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REPORT OF THE

NEARSHORE ROCKFISH

WORKSHOP

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EXECUTIVE SUMMARY

In 1992, the Technical Subcommittee of the U.S. Canada Groundfish Committee met in Seattle, Washington, and raised concerns over the status and management of rockfish (*Sebastes spp.*) for which biological and abundance information is largely lacking. Concerns were also expressed regarding the generally poor track record of rockfish management coastwide, and the longevity and vulnerability to over-exploitation associated with these species, even when some biological parameters are known. Based on that meeting, the Pacific States Marine Fisheries Commission sponsored the "Nearshore Rockfish Management Workshop" in March 1994. Facilitation services for the workshop were provided by the Organization of Wildlife Planners.

I. WORKSHOP PRESENTATIONS

State and provincial rockfish managers and biologists from Alaska, British Columbia, Washington, Oregon, and California gave presentations on their rockfish management programs, portions of which are summarized below:

Alaska, Southcentral: To improve sustainable yield from nearshore rockfish populations, management plans were adopted in 1993 to impose trip limits and provide the authority and guidelines for by-catch only fisheries. Development of management strategies for nearshore rockfish remains hampered by limited funding and a low institutional priority.

Alaska, Southeast: A domestic longline fishery for nearshore rockfish (specifically yelloweye rockfish) developed in the mid-1980's. The fishery has developed signs of localized depletion, including declines in average age, pounds/hook, and average pounds per landing.

British Columbia, Canada: In 1993, the recreational bag limit in the Strait of Georgia was reduced from 8 to 5 rockfish in response to concerns over stock status. There are severe sampling and data problems because of numerous ports and patchy nearshore rockfish distribution.

Washington, Coastal: Survey data between 1981 and 1990 from Cannon Beach, Oregon to Cape Flattery, Washington, showed a significant reduction in mean length of black rockfish coastwide. In 1991, concern regarding localized depletion resulted in reduction in recreational bag limit from 15 to 12, as well as commercial area closures.

Washington, Puget Sound: There has been a long term decline (1977-1991) in rockfish catch per unit effort. The recent decline in total catch has been a result of decreased effort and an apparent decline in stock abundance.

Oregon: Black rockfish is a "stock of concern". The black rockfish recreational bag limit was reduced in 1994 from 15 to 10 fish. In March 1994, the Pacific Fishery Management Council limited the commercial rockfish harvest in some areas to a daily limit of 200 pounds or 65 fish (which ever is greater).

California: Since the mid-1980's, concerns for adverse impacts on nearshore rockfish populations and the quality of the sport fisheries they provide have been created by the expansion of the nearshore commercial hook and line fisheries. As a response to length frequency data analysis of black rockfish showing a trend of decreasing mean length and an increasing proportion of sexually immature black rockfish sampled in the sport catch (primarily from the San Francisco area), a voluntary catch and release program for black rockfish was instituted April 1 in the Northern and Central California sport and commercial fishery.

II. WORKSHOP PRODUCT DEVELOPMENT

The workshop concentrated on three major topics which were posed as questions. Each of the three main questions were further elaborated upon in small group sessions, and are listed below. (Responses to the questions were developed and ranked, and can be found in the main text of this report):

1. **HOW DO WE DETERMINE THE POPULATION STATUS OF NEARSHORE ROCKFISH?** The group talked about how to determine what are nearshore rockfish "biological" stocks; what are the appropriate management units for nearshore rockfish; and what information should be provided to managers in the absence of rockfish abundance estimates.

2. **HOW DO WE MANAGE AND SET HARVEST RATES FOR NEARSHORE ROCKFISH?** Discussion included how to develop management philosophies without sufficient biological information, how to convince management entities to reduce harvest when biological data is lacking, how to determine the level of acceptable biological risk (biological information), how to get minimum data to manage rockfish stocks and alleviate conservation concerns, how to identify the rockfish management unit, and how to maximize profits and social returns.

3. **HOW TO BALANCE NEARSHORE ROCKFISH POPULATIONS WITH HARVEST MANAGEMENT AND PUBLIC PERCEPTIONS OF HARVEST MANAGEMENT?** Topics for dialogue included how to involve the public in the "balancing" process; what information should we be providing to user groups; what information should we be getting from the public on rockfish management; and what are feedback measures to evaluate the success or effectiveness of public involvement measures.

III. CONCLUSIONS

At the end of the conference, participants discussed some of their concerns regarding nearshore rockfish management. These concerns fell into the following categories:

1. Currently, in most cases, managers do not have sufficient information to determine the abundance levels of nearshore rockfish.

2. The current political process that determines rockfish management has a short term view, while the longevity of these species is long term. While recovery may require decades, the time frame for decline of a nearshore stock can be as short as three years or even less. The group was concerned that in many instances, if the current systems under which these species are managed continues, declines may become even more dramatic.

3. Most of the group felt that we currently lack either the money or the technical tools or both to determine withprecision the biological data necessary to properly manage these species.

I. BACKGROUND

The Canada/U.S. Groundfish Committee is the arm of the U.S.- Canada Treaty which discusses groundfish stock assessment and management issues of mutual concern to the two countries.The Technical Subcommittee (TSC) of the Canada/U.S. Groundfish Committee, is composed of scientists from the States of Alaska, Washington, Oregon, and California, the National Marine Fisheries Service, and the Canadian Department of Fisheries and Oceans.

In May of 1992, the TSC met in Seattle, Washington. At that meeting, there was discussion of the management of **rockfish** (*Sebastes spp.*) for which biological and abundance information is largely lacking. The major issues of concern included:

- the lack of biological information and abundance for many nearshore rockfish species;
- the generally poor track record of rockfish management coast-wide;
- the notable difficulty in managing nearshore species; and
- the longevity and vulnerability to over-exploitation associated with these species, even when some biological parameters are known.

Based on these concerns, the TSC recommended that a workshop be convened to discuss nearshore rockfish management options and to advocate appropriate measures to manage this valuable resource.

