


MEMORANDUM

TO: Council, SSC and AP Members
FROM: Clarence G. Pautzke 
Executive Director
DATE: January 5, 1994
SUBJECT: Full Utilization

ESTIMATED TIME 2 HOURS

ACTION REQUIRED

Give staff direction on further work on this issue.

BACKGROUND

Under this tab are the materials on full utilization and discard developed for the Council's September meeting. We did not have time to discuss it then or at the December meeting in Seattle. The only items I have added are a set of tables of 1992 (D-2(b)(1)) and 1993 (D-2(b)(2)) discards provided by NMFS at the meeting with industry during the December Council meeting week, and a copy of the Senate bill (D-2(b)(3)) submitted by Senator Murkowski concerning bycatch and waste. I understand that additional amendments to the Magnuson Act may be offered as well in the near future. When we take up this issue this week, I will provide a synopsis of the industry meeting in December.

Basically, we are at the same point as we were last September, attempting to determine how far and fast to move on addressing full utilization. The following materials provide background information on the policy environment for this issue, estimations of discards, and several proposed alternatives. The staff needs direction on what to do next on this issue.

Item D-2(b)(4) is a proposal from the Alaska Marine Conservation Council to grant harvest priorities to those fishermen that minimize bycatch.

MEMORANDUM

TO: Council, SSC and AP Members

FROM: Clarence G. Pautzke
Executive Director

DATE: September 17, 1993

SUBJECT: Full Utilization

ESTIMATED TIME
2 HOURS

ACTION REQUIRED

Discuss full utilization and discard and give staff direction on further work on this issue.

BACKGROUND

In June during Council consideration of Pacific cod allocations by gear type, a motion was made to adopt an Advisory Panel recommendation that stated:

"Prohibit the discard of cod in all BSAI groundfish fisheries including cod taken in the directed cod fisheries and cod taken as bycatch in other fisheries. Prohibit the discard of all groundfish species harvested by any gear type in the directed BSAI cod fisheries, excepting arrowtooth flounder, squid, and species in the "other species" category."

During discussion, the motion was expanded to include all groundfish fisheries in all areas. The Council requested a discussion paper for September to help in defining goals and alternatives. This action was timely on the part of the Council and its AP because bycatch, discard, waste, and full utilization have become watchwords of the 1990s and a rallying point for many interest groups concerned with the health and long term well-being of the ocean ecosystems. Waste and full utilization helped shape the pollock roe-stripping dispute that began with foreign joint ventures in the mid-1980s and continued through to the ban in 1990. Bleeding of excessively large tows also has been an issue off and on since first reported off Dutch Harbor in the mid-1980s. Waste and discard were central themes in the inshore-offshore allocation debates in 1991 and 1992. High seas driftnetting also has helped considerably to elevate waste and discard as public issues.

Regardless of which particular fishing practice was pivotal in raising public awareness, waste has become a public issue of major proportions, regionally, nationally, and internationally. The genie is out of the bottle; so to speak, and will not be reconfined. We seem to have turned the page on a new chapter on waste, bycatch and full utilization that likely may be cast more in major biological, social and political dimensions, than in efficiency arguments structured simply around economic cost-benefit solutions. The following sections summarize current international and national views on waste and discards, then presents general estimates of discards in North Pacific groundfish fisheries, and ends with a discussion of possible alternatives and a schedule for decisionmaking.

International Initiatives

There have been the following recent conferences and agreements concerning high seas and fisheries within national boundaries:

May 1992	International Conference on Responsible Fishing Cancun, Mexico
June 1992	United Nations Conference on Environment and Development (UNCED Agenda 21) Rio de Janeiro
March 1993	FAO Committee on Fisheries Twentieth Session Rome
July 1993	United Nations Conference on Straddling Fish Stocks and Highly Migratory Fish Stocks New York
July 1993	Inter-American Conference on Responsible Fishing Mexico City

Each forum expressed the need to address bycatch and waste. The Declaration of Cancun declared that nations ". . . should promote the development and use of selective fishing gear and practices that minimize waste of catch of target species and minimize bycatch of non-target species." UNCED adopted an objective to promote conservation and sustainable use of marine living resources, urging nations to ". . . take measures to increase the availability of marine living resources as human food by reducing wastage, post-harvest losses and discards, and improving techniques of processing, distribution and transportation."

The FAO Committee on Fisheries developed a draft International Code of Conduct for Responsible Fishing. Article 19 states:

"Following the responsibility of States as provided in the 1982 Convention on the Law of the Sea and, in particular, Articles 61, 62 and 119, guidelines would be developed with respect to:

- the restoration and proper maintenance of ecosystems;
- the maintenance of biodiversity;
- minimizing the risk of long-term or irreversible effects of fishing operations;
- ensuring that each fish population is harvested in areas and at the stage of its life cycle consistent with the basic principles for the sustainability of a renewable resource and with due regard to economic efficiency;
- avoiding wastage and incidental damage to the marine resource and environment."

At the July 1993 UN conference, the United States supported developing the code and suggested principles for responsible fishing such as minimizing bycatch and other forms of waste. And finally, the Communique of the Inter-American Conference in Mexico City, July 1993, suggested that the code should urge nations to promote the development of gears to permit greater selectivity in catches and establish criteria governing the use of all types of fishing gear considered destructive and

unsuitable. It was the consensus of that meeting that the United Nations should declare the 1990s the "Decade of Responsible Fishing."

NOAA/NMFS Perspectives

United States support for "responsible fishing" on the international front has been incorporated in policy statements by NOAA and NMFS for domestic fisheries. For example, in *Living Oceans - Report on the Status of U.S. Living Marine Resources*, 1992, NMFS has developed a Strategic Plan for the Conservation and Wise Use of America's Living Marine Resources which, among other things, calls for development of more selective fishing practices to reduce bycatch. Spotlight 2 of the report is titled "Bycatch Problems and Fishery Management" (see item C-8(a)).

