OREGON'S GROUNDFISH FISHERIES AND INVESTIGATIONS IN 2012

OREGON DEPARTMENT OF FISH AND WILDLIFE

2013 AGENCY REPORT
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OREGON DEPARTMENT OF FISH AND WILDLIFE

A. AGENCY OVERVIEW – MARINE RESOURCES PROGRAM

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The Marine Resources Program (MRP) is within the Oregon Department of Fish and Wildlife (ODFW) and has the jurisdiction over marine fish, wildlife, and habitat issues coastwide. MRP is headquartered at Newport in the Hatfield Marine Science Center, with field stations at the cities of Astoria, Charleston, Brookings and Corvallis. MRP is tasked with the responsibility for assessment, management, and sustainability of Oregon's marine habitat, biological resources and fisheries. In addition to direct responsibilities in state waters (from shore to three miles seaward), MRP provides technical support and policy recommendations to state, federal, regional, and international decision-makers who develop management strategies that affect Oregon fish and shellfish stocks, fisheries, and coastal communities. Staffing consists of approximately 60 permanent and more than 60 seasonal or temporary positions. The current annual program budget is approximately $8 million, with about 70% coming from state funds including sport license fees, commercial fish license and landing fees, and a small amount of state general fund. Grants from federal agencies and non-profit organizations account for the remaining 30% of the annual program budget.

B. MULTISPECIES STUDIES

1. Sport Fisheries Project

Sampling of the ocean boat sport fishery by MRP's Ocean Recreational Boat Survey (ORBS) continued in 2012. Starting in November 2005, major ports were sampled year-round and minor ports for peak summer-fall season. We continue to estimate catch during unsampled time periods in minor ports based on the relationship of effort and catch relative to major ports observed during summer-fall periods when all ports are sampled. Samplers were stationed in all ports during the winter of 2011-2012, to attempt to groundtruth estimates for minor ports in unsampled periods. This was the result of a review of the ORBS program and funded through the National Marine Recreational Information Program (MRIP). Black rockfish (*Sebastes melanops*) remains the dominant species caught in the ocean boat fishery. Lingcod (*Ophiodon elongatus)*, several other rockfish species, cabezon (*Scorpaenichthys marmoratus)* and kelp greenling (*Hexagrammos decagrammus)* are also commonly landed. Oregon's fishery for Pacific halibut (*Hippoglossus stenolepis)* continues to be a popular, high profile fishery requiring International Pacific Halibut Commission (IPHC), federal, and state technical and management considerations.

The ORBS program continued collecting information on species composition, length and weight of landed groundfish species at Oregon coastal ports during 2012. Since 2003, as part of a related marine fish ageing research project, lingcod fin rays and otoliths from several species of nearshore groundfish including rockfish species, kelp greenling and cabezon, were gathered. Starting in 2001, from April through October, a portion of sport charter vessels were sampled using ride-along observers for species composition, discard rates and sizes, location, depth and catch per angler (CPUE).

Starting in 2003, the recreational harvest of several groundfish species is monitored inseason for catch limit tracking purposes. Pre-season, the cabezon season was reduced to April 1 through September 30; however, inseason action was still necessary in 2012 to prohibit retention of cabezon by anglers fishing from boats and shore to avoid exceeding allowable catch limits. As in recent years, the retention of canary rockfish (*S. pinniger)* and yelloweye rockfish (*S. ruberrimus)* was prohibited year round. In order to remain within the yelloweye rockfish impact cap (via discard mortality), the recreational groundfish fishery was restricted pre-season to inside of 30 fathoms from April 1 to September 30. Landings in the sport Pacific halibut fisheries were monitored weekly for tracking the status of catch limits. The majority of halibut continue to be landed in the central coast sub-area, with the greatest landings in Newport. Other ODFW management activities in 2012 include participation in the U.S. West Coast Recreational Fish International Network (RecFIN) process, data analysis, public outreach and education, and public hearings to discuss changes to the management of Pacific halibut and groundfish fisheries for 2013.

Starting in July 2005, sampling of the shore and estuary fishery was discontinued due to a lack of funding. Black rockfish make up the largest component of the estuary boat groundfish taken and surfperch made up the majority of shore-based catch by weight. Salmon dominate estuary boat landings by weight. Pacific herring historically have comprised the majority of both shore- and estuary-based boat landings by number of fish, but have not dominated catch in recent years. ODFW continues to pursue funding opportunities to reinstate the shore and estuary sampling program.

