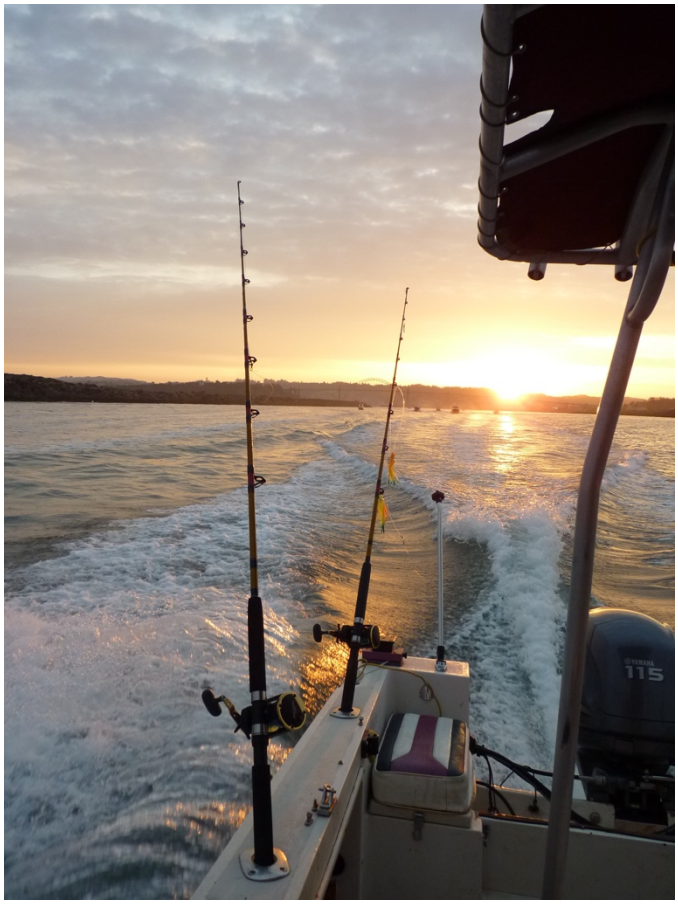
Recreational Fisheries Information Network (RecFIN)
Marine Recreational Information Program (MRIP)

Regional Implementation Planning Priorities
2019–2021



RecFIN
RECREATIONAL FISHERIES INFORMATION NETWORK

CALIFORNIA DEPARTMENT OF FISH & WILDLIFE

WASHINGTON DEPARTMENT OF FISH AND WILDLIFE

OREGON Fish & Wildlife

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NOAA NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION U.S. DEPARTMENT OF COMMERCE

PACIFIC FISHERY MANAGEMENT COUNCIL

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Recreational Fisheries Information Network (RecFIN)/MRIP Implementation Plan (2019–2021)

Implementation Plan Purpose

The Pacific Coast Recreational Fisheries Information Network (RecFIN) is a project of the Pacific States Marine Fisheries Commission (PSFMC).

Established in 1992, RecFin integrates data from state and federal marine recreational fishery sampling efforts into a single database to provide important biological, social, and economic data for Pacific Coast recreational fishery biologists, managers, and anglers.

The three Interstate Marine Fishery Commissions[1] are critical to managing and conserving shared coastal fisheries—marine, shell, and anadromous—within the first three miles of the nation's coastline for sustainable use.

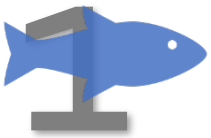
This plan was developed in response to Pacific Coast regional needs to enhance data for regional fishery management and science, and integrates West Coast data collection and reporting efforts with the goals of the MRIP national plan.

RecFIN Steering Committee

Randy Fisher (Chair) – Pacific States Marine Fisheries Commission
Ryan Wulff – National Oceanic and Atmospheric Administration – West Coast Region
Chuck Tracy – Pacific Fishery Management Council
Ed Bowles – Oregon Department of Fish and Wildlife
Michele Culver – Washington Department of Fish and Wildlife
Craig Shuman – California Department of Fish and Wildlife

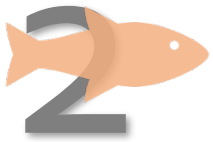
[1] Atlantic States Marine Fisheries Commission, Gulf States Marine Fisheries Commission, Pacific States Marine Fisheries Commission

RecFIN Top Seven Funding Priorities



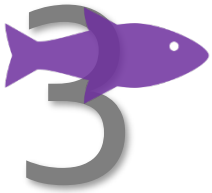
Maintain and Restore Base Level Sampling

Funding needed to maintain the current service level and to restore lost base levels of sampling (including new funding for certified programs).



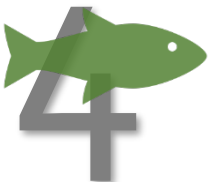
Implement and Support Enhanced Electronic Data Collection

Implement and support electronic data collection applications across all sampling modes.



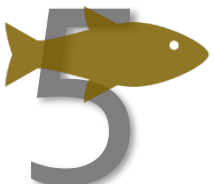
Increase Onboard Sampling

Expansion of Onboard Sampling of Commercial Passenger Fishing Vessels or Recreational Charter Boats

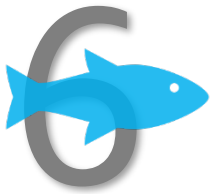


Investigate and Maintain Video Effort Counts

Investigate and maintain current video effort counts.

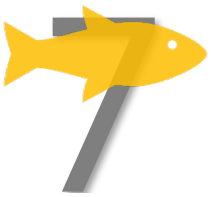


Stratify Party Charter (PC) Sampling by Trip Type and Sampling Period for Southern California Highly Migratory Fisheries



Provide Improved Access to Marine Recreational Fisheries Statistics Survey (MRFSS) Database

One-time funding to provide improved access to MRFSS database.



State Calibration of Historical Catch

Calibrate legacy MRFSS estimates.