Following through on the TSC recommendation, on March 1 and 2, 1994, federal, state, and provincial rockfish biologists and managers from Alaska, British Columbia, Washington, Oregon, and California convened in Portland Oregon, for the "Nearshore Rockfish Management Workshop". The workshop was sponsored by the Pacific States Marine Fisheries Commission. Facilitation services were provided by the Organization of Wildlife Planners.

II. WORKSHOP GOALS

The initial goals of this workshop were to answer the following questions:

1. Many nearshore stocks appear to be in decline, and/or have not recovered from over-exploitation. What factors have contributed or are continuing to contribute to this condition?

2. Is current available biological information adequate for management of nearshore rockfish?

3. What additional information is necessary to better manage these species?

4. Are existing management strategies appropriate for management of nearshore rockfish, or do new management strategies need to be implemented? If so, what are they?

III. WORKSHOP PRESENTATIONS

The state agencies and the Canadian Department of Fisheries and Oceans gave brief presentations about rockfish management under their jurisdictions. Abstracts from these talks can be found in Appendix A. Major themes of the presentations are summarized below:

1) **Oregon**: Black rockfish is a stock of concern. The black rockfish recreational bag limit was reduced in 1994 from 15 to 10. Also, the Pacific Fishery Management Council has taken final action on a regulatory amendment to limit the commercial rockfish daily harvest in some areas to 200 pounds or 65 fish which ever is greater. There is critical need for adequate catch and effort estimates for nearshore fisheries. Current funding will not provide additional sampling needed (Elaine Stewart, ODF&W).

2) **Washington, Coastal:** In the last 10 years there has been increased commercial and recreational effort on black rockfish. Eighty percent of black rockfish landings are by the recreational fishery. In 1991, concern regarding localized depletion resulted in reduction in recreational bag limit from 15 to 12, and commercial area closures. Survey data between 1981 and 1990 from Cannon Beach, Oregon to Cape Flattery, Washington showed a significant reduction in mean length of black rockfish coastwide (Farron Wallace, WDF&W).

3) **Washington, Puget Sound:** In 1980, rockfish catches peaked at 418 mt, and in 1992 declined to 128 mt. There has been a long term decline (1977-1991) in rockfish CPUE. Recent decline has been a result of decreased effort and an apparent decline in stock abundance. There has been a shift in species catch composition showing fewer black rockfish, and more quillback and copper rockfish. (Wayne Palsson, WDF&W)

4) **British Columbia, Canada:** There are severe sampling and data problems because of numerous ports and patchy nearshore rockfish distribution. Coastwide catches of nearshore rockfish (mostly yelloweye rockfish) increased from about 180 tonnes in 1976 to 2200 tonnes in 1990 and 1991. In 1993, recreational bag limit was reduced from 8 to 5 rockfish (Devona Adams, Lynne Yamanaka, DFO).

5) **California:** There is a paucity of current nearshore rockfish commercial fishery and biological information because of lack of funding. The use of direct marketing channels, high frequency of small landings, poor catch reporting compliance, and lack of good data have hindered the assessment of the commercial nearshore rockfish fishery. Since mid-1980's, there have been concerns for adverse impacts on nearshore rockfish populations and the quality of sport fisheries by the expansion of the nearshore commercial hook and line fisheries. Two surveys taken between the early 1960's and early 1970's showed a considerable increase in sport take of rockfish and a decrease in the average weight (1.8 to 1.6 lbs/fish). All five nearshore species examined (blue, black, brown, gopher, olive) showed decreases in mean length. As a response to length frequency data analysis of black rockfish, showing a trend of decreasing mean length and increasing proportion of sexually immature fish sampled in the sport catch (primarily from the San Francisco area), a

voluntary catch and release program was instituted April 1, 1994 in the Northern and Central California sport and commercial fisheries for black rockfish < 14" in length (Doug Albin, Paul Reilly, and Frank Henry, CDF&G)

6) **Alaska, Southcentral:** To improve sustainable yield from nearshore rockfish populations, management plans were adopted in 1993 to impose trip limits and provide the authority and guidelines for by-catch only fisheries. Socio-economic impacts from the Exxon-Valdez oil spill has increased fishing pressure. Development of management strategies for nearshore rockfish remains hampered by limited funding and a low institutional priority (Bill Bechtol, ADF&G).

7) **Alaska, Southeast:** Nearshore "demersal shelf" rockfish species include canary, china, copper, and quillback. These fishes have been landed incidental to halibut for nearly a century. A domestic longline fishery for nearshore rockfish (specifically yelloweye) developed in the mid-1980s. The fishery has developed signs of localized depletion, including declines in average age, pounds/hook, and average pounds per landing (Barry Bracken, ADF&G).

IV. MEETING FACILITATION AND PRODUCT DEVELOPMENT

The workshop was facilitated by the Organization of Wildlife Planners. The OWP was established in 1978 to promote and facilitate the development of effective fish and wildlife agency management systems. The three OWP facilitators were Bob Hasenyager of the Utah Department of Natural Resources, Wildlife Division; Verlyn Ebert of the U.S. Fish and Wildlife Service, and Dwight Guynn of the Montana Department of Fish, Wildlife & Parks.

Following the presentations, the group revisited the initial questions (see page 3, "Workshop Goals") and rephrased them as follows:

1) How do we determine the population status of nearshore rockfish?

2) How do we manage and set harvest rates for nearshore rockfish ?

3) How to balance nearshore rockfish populations with harvest management and public perceptions of harvest management?

The workshop was broken down into three groups. Each small group took one of the questions for refining further and to develop solutions.

On the afternoon of the second day of the workshop, the entire group reconvened and discussed their findings. Solutions to the questions posed by the small groups were then ranked by the entire group. To help prioritize recommended solutions and methods, rankings have been divided into three categories: "Preferred recommendations", "Recommendations of lesser importance", and "Recommendations that did not receive votes".

