

## 2007 Sturgeon Fishing Report Card: Preliminary Data Report

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### Summary

A Sturgeon Fishing Report Card (Card) became part of a suite of sport fishing regulations in March 2007 that were intended to protect California's white sturgeon fishery while increasing protections for the federally-threatened green sturgeon and adding resiliency to the white sturgeon population. This report summarizes data about 2007 Cards.

The 2007 Card was printed using Bay-Delta Sport Fishing Enhancement Stamp funds and then issued to any angler at no charge. Card data was managed using Sport Fish Restoration Act and Interagency Ecological Program funds.

The sturgeon fishing season begins in Fall and Cards were first distributed in February, so data from 2007 Cards does not represent a full fishing season. 200,000 Cards were printed at a cost of \$26,280 before taxes and approximately 41,000 Cards were issued. 6,573 Cards were returned by anglers to the Department and 1,801 of those Cards had data on sturgeon catch.

Anglers released 311 green sturgeon, kept 1,399 white sturgeon, and released 4,612 white sturgeon. Over half of the total catch of sturgeon was from March, November, and December.

Catch of green sturgeon was greatest in the Sacramento River from Red Bluff to Colusa and the Sacramento River from Rio Vista to Chipps Island. Catch of white sturgeon was greatest in Suisun Bay, the Sacramento River from Rio Vista to Chipps Island, and Montezuma Slough.

Released green sturgeon total length averaged 37 inches and ranged 19-86 inches. Kept white sturgeon total length averaged 55 inches and ranged 12-68 inches. Released white sturgeon total length averaged 44 inches and ranged 8-107 inches.

We recommend continuing use of Sturgeon Fishing Report Cards and several changes to the 2010 Card. Fishing effort could be better estimated by adding a 'check box' for whether or not the angler fished for sturgeon or by using location information in a fashion similar to that in the Steelhead Fishing Report and Restoration Card. Aspects of sturgeon ecology and population dynamics can be better monitored if the length of released fish is recorded.

## Introduction

This report summarizes data about 2007 Sturgeon Fishing Report Card (Cards). The Card became part of a suite of sportfishing regulations in March 2007 that was intended to protect California's year-round white sturgeon fishery while increasing protections for the federally-threatened green sturgeon population and adding resiliency to the conservation-dependent white sturgeon population.

The 2007 Card was distributed to any angler at no charge and was required of every angler — including minors, those fishing only from piers, and those fishing on 'free fishing' days — who would fish for or keep a sturgeon in California.

Cards were printed using Bay-Delta Sport Fishing Enhancement Stamp funds. Sport Fish Restoration Act and Interagency Ecological Program funds were used to manage Card data and prepare this report.

Cards include fields for contact information, kept fish, and released fish (Appendix 1). To aid the Department's efforts to reduce illegal commercialization of sturgeon and to enforce the daily and annual bag limits on white sturgeon, the Cards also included detachable single-use serially-numbered Card-specific tags to be placed on fish kept by anglers.

The sturgeon fishing season begins in Fall and Cards were first distributed in February 2007, so data about and from 2007 Cards does not describe a full fishing season.

Information on catch of sturgeon from 2007 Cards is complementary to on-going research conducted by the Department and others, and will be used in planned articles and technical reports. Future year-specific Sturgeon Fishing Report Card data reports will include a bibliography of documents that used Card data.

## Card Distribution and Return

200,000 Cards were printed at a cost of \$26,280 before taxes then distributed beginning in February to Department offices and licensed sales agents using the License and Revenue Branch 'steelhead card distribution list'. Approximately 41,000 Cards were issued to anglers.

Anglers began returning Cards almost immediately after distribution and most were returned by April 2008. The few Cards returned during preparation of this report are not described here.

6,573 Cards were returned and 1,801 of those had data on sturgeon catch. Cards with catch data were issued throughout 2007, with nearly 50% issued in March (Table 1).

Table 1. Monthly issuance of 2007 Cards returned with catch data.

<b>Monthly Issuance</b>	<b>Number of Cards</b>
Unknown date	46
January	10*
February	337
March	879
April	126
May	83
June	32
July	22
August	21
September	40
October	82
November	88
December	35
<b>Total</b>	<b>1801</b>

\* Because issuance of cards began in February 2007, these records are reporting errors.

### Angler Data

Fields on the Card include those for general personal and contact information (Appendix 1), as well as for catch data. Contact information includes California fishing license number and street address.

