

Sampling Oregon's Shore and Estuary Boat Recreational Fishery

Marine Resources Program
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Introduction

Shore and estuary boat sampling (SEBS) in Oregon is intended to produce catch and effort estimates for three modes of marine recreational fishing: man-made structures (MM), beaches and banks (BB), and private and rental boats (PR). Shore modes (MM and BB) include fishing that occurs in the ocean and in estuaries, while the PR mode includes only estuary fishing.

An angler intercept survey, based on access-point survey methodology from the Marine Recreational Fisheries Statistics Survey (MRFSS), is used to calculate catch per unit effort (CPUE). A telephone survey of angling license holders is expected to be used to estimate angler effort. Catch estimates will be calculated using CPUE from the angler intercept survey and trip estimates from the telephone survey.

Where is the charter boat mode? The charter and guide boat mode (PC) in Oregon estuaries is limited to salmon and sturgeon fishing which, along with striped bass fishing, is not sampled by the SEBS intercept survey. The SEBS telephone survey, on the other hand, will include (at least initially) ocean boat fishing and salmon/sturgeon/striped bass fishing so that effort estimates from three sources—the SEBS license frame telephone survey, the federal random digit dial (RDD) telephone survey, and Oregon Recreational Boat Survey (ORBS)—can be compared.

Oregon is sampled as a single geographic area for the SEBS survey. Estimates of catch and effort are made for each mode (MM, BB and PR) for each wave (2-month period).

SEBS Departures From MRFSS

Departure 1: As of May 1, 2003, Oregon MRFSS sample data no longer include information from ocean boat anglers.

Rationalization: Ocean boat catch and trip estimates are provided by the state's Oregon Recreational Boat Survey (ORBS) which has a more robust sampling rate and provides more accurate and timely estimates than MRFSS. Catch and angler trip estimates are posted to the RecFIN Web site. An added SEBS benefit of sampling only estuary boats is that it eliminates the need to post-stratify trips by area (ocean and inland waters).

Downside: Because ORBS is a boat-based program, the MRFSS time series of angler-based sample data comes to an end. Ports are not sampled year round, and some lesser ports are not sampled at all. (However, catch and effort outside the sample period is a small percentage of the annual ocean boat catch and effort, and historical data is used to expand catch and trip estimates for the unsampled period and ports.)

Departure 2: As of July 1, 2003, Oregon MRFSS sample data no longer include information from shore anglers or estuary boat anglers who targeted only salmon, sturgeon and/or striped bass.

Rationalization: By foregoing salmon, sturgeon and striped bass only anglers, SEBS samplers are available to focus on true marine (non-anadromous) fishes such as groundfish. The ability to concentrate on these species is especially valuable now that samplers are responsible for tasks in addition to SEBS assignments¹. The reduced intercept sampling time is best used collecting information needed for the management of groundfish, not salmon or sturgeon. (Historically, MRFSS samplers only rarely intercepted striped bass anglers.) Salmon and sturgeon fisheries that take place aboard ocean boats are covered by ORBS. Estuary catch estimates of salmon and sturgeon can be derived from harvest cards and creel surveys.

Another reason for dropping salmon, sturgeon and striped bass from SEBS sampling is the incomplete catch estimate that results for a species that is caught in both saltwater and freshwater. A "saltwater" estimate generated for the estuary catch of any of these species is of limited value because it represents only part of the inland catch and because of the somewhat arbitrary and inconsistent placement of MRFSS saltwater cutoffs.

¹ Spring through Fall: samplers document releases and catch location aboard charter vessels. Fall through Spring: samplers collect groundfish maturity, fecundity and age data; enter data from their charter sampling; and age surfperch otoliths.