NOAA has committed to promoting global stewardship by fulfilling UNCED commitments. In NOAA's 1995-2005 Strategic Plan (June 1, 1993 draft) is a Prospectus for the 21st Century - Vision for 2005, which has an Environmental Stewardship Program Portfolio. In that portfolio, one of the six key program elements for rebuilding U.S. fisheries is:

"Reducing Bycatch. This action addresses wasteful bycatch (of young or non-target species) which impedes rebuilding of many fisheries, and kills marine mammals and endangered species. NOAA will expand data collection to quantify the problem, take account of the effects of bycatch in fisheries management models, and work with the fishing industry to develop new technology and strategies to reduce bycatch." (see item C-8(b)).

Magnuson Act Reauthorization

During Magnuson Act reauthorization hearings in 1989, concerns were raised with bycatch and waste. The State of Alaska supported stronger conservation provisions to address waste and promote full utilization. Various industry members testified in support of cleaner fishing methods and incentives to minimize bycatch. Greenpeace proposed a new national standard to assess the extent and effect of discard mortality on fisheries management and the health of fish stocks. These efforts culminated in a 1990 amendment revising Magnuson Act policy to assure that the national fishery conservation and management program considers the effects of fishing on immature fish and encourages development of practical measures that avoid unnecessary waste of fish, and is workable and effective. Congress also banned pollock roe-stripping and discard of pollock flesh.

Following reauthorization, the pace of activity on discard and waste quickened. The Library of Congress Congressional Research Service published an extensive report (CRS Report For Congress 90-575 ENR, December 9, 1990) entitled "Waste from Fish Harvesting and Processing: Growing Environmental Concerns." The Audubon Wildlife Report for 1989 and 1990 included an article entitled "Discarded Catch in U.S. Commercial Marine Fisheries," and the cover of the U.S. News and World Report for June 22, 1992 featured the headlines: "The Rape of the Oceans: The growing threats to the nation's last frontier."

Bycatch and waste also are major issues for this year's reauthorization hearings. Most groups testifying before Senate and House committees spoke of the need for stronger measures to control bycatch and encourage full utilization. Suggestions include adding a new national policy or standard to reduce bycatch waste, a prohibition on wanton waste, a priority to clean gears, and a reduction in bycatch to zero.

National Industry Bycatch Coalition

Industry members from across the U.S. convened in Newport, Oregon for the National Industry Bycatch Workshop of February 4-6, 1992. It was an upbeat meeting that generated draft goals, objectives and terminology. Lee Alverson offered the following proposed national goals:

Conservation goals (Priority 1)

1. Minimize bycatch on threatened and/or endangered species (birds, turtles, marine mammals, etc.).
2. Minimize bycatch on over-fished species of fish and/or invertebrates, including undersized target species.

Economic and social goals (Priority 2)

3. Minimize catch on non-target species which have value to other sectors of the industry.
4. Minimize catch of undersize target species with the goal of later increasing their catch as adults in directed fisheries.

Full Use Goals (Priority 3)

5. Find and promote market opportunities for unused bycatch species.

The Workshop generally agreed with these goals, while opining that achieving zero bycatch is probably not possible, and that reducing bycatch to its lowest practical minimum must be approached with full consideration of the impacts on current participants in the fishing industry.

Subsequently, in Boston in July 1992, coalition representatives suggested the following mission statement and goals:

Industry Coalition Mission Statement:

To reduce bycatch, discarded catch and waste in the nation's fisheries in order to protect the ecosystem health and to increase long-term economic and social benefits from optimum use of U.S. living marine resources.

Five Industry Coalition Goals:

1. Plan, manage, and evaluate a coordinated industry-government bycatch discarded catch reduction program for the nation.
2. Provide scientific and socio-economic information on fishery resources and their harvesting sectors that is necessary for sound, timely, bycatch-related decisions.
3. Develop and transfer to industry the information and technology that will reduce, minimize discards, and utilize non-target fishery resources and presently unused catches.

4. Correct elements of the fishery management process that create bycatch, are ineffective in reducing bycatch, or that unnecessarily reduce economic and social benefits related to it.
5. Inform the fishing industry and the general public of activities that promote fishery resource conservation, reduce bycatch discards, minimize discards, and improve compliance with management regulations.

Though the National Industry Bycatch Workshop created considerable momentum to address waste and discard, the level of funding and support from both government and industry to keep that momentum have not materialized. It looks now as if bycatch will need to be addressed at the regional level by the concerned industries, and once again the fishing industry that works off Alaska will need to exhibit the leadership that it is known for in resolving sticky management issues.

North Pacific Council Activities

In 1984 the Council adopted Comprehensive Goals. Goal 5 states: "Minimize the catch, mortality, and waste of non-target species, and reduce the adverse impacts of one fishery on another."

Subsequently, the Council has banned pollock roe-stripping, issued a policy statement that the pollock harvest should be used for human consumption to the maximum extent possible, established an observer program that reports discards regularly, and taken many actions to control bycatch of prohibited species.

Our most recent round of considerations of waste and full utilization began in September 1990 when the Council received and reviewed many groundfish proposals, including several dealing with bycatch reduction and full utilization. One proposal, to prohibit discard of finfish for which a TAC exists, was not acted on, though the Plan Amendment Advisory Group (PAAG) noted that further consideration of the issue may be warranted, particularly because current management programs may promote discarding. The PAAG urged the Council to consider ways to reduce current levels of discards, perhaps using a phased approach that would ultimately lead to an overall prohibition.

In June 1992 the Council established a Discard Committee, Chaired by Rick Lauber and having Council members Larry Cotter and Wally Pereyra. They developed the following statement as the goal of discard management:

Discard Committee Goal:

"Increase the quantity and quality of food and byproducts produced from the fishery resources harvested in the BS/AI and GOA by reducing the amount of harvest discarded to the maximum extent practicable while recognizing the contributions of these fishery resources to our marine ecosystems and the economic and social realities of our fisheries."

The Council has not had an opportunity to consider the Discard Committee's recommendations because of the press of other business.

