

Introduction

Data from the Department of Fish and Game's (CDFG) adult striped bass (ASB) creel survey were used to generate this report. Data were from sampling years 1976 and 1979 to 2008. Note: Only commercial passenger fishing vessels (party boats) were surveyed in 1977 and 1978, and no electronic files exist for 1969¹ to 1975.

The creel survey — by design and unlike conventional creel surveys — existed only for the expressed purpose of observing striped bass for the population study, and thus was biased (positively) toward catch of successful² anglers. Creel clerks were trained to target successful anglers, and catch was strictly limited to only those striped bass observed (seen) by creel clerks (i.e., striped bass reported by an angler as having been released were not included in catch).

The data used were housed in database “ASB Creel Census Database.mdb”. Calculations and graphics were generated using R software (v 2.14.0) with the database query “qryStripedBassCreel”. Calculations were completed in November 2011 (J. DuBois). For metadata about the data and database, refer to “ASB Metadata for ASB Creel Databases.doc”.

Catch per angler was calculated as $\sum \text{catch} \div \sum \text{angler}$ per each group of anglers encountered by a creel clerk on a given day. A group could be one angler (solo) or could be many (e.g., 50) if the creel clerk was surveying a party boat, for example. Thus, the creel clerk recorded totals for the group as a whole, not each angler within the group. The annual average (with replicate = group) was calculated using the following criteria:

1. Successful solo (single) anglers;
2. All solo anglers;
3. All anglers, excluding trips where catch/angler > 2 and anglers were on a party boat; and
4. All anglers (essentially, all data).

Standard error (SE) was calculated for each average. Sample size (on which the average and SE were calculated; N) was the number of groups surveyed within a year, and Days was the number of calendar days on which sampling occurred within a year.

Successful solo anglers

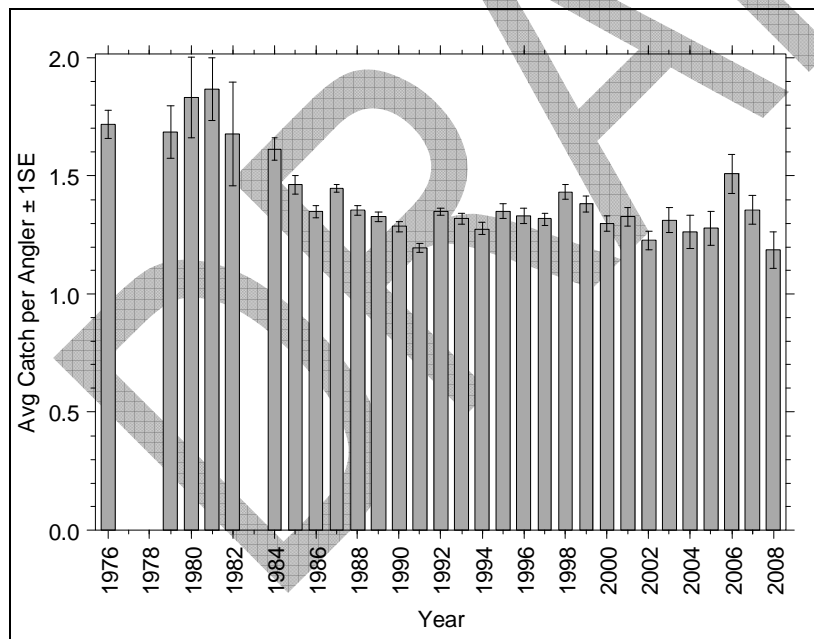
For successful solo anglers, catch/angler was never less than about 1.2 ± 0.08 (2008) and never more than about 1.9 ± 0.13 (1981; Table 1 and Figure 1). Between 1985 and 2008, the average catch/angler was about 1.5 or less. No successful solo anglers were encountered in 1983.

