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California Department of Fish and Game Agency Report to the Technical Subcommittee of the Canada-United States Groundfish Committee

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A. AGENCY OVERVIEW

During 2001, CDFG continued the process of implementing the Marine Life Management Act of 1998 (MLMA; AB 1241, Keeley), which greatly affects the way that marine fisheries will be managed in the state. The MLMA has provisions that affect nearshore fisheries management, and also change the way that future regulations will be developed. The intent is to move regulatory authority for marine fisheries from the state legislature to the California Fish and Game Commission, where management will be accomplished through the adoption of FMP's for state regulated fisheries. Considerable progress was made on the draft nearshore finfish FMP, which is expected to be adopted by the California Fish and Game Commission during 2002.

1. 2001/02 State Management Measures Affecting Groundfish

In order to achieve the lower catches necessary to rebuild lingcod, cowcod, bocaccio, and canary rockfish, several new regulations were imposed on the recreational fishery for 2002, and a number of other recent restrictions were continued:

- Four-month season closures are imposed during Jan-Feb and Nov-Dec for lingcod and rockfish, in waters south of Point Conception.
- Between Point Conception and Cape Mendocino, fishing for shelf rockfish and lingcod is only permitted during Jan-Feb and Jul-Aug.
- Between Point Conception and Cape Mendocino, fishing for nearshore rockfish is only permitted during Jan-Feb and May-Oct.
- The overall combined rockfish daily bag limit remains at 10 fish.
- The lingcod minimum size limit is reduced to 24 inches.
- Within the overall rockfish bag limit, only 2 fish may be bocaccio, and 1 may be canary.
- A minimum size of 10 inches is continued for bocaccio.
- Retention of cowcod is prohibited.
- No more than one line and 2 hooks may be used when fishing for rockfish and lingcod.

Contributed by Tom Barnes (858.546.7167)

2. Nearshore Management

<u>Draft Nearshore Fishery Management Plan</u>

Ninteen nearshore finfish species will be managed under the Nearshore Fishery Management Plan (NFMP), based on a framework management approach that gives the California Fish and Game Commission (Commission) a comprehensive management strategy to prevent overfishing, rebuild depressed stocks, ensure conservation, promote habitat protection and provide for non-consumptive use. Species included under the plan are:

Cabezon	*Scorpaenichthys marmoratus*
California scorpionfish	*Scorpaena guttata*
California sheephead.....	*Semicossyphus pulcher*
Monkeyface prickleback	*Cebidichthys violaceus*
Greenlings	
Kelp greenling.....	*Hexagrammos decagrammus*
Rock greenling	*Hexagrammos superciliosus*
Rockfishes	
Black.....	*Sebastes melanops*
Black-and-yellow	*Sebastes chrysomelas*
Blue	*Sebastes mystinus*
Brown	*Sebastes auriculatus*
Calico.....	*Sebastes dalli*
China	*Sebastes nebulosus*
Copper.....	*Sebastes caurinus*
Gopher.....	*Sebastes carnatus*
Grass.....	*Sebastes rastrelliger*
Kelp	*Sebastes atrovirens*
Olive	*Sebastes serranoides*
Quillback.....	*Sebastes maliger*
Treefish	*Sebastes serriceps*

The Commission granted an 8 month extension for the adoption of the newly drafted NFMP, with a revised adoption date of August 2002. The Commission granted the extension for the Department to review the extensive public and peer review comments that were received on the 2001 draft. Several substantial improvements have been made to the 2002 revision of the NFMP draft, including a substantive revision of control rules, reorganizing the format, and improving the readability of the document. Section 1 of the NFMP presents the Department's proposed management strategy. Section 2 includes the environmental analysis required by the Regulation Procedures described in Title 14 Section 781.5, including a review of alternatives and options. Section 3 includes draft regulations that would implement the Department's proposed management strategy.

The Recommended NFMP Management Project presented in Section 1 is an integration of 5 management measures that together, over time, meet the goals and objectives of the Marine Life Management Act (MLMA) and provide sustainability for the nearshore fisheries and ecosystem. The five measures are:

- Fishery Control Rule (FCR): the primary mechanism for achieving sustainable use and preventing overfishing. The FCR formula sets the Total Allowable Catch (TAC) for each species or species group under various stages of fishery information;

- Regional Management: the establishment of 3 management zones along the California coast to allow for localized fishery planning and policy;

- Resource Allocation: the fair and equitable distribution of resources between recreational and commercial fishing sectors within each of the management zones;

- Marine Protected Areas: the inclusion of reserves, conservation areas and parks within the nearshore ecosystem under the process of the MLPA;

- Restricted Access: the reduction of the commercial fishery fleet to match available marine resources.