GROUP ONE

QUESTION: HOW DO WE DETERMINE THE POPULATION STATUS OF NEARSHORE ROCKFISH?

Group One tackled the question "How do we determine the population status of nearshore rockfish?" Group One's original list of questions can be found in Appendix B. The original list of questions were then consolidated into the numbered questions below. Solutions to these questions were then developed by group one. The entire group then ranked the recommended solutions by vote.

1. HOW DO WE DETERMINE WHAT ARE NEARSHORE ROCKFISH 'BIOLOGICAL" STOCKS?

CATEGORY	# OF VOTES
Preferred recommendations:	
- Genetic differences	14
- Distinct difference in growth rates and other life history characteristics	14
- Morphometric / meristics (eye orbit, fin rays, etc)	12
Recommendations of lesser importance:	
- Tagging and recapture studies	6
- Area production units / Habitat management assemblage	5

Recommendations that did not receive votes:

- Parasites
- Reproductive strategies
- Infrared sounding - hydro-acoustic
- Temporal changes - ranges
- Estimate drift of larvae through ocean current larval drift

2. WHAT ARE APPROPRIATE MANAGEMENT UNITS FOR NEARSHORE ROCKFISH?

Preferred recommendations:

- Management unit by biological stock boundary - sub-stock/sub-area 23
- Multi-species aggregation 22

Recommendations of lesser importance:

- Based on enforceability 15
- Gear type selectivity assemblages 11
- The use of protection zones/refuges 9
- Production/availability 3
- Logistical sampling constraints 2
- Habitat/depth areas 1
- Previously established by historical/statistical "other" species management 1
- Species area complexes (ratios) made up of desirable/less- desirable species) 1

Other recommendations that did not receive votes:

- Political allocation zones
- Agency boundaries
- Judicial boundaries
- Market and economic considerations
- Recreational/commercial distribution

3. IN THE ABSENCE OF ROCKFISH ABUNDANCE ESTIMATES, WHAT SHOULD BE PROVIDED TO MANAGERS?

Preferred recommendations :

- Changes or trends in size/age composition 17
- Distribution of effort (Fleet dynamics, i.e., fishing out) 14
- Case histories (Risk analysis, likely productivity) 12

Recommendations of lesser importance:

- Catch caps / history 5
- Catch rates in area fished 5
- Anecdotal info. Fishermen Expertise 1

Other recommendations that did not receive votes:

- Yield per permit
- Bycatch rates
- Limit vessel numbers, effort
- Maintenance of a harvest level

GROUP TWO

QUESTION: "HOW DO WE DETERMINE MANAGEMENT AND HARVEST RATES OF NEARSHORE ROCKFISH?"

Group two tackled the question "How do we determine management and harvest rates of nearshore rockfish?" Group two's original list of questions can be found in Appendix B. The original list of questions were then consolidated into the numbered questions below. Solutions to these questions were then developed by group two. The entire group then ranked the solutions by vote.

1. HOW TO DEVELOP MANAGEMENT PHILOSOPHY WITHOUT SUFFICIENT BIOLOGICAL INFORMATION & CONVINCE MANAGEMENT BODIES TO REDUCE HARVEST

Preferred recommendations:

- Inform publics of vulnerability to over-exploitation 18
- Provide case histories of declining fisheries to all publics 10
- Place provisional caps on harvest (and observe stock response) 10

Recommendations of lesser importance:

- Public support gained (through informing publics) to influence regulatory bodies; Involve industry in decisions; Involve consumptive and non-consumptive users; Change manner in which regulatory bodies work 7
- Conservative harvest quotas of unknown "pies" (management units) 4
- No fishing until publics' demand (and support) is high enough for funding of information collection 3
- Involve industry in population assessment (credibility w/industry; skipper's logs, etc., industry funded observers) 1

Other recommendations that did not receive votes:

- Inside support within regulatory body (cooperation and information)
- Strategies commonly used to manage, or historic harvest rates
- Prevent shift of harvest effort for fisheries you don't have data on, by limiting the number of participants through permit process, or preventing new entries.
- Estimate/describe overharvest & potential impacts on marine ecosystem

2. HOW TO DETERMINE THE LEVEL OF ACCEPTABLE BIOLOGICAL RISK (BIOLOGICAL INFORMATION)

Preferred recommendations:

- Avoid localized depletion 17
- Two kinds of risk defined: Risk of population collapse or risk of not meeting certain population goals for use, etc. 16
- Establish optimal exploitation rate 14

Recommendations of lesser importance:

- Establish threshold levels for minimum viable populations 11
- Use life history parameters 8
- Use lower confidence interval (90%) to reduce risk 7
- Use comparison of management history with other similar species 3
- Biomass and yield projections 3
- Confidence interval around abundance estimate 2
- Recruitment forecasts 1
- Monitor age distribution 1
- Maintain historical catch per unit effort by area 1

Other recommendations that did not receive votes:

- Define what "bad" populations are (what "bad" means); define % time want to be above "bad levels (90%); dependent upon data to quantify.

3. HOW TO GET MINIMUM DATA TO MANAGE ROCKFISH STOCKS & ALLEVIATE CONSERVATION CONCERNS

Preferred recommendations:

- Port sampling (including sport fisheries) 18
- Enforcement of landing receipts 15
- Agency population surveys 14
- Involve user groups: mandatory log books, observers 13

Recommendations of lesser importance:

- User fees to be used for collecting data 8
- Permit process requirement for logbooks, etc 5
- Creel census 5
- Postal survey of recreation users 3
- Anecdotal information from advisory commissions 1
- Volunteer creel surveys 1
- Acquiring grants for data collection 1
- Dedicated funds from licensing for data collection 1
- Skipper interviews 1

Other recommendations that did not receive votes:

- Voluntary use of user groups
- Donation of biological samples
- Stick/carrot approach using season & limits to force users to collect data

4. HOW TO IDENTIFY THE ROCKFISH MANAGEMENT UNIT

Preferred recommendations:

- Define units that can be managed by year or time or area or gear or user group 19
- Manages as if only major (most abundant or highest demand) species exist; Manage for critical (weak stock, highest risk) species 13

Recommendations of lesser importance:

- Define major component of the catch over time 5
- Get users to tell you their priorities 1

5. HOW TO MAXIMIZE PROFITS & SOCIAL RETURNS (HOW TO SET THOSE GOALS)

Preferred recommendations:

- Determine maximum potential harvest & dollar value and weigh against social costs of depletion 14
- Determine public demand 13

Recommendations of lesser importance:

- Managing user conflict (dollars versus social return) 4
- Designated recreation and commercial use areas and areas for non-consumptive use 1
- Social considerations becoming more important 1

Other recommendations that did not receive votes:

- Legislate for inefficient harvest to meet other objectives (prevent catch of unusable biomass also)
- Encourage user participation in process

The group also developed a list of tools to manage users, these were not ranked:

- Quotas
- Bag limits
- Trip limits
- Limited Entry
- Time/area closure
- Area/gear restrictions
- Non-restricted permits (ID players)
- Size limits
- Individual quotas
- Depth closures
- Refuges
- Bycatch restrictions
- Logbook & fish ticket information
- Failure to report required info results in loss of fishing privileges
- Vessel size/capacity limits
- Use of observers
- Fisheries/port monitoring
- Design licenses for gear categories
- User fees as tool
- Community development quotas
- Limit number of fishermen per vessel
- Landing reporting requirements
- Enhancement: habitat, artificial propagation
- Enforcement

GROUP THREE

QUESTION: HOW TO BALANCE POPULATIONS WITH HARVEST AND MANAGEMENT

Group three tackled the question "How to Balance populations with harvest and management". The word "publics" used here means all commercial and recreational fishing users groups, consumers, environmental groups, politicians etc. Group three original list of questions can be found in Appendix B. The original list of questions were then consolidated into the numbered questions below. Solutions to these questions were then developed by group three. The entire group then ranked the solutions by vote.

1. HOW TO INVOLVE PUBLIC AND OTHERS IN THE 'BALANCING' PROCESS?

Preferred recommendations:

- Disseminate information through general news publications - magazines, technical publications, bulletins, special issue brochures, all "translated" to eliminate technical 'jargon'	22
- Management workshops with resource users	17
- Advisory groups/panels	16
- Public meetings	16

Recommendations of lesser importance:

- Public outreach campaigns	8
- Posters at ports explaining species and their vulnerability	7
- Professional reports in lay language	6
- Public service announcement campaigns	6
- Resource agency "open houses"	6
- Recognizing language/cultural needs in communicating/involving publics	4
- Educational campaigns (work rockfish information into general agency efforts)	2
- Surveys of public to determine needs	1
- One on one contacts with users	1
- Booths/displays at fairs, sport shows, etc.	1
- Mail outs of meeting notices	1

Other recommendations that did not receive votes::

- Free Fishing Days; use an opportunity to communicate with public
- Involvement of agency public relations/information education staff

2. WHAT INFORMATION SHOULD WE BE PROVIDING TO USER GROUPS?

Preferred recommendations:

- Risk analyses - explanations of expected consequences and costs of errors/failures in management 18
- Stock assessment information: including where we lack information; ranges of results, reasonable choices, flexibility of analyses, exploitation rates, management targets (and how derived), levels and reasons for some uncertainty. 17

Recommendations of lesser importance:

- Management strategies: short and long term planning, why and what options are being considered 12
- How decision making process works, and how they can get plugged-in to the process 11
- Make sure goals of management processes are clear 10
- Time frames for management alternatives 4
- Explain who the other players are (managers and users) 1
- How rockfish 'fit' into the system they live in, and what the implications are for their removal 1
- What are current known management options 1
- Where we currently are spending funding 1

Other recommendations that did not receive votes:

- Where agency funding comes from
- What are our management goals are based on current knowledge

3. WHAT INFORMATION SHOULD WE BE GETTING FROM THE PUBLICS ON ROCKFISH MANAGEMENT

Preferred recommendations:

- Do they agree with our clearly defined management goals, do they have other ideas 17
- What they want/expect from the resource 14

Recommendations of lesser importance:

- What issues are important to the public 9
- What should we do when we don't have data to make management decisions 7
- Are they willing to help get more funding and/or resources to manage the rockfish resource 4
- Where they think we should be spending funding and investing effort 2
- How they would like to get 'there' from 'here' 2
- How would it be easier for them to be involved - techniques they prefer 1

4. WHAT ARE SOME FEEDBACK MEASURES TO EVALUATE THE SUCCESS OR EFFECTIVENESS OF PUBLIC INVOLVEMENT MEASURES

Preferred recommendations:

- Stock assessments ... how is the resource doing? 19
- Accomplishment of management goals 18

Recommendations of lesser importance:

- Credibility status of agency, is it up, down, identify areas of contention 6
- Was rationale for final management actions accepted by public 6
- Was there a diverse set of stakeholders involved in decision making process 3
- Public evaluation of progress toward management goals 3
- Agency managers 'comfort level' with both the process and the results 1
- Did funding for program improve 1

Other recommendations that did not receive votes:

- Agency support levels increase or decrease (funding, political support)
- How public opinion has changed (relative measures of satisfaction)
- Resource agency staff turnover (satisfaction)

V. CONCLUSIONS

At the end of the second day of the conference, participants stated some of their concerns regarding nearshore rockfish. These concerns fell into the following categories:

1. Currently, in most cases, managers do not have sufficient information to determine the abundance levels of nearshore rockfish.

2. The current political process that determines rockfish management has a short term view, while the longevity of these species is long term. While recovery may require decades, the time frame for decline of a nearshore stock can be as short as three years or even less. The group was concerned that in many instances, if the current systems under which these species are managed continues, declines may become even more dramatic.

3. Most of the group felt that we currently lack either the money or the technical tools or both to determine with precision the biological data necessary to properly manage these species.

