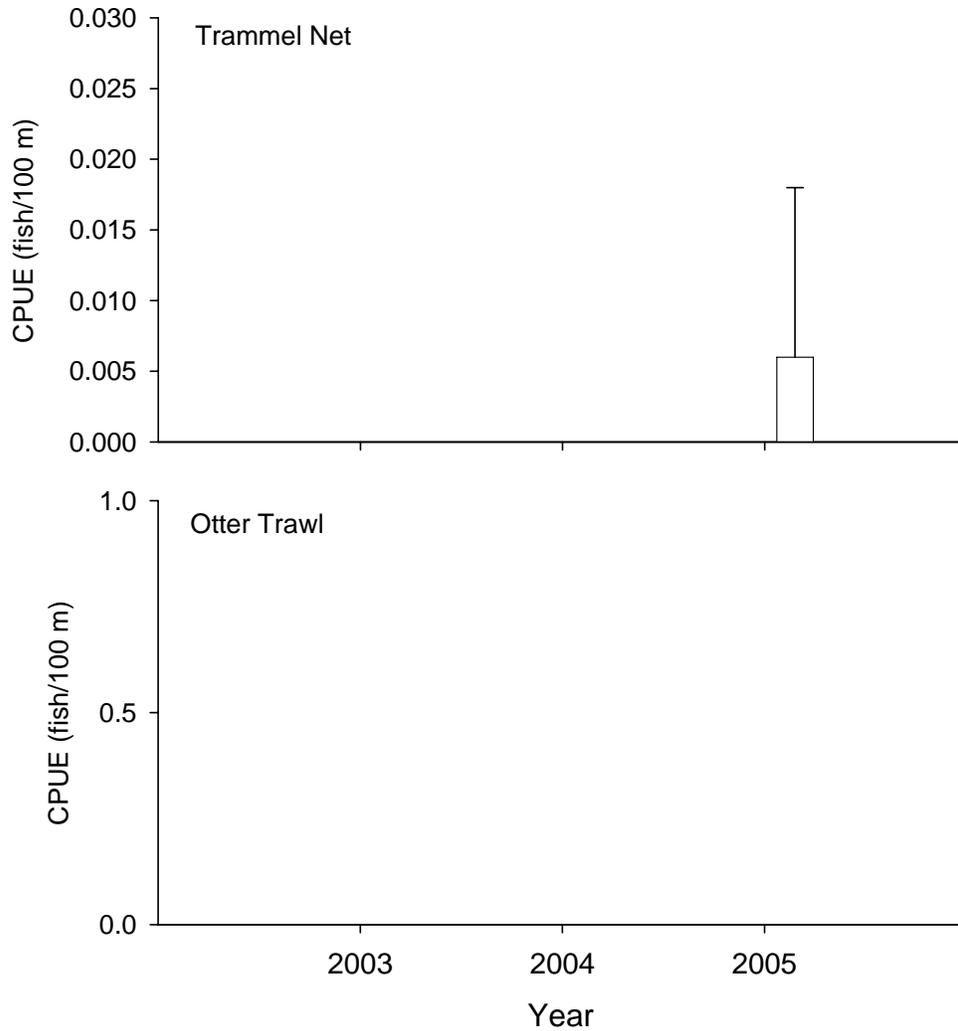


Figure 5. Mean annual catch-per-unit-effort (± 2 SE) of wild (black bars) and stocked (white bars) pallid sturgeon in gill nets and otter trawls in segment 7 of the Missouri River during fishcommunity season 2003-2005. All pallids that were captured with no evidence of previously being tagged were deemed wild pending genetic verification.

Segment 7 - Pallid Sturgeon / Fish Community Season

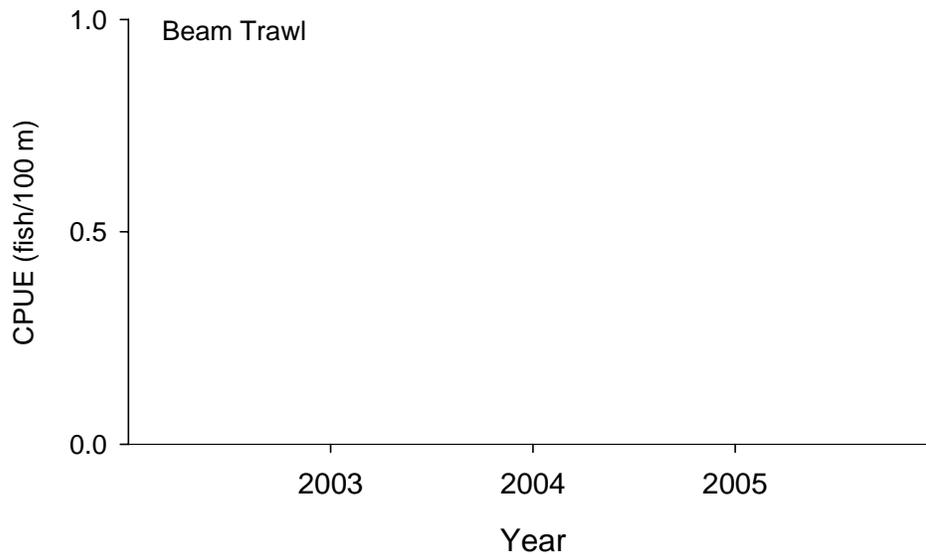


Figure 6. Mean annual catch-per-unit-effort (± 2 SE) of wild (black bars) and stocked (white bars) pallid sturgeon in segment 7 of the Missouri River during fish community season 2003-2005. All pallids that were captured with no evidence of previously being tagged were deemed wild pending genetic verification.

Segment 7 - Pallid Sturgeon / Fish Community Season

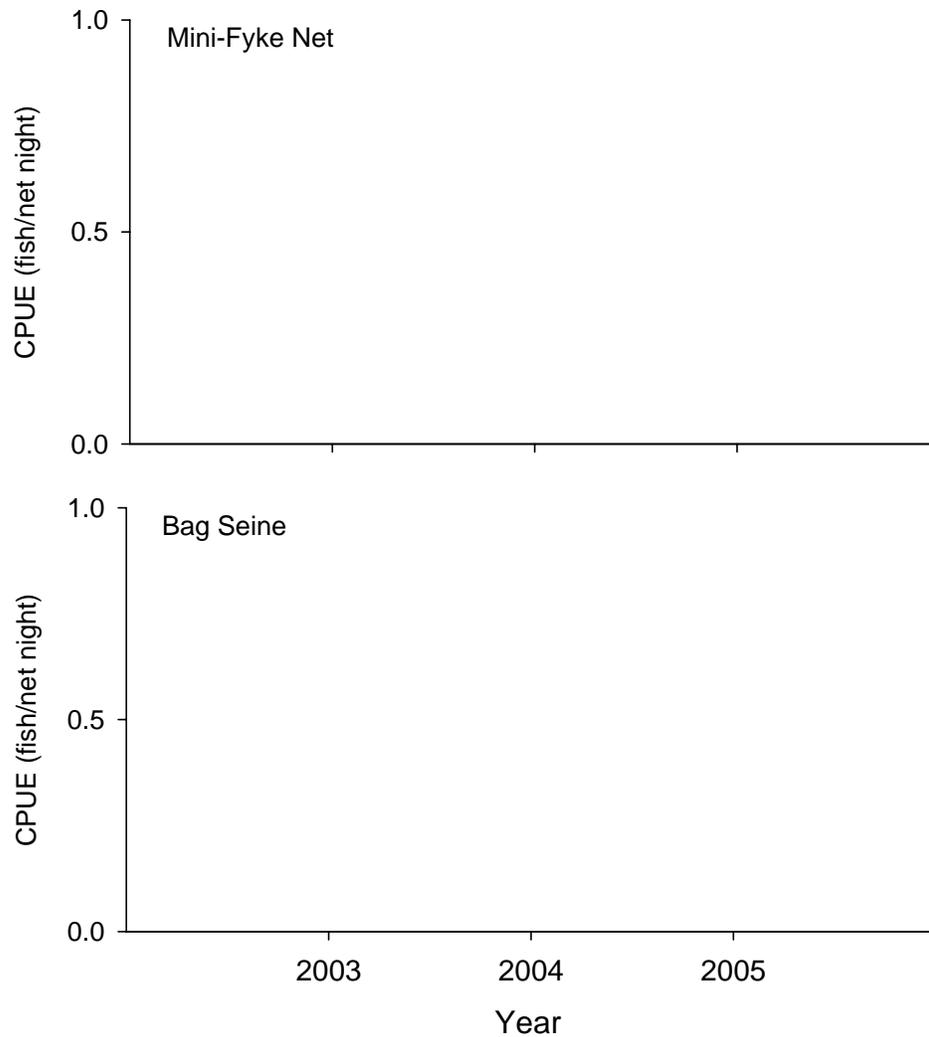


Figure 7. Mean annual catch-per-unit-effort (± 2 SE) of wild (black bars) and stocked (white bars) pallid sturgeon in segment 7 of the Missouri River during fish community season 2003-2005. All pallids that were captured with no evidence of previously being tagged were deemed wild pending genetic verification.

Table 9. Total number of sub-stock size (0-199 mm) pallid sturgeon captured for each gear during each season and the proportion caught within each macrohabitat type in segment 7 of the Missouri River during 2005. The percent of total effort for each gear in each habitat is presented on the second line of each gear type. Size categories described in Table 7. N-E indicates the habitat is non-existent in the segment.

Gear	N	Macrohabitat													
		BRAD	CHXO	CONF	DEND	DRNG	ISB	OSB	SCCL	SCCS	SCCN	TRIB	TRML	TRMS	WILD
Sturgeon Season (Fall through Spring)															
1 Inch Trammel Net	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		5	24	0	3	5	20	27	6	5	0		0	0	5
2.5 Inch Trammel Net	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		0	0	0	0	0	0	0	0	0	0		0	0	0
Gill Net	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		0	25	0	0	0	35	30	10	0	0		0	0	0
Otter Trawl	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		0	0	0	0	0	0	0	0	0	0		0	0	0
Fish Community Season (Summer)															
1 Inch Trammel Net	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		13	19	1	2	6	20	19	9	7	0		0	0	3
Bag Seine	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		4	0	2	0	0	33	6	10	36	4		0	3	0
Mini-Fyke Net	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		15	0	2	2	0	22	13	13	24	5		2	4	0
Otter Trawl	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		14	22	3	0	3	30	23	2	5	0		0	0	0

Table 10. Total number of sub-stock size (0-199 mm) pallid sturgeon captured for each gear during each season and the proportion caught within each mesohabitat type in segment 7 of the Missouri River during 2005. The percent of total effort for each gear in each habitat is presented on the second line of each gear type. Size categories described in Table 7. N-E indicates the habitat is non-existent in the segment.

Gear	N	Mesohabitat				
		BARS	CHNB	DTWT	ITIP	POOL
Sturgeon Season (Fall through Spring)						
1 Inch Trammel Net	0	0 1	0 86	0 5	0 7	0 1
2.5 Inch Trammel Net	0	0 0	0 0	0 0	0 0	0 0
Gill Net	0	0 0	0 79	0 0	0 3	0 17
Otter Trawl	0	0 0	0 0	0 0	0 0	0 0
Fish Community Season (Summer)						
1 Inch Trammel Net	0	0 1	0 87	0 3	0 9	0 0
Bag Seine	0	0 96	0 0	0 0	0 0	0 0
Mini-Fyke Net	0	0 86	0 9	0 0	0 0	0 0
Otter Trawl	0	0 0	0 95	0 0	0 5	0 0

Table 11. Total number of sub-stock size (200-329 mm) pallid sturgeon captured for each gear during each season and the proportion caught within each macrohabitat type in segment 7 of the Missouri River during 2005. The percent of total effort for each gear in each habitat is presented on the second line of each gear type. Size categories described in Table 7. N-E indicates the habitat is non-existent in the segment.

Gear	N	Macrohabitat													
		BRAD	CHXO	CONF	DEND	DRNG	ISB	OSB	SCCL	SCCS	SCN	TRIB	TRML	TRMS	WILD
Sturgeon Season (Fall through Spring)															
1 Inch Trammel Net	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		5	24	0	3	5	20	27	6	5	0		0	0	5
2.5 Inch Trammel Net	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		0	0	0	0	0	0	0	0	0	0		0	0	0
Gill Net	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		0	25	0	0	0	35	30	10	0	0		0	0	0
Otter Trawl	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		0	0	0	0	0	0	0	0	0	0		0	0	0
Fish Community Season (Summer)															
1 Inch Trammel Net	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		13	19	1	2	6	20	19	9	7	0		0	0	3
Bag Seine	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		4	0	2	0	0	33	6	10	36	4		0	3	0
Mini-Fyke Net	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		15	0	2	2	0	22	13	13	24	5		2	4	0
Otter Trawl	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		14	22	3	0	3	30	23	2	5	0		0	0	0

Table 12. Total number of sub-stock size size (200-329 mm) pallid sturgeon captured for each gear during each season and the proportion caught within each mesohabitat type in segment 7 of the Missouri River during 2005. The percent of total effort for each gear in each habitat is presented on the second line of each gear type. Size categories described in Table 7. N-E indicates the habitat is non-existent in the segment.

Gear	N	Mesohabitat				
		BARS	CHNB	DTWT	ITIP	POOL
Sturgeon Season (Fall through Spring)						
1 Inch Trammel Net	0	0 1	0 86	0 5	0 7	0 1
2.5 Inch Trammel Net	0	0 0	0 0	0 0	0 0	0 0
Gill Net	0	0 0	0 79	0 0	0 3	0 17
Otter Trawl	0	0 0	0 0	0 0	0 0	0 0
Fish Community Season (Summer)						
1 Inch Trammel Net	0	0 1	0 87	0 3	0 9	0 0
Bag Seine	0	0 96	0 0	0 0	0 0	0 0
Mini-Fyke Net	0	0 86	0 9	0 0	0 0	0 0
Otter Trawl	0	0 0	0 95	0 0	0 5	0 0

Table 13. Total number of stock size (330-629 mm) pallid sturgeon captured for each gear during each season and the proportion caught within each macrohabitat type in segment 7 of the Missouri River during 2005. The percent of total effort for each gear in each habitat is presented on the second line of each gear type. Size categories described in Table 7. N-E indicates the habitat is non-existent in the segment.

Gear	N	Macrohabitat													
		BRAD	CHXO	CONF	DEND	DRNG	ISB	OSB	SCCL	SCCS	SCCN	SCN	TRIB	TRML	TRMS
Sturgeon Season (Fall through Spring)															
1 Inch Trammel Net	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		5	24	0	3	5	20	27	6	5		0		0	0
2.5 Inch Trammel Net	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gill Net	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			25	0	0	0	35	30	10	0		0		0	0
Otter Trawl	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fish Community Season (Summer)															
1 Inch Trammel Net	1	0	0	0	0	0	0	0	0	100	0	0	0	0	0
		13	19	1	2	6	20	19	9	7	0		0	0	0
Bag Seine	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		4	0	2	0	0	33	6	10	36	4		0	0	3
Mini-Fyke Net	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		15	0	2	2	0	22	13	13	24	5		2	4	
Otter Trawl	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		14	22	3	0	3	30	23	2	5	0		0	0	0

Table 14. Total number of stock size (330-629 mm) pallid sturgeon captured for each gear during each season and the proportion caught within each mesohabitat type in segment 7 of the Missouri River during 2005. The percent of total effort for each gear in each habitat is presented on the second line of each gear type. Size categories described in Table 7. N-E indicates the habitat is non-existent in the segment.

Gear	N	Mesohabitat				
		BARS	CHNB	DTWT	ITIP	POOL
Sturgeon Season (Fall through Spring)						
1 Inch Trammel Net	0	0 1	0 86	0 5	0 7	0 1
2.5 Inch Trammel Net	0	0 0	0 0	0 0	0 0	0 0
Gill Net	0	0 0	0 79	0 0	0 3	0 17
Otter Trawl	0	0 0	0 0	0 0	0 0	0 0
Fish Community Season (Summer)						
1 Inch Trammel Net	1	0 1	0 87	0 3	100 9	0 0
Bag Seine	0	0 96	0 0	0 0	0 0	0 0
Mini-Fyke Net	0	0 86	0 9	0 0	0 0	0 0
Otter Trawl	0	0 0	0 95	0 0	0 5	0 0

Table 15. Total number of quality and above size (>630 mm) pallid sturgeon captured for each gear during each season and the proportion caught within each macrohabitat type in segment 7 of the Missouri River during 2005. The percent of total effort for each gear in each habitat is presented on the second line of each gear type. Size categories described in Table 7. N-E indicates the habitat is non-existent in the segment.

Gear	N	Macrohabitat													
		BRAD	CHXO	CONF	DEND	DRNG	ISB	OSB	SCCL	SCCS	SCN	TRIB	TRML	TRMS	WILD
Sturgeon Season (Fall through Spring)															
1Inch Trammel Net	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		5	24	0	3	5	20	27	6	5	0		0	0	5
2.5 Inch Trammel Net	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		0	0	0	0	0	0	0	0	0	0		0	0	0
Gill Net	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		0	25	0	0	0	35	30	10	0	0		0	0	0
Otter Trawl	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		0	0	0	0	0	0	0	0	0	0		0	0	0
Fish Community Season (Summer)															
1 Inch Trammel Net	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		13	19	1	2	6	20	19	9	7	0		0	0	3
Bag Seine	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		4	0	2	0	0	33	6	10	36	4		0	3	0
Mini-Fyke Net	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		15	0	2	2	0	22	13	13	24	5		2	4	0
Otter Trawl	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		14	22	3	0	3	30	23	2	5	0		0	0	0

Table 16. Total number of quality and above size (>630 mm) pallid sturgeon captured for each gear during each season and the proportion caught within each mesohabitat type in segment 7 of the Missouri River during 2005. The percent of total effort for each gear in each habitat is presented on the second line of each gear type. Size categories described in Table 7. N-E indicates the habitat is non-existent in the segment.

Gear	N	Mesohabitat				
		BARS	CHNB	DTWT	ITIP	POOL
Sturgeon Season (Fall through Spring)						
1 Inch Trammel Net	0	0 1	0 86	0 5	0 7	0 1
2.5 Inch Trammel Net	0	0 0	0 0	0 0	0 0	0 0
Gill Net	0	0 0	0 79	0 0	0 3	0 17
Otter Trawl	0	0 0	0 0	0 0	0 0	0 0
Fish Community Season (Summer)						
1 Inch Trammel Net	0	0 1	0 87	0 3	0 9	0 0
Bag Seine	0	0 96	0 0	0 0	0 0	0 0
Mini-Fyke Net	0	0 86	0 9	0 0	0 0	0 0
Otter Trawl	0	0 0	0 95	0 0	0 5	0 0

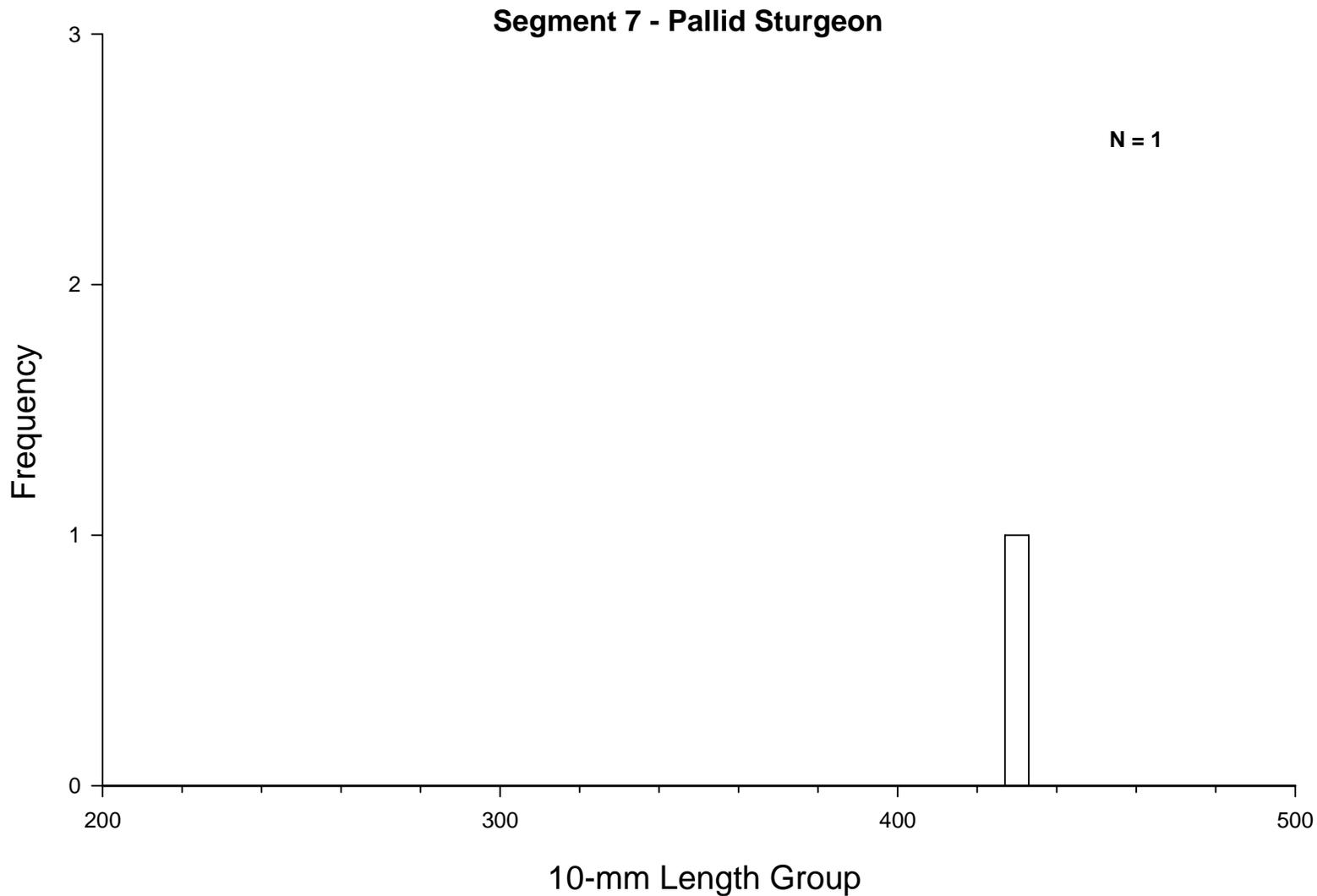


Figure 8. Length frequency of pallid sturgeon during fall through spring (sturgeon season, black bars) and summer (fish community season, white bars) in segment 7 of the Missouri River during 2004 - 2005.

Segment 7 - Cumulative Pallid Sturgeon Capture History

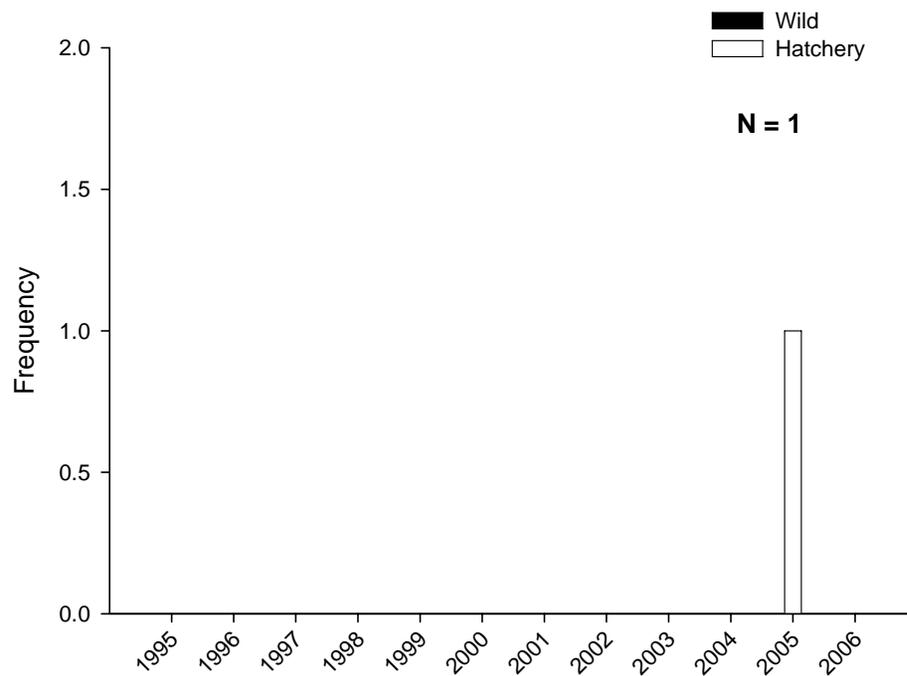


Figure 9. Cumulative capture history of wild (black bars), hatchery reared (white bars), and unknown origin (cross-hatched bars) pallid sturgeon collected in segment 7 of the Missouri River from 1995 to 2005.

Segment 7 - Cumulative Pallid Sturgeon Length Frequency History

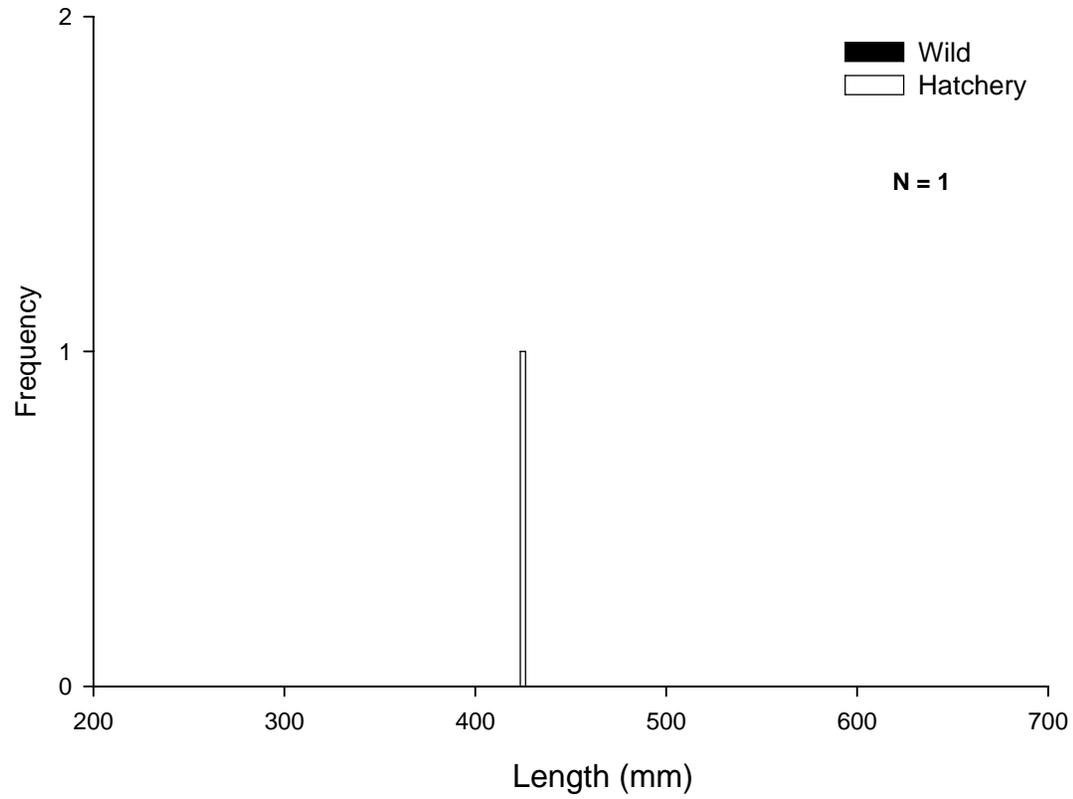


Figure 10. Cumulative pallid sturgeon length frequency histogram for segment 7 comparing hatchery reared (white bars), wild (black bars), and unknown origin (cross-hatched bars) pallid sturgeon captures in 2005.

Shovelnose X Pallid Sturgeon Hybrids

No shovelnose X pallid sturgeon hybrids were captured during the 2005 sampling season.

Targeted Native River Species

Shovelnose Sturgeon

Shovelnose sturgeon

A total of 511 shovelnose sturgeon were captured in 2005. Active gears caught 444 fish and passive gears 66 fish. The majority of the sturgeon were captured in small-mesh (1" inner panel) trammel nets (n= 372). Most of those (N=157) were sampled during the sturgeon season (CPUE = 1.2 fish/100m) and 215 during the fish community season (CPUE = 2.0 fish/100m). Detailed catch-per-unit-effort data can be found in Figures 12 and 14. Gillnets captured 67 fish resulting in a CPUE of 1.06 fish/ net night. Otter trawls captured 68 fish resulting in a CPUE of 0.375 fish/100m. Bag seines captured 4 sturgeon during the 2005 season. No shovelnose sturgeon were caught in the mini-fyke nets.

Gears were set in a total of 13 macrohabitats, and shovelnose sturgeon were captured in 9 of them. During the sturgeon season, shovelnose sturgeon were most frequently found in inside bend (37%) and channel crossover (27%) macrohabitats. Similarly, during the fish community season, catches were once again highest in inside bends (39%) and channel crossovers (23%). Confluence macrohabitats yielded the highest catch rates for 1" trammel (3.2 fish/100m) over the entire year (both seasons combined). Channel borders were the most productive mesohabitat, producing 81% of the shovelnose sturgeon catch.

Shovelnose sturgeon fork lengths ranged from 360 to 760 mm (figure 17). Most of the fish were over 500 mm in length. Incremental RSD analysis yielded RSD-P values of 89 and 85 for the sturgeon and fish community season, respectively. The mean relative weight for shovelnose sturgeon was 81.6 with a range of 62 to 108.

Segment 7 - Shovelnose Sturgeon / Sturgeon Season

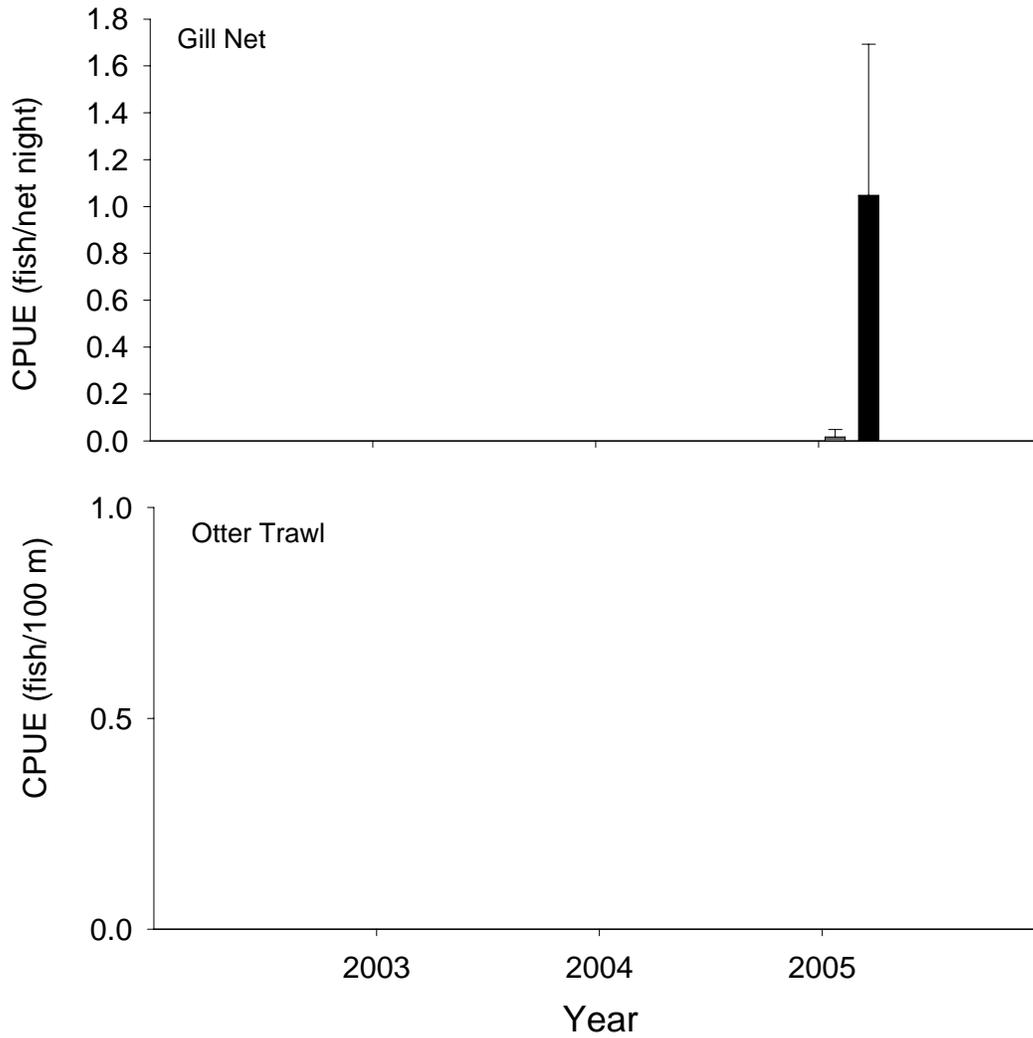


Figure 11. Mean annual catch-per-unit-effort (+/- 2SE) of sub-stock size (0-149 mm; white bars), sub-stock size (150-249; cross-hatched), stock size (250-379 mm; gray bars), and quality and above size (> 380 mm; black bars) shovelnose sturgeon in gill nets and otter trawls in segment 7 of the Missouri River during sturgeon season 2003 - 2005.