The 2002 revisions to the NFMP provides the framework in which the Commission can build specific, localized, management measures that respond to changes in knowledge about the nearshore ecosystem without the need to amend the plan.

Contributed by Nancy Wright (831.649.2093)

Restricted Access for Nearshore Fisheries

Considerable progress was made on developing options for proceeding with restricted access for the nearshore fishery. The following options were included in the first draft of the NFMP:

•Status Quo - commercial permit moratorium, no recreational restrictions
•Commercial Restricted Access Program for 10 California nearshore species.
Preferred option: Individual Fishing Shares (IFS) Program (similar to Individual Transferable Quota (ITQ) programs)
Option 1. Basic limited entry
Option 2. Basic tier system
•Limiting net and trawl fisheries to bycatch status
•Commercial Passenger Fishing Vessel (CPFV) control date - first step in restricting the number of CPFVs
•Nearshore Recreational Permit - non-restrictive, used to track participation

Limiting the number of CPFVs may be unnecessary because their numbers have been declining. Further permit requirements for the recreational fishery could remove the opportunity to fish for some participants. Consequently, status quo was recommended for the recreational fishery at this time.

For the commercial fishery, status quo was not a practical option. The fishery is significantly overcapitalized and in 2001 the cabezon, sheephead and greenling fisheries each closed before the end of the year, even though there were monthly closures and only three days of fishing per week. While some fishermen favored an IFS program, many were skeptical about how it would work in this fishery. Additionally, concerns over the Federal moratorium on ITQ programs

coupled with the Federal management authority for the nearshore rockfish species led to revising the preferred option. In the future, the Department would like to adopt an IFS program, however, basic limited entry or a basic tier system is what can be implemented at this time. Most stakeholders agreed that since net and trawl vessels, with few exceptions, can only fish outside three miles, their catch of nearshore species was not targeted and should be restricted to bycatch.

Considerable efforts were devoted to developing the new options (basic limited entry, basic tier system) and talking with small groups of active nearshore fishermen in nine California ports. Fleet profiles for each area were used as background information in soliciting stakeholder recommendations for limiting participation in this fishery. In central and southern California, the most common qualifying criteria mentioned was three years participation with 500 pounds of nearshore landings between 1994 and 1999. Criteria varied in northern California because the fishery has developed there more recently and catch is often limited by weather. Based on the results of these meetings, different options for qualifying criteria and capacity goals were developed by the Department.

Plans for 2002 include a series of public meetings to receive feedback on the different nearshore restricted access options that have been developed by the Department. Based on the outcome of these meetings, the restricted access options will be finalized. The intent is to have the nearshore restricted access program implemented at the beginning of the 2003-2004 fishing season.

Contributed by Traci Bishop (805.568.1323)

Cooperative Research and Assessment of Nearshore Ecosystems (CRANE)

In 2001, Fish and Game and more than 15 universities and governmental agencies began to plan a cooperative sampling effort that will provide information for managing California's nearshore rocky reef fish and invertebrate populations as well as information that can be used to evaluate rocky reef ecosystems as a whole. Specifically, the objectives of the sampling are: 1) to estimate the density of nearshore fish and invertebrates that are subject to fisheries, 2) to measure the size structure of these populations, and 3) to measure habitat and ecosystem components that can be associated with changes in density and size distributions over space and time.

It is expected that the final sampling design, including a training plan, will be completed in June 2002. Training and technique validation will be completed in the fall of 2002 with the full-scale survey to follow in the fall of 2003. Using existing resources, we are planning to sample approximately 90 stations from Oregon to the Mexican border. Divers will survey transects from 6 m to safe diver depths (to be determined, but between 20 and 30 m). We are also working on techniques for measuring size and density of fish and invertebrates with ROV's. If the techniques are validated, a subset of the sites sampled by divers would the surveyed to a depth of 100 m.

Contributed by Mary Bergen

3. Marine Protected Areas

The Marine Life Protection Act

The Marine Life Protection Act (MLPA) requires the California Department of Fish and Game (Department) to develop a master plan for Marine Protected Areas (MPAs) in California. This plan must include information on specific site recommendations, implementation and phasing, funding, monitoring, enforcement and management. The MLPA contains specific goals for MPAs including, but not limited to, ecosystem protection, representing habitats, helping sustain populations, improving the existing array of MPAs, and ensuring that the new system functions, to the extent possible, as a network.