A large fraction of the contact information was illegible, so we only added a subset of those fields to the database and summarized a subset of the data.

Eighty-six anglers supplied no California fishing license number, or submitted illegible or non-standard license numbers. Seven anglers were specifically described as 'juniors'. At least 28 anglers were from out of state.

County of residence was determined for California anglers by using the provided zip code. Most were from Sacramento, Contra Costa, and Solano counties (Table 2).

Table 2. Residence of anglers returning 2007 Cards with catch data.

<b>County</b>	<b>Number of Anglers</b>	<b>County</b>	<b>Number of Anglers</b>
Unknown/Out of state	83	Sacramento	273
Alameda	118	San Bernardino	1
Amador	9	San Diego	1
Butte	41	San Francisco	18
Calaveras	5	San Joaquin	181
Colusa	9	San Mateo	21
Contra Costa	265	Santa Barbara	2
El Dorado	27	Santa Clara	107
Fresno	14	Santa Cruz	1
Glenn	6	Shasta	11
Kings	3	Siskiyou	3
Lake	8	Solano	197
Los Angeles	1	Sonoma	65
Madera	2	Stanislaus	55
Marin	19	Sutter	37
Mariposa	1	Tehama	9
Merced	9	Trinity	1
Monterey	1	Tulare	4
Napa	92	Tuolumne	1
Nevada	7	Yolo	34
Placer	45	Yuba	10
Plumas	4		

### Catch Data

The Card was structured into sections on sturgeon kept by anglers and on sturgeon released by anglers. Both of those sections included date and location fields.

Fish in the kept-fish section were required to be white sturgeon. Fields in this section also include length and Card-specific tag number.

Fish in the released-fish section could be either white sturgeon or green sturgeon, with the species indicated by the angler. Length of released fish was not required or requested, but many anglers provided it.

*Catch data* — Anglers reported releasing 311 green sturgeon, while keeping 1,399 white sturgeon and releasing 4,612 white sturgeon (Table 3). Species was not reported for just 21 sturgeon because anglers did not document species or specifically wrote that the species was unknown.

Table 3. White sturgeon and green sturgeon catch reported on 2007 Cards.

	White	Green	Unidentified	Total
<b>Retained</b>				
Measured	1392	0	0	<b>1392</b>
Unmeasured	7	0	0	<b>7</b>
<b>Total</b>	<b>1399</b>	<b>0</b>	<b>0</b>	<b>1399</b>
<b>Released</b>				
Measured	593	20	0	<b>613</b>
Unmeasured	4019	291	21	<b>4310</b>
<b>Total</b>	<b>4612</b>	<b>311</b>	<b>21</b>	<b>4944</b>
<b>Overall Total</b>	<b>6011</b>	<b>311</b>	<b>21</b>	<b>6343</b>

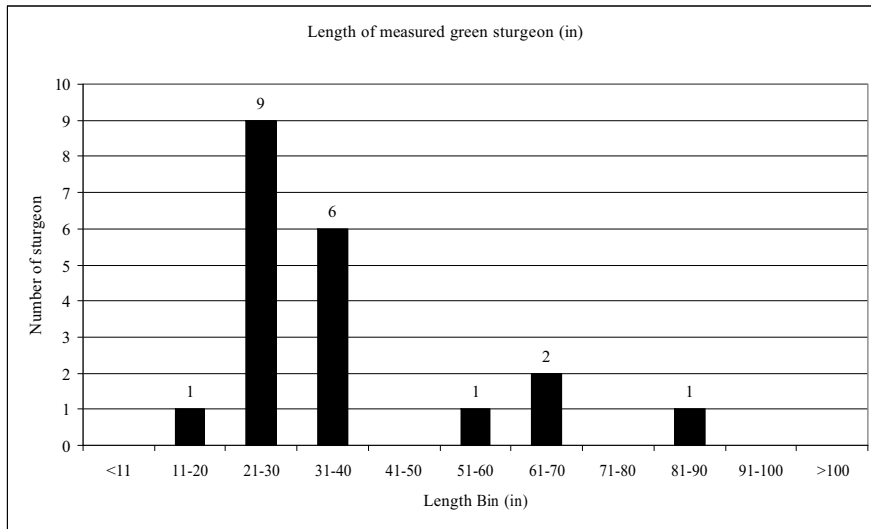
The 1,072 anglers who retained white sturgeon kept an average of 1.3 white sturgeon (Table 4). Just 60 anglers kept the limit of three white sturgeon. Of the 1,774 anglers who caught white sturgeon, 238 anglers kept and released white sturgeon on the same day (average=1.5, maximum=7). Because the length of sturgeon released was not a required field on the Card, we can not calculate the number of white sturgeon voluntarily conserved.