Scope of Discard Problem

Discard amounts vary by species and year. As shown in Table 1, sablefish has consistently low discard, pollock 9-10%, Pacific cod 7-17%, flatfish up to 54% overall, and 78-85% for other species. Over all species and areas combined, discards ranged from 15-18% of the annual harvest for 1991-1993. The 18% for 1993 is equivalent to almost 280,000 mt discarded through September 4.

The numbers shown in Table 1 give a general picture of the scope of discard. Table 2 gives additional detail that helps pinpoint where the actual discard problems are in the flatfish and rockfish categories. There it is shown that 92-94% of the arrowtooth flounder harvested is discarded in the BSAI and GOA, while 65-66% of BSAI rocksole and other flatfish are discarded. BSAI yellowfin sole and GOA shallow flatfish and flathead sole fall in the 31-33% discard range, though only yellowfin has any significant tonnage (18,231 mt discarded). For rockfish, the species with higher rates of discard and larger tonnages include Sharpchin/Northern rockfish in the GOA and POP and Other rockfish in the BSAI.

While the estimates of discards presented in Tables 1 and 2 give a general appreciation of the magnitude of the problem, potential solutions will require closer examination of the fisheries that generate the discards. Is it the directed fishery for a species that is responsible for most of the discards, or do other target fisheries take high bycatches that are not used?

Let's take a closer look at pollock in the BSAI. Detailed discard data by fishery for 1991 were provided by NMFS to our Discard Committee in June 1992 (item C-8(c)). They show that about 89,000 mt pollock was discarded in the BSAI in 1991. More importantly, they show that the following four directed fisheries (as defined by NMFS) accounted for 97% of the pollock discards:

Pacific cod fishery	21,944 mt	25% of total discards
Pollock fishery	40,476 mt	46%
Rocksole fishery	15,947 mt	18%
Yellowfin sole	7,197 mt	8%

Similarly, for Pacific cod, the following four fisheries accounted for roughly 95% of the Pacific cod discard, which totalled 8,692 mt in 1991:

Pacific cod fishery	1,739 mt	20%
Pollock fishery	3,917 mt	45%
Rocksole fishery	1,395 mt	16%
Yellowfin sole	1,202 mt	14%

These estimates show that the same four major fisheries contributed 95-97% of the "discard problem" for both pollock and cod, and that it is not just a simple matter of requiring the target cod and pollock fisheries to keep more of their fish. And as we know from past examination of this issue, and from considerable industry input over the years, there are many reasons why a portion of the catch is discarded. Discards result from a combination of disincentives to further process the catch. These may be regulatory in nature, such as limitations of directed fishing standards, or economic, such as small fish that cannot be processed through the machines, or the machines are set for processing another species, and not easily changed. Each one of these contributes to the overall problem.

Detailed information for 1992 and 1993 has been requested from NMFS and may be available this week. If not, we will need the discard information by fishery and species between now and December as we begin to look more closely at the discard problem.

Structuring the Alternatives

There are several different ways the Council could approach this issue. One course of action is to take no action to specifically mandate a reduction in discard. Indirect management tools could be used, such as mesh size regulations, that would reduce the amount of fish retained in the gear and

brought aboard, or seasons and time/area closures might lead to cleaner, more fully useable hauls. Then the Council could just wait and see if these changes effected any reduction in discard rates over the next two to three years. Also, we have the comprehensive plan which may be based on IFQs. If that comes on line sometime in or after 1996, presumably the industry would have greater incentive to use the catch more fully, as apparently has happened in the CDQ fisheries.

An alternative at the other extreme would be to mandate a large reduction in discards for all species for all areas in 1995. Some interest groups, such as the Center for Marine Conservation, have called for a reduction of bycatch to zero, though as I mentioned earlier, industry representatives at the National Workshop in Newport stated their belief that zero bycatch was not achievable. Such action would have high economic costs for the industry, and certainly would be far more stringent than, and well outside the bounds of, any of the goals recently established nationally or internationally for reducing bycatch as were reviewed earlier in this paper.

A more moderate middle ground may be to select four to five of the problem species and do some additional homework on them, in cooperation with industry, between now and the December or January Council meetings. Pacific cod is obviously one that needs further examination. It is the subject of allocational disputes, and contributed to the current momentum surrounding the discard issue. It also is highly valued and significant discard tonnages are involved (17%, or 37,600 mt).

Pollock also is a good candidate for further consideration. The overall discard rate is a relatively low 9-10%, but significant tonnages are involved and again, this is a highly sought after fish which has been the subject of very contentious allocational disputes.

Third, the Council may want to examine several flatfish species such as BSAI rocksole and yellowfin sole. Both fisheries contribute high tonnages of discards, and both fisheries contribute significantly to pollock and Pacific cod discards. Shallow flatfish in GOA also may need scrutiny.

Fourth, some of the rockfish species may warrant further examination. POP is a highly valued species and yet there is considerable discard, particularly in the GOA where the rate reached 80%. Apparently the late season opening of July 1 for GOA rockfish contributes significantly to discard. GOA Other Rockfish (59% discard rate) and BSAI sharpchin/northern complex (89%) may warrant examination also.

The Council also needs to consider whether the reduction in discards for a particular species or fishery should occur all at once, or over a two- to three-year period. Fuller utilization may have a large economic cost to it, and therefore spreading that cost over a number of years would be easier on industry.

In summary, here are some alternatives the Council could discuss at this meeting. They are listed in order from least burdensome to most burdensome on the industry.

Alternative 1: ---Status quo.--- Take no action now. - Wait for comprehensive rationalization program to come on line and let the problem sort itself out then.

Alternative 2: Modified status quo. Use other management approaches such as gear restrictions and time-area closures to address problem, rather than mandating a specified reduction in discard.

Alternative 3:

Select several problem species for further consideration of a discard reduction schedule. Pollock, Pacific cod, rocksole, yellowfin sole, and one or two rockfish categories were mentioned above as starting points for discussion.

Suboptions include phasing in the reduction over several years or just in specific fisheries that contribute significantly to the discard problem. The Council would need to set the final goal and timetable of the program (e.g., a 75% reduction in Pacific cod discard by the end of 1997).