Budget Narrative/Justification

Priority 1 – Maintain and Restore Base Level Sampling

Oregon Department of Fish and Wildlife

A. Ocean Recreational Boat Survey (ORBS)

Oregon's primary needs for management of the marine recreational fishery are for accurate and timely information on catch and effort, and biological data for use in stock assessments to maintain a sustainable fishery. Funding received through PSMFC is used to augment Oregon's ongoing annual Ocean Recreational Boat Survey (ORBS) to provide timely catch, effort, and biological data needed by both state and federal managers. Catch and effort data from ORBS are compiled and reported on the RecFIN website. Funding for the project comes from a variety of sources, including the National Marine Fisheries Service (NMFS), US Fish and Wildlife Service (USFWS), and state funds. ORBS continues to be the source of official catch and effort estimates for the Oregon ocean boat recreational fishery.

The FY 2019 base level of funding received from PSMFC to support ORBS, which supplements funding from other federal and state sources, is $275,000. The PSMFC contribution to this monitoring program has remained relatively flat since 2011, when PSMFC provided ODFW with $270,500 in support. Inflation has reduced the buying power of these 2011 dollars substantially: assuming 2.44% inflation rate per year using the Employment Cost Index from the Bureau of Labor Statistics (https://www.bls.gov/ect/#tables), ODFW would require $334,000 to perform the same level of sampling effort that was conducted during 2011. This $59,000 shortfall from the current funding of $275,000 provided by PSMFC has been compensated by obtaining additional state funding. However, internal ODFW state funding cannot be relied upon to backfill the inflationary deterioration of base funds provided by PSMFC.

Results of recent pilot studies, along with recommendations from MRIP-supported consultants, demonstrate the need for improvements in the ORBS sampling program to increase precision of effort and catch estimates:

- (1) increase sampling effort at three ports by 2.5 months to include periods of relatively high and variable effort during shoulder months (May 1–June 15 and October 1–31); and
- (2) increase sampling effort in the port of Charleston from eight months to year-round to better account for significant and variable fishing effort.

Budget

1. **Option A - Status quo ($275,000/year):** Status quo represents no change in funding for FY 2019 and beyond. Funding has remained flat since at least 2011, when ODFW received $270,500 from PSMFC to augment ORBS. Funding has remained stable since 2011, at about $275,000 per year.

2. **Option B - Return to funding equivalent of 2011 levels ($334,000/year):** The Employment Cost Index has been rising at a mean annual rate of 2.44%. Applying this "inflation" rate to the base funding, $334,000 would be needed in FY 2019 to equal the buying power of the 2011 funding level.

3. **Option C - Implement recommendations based on MRIP-funded pilot studies, including inflationary increases ($402,770/year):** Conclusions of past MRIP pilot studies and consultant recommendations demonstrate the need for (a) increasing sampling efforts at three ports (Pacific City, Bandon, and Gold Beach) to include shoulder months (estimated cost = $44,850, including indirect) and (b) extend sampling efforts in Charleston from eight months to year-round (estimated cost = $23,920, including indirect). Including the $59,000 inflation adjustment shown in Option B, the current base funding from RecFIN ($275,000) would increase by $127,770 annually, totaling $402,770.

   Table 1. ORBS Budget.

Options	Explanation	Budget
A	Status Quo	**$275,000**
B	Option A ($275,000) plus 2.44% Annual Inflation (2011-2019) estimated at $59,000	**$334,000**
C	Option A plus Option B plus Shoulder-month Sampling (3 ports; 2.5 mo/port = $44,850) plus Winter Sampling (Charleston, 4 additional months = $23,920)	**$402,770**

B. Implement Shore and Estuary Boat Survey (SEBS) off Oregon Coast

The Shore and Estuary Boat Survey (SEBS) is a state survey designed to estimate catch and effort of Oregon's non-anadromous marine recreational fisheries from shore and estuary boats. Catch and effort estimates for ocean boats are generated by the ORBS survey, also conducted by ODFW.

Like ORBS, SEBS is concerned with groundfish, surfperch, and any other finfish species. Catch and effort estimates for these fishes are derived from two complementary surveys: (1) an angler intercept survey to determine catch-per-unit-effort (angler trip) and average weight by species and (2) a telephone or mail survey of angling licensees to generate an estimate of angler effort. Future SEBS effort estimates could incorporate other means of contacting shore

and estuary boat anglers, including e-mail or online surveys. It is necessary to combine results of both survey types to generate catch estimates in both numbers and weight of fish.

Year-round SEBS sampling was last conducted in Oregon from July 2003 through April 2005, when the survey was suspended due to budget constraints and reprioritization of sampling resources. More recently, an MRIP-funded SEBS pilot study was implemented from May 1–October 31, 2016, during three consecutive 2-month waves (waves 3, 4, and 5) in a limited geographic area to (a) evaluate the need and expense of reinitiating a SEBS program in Oregon and (b) compare response rates and potential bias in effort estimates between telephone and mail surveys. Data from that pilot study have been analyzed and final reports are available.

Catch estimates for shore and estuary boat fishers from the surveys that ended in 2005 inform management and stock assessments of groundfish (e.g., black rockfish), surfperch, greenling, and other species. It is unlikely, however, that these legacy data sets are representative of the current status of the resource, or of fishing effort. There is a need for more current and representative data to effectively and responsibly manage this fishery.

Three budget alternatives for reinitiating and implementing SEBS in Oregon are shown in the table below. The alternatives range from a comprehensive sampling plan (Option A) to a minimal sampling plan (Option C). Either a telephone or a mail survey will be needed to create estimates of fishing effort. For the purpose of this document, we assume that a mail survey will be used to estimate fishing effort to provide a "maximum" cost estimate. A decision regarding implementation of phone versus mail survey is dependent on the outcome of the pilot study.

Staff expense is consistent among the three alternatives for sampler effort. Staff to implement the three alternatives include (a) SEBS coordinator (12 months), (b) developer/database manager (2 months), (c) statistician (1 month), and (d) supervisory fish and wildlife biologist (1 month). Sampler months, travel, and supplies vary among alternatives (i.e., highest for Option A and lowest for Option C). Specific differences are described below.

