

MARINE RECREATIONAL INFORMATION PROGRAM

FY 2011 Final Report:

Oregon Ocean Recreational Boat Survey (ORBS): Supplemental Sampling Evaluation of Bottomfish Effort and Catch in Unsampled Ports and Time Periods

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Table of Contents

1	Project Description.....	3
1.1	Background	3
1.2	Project Objectives	4
1.3	Methods - Effort.....	4
1.4	Methods – Interviews and Catch.....	6
1.5	Methods - Evaluation.....	6
2	Results	7
2.1	Results - Effort.....	7
2.2	Results - Catch	10
3	Discussion and Assessment	15
3.1	Effort	15
3.2	Catch	26
3.3	Additional Concerns and Considerations.....	33
4	Conclusions and Recommendations	33
4.1	Sampling structure	33
4.2	Estimation	34

1 Project Description

1.1 Background

The Magnuson Fishery Conservation and Management Act (MFCMA, 16 USC 1801) in 1976 mandated collection of data for both recreational and commercial marine fisheries. The National Marine Fisheries Service (NMFS) initiated the Marine Recreational Fisheries Statistics Survey (MRFSS) in the late 1970s to monitor all modes of marine recreational fishing. The MRFSS was designed to estimate annual fishing effort and catch by species on a regional scale. However, fisheries management and stock assessment practices now require more timely and accurate estimates at finer geographic and temporal scales than those generated by the original program. As a result, a number of regional angler data collection programs and surveys have been developed and integrated into or have replaced the original MRFSS methodology.

On the Pacific coast, a series of state surveys provide data on recreational fishing effort and catch to the Pacific Recreational Fisheries Information Network (Pacific RecFIN). In Oregon, on-site angler interviews and sampling are conducted by the Oregon Department of Fish and Wildlife's Ocean Recreational Boat Survey (ORBS). Because boat access to ocean waters in Oregon is restricted primarily to specific ports where jetties have been built, these limited access-point interception areas enable direct monitoring and estimation of ocean recreational effort and catch. The ORBS collects information on ocean boat recreational fishing effort and catch by species; biological data are also collected for stock assessment and management purposes.

The ORBS program does not have sufficient resources to conduct year-round sampling in most ports, or to sample in smaller ports. Estimates of effort and catch in these unsampled strata are made using a combination of current data from nearby major ports, data from the last time the port/time of interest was actually sampled, and assumptions about the relationships between these variables. Several of these assumptions have not been tested, and the potential for bias due to violations of their premises exists. There is no way to test the assumptions or address the bias using current sampling data. There has been an additional expectation that the ports of Garibaldi, Bandon, and Gold Beach were likely to have a disproportionate decrease in over-winter activity due to the physical nature of their bars and the effects of increased river flow during the winter period coupled with changes in ocean swells.

Similar concerns have also been expressed by the charter boat industry for several of the ports. Industry comments indicated that charter operations in a number of locations simply close down for the "winter period" defined in this report as the months of November, December, January, and February. Industry comments also indicated that many operations were closed during the months of October, March, and/or April (depending on the port).

Off-peak season influences at the very unique access sites of Pacific City (beach launch) and Port Orford (sling launch) are less well understood. At Pacific City, the winter beach conditions for launching and retrieval are generally poorer than during the prime season as there is transport of sand away from the beach during the winter, and it was anticipated that the change in the primary swell direction from NW to SW during the winter would also be

likely to result in a differentially lower activity rate. While it appears that seasonal effects on the sling launch at Port Orford may be limited solely to the primary swell direction and frequency of storms.

Motivated in part by the National Research Council's review of recreational fisheries survey methods (2006), the National Marine Fisheries Service's Marine Recreational Information Program (MRIP) has undertaken many efforts to improve recreational fisheries monitoring, including a review of ORBS begun in 2010. Consulting statisticians Jay Breidt and Jean Opsomer made strong recommendations for addressing under-coverage issues at less-frequented ports and/or in the off-season and winter season by increasing sampling coverage to obtain data for these unsampled ports and times. The MRIP priorities include ensuring that sampling and estimation methodologies are consistent, statistically valid, and unbiased; and assessing the degree of potential bias associated with under-coverage and the impact of potential biases on final catch and effort estimates.

Beginning in July 2011 and continuing through October 2012, ORBS was provided funding through MRIP to staff additional port sampling crew to collect data for catch and effort estimation for a full year in all significant port/ocean access points for bottomfish activity.

1.2 Project Objectives

The project's objectives were to collect sufficient information on recreational fishing effort and catch in all primary and secondary bottom fishing ports to assess the magnitude of gaps in the current ORBS structure. A second goal was to compare the existing method of sampling estimation for the full year to a full year of sampled effort and catch. The final objective was to consider how this new information might be used to improve upon the current approach to estimating the unsampled ports and time periods.

1.3 Methods - Effort

For the purposes of this project, the Columbia River (ports of Astoria, Warrenton, and Hammond), Florence, and Winchester Bay were not included as these ports have minimal bottomfishing activity due to a lack of readily accessible rocky reef habitat. The bottomfishing activity in these ports during the peak summer months totals 0.35% of the statewide total, with 0.31% coming from the Columbia River ports and 0.04% coming from Florence and Winchester Bay combined.

Sampling staff were added to Garibaldi, Depoe Bay, Newport, Charleston, and Brookings for the period of November 2011 through February 2012. Similarly, sampling coverage was increased at Pacific City, Bandon, and Gold Beach to cover the period from October 2011 through mid-June 2012. In addition, a sampler was also hired to collect data at Port Orford where sampling has only occurred sporadically in the past. Due to hiring difficulties, we supported sampling at Port Orford during the winter by having the Bandon and Gold Beach samplers spend approximately a third of their sampling days at Port Orford. In all cases, the staffing for the purposes of the study was a single employee at each site with the following exceptions: In Garibaldi, Newport, and Brookings additional sampling support was provided by existing Pacific States Marine Fisheries Commission (PSFMC) employees that have been providing winter sampling support to ORBS for the past several years.

Effort Assessment: The unit of effort measured by ORBS is a boat trip stratified by boat type (charter/CPFV and private boat). When combined with the interview data, an estimate of the number of angler trips by trip type is generated. A primary duty of ORBS samplers is to collect the effort information. For charter vessels, that information is gathered by contacting all charter offices for the number of boat trips by target species trip type for all days of the week (Note: Some charters do not operate out of fixed charter offices and are included with the private boats in the effort counts, but are labeled as “guide boats” in the interviews).

Only the trip type of “bottomfishing” was used in the effort analysis. There is additional bottomfishing activity that occurs with “combination” trips (salmon plus another target species group), but it is not possible to accurately pull the salmon plus bottomfishing trips out of the combination trips. In addition, the combination trips are limited to the time of year when the salmon season is open; this varies by area of the coast and year but is largely limited to the May through September period. By not including the combination trip effort, it does create a slight bias towards an increased portion of the effort during the winter period. This same bias would not be reflected in the catch.

There are several different methods of private boat effort accounting that were used during the course of the study. The method chosen for each port/access point has been selected based on the most appropriate and/or accurate method for the site. For days when no count is conducted, an average of the counts within the same strata (week, month, season type, day type) is applied. Video boat count (VBC) recordings were made at Garibaldi (started June 4, 2012), Newport, Charleston, Gold Beach, and Brookings. The VBC is the most recent addition to the ORBS effort assessment methodology. The VBC typically captures two camera angles: direct across the channel for vessel identification, and at the bar for verification of ocean entrance. Samplers then review the video for the period of 04:15-16:15, counting all outgoing private recreational vessels, and all incoming private recreational vessels. Because VBC recordings are conducted 24 hours a day, 7 days a week and stored to a hard drive, there is no loss of daily effort estimation due to the absence of a sampler on a given day. A twelve hour video count can typically be completed by a sampler in less than two and a half hours.

The second effort accounting methodology is the live bar crossing count. As in the video boat count (VBC), both an “out” an “in” count are conducted simultaneously for private recreational boats. This count method involves stationing a sampler at a vantage point where they can count bar crossings with the aid of binoculars. These live counts are typically conducted for the period of dawn to 10:15 (11:15 in Garibaldi). For both the VBC and live bar crossing counts, an expansion is made based on interviews for any trips that cross the bar before or after the count period (details on this method are available on-line at www.dfw.state.or.us/MRP/salmon/docs/ORBS_Design.pdf). During the study period, the live bar crossing count was used at Garibaldi through June 3, 2012, and sporadically at other locations when VBC equipment malfunctions occurred.

The third effort methodology employed is the alternate effort count. This is a combined trailer and moorage slip count plus any additional departures during the sampling period. This count is combined with a tally of returning trips to estimate the number of private boats that entered the ocean. The tally of returning trips is a filter to remove estuary boats, smaller

trailered commercial fishing vessels, and other non-ocean recreational private boats from the trailer/moorage slip/launch count. The alternate effort count is employed at Pacific City and Bandon.

The final method is specific to Port Orford. At Port Orford most vessels are launched via a hoist. The launch records are available to ORBS from the hoist operator for all days of the week. In addition, there are some small vessels that are launched off the adjacent beach. These beach launched vessels are tallied using the alternate effort count methodology on days when the sampler was on site and averaged for the days when the sampler was not on site.

1.4 Methods - Interviews and Catch

A subset of the fishing trips are met shore side to determine the target trip type, the number of anglers per boat, the total catch by species per boat, the released catch by species per boat, and to collect ancillary biological and fishery management information. Charter boat interviews are scheduled based on needed sampling within strata, and known trip types. Private boat interviews are selected without regard to trip type, size of vessel, or any other visible characteristics. The adopted approach utilizes a “next boat” protocol in which the next private/guide boat entering the sampler’s coverage area is approached and interviewed. Interviews are only conducted for completed trips, and all catch and angler trips for the boat are included in the interview.

1.5 Methods - Evaluation

Estimated bottomfishing angler trips by boat type were summed for a total port/month estimate, and percent by port and month compared with traditional sampling periods. Expanded effort for bottomfishing angler trips; and catch estimates for aggregated rockfish (*Sebastes* spp.), and lingcod (*Ophiodon elongatus*) were summed to statistical month by port and boat type (charter/private). Lingcod were evaluated as this is a common target species for deepwater areas that have been closed except during the winter months, and a separate evaluation of lingcod was done to help evaluate any potential specific seasonal bias in the catch estimation that might be exacerbated by a simple expansion of catch to the non-sampled effort period. Lingcod also exhibit a winter-spring spawning and nest guarding season when they are more available and susceptible to recreational fishing activity. The results for rockfish and lingcod were then compared to the existing expansion method for non-sampled times and ports.

Additional evaluations of some rockfish by individual species were made to look at possible seasonal variations in catch. Seasonal differences in catch rates for various species have not been examined in detail previously, and may vary greatly. Due to sample size limitations, the rockfish species assessed were restricted to black rockfish (*Sebastes melanops*), blue rockfish (*Sebastes mystinus*), yellowtail rockfish (*Sebastes flavidus*), quillback rockfish (*Sebastes maliger*), China rockfish (*Sebastes nebulosus*), and copper rockfish (*Sebastes caurinus*). Although both blue rockfish and yellowtail rockfish are available in the nearshore areas, they are generally more common off Oregon in waters outside of the shallow reefs.

2 Results

2.1 Results - Effort

Monthly estimates of angler effort by port and boat type were compared to evaluate the current level of sampling coverage. Tables 1a – 1c show the estimated number of bottomfish angler trips by port and month for charter boat trips, private boat trips, and summed trips. Months shaded indicate the standard ORBS sampling periods for each port (Note: For Pacific City, Bandon, and Gold Beach where June is the first month shaded, only the second half of June is within the standard sampling structure). In recent years, supplemental winter ORBS sampling has occurred in Depoe Bay, Newport, and Brookings allowing for full year assessment of angling activity.

Table 1a. Charter boat estimated angler trips by port and month for bottomfish trips, July 2011 - June 2012.

Month	Garibaldi	Pacific City	Depoe Bay	Newport	Charleston	Bandon	Port Orford	Gold Beach	Brookings	Total
July	1,070	148	2,221	1,986	524	228		174	526	6,877
Aug	721	97	2,642	2,202	571	388		248	551	7,420
Sept	303	22	1,531	1,407	391	108	21	101	252	4,136
Oct	152	12	379	605	147	7	13		63	1,378
Nov			33	87						120
Dec	16		77	202					18	313
Jan			52	119					11	182
Feb			79	225					15	319
Mar	48		373	708	63				2	1,194
Apr	161	28	844	1,200	370			42	71	2,716
May	393	71	1,317	1,628	521	92	31	106	268	4,427
June	722	117	1,946	1,759	765	223		187	507	6,226
Total	3,586	495	11,494	12,128	3,352	1,046	65	858	2,284	35,308

Table 1b. Private boat estimated angler trips by port and month for bottomfish trips, June 2011 - July 2012.

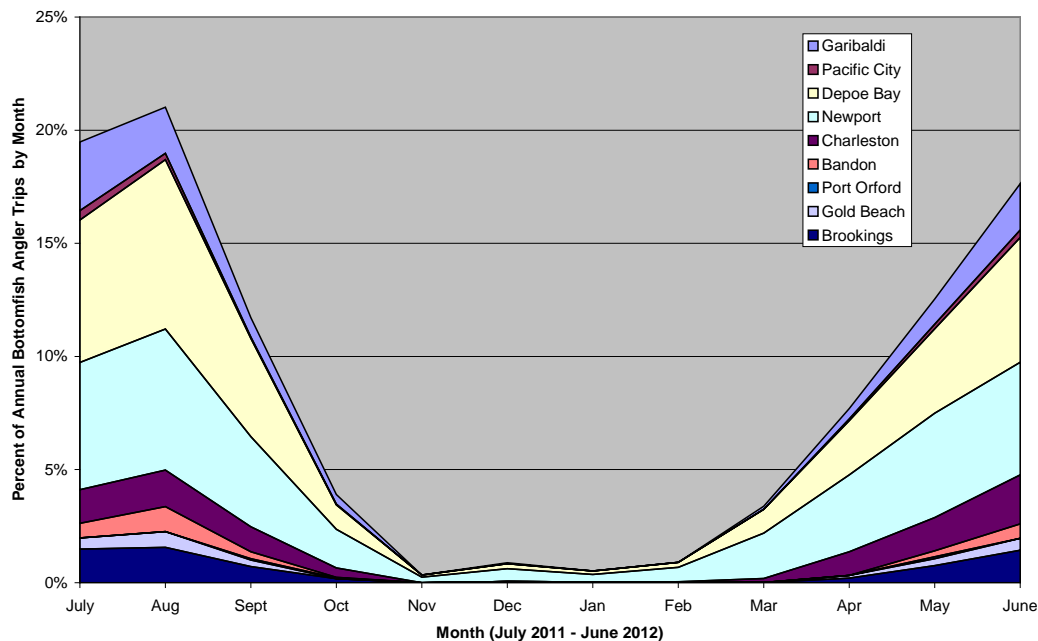
Month	Garibaldi	Pacific City	Depoe Bay	Newport	Charleston	Bandon	Port Orford	Gold Beach	Brookings	Total
July	357	620	243	836	785	161	394	270	2,707	6,373
Aug	408	742	237	1,141	965	208	57	421	2,464	6,643
Sept	144	65	108	356	404	63	61	78	1,691	2,970
Oct	151	67	39	210	332	139	40	77	631	1,686
Nov			5	18	32		4	4	93	156
Dec	47	18	69	205	239	9	15	13	326	941
Jan	23		18	146	131	4	12	14	159	507
Feb			24	32	70		3		191	320
Mar	38	60	55	229	353		8	4	219	966
Apr	171	216	323	671	609	109	43	6	495	2,643
May	451	362	381	910	880	186	131	208	1,952	5,461
June	720	471	431	633	1,020	248	55	133	1,408	5,119
Total	2,510	2,621	1,933	5,387	5,820	1,127	823	1,228	12,336	33,785

Table 1c. Total estimated angler trips by port and month for bottomfish trips, June 2011 - July 2012.