Alternative 4:

Prohibit all discard (above NMFS retention standards) in 1995 (or again, over some scheduled phase-in).

In cases where discard is primarily a result of current regulations such as the directed fishing standards, perhaps a critical review of existing regulations would be desirable under any of the above alternatives.

Amendment Schedule

Regardless of which set of the above alternatives that the Council chooses to consider further, the staffs of the Council and NMFS need to make available the detailed bycatch patterns for 1992 and 1993. With those in hand, I think we need to meet with industry in October and/or November and begin a serious dialogue to pinpoint the exact reasons that a particular fishery, fleet, vessel or company decides to either keep or discard the species of interest. Through this interaction, we may be able to come back to the Council in December or January with a slate of possible actions that the Council could take that would give us the most bang for the buck in addressing the discard problem.

The Council could then finalize its slate of alternatives in December or January, and the analysis would be presented initially to the Council in April 1994. Final review would occur in June 1994, concurrent with consideration of comprehensive rationalization. The approved alternative could be implemented beginning in 1995.

Table 1. Percentage discards of groundfish off Alaska in 1991-1993 and discard tonnages for 1993.

	<u>1991</u> ¹	<u>1992</u> ¹	<u>1993</u> ²	
Pollock	10%	10%	9%	(93,731 mt)
Sablefish	2	4	3	(827 mt)
Pacific cod	7	10	17	(36,025 mt)
Flatfish	48	49	54	(104,385 mt)
Rockfish	23	24	35	(10,575 mt)
A. Mackerel	12	17	20	(9,244 mt)
Other	85	83	78	(24,146 mt)
Overall	15%	17%	18%	(278,933 mt)

¹ Source: Table 20 of 1993 NMFS Economics Status of the Groundfish Fisheries off Alaska (Preliminary).

² Source: NMFS Bulletin Board through September 4, 1993.

Table 2. Flatfish and rockfish discards through September 4, 1993.
 (Source: NMFS Bulletin Board)

	<u>Catch</u> (mt)	<u>Discard</u> (mt)	<u>Percent</u>
FLATFISH			
<u>Bering Sea/Aleutian Islands</u>			
Arrowtooth	9014	8470	94
Greenland Turbot	8054	1409	18
Other Flats	23238	15414	66
Rocksole	62641	40916	65
Yellowfin sole	58114	18231	31
<u>Gulf of Alaska</u>			
Arrowtooth	17860	16454	92
Deep flatfish	6348	1088	17
Shallow flats	5095	1611	32
Flathead sole	2400	792	33
ROCKFISH			
<u>Bering Sea/Aleutian Islands</u>			
Other Rockfish	655	207	32
POP	16526	2580	16
Other Red Rockfish	639	137	21
Sharpchin/Northern	2125	1899	89
Shortraker/rougheye	1135	398	35
<u>Gulf of Alaska</u>			
Pelagic Shelf	3070	283	9
POP	2219	1772	80
Shortraker/rougheye	1832	421	23
Other rockfish	3391	2012	59
N. Rockfish	4692	773	16
Demersal Shelf	421	74	18
Thornyhead	1379	483	35



OUR LIVING OCEANS

REPORT ON
THE STATUS
OF U.S. LIVING
MARINE
RESOURCES,
1992

December 1992
NOAA Tech. Memo. NMFS-F/SPO-2



**U.S. DEPARTMENT
OF COMMERCE**

**NATIONAL OCEANIC
AND ATMOSPHERIC
ADMINISTRATION**

**NATIONAL MARINE
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... Bycatch Problems and Fishery Management

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... Conservation Problems

generate excessive fishing mortality on nontarget species even though the target species is not overutilized. This occurs when the bycatch species is slower growing and longer lived than the target species and is therefore less tolerant of a high rate of fishing. For example, the optimal level of shrimp fishing in the Gulf of Mexico

might still be excessive for the incidentally captured finfishes that mature more slowly. Reducing the take of a bycatch species through gear restrictions or modifications or area and season closures, for instance, can help solve this type of bycatch problem.

LEGISLATIVE BACKGROUND

Congress has addressed bycatch problems in commercial fisheries by amending several laws, most recently through the 1990 amendments to the MFCMA. The MFCMA encourages measures to avoid unnecessary waste of fish, the development of research programs that address bycatch and methods for its reduction, and the establishment of an observer program in the North Pacific to monitor existing bycatch measures. The 1990 amendments to the Act also mandated a research program on the impact of incidental harvest in the southeastern U.S. shrimp trawl fishery and prohibited any measures to mitigate this bycatch until 1 January 1994.

The Marine Mammal Protection Act of 1972 imposed a moratorium on the kill of marine mammals, including their incidental capture in fisheries. The 1988 amendments to the MMPA provided most commercial fisheries with a 5-year exemption from the prohibition on capture of mammals, while information on the levels

and impacts of these kills is collected and analyzed. A permanent legislative approach to the capture of marine mammals in commercial fisheries is being developed for congressional consideration in the reauthorization of the MMPA in 1993.

Finally, the ESA prohibits the incidental killing of species listed as endangered and allows such prohibitions or other conditions to be placed on the kill of threatened species. The ESA does allow the incidental capture of endangered species under limited circumstances, provided that the bycatch neither violates the incidental take provisions of the Act nor jeopardizes the continued existence of the species. The 1988 amendments to the ESA also required some South Atlantic and Gulf of Mexico shrimp fishermen to use Turtle Excluder Devices (TED's) during certain times of the year to avoid incidental capture of endangered and threatened sea turtles.

INFORMATION NEEDS

Effective bycatch management requires data on the magnitude, distribution, and species composition of the bycatch in a fishery. Such information generally requires observers on fishing vessels. Multi-year observer programs are needed to reflect interannual variation in the abundance of target and nontarget species to determine the magnitude of bycatch and its effects.