Angler intercept surveys may be conducted across three regions (north coast, central coast, and south coast) and six 2-month waves using various designs. Differences in those potential designs are described in the alternatives below and in Table 1.

Options

1. **SEBS Option A (cost ~ $768,714):** A comprehensive SEBS program may be implemented for an estimated cost of $768,714/year. All coastal regions (north, central, and south) would be sampled annually during all months of the year (i.e., waves 1–6) by both angler intercept surveys and mail surveys. This alternative would include nine samplers (three in each region) conducting work during waves 2–5, and three samplers (one in each region) conducting work during winter months (waves 1 and 6). Winter sites would be reduced to include primarily estuary anglers (boat and shore). Sampling would be reduced along ocean beaches because it is unlikely that much fishing would

occur on the beach during winter months.

2. **SEBS Option B ($657,683):** A spring/summer/fall SEBS sampling program may be implemented at an estimated cost of $657,683/year. All coastal regions (north, central, and south) would be sampled annually during all waves except waves 1 and 6 (i.e., winter sampling would be excluded). Mail surveys would also be completed annually, but only during waves 2–5.

3. **SEBS Option C ($349,987):** A third alternative, in which sampling efforts are only 33% of Option A, may be implemented for an estimated cost of $349,987/year. Angler intercept sampling may occur in only one geographic area per year, so that all areas are sampled during a three-year period. During a single year, only 3 samplers would conduct surveys in a single geographic area (e.g., north coast) during waves 2–5, and one sampler would conduct surveys in the same geographic area during waves 1 and 6. A different geographic area would be selected during the subsequent year. Other angler-intercept designs would be considered under this alternative. Mail surveys would be conducted once every three years under this alternative. Note: The cost of the mail survey shown in this annual estimate represents the average annual cost over the 3-year period.

Table 2. SEBS Funding Alternatives.

	Option A	Option B	Option C
Regions	North, Central, and South annually	North, Central, and South annually	One geographic region annually
Months	Spring, Summer, Fall and Winter: (waves 1–6)	Spring, Summer, Fall: waves 2–5 (no winter sampling during waves 1 and 6)	Spring, Summer, Fall and Winter
Methodology	Angler intercept surveys and mail surveys conducted annually	Angler intercept surveys and mail surveys conducted annually	Angler intercept surveys in one region conducted annually; mail surveys conducted once every 3 years
Staffing	9 samplers (3 in each region during waves 2–5 and 1 sampler in each region during waves 1 and 6	9 samplers (3 in each region during waves 2–5)	3 samplers (in one region during waves 2–5); 1 sampler in one region during waves 1 and 6
Cost	**$768,714**	**$657,683**	**$349,987**

Washington Department of Fish and Wildlife

Washington Ocean Sampling Program (OSP) and Puget Sound Sampling Program (PSSP)

Need: The Ocean Sampling Program is the source of official catch and effort estimates for Washington's ocean boat recreational fishery, and PSSP continues to be the source of official catch and effort estimates for much of Washington's Puget Sound boat recreational fishery. Estimates of catch are used to manage ocean and Puget Sound recreational marine fisheries.

Washington's primary needs for management of the marine recreational fisheries are for accurate and timely information on catch and effort to ensure that harvest does not exceed allowable levels, and for biological data for use in stock assessments to maintain a sustainable fishery. Funding is used to augment Washington's ongoing annual OSP and PSSP to provide catch, effort, and biological data to both state and federal managers. These data are compiled and reported on the RecFIN website and in other locations.

Funding for the OSP and PSSP projects is derived from a variety of sources, including NMFS, USFWS, and state funds. Funding for both OSP and PSSP to support base level sampling has been received annually through PSMFC, and the funding is split between the programs: 89% is allocated to OSP, and 11% is allocated to PSSP. The FY 2018 base level funding received from PSMFC to support OSP and PSSP, which supplements funding from other federal and state sources, is $202,500. The PSMFC contribution to these recreational monitoring programs has remained relatively flat since 2006, when PSMFC provided WDFW with $204,800 to support OSP and PSSP. Inflation has reduced the buying power of these 2006 dollars substantially: assuming 3% inflation rate per year, WDFW would require $292,000 to perform the same level of sampling effort that was conducted during 2006, given all other circumstances being equal. This shortfall from the current funding of $202,500 provided by PSMFC has been compensated for by (a) obtaining additional state funding, (b) reducing or eliminating some sampling (e.g., reductions to sampling coastwide, reductions in biological data collection, and elimination of early- or late-season sampling in some coastal and Puget Sound ports), and (c) improving efficiencies through successful application of MRIP-funded pilot study results (e.g., adopting electronic sampling). State funding cannot be relied upon to backfill the inflationary deterioration of base funds provided by PSMFC. For example, the FY 2019 Washington State Budget projected a large deficit for WDFW, and internal funding may be reduced in the near future.

To restore WDFW's OSP and PSSP to fully funded levels relative to 2006 would require an increase in the funding provided by PSMFC to compensate for inflation. Scientific technicians conduct sampling for both OSP and PSSP. Salary and benefits for these staff have increased at an average annual rate of 2.5% from 2006 to 2018. Assuming 2.5% "inflation", $275,500 would be needed in FY 2018 to equal the buying power of the 2006 funding level. As shown above, FY

2018 base funding for OSP is $202,500, which is **$**73,000 less than the amount needed to compensate for 2.5% annual increases in WDFW salaries and expenses since 2006. Full funding would allow restoration of sampling levels to 2006 levels (reinstatement of spatial and temporal sampling coverage and increased biological sampling) and would reduce the reliance on unstable state funds. The "status quo" alternative (base line - no funding increase; PSMFC contribution to sampling programs remains flat-funded) will result in gradual decreases in spatial and temporal sampling coverage and data collection as staff levels are reduced to account for inflation.