¹ The year in which the CDFG adult striped bass program began

² Defined as an angler who caught and kept at least one fish (i.e., catch > 0)

Table 1. ASB creel data for successful solo anglers

Year	Average	SE	N	Days
1976	1.716	0.060	211	86
1977	no data			
1978	no data			
1979	1.684	0.112	57	44
1980	1.833	0.172	48	34
1981	1.867	0.133	45	34
1982	1.676	0.219	37	22
1983	no data			
1984	1.612	0.048	103	53
1985	1.464	0.040	220	70
1986	1.349	0.025	461	111
1987	1.447	0.016	1,177	157
1988	1.355	0.020	591	175
1989	1.326	0.019	629	168
1990	1.285	0.021	557	156
1991	1.195	0.021	390	112
1992	1.349	0.014	1,336	190
1993	1.320	0.024	419	128
1994	1.276	0.025	322	135
1995	1.350	0.032	254	115
1996	1.331	0.031	239	112
1997	1.317	0.027	338	125
1998	1.431	0.029	332	114
1999	1.381	0.033	236	104
2000	1.299	0.032	221	110
2001	1.325	0.040	166	78
2002	1.227	0.039	119	70
2003	1.311	0.054	74	45
2004	1.263	0.072	38	31
2005	1.279	0.071	61	42
2006	1.509	0.082	55	35
2007	1.355	0.061	62	39
2008	1.185	0.076	27	12

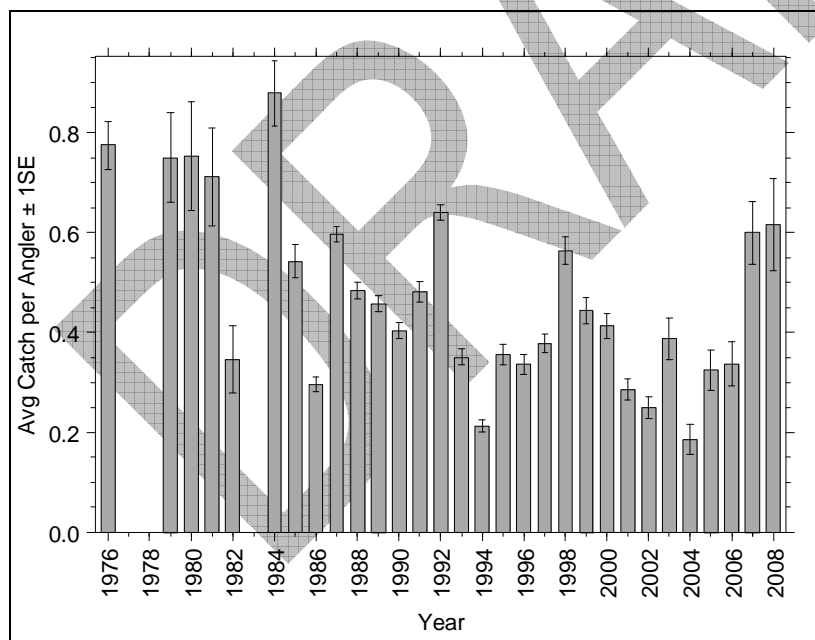
**Figure 1. Time series of average catch per angler ($\pm 1SE$) from ASB creel data for successful solo anglers****All solo anglers**

For all solo anglers (irrespective of catch), average catch/angler was never less than about $0.2^3 \pm 0.03$ (2004) and never more than about 0.9 ± 0.06 (1984; Table 2 and Figure 2). Average catch/angler varied annually but between 1986 and 2008 was never greater than about 0.6.

³ 1983 average was 0, but N=1

Table 2. ASB creel data for all (successful or not) solo anglers

Year	Average	SE	N	Days
1976	0.775	0.048	468	103
1977	no data			
1978	no data			
1979	0.750	0.089	128	72
1980	0.752	0.109	117	59
1981	0.712	0.098	137	76
1982	0.346	0.068	179	62
1983	-	N/A	1	1
1984	0.878	0.064	190	75
1985	0.543	0.033	593	97
1986	0.296	0.013	2,100	138
1987	0.597	0.015	2,854	179
1988	0.484	0.017	1,656	239
1989	0.458	0.016	1,820	218
1990	0.404	0.016	1,774	210
1991	0.482	0.021	966	168
1992	0.640	0.014	2,815	263
1993	0.351	0.016	1,577	214
1994	0.213	0.012	1,926	252
1995	0.355	0.021	965	222
1996	0.336	0.020	946	215
1997	0.378	0.019	1,177	218
1998	0.563	0.027	843	173
1999	0.444	0.026	734	173
2000	0.414	0.025	694	177
2001	0.286	0.022	769	170
2002	0.250	0.022	585	161
2003	0.388	0.041	250	93
2004	0.186	0.030	258	64
2005	0.325	0.040	240	84
2006	0.337	0.044	246	105
2007	0.600	0.063	140	64
2008	0.615	0.092	52	20

**Figure 2. Time series of average catch per angler ($\pm 1SE$) from ASB creel data for all (successful or not) solo anglers****Comparison (All Solo Anglers versus All Successful Solo Anglers)**

Annual average catch/angler for all solo anglers was always less than annual average catch/angler for successful solo anglers, as evidenced by all points being above the diagonal line through the origin ($x=0, y=0$; Figure 3). Correlation was positive ($r=0.64$, $p<0.05$) but the ratio (of the two annual averages) was not consistent (e.g., always 1 to 0.5).