One of the MRFSS criteria for saltwater cutoffs is that they be readily identifiable landmarks that anglers recognize. In many Oregon waters, the Highway 101 bridge was used as the saltwater cutoff. In most cases, the bridges are readily identifiable, but they are not located consistently from water to water, so the saltwater cutoffs in some estuaries are further upstream than in other estuaries. Consequently, some estuaries were more heavily sampled for salmon and sturgeon than were other estuaries, not because of fishery effort or catch but because of bridge placement. In an attempt to remedy this inconsistency of estuary coverage, other landmarks (boat ramps and sloughs) have been used to define saltwater cutoffs. These cutoffs worked well enough for the intercept survey because samplers could determine angler eligibility by observing angler effort, pointing to landmarks and to the direction below a cutoff, or showing nautical charts to anglers. However, the telephone survey has no other technique for determining angler eligibility than to describe a cutoff, which may or may not be understood over the phone. In addition, not all anglers understand what fishing "above" or "below" a particular landmark means. Consequently, effort derived from the telephone survey does not necessarily correspond to the CPUE derived from the intercept survey. Eliminating salmon, sturgeon and striped bass from SEBS sampling eliminates the need for saltwater cutoffs.

Downside: The time series of MRFSS sample data and estimates will be affected by the absence of salmon and sturgeon (and, to a lesser degree, striped bass). For example, the catch composition will change, not because of changes in the fishery—as might be interpreted by data users—but because of changes in methodology. This situation will be flagged on the RecFIN Web site.

Another downside is that most estuaries are limited to salmon effort in fall and some estuaries are limited to sturgeon effort in winter, so removing these species from the sampling frame will leave those areas and periods entirely or nearly void of eligible anglers. In the former case, samplers will take on tasks such as ageing surfperch otoliths or entering data. In the latter case (when some eligible activity may be present but only as a fraction of total activity), a method of sampling that is more efficient than the currently-used MRFSS method may need to be developed or sampling goals may need to be revised.

Foregoing anglers who target only salmon, sturgeon or striped bass means that some non-salmon/sturgeon/striped bass "bycatch" will go missing from the sample data. For most species, the bycatch is minor, but for a few (such as Pacific staghorn sculpin, sand sole and starry flounder) it can be significant (Table 1).

Table 1. Sampler observed catch (numbers of fish) other than salmon/sturgeon/striped bass caught by salmon/sturgeon/striped bass SEBS anglers, 1993-2002.

Species	Angler Category				Total N
	SSS		pSSS	nonSSS	
	N	%	N	N	
whiting	1	100%			1
wolfeel	1	100%			1
Pac. staghorn sclpn	26	37%		45	71
sand sole	6	21%		22	28
quillback RF	1	11%		8	9
starry flounder	14	9%		144	158
Pac. mackerel	1	4%		22	23
lingcod	18	3%	13	544	575
topsmelt	1	2%		57	58
copper RF	4	1%	6	314	324
shiner SP	3	1%	1	244	248
black RF	34	1%	22	2999	3055
blue RF	6	1%	4	829	839
rock grnlg	2	0%	6	394	402
striped SP	13	0%	12	2784	2809
kelp grnlg	10	0%	19	4211	4240
redtail SP	3	0%	17	4653	4673
herring	5	0%	105	14982	15092
anchovy			132	722	854
pile SP			12	1395	1407
jacksmelt			8	214	222
white SP			5	372	377
canary RF			4	51	55
walleye SP			2	203	205
ocean sunfish			2		2
China RF			1	9	10
cabezon			1	368	369
Total	149	0.4%	372	35586	36107

SSS = only salmon, sturgeon or striped bass were targeted

pSSS = one of the targets was salmon, sturgeon or striped bass;
the other target was a true marine species or group

nonSSS = salmon, sturgeon or striped bass were not targeted at all

One possible solution to the problem of missed bycatch from salmon/sturgeon/striped bass only anglers is to consider these anglers eligible for the intercept survey if they caught something else. However, if this approach were used, then intercept CPUE would not correspond to telephone effort because the telephone survey will only consider target species in establishing who is an eligible angler. To account for missed bycatch, it may be possible to expand catch estimates to include catch from salmon/sturgeon/striped bass only anglers based on historical MRFSS data.

