SUMMARY REPORT

STATUS OF WHITE STURGEON IN THE LOWER FRASER RIVER

REPORT ON THE FINDINGS OF THE LOWER FRASER RIVER WHITE STURGEON MONITORING AND ASSESSMENT PROGRAM 2008

BY

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TABLE OF CONTENTS

Page

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

EXECUTIVE SUMMARY

The Fraser River Sturgeon Conservation Society (FRSCS), a not-for-profit charitable organization founded in 1997, has a mandate to conserve and restore Fraser River white sturgeon stocks, raise public awareness regarding Fraser River sturgeon and their ecosystem, and gather reliable information on sturgeon and their habitat. This summary report presents data summaries and updated population assessments (as of January 2008) for the FRSCS' Lower Fraser River White Sturgeon Monitoring and Assessment Program. For detailed information regarding program background, methodology, and population modeling, please refer to the 2007 manuscript report (Nelson et al. 2008) available on the FRSCS web site (http://www.frasersturgeon.com/research.html).

Since April 2000, this program has relied greatly on the in-kind efforts and contributions from true stewards of the resource: angling guides, recreational, commercial, and Aboriginal fishermen, test fishery and enforcement personnel, and various fishery monitors. Volunteers from each of these sectors were trained to sample and tag white sturgeon, and record and transfer data. By December 2008, volunteers had tagged and released 39,469 sturgeon, sampled 66,186 sturgeon for the presence of a tag, and documented 21,790 recapture events of tags applied under the FRSCS program.

A descriptive population model has been developed to provide reliable estimates of the population of white sturgeon in the lower Fraser River, by size/age group and location, based on tag release and recapture. The population component of the model considers tag distribution and seasonal mixing, and is sensitive to estimates of mortality, emigration, and observer error. The model also describes patterns of inter- and intra-annual movements by size/age group.

As of January 2008, the population estimate for white sturgeon (from 40-260 cm fork length) in the lower Fraser River was 45,896. This mean population estimate represents a population decrease of 0.5% from the previous (2007) estimate, and a 26.7% decrease from the 2003 mean estimate. Comparative population estimates of the numbers of sturgeon before and after January 2003 strongly suggest a decrease in the overall population of lower Fraser sturgeon, with the greatest decreases occurring for sturgeon less than 100 cm fork length). These estimates also suggest that, since 2003, the survival rates of sturgeon over 180 cm fork length is relatively stable.

Recaptures of tagged sturgeon during this study confirm that movements and migrations occur throughout the entire lower Fraser River study area. In addition, in 2007, two recapture events provided confirmation of movements between the lower and middle Fraser stock groups. Fraser River recaptures of white sturgeon originally tagged in the lower Columbia River (Oregon) have also been documented.

A comparison of average annual growth rates of specified size groups of white sturgeon, determined from measurements obtained from individual tagged sturgeon that were subsequently recaptured, strongly suggests that annual growth rates for all size groups of white sturgeon were greater before 2005 than after 2005.

TABLES

Table 1. Sampling zones used for population estimation of white sturgeon, 2007-2008

Zone	River Km	From	To
S*	1-26	Georgia Strait	Eastern Annacis Island
3, 5**	26-56.5 & P0-P4	Eastern Annacis Island	Albion Ferry Crossing
6	56.5-79	Albion Ferry Crossing	Mission Bridge
8	79-94	Mission Bridge	Mouth of Sumas River
10	H0-H19	Confluence Fraser River	Outlet of Harrison Lake
12	94-123	Mouth of Sumas River	Agassiz Bridge
13	123-159	Agassiz Bridge	Hwy 1 Bridge (Hope)
14	159-187	Hwy 1 Bridge (Hope)	Lady Franklin Rock (Yale)

* Zone S is the Main (South) Arm including Canoe Pass; from Figure 3 this is zone 2S and zone 2C
** Zone 5 includes the lower 4 kms of the Pitt River, from the Fraser mainstem to the Hwy 7 Bridge

Table 2. Sampling regions used for population estimates of white sturgeon, 2007-2008.

Region	Zones	Description
A	S	Georgia Strait to Eastern Annacis Island (South Arm of Fraser)
B	3-5, 6	Eastern Annacis Island to Mission Bridge
C	8, 10, 12, 13	Mission Bridge to Hope including the Harrison River
D	14	Hwy 1 Bridge (Hope) to Lady Franklin Rock (Yale)

Table 3. Parameter estimates for linear and non-linear sturgeon growth models (2007-2008).

Parameter	Estimate	Std Error	R^2
Linear			0.306
Daily Increment	9.556E-03	2.606E-04	
Non-Linear von-Bertalanffy			
L_∞	532.6	15.8	
g	2.306E-05	6.362E-07	

Table 4. Numbers of sturgeon examined for marks (Catch), and number of recaptures (Rec)[1], by month and sampling zone, 2007-2008.

	Zone S		Zone 3-5		Zone 6		Zone 8		Zone 10		Zone 12		Zone 13		Zone 14		Total	
Month	Catch	Rec	Catch	Rec	Catch	Rec	Catch	Rec	Catch	Rec	Catch	Rec	Catch	Rec	Catch	Rec	Catch	Rec
Jan-07	0	0	0	0	46	0	0	0	0	0	12	0	0	0	0	0	58	0
Feb-07	1	0	0	0	115	2	0	0	0	0	4	0	0	0	0	0	120	2
Mar-07	20	0	18	1	472	9	0	0	0	0	32	0	7	0	0	0	549	10
Apr-07	38	2	136	2	241	11	32	1	0	0	129	3	14	1	0	0	590	20
May-07	1	0	16	0	75	2	22	1	0	0	174	16	18	0	6	0	312	19
Jun-07	31	1	1	0	20	3	69	14	1	0	287	26	28	2	14	0	451	46
Jul-07	31	0	1	0	46	0	225	28	0	0	381	43	75	3	61	3	820	77
Aug-07	54	5	16	0	72	5	455	49	19	3	604	95	122	14	62	6	1404	177
Sep-07	133	4	51	1	277	27	1093	107	123	16	843	161	36	3	41	5	2597	324
Oct-07	10	0	76	3	296	18	935	137	377	83	540	101	14	6	0	0	2248	348
Nov-07	17	1	27	2	214	22	596	84	92	29	242	56	5	2	0	0	1193	196
Dec-07	0	0	0	0	29	6	2	0	4	3	8	0	0	0	0	0	43	9
Jan-08	2	0	0	0	46	4	0	0	0	0	10	3	0	0	0	0	58	7
Feb-08	0	0	0	0	23	0	0	0	0	0	3	1	0	0	0	0	26	1
Mar-08	0	0	3	0	46	8	48	7	0	0	20	4	0	0	0	0	117	19
Apr-08	1	0	110	10	178	31	82	17	0	0	60	25	9	1	6	1	446	85
May-08	5	0	43	6	79	18	162	35	1	0	182	70	8	2	2	1	482	132
Jun-08	19	1	20	3	20	2	65	19	9	3	216	76	17	1	58	6	424	111
Jul-08	31	4	6	0	23	3	122	35	13	6	260	97	30	4	67	13	552	162
Aug-08	11	2	95	12	86	15	225	79	30	13	289	131	35	4	77	15	848	271
Sep-08	29	7	141	23	238	45	498	148	147	71	282	112	28	5	40	3	1403	414
Oct-08	1	0	108	16	559	116	625	165	342	168	257	115	17	5	4	0	1913	585
Nov-08	18	1	130	16	429	88	718	185	173	97	240	79	2	0	0	0	1710	466
Dec-08	0	0	2	0	33	2	32	9	1	1	12	6	0	0	0	0	80	18
Totals	453	28	1,000	95	3,663	437	6,006	1,120	1,332	493	5,087	1,220	465	53	438	53	18,444	3,499

[1] Recaptures listed in this table are recaptured marks that were sampled or applied during the sampling period of Jan 2007-Dec 2008.

Table 5. Number of sturgeon recaptured and examined for a mark by sampling zone of release and recapture, 2007-2008.

Release Zone	Recapture Zone								
	Zone S	Zone 3-5	Zone 6	Zone 8	Zone 10	Zone 12	Zone 13	Zone 14	Total
Zone S	19	6	3	15	1	5	0	1	50
Zone 3-5	3	28	14	22	1	4	0	0	72
Zone 6	2	29	245	130	5	42	0	0	453
Zone 8	1	23	119	689	26	197	5	2	1,062
Zone 10	1	0	7	12	274	85	2	0	381
Zone 12	2	7	47	244	182	856	16	1	1,355
Zone 13	0	2	2	7	4	31	27	4	77
Zone 14	0	0	0	1	0	0	3	45	49
Number Recaptured	28	95	437	1120	493	1220	53	53	3,499
Number Examined	453	1,000	3,663	6,006	1,332	5,087	465	438	18,444

Table 6. Proportion (corrected) of sturgeon recaptured by sampling zone of release, 2007-2008 (recapture corrected for sampling intensity; see equation 3).

Release Zone	Recapture Zone								
	Zone S	Zone 3-5	Zone 6	Zone 8	Zone 10	Zone 12	Zone 13	Zone 14	Total
Zone S	0.759	0.109	0.015	0.045	0.014	0.018	0.000	0.041	1.000
Zone 3-5	0.152	0.642	0.088	0.084	0.017	0.018	0.000	0.000	1.000
Zone 6	0.033	0.216	0.499	0.162	0.028	0.062	0.000	0.000	1.000
Zone 8	0.009	0.094	0.132	0.466	0.079	0.157	0.044	0.019	1.000
Zone 10	0.009	0.000	0.008	0.009	0.883	0.072	0.018	0.000	1.000
Zone 12	0.011	0.017	0.032	0.100	0.336	0.414	0.085	0.006	1.000
Zone 13	0.000	0.025	0.007	0.015	0.038	0.076	0.726	0.114	1.000
Zone 14	0.000	0.000	0.000	0.002	0.000	0.000	0.059	0.939	1.000

Table 7. Number of marked sturgeon released each month from January 2007 to December 2008 by sampling zone, including releases of fish that were previously tagged (i.e., recaptures) and marked fish removed (i.e., recapture not returned) from the population (see equation 4).