In late June 2001, the Department introduced Initial Draft Concepts for MPAs to meet the MLPA goals and requirements. These Concepts were developed with the assistance of a Planning Team as required by the MLPA. While some public input was acquired prior to the release of the Concepts, they were intended as a starting point to gather more public input and develop the final master plan. Ten public workshops were held in July 2001 to begin this public input process.

One of the most frequent and important comments given at these meetings was that the Department had not effectively involved the public in early planning, and that future drafts needed to have significant levels of constituent input. In an effort to address these concerns, the Department held informal small group meetings with various constituent groups in the fall, and will hold a series of facilitated constituent workshops in 2002. The small group meetings were used to inform constituents of the MLPA process and time line, gather information on general concerns, and discuss potential processes to complete the MLPA master plan, as well as specific alternatives for MPA siting.

Summaries of the July meetings and small group meetings can be found on the Department's MLPA Web site and as hard copies at Department offices. The Web site will be used as one way to keep people involved and informed as the MLPA process continues. Updates will be provided, as well as various siting alternatives, as they are developed.

The MLPA Web site address is: www.dfg.ca.gov/mrd/mlpa/index.html

As the next step, the Department will launch a series of facilitated constituent workshops. These workshops will provide a more formal forum for constituent input. The Department plans to establish one or two groups in each of four planning regions, with representatives from recreational and commercial fishing, diving, environmental, and ecotourism interests, harbor districts, scientists, and research/education and military organizations.

The Department and Planning Team have reviewed the tremendous number of comments received through the July public workshops, small group meetings, e-mails, faxes, letters, and phone calls. Using this input, the Department will launch a stepwise process to develop the

MLPA master plan. The process seeks to directly involve a broad range of constituents in the planning of preferred and alternative sites, as well as developing implementation, phasing, monitoring, and management strategies. The starting point will be to review the overall goals, objectives, and intent of the MLPA, and then ask constituents to develop new options for MPA siting. The key points of this process and the steps for completing the draft master plan are as follows:

- The Major Issues
  The single most common concern from all parties is the overall scope of the MPA network. The other major issues expressed include: clarifying the legal mandates and requirements of the MLPA, proximity of MPAs to ports or major access points, the relative need for protection in various regions, the current levels of use in particular areas, the scientific value of MPAs, and safety concerns including transit and anchoring issues. These and other issues will be discussed at the workshops.

- A Stepwise Process
  In order to adequately address constituent concerns, allow for detailed discussion, and fulfill the requirements of the MLPA, a stepwise process will be used. This approach will ask for input on specific portions of the MLPA master plan. Through facilitated regional workshops, the goals of MLPA will be reviewed, and alternatives for MPA sites will be developed from the ground up.

  Contributed by John Ugoretz (805.560.6758)

Channel Islands Marine Protected Areas

In 1998, the California Fish and Game Commission (Commission) received a recommendation to create marine reserves, or no-take zones, around the northern Channel Islands. This recommendation suggested closing 20% of the shoreline outward to 1 nautical mile to all fishing. The recommendation led to nearly one year of public discussion of the issue in the Commission forum. In response to the proposal and the need for an open constituent based process, the Channel Islands National Marine Sanctuary (Sanctuary) and the California Department of Fish and Game (Department) developed a joint federal and state partnership to consider the establishment of marine reserves in the Sanctuary. The Commission endorsed this process at its March 4, 1999 meeting.

The Channel Islands National Marine Sanctuary Advisory Council (SAC), an advisory body to the Sanctuary Manager, created a stakeholder based community group called the Marine Reserves Working Group (MRWG) in July, 1999. This constituent panel was comprised of 17 members representing State and federal agencies, conservation interests, consumptive recreational and commercial groups, the public at large, and the California Sea Grant program. The MRWG met 24 times between July 1999 and June 2001 to discuss issues surrounding the potential establishment of new MPAs and try to come to consensus on a recommendation on

marine reserves at the Channel Islands.