The final downside to excluding salmon/sturgeon/striped bass only anglers from the sample frame is that economic surveys—used to estimate the value of marine recreational fisheries to local economies—would be negatively impacted by the exclusion of salmon/sturgeon/striped bass effort in estuaries. Therefore, during years in which economic surveys are conducted, sampling may be expanded to include SEBS salmon/sturgeon/striped bass only anglers (as well as ocean boat anglers) for the economic questions.

Departure 3: As of July 1, 2003, angler trip estimates for shore and estuary boats are based on an angling license frame telephone survey conducted by CIC Research (Attachment A).

Rationalization: Using a license frame will be more efficient than dialing random numbers because calls will not be wasted on households that have nothing to do with fishing. Because more anglers will be interviewed, the precision of trip estimates will be improved. In addition, a license frame allows calls to anglers outside the RDD coastal area used by MRFSS. Estimates from the license frame survey will be compared to those from the RDD survey and ORBS. (Therefore, during the comparison phase, the license frame telephone survey will cover ocean boat trips as well as salmon/sturgeon/striped bass trips.)

Downside: The small percentage of anglers who fish without an angling license cannot be called because the frame includes only people who hold a license. An angling license is required of all anglers age 14 or older except when angling for smelt. To account for anglers missing from the license frame, the intercept survey asks what type of license each angler has. The resulting ratio estimator is used to estimate trips taken by non-license holders.

Departure 4: As of May 1, 2003, the duties of samplers formerly dedicated to MRFSS are expanded to include collecting discard and catch location aboard CPFV vessels and collecting biological information such as maturity and age structure samples from groundfish.

Rationalization: Supplemental sampling of marine recreational fisheries provides valuable information needed to successfully manage a sustainable fishery.

Downside: The expansion of duties means that fewer SEBS assignments can be completed during a wave than if SEBS were the only task undertaken by samplers. Yet, for the first full wave of SEBS sampling, more interviews of anglers targeting "true" marine fishes (non-salmon/sturgeon/striped bass) were obtained compared to the average for MRFSS sampling (Table 2).

Table 2. SEBS angler intercept progress (number of completed interviews) compared to MRFSS average.

Wave	MRFSS Average					SEB					
4 Jul-Aug	2001-2002					2003					
		MM	BB	PR	PC	Total	MM	BB	PR	PC	Total
	# Assigns	34	25	49	15	123	29	27	33	0	89
	# Interviews	197	223	1103	293	1816	218	205	73	0	496
	# Intvs/Assgn	6	9	23	20	15	8	8	2	0	6
	% nonSSS	86%	79%	X	X		<u>No Ocean Boats or SSS</u> ^{/1}				
	% Estuary nonSSS	X	X	5%	0%						
	119	# Days sampled				81	# Days sampled				
5 Sep-Oct	2001-2002					2003 thru 10/5					
		MM	BB	PR	PC	Total	MM	BB	PR	PC	Total
	# Assigns	30	26	56	10	122	11	14	12	0	37
	# Interviews	95	227	1004	120	1446	66	53	47	0	166
	# Intvs/Assgn	3	9	18	12	12	6	4	4	0	4
	% nonSSS	69%	37%	X	X		<u>No Ocean Boats or SSS</u> ^{/1}				
	% Estuary nonSSS	X	X	2%	0%						
	118	# Days sampled				36	# Days sampled				

^{/1} SSS =salmon, sturgeon, striped bass only

Description of SEBS Sampling Methodology

Catch and effort estimates will be calculated for three modes of marine recreational fishing (MM, BB and PR) as follows.

Catch

Catch estimates are based on CPUE calculated from an intercept survey of anglers using MRFSS methodology.

Sample selection

All public sites with shore access to the ocean or an estuary and with boat access to an estuary are included in the sample frame. Sites are described in a master site registry. Sites are randomly selected for sampling after being weighted according to anticipated fishing effort, so busier sites have a higher probability of selection. Sampling is stratified by wave and mode. The pressure file, from which assignments are drawn, distinguishes kind of day (weekday and weekend/holiday) and is updated each month prior to the next assignment draw.