Table 4. Summary statistics for per-angler catch from 2007 Cards with catch data.

	Number of Anglers	Number of Sturgeon	Maximum Number	Average Number
Retained White	1072	1399	3	1.3
Released White	1194	4612	38	3.9
Green	154	311	37*	2
Unknown	21	21	9	1.6

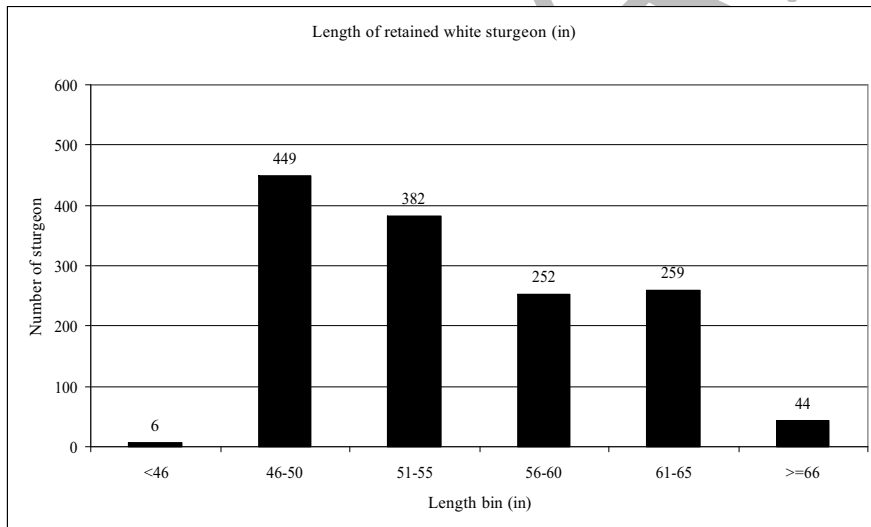
\* Because this value is an outlier, we suspect the angler mis-identified the species.

*Length data* — Released green sturgeon total length averaged 37 inches and ranged 19-86 inches (Figure 1). Kept white sturgeon total length averaged 55 inches and ranged 12-68 inches (Figure 2). Released white sturgeon total length averaged 44 inches and ranged 8-107 inches (Figure 3). The lengths of seven kept white sturgeon were not recorded.



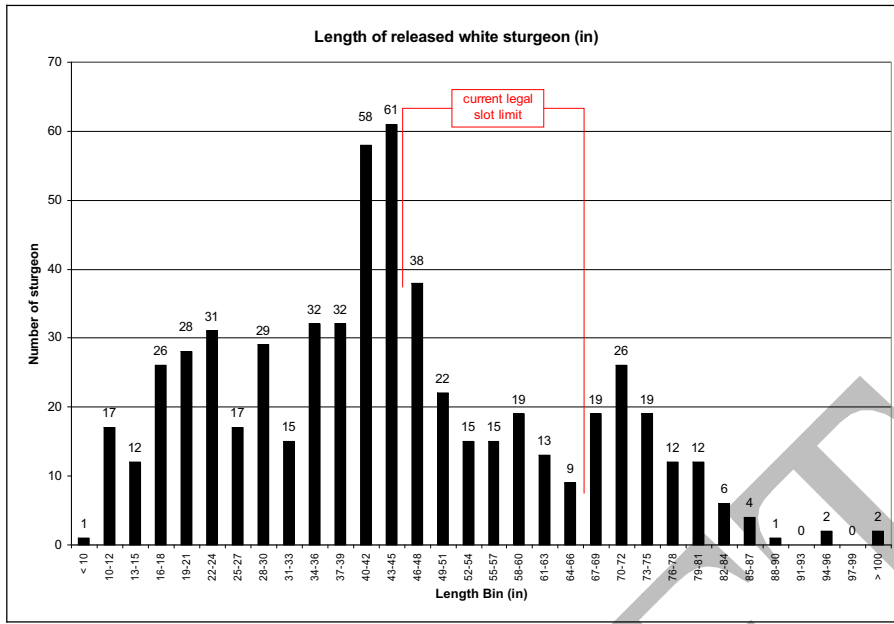
<b>Green Sturgeon</b>	
Total Catch	311
# Measured	20
Min.Length	19 in
Max. Length	86 in
Avg. Length	37 in

Figure 1. Total lengths of green sturgeon as reported on 2007 Cards (n=20).



