OREGON'S GROUNDFISH FISHERIES AND INVESTIGATIONS IN 2004

OREGON DEPARTMENT OF FISH AND WILDLIFE

2004 AGENCY REPORT
PREPARED FOR THE MAY 4 -5, 2005 MEETING OF THE TECHNICAL SUB-COMMITTEE
OF THE CANADA-UNITED STATES GROUNDFISH COMMITTEE

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April 2005
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 jurisdiction over fish, wildlife, and habitat issues coast-wide. MRP is headquartered at Newport in the Hatfield Marine Science Center, with field stations at the coastal ports of Astoria, Tillamook, Charleston, Gold Beach, Brookings, and Corvallis. It 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 50 permanent and more than 70 seasonal or temporary positions. The program budget is approximately $5 million yearly, with about 50% of funding from federal sources and the remainder from various state sources.

B. MULTISPECIES STUDIES

1. Sport Fisheries Project:

Sampling of the ocean boat sport fishery by MRP's Ocean Recreational Boat Survey (ORBS) continued in 2004. Based on the results of year round sampling in 1999-2000, less than 5 percent of the annual fishing effort and catch occurred during the winter period (Nov - Feb). Oregon plans to continue sampling the March through October period during 2005.

Black rockfish remains the dominant species caught in the ocean boat fishery. Lingcod, several other rockfish species (blue rockfish, China rockfish and other nearshore species), cabezon and greenling are also commonly landed. Oregon's fishery for Pacific halibut continues to be very popular, high profile fishery requiring International Pacific Halibut Commission (IPHC), federal, and state technical and management consideration and management.

The ORBS continued its species composition and biological sampling of groundfish species at Oregon coastal ports during 2003. Black rockfish and blue rockfish otoliths were gathered, in addition to lingcod fin rays, for ageing studies. ORBS continued collecting of length and weight data from groundfish species.

From April through September, a portion of sport charter vessels were sampled at sea for species composition, discard rates and sizes, location, depth and catch per angler (CPUE) using ride-along samplers.

Other ODFW management activities included participation in the U.S. West Coast Recreational Fish International Network (RecFIN) process, data analysis and sponsoring public hearings to discuss changes to the management of Pacific halibut, lingcod and rockfish fisheries. See the specific section for more details.

Through June 2003, port samplers continued conducting the federal Marine Recreational Fisheries Statistical Survey (MRFSS) by collecting demographic and creel data from boat and shore anglers in the ocean and estuaries. Species composition, length and weight data were collected.

The Shore and Estuary Boat (SEB) sampling program is focused on non-salmonid and non-sturgeon fisheries. Black rockfish continued to dominate estuary boat groundfish landings and surfperch made up the majority of shore-based catch by weight. Salmon dominated estuary boat landings by weight. Pacific herring made up the majority of both shore-based and estuary boat landings by number of fish.

ODFW continued funding for a project to determine if phone angler surveys for effort and trip type from shore and estuaries can be estimated based on an angler license frame.

Weekly harvest in the sport and commercial halibut fisheries were monitored for quota tracking purposes. The majority of recreational caught halibut continue to be landed in the central coast sub-area (Newport and Garibaldi). In 2004, the directed sport fishery was open for 42 days, which was up compared to recent years but drastically down from a decade ago when it was open nearly year round. The commercial directed fishery was open for four 10-hour periods. In 2004 as in recent years, the sport and commercial halibut fisheries received equal allocations. In 2004, Oregon commercial fishers landed 345,465 pounds down slightly from 341,521 pounds in 2003.
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2. Maturity Studies
We continued research begun several years ago to gather female maturity data from a variety of species for which such data is unavailable, outdated or only available for areas far from Oregon. This work continued in 2004, with a focus on nearshore rockfish, other nearshore species and poorly known slope rockfish species (aurora, POP, redbanded). This study also utilizes histology to validate maturity status on uncertain ovaries. This work will continue in 2005.

