OREGON'S GROUNDFISH FISHERIES AND INVESTIGATIONS IN 2014

OREGON DEPARTMENT OF FISH AND WILDLIFE

2015 AGENCY REPORT
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OREGON DEPARTMENT OF FISH AND WILDLIFE

A. AGENCY OVERVIEW – MARINE RESOURCES PROGRAM

MRP Program Manager:	Dr. Caren Braby
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The Marine Resources Program (MRP) is within the Oregon Department of Fish and Wildlife (ODFW) and has 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 $8.75 million, with about 77% 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 23% 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 2014. Starting in November 2005, major ports were sampled year-round and minor ports for peak summer-fall season. We continue to estimate catch during un-sampled 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. 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 2014. 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, 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 (See Section B.2).

Beginning in 2003, the recreational harvest of several groundfish species is monitored in-season for catch limit tracking purposes. Pre-season in 2014, the cabezon season was modified to July 1 through December

31. This allowed the cabezon season to proceed with no in-season actions being necessary for the first time in many years. 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 are 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 followed by Pacific City. Other ODFW management activities in 2014 include participation in the U.S. West Coast Recreational Fish International Network (RecFIN) process, data analysis, public outreach and education, and public input processes to discuss changes to the management of groundfish and Pacific halibut fisheries for 2015, 2016, and beyond.

Starting in July 2005, sampling of the shore and estuary fishery was discontinued due to a lack of funding. While salmon dominate estuary boat landings by weight, 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. 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. “No Floaters: Release At-Depth” Barotrauma Outreach Campaign

To reduce bycatch mortality of overfished rockfish species in the sport fisheries, ODFW began an outreach campaign in 2013 with the goal of increasing descending device usage among sport anglers. The effort, branded “No Floaters: Release At-Depth”, has distributed over 5,000 descending devices to date, to all charter vessel owners and to the majority of sport boat owners who had previously targeted groundfish or halibut. In addition, several thousand stickers bearing an emblem of the brand (Figure 1) have been distributed with the goal of making rockfish conservation an innate aspect of fishing culture. The continued outreach campaign appears to be successful. Prior to the beginning of the campaign, fewer than 40 percent of anglers used descending devices. After the campaign, the percentage of users increased to greater than 80 percent. The percentage of users has remained near that 80 percent level. Additional outreach efforts include: videos are being produced that show fish successfully swimming away after release with a device and new rockfish barotrauma flyers have been produced. This outreach campaign has been the result of collaboration between ODFW, two angler groups (Oregon Coalition for Educating Anglers and Oregon Angler Research Society), Utah’s Hogle Zoo, and ODFW’s Restoration and Enhancement (R & E) program. As part of a new National Marine Fisheries Service (NMFS) Saltwater Recreational Policy, additional resources to continue this outreach may be available.

Figure 1: Picture of sticker provided to anglers as part of the “No Floaters” outreach campaign.

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3. 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 in-season adjustments of the commercial nearshore fishery (Section B.5), which is conducted in state waters, and for participation in the Pacific Fisheries Information Network (PacFIN). Species composition sampling of rockfish and biological sampling of commercially landed finfish continued in 2014 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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4. Oregon's Commercial Nearshore Fishery

The commercial nearshore fishery in Oregon became a limited-entry permit-based program in 2004, following the development of the open access nearshore fishery in the late 1990's. The commercial nearshore fishery exclusively targets groundfish, including Black Rockfish, Blue Rockfish (*S. mystinus*), Cabezon, Kelp Greenling, and Oregon's "Other Nearshore Rockfish" complex. The fishery is primarily composed of small vessels (25 ft. average) fishing in waters less than 30 fathoms. Major gear types include hook-and-line, longline and fish pots. Fish landed in this fishery supply mainly live fish markets, but also provide product for fresh fish markets. Landings are regulated through two-month trip limits, minimum size limits, and annual harvest guidelines. Weekly updates on landings allow MRP staff to more effectively manage the fishery in-season.