Month	Zone S	Zone 3-5	Zone 6	Zone 8	Zone 10	Zone 12	Zone 13	Zone 14	Total
Jan-07	2	10	23	9	5	8	1	0	58
Feb-07	5	25	57	19	5	9	0	0	118
Mar-07	33	114	234	80	25	43	8	2	538
Apr-07	57	144	135	77	54	75	21	4	566
May-07	7	30	45	39	57	74	28	9	290
Jun-07	27	18	24	56	94	120	44	20	403
Jul-07	31	40	60	135	133	179	93	70	740
Aug-07	51	79	106	255	224	289	143	77	1224
Sep-07	118	195	282	576	410	464	128	64	2239
Oct-07	42	188	265	467	479	345	83	18	1887
Nov-07	29	108	168	286	164	173	41	11	981
Dec-07	1	5	12	5	4	5	1	0	34
Jan-08	3	9	21	8	4	6	1	0	51
Feb-08	1	5	11	4	1	2	0	0	24
Mar-08	2	13	25	26	9	14	3	1	93
Apr-08	21	102	91	65	23	36	12	7	357
May-08	14	51	54	83	51	71	19	5	348
Jun-08	18	23	21	40	57	67	28	53	308
Jul-08	25	22	27	62	69	85	39	55	384
Aug-08	23	85	66	101	84	97	45	64	564
Sep-08	46	155	158	220	160	146	49	40	973
Oct-08	36	200	295	308	248	172	44	14	1318
Nov-08	48	200	253	328	174	178	40	12	1232
Dec-08	2	10	19	17	5	8	2	0	62
Totals	642	1,832	2,451	3,264	2,538	2,665	873	527	14,792

Table 8. Population estimates for white sturgeon in the Lower Fraser River, by sampling region, as of 1 January 2008.

Sampling Region					95% HPD[1]		
	From	To	Zone Codes	Mean	Low	High	Std. Dev
A	Georgia Strait	East Annacis Is.	S	4,483	2,960	6,200	856
B	East Annacis Is.	Mission Br.	3 to 6	18,020	16,630	19,450	716
C	Mission Br.	Hwy 1 Br. (Hope)	8 to 13	21,187	20,540	21,850	331
D	Hwy 1 Br. (Hope)	Yale	14	2,206	1,680	2,785	285
			Total	45,896	43,547	48,245	1,199

[1] HPD - Highest Probability Density . See Nelson et al. 2004 for explanation of this statistic.

Table 9. Population estimates for white sturgeon in the Lower Fraser River, by 20-cm size class, as of 1 January 2008. Estimates standardized to the mean total estimate (see Table 8).

Size Class (cm)	MLE[1]	Percent of MLE[1]	HPD[2] (% of MLE[1]) Low	HPD[2] (% of MLE[1]) High	CV[3] (%)
40-59	3,769	8.2	5.5	13.1	22.6
60-79	7,982	17.4	15.7	19.3	5.2
80-99	8,937	19.5	18.2	20.9	3.4
100-119	7,439	16.2	15.1	17.5	3.7
120-139	5,287	11.5	10.6	12.6	4.3
140-159	3,677	8.0	7.4	8.7	4.0
160-179	2,879	6.3	5.7	7.0	5.1
180-199	2,669	5.8	5.0	6.9	8.3
200-219	1,544	3.4	2.8	4.2	10.4
220-239	1,223	2.7	1.9	4.0	19.8
240-259	489	1.1	0.6	2.0	30.9
Total	45,896	100.0			2.6

[1] MLE - Maximum Likelihood Estimate
[2] HPD - Highest Probability Density
[3] CV - Coefficient of Variation

Table 10. Summary of the distribution of white sturgeon recapture events, and the total number of recapture events, for tags applied to sturgeon under the FRSCS monitoring and assessment program, from 1999-2008. For example, the number of individual sturgeon recaptured 5 times is 198; the total number of recapture events for these 198 sturgeon is 990. Further, 3 individual sturgeon have been recaptured 11 times (each), for a total of 33 recapture events.

FRSCS Recapture Events 1999-2008

Number of Recaptures	Number of Recapture Events	Total Number of Recapture Events
1	8367	8367
2	2942	5884
3	1159	3477
4	468	1872
5	198	990
6	84	504
7	45	315
8	19	152
9	15	135
10	6	60
11	3	33
Total Recapture Events (1999-2008)		**21,789**

Table 11. Summary of changes in the annual population estimates, and respective proportional (percent) changes, of white sturgeon in the lower Fraser River, 1999-2008, and respective changes since 2003.

Population Assessment Year:	1999	2001	2002	2003	2004	2005	2006	2007*	2008
Mean (Annual) Population Estimate:	47,431	50,654	57,262	**62,611**	56,268	48,995	46,957	46,108	45,896
Change (No. Sturgeon) from previous (annual) estimate:	-	3,223	6,608	5,349	-6,343	-7,273	-2,038	-849	-212
Percent change from previous (annual) estimate:	-	6.8%	13.0%	9.3%	-10.1%	-12.9%	-4.2%	-1.8%	-0.5%
Change (No. Sturgeon) from 2003 estimate:	-	-	-	-	-6,343	-13,616	-15,654	-16,503	-16,715
Percent change from 2003 estimate:	-	-	-	-	-10.1%	-21.7%	-25.0%	-26.4%	-26.7%

* The 2007 population estimate includes an estimate (358 fish) for the 260-279 cm size category that was not represented in previous years. Disregarding the 260-279 cm size component for 2007, the change between the 2007 population estimate and the previous (2006) estimate would be -1,207 fish (rather than -849 fish) and the percent annual change would be -2.6% (rather than -1.8%).

FIGURES

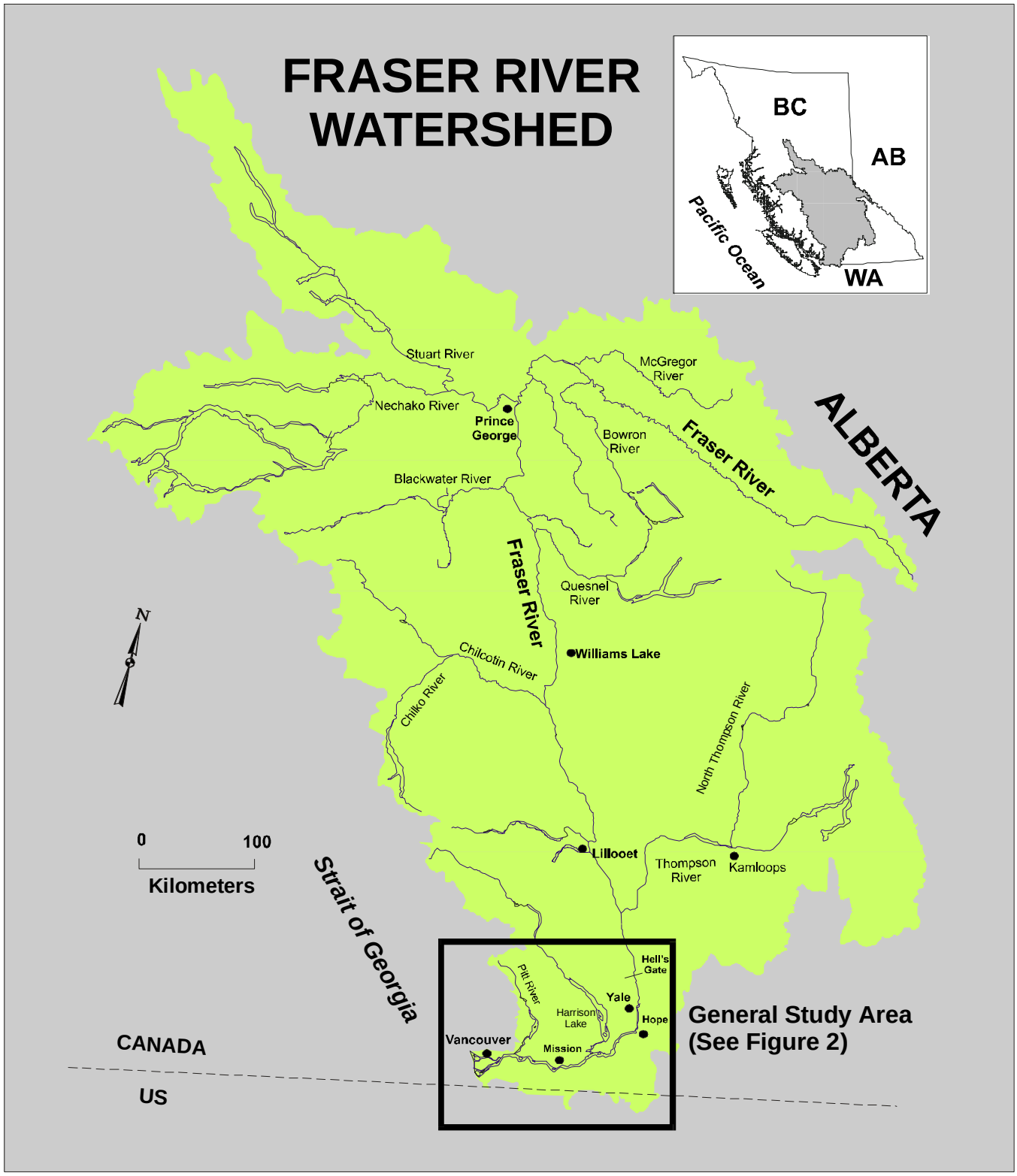


Figure 1. Map of the Fraser River watershed and its location in BC, and the general study area for the Lower Fraser River White Sturgeon Monitoring and Assessment Program 1999-2008.