We investigated the maturity of female Pacific ocean perch (Sebastes alutus) in waters off Oregon. A comparison of visual and histological methods produced similar results during the December to March spawning season, however neither method provided reliable determinations of maturity in other seasons. Evidence of abortive maturation, characterized by mass atresia of the developing class of oocytes, was observed in 7.1% of the fish sampled during the winter months, with a strong age-related decline in prevalence. Fish older than 18 (N=73) showed no evidence of abortive maturation regardless of size, further supporting the higher reproductive value of older rockfishes. Abortive maturation was associated with adolescence (age 5-9 years), but was also observed in post-adolescent fish, especially in 2001 samples. Rates of abortive maturation varied interannually, suggesting an environmental influence on successful egg development in younger fish. Pacific ocean perch off Oregon were 50% mature at a length of about 31 cm and an age of six, two years younger than assumed in recent stock assessments for the west coast population.
Contact: Bob Hannah at (541) 867-0300 ext. 231, bob.hannah@oregonstate.edu

3. Cooperative Nearshore Survey Project.

During 2004, ODFW developed a cooperative research project with the Oregon South Coast, Port Orford Ocean Resource Team (POORT). The extended sampling project started in January 2004 and continued through December of 2004. The project involved POORT contracting commercial fishing vessels to catch three nearshore species of fish, china rockfish, kelp greenling, and cabezon. POORT also hired a sampling crew to record the species, length, and weight of the fish. The crew collected biological samples, otoliths for aging, gonad samples for histology, and fin-clips for genetic sampling. The ODFW supplied most of the sampling equipment, trained the sampling crew and monitored the project. Biological samples are stock piled until funding is available to analyze the data collected.
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4. Development and Testing of a Selective Flatfish Trawl
The Oregon Department of Fish and Wildlife and the Northwest Fisheries Science Center of NOAA conducted an Exempted Fishing Permit fishery test of a new selective flatfish trawl to estimate bycatch rates in the continental shelf flatfish fishery in 2003, with the report completed in 2004. Eight vessels participated, with observer coverage from May through October 2003 (Figure 1). The trawl performed well and reductions in bycatch observed were consistent with the effects previously demonstrated in the controlled experiments. We recommend that a flatfish target fishery using this trawl be developed for use on the continental shelf off the west coast as a mechanism to reduce bycatch of some critical rockfish species.

We then tested the potential of a selective flatfish trawl to reduce bycatch of slope rockfish in the upper continental slope bottom-trawl fishery (250-500 m). The trawl we tested differed from typical slope trawls in that it was a low-rise, two-seam trawl with a severely cut-back headrope. The study used an alternate haul, randomized block design to compare catches of the experimental trawl with those of a typical 4-seam, high-rise design and to examine diel changes in catch rates for both trawls. The experimental trawl produced similar catches to the control trawl for all commercially valuable flatfish except arrowtooth flounder (*Atheresthes stomias*), which was reduced 24%. Catches of most rockfish and roundfish were significantly reduced in the experimental trawl (50 – 94% depending on species). However, the catches of darkblotched rockfish (*Sebastes crameri*) and redbanded rockfish (*Sebastes babcocki*) were not reduced significantly in the experimental trawl. Nighttime catches were reduced 30 – 99% for most rockfish species, with the greatest reductions observed in the experimental trawl. The nighttime catch reduction for several rockfish species with the control trawl (-86%) along with no reduction in Dover sole catch, suggests that fishing only at night may be a viable bycatch reduction strategy. The variation in relative catch rates of the two trawls, both between day and night and with increasing depth, indicates that a better understanding of near-bottom vertical distribution of fish is critical to development of more selective trawls.

In 2004, the selective flatfish trawl was evaluated by the PFMC for effectiveness and was implemented as required gear for trawling, shoreward of the Rockfish Conservation Area (RCA), starting in 2005, north of 40° 10' N. latitude. The reduction in projected canary rockfish bycatch resulting from mandating this style of trawl allowed the shoreward boundary of the RCA to be moved seaward to 100 fathoms for most of the year and allowed increased catch limits for most flatfish species shoreward of the RCA, potentially reducing fishing pressure on the upper continental slope species. We collaborated with Oregon Sea Grant Extension to conduct three informational workshops for fishermen to inform them of the regulation changes, introduce them

to the trawl design, and discuss issues surrounding conversion of existing trawl gears to the new design.

Work in 2005 with the selective flatfish trawl will focus on using an imaging sonar to study fish behavior inside and ahead of a selective trawl to try and understand the factors that result in either capture or escapement. This is a cooperative project with NMFS, Northwest Science Center.

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5. Nearshore Reef Habitat Studies:
Nearshore reef habitat studies continued on subtidal rocky bottom habitats off the Oregon coast. ODFW staff returned to Cape Perpetua for a fifth year to conduct ROV surveys of fish populations and habitat associations. Twelve transects, all but one of them repeats of previously surveyed transects, were surveyed over two days in September 2004. Analysis of 2003 survey data showed little apparent recovery from the 2002 hypoxia event, which will make analysis of 2004 survey data of greater interest.

a. GIS Description**:**
The Marine Resources Program GIS was summarized in the 1997 TSC report. Additions to the GIS in 2004 are listed below.

b. Base Maps and Baseline Data
Base Maps
No additions for 2004.