Segment 7 - Shovelnose Sturgeon / Sturgeon Season

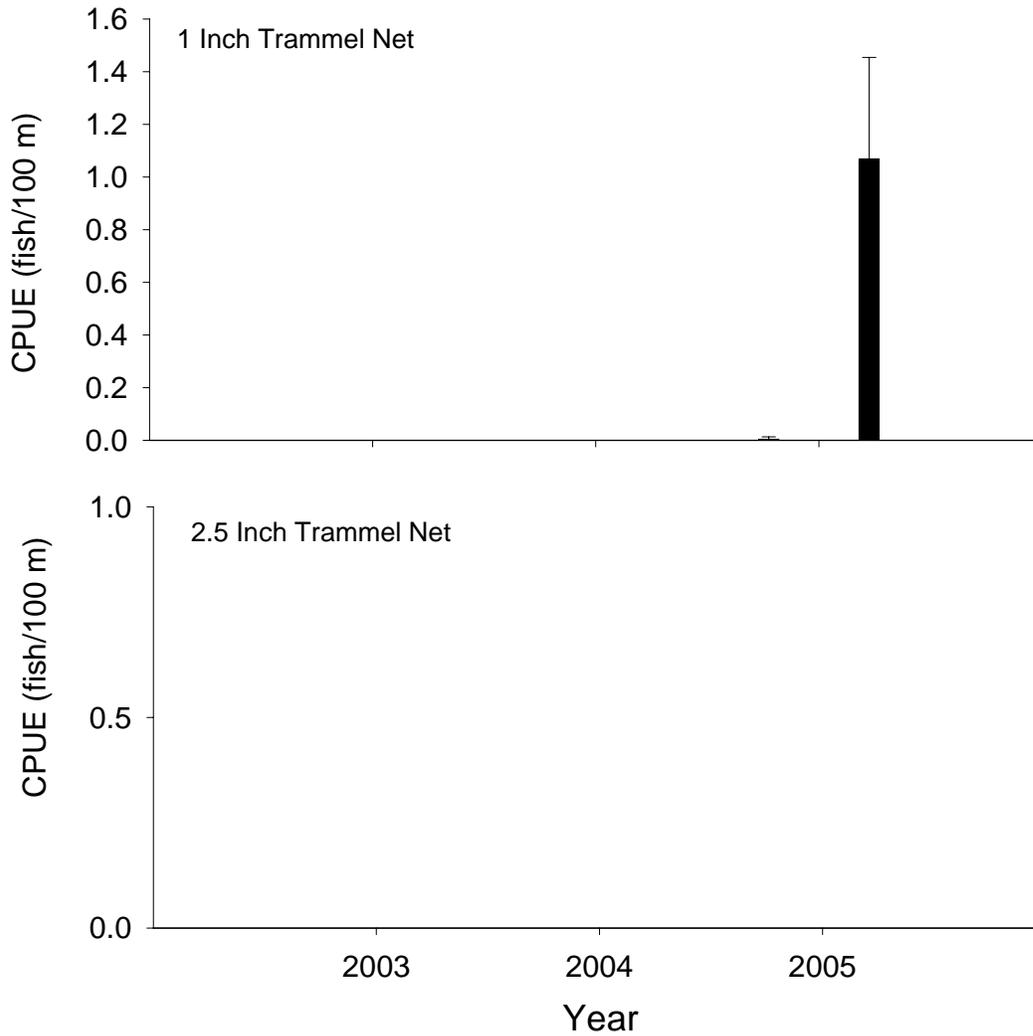


Figure 12. Mean annual catch-per-unit-effort (+/- 2SE) of sub-stock size (0-149 mm; white bars), sub-stock size (150-249; cross-hatched), stock size (250-379 mm; gray bars), and quality and above size (> 380 mm; black bars) shovelnose sturgeon in trammel nets in segment 7 of the Missouri River during sturgeon season 2003 - 2005.

Segment 7 - Shovelnose Sturgeon / Sturgeon Season

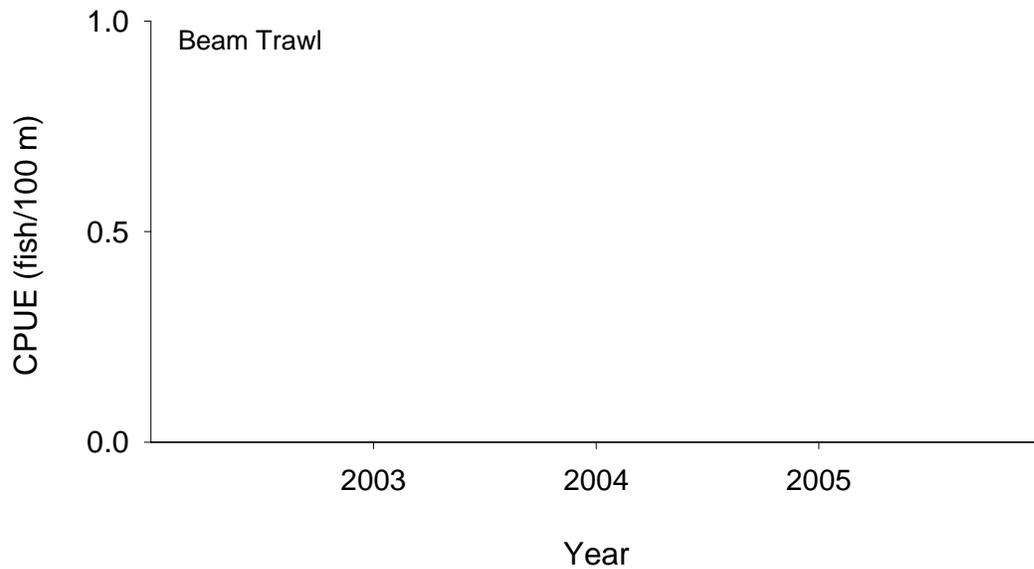


Figure 13. Mean annual catch-per-unit-effort (\pm 2SE) of sub-stock size (0-149 mm; white bars), sub-stock size (150-249; cross-hatched), stock size (250-379 mm; gray bars), and quality and above size (> 380 mm; black bars) shovelnose sturgeon in beam trawls in segment 7 of the Missouri River during sturgeon season 2003 - 2005.

Segment 7 - Shovelnose Sturgeon / Fish Community Season

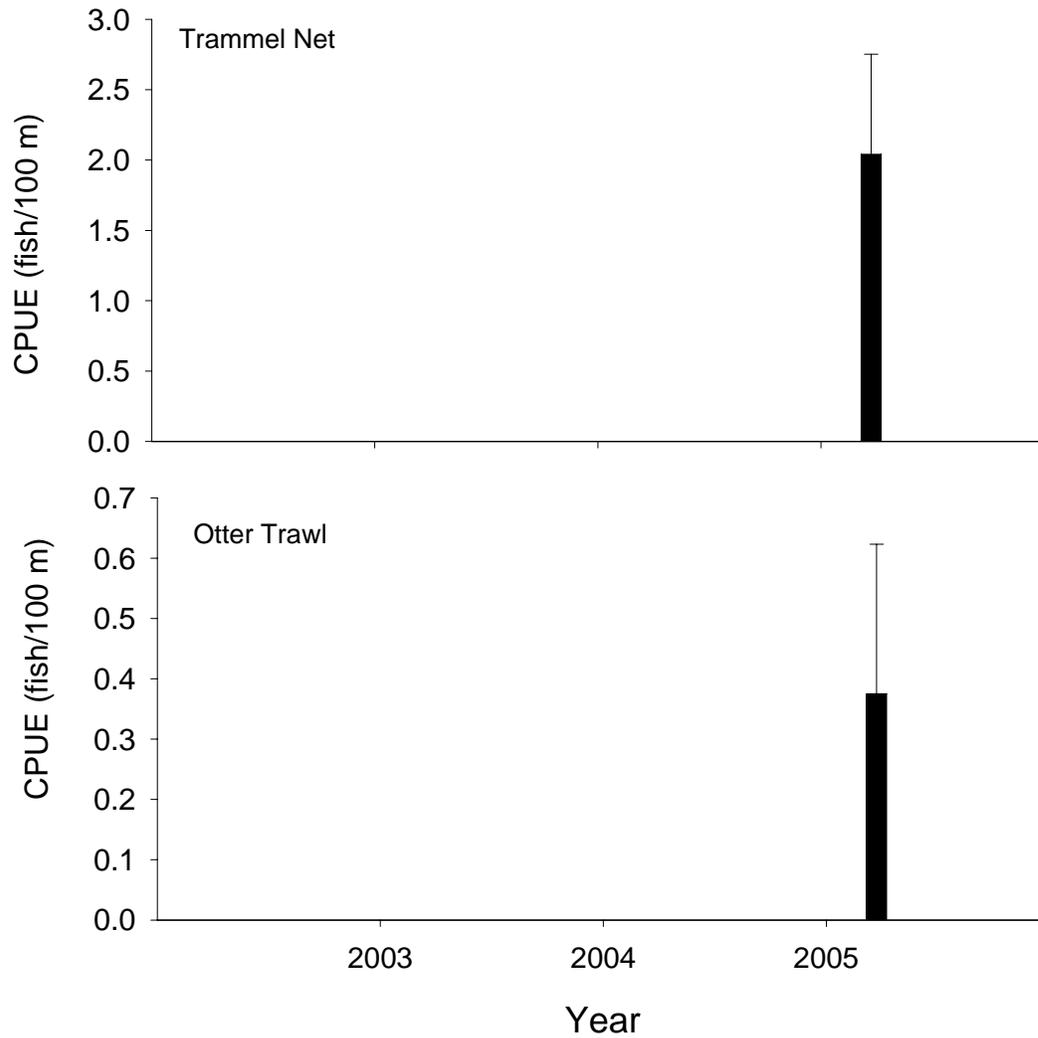


Figure 14. Mean annual catch-per-unit-effort ($\pm 2SE$) of sub-stock size (0-149 mm; white bars), sub-stock size (150-249; cross-hatched), stock size (250-379 mm; gray bars), and quality and above size (> 380 mm; black bars) shovelnose sturgeon in trammel nets and otter trawls in segment 7 of the Missouri River during fish community season 2003 - 2005.

Segment 7 - Shovelnose Sturgeon / Fish Community Season

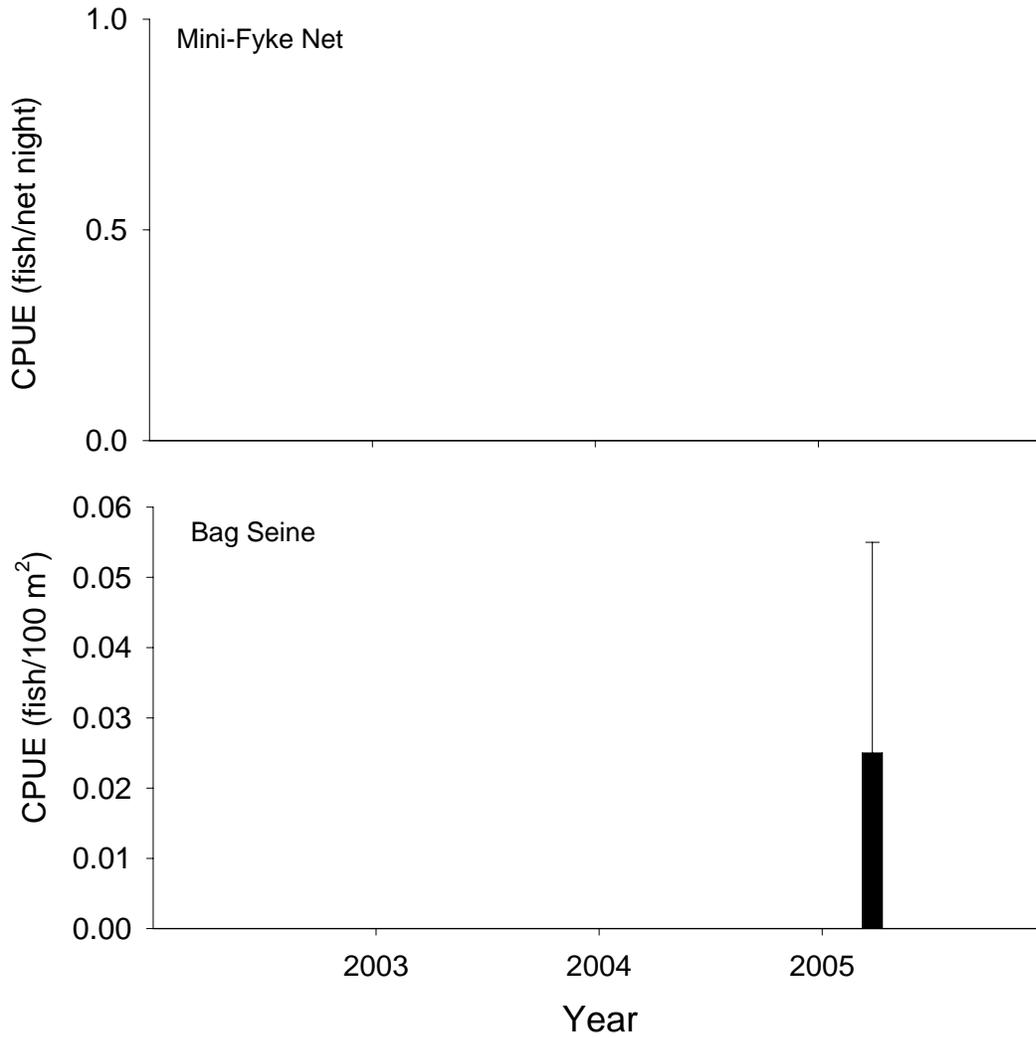


Figure 15. Mean annual catch-per-unit-effort (+/- 2SE) of sub-stock size (0-149 mm; white bars), sub-stock size (150-249; cross-hatched), stock size (250-379 mm; gray bars), and quality and above size (> 380 mm; black bars) shovelnose sturgeon in mini-fyke and bag seines in segment 7 of the Missouri River during fish community season 2003 - 2005.

Segment 7 - Shovelnose Sturgeon / Fish Community Season

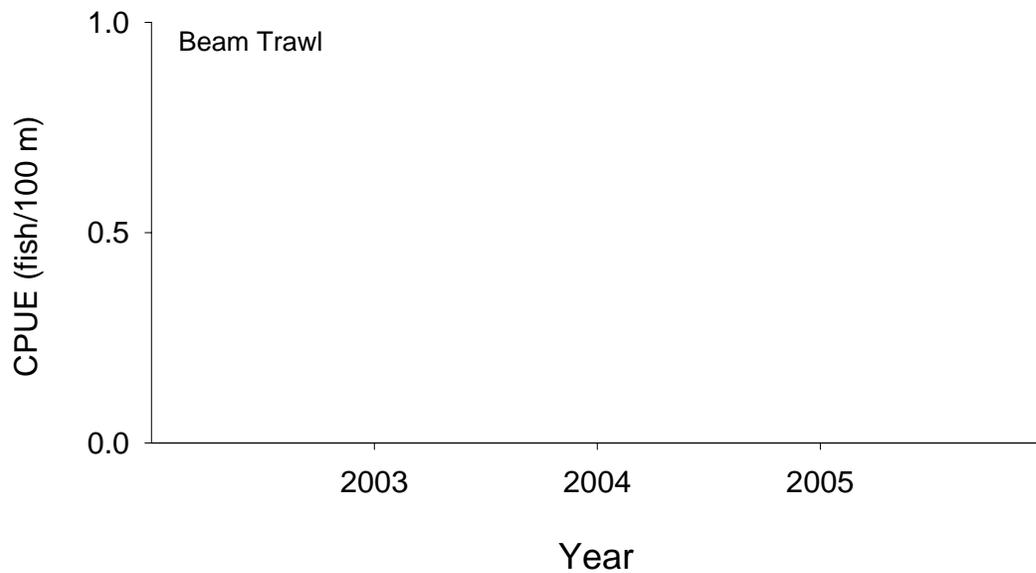


Figure 16. Mean annual catch-per-unit-effort (\pm 2SE) of sub-stock size (0-149 mm; white bars), sub-stock size (150-249; cross-hatched), stock size (250-379 mm; gray bars), and quality and above size (> 380 mm; black bars) shovelnose sturgeon in beam trawls in segment 7 of the Missouri River during fish community season 2003 - 2005.

Table 17. Total number of sub-stock size (0-149 mm) shovelnose sturgeon captured for each gear during each season and the proportion caught within each macrohabitat type in segment 7 of the Missouri River during 2005. The percent of total effort for each gear in each habitat is presented on the second line of each gear type. Size categories described in Table 25. N-E indicates the habitat is non-existent in the segment.

Gear	N	Macrohabitat													
		BRAD	CHXO	CONF	DEND	DRNG	ISB	OSB	SCCL	SCCS	SCN	TRIB	TRML	TRMS	WILD
Sturgeon Season (Fall through Spring)															
1 Inch Trammel Net	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		5	24	0	3	5	20	27	6	5	0		0	0	5
2.5 Inch Trammel Net	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		0	0	0	0	0	0	0	0	0	0		0	0	0
Gill Net	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		0	25	0	0	0	35	30	10	0	0		0	0	0
Otter Trawl	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		0	0	0	0	0	0	0	0	0	0		0	0	0
Fish Community Season (Summer)															
1 Inch Trammel Net	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		13	19	1	2	6	20	19	9	7	0		0	0	3
Bag Seine	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		4	0	2	0	0	33	6	10	36	4		0	3	0
Mini-Fyke Net	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		15	0	2	2	0	22	13	13	24	5		2	4	0
Otter Trawl	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		14	22	3	0	3	30	23	2	5	0		0	0	0

Table 18. Total number of sub-stock size (0-149 mm) shovelnose sturgeon captured for each gear during each season and the proportion caught within each mesohabitat type in segment 7 of the Missouri River during 2005. The percent of total effort for each gear in each habitat is presented on the second line of each gear type. Size categories described in Table 25. N-E indicates the habitat is non-existent in the segment.

Gear	N	Mesohabitat				
		BARS	CHNB	DTWT	ITIP	POOL
Sturgeon Season (Fall through Spring)						
1 Inch Trammel Net	0	0 1	0 86	0 5	0 7	0 1
2.5 Inch Trammel Net	0	0 0	0 0	0 0	0 0	0 0
Gill Net	0	0 0	0 79	0 0	0 3	0 17
Otter Trawl	0	0 0	0 0	0 0	0 0	0 0
Fish Community Season (Summer)						
1 Inch Trammel Net	0	0 1	0 87	0 3	0 9	0 0
Bag Seine	0	0 96	0 0	0 0	0 0	0 0
Mini-Fyke Net	0	0 86	0 9	0 0	0 0	0 0
Otter Trawl	0	0 0	0 95	0 0	0 5	0 0

Table 19. Total number of sub-stock size (150-249 mm) shovelnose sturgeon captured for each gear during each season and the proportion caught within each macrohabitat type in segment 7 of the Missouri River during 2005. The percent of total effort for each gear in each habitat is presented on the second line of each gear type. Size categories described in Table 25. N-E indicates the habitat is non-existent in the segment.

Gear	N	Macrohabitat													
		BRAD	CHXO	CONF	DEND	DRNG	ISB	OSB	SCCL	SCCS	SCN	TRIB	TRML	TRML	WILD
Sturgeon Season (Fall through Spring)															
1 Inch Trammel Net	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		5	24	0	3	5	20	27	6	5	0		0	0	5
2.5 Inch Trammel Net	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		0	0	0	0	0	0	0	0	0	0		0	0	0
Gill Net	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		0	25	0	0	0	35	30	10	0	0		0	0	0
Otter Trawl	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		0	0	0	0	0	0	0	0	0	0		0	0	0
Fish Community Season (Summer)															
1 Inch Trammel Net	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		13	19	1	2	6	20	19	9	7	0		0	0	3
Bag Seine	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		4	0	2	0	0	33	6	10	36	4		0	3	0
Mini-Fyke Net	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		15	0	2	2	0	22	13	13	24	5		2	4	0
Otter Trawl	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		14	22	3	0	3	30	23	2	5	0		0	0	0

Table 20. Total number of sub-stock size size (150-249 mm) shovelnose sturgeon captured for each gear during each season and the proportion caught within each mesohabitat type in segment 7 of the Missouri River during 2005. The percent of total effort for each gear in each habitat is presented on the second line of each gear type. Size categories described in Table 25. N-E indicates the habitat is non-existent in the segment.

Gear	N	Mesohabitat				
		BARS	CHNB	DTWT	ITIP	POOL
Sturgeon Season (Fall through Spring)						
1 Inch Trammel Net	0	0 1	0 86	0 5	0 7	0 1
2.5 Inch Trammel Net	0	0 0	0 0	0 0	0 0	0 0
Gill Net	0	0 0	0 79	0 0	0 3	0 17
Otter Trawl	0	0 0	0 0	0 0	0 0	0 0
Fish Community Season (Summer)						
1 Inch Trammel Net	0	0 1	0 87	0 3	0 9	0 0
Bag Seine	0	0 96	0 0	0 0	0 0	0 0
Mini-Fyke Net	0	0 86	0 9	0 0	0 0	0 0
Otter Trawl	0	0 0	0 95	0 0	0 5	0 0

Table 21. Total number of stock size (250-379 mm) shovelnose sturgeon captured for each gear during each season and the proportion caught within each macrohabitat type in segment 7 of the Missouri River during 2005. The percent of total effort for each gear in each habitat is presented on the second line of each gear type. Size categories described in Table 25. N-E indicates the habitat is non-existent in the segment.

Gear	N	Macrohabitat													
		BRAD	CHXO	CONF	DEND	DRNG	ISB	OSB	SCCL	SCCS	SCN	TRIB	TRML	TRMS	WILD
Sturgeon Season (Fall through Spring)															
1 Inch Trammel Net	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		5	24	0	3	5	20	27	6	5	0		0	0	5
2.5 Inch Trammel Net	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		0	0	0	0	0	0	0	0	0	0		0	0	0
Gill Net	1	0	0	0	0	0	100	0	0	0	0		0	0	0
		0	25	0	0	0	35	30	10	0	0		0	0	0
Otter Trawl	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		0	0	0	0	0	0	0	0	0	0		0	0	0
Fish Community Season (Summer)															
1 Inch Trammel Net	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		13	19	1	2	6	20	19	9	7	0		0	0	3
Bag Seine	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		4	0	2	0	0	33	6	10	36	4		0	3	0
Mini-Fyke Net	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		15	0	2	2	0	22	13	13	24	5		2	4	0
Otter Trawl	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		14	22	3	0	3	30	23	2	5	0		0	0	0

Table 22. Total number of stock size (250-379 mm) shovelnose sturgeon captured for each gear during each season and the proportion caught within each mesohabitat type in segment 7 of the Missouri River during 2005. The percent of total effort for each gear in each habitat is presented on the second line of each gear type. Size categories described in Table 25. N-E indicates the habitat is non-existent in the segment.

Gear	N	Mesohabitat				
		BARS	CHNB	DTWT	ITIP	POOL
Sturgeon Season (Fall through Spring)						
1 Inch Trammel Net	0	0	0	0	0	0
		1	86	5	7	1
2.5 Inch Trammel Net	0	0	0	0	0	0
		0	0	0	0	0
Gill Net	1	0	100	0	0	0
		0	79	0	3	17
Otter Trawl	0	0	0	0	0	0
		0	0	0	0	0
Fish Community Season (Summer)						
1 Inch Trammel Net	0	0	0	0	0	0
		1	87	3	9	0
Bag Seine	0	0	0	0	0	0
		96	0	0	0	0
Mini-Fyke Net	0	0	0	0	0	0
		86	9	0	0	0
Otter Trawl	0	0	0	0	0	0
		0	95	0	5	0

Table 23. Total number of quality and above size (>380 mm) shovelnose sturgeon captured for each gear during each season and the proportion caught within each macrohabitat type in segment 7 of the Missouri River during 2005. The percent of total effort for each gear in each habitat is presented on the second line of each gear type. Size categories described in Table 25. N-E indicates the habitat is non-existent in the segment.

Gear	N	Macrohabitat													
		BRAD	CHXO	CONF	DEND	DRNG	ISB	OSB	SCCL	SCCS	SCN	TRIB	TRML	TRMS	WILD
Sturgeon Season (Fall through Spring)															
1 Inch Trammel Net	157	6	31	0	1	3	36	20	1	4	0		0	0	0
		5	24	0	3	5	20	27	6	5	0		0	0	5
2.5 Inch Trammel Net	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		0	0	0	0	0	0	0	0	0	0		0	0	0
Gill Net	66	0	17	0	0	0	39	12	32	0	0		0	0	0
		0	25	0	0	0	35	30	10	0	0		0	0	0
Otter Trawl	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		0	0	0	0	0	0	0	0	0	0		0	0	0
Fish Community Season (Summer)															
1 Inch Trammel Net	215	9	25	2	0	6	41	1	9	6	0		0	0	0
		13	19	1	2	6	20	19	9	7	0		0	0	3
Bag Seine	4	0	0	0	25	0	25	0	0	50	0		0	0	0
		4	0	2	0	0	33	6	10	36	4		0	3	0
Mini-Fyke Net	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		15	0	2	2	0	22	13	13	24	5		2	4	0
Otter Trawl	68	9	18	1	0	0	34	6	3	29	0		0	0	0
		14	22	3	0	3	30	23	2	5	0		0	0	0

Table 24. Total number of quality and above size (>380 mm) shovelnose sturgeon captured for each gear during each season and the proportion caught within each mesohabitat type in segment 7 of the Missouri River during 2005. The percent of total effort for each gear in each habitat is presented on the second line of each gear type. Size categories described in Table 25. N-E indicates the habitat is non-existent in the segment.

Gear	N	Mesohabitat				
		BARS	CHNB	DTWT	ITIP	POOL
Sturgeon Season (Fall through Spring)						
1 Inch Trammel Net	157	0	94	0	5	1
		1	86	5	7	1
2.5 Inch Trammel Net	0	0	0	0	0	0
		0	0	0	0	0
Gill Net	66	0	50	0	0	50
		0	79	0	3	17
Otter Trawl	0	0	0	0	0	0
		0	0	0	0	0
Fish Community Season (Summer)						
1 Inch Trammel Net	215	0	87	0	12	0
		1	87	3	9	0
Bag Seine	4	100	0	0	0	0
		96	0	0	0	0
Mini-Fyke Net	0	0	0	0	0	0
		86	9	0	0	0
Otter Trawl	68	0	71	0	29	0
		0	95	0	5	0

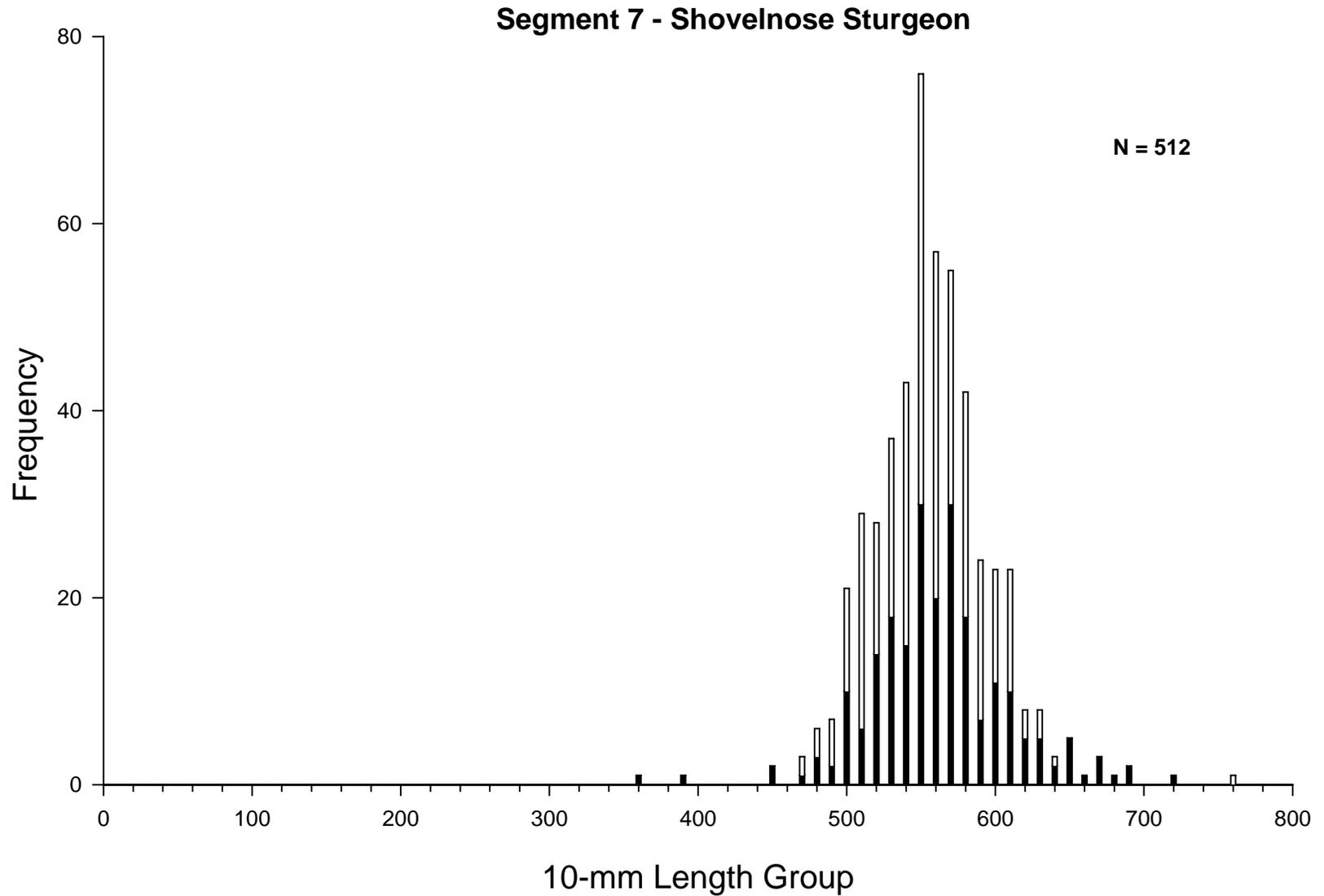


Figure 17. Length frequency of shovelnose sturgeon from fall through spring (sturgeon season, black bars) and summer (fish community season, white bars) in segment 7 of the Missouri River during 2004 - 2005.

Table 25. Relative stock density (RSD)^a by a length category for shovelnose sturgeon in segment 7 of the Missouri River captured during 2005. Length categories^b determined using methods proposed by Quist (1998).

Length category	N	RSD
Sturgeon Season		
Sub-stock (0-149 mm)	0	
Sub-stock (150-249 mm)	0	
Stock	224	
Quality	224	100
Preferred	199	89
Memorable	13	6
Trophy	0	0
Fish Community Season		
Sub-stock (0-149 mm)	0	
Sub-stock (150-249 mm)	0	
Stock	287	
Quality	287	100
Preferred	245	85
Memorable	1	0
Trophy	0	0

^a RSD = number of fish of a specified length ÷ number minimum stock length fish x 100.

^b Length categories based on the percentage of the largest known shovelnose sturgeon: Sub-stock FL < 250 mm (20 %), Stock FL = 250-379 mm (20 – 36 %), Quality FL = 380 – 509 mm (36 – 45 %), Preferred FL = 510 - 639 mm (45 – 59 %), Memorable FL = 640 – 809 mm (59 – 74 %), Trophy FL > 810 mm (>74 %).

Sturgeon Chub

A single sturgeon chub was captured in 2005. An otter trawl produced the fish on 8/23/05 at rivermile 761. The 66 mm, 2.0 g, specimen was captured in an outside bend macrohabitat and channel border mesohabitat. Depths on the trawl run ranged from 3.0 m to 1.5 m and flow velocity ranged from 0.78 m/s (bottom) to 1.05 m/S (near surface). The substrate was classified as 75% sand and 25% gravel.

Segment 7 - Sturgeon Chub / Sturgeon Season

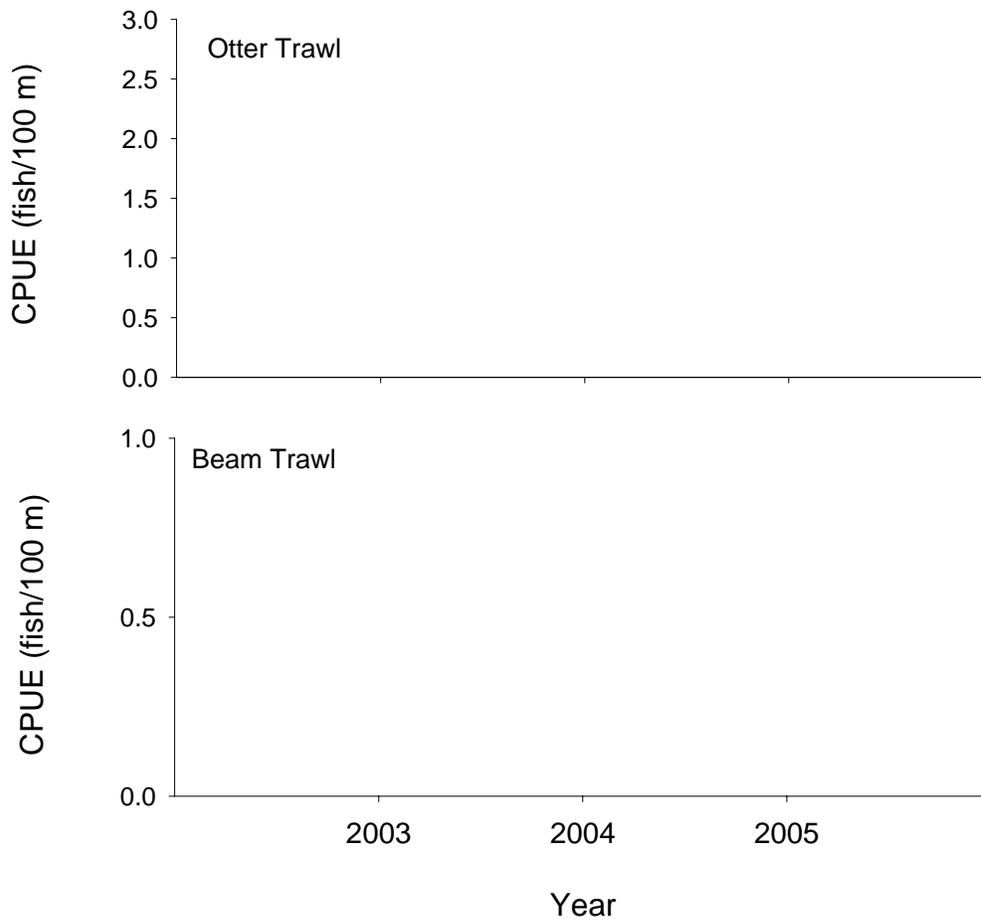


Figure 18. Mean annual catch-per-unit-effort ($\pm 2SE$) of sturgeon chub in trawls in segment 7 of the Missouri River during sturgeon season 2003-2005.