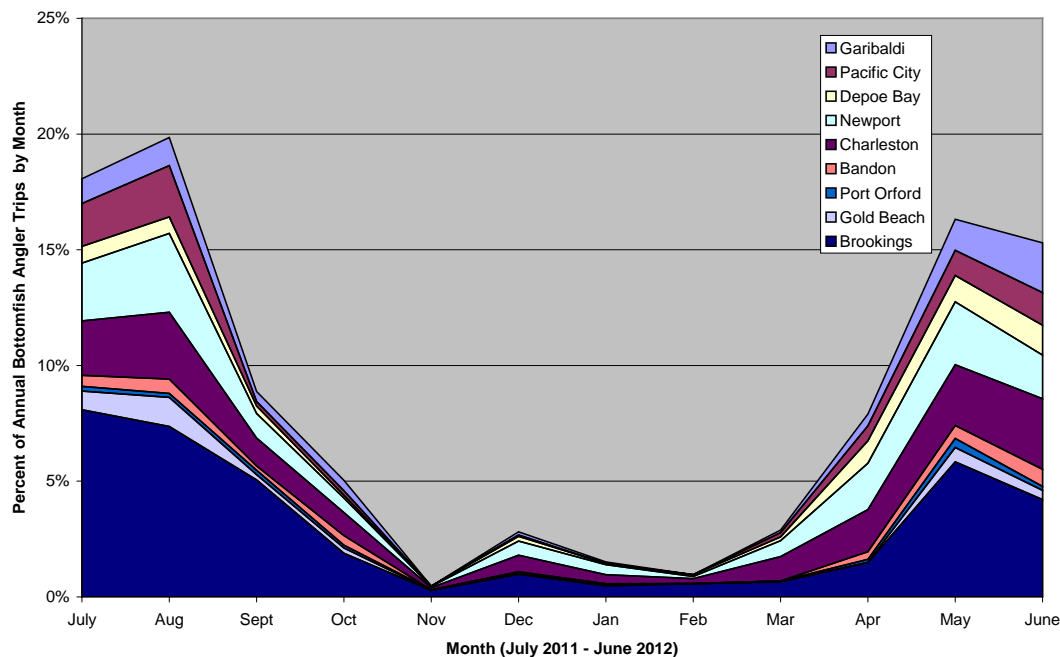
Month	Garibaldi	Pacific City	Depoe Bay	Newport	Charleston	Bandon	Port Orford	Gold Beach	Brookings	Total
July	1,428	768	2,464	2,822	1,308	389	394	444	3,234	13,251
Aug	1,129	839	2,879	3,343	1,536	596	57	669	3,014	14,062
Sept	447	87	1,639	1,763	794	171	82	179	1,943	7,105
Oct	303	79	418	814	479	146	53	77	694	3,063
Nov			38	104	32		4	4	93	275
Dec	63	18	146	407	239	9	15	13	344	1,254
Jan	23		70	265	131	4	12	14	169	688
Feb			102	257	70		3		206	638
Mar	86	60	427	937	416		8	4	221	2,159
Apr	332	243	1,168	1,870	978	109	43	48	566	5,357
May	844	433	1,699	2,538	1,401	278	162	313	2,221	9,889
June	1,442	588	2,377	2,391	1,784	471	55	320	1,915	11,343
Total	6,097	3,115	13,427	17,511	9,168	2,173	888	2,085	14,620	69,084

Charter boat angler trips were essentially absent during the winter period (November through February) in Garibaldi, Pacific City, Charleston, Bandon, Port Orford, and Gold Beach (Figure 1). Private boat activity similarly declined dramatically during the winter period, but some fishing activity did occur throughout the winter, although there were a number of full month/port periods when no activity occurred (Figure 2).

**Figure 1. Oregon Recreational Ocean Charter Boat Bottomfish Angler Trips
Percent by Port and Month, 2011-12**



**Figure 2. Oregon Recreational Ocean Private Boat Bottomfish Angler Trips
Percent by Port and Month, 2011-12**



During the study period, the sampling regime currently in use by ORBS accounted for 95.4% of the charter boat bottomfish angler trips (Table 2a), and 87.3% of the private boat bottomfish angler trips (Table 2b). In total, the current ORBS sampling structure (without adjustments for missing port and time expansions, and not including the current “winter ORBS” estimations in Depoe Bay, Newport, and Brookings) would have accounted for 91.5% of the combined charter and private boat bottomfishing angler effort during the study period (Table 2c).

Slightly more than half of the recreational bottomfish trips were from charter boat anglers (51%). The Central Coast ports of Depoe Bay and Newport accounted for 67% of all charter effort. For private boat anglers, Brookings was the most important port with 37% of the private angler trips, followed by Charleston with 17% and Newport with 16% as the next most active bottomfishing locations. Port Orford, which is not normally sampled as part of ORBS, had the lowest level of annual bottomfishing effort for both charter (0.18%) and private boats (1.48%).

Table 2a. Charter boat percent of total annual angler trip effort by port and month for bottomfish trips, July 2011 - June 2012.

Month	Garibaldi	Pacific City	Depoe Bay	Newport	Charleston	Bandon	Port Orford	Gold Beach	Brookings	Total
July	3.03%	0.42%	6.29%	5.62%	1.48%	0.65%	0.00%	0.49%	1.49%	19.48%
Aug	2.04%	0.27%	7.48%	6.24%	1.62%	1.10%	0.00%	0.70%	1.56%	21.02%
Sept	0.86%	0.06%	4.34%	3.98%	1.11%	0.31%	0.06%	0.29%	0.71%	11.71%
Oct	0.43%	0.03%	1.07%	1.71%	0.42%	0.02%	0.04%	0.00%	0.18%	3.90%
Nov	0.00%	0.00%	0.09%	0.25%	0.00%	0.00%	0.00%	0.00%	0.00%	0.34%
Dec	0.05%	0.00%	0.22%	0.57%	0.00%	0.00%	0.00%	0.00%	0.05%	0.89%
Jan	0.00%	0.00%	0.15%	0.34%	0.00%	0.00%	0.00%	0.00%	0.03%	0.52%
Feb	0.00%	0.00%	0.22%	0.64%	0.00%	0.00%	0.00%	0.00%	0.04%	0.90%
Mar	0.14%	0.00%	1.06%	2.01%	0.18%	0.00%	0.00%	0.00%	0.01%	3.38%
Apr	0.46%	0.08%	2.39%	3.40%	1.05%	0.00%	0.00%	0.12%	0.20%	7.69%
May	1.11%	0.20%	3.73%	4.61%	1.48%	0.26%	0.09%	0.30%	0.76%	12.54%
June	2.04%	0.33%	5.51%	4.98%	2.17%	0.63%	0.00%	0.53%	1.44%	17.63%
Total	10.16%	1.40%	32.55%	34.35%	9.49%	2.96%	0.18%	2.43%	6.47%	100.00%

Table 2b. Private boat percent of total annual angler trip effort by port and month for bottomfish trips, July 2011 - June 2012.

Month	Garibaldi	Pacific City	Depoe Bay	Newport	Charleston	Bandon	Port Orford	Gold Beach	Brookings	Total
July	1.07%	1.85%	0.73%	2.50%	2.35%	0.48%	0.20%	0.81%	8.09%	18.07%
Aug	1.22%	2.22%	0.71%	3.41%	2.88%	0.62%	0.17%	1.26%	7.36%	19.86%
Sept	0.43%	0.19%	0.32%	1.06%	1.21%	0.19%	0.18%	0.23%	5.05%	8.88%
Oct	0.45%	0.20%	0.12%	0.63%	0.99%	0.42%	0.12%	0.23%	1.89%	5.04%
Nov	0.00%	0.00%	0.01%	0.05%	0.10%	0.00%	0.01%	0.01%	0.28%	0.47%
Dec	0.14%	0.05%	0.21%	0.61%	0.71%	0.03%	0.04%	0.04%	0.97%	2.81%
Jan	0.07%	0.00%	0.05%	0.44%	0.39%	0.01%	0.04%	0.04%	0.48%	1.52%
Feb	0.00%	0.00%	0.07%	0.10%	0.21%	0.00%	0.01%	0.00%	0.57%	0.96%
Mar	0.11%	0.18%	0.16%	0.68%	1.06%	0.00%	0.02%	0.01%	0.65%	2.89%
Apr	0.51%	0.65%	0.97%	2.01%	1.82%	0.33%	0.13%	0.02%	1.48%	7.90%
May	1.35%	1.08%	1.14%	2.72%	2.63%	0.56%	0.39%	0.62%	5.83%	16.32%
June	2.15%	1.41%	1.29%	1.89%	3.05%	0.74%	0.16%	0.40%	4.21%	15.30%
Total	7.50%	7.83%	5.78%	16.10%	17.40%	3.37%	1.48%	3.67%	36.87%	100.00%

Table 2c. Percent of total annual angler trip effort by port and month for bottomfish trips, July 2011 - June 2012.

Month	Garibaldi	Pacific City	Depoe Bay	Newport	Charleston	Bandon	Port Orford	Gold Beach	Brookings	Total
July	2.08%	1.12%	3.58%	4.10%	1.90%	0.57%	0.10%	0.65%	4.70%	18.80%
Aug	1.64%	1.22%	4.19%	4.86%	2.23%	0.87%	0.08%	0.97%	4.38%	20.45%
Sept	0.65%	0.13%	2.38%	2.56%	1.15%	0.25%	0.12%	0.26%	2.83%	10.33%
Oct	0.44%	0.11%	0.61%	1.18%	0.70%	0.21%	0.08%	0.11%	1.01%	4.45%
Nov	0.00%	0.00%	0.06%	0.15%	0.05%	0.00%	0.01%	0.01%	0.14%	0.40%
Dec	0.09%	0.03%	0.21%	0.59%	0.35%	0.01%	0.02%	0.02%	0.50%	1.82%
Jan	0.03%	0.00%	0.10%	0.39%	0.19%	0.01%	0.02%	0.02%	0.25%	1.00%
Feb	0.00%	0.00%	0.15%	0.37%	0.10%	0.00%	0.00%	0.00%	0.30%	0.93%
Mar	0.13%	0.09%	0.62%	1.36%	0.61%	0.00%	0.01%	0.01%	0.32%	3.14%
Apr	0.48%	0.35%	1.70%	2.72%	1.42%	0.16%	0.06%	0.07%	0.82%	7.79%
May	1.23%	0.63%	2.47%	3.69%	2.04%	0.40%	0.24%	0.46%	3.23%	14.38%
June	2.10%	0.86%	3.46%	3.48%	2.59%	0.69%	0.08%	0.47%	2.79%	16.50%
Total	8.87%	4.53%	19.53%	25.47%	13.33%	3.16%	0.81%	3.03%	21.26%	100.00%

2.2 Results - Catch

Estimated catches of all rockfish (*Sebastes* spp.) (tables 3a – 3c) and lingcod (*Ophiodon elongatus*) (tables 4a – 4c) were summed for each port and month cell by boat type and in total. Additional table series were generated for the charter and private boat catches of the individual rockfish species of black rockfish (*Sebastes melanops*), blue rockfish (*Sebastes mystinus*), yellowtail rockfish (*Sebastes flavidus*), quillback rockfish (*Sebastes maliger*), China rockfish (*Sebastes nebulosus*), and copper rockfish (*Sebastes caurinus*). The shaded cells in each of the tables (tables 3a – 10b) indicate the months when ORBS normally conducts sampling. For those ports where June is the first month shaded, only the second half of June is regularly sampled.

Rockfish catch data grossly mirrors the effort data, but seasonal differences in the data are also apparent, and are more pronounced for certain individual species of rockfish as well as lingcod. During the winter period, yellowtail rockfish, blue rockfish, and lingcod all showed increased rates of catch.

Table 3a. Charter boat estimated catch of rockfish (*Sebastes* spp.) by port and month, July 2011 - June 2012.

Month	Garibaldi	Pacific City	Depoe Bay	Newport	Charleston	Bandon	Port Orford	Gold Beach	Brookings	Total
July	5,838	627	5,107	4,414	2,678	1,339		1,033	3,081	24,117
Aug	2,232	465	7,077	3,010	1,992	2,339		1,668	3,201	21,984
Sept	1,348	89	4,677	3,709	2,262	610	120	631	1,411	14,857
Oct	958	53	1,918	3,319	959	42	77		354	7,680
Nov			198	512						710
Dec	112		253	765					111	1,241
Jan			189	322					58	569
Feb			257	919					86	1,262
Mar	268		1,285	2,435	382				10	4,380
Apr	1,035	193	4,036	6,632	2,201			256	408	14,761
May	2,144	455	5,465	7,331	3,013	523	204	708	1,492	21,335
June	4,120	593	7,138	5,621	4,358	1,409		991	2,986	27,216
Total	18,055	2,475	37,600	38,989	17,845	6,262	401	5,287	13,198	140,112

Table 3b. Private boat estimated catch of rockfish (*Sebastes* spp.) by port and month, July 2011 - June 2012.

Month	Garibaldi	Pacific City	Depoe Bay	Newport	Charleston	Bandon	Port Orford	Gold Beach	Brookings	Total
July	1,104	2,008	429	1,340	2,350	423	140	1,180	8,298	17,272
Aug	796	1,759	324	1,822	2,641	583	250	1,984	8,008	18,167
Sept	248	109	231	943	555	208	281	402	3,483	6,460
Oct	281	276	178	778	1,130	651	194	487	2,312	6,287
Nov			37	76	124		10		349	596
Dec	45	50	163	420	501	24	60	84	1,033	2,380
Jan	116		35	336	281		30	49	247	1,094
Feb			11	15	219		4		254	503
Mar	85	271	92	669	244		20	4	259	1,644
Apr	620	844	935	2,264	2,230	232	263	42	1,412	8,842
May	1,425	1,855	871	2,541	2,819	765	629	968	6,718	18,591
June	1,621	1,456	868	1,365	2,932	982	178	444	5,720	15,566
Total	6,341	8,628	4,174	12,569	16,026	3,868	2,059	5,644	38,093	97,402

Table 3c. Total estimated catch of rockfish (*Sebastes* spp.) by port and month, July 2011 - June 2012.

Month	Garibaldi	Pacific City	Depoe Bay	Newport	Charleston	Bandon	Port Orford	Gold Beach	Brookings	Total
July	6,942	2,635	5,536	5,754	5,028	1,762	140	2,213	11,379	41,389
Aug	3,028	2,224	7,401	4,832	4,633	2,922	250	3,652	11,209	40,151
Sept	1,596	198	4,908	4,652	2,817	818	401	1,033	4,894	21,317
Oct	1,239	329	2,096	4,097	2,089	693	271	487	2,666	13,967
Nov			235	588	124		10		349	1,306
Dec	157	50	416	1,185	501	24	60	84	1,144	3,621
Jan	116		224	658	281		30	49	305	1,663
Feb			268	934	219		4		340	1,765
Mar	353	271	1,377	3,104	626		20	4	269	6,024
Apr	1,655	1,037	4,971	8,896	4,431	232	263	298	1,820	23,603
May	3,569	2,310	6,336	9,872	5,832	1,288	833	1,676	8,210	39,926
June	5,741	2,049	8,006	6,986	7,290	2,391	178	1,435	8,706	42,782
Total	24,396	11,103	41,774	51,558	33,871	10,130	2,460	10,931	51,291	237,514

Table 4a. Charter boat estimated catch of lingcod (*Ophiodon elongatus*) by port and month, July 2011 - June 2012.