Need: Results of recent MRIP-funded pilot studies and recommendations from MRIP consultants illustrate the need for minor improvements in the OSP and PSSP sampling programs to increase precision of effort and catch estimates.

A) status quo plus 2.5% annual inflation (2006–2018)

B) increase sampling effort at all four major coastal ports to include periods of relatively high and variable effort during shoulder months (March 10–April 30 and October 1–20); and

C) periodically dedicate sampling effort in "minor" coastal ports, including Ocean Shores, Tokeland, and South Bend to assess changes in fishing effort.

Implementing recommendation (B) would require an additional 2.5 Scientific Technician staff months/port. The estimated annual cost for fully sampling shoulder months coastwide is **$66,450** ($51,600 salaries and benefits, $14,850 indirect).

Implementing recommendation (C) would require an increase in Scientific Technician staff months every three years. To sample the three minor ports showing the most significant effort would require the addition of 2 staff for four months each at an estimated cost of **$53,890 every three years** ($41,300 salaries and benefits, $550 POV travel, $12,040 indirect).

Table 3. Expenses and total cost of restoring sampling effort to 2006 levels and for improving the precision of effort and catch estimates.

Annual Funding		
2018 Base Funding		$202,500 **(Baseline)**
2.5% Annual Inflation (2006–2018)		$ 73,000
	Subtotal	**$275,500 (A)**
Increase Shoulder-Month Sampling		$ 66,450
	Subtotal	**$341,950 (B)**
Minor Port Sampling		$ 53,890
	Grand Total	**$395,840 (C)**

California Department of Fish and Wildlife

California Recreational Fisheries Survey (CRFS) funding to maintain the current service level and restore the Beach and Bank (BB) surveys and undercoverage survey for the private and rental boat private access and nighttime effort (PR-PAN).

Need: CRFS is the primary source of official catch and effort estimates for California's diverse recreational fisheries. These estimates are used in conjunction with other fisheries information to manage mixed jurisdiction Federal/State groundfish, highly migratory species and state-managed fisheries. CRFS provides recreational fisheries data and estimates needed to manage California's marine and estuarine finfish resources on a sustainable basis. Management requires accurate and timely information on catch and effort to ensure harvest does not exceed allowable levels; in addition, catch location and biological data are used in stock assessments. CRFS collects data on California's marine recreational fisheries and provides monthly estimates of catch and effort of angler fishing for marine finfish in California. CRFS currently monitors three modes of saltwater fishing:

- Party and Charter boat (PC);
- Private and rental boats (PR); and
- Man-made structures (MM).

The data and estimates generated by CRFS are provided to RecFIN as part of the MOA between California and the National Oceanic Atmospheric Administration (NOAA) granting an exemption to the National Angler Registry.

CRFS is partially supported by a NOAA grant with funding passed through PSMFC. The state provides the majority of funds, which support dedicated permanent staff, temporary staff for field sampling, and operational costs. The NOAA grant funding, which totaled $1,153,000 in FY2018/19, is primarily used to supplement data collection activities. This funding has not substantially changed since 2004 when CRFS replaced the MRFSS. Inflation has substantially reduced the buying power of these 2004 dollars. Using the California Consumer Price Index (CPI) calculator, (https://www.dir.ca.gov/OPRL/CAPriceIndex.htm), between 2004 and 2018, the CPI increased by 42.4%. To maintain the funding relationship established in 2004, NOAA would have provided an additional $488,900 in fiscal year 2018/19.

This funding shortfall has been compensated by obtaining additional state funding, promoting sampling efficiencies, and reducing sampling, or sampling rates, at the cost of estimate precision. Sampling rate reductions occurred in 2015 for PR, PC, and MM modes. In 2016, the monthly quota of anglers contacted by the Angler License Directory Telephone Survey (ALDTS) that produces data needed to estimate BB and PR-PAN effort was reduced. In 2018, further budget reductions offset inflation and limited state resources. State funding will no longer be available to backfill the inflationary deterioration of NOAA funds. As such, CDFW had to reduce sampling by eliminating the ALDTS and the BB catch rate survey. Remaining

funds resulting from the sampling reduction were redirected to increase sampling of other modes to pre-2015 sampling rates. Thus, since CRFS inception in 2004, the survey did not have full coverage of all modes of access to the recreational fisheries and could not directly estimate effort and catch from PR-PAN (based on ALDTS data) or BB.

Cost: To restore CDFW's CRFS coverage to fully funded levels prior to program reductions and to account for cost increases due to salary and benefit increases in 2018 and 2019 requires a total of $510,000 in addition to the base funds currently provided. Re-establishing base funding would allow CDFW to sample all fishing modes including BB as well as perform an offsite survey to estimate PR-PAN.

Table 4. California Recreational Fisheries Survey (CRFS) Sampling Costs for 2019 supported by NOAA.

Mode	Approx. # of Assignments	Sampling Cost	Overhead (25%)	Total
Party and Charter Surveys (PC)	1,000	$148,700	$37,200	$185,900
Private and Rental Boat Surveys (PR)	2,800	$578,700	$144,600	$723,300
Man-Made (MM)	1,200	$195,100	$48,700	$243,800
			Total Sampling Costs	**$1,153,000**

Costs for Modes Eliminated in 2018 to Compensate for Inflation				Total
Beaches and Banks (BB)	800	$200,000	$50,000	$250,000
Angler License Directory Telephone Survey*	**CIC Research Inc.**			$260,000
* or alternative offsite method (e.g., online, mail)			**Total**	**$510,000**

CRFS Total Annual Costs for Full Survey Coverage	**$1,663,000**

Priority 1 Budget Summary

Oregon Department of Fish and Wildlife

Maintain and Restore Base Level Sampling and Improve the Precision of Effort and Catch Estimates

2011 Base Funding	$275,000
2.44% Annual Inflation (2011–2019)	$ 59,000
Shoulder-Month Sampling (3 ports; 2.5 months/port)	$ 44,850
Winter Sampling (Charleston, 4 additional months)	$ 23,920
Total	**$402,770**