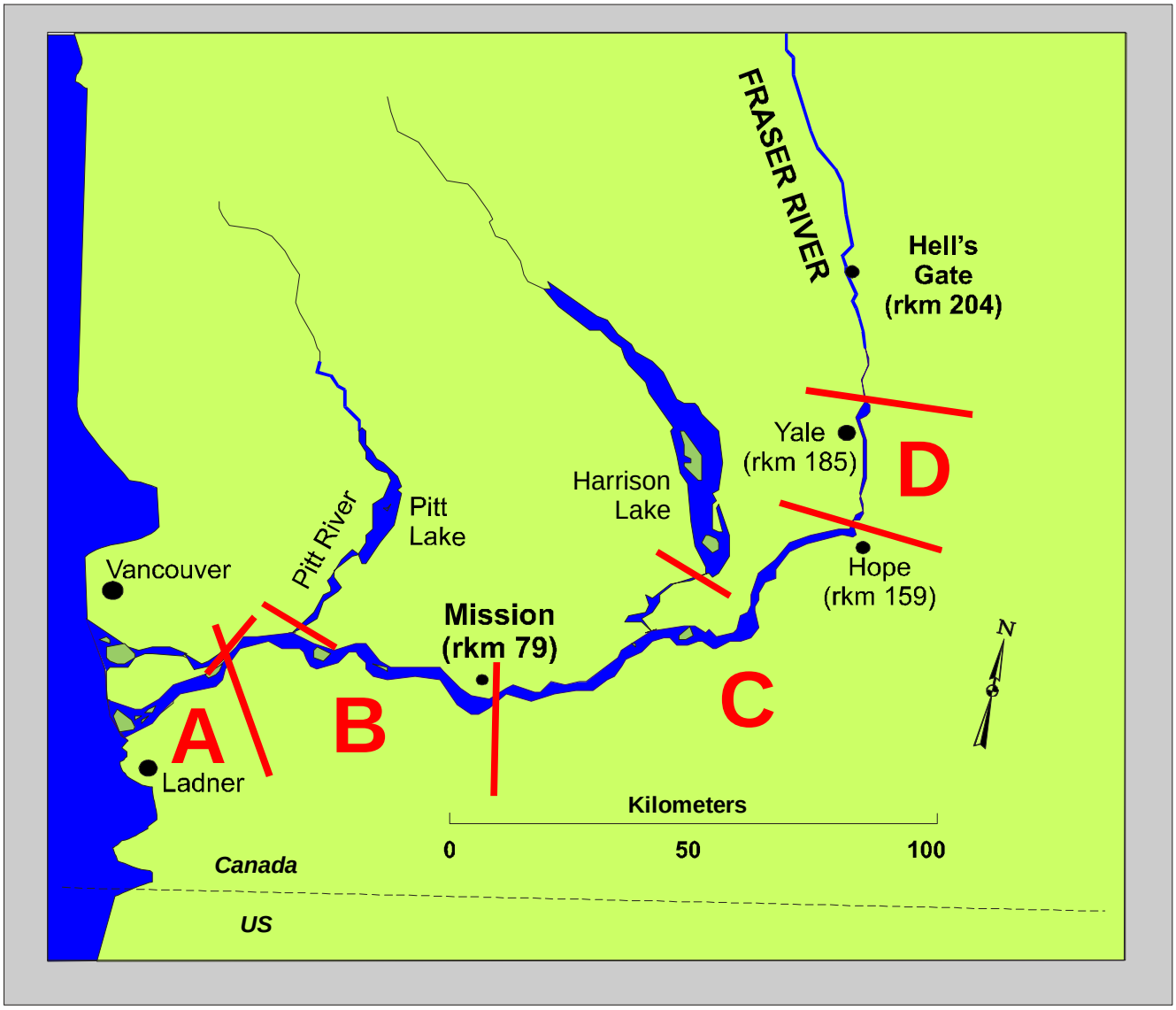


Figure 2. Illustration of the general study area and the location of the four main sampling regions (A, B, C, and D) used for data summaries presented in this report. See Table 2 for a description of the boundaries for each sampling region.

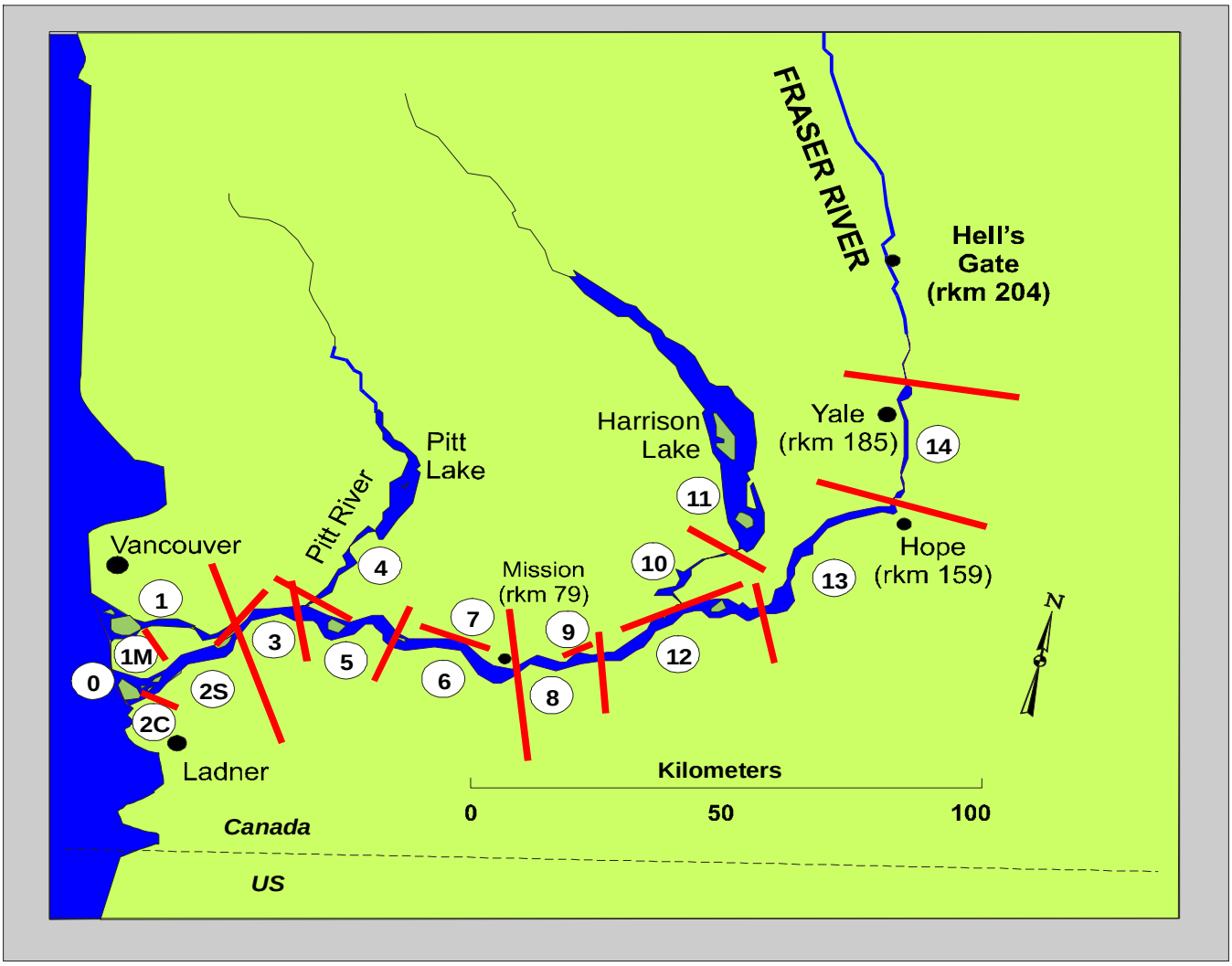


Figure 3. Locations of sampling zones used for data summaries during the Lower Fraser River White Sturgeon Monitoring and Assessment Program 1999-2008.

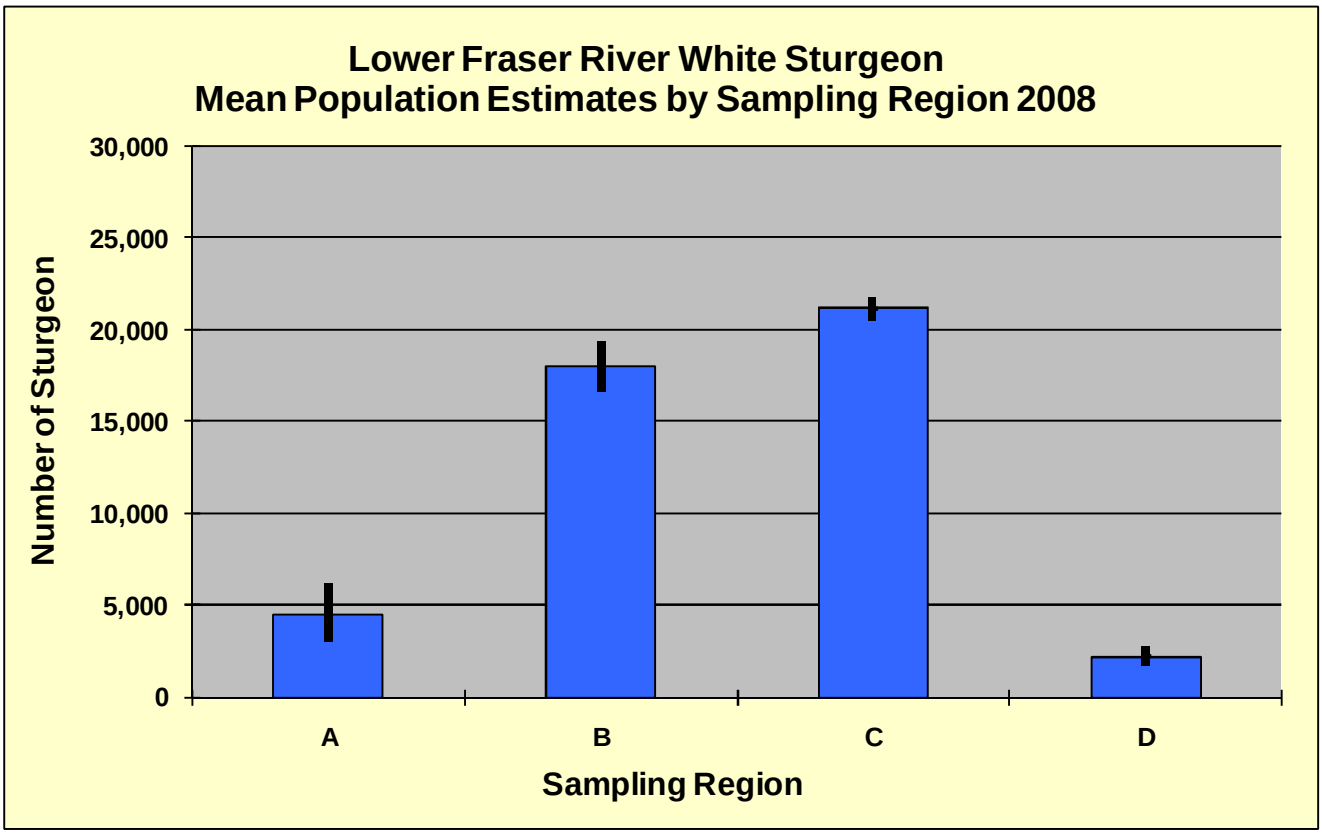


Figure 4. Mean population estimates of white sturgeon in the lower Fraser River, by sampling region, as of 1 January 2008 (see Table 8). Ranges show the 95% Highest Probability Density.