While the MRWG did not reach consensus on a specific recommendation for the spatial placement of Marine Protected Areas, they did agree on a mission statement, problem statement, goals and objectives. The MRWG's goals stated the following:

> Ecosystem Biodiversity Goal: To protect representative and unique marine habitats, ecological processes, and populations of interest.
>
> Socio-Economic Goal: To maintain long-term socioeconomic viability while minimizing short-term socioeconomic losses to all users and dependent parties.
>
> Sustainable Fisheries Goal: To achieve sustainable fisheries by integrating marine reserves into fisheries management.
>
> Natural and Cultural Heritage Goal: To maintain areas for visitor, spiritual, and recreational opportunities which include cultural and ecological features and their associated values.
>
> Education Goal: To foster stewardship of the marine environment by providing educational opportunities to increase awareness and encourage responsible use of resources.

The information and recommendations developed in the MRWG process led to a Department recommendation for MPAs in the region. This recommendation, along with a range of alternatives, was presented to the Commission in August 2002. The Commission requested that the Department develop proposed regulations for the range of alternatives and an environmental document describing the potential impacts of each. The alternatives range from about 12% of State waters within the Sanctuary to more than 30% of State waters within the Sanctuary. A no-project alternative (which would leave the existing regulations in place) and an alternative to defer decision to the MLPA process are also included.

As a part of the regulatory process the Department is also preparing a Draft Environmental Document (DED) to meet California Environmental Quality Act (CEQA) requirements. This document details the potential environmental impacts of each MPA alternative. The DED includes information on potential impacts to both the natural environment and the human environment in the Channel Islands area. The human environment includes potential socioeconomic impacts to both consumptive and non-consumptive user groups. The DED will be available for written public comment and review for a period of 45 days once it is submitted to the Commission. The Commission is not expected to make a decision on the matter before their August 2 meeting in San Luis Obispo.

More information on the Channel Islands MPA process, including descriptions and maps of the

MPA alternatives is available on the Department web site:
www.dfg.ca.gov/mrd/channel_islands/index.html

Contributed by John Ugoretz (805.560.6758)

B. 2001 CALIFORNIA FISHERY REVIEW

The California commercial groundfish harvest for 2001 was 11,862 metric tons (Table 1). Total 2001 landings decreased 28%, or 4,500 metric tons from 2000, and compared to1991, have decreased 67% or 23,973 metric tons. However, if Pacific whiting landings are removed from 1991, 2000 and 2001 total groundfish landings, then the total harvest of the remaining groundfish actually show a 16% decline from 2000 and a 59% decline from 1991. The ex-vessel value for all groundfish in 2001 was approximately $16.2 million, a decrease of $4.0 million or 20 % from 2000 revenues.

In 2001, 86% of the groundfish landed was taken by bottom and mid-water trawl gear, a slight decrease from the 89% observed in 2000. Line gear accounted for the second largest amount at 11%, a slight increase from 9% observed in 2000. The line gear contribution was at a recent high of 18% in 1992. The gill and trammel net component remained at just under 1% after a steady decline from 5% in 1993 to 1 % in 1996. Trap gear rose to nearly 2% of total 2001 groundfish landings.

California's 2001 groundfish harvest was again dominated by Dover sole, thornyheads, sablefish , rockfish and Pacific whiting. Landings of the DTS complex, (Dover sole, thornyheads and sablefish), and most rockfish experienced a substantial decline, while lingcod and flatfish, other than Dover sole, were relatively stable. The declines, reflect more restrictive landing limitations adopted by Pacific Fishery Management Council in November 2000 which were designed to reduce the harvest of depleted stocks which now include widow and darkblotched rockfish. Shore-side landings of Pacific whiting declined because of a reduced availability in the Eureka - Crescent City area during spring and early summer.

Contributed by Dave Thomas (510.581.7358).

C. MULTISPECIES STUDIES

1. Central California Refugia Study

Reserve Studies

The ability to quantify fish densities within and outside of marine reserves is pivotal to determining the effectiveness of marine reserves as a management tool. For the last 7 years our project's research activities have been focused on the assessment of densities of sport fish

populations and their habitat associations within and adjacent to marine protected areas. Since both fishery-independent and fishery-dependent data are crucial in the evaluation of the reserve as a fishery management tool, we collected data from *in situ* surveys of fish populations (scuba surveys) within the recently established Big Creek Ecological Reserve (BCER) and Point Lobos Ecological Reserve (PLER), which was established in 1973, and adjacent areas. We also monitored the landings of commercial and recreational fisheries targeting fishes in the vicinity of BCER.