Landings from the 2013 commercial nearshore fishery, logbook compliance, economic data, and biological data are detailed in the 2013 Commercial Nearshore Fishery Summary (Rodomsky et al. 2014; http://www.dfw.state.or.us/MRP/publications/docs/2013%20The%20Oregon%20Commercial%20Nearshore%20Fishery%20Summary.pdf). Overall, the majority of active permit holders are located on the southern

Oregon coast, resulting in most of the catch consistently landed in Port Orford, Gold Beach and Brookings. Black Rockfish continued to comprise the majority of landings by weight. In-season management in 2013 included increases to two-month trip limits for Black and Blue Rockfish and Cabezon.

Fishery management staff are also working to ready data for 2015 stock assessments of nearshore species including Black Rockfish, China Rockfish and Kelp Greenling. These tasks include preparing a report on Kelp Greenling growth and length-at-maturity, and shaping nearshore logbook data for use as an index of abundance.

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5. Continuation of Marine Fish Ageing Project at MRP

During 2014, 3,775 age estimates were produced for recreation, commercial, and research purposes within the Marine Resource Program. For recreation and commercial programs, 1,576 kelp greenling and 805 black rockfish ages were produced, with an additional 251 and 161 test ages respectively generated. To fulfill research needs within MRP, an additional 189 black rockfish (175 tested), 260 copper rockfish (52 tested), 75 blue rockfish (15 tested), and 195 kelp greenling (21 tested) were also aged.

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6. 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. We continued work on female blue-sided rockfish and blue-blotched rockfish, as well as kelp greenling. We completed an agency Informational Report describing our findings for female copper rockfish that can be accessed at: http://www.dfw.state.or.us/MRP/publications/#Research.

Contact: Bob Hannah (bob.w.hannah@state.or.us, rockfish); Brett Rodomsky (Brett.T.Rodomsky@state.or.us, kelp greenling)

7. Movement of Rockfishes Using Acoustic Telemetry

We completed some work on the write-up of prior years' field work on yelloweye rockfish movements.

Contact: Bob Hannah, (bob.w.hannah@state.or.us), or Polly Rankin (polly.s.rankin@state.or.us)

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

We continued work developing and testing video landers as survey tools for rocky reef fishes. Field research evaluating the effect of light color on avoidance of the lander was abandoned after no apparent avoidance effect was detected. Later in 2014, we initiated a study investigating the effects of ambient light and turbidity/scattering on the effective sampling range of a stereo-video lander. This work will continue in 2015. We also published a paper describing our work evaluating the effect of bait and stereo-video on lander performance.

Contact: Bob Hannah, (bob.w.hannah@state.or.us), or Matthew Blume (matthew.blume@state.or.us)

9. Reducing the Residual Bycatch of Eulachon Smelt and Groundfish in Pink Shrimp Trawls

In July 2014, we tested the effect of adding artificial light at the bycatch reduction device (grid) and at the trawl footrope on the residual bycatch of eulachon and groundfish in a pink shrimp trawl. We used green Lindgren-Pitman® lights as the light source and changed one net on a double-rigged shrimper, using the other net as a control. Adding light on or near the grid increased eulachon bycatch by 104% and slender sole bycatch by 77%, apparently defeating the exclusion effect of the grid for these small fishes. Conversely, adding 10 green Lindgren-Pitman lights along the fishing line of the trawl (where the netting is attached, approximately 0.5 m above the seafloor on most trawls) reduced bycatch of eulachon by 91%, juvenile darkblotched rockfish by 82%, slender sole and other small flatfish by 69% and the bycatch of other juvenile rockfishes by 56%. We notified the shrimp fleet of these findings via a special mid-season newsletter, and by the end of the April-October fishing season, virtually the entire 60-boat Oregon shrimp fleet was fishing 6-15 green Lindgren-Pitman lights on each of their trawl footropes. A manuscript describing this research is currently in review.