Implement Shore and Estuary Boat Survey (SEBS) off Oregon Coast

Total	**$768,714**

Washington Department of Fish and Wildlife

Maintain and Restore Base Level Sampling and Improve the Precision of Effort and Catch Estimates

2018 Base Funding	$202,500
2.5% Annual Inflation (2006 – 2018)	$ 73,000
Shoulder-Month Sampling (4 ports; 2.5 months/port)	$ 66,450
Minor Port Sampling (**Every 3 years**)	$ 53,890
Total	**$395,840**

California Department of Fish and Wildlife

Maintain and Restore Base Level Sampling and Improve the Precision of Effort and Catch Estimates

2018 Base Funding	$1,153,000
Annual Inflation (2004-2018)/Restore BB and PR-PAN	$ 510,000
Total	**$1,663,000**

Priority 1 Total Budget

Oregon Department of Fish and Wildlife Total	$1,171,484
Washington Department of Fish and Wildlife Total	$ 395,840
California Department of fish and Wildlife Total	$1,663,000
Total	**$3,230,324**

Priority 2 - Implement and Support Enhanced Electronic Data Collection Applications

Oregon Department of Fish and Wildlife

Oregon's marine recreational fisheries benefit from timely and accurate data collection and harvest estimation. New handheld computers will allow the ORBS to continue to provide catch estimates and biological data that are critical data for fisheries management. Timely and accurate fisheries data maximizes fishing opportunity while preventing harm to our marine resources.

Many marine fish species are managed with annual quotas, and recreational harvest estimates rely on dockside creel survey data reaching fisheries managers as soon as possible. Upgrades to the hardware and software are continually needed to provide the highest quality catch estimates to avoid exceeding quotas.

ORBS currently has 40 handheld computers in service used by samplers in 11 different ports. The handheld devices are programmed with a custom survey application written and maintained by ODFW's in-house programmer. The current devices (Juniper Systems Mesa2, Windows 10 OS) are expected to achieve 5 years of service before full replacement, with an estimated 20% annual failure rate. Technical support requires four months of programmer time annually.

Phased annual replacement, assuming 20% annual replacement (the costs below are for 3 years)

Windows 10 tablets (24 @ $2,100, plus indirect cost)	$ 81,900
Programmer support (12 months @ $8,500, plus indirect cost)	$132,600
Total Annual Cost	**$214,500**

Washington Department of Fish and Wildlife

Need: *The WDFW OSP implemented electronic data collection for recreational dockside interviews in 2016; the PSSP followed in 2017. Electronic sampling requires data capture devices, technical support, education, and e-forms updates.*

Both the OSP and the PSSP are currently using iPads and the iForms application to collect marine fishery catch and effort data. Biological data are also recorded electronically. Electronic sampling allows WDFW to build criteria into the data collection application (minimizes potential error) and significantly increase the speed at which data can be processed and used for catch estimation. Although some cost savings were realized with electronic sampling (cost of keying paper data, form-related materials), other costs were incurred.

Monthly costs—Devices are currently leased monthly, at a cost of $40 per month per person without 4G capability, $50 per month per person with 4G capability.

Accessories—Accessories include screen protectors, car chargers, and charging devices for field offices.

Training—Some staff have taken an iForms certification course ($560/person) to allow them to develop and manipulate data collection applications, but more staff need this education to ensure adequate form support in-season.

Technology Support—Dedicated technology support for sampling applications and data storage and transfer is necessary; current staffing levels are inadequate to provide the support needed for the volume of data collected by these two programs.

Budget

	OSP	PSSP
iPad Lease	$19,680 (41 units, no 4G)	$49,800 (83 units, with 4G)
Technical support	$26,790 (5 months)	$32,148 (6 months)
Sub-Totals	$46,470	$81,948
Total		**$128,418**

California Department of Fish and Wildlife

West Coast marine recreational fisheries benefit from timely and accurate data collection and harvest estimation. The use of handheld computers or tablets used in Oregon and Washington have proven beneficial by reducing data processing time and has promoted cost efficiencies. Electronic data collection allows for additional validation checks and immediate feedback to the data collector to correct errors or conduct additional checks. Quality assurance checks can also be implemented when the data is uploaded to a database. Electronic data recording eliminates the need to record on paper and key the data into a database. The potential benefits for CDFW in adopting a similar system will include reduced time between data collection and estimation, provide timely catch data for in-season tracking of quota or fisheries constrained with low ACLs and provide cost savings.

CDFW is conducting an initial business analysis to determine the feasibility of adopting electronic data collection. The results of the analysis will ensure compliance with the California State Administrative Manual Data Security and Standards policies, determine logistical feasibility and eventually estimate cost associated with programing and the purchase of equipment. The type of application and equipment has not been determined and an implementation plan has not identified the scope of electronic data recording. Therefore, CDFW at this time cannot provide an estimated budget. CDFW is supportive of electronic data collection and with funding will continue to work towards implementation.

Total Annual Cost: TBD

Priority 3 - Increase Onboard Sampling

Oregon Department of Fish and Wildlife

Expansion of On-Board Sampling of Commercial Passenger Fishing Vessels or Recreational Charter Boats in Oregon

PSMFC biologists currently conduct at-sea sampling on board charter vessels operating off Oregon's coast. This onboard sampling program provides an essential piece of information necessary for responsibly managing Oregon's recreational fisheries, such as providing supplemental data for ORBS, ODFW's shore-side recreational sampling program. At-sea data collections are necessary to provide improved catch per unit effort (CPUE) estimates (e.g., used in stock assessments) and to provide size/weight data of discarded fish (e.g., needed for expanded catch weights).