Permanent stations within, north and south of BCER were established to eliminate the variability due to habitat during sampling over years. Our analysis shows that densities of all fish were significantly different among the three areas, when differences due to surge values were removed, and that density of fish within BCER was higher than the numbers north or south of BCER. We also examined densities of all fish observed during random transects conducted within and adjacent to BCER. Randomly collected data is more representative of the surveyed areas and essential for statistical inference; however, it is more variable than data from permanent stations. Significant differences among years and areas were noted for randomly collected data. Few consistent differences were noted in the species densities or stage of sexual maturation among areas or among years within each area in the Big Creek study area. We found significantly higher densities of fish within PLER compared BCER and to Monolobo, an adjacent fished area.

A high percentage of 1998-99 Big Sur commercial skiff fishery landings were composed of cabezon and black-and-yellow and gopher rockfishes. This study documented that 4.5 times more trips, which departed from San Simeon, San Luis Obispo County, were made to the Cape San Martin region as were made to the Point Sur region. Most species taken in the Point Sur region were larger than those taken in the Cape San Martin region; however, there was not a significant difference in the CPUE between the two areas.

Contributed by David VenTresca (831.649.2881).

2. Nearshore Reef Fish Tagging Project (Northern California)

Between 1995 and 1998, our catch, tag and release program headquartered in Fort Bragg captured 12,293 fish, of which 11,275 were tagged and released. A reward program was established to entice fishers to bring in tagged fish, offering rewards worth up to $1000. Currently, the percentage of fish tags returned ranges from 1% to 7%, dependent on species. Analysis of this still-growing volume of data is currently under way. Preliminary results from tag returns suggest a high degree of residentiality (staying close to a ‘home’ territory) for gopher rockfish, china rockfish, black-and-yellow rockfish, kelp greenling and cabezon. Long-distance movement has been documented for black rockfish, yellowtail rockfish, canary rockfish (northward), vermilion rockfish (southward) and lingcod (north and south, as well as nearshore-offshore). Results also indicate that rockfish survive over the long term after having their swim bladders punctured. Puncturing rockfish swim bladders relieves overinflation, which occurs

when the are brought rapidly to the surface. Additional studies are needed to isolate tagging, hooking, and other causes of mortality for all species of concern, and to determine degree-of-movement for species such as cabezon, black rockfish and gopher rockfish.

Contributed by Kon Karpov (707.964.7298)

3. Punta Gorda Resource Inventory

A quantitative inventory of habitat and species of management concern at Punta Gorda Ecological Reserve was completed with results presented at the CalCOFI conference. Sea Grant is currently preparing a publication of the study results. ROV, SCUBA, and side-scan sonar mapping were combined in this GIS based study. In addition a red abalone DNA study was also completed as part of this work.

During August of 2001 a ROV research cruise was completed on the RV Mako over areas that had previously been mapped using multi-beam sonar. We completed approximately 29 km of habitat ROV transect. The following key results were obtained:

- We completed 600 meters of diver and ROV transects at two locations off Monterey.
    1. We determined that fixed transects more appropriate for future comparisons.

- We completed over 29 km of ROV transect covering most of the targeted locations.
    1. We improved precision of ROV tracking and navigation.
    2. We added a vertical camera that allowed improved finfish and concurrent invertebrate and counts and sizes.

Contributed by Kon Karpov (707.964.7298)

4. Fishery Monitoring

Statistical and biological data from landings are continually collected and routinely analyzed by CDFG to provide current information on groundfish fisheries and the status of the stocks. Outside funding also enables California fishery data to be routinely incorporated into regional databases such as PacFIN, RecFIN and MRFSS.

Contact Dave Thomas for more information (510.581.7358).

<u>In-season Monitoring</u>

The California Fish and Game Commission (Commission) and the Department of Fish and Game (Department) have the authority to manage nearshore species as defined by the Marine Life Management Act and the Nearshore Fisheries Management Act. Four of those species are cabezon, California sheephead, and kelp and rock greenling. Within the scope of management

methods, annual optimum yields (OY) were established by the Commission in December 2000 for these species with separate allocation limits for the recreation and commercial sectors. In the summer and fall of 2001, the Commission had to exercise its emergency regulatory powers to close the commercial nearshore fisheries for these species when the OYs were expected to be reached and possibly exceeded. Emergency action was necessary because neither the OY nor the mechanism for closing the fisheries in the event an allocation was reached was established in regulation. Furthermore, due to the time lag of reported landings entering the computerized system and the necessary time it took to carry out the emergency closure procedures, these OYs were exceeded. To prevent this from happening again and to improve the in-season monitoring of these fisheries, the Commission gave authority to the Department to take action as a routine management measure to close either or both recreational and commercial sectors of the cabezon, California sheephead, and greenling fisheries upon projected attainment of the established OYs and fishery allocations. This action took place in April 2002.