Month	Garibaldi	Pacific City	Depoe Bay	Newport	Charleston	Bandon	Port Orford	Gold Beach	Brookings	Total
July	308	97	751	655	135	206		113	94	2,359
Aug	178	71	832	561	138	183		305	168	2,436
Sept	102	29	468	204	88	51	39	144	45	1,170
Oct	194	4	140	176	77	13	26		12	642
Nov			24	65						89
Dec	32		110	236					18	396
Jan			49	137					10	196
Feb			55	171					7	233
Mar	70		494	1,355	18				2	1,939
Apr	176	61	817	993	150			74	64	2,335
May	506	131	959	1,082	423	126	66	161	160	3,614
June	707	164	998	609	323	150		296	184	3,431
Total	2,273	557	5,697	6,244	1,352	729	131	1,093	764	18,840

Table 4b. Private boat estimated catch of lingcod (*Ophiodon elongatus*) by port and month, July 2011 - June 2012.

Month	Garibaldi	Pacific City	Depoe Bay	Newport	Charleston	Bandon	Port Orford	Gold Beach	Brookings	Total
July	246	460	133	182	191	89	48	142	473	1,964
Aug	169	502	116	467	316	88	34	177	811	2,680
Sept	76	77	28	115	120	51	55	30	272	824
Oct	179	22	28	40	265	89	46	49	171	889
Nov			7	2	16		16		32	73
Dec	63	23	84	253	265	18	15	20	116	857
Jan	30		20	178	199		2		31	460
Feb			17	6	95		5		20	143
Mar	68	110	104	387	433		4		26	1,132
Apr	107	376	503	1,002	415	106	63	12	158	2,742
May	560	722	540	888	786	215	147	278	1,362	5,498
June	711	561	454	351	469	185	58	65	521	3,375
Total	2,209	2,853	2,034	3,871	3,570	841	493	773	3,993	20,637

Table 4c. Total estimated catch of lingcod (*Ophiodon elongatus*) by port and month, July 2011 - June 2012.

Month	Garibaldi	Pacific City	Depoe Bay	Newport	Charleston	Bandon	Port Orford	Gold Beach	Brookings	Total
July	554	557	884	837	326	295	48	255	567	4,323
Aug	347	573	948	1,028	454	271	34	482	979	5,116
Sept	178	106	496	319	208	102	94	174	317	1,994
Oct	373	26	168	216	342	102	72	49	183	1,531
Nov			31	67	16		16		32	162
Dec	95	23	194	489	265	18	15	20	134	1,253
Jan	30		69	315	199		2		41	656
Feb			72	177	95		5		27	376
Mar	138	110	598	1,742	451		4		28	3,071
Apr	283	437	1,320	1,995	565	106	63	86	222	5,077
May	1,066	853	1,499	1,970	1,209	341	213	439	1,522	9,112
June	1,418	725	1,452	960	792	335	58	361	705	6,806
Total	4,482	3,410	7,731	10,115	4,922	1,570	624	1,866	4,757	39,477

Table 5a. Charter boat estimated catch of black rockfish (*Sebastes melanops*) by port and month, July 2011 - June 2012.

Month	Garibaldi	Pacific City	Depoe Bay	Newport	Charleston	Bandon	Port Orford	Gold Beach	Brookings	Total
July	5,061	552	3,959	3,661	2,233	901		843	2,467	19,677
Aug	1,887	394	5,722	2,489	946	1,769		1,311	2,453	16,971
Sept	891	68	2,268	1,928	561	283	6	298	747	7,050
Oct		46	472	1,031	143		3		179	1,874
Nov			135	229						364
Dec			119	270					71	460
Jan			105	147					42	294
Feb			77	490					73	640
Mar			542	2,059	210				8	2,819
Apr	474	157	1,908	4,766	727			133	286	8,451
May	1,642	436	4,440	6,705	2,144	157	139	380	1,203	17,246
June	3,542	530	5,806	4,858	3,159	953		711	2,537	22,096
Total	13,497	2,183	25,553	28,633	10,123	4,063	148	3,676	10,066	97,942

Table 5b. Private boat estimated catch of black rockfish (*Sebastes melanops*) by port and month, July 2011 - June 2012.

Month	Garibaldi	Pacific City	Depoe Bay	Newport	Charleston	Bandon	Port Orford	Gold Beach	Brookings	Total
July	967	1,813	378	1,283	1,949	289	125	988	7,574	15,366
Aug	657	1,529	298	1,661	2,273	486	141	1,716	6,558	15,319
Sept	121	62	183	790	370	121	181	335	2,251	4,414
Oct	88	266	60	537	538	335	61	328	1,285	3,498
Nov			9	51	52		4		238	354
Dec	41	42	105	225	54	3	18	72	571	1,131
Jan	10		15	270	46		9	7	113	470
Feb			11	15	7		4		162	199
Mar	45	238	88	567	95		16	4	198	1,251
Apr	609	660	849	1,874	1,384	190	83	30	1,118	6,797
May	1,153	1,746	820	2,344	2,216	538	590	397	6,143	15,947
June	1,121	1,342	787	1,225	2,404	633	166	408	5,381	13,467
Total	4,812	7,698	3,603	10,842	11,388	2,595	1,398	4,285	31,592	78,213

Table 6a. Charter boat estimated catch of blue rockfish (*Sebastes mystinus*) by port and month, July 2011 - June 2012.

Month	Garibaldi	Pacific City	Depoe Bay	Newport	Charleston	Bandon	Port Orford	Gold Beach	Brookings	Total
July	48	10	299	263	165	105		44	400	1,334
Aug	21	5	350	187	372	94		127	537	1,693
Sept	24	1	1,634	841	1,236	112	51	212	560	4,671
Oct	2	5	1,345	365	720	22	34		156	2,649
Nov			60	259						319
Dec			103	359					36	498
Jan			25	112					14	151
Feb			161	212					13	386
Mar			634	309	161				1	1,105
Apr	208	30	1,798	1,636	1,217			88	120	5,097
May	17	2	381	340	411	54	11	50	203	1,469
June	9	1	680	404	638	118		15	246	2,111
Total	329	54	7,470	5,287	4,920	505	96	536	2,286	21,483

Table 6b. Private boat estimated catch of blue rockfish (*Sebastes mystinus*) by port and month, July 2011 - June 2012.

Month	Garibaldi	Pacific City	Depoe Bay	Newport	Charleston	Bandon	Port Orford	Gold Beach	Brookings	Total
July	3	50		22	47	21	10	78	521	752
Aug	10	44		46	69	7	80	154	1,028	1,438
Sept	56	4	28	121	35	10	84	50	1,112	1,500
Oct	20	3	108	45	337	199	116	131	885	1,844
Nov			27	11	36		4		84	162
Dec		4	50	111	211		40	10	396	822
Jan			15	37	37		21	42	125	277
Feb					18				88	106
Mar	1	25		93	4		4		57	184
Apr	2	151	52	306	470	26	160	12	265	1,444
May	7	29	30	92	119	98	21	336	365	1,097
June	7	7	18	71	70	39	6	21	235	474
Total	106	317	328	955	1,453	400	546	834	5,161	10,100

Table 7a. Charter boat estimated catch of China rockfish (*Sebastes nebulosus*) by port and month, July 2011 - June 2012.

Month	Garibaldi	Pacific City	Depoe Bay	Newport	Charleston	Bandon	Port Orford	Gold Beach	Brookings	Total
July	37	23	173	41	45	24		34	16	393
Aug	2	15	142	72	46	42		49	27	395
Sept	14	5	75	29	51	28	15	34	10	261
Oct			15	4	3		10		1	33
Nov				4						4
Dec			4	14						18
Jan			4	6						10
Feb				2						2
Mar			7	17	4					28
Apr			26	25	13			12		76
May	4	6	37	39	66	47	7	74	7	287
June	22	22	81	16	49	43		38	8	279
Total	79	71	564	269	277	184	32	241	69	1,786

Table 7b. Private boat estimated catch of China rockfish (*Sebastes nebulosus*) by port and month, July 2011 - June 2012.

Month	Garibaldi	Pacific City	Depoe Bay	Newport	Charleston	Bandon	Port Orford	Gold Beach	Brookings	Total
July	8	36	13	9	17	11	5	19	38	156
Aug	4	37	14	35	37	16	22	15	130	310
Sept	3	3	3	20	40	6	9	1	30	115
Oct			1	8		40	6	13	10	78
Nov			1						2	3
Dec			2	16	16	6	2	2	16	60
Jan				2	6					8
Feb										0
Mar		4	4		4				2	14
Apr		15	7	8	44		17		9	100
May	3	14	7	20	97	46	12	2	55	256
June	10	21	16	26	62	44	2	7	18	206
Total	28	130	68	144	323	169	75	59	310	1,306

Table 8a. Charter boat estimated catch of copper rockfish (*Sebastes caurinus*) by port and month, July 2011 - June 2012.

Month	Garibaldi	Pacific City	Depoe Bay	Newport	Charleston	Bandon	Port Orford	Gold Beach	Brookings	Total
July	80	8	175	86	34	33		22	5	443
Aug	41	9	171	102	76	76		22	15	512
Sept	6	4	42	49	85	32		8		226
Oct			5	6	11	4				26
Nov				2						2
Dec				13						13
Jan			1	9						10
Feb				3						3
Mar			1	17						18
Apr	6	1	23	26	41					97
May	14	5	41	57	117	16	14	37	2	303
June	53	17	60	34	116	36		70	8	394
Total	200	44	519	404	480	197	14	159	30	2,047

Table 8b. Private boat estimated catch of copper rockfish (*Sebastes caurinus*) by port and month, July 2011 - June 2012.

Month	Garibaldi	Pacific City	Depoe Bay	Newport	Charleston	Bandon	Port Orford	Gold Beach	Brookings	Total
July	6	8	2	11	98	21		10	2	158
Aug	17	13	6	31	173	17	2	26	9	294
Sept	3	2	6	12	46	3	3	7	5	87
Oct	4		2		18	7		8	4	43
Nov	2					6			2	10
Dec				4	12				5	21
Jan				10	4					14
Feb										0
Mar		2								2
Apr		2	8	19	73	8	3			113
May	15	12	2	34	105	11		33	17	229
June	59	21	2	7	153	36			2	280
Total	106	60	28	128	682	109	8	84	46	1,251

Table 9a. Charter boat estimated catch of quillback rockfish (*Sebastes maliger*) by port and month, July 2011 - June 2012.

Month	Garibaldi	Pacific City	Depoe Bay	Newport	Charleston	Bandon	Port Orford	Gold Beach	Brookings	Total
July	106	18	175	201	32	69		24	11	636
Aug	46	32	263	65	34	104		40	33	617
Sept	13	7	214	10	56	17	6	2	4	329
Oct			16		13	9	4			42
Nov				2					1	3
Dec			7	9						16
Jan			7	1						8
Feb			1	6						7
Mar			6	6	4					16
Apr	30	1	70	22	11					134
May	131		103	54	36	126	14	38	14	516
June	154	4	130	22	59	121		34	6	530
Total	480	62	992	398	245	446	24	138	69	2,854

Table 9b. Private boat estimated catch of quillback rockfish (*Sebastes maliger*) by port and month, July 2011 - June 2012.

Month	Garibaldi	Pacific City	Depoe Bay	Newport	Charleston	Bandon	Port Orford	Gold Beach	Brookings	Total
July	16	34	33	4	104	34		15	8	248
Aug	20	54	6	49	19	18		20	22	208
Sept	13	14	3	32	27	9	2	4	2	106
Oct	8		2		18	17		3	2	50
Nov				2					2	4
Dec		2	4		9				2	17
Jan										0
Feb										0
Mar										0
Apr	2	4	9	5	81	5			3	109
May	62	17	4	14	90	21		100	36	344
June	207	33	45	5	49	72			10	421
Total	328	158	106	111	397	176	2	142	87	1,507

Table 10a. Charter boat estimated catch of yellowtail rockfish (*Sebastes flavidus*) by port and month, July 2011 - June 2012.

Month	Garibaldi	Pacific City	Depoe Bay	Newport	Charleston	Bandon	Port Orford	Gold Beach	Brookings	Total
July	445	11	274	121	84	110		13	170	1,228
Aug	200	3	333	86	464	148		23	134	1,391
Sept	377	2	349	825	182	99	30	28	94	1,986
Oct	892	2	57	1,688	23	1	20		12	2,695
Nov			3	16						19
Dec	88		16	77					2	183
Jan			44	44						88
Feb			14	93						107
Mar	190		76	23	1					290
Apr	284	1	137	139	113			7	2	683
May	307	1	437	108	123	50	2	21	52	1,101
June	303	3	348	284	192	73		3	168	1,374
Total	3,086	23	2,088	3,504	1,182	481	52	95	634	11,145

Table 10b. Private boat estimated catch of yellowtail rockfish (*Sebastes flavidus*) by port and month, July 2011 - June 2012.

Month	Garibaldi	Pacific City	Depoe Bay	Newport	Charleston	Bandon	Port Orford	Gold Beach	Brookings	Total
July	89	48	3	7	61	13		4	122	347
Aug	65	50			13	9	3	8	227	375
Sept	43	24	8			4	1	3	71	154
Oct	157	5	5	133	57	20	7	2	115	501
Nov				14	36				19	69
Dec	2			50	155				35	242
Jan	67		5	17	172				8	269
Feb					180				2	182
Mar	36			6	102				2	146
Apr	7	4	2	12	107				8	140
May	127	13	2	21	76	10	6	5	32	292
June	176	28		28	100	76		1	45	454
Total	769	172	25	288	1,059	132	17	23	686	3,171

3 Discussion and Assessment

3.1 Effort

During the period of 2006 through 2011, over-winter sampling was conducted in the ports of Depoe Bay, Newport, and Brookings. This sampling has been conducted by re-tasking three Pacific States Marine Fisheries Commission (PSFMC) recreational samplers to ORBS duties from November through February of each year. Data from the winter of '08-'09 was excluded from the analysis for Depoe Bay (private boat effort count problems), and the winter of '09-'10 was excluded for Brookings (no sampling). What was found during this period was that the non-winter sampling that occurred prior to the coming winter period accounted for 92%-99% of the charter effort and 92%-98% of the private boat effort (Table 11). The PSFMC samplers that conducted the sampling during the winters prior to this MRIP study were splitting their work hours between ORBS duties and additional PSFMC tasks. The results from the MRIP evaluation are consistent with the prior over winter period data, and are included in Table 11.

Table 11. Seasonal proportion of ocean recreational bottomfishing angler trips by boat type for Depoe Bay, Newport, and Brookings (Spring-Fall, 2006 through Winter 2011-2012).

Season	Charter Boats			Private Boats		
	Depoe Bay	Newport	Brookings	Depoe Bay	Newport	Brookings
2006 Spring-Fall : Following Winter ^{a/}	98%	96%	94%	96%	95%	96%
2007 Spring-Fall : Following Winter ^{a/}	98%	95%	97%	92%	95%	98%
2008 Spring-Fall : Following Winter ^{a/}	NA	93%	96%	NA	92%	93%
2009 Spring-Fall : Following Winter ^{a/}	96%	92%	NA	94%	94%	NA
2010 Spring-Fall : Following Winter ^{a/}	97%	94%	99%	92%	94%	93%
2011 Spring-Fall : Following Winter ^{a/} (MRIP Study)	98%	95%	98%	94%	93%	94%
Range	96%-98%	92%-96%	94%-99%	92%-96%	92%-95%	93%-98%

^{a/} Spring - Fall defined as statistical months of Mar. through Oct., and Winter defined as statistical months of Nov. through Feb.