Baseline Data
Fish densities by habitat type at Cape Perpetua reef.

c. Software
No additions for 2004.

d. Bathymetric Data Sources
No additions for 2004.
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6. Developmental Fisheries Project:
The ODFW Developmental Fisheries Program was created in 1993 to allow for controlled development of new species and fisheries. Each year, the Developmental Fishery Board recommends to the Oregon Fish and Wildlife Commission a list of food fish species that are considered to be developmental and a harvest program that includes a limited entry system. The Developmental Fishery Board is made up of members from a broad range of fishing interests (harvesters, processors, and state agencies).

In 2004, a total of 89 permits were issued for all species; 47 permits for finfish species. This is a reduction in permits from 2003, mainly because nearshore rockfish were removed from the developmental species list in 2004. The main finfish of interest were-sardines, for which there were 20 permits issued. Other finfish species for which we issued permits were hagfish (15), anchovy/herring 10), and swordfish (1).

Market samples of sardines were collected for length, weight, maturity, and age data. See section 11(b) under "By Species: Mackerel and Sardines" for details.
Contact Jean McCrae for more information (541-867-4741) Jean.E.McCrae@state.or.us

7. Marine Finfish Ageing Unit:

In February, 2005, ODFW ended their participation in PacFIN groundfish ageing projects due to a lack of funding. Finfish ageing effort has shifted from species with lots of federal assessment effort to species of interest to the state that do not have other concentrated effort. Work is continuing on recreational black rockfish, dover sole collected in seal scat, aurora rockfish, and other miscellaneous species. In addition time is being spent training a seasonal employee to age pacific herring.
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C. BY SPECIES

1. Black rockfish PIT tagging
Oregon's primary recreational groundfish fishery targets the nearshore species, black rockfish (*Sebastes melanops*). Previous assessments relied on the relative CPUE trends derived from recreational fishery sampling programs. These data are not robust to problems of sampling bias or changes in fishing distribution, and can result in errors in the trend of relative population abundance. The need to independently estimate exploitation rates for black rockfish off Oregon prompted us to investigate the use of passive integrated transponder (PIT) tags for a mark-recapture program. Because PIT tags are invisible to anglers, there is no tag non-reporting problem, and tag detection rates can be estimated directly. We tagged 2,550 fish in 2002, 3,000 fish in 2003 and 3,001 in 2004 (29 – 54 cm) with PIT tags (12mm x 2mm) during 20 days of fishing each year near Newport, Oregon. Tags were injected in the hypaxial musculature below the gill arches, determined to be the best site by a previous PIT tag retention study. At tagging, categorical barotrauma symptoms were noted and fish with significant barotrauma symptoms were recompressed by immediate submersion in a cage and release at depth. During the fishing seasons (May – October), carcasses of almost all black rockfish landed by charter vessels in Newport and Depoe Bay were counted by samplers and electronically scanned for tags. We have had good recoveries each year (52, 86 and 167) and exploitation rates are within expected assessment values of approximately 5%. This program design will integrate well with the current tagging program used by Washington state and may result in a valuable abundance index for a combined Oregon – Washington assessment. We have begun the fourth year of tagging and will likely continue the project for the next 5 years.
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2. Barotrauma in rockfishes

We have built three pressurized aquaria that can hold up to 6 rockfish each and simulate depths of up to 30 m. We have documented the acclimation rates for black rockfish to increases and decreases in ambient pressures along with the physical symptoms associated with this barotrauma. We have also conducted process-oriented experiments to simulate hook and line capture and ascent to document physiological symptoms and mortality associated with capture. This information is intended to address assumptions in our PIT tagging program related to tagging mortality. Experiments indicated 97% ± 4% survival for fish in a simulated capture from 30m, with 2 minutes at the surface (in seawater) and a 30 second recompression to depth. Also, acclimation times to increase and decreases in pressure were very slow, with rates of about 1 ATA per 24 h of acclimation for increasing pressure, and 1 ATA every 12 h for decreasing pressure.

We also constructed a "camera cage" in 2004 using a low-light underwater video camera to observe recompression and release at depth of 9 species of rockfish captured at depths up to 60m. Observations showed that many rockfish that appear dead at surface pressure are immobilized from gas expansion and show substantial recovery of normal behavior and appearance upon rapid recompression, generally appearing competent at release (properly oriented, swimming towards bottom). We attained depths of release up to 25m with the cage-camera system. Species differed in the percentage that appeared competent at release, with blue rockfish showing the poorest rate of recovery, at just 65%, despite appearing lively at the surface. Some species that have a reputation for surviving poorly at surface pressures (e.g. canary rockfish) appeared to fair better upon recompression. These results are encouraging in that they suggest survival of recompressed fish may be higher than anticipated based on apparent condition at the surface. Longer term survival of severe barotrauma though, remains unknown.