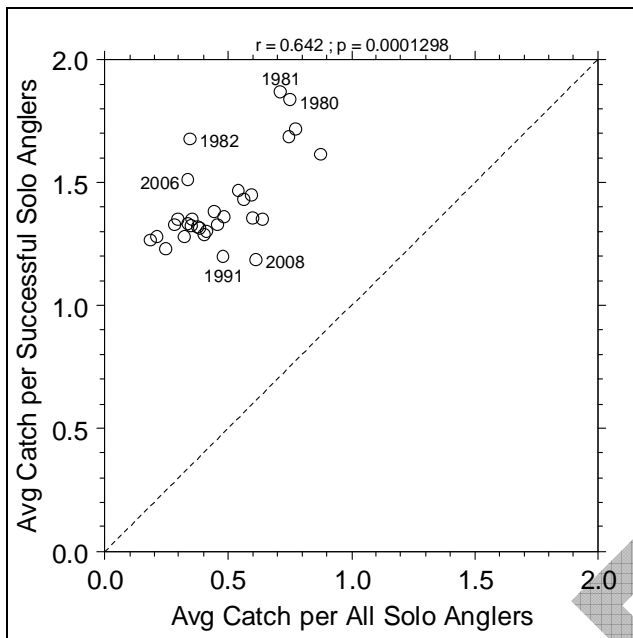


Figure 3. Scatterplot of average catch per solo anglers (successful or not) versus average catch per successful solo angler

All Anglers (excluding encounters by anglers on a party boat where catch/angler > 2)

Catch per angler exceeded 2 — the daily bag limit for most of the time series in question⁴ — in certain locations during some years (Figure 4). This was likely the result of incomplete recording of total number of anglers fishing on party boats. To mitigate this error, average catch/angler was calculated using all data, except where catch/angler exceeded 2 for anglers fishing on party boats (Table 3, Figure 5).

Average catch/angler was never less than about 0.22 ± 0.01 (1994) and never more than about 0.99 ± 0.05 (1983⁵; Table 3 and Figure 5). From 1985 to 2008, average catch/angler was about 0.4.