Sampling rates for the three ports with the extended winter sampling history all exceeded the ORBS minimum sampling target of 20% (Table 12). With the narrow range of variation in

the observed winter portion of the effort in the primary ports, a single expansion factor for each port and boat type could be applied to address the unsampled winter period. It should be noted that study period sampling was more uniform and complete than the earlier years.

Winter period charter boat activity during the study period was largely limited to Depoe Bay, Newport, and Brookings (Table 2a). Somewhat surprising was the lack of charter trips out of Charleston during the winter period; however, charter operations often shut down during the off-season. The two largest fleets of charter vessels on the Oregon Coast are located in Depoe Bay and Newport and are primary tourist destinations on the Oregon Coast within easy driving distance of the core population base of Oregon. Charter activity is potential more volatile, as a port with no current winter activity could easily have an office stay open for the winter and begin booking trips. This is almost as simple as the office staff flipping

Table 12. Winter period sampling rate for ocean recreational bottomfishing angler trips by boat type for Depoe Bay, Newport, and Brookings (Winter 2006/07-2011/12).

<u>Season</u>	<u>Charter Boats</u>			<u>Private Boats</u>		
	<u>Depoe Bay</u>	<u>Newport</u>	<u>Brookings</u>	<u>Depoe Bay</u>	<u>Newport</u>	<u>Brookings</u>
2006-07 Winter Sampling Rate	56%	71%	53%	43%	38%	54%
2007-08 Winter Sampling Rate	74%	46%	75%	30%	49%	48%
2008-09 Winter Sampling Rate	NA	35%	58%	NA	23%	36%
2009-10 Winter Sampling Rate	57%	44%	NA	56%	25%	NA
2010-11 Winter Sampling Rate	71%	70%	25%	50%	30%	29%
2011-12 Winter Sampling Rate (MRIP Study Period)	67%	86%	77%	54%	57%	58%

the “closed for the winter sign” back to “open.” Other factors such as ocean conditions and angler availability would continue to largely affect the winter period; however, the concern remains that forecasting winter activity for the charter fleet is likely to have greater variability as it is driven by business practices of the individual charter offices. Although the “weather windows” for ocean access are wider for the larger charter vessels than for private boats, the winter period has more periods that are still inaccessible or at least unfishable which results in unreliable bookings and creates scheduling difficulties for charter trips.

Prior to implementation of this project, the expectations were for higher private boat bottomfishing winter activity at Depoe Bay, Newport, Charleston, and Brookings; lower activity at Pacific City, Bandon, and Gold Beach; and unknown winter effects at Port Orford. These generalized trends were observed in the ports as expected, and Port Orford followed the larger port trend of a higher portion of winter activity, with 6.9% of the annual effort at Port Orford occurring during the winter. Overall, the spring through fall period accounted for 97.4% of the charter angler trips and 94.3% of the private boat angler trips. Higher private boat activity than charter boat activity during the winter is largely a reflection of winter charter closures combined with a small segment of the private boat community that are ready to fish at any time during the year, and are simply waiting for safe “weather windows” to access the ocean. The available “weather windows” are also impacted by bar crossing restrictions by the US Coast Guard, which differentially affects private boats as compared to inspected charter vessels.

Comparing the standard sampling period to the year round sampling (Table 13), the ORBS standard sample period accounted for 95.4% of the statewide charter boat bottomfishing trips and 87.3% of the statewide private boat bottomfishing trips. However, the standard sampling

period of mid-June through September at Pacific City, Bandon, and Gold Beach accounted for a much lower than average level of coverage (49.3%-79.9%) in those ports.

In consideration of standardizing the sampling period for all ports, including Port Orford, to the March through October period, it would take a substantial increase in resources to reach this level of sampling. Currently the staff required to cover the standard ORBS sampling period for the eight ports of Garibaldi, Pacific City, Depoe Bay, Newport, Charleston, Bandon, Gold Beach, and Brookings is 93.5 sampler months. An additional 21.5 months of sampler time would be needed in order to cover Port Orford and extend sampling in Pacific City, Bandon, and Gold Beach to the March through October period. If this expansion of the sampling activity had occurred during the study period year, it would have resulted in estimation of approximately 97.4% of the charter angler trips, 94.3% of the private boat angler trips, and 95.9% of the combined effort (Table 14). If Port Orford is left out of consideration; it would still take 13.5 additional sampler months, and the increased sampling period could be expected to account for 97.2% of the charter angler trips and 92.8% of the private boat angler trips, and 95.0% of the combined effort.

Assuming that some funding is available to increase sampling, a more optimized sampling structure could be accomplished that would require 8.5 additional sampler months (Table 15). This could be expected to increase the overall charter coverage rate to 97.0%, the overall private boat rate to 92.5%, and the overall coverage to approximately 94.8%, with no sampled boat type/port rate below 91%. This approach would still leave Port Orford as an unsampled port and approximately 0.2% of the overall charter boat effort and 1.5% of the overall private boat effort in an unsampled status (based on this one year of data).

The existing method of estimating unsampled times and areas was compared to the actual results from the MRIP study period. At a minimum, the current method requires sampling in at least one port for any period where an expansion would be needed. The current method of expanding for unsampled ports and time periods uses the ratio of effort in the sampled port(s) to the unsampled port(s) as observed during the preceding year to estimate the activity for the unsampled period(s). Expansions for unsampled periods were made using the current system with several different year-round sampling scenarios to account for the November through February period. These scenarios are as follows:

- Newport only (tables 16a - 16d);
- Charleston only (tables 17a - 17d);
- Brookings only (tables 18a - 18d);
- Newport, Charleston, and Brookings combined (tables 19a - 19d); and
- Depoe Bay, Newport, and Brookings combined (tables 20a - 20d) (the current slate of ports sampled year round).

The standard ORBS expansion also includes a 4% expansion to all private boat effort to account for minor unsampled areas and extremely late trips. The 4% expansion was removed from the calculations in order to compare the ORBS estimation to the actual observations during the MRIP study period.

The current ORBS method to account for unsampled times had a strong tendency to overestimate fishing activity. This overestimation was most pronounced in Pacific City and Gold Beach. Interestingly, private boat activity at Bandon was underestimated in all

scenarios while charter boat effort at Bandon was overestimated in all scenarios (Table 21). The Bandon charter boat overestimation was consistent with what occurred in Pacific City and Gold Beach, and the private boat underestimation may be a systematic problem with the alternate effort count methodology for private boats that is in use at Bandon.

Table 13. Proportion of annual ocean recreational bottomfishing angler trips estimated during standard sampling period (July, 2011 - June, 2012) by boat type and port.

	<u>Standard Sample</u>			
	<u>Period</u>	<u>Charter Boats</u>	<u>Private Boats</u>	<u>Total (all boat types)</u>
Garibaldi	Mar - Oct	99.6%	97.2%	98.6%
Pacific City	mid-June - Sept.	65.8%	63.4%	63.8%
Depoe Bay	Mar - Oct	97.9%	94.0%	97.4%
Newport	Mar - Oct	94.8%	92.6%	94.1%
Charleston	Mar - Oct	100.0%	91.9%	94.9%
Bandon	mid-June - Sept.	79.9%	49.3%	64.0%
Port Orford	none	0.0%	0.0%	0.0%
Gold Beach	mid-June - Sept.	71.9%	68.0%	69.6%
Brookings	Mar - Oct	98.1%	93.8%	94.5%
Statewide		95.4%	87.3%	91.5%

Table 14. Proportion of annual ocean recreational bottomfishing angler trips during the spring through fall period (Mar - Oct) by boat type and port (Spring-Fall, 2011 : Winter 2011-2012).

	<u>Charter Boats</u>	<u>Private Boats</u>	<u>Total (all boat types)</u>	<u>Additional Sampler Months Required for Implementation</u>
Garibaldi	99.6%	97.2%	98.6%	0
Pacific City	100.0%	99.3%	99.4%	4.5
Depoe Bay	97.9%	94.0%	97.4%	0
Newport	94.8%	92.6%	94.1%	0
Charleston	100.0%	91.9%	94.9%	0
Bandon	100.0%	98.8%	99.4%	4.5
Port Orford	100.0%	93.1%	93.9%	8
Gold Beach	100.0%	97.5%	98.5%	4.5
Brookings	98.1%	93.8%	94.5%	0
Statewide	97.4%	94.3%	95.9%	21.5

Table 15. Proportion of ocean recreational bottomfishing angler trips estimated during optimized sampling period (July, 2011 - June, 2012) by boat type and port to non-sampled period.

	<u>Optimized Sample</u>				<u>Additional Sampler Months Required for Implementation</u>
	<u>Period</u>	<u>Charter Boats</u>	<u>Private Boats</u>	<u>Total (all boat types)</u>	
Garibaldi	Mar - Oct	99.6%	97.2%	98.6%	0
Pacific City	April - Sept.	97.6%	94.5%	95.0%	2.5
Depoe Bay	Mar - Oct	97.9%	94.0%	97.4%	0
Newport	Mar - Oct	94.8%	92.6%	94.1%	0
Charleston	Mar - Oct	100.0%	91.9%	94.9%	0
Bandon	April - Oct	100.0%	98.9%	99.4%	3.5
Port Orford	none	0.0%	0.0%	0.0%	0
Gold Beach	May - Oct	95.1%	96.7%	96.0%	2.5
Brookings	Mar - Oct	98.1%	93.8%	94.5%	0
Statewide		97.0%	92.5%	94.8%	8.5

Table 16a. Estimated charter boat bottomfish angler trips by port and month for sampled and unsampled periods using the adopted estimator for unsampled periods with Newport as the only full year sampled port (Shaded cells indicate times and areas where ORBS unsampled period expansions were applied. June cells that are shaded were only expanded for the first half of June.).

Year	Month	Garibaldi	Pacific City	Depoe Bay	Newport	Charleston	Bandon	Gold Beach	Brookings	Total
2011	March	56	12	404	564	91	45	4	4	
2011	April	193	24	549	680	262	71	10	41	
2011	May	259	37	991	827	380	115	9	233	
2011	June	974	98	2,148	2,180	712	257	77	609	
2011	July	1,071	149	2,220	1,986	524	229	174	526	6,879
2011	August	721	97	2,642	2,201	571	387	249	550	7,418
2011	September	303	22	1,531	1,407	390	132	101	252	4,138
2011	October	152	26	379	604	147	55	38	62	1,463
2011	November	36	5	95	87	26	11	7	22	289
2011	December	84	12	221	202	61	25	17	52	674
2012	January	50	6	127	119	34	15	10	32	393
2012	February	95	11	239	225	65	27	18	60	740
2012	March	48	18	373	707	63	44	32	2	1,287
2012	April	161	44	844	1,199	369	108	73	70	2,868
2012	May	393	69	1,317	1,629	521	169	112	269	4,479
2012	June	722	110	1,946	1,759	763	212	203	508	6,223
Total		5,318	740	16,026	16,376	4,979	1,902	1,134	3,292	36,851

Table 16b. Estimated private boat bottomfish angler trips by port and month for sampled and unsampled periods using the adopted estimator for unsampled periods with Newport as the only full year sampled port (Shaded cells indicate times and areas where ORBS unsampled period expansions were applied. June cells that are shaded were only expanded for the first half of June.).

Year	Month	Garibaldi	Pacific City	Depoe Bay	Newport	Charleston	Bandon	Gold Beach	Brookings	Total
2011	March	21	28	13	97	37	8	6	90	
2011	April	124	206	250	841	133	63	14	567	
2011	May	241	395	246	841	545	122	52	1,539	
2011	June	833	868	663	1,320	1,797	207	159	3,643	
2011	July	372	645	252	721	817	167	281	2,820	6,075
2011	August	424	773	247	1,150	1,006	218	438	2,567	6,823
2011	September	149	67	111	371	420	77	81	1,762	3,038
2011	October	158	169	40	218	345	45	96	657	1,728
2011	November	8	9	5	18	15	2	5	37	99
2011	December	93	107	64	214	171	28	60	435	1,172
2012	January	58	76	46	152	111	18	40	315	816
2012	February	13	17	10	33	24	4	9	69	179
2012	March	39	97	57	239	368	23	51	152	1,026
2012	April	177	288	337	699	635	68	153	516	2,873
2012	May	470	595	398	948	916	141	314	2,033	5,815
2012	June	750	543	448	660	1,063	185	252	1,466	5,367
Total		3,930	4,883	3,187	8,522	8,403	1,376	2,011	18,668	35,011

Table 16c. Difference between effort observed in MRIP study for charter boat bottomfish angler trips, and current ORBS unsampled period estimation when Newport is the year round sampled port used for ORBS expansions for unsampled periods (Shaded cells indicate times and areas where ORBS unsampled period expansions were applied. June cells that are shaded were only expanded for the first half of June.).

Year	Month	Garibaldi	Pacific City	Depoe Bay	Newport	Charleston	Bandon	Gold Beach	Brookings	Total
2011	July	-1	-1	1	0	0	-1	0	0	-2
2011	August	0	0	0	1	0	1	-1	1	2
2011	September	0	0	0	0	1	0	0	0	1
2011	October	0	-14	0	1	0	-48	-38	1	-98
2011	November	-36	-5	-62	0	-26	-11	-7	-22	-169
2011	December	-68	-12	-144	0	-61	-25	-17	-34	-361
2012	January	-50	-6	-75	0	-34	-15	-10	-21	-211
2012	February	-95	-11	-160	0	-65	-27	-18	-45	-421
2012	March	0	-18	0	1	0	-44	-32	0	-93
2012	April	0	-16	0	1	1	-108	-31	1	-152
2012	May	0	2	0	-1	0	-77	-6	-1	-83
2012	June	0	7	0	0	2	11	-16	-1	3
Total Difference		-250	-74	-440	3	-182	-344	-176	-121	-1,584
Percent Difference of (ORBS Expansion - Year Round Estimate)/Year Round Estimate										
		-7%	-15%	-4%	0%	-5%	-33%	-21%	-5%	-4.3%

Table 16d. Difference between effort observed in MRIP study for private boat bottomfish angler trips, and current ORBS unsampled period estimation when Newport is the year round sampled port used for ORBS expansions for unsampled periods (Shaded cells indicate times and areas where ORBS unsampled period expansions were applied. June cells that are shaded were only expanded for the first half of June.).

Year	Month	Garibaldi	Pacific City	Depoe Bay	Newport	Charleston	Bandon	Gold Beach	Brookings	Total
2011	July	-1	0	1	0	-1	0	0	-5	-5
2011	August	0	-1	-1	-2	-2	-2	0	-4	-12
2011	September	1	1	1	-1	0	0	0	-3	-1
2011	October	-1	-96	1	0	0	96	-15	-1	-16
2011	November	-8	-9	0	1	18	-2	-1	57	57
2011	December	-42	-85	7	-1	75	-18	-45	-92	-201
2012	January	-33	-73	-26	0	24	-13	-24	-144	-290
2012	February	-13	-16	14	0	47	-4	-9	125	145
2012	March	1	-33	0	-1	-1	-22	-45	0	-102
2012	April	1	-61	-1	-1	-2	44	-141	-1	-163
2012	May	-1	-210	-2	-2	-1	50	-94	-3	-261
2012	June	-1	-51	0	-2	-2	70	-109	-2	-97
Total Difference		-97	-635	-4	-7	156	200	-484	-73	-944
Percent Difference of (ORBS Expansion - Year Round Estimate)/Year Round Estimate										
		-4%	-24%	0%	0%	3%	18%	-39%	-1%	-2.7%

Table 17a. Estimated charter boat bottomfish angler trips by port and month for sampled and unsampled periods using the adopted estimator for unsampled periods with Charleston as the only full year sampled port (Shaded cells indicate times and areas where ORBS unsampled period expansions were applied. June cells that are shaded were only expanded for the first half of June.).