APPENDIX A:

ABSTRACTS OF AGENCY PRESENTATIONS

Oregon's Nearshore Rockfish Work

Principal rockfish species harvested from Oregon's nearshore reefs are black, blue, copper, quillback, china, yellowtail, canary, yelloweye and tiger rockfish. The black rockfish dominates inshore catches and most work to date has focused on that species. Sport anglers have been the principal users of nearshore rockfish, while commercial harvest by small-boat operators fishing various hook and line gears has been sporadic but is growing. Nearshore rockfish have been managed by a bag limit on the sport fishery, although measures to regulate commercial harvest of black rockfish are under consideration by PFMC. Future resource work includes analysis of fishery species compositions, studies to examine relationships of biotic communities and habitats, cooperative work with universities and others, and comparing species compositions from fishery harvests with those from SCUBA and submersible work. Management concerns to be addressed include obtaining adequate catch and effort estimates, obtaining sufficient and stable funding, exploring alternative management processes to improve response time, managing activities with potential impacts (e.g., kelp harvest), and communicating more effectively with a broader public.

Elaine Stewart, ODFW 2/15/94

WASHINGTON DEPARTMENT OF FISHERIES
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TO: Stephen Phillips, PSMFC DATE: February 14, 1994

FROM: Farron Wallace, WDF

SUBJECT: Presentation abstract for the "Nearshore Rockfish Management Workshop"

Coastal Nearshore Rockfish Management in Washington State.

Prior to the early 1980's black rockfish were not an important target of coastal recreational anglers and were primarily an incidental species for commercial fisheries. Increased targeting by recreational anglers and commercial jiggers resulted in substantial growth in these fisheries during the mid 1980's. The trawl harvest for black rockfish peaked at over 500 metric tons in 1980, but decreased dramatically as this fishery moved offshore to harvest other more productive species and now is less than 100 metric tons per year. Decreased seasons for the salmon trollers have reduced their rockfish landings from over 250 metric tons in 1978 to less than 50 metric tons annually.

Concern expressed by recreational anglers in the Westport and Neah Bay areas regarding depletion of local black rockfish populations led WDF to reduce sport limits and geographically separate sport and commercial fisheries in 1991. Commercial jig and sport black rockfish landings have declined slightly over the last 5 years. We are concerned that in response to reduced salmon seasons sport bottomfish effort may increase. Additionally, confinement of the commercial jig fishery to a relatively small area may result in localized depletion of black rockfish in the La Push area. Tagging data indicate that these fish contribute to the large sport fishery operating to the south. Thirty percent of La Push (Catch Record Area 3) tag releases were recovered by the charter fishery near Westport (Catch Record Area 2). Mixing rates and relative contribution have not been estimated. Survey data taken between 1981 and 1990, from Cannon Beach, Oregon and Cape Flattery, Washington, show a significant reduction in mean length of black rockfish coastwide. This suggests a fishery induced change in the size-age distribution of the stock. We are currently configuring the population Stock Synthesis Model (Methot, 1986) to estimate population abundance.

Rockfish Management in Puget Sound, Washington

by

Wayne A. Palsson

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Puget Sound, an extensive estuary, provides relatively calm marine waters for year round fisheries. The Washington State Department of Fisheries (WSDF) has complete jurisdiction for management, and since the early 1980s has primarily managed rockfish for recreational fishers. Copper and quillback rockfishes are the primary species caught in all fisheries in the Sound with black and brown rockfish comprising the secondary species in the catches.

Annual rockfish catches have ranged from 81 mt in the early 1970s to a peak catch of 418 mt in 1980. Since the peak, catches have declined to 128 mt in 1992. Recreational fishers have caught the majority of these rockfish in most years, but commercial catches have ranged to more than 50% of the annual harvest. Most recently, commercial catches have been about a third of the total catch.

The recent decline in catches is the result of decreased effort and an apparent decline in stock abundance. Stock assessments are limited to trends in catch rates of the recreational fishery, and these catch rates have shown long-term declines of in most statistical areas. Average sizes of copper and quillback rockfishes have shown a corresponding decrease from the mid-1970s to the early 1990s.

WSDF is developing a new method to assess nearshore rockfish. Using an underwater television camera and a scientific echosounder, rocky reef habitats are

being inventoried and surveyed for rockfish abundance. Preliminary results suggest the technique will provide meaningful population estimates for establishing harvest strategies.

THE NEARSHORE ROCKFISH FISHERIES IN BRITISH COLUMBIA.

Laura J. Richards and K. Lynne Yamanaka. Department of Fisheries and Oceans, Biological Sciences Branch, Marine Fish Division, Nanaimo, B. C. V9R 5K6 Canada

Devona Adams. Department of Fisheries and Oceans, Operations Branch, Groundfish Management Unit, Vancouver, B. C. V6B 5G3 Canada

Historically, nearshore rockfish were taken incidentally in other hook and line fisheries, such as salmon, halibut, lingcod and dogfish. Coastwide landings between 1956 and 1975 fluctuated little and averaged under 160 tonnes annually. In the mid-70's a handline/troll fishery for live rockfish, primarily quillback rockfish, *S. maliger*, developed in areas near Vancouver markets. As the fishery expanded, fleets moved throughout the Strait of Georgia and by the late-80's had expanded north into the central and northern portions of the B.C. coast. This fishery continues to supply a live rockfish market in Vancouver. The longline fishery has also expanded rapidly from southern areas off Vancouver Island, north to the Queen Charlotte Islands. The longline fishery targets yelloweye rockfish, *S. ruberrimus*, and supplies fresh markets in Vancouver and the U.S.. Coastwide catches of nearshore rockfish increased from about 180 tonnes in 1976 to a peak of 2200 tonnes in 1990 and 1991. The recreational rockfish catch has fluctuated from 95 to 140 tonnes in the Strait of Georgia between 1982 and 1992. Recreational catches in the other regions of the coast are unknown.