Segment 7 - Sturgeon Chub / Fish Community Season

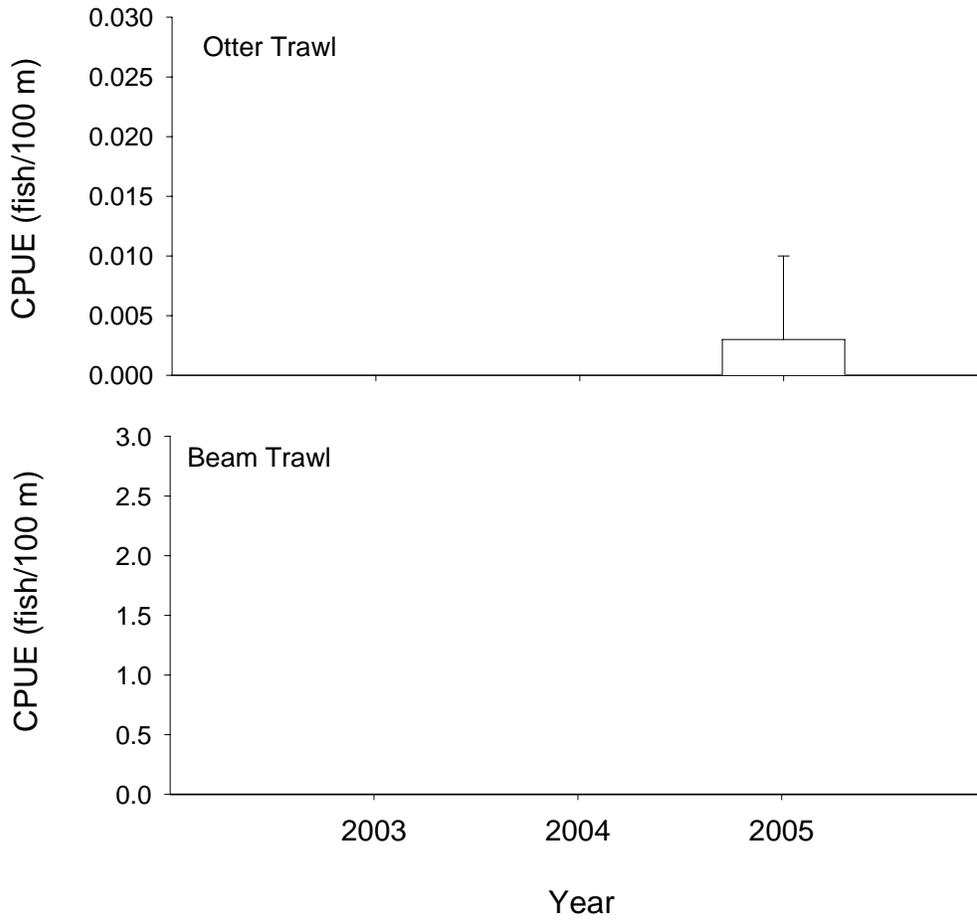


Figure 19. Mean annual catch-per-unit-effort ($\pm 2SE$) of sturgeon chub in trawls in segment 7 of the Missouri River during fish community season 2003-2005.

Segment 7 - Sturgeon Chub / Fish Community Season

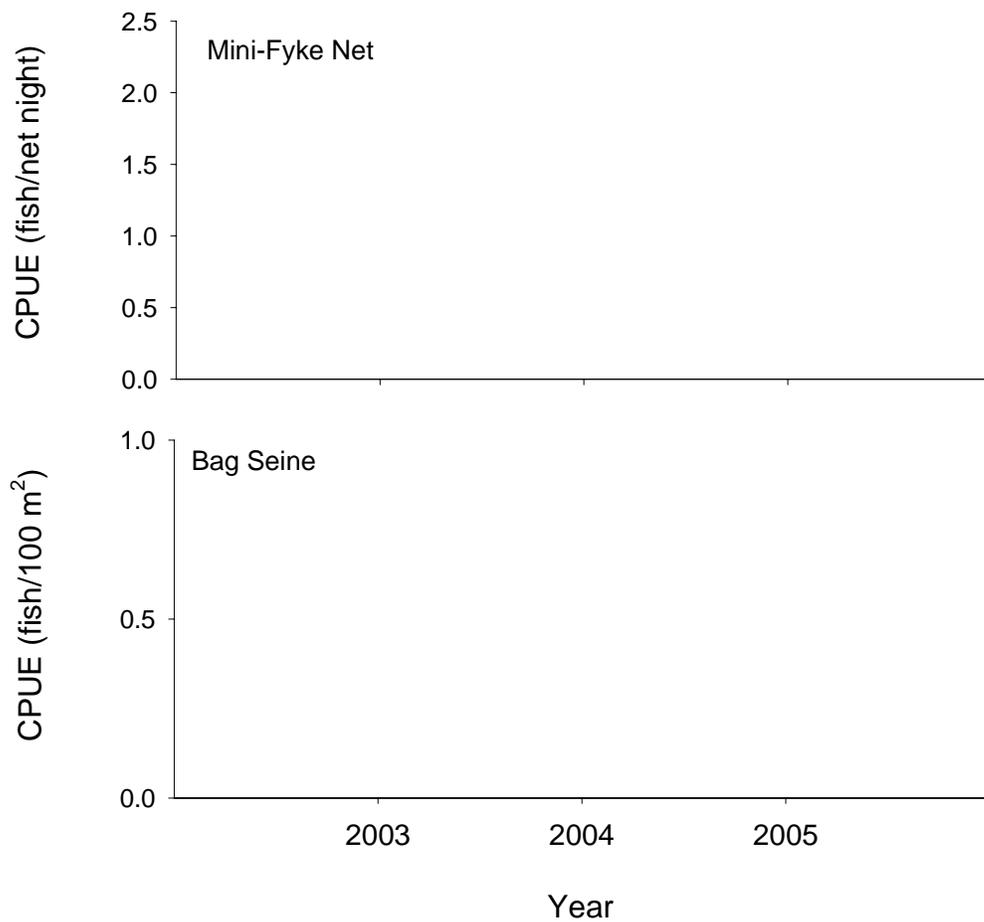


Figure 20. Mean annual catch-per-unit-effort (\pm 2SE) of sturgeon chub in mini-fyke nets and bag seines in segment 7 of the Missouri River during fish community season 2003-2005.

Table 26. Total number of sturgeon chubs captured for each gear during each season and the proportion caught within each macrohabitat type in segment 7 of the Missouri River during 2005. The percent of total effort for each gear in each habitat is presented on the second line of each gear type. N-E indicates the habitat is non-existent in the segment.

Gear	N	Macrohabitat													
		BRAD	CHXO	CONF	DEND	DRNG	ISB	OSB	SCCL	SCCS	SCN	TRIB	TRML	TRMS	WILD
Sturgeon Season (Fall through Spring)															
1 Inch Trammel Net	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		5	24	0	3	5	20	27	6	5	0		0	0	5
2.5 Inch Trammel Net	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		0	0		0	0	0	0	0	0	0		0	0	0
Gill Net	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		0	25	0	0	0	35	30	10	0	0		0	0	0
Otter Trawl	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		0	0	0	0	0	0	0	0	0	0		0	0	0
Fish Community Season (Summer)															
1 Inch Trammel Net	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		13	19	1	2	6	20	19	9	7	0		0	0	3
Bag Seine	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		4	0	2	0	0	33	6	10	36	4		0	3	0
Mini-Fyke Net	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		15	0	2	2	0	22	13	13	24	5		2	4	0
Otter Trawl	1	0	0	0	0	0	0	0	100	0	0		0	0	0
		14	22	3	0	3	30	23	2	5	0		0	0	0

Table 27. Total number of sturgeon chubs captured for each gear during each season and the proportion caught within each mesohabitat type in segment 7 of the Missouri River during 2005. The percent of total effort for each gear in each habitat is presented on the second line of each gear type. N-E indicates the habitat is non-existent in the segment.

Gear	N	Mesohabitat				
		BARS	CHNB	DTWT	ITIP	POOL
Sturgeon Season (Fall through Spring)						
1 Inch Trammel Net	0	0 1	0 86	0 5	0 7	0 1
2.5 Inch Trammel Net	0	0 0	0 0	0 0	0 0	0 0
Gill Net	0	0 0	0 79	0 0	0 3	0 17
Otter Trawl	0	0 0	0 0	0 0	0 0	0 0
Fish Community Season (Summer)						
1 Inch Trammel Net	0	0 1	0 87	0 3	0 9	0 0
Bag Seine	0	0 96	0 0	0 0	0 0	0 0
Mini-Fyke Net	0	0 86	0 9	0 0	0 0	0 0
Otter Trawl	1	0 0	100 95	0 0	0 5	0 0

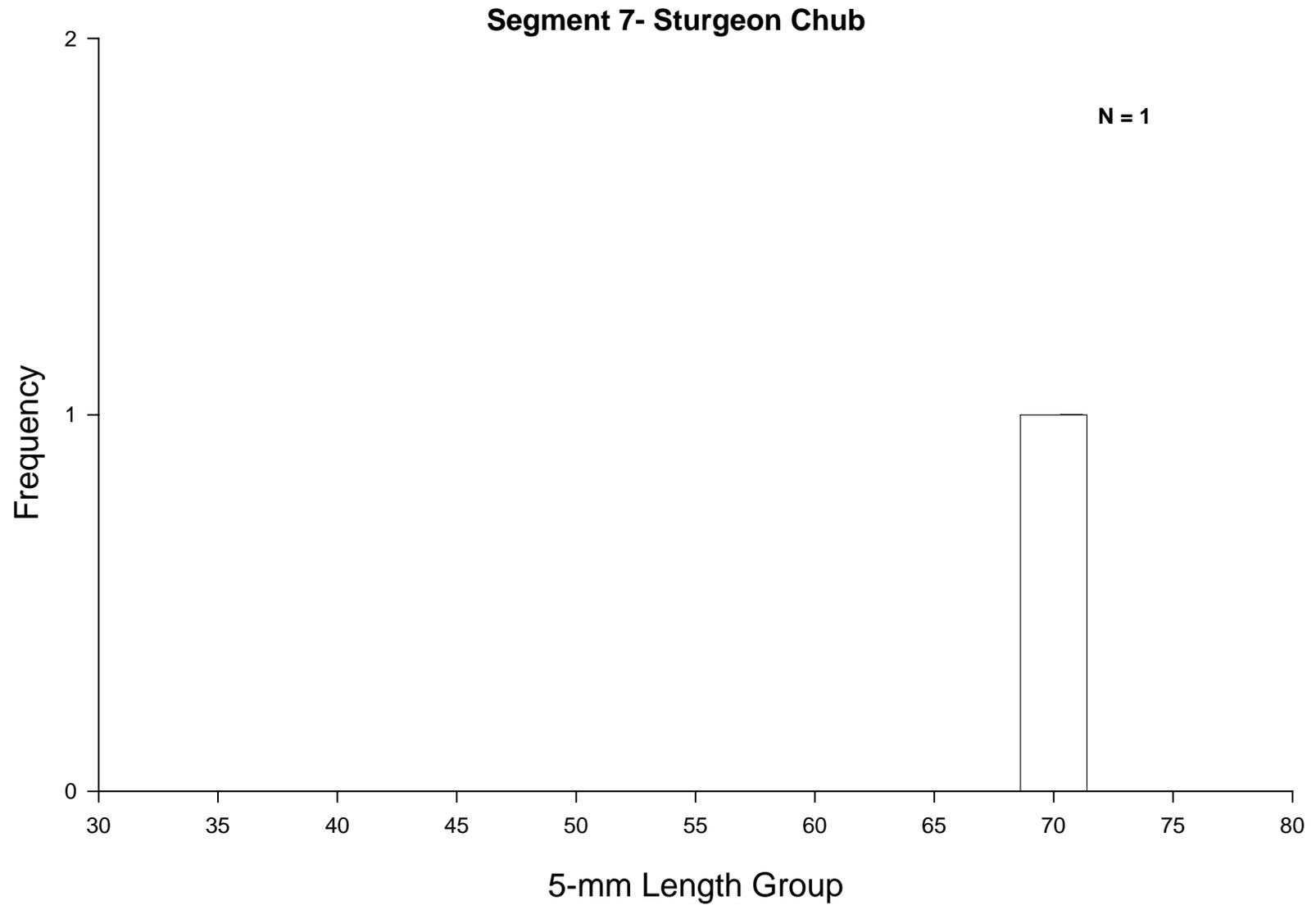


Figure 21. Length frequency of sturgeon chubs during fall through spring (sturgeon season, black bars) and summer (fish community season, white bars) in segment 7 of the Missouri River during 2004 - 2005.

Sicklefin Chub

A single sicklefin chub was captured in 2005. An otter trawl produced the fish on 10/03/05 at rivermile 776. The 197 mm, 5.3 g, specimen was captured in a channel crossover macrohabitat and channel border mesohabitat. Depths trawled averaged 3.0 m and flow velocity ranged from 0.57 m/s (bottom) to 0.96 m/S (near surface). The substrate was classified as 95% sand and 5% gravel.

Segment 7 - Sicklefin Chub / Sturgeon Season

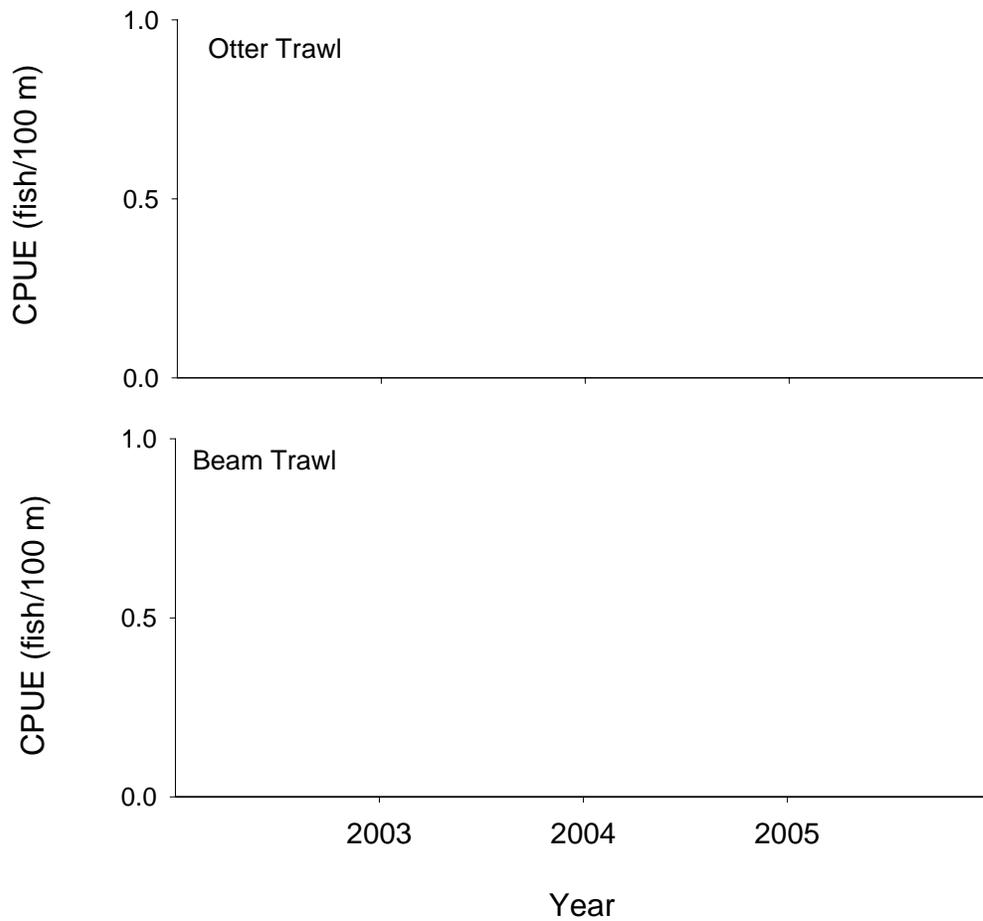


Figure 22. Mean annual catch-per-unit-effort (+/- 2SE) of sicklefin chub in trawls in segment 7 of the Missouri River during sturgeon season 2003-2005.

Segment 7 - Sicklefin Chub / Fish Community Season

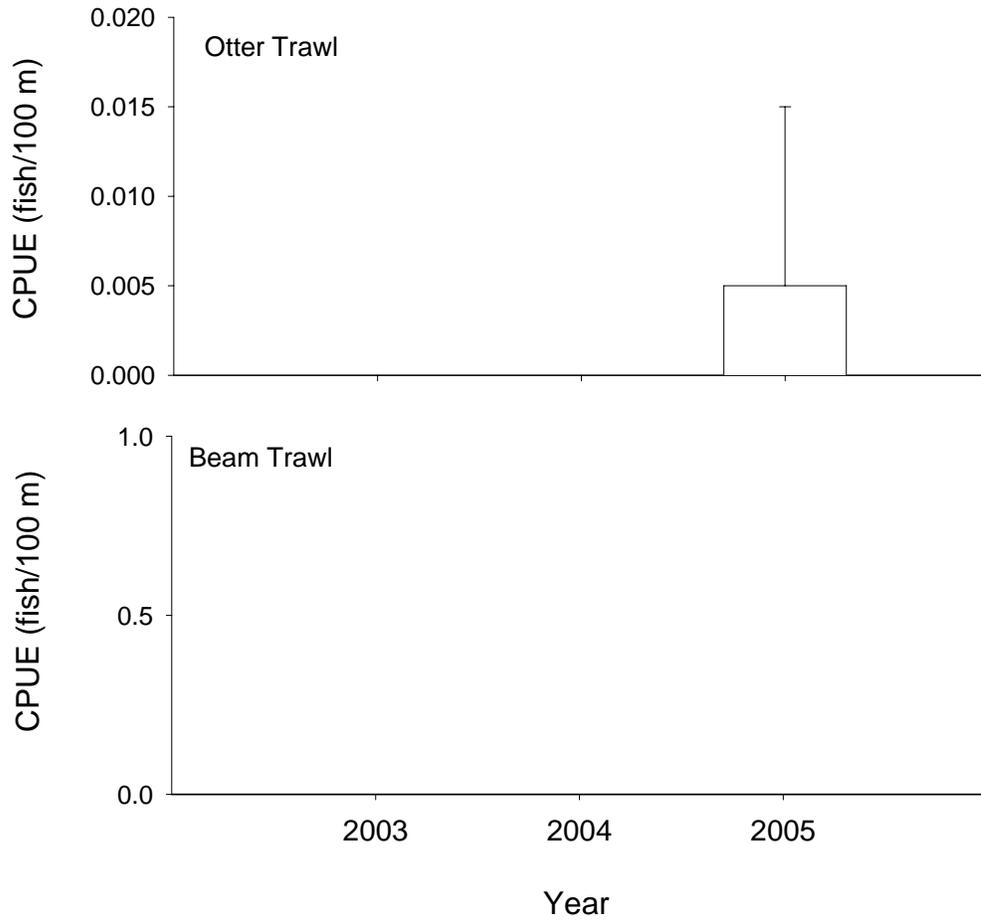


Figure 23. Mean annual catch-per-unit-effort ($\pm 2SE$) of sicklefin chub in trawls in segment 7 of the Missouri River during fish community season 2003-2005.

Segment 7 - Sicklefin Chub / Fish Community Season

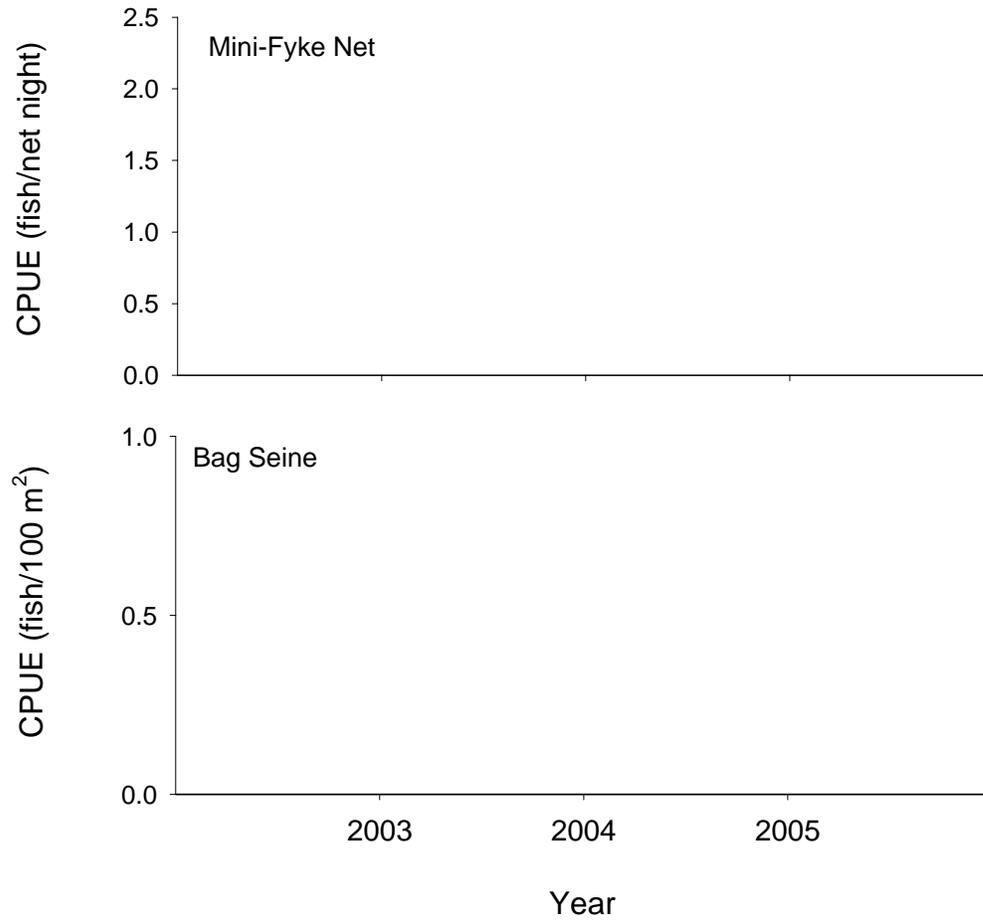


Figure 24. Mean annual catch-per-unit-effort (+/- 2SE) of sicklefin chub in mini-fyke nets and bag seines in segment 7 of the Missouri River during fish community season 2003-2005.

Table 28. Total number of sicklefin chubs captured for each gear during each season and the proportion caught within each macrohabitat type in segment 7 of the Missouri River during 2005. The percent of total effort for each gear in each habitat is presented on the second line of each gear type. N-E indicates the habitat is non-existent in the segment.

Gear	N	Macrohabitat													
		BRAD	CHXO	CONF	DEND	DRNG	ISB	OSB	SCCL	SCCS	SCN	TRIB	TRML	TRMS	WILD
Sturgeon Season (Fall through Spring)															
1 Inch Trammel Net	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		5	24	0	3	5	20	27	6	5	0		0	0	5
2.5 Inch Trammel Net	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		0	0	0	0	0	0	0	0	0	0		0	0	0
Gill Net	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		0	25	0	0	0	35	30	10	0	0		0	0	0
Otter Trawl	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		0	0	0	0	0	0	0	0	0	0		0	0	0
Fish Community Season (Summer)															
1 Inch Trammel Net	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		13	19	1	2	6	20	19	9	7	0		0	0	3
Bag Seine	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		4	0	2	0	0	33	6	10	36	4		0	3	0
Mini-Fyke Net	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		15	0	2	2	0	22	13	13	24	5		2	4	0
Otter Trawl	1	0	100	0	0	0	0	0	0	0	0		0	0	0
		14	22	3	0	3	30	23	2	5	0		0	0	0

Table 29. Total number of sicklefin chubs captured for each gear during each season and the proportion caught within each mesohabitat type in segment 7 of the Missouri River during 2005. The percent of total effort for each gear in each habitat is presented on the second line of each gear type. N-E indicates the habitat is non-existent in the segment.

Gear	N	Mesohabitat				
		BARS	CHNB	DTWT	ITIP	POOL
Sturgeon Season (Fall through Spring)						
1 Inch Trammel Net	0	0 1	0 86	0 5	0 7	0 1
2.5 Inch Trammel Net	0	0 0	0 0	0 0	0 0	0 0
Gill Net	0	0 0	0 79	0 0	0 3	0 17
Otter Trawl	0	0 0	0 0	0 0	0 0	0 0
Fish Community Season (Summer)						
1 Inch Trammel Net	0	0 1	0 87	0 3	0 9	0 0
Bag Seine	0	0 96	0 0	0 0	0 0	0 0
Mini-Fyke Net	0	0 86	0 9	0 0	0 0	0 0
Otter Trawl	1	0 0	100 95	0 0	0 5	0 0

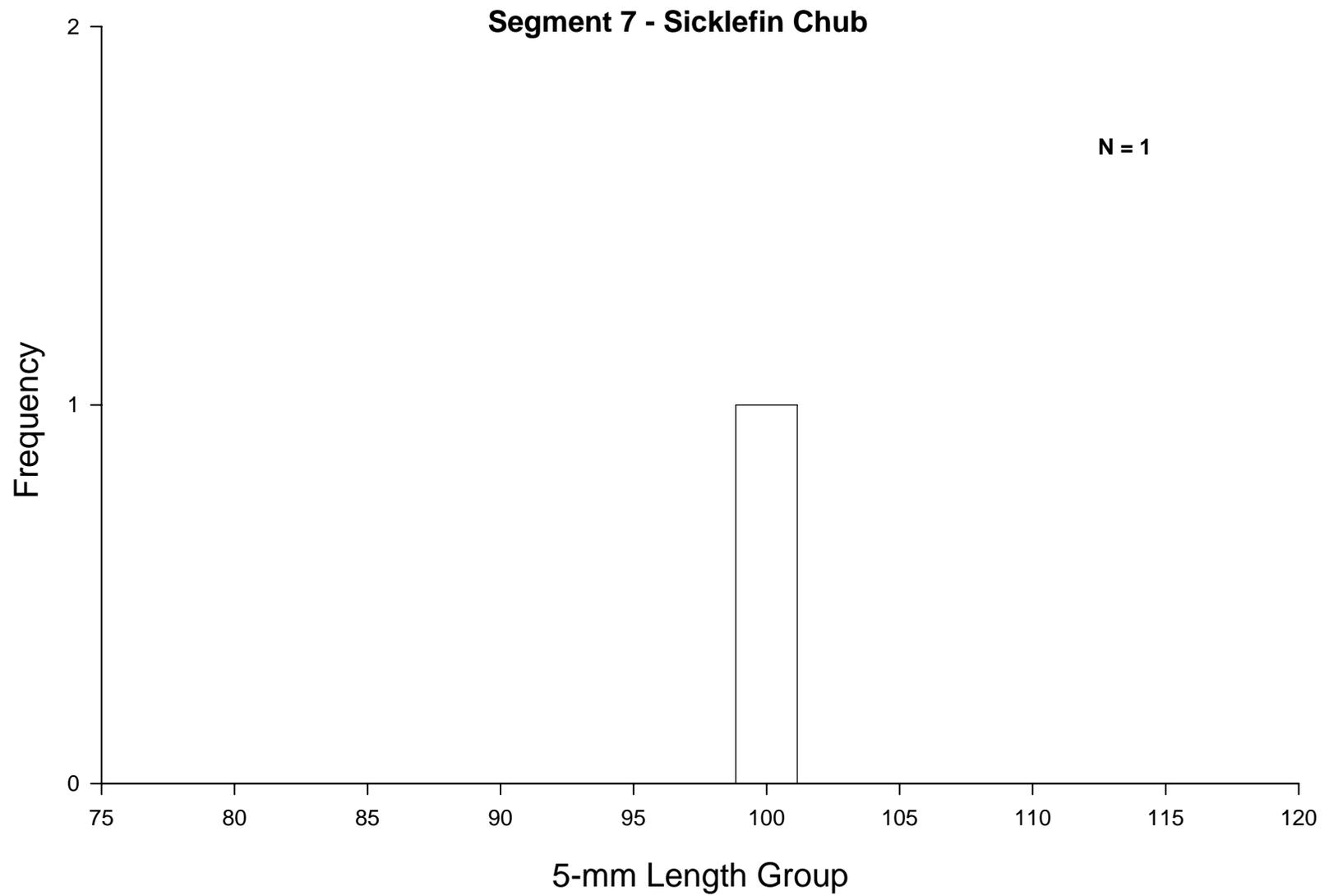


Figure 25. Length frequency of sicklefin chubs during fall through spring (sturgeon season, black bars) and summer (fish community season, white bars) in segment 7 of the Missouri River during 2004 - 2005.

Speckled Chub

A single speckled chub was captured in 2005. An otter trawl produced the fish on 08/17/05 at rivermile 768.5. The 58 mm, 1.7 g, specimen was captured in a channel crossover macrohabitat and channel border mesohabitat. Depths on the trawl run ranged from 1.4 m to 2.0 m and flow velocity ranged from 0.64 m/s (bottom) to 0.69 m/S (near surface). The substrate was classified as 100% sand.

Segment 7 - Speckled Chub / Sturgeon Season

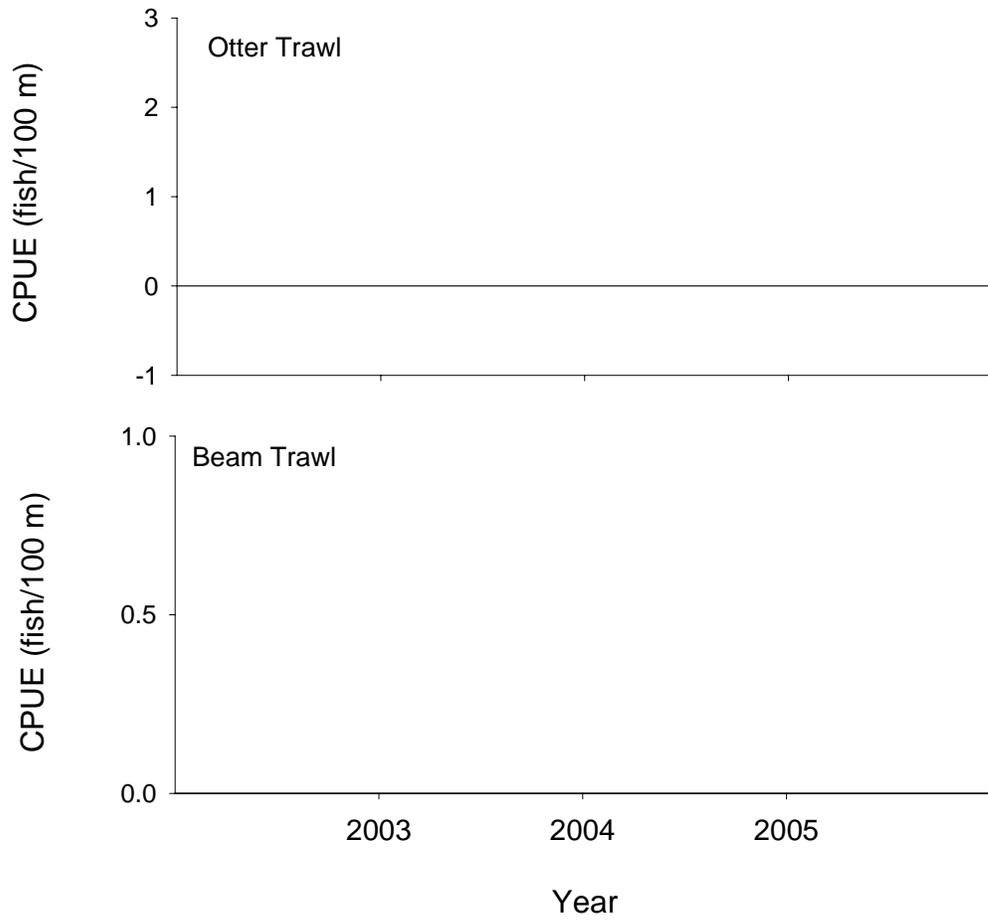


Figure 26. Mean annual catch-per-unit-effort (+/- 2SE) of speckled chub in trawls in segment 7 of the Missouri River during sturgeon season 2003-2005.

Segment 7 - Speckled Chub / Fish Community Season

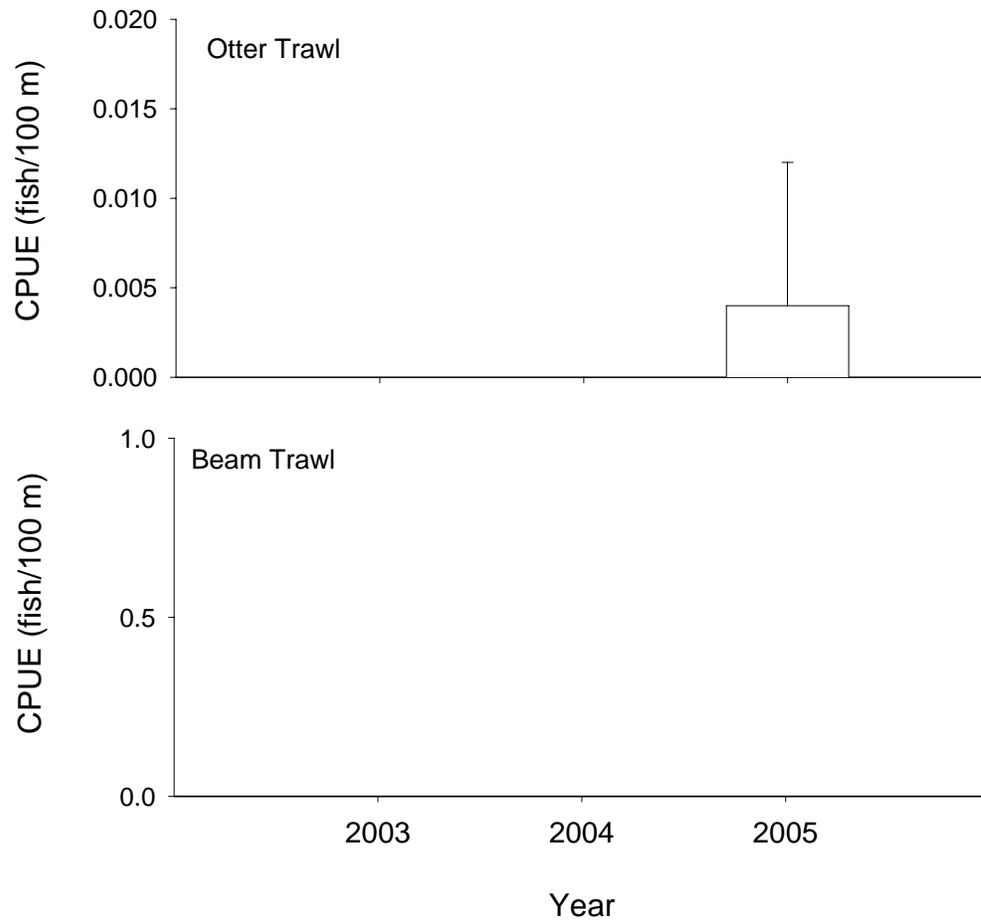


Figure 27. Mean annual catch-per-unit-effort ($\pm 2SE$) of speckled chub in trawls in segment 7 of the Missouri River during fish community season 2003-2005.