Year	Month	Garibaldi	Pacific City	Depoe Bay	Newport	Charleston	Bandon	Gold Beach	Brookings	Total
2011	March	56	12	404	564	91	45	4	4	
2011	April	193	24	549	680	262	71	10	41	
2011	May	259	37	991	827	380	115	9	233	
2011	June	974	98	2,148	2,180	712	257	77	609	
2011	July	1,071	149	2,220	1,986	524	229	174	526	6,879
2011	August	721	97	2,642	2,201	571	387	249	550	7,418
2011	September	303	22	1,531	1,407	390	132	101	252	4,138
2011	October	152	26	379	604	147	55	38	62	1,463
2011	November									0
2011	December									0
2012	January									0
2012	February									0
2012	March	48	18	373	707	63	44	32	2	1,287
2012	April	161	44	844	1,199	369	108	73	70	2,868
2012	May	393	69	1,317	1,629	521	169	112	269	4,479
2012	June	722	110	1,946	1,759	763	212	203	508	6,223
Total		5,053	706	15,344	15,743	4,793	1,824	1,082	3,126	34,755

Table 17b. Estimated private boat bottomfish angler trips by port and month for sampled and unsampled periods using the adopted estimator for unsampled periods with Charleston as the only full year sampled port (Shaded cells indicate times and areas where ORBS unsampled period expansions were applied. June cells that are shaded were only expanded for the first half of June.).

Year	Month	Garibaldi	Pacific City	Depoe Bay	Newport	Charleston	Bandon	Gold Beach	Brookings	Total
2011	March	21	28	13	97	37	8	6	90	
2011	April	124	206	250	841	133	63	14	567	
2011	May	241	395	246	841	545	122	52	1,539	
2011	June	833	868	663	1,320	1,797	207	159	3,643	
2011	July	372	645	252	721	817	167	281	2,820	6,075
2011	August	424	773	247	1,150	1,006	218	438	2,567	6,823
2011	September	149	67	111	371	420	77	81	1,762	3,038
2011	October	158	169	40	218	345	45	96	657	1,728
2011	November	18	21	12	42	33	6	12	85	229
2011	December	135	156	93	311	249	41	88	633	1,706
2012	January	72	93	56	188	137	22	49	389	1,006
2012	February	39	50	30	101	73	12	27	209	541
2012	March	39	97	57	239	368	23	51	152	1,026
2012	April	177	288	337	699	635	68	153	516	2,873
2012	May	470	595	398	948	916	141	314	2,033	5,815
2012	June	750	543	448	660	1,063	185	252	1,466	5,367
Total		4,022	4,994	3,253	8,747	8,574	1,405	2,073	19,128	36,227

Table 17c. Difference between effort observed in MRIP study for charter boat bottomfish angler trips, and current ORBS unsampled period estimation when Charleston is the year round sampled port used for ORBS expansions for unsampled periods (Shaded cells indicate times and areas where ORBS unsampled period expansions were applied. June cells that are shaded were only expanded for the first half of June.).

Year	Month	Garibaldi	Pacific City	Depoe Bay	Newport	Charleston	Bandon	Gold Beach	Brookings	Total
2011	July	-1	-1	1	0	0	-1	0	0	-2
2011	August	0	0	0	1	0	1	-1	1	2
2011	September	0	0	0	0	1	0	0	0	1
2011	October	0	-14	0	1	0	-48	-38	1	-98
2011	November	0	0	33	87	0	0	0	0	120
2011	December	16	0	77	202	0	0	0	18	313
2012	January	0	0	52	119	0	0	0	11	182
2012	February	0	0	79	225	0	0	0	15	319
2012	March	0	-18	0	1	0	-44	-32	0	-93
2012	April	0	-16	0	1	1	-108	-31	1	-152
2012	May	0	2	0	-1	0	-77	-6	-1	-83
2012	June	0	7	0	0	2	11	-16	-1	3
Total Difference		15	-40	242	636	4	-266	-124	45	512
Percent Difference of (ORBS Expansion - Year Round Estimate)/Year Round Estimate		0%	-8%	2%	5%	0%	-25%	-14%	2%	1.5%

Table 17d. Difference between effort observed in MRIP study for private boat bottomfish angler trips, and current ORBS unsampled period estimation when Charleston is the year round sampled port used for ORBS expansions for unsampled periods (Shaded cells indicate times and areas where ORBS unsampled period expansions were applied. June cells that are shaded were only expanded for the first half of June.).

Year	Month	Garibaldi	Pacific City	Depoe Bay	Newport	Charleston	Bandon	Gold Beach	Brookings	Total
2011	July	-1	0	1	0	-1	0	0	-5	-5
2011	August	0	-1	-1	-2	-2	-2	0	-4	-12
2011	September	1	1	1	-1	0	0	0	-3	-1
2011	October	-1	-96	1	0	0	96	-15	-1	-16
2011	November	-17	-20	-7	-22	0	-6	-8	11	-68
2011	December	-83	-132	-20	-94	0	-30	-72	-283	-714
2012	January	-46	-89	-36	-35	-1	-17	-33	-215	-472
2012	February	-38	-48	-5	-65	0	-12	-26	-10	-203
2012	March	1	-33	0	-1	-1	-22	-45	0	-102
2012	April	1	-61	-1	-1	-2	44	-141	-1	-163
2012	May	-1	-210	-2	-2	-1	50	-94	-3	-261
2012	June	-1	-51	0	-2	-2	70	-109	-2	-97
Total Difference		-185	-742	-68	-224	-9	172	-543	-515	-2,114
Percent Difference of (ORBS Expansion - Year Round Estimate)/Year Round Estimate		-7%	-28%	-4%	-4%	0%	15%	-44%	-4%	-5.8%

Table 18a. Estimated charter boat bottomfish angler trips by port and month for sampled and unsampled periods using the adopted estimator for unsampled periods with Brookings as the only full year sampled port (Shaded cells indicate times and areas where ORBS unsampled period expansions were applied. June cells that are shaded were only expanded for the first half of June.).

Year	Month	Garibaldi	Pacific City	Depoe Bay	Newport	Charleston	Bandon	Gold Beach	Brookings	Total
2011	March	56	12	404	564	91	45	4	4	
2011	April	193	24	549	680	262	71	10	41	
2011	May	259	37	991	827	380	115	9	233	
2011	June	974	98	2,148	2,180	712	257	77	609	
2011	July	1,071	149	2,220	1,986	524	229	174	526	6,879
2011	August	721	97	2,642	2,201	571	387	249	550	7,418
2011	September	303	22	1,531	1,407	390	132	101	252	4,138
2011	October	152	26	379	604	147	55	38	62	1,463
2011	November									0
2011	December	29	4	77	70	21	9	6	18	234
2012	January	16	2	42	39	11	5	3	10	128
2012	February	23	3	58	55	16	7	4	15	181
2012	March	48	18	373	707	63	44	32	2	1,287
2012	April	161	44	844	1,199	369	108	73	70	2,868
2012	May	393	69	1,317	1,629	521	169	112	269	4,479
2012	June	722	110	1,946	1,759	763	212	203	508	6,223
Total		5,121	715	15,521	15,907	4,841	1,845	1,095	3,169	35,298

Table 18b. Estimated private boat bottomfish angler trips by port and month for sampled and unsampled periods using the adopted estimator for unsampled periods with Brookings as the only full year sampled port (Shaded cells indicate times and areas where ORBS unsampled period expansions were applied. June cells that are shaded were only expanded for the first half of June.).

Year	Month	Garibaldi	Pacific City	Depoe Bay	Newport	Charleston	Bandon	Gold Beach	Brookings	Total
2011	March	21	28	13	97	37	8	6	90	
2011	April	124	206	250	841	133	63	14	567	
2011	May	241	395	246	841	545	122	52	1,539	
2011	June	833	868	663	1,320	1,797	207	159	3,643	
2011	July	372	645	252	721	817	167	281	2,820	6,075
2011	August	424	773	247	1,150	1,006	218	438	2,567	6,823
2011	September	149	67	111	371	420	77	81	1,762	3,038
2011	October	158	169	40	218	345	45	96	657	1,728
2011	November	21	24	14	47	38	6	13	97	260
2011	December	72	84	50	167	133	22	47	339	914
2012	January	31	40	24	80	58	9	21	166	429
2012	February	37	48	29	96	70	11	25	199	515
2012	March	39	97	57	239	368	23	51	152	1,026
2012	April	177	288	337	699	635	68	153	516	2,873
2012	May	470	595	398	948	916	141	314	2,033	5,815
2012	June	750	543	448	660	1,063	185	252	1,466	5,367
Total		3,919	4,870	3,179	8,495	8,381	1,372	2,003	18,613	34,863

Table 18c. Difference between effort observed in MRIP study for charter boat bottomfish angler trips, and current ORBS unsampled period estimation when Brookings is the year round sampled port used for ORBS expansions for unsampled periods. (Shaded cells indicate times and areas where ORBS unsampled period expansions were applied. June cells that are shaded were only expanded for the first half of June.)

Year	Month	Garibaldi	Pacific City	Depoe Bay	Newport	Charleston	Bandon	Gold Beach	Brookings	Total
2011	July	-1	-1	1	0	0	-1	0	0	-2
2011	August	0	0	0	1	0	1	-1	1	2
2011	September	0	0	0	0	1	0	0	0	1
2011	October	0	-14	0	1	0	-48	-38	1	-98
2011	November	0	0	33	87	0	0	0	0	120
2011	December	-13	-4	0	132	-21	-9	-6	0	79
2012	January	-16	-2	10	80	-11	-5	-3	1	54
2012	February	-23	-3	21	170	-16	-7	-4	0	138
2012	March	0	-18	0	1	0	-44	-32	0	-93
2012	April	0	-16	0	1	1	-108	-31	1	-152
2012	May	0	2	0	-1	0	-77	-6	-1	-83
2012	June	0	7	0	0	2	11	-16	-1	3
Total Difference		-53	-49	65	472	-44	-287	-137	2	-31
Percent Difference of (ORBS Expansion - Year Round Estimate)/Year Round Estimate										
		-1%	-10%	1%	4%	-1%	-27%	-16%	0%	-0.1%

Table 18d. Difference between effort observed in MRIP study for private boat bottomfish angler trips, and current ORBS unsampled period estimation when Brookings is the year round sampled port used for ORBS expansions for unsampled periods (Shaded cells indicate times and areas where ORBS unsampled period expansions were applied. June cells that are shaded were only expanded for the first half of June.)

Year	Month	Garibaldi	Pacific City	Depoe Bay	Newport	Charleston	Bandon	Gold Beach	Brookings	Total
2011	July	-1	0	1	0	-1	0	0	-5	-5
2011	August	0	-1	-1	-2	-2	-2	0	-4	-12
2011	September	1	1	1	-1	0	0	0	-3	-1
2011	October	-1	-96	1	0	0	96	-15	-1	-16
2011	November	-20	-23	-8	-27	-5	-6	-9	0	-98
2011	December	-22	-63	21	44	111	-12	-32	0	47
2012	January	-7	-38	-5	69	75	-5	-6	-1	83
2012	February	-36	-46	-4	-60	3	-11	-24	0	-178
2012	March	1	-33	0	-1	-1	-22	-45	0	-102
2012	April	1	-61	-1	-1	-2	44	-141	-1	-163
2012	May	-1	-210	-2	-2	-1	50	-94	-3	-261
2012	June	-1	-51	0	-2	-2	70	-109	-2	-97
Total Difference		-86	-622	3	19	177	203	-476	-20	-802
Percent Difference of (ORBS Expansion - Year Round Estimate)/Year Round Estimate										
		-3%	-24%	0%	0%	3%	18%	-39%	0%	-2.3%

Table 19a. Estimated charter boat bottomfish angler trips by port and month for sampled and unsampled periods using the adopted estimator for unsampled periods with Newport, Charleston, and Brookings as the full year sampled ports (Shaded cells indicate times and areas where ORBS unsampled period expansions were applied. June cells that are shaded were only expanded for the first half of June.).

Year	Month	Garibaldi	Pacific City	Depoe Bay	Newport	Charleston	Bandon	Gold Beach	Brookings	Total
2011	March	56	12	404	564	91	45	4	4	
2011	April	193	24	549	680	262	71	10	41	
2011	May	259	37	991	827	380	115	9	233	
2011	June	974	98	2,148	2,180	712	257	77	609	
2011	July	1,071	149	2,220	1,986	524	229	174	526	6,879
2011	August	721	97	2,642	2,201	571	387	249	550	7,418
2011	September	303	22	1,531	1,407	390	132	101	252	4,138
2011	October	152	26	379	604	147	55	38	62	1,463
2011	November	23	3	61	87		7	5		186
2011	December	59	8	155	202		17	12	18	471
2012	January	35	4	88	119		10	7	10	273
2012	February	65	8	163	225		19	13	15	508
2012	March	48	18	373	707	63	44	32	2	1,287
2012	April	161	44	844	1,199	369	108	73	70	2,868
2012	May	393	69	1,317	1,629	521	169	112	269	4,479
2012	June	722	110	1,946	1,759	763	212	203	508	6,223
Total		5,235	729	15,811	16,376	4,793	1,877	1,119	3,169	36,193

Table 19b. Estimated private boat bottomfish angler trips by port and month for sampled and unsampled periods using the adopted estimator for unsampled periods with Newport, Charleston, and Brookings as the full year sampled ports (Shaded cells indicate times and areas where ORBS unsampled period expansions were applied. June cells that are shaded were only expanded for the first half of June.).

Year	Month	Garibaldi	Pacific City	Depoe Bay	Newport	Charleston	Bandon	Gold Beach	Brookings	Total
2011	March	21	28	13	97	37	8	6	90	
2011	April	124	206	250	841	133	63	14	567	
2011	May	241	395	246	841	545	122	52	1,539	
2011	June	833	868	663	1,320	1,797	207	159	3,643	
2011	July	372	645	252	721	817	167	281	2,820	6,075
2011	August	424	773	247	1,150	1,006	218	438	2,567	6,823
2011	September	149	67	111	371	420	77	81	1,762	3,038
2011	October	158	169	40	218	345	45	96	657	1,728
2011	November	17	19	11	18	33	5	11	97	211
2011	December	91	105	62	214	249	28	59	339	1,147
2012	January	46	60	36	152	137	14	31	166	642
2012	February	31	40	24	33	73	9	21	199	430
2012	March	39	97	57	239	368	23	51	152	1,026
2012	April	177	288	337	699	635	68	153	516	2,873
2012	May	470	595	398	948	916	141	314	2,033	5,815
2012	June	750	543	448	660	1,063	185	252	1,466	5,367
Total		3,943	4,898	3,195	8,522	8,574	1,380	2,019	18,613	35,175

Table 19c. Difference between effort observed in MRIP study for charter boat bottomfish angler trips, and current ORBS unsampled period estimation when Newport, Charleston, and Brookings are the year round sampled ports used for ORBS expansions for unsampled periods (Shaded cells indicate times and areas where ORBS unsampled period expansions were applied. June cells that are shaded were only expanded for the first half of June.).