However, observer programs have several drawbacks. Placing observers on fishing vessels can be expensive for both vessel owners (because valuable bunk and working space is lost) and for fishery management agencies. The number of

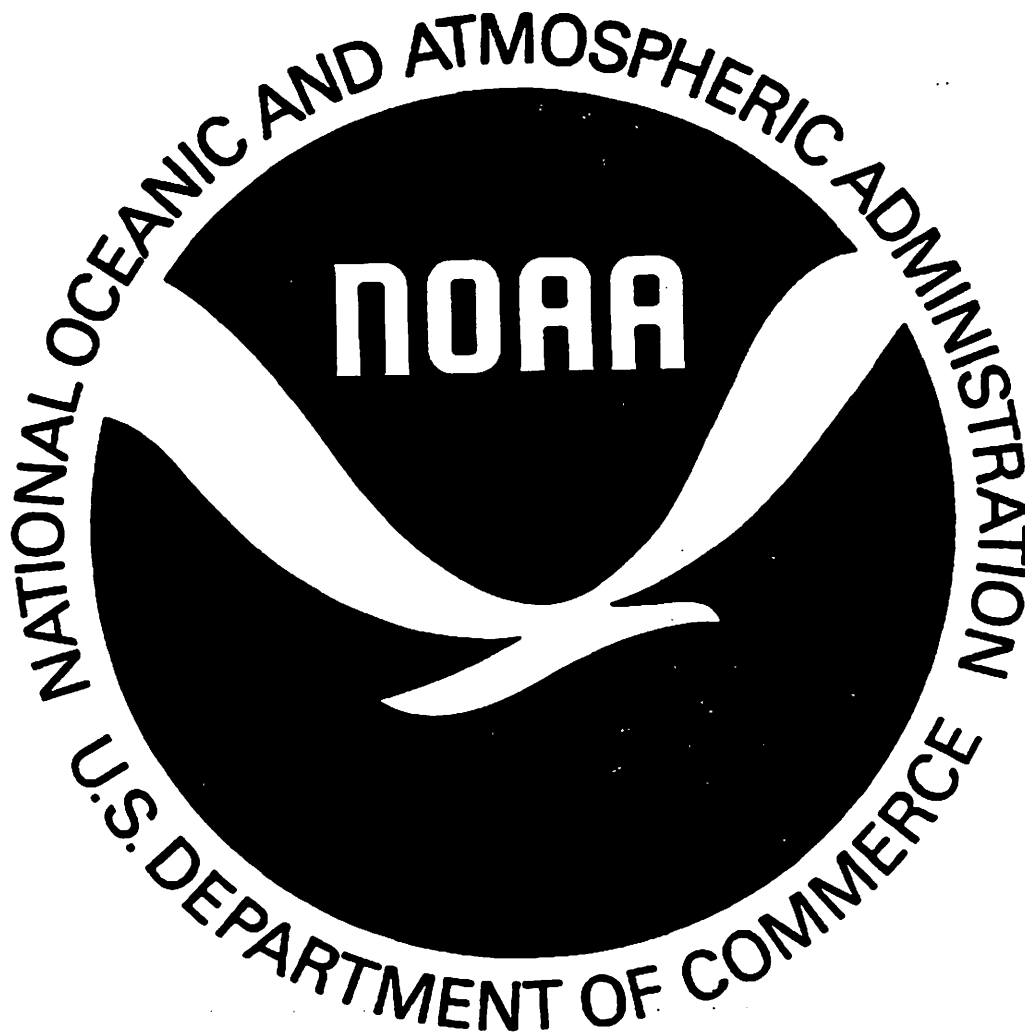
observations made may be small because of budget constraints and may not give an accurate picture of the incidental catch. The presence of an observer can also influence the fishing methods employed by a fisherman, either to avoid or to seek bycatch species. In addition, it may take several years before data from observer programs become useful in assessing the status of fish resources and the magnitude of bycatch effects, while pressure to address the problems increases and calls for more immediate action.

Where one fishery incidentally captures fish that are of economic value to other fisheries, calculating the foregone present

National Oceanic and Atmospheric Administration

1995 - 2005 STRATEGIC PLAN

Summary



June 1, 1993

DRAFT

3.5 REDUCING BYCATCH

Heavy bycatches of non-target resources are a major impediment to increased fishery yields and substantial economic gains. Most fisheries are managed on the basis of size and seasonal availability. Regulations on mesh sizes of fishing nets determines the size of individuals that escape. Similarly, hook size can be specified in order to regulate size of fishes caught. Still, non-targeted animals commonly appear as bycatch. Many methods of fishing are nonselective, and this results in bycatch of some species, including marine mammals and endangered or threatened species, while fishing for other species, as well as the capture of undesired sizes (e.g., juveniles) of some target species. The inadvertent capture of juveniles or "brood stock" of highly exploited species can make restoration of such species more difficult. Bycatch sometimes results in at-sea discarding of a large portion of the catch, although the extent of this practice is poorly known in many fisheries. Most discards do not survive.

Bycatch also causes significant loss of potential economic benefits when directed fisheries are closed because of heavy "prohibited species" bycatch. (Table 2 is a partial list of bycatch-related closures in the North Pacific in FY 1990-1991.). Also, the general public is becoming increasingly aware and critical of the waste of hugh quantities of bycatch. In some cases, the bycatch problem contributes to overfishing itself, and may jeopardize recovery of a depleted stock. Gulf of Mexico juvenile red snapper caught in the shrimp trawl fishery is an example.

Bycatch also causes significant loss of potential economic benefits when directed fisheries are closed because of heavy "prohibited species" bycatch. This problem is illustrated in the

June 15, 1993

1. Train and deploy observers for major fisheries where bycatch is known to be a significant barrier to achieving full economic benefits.
2. Incorporate observer information into data bases used by fishery scientists and managers, and by industry parties seeking to reduce bycatch levels.
3. Use observer data in the production of stock assessments, and in the recommendation of regulatory measures to protect prohibited species and conserve other non-target fishery resources.
4. Determine the impact of bycatch on targeted species and populations and subsequent recruitment to the fishery.
5. Determine the cost of reducing bycatch while maintaining a targeted fishery.