Currently, about 100 charter trips are sampled at-sea by PSMFC biologists each year. These trips are voluntary; charter companies do not receive monetary compensation for allowing samplers on board. The current sampling effort (about 100 trips) might represent a saturation point, in which a higher sampling rate can only be achieved through a cash incentive to attract additional volunteer vessels, or through regulations that require charter vessels to accept at-sea samplers. Vessels that currently opt out from accepting PSMFC samplers do so because vessel capacity is often met due to small vessel size or popularity of the fishing season and/or fishing port. Hence, carrying an at-sea sampler may reduce their income by one paying customer for certain trips.

Expanding this at-sea sampling program would be beneficial to reduce uncertainty in CPUE indices and in the calculations of weight and length of discarded fish. The latter benefit is especially true for less common species. Expanding this program may also improve the representativeness of samples (i.e., reduce bias).

The first step in expanding sampling effort is to conduct simulations to evaluate how increasing trips might reduce uncertainty in important metrics. This task would require a one-time expense of approximately $15,000. Assuming a goal is developed to increase coverage by 50%, then ODFW or PSMFC would be required to hire one additional sampler (approximately $75,000 / year for salary and benefits) and may have to pay vessels some incentive to replace the lost income of a single paying fisher (approximately $100/trip for 150 trips). The final estimated budget needed to expand the at-sea sampling program is $95,000 annually, plus a one time "planning" expense of $15,000.

Budget

Develop sample size & sampling design (one-time expense)		**$15,000**
PSMFC or ODFW sampler (12 months / year)		$75,000
Travel and other supplies		$ 5,000
Vessel incentive ($100 / trip x 150 trips)		$15,000
	Total	**$ 95,000**
	Grand Total	**$110,000**

Priority 4 - Investigate and Maintain Video Effort Counts

Oregon Department of Fish and Wildlife

ODFW seeks to improve the recreational saltwater fishing vessel effort count procedures in at least seven Oregon ports through the deployment of High Definition (HD) video camera and networked video recorder (NVR) systems. ORBS has proven that using strategically placed video cameras can provide round-the-clock monitoring of recreational fishing vessels as they exit harbors to fish in the ocean. The current video camera systems used to enumerate fishing effort were first installed in 2007. ODFW seeks to explore high tech solutions as an upgrade from the analog standard definition cameras in use today.

The equipment needs include seven replicate systems of cameras, recorders, cabling, and media storage devices. The new Internet Protocol (IP) cameras will be HD, outdoor-rated (IP67), Power over Ethernet (POE), and will be connected to NVRs via a local network. Depending on the needs of each individual port location, each system will have one to three cameras networked to one recorder. Software to play back recorded video and assist with boat counts may also be necessary. Additional networking hardware, such as WiFi antennas, will be necessary to evaluate the advantage of connecting the NVRs to the Internet for remote cloud-based playback. Installation will be accomplished with a combination of existing ODFW staff (9 months total) and professional contract services ($10,000).

Budget (including 30% indirect cost)

HD Camera and NVR System (7 @ $5,000 each)		$45,500
Technical support (9 months @ $8,000/month)		$93,600
Contract technical services		$13,000
Travel		$ 6,500
	Total	**$158,600**

Washington Department of Fish and Wildlife

A video monitoring system to record daily boat effort in ports sampled by the Washington OSP would provide a complete record of departing/returning trips throughout the entire fishing day and could free sampler work shifts normally assigned to boat counts to be reassigned to increase dockside sampling. Also, daily effort for non-sampled days is currently estimated from the mean observed effort of sampled days within the stratum. Because ocean recreational effort is often highly variable from one day to the next, estimates generated from mean daily effort add significant variability to the estimate. Video monitoring would provide a more precise count of effort for every day, potentially improving the precision of catch estimates.

Washington's OSP currently uses several methods to estimate ocean recreational fishing effort. Primarily, exit (visual counts of vessels leaving port) or entrance (visual counts of vessels entering port) counts are used; these may be augmented by slip counts (identification of vessels missing from their mooring slips) or trailer counts (counts of empty trailers at launch sites). Both exit and entrance counts rely on staff presence for the entire period of time each day that vessels are either exiting or entering port. Boat counts are collected only on sampled days and are the foundation of the catch and effort estimates generated by the OSP.

Since 2010, Oregon's ORBS has employed video monitoring systems as a tool to estimate ocean recreational fishing effort in Oregon. This technology could potentially benefit Washington's coast in ways similar to the benefits seen in Oregon, including increased temporal coverage of effort counts both within and across days, greater flexibility and efficiency in allocating sampler work shifts, increased safety, reduced staff costs and increased accuracy and precision of effort and catch estimates.

The OSP proposes a multi-stage implementation process for migrating to video effort counts. The first stage would be to pilot the accuracy and effectiveness of using video counts, likely starting in the ports of Neah Bay and Ilwaco. Those ports are identified as the best candidates for video because each has a secure Coast Guard station, and the stations are both near the channel used by vessels to exit port. Once the evaluation of the pilot is complete, we anticipate expanding video counts to other access sites, including the ports of La Push, Westport, and Chinook. The final stage of implementation would involve revising the catch and effort estimation program used by the OSP to incorporate new effort data for non-sampled days.

Budget (based on ODFW's program)

One-time costs

Equipment, supplies, and installation		$53,650
Staff time for investigative comparison		$ 7,580
IT support (expansion program revision)		$ 7,460
Biometrician support (catch estimation algorithm review)		$10,540
	Total	**$79,230**

Annual costs

Repair, replacement, and maintenance	**Total**	**$ 7,750**

California Department of Fish and Wildlife

The CRFS currently uses several methods to estimate private and rental boat recreational fishing effort in coastal waters. Primarily, tallies of angling parties are collected during the catch rate surveys and are supplemented by trailer counts for late returning boats after the survey has concluded. The former ALDTS collected data on trips that originate from private marinas and nighttime fishing effort not sampled by CRFS field intercept surveys. ALDTS was discontinued in January 2018. In addition, ALDTS poorly represented sparsely populated districts of California's north coast. CDFW would like to explore alternative onsite methodologies to collect effort data to compensate for the loss of ALDTS.