Year	Month	Garibaldi	Pacific City	Depoe Bay	Newport	Charleston	Bandon	Gold Beach	Brookings	Total
2011	July	-1	-1	1	0	0	-1	0	0	-2
2011	August	0	0	0	1	0	1	-1	1	2
2011	September	0	0	0	0	1	0	0	0	1
2011	October	0	-14	0	1	0	-48	-38	1	-98
2011	November	-23	-3	-28	0	0	-7	-5	0	-66
2011	December	-43	-8	-78	0	0	-17	-12	0	-158
2012	January	-35	-4	-36	0	0	-10	-7	1	-91
2012	February	-65	-8	-84	0	0	-19	-13	0	-189
2012	March	0	-18	0	1	0	-44	-32	0	-93
2012	April	0	-16	0	1	1	-108	-31	1	-152
2012	May	0	2	0	-1	0	-77	-6	-1	-83
2012	June	0	7	0	0	2	11	-16	-1	3
Total Difference		-167	-63	-225	3	4	-319	-161	2	-926
Percent Difference of (ORBS Expansion - Year Round Estimate)/Year Round Estimate		-5%	-13%	-2%	0%	0%	-30%	-19%	0%	-2.6%

Table 19d. Difference between effort observed in MRIP study for private boat bottomfish angler trips, and current ORBS unsampled period estimation when Newport, Charleston, and Brookings are the year round sampled ports used for ORBS expansions for unsampled periods (Shaded cells indicate times and areas where ORBS unsampled period expansions were applied. June cells that are shaded were only expanded for the first half of June.).

Year	Month	Garibaldi	Pacific City	Depoe Bay	Newport	Charleston	Bandon	Gold Beach	Brookings	Total
2011	July	-1	0	1	0	-1	0	0	-5	-5
2011	August	0	-1	-1	-2	-2	-2	0	-4	-12
2011	September	1	1	1	-1	0	0	0	-3	-1
2011	October	-1	-96	1	0	0	96	-15	-1	-16
2011	November	-16	-18	-6	1	0	-5	-7	0	-51
2011	December	-41	-83	9	-1	0	-18	-44	0	-177
2012	January	-21	-58	-17	0	-1	-9	-16	-1	-122
2012	February	-30	-38	1	0	0	-9	-20	0	-96
2012	March	1	-33	0	-1	-1	-22	-45	0	-102
2012	April	1	-61	-1	-1	-2	44	-141	-1	-163
2012	May	-1	-210	-2	-2	-1	50	-94	-3	-261
2012	June	-1	-51	0	-2	-2	70	-109	-2	-97
Total Difference		-109	-649	-12	-7	-9	196	-491	-20	-1,102
Percent Difference of (ORBS Expansion - Year Round Estimate)/Year Round Estimate										
		-4%	-25%	-1%	0%	0%	17%	-40%	0%	-3.1%

Table 20a. Estimated charter boat bottomfish angler trips by port and month for sampled and unsampled periods using the adopted estimator for unsampled periods with Depoe Bay, Newport, and Brookings as the full year sampled ports (standard ORBS estimator) (Shaded cells indicate times and areas where ORBS unsampled period expansions were applied. June cells that are shaded were only expanded for the first half of June.).

Year	Month	Garibaldi	Pacific City	Depoe Bay	Newport	Charleston	Bandon	Gold Beach	Brookings	Total
2011	March	56	12	404	564	91	45	4	4	
2011	April	193	24	549	680	262	71	10	41	
2011	May	259	37	991	827	380	115	9	233	
2011	June	974	98	2,148	2,180	712	257	77	609	
2011	July	1,071	149	2,220	1,986	524	229	174	526	6,879
2011	August	721	97	2,642	2,201	571	387	249	550	7,418
2011	September	303	22	1,531	1,407	390	132	101	252	4,138
2011	October	152	26	379	604	147	55	38	62	1,461
2011	November	21	3	33	87	15	6	4		169
2011	December	52	7	77	202	38	16	11	18	421
2012	January	33	4	52	119	22	9	6	10	255
2012	February	57	7	79	225	39	17	11	15	450
2012	March	48	18	373	707	63	44	32	2	1,287
2012	April	161	44	844	1,199	369	108	73	70	2,868
2012	May	393	69	1,317	1,629	521	169	112	269	4,478
2012	June	722	110	1,946	1,759	763	212	203	508	6,225
Total		5,216	727	15,585	16,376	4,907	1,872	1,114	3,169	36,049

Table 20b. Estimated private boat bottomfish angler trips by port and month for sampled and unsampled periods using the adopted estimator for unsampled periods with Depoe Bay, Newport, and Brookings as the full year sampled ports (standard ORBS estimator) (Shaded cells indicate times and areas where ORBS unsampled period expansions were applied. June cells that are shaded were only expanded for the first half of June.).

Year	Month	Garibaldi	Pacific City	Depoe Bay	Newport	Charleston	Bandon	Gold Beach	Brookings	Total
2011	March	21	28	13	97	37	8	6	90	
2011	April	124	206	250	841	133	63	14	567	
2011	May	241	395	246	841	545	122	52	1,539	
2011	June	833	868	663	1,320	1,797	207	159	3,643	
2011	July	372	645	252	721	817	167	281	2,820	6,075
2011	August	424	773	247	1,150	1,006	218	438	2,567	6,823
2011	September	149	67	111	371	420	77	81	1,762	3,038
2011	October	158	169	40	218	345	45	96	657	1,720
2011	November	16	18	6	18	29	5	10	97	199
2011	December	81	94	72	214	150	25	53	339	1,028
2012	January	38	50	18	152	72	12	26	166	534
2012	February	29	38	25	33	55	9	20	199	408
2012	March	39	97	57	239	368	23	51	152	1,025
2012	April	177	288	337	699	635	68	153	516	2,866
2012	May	470	595	398	948	916	141	314	2,033	5,800
2012	June	750	543	448	660	1,063	185	252	1,466	5,274
Total		3,922	4,874	3,183	8,522	8,388	1,375	2,006	18,613	34,790

Table 20c. Difference between effort observed in MRIP study for charter boat bottomfish angler trips, and current ORBS unsampled period estimation when Depoe Bay, Newport, and Brookings are the year round sampled ports used for ORBS expansions for unsampled periods (standard ORBS estimator) (Shaded cells indicate times and areas where ORBS unsampled period expansions were applied. June cells that are shaded were only expanded for the first half of June.).

Year	Month	Garibaldi	Pacific City	Depoe Bay	Newport	Charleston	Bandon	Gold Beach	Brookings	Total
2011	July	-1	-1	1	0	0	-1	0	0	-2
2011	August	0	0	0	1	0	1	-1	1	2
2011	September	0	0	0	0	1	0	0	0	1
2011	October	0	-14	0	1	0	-48	-38	1	-98
2011	November	-21	-3	0	0	-15	-6	-4	0	-49
2011	December	-36	-7	0	0	-38	-16	-11	0	-108
2012	January	-33	-4	0	0	-22	-9	-6	1	-73
2012	February	-57	-7	0	0	-39	-17	-11	0	-131
2012	March	0	-18	0	1	0	-44	-32	0	-93
2012	April	0	-16	0	1	1	-108	-31	1	-152
2012	May	0	2	0	-1	0	-77	-6	-1	-83
2012	June	0	7	0	0	2	11	-16	-1	3
Total Difference		-148	-61	1	3	-110	-314	-156	2	-783
Percent Difference of (ORBS Expansion - Year Round Estimate)/Year Round Estimate										
		-4%	-12%	0%	0%	-3%	-30%	-18%	0%	-2.2%

Table 20d. Difference between effort observed in MRIP study for private boat bottomfish angler trips, and current ORBS unsampled period estimation when Depoe Bay, Newport, and Brookings are the year round sampled ports used for ORBS expansions for unsampled periods (standard ORBS estimator) (Shaded cells indicate times and areas where ORBS unsampled period expansions were applied. June cells that are shaded were only expanded for the first half of June.).

Year	Month	Garibaldi	Pacific City	Depoe Bay	Newport	Charleston	Bandon	Gold Beach	Brookings	Total
2011	July	-1	0	1	0	-1	0	0	-5	-5
2011	August	0	-1	-1	-2	-2	-2	0	-4	-12
2011	September	1	1	1	-1	0	0	0	-3	-1
2011	October	-1	-96	1	0	0	96	-15	-1	-16
2011	November	-15	-17	-1	1	4	-5	-6	0	-39
2011	December	-31	-72	0	-1	95	-15	-38	0	-62
2012	January	-14	-48	1	0	62	-8	-11	-1	-18
2012	February	-28	-37	0	0	17	-9	-19	0	-75
2012	March	1	-33	0	-1	-1	-22	-45	0	-102
2012	April	1	-61	-1	-1	-2	44	-141	-1	-163
2012	May	-1	-210	-2	-2	-1	50	-94	-3	-261
2012	June	-1	-51	0	-2	-2	70	-109	-2	-97
Total Difference		-89	-626	-1	-7	170	201	-479	-20	-851
Percent Difference of (ORBS Expansion - Year Round Estimate)/Year Round Estimate										
		-4%	-24%	0%	0%	3%	18%	-39%	0%	-2.4%

Based on the results of this study, the current ORBS methodology for unsampled time periods does not appear to provide an ideal estimator for the unsampled periods. In testing the additional single ports of Newport, Charleston, and Brookings, and the other three port combination of Newport, Charleston, and Brookings; the three current ports of Depoe Bay, Newport, and Brookings generally performed better than any of the other options examined. The inadequacies of the method are more pronounced in the smaller ports with a shorter sampling season (Pacific City, Bandon, and Gold Beach), and none of the options came close to reducing the errors in those locations. The 4% added expansion would exacerbate the overestimation, and it is also unlikely that the 4% is appropriate during the winter period as we observed substantially less activity at the smaller ports and the reduced daylight period results in only the remote chance that there will be fishing activity outside of the effort counting period in the larger ports.

Table 21. Comparison of percent difference in annual bottomfish angler trips by boat type and port between standard ORBS estimation methodology using several significant ports for winter estimation, and the observed effort during the MRIP study period (July 2011 - June 2012). (Negative numbers displayed in lavender indicate an overexpansion by the current ORBS methodology and positive numbers displayed in yellow indicate an underexpansion by the current ORBS methodology).

	<u>Garibaldi</u>	<u>Pacific City</u>	<u>Depoe Bay</u>	<u>Newport</u>	<u>Charleston</u>	<u>Bandon</u>	<u>Gold Beach</u>	<u>Brookings</u>	<u>Total</u>
Charter Boat Comparisons									
Newport only to expand for winter period	-7.0%	-14.9%	-3.8%	NA	-5.4%	-32.9%	-20.5%	-5.3%	-4.3%
Charleston only to expand for winter period	0.4%	-8.1%	2.1%	5.2%	NA	-25.4%	-14.5%	2.0%	1.5%
Brookings only to expand for winter period	-1.5%	-9.9%	0.6%	3.9%	-1.3%	-27.4%	-16.0%	NA	-0.1%
Newport + Charleston + Brookings to expand for winter period	-4.7%	-12.7%	-2.0%	NA	NA	-30.5%	-18.8%	NA	-2.6%
Depoe Bay + Newport + Brookings to expand for winter period	-4.1%	-12.3%	NA	NA	-3.3%	-30.0%	-18.2%	NA	-2.2%
Private Boat Comparisons									
Newport only to expand for winter period	-3.9%	-24.2%	-0.2%	NA	2.7%	17.7%	-39.4%	-0.6%	-2.7%
Charleston only to expand for winter period	-7.4%	-28.3%	-3.5%	-4.2%	NA	15.2%	-44.2%	-4.2%	-5.8%
Brookings only to expand for winter period	-3.4%	-23.7%	0.2%	0.3%	3.0%	18.0%	-38.7%	NA	-2.3%
Newport + Charleston + Brookings to expand for winter period	-4.4%	-24.8%	-0.6%	NA	NA	17.4%	-40.0%	NA	-3.1%
Depoe Bay + Newport + Brookings to expand for winter period	-3.5%	-23.9%	NA	NA	2.9%	17.8%	-39.0%	NA	-2.4%

3.2 Catch

It was expected that there would be seasonal variation in the catch for some species. In fact, there is a relatively regular seasonal drop in overall bottomfish catch rates in mid to late summer that has been observed to occur in many years. The reason(s) for this summer drop have not been investigated, but may be related to the ocean upwelling and productivity that occurs off the Oregon Coast during the summer.

During the study period, trends of seasonal bias were observed between the sampling period and non-sampling period for blue rockfish (Figure 6), yellowtail rockfish (Figure 7), and lingcod (Figure 3) in most ports with higher catch rates for these species outside of the standard sampling period (Table 13). The differences were more pronounced in those ports with the mid-June through September traditional sampling period. In addition, there appeared to be a lower catch rate of China rockfish during the fall and winter (Figure 8); however, with the low CPUE for China rockfish, it is difficult to adequately assess this possible trend.

Figure 3. Observed average catch of lingcod per bottomfishing angler trip off Oregon and total estimated catch by statistical month (Garibaldi, Pacific City, Depoe Bay, New port, Charleston, Bandon, Port Orford, Gold Beach, and Brookings), July 2011 - June 2012.

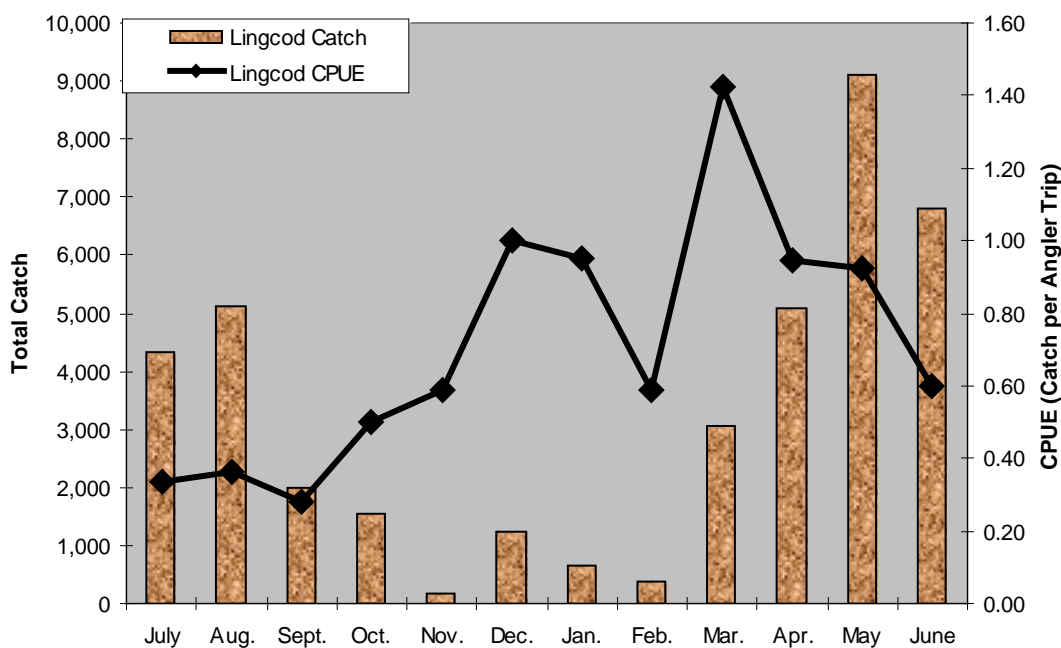


Figure 4. Observed average catch of combined rockfish per bottomfishing angler trip off Oregon and total estimated catch by statistical month (Garibaldi, Pacific City, Depoe Bay, New port, Charleston, Bandon, Port Orford, Gold Beach, and Brookings), July 2011 - June 2012.