Department personnel were assigned the task of in-season monitoring of these fisheries and to develop methodologies to project when the allocation limits of the OYs would be attained.

Contributed by Bob Leos (831.649.2889).

5. Ageing Work

Age Validation studies on Nearshore rockfish *Sebastes mystinus* (blue), *Sebastes melanops* (black), *Semicossyphus pulchrum* was started late summer of 2001at the CDFG's ageing laboratory in Monterey. Daily growth ring and annular growth ring validation studies are presently being conducted with marked fish. Daily growth ring validation studies on *S.mystinus* and *S.melanops* will be completed by August 2002. These studies are conducted in collaboration with Stanford University's 'Hopkins Marine Station' in Pacific Grove, 'Monterey Bay Aquarium' and the 'Aquarium of the Bay' in San Francisco.

The laboratory is also conducting production ageing of *Clupea harengus pallasi* (herring).

Contributed by George Isaac (831.649.2813).

6. *Prawn Trawl Bycatch*

<u>Spot Prawn Observer Program</u>

From July 2000 through March 2001 the Department of Fish and Game required payment of an observer fee for all commercial fishing vessels landing spot prawns. The observer fee was $250 for each trap vessel and either $250, $500, or $1,000 for each trawl vessel, based on recent landings The purpose of the fee was to provide funds to place observers on board spot prawn trap

and trawl vessels to document the relative amount and types of bycatch, with primary focus on fishes. Although 28 trawl vessels and 27 trap vessels paid the fee, not all of those vessels fished for spot prawns during the period. Among those that did fish, only some had observers onboard. Samplers were able to obtain passage on 9 trawl vessels and 17 trap vessels and observed a total of 85 trawl tows and 262 trap strings. In general trawl tows showed a substantially higher ratio of total weight of bycatch to total weight of spot prawns compared with trap strings, primarily due to the occurrence of fish species. Although ratio of weight of invertebrates other than spot prawns to spot prawns was only slightly lower in observed traps compared with observed trawl tows, most invertebrates in traps arrived at the surface alive while most observed in trawl tows were dead.

Primary bycatch species of fishes by weight observed in trawl tows from vessels originating north of Point Conception were Pacific hake, Dover sole, sablefish (many alive when observed), English sole, and splitnose rockfish. For trawl vessels fishing from ports south of Point Conception, the primary bycatch fish species were Pacific sanddab, Pacific hake, slender sole, shortbelly rockfish, and Dover sole. For northern and southern trawl vessels, rockfishes comprised 25% and 9%, respectively, by weight of the total fish bycatch.

Primary bycatch species of fishes by weight observed in trap strings from vessels originating north of Point Conception were sablefish (most were alive when observed), rosethorn rockfish, greenblotched rockfish group, spotted cusk eel (some alive when observed), and filetail catshark (all alive when observed). For trap vessels fishing from ports south of Point Conception, the primary bycatch fish species were lingcod (most were alive when observed), greenblotched rockfish group, threadfin sculpin (most were alive when observed), sablefish (all alive when observed), and swell shark (all alive when observed). For northern and southern trap vessels, rockfishes comprised 25% and 32%, respectively, by weight of the total fish bycatch.

Data are currently being analysis and a summary report will be provided to the California Fish and Game Commission and the public.

Contributed by Paul Reilly (831.649.2879).

D. BY SPECIES

1. Shoreside Whiting

General Season

California shore-based landings of Pacific whiting (Merluccius productus) totaled 2,305 metric tons (MT) in 2001, 3.2% of the 71,093 MT US shore-based total, and 67 % of the 3,421 MT California allotment. Landings in 2001 represented a 54% decrease from the 4,984 metric tons

landed in 2000.

Five vessels targeted Pacific whiting during the 2001 primary season. The early California season started April 1, 2001 from 40° 30' N. lat to 42° 00' N. lat. with the first deliveries on April 1, 2001. For the balance of California the season opened April 15, 2001. The general coastwide (Washington, Oregon and California) season started June 15, 2001 and ended September 26. The last California landings occurred on July 2, 2001.

EFP Fishery

Five midwater trawlers landed 2,297 MT of unsorted whiting to three designated processing plants during 2001. The trawlers fished under the provisions of an exempted fishing permit (EFP), allowing them to land unsorted whiting catches at designated processing plants without penalty for taking prohibited species or exceeding trip limits. The EFP implements a cooperative state/federal/industry program to monitor and quantify the bycatch of salmon and groundfish in the shore-based Pacific whiting fishery.