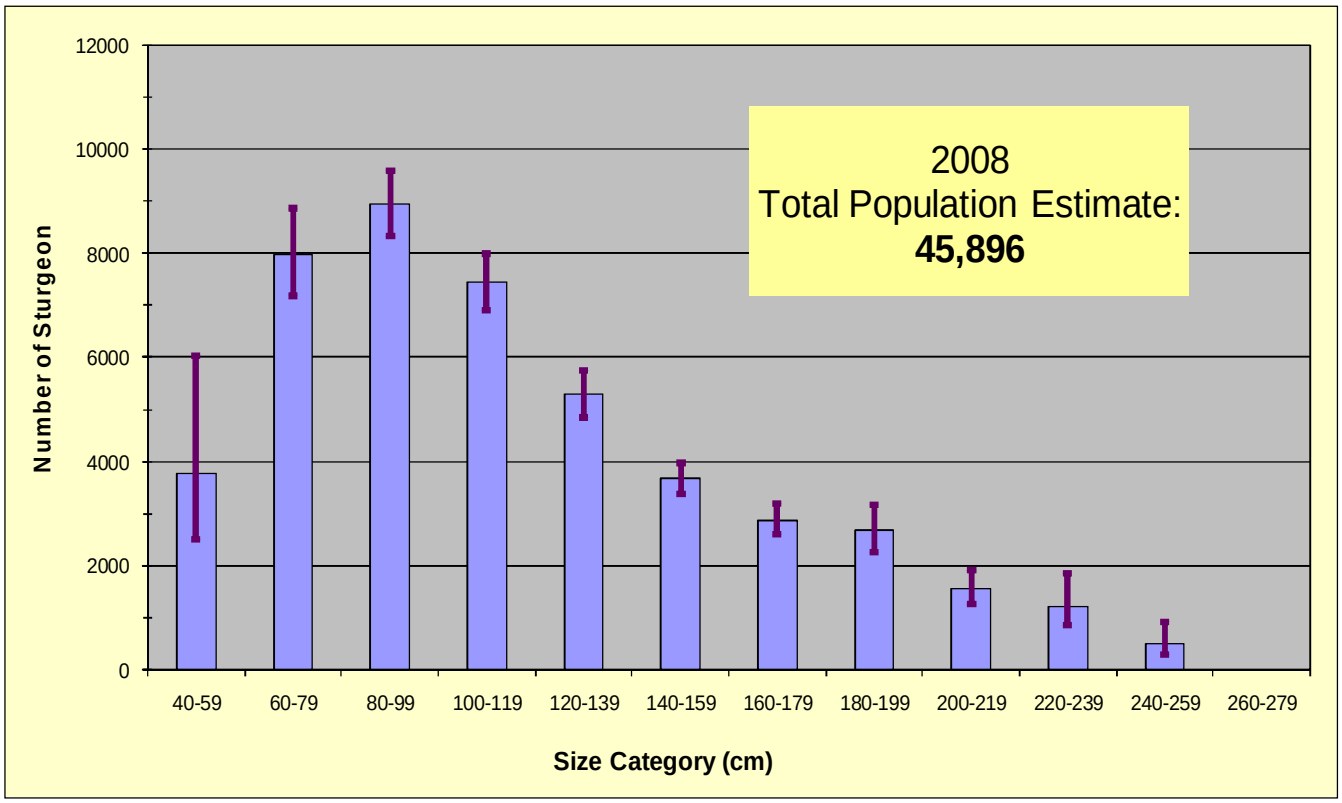
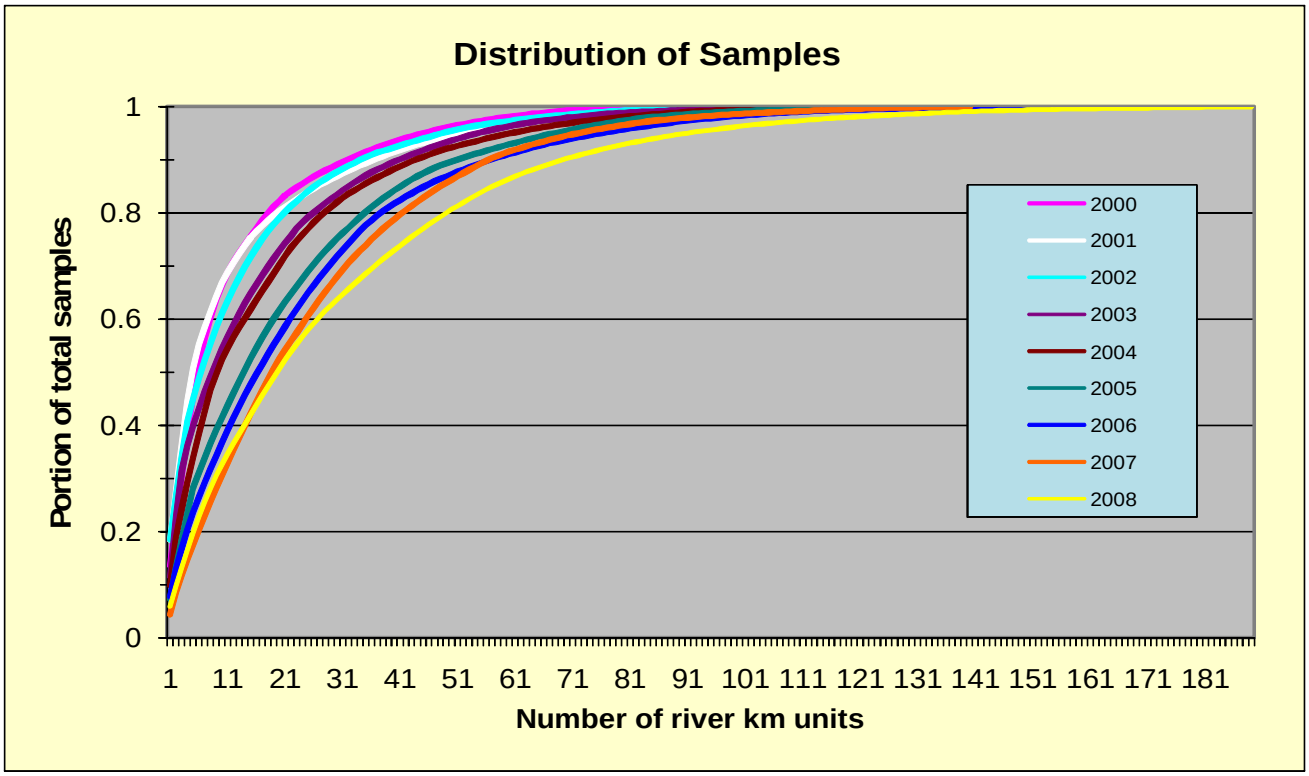


Figure 5. Mean population estimates of white sturgeon in the lower Fraser River, by 20-cm size category, as of 1 January 2008. Ranges show the 95% Highest Probability Density. All sampling regions are combined for this analysis.



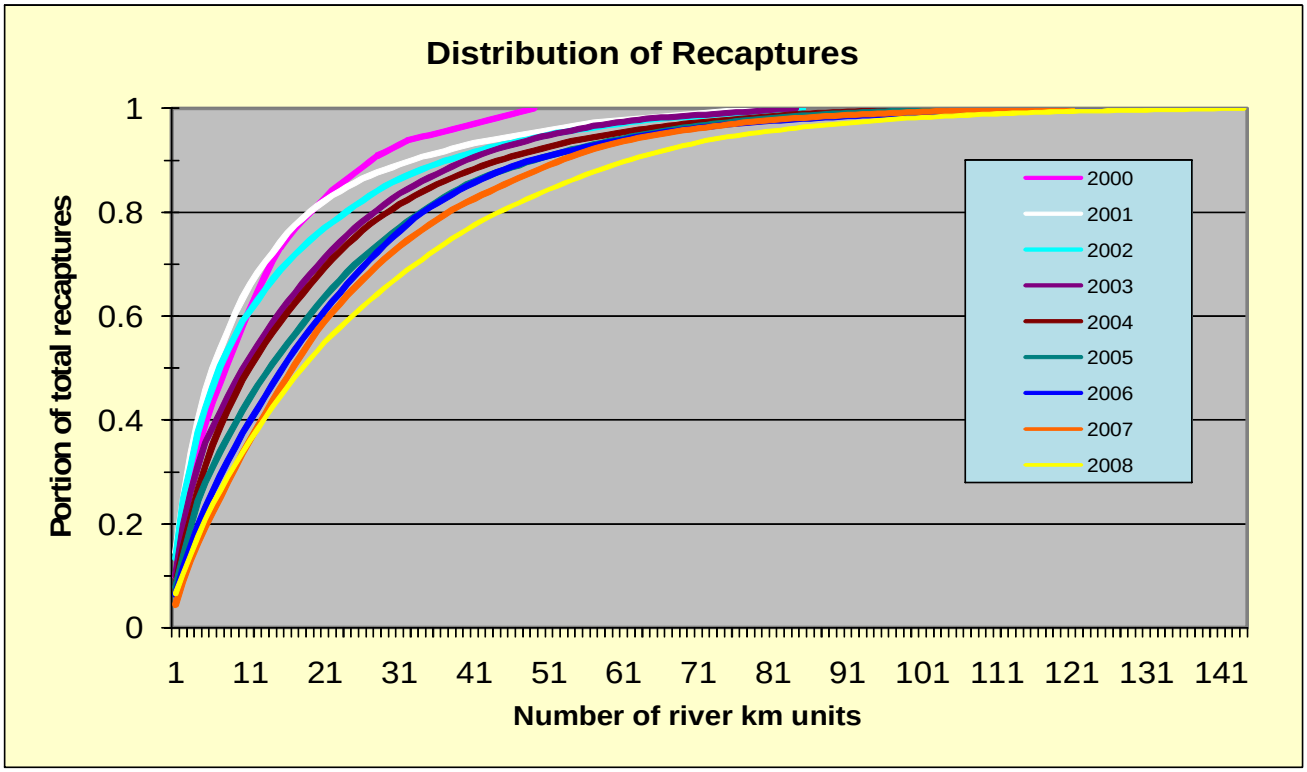


Figure 6. Illustrations of the degree to which the distribution (geographic spread within the study area, in "river km units") of applied sampling effort, and the respective distribution of recapture events, has changed from 2000 to 2008. Curves closer to the y-axis indicate that fewer sampling locations (river km units) comprise a larger portion of the respective total sturgeon sample (top chart) or recaptured sturgeon (bottom chart) than curves farther from the y-axis.