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2. Commercial Fisheries Monitoring and Sampling

Data from commercial groundfish landings are collected throughout the year and routinely analyzed by ODFW to provide current information on groundfish fisheries and the status of the stocks. This information is used in management, including inseason adjustments of the commercial nearshore fishery, which is conducted in state waters, and participation in the Pacific Fisheries Information Network (PacFIN). Species composition sampling of rockfish and biological sampling of commercially landed finfish continued in 2012 for commercial trawl, fixed gear, and hook and line landings. Biological data including length, age, sex, and maturity status continued to be collected from landings of major commercial groundfish species.

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3. Continuation of Marine Fish Ageing Project at MRP

In May 2012, Lisa Kautzi became the new Marine Age Reading Specialist for the Marine Resources Program's ageing project. Since starting, work has focused on production ageing of commercially and recreationally caught black rockfish collected during the position's vacancy. A total of 2,403 ages were generated with 474 (19.7%) of those samples examined a second time to check for precision. Ages are compiled in separate databases for both commercially and recreationally captured fish.

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4. Developing an improved rockfish species composition expansion model

Work was initiated in 2010 to develop a better model to apply species composition data collected by port samplers to fisheries catch data. The original framework relies on a series of borrowing rules based on temporal and spatial factors in order to estimate unsampled ports and landings. Documentation on the original borrowing rules and rationale are no longer available. While many different fish families are potentially affected by these rules, rockfish, due to their high species diversity and nominal category designation, are most in need of a better expansion model. In 2012, using feedback from both port samplers and local stock assessment authors, staff from the Technical and Data Services section evaluated several different borrowing rule options. These options included: one, borrowing from the same quarter in previous years; two, borrowing from other quarters in the same year; and three, a combination of both scenario one and two. Using simulations with hypothetically missing data, these scenarios were not found to be dramatically different and all were found to provide reasonable estimates of species compositions after borrowing rules had been applied. Given this information, staff felt that scenario one would be the best option for the new expansion model. If the minimum number of samples (5) were not met, scenario three would be the next option to boost sample sizes. If both of these scenarios did not meet the minimum sample size, the data would be submitted to PacFIN as nominal, as per the current process.

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5. Rockfish Maturity Studies

We continued research begun several years ago to produce histologically verified female maturity data for a variety of species for which maturity data is unavailable or outdated. A report detailing age and length at maturity data for vermilion rockfish was completed in 2012, available at: http://www.dfw.state.or.us/MRP/publications/#Research. Maturity was evaluated visually for 335 female vermillion rockfish and histology slides were developed and reviewed for 237 of these. Samples were collected from 2000 to 2011. Results indicate a broad seasonal peak in ovarian development, with ripe ovaries encountered from April through October.

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6. Movement of Rockfishes Using Acoustic Telemetry

2012 work was focused on attempting to acoustically tag yelloweye rockfish at Stonewall Bank and evaluate home range and movements within a VPS receiver grid, placed along the boundary of a Marine Protected Area. Eleven fish were tagged and all either died or shed their surgically-implanted tags within 5 days of tagging. This conflicts with cage-survival studies that show very high survival rates of untagged fish with capture-related barotrauma from these same depths, but is consistent with some anecdotal reports from other researchers about poor survival of acoustically-tagged yelloweye rockfish. To further investigate the causes of poor survival, fish were surgically tagged and then held in cages for up to 4 days, with 100% survival. Additional investigations are planned for 2013.

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7. Development and Testing of a Video Lander for Studying Demersal Fishes on Nearshore Rocky Reefs

We continued work developing and testing a video lander as a survey tool for rocky reef fishes. Progress in 2012 included publication of the 2010/2011 results, development and testing of a high definition lander system and initial experimentation and development of a stereo high-definition system that can be used to estimate fish lengths from video. Work will continue in 2013 at Stonewall Bank.