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10. Discard Mortality of Hook-and-Line-Caught Rockfish with Barotrauma

We conducted a study to evaluate the longer-term survival and health of yelloweye rockfish experiencing capture-related barotrauma. We utilized a combination of sea-cage and laboratory holding to evaluate fish condition at 4 time intervals throughout a 30-day period. Yelloweye rockfish were captured from a depth range of 140-150m, and evaluated for injury while live, post recompression and after euthanasia at 15 and 30 days. Staff and OSU veterinarians Dr. Jerry Heidel and Dr. Tim Miller-Morgan conducted necropsies and took blood samples for analysis. All fish exhibited extensive barotrauma from initial capture, but external signs resolved post-recompression. Fish that survived to 15 and 30 days (5/6 for each trial) had severely compromised buoyancy. All necropsies on day 15, revealed blood clots or active hemorrhaging in the body cavity and within organs and extensive swimbladder injury. Necropsies on day 30 showed continued swimbladder compromise. Although its encouraging that these fish survived longer-term post-recompression, their condition indicates that serious injury remains for weeks and even a month post-capture. Of concern as well, is that lack of neutral buoyancy is a serious physical and behavioral impairment for physoclists. The condition of these fish indicated that latent mortality studies in fish captured from these deep, cold waters may need to extend beyond 30 days. We also published a paper describing our 2013 research comparing post-recompression mortality of canary and yelloweye rockfish captured at depths greater than 84 m.

Contact: Polly Rankin (polly.s.rankin@state.or.us) or Bob Hannah (bob.w.hannah@state.or.us)

11. Investigation of Shrimp Trawl Impacts on Seafloor Habitat.

We completed the write-up of a 2013 ROV-based re-survey of seafloor habitat and benthic invertebrates at 4 mud-habitat areas near Nehalem Bank, 2 that have been closed to bottom contact gear since 2007 and 2 that have remained open to shrimp trawling. The re-survey found very large increases in sea whip densities at all 4 sites in the 6-year interval, suggesting these deep mud habitats can change rapidly. The results comparing the 2007 and 2013 surveys are summarized in an Informational Report available at:

http://www.dfw.state.or.us/MRP/publications/#Research.

12. Marine Reserves in Oregon

In Oregon, marine reserves are areas of the ocean dedicated to conservation and research. There are five marine reserve sites located off the coast of Oregon at Cape Falcon, Cascade Head, Otter Rock, Cape Perpetua, and Redfish Rocks. Within the marine reserves all take of marine life and ocean development is prohibited. Adjacent to the marine reserves are marine protected areas which prohibit all ocean development, but do allow for certain fishing activities.

There are three goals of Oregon's marine reserve sites. The first is the marine reserves are to conserve marine habitats and biodiversity. The next is the marine reserves are to serve as scientific reference areas to learn about marine reserve effectiveness and to learn about Oregon's nearshore environment in support of nearshore resource management in general. The last is the marine reserves are to avoid significant impacts to ocean users and coastal communities.

The ODFW Oregon Marine Reserves Program is responsible for overseeing the management and scientific monitoring of Oregon's marine reserves. Below is an overview of ecological monitoring activities that took place during 2014.

Status of sites
Harvest prohibitions took effect on January 1, 2014 for two new marine reserves at Cascade Head and Cape Perpetua, bringing the total number of implemented no-take reserves in state waters to four. Harvest prohibitions at a fifth and final marine reserve site at Cape Falcon will begin on January 1, 2016, as mandated by Senate Bill 1510 passed by the 2012 Oregon Legislature.

Site management plans have been completed and are currently being implemented for the Redfish Rocks and Otter Rock Marine Reserves. Development of site management plans for the Cape Perpetua and Cascade Head sites is currently underway, with assistance from local communities. Management plans outline site-specific strategies for outreach, reporting on monitoring activities and results, ways to improve compliance and enforcement, opportunities for community and public engagement and for addressing site specific management issues. The plans also highlight local community interests, priorities, and projects for the marine reserve site.

Monitoring Program

Survey Design: Monitoring data were collected inside the no-take marine reserves and outside the reserves in control sites, hereafter referred to as comparison areas. Comparison areas were selected based on similar depths, habitats, oceanographic conditions and fishing pressure as the associated marine reserve. Unlike the reserve however, comparison areas remain open to fishing. Long-term monitoring of the marine community will be conducted identically in both the reserve and comparison areas to discern changes due to environmental variation from changes caused by marine reserve protection. Baseline data establishes a starting point, from which future changes will be monitored in both the reserve and comparison areas through time. To detect reserve effects, the analyses will focus on comparing the magnitude of temporal change from the baseline data for response variables such as fish and invertebrate

diversity, size and abundance.