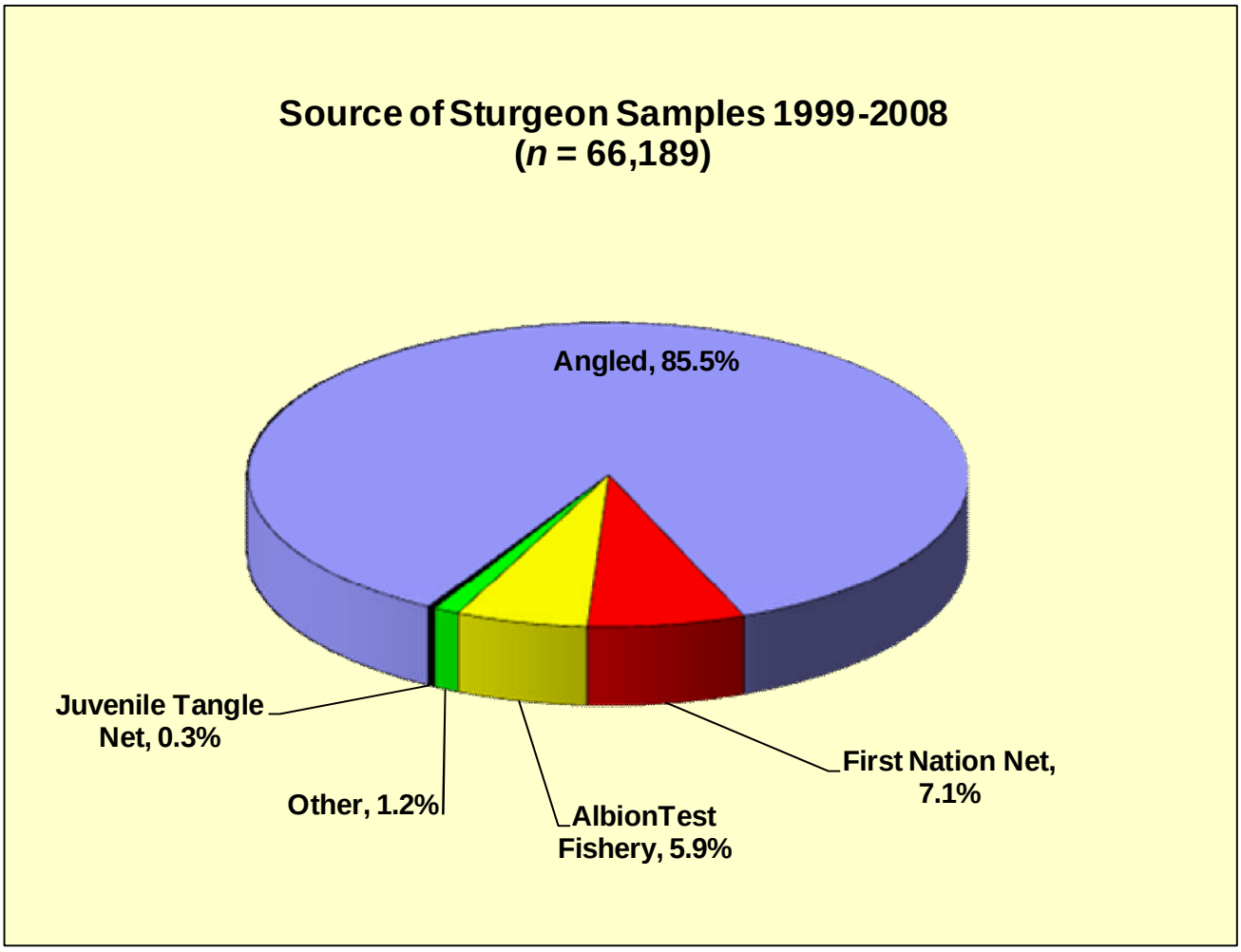
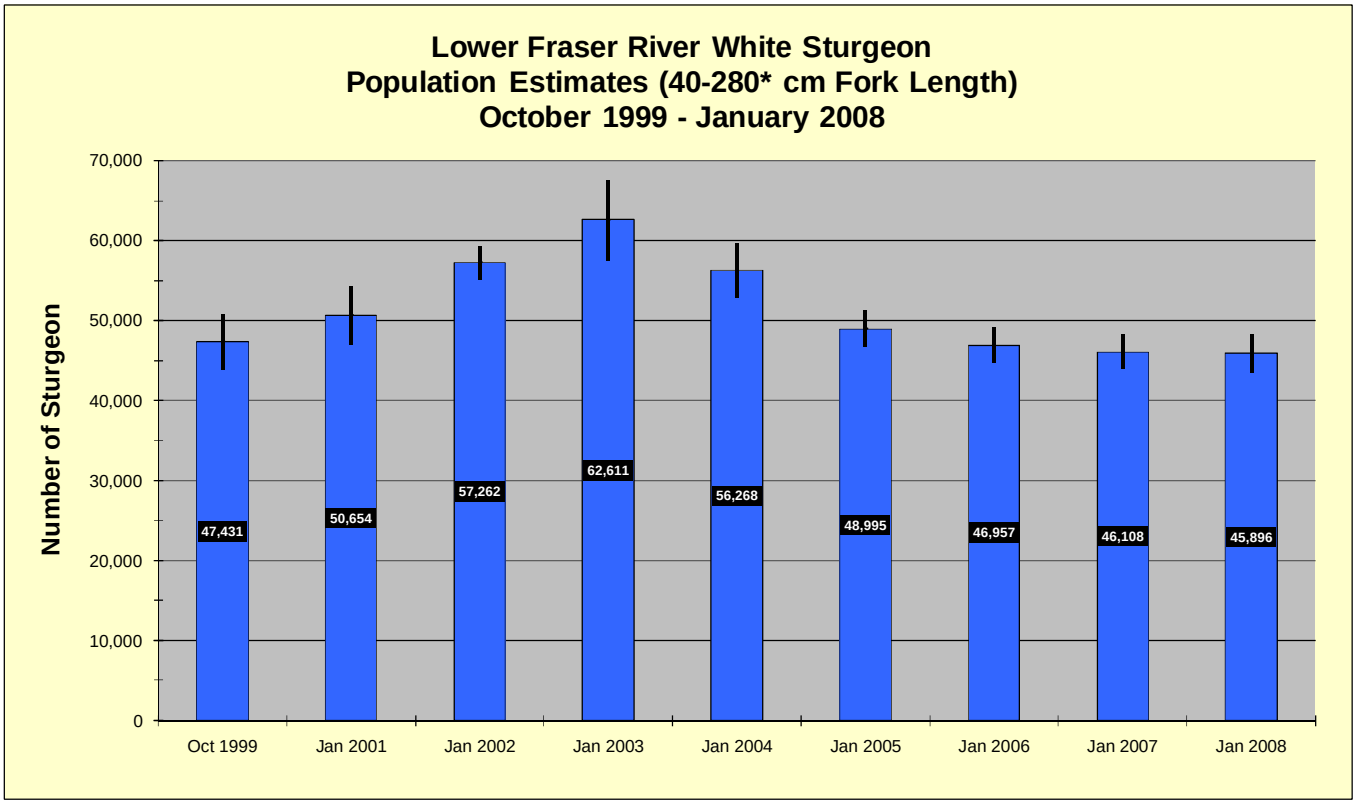


Figure 7. Sources of sturgeon samples that have contributed to the FRSCS Lower Fraser White Sturgeon Monitoring and Assessment Program from 1999-2008 (total sample of scanned sturgeon through December 2008 was 66,189).



Note: The estimates for Jan 2001 and Jan 2003 are date mid-points for population estimates (before and after January 2002; see Table 9, Nelson et al. 2004)
* The1999, 2001, 2002, and 2003 estimates do not include fish over 220 cm
* The Jan 2004 estimate is the mid-point of 2003-2004 (Jan 2004) and includes fish from 220-240 cm FL (303 fish)
* The Jan 2005 estimate is the mid-point of 2004-2005 (Jan 2005) and includes fish from 220-260 cm FL (545 fish)
* The Jan 2006 estimate is the mid-point of 2005-2006 (Jan 2006) and includes fish from 220-260 cm FL (874 fish)
* The Jan 2007 estimate is the mid-point of 2006-2007 (Jan 2007) and includes fish from 220-280 cm FL (2012 fish)
* The Jan 2008 estimate is the mid-point of 2007-2008 (Jan 2008) and includes fish from 220-260 cm FL (1713 fish)

Figure 8. Comparison of mean annual population estimates of lower Fraser River white sturgeon, 1999-2008. Confidence ranges show the 95% Highest Probability Density. All sampling regions are combined for this analysis.