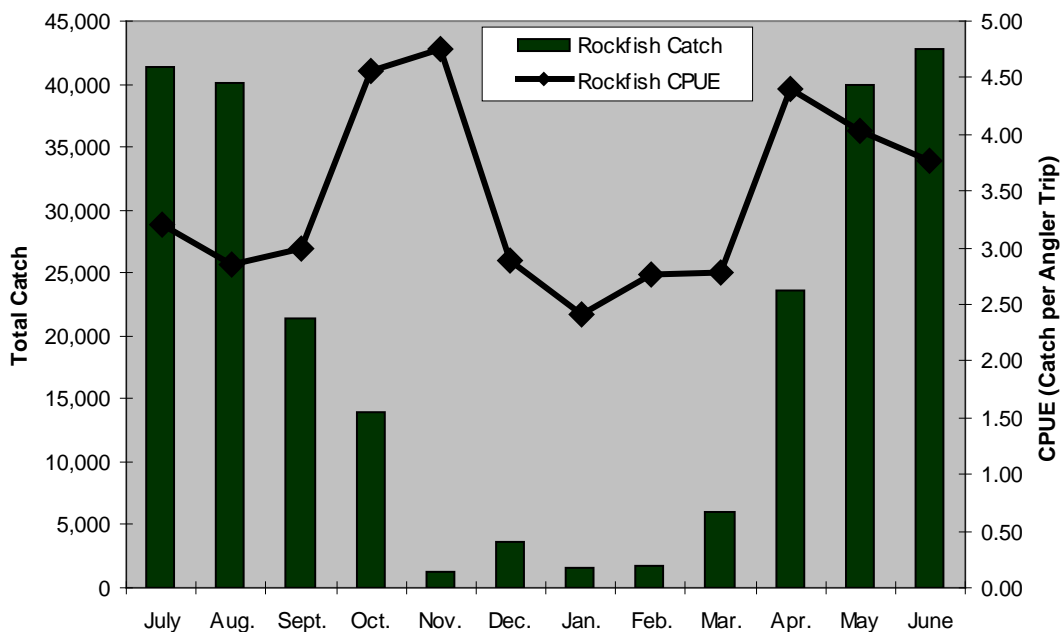


Figure 5. Observed average catch of black rockfish per bottomfishing angler trip off Oregon and total estimated catch by statistical month (Garibaldi, Pacific City, Depoe Bay, New port, Charleston, Bandon, Port Orford, Gold Beach, and Brookings), July 2011 - June 2012.

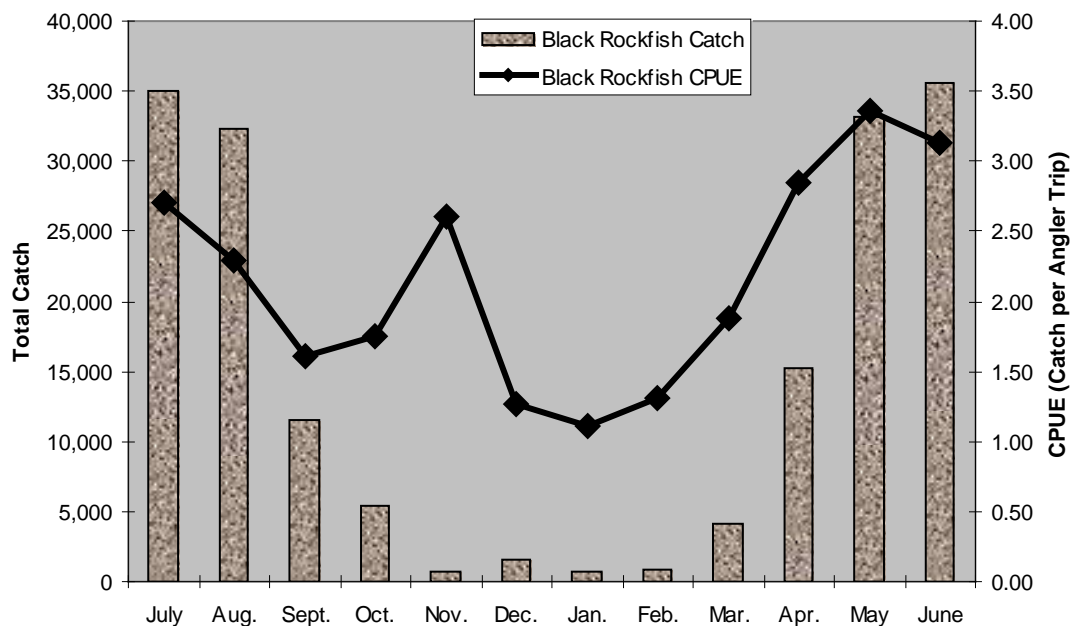


Figure 6. Observed average catch of blue rockfish per bottomfishing angler trip off Oregon and total estimated catch by statistical month (Garibaldi, Pacific City, Depoe Bay, New port, Charleston, Bandon, Port Orford, Gold Beach, and Brookings), July 2011 - June 2012.

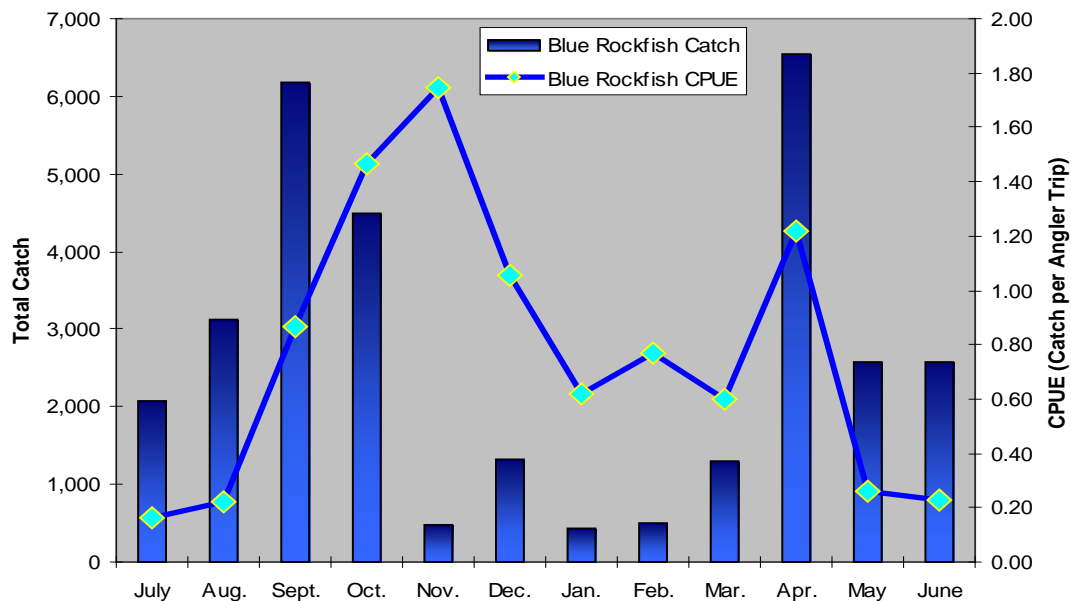


Figure 7. Observed average catch of yellow tail rockfish per bottomfishing angler trip off Oregon and total estimated catch by statistical month (Garibaldi, Pacific City, Depoe Bay, New port, Charleston, Bandon, Port Orford, Gold Beach, and Brookings), July 2011 - June 2012.

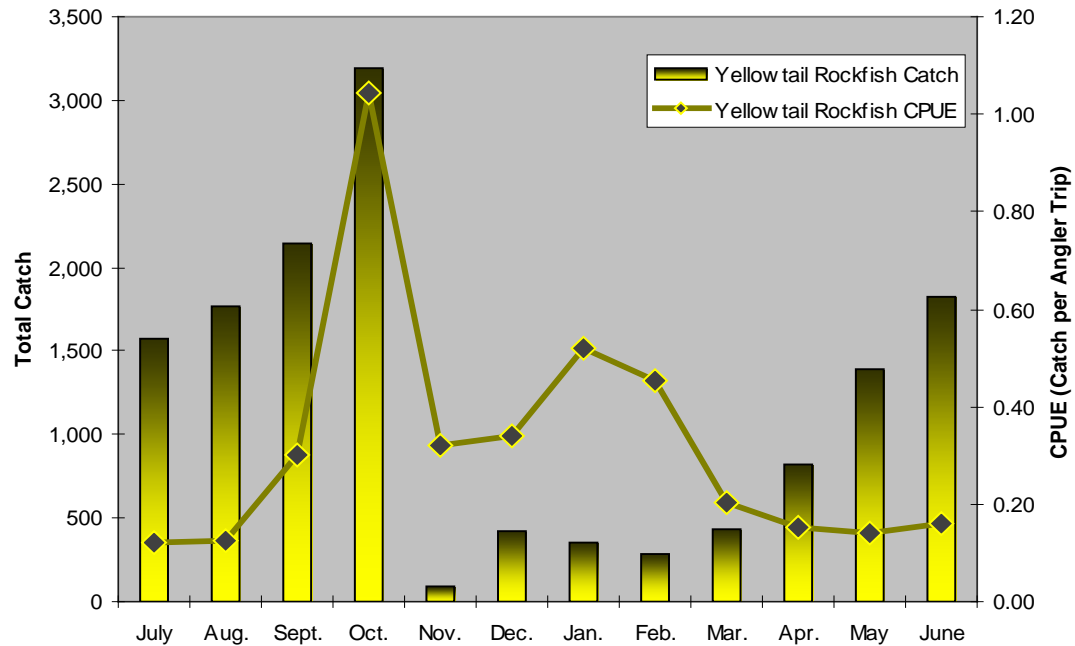
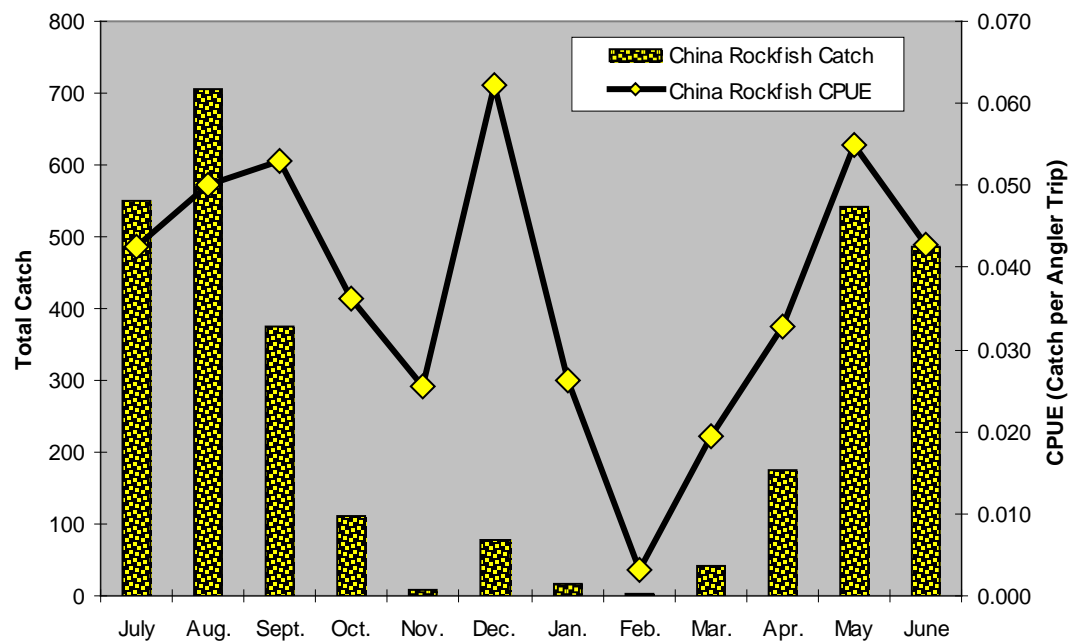


Figure 8. Observed average catch of China rockfish per bottomfishing angler trip off Oregon and total estimated catch by statistical month (Garibaldi, Pacific City, Depoe Bay, New port, Charleston, Bandon, Port Orford, Gold Beach, and Brookings), July 2011 - June 2012.



Other seasonal variations in catches of some rockfish species are likely to be directly related to seasonal fishing restrictions that have limited offshore bottomfish opportunity recently to the October through March period only. There are other variations in catch rates due to behavior of the fish such as the late winter – spring lingcod spawning and nest guarding period.

By using the estimated angler trips by boat type, and applying the observed CPUE for the sampled months to the unsampled months effort, and then summing the months for each species/species group within a port, and then across ports; we were able to evaluate the magnitude of the seasonal catch biases for those species and species groups. Table 22 summarizes the percent difference by species and port, and the summed port difference, as well as the difference by those ports with a standard sampling period of March through October, and those with a standard sampling period of mid-June through September. Using this approach, the estimated catch of all rockfish landings would have resulted in a 0.34% overestimate of the catch; however, the individual species show more significant variations with blue rockfish underestimated by 6.9%, yellowtail rockfish underestimated by 4.6%, and black rockfish overestimated by 2.0%.

Not surprisingly, the ports of Pacific City, Bandon, and Gold Beach with only a mid-June through September standard sampling frame showed greater variation, and did not necessarily follow the trends of the ports with longer term sampling (e.g. yellowtail rockfish at Pacific City and Bandon, lingcod at Bandon, and black rockfish at Pacific City) (figures 9-13). The standard estimation process for these three ports combined showed an overestimate of 3.1% of the black rockfish catch and 13% of the yellowtail rockfish catch, and underestimates of 17% for blue rockfish and 9.7% for lingcod.

Table 22. Comparison of seasonal catch rate bias by port, species, and sample period within Oregon ocean recreational ports. Comparison of full year catch estimates for the ports of Garibaldi, Pacific City, Depoe Bay, Newport, Charleston, Bandon, Gold Beach, and Brookings to standard sampling period.^{a/} Data from July 2011-June 2012.

	<u>Rockfish Total</u>	<u>Black Rockfish</u>	<u>Blue Rockfish</u>	<u>Yellowtail Rockfish</u>	<u>Lingcod</u>
	Percent Change from Sampled Estimate	Percent Change from Sampled Estimate	Percent Change from Sampled Estimate	Percent Change from Sampled Estimate	Percent Change from Sampled Estimate
Garibaldi	-0.06%	0.80%	1.04%	-3.20%	-1.21%
Pacific City	-13.43%	-13.99%	-53.70%	20.06%	-22.87%
Depoe Bay	-0.25%	0.63%	-3.51%	-1.78%	-1.65%
Newport	-0.80%	1.63%	-12.78%	-3.01%	-4.57%
Charleston	0.56%	3.87%	-3.14%	-22.20%	-6.31%
Bandon	15.75%	20.16%	-1.94%	13.40%	11.53%
Gold Beach	4.72%	10.09%	-16.49%	1.67%	-3.49%
Brookings	1.02%	2.29%	-5.58%	-0.93%	0.68%
Mar - Oct Ports	0.09%	1.84%	-5.95%	-5.89%	-2.88%
June - Sept Ports	1.93%	3.11%	-16.73%	13.30%	-9.70%
Total	0.34%	2.02%	-6.87%	-4.64%	-4.08%

^{a/} Standard sampling period is March through October for Garibaldi, Depoe Bay, Newport, Charleston, and Brookings; and mid-June through September for Pacific City, Bandon, and Gold Beach.

Figure 9. Rockfish (*Sebastes* spp.) estimated catch from normal ORBS sampling period expanded to full year by using proportion of annual effort during the sample period as compared to the estimated annual catch from the MRIP study.