Fishery technicians observed five of 48 EFP deliveries (a 10.4% observation rate). The observed landings included 281 MT of whiting, 2.5 MT of groundfish, and 11 Chinook salmon weighing 209 pounds. The bycatch rate for the observed EFP deliveries was .04 salmon/MT, and 20 pounds groundfish per metric ton of whiting.

The total bycatch for all EFP whiting vessels weighed 17.7 MT. The bycatch included 111 Chinook and 1 Pink salmon (910 pounds total) for a harvest rate of .05 salmon/MT. The bycatch of rockfish amounted to 17.2 MT (37,854 lbs) with a harvest rate of 16.5 lbs rockfish per metric ton of whiting. The rockfish bycatch included Widow rockfish (9.1 MT), Darkblotched rockfish (3.1 MT), Chilipepper rockfish (1.0 MT), Splitnose rockfish (0.9 MT), Shortbelly rockfish (0.5 MT), miscellaneous slope rockfish (2.57 MT), and seven pounds of Canary rockfish. The combined bycatch of other fish, including spiny dogfish, Pacific mackerel, and sablefish, weighed 20 pounds. The EFP whiting vessels caught 224 pounds of miscellaneous squid. One Pacific halibut, weighing 8 pounds, was landed as bycatch. It was the second Pacific halibut landed in California since the inception of the observation program in 1992.

Contributed by Patrick Collier (707. 441.5755).

E. GEOGRAPHIC INFORMATION SYSTEM (GIS) APPLICATIONS

The California Department of Fish and Game has marine GIS data of varying resolution, scales and quality. Spatial ranges of the data include coastal out to 200 miles offshore. Types of data include bathymetric, biological, hydrological, oceanographic, topological features and administrative boundaries. Two hundred meter resolution bathymetry is available from the nearshore out to 200 miles, and 1-meter resolution multibeam bathymetry is available for select

portions of the coast. From these remotely-sensed data, contours, hillshade and slope may be derived. Biological data include 1989 and 1999 kelp surveys and coastal spatial representation of catch by weight and corresponding market price of 19 federally managed nearshore fish species and several species of invertebrates. Main rivers, lakes and watersheds are also available, showing major sources and locations of coastal runoff. Oceanographic data include submarine features, generalized locations of coastal upwelling and sea surface temperature. Coastal points, rocks, coastline and several other topological datasets are frequently used. Management area data sets showing existing marine protected areas restricted fishing areas, administrative fishing blocks and district, county, statewater and kelp administrative boundaries. Reference maps are also helpful in our analysis and geographic representations. NOAA maps, digital raster graphics and aerial photos of the whole state can be used as georeferencing points.

With these and other data, we have been able to produce analyses, trends and general references to aid biologists and managers in their sampling design and management decisions.

Marine Region GIS has been instrumental in the experimental design of a rockfish survey project in southern Monterey Bay. Transects are selected on specific submarine features imaged from remotely sensed bathymetry data. Established navigation points are used in the field and are hit by divers with excellent accuracy. The acquired transect data can then be correlated to rugosity and other oceanographic parameters.

Other analyses include the correlation of nearshore fish market catch to fishing block and time, which has shown resource managers where the “hot-spots” are. New marine protected areas are currently being drafted and revised with the assistance of reference maps and analyses from this lab. The lab has also created sport fishing pamphlets distributed by the thousands throughout the state, showing fishing restrictions spatially and temporally with a map and a matrix, which is more “user-friendly” format than pages of text. Maps have been produced for DFG publications as well as references for the general public and employees within the department.

Nancy Wright and the Marine Region GIS lab have also initiated interdepartmental and interagency cooperation. The Marine Mapping Users Group (MMUG) was established in 2000 in order to facilitate communication and exchange of data and ideas between educational, state and federal organizations involved in GIS on the west coast. Meetings are held regularly to discuss these ideas, and a guest speaker is invited as well to present the latest in research and technology relating to GIS and/or remote sensing. Current members include the California Coastal Commission, California Coastal Conservancy, Southern California Coastal Water Research Project, Channel Islands National Marine Sanctuary, National Oceanic and Atmospheric Administration, Monterey Bay National Marine Sanctuary, SIMON, United States Geological Society, National Marine Fisheries Service, Naval Facilities Engineering Service Center, University of California, Santa Cruz, California State University, Monterey Bay, Moss Landing Marine Laboratories, University of California, Santa Barbara, Oregon State University, Boston University, Woods Hole, University of California, Davis, Bodega Bay Marine Laboratories, Monterey Peninsula College, University of California, San Diego,

California State University, Monterey Bay, Ocean Imaging, Inc., Tahoe Maps, Inc. and Environmental Systems Research Institute, Inc.