<b>Retained White Sturgeon</b>	
Total Catch	1399
# Measured	1392
Min.Length	12 in
Max. Length	68 in
Avg. Length	55 in

Figure 2. Total lengths of retained white sturgeon as reported on 2007 Cards (n=1392).



Released White Sturgeon	
Total Catch	4612
# Measured	593
Min.Length	8 in
Max. Length	107 in
Avg. Length	44 in

Figure 3. Total lengths of released white sturgeon as reported on 2007 Cards (n=593).

*Location data* — Sturgeon were collected in 22 (Figure 4) of the 25 locations described on the Card. Catch of green sturgeon was greatest in the Sacramento River from Red Bluff to Colusa and the Sacramento River from Rio Vista to Chipps Island (Table 5). Catch of white sturgeon was greatest in Suisun Bay, the Sacramento River from Rio Vista to Chipps Island, and Montezuma Slough (Tables 6 and 7).

Location codes were either not specified or were illegible for 105 kept white sturgeon, 72 released white sturgeon, and 2 green sturgeon. Of those 105 records for kept sturgeon, 81 included possibly-useable location notations (rather than the required codes) and 24 included no location code, illegible location codes, and vague location notations (e.g. ‘San Joaquin River’). Of those 72 records for released white sturgeon, 53 included possibly-useable location notations and 19 included no location code, illegible location codes, or vague location notations.

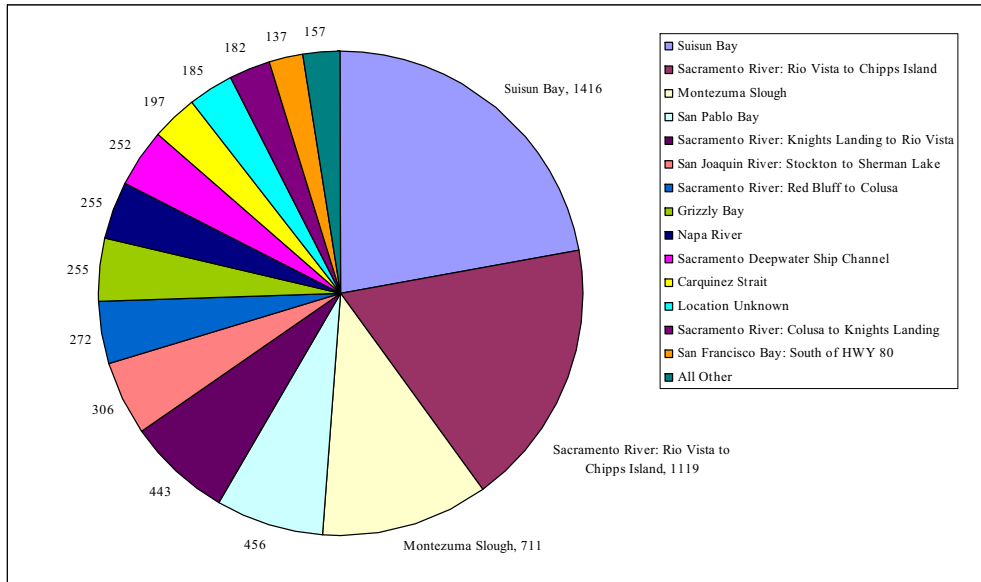


Figure 4. Catch of all sturgeon by location as reported on 2007 Cards.

*Seasonality* — Catch of green sturgeon (Table 5) and white sturgeon (Tables 6 and 7) was greatest during the Spring and Fall. Over half of the total catch of sturgeon was from March, November, and December.



Table 5. Green sturgeon catch by location and associated length data as provided on 2007 Cards. The five locations where sturgeon catch was highest are ranked. Seasons are defined as follows: Winter=December-February, Spring= March-May, Summer=June-August, Fall=September-November, Unk=Unknown date of capture.