Anglers are not intercepted at private sites (because of access issues) or at night (safety issues). Catch composition and catch rates outside of the sampling frame are assumed to be the same as inside the frame. Few private sites are used by marine recreational anglers in Oregon. The catch composition at night likely differs from daytime.

Samplers may sample up to two alternate sites in addition to the assigned site.

A minimum of 30 intercepts, established by MRFSS methodology, is sought for each stratum (wave and mode). Beyond this minimum, samples are allocated in proportion to effort from previous years.

Data collection

Anglers are interviewed at the conclusion of their fishing. BB anglers may be interviewed before completing their fishing if they have completed 50% or more of their BB fishing for the day and no more than 50% of BB interviews are conducted for incomplete trips. The catch rate for the completed portion of an incomplete BB trip is used for the incomplete portion.

Anglers who target only salmon, sturgeon and/or striped bass are not eligible to be interviewed.

Data elements

Intercept: date, time, county, site

Effort: site, mode, water area, target, gear type, wet-gear time (BB expected additional wet-gear time)

Angler: residence information, gender, frequency of marine fishing, fishing license type, number of days fished with daily license

Catch, available: species, count, length, weight, sex (select species), catch disposition

Catch, unavailable: species or species group, count, catch disposition

Data processing

Samplers submit intercept forms weekly to Pacific States Marine Fisheries Commission (PSMFC) for entry and monthly summarization. Monthly preliminary data reports are reviewed by Oregon Department of Fish and Wildlife (ODFW).

Estimation and analysis

(MRFSS methodology)

Effort

Effort estimates are based on a telephone survey of angling license holders conducted by CIC Research.

Sample selection

A current angling license frame, which includes licenses purchased through the end of the wave for which estimates will be produced, is used. The license frame is stratified by ZIP code and license type: Stratum 1 includes resident and non-daily licenses with ZIP codes from coastal counties (or, in the case of two coastal counties that extend into Stratum 2, ZIP codes within approximately 20 miles of the coast); Stratum 2 includes resident and non-daily licenses with ZIP codes east of Stratum 1 to the Cascades; and

Stratum 3 includes everyone else including residents east of the Cascades, non-resident licenses and daily licenses.

Optimal allocation (not proportional allocation) is used to distribute the target sample size among the three strata. Allocation is optimized for the number of SEBS non-anadromous fishing trips. As a result, 30% of the samples are allocated to Stratum 1 (coastal residents), 55% to Stratum 2 (valley residents), and 15% to Stratum 3 (everyone else). The allocation of sample between strata may change after further analysis.

Based on current funding levels and results from the telephone survey pretest, an average of 550 complete interviews can be conducted per wave. The number of complete interviews may increase based on actual costs. A complete interview is one in which the selected license holder reports the number of days (including zero) fished in saltwater in Oregon during the specified wave. Fewer complete interviews will be conducted in winter than in summer because of reduced angler effort.

The file of license holders submitted to CIC Research contains extra records—three times the targeted number of complete interviews for each stratum—to allow for telephone numbers that cannot be found, unavailable anglers, answering machines, etc. CIC Research attempts to contact a license holder twelve times before dropping the name and selecting the next name on the list.

Data collection

License holders are telephoned and asked about their saltwater recreational fishing activities during the previous wave. Proxies are not used to answer questions on behalf of license holders selected for the survey because of concerns about data accuracy.

Data elements

Interview: date, time, interview duration, number of call attempts, stratum, license type

Effort: number of trips, mode, water area, port, beach area, nearest town, name of inland water body, target species

Data processing

CIC Research provides survey results to ODFW and PSMFC no more than 3 weeks after receiving the license holder file.

Estimation and analysis

PSMFC produces catch and trip estimates based on intercept CPUE and telephone results. Wave 4 (July-August) 2003 will be the first wave to undergo this procedure.