Segment 7 - Speckled Chub / Fish Community Season

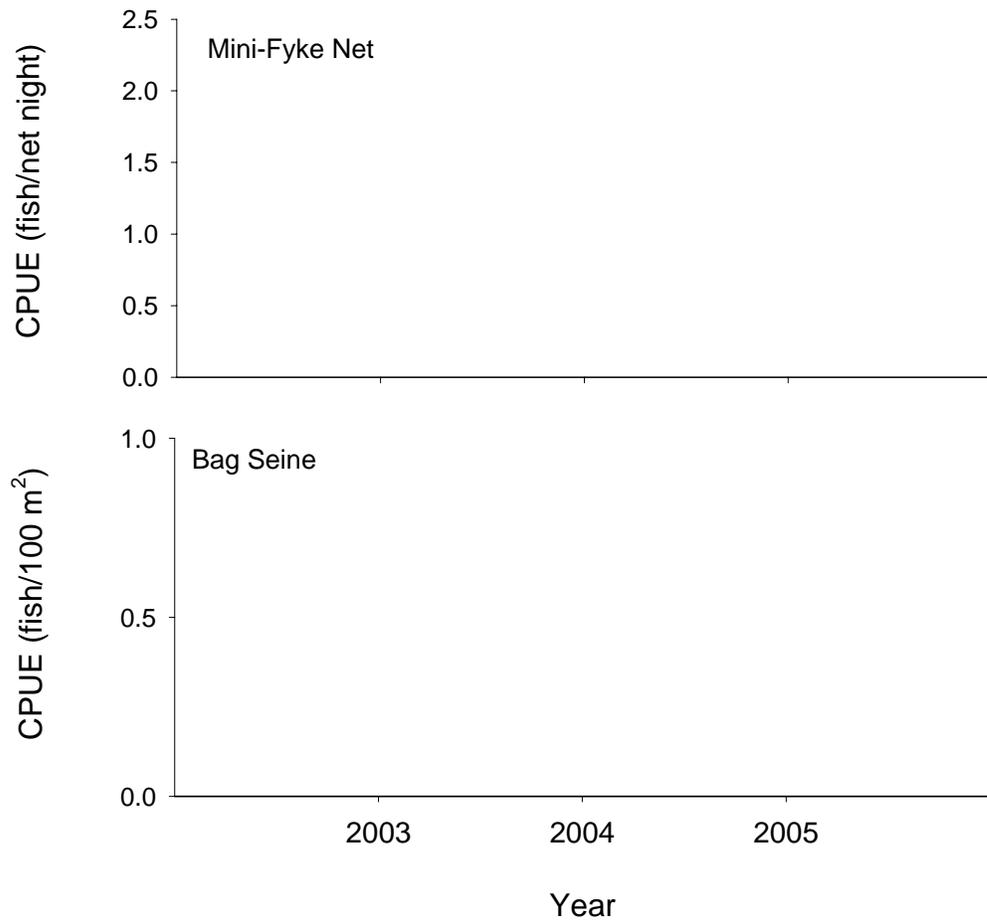


Figure 28. Mean annual catch-per-unit-effort (+/- 2SE) of speckled chub in mini-fyke nets and bag seines in segment 7 of the Missouri River during fish community season 2003-2005.

Table 30. Total number of speckled chubs captured for each gear during each season and the proportion caught within each macrohabitat type in segment 07 of the Missouri River during 2005. The percent of total effort for each gear in each habitat is presented on the second line of each gear type. N-E indicates the habitat is non-existent in the segment.

Gear	N	Macrohabitat													
		BRAD	CHXO	CONF	DEND	DRNG	ISB	OSB	SCCL	SCCS	SCN	TRIB	TRML	TRMS	WILD
Sturgeon Season (Fall through Spring)															
1 Inch Trammel Net	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		5	24	0	3	5	20	27	6	5	0		0	0	5
2.5 Inch Trammel Net	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		0	0	0	0	0	0	0	0	0	0		0	0	0
Gill Net	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		0	25	0	0	0	35	30	10	0	0		0	0	0
Otter Trawl	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		0	0	0	0	0	0	0	0	0	0		0	0	0
Fish Community Season (Summer)															
1 Inch Trammel Net	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		13	19	1	2	6	20	19	9	7	0		0	0	3
Bag Seine	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		4	0	2	0	0	33	6	10	36	4		0	3	0
Mini-Fyke Net	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		15	0	2	2	0	22	13	13	24	5		2	4	0
Otter Trawl	1	0	100	0	0	0	0	0	0	0	0		0	0	0
		14	22	3	0	3	30	23	2	5	0		0	0	0

Table 31. Total number of speckled chubs captured for each gear during each season and the proportion caught within each mesohabitat type in segment 7 of the Missouri River during 2005. The percent of total effort for each gear in each habitat is presented on the second line of each gear type. N-E indicates the habitat is non-existent in the segment.

Gear	N	Mesohabitat				
		BARS	CHNB	DTWT	ITIP	POOL
Sturgeon Season (Fall through Spring)						
1 Inch Trammel Net	0	0 1	0 86	0 5	0 7	0 1
2.5 Inch Trammel Net	0	0 0	0 0	0 0	0 0	0 0
Gill Net	0	0 0	0 79	0 0	0 3	0 17
Otter Trawl	0	0 0	0 0	0 0	0 0	0 0
Fish Community Season (Summer)						
1 Inch Trammel Net	0	0 1	0 87	0 3	0 9	0 0
Bag Seine	0	0 96	0 0	0 0	0 0	0 0
Mini-Fyke Net	0	0 86	0 9	0 0	0 0	0 0
Otter Trawl	1	0 0	100 95	0 0	0 5	0 0

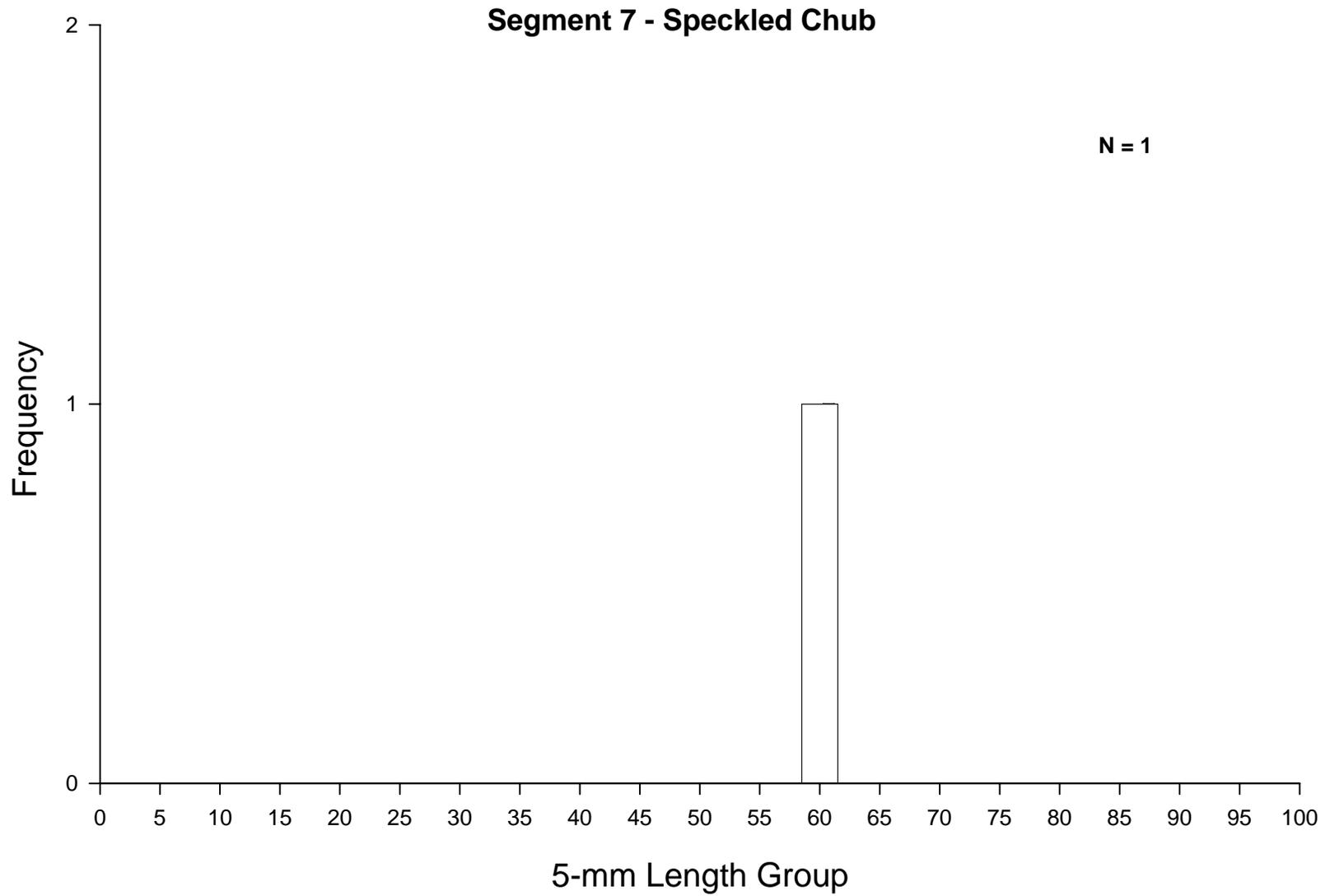


Figure 29. Length frequency of speckled chubs during fall through spring (sturgeon season, black bars) and summer (fish community season, white bars) in segment 7 of the Missouri River during 2004 - 2005.

Sand Shiner

Sand shiners were common in Segment 7 in 2005. A total of 1251 were sampled during the fish community season. Bag seine hauls captured 271 (2 fish/100 m) and mini fyke nets 979 (9.6 fish/net night). Otter trawls produced a single sand shiner. Most of the fish were caught in large secondary channels (45%) and inside bends (18%). Habitat-based CPUE data can be found in Table 32. Sand shiners ranged in length from 27 mm to 63 mm (Figure 33). No fish were captured during the sturgeon season.

Segment 7 - Sand Shiner / Sturgeon Season

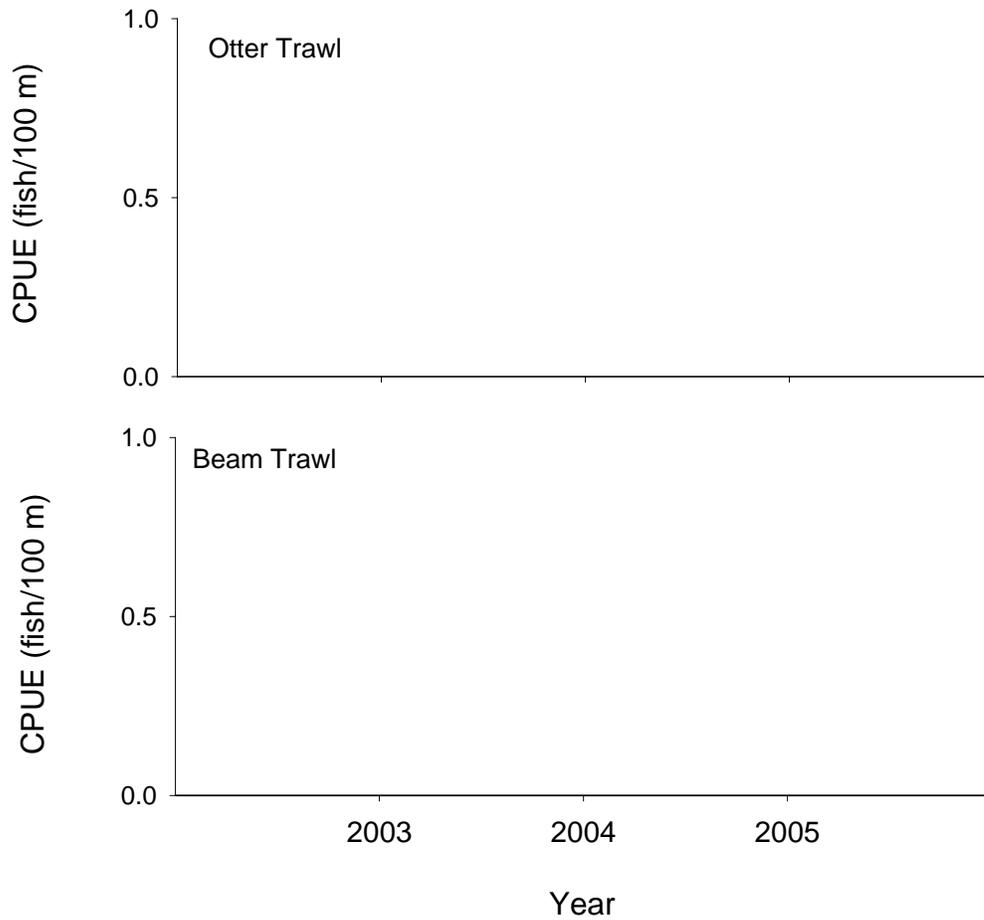


Figure 30. Mean annual catch-per-unit-effort (\pm 2SE) of sand shiner in trawls in segment 7 of the Missouri River during sturgeon season 2003-2005.

Segment 7 - Sand Shiner / Fish Community Season

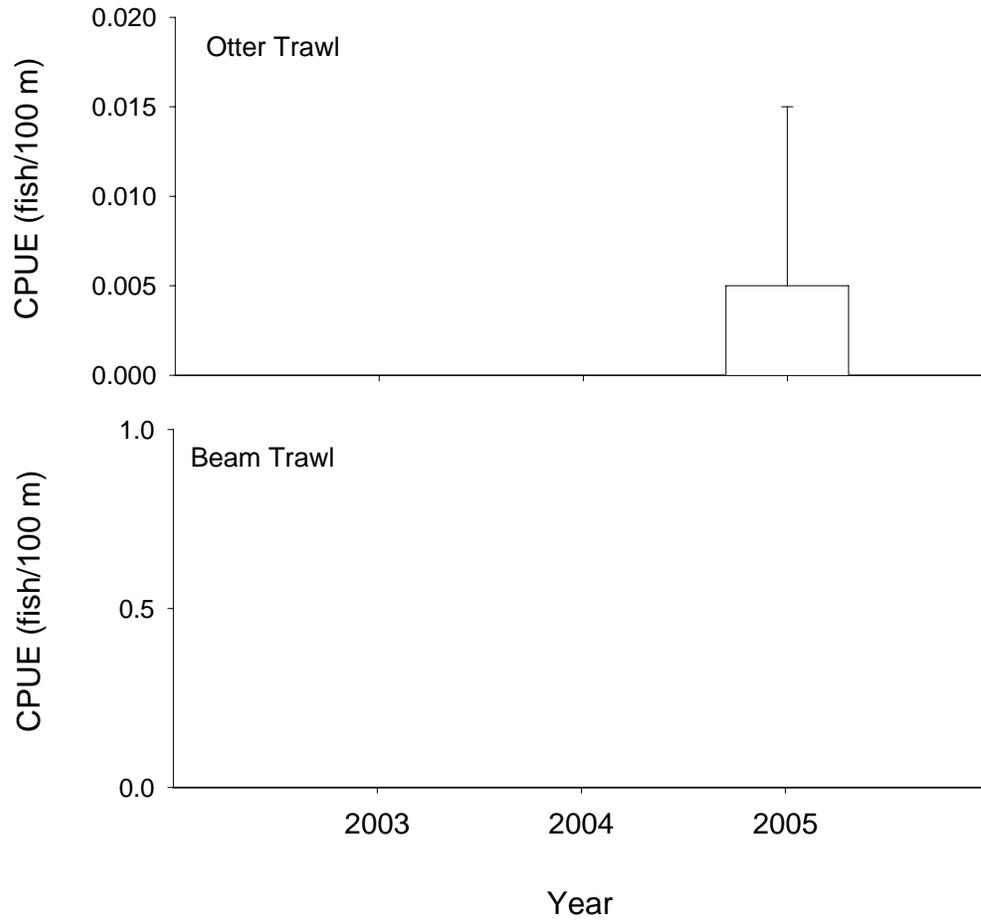


Figure 31. Mean annual catch-per-unit-effort ($\pm 2SE$) of sand shiner in trawls in segment 7 of the Missouri River during fish community season 2003-2005.

Segment 7 - Sand Shiner / Fish Community Season

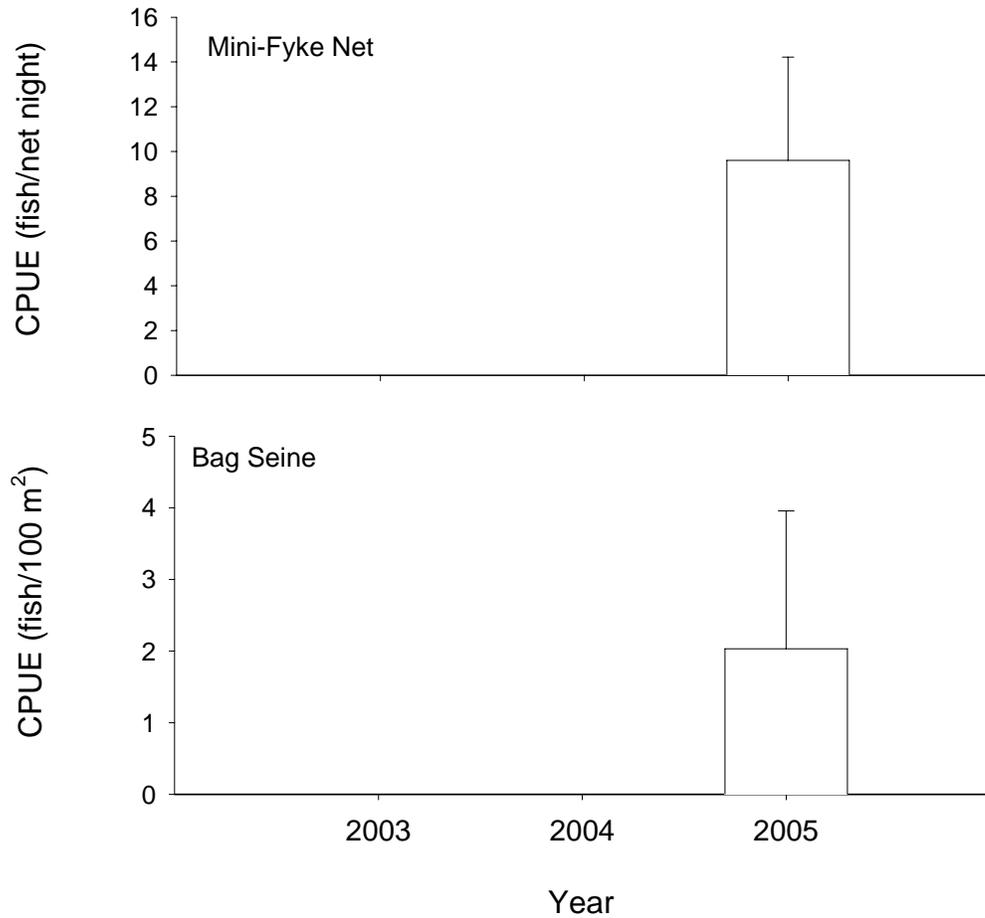


Figure 32. Mean annual catch-per-unit-effort ($\pm 2SE$) of sand shiner in mini-fyke nets and bag seines in segment 7 of the Missouri River during fish community season 2003-2005.

Table 32. Total number of sand shiners captured for each gear during each season and the proportion caught within each macrohabitat type in segment 7 of the Missouri River during 2005. The percent of total effort for each gear in each habitat is presented on the second line of each gear type. N-E indicates the habitat is non-existent in the segment.

Gear	N	Macrohabitat													
		BRAD	CHXO	CONF	DEND	DRNG	ISB	OSB	SCCL	SCCS	SCN	TRIB	TRML	TRMS	WILD
Sturgeon Season (Fall through Spring)															
1 Inch Trammel Net	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		5	24	0	3	5	20	27	6	5	0		0	0	5
2.5 Inch Trammel Net	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0		0	0	0
Gill Net	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	25	0	0	0	35	30	10	0	0		0	0	0
Otter Trawl	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0		0	0	0
Fish Community Season (Summer)															
1 Inch Trammel Net	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		13	19	1	2	6	20	19	9	7	0		0	0	3
Bag Seine	271	2	0	1	5	0	38	1	15	36	0		0	1	0
		4	0	2	0	0	33	6	10	36	4		0	3	0
Mini-Fyke Net	979	22	0	0	0	0	13	10	5	47	2		0	1	0
		15	0	2	2	0	22	13	13	24	5		2	4	0
Otter Trawl	1	0	0	0	0	0	0	100	0	0	0		0	0	0
		14	22	3	0	3	30	23	2	5	0		0	0	0

Table 33. Total number of sand shiners captured for each gear during each season and the proportion caught within each mesohabitat type in segment 7 of the Missouri River during 2005. The percent of total effort for each gear in each habitat is presented on the second line of each gear type. N-E indicates the habitat is non-existent in the segment.

Gear	N	Mesohabitat				
		BARS	CHNB	DTWT	ITIP	POOL
Sturgeon Season (Fall through Spring)						
1 Inch Trammel Net	0	0 1	0 86	0 5	0 7	0 1
2.5 Inch Trammel Net	0	0 0	0 0	0 0	0 0	0 0
Gill Net	0	0 0	0 79	0 0	0 3	0 17
Otter Trawl	0	0 0	0 0	0 0	0 0	0 0
Fish Community Season (Summer)						
1 Inch Trammel Net	0	0 1	0 87	0 3	0 9	0 0
Bag Seine	271	100 96	0 0	0 0	0 0	0 0
Mini-Fyke Net	979	98 86	0 9	0 0	0 0	0 0
Otter Trawl	1	0 0	100 95	0 0	0 5	0 0

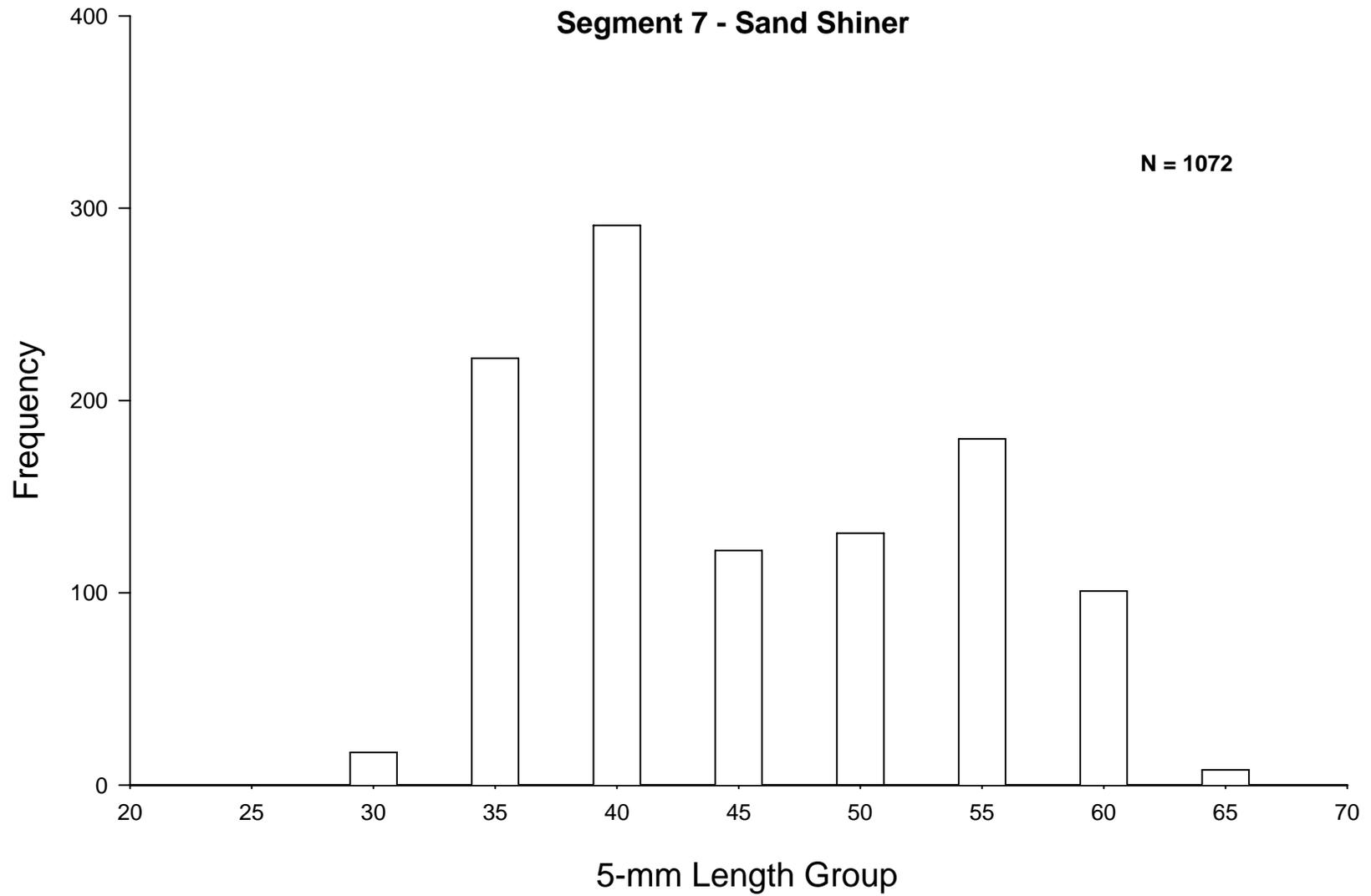


Figure 33. Length frequency of sand shiners in segment 7 of the Missouri River during summer (fish community season) 2005.

Hybognathus spp.

Three *Hybognathus* spp. were captured in 2005. All were captured in beach seines during the Fish Community season (Table 34). Two of the fish were captured in inside bend (macro) bar (meso) habitats and the other was found in a braided (macro) bar (meso) habitat. These fish were all captured in July, and they ranged in length from 61 to 87 mm.

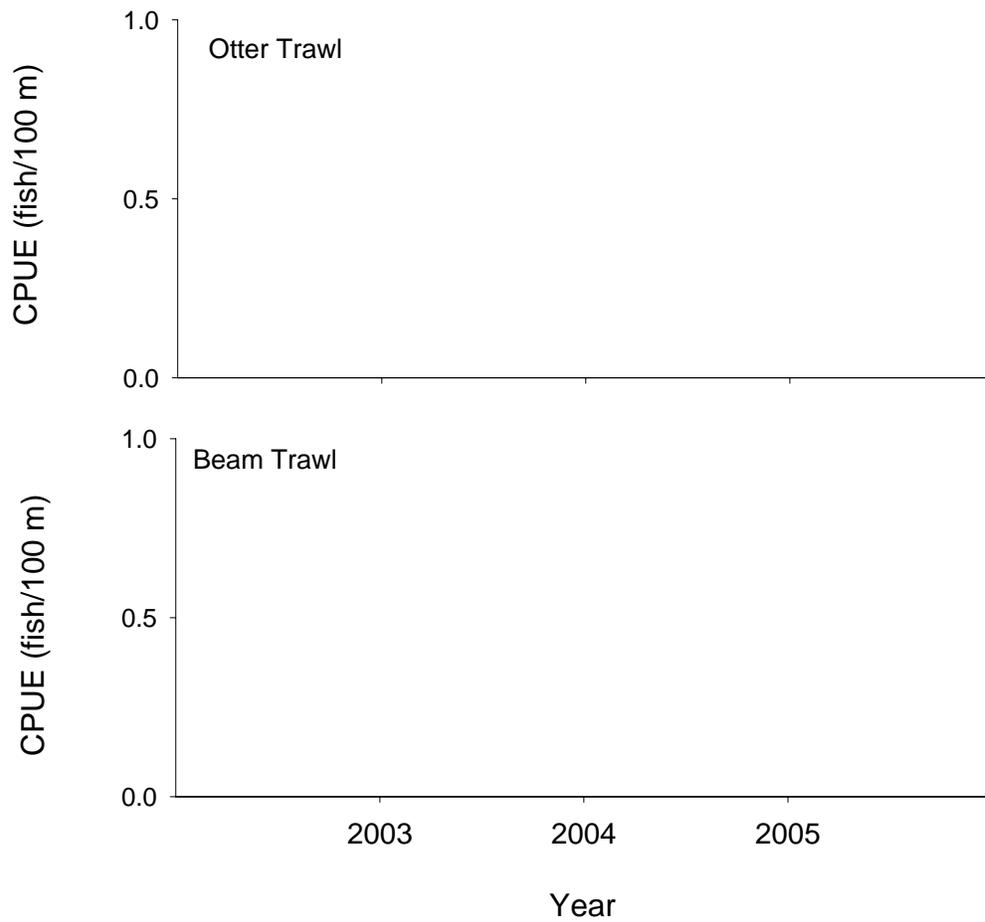
Segment 7 - *Hybognathus* spp. / Sturgeon Season

Figure 34. Mean annual catch-per-unit-effort (\pm 2SE) of *Hybognathus* spp. in trawls in segment 7 of the Missouri River during sturgeon season 2003-2005.

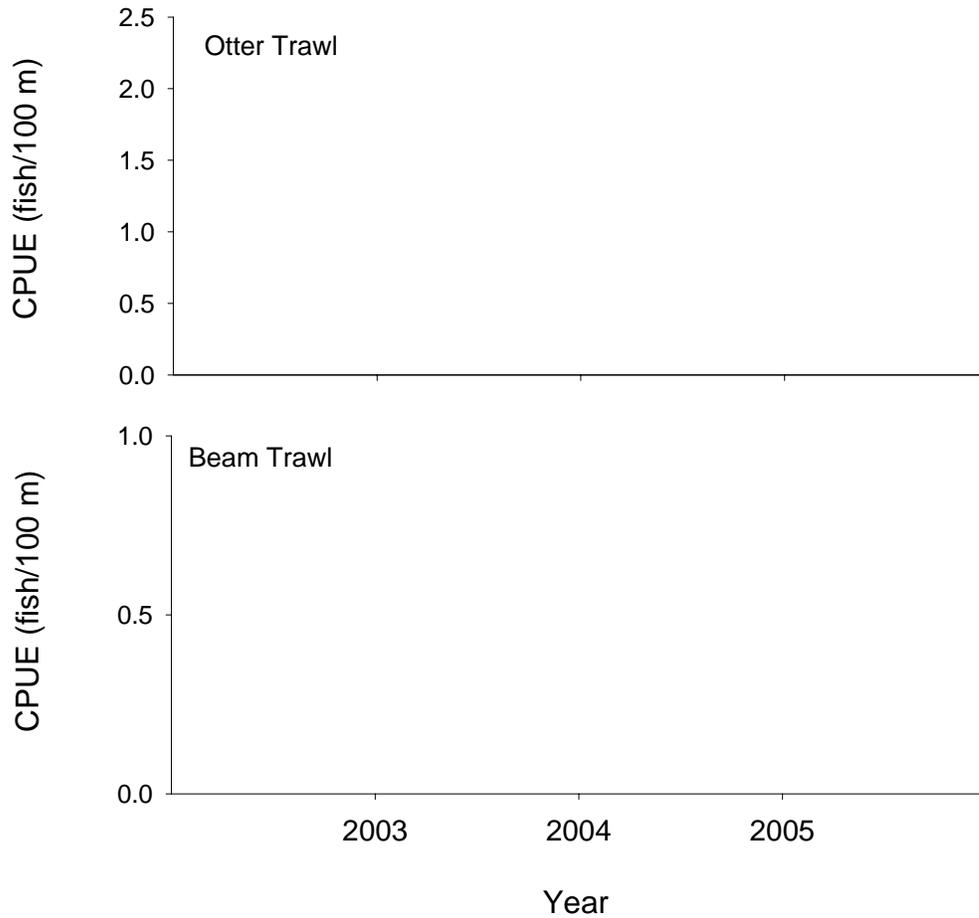
Segment 7 - *Hybognathus* spp. / Fish Community Season

Figure 35. Mean annual catch-per-unit-effort (\pm 2SE) of *Hybognathus* spp. in trawls in segment 7 of the Missouri River during fish community season 2003-2005.

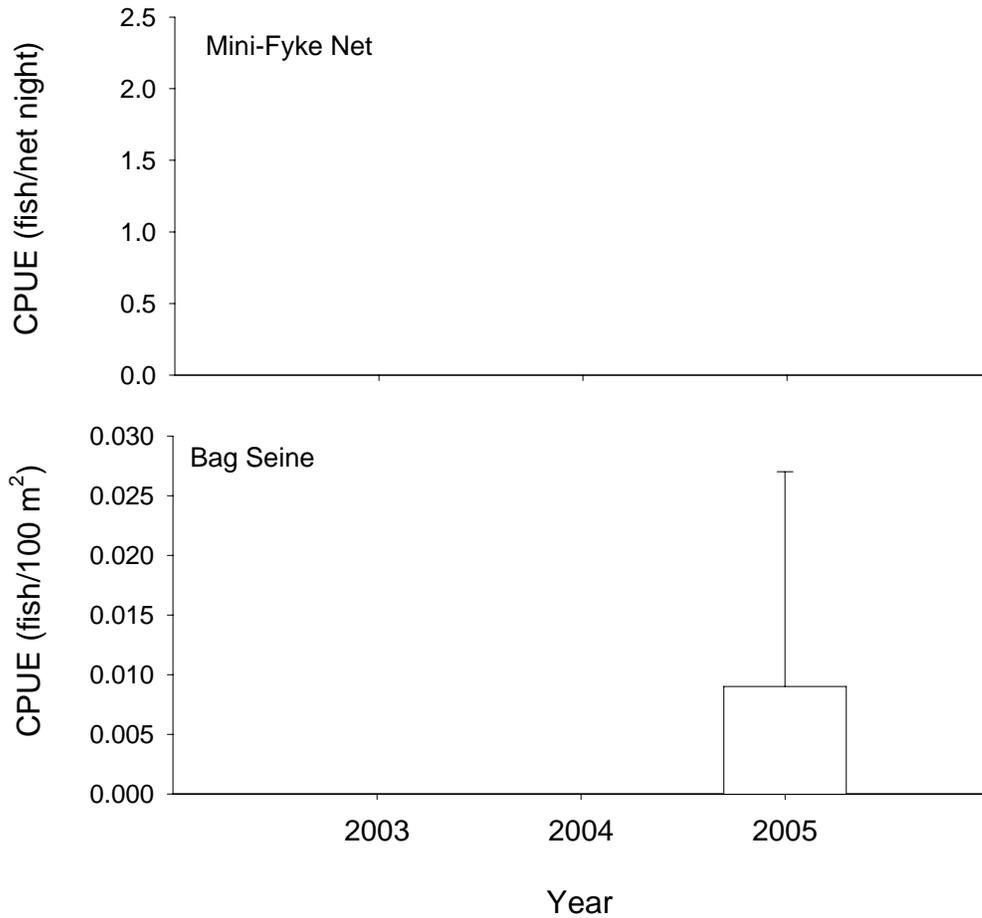
Segment 7 - *Hybognathus* spp. / Fish Community Season

Figure 36. Mean annual catch-per-unit-effort (\pm 2SE) of *Hybognathus* spp. in mini-fyke nets and bag seines in segment 7 of the Missouri River during fish community season 2003-2005.