B. Advancing conservation engineering

The Magnuson Fishery Conservation and Management Act, as amended in 1990, specifically directed the Department of Commerce to conduct research in the field known as "conservation engineering". Some conservation engineering activities to develop highly selective harvesting gear are well known; for example, the development and application of devices to exclude protected species from fishing gear (e.g., turtle excluder devices, or TEDs, in shrimp trawl nets). Development of gear that will not catch non-target species is needed for some fisheries (e.g., Pacific halibut in Alaska trawl fisheries), while in others, gear must be developed that will permit non-target organisms, such as undersize swordfish taken on longline, to escape unharmed even if captured.

Another way of reducing bycatch is by controlling fishing practices -- how, when and where fishing takes place. Examples include the redirection of tuna fishing away from areas with high numbers of porpoises, and prohibition of certain types of gear (e.g., gillnets) in nearshore areas. Very careful studies and tests must be performed to ensure that recommended practices or gears will reduce bycatch significantly but with minimal economic loss to the industry.

Development of conservation gear by the private sector will be actively encouraged, but it is expected that NOAA will continue to have a primary role in certifying the efficacy of devices and practices designed to conserve protected species. As conservation practices and gears become legislatively mandated for Federal waters or interjurisdictional species, NOAA will be required to verify their success and minimize disruption among users. Additionally, it is NOAA's responsibility to develop methodologies for accurately assessing the extent and composition of bycatch for application to the generation of stock assessments and regulatory measures. NOAA proposes to:

1. Develop and test prototype finfish excluder devices for application in trawl fisheries.

1991 Retained / Discarded Groundfish

BY AREA & TARGET

left(key,7)	total	omck	omck_disc	arth	arth_disc	demi	demi_disc	dfl1	dfl1_disc	flou	flou_disc	fool	fool_disc	gtrb	gtrb_disc
5 AMCK	27916.15	21886.08	1438.18	5.40	166.79	0.00	0.00	0.00	0.00	9.23	85.59	0.00	0.00	29.62	1.53
5 ARTH	2174.75	0.00	0.00	1183.52	102.95	0.00	0.00	0.00	0.00	78.59	1.67	0.00	0.00	128.45	139.36
5 FLOU	4629.48	0.00	0.00	6.51	476.22	0.00	0.00	0.00	0.00	1442.82	521.32	0.00	0.00	0.80	6.70
5 GTRB	8800.14	0.00	56.74	411.94	1231.38	0.00	0.00	0.00	0.00	112.61	77.99	0.00	0.00	5030.84	62.20
5 NULL	881.66	0.00	60.30	0.00	68.96	0.00	0.00	0.00	0.00	0.00	34.60	0.00	0.00	0.00	15.99
5 PCOD	202515.87	65.64	704.78	223.21	3775.16	0.00	0.09	0.00	4.32	668.82	3298.87	0.00	0.00	43.89	504.84
5 PLCK	1334824.4	152.30	9.77	46.76	3501.29	0.00	0.00	0.00	0.00	687.06	3565.69	0.00	0.65	1.63	125.03
5 POPA	6773.25	3.92	114.60	17.94	806.51	0.00	0.00	0.00	0.00	77.71	244.36	0.00	0.00	42.56	16.66
5 ROCK	305.75	0.00	0.00	0.00	107.90	0.00	0.00	0.00	0.00	0.02	48.30	0.00	0.00	0.00	0.06
5 RSOL	64841.31	0.00	0.00	27.95	988.64	0.00	0.00	0.00	0.00	673.36	5031.40	0.00	0.00	10.87	8.33
5 SABL	5319.85	0.00	0.00	17.99	266.73	0.00	0.00	0.00	0.00	9.61	32.27	0.00	0.00	93.65	645.59
5 SRSH	1342.01	0.00	0.00	110.31	326.28	0.00	0.00	0.00	0.00	15.71	0.55	0.00	0.00	0.22	47.99
5 YSOL	129221.67	0.00	1.01	2.12	209.65	0.00	0.00	0.00	0.00	3269.01	10467.50	0.00	0.00	0.00	19.10
6 AMCK	3654.63	3087.10	52.74	1.75	6.39	0.00	2.90	0.14	1.60	0.00	0.00	0.00	0.50	0.00	0.00
6 ARTH	3078.41	0.00	0.00	793.38	467.93	0.04	0.00	218.16	93.01	0.00	0.00	7.66	1.50	0.00	0.00
6 DEMI	444.21	0.00	0.00	0.20	0.00	350.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6 DFL1	22444.73	0.00	0.00	92.20	8799.82	20.90	13.13	6401.11	773.78	0.00	0.00	358.90	37.34	0.00	0.00
6 FSOL	472.99	0.00	0.00	0.00	89.17	0.00	0.00	24.39	3.11	0.00	0.00	145.47	19.01	0.00	0.00
6 GTRB	33.19	0.00	0.00	0.00	18.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6 NULL	151.10	0.00	0.00	0.00	6.29	0.00	0.00	0.00	0.68	0.00	0.00	0.00	0.00	0.00	0.00
6 PCOD	77885.91	1.02	53.85	40.56	1323.78	61.40	7.95	1125.40	270.20	0.00	1.10	128.08	115.53	0.00	0.00
6 PELS	2155.97	0.00	0.00	15.95	36.30	35.10	14.80	5.47	26.90	0.00	0.00	0.03	0.00	0.00	0.00
6 PLCK	90130.00	0.00	0.25	116.66	518.17	0.00	0.20	280.70	62.38	0.00	0.00	65.98	27.90	0.00	0.46
6 POPA	8383.34	17.88	20.00	139.82	1053.04	13.74	12.50	70.43	160.06	0.00	8.80	6.19	1.20	0.00	0.00
6 ROCK	289.20	0.00	0.00	0.00	41.99	0.22	0.00	6.60	11.25	0.00	0.00	3.21	0.00	0.00	0.00
6 SABL	22206.92	0.00	0.02	44.34	274.04	146.84	9.31	36.77	108.92	0.00	0.43	5.25	3.40	0.00	0.20
6 SFL1	1609.15	0.00	0.00	11.68	266.67	0.00	0.00	265.34	17.16	0.00	0.00	39.66	14.11	0.00	0.00
6 SLR1	8645.85	15.60	10.06	167.66	1293.10	8.10	1.00	95.04	109.24	0.00	0.00	10.74	0.00	0.15	0.00
6 SRRE	714.00	0.00	0.00	8.90	162.11	12.64	0.30	13.49	22.74	0.00	0.00	0.11	0.00	0.00	0.00
6 THDS	173.44	0.00	0.00	19.01	28.14	0.84	0.00	2.19	4.56	0.00	0.00	0.11	0.00	0.00	0.00
N NULL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
N PCOD	201.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