Staffing

To accomplish SEBS sampling, three samplers each work an average of three SEBS assignments per week for most of the year. Samplers are employed year-round despite the Northwest climate factor which often discourages anglers from venturing out. Keeping year-round staff rather than seasonal staff means that data collection, personnel recruitment, and training problems are minimal. In addition, species composition and size vary with time of year, particularly in SEBS fisheries, so collecting SEBS data throughout the year ensures a representative sample. During adverse weather, samplers are kept busy entering data, processing biological samples, and ageing fish.

Attachment A - Oregon License-Frame Telephone Survey Instrument

Wave 4: July-August, 2003 Fishing

Hello. May I speak to <license holder>? (ARRANGE CB OR CONTINUE) Hello, my name is _____, and I'm calling for the Oregon Department of Fish and Wildlife, which is collecting information about saltwater sport fishing. May I ask you some questions about your fishing activities? The information you provide will be confidential.

QA.. Our survey deals with saltwater sport fishing in Oregon. By "sport fishing" I mean the primary purpose of fishing or spearfishing was for fun, relaxation or personal consumption—not for income. By "saltwater" I mean ocean, bays, estuaries and salty areas of rivers. In < July and August> did you go saltwater sport fishing or spearfishing for fish—not crabs—in Oregon?

1. yes (CONTINUE)
2. no (THANK & TERMINATE; IT'S A COMPLETE)

Q1. How many days did you go saltwater sportfishing for fish in Oregon between July 1st and August 31st?

_____ days

98. Don't know (no. of days not established) [PROBE WELL FOR THEIR BEST GUESS AND CONTINUE; IF ABSOLUTELY CANNOT REMEMBER ANYTHING, THANK & TERMINATE; NOT A COMPLETE]

99. Refused (no. of days not established) [THANK & TERMINATE; NOT A COMPLETE]

Q2. Can you recall the approximate date(s)? I have a calendar here in case you need help. (RECORD DATES; IF DK DATES, PROBE FOR AS MUCH INFORMATION AS POSSIBLE: MONTH, WEEKDAY VS. WEEKEND, HOLIDAY, FREQUENCY, ETC.)

Dates: _____

Q3. (IF DAYS>1, THEN START WITH THE MOST RECENT DATE:) Regarding <date>, was most of your saltwater sport fishing that day done from a boat, beach, bank, jetty, dock, pier or bridge?

1. Boat [GO TO B1]
2. Beach or bank (BB) [GO TO S1]
3. Jetty, dock, pier, bridge (MM) [GO TO S1]
4. Other [SPECIFY] [go to S1]
8. Don't know [PROBE FOR DESCRIPTION & RECORD UNDER "OTHER"; THEN GO TO S1]
9. Refused [GO TO S1]

BOATS

B1. (Boat) Was that on a charter boat or a private or rental boat?

1. Charter or guide boat (CONTINUE)
2. Private or rental boat [SKIP TO B3]
8. Don't know [SKIP TO B3]
9. Refused [SKIP TO B3]

B2. Were you the captain or a crew member of the charter (or guide) boat on that trip?

1. yes [GO TO NEXT TRIP]
2. no (CONTINUE)
9. Refused [CONTINUE]

B3. Was most of that fishing in the ocean, a bay or a river?

1. Ocean [CONTINUE]
2. Bay or estuary [SKIP TO Q4]
3. River [SKIP TO Q4]
4. Other [SPECIFY] [SKIP TO Q4] _____
8. Don't know [SKIP TO Q5]
9. Refused [SKIP TO Q5]

B4. (Boat) What is the name of the port you went out of?

1. Astoria
 2. Bandon
 3. Brookings
 4. Charleston
 5. Depoe Bay
 6. Florence
 7. Garibaldi
 8. Gold Beach
 9. Hammond
 10. Nehalem
 11. Newport
 12. Pacific City
 13. Port Orford
 14. Salmon Harbor
 15. South Beach
 16. Warrenton
 17. Winchester Bay
 18. Other (SPECIFY) _____ [SKIP TO Q5]
 98. Don't know [SKIP TO Q5]
 99. Refused [SKIP TO Q5]
-

