OREGON'S GROUNDFISH FISHERIES AND INVESTIGATIONS IN 2005

OREGON DEPARTMENT OF FISH AND WILDLIFE

2005 AGENCY REPORT
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OF THE CANADA-UNITED STATES GROUNDFISH COMMITTEE

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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 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

2. Oregon

1. Sport Fisheries Project:

Sampling of the ocean boat sport fishery by MRP's Ocean Recreational Boat Survey (ORBS) continued in 2005. 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 2006.

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 expanded its species composition and biological sampling of groundfish species at Oregon coastal ports during 2005. As in prior years, black rockfish and blue rockfish otoliths were gathered, in addition to lingcod fin rays, for ageing studies. Age structure sampling was expanded in 2005 to include many additional nearshore species. ORBS continued collecting of length and weight data from all 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.

Starting in 2004, the harvest of several species was monitored inseason for quota tracking purposes. Inseason action was taken in 2005 to close cabezon (mid-August) and the nearshore fishery out to 40-fathoms (mid-October) due to harvest cap attainment of black rockfish. The shore fishery remained open.

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, groundfish fisheries.

Starting 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 and surfperch made up the majority of shore-based catch by weight. Salmon dominate estuary boat landings by weight. Pacific herring made up the majority of both shore-based and estuary boat landings by number of fish.

ODFW discontinued the 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 due to funding constraints.

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 2005, the directed sport fishery was open for 60 days, which was an increase over recent years. The commercial directed fishery was open for four 10-hour periods as in 2004. In 2005 as in recent years, the sport and commercial halibut fisheries received equal allocations.

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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 2005, with a focus on nearshore rockfish, other nearshore species and poorly known slope rockfish species (aurora, POP, redbanded). We used the Port Liaison Project, through OSU extension to fund collection of aurora and redbanded rockfish from commercial catches that would have been discarded at sea. This study also utilizes histology to validate maturity status on uncertain ovaries. This work will continue in 2006.

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3. Development and Testing of a Selective Flatfish Trawl

The selective flatfish trawl became required fishing gear for all U.S. groundfish trawling shoreward of the Rockfish Conservation Area on January 1, 2005. The only problem noted with these trawls to date is that catch efficiency drops off when water clarity declines severely, for example during strong upwelling-driven plankton blooms. Work in 2005 with the selective flatfish trawl focused on using an imaging sonar to study fish behavior inside and ahead of the trawl to try and understand the factors that result in either capture or escapement. This is a cooperative project with NMFS, Northwest Science Center, and will continue into 2006. To date, we have successfully attached a DIDSON sonar to a bottom trawl, imaging fish in front of

the footrope and out along the wings. Specifically, we are trying to understand how different species react to and possibly escape the selective flatfish trawl. Halibut may go over the tops of the wings instead of herding. Others may rise over the headrope or go under the footrope. More work in deeper water and more encounters with various species are needed. We will also try several new views, looking down and backwards toward the footrope and possible from the footrope up towards the cutback headrope of the selective flatfish trawl.

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4. Nearshore Reef Habitat Studies:
ODFW contracted with a local hydrographer to conduct a multibeam mapping project off Seal Rock, just south of Newport. The area mapped was 3 km wide and 15 km long, positioned just off the coastline from 9-40 m. The 2-m horizontal resolution map was used to provide context for the black rockfish telemetry study.

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5. 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 2005, a total of 83 permits were issued for all species; 45 permits for finfish species; similar to the number of permits issued 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 (10), anchovy/herring (13), blue shark (1), and swordfish (1).

Market samples of sardines were collected for length, weight, maturity, and age data. See section 6 under "By Species: Sardines" for details.
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6. Marine Finfish Ageing Unit:

The untimely death of our principal age-reader, Bob Mikus, in summer 2005 brought our ageing work to an abrupt halt. We did accomplish some ageing work on otoliths of nearshore and slope rockfish as part of our maturity study, by bringing Bill Barss out of retirement in a temporary appointment. In 2006, Josie Thompson has been hired to replace Bob and will be re-evaluating our ageing project and setting goals for the next several years when she starts in the near future. Contact Bob Hannah (541) 867-0300, ext. 231. bob.w.hannah@state.or.us

C. BY SPECIES

1. Nearshore rockfish

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, 3,013 in 2004, and 2,882 in 2005 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 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 fifth year of tagging and will likely continue the project for the next several 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. In 2005, a new PhD student (Alena Pribyl) began work on identifying the actual tissue level effects of barotrauma in different rockfish species using these tanks. Her project will use histology to evaluate embolism in various susceptible tissues, examine survival and recovery rates in several ecologically different rockfishes, and also utilize new genetic microarray techniques to compare gene expression in different tissues both as a direct response to barotrauma and throughout the healing process. Ultimately this may show when a fish has "recovered" using gene expression in control fish as "normal"**.**

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 below) indicates that several species in deeper water at least orient and swim towards the bottom when released at > 20m depth. We captured 6 yelloweye rockfish off Stonewall Bank in 60 meters depth, attached an external transmitter, and recompressed the fish with a video release cage. We then monitored the horizontal and vertical movements of the fish with moored receivers for 4 months. Utilizing vertical movements to indicate they were alive, we concluded that 3 of the 6 fish were alive at 21 days post release. Two others were likely alive but data was not complete enough to confirm movement. Only one fish definitely died within 5 days of release. All fish exhibited severe barotrauma on capture. One interesting observation was dramatic (>40m) vertical movements shown by 5 of 6 fish after release. This entailed rapid

movement from 60 m to10-20m and back. In one fish this was observed continuously every night. All fish showed more vertical activity during darkness.