The ODFW ORBS has demonstrated that using strategically placed video cameras can provide round-the-clock monitoring of recreational fishing vessels as they exit harbors to fish in the ocean. ODFW has integrated video counts in the ORBS effort estimation procedures and is undergoing the final steps of certifying this method through MRIP. It is expected MRIP will endorse ORBS effort estimation methods. California's north coast ports have similar logistical attributes to ports sampled by ORBS and video monitoring may be a feasible means to collect effort data. With funding, CDFW will investigate video monitoring in northern California by conducting feasibility studies. Without additional information CDFW cannot provide a budget but supports further investigation into video effort counts in northern California.

Total Annual Cost: TBD

Priority 5 - Stratify PC Sampling by Trip Type and Sampling Period for Southern California Highly Migratory Fisheries.

California Department of Fish and Wildlife

Highly migratory species (HMS) support an important recreational fishery in California, providing substantial economic contribution to the local economy. When HMS are present, both recreational private boat and commercial passenger fishing vessel (CPFV, also commonly called party or charter boats) anglers target tuna and other species. The majority of the effort occurs in southern California on CPFVs ranging in capacity from a few anglers to more than 100 anglers, and with trip durations ranging from one half-day to 14 days. The long-range trips almost exclusively target HMS in more distant U.S. and Mexican waters whereas the shorter duration trips occur in local waters when HMS species are seasonally present. The logistics of departure and subsequent landings are dependent on the duration, target, and port for each CPFV trip and can occur day or night.

The Pacific Fisheries Management Council (PFMC) and the Inter-American Tropical Tuna Commission (IATTC) manage HMS. Within this management framework, concerns regarding overfishing for Bluefin and Yellowfin tunas has highlighted the need for more representative data collection and greater precision of estimates of removals and effort. Management relies on estimates of catch in numbers of fish as well as tonnage, catch rate indices, biological measurements for average weight calculations, and ancillary data collection for stock assessments (e.g., genetic samples). Data collection is achieved using multiple surveys for estimates of total removal and opportunistic data collection. When direct recreational data are absent, surrogate data are used.

In California, two data sources are combined to estimate total removals: CRFS Private and Rental Boat Survey (PR) HMS estimates and CPFV log summaries of HMS catch. CDFW currently relies on CPFV log data for management of select HMS instead of CRFS Party/Charter Boat (PC) estimates. CPFV log data have been collected in a similar manner since 1936. They provide a long-term data set of self-reported data on effort and catch from CPFV owners or operators. The CDFW log program requires that captains and operators submit logs for each trip that contain a complete and accurate record of fishing activities. Data collected in the log consists of target species, duration, start and return times, fishing location, number of fishing passengers and catch by species. Caveats:

1) Although logs are required to be submitted monthly, not all logs are submitted and compliance is typically about 70% for southern California.

2) CPFV log catch reports are not validated and are subject to self-report bias.

3) The CPFV log does not collect biological measurements, therefore disconnected data

sources are used by managers to determine average fish weights. Biological data used for average weight calculations are determined by ancillary collections, which may not be representative of the fishery, and thus is a concern (A. Siddall, Sportfishing Association of California, personal communication, 2017).

CRFS PC estimates use the effort data from CPFV logs (number of angler-days) and the corresponding confirmed CPFV fishing trips from the CRFS effort check survey to determine compliance fractions (the percent of confirmed trips identified in the CRFS survey that submitted logs). The compliance fraction adjusts CPFV log summaries for trips not reported to produce an estimate of total angler trips. This assumed unbiased effort estimator is applied to catch rate data collected by field intercept surveys to estimate catch along with biological data used for conversion of catch in numbers to metric tons. The data are either collected onboard Party and Charter boats while at-sea (PCO) or dockside (PCD) at the end of the fishing trip.

CRFS PC catch rate surveys perform well for the majority of California's fisheries. However, the CRFS PC catch rate surveys do not adequately represent the HMS fishery for several reasons. The majority of HMS catch occurs during multiday trips and trips in Mexican waters, which typically return at night. Due to logistical sampling constraints, CRFS does not sample PCO multi-day trips or trips to Mexico, and the PCD survey is not conducted at night when a substantial amount of HMS landings occur. In addition, CRFS relies heavily on PCO sampling in southern California to maximize the collection of biological data on retained and discarded catch, rarely relying on dockside. The deficiency of the existing PC catch rate survey's sampling frame produces non-representative samples of HMS trips.

To account for the unique attributes of the HMS fishery, CDFW is proposing a separate HMS dockside sampling program. Although no MRIP-certified methods are available to specifically address California's unique HMS CPFV fishery, CDFW will build upon the framework of the MRIP Large Pelagic Intercept Survey and the Access Point Angler Intercept Survey. The design will use weighted probability sampling for landings based on historic CPFV log summaries restricted to HMS trip types. In addition, the proposed survey will use non-overlapping sampling shifts to cover a 24-hour sample day. Fishing pressure for each shift will be determined from landing data recorded on CPFV logs (number of anglers and time of landing). The fishing pressure is site- and time-specific based on the average number of anglers landing at each site within a specific shift. The sample selection probability for each site will be weighted by the pressure estimates for each domain (month, kind of day and time period). The proposed methods are conceptual and as additional information becomes available, CDFW will evaluate the methods to better align the survey with the fishery attributes while considering the data needs for HMS fisheries management.

The new survey will directly benefit management of HMS fisheries. Estimates of effort and catch will be based from comprehensive sampling frames. Biological data collected will be directly representative of the fishery. Based on weighed probability sampling, the new survey will also be cost efficient. The survey will be conducted year-round and require about 40

sampler months to conduct. The total cost of the survey is estimated at $100,000 and is inclusive of wages, benefits, travel costs, equipment and overhead.