SHORE

- S1.** (Shore) Was most of that fishing in the ocean, a bay or a river?
1. Ocean [IF MM (Q3 = 3), SKIP TO Q5; OTHERWISE CONTINUE TO S2]
 2. Bay or estuary [SKIP TO Q4]
 3. River [SKIP TO Q4]
 4. Other [SPECIFY] [SKIP TO Q4]
 8. Don't know [SKIP TO Q5]
 9. Refused [SKIP TO Q5]
- S2.** Do you know the name of the beach or area where you did most of that fishing? (REFER TO LIST; IF NOT ON LIST, RECORD UNDER "OTHER")
- Area # _____[NOW SKIP TO Q5]
1. Other (SPECIFY) _____[SKIP TO Q5]
 8. Don't know [SKIP TO Q5]
 9. Refused [SKIP TO Q5]
-

- Q4.** What is the name of that <bay, estuary, river>? (USE LIST TO DETERMINE CODE; IF NOT ON LIST, RECORD UNDER "OTHER")
- Body of Water # _____
1. Other (SPECIFY) _____
 8. Don't know
 9. Refused
- Q5.** What is the nearest town to where you did most of that fishing? (USE LIST TO RECORD NAME OF NEAREST TOWN; IF DK TOWN, RECORD NAME OF NEAREST STATE PARK, LANDMARK, ETC. IF NOT ON LIST; RECORD UNDER "OTHER")
- Town # _____
1. Other (SPECIFY) _____
 8. Don't know
 9. Refused

Q6. What kinds of fish did you try to catch that day? (CHECK ALL THAT APPLY) [NOTE: RESPONDENT MUST SAY EXACT WORDING TO BE INCLUDED IN A GROUP, OTHERWISE RECORD UNDER "OTHER".]

1. Anything (or nothing in particular)
2. Bottomfish
3. Cabezon 98. Don't know
4. Flounder, sole, sanddab, flatfish 99. Refused
5. Greenling, "Sea Trout "
6. Herring, Pacific herring
7. Lingcod, "Ling"
8. Pacific Halibut
9. Rockfish, "Sea Bass," "Rock Bass"
10. Salmon, steelhead, trout, chinook, coho, silver and king
11. Sturgeon
12. Surfperch, "Sea Perch," "Perch"
13. Tuna, Albacore
14. Other [SPECIFY] _____

Q7. Did you do any other saltwater sport fishing that day, for example from {RESTORE OPPOSITE OF CURRENT MODE, I.E. "A BOAT" OR "SHORE"}?

1. Yes [GO TO Q3 WITH MODIFIED WORDING: WAS MOST OF THAT FISHING DONE FROM A BOAT, BEACH...?, THEN S1 OR B1 FOR ANOTHER MODE OF FISHING; SKIP Q7]
2. No [IF NUMBER OF DAYS (Q1) IS MORE THAN ONE AND NOT ALL DAYS HAVE BEEN DISCUSSED, THEN GO TO Q3 FOR ANOTHER DAY OF FISHING; OTHERWISE, GO TO Q9]
8. Don't know [IF NUMBER OF DAYS (Q1) IS MORE THAN ONE AND NOT ALL DAYS HAVE BEEN DISCUSSED, THEN GO TO Q3 FOR ANOTHER DAY OF FISHING; OTHERWISE, GO TO Q9]
9. Refused [IF NUMBER OF DAYS (Q1) IS MORE THAN ONE AND NOT ALL DAYS HAVE BEEN DISCUSSED, THEN GO TO Q3 FOR ANOTHER DAY OF FISHING; OTHERWISE, GO TO Q9]

Q8. While we were talking, did you think of any other saltwater sport fishing you did in Oregon in < July and August> that we have not discussed?

1. Yes [RETURN TO Q2 FOR THE DATE, THEN CONTINUE LOOP WITH Q3]
2. No [THANK & TERMINATE]
8. Don't know [THANK & TERMINATE]
9. Refused [THANK & TERMINATE]

On behalf of the Oregon Department of Fish and Wildlife, I want to thank you very much for taking the time to answer these questions. You have been very helpful. Thanks again, and good luck on your next fishing trip.