Prior to a winter closure for the Strait of Georgia in 1987, the commercial rockfish fishery was unrestricted. Closed areas, and open seasons restricted the fishery between 1988 and 1990. In 1991, area licensing and catch quotas were initiated for all regions of the coast. Limited entry licensing was implemented for the Strait of Georgia in 1992 and for all other areas in 1993. Management actions such as limited entry, time and region closures, and regional catch quotas have reduced the catch in recent years to under 1700 tonnes. The recreational catch was managed through a bag limit of 8 rockfish between 1986-93. In 1993 the limit was reduced to 5 rockfish.

The primary problems with managing these fisheries are to obtain timely and accurate information on catches for in-season quota monitoring purposes and determining stock abundance for assessment purposes. There is poor communication between the fishermen, buyers, retailers and the Department. Therefore, it is difficult to obtain timely catch information. With small regional quotas, the risk of quota overruns is high. Commercial catch trends are difficult to interpret because of fleet movements related to localized stock depletions. Sampling the commercial catch is difficult and costly. It is often impossible to collect a time series of samples from each fishing area. Fleet movements and catch trends from geo-referenced logbook records may be useful in future stock assessments.

Historical Overview of Nearshore Rockfishes of Concern in Northern and Central California

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Since the mid 1980's, concerns for adverse impacts on nearshore rockfish populations and the quality of their sport fisheries have been created by expansion of nearshore commercial hook and line fisheries. From natural history point of view, the definition of "nearshore rockfishes" would be *Sebastes spp.* that are generally limited to shallower depths (< about 40 fm or 70 m). Little biological work has been done on some of those species.

The history of rockfish fisheries in California includes significant take prior to WW II with hook and line in southern and central California. Northern California stocks (Fort Bragg north) were not heavily fished prior to WW II. After WW II newly refined otter trawl techniques proved far more efficient than hook and line and became the main gear used. Northern California stocks also began to be significantly exploited.

In 1958-61 the first comprehensive survey of sport take by species was conducted (2.2 million lb. of rockfish/year). In 1980-86 Marine Recreational Fisheries Statistics Survey estimates show a considerable increase in sport take of rockfishes (5.3 million lb./year). Average weight per rockfish decreased from 1.8 lb./fish to 1.6 lb./fish between the two surveys. All 5 shallow water species examined (blue, black, brown, gopher, olive) showed decreases in mean weight (ave 0.22 lb).

Nearshore commercial hook and line landings have risen greatly since the mid 1980's. Present landings are about 5 million pounds per year. Main gear types include hook and line, traditional longline, and longline troll (a new technique). The most of the main species taken are not shallow water species. Non-*Sebastes* species of concern due to increased take by line fisheries include lingcod, kelp greenling, and cabezon.

Management Strategies for California's Nearshore Rockfish Sport Fishery

ABSTRACT

The primary management tool for California's nearshore rockfish sport fishery is an aggregate bag limit of 15 fish per person, all of which may be of the same species. There are no seasonal restrictions or minimum size requirements.

Until January 1, 1994 zonal restrictions consisted of small, scattered areas where finfishing was prohibited. These areas are called either ecological reserves, reserves, or marine life refuges. On January 1 a legislative act created four new marine ecological reserves along the mainland coast, each with a minimum surface area of two square miles. In these reserves all uses other than scientific research and vessel transit are prohibited. It is hoped that these reserves will prove to be a valuable management alternative by protecting sexually mature individuals of heavily fished nearshore rockfish species, such as copper, vermilion, gopher, black, blue, and olive.

Recent studies using a two-person submersible in Monterey Bay indicate populations of large, sexually mature rockfishes exist in relatively inaccessible rocky habitat along submarine canyon walls. This habitat serves as ad hoc refuges which protect spawning populations of several highly desirable species, particularly greenspotted and yelloweye rockfish, and cowcod.

California's rockfish management strategies include monitoring of the recreational catch. Since 1987 samplers from the Central California Sport Fish Project (using 75% SFRA funds) have been observing catch and effort at discrete locations while on board Commercial Passenger Fishing Vessels. The federally-funded Marine Recreational Fisheries Statistics Survey monitors catch from private and rental skiffs and from shore.

Ongoing research by the Department of Fish and Game includes investigating aspects of all life history stages of many of the important species of nearshore rockfishes.

A voluntary catch-and-release program for black rockfish less than 14 inches TL will begin April 1 in the northern and central California sport fishery. This is in response to an analysis of length frequency data, primarily from the San Francisco area, indicating a trend of decreasing mean length and increasing proportion of sexually immature fish in the sampled sport catch from 1988 to 1991.

SUBMITTED BY PAUL REILLY, CDFG

CALIFORNIA'S CURRENT AND FUTURE NEARSHORE ROCKFISH MANAGEMENT STRATEGIES

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The California Department of Fish and Game's recent response to the rapid escalation in the commercial nearshore rockfish fishery has taken the form of analyses of historical data and initiation of a line-fishery monitoring program in all principal ports from Morro Bay to Crescent City. The paucity of current fishery and biological information and obstacles to data collection have placed the highest priority on the quantification of rockfish removals by species and catch locality.

The use of non-traditional or direct marketing channels, the high frequency of small landings, poor catch reporting compliance, and a skeletal monitoring program have hindered assessment of this burgeoning fishery. Nevertheless, Department staff have amassed considerable information on this complex fishery, identifying target species, depths of capture, the numerous and evolving gear types, affected user groups, and potential regulatory approaches.

The considerable challenges to both the assessment of nearshore rockfishes and, ultimately, the promulgation of appropriate fishery regulations may dictate a case history approach to management, primarily drawing upon the collective experiences of other resource agencies.