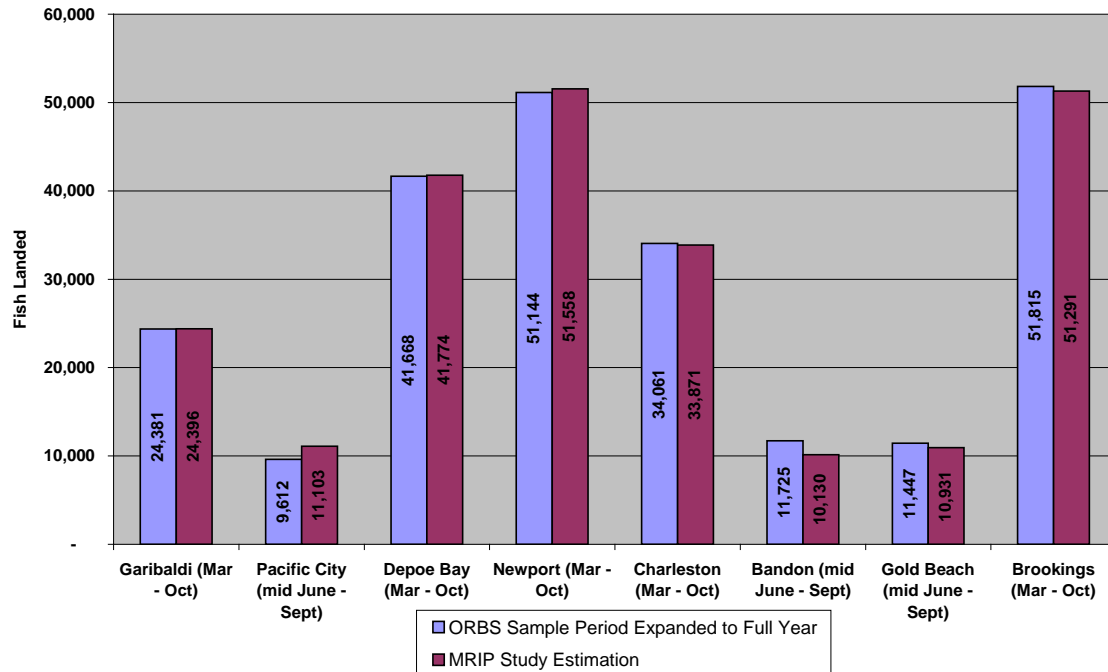


Figure 10. Black rockfish (*Sebastes melanops*) estimated catch from normal ORBS sampling period expanded to full year by using proportion of annual effort during the sample period as compared to the estimated annual catch from the MRIP study.

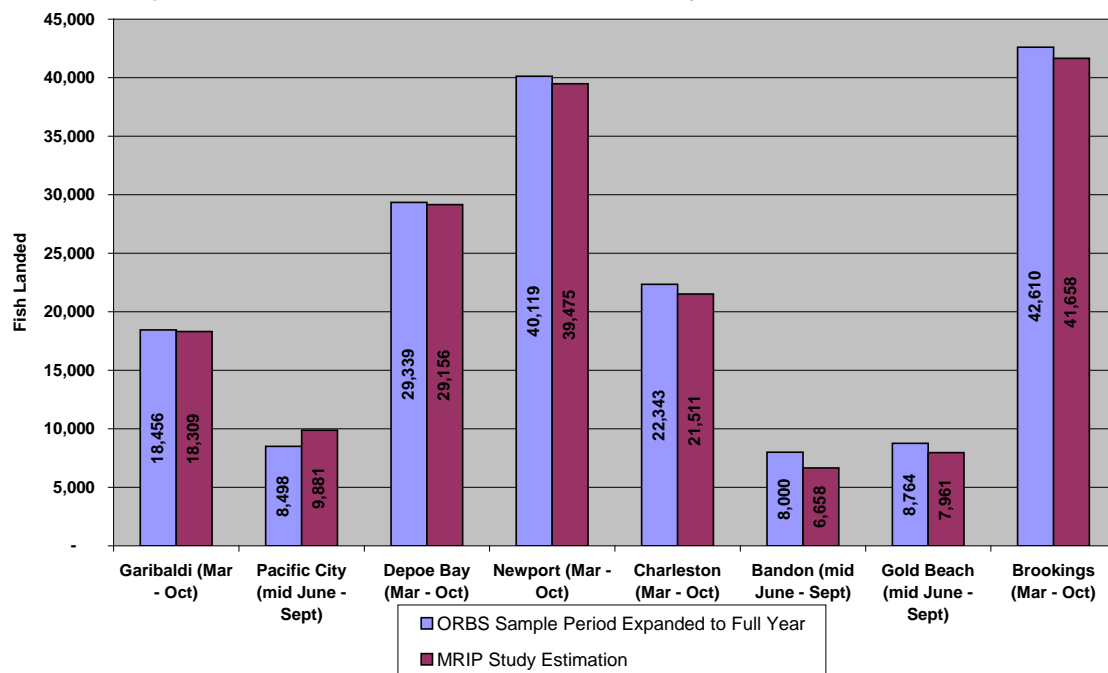


Figure 11. Blue rockfish (*Sebastes mystinus*) estimated catch from normal ORBS sampling period expanded to full year by using proportion of annual effort during the sample period as compared to the estimated annual catch from the MRIP study.

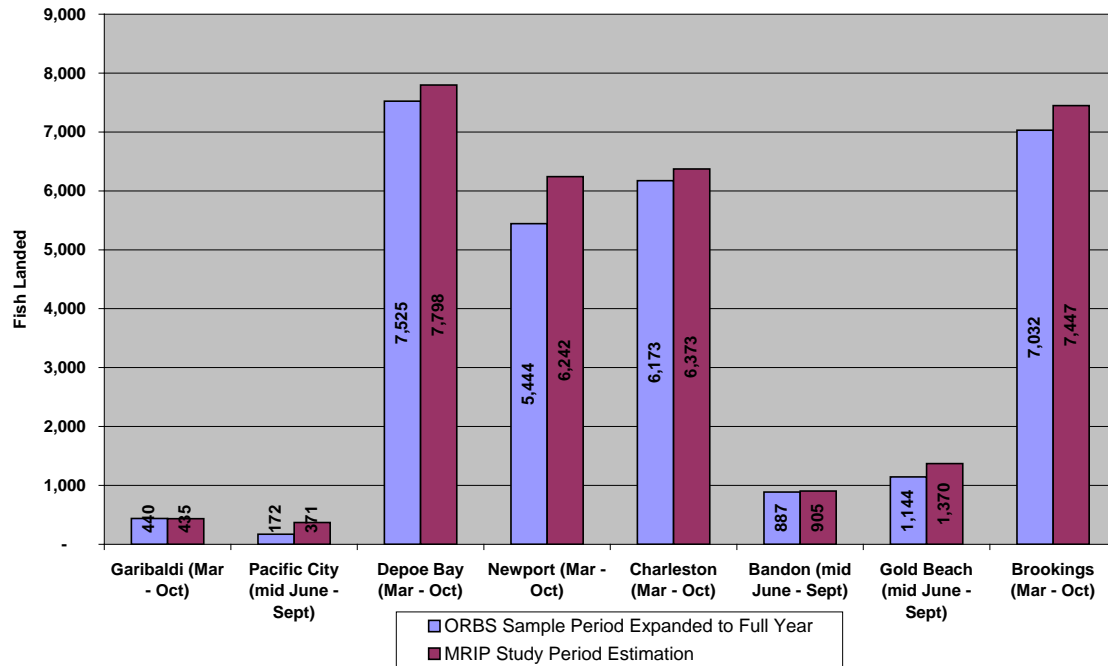


Figure 12. Yellowtail rockfish (*Sebastes flavidus*) estimated catch from normal ORBS sampling period expanded to full year by using proportion of annual effort during the sample period as compared to the estimated annual catch from the MRIP study.

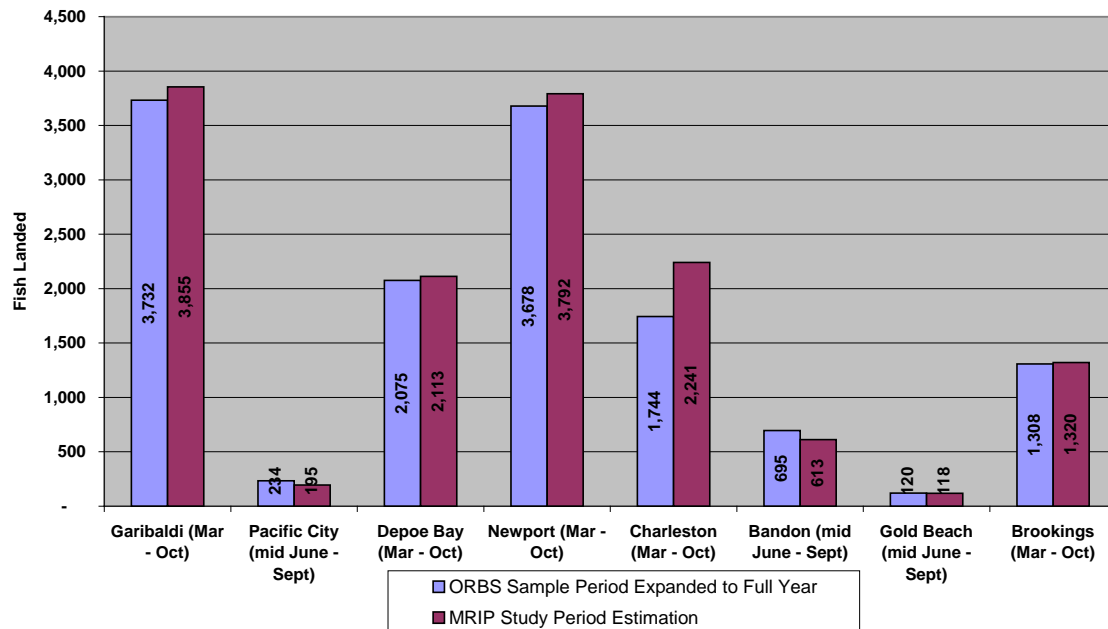
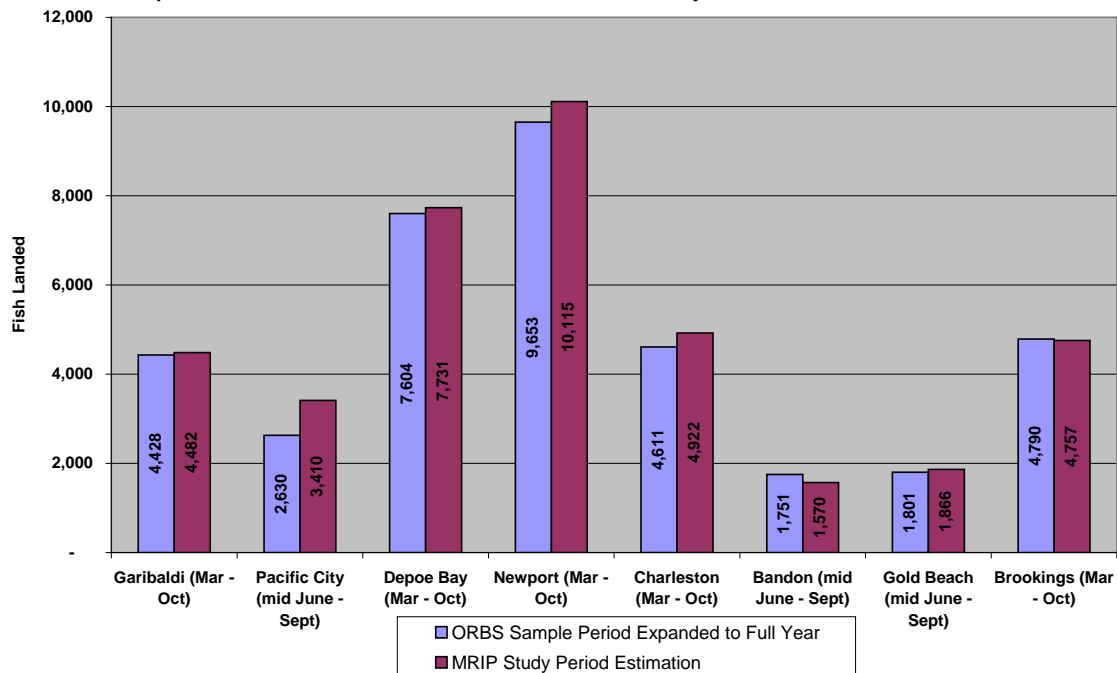


Figure 13. Lingcod (*Ophiodon elongatus*) estimated catch from normal ORBS sampling period expanded to full year by using proportion of annual effort during the sample period as compared to the estimated annual catch from the MRIP study.



3.3 Additional Concerns and Considerations

Although the recommended method for addressing the missing periods for each port is to utilize the sampled time period to expand for the unsampled period prior to the next sampling season, this is not without its own set of problems. The resolution of this method is best for the entire unsampled period; yet, the data will need to be parsed out to the month level. The simplest method would be to equally divide by month, but this has a high likelihood to bias estimates higher for the winter period (Nov.-Feb.), and lower for the late fall and early spring periods. This issue would be most problematic in those smaller ports where sampling starts in mid-June and ends in September. In those ports with sampling coverage from March through October, an equal split for the winter months is unlikely to have a substantive bias on the estimates by month although higher effort is often associated with the late December and early January holiday season.

4 Conclusions and Recommendations

4.1 Sampling structure

The current sampling structure can provide an accurate estimate of annual fishing effort for the primary ports that are sampled utilizing a March through October time sampling period. However, the mid-June through September sampling frame for the ports of Pacific City,

Bandon, and Gold Beach is not adequate to accurately estimate the annual fishing activity in these locations. The following recommendations should be considered and implemented to the extent possible:

- The current use of PSFMC samplers to provide November through February sampling and effort estimation in Depoe Bay, Newport, and Brookings should be continued at the monthly strata during the winter period. If PSFMC samplers are not available to provide this support, it is highly advisable to find funding means by which to maintain this sampling. It is possible that a single sampler might be able to provide this winter period sampling for both Depoe Bay and Newport at the monthly strata.
- If funding can be secured: Charleston sampling for the winter period of November through February should be added. Charleston is a major deepwater port that sees less of a change in bar crossing conditions in the winter than any other port on the coast.
- The March through October sampling time frame for standard ORBS sampling should be continued on a weekly strata for the ports of Garibaldi, Depoe Bay, Newport, Charleston, and Brookings.
- If funding can be secured for 4.5 additional months of seasonal port samplers then sampling in the ports of Pacific City, Bandon, and Gold Beach should be extended to include the period of May through September. This will provide an increase from only 66% of the annual effort covered to an expected 89% of the effort for these three ports. This would additionally provide a significant move towards reducing the seasonal catch biases in these ports. If support is available for 8.5 months of seasonal sampling time, then moving to the optimized sampling structure as described in Table 15 should be considered.
- Sampling of the recreational fishery at Port Orford should not be continued. Total bottomfishing effort at Port Orford during the study accounted for less than 1% of the total for the nine ports included in the project. Effort and catch for Port Orford should continue to be included in the 4% unsampled port and time period expansion.

4.2 Estimation

Recommendations for the catch and effort estimates for the unsampled time periods rely on the level of sampling that can be instituted. The current sampling frame of mid-June through September for the ports of Pacific City, Bandon, and Gold Beach is problematic for using a simple expansion for the winter; however, it can be substantially improved by a modest extension of the sampling time frame for those three ports. The current ORBS ratio expansion for those three ports which is based on the effort for ports being sampled between March and mid-June does a poor job of representing these three ports for the unsampled periods.