Much of the latest software and hardware is available to the GIS analysts in the lab. Computer processing power is more than adequate, and we are running the latest ArcGIS 8.1 software from ESRI, complete with most of the analytical extensions. Other GIS software in the lab includes ERDAS Imagine and TNT Mips. We have extensive graphics software to aid in map and data presentation. A plotter is in-house for printing large maps.

Contributed by Chad King (831.649.7143)

F. ONGOING AND FUTURE RESEARCH AND ASSESSMENT ACTIVITIES

Collaborative Cowcod Survey

CDFG has planned three collaborative ROV survey crusies during 2002 with John Butler, NMFS, La Jolla. The cruises will take place during June 3-10, September 19-October 3, and during the first half of November. The research platforms will be the CDFG research vessel *Mako*, and a chartered CPFV vessel *Outer Limits*.

This project will provide baseline inventory data for use in monitoring the recovery of cowcod and bocaccio. The data will be collected in coordination with a three-year study that was initiated by in 2001 by NMFS and CDFG. The additional transects that are surveyed as a result of this project will increase the precision of the findings from the ongoing study.

In addition, in the 2000-2002 Research and Data Needs, the PFMC specifically called for "increased monitoring of marine reserves and other areas of restricted fishing in order to gain information on current reserves that might be extrapolated to evaluate the creation of additional reserves on the West Coast." Results from this study are anticipated to be applicable to other species and other areas.

The surveys will be conducted using a habitat based block design where the number of transects will be higher in blocks with the most suitable habitat for cowcod. We shall use the NMFS Phantom ROV which is equipped with paired lasers to measure distance covered and fish size , and with software to provide exact GPS positioning of ROV transects and sited individuals. All species of rockfishes will be identified and measured using a laser calibrated field of view. Video cameras mounted on the ROV will record all transect observations on high-resolution videotape for post-cruise analysis. The primary use of these ROV surveys is to provide non-destructive information on the size composition of the cowcod, and an estimate of the minimum number of cowcod and other species in the CAA. Size composition is important for interpreting the state of the recovery since it is a proxy for potential reproductive output. The surveys will be carried out systematically so they could also provide an imprecise index of adult abundance.

All finfish will be identified in the videotapes and habitat associations will be recorded. Size composition will be determined from parallel lasers. Using track logs from the GPS software, the area searched will be determined. The exact locality of target species will be recorded. All information will be entered into electronic databases, and the data will be edited for errors. Key sites identified during a 2001 NMFS/CDFG cruise will be revisited to determine site fidelity of target species.

Contributed by Tom Barnes (858.546.7167)

Table 1.
California 2001 Commercial Groundfish Landings (Metric Tons)

	2001	2000	% Change From 2000	1991	%Change From1991

FLATFISH	4,559	5,259	-13	10,766	-58
Dover sole	2,399	3,267	-27	7,721	-69
English sole	419	299	40	812	-48
Petrale sole	555	628	-12	734	-24
Rex sole	235	223	5	621	-62
Sanddabs	788	727	8	559	41
Other flatfish	163	115	42	319	-49
ROCKFISH	2,401	3,238	-26	13,830	-83
Thornyheads	847	1,240	-32	2,871	-71
Widow rockfish	332	705	-53	1,304	-75
Chillipepper	343	444	-23	3,116	-89
Bocaccio	23	27	-15	1,314	-98
Canary	9	13	-31	271	-97
Darkblotched	71	99	-28	341	-79
Splitnose rockfish	95	78	22	488	-80
Other rockfish	681	632	8	4,125	-84
ROUNDFISH	4,198	7,232	-42	11,111	-62
Lingcod	62	54	15	787	-92
Sablefish	1,547	1,859	-17	3,353	-54
Pacific whiting	2,306	4,986	-54	6,893	-67
Grenadier	211	221	-5	71	197
Cabezon	72	112	-36	7	929
OTHER GROUNDFISH	704	633	11	128	450
TOTAL	11,862	16,362	-28	35,835	-67