Table 34. Total number of *Hybognathus* spp. captured for each gear during each season and the proportion caught within each macrohabitat type in segment 7 of the Missouri River during 2005. The percent of total effort for each gear in each habitat is presented on the second line of each gear type. N-E indicates the habitat is non-existent in the segment.

Gear	N	Macrohabitat													
		BRAD	CHXO	CONF	DEND	DRNG	ISB	OSB	SCCL	SCCS	SCN	TRIB	TRML	TRMS	WILD
Sturgeon Season (Fall through Spring)															
1 Inch Trammel Net	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		5	24	0	3	5	20	27	6	5	0		0	0	5
2.5 Inch Trammel Net	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		0	0	0	0	0	0	0	0	0	0		0	0	0
Gill Net	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		0	25	0	0	0	35	30	10	0	0		0	0	0
Otter Trawl	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		0	0	0	0	0	0	0	0	0	0		0	0	0
Fish Community Season (Summer)															
1 Inch Trammel Net	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		13	19	1	2	6	20	19	9	7	0		0	0	3
Bag Seine	3	33	0	0	0	0	67	0	0	0	0		0	0	0
		4	0	2	0	0	33	6	10	36	4		0	3	0
Mini-Fyke Net	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		15	0	2	2	0	22	13	13	24	5		2	4	0
Otter Trawl	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		14	22	3	0	3	30	23	2	5	0		0	0	0

Table 35. Total number of *Hybognathus* spp. captured for each gear during each season and the proportion caught within each mesohabitat type in segment 7 of the Missouri River during 2005. The percent of total effort for each gear in each habitat is presented on the second line of each gear type. N-E indicates the habitat is non-existent in the segment.

Gear	N	Mesohabitat				
		BARS	CHNB	DTWT	ITIP	POOL
Sturgeon Season (Fall through Spring)						
1 Inch Trammel Net	0	0 1	0 86	0 5	0 7	0 1
2.5 Inch Trammel Net	0	0 0	0 0	0 0	0 0	0 0
Gill Net	0	0 0	0 79	0 0	0 3	0 17
Otter Trawl	0	0 0	0 0	0 0	0 0	0 0
Fish Community Season (Summer)						
1 Inch Trammel Net	0	0 1	0 87	0 3	0 9	0 0
Bag Seine	3	100 96	0 0	0 0	0 0	0 0
Mini-Fyke Net	0	0 86	0 9	0 0	0 0	0 0
Otter Trawl	0	0 0	0 95	0 0	0 5	0 0

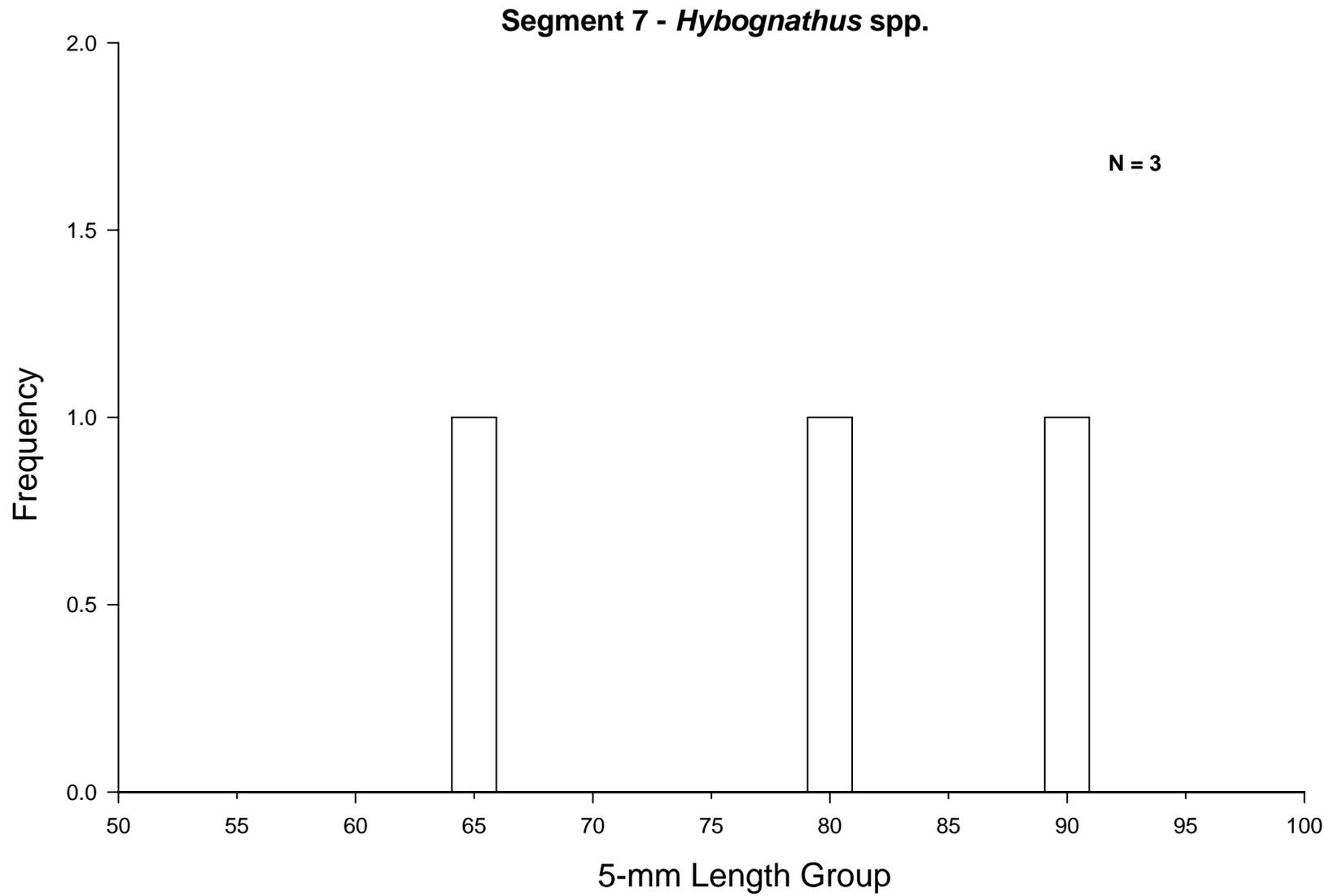


Figure 37. Length frequency of *Hybognathus* spp. caught in segment 7 of the Missouri River during summer (fish community season) 2004-2005

Blue Sucker

A total of 192 blue suckers were captured in 2005. Active gears caught 143 fish and passive gears 49 fish. The majority of blue suckers were captured in small-mesh (1" inner panel) trammel nets (n= 113). The sturgeon season produced 74 of those fish (CPUE = 0.56 fish/100m) and 39 were caught during the community season (CPUE = 0.41 fish/100m). Detailed catch per unit effort data can be found in Appendix H and tables 36 and 37. Gillnets captured 49 fish (fall sampling only) resulting in a CPUE of 0.78 fish per net night. Otter trawls (fish community season only) captured 30 fish resulting in a CPUE of 0.15 fish per 100m. No blue suckers were caught in mini-fyke nets or seines.

Gears were set in a total of 13 macrohabitats. Blue suckers were captured in 9. During the sturgeon season, most of the blue suckers were captured in channel crossover (41%) and inside bend (33%) macrohabitats. Blue suckers appeared to be more evenly distributed among macrohabitats during the Fish Community season. Inside bends (28%), outside bends (16%), and channel crossovers (16%) held the highest number of the fish during these summer and early fall months. Most blue suckers were captured in channel border mesohabitats, producing 80% of our blue sucker catch. Catch rates for 1" trammel nets were the highest in confluence macrohabitats (5.2 fish per 100m).

Blue sucker lengths ranged from 153 to 730 mm (figure 44). Most of the fish were over 550 mm in length. This population is dominated by large fish. A 153 mm fish (determined to be age zero by scale and ray analysis) was captured in an otter trawl on 8/18/05 at mile 767. This was the lone young-of-year blue sucker sampled in 2005. The fish was captured in a braided (macro habitat) channel border (meso habitat). Depths during the drift varied from 1.8 to 3.0 m.

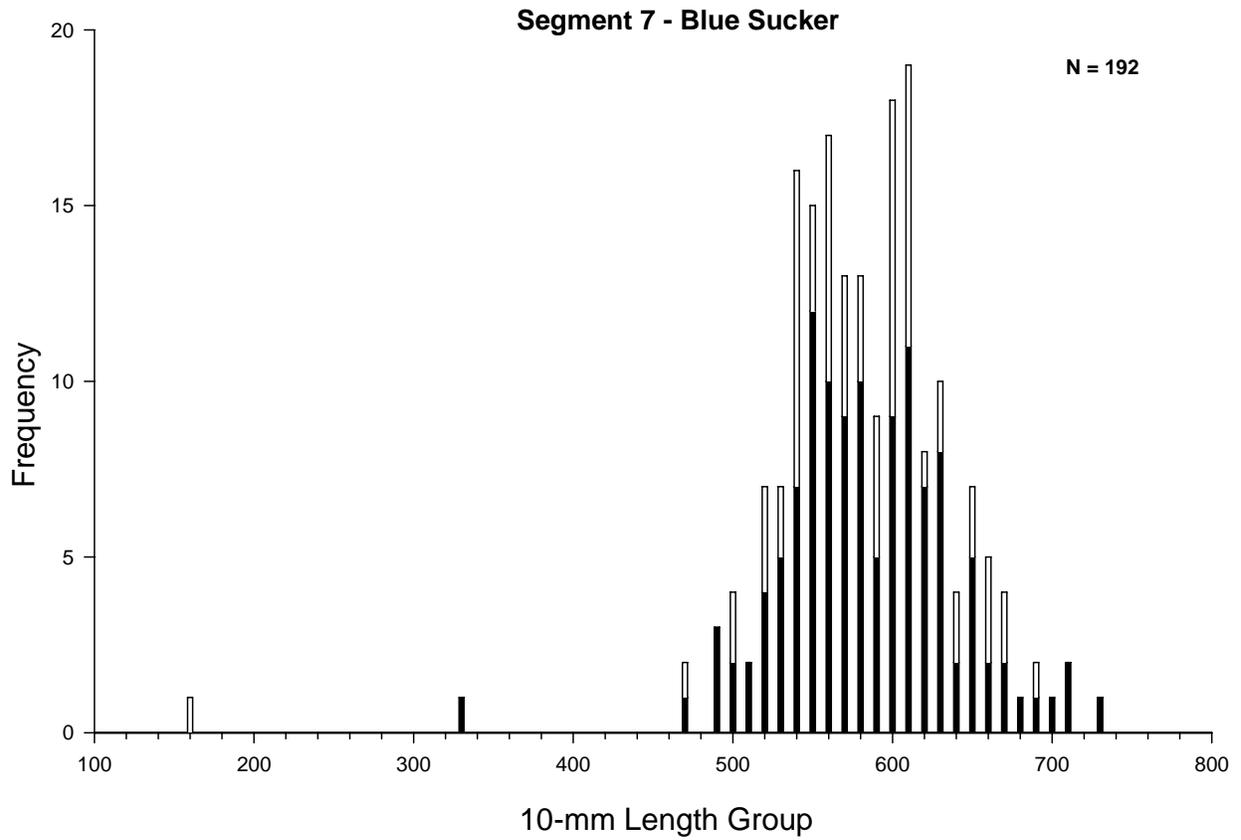


Figure 44. Length frequency of blue suckers during fall through spring (sturgeon season, black bars) and summer (fish community season, white bars) in segment 7 of the Missouri River during 2004 - 2005.

Segment 7 - Blue Sucker / Sturgeon Season

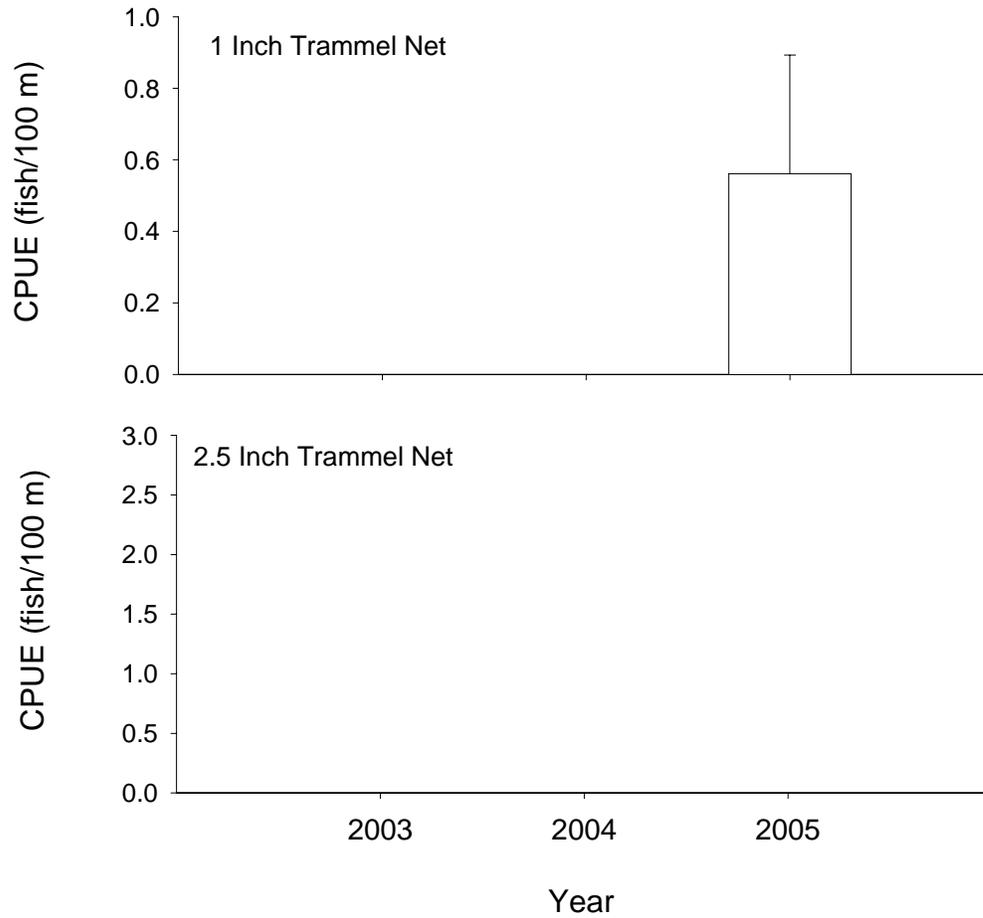


Figure 39. Mean annual catch-per-unit-effort (\pm 2SE) of blue sucker in trammel nets in segment 7 of the Missouri River during sturgeon season 2003-2005.

Segment 7 - Blue Sucker / Sturgeon Season

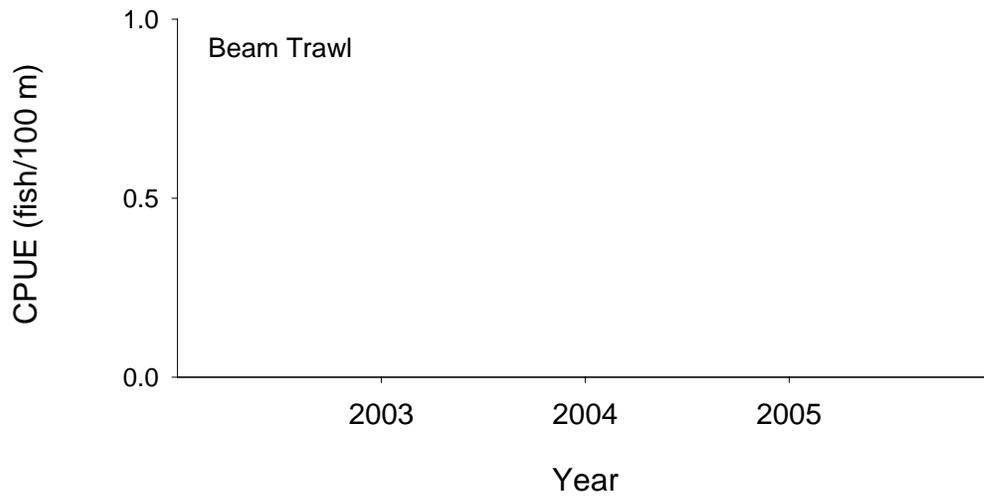


Figure 40. Mean annual catch-per-unit-effort (+/- 2SE) of blue sucker in beam trawls in segment 7 of the Missouri River during sturgeon season 2003-2005.

Segment 7 - Blue Sucker / Fish Community Season

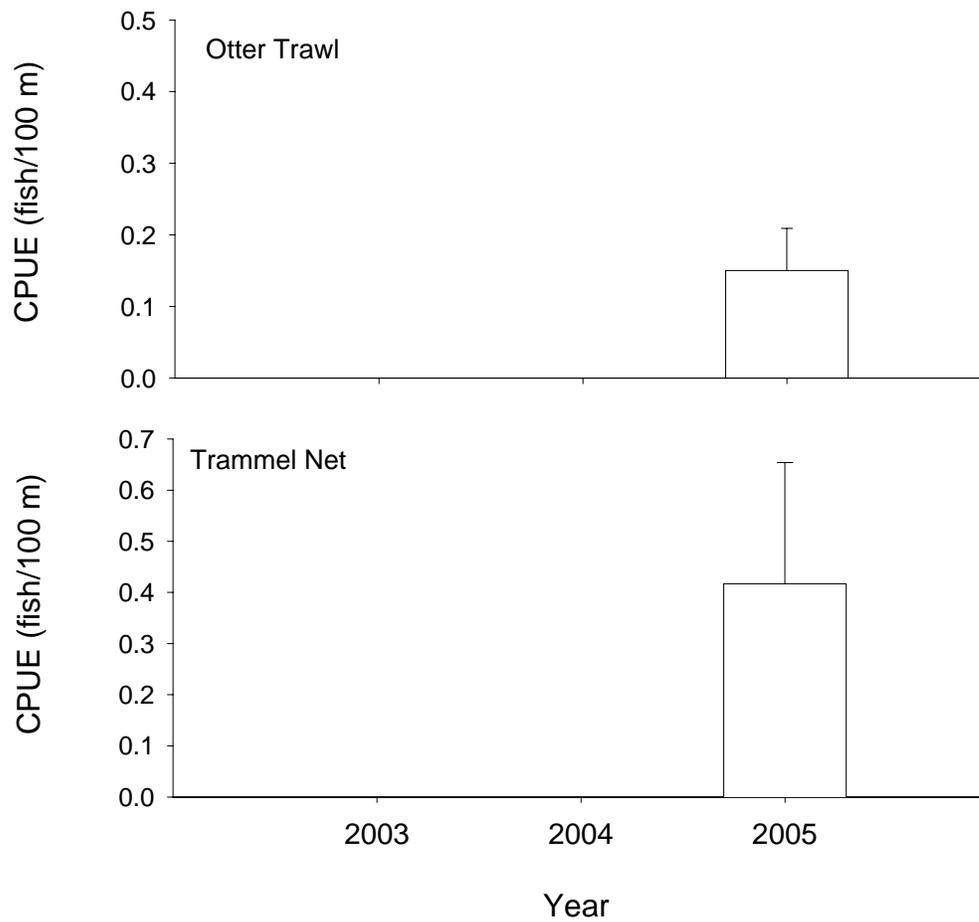


Figure 41. Mean annual catch-per-unit-effort ($\pm 2SE$) of blue sucker in otter trawls and trammel nets in segment 7 of the Missouri River during fish community season 2003-2005.

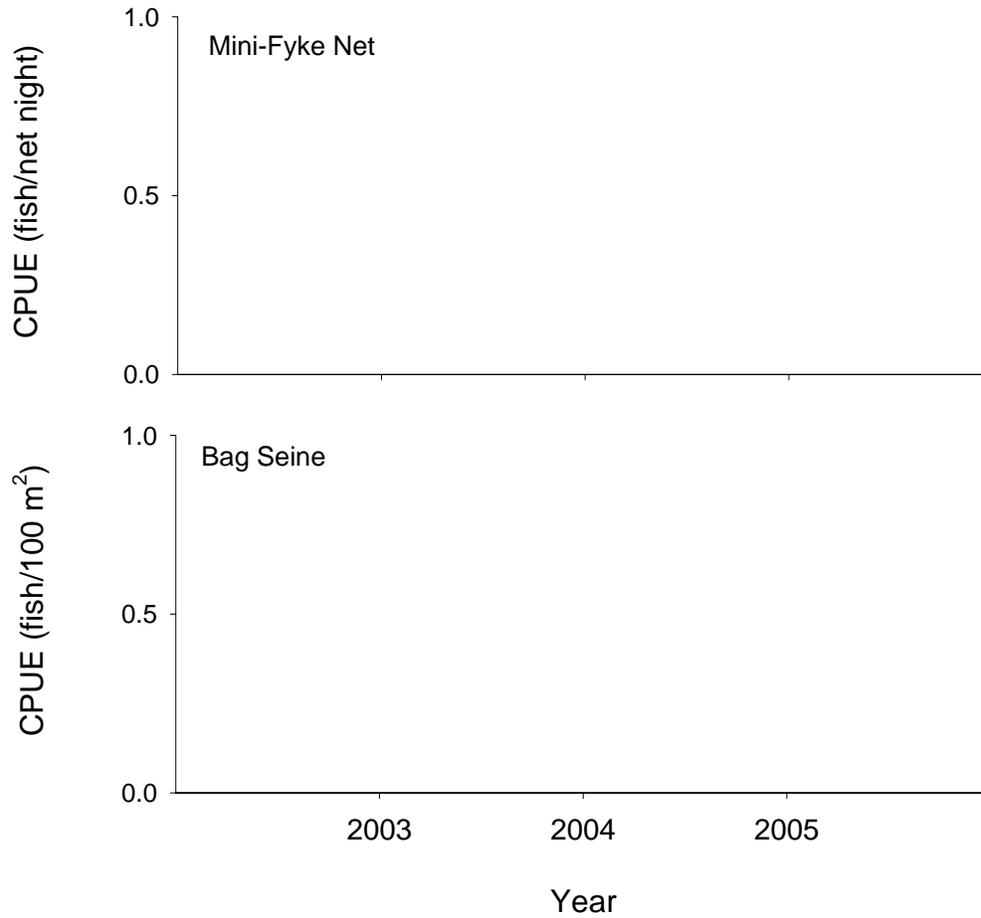
Segment 7 - Blue Sucker / Fish Community Season

Figure 42. Mean annual catch-per-unit-effort (\pm 2SE) of blue sucker in mini-fyke nets and bag seines in segment 7 of the Missouri River during fish community season 2003-2005.

Segment 7 - Blue Sucker / Fish Community Season

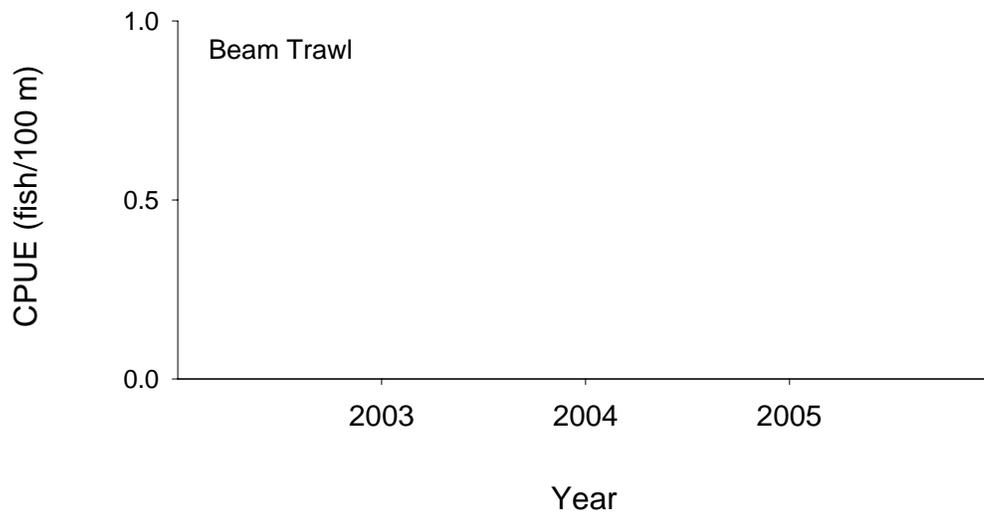


Figure 43. Mean annual catch-per-unit-effort (+/- 2SE) of blue sucker in beam trawls in segment 7 of the Missouri River during fish community season 2003-2005.

Table 36. Total number of blue suckers captured for each gear during each season and the proportion caught within each macrohabitat type in segment 7 of the Missouri River during 2005. The percent of total effort for each gear in each habitat is presented on the second line of each gear type. N-E indicates the habitat is non-existent in the segment.

Gear	N	Macrohabitat													
		BRAD	CHXO	CONF	DEND	DRNG	ISB	OSB	SCCL	SCCS	SCN	TRIB	TRML	TRMS	WILD
Sturgeon Season (Fall through Spring)															
1 Inch Trammel Net	74	0	62	0	0	1	7	7	1	0	0		0	0	22
		5	24	0	3	5	20	27	6	5	0		0	0	5
2.5 Inch Trammel Net	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		0	0	0	0	0	0	0	0	0	0		0	0	0
Gill Net	49	0	10	0	0	0	73	12	4	0	0		0	0	0
		0	25	0	0	0	35	30	10	0	0		0	0	0
Otter Trawl	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		0	0	0	0	0	0	0	0	0	0		0	0	0
Fish Community Season (Summer)															
1 Inch Trammel Net	39	10	18	21	0	3	18	8	8	5	0		0	0	10
		13	19	1	2	6	20	19	9	7	0		0	0	3
Bag Seine	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		4	0	2	0	0	33	6	10	36	4		0	3	0
Mini-Fyke Net	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		15	0	2	2	0	22	13	13	24	5		2	4	0
Otter Trawl	30	7	13	3	0	0	40	27	7	3	0		0	0	0
		14	22	3	0	3	30	23	2	5	0		0	0	0

Table 37. Total number of blue suckers captured for each gear during each season and the proportion caught within each mesohabitat type in segment 7 of the Missouri River during 2005. The percent of total effort for each gear in each habitat is presented on the second line of each gear type. N-E indicates the habitat is non-existent in the segment.

Gear	N	Mesohabitat				
		BARS	CHNB	DTWT	ITIP	POOL
Sturgeon Season (Fall through Spring)						
1 Inch Trammel Net	74	0 1	78 86	22 5	0 7	0 1
2.5 Inch Trammel Net	0	0 0	0 0	0 0	0 0	0 0
Gill Net	49	0 0	69 79	0 0	0 3	31 17
Otter Trawl	0	0 0	0 0	0 0	0 0	0 0
Fish Community Season (Summer)						
1 Inch Trammel Net	39	0 1	85 87	10 3	5 9	0 0
Bag Seine	0	0 96	0 0	0 0	0 0	0 0
Mini-Fyke Net	0	0 86	0 9	0 0	0 0	0 0
Otter Trawl	30	0 0	97 95	0 0	3 5	0 0

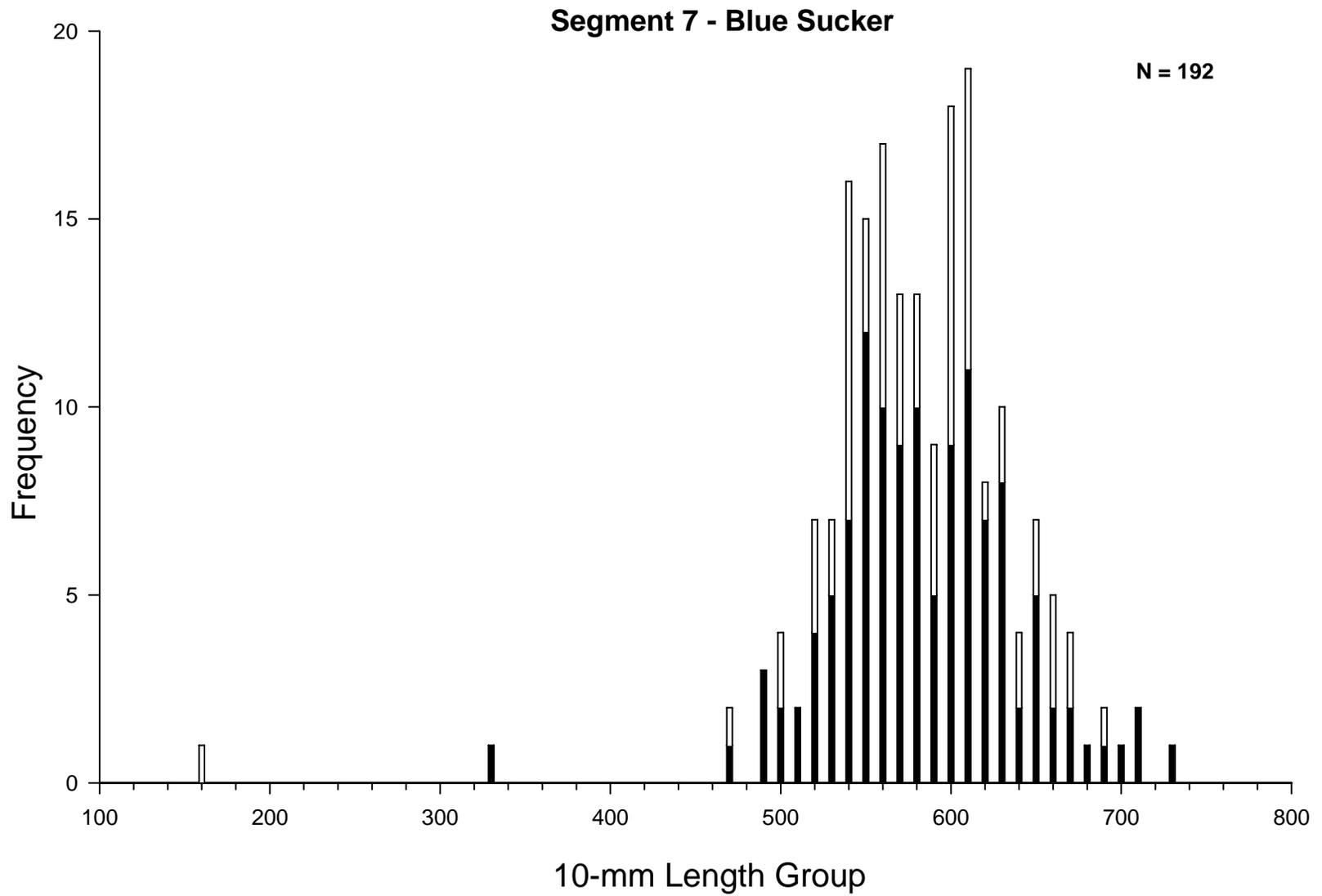


Figure 44. Length frequency of blue suckers during fall through spring (sturgeon season, black bars) and summer (fish community season, white bars) in segment 7 of the Missouri River during 2004 - 2005.

Sauger

A total of 44 sauger were captured in 2005. The majority of the sauger were captured in shallow water gears during the Fish Community season. Bag seines captured 41% of the entire year's catch (n=18) and mini-fyke nets accounted for another 7 fish. No adult saugers were caught with these gears. Most of the shallow water fish (52%) came from areas classified as small secondary channels (Table 38). 1" trammel nets sampled the most adult fish (n= 12). Seven of these came from channel crossover macro habitat. Trammel net catch rates were low during both the sturgeon season and (CPUE = 0.03 fish/100m) the fish community season (CPUE = 0.07 fish/100m). Detailed catch per unit effort data can be found in Appendix H and tables 38 and 39. Gillnets captured only 3 saugers (fall sampling only) resulting in a CPUE of 0.05 fish/net night. Gears were set in a total of 13 macrohabitats, and sauger were captured in 7 of them (Table 38).

Sauger lengths ranged from 50 – 450 mm (figure 51). Many of these fish were young-of-year captured during the late summer to early fall.