COMMERCIAL ROCKFISH FISHERIES IN SOUTHCENTRAL ALASKA

by
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ABSTRACT

State waters of southcentral Alaska are divided into the Prince William Sound, Cook Inlet, and North Gulf areas. Since 1987, commercial rockfish harvests in southcentral Alaska have ranged from 141,000 lb in 1989 to 529,000 lb in 1990. Historically, rockfish removals were poorly documented, particularly with respect to species composition, harvest location, and the retention of commercial catch as homepack. Longline gear has produced 72%, jig gear 24%, and trawl gear 4% of all rockfish harvests since 1987. In most areas, rockfish have primarily been caught incidentally in other shellfish and groundfish fisheries, particularly on longline gear. However, jig and longline fisheries targeting rockfish have also developed in the North Gulf. Although impacts from the EXXON VALDEZ Oil Spill remain unclear, rockfish were the only fish documented as having been directly killed by hydrocarbon contamination. Socio-economic impacts from the oil spill also increased rockfish fishing pressure. To improve sustainable yield from nearshore rockfish populations, management plans were adopted in 1993 to impose trip limits and provide the authority and guidelines for bycatch-only fisheries. Because of the low exvessel value of rockfish relative to other commercial species, stock assessment and the further development of management strategies in southcentral Alaska remains hampered by limited funding and a low institutional priority.

TORY O'CONNELL
ALASKA DEPARTMENT OF FISH AND GAME

Southeast Alaska's Demersal Shelf Rockfish Fishery: A Case Study

Life History: Demersal shelf rockfish (DSR) in the eastern Gulf of Alaska comprises eight species of nearshore, demersal *Sebastes*. Life history information is collected from port sampling and research surveys. Yelloweye rockfish, *S. ruberrimus*, will be used to illustrate key life history characteristics. Yelloweye rockfish occur over rocky reefs and pinnacle between 10 and 300 fathoms with the greatest density between 40 and 80 fathoms. Although aging techniques have not been validated for any DSR species, maximum age for yelloweye rockfish using break-and burn and sectioned readings of otoliths is estimated at 114 years. Von Bertalanffy parameters have been estimated and growth curves reveal an asymptote at about 30 to 35 years of age. Fifty percent sexual maturity is about 20 years of age and natural mortality estimates range between 0.016 and 0.02. *Sebastes* are either ovoviviparous or viviparous and parturition season is protracted. DSR are presumed to be non-migratory. *In-situ* tagging of yelloweye has yielded three tag recoveries, all fish were recovered on the same reef structure where tagged, the longest was at liberty 570 days.

Fishery: These fishes have been landed incidental to longline fisheries, particularly halibut, for nearly a century. A domestic longline fishery for DSR developed rapidly in Southeast Alaska during the early 1980's. The target species of this fishery is *S. ruberrimus*, the yelloweye rockfish. Sitka was the primarily port of landing until 1985 when new effort arose out of southern southeastern ports. As the fishery developed, vessels moved increasingly further from their port of landing to maintain high catch rates. This is significant because DSR are primarily delivered as a fresh, round product. Other signs of localized depletion were evident from port sampling data including declines in average length, pounds/hook, and average pounds per landing. However, it is difficult to defend reductions in harvest limits based solely on fishery performance indicators since rapid fleet turnover, fleet mobility, changes in market demand, and depth stratification of rockfish complicate these data.

Management: In 1984 the directed harvest exceeded 1 million pounds and the Alaska Department of Fish and Game (ADF&G) and the National Marine Fisheries Service (NMFS) put a 600 mt "cap" on the harvest of DSR in the Central Southeast Outside (CSEO) area adjacent to Sitka. In 1986 ADF&G was given limited management authority over the demersal shelf group in southeast Alaska east of 137° W. longitude (Southeast Outside District). ADF&G reduced the harvest in CSEO based on the five year harvest average and implemented harvest limits in the other 4 management areas in Southeast based roughly on the relationship between the harvest level in CSEO/unit habitat within the 100 fm edge and the available habitat in each of the other management units. The Southeast Outside district is managed under an annual TAC set by the NPFMC and the two internal water areas are managed for a directed fishery quota. During 1988 ADF&G met with an industry working group to determine appropriate in-season management for distribution of harvest etc. In 1989 the Board of Fisheries (BOF) adopted the industry/ADF&G suggestions for in-season management including trip limits and mandatory logbooks. At ADF&G's request the BOF also reduced the guideline harvest limits by 50% in all areas, as indications of depletion persisted. During 1990 NPFMC expanded ADF&G's management authority to include in-season management provisions, making this the first interjurisdictional groundfish fishery in Alaska. In 1992 the Southeast District was expanded west to 140° W. longitude. Also, in 1992, ADF&G provided the NPFMC with an estimate of yelloweye rockfish biomass which was based on submersible line transect surveys in two portions of the Eastern Gulf. The NPFMC accepted ADF&G's recommendation to apply the natural mortality rate for yelloweye rockfish (0.02) to the estimated yelloweye rockfish biomass to define ABC for the fishery. All other species in the complex are considered to be bycatch in the directed fishery for yelloweye rockfish. The fishery is closely monitored in-season and the TAC has never been exceeded.

APPENDIX B:

ORIGINAL QUESTIONS DEVELOPED BY THE LARGE GROUP, LATER REFINED BY THE SMALL WORKING GROUPS.

GROUP ONE

HOW DO WE TO DETERMINE THE POPULATION STATUS OF NEARSHORE ROCKFISH ?

ROCKFISH STOCK/MANAGEMENT UNITS

- How can we demonstrate rockfish stock conservation problem (key indicators)?
- Stock Structure/Dynamics?
- What is (should be) a management unit?
- What unit to manage? Stock? Species? Community?

ABUNDANCE

- How to determine stock abundance?
- How do you determine biomass levels of a multi-species complex in order to determine acceptable harvest levels?
- How to get needed info. on abundance?
- How do we obtain better stock assessment data? (taking into account difficulty and cost)
- How to collect representative samples from a species with a patchy distribution.
- How to assess stocks without customary data?
- Interpreting catch per unit effort indices?
- Declining Catch Per Unit Effort (CPUE) or mean length observed in many areas.
- Unknown status of stock condition for most (all?) rockfish species.