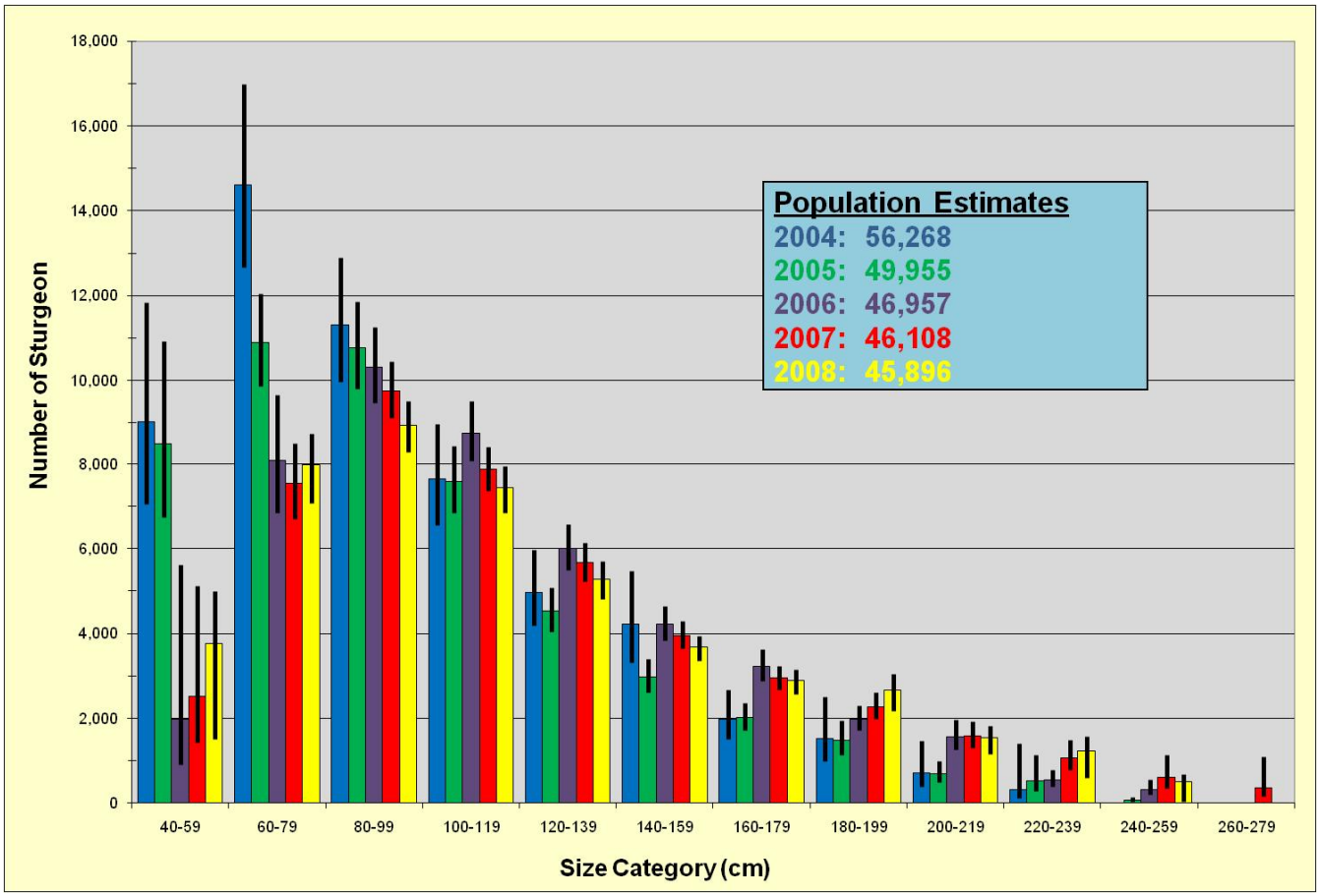


Figure 9. Comparison of mean population estimates of white sturgeon in the lower Fraser River, by 20-cm size category, for assessment years 2004 through 2008. Ranges show the 95% Highest Probability Density.

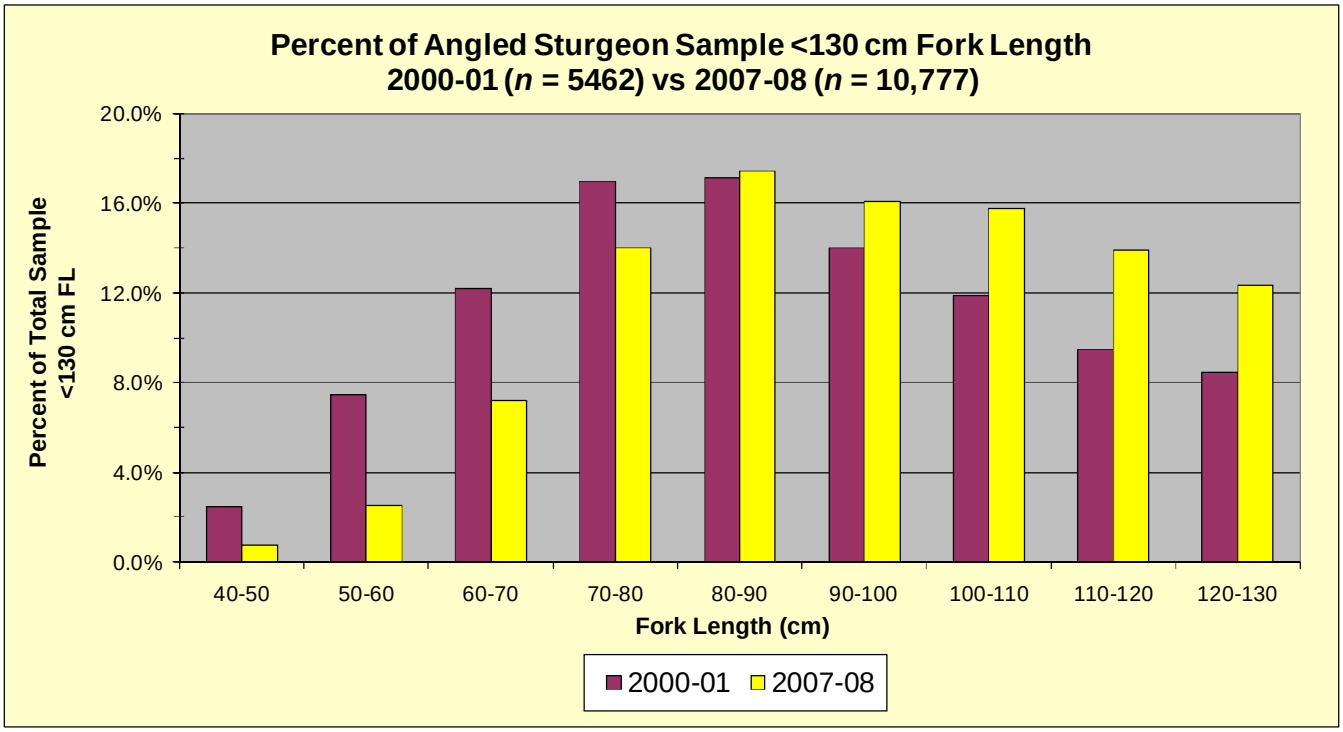


Figure 10. Illustration of the comparative percentages of sampled sturgeon less than 130 cm FL, by 10-cm size groups, captured by angling in 2000-01 and 2007-08.

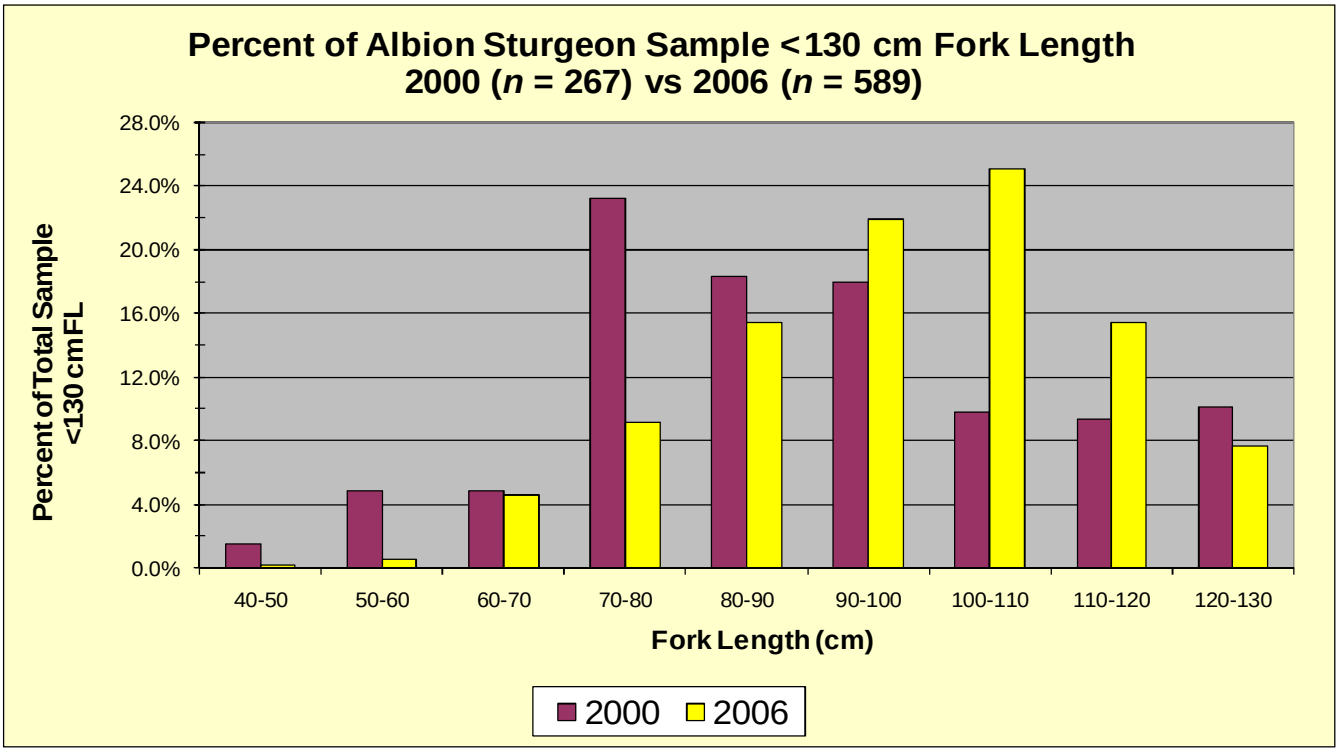


Figure 11. Illustration of the comparative percentages of sampled sturgeon less than 130 cm FL, by 10-cm size groups, captured in the Albion Test Fishery in 2000 and 2006. A comparison with 2008 data was not possible because the Albion Test Fishery did not operate over the full (traditional) sampling period in 2008.