Segment 7 - Sauger / Sturgeon Season

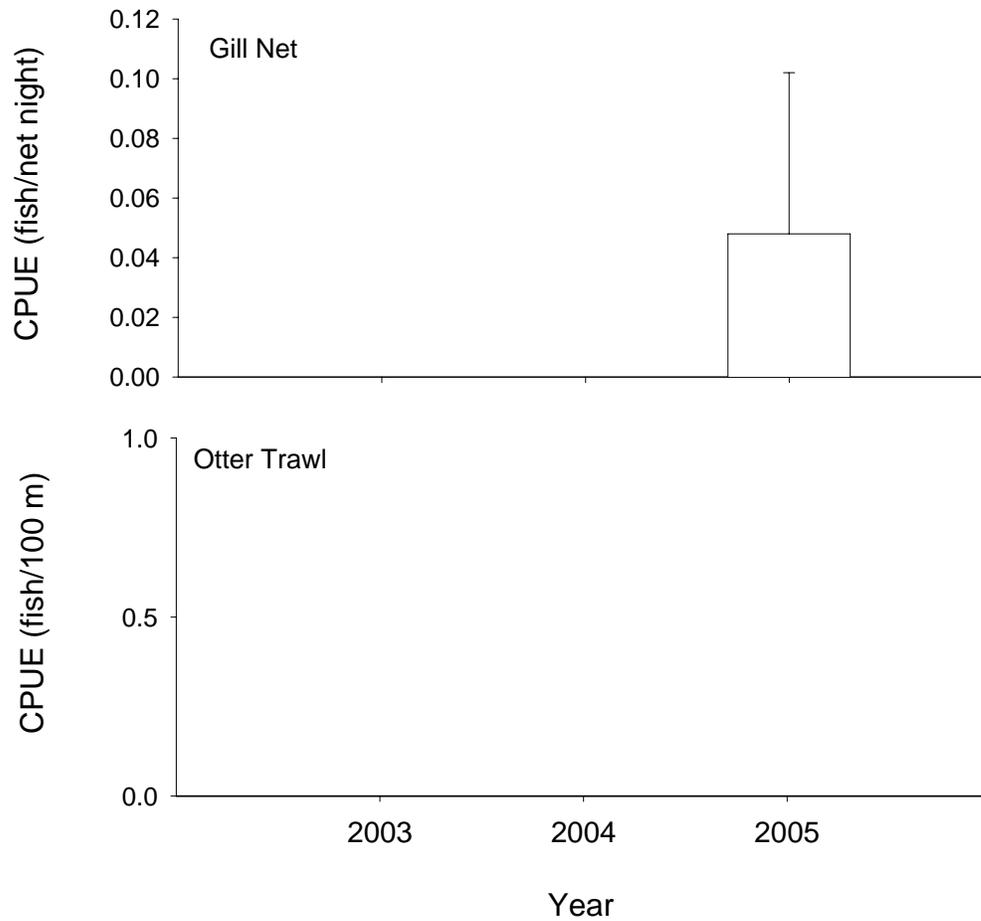


Figure 45. Mean annual catch-per-unit-effort ($\pm 2SE$) of sauger in gill nets and trawls in segment 7 of the Missouri River during sturgeon season 2003-2005.

Segment 7 - Sauger / Sturgeon Season

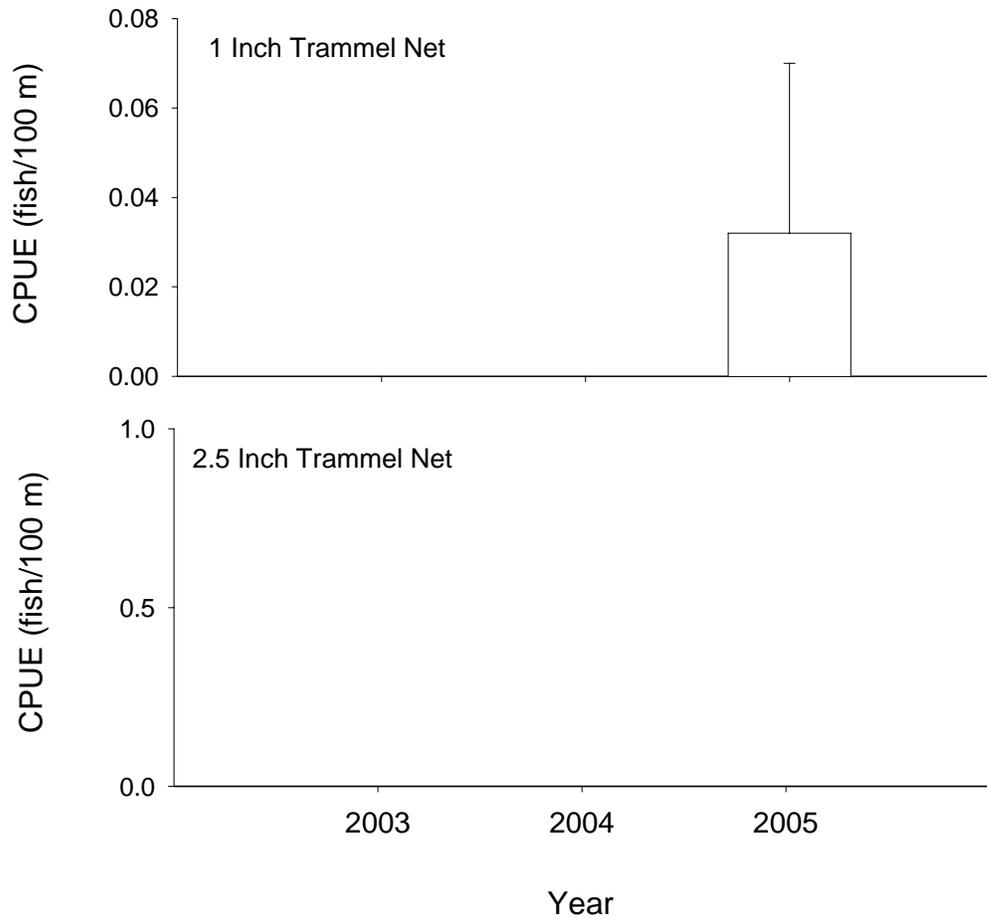


Figure 46. Mean annual catch-per-unit-effort (\pm 2SE) of sauger in trammel nets in segment 7 of the Missouri River during sturgeon season 2003-2005.

Segment 7 - Sauger / Sturgeon Season

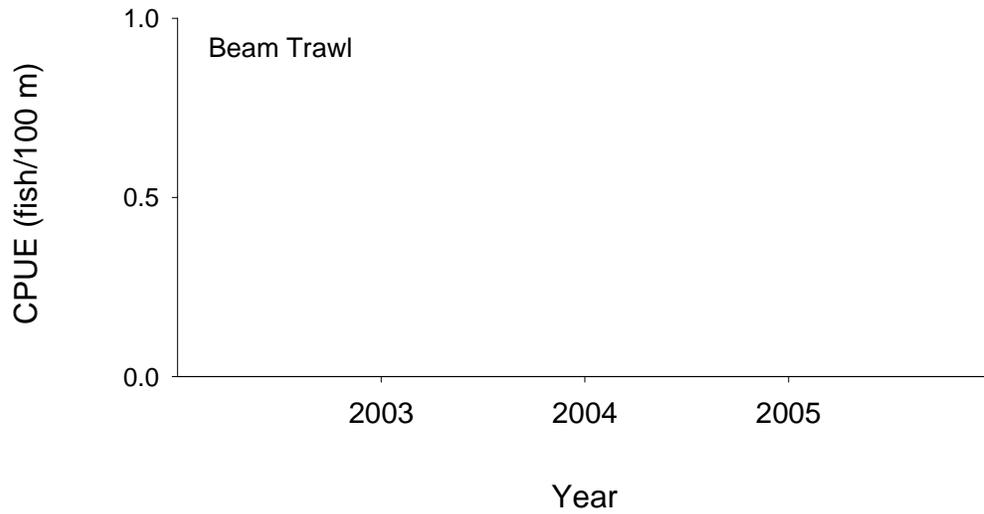


Figure 47. Mean annual catch-per-unit-effort ($\pm 2SE$) of sauger in beam trawls in segment 7 of the Missouri River during sturgeon season 2003-2005.

Segment 7 - Sauger / Fish Community Season

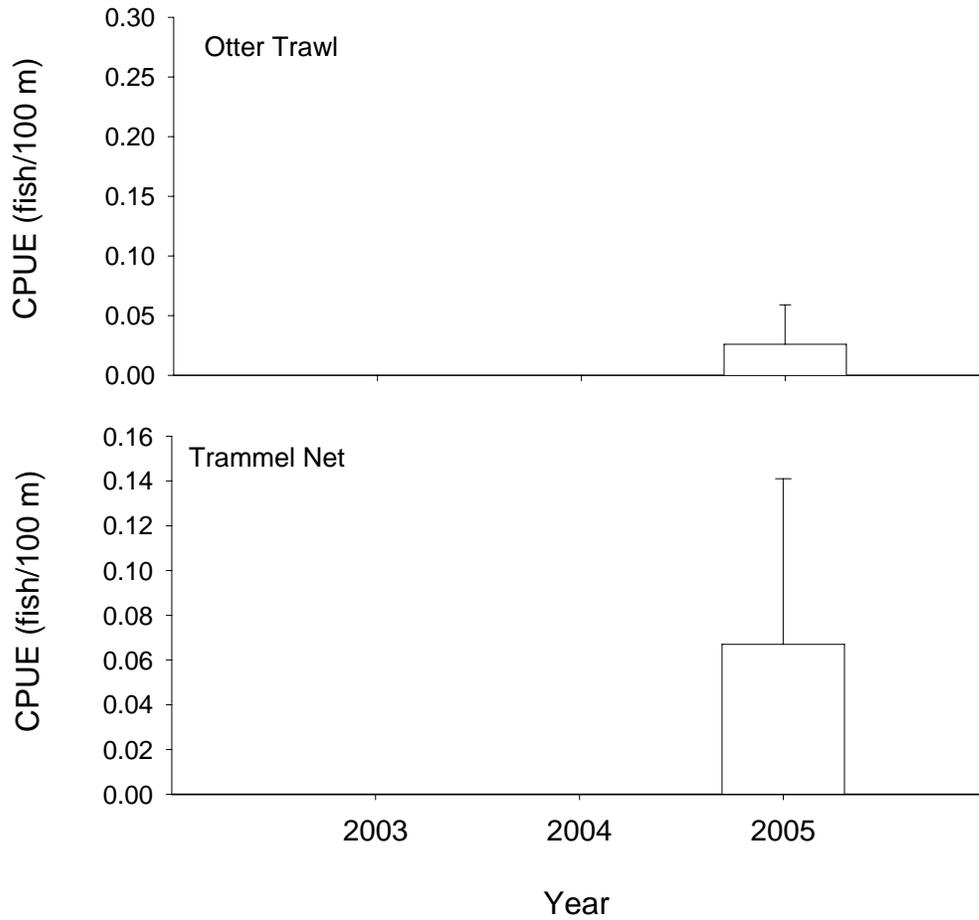


Figure 48. Mean annual catch-per-unit-effort ($\pm 2SE$) of sauger in otter trawls and trammel nets in segment 7 of the Missouri River during fish community season 2003-2005.

Segment 7 - Sauger / Fish Community Season

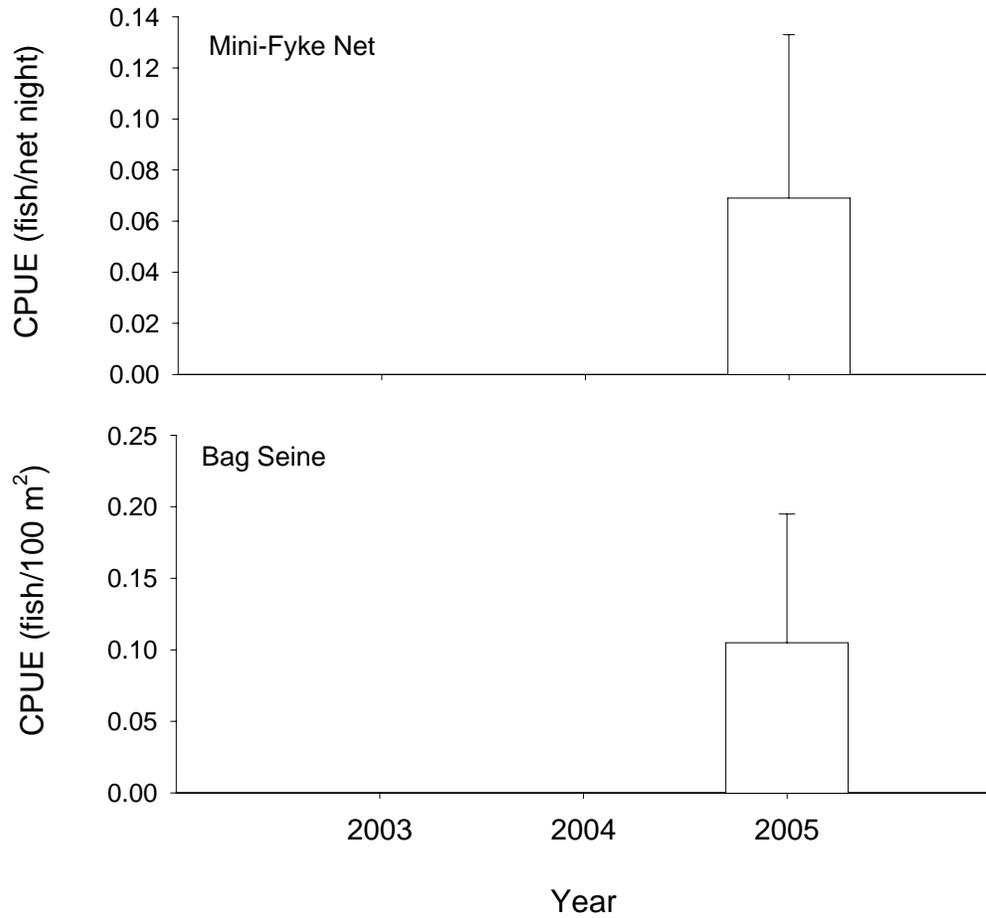


Figure 49. Mean annual catch-per-unit-effort ($\pm 2SE$) of sauger in mini-fyke nets and bag seines in segment 7 of the Missouri River during fish community season 2003-2005.

Segment 7 - Sauger / Fish Community Season

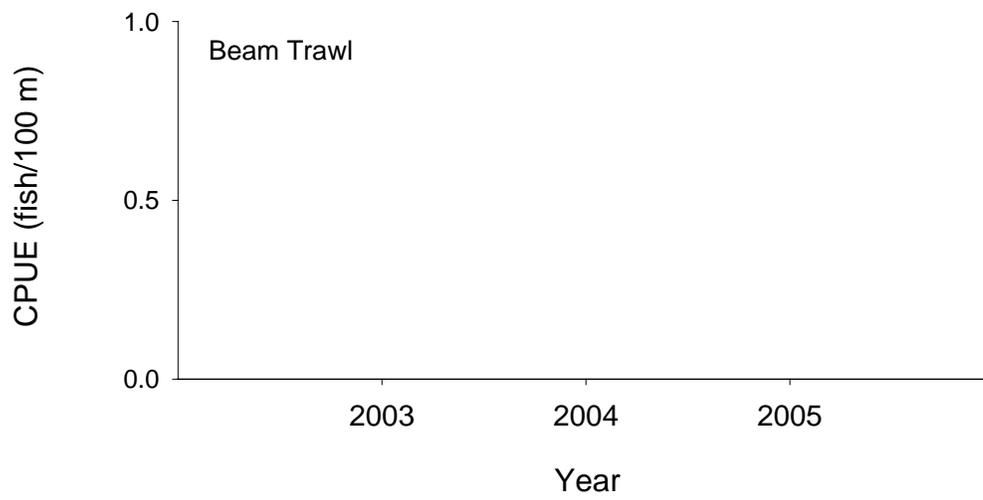


Figure 50. Mean annual catch-per-unit-effort (\pm 2SE) of sauger in beam trawls in segment 7 of the Missouri River during fish community season 2003-2005.

Table 38. Total number of saugers captured for each gear during each season and the proportion caught within each macrohabitat type in segment 7 of the Missouri River during 2005. The percent of total effort for each gear in each habitat is presented on the second line of each gear type. N-E indicates the habitat is non-existent in the segment.

Gear	N	Macrohabitat													
		BRAD	CHXO	CONF	DEND	DRNG	ISB	OSB	SCCL	SCCS	SCN	TRIB	TRML	TRMS	WILD
Sturgeon Season (Fall through Spring)															
1 Inch Trammel Net	5	0	60	0	0	0	20	0	20	0	0		0	0	0
		5	24	0	3	5	20	27	6	5	0		0	0	5
2.5 Inch Trammel Net	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		0	0	0	0	0	0	0	0	0	0		0	0	0
Gill Net	3	0	0	0	0	0	0	67	33	0	0		0	0	0
		0	25	0	0	0	35	30	10	0	0		0	0	0
Otter Trawl	0	0	0	0	0	0	0	0	0	0	0		0	0	0
		0	0	0	0	0	0	0	0	0	0		0	0	0
Fish Community Season (Summer)															
1 Inch Trammel Net	7	0	57	14	0	0	14	0	0	14	0		0	0	0
		13	19	1	2	6	20	19	9	7	0		0	0	3
Bag Seine	18	6	0	11	0	0	22	6	0	56	0		0	0	0
		4	0	2	0	0	33	6	10	36	4		0	3	0
Mini-Fyke Net	7	0	0	0	0	0	43	0	14	43	0		0	0	0
		15	0	2	2	0	22	13	13	24	5		2	4	0
Otter Trawl	4	0	0	0	0	0	75	0	0	25	0		0	0	0
		14	22	3	0	3	30	23	2	5	0		0	0	0

Table 39. Total number of saugers captured for each gear during each season and the proportion caught within each mesohabitat type in segment 7 of the Missouri River during 2005. The percent of total effort for each gear in each habitat is presented on the second line of each gear type. N-E indicates the habitat is non-existent in the segment.

Gear	N	Mesohabitat				
		BARS	CHNB	DTWT	ITIP	POOL
Sturgeon Season (Fall through Spring)						
1 Inch Trammel Net	5	0 1	100 86	0 5	0 7	0 1
2.5 Inch Trammel Net	0	0 0	0 0	0 0	0 0	0 0
Gill Net	3	0 0	100 79	0 0	0 3	0 17
Otter Trawl	0	0 0	0 0	0 0	0 0	0 0
Fish Community Season (Summer)						
1 Inch Trammel Net	7	0 1	86 87	0 3	14 9	0 0
Bag Seine	18	100 96	0 0	0 0	0 0	0 0
Mini-Fyke Net	7	43 86	57 9	0 0	0 0	0 0
Otter Trawl	4	0 0	75 95	0 0	25 5	0 0

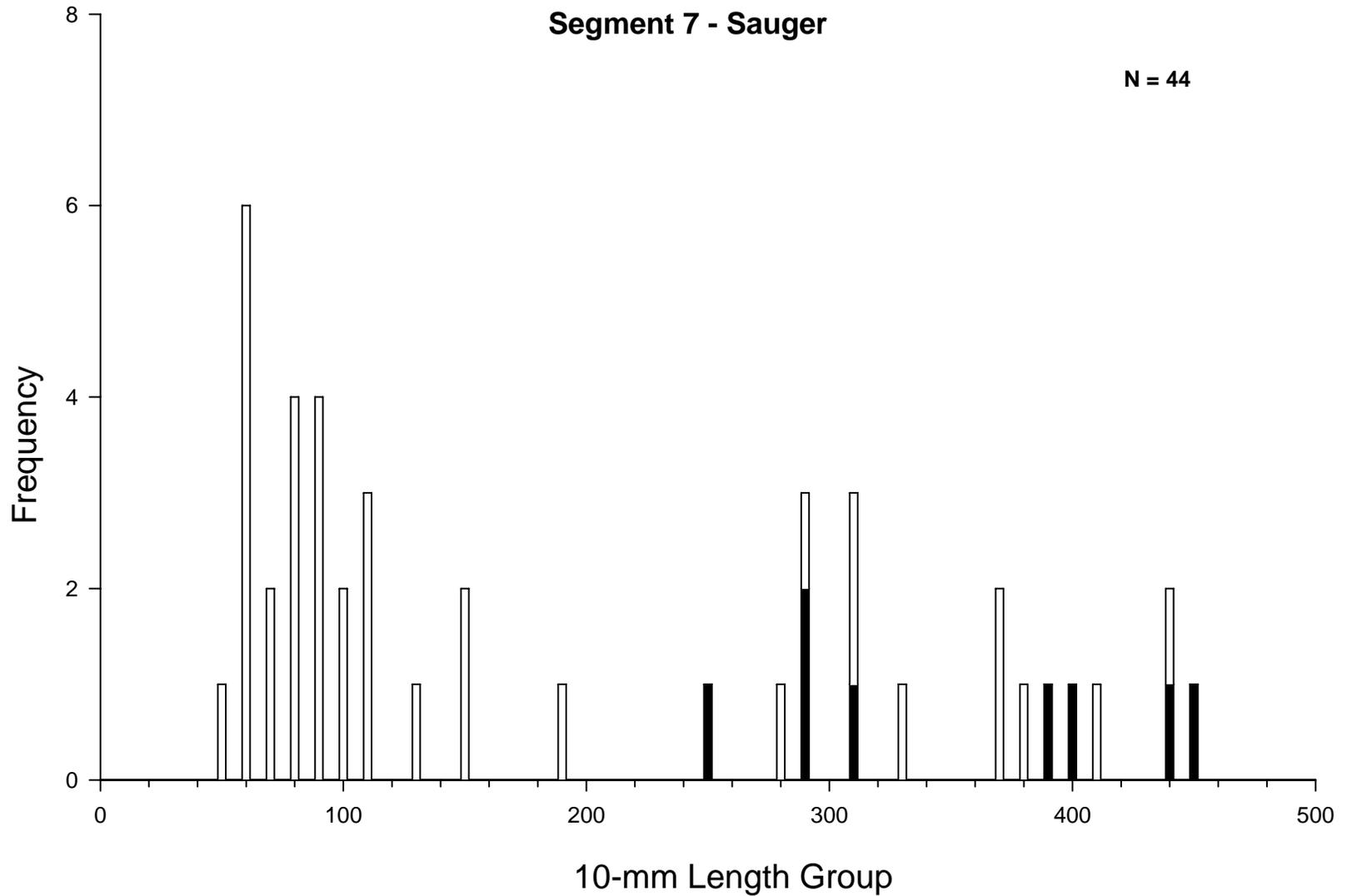


Figure 51. Length frequency of sauger during fall through spring (sturgeon season, black bars) and summer (fish community season, white bars) in segment 7 of the Missouri River during 2004-2006.

Missouri River Fish Community

A total of 51 species and 1 hybrid were captured in Segment 7 during the 2005 sampling season. This includes 13,823 individual fish. The most diversity (49 different species) was seen during the fish community season. The sturgeon season yielded 21 different species. The most common fish sampled during the fish community season were red shiners *Cyprinella lutrensis* (N=3633), emerald shiners *Notropis atherinoides* (N= 2344), and YOY carpsuckers *Cariodes spp.* (N= 1714) that were not yet old enough to identify to species. Nearly all of these were sampled in shallow water with mini-fyke nets and bag seines. These same gears also captured large numbers of young gizzard shad *Dorosoma cepedianum* (n= 1115) and freshwater drum *Aplodinotus grunniens* (n=531). Shovelnose sturgeon (N=243), goldeye *Hiodon alosoides* (N= 176) and channel catfish *Ictalurus punctatus* (N= 170) were the most common species during the sturgeon season. Several species were represented by a single individual for the year including: speckled, sicklefin, and sturgeon chubs.

All 4 of the gears used during 2005 caught native target species. Otter trawls captured the 6 of the 10 target fishes with the exception of pallid sturgeon and the hybognathus sp. Mini-Fyke nets had the most diverse overall catch (33 species) and gillnets the least (13 species). Small mesh trammel nets caught 23 species (including 3 target fishes). The most common (number) fish captured in 1" trammel nets during the sturgeon season were shovelnose sturgeon (CPUE = 2.05 fish / 100m). Channel catfish (CPUE = 1.35 fish / 100m) were the most common fish during the Fish Community season.

Sauger were the most common percid sampled throughout 2005 (n=44). Walleye *Sander vitreum* catches totaled 23 fish. A total of 20 walleye X sauger hybrids (saugeye) were sampled. It is very likely that there are multiple generations of back-crossing, making it challenging to differentiate between saugers and saugeye.

Several exotic carp were sampled in 2005. We captured 1 silver carp, 2 bighead carp, 1 grass carp, and 138 common carp. Most (96%) of the common carp we sampled were YOY fish (<100mm) sampled in shallow water. Silver carp were frequently observed jumping at the mouths of the James and Vermillion Rivers during the summer and early fall. Both bighead and silver carp seem very adept at avoiding our current gears. Bighead carp are often spotted in the tailrace area below Gavins Point Dam. Additionally, they are commonly taken by bow

fishermen throughout Segment 7. No zebra mussels or Asian clams were observed in Segment 7 during 2005.

Turtle catches were recorded starting in September of 2005. Through the end of the 2005 season we had the following catches: 49 false map *Graptemys pseudogeographica*, 5 smooth softshell *Apalone mutica*, and 1 painted turtle *Chrysemys picta bellii*. Mini-fyke nets accounted for all of the false map catches, and similar numbers were caught in the July-August period (prior to recording). Smooth softshells were captured in the trawl (n=4) and mini-fyke nets (n=2). No spiny softshell turtles *Apalone spinifera* were captured.

Discussion

Only a single pallid sturgeon was captured in Segment 7 during 2005. However, caution must be used when interpreting that fact. 2005 was the inaugural year for population assessment sampling in Segment 7. Because of personnel issues (e.g., no full time staff until mid-May), very little sampling was done prior to June. A partial set of gillnets was deployed (63 nets) in the late fall (November and December 2004) by a temporary crew. That, plus 120 small-mesh trammel drifts in the spring, represented the entire effort for the 2005 Sturgeon season. The full time crew was not outfitted in time to deploy any gillnets, 2.5" trammel nets, or otter trawls before July 1. Full sampling effort is being deployed during the 2006 season and this has already produced multiple pallid sturgeon catches.

Shovelnose sturgeon catches indicated a lack of immature fish in Segment 7. Only 22 of 242 fish were less than 500 mm in length (Figure 17). This could be the result of a general lack of reproduction/recruitment in Segment 7. It just as likely could indicate that larval sturgeon produced in this area drift downstream into the lower reaches of the river (Kynard et al. 2002). A third explanation is that current gears do not adequately sample young sturgeon. However, downstream crews have had success using these same gears (Doyle et al. 2005, NGPC 2004). Many gravid-looking sturgeon (robust and dark-colored midsection) were observed in May, indicating that spawning was possible. The effects of Gavins Point dam has led to a profusion of glacially-derived hard substrate (cobble and boulders) in the upper 10 miles of Segment 7 (USACE 1996). This type of habitat is a potential spawning site for sturgeon (Keenlyne 1989). Altered hydrographs, thermal regimes, and lack of sediment due to the effects of Gavins Point Dam could be affecting sturgeon spawning behavior in Segment 7 (Dryer and Sandvol 1993).

Blue sucker length data shows similarities to shovelnose sturgeon. Mature fish dominated the 2005 catch (Figure 44). Only 10 of 192 fish were less than 500 mm in length. Low catch rates of juvenile fish in downstream reaches also indicates that current gears may be ineffective (Doyle et al. 2005, NGPC 2004). Little is known about the early-life stages of this fish in the Missouri River.

Very few chubs were sampled in Segment 7 during 2007. Silver chubs were the most common (n=15). Speckled, sicklefin, and sturgeon chubs were represented by only a single individual. All of the chubs (save one silver) were sampled in the otter trawl. The low catch numbers may be partially attributable to the difficulty associated with trawling in such a challenging environment. Sand waves, cobble, and constant woody snags may decrease trawl

efficiency. It is also possible that the effects of Gavins Point Dam have reduced chub numbers. Reduced turbidity may make these fish more vulnerable to sight-feeding predators (Everett 1999). Hydrograph or thermal modification could have also altered habitat and food availability (Hesse 1994). The same could be said for the *Hybognathus* spp. Only three individuals were captured in 2005 (all in bag seines).

Given the challenges associated with starting a new crew in nearly mid-season in 2005, we expect that catch rates may change somewhat in 2006. The pre-spawn period for natives like the blue sucker and shovelnose sturgeon will be sampled with a full complement of gears. It is expected that this will increase catch frequencies for these species. The 2006 report should offer a clearer picture of the status of native fishes in Segment 7 of the Missouri River.

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APPENDICES

Appendix A. Phylogenetic list of Missouri River fishes with corresponding letter codes used in the long-term pallid sturgeon and associated fish community sampling program. The phylogeny follows that used by the American Fisheries Society, Common and Scientific Names of Fishes from the United States and Canada, 5th edition. Asterisks and bold type denote targeted native Missouri River species.

Scientific name	Common name	Letter Code
CLASS CEPHALASPIDOMORPHI-LAMPREYS		
ORDER PETROMYZONTIFORMES		
Petromyzontidae – lampreys		
<i>Ichthyomyzon castaneus</i>	Chestnut lamprey	CNLP
<i>Ichthyomyzon fossor</i>	Northern brook lamprey	NBLP
<i>Ichthyomyzon unicuspis</i>	Silver lamprey	SVLP
<i>Ichthyomyzon gagei</i>	Southern brook lamprey	SBLR
Petromyzontidae	Unidentified lamprey	ULY
Petromyzontidae larvae	Unidentified larval lamprey	LVLP
CLASS OSTEICHTHYES – BONY FISHES		
ORDER ACIPENSERIFORMES		
Acipenseridae – sturgeons		
<i>Acipenser fulvescens</i>	Lake sturgeon	LKSG
<i>Scaphirhynchus</i> spp.	Unidentified Scaphirhynchus	USG
<i>Scaphirhynchus albus</i>	Pallid sturgeon	PDSG*
<i>Scaphirhynchus platyrhynchus</i>	Shovelnose sturgeon	SNSG*
<i>S. albus</i> X <i>S. platyrhynchus</i>	Pallid-shovelnose hybrid	SNPD
Polyodontidae – paddlefishes		
<i>Polyodon spathula</i>	Paddlefish	PDFH
ORDER LEPISOSTEIFORMES		
Lepisosteidae – gars		
<i>Lepisosteus oculatus</i>	Spotted gar	STGR
<i>Lepisosteus osseus</i>	Longnose gar	LNGR
<i>Lepisosteus platostomus</i>	Shortnose gar	SNGR
ORDER AMMIFORMES		
Amiidae – bowfins		
<i>Amia calva</i>	Bowfin	BWFN
ORDER OSTEOGLOSSIFORMES		
Hiodontidae – mooneyes		
<i>Hiodon alosoides</i>	Goldeye	GDEY
<i>Hiodon tergisus</i>	Mooneye	MNEY
ORDER ANGUILLIFORMES		
Anguillidae – freshwater eels		
<i>Anguilla rostrata</i>	American eel	AMEL

Appendix A. (continued).

Scientific name	Common name	Letter Code
ORDER CLUPEIFORMES		
Clupeidae – herrings		
<i>Alosa alabame</i>	Alabama shad	ALSD
<i>Alosa chrysochloris</i>	Skipjack herring	SJHR
<i>Alosa pseudoharengus</i>	Alewife	ALWF
<i>Dorosoma cepedianum</i>	Gizzard shad	GZSD
<i>Dorosoma petenense</i>	Threadfin shad	TFSD
<i>D. cepedianum</i> X <i>D. petenense</i>	Gizzard-threadfin shad hybrid	GSTS
ORDER CYPRINIFORMES		
Cyprinidae – carps and minnows		
<i>Campostoma anomalum</i>	Central stoneroller	CLSR
<i>Campostoma oligolepis</i>	Largescale stoneroller	LSSR
<i>Carassus auratus</i>	Goldfish	GDFH
<i>Carassus auratus</i> X <i>Cyprinus carpio</i>	Goldfish-Common carp hybrid	GFCC
<i>Couesius plumbeus</i>	Lake chub	LKCB
<i>Ctenopharyngodon idella</i>	Grass carp	GSCP
<i>Cyprinella lutrensis</i>	Red shiner	RDSN
<i>Cyprinella spiloptera</i>	Spotfin shiner	SFSN
<i>Cyprinus carpio</i>	Common carp	CARP
<i>Erimystax x-punctatus</i>	Gravel chub	GVCB
<i>Hybognathus argyritis</i>	Western silvery minnow	WSMN*
<i>Hybognathus hankinsoni</i>	Brassy minnow	BSMN
<i>Hybognathus nuchalis</i>	Mississippi silvery minnow	SVMW
<i>Hybognathus placitus</i>	Plains minnow	PNMW*
<i>Hybognathus</i> spp.	Unidentified <i>Hybognathus</i>	HBNS*
<i>Hypophthalmichthys molitrix</i>	Silver carp	SVCP
<i>Hypophthalmichthys nobilis</i>	Bighead carp	BHCP
<i>Luxilus chrysocephalus</i>	Striped shiner	SPSN
<i>Luxilus cornutus</i>	Common shiner	CMSN
<i>Luxilus zonatus</i>	Bleeding shiner	BDSN
<i>Lythrurus unbratilis</i>	Western redfin shiner	WRFS
<i>Macrhybopsis aestivalis</i>	Speckled chub	SKCB*
<i>Macrhybopsis gelida</i>	Sturgeon chub	SGCB*
<i>Macrhybopsis meeki</i>	Sicklefin chub	SFCB*
<i>Macrhybopsis storeriana</i>	Silver chub	SVCB
<i>M. aestivalis</i> X <i>M. gelida</i>	Speckled-Sturgeon chub hybrid	SPST
<i>M. gelida</i> X <i>M. meeki</i>	Sturgeon-Sicklefin chub hybrid	SCSC
<i>Macrhybopsis</i> spp.	Unidentified chub	UHY
<i>Margariscus margarita</i>	Pearl dace	PLDC
<i>Mylocheilus caurinus</i>	Peamouth	PEMT
<i>Nocomis biguttatus</i>	Hornyhead chub	HHCB
<i>Notemigonus crysoleucas</i>	Golden shiner	GDSN
<i>Notropis atherinoides</i>	Emerald shiner	ERSN
<i>Notropis blennioides</i>	River shiner	RVSN
<i>Notropis boops</i>	Bigeye shiner	BESN
<i>Notropis burchanani</i>	Ghost shiner	GTSN
<i>Notropis dorsalis</i>	Bigmouth shiner	BMSN
<i>Notropis greeni</i>	Wedgespot shiner	WSSN

Appendix A. (continued).