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8. Reducing Eulachon Entrainment at the Footrope of a Shrimp Trawl

We continued field studies in 2012 examining how footrope changes can be used to reduce entrainment and subsequent bycatch of eulachon and other small demersal fish in a shrimp trawl. A field study was conducted evaluating a "footrope window", created by eliminating a short (5 ft.) section of groundline under the central portion of the trawl fishing line. The concept is to allow fish escapement through the "window" via herding behavior towards the center of the groundline, while minimizing shrimp escapement under the fishing line by keeping most of the groundline intact. Initial results were promising, however additional field tests were considered necessary due to high between-haul variation. Work will continue in 2013.

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9. Discard mortality of hook-and-line-caught rockfish with barotrauma

We conducted additional cage-survival experiments in 2012, extending published work on 2-day post-recompression survival of yelloweye and canary rockfish (< 64 meters (m) capture depth) to deeper depths and longer cage-holding intervals. So far, results suggest high 3-4 day post-recompression survival of yelloweye rockfish out to 84 m capture depth and that canary rockfish survival begins to decline outside 64 m capture depth, however canary rockfish sample sizes are small so far. Work will continue into 2013.

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10. Marine Reserves in Oregon

Status of sites: Harvest prohibitions took effect on January 1, 2012 for Oregon's first two established marine reserve sites, Redfish Rocks and Otter Rock. Three new marine reserve sites (Cape Perpetua, Cascade Head and Cape Falcon) have been identified and are to be established, as mandated by Senate Bill 1510, which was passed by the 2012 Oregon Legislature. Additionally, in 2012, administrative rules were adopted for Oregon's system of five marine reserve and protected area sites.

Start of harvest prohibitions:

- January 1, 2012 for Redfish Rocks and Otter Rock sites
- January 1, 2014 for Cape Perpetua and Cascade Head sites
- January 1, 2016 for Cape Falcon site

Monitoring: Monitoring plans, for the ecological and human dimensions (economic, social, cultural) aspects of Oregon's marine reserve system, were completed in 2012. The monitoring plans are available on the Oregon Marine Reserves website at www.oregonocean.info/marinereserves (click on the 'Science' tab). Data collection is conducted by ODFW staff, in collaboration with external scientific research partners. Local fishing vessels are contracted when and where feasible to assist with ecological monitoring efforts. Two years of ecological and human dimensions baseline data collection were completed in 2011 for the Redfish Rocks and Otter Rock sites. Ongoing, long-term monitoring is currently underway at these sites. A first year of baseline data collection was completed in 2012 for the Cape Perpetua and Cascade Head sites. A second year of baseline data collection will be conducted in 2013, prior to the implementation of harvest restrictions. Baseline monitoring reports for Redfish Rocks and Otter Rock are in prep and will be completed in 2013.

Management plans: Site management plans outline strategies for ecological and human dimensions monitoring, reporting, and evaluation; outreach; compliance and enforcement; and community and public engagement. The plans also highlight priorities and implementation efforts of local communities that complement those of the state. The management plan for the Redfish Rocks site was completed in 2012. A draft management plan for the Otter Rock site was completed in 2012 and is to be finalized in 2013. These plans are available on the Oregon Marine Reserves website at www.oregonocean.info/marinereserves (click on the link for the respective site). Development of site management plans for the Cape Perpetua and Cascade Head sites will begin in 2013 and be completed in 2014. Development of a site management plan for Cape Falcon will begin in 2014.

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11. North Coast Rocky Reef ROV Surveys

The Marine Habitat project conducted a survey of seafloor biota at six rocky reefs areas on the northern Oregon coast (Government Point, Cascade Head, Cape Kiwanda, Cape Meares, Manzanita, and Cannon Beach) with a Remotely Operated Vehicle (ROV) during September and October of 2012. Our objective was to conduct the first visual survey of these recently mapped rocky reef areas. The video from this survey is slated to be reviewed during the spring of 2013. Cascade Head is designated as one of three new marine reserve sites in Oregon state waters, and these efforts are part of the baseline data collection at this site, as mentioned in the previous section.

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12. Ongoing Hypoxia Monitoring

Personnel from ODFW's Marine Habitat project partnered with the Partnership for Interdisciplinary Study of Coastal Oceans (PISCO) at Oregon State University to continue and expand documentation of the ecological effects, including disturbance and recovery, of hypoxia events on seafloor communities off the Oregon coast. In October of 2012, the Marine Habitat Project returned to Cape Perpetua and Yaquina Head to continue monitoring the ecological effects of hypoxia on these rocky reef complexes. A report documenting the Marine Habitat project's efforts to this ongoing monitoring project is currently in prep and scheduled to be completed in 2013.