Location Code	Location	Rank	No. Anglers	Catch					Total	No. Measured	Avg. Length	Min. Length	Max. Length
				Winter	Spring	Summer	Fall	Unk					
	Unknown		2	1			1		2				
1	Sacramento River: Red Bluff to Colusa	1	11	17	2	10	38		67	1		65	
2	Sacramento River: Colusa to Knights Landing		5	4	3		1	1	9				
3	Sacramento River: Knights Landing to Rio Vista		12	2	6	1	7		16	1		36	
4	Sacramento River: Rio Vista to Chipps Island	2	42	17	10	4	28	3	62	7	42	19	86
5	Feather River		1			2			2				
6	American River												
7	Sacramento Deepwater Ship Channel		3		1		2		3	1		24	
8	Yolo Bypass												
9	Montezuma Slough		13	5	4	1	4		14	1		27	
10	Napa River		6	1	4	1	1		7	1		28	
11	Petaluma River		1				1		1				
12	San Joaquin River: Upstream of HWY 140 bridge												
13	San Joaquin River: HWY 140 bridge to Stockton												
14	San Joaquin River: Stockton to Sherman Lake	3	9	6	13		7	22	48				
15	Old River												
16	San Pablo Bay	5	15	5	12	2	1		20	1		38	
17	Carquinez Strait		11	4	4	2	3		13	2	34	32	36
18	Suisun Bay	4	23	4	9	3	14		30	5	30	22	40
19	Grizzly Bay		11	2	3	1	8		14				
20	San Francisco Bay: North of HWY 80		1	1			1		2				
21	San Francisco Bay: South of HWY 80		1		1				1				
22	Pacific Ocean: North of Golden Gate Bridge												
23	Pacific Ocean: Golden Gate Bridge to Point Sur												
24	Pacific Ocean: Point Sur to San Diego												
25	Any reservoir or lake												
<b>TOTAL</b>			<b>154</b>	<b>69</b>	<b>72</b>	<b>34</b>	<b>132</b>	<b>4</b>	<b>311</b>				

Table 6. Retained white sturgeon catch by location and associated length data as provided on 2007 Cards. The five locations where sturgeon catch was highest are ranked. Seasons are defined as follows: Winter=December-February, Spring= March-May, Summer=June-August, Fall=September-November, Unk=Unknown date of capture.

Location Code	Location	Rank	No. Anglers	Catch					Total	No. Measured	Avg. Length	Min. Length	Max. Length
				Winter	Spring	Summer	Fall	Unk					
	Unknown	5	88	13	51	10	31		105	105	55	40	66
1	Sacramento River: Red Bluff to Colusa		49	1	57	1	5		64	64	59	45	66
2	Sacramento River: Colusa to Knights Landing		61	3	67		3		73	73	58	46	66
3	Sacramento River: Knights Landing to Rio Vista	3	124	18	107	5	20		150	150	57	46	66
4	Sacramento River: Rio Vista to Chipps Island	2	148	36	42	6	106	1	191	188	54	40	68
5	Feather River		3		3				3	3	54	49	60
6	American River		2	1		1			2	2	30	12	48
7	Sacramento Deepwater Ship Channel		37	16	13	3	22		54	54	55	46	66
8	Yolo Bypass		5	1	3		2		6	5	55	52	56
9	Montezuma Slough	4	103	29	51	5	33	1	119	119	54	46	66
10	Napa River		52	9	35	9	8	1	62	59	54	46	65
11	Petaluma River		5		3		2		5	5	51	46	66
12	San Joaquin River: Upstream of HWY 140 bridge		7	4	1		3		8	8	53	46	62
13	San Joaquin River: HWY 140 bridge to Stockton		5	1	5		1		7	7	54	47	65
14	San Joaquin River: Stockton to Sherman Lake		37	12	6	3	26		47	47	54	46	66
15	Old River		2		1		1		2	2	50	49	50
16	San Pablo Bay		71	11	56	7	4		78	78	52	46	68
17	Carquinez Strait		35	7	11	13	6		37	37	51	46	66
18	Suisun Bay	1	219	55	71	28	116		270	270	54	42	68
19	Grizzly Bay		48	9	14	3	30		56	56	54	46	66
20	San Francisco Bay: North of HWY 80		5		5	1			6	6	53	48	62
21	San Francisco Bay: South of HWY 80		42	19	26	1	7		53	53	56	46	66
22	Pacific Ocean: North of Golden Gate Bridge												
23	Pacific Ocean: Golden Gate Bridge to Point Sur		1	1					1	1		52	
24	Pacific Ocean: Point Sur to San Diego												
25	Any reservoir or lake												
<b>TOTAL</b>			<b>1072</b>	<b>246</b>	<b>628</b>	<b>96</b>	<b>426</b>	<b>3</b>	<b>1399</b>				

Table 7. Released white sturgeon catch by location and associated length data as provided on 2007 Cards. The five locations where sturgeon catch was highest are ranked. Seasons are defined as follows: Winter=December-February, Spring= March-May, Summer=June-August, Fall=September-November, Unk=Unknown date of capture.