⁴ Prior to 01-Mar-1982, daily bag limit was 3

⁵ Low sample size (N=194) relative to every other year sampled

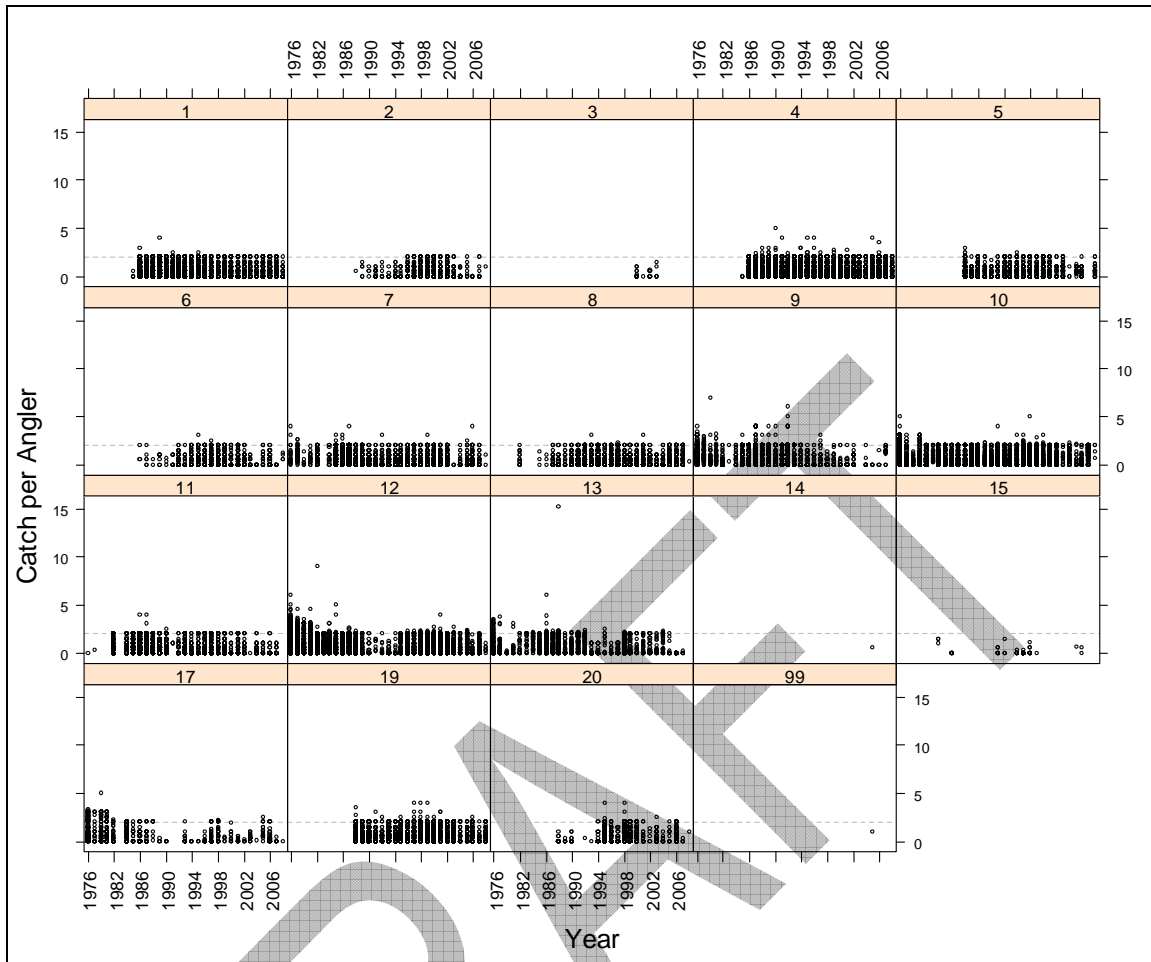


Figure 4. Catch/angler (includes all anglers) per each location and year for each group; dashed grey line is catch/angler = 2; note: years 1977 and 1978 not included (not sampled); see Appendix 1 for description of location codes (01 – 20); code 99 = Moors Landing

Table 3. ASB creel data less catch per angler >2 where anglers were fishing on party boats

Year	Average	SE	N	Days
1976	0.535	0.009	7,405	141
1977	no data			
1978	no data			
1979	0.496	0.018	1,674	117
1980	0.470	0.022	1,391	107
1981	0.591	0.022	1,360	115
1982	0.337	0.013	2,185	107
1983	0.991	0.052	194	88
1984	0.743	0.018	1,680	114
1985	0.404	0.010	3,951	114
1986	0.275	0.005	11,908	142
1987	0.452	0.006	13,567	189
1988	0.385	0.006	10,612	276
1989	0.400	0.006	10,388	234
1990	0.343	0.006	9,215	224
1991	0.352	0.008	4,562	230
1992	0.355	0.006	11,070	310
1993	0.280	0.005	9,007	252
1994	0.224	0.004	10,659	262
1995	0.366	0.008	6,208	254
1996	0.365	0.008	5,909	246
1997	0.354	0.007	7,038	251
1998	0.633	0.010	5,894	245
1999	0.463	0.008	6,525	246
2000	0.443	0.008	6,290	250
2001	0.258	0.007	5,605	241
2002	0.308	0.009	3,645	243
2003	0.411	0.013	2,242	134
2004	0.284	0.015	1,203	121
2005	0.434	0.014	1,937	169
2006	0.402	0.014	1,938	179
2007	0.612	0.021	1,146	142
2008	0.567	0.032	401	42