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13. Ocean and Estuary Shoreline Habitat Mapping

Marine Resources Program staff are currently working on a project to classify and map Oregon's ocean and estuary shorelines using the ShoreZone mapping protocol. ShoreZone is a coastal habitat mapping and classification system in which aerial imagery is collected specifically for the interpretation and delineation of geomorphic and biological features of the intertidal zone and shoreline environment. The overall goal of ShoreZone mapping is to provide a representation of the coastal and estuarine shoreline morphology and a basic framework for the biophysical characterization of the coast. This mapping protocol has been used extensively in Alaska, British Columbia, and Washington, and is now being extended into Oregon. The project is divided into 2 phases. Phase 1, the aerial surveys, was completed in 2011 and Phase 2, aerial image interpretation and mapping, is 80% complete at the time of this report. Staff has contracted with Coastal Ocean Resources, Inc. (the same firm used for the Alaska, B.C., and Washington projects) to do the work. The aerial photography is viewable at http://www.coastalatlas.net/shorezone/, and the mapping products for the 80% completed so far will be made available in the summer of 2013. We are pursuing funding to complete the final 20% of the shoreline habitat interpretation and, if successful, hope to have that done within a year.

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C. BY SPECIES

1. Black Rockfish PIT Tagging

Black rockfish comprise approximately 50% of the catch in Oregon's recreational groundfish fishery, making this species an important component of managing the fishery. Historically, assessments of black rockfish have relied on CPUE data from recreational fisheries to estimate the trend of relative population abundance. However, these data are not robust to sampling bias, or to changes in fishing distribution, bag limits, or fishing power. The need to independently estimate exploitation rates and population abundances for black rockfish off Oregon prompted us to investigate the use of passive integrated transponder (PIT) tags for a mark-recapture program. Tags are injected in the hypaxial musculature below the gill arches, determined to be the best site by a previous PIT tag retention study by ODFW. Since PIT tags are invisible to anglers, there is no tag non-reporting bias and tag detection rates can be estimated directly. The program has been ongoing since 2002. The minimum size for tagging was increased from 29 centimeters (cm) to 32 cm in 2007.

In 2012, PIT tags (12 millimeters (mm) x 2mm) were inserted in 3,035 black rockfish during 15 days of fishing near Newport, Oregon. Categorical barotrauma symptoms of each fish tagged were recorded. Fish with significant barotrauma symptoms that were unable to submerge when released were recompressed in a cage and released at depth. The total number of black rockfish ≥ 32 cm tagged since the project began in 2002 is now 32,181. Carcasses of black rockfish are counted and electronically scanned for tags year-round upon being landed by recreational fishers. In the study recovery year (July 1 2011 to June 30 2012), 30,347 black rockfish landed in Newport and 11,744 landed in nearby Depoe Bay were scanned for tags, an estimated 76% and 40% of the total black rockfish landed in each port, respectively. In 2011/2012, we recovered 323 tags, all in Newport. Tags were recovered from all eleven tagging cohort years. Estimates of annual exploitation rate derived from this project vary from 3.40% to 4.97% and are less than expected assessment values of approximately 5%. The annual exploitation rate in 2010/2011 was 4.43%. Exploitation rates for 2011/2012 will be available in 2013. Annual population estimates range from 1.2 to 1.9 million fishery-sized fish.

Black rockfish in Oregon and California were assessed in 2007. Results from this study were included in the 2007 assessment as an index of abundance for the assessed population. Based on the input of the assessment author and reviewers, this index will likely be incorporated in future assessments of black rockfish.