1 - Minimum retained target size

5 = BSAI

6 = GOM

Source: Weekly Production Report Database, NMFS ALASKA REGION

ALASKA MARINE CONSERVATION COUNCIL

Box 101145 Anchorage, Alaska 99510
(907) 277-5357 (kelp) 274-4145 (Fax)

HARVEST PRIORITY: QUESTIONS AND ANSWERS

What is it? An economic incentive to reward those fishermen who successfully minimize bycatch, waste and disruption to habitat by giving them additional fishing time, a reserved portion of the total allowable catch(TAC) or some other harvest preference as determined by the Council.

Would harvest priority favor one gear over another? Bycatch rates vary among gear. We do not know what the lowest rates for most gears are now because there has not been a direct economic incentive to operate them in a selective manner. Some gears with current high bycatch rates may actually be capable of very low bycatch rates. We would anticipate a push within all fisheries to clean up the use of their fishing gear. Conversion to and development of more selective gear and techniques is a way some fishermen will reduce their bycatch rates.

Doesn't Comprehensive Rationalization involving Individual Fishing Quotas accomplish the same thing as Harvest Priority? IFQ's address the problem of fleet overcapitalization, but do not fully solve the conservation problems of bycatch, highgrading and habitat disruption in most fisheries. Possible bycatch reduction is governed by the economics within a particular fishery. If the product from a particular area can be value enhanced by such things as fresh market expansion, than IFQ's may spread the catch over a longer period of time and possibly result in more specific targeting of catch. If the product is frozen or further processed, fishermen will try to minimize cost by fishing quickly to allow their vessels harvesting opportunities in other fisheries. If size, color or other fact is increase value of one part of the catch, than IFQ's will stimulate high grading which increases the discard rate.

Harvest priority does not prevent the eventual implementation of other programs such as Comprehensive Rationalization. In order for Harvest Priority to lower bycatch, however, it must come first since the allocation of harvest inherent in IFQ's would preclude its use.

What about full utilization? If full utilization results in the bycatch being turned into fishmeal or oil, the ecosystem still suffers from the impact of the biomass extraction without knowing the effects. Many species have no fisheries management plans and harvesting them before knowing their ecology is inviting stock depletion or major composition shifts in the ocean food web.

Industry and management needs to concentrate efforts in not catching non-target marine life in the first place.

*
What about full retention? Again, from a conservation and enforcement point of view, it would be better to concentrate our efforts in not catching non-target species in the first place through the use of improved fishing practices as promoted under a harvest priority incentive.

If retained bycatch generates revenue to the vessel or covers the cost of handling, no reduction can be anticipated. Operational costs may be reduced since the whole catch could be dumped in the hold without sorting and dealt with by the processor at shoreside delivery. If bycatch fees, funds or fines become a revenue stream for the managing agency, agency resistance to reduction could be anticipated. No matter who is the beneficiary of the bycatch, a constituency for that bycatch will be created for continued access to that product. Full retention requires a high level of enforcement on every vessel to prevent many practices such as night dumping and highgrading.

Who benefits from the Harvest Priority system? Fishermen who can minimize catch of non-target species; Agencies who can achieve the goal without high cost or additional staff; subsistence users who rely on bycatch for food and culture; recreational and commercial fishermen; Marine predators dependent on the ocean food chain; Fishermen in other fisheries that have occasional interaction with or take of marine mammals and birds threatened by ESA fishery shutdowns.

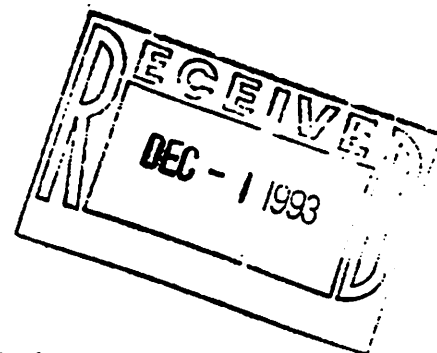
Won't this system fail because the observer data is not scientific enough to stand up in court as with previous vessel incentive programs? Previous programs were enforcement actions for violations of regulation caps. As a fishery management measure, a harvest priority program is not punishing offenders but rather rewarding those who choose to participate using the best available data as required by the Magnuson Act. In this case, federal observer program data would be the "best available" to participants in this voluntary program.

Variability among observer data has been a concern. The Council can make allowance for some variance since the downward pressure on bycatch rates, not a fixed number, is the goal. For example: The yellowfin sole fishery has an average discard rate of 38%. If it was determined that 8% was the qualifying bycatch rate, a 20% variability could be built into so that any rate under 10% would qualify. Bycatch would still be reduced bycatch about 400% below current practice. Data variability should decrease with 24 hour observer coverage on each qualifying vessel.

What about CDQ programs? How would harvest priority effect them? A CDQ program can coexist with the harvest priority system by reserving a fixed portion of the TAC to coastal communities as currently takes place with Bering Sea pollock. We encourage the use of bycatch and discard reduction in CDQ fisheries as a criterion for awarding CDQ allocations among applicants. Since CDQ's are proportioned yearly, harvest priority for selective fishing could actively work to reduce bycatch in this program as well as in the general commercial fishery.