Scientific name	Common name	Letter Code
Cyprinidae – carps and minnows		
<i>Notropis heterolepsis</i>	Blacknose shiner	BNSN
<i>Notropis hudsonius</i>	Spottail shiner	STSN
<i>Notropis nubilus</i>	Ozark minnow	OZMW
<i>Notropis rubellus</i>	Rosyface shiner	RYSN
<i>Notropis shumardi</i>	Silverband shiner	SBSN
<i>Notropis stilbius</i>	Silverstripe shiner	SSPS
<i>Notropis stramineus</i>	Sand shiner	SNSN*
<i>Notropis topeka</i>	Topeka shiner	TPSN
<i>Notropis volucellus</i>	Mimic shiner	MMSN
<i>Notropis wickliffi</i>	Channel shiner	CNSN
<i>Notropis</i> spp.	Unidentified shiner	UNO
<i>Opsopoeodus emiliae</i>	Pugnose minnow	PNMW
<i>Phenacobius mirabilis</i>	Suckermouth minnow	SMMW
<i>Phoxinus eos</i>	Northern redbelly dace	NRBD
<i>Phoxinus erythrogaster</i>	Southern redbelly dace	SRBD
<i>Phoxinus neogaeus</i>	Finescale dace	FSDC
<i>Pimephales notatus</i>	Bluntnose minnow	BNMW
<i>Pimephales promelas</i>	Fathead minnow	FHMW
<i>Pimephales vigilas</i>	Bullhead minnow	BHMW
<i>Platygobio gracilis</i>	Flathead chub	FHCB
<i>P. gracilis</i> X <i>M. meeki</i>	Flathead-sicklefin chub hybrid	FCSC
<i>Rhinichthys atratulus</i>	Blacknose dace	BNDC
<i>Rhinichthys cataractae</i>	Longnose dace	LNDC
<i>Richardsonius balteatus</i>	Redside shiner	RDSS
<i>Scardinius erythrophthalmus</i>	Rudd	RUDD
<i>Semotilus atromaculatus</i>	Creek chub	CKCB
	Unidentified Cyprinidae	UCY
Catostomidae - suckers		
<i>Carpiodes carpio</i>	River carpsucker	RVCS
<i>Carpiodes cyprinus</i>	Quillback	QLBK
<i>Carpiodes velifer</i>	Highfin carpsucker	HFCS
<i>Carpiodes</i> spp.	Unidentified <i>Carpiodes</i>	UCS
<i>Catostomus catostomus</i>	Longnose sucker	LNSK
<i>Catostomus commersoni</i>	White sucker	WTSK
<i>Catostomus platyrhincus</i>	Mountain sucker	MTSK
<i>Catostomus</i> spp.	Unidentified <i>Catostomus</i> spp.	UCA
<i>Cycleptus elongates</i>	Blue sucker	BUSK*
<i>Hypentelium nigricans</i>	Northern hog sucker	NHSK
<i>Ictiobus bubalus</i>	Smallmouth buffalo	SMBF
<i>Ictiobus cyprinellus</i>	Bigmouth buffalo	BMBF
<i>Ictiobus niger</i>	Black buffalo	BKBF
<i>Ictiobus</i> spp.	Unidentified buffalo	UBF
<i>Minytrema melanops</i>	Spotted sucker	SPSK
<i>Moxostoma anisurum</i>	Silver redhorse	SVRH
<i>Moxostoma carinatum</i>	River redhorse	RVRH
<i>Moxostoma duquesnei</i>	Black redhorse	BKRH
<i>Moxostoma erythrurum</i>	Golden redhorse	GDRH
<i>Moxostoma macrolepidotum</i>	Shorthead redhorse	SHRH
<i>Moxostoma</i> spp.	Unidentified redhorse	URH

Appendix A. (continued).

Scientific name	Common name	Letter Code
Catostomidae - suckers	Unidentified Catostomidae	UCT
ORDER SILURIFORMES		
Ictaluridae – bullhead catfishes		
<i>Ameiurus melas</i>	Black bullhead	BKBH
<i>Ameiurus natalis</i>	Yellow bullhead	YLBH
<i>Ameiurusnebulosus</i>	Brown bullhead	BRBH
<i>Ameiurus</i> spp.	Unidentified bullhead	UBH
<i>Ictalurus furcatus</i>	Blue catfish	BLCF
<i>Ictalurus punctatus</i>	Channel catfish	CNCF
<i>I. furcatus</i> X <i>I. punctatus</i>	Blue-channel catfish hybrid	BCCC
<i>Ictalurus</i> spp.	Unidentified <i>Ictalurus</i> spp.	UCF
<i>Noturus exilis</i>	Slender madtom	SDMT
<i>Noturus flavus</i>	Stonecat	STCT
<i>Noturus gyrinus</i>	Tadpole madtom	TPMT
<i>Noturus nocturnes</i>	Freckled madtom	FKMT
<i>Pylodictis olivaris</i>	Flathead catfish	FHCF
ORDER SALMONIFORMES		
Esocidae - pikes		
<i>Esox americanus vermiculatus</i>	Grass pickerel	GSPK
<i>Esox lucius</i>	Northern pike	NTPK
<i>Esox masquinongy</i>	Muskellunge	MSKG
<i>E. lucius</i> X <i>E. masquinongy</i>	Tiger Muskellunge	TGMG
Umbridae - mudminnows		
<i>Umbra limi</i>	Central mudminnow	MDMN
Osmeridae - smelts		
<i>Osmerus mordax</i>	Rainbow smelt	RBST
Salmonidae - trouts		
<i>Coregonus artedi</i>	Lake herring or cisco	CSCO
<i>Coregonus clupeaformis</i>	Lake whitefish	LKWF
<i>Oncorhynchus aguabonita</i>	Golden trout	GDTT
<i>Oncorhynchus clarki</i>	Cutthroat trout	CTTT
<i>Oncorhynchus kisutch</i>	Coho salmon	CHSM
<i>Oncorhynchus mykiss</i>	Rainbow trout	RBTT
<i>Oncorhynchus nerka</i>	Sockeye salmon	SESM
<i>Oncorhynchus tshawytscha</i>	Chinook salmon	CNSM
<i>Prosopium cylindraceum</i>	Bonniville cisco	BVSC
<i>Prosopium williamsoni</i>	Mountain whitefish	MTWF
<i>Salmo trutta</i>	Brown trout	BNTT
<i>Salvelinus fontinalis</i>	Brook trout	BKTT
<i>Salvelinus namaycush</i>	Lake trout	LKTT
<i>Thymallus arcticus</i>	Arctic grayling	AMGL

Appendix A. (continued).

Scientific name	Common name	Letter Code
ORDER PERCOPSIFORMES		
Percopsidae – trout-perches		
<i>Percopsis omiscomaycus</i>	Trout-perch	TTPH
ORDER GADIFORMES		
Gadidae - cods		
<i>Lota lota</i>	Burbot	BRBT
ORDER ATHERINIFORMES		
Cyprinodontidae - killifishes		
<i>Fundulus catenatus</i>	Northern studfish	NTSF
<i>Fundulus daphanus</i>	Banded killifish	BDKF
<i>Fundulus notatus</i>	Blackstripe topminnow	BSTM
<i>Fundulus olivaceus</i>	Blackspotted topminnow	BPTM
<i>Fundulus sciadicus</i>	Plains topminnow	PTMW
<i>Fundulus zebrinus</i>	Plains killifish	PKLF
Poeciliidae - livebearers		
<i>Gambusia affinis</i>	Western mosquitofish	MQTF
Atherinidae - silversides		
<i>Labidesthes sicculus</i>	Brook silverside	BKSS
ORDER GASTEROSTEIFORMES		
Gasterosteidae - sticklebacks		
<i>Culea inconstans</i>	Brook stickleback	BKSB
ORDER SCORPAENIFORMES		
Cottidae - sculpins		
<i>Cottus bairdi</i>	Mottled sculpin	MDSP
<i>Cottus carolinae</i>	Banded sculpin	BDSP
ORDER PERCIFORMES		
Percichthyidae – temperate basses		
<i>Morone Americana</i>	White perch	WTPH
<i>Morone chrysops</i>	White bass	WTBS
<i>Morone mississippiensis</i>	Yellow bass	YWBS
<i>Morone saxatilis</i>	Striped bass	SDBS
<i>M. saxatilis X M. chrysops</i>	Striped-white bass hybrid	SBWB
Centrarchidae - sunfishes		
<i>Ambloplites rupestris</i>	Rock bass	RKBS
<i>Archoplites interruptus</i>	Sacramento perch	SOPH
<i>Lepomis cyanellus</i>	Green sunfish	GNSF
<i>Lepomis gibbosus</i>	Pumpkinseed	PNSD
<i>Lepomis gulosus</i>	Warmouth	WRMH
<i>Lepomis humilis</i>	Orangespotted sunfish	OSSF
<i>Lepomis macrochirus</i>	Bluegill	BLGL
<i>Lepomis magalotis</i>	Longear sunfish	LESF
<i>Lepomis microlophus</i>	Redear sunfish	RESF
<i>L. cyanellus X L. macrochirus</i>	Green sunfish-bluegill hybrid	GSBG

Appendix A. (continued).

Scientific name	Common name	Letter Code
Centrarchidae - sunfishes		
<i>L. cyanellus</i> X <i>L. humilis</i>	Green-orangespotted sunfish hybrid	GSOS
<i>L. macrochirus</i> X <i>L. microlophus</i>	Bluegill-redear sunfish hybrid	BGRE
<i>Lepomis</i> spp.	Unidentified <i>Lepomis</i>	ULP
<i>Micropterus dolomieu</i>	Smallmouth bass	SMBS
<i>Micropterus punctatus</i>	Spotted sunfish	STBS
<i>Micropterus salmoides</i>	Largemouth bass	LMBS
<i>Micropterus</i> spp.	Unidentified <i>Micropterus</i> spp.	UMC
<i>Pomoxis annularis</i>	White crappie	WTCP
<i>Pomoxis nigromaculatus</i>	Black crappie	BKCP
<i>Pomoxis</i> spp.	Unidentified crappie	UCP
<i>P. annularis</i> X <i>P. nigromaculatus</i>	White-black crappie hybrid	WCBC
Centrarchidae	Unidentified centrarchid	UCN
Percidae - perches		
<i>Ammocrypta asprella</i>	Crystal darter	CLDR
<i>Etheostoma blennioides</i>	Greenside darter	GSDR
<i>Etheostoma caeruleum</i>	Rainbow darter	RBDR
<i>Etheostoma exile</i>	Iowa darter	IODR
<i>Etheostoma flabellare</i>	Fantail darter	FTDR
<i>Etheostoma gracile</i>	Slough darter	SLDR
<i>Etheostoma microperca</i>	Least darter	LTDR
<i>Etheostoma nigrum</i>	Johnny darter	JYDR
<i>Etheostoma punctulatum</i>	Stippled darter	STPD
<i>Etheostoma spectabile</i>	Orangethroated darter	OTDR
<i>Etheostoma tetrazonum</i>	Missouri saddled darter	MSDR
<i>Etheostoma zonale</i>	Banded darter	BDDR
<i>Etheostoma</i> spp.	Unidentified <i>Etheostoma</i> spp.	UET
<i>Perca flavescens</i>	Yellow perch	YWPH
<i>Percina caproides</i>	Logperch	LGPH
<i>Percina cymatotaenia</i>	Bluestripe darter	BTDR
<i>Percina evides</i>	Gilt darter	GLDR
<i>Percina maculate</i>	Blackside darter	BSDR
<i>Percina phoxocephala</i>	Slenderhead darter	SHDR
<i>Percina shumardi</i>	River darter	RRDR
<i>Percina</i> spp.	Unidentified <i>Percina</i> spp.	UPN
	Unidentified darter	UDR
<i>Sander canadense</i>	Sauger	SGER*
<i>Sander vitreus</i>	Walleye	WLEY
<i>S. canadense</i> X <i>S. vitreus</i>	Sauger-walleye hybrid/Saugeye	SGWE
<i>Sander</i> spp.	Unidentified <i>Sander</i> (formerly <i>Stizostedion</i>) spp.	UST
	Unidentified Percidae	UPC
Sciaenidae - drums		
<i>Aplodinotus grunniens</i>	Freshwater drum	FWDM
NON-TAXONOMIC CATEGORIES		
	Age-0/Young-of-year fish	YOYF
	Lab fish for identification	LAB
	No fish caught	NFSH
	Unidentified larval fish	LVFS
	Unidentified	UNID
	Net Malfunction (Did Not Fish)	NDNF

Appendix B. Definitions and codes used to classify standard Missouri River habitats in the long-term pallid sturgeon and associated fish community sampling program. Three habitat scales were used in the hierarchical habitat classification system: Macrohabitats, Mesohabitats, and Microhabitats.

Habitat	Scale	Definition	Code
Braided channel	Macro	An area of the river that contains multiple smaller channels and is lacking a readily identifiable main channel (typically associated with unchannelized sections)	BRAD
Main channel cross over	Macro	The inflection point of the thalweg where the thalweg crosses from one concave side of the river to the other concave side of the river, (i.e., transition zone from one-bend to the next bend). The upstream CHXO for a respective bend is the one sampled.	CHXO
Tributary confluence	Macro	Area immediately downstream, extending up to one bend in length, from a junction of a large tributary and the main river where this tributary has influence on the physical features of the main river	CONF
Dendric	Macro	An area of the river where the river transitions from meandering or braided channel to more of a treelike pattern with multiple channels (typically associated with unchannelized sections)	DEND
Deranged	Macro	An area of the river where the river transitions from a series of multiple channels into a meandering or braided channel (typically associated with unchannelized sections)	DRNG
Main channel inside bend	Macro	The convex side of a river bend	ISB
Main channel outside bend	Macro	The concave side of a river bend	OSB
Secondary channel-connected large	Macro	A side channel, open on upstream and downstream ends, with less flow than the main channel, large indicates this habitat can be sampled with trammel nets and trawls based on width and/or depths > 1.2 m	SCCL
Secondary channel-connected small	Macro	A side channel, open on upstream and downstream ends, with less flow than the main channel, small indicates this habitat cannot be sampled with trammel nets and trawls based on width and/or on depths < 1.2 m	SCCS
Secondary channel-non-connected	Macro	A side channel that is blocked at one end	SCCN
Tributary	Macro	Any river or stream flowing in the Missouri River	TRIB
Tributary large mouth	Macro	Mouth of entering tributary whose mean annual discharge is > 20 m ³ /s, and the sample area extends 300 m into the tributary	TRML
Tributary small mouth	Macro	Mouth of entering tributary whose mean annual discharge is < 20 m ³ /s, mouth width is > 6 m wide and the sample area extends 300 m into the tributary	TRMS
Wild	Macro	All habitats not covered in the previous habitat descriptions	WILD
Bars	Meso	Sandbar or shallow bank-line areas with depth < 1.2 m	BARS
Pools	Meso	Areas immediately downstream from sandbars, dikes, snags, or other obstructions with a formed scour hole > 1.2 m	POOL
Channel border	Meso	Area in the channelized river between the toe and the thalweg, area in the unchannelized river between the toe and the maximum depth	CHNB
Thalweg	Meso	Main channel between the channel borders conveying the majority of the flow	TLWG
Island tip	Meso	Area immediately downstream of a bar or island where two channels converge with water depths > 1.2 m	ITIP

Appendix C. List of standard and wild gears (type), their corresponding codes in the database, seasons deployed (Fall-Spring, Summer, or all), years used, and catch-per-unit-effort units for collection of Missouri River fishes in segment **xx** for the long-term pallid sturgeon and associated fish community sampling program. Long-term monitoring began in 20**xx** for segment **xx**.

Gear	Code	Type	Season	Years	CPUE units
Trammel net – 1 inch inner mesh	TN	Standard	All	2003 - Present	fish/100 m drift
Trammel net – 2.5 inch inner mesh	TN25	Standard	Sturgeon	2005 - Present	fish/100 m drift
Gillnet – 4 meshes, small mesh set upstream	GN14	Standard	Sturgeon	2003 - Present	fish/net night
Gillnet – 4 meshes, large mesh set upstream	GN41	Standard	Sturgeon	2003 - Present	fish/net night
Gillnet – 8 meshes, small mesh set upstream	GN18	Standard	Sturgeon	2003 - Present	fish/net night
Gillnet – 8 meshes, large mesh set upstream	GN81	Standard	Sturgeon	2003 - Present	fish/net night
Otter trawl – 16 ft head rope	OT16	Standard	All	2003 - Present	fish/100 m trawled
Beam trawl	BT	Standard*	All	2003 - 2004	fish/100 m trawled
Bag Seine – quarter arc method pulled upstream	BSQU	Standard	Fish Comm.	2003 - Present	fish/100 m ²
Bag Seine – quarter arc method pulled downstream	BSQD	Standard	Fish Comm.	2003 - Present	fish/100 m ²
Bag Seine – half arc method pulled upstream	BSHU	Standard	Fish Comm.	2003 - Present	fish/100 m ²
Bag Seine – half arc method pulled downstream	BSHD	Standard	Fish Comm.	2003 - Present	fish/100 m ²
Bag seine – rectangular method pulled upstream	BSRU	Standard	Fish Comm.	2003 - Present	fish/100 m ²
Bag seine – rectangular method pulled upstream	BSRD	Standard	Fish Comm.	2003 - Present	fish/100 m ²
Mini-fyke net	MF	Standard	Fish Comm.	2003 - Present	fish/net night

* Standard only in upper Missouri River segments

Appendix D. Stocking locations and codes for pallid sturgeon by Recovery Priority Management Area (RPMA) in the Missouri River Basin.

State(s)	RPMA	Site Name	Code	River	RM
MT	2	Above Intake	AIN	Yellowstone	70 +
MT	2	Intake	INT	Yellowstone	70.0
MT	2	Sidney	SID	Yellowstone	31.0
MT	2	Big Sky Bend	BSB	Yellowstone	17.0
ND	2	Fairview	FRV	Yellowstone	9.0
MT	2	Milk River	MLK	Milk	11.5
MT	2	Mouth of Milk	MOM	Missouri	1761.5
MT	2	Wolf Point	WFP	Missouri	1701.5
MT	2	Poplar	POP	Missouri	1649.5
MT	2	Brockton	BRK	Missouri	1678.0
MT	2	Culbertson	CBS	Missouri	1621.0
MT	2	Nohly Bridge	NOB	Missouri	1590.0
ND	2	Confluence	CON	Missouri	1581.5
SD/NE	3	Sunshine Bottom	SUN	Missouri	866.2
SD/NE	3	Verdel Boat Ramp	VER	Missouri	855.0
SD/NE	3	Standing Bear Bridge	STB	Missouri	845.0
SD/NE	4	St. Helena	STH	Missouri	799.0
SD/NE	4	Mullberry Bend	MUL	Missouri	775.0
NE/IA	4	Ponca State Park	PSP	Missouri	753.0
NE/IA	4	Sioux City	SIO	Missouri	732.6
NE/IA	4	Decatur	DCT	Missouri	691.0
NE/IA	4	Boyer Chute	BYC	Missouri	637.4
NE/IA	4	Bellevue	BEL	Missouri	601.4
NE/IA	4	Rulo	RLO	Missouri	497.9
NE/MO/KS	4	Kansas River	KSR	Missouri	367.5
NE	4	Platte River	PLR	Platte	5.0
KA/MO	4	Leavenworth	LVW	Missouri	397.0
MO	4	Kansas City	KAC	Missouri	342.0
MO	4	Miami	MIA	Missouri	262.8
MO	4	Grand River	GDR	Missouri	250.0
MO	4	Boonville	BOO	Missouri	195.1
MO	4	Overton	OVT	Missouri	185.1
MO	4	Hartsburg	HAR	Missouri	160.0
MO	4	Jefferson City	JEF	Missouri	143.9
MO	4	Mokane	MOK	Missouri	124.7
MO	4	Hermann	HER	Missouri	97.6
MO	4	Washington	WAS	Missouri	68.5
MO	4	St. Charles	STC	Missouri	28.5

Appendix E. Juvenile and adult pallid sturgeon stocking summary for segment 7 of the Missouri River (RPMA 4)

Year	Stocking Site	Number Stocked	Year Class	Stock Date	Average Length (mm)	Primary Mark	Secondary Mark
2002	Ponca State Pk	215	2001			PIT	Elastomere R - Green
2002	Mulberry Bend	1761	2001	4/11/02		PIT	Elastomere R - Green
2002	St. Helena	280	2001			PIT	Elastomere R - Green
2003	Mulberry Bend	4998	2002	7/16/2003		PIT	Elastomere

Appendix F

Total catch, overall mean catch per unit effort [± 2 SE], and mean CPUE (fish/100 m) by Mesohabitat within a Macrohabitat for all species caught with each gear type during sturgeon season and fish community season for segment 7 of the Missouri River during 2004-2005. Species captured are listed alphabetically and their codes are presented in Appendix A. Asterisks with bold type indicate targeted native Missouri River species and habitat abbreviations are presented in Appendix B. Standard Error was not calculated when $N < 2$.

Appendix F1. Gill Net: overall season and segment summary. Lists CPUE (fish/net night) and 2 standard errors in brackets.

Species	Total Catch	Overall CPUE	CHXO		ISB		OSB		SCCL		
			CHNB	POOL	CHNB	POOL	CHNB	POOL	CHNB	ITIP	POOL
BHCP	2	0.032 [0.063]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	1 [2]	0 [0]
BKCP	0	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]
BLGL	0	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]
BMBF	0	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]
BMSN	0	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]
BSMW	0	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]
BUSK	49	0.778 [0.633]	0.214 [0.228]	1 [2]	1.471 [2.101]	2.2 [3.124]	0.353 [0.294]	0 [0]	0 [0]	0 [0]	1 [2]
CARP	0	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]
CKCB	0	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]
CNCF	4	0.063 [0.062]	0 [0]	0.5 [1]	0 [0]	0.4 [0.49]	0 [0]	0 [0]	0.5 [1]	0 [0]	0 [0]
ERSN	0	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]
FHCB	0	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]
FHCF	0	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]
FHMW	0	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]
FWDM	0	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]
GDEY	78	1.238 [1.471]	0.071 [0.143]	0.5 [1]	0 [0]	1.4 [2.332]	0.706 [1.412]	0.5 [1]	23.5 [41]	4.5 [9]	0 [0]
GNSF	0	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]
GDBG	0	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]

Appendix F1 (continued).

Species	Total Catch	Overall CPUE	CHXO		ISB		OSB		SCCL		
			CHNB	POOL	CHNB	POOL	CHNB	POOL	CHNB	ITIP	POOL
GSCP	1	0.016 [0.032]	0	0	0	0	0	0	0.5	0	0
GZSD	0	0 [0]	0	0	0	0	0	0	0	0	0
HBNS	0	0 [0]	0	0	0	0	0	0	0	0	0
HFCS	0	0 [0]	0	0	0	0	0	0	0	0	0
JYDR	0	0 [0]	0	0	0	0	0	0	0	0	0
LMBS	0	0 [0]	0	0	0	0	0	0	0	0	0
LNGR	1	0.016 [0.032]	0	0	0	0	0	0	0	0.5	0
NFSH	0	0 [0]	0	0	0	0	0	0	0	0	0
OSSF	0	0 [0]	0	0	0	0	0	0	0	0	0
PDFH	4	0.063 [0.1]	0	0	0	0.2	0	0	0	1.5	0
PDSG	0	0 [0]	0	0	0	0	0	0	0	0	0
QLBK	13	0.206 [0.213]	0	0	0	2.2	0	0	1	0	0
RDSN	0	0 [0]	0	0	0	0	0	0	0	0	0
RKBS	0	0 [0]	0	0	0	0	0	0	0	0	0
RVCS	0	0 [0]	0	0	0	0	0	0	0	0	0
RVSN	0	0 [0]	0	0	0	0	0	0	0	0	0
SFCB	0	0 [0]	0	0	0	0	0	0	0	0	0
SGCB	0	0 [0]	0	0	0	0	0	0	0	0	0

Species	Total Catch	Overall CPUE	CHXO		ISB		OSB		SCCL		
			CHNB	POOL	CHNB	POOL	CHNB	POOL	CHNB	POOL	CHNB
SGER	3	0.048 [0.054]	0	0	[0]	[0]	[0]	[0]	[0]	[0]	[0]
SGWE	0	0 [0]	0	0	[0]	[0]	[0.161]	[0]	[1]	[0]	[0]
SHRH	5	0.079 [0.104]	0	0	[0]	[0]	[0]	[0]	[0]	[0]	[0]
SJHR	0	0 [0]	0	0	[0.118]	[1.2]	[0]	[1]	[0]	[0]	[0]
SKCB	0	0 [0]	0	0	[0]	[0]	[0]	[0]	[0]	[0]	[0]
SMBF	3	0.048 [0.071]	0	0	[0]	[0]	[0]	[0]	[0]	[0]	[0]
SMBS	0	0 [0]	0	0	[0]	[0.4]	[0.235]	[0]	[0]	[0]	[0]
SNGR	2	0.032 [0.045]	0	0	[0]	[0]	[0]	[0]	[0]	[0]	[0]
SNSG	67	1.063 [0.654]	0.143 [0.194]	4.5 [7]	[0]	[0.4]	[0]	[0]	[0]	[1]	[0]
SNSN	0	0 [0]	0	0	[0.825]	[3.878]	[0.228]	[3]	[10]	[0]	[1]
STCT	0	0 [0]	0	0	[0]	[0]	[0]	[0]	[0]	[0]	[0]
STSN	0	0 [0]	0	0	[0]	[0]	[0]	[0]	[0]	[0]	[0]
SVCB	0	0 [0]	0	0	[0]	[0]	[0]	[0]	[0]	[0]	[0]
SVCP	0	0 [0]	0	0	[0]	[0]	[0]	[0]	[0]	[0]	[0]
UBF	0	0 [0]	0	0	[0]	[0]	[0]	[0]	[0]	[0]	[0]
UCS	0	0 [0]	0	0	[0]	[0]	[0]	[0]	[0]	[0]	[0]
UCT	0	0 [0]	0	0	[0]	[0]	[0]	[0]	[0]	[0]	[0]
UNID	0	0 [0]	0	0	[0]	[0]	[0]	[0]	[0]	[0]	[0]

Appendix F1 (continued)

Species	Total Catch	Overall CPUE	CHXO		ISB		OSB		SCCL						
			CHNB	POOL	CHNB	POOL	CHNB	POOL	CHNB	ITIP	POOL				
UNO	0	0	0	0	0	0	0	0	0	0	0	UNO	0	0	0
		[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]			[0]	[0]
WLYE	0	0	0	0	0	0	0	0	0	0	0	WLYE	0	0	0
		[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]			[0]	[0]
WTBS	0	0	0	0	0	0	0	0	0	0	0	WTBS	0	0	0
		[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]			[0]	[0]
WTCP	0	0	0	0	0	0	0	0	0	0	0	WTCP	0	0	0
		[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]			[0]	[0]
YOYF	0	0	0	0	0	0	0	0	0	0	0	YOYF	0	0	0
		[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]			[0]	[0]

Appendix F2. 1 Inch Trammel Net: overall season and segment summary. Lists CPUE (fish/100 m) and 2 standard errors in brackets.

Species	Total Catch	Overall CPUE	BRAD		CHXO	CONF	DEND	DRNG	ISB	OSB			SCCL	SCCS		WILD	
			CHNB	ITIP	CHNB	CHNB	CHNB	CHNB	BARS	CHNB	CHNB	BARS	CHNB	ITIP	ITIP	POOL	DTWT
BHCP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]
BKCP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]
BLGL	1	0.005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.101
		[0.01]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0.202]
BMBF	3	0.015	0	0	0.017	0	0	0	1.25	0	0	0	0	0	0	0	0.121
		[0.018]	[0]	[0]	[0.034]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0.242]
BMSN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]
BSMW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]
BUSK	113	0.494	0.266	0	0.911	5.208	0	0.155	0	0.312	0.162	0	0.345	0	0.093	0	2.181
		[0.208]	[0.408]	[0]	[0.727]	[2.917]	[0]	[0.207]	[0]	[0.318]	[0.128]	[0]	[0.409]	[0]	[0.185]	[0]	[1.701]
CARP	1	0.006	0	0	0	0	0	0	0	0	0.026	0	0	0	0	0	0
		[0.011]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0.051]	[0]	[0]	[0]	[0]	[0]	[0]
CKCB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]
CNCF	204	0.91	0.305	16.667	1.318	5.042	0	0.167	0	0.959	0.398	0	0.621	0	0.529	0	1.346
		[0.335]	[0.332]	[17.333]	[0.843]	[7.417]	[0]	[0.222]	[0]	[0.585]	[0.275]	[0]	[0.452]	[0]	[0.444]	[0]	[0.626]
ERSN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]
FHCB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]
FHCF	1	0.006	0	0	0	0	0	0	0	0	0	0	0	0	0.111	0	0
		[0.012]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0.222]	[0]	[0]
FHMW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]
FWDM	1	0.004	0	0	0	0	0	0	0	0.022	0	0	0	0	0	0	0
		[0.009]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0.043]	[0]	[0]	[0]	[0]	[0]	[0]	[0]
GDEY	133	0.656	0.42	2	0.6	0.667	0.253	0.167	1.25	0.627	0.312	0	0.458	1.127	0.145	1.974	3.604
		[0.307]	[0.35]	[1.333]	[0.378]	[1.333]	[0.292]	[0.222]	[0]	[0.484]	[0.24]	[0]	[0.579]	[1.746]	[0.204]	[3.947]	[5.196]

Species	Total Catch	Overall CPUE	Annual Report Template														
			BRAD		CHXO	CONF	DEND	DRNG	ISB	OSB		SCCL	SCCS			WILD	
			CHNB	ITIP	CHNB	CHNB	CHNB	CHNB	BARS	CHNB	CHNB	BARS	CHNB	ITIP	ITIP	POOL	DTWT
GNSF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]
GSBG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]
GSCP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]
GZSD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]
HBNS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]
HFCS	16	0.064	0.224	0	0.05	0	0.125	0.13	0	0	0.102	0	0	0.167	0	0	0
		[0.038]	[0.317]	[0]	[0.05]	[0]	[0.25]	[0.17]	[0]	[0]	[0.09]	[0]	[0]	[0.333]	[0]	[0]	[0]
JYDR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]
LMBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]
LNGR	4	0.021	0.135	0	0	0	0	0.133	0	0.021	0	0	0	0	0	0	0
		[0.021]	[0.185]	[0]	[0]	[0]	[0]	[0.26]	[0]	[0.04]	[0]	[0]	[0]	[0]	[0]	[0]	[0]
NFSH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]
OSSF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]
PDFH	15	0.066	0.069	0	0.011	0	0	0	0	0.018	0	0	0	0	0	0	1.096
		[0.054]	[0.139]	[0]	[0.02]	[0]	[0]	[0]	[0]	[0.03]	[0]	[0]	[0]	[0]	[0]	[0]	[0.86]
PDSG	1	0.003	0	0	0	0	0	0	0	0	0	0	0	0	0.052	0	0
		[0.006]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0.10]	[0]	[0]
QLBK	1	0.003	0	0	0	0	0	0	0	0	0.016	0	0	0	0	0	0
		[0.007]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0.03]	[0]	[0]	[0]	[0]	[0]	[0]
RDSN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]
RKBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]

Species	Total Catch	Overall CPUE	Annual Report Template														
			BRAD		CHXO	CONF	DEND	DRNG	ISB	OSB		SCCL	SCCS			WILD	
			CHNB	ITIP	CHNB	CHNB	CHNB	CHNB	BARS	CHNB	CHNB	BARS	CHNB	ITIP	ITIP	POOL	DTWT
RVCS	34	0.145	0.27	0	0.145	0	0	0.13	1.25	0.054	0.141	0	0.351	0	0.093	0	0.303
		[0.069]	[0.37]	[0]	[0.11]	[0]	[0]	[0.17]	[]	[0.05]	[0.11]	[0]	[0.70]	[0]	[0.18]	[0]	[0.60]
RVSN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		[0]	[0]	[0]	[0]	[0]	[0]	[0]	[]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]
SFCB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		[0]	[0]	[0]	[0]	[0]	[0]	[0]	[]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]
SGCB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		[0]	[0]	[0]	[0]	[0]	[0]	[0]	[]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]
SGER	12	0.049	0	0	0.127	0.667	0	0	0	0.043	0	0	0.056	0	0.093	0	0
		[0.04]	[0]	[0]	[0.16]	[1.33]	[0]	[0]	[]	[0.06]	[0]	[0]	[0.11]	[0]	[0.18]	[0]	[0]
SGWE	3	0.014	0	0	0	1.333	0.128	0	0	0	0	0	0	0	0	0	0
		[0.025]	[0]	[0]	[0]	[2.66]	[0.25]	[0]	[]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]
SHRH	35	0.152	0	0.667	0.15	1.875	0	0	0	0.165	0.205	0	0.093	0	0	0	0.287
		[0.088]	[0]	[1.333]	[0.24]	[3.75]	[0]	[0]	[]	[0.15]	[0.21]	[0]	[0.18]	[0]	[0]	[0]	[0.54]
SJHR	1	0.003	0	0	0.017	0	0	0	0	0	0	0	0	0	0	0	0
		[0.007]	[0]	[0]	[0.03]	[0]	[0]	[0]	[]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]
SKCB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		[0]	[0]	[0]	[0]	[0]	[0]	[0]	[]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]
SMBF	4	0.018	0	0	0.03	0	0	0	0	0.011	0.016	0	0.111	0	0	0	0
		[0.019]	[0]	[0]	[0.06]	[0]	[0]	[0]	[]	[0.02]	[0.03]	[0]	[0.22]	[0]	[0]	[0]	[0]
SMBS	1	0.003	0	0	0	0	0	0.071	0	0	0	0	0	0	0	0	0
		[0.006]	[0]	[0]	[0]	[0]	[0]	[0.14]	[]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]
SNGR	3	0.014	0	0	0	0	0	0	0	0.015	0	0	0.197	0	0	0	0
		[0.016]	[0]	[0]	[0]	[0]	[0]	[0]	[]	[0.03]	[0]	[0]	[0.27]	[0]	[0]	[0]	[0]
SNSG	374	1.532	1.572	2	1.956	3.208	0.25	1.229	0	2.796	0.631	0.667	0.579	3.111	1.114	1.316	0
		[0.396]	[1.303]	[1.333]	[1.14]	[1.08]	[0.5]	[1.29]	[]	[1.03]	[0.32]	[1.33]	[0.66]	[5.70]	[1.34]	[2.63]	[0]
SNSN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		[0]	[0]	[0]	[0]	[0]	[0]	[0]	[]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]

Species	Total Catch	Overall CPUE	Annual Report Template														
			BRAD		CHXO	CONF	DEND	DRNG	ISB	OSB		SCCL	SCCS			WILD	
			CHNB	ITIP	CHNB	CHNB	CHNB	CHNB	BARS	CHNB	CHNB	BARS	CHNB	ITIP	ITIP	POOL	DTWT
STCT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]
STSN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]
SVCB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]
SVCP	1	0.006	0	0	0	0	0	0	0	0.032	0	0	0	0	0	0	0
		[0.013]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0.06]	[0]	[0]	[0]	[0]	[0]	[0]	[0]
UBF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]
UCS	1	0.003	0	0	0	0	0	0.071	0	0	0	0	0	0	0	0	0
		[0.006]	[0]	[0]	[0]	[0]	[0]	[0.14]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]
UCT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]
UNID	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]
UNO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]
WLYE	5	0.024	0.139	0	0.02	0	0	0	0	0.03	0	0	0	0	0.052	0	0
		[0.022]	[0.192]	[0]	[0.04]	[0]	[0]	[0]	[0]	[0.06]	[0]	[0]	[0]	[0]	[0.10]	[0]	[0]
WTBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]
WTCP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]
YOYF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]

Appendix F3. 2.5 Inch Trammel Net: overall season and segment summary. Lists CPUE (fish/100 m) and 2 standard errors in brackets.