Budget

HMS Dockside Party Charter Surveys Sampling Cost		$80,000
Overhead rate (25%)		$20,000
	Total	**$100,000**

Priority 6 - Provide Improved Access to Marine Recreational Fisheries Statistics Survey (MRFSS) Database

Pacific States Marine Fisheries Commission

Need:
Prior to 2014, the RecFIN database stored all data in a network of SAS data files. To improve data integrity, accessibility, and analytical efficiency, RecFIN completed a project in 2015 to redevelop its database architecture to a relational structure on an Oracle platform. As part of the redevelopment, data collected by the states after the cessation of the MRFSS was migrated to the new Oracle-based database. However, data collected by MRFSS prior to 2003 has not been migrated and remains stored in the SAS-based system. Work has been completed to extract this data from the legacy reporting system and upload it to the current RecFIN database. However, the data is difficult for users to access, and the structure is not consistent with the contemporary data set. To improve the accessibility and usability of the MRFSS dataset, RecFIN will:

1) standardize MRFSS data elements to match the data model of the contemporary RecFIN dataset;

2) leverage the relational structure of the current RecFIN database to create linkage between MRFSS data types;

3) document and provide access to relevant MRFSS metadata; and

4) develop enhanced reporting tools for MRFSS data.

Cost (One-Time Funding):
To incorporate the MRFSS data into the current RecFIN database architecture and develop reporting tools will require contractual services for about seven weeks of dedicated effort, estimated at $40,000. This work may need to be distributed among several different Database Management Consultants to effectively complete the database redevelopment.

Priority 7 - State Calibration of Historical Catch

Oregon Department of Fish and Wildlife

ODFW seeks to comprehensively reconstruct all marine fish recreational ocean boat landings from 1979 to 2001. Reconstructed catch estimates from ORBS will improve estimates from MRFSS, which have known biases related to effort estimation and sampling (Van Voorhees et al. 2000). The methods used to reconstruct recreational catch estimates will be consistent with recent assessments for nearshore species (Dick et al. 2016; Dick et al. 2018; Haltuch et al. 2018).

Prior to 2001, ORBS monitored marine species in both multi-species categories, such as rockfish, flatfish, and other miscellaneous fishes, and as individual species, such as lingcod or halibut. For this comprehensive reconstruction, four species categories will be reconstructed (rockfish, lingcod, flatfish and miscellaneous), constituting the bulk of the managed marine fish species. Category-level estimates will be expanded to account for gaps in sampling coverage and species compositions based on the best available data will be applied.

Budget

Marine Fisheries Analyst (12.0 months FTE, including indirect) **$137,280**

References

Dick, EJ, Monk, M, Taylor, I, Haltuch, M, Tsou, T, and Mirick, P. 2016. Status of China Rockfish of the U.S. Pacific Coast in 2015. Pacific Fisheries Management Council.

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Haltuch, MA, Wallace, J, Akselrud, CA, Nowlis, J, Barnett, LA, Valero, JL, Tsou, T, and Lam, L. 2018. 2017 Lingcod Assessment. Pacific Fisheries Management Council.

Van Voorhees, D, Hoffman, A, Lowther, A, Van Buskirk, W, Weinstein, J, and White J. 2000. An evaluation of alternative estimators of ocean boat fishing effort and catch in Oregon. The Pacific RecFIN Statistics Subcommittee.

Washington Department of Fish and Wildlife

Catch and effort creel data and expanded catch data for Washington's ocean boat recreational fishery are available from OSP sampling from 1990. Prior to that, records of catch exist in Washington Sport Catch Reports. During some years, data from the federal MRFSS are also available. Both MRFSS and OSP data reside in the RecFIN database. There is a need to identify the best data sources to avoid duplication and maximize accuracy and precision of catch and effort statistics for Washington's recreational fisheries.

Groundfish stock assessments rely on historic catch and effort data available in the RecFIN database. Prior to 1990, both the WDFW OSP and federal MRFSS programs collected ocean boat-based catch and effort data. In addition, MRFSS collected data from land-based (mainly beach/bank) fisheries along the Washington coast. Electronic creel data and groundfish catch estimates from the OSP prior to 1990 were not migrated to an in-house mainframe from an external mainframe storage system. The original survey cards from 1976–1989 exist; some of these data have been keyed, and some cards have been scanned, but the data are currently not in useable form.

We propose inventorying available data, assessing formats, standardizing electronic formatting of pre-1990 WDFW data, and comparing WDFW and MRFSS data to identify the best data sources and develop the most complete dataset possible while eliminating duplication. This may include re-estimation of historical total catch if sufficient data and design documentation allow.

Budget

One entry-level project biologist (12 months)		$71,160
Equipment		$ 600
	Total	**$71,760**

2019–2021 Implementation Priorities Budget Summary*

***Note:** When funding options are presented for specific projects, the option in blue text is recommended. One-time projects, or portions of projects, are highlighted in red text.

1– Maintain and Restore Base Level Sampling				
	ANNUAL COSTS			ONE-TIME COSTS
	Option A	Option B	Option C	
ODFW-ORBS	$275,000	$334,000	$402,770	
ODFW-SEBS	$768,714	$657,683	$349,987	
WDFW – OSP & PSSP	$275,500	$341,950	$395,840	
CDFW - CRFS	$1,153,000	$1,663,000		
PREFERRED OPTION TOTAL	**$3,230,324**			
2 – Implement and Support Enhanced Electronic Data Collection Applications				
ODFW	$214,500			
WDFW	$128,418			
TOTAL	**$342,918**			
CDFW	TBD			
3 – Increase Onboard Sampling				
ODFW	$95,000			$15,000
TOTAL	**$95,000**			**$15,000**
4 – Investigate and Maintain Video Effort Count				
ODFW				$158,600
WDFW	$7,750			$79,230
TOTAL	**$7,750**			**$237,830**
CDFW	TBD			
5 – Stratify PC Sampling by Trip Type and Sampling Period				
CDFW	$100,000			
TOTAL	**$100,000**			
6 – Provide Improved Access to MRFSS Database				
PSMFC				$40,000
TOTAL				**$40,000**
7 – State Calibration of Historical Catch				
ODFW				$137,280
WDFW				$71,760
TOTAL				**$209,040**