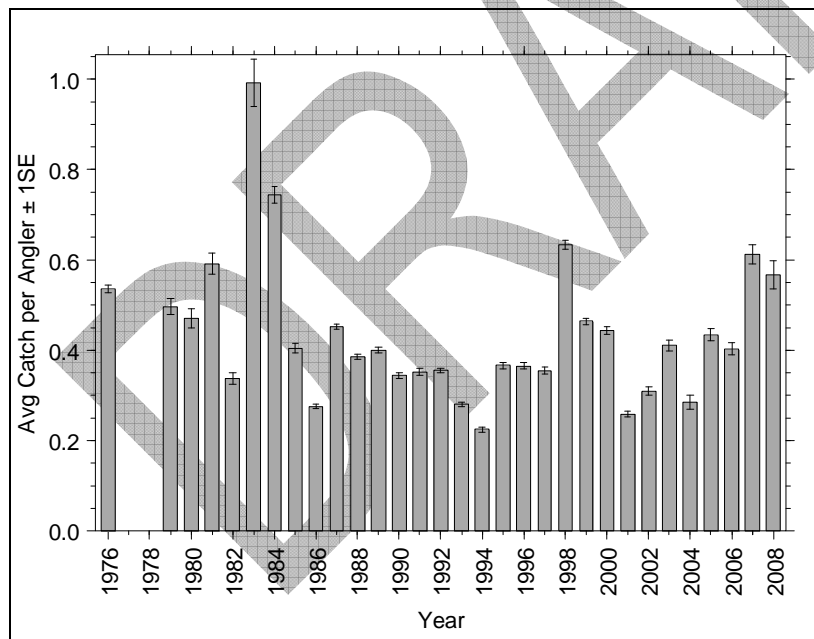


Figure 5. Time series of average catch per angler ($\pm 1SE$) from ASB creel data less catch per angler >2 where anglers were fishing on party boats

All Angler Data

Average catch/angler was calculated using all creel data where both catch (in database field C_CATCH) and angler (in database field C_ANGLER) data were available (Table 4 and Figure 6). Average catch/angler was never less than about 0.22 ± 0.01 (1994) and never more than

about 1.00 ± 0.05 (1983⁶; Table 4 and Figure 6). From 1985 to 2008, average catch/angler was about 0.4.

Table 4. ASB creel data (includes all anglers)

Year	Average	SE	N	Days
1976	0.586	0.010	7,574	141
1977	no data			
1978	no data			
1979	0.592	0.020	1,752	117
1980	0.484	0.022	1,400	107
1981	0.634	0.023	1,388	115
1982	0.341	0.013	2,187	107
1983	0.996	0.052	195	88
1984	0.748	0.018	1,686	114
1985	0.404	0.010	3,952	114
1986	0.277	0.005	11,915	142
1987	0.453	0.006	13,573	189
1988	0.388	0.006	10,619	276
1989	0.400	0.006	10,388	234
1990	0.343	0.006	9,216	224
1991	0.353	0.008	4,566	232
1992	0.356	0.006	11,074	310
1993	0.281	0.005	9,010	252
1994	0.224	0.004	10,660	262
1995	0.366	0.008	6,209	254
1996	0.365	0.008	5,910	246
1997	0.357	0.007	7,046	251
1998	0.636	0.010	5,906	245
1999	0.466	0.008	6,534	246
2000	0.445	0.008	6,296	250
2001	0.258	0.007	5,607	241
2002	0.310	0.009	3,648	243
2003	0.413	0.013	2,244	134
2004	0.291	0.016	1,207	122
2005	0.439	0.014	1,943	170
2006	0.402	0.014	1,938	179
2007	0.613	0.021	1,147	142
2008	0.567	0.032	401	42

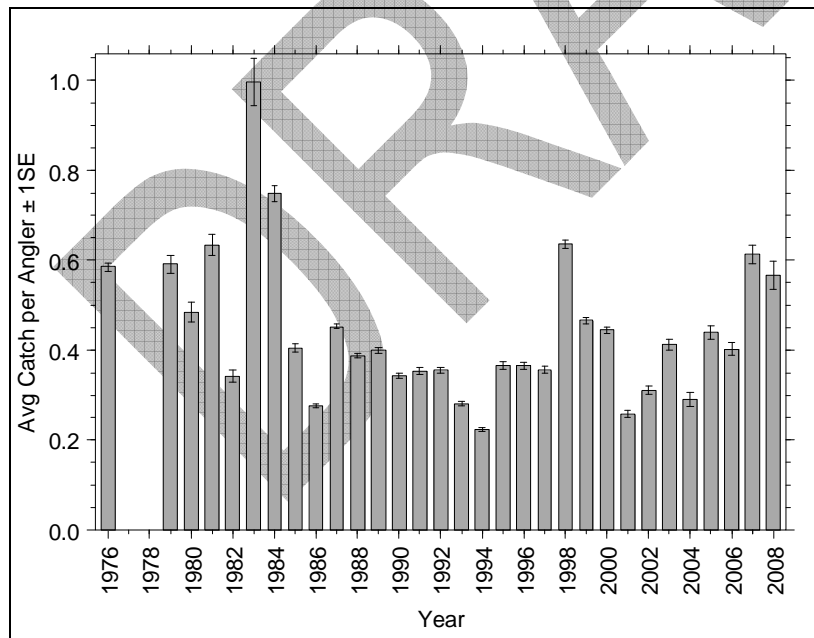


Figure 6. Time series of average catch per angler (± 1 SE) from ASB creel data (for which catch/angler could be calculated)