Monitoring Conducted in 2014

Hook and Line Surveys: The Oregon Marine Reserves Program continued hook and line surveys in 2014 adding a fourth site, Cape Falcon Marine Reserve and its associated Cape Meares Comparison Area, to our monitoring efforts. Data collection was broken into two periods: Spring (April-May) and Fall (September-October). Combining both periods, the program sampled five days in Cape Falcon, eight days in Cascade Head, eight days in Cape Perpetua, and ten days in Redfish Rocks. In total this amounted to 31 trips led out of four different ports, with participation from 165 volunteer anglers. Although each site is unique, the 2014 survey caught a total of 5,729 fish representing 26 species between marine reserves (3,731 fishes) and comparison areas (1,998 fishes). The 26 species were distributed across five families: rockfishes—14 species, sculpins—4 species, flatfish—5 species, greenling—2 species, and surf perch—1 species. Although salmon were not included in our data, the survey did encounter at least six Coho Salmon in three different sites. Daily catches ranged from a low of 39 to a high of 431 fish measured, weighed, and released.

Honing of Sampling Methods – Trifecta Study: Oregon's five marine reserve sites host a variety of nearshore marine habitats and species. To monitor habitats and species over time, Program staff are using a suite of sampling tools. Particular sampling tools are better at sampling certain species or capturing certain measurements. To better understand the sampling biases of the tools being used to assess shallow rocky reef areas of marine reserve sites, Program staff conducted a pilot "Trifecta Study" in 2014. The Trifecta Study entailed conducting simultaneous surveys using three different sampling tools to see if they produce similar measures of fish abundance, fish length, and species composition. The study was conducted at the Redfish Rocks Marine Reserve and looked at the differences between hook-and-line, subtidal SCUBA transects, and video lander (i.e. stationary drop camera) sampling tools. Preliminary results indicate that the video lander was slightly less effective than the other tools, although data is still being collected for this study. The video lander was limited in its ability to visually identify all fish to the species level, which reduces the overall species richness (number of different species) observed. Also, hook-and-line surveys were the only tool able to capture less common species of rockfishes including China and Quillback Rockfish. Program staff are looking at expanding the sample size of this study, to continue to hone in on the best methods to use to answer specific research questions.

More information, including copies of monitoring plans and reports, is available on the Oregon Marine Reserves website at www.oregonocean.info/marinereserves.

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13. Ocean and Estuary Shoreline Habitat Mapping

MRP staff completed a project to map and classify 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 has now extended into Oregon. The final geodatabase, aerial photos, and related products can be viewed or downloaded from http://www.coastalatlas.net/shorezone/.

Staff are now participating in a partnership with NOAA, Alaska ShoreZone, and other collaborators in Washington and British Columbia to develop an integrated, consistent ShoreZone dataset that will include all of the western North America surveys, extending for over 60,000 miles of shoreline. NOAA plans create a website that serves and displays the habitat data, photography, and videography in 2015.

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14. Surveys of Subtidal Rocky Areas in Oregon's Territorial Sea

Fishery independent data for many fish species found in Oregon's territorial sea is currently minimal or entirely lacking. Surveys of shallow (<55 m) subtidal rocky areas were undertaken in the spring of 2014 in the waters near Newport, OR. This effort focused on exploring the use of the video lander designed by ODFW (Hannah and Blume 2012) to investigate its use as a tool for fishery independent surveys of nearshore rocky reef associated fishes and invertebrates. Seawater properties were also collected during each video lander drop using a casting Seabird 19plus CTD equipped with an oxygen sensor. Initial analysis of video data will focus on determining if there is a measurable response to the lander, either positive or negative, and exploring optimal bottom times for nearshore work to capture adequate representation of biodiversity and abundance of species observed given the tradeoff between increased bottom time and number of drops that can be done in day of field work. Analysis has been undertaken in collaboration with the ODFW marine reserves ecological monitoring project which also has interest in using a video lander as a survey tool. This is the first step in the process of investigating this tool as one method to be employed for fishery independent surveys in rocky areas throughout Oregon's territorial sea.