We continued work with a "camera cage" in 2005 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). Species differed in the percentage that appeared competent at release, with blue rockfish showing the poorest rate of recovery, 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. A decline in behavioral scores with increasing depth of capture was observed, with poor ability to orient vertically and sluggishness the principal symptoms of lingering effects from barotrauma.

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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). We recorded over 2.8 million detections, and documented home range sizes from 3-271 ha, with a mean of 55 ha. We also documented longer absences from the area by females during winter months, suggesting that there may be reproductive-based movements. The scale of these movements remains unknown, but fish were only absent for a week on average. Some were absent for up to a month. We also examined vertical movement patterns. We observed patterns of strong diurnal vertical migration, but shallower at night and during the day. We also observed periods of continuous large vertical movements, and also period of little activity. There were seasonal patterns the prevalence of vertical movement behavior categories. We saw no correlation of vertical movements with environmental variables such as lunar phase, cloud cover, or temperature. 2005 was an atypical year with regard to upwelling pattern, which complicated analysis of behavior with respect to upwelling conditions.
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Shelf

1. Petrale sole

ODFW, in collaboration with Steve Berkeley at UCSC, is conducted 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 snow 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 three different types allow easier access for flatfish yet prevent lingcod and halibut from entering. We conducted more trials in August of 2005. The presence of Petrale in the area was confirmed by several bottom trawlers fishing nearby at the same time. We found poor catch rates in all pots, due mainly we think, to excessive Dungeness crab catch. All of the tunnel designs we tested were vulnerable to Dungeness crab invasion, and any flatfish entering the pot were usually damaged or killed by the crabs. We could not find an area where there were Petrale sole, but not Dungeness. Another try may occur using slightly different tunnel designs off central California, but the feasibility based on work to date is not encouraging.
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5. Pacific hake

The PFMC's US optimum yield (OY) increased from 250,000 mt to 269,069 mt in 2005. This OY was limited due to bycatch concerns for widow rockfish and estimated canary rockfish bycatch. The directed season for mothership and catcher/processor at-sea processing (north of 42^{o} N) began on the 15^{th} 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. No landings were made in California after June 15^{th}.

Surprisingly, the primary issue in the 2005 fishery was salmon bycatch. The entire fishery operates under an 11,000 Chinook, which was exceeded by almost 1,000 fish. This was especially controversial because the salmon troll fishery was severely restricted due to Klamath River concerns. Exceeding the cap requires re-initiation of Section 7 ESA consultation, which may trigger further restrictions to reduce Chinook catch. Bycatch of other species of rockfish increased, often at a rate greater than the increase in hake quota. This may create concerns in the future, as these rockfish species are under strict constraints (namely Canary, widow and darkblotched rockfish).

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 2005, landings for sardine continued to increase. Twenty vessels landed 99.4 million pounds (45,110 mt); a 25 % increase from 2004. 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 0.7 % 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 logbook data, bycatch consisted of sharks and some salmon.

Salmon averaged 0.5 per trip, with 70 % being released alive. Market samples were collected for length, weight, maturity, and age data. The average length and weight for all samples was 174 mm (standard length) and 87 gm. The size of sardines off Oregon in 2005 was considerably smaller (length and weight) than in 2004 due to an influx of smaller, and presumably younger, fish. The abundance of small fish caused problems for harvesters and processors as established markets were geared toward the larger sized fish.
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7. Angling Selectivity Studies

In 2005 we began work on some small scale experiments to determine the potential for using changes in terminal tackle to reduce bycatch in recreational hook and line fisheries. Results to date simply demonstrated that these kind of studies were feasible, but were complicated by choice of fishing location and seasonal variations in species abundance. In 2006, these small scale studies will continue and will examine potential bycatch reduction techniques for yelloweye rockfish and canary rockfish.
Contact: Bob Hannah at 541-867-4741, bob.w.hannah@state.or.us

D. PUBLICATIONS

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Biology, Assessment, and Management of North Pacific Rockfishes, Alaska Sea Grant, Anchorage.

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.

Projects planned for year 2005:

1. **Barotrauma in rockfishes**: We plan to continue the telemetry work described above with black rockfish, yelloweye rockfish and other species such as canary rockfish, china rockfish or quillback rockfish. The work will be conducted off Siletz reef, with the hope of encountering fish in shallower water to remove some of the barotrauma. We will also displace some of the fish approximately 10 km to examine homing ability. We will deploy approximately 30 acoustically tagged fish.

In a related project, we will have an undergraduate intern collect rockfish condition information from the recreational fishery to determine the percentage of fish caught in the fishery that have specific injuries, such as a ruptured swimbladder, bruised organs, exopthalmia etc… This student will also demonstrate the use of recompression devices to the charter fleet and collect information on what techniques are being used by the fleet for release of rockfishes.

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2. Nearshore Management Strategy: In December 2006, Marine Resources Program staff completed *Oregon's Nearshore Marine Resources Management Strategy* (Nearshore Strategy). The Nearshore Strategy's 16 recommendations will guide future management decisions affecting Oregon's nearshore marine resources and direct managers' attention and resources to priority areas where they can have the most positive impact on nearshore fish and wildlife. Implementation of the Nearshore Strategy will begin with establishment of a Nearshore Advisory Committee (NAC) that will provide advice to ODFW staff during implementation of Strategy recommendations. ODFW staff will focus on inter-agency management coordination, nearshore habitat surveys at Port Orford Reef, a revision of the Interim Management Plan for Oregon's Commercial Nearshore Fishery, and expanded outreach including revisions to the ODFW/MRP website (http://www.dfw.state.or.us/MRP/). ODFW will review the Nearshore Strategy for consistency with current resource issues, state policies, scientific information and public interest approximately every five years.

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