⁶ Low sample size (N=195) relative to every other year sampled

Comparison (All Anglers versus All Anglers — less catch/angler >2 from party boats)

Annual average catch/angler for all anglers was equivalent to annual average catch/angler for all anglers (less catch/angler > 2 from party boats), as evidenced by nearly all points being on the diagonal line through the origin ($x=0,y=0$; Figure 7). Correlation was positive ($r=0.99$, $p<0.05$) and — along with the alignment of the points on the diagonal line — indicated the ratio (of the two annual averages) was pretty much 1 to 1. Thus, inclusion of catch/angler >2 from party boats did not affect annual averages.

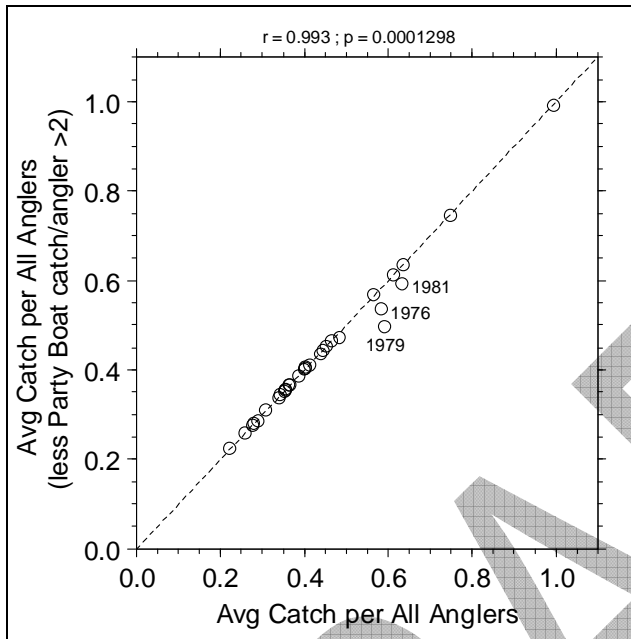


Figure 7. Scatterplot of average catch per all anglers versus average catch per all anglers (less party boat catch/angler >2)

Appendix 1. Recapture location code descriptions

Recapture Location Code	Recapture Location Description
01	Lower San Joaquin Delta - Broad Slough, Sherman Lake, San Joaquin River to Mokelumne River
02	Upper San Joaquin Delta - area bounded by San Joaquin River from Mokelumne River to Mossdale, Old River, and Salmon Slough
03	San Joaquin River - above Mossdale
04	Sacramento River - Sherman Island to Courtland
05	Sacramento River - Courtland to the mouth of the Feather River, including the American River to Nimbus Dam
06	Mokelumne River, Georgiana Slough, and sloughs north of the San Joaquin River and east of the Mokelumne River
07	Sacramento River - Sherman Island to SP Railroad Bridge (Martinez) - includes Suisun and Honker bays
08	Montezuma and Suisun Sloughs
09	Carquinez Strait - SP Railroad Bridge (Martinez) to Carquinez Bridge
10	San Pablo Bay - Davis Point to Points San Pablo and San Pedro, east to Carquinez Bridge
11	Napa River and sloughs north of San Pablo Bay, west to Sonoma Creek
12	North San Francisco Bay - bounded on the west by GG Bridge and on the south by Bay Bridge
13	Pacific Ocean
14	Unknown
15	Novato Creek, Petaluma Creek, and tributaries
16	Tomaes Bay
17	South San Francisco Bay - south of Bay Bridge
18	San Francisco Bay - unknown north or south
19	Sacramento River and tributaries - above the mouth of the Feather River
20	Feather River and tributaries, Rio Oso, and the Yuba River

Recapture Location Description taken from CDFG Striped Bass Creel Census instructions.