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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 the fishery, such as effort distribution and regulations. The need to independently estimate exploitation rates and population abundances for black rockfish off Oregon prompted the development of a mark-recapture program using passive integrated transponder (PIT) tags. 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 was conducted from 2002 to 2014. The minimum size for tagging was increased from 29 centimeters (cm) to 32 cm in 2007.

In early 2014, due to the lack of federal funding, tagging operations for this project has been terminated. Tag recovery collection will continued through the end of June 2014. Because these tags will last for decades within the population, it may be possible to recover tags in the future and use this data to make further estimates if there is adequate funding and staff to continue scanning black rockfish carcasses and analyzing data.

Contact: D. Wolfe Wagman (541) 867-0300 ext. 289 (David.W.Wagman@state.or.us), Troy Buell (Troy.Buell@state.or.us)

D. PUBLICATIONS

Hannah, R.W. 2014. Length and age at maturity of female copper rockfish (*Sebastes caurinus*) from Oregon waters based on histological evaluation of ovaries. Oregon Department of Fish and Wildlife, Information Rept. Ser., Fish. No. 2014-04. 18 p.

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Hannah, R.W., S.A. Jones, S. Kupillas and W. Miller. 2014. A comparison of 2007 and 2013 macroinvertebrate surveys of mud habitats at Nehalem Bank, Oregon: changes in areas with continued trawling and those closed to trawling in 2006. Oregon Department of Fish and Wildlife, Information Rept. Ser., Fish. No. 2014-03. 26 p.

Hannah, R.W., P. S. Rankin and M. T. O. Blume. 2014. The divergent effect of capture depth and associated barotrauma on post-recompression survival of canary (*Sebastes pinniger*) and yelloweye rockfish (*S. ruberrimus*). Fisheries Research 157:106-112.

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Rodomsky, B.T., G.K. Krutzikowsky, R.C. Ireland, and T.R. Calavan. 2014. The Oregon Commercial Nearshore Fishery Summary: 2013. Marine Resources Program Publications: Finfish Reports. http://www.dfw.state.or.us/MRP/publications/docs/2013%20The%20Oregon%20Commercial%20Nearshore%20Fishery%20Summary.pdf.

E. PROJECTS PLANNED FOR YEAR 2014

1. Maturity Studies

Maturity data for blue-sided rockfish will be finalized and summarized. Work will continue on tiger and redbanded rockfishes.

Contact: Bob Hannah, (bob.w.hannah@state.or.us)

2. Testing a Video Lander for Surveying Rocky Reefs

The in-progress study of how ambient light and turbidity/scattering influence the performance of a stereo-video lander will be completed.

Contact: Bob Hannah, (bob.w.hannah@state.or.us), Matthew Blume (matthew.blume@state.or.us)

3. Investigation of Hook-and-Line Surveys for Nearshore Reefs

We will be investigating the effectiveness of standardized hook-and-line surveys for nearshore rocky-reef fishes by conducting some replicate surveys comparing two different approaches for site selection.

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4. Discard Mortality of Rockfishes

ODFW will be investigating several aspects of the health of yelloweye rockfish that have experienced capture-related barotrauma. One experiment will utilize an on-bottom observation cage to evaluate the post-recompression behavior of yelloweye rockfish. An additional experiment will employ longer term holding and veterinarian-led necropsies of yelloweye rockfish that have experienced, and recovered or died from capture-related barotrauma.

Contact: Bob Hannah (bob.w.hannah@state.or.us), Polly Rankin (polly.s.rankin@state.or.us)

5. Nearshore Video Lander and CTD Survey

In 2014, ODFW used a high-definition video lander and a Seabird CTD to study habitat characteristics and demersal fish populations on nearshore rocky reefs. The study area ranged from Yaquina Bay to Alsea Bay, offshore to about 20 fathoms. Approximately 115 individual video lander drops of footage were collected, with 115 associated CTD casts. Observations of seabirds and marine mammals were also collected during this survey. Data were entered into a database and analyses are underway. In 2015, the survey will continue covering the nearshore area from Yaquina Bay to Cape Foulweather.

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6. Marine Finfish Ageing

Ageing of commercially and recreationally captured black rockfish otoliths will continue in 2015.

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