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3. Black rockfish telemetry

We studied the movement patterns of black rockfish (*Sebastes melanops*) along the open Oregon coast to estimate home range over short to annual time scales, describe the frequency and range of vertical movements, and evaluate the influence of environmental variation on behavior. We moored 18 acoustic receivers in a 3x5 km grid south of Newport, OR at depths from 9 – 36 m. We then surgically implanted black rockfish (34 – 40 cm) with coded, pressure transmitters with a lifespan of about 6 months. Fish were tagged in August (n = 6), September (14), October (7), and February (8, + 8 coded only). Within 6 months we recorded more than one million detections, and saw no evidence of mortality in tagged fish. Home ranges were small (< 25 ha) and did not vary from summer to winter. Most black rockfish showed significant vertical movement on a daily basis, especially in the summer. Our data indicate that black rockfish in open coastal waters live in a very restricted area for long periods, potentially making them susceptible to local depletion from targeted fishing, but also good candidates for protection using local area closures or small marine reserves.

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4. Petrale sole

ODFW, in collaboration with Steve Berkeley at UCSC, is conducting a feasibility experiment to capture flatfish (specifically Petrale sole) using a fish trap. If feasible, the use of a Petrale pot may allow more productive flatfish stocks to be accessed in areas closed to trawling due to rockfish conservation efforts. Initial experiments at UCSC determined that Petrale sole are attracted to dead bait and will pass through a tunnel to access squid and sardines. Commercial sized traps were designed by modifying Alaskan Opio crab pots to have a long wide entrance at the bottom on three sides, and varying the mesh materials. Initial field trials were conducted in the fall of 2004. Following the cruise, the pots were refitted with better mesh and tunnels were reconfigured to allow easier access for flatfish yet prevent lingcod and halibut from entering. Field trials with the new pots to compare catches in areas where Petrale presence is confirmed via trawler will occur in the summer of 2005.
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5. Pacific hake

The PFMC's optimum yield (OY) increased from 148,200 mt to 250,000 mt 2004 (Table 1). The tribal fishery was allocated 13.8% of the OY (32,500 mt) and began harvesting on May 20th, 2004. Commercial fisheries received 86.2% of the U.S. OY. Allocations of this amount were 42% to vessels landing at shoreside processing plants (90,510 mt) (up from 50,904 mt in 2003), 34% to catcher/processors (73,270 mt), and 24% to catcher vessels delivering to motherships (51,720 mt). The directed season for mothership and catcher/processor at-sea processing (north of 42^{o} N) began on the 15th of May 2004. The 2004 directed shoreside hake fishery began on 01 April 2004 off California (south of 42^{o} N), and on 15 June 2004 off Oregon and Washington (north of 42^{o} N). To avoid pre-empting more northerly segments of the fishery, the California component of the hake fishery is limited to 5% of the total shoreside allocation until the northern component of the shoreside fishery begins. The California fishery closed on May 22nd because 5% of the allocation was met. No landings were made in California for the rest of the primary season.

The primary issue in the 2004 fishery was canary bycatch. The entire fishery operated under a 7.3 mt cap and information was provided to the fleet to avoid canary rockfish areas of concentration. Total canary catch was 6.03 mt, with 4 mt taken in the non-tribal mothership fishery. In addition, the hake quota was reduced to 250,000 mt in an effort to reduce widow rockfish bycatch. The shoreside sector took 28.59 mt of the 50 mt of widow rockfish taken by the whiting fishery in 2004.

Yellowtail rockfish otoliths and length-frequency information are provided to Sandra Rosenfeld at the Department of Fisheries Marine Fish & Shellfish Division in Olympia, Washington for future stock assessments on this species. Biological samples of Pacific mackerel are provided to the CDFG for their stock assessment work on this species. Biological samples of widow rockfish are sent to Don Pearson NMFS in Santa Cruz, California. Sablefish, jack and pacific mackerel, darkblotched, bocaccio and canary rockfish have been retained at ODFW and are available for future assessment efforts. Past shoreside hake observation reports are available on the internet at http://hmsc.oregonstate.edu/ odfw/reports/whiting.html
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6. Pacific Sardine

In 2004, landings for sardine continued to increase. Nineteen vessels landed 79.6 million pounds (36,111 mt); an 43 % increase from 2003. Most of the sardine catch was by seine gear (99 %), and most fish were landed into Astoria and processed as bait for a Japanese longline fishery. Incidental landings of mackerel accounted for approximately 0.6 % of the catch.