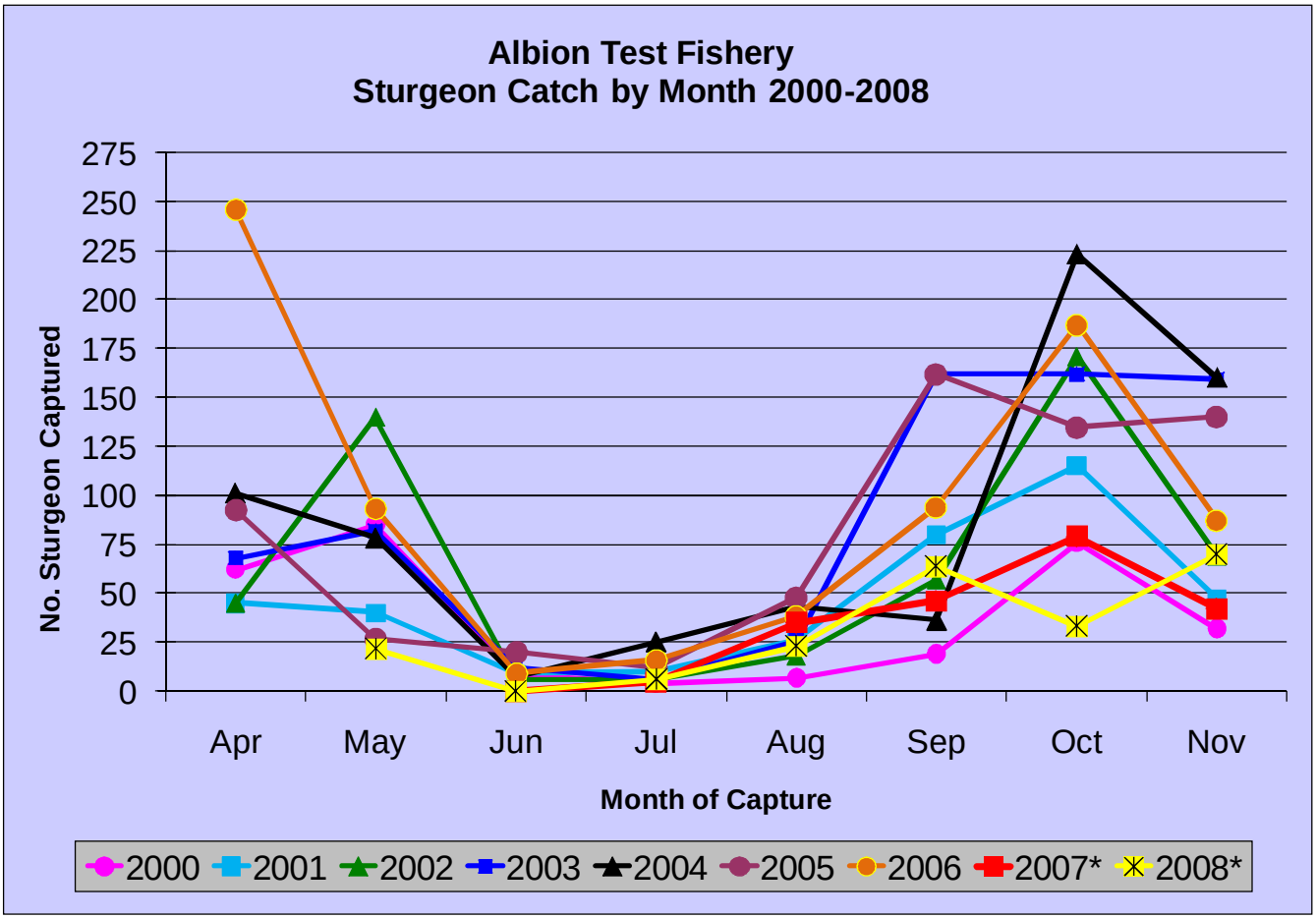


Figure 12. Comparison of the number of white sturgeon (all sizes) captured in the Albion Test Fishery, by like month, in 2000-2008. The Albion Test Fishery (a test gill net) applies relatively similar levels of effort (two 20-min sets during high slack tide) on a daily basis from April-November at the same location (sampling region B, rkm 58) in the mainstem Fraser River.
* In 2007 the test fishery operated from 18 June through 30 November; in 2008 the test fishery operated from 5 May through 30 November.

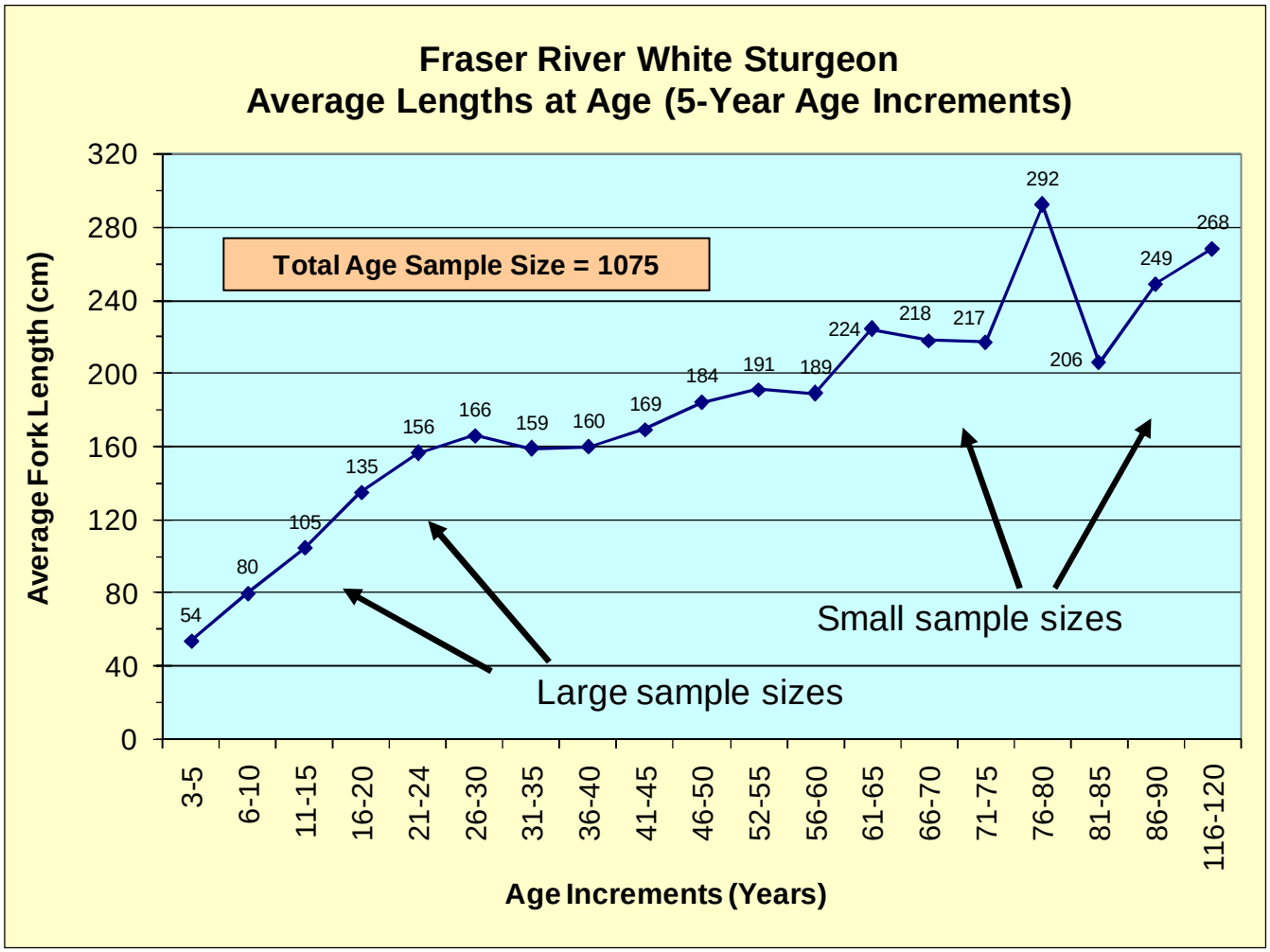


Figure 13. Average lengths at estimated age for Fraser River white sturgeon sampled from 1995-99 (data provided by Ted Down, BC Fisheries). Age data were derived from pectoral fin ray analysis and include samples from throughout the Fraser River watershed.

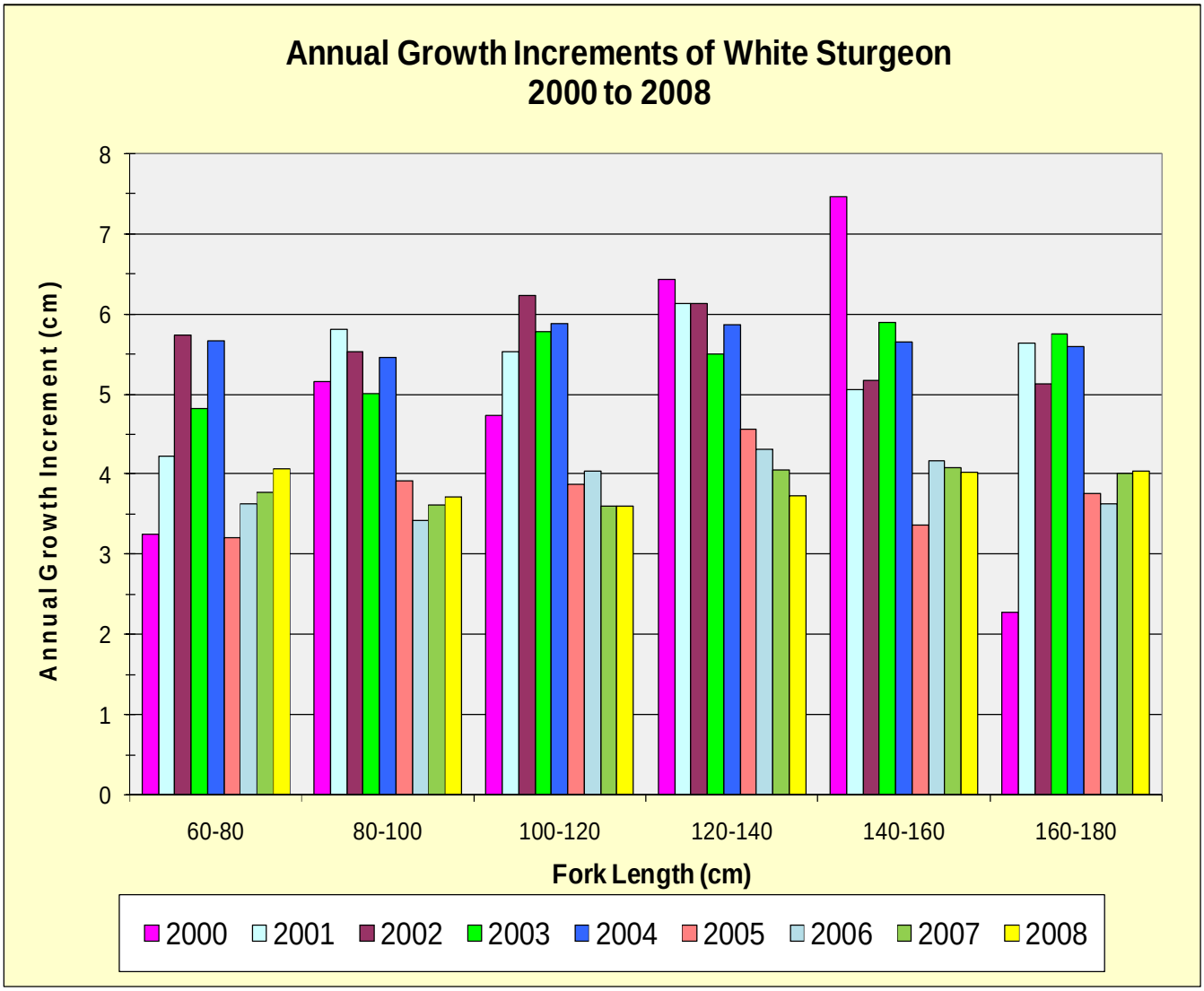


Figure 14. Comparison of average annual growth increments of white sturgeon (cm), by 20-cm size groups, from 2000 through 2008. Annual growth was determined from measurements obtained from individual, tagged sturgeon that were subsequently recaptured.