EXPLOITATION RATES

- What stock production models are most appropriate? (Given the assessment that is needed/available?)
- What are the preferred standards for setting exploitation rates?
- If you have a measure of abundance what should you use as a harvest rate for/to sustain a recreational sport fishery? F-35%? Other historical ratio?
- Evaluation of optimal harvest rates and strategies.
- Determination of sustained yield (cost)
- How to assign harvest guidelines when stock status is not known?
- Rockfish vulnerable to over-fishing

GROUP TWO

DETERMINATION OF MANAGEMENT HARVEST RATES OF NEARSHORE ROCKFISH

HOW TO DEVELOP GOALS FOR NEARSHORE ROCKFISH

- Single or multiple species management?
  Lump/split: Identify management units;
  Units vulnerable to management strategy as way to define groups?
  weak link management as strategy?
  market demand & consumer demand are influences?
- Should we satisfy publics and/or avoid conservation concerns (minimum catch rate measure)?
- How do we get funding (or maintain it) for management information?
- What are our goals for habitat (can habitat be used as a managment tool?)
- How to maximize economic returns?
- How to maximize social returns?
- How to determine level of acceptable risks (i.e. need population info here - biol. job here)?
- Political decision; biologist provide information for informed decisions

HOW TO DETERMINE ALLOCATION OF NEARSHORE ROCKFISH STOCKS

- Direct to user group (recreation fisheries, etc.)?
- Indirect methods (trip limits, etc.)
- What are our social, economic, political, biological goals?
- How allocation decision impacts on resource and whether it is a political, not a biological decision?
- How to get minimum data to manage present conservation concerns?
- How to measure the success of regulations; against regional goal and public satisfaction,etc.?
- How to slow harvest during monitoring stage for what, good data, etc.;
- How to Prevent the exceeding quotas?
- Managers as resource advocates, does their job include allocation-best use?
- Refuges: How to determine if they work (for future harvest or as parks/reserves?)?;
  Uses - Control areas for research?,
  reproductive reserves, to rebuild depleted populations?, opportunity for non-consumptive use?
- Conservative Management or How to prevent overharvest?

- How to develop management philosophy in absence of information?
- How to convince regulatory bodies need to reduce harvest before all information s available or problem(s) occurs?
- Data: How to get it at all?
- How to get data in timely fashion?
- How to manage users: recreational, commercial, subsistence, 'personal use', nonconsumptive?

GROUP 3

HOW TO BALANCE POPULATIONS WITH HARVEST AND MANAGEMENT

- How do we convince public and decision makers of need for more restrictive mgmt, absent scientific proof of stock decline?
- How to include public or all affected groups in management process?
- How to convince people we're doing a good job? (ourselves?)
- How to educate public about resource?
- How do we accomplish necessary restrictions?
- What organizations and individuals should be pulled into the management process?
- To what extent is species identification by the public important? (i.e., how to improve species identification, if appropriate)
- Do we need more consistent management coast wide? (would this increase credibility?)
- Is the decline of stocks is so slow and invisible that the public is unaware?
- Where do we get Adequate and stable funding.
- How do we convince agencies/industry of need for more conservative management?
- How to generate a budget adequate to meet assessment and management needs?

Who to Involve - The following is not meant to be an exhaustive listing of stakeholders; rather it is a preliminary listing to prompt agency folks to broaden their perspectives of who cares about the rockfish resources, and have a stake in the management of the resource:

- license holders
- volunteers
- school systems
- folks who have any sort of financial stake
- politicians (at all levels of government)
- harvesters
- viewers (divers, etc.)
- non-consumptive users (care that stocks exist for various reasons)
- cultural/religious users
- nonprofit environmental groups
- non-organized folks in both user and non-user 'carer' categories
- users - commercial, recreational, subsistence
- fish marketers
- end consumers (wholesalers, retailers, consumers)
- tackle/bait shops
- equipment manufacturers
- motels
- truckers
- distributors
- restaurants
- science/management peers

NEARSHORE ROCKFISH WORKSHOP ATTENDEES

Jack Tagart	Washington Department of Fish and Wildlife	Olympia, Washington
Dan Ito	National Marine Fisheries Service	Seattle, Washington
Laura Richards	Canadian Department of Fisheries and Oceans	Nanaimo, British Columbia
Bill Bechtol	Alaska Department of Fish and Game	Homer, Alaska
Devona Adams	Canadian Department of Fisheries and Oceans	Vancouver, British Columbia
Paul Reilly	California Department of Fish and Game	Monterely, California
Jim Glock	Pacific Fishery Management Council	Portland, Oregon
Barry Bracken	Alaska Department of Fish and Game	Petersburg, Alaska
Victoria O'Connell	Alaska Department of Fish and Game	Sitka, Alaska
Elaine Stewart	Oregon Department of Fish and Wildlife	Newport, Oregon
Dave Witherall	North Pacific Fishery Management Council	Anchorage, Alaska
Bill Barss	Oregon Department of Fish and Wildlife	Newport, Oregon
Lynne Yamanaka	Canadian Department of Fisheries and Oceans	Nanaimo, British Columbia
Doug Vincent-Lang	Alaska Department of Fish and Game	Anchorage, Alaska
Wayne Palsson	Washington Department of Fish and Wildlife	Olympia, Washington
Frank Henry	California Department of Fish and Game	Menlo Park, California
Verlyn Ebert	United States Fish and Wildlife Service	Fort Collins, Colorado
Bob Hasenyager	Utah Department of Natural Resources	Salt Lake City, Utah
Farron Wallace	Washington Department of Fish and Wildlife	Montesanto, Washington
Doug Albin	California Department of Fish and Game	Fort Bragg, California
Stephen Phillips	Pacific States Marine Fisheries Commission	Gladstone, Oregon
Dwight Guynn	Montana Department of Wildlife and Parks	Helena, Montana
Larry Six	Pacific Fishery Management Council	Portland, Oregon