Location Code	Location	Rank	No. Anglers	Winter	Spring	Catch			Total	No. Measured	Avg. Length	Min. Length	Max. Length
						Summer	Fall	Unk					
	Unknown		31	12	41	4	15		72	5	53	30	74
1	Sacramento River: Red Bluff to Colusa		38	29	76	3	33		141	8	77	67	86
2	Sacramento River: Colusa to Knights Landing		45	16	78		6		100	11	61	27	107
3	Sacramento River: Knights Landing to Rio Vista	5	114	59	116	5	89	1	270	15	51	34	95
4	Sacramento River: Rio Vista to Chipps Island	2	229	196	158	42	439	28	863	155	32	12	80
5	Feather River		1		3				3	0			
6	American River												
7	Sacramento Deepwater Ship Channel		50	44	41	5	105		195	28	38	14	80
8	Yolo Bypass		6	3	13	2	2		20	5	57	47	70
9	Montezuma Slough	3	192	122	231	44	181		578	86	53	15	96
10	Napa River		69	43	66	39	35		183	15	42	29	71
11	Petaluma River		13	1	9	5	6		21	0			
12	San Joaquin River: Upstream of HWY 140 bridge		6	2	6	2	7		17	2	61	59	63
13	San Joaquin River: HWY 140 bridge to Stockton		7	6	9	7	6		28	0			
14	San Joaquin River: Stockton to Sherman Lake		55	44	29	23	115		211	15	36	8	50
15	Old River		1			1			1	0			
16	San Pablo Bay	4	162	57	239	17	45		358	33	42	14	72
17	Carquinez Strait		74	25	63	26	33		147	22	42	10	79
18	Suisun Bay	1	304	266	324	107	417	1	1115	169	48	12	102
19	Grizzly Bay		79	41	45	10	88		184	15	58	33	86
20	San Francisco Bay: North of HWY 80		11	7	3	7	5		22	4	48	36	72
21	San Francisco Bay: South of HWY 80		38	31	43	2	7		83	5	48	34	67
22	Pacific Ocean: North of Golden Gate Bridge												
23	Pacific Ocean: Golden Gate Bridge to Point Sur												
24	Pacific Ocean: Point Sur to San Diego												
25	Any reservoir or lake												
<b>TOTAL</b>			<b>1194</b>	<b>1004</b>	<b>1593</b>	<b>351</b>	<b>1634</b>	<b>30</b>	<b>4612</b>				

## Discussion

The 2007 Sturgeon Fishing Report Cards provided pertinent information for relatively little cost. We recommend continuing use of Sturgeon Fishing Report Cards.

Highlights of information from 2007 Cards include the following:

- (1) Thousands of anglers took great care completing the Cards and many volunteered information and/or comments that proved both interesting and helpful.
- (2) Card data provided the first direct measure of white sturgeon harvest, which will complement on-going long-term monitoring of annual harvest rate (i.e., fraction of population harvested) and annual estimates of abundance.
- (3) Card data corroborate anecdotal reports that green sturgeon are only a major fraction of reach-specific fisheries in the Red Bluff-to-Colusa reach. Because most of the Central Valley's green sturgeon spawning grounds are in that reach and adult green sturgeon occur there year-round, focused emphasis on green sturgeon conservation is appropriate there.
- (4) Only three strong white sturgeon size-class appear susceptible to sportfishing gear, which corroborates other information demonstrating that it is appropriate to continue conservation efforts.
- (5) Most anglers who took the time to submit their Card never caught a sturgeon and an average successful angler kept less than  $\frac{1}{2}$  the annual bag limit of 3 white sturgeon.

From the 2007 Card data, it is clear that small changes to subsequent-year Sturgeon Fishing Report Cards and management of the Program could provide more and better information for little or no cost. These changes include at least the following:

- (1) Aspects of sturgeon ecology and population dynamics can be better monitored if the length of released fish is required.
- (2) Fishing effort — a very important aspect of the fishery — could be better estimated by adding a 'check box' for whether (or not) the angler fished for sturgeon or by using location information in a fashion similar to that in the Steelhead Fishing Report and Restoration Card.
- (3) Additional outreach via the internet would likely increase the proportion of Cards that are returned and the quality of information on Cards that are returned.

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