APPENDIX A

Sturgeon biosampling, tagging, and recapture data entry form

FRASER RIVER STUGEON CONSERVATION SOCIETY FAX to Jim Rissling: 604-792-2630 (phone: 604-792-4368)

WHITE STURGEON BIOSAMPLING, TAGGING, AND MARK- RECAPTURE RECORDS Page: _____ of _____

Name/Phone Number of Person that Recorded Data: _____

Phone No: _____

Date (dd/mmm/yy _____ Sampling Area: _____ Weather: _____ No. Passengers: _____

Vessel Information: Vessel Name _____ Launch Location _____ Launch Time: _____ Return Time: _____

Angling/Sampling Effort	Start Time	End Time	Total Minutes	Start Time	End Time	Total Minutes	Start Time	End Time	Total Minutes	Grand Total (Minutes)
Rod/Gear 1 (Name) _____										
Rod/Gear 2 (Name) _____										
Rod/Gear 3 (Name) _____										
Rod/Gear 4 (Name) _____										

COMPLETE FOR ALL STURGEON CAPTURED						TAGS APPLIED	RECAPTURES	tn2OTHER	
Fish No.	**River Km (Captured)**	**Was the Sturgeon Scanned? (Yes/No)**	**Fork Length (cm)**	**Girth (cm)**	**Deformity / Wound Code[1]**	**Verified (Scanned at release) Tag Number**	**Tag Number**	**Condition code for sturgeon at release[2]**	**Comments**

Comments:

[1]Deformity/wound/scar codes: DEF = physical deformity; BLED = bleeding; BITE = seal bite; CUT = slice or tear; NET = net scar; OTHER = other (note in comments)

[2]Condition codes: 1 = vigorous, no bleeding; 2 = vigorous, bleeding; 3 = lethargic, no bleeding; 4 = lethargic, bleeding; 5 = dead

APPENDIX B

Lower Fraser River sturgeon sampling, tagging, and recapture summary, by month and year, 1999-2008.

Appendix B. Lower Fraser River sturgeon sampling, tagging, and recapture summary, by month and year, 1999-2008.

Month	No. Scanned (All)*	No. Released **With** Tag (Head)	No. Scanned, **Not** Tagged, **Not** Recaptured	No. Recaptured (Head Tag)	Mark Rate (%)	Year	No. Scanned (All)	No. Released **With** Tag (Head)	No. Scanned, **Not** Tagged, **Not** Recaptured	No. Recaptured (Head Tag)	Mark Rate (%)
Oct-99	96	89	7	0	0.0%						
Nov-99	206	182	24	0	0.0%						
Dec-99	157	143	14	0	0.0%	**1999**	459	414	45	0	**0.0%**
Jan-00	38	37	1	0	0.0%						
Feb-00	148	135	6	7	4.7%						
Mar-00	232	191	33	8	3.4%						
Apr-00	286	265	12	9	3.1%						
May-00	380	351	17	12	3.2%						
Jun-00	279	257	15	7	2.5%						
Jul-00	753	695	27	31	4.1%						
Aug-00	471	424	23	24	5.1%						
Sep-00	469	437	5	27	5.8%						
Oct-00	711	629	38	44	6.2%						
Nov-00	561	506	12	43	7.7%						
Dec-00	57	45	6	6	10.5%	**2000**	4385	3972	195	218	**5.0%**
Jan-01	178	165	0	13	7.3%						
Feb-01	152	134	0	18	11.8%						
Mar-01	299	250	0	49	16.4%						
Apr-01	423	340	30	53	12.5%						
May-01	410	361	5	44	10.7%						
Jun-01	509	427	8	74	14.5%						
Jul-01	434	357	14	63	14.5%						
Aug-01	844	717	20	107	12.7%						
Sep-01	582	484	4	94	16.2%						
Oct-01	851	711	26	114	13.4%						
Nov-01	512	417	6	89	17.4%						
Dec-01	316	197	78	41	13.0%	**2001**	5510	4560	191	759	**13.8%**
Jan-02	117	60	46	11	9.4%						
Feb-02	147	45	83	19	12.9%						
Mar-02	138	65	53	20	14.5%						
Apr-02	251	107	102	42	16.7%						
May-02	343	173	114	56	16.3%						
Jun-02	225	131	36	58	25.8%						
Jul-02	730	529	87	114	15.6%						
Aug-02	866	622	78	166	19.2%						
Sep-02	396	149	151	96	24.2%						
Oct-02	1149	582	368	199	17.3%						
Nov-02	531	187	232	112	21.1%						
Dec-02	157	97	31	29	18.5%	**2002**	5050	2747	1381	922	**18.3%**
Jan-03	72	55	11	6	8.3%						
Feb-03	39	20	12	7	17.9%						
Mar-03	131	89	28	14	10.7%						
Apr-03	451	290	77	84	18.6%						
May-03	553	383	84	86	15.6%						
Jun-03	310	180	73	57	18.4%						
Jul-03	474	311	92	71	15.0%						
Aug-03	674	473	89	112	16.6%						
Sep-03	1132	759	134	239	21.1%						
Oct-03	835	586	68	181	21.7%						
Nov-03	659	395	132	132	20.0%						
Dec-03	114	97	1	16	14.0%	**2003**	5444	3638	801	1005	**18.5%**
Jan-04	144	122	0	22	15.3%						
Feb-04	316	272	3	41	13.0%						
Mar-04	145	114	3	28	19.3%						
Apr-04	743	575	7	161	21.7%						
May-04	589	447	4	138	23.4%						
Jun-04	430	314	7	109	25.3%						
Jul-04	493	362	5	126	25.6%						
Aug-04	656	434	44	178	27.1%						
Sep-04	840	583	14	243	28.9%						
Oct-04	1695	917	310	468	27.6%						
Nov-04	1092	603	205	284	26.0%						
Dec-04	97	64	6	27	27.8%	**2004**	7240	4807	608	1825	**25.2%**

(continued)

(*continued from 2004*)

Appendix B. Lower Fraser River sturgeon sampling, tagging, and recapture summary, by month and year, 1999-2008.

Month	No. Scanned (All)*	No. Released **With** Tag (Head)	No. Scanned, **Not** Tagged, **Not** Recaptured	No. Recaptured (Head Tag)	Mark Rate (%)	Year	No. Scanned (All)	No. Released **With** Tag (Head)	No. Scanned, **Not** Tagged, **Not** Recaptured	No. Recaptured (Head Tag)	Mark Rate (%)
Jan-05	28	23	0	6	21.4%						
Feb-05	221	178	0	43	19.5%						
Mar-05	288	222	1	65	22.6%						
Apr-05	831	572	20	239	28.8%						
May-05	475	282	28	165	34.7%						
Jun-05	738	439	16	283	38.3%						
Jul-05	738	480	20	238	32.2%						
Aug-05	1425	788	155	482	33.8%						
Sep-05	1835	768	415	652	35.5%						
Oct-05	2092	966	319	807	38.6%						
Nov-05	1076	420	321	335	31.1%						
Dec-05	286	137	91	58	20.3%	**2005**	10033	5275	1386	3373	**33.6%**
Jan-06	83	68	0	15	18.1%						
Feb-06	2	2	0	0	0.0%						
Mar-06	116	76	3	37	31.9%						
Apr-06	885	582	8	295	33.3%						
May-06	439	254	10	175	39.9%						
Jun-06	274	161	6	107	39.1%						
Jul-06	523	289	26	208	39.8%						
Aug-06	810	451	32	327	40.4%						
Sep-06	1297	674	9	614	47.3%						
Oct-06	2566	1338	14	1214	47.3%						
Nov-06	1863	1054	38	770	41.3%						
Dec-06	171	116	0	55	32.2%	**2006**	9029	5065	146	3817	**42.3%**
Jan-07	59	45	0	14	23.7%						
Feb-07	122	83	0	39	32.0%						
Mar-07	558	359	1	198	35.5%						
Apr-07	602	363	5	234	38.9%						
May-07	326	154	5	167	51.2%						
Jun-07	466	222	2	242	51.9%						
Jul-07	832	378	3	451	54.2%						
Aug-07	1456	614	6	836	57.4%						
Sep-07	2666	1243	36	1387	52.0%						
Oct-07	2288	1091	17	1180	51.6%						
Nov-07	1219	614	17	588	48.2%						
Dec-07	43	27	0	16	37.2%	**2007**	10637	5193	92	5352	**50.3%**
Jan-08	60	42	0	18	30.0%						
Feb-08	26	18	1	7	26.9%						
Mar-08	118	66	5	47	39.8%						
Apr-08	464	233	3	228	49.1%						
May-08	495	199	5	291	58.8%						
Jun-08	442	189	4	249	56.3%						
Jul-08	576	240	10	326	56.6%						
Aug-08	877	354	12	511	58.3%						
Sep-08	1455	616	16	823	56.6%						
Oct-08	2014	896	12	1106	54.9%						
Nov-08	1789	894	14	881	49.2%						
Dec-08	83	51	0	32	38.6%	**2008**	8399	3798	82	4519	**53.8%**
Totals	**66,186**	**39,469**	**4,927**	**21,790**	**32.9%**	**1999-2008**	**66,186**	**39,469**	**4,927**	**21,790**	**32.9%**

* Lower Fraser River samples only for sturgeon captured downstream of rkm 188 (Yale).