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2. Photograph-based Length Estimation of Recreational Yelloweye Rockfish Discards

In 2012, we continued a portion of a 2010 pilot project designed to collect data on the length distribution of yelloweye rockfish discarded in the recreational groundfish and halibut fisheries off Oregon. Due to the prohibition on yelloweye rockfish retention in most U.S. West Coast fisheries, data of this type has become extremely limited in recent years. Anglers were asked to photograph any yelloweye encountered with a known-size reference object in the photograph frame. The relationship between the length of the fish and the size of the reference object in the photograph can then be used to estimate the length of fish using computer software. In 2012, we provided digital cameras to crewmembers of 10 participating charter vessels, and asked that they photograph all yelloweye rockfish encountered over the course of the season. Participation by charter vessels was substantially lower in 2012 than in 2010 or 2011. The reason most commonly given for not participating was the competing demands on crew time created when attempting to photograph fish, release them with a descending device, and serve paying passengers. We suspended work with private vessels in 2011 due to the high effort required and low number of photos obtained until a more efficient method can be developed. In 2010 and 2011, 101 and 181 usable photographs were collected respectively. All fish from 2011 were digitally measured in 2012. Mean length of fish did not differ greatly between 2010 and 2011 at 40.31 and 40.07 cm respectively. The number of usable photographs and fish measurements for 2012 were not available at the time of this report, but will be evaluated in 2013.

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3. Kelp greenling growth and maturity work

In 2012, ODFW renewed efforts to fill in data gaps on the growth and maturity of kelp greenling in Oregon waters. A review of data collected to date indicated that additional samples of small kelp greenling (<25 cm) were needed. Efforts to collect fish through fishing, beach seining and collaborations with an Oregon State University graduate student yielded 12 kelp greenling >25 cm. Six fish were collected in Siletz Bay and six from Yaquina Bay, both on the central Oregon coast. Fish ranged from 8.9 to 14.3 cm with weights from 7.4 to 31.7 grams (g). Nine of the 12 fish (75%) were females. Gonad weights of females ranged from 0.0063 to 0.0238 g. Additional sampling efforts are anticipated to continue in 2013.

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D. PUBLICATIONS

Hannah, R. W. and M. T. O. Blume. 2012. Tests of an experimental unbaited video lander as a marine fish survey tool for high-relief deepwater rocky reefs. Journal of Experimental Marine Biology And Ecology 430-431:1-9.

Hannah, R.W. and S.A. Jones. 2012. Evaluating the behavioral impairment of escaping fish can help measure the effectiveness of bycatch reduction devices. Fisheries Research 131-133:39-44.

Hannah, R.W. and L.A. Kautzi. 2012. Age, growth and female maturity of vermilion rockfish (*Sebastes miniatus*) from Oregon waters. Oregon Dept. Fish Wildl., Information Rept. Ser., Fish. No. 2012-05. 15 p.

Hannah, R. W., P. S. Rankin and M. T. O. Blume. 2012. Use of a novel cage system to measure post-recompression survival of Northeast Pacific rockfish. Marine and Coastal Fisheries: Dynamics, Management and Ecosystem Science 4:46-56.

E. PROJECTS PLANNED FOR YEAR 2013

1. Maturity studies for rockfish and kelp greenling

Maturity data for solid blue rockfish will be evaluated and summarized in an upcoming ODFW report. Data collection efforts for small kelp greenling will also continue in 2013.

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2. Rockfish Movement

Planned work in 2013 will evaluate whether cage confinement following surgical tag implantation, followed by delayed-release at depth, can improve survival of tagged yelloweye and provide movement data.

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3. Testing a Video Lander for Surveying Rocky Reefs

Work planned for 2013 includes the field tests of a stereo high-definition lander system to compare abundance and species composition of demersal fishes with and without bait as an attractant, at Stonewall Bank.

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4. Reducing eulachon entrainment at the footrope of a shrimp trawl

We plan to conduct additional trials testing a “footrope window” in a shrimp trawl in 2013.

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5. Discard Mortality of Rockfishes

We anticipate extending 2012 studies on yelloweye and canary rockfish post-recompression survival into even deeper waters, more representative of capture depths for rockfish bycatch in the Pacific halibut fishery. Sample sizes at capture depths of 50-84 m will also be increased.

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8. Incorporating Discard Mortality Rates with use of Descending Devices into Management

In 2013, the Pacific Fisheries Management Council is developing adjusted mortality rates for rockfish released using descending devices from the recreational fishery. Once those rates are determined, a methodology will be developed to incorporate those rates into inseason management of the recreational fisheries. This will be followed by incorporation into projection models used for setting future years' season structure and regulations.

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5. Black Rockfish Ageing

MRP's new ageing specialist will continue efforts to age commercially and recreationally captured black rockfish otoliths into 2013.

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