We were, again, unable to hire a seasonal worker to conduct ride-along trips to observe by-catch, but staff made a few observed trips. From observed trips and logbook data, bycatch consisted of sharks and some salmon. Salmon averaged 0.9 per trip, with 68 % being released alive. Market samples were collected for length, weight, maturity, and age data. The average length and weight for all samples was 206 mm (standard length) and 154 gm. The length of sardines harvested in Oregon continues to be large and showed a slight increase over 2003. However, there was also an increase in the amount of small fish harvested, thus a smaller overall average size for 2004. In 2003, 15% of the fish were smaller than 200 mm in length; in 2004, 35% were smaller than 200 mm. The size composition of the harvested catch probably does not reflect the composition of the population off the Northwest as a whole. Harvesters reported actively avoiding schools of the very small fish, as they would plug the mesh of their nets.
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D. PUBLICATIONS

Davis, M. W. and S. J. Parker. 2004. Fish size and exposure to air: Potential effects on behavioral impairment and mortality rates in discarded sablefish. North American Journal of Fisheries Management 24 (2): 518–524.

Gallagher, C. M., R. W. Hannah and G. Sylvia. 2004. A comparison of yield per recruit models for the Oregon ocean shrimp, *Pandalus jordani*, fishery. Fisheries Research 66:71-84.

Hannah, R. W. and S. A. Jones. 2005. A Survey Evaluating Shrimp Abundance, Sex Composition, Bycatch and Trawl Gear Performance on the Northern Oregon Shrimp Grounds – Fall 2004. Oregon Department of Fish Wildlife, Information Report Series, No. 2005-01. 33p.

Hannah, R. W. and S. J. Parker. 2004. Use of an exempted fishing permit to test a discard reduction strategy for the deepwater complex trawl fishery. Oregon Department of Fish Wildlife, Information Report Series, No. 2004-03. 18p.

Hannah, R. W., S. J. Parker and T. V. Buell. (In Press). Evaluation of a Selective Flatfish Trawl and Diel Variation in Rockfish Catchability as Bycatch Reduction Tools in the Deepwater Complex Fishery off the U.S. West Coast. North American Journal of Fisheries Management.

King, S. E., R. W. Hannah, S. J. Parker, K. M. Matteson, and S. A. Berkeley. 2004. Protecting rockfish through gear design: Development of a selective flatfish trawl for the U.S. West Coast bottom trawl fishery. Canadian Journal of Fisheries and Aquatic Sciences. 61(3):487-496.

Parker, S. J., M. R. Saelens, S. A. Kupillas, and R. W. Hannah. 2004. Using an exempted fishing permit for a large-scale test of a selective flatfish trawl in the continental shelf flatfish

fishery. Oregon Department of Fish and Wildlife Information Reports 2004-01. Fish Division, Salem, OR. 22p.

Wiedoff, B. L., and S. J. Parker. The shoreside whiting observation program: 2004. Oregon Department of Fish and Wildlife, Fish Research Project, 27 pp. Progress Report Series, Portland, Oregon.

Projects planned for year 2005:

1. **Barotrauma in rockfishes**: Work examining barotrauma and discard mortality is hampered by difficulties in capturing numbers of target rockfish species, and if captured, transporting them to lab facilities with low mortality. However, our work with recompression with black rockfish and with cage cam (see above) indicates that several species in deeper water at least orient and swim towards the bottom when released at > 20m depth. We plan to capture yelloweye rockfish in 30-40 m depth using hook and line, attach an external acoustic depth transmitter, recompress the fish in a video cage, and then return in 2-4 weeks with an ROV to find the fish and hopefully film it to show degree of recovery and potential mortality.
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2. **Nearshore Management Strategy**: In February 2005, Marine Resources Program will begin developing a comprehensive, nearshore marine resource management plan. The planning project involves three primary components: information-gathering, public process, and plan development. The public process includes a stakeholder advisory committee and public meetings to guide plan development. Participation will also be solicited from representatives of academia, government agencies, environmental organizations, and other interested groups. Individual experts will be consulted on specific issues as necessary. The product will be a plan document outlining conservation strategies, management regulations, and biological and ecological and ecological information on nearshore species. The nearshore plan is being developed in conjuncton with a larger statewide wildlife conservation planning effort.
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