No 2.5" trammel nets were deployed during the 2005 season.

Appendix F4. Otter Trawl: overall season and segment summary. Lists CPUE (fish/100 m) and 2 standard errors in brackets.

Species	Total Catch	Overall CPUE	BRAD	CHXO	CONF	DRNG	ISB	OSB	SCCL	SCCS
			CHNB	CHNB	CHNB	CHNB	CHNB	CHNB	CHNB	CHNB
BHCP	0	0	0	0	0	0	0	0	0	0
		[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]
BKCP	0	0	0	0	0	0	0	0	0	0
		[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]
BLGL	0	0	0	0	0	0	0	0	0	0
		[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]
BMBF	0	0	0	0	0	0	0	0	0	0
		[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]
BMSN	0	0	0	0	0	0	0	0	0	0
		[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]
BSMW	0	0	0	0	0	0	0	0	0	0
		[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]
BUSK	30	0.15	0.065	0.084	0.167	0	0.207	0.167	0.5	0.128
		[0.059]	[0.088]	[0.083]	[0.333]	[0]	[0.117]	[0.143]	[1]	[0.256]
CARP	1	0.003	0.03	0	0	0	0	0	0	0
		[0.007]	[0.061]	[0]	[0]	[0]	[0]	[0]	[0]	[0]
CKCB	0	0	0	0	0	0	0	0	0	0
		[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]
CNCF	39	0.185	0	0.185	0.333	0	0.292	0.164	0.5	0
		[0.085]	[0]	[0.143]	[0]	[0]	[0.229]	[0.135]	[1]	[0]
ERSN	27	0.078	0.429	0.068	0.167	0	0.039	0	0	0
		[0.051]	[0.312]	[0.1]	[0.333]	[0]	[0.055]	[0]	[0]	[0]
FHCB	0	0	0	0	0	0	0	0	0	0
		[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]
FHCF	3	0.01	0	0	0	0	0	0.042	0	0
		[0.02]	[0]	[0]	[0]	[0]	[0]	[0.083]	[0]	[0]
FHMW	0	0	0	0	0	0	0	0	0	0
		[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]
FWDM	8	0.041	0	0	0.333	0	0.051	0.042	0	0.139
		[0.03]	[0]	[0]	[0.667]	[0]	[0.057]	[0.058]	[0]	[0.278]
GDEY	2	0.02	0	0.031	0	0	0	0	0	0.208
		[0.029]	[0]	[0.063]	[0]	[0]	[0]	[0]	[0]	[0.417]
GNSF	0	0	0	0	0	0	0	0	0	0
		[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]
GSBG	0	0	0	0	0	0	0	0	0	0
		[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]

Appendix F4 (continued).

Species	Total Catch	Overall CPUE	BRAD	CHXO	CONF	DRNG	ISB	OSB	SCCL	SCCS
			CHNB	CHNB	CHNB	CHNB	CHNB	CHNB	CHNB	CHNB
GSCP	0	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]
GZSD	1	0.003 [0.007]	0 [0]	0.015 [0.03]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]
HBNS	0	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]
HFCS	2	0.013 [0.02]	0 [0]	0 [0]	0 [0]	0 [0]	0.017 [0.033]	0 [0]	0 [0]	0.139 [0.278]
JYDR	0	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]
LMBS	0	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]
LNGR	0	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]
NFSH	0	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]
OSSF	0	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]
PDFH	0	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]
PDSG	0	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]
QLBK	0	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]
RDSN	3	0.013 [0.015]	0.067 [0.09]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0.25 [0.5]	0 [0]
RKBS	0	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]
RVCS	2	0.01 [0.014]	0 [0]	0 [0]	0 [0]	0 [0]	0.017 [0.034]	0 [0]	0 [0]	0.083 [0.167]
RVSN	0	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]
SFCB	1	0.005 [0.01]	0 [0]	0.023 [0.045]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]
SGCB	1	0.003 [0.007]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0.014 [0.028]	0 [0]	0 [0]

Appendix F4 (continued).

Species	Total Catch	Overall CPUE	BRAD	CHXO	CONF	DRNG	ISB	OSB	SCCL	SCCS
			CHNB	CHNB	CHNB	CHNB	CHNB	CHNB	CHNB	CHNB
SGWE	9	0.045 [0.033]	0 [0]	0 [0]	0 [0]	0 [0]	0.102 [0.09]	0.028 [0.038]	0 [0]	0.128 [0.256]
SHRH	14	0.071 [0.042]	0 [0]	0.053 [0.06]	0 [0]	0 [0]	0.104 [0.087]	0.097 [0.122]	0 [0]	0.069 [0.139]
SJHR	0	0 [0]	0 [0]	0 [0]						
SKCB	1	0.004 [0.008]	0 [0]	0.018 [0.036]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]
SMBF	0	0 [0]	0 [0]	0 [0]						
SMBS	3	0.012 [0.018]	0 [0]	0 [0]	0 [0]	0.167 [0.333]	0 [0]	0 [0]	0 [0]	0.139 [0.278]
SNGR	0	0 [0]	0 [0]	0 [0]						
SNSG	68	0.375 [0.248]	0.2 [0.22]	0.233 [0.138]	0.167 [0.333]	0 [0]	0.362 [0.22]	0.068 [0.077]	0.5 [1]	2.658 [3.587]
SNSN	1	0.005 [0.01]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0.021 [0.042]	0 [0]	0 [0]
STCT	0	0 [0]	0 [0]	0 [0]						
STSN	0	0 [0]	0 [0]	0 [0]						
SVCB	15	0.082 [0.065]	0 [0]	0.143 [0.164]	0 [0]	0 [0]	0.066 [0.131]	0.035 [0.049]	0.25 [0.5]	0.278 [0.556]
SVCP	0	0 [0]	0 [0]	0 [0]						
UBF	0	0 [0]	0 [0]	0 [0]						
UCS	2	0.007 [0.011]	0.036 [0.073]	0.015 [0.03]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]
UCT	0	0 [0]	0 [0]	0 [0]						
UNID	0	0 [0]	0 [0]	0 [0]						
UNO	0	0 [0]	0 [0]	0 [0]						

Species	Total Catch	Overall CPUE	BRAD	CHXO	CONF	DRNG	ISB	OSB	SCCL	SCCS
			CHNB	CHNB	CHNB	CHNB	CHNB	CHNB	CHNB	CHNB
WLYE	8	0.034	0.096	0	0.167	0	0.052	0	0	0.069
		[0.023]	[0.099]	[0]	[0.333]	[0]	[0.058]	[0]	[0]	[0.139]
WTBS	7	0.031	0	0.075	0	0	0.047	0	0	0
		[0.029]	[0]	[0.084]	[0]	[0]	[0.073]	[0]	[0]	[0]
WTCP	0	0	0	0	0	0	0	0	0	0
		[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]
YOYF	0	0	0	0	0	0	0	0	0	0
		[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]

Appendix F5. Beam Trawl: overall season and segment summary. Lists CPUE (fish/100 m) and 2 standard errors in brackets.

No beam trawls were deployed during 2005.

Appendix F6. Mini-fyke Net: overall season and segment summary. Lists CPUE (fish/net night) and 2 standard errors in brackets.

Species	Total Catch	Overall CPUE	BRAD	CONF	DEND	ISB	OSB		SCCL	SCCS	SCN	TRML	TRMS		
			BARS	BARS	BARS	BARS	CHNB	BARS	CHNB	BARS	BARS	CHNB	(blank)	BARS	BARS
BHCP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	
BKCP	14	0.137	0.133	0	0	0	0.5	0.1	0.333	0.077	0	0	0.6	1	0.75
		[0.097]	[0.267]	[0]	[0]	[0]	[1]	[0.2]	[0.667]	[0.154]	[0]	[0]	[0.8]	[2]	[1.5]
BLGL	27	0.265	0.267	0	0	0.05	0	0.3	0.333	0.385	0	0	2.6	0	0
		[0.18]	[0.307]	[0]	[0]	[0.1]	[0]	[0.427]	[0.667]	[0.482]	[0]	[0]	[2.577]	[0]	[0]
BMBF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]
BMSN	49	0.48	1.2	1	0	0.1	0	0.2	0	0.154	0.65	0	0	0	2.5
		[0.289]	[0.98]	[0]	[0]	[0.138]	[0]	[0.267]	[0]	[0.308]	[0.715]	[0]	[0]	[0]	[5]
BSMW	1	0.01	0	0	0	0	0	0	0	0.00	0.05	0	0	0	0
		[0.02]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0.1]	[0]	[0]	[0]	[0]
BUSK	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]
CARP	44	0.431	1.333	2.5	0	0	0	0.2	0	0.077	0.75	0	0.2	0	0
		[0.275]	[1.57]	[3]	[0]	[0]	[0]	[0.267]	[0]	[0.154]	[0.521]	[0]	[0.4]	[0]	[0]
CKCB	53	0.52	0.533	1.5	0	0.2	0	0.6	0	0.154	1.35	0	0	1.5	0
		[0.338]	[0.933]	[3]	[0]	[0.234]	[0]	[1.2]	[0]	[0.208]	[1.363]	[0]	[0]	[1]	[0]
CNCF	28	0.275	0.2	1.5	0.5	0.2	0	0.1	0	0.077	0.65	0	0	0.5	0.25
		[0.112]	[0.214]	[1]	[1]	[0.184]	[0]	[0.2]	[0]	[0.154]	[0.391]	[0]	[0]	[1]	[0.5]
ERSN	1938	19	14.27	7	0	12.55	1	52.8	0	11.615	9.15	2.5	6.8	128.5	73.5
		[9.445]	[9.321]	[14]	[0]	[8.938]	[2]	[55.495]	[0]	[14.034]	[6.353]	[2.082]	[8.304]	[257]	[125.9]
FHCB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]
FHCF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]
FHMW	4	0.039	0.067	0	0	0.1	0	0	0	0	0.05	0	0	0	0
		[0.039]	[0.133]	[0]	[0]	[0.138]	[0]	[0]	[0]	[0]	[0.1]	[0]	[0]	[0]	[0]
FWDM	289	2.833	1.267	21	0	2.85	0.5	1.1	0	1.385	5.05	1	0.8	13	1.5
		[1.191]	[1.44]	[10]	[0]	[1.348]	[1]	[0.814]	[0]	[1.272]	[4.562]	[1.414]	[0.748]	[14]	[1.732]
GDEY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]
GNSF	4	0.039	0.067	0	0	0.1	0	0	0	0	0.05	0	0	0	0
		[0.048]	[0.133]	[0]	[0]	[0.2]	[0]	[0]	[0]	[0]	[0.1]	[0]	[0]	[0]	[0]

Appendix F6 continued.

Species	Total Catch	Overall CPUE	BRAD	CONF	DEND	ISB	OSB		SCCL	SCCS		SCN	TRML	TRMS	
			BARS	BARS	BARS	BARS	CHNB	BARS	CHNB	BARS	BARS	CHNB	(blank)	BARS	BARS
GSBG	1	0.01 [0.02]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0.1 [0.2]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]
GSCP	0	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]
GZSD	417	4.088 [4.431]	17 [29.392]	7.5 [3]	1.5 [1]	1.7 [2.988]	0 [0]	1.4 [1.96]	0 [0]	0.538 [0.431]	2.05 [2.115]	2.25 [3.862]	0 [0]	5 [8]	7.25 [13.841]
HBNS	0	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]
HFCS	0	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]
JYDR	4	0.039 [0.039]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0.2 [0.184]	0 [0]	0 [0]	0 [0]	0 [0]
LMBS	4	0.039 [0.048]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0.1 [0.2]	0.667 [1.333]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0.25 [0.5]
LNGR	4	0.039 [0.039]	0 [0]	0.5 [1]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0.1 [0.138]	0 [0]	0 [0]	0.5 [1]	0 [0]
NFSH	0	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]
OSSF	14	0.137 [0.131]	0.2 [0.214]	0 [0]	0 [0]	0 [0]	0 [0]	0.1 [0.2]	0 [0]	0 [0]	0 [0]	0 [0]	0.6 [0.8]	0 [0]	1.75 [2.872]
PDFH	0	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]
PDSG	0	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]
QLBK	0	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]
RDSN	3164	31.02 [17.31]	31.2 [20.21]	3.5 [5]	10 [20]	10.05 [4.327]	3.5 [5]	130.5 [157.151]	0.333 [0.667]	15.462 [21.338]	24.05 [14.366]	11 [10.424]	54.2 [71.89]	8.5 [17]	35.25 [40.409]
RKBS	2	0.02 [0.028]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0.2 [0.267]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]
RVCS	3	0.029 [0.034]	0.067 [0.133]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0.1 [0.138]	0 [0]	0 [0]	0 [0]	0 [0]

Appendix F6 continued.

Species	Total Catch	Overall CPUE	BRAD	CONF	DEND	ISB	OSB		SCCL	SCCS		SCN	TRML	TRMS	
			BARS	BARS	BARS	BARS	CHNB	BARS	CHNB	BARS	BARS	CHNB	(blank)	BARS	BARS
RVSN	1	0.01 [0.02]	0 [0]	0 [0]	0 [0]	0.05 [0.1]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]
SFCB	0	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]
SGCB	0	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]
SGER	7	0.069 [0.064]	0 [0]	0 [0]	0 [0]	0.05 [0.1]	1 [2]	0 [0]	0 [0]	0.077 [0.154]	0.05 [0.1]	0.5 [1]	0 [0]	0 [0]	0 [0]
SGWE	5	0.049 [0.051]	0.067 [0.133]	0 [0]	0 [0]	0 [0]	1 [2]	0.1 [0.2]	0.333 [0.667]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]
SHRH	1	0.01 [0.02]	0 [0]	0 [0]	0 [0]	0.05 [0.1]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]
SJHR	0	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]
SKCB	0	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]
SMBF	1	0.01 [0.02]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0.05 [0.1]	0 [0]	0 [0]	0 [0]	0 [0]
SMBS	23	0.225 [0.155]	0 [0]	0 [0]	0 [0]	0.1 [0.2]	0 [0]	0.1 [0.2]	3.667 [2.404]	0.154 [0.308]	0.2 [0.184]	0.75 [0.957]	0 [0]	0 [0]	0 [0]
SNGR	40	0.392 [0.174]	0.4 [0.327]	0.5 [1]	0 [0]	0.3 [0.328]	0 [0]	0.3 [0.306]	0 [0]	0.308 [0.35]	0.45 [0.34]	0 [0]	0 [0]	1.5 [3]	2 [2.828]
SNSG	0	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]
SNSN	979	9.598 [4.622]	14.2 [16.881]	1 [0]	0 [0]	6.6 [4.133]	0 [0]	9.8 [6.094]	0 [0]	3.462 [4.759]	23.1 [17.804]	0 [0]	3.8 [6.21]	1 [2]	1.5 [3]
STCT	1	0.01 [0.02]	0 [0]	0 [0]	0 [0]	0.05 [0.1]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]
STSN	18	0.176 [0.166]	0 [0]	0 [0]	0 [0]	0.05 [0.1]	0 [0]	0.1 [0.2]	0 [0]	0 [0]	0.55 [0.718]	1 [2]	0.2 [0.4]	0 [0]	0 [0]
SVCB	1	0.01 [0.02]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0.1 [0.2]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]

Appendix F6 (continued).

Species	Total Catch	Overall CPUE	BRAD	CONF	DEND	ISB	OSB		SCCL	SCCS	SCN	TRML	TRMS	
			BARS	BARS	BARS	BARS	CHNB	BARS	CHNB	BARS	BARS	CHNB	(blank)	BARS
SVCP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]
UBF	3	0.029	0	0	0	0.05	0	0	0	0	0.05	0	0	0.5
		[0.034]	[0]	[0]	[0]	[0.1]	[0]	[0]	[0]	[0]	[0.1]	[0]	[0]	[1]
UCS	256	2.51	2.867	1	0	0.95	0	0.3	0	0.385	8.2	0.25	0.8	7.5
		[1.863]	[2.413]	[2]	[0]	[0.492]	[0]	[0.306]	[0]	[0.361]	[8.943]	[0.5]	[0.748]	[9]
UCT	11	0.108	0.133	0	0	0.1	0	0	0	0	0.3	0	0	0.5
		[0.108]	[0.182]	[0]	[0]	[0.138]	[0]	[0]	[0]	[0]	[0.505]	[0]	[0]	[1]
UNID	1	0.01	0	0	0	0.05	0	0	0	0	0	0	0	0
		[0.02]	[0]	[0]	[0]	[0.1]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]
UNO	522	5.118	0	0	0	0	0	0	0	0	1	0	100.4	0
		[9.845]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[1.711]	[0]	[200.8]	[0]
WLYE	6	0.059	0.133	0	0	0	0	0	0	0.154	0	0.25	0.2	0
		[0.054]	[0.182]	[0]	[0]	[0]	[0]	[0]	[0]	[0.308]	[0]	[0.5]	[0.4]	[0]
WTBS	203	1.99	2.2	16	0.5	1.4	3.5	1.1	1.667	0.923	1.75	1.5	1.6	11.5
		[0.793]	[1.658]	[26]	[1]	[0.967]	[7]	[0.917]	[3.333]	[1.367]	[1.141]	[3]	[3.2]	[13]
WTCP	5	0.049	0	0	0	0.05	0	0.3	0	0	0	0	0	0.5
		[0.043]	[0]	[0]	[0]	[0.1]	[0]	[0.306]	[0]	[0]	[0]	[0]	[0]	[1]
YOYF	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]

Appendix F7. Bag Seine: overall season and segment summary. Lists CPUE (fish/100 m²) and 2 standard errors in brackets.

Species	Total Catch	Overall CPUE	BRAD	CONF	DEND	ISB		OSB	SCCL	SCCS	SCN	TRML	TRMS
			BARS	BARS	BARS	BARS	CHNB	BARS	BARS	BARS	(blank)	BARS	BARS
BHCP	0	0	0	0		0		0	0	0	0		0
		[0]	[0]	[]	[]	[0]	[]	[0]	[0]	[0]	[0]	[]	[0]
BKCP	0	0	0	0		0		0	0	0	0		0
		[0]	[0]	[]	[]	[0]	[]	[0]	[0]	[0]	[0]	[]	[0]
BLGL	15	0.339	0	0		0		0	0	0	4.974		0
		[0.475]	[0]	[]	[]	[0]	[]	[0]	[0]	[0]	[5.007]	[]	[0]
BMBF	0	0	0	0		0		0	0	0	0		0
		[0]	[0]	[]	[]	[0]	[]	[0]	[0]	[0]	[0]	[]	[0]
BMSN	98	0.967	7.257	0		0.741		0	0.166	1.325	0		0
		[1.001]	[13.324]	[]	[]	[1.184]	[]	[0]	[0.332]	[2.563]	[0]	[]	[0]
BSMW	1	0	0	0		0		0	0	0	0		0
		[0]	[0]	[]	[]	[0]	[]	[0]	[0]	[0]	[0]	[]	[0]
BUSK	0	0	0	0		0		0	0	0	0		0
		[0]	[0]	[]	[]	[0]	[]	[0]	[0]	[0]	[0]	[]	[0]
CARP	92	0.462	0	0.714		0.248		0	0	1.24	0		0.497
		[0.46]	[0]	[]	[]	[0.495]	[]	[0]	[0]	[1.514]	[0]	[]	[0.995]
CKCB	0	0	0	0		0		0	0	0	0		0
		[0]	[0]	[]	[]	[0]	[]	[0]	[0]	[0]	[0]	[]	[0]
CNCF	34	0.068	0	0		0.133		0.332	0	0	0		0
		[0.1]	[0]	[]	[]	[0.265]	[]	[0.663]	[0]	[0]	[0]	[]	[0]
ERSN	384	4.469	0.298	0		2.536		9.465	13.71	2.454	0.332		8.455
		[2.827]	[0.595]	[]	[]	[2.269]	[]	[16.4]	[15.761]	[3.43]	[0.663]	[]	[6.963]
FHCB	1	0	0	0		0		0	0	0	0		0
		[0]	[0]	[]	[]	[0]	[]	[0]	[0]	[0]	[0]	[]	[0]
FHCF	0	0	0	0		0		0	0	0	0		0
		[0]	[0]	[]	[]	[0]	[]	[0]	[0]	[0]	[0]	[]	[0]
FHMW	1	0.007	0	0		0.021		0	0	0	0		0
		[0.014]	[0]	[]	[]	[0.041]	[]	[0]	[0]	[0]	[0]	[]	[0]
FWDM	233	2.554	0	4.286		3.302		0.513	0.123	2.288	0		14.423
		[2.176]	[0]	[]	[]	[5]	[]	[1.026]	[0.245]	[2.398]	[0]	[]	[26.857]
GDEY	0	0	0	0		0		0	0	0	0		0
		[0]	[0]	[]	[]	[0]	[]	[0]	[0]	[0]	[0]	[]	[0]
GNSF	0	0	0	0		0		0	0	0	0		0
		[0]	[0]	[]	[]	[0]	[]	[0]	[0]	[0]	[0]	[]	[0]

Appendix F7 continued.

Species	Total Catch	Overall CPUE	BRAD	CONF	DEND	ISB		OSB	SCCL	SCCS	SCN	TRML	TRMS
			BARS	BARS	BARS	BARS	CHNB	BARS	BARS	BARS	BARS	(blank)	BARS
GSCP	0	0	0	0		0		0	0	0	0		0
		[0]	[0]	[]	[]	[0]	[]	[0]	[0]	[0]	[0]	[]	[0]
GZSD	697	5.091	9.158	0		1.041		2.653	3.281	8.728	1.658		26.36
		[3.872]	[18.315]	[]	[]	[0.976]	[]	[2.891]	[4.101]	[10.875]	[0.663]	[]	[52.72]
HBNS	3	0.009	0	0		0.026		0	0	0	0		0
		[0.018]	[0]	[]	[]	[0.052]	[]	[0]	[0]	[0]	[0]	[]	[0]
HFCS	0	0	0	0		0		0	0	0	0		0
		[0]	[0]	[]	[]	[0]	[]	[0]	[0]	[0]	[0]	[]	[0]
JYDR	1	0.014	0.298	0		0		0	0	0	0		0
		[0.027]	[0.595]	[]	[]	[0]	[]	[0]	[0]	[0]	[0]	[]	[0]
LMBS	3	0.068	0	0		0		0	0	0	0		1.492
		[0.1]	[0]	[]	[]	[0]	[]	[0]	[0]	[0]	[0]	[]	[0.995]
LNGR	0	0	0	0		0		0	0	0	0		0
		[0]	[0]	[]	[]	[0]	[]	[0]	[0]	[0]	[0]	[]	[0]
NFSH	0	0	0	0		0		0	0	0	0		0
		[0]	[0]	[]	[]	[0]	[]	[0]	[0]	[0]	[0]	[]	[0]
OSSF	5	0	0	0		0		0	0	0	0		0
		[0]	[0]	[]	[]	[0]	[]	[0]	[0]	[0]	[0]	[]	[0]
PDFH	0	0	0	0		0		0	0	0	0		0
		[0]	[0]	[]	[]	[0]	[]	[0]	[0]	[0]	[0]	[]	[0]
PDSG	0	0	0	0		0		0	0	0	0		0
		[0]	[0]	[]	[]	[0]	[]	[0]	[0]	[0]	[0]	[]	[0]
QLBK	0	0	0	0		0		0	0	0	0		0
		[0]	[0]	[]	[]	[0]	[]	[0]	[0]	[0]	[0]	[]	[0]
RDSN	467	6.565	7.715	1.429		7.832		5.248	1.395	9.127	5.305		2.487
		[4.98]	[9.478]	[]	[]	[13.11]	[]	[6.224]	[1.235]	[8.132]	[7.018]	[]	[0.995]
RKBS	0	0	0	0		0		0	0	0	0		0
		[0]	[0]	[]	[]	[0]	[]	[0]	[0]	[0]	[0]	[]	[0]
RVCS	12	0.049	0	2.143		0		0	0	0	0		0
		[0.097]	[0]	[]	[]	[0]	[]	[0]	[0]	[0]	[0]	[]	[0]
RVSN	0	0	0	0		0		0	0	0	0		0
		[0]	[0]	[]	[]	[0]	[]	[0]	[0]	[0]	[0]	[]	[0]
SFCB	0	0	0	0		0		0	0	0	0		0
		[0]	[0]	[]	[]	[0]	[]	[0]	[0]	[0]	[0]	[]	[0]

Appendix F7 (continued).

Species	Total Catch	Overall CPUE	BRAD	CONF	DEND	ISB		OSB	SCCL	SCCS	SCN	TRML	TRMS
			BARS	BARS	BARS	BARS	CHNB	BARS	BARS	BARS	BARS	(blank)	BARS
SGCB	0	0	0	0		0		0	0	0	0		0
		[0]	[0]	[]	[]	[0]	[]	[0]	[0]	[0]	[0]	[]	[0]
SGER	18	0.105	0	0		0.066		0.171	0	0.258	0		0
		[0.09]	[0]	[]	[]	[0.071]	[]	[0.342]	[0]	[0.298]	[0]	[]	[0]
SGWE	3	0.023	0	0		0		0	0	0	0		0.497
		[0.045]	[0]	[]	[]	[0]	[]	[0]	[0]	[0]	[0]	[]	[0.995]
SHRH	19	0.023	0	0		0		0	0	0	0.332		0
		[0.045]	[0]	[]	[]	[0]	[]	[0]	[0]	[0]	[0.663]	[]	[0]
SJHR	0	0	0	0		0		0	0	0	0		0
		[0]	[0]	[]	[]	[0]	[]	[0]	[0]	[0]	[0]	[]	[0]
SKCB	0	0	0	0		0		0	0	0	0		0
		[0]	[0]	[]	[]	[0]	[]	[0]	[0]	[0]	[0]	[]	[0]
SMBF	0	0	0	0		0		0	0	0	0		0
		[0]	[0]	[]	[]	[0]	[]	[0]	[0]	[0]	[0]	[]	[0]
SMBS	9	0.034	0	0		0		0.171	0	0	0.332		0
		[0.05]	[0]	[]	[]	[0]	[]	[0.342]	[0]	[0]	[0.663]	[]	[0]
SNGR	4	0.06	0	0		0		0	0	0.056	0		0.995
		[0.069]	[0]	[]	[]	[0]	[]	[0]	[0]	[0.111]	[0]	[]	[0]
SNSG	4	0.025	0	0		0.034		0	0	0.05	0		0
		[0.03]	[0]	[]	[]	[0.068]	[]	[0]	[0]	[0.072]	[0]	[]	[0]
SNSN	271	2.032	1.465	0		3.687		0.171	0.705	2.202	0		0
		[1.925]	[2.93]	[]	[]	[5.032]	[]	[0.342]	[1.202]	[3.114]	[0]	[]	[0]
STCT	0	0	0	0		0		0	0	0	0		0
		[0]	[0]	[]	[]	[0]	[]	[0]	[0]	[0]	[0]	[]	[0]
STSN	13	0.325	0	0		0		0	0	1.191	0		0
		[0.501]	[0]	[]	[]	[0]	[]	[0]	[0]	[1.794]	[0]	[]	[0]
SVCB	0	0	0	0		0		0	0	0	0		0
		[0]	[0]	[]	[]	[0]	[]	[0]	[0]	[0]	[0]	[]	[0]
SVCP	0	0	0	0		0		0	0	0	0		0
		[0]	[0]	[]	[]	[0]	[]	[0]	[0]	[0]	[0]	[]	[0]
UBF	4	0.013	0	0		0.038		0	0	0	0		0
		[0.026]	[0]	[]	[]	[0.076]	[]	[0]	[0]	[0]	[0]	[]	[0]
UCS	1455	16.185	52.381	0		23.353		3.75	3.977	16.425	5.637		3.979
		[14.814]	[104.762]	[]	[]	[39.464]	[]	[6.531]	[6.182]	[17.841]	[5.894]	[]	[3.979]

Appendix F7 (continued).

Species	Total Catch	Overall CPUE	BRAD	CONF	DEND	ISB	OSB	SCCL	SCCS	SCN	TRML	TRMS
			BARS	BARS	BARS	BARS	CHNB	BARS	BARS	BARS	(blank)	BARS
UCT	0	0	0	0		0		0	0	0		0
		[0]	[0]	[]	[]	[0]	[]	[0]	[0]	[0]	[]	[0]
UNID	0	0	0	0		0		0	0	0		0
		[0]	[0]	[]	[]	[0]	[]	[0]	[0]	[0]	[]	[0]
UNO	0	0	0	0		0		0	0	0		0
		[0]	[0]	[]	[]	[0]	[]	[0]	[0]	[0]	[]	[0]
WLYE	3	0.068	0	0		0.066		0	0	0		0.995
		[0.1]	[0]	[]	[]	[0.133]	[]	[0]	[0]	[0]	[]	[1.989]
WTBS	329	5.061	2.129	5		7.801		3.989	0.463	2.33	0.663	25.863
		[4.803]	[3.068]	[]	[]	[13.139]	[]	[5.958]	[0.926]	[1.921]	[1.326]	[27.852]
WTCP	0	0	0	0		0		0	0	0		0
		[0]	[0]	[]	[]	[0]	[]	[0]	[0]	[0]	[]	[0]
YOYF	1	0.017	0	0		0		0	0.123	0	0	0
		[0.033]	[0]	[]	[]	[0]	[]	[0]	[0.245]	[0]	[0]	[0]

Appendix G. Hatchery names, locations, and abbreviations.

Hatchery	State	Abbreviation
Blind Pony State Fish Hatchery	MO	BYP
Neosho National Fish Hatchery	MO	NEO
Gavins Point National Fish Hatchery	SD	GAV
Garrison Dam National Fish Hatchery	ND	GAR
Miles City State Fish Hatchery	MT	MCH
Blue Water State Fish Hatchery	MT	BLU
Bozeman Fish Technology Center	MT	BFT
Fort Peck State Fish Hatchery	MT	FPH

Appendix H. Alphabetic list of Missouri River fishes with total catch-per-unit-effort by gear type for sturgeon season (fall through spring) and fish community season (summer) during 200x – 20xx for segment xx of the Missouri River. Species codes are located in Appendix A. Asterisks and bold type denote targeted native Missouri River species.

Species Code	Sturgeon Season (Fall through Spring)				Fish Community Season (Summer)			
	1 Inch Trammel Net	2.5 Inch Trammel Net	Gill Net	Otter Trawl	1 Inch Trammel Net	Bag Seine	Mini-Fyke Net	Otter Trawl
BDKF								
BESN								
BHCP			0.032					
BHMW								
BKBF								
BKBH								
BKCP							0.137	
BKSS								
BLCF								
BLGL					0.011	0.339	0.265	
BMBF	0.017				0.013			
BMSN						0.967	0.48	
BNMW								
BRBT								
BSMW							0.01	
BTTM								
BUSK	0.561		0.778		0.417			0.15
CARP	0.011					0.462	0.431	0.003
CKCB							0.52	
CLSR								
CMSN								
CNCF	1.346		0.063		0.416	0.068	0.275	0.185
CNLP								
CNSN								
ERSN						4.469	19	0.078
FHCB								
FHCF					0.013			0.01
FHMW						0.007	0.039	
GDEY	0.903		1.238		0.375			0.02

Appendix H. (continued).

Species Code	Sturgeon Season (Fall through Spring)				Fish Community Season (Summer)			
	1 Inch Trammel Net	2.5 Inch Trammel Net	Gill Net	Otter Trawl	1 Inch Trammel Net	Bag Seine	Mini-Fyke Net	Otter Trawl
GDFH								
GDRH								
GDSN								
GNSF							0.039	
GSBG							0.01	
GSCP			0.016					
GSPK								
GZSD						5.091	4.088	0.003
HBNS						0.009		
HFCS	0.057				0.072			0.013
JYDR						0.014	0.039	
LAB								
LESF								
LGPH								
LKSG								
LMBS						0.068	0.039	
LNDC								
LNGR			0.016		0.045		0.039	
MMSN								
MNEY								
MQTF								
NFSH	0		0		0			0
NTPK								
OSSF							0.137	
PDFH	0.114		0.063		0.012			
PDSG					0.006			
PNMW								
QLBK			0.206		0.007			
RBST								
RDSN						6.565	31.02	0.013

Appendix H. (continued).

Species Code	Sturgeon Season (Fall through Spring)				Fish Community Season (Summer)			
	1 Inch Trammel Net	2.5 Inch Trammel Net	Gill Net	Otter Trawl	1 Inch Trammel Net	Bag Seine	Mini-Fyke Net	Otter Trawl
RFSN								
RKBS							0.02	
RVCS	0.162				0.125	0.049	0.029	0.01
RVRH								
RVSN							0.01	
SBWB								
SDBS								
SFCB								0.005
SFSN								
SGCB								0.003
SGER	0.032		0.048		0.067	0.105	0.069	0.026
SGWE	0.004				0.026	0.023	0.049	0.045
SHRH	0.213		0.079		0.083	0.023	0.01	0.071
SJHR	0.007							
SKCB								0.004
SMBF	0.034		0.048				0.01	
SMBS					0.007	0.034	0.225	0.012
SMMW								
SNGR			0.032		0.029	0.06	0.392	
SNPD								
SNSG	1.071		1.063		2.054	0.025		0.375
SNSN						2.032	9.598	0.005
SPSK								
STBS								
STCT							0.01	
STSN						0.325	0.176	
SVCB							0.01	0.082
SVCP	0.012							
TPMT								
UBF						0.013	0.029	

Appendix H. (continued).

Species Code	Sturgeon Season (Fall through Spring)				Fish Community Season (Summer)			
	1 Inch Trammel Net	2.5 Inch Trammel Net	Gill Net	Otter Trawl	1 Inch Trammel Net	Bag Seine	Mini-Fyke Net	Otter Trawl
UCN					0.007	16.185	2.51	0.007
UCS							0.108	
UCT								
UCY								
UHY								
ULP							0.01	
UNID							5.118	
UNO								
URH								
USG					0.043	0.068	0.059	0.034
WLYE	0.008							
WSMW						5.061	1.99	0.031
WTBS							0.049	
WTCP								
WTSK								
YLBH						0.017		
YOYF								
YWPH								