ALASKA MARINE CONSERVATION COUNCIL

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December 1, 1993



North Pacific Fishery Management Council
Mr. Rick Lauber, Chairman
Box 103136
Anchorage, Alaska 99833

Re: Bycatch and Discard in Our Fisheries: The Harvest Priority Solution

Dear Mr. Lauber,

Last year more fish were discarded dead in our fisheries in the North Pacific than were landed by U.S. fishermen in the North Atlantic. Over half a billion pounds of dead or dying fish were dumped over the side in 1992 including 20 million pounds of halibut, a million pounds of herring, 20 million crab; and, this year over 360,000 salmon were intercepted in the trawl fisheries.

In the last few years suggestions have been made on how to deal with this problem including across the board implementation of ITQ's (Comprehensive Rationalization) and full retention of catch. While these proposals may reduce some levels of bycatch, enforcing them will be difficult, expensive and could result in legitimizing the harvesting of non-commercial and non-target species. Highgrading and night dumping will continue to be problems unless expensive enforcement measures are taken.

We respectfully ask that you evaluate another approach, one that rewards those fishermen who successfully minimize bycatch, waste and disruption to habitat by giving them the opportunity to fish earlier, longer or some other harvest priority allocation. Individually tailored to various fisheries, a harvest priority program could voluntarily lead to a rapid conversion to cleaner fishing. This economic incentive approach was used to Americanize our fisheries in the "80's" - it could be used again, this time to clean them up.

In addition to seeking the Council's consideration, we are also recommending that harvest priority language be incorporated into the Magnuson Act. As envisioned a harvest priority program would be designed for each fishery. The Council and fishermen in that fishery would negotiate reduced maximum bycatch rates that would then have to be achieved to qualify for additional fishing time; a reserved portion of the total allowable catch (TAC) or some other harvest preference incentive.

In order to qualify, fishermen would have to have full observer coverage to verify their harvest and bycatch levels. If any portion of the catch was not observed, it would be calculated at the fleet average effectively providing an incentive to make sure everything is

seen. If a gear is shown to be inherently selective with a low bycatch rate, use of that gear would not require further observer coverage. If a lower rate was being purported by selective practices within a gear type, observer verification would be necessary. The Council would need to design an adequate harvest priority economic incentive so participants could cover observer expenses and generate significant bottom line profit.

In many fisheries full retention of target species will be inherent since the quickest way for fishermen to reduce their discard rate will be to fully utilize their entire target species catch.

The advantages of harvest priority as an economic incentive approach are numerous:

1. Harvest priority allocations will result in minimizing bycatch, waste and habitat disruption by rewarding those fishermen who can demonstrate cleaner fishing practices. Emphasis will be placed on not catching undesired species in the first place;
2. Efforts to reduce bycatch will be institutionalized because the 'best fishermen in each fishery will push for further reductions in bycatch because they know they can be more selective;
3. There is no inherent administrative cost to the program, no bureaucracy expansion and no enforcement costs above the current system;
4. This proposed system makes management changes that result in direct achievement of the goal of reducing waste of our public resources;
5. The reductions can be sequentially lowered in each particular fishery;
6. Confidentiality of data is not an issue since anyone wishing to qualify for harvest priority will volunteer their data and verification.

In conclusion, we are faced with declining populations and potential ESA listing of several marine species in the Bering Sea and Gulf of Alaska. Many of our livelihoods and subsistence cultures are at risk. We are seeking proactive solutions that both protect the environment and our communities. We ask you consider harvest priority as a realistic and ecologically responsible way to actually reduce bycatch.

Sincerely,



Nevette Bowen
Coordinator

NEWS



U.S. SENATOR

**FRANK
MURKOWSKI**

OF ALASKA

For Immediate Release Contact: Chuck Kleeschulte or Cindi Bookout
Nov. 22, 1993 O(202) 224-9306; H338-2414; 224-8767

MURKOWSKI INTRODUCES BILL TO CUT FISH WASTE

WASHINGTON -- Saying the waste problem is so great that it threatens the health of the nation's fisheries, Sen. Frank Murkowski over the weekend introduced legislation to require regional fishing management councils to reduce by-catches and fish waste.

"Fish discards have achieved a level of overall waste in commercial fisheries that is absolutely appalling. In a world where millions of people are starving, this is a disgrace of unparalleled proportions," said Murkowski late Saturday night in introducing the legislation.

He said he wanted to introduce the bill prior to the end of this session so it could be studied over the interim and be available to members of the Senate next session when the Commerce Committee begins work on reauthorizing the Magnuson Act - the overall blueprint for fishery management in this country.

Murkowski said fish waste consists of three distinct types. The first two types of waste involve fish that are caught incidental to harvesting of a preferred species, which are often discarded overboard. The final type of waste comes from the discard of unprocessed fish parts which often are thrown overboard by factory trawlers, rather than turned into useful fish meal and oil.

Murkowski said that, in some U.S. fisheries, the by-catch rate is estimated to be as high as nine pounds for every one pound of fish retained. Even in Alaska, where efforts to discourage by-catch are more strenuous than in other regions, discard levels reach two-to-one ratios in some fisheries.

Murkowski: Fish Waste Bill Introduced 2-2-2
Nov. 22, 1993

"Globally, some sources estimated that by-catch is in the realm of 10 to 20 billion pounds of non-target sea creatures per year. The sea's bounty is not boundless. We must reassess our fish policies now, before the resources goes the way of the American bison," said Murkowski.

Murkowski said while by-catch must be attacked, he doesn't believe Congress can mandate a single solution for all fisheries. Thus his bill established reduction of by-catch as a fishery management goal for the regional councils and will change the Magnuson Act in two other ways.

It will require the councils when writing new fishery management plans to specify what levels of by-catch are to be expected as a result of harvest in each managed fishery, and to describe measures to reduce mortality to non-targeted species and utilize retained fish more efficiently. All existing plans will have to be rewritten to follow the new guidelines.

This new authority and "flexibility" to tighten by-catch, impose changes in fishing practices to reduce by-catch and require processors to process waste fish parts could benefit on-shore, versus off-shore factory trawlers, since on-shore plants traditionally have a far better record regarding fish utilization.

Murkowski said he wanted to be very clear that he blames economic problems in the fish industry, not fishermen, for the by-catch problem.

"Fishermen tend to be, both by inclination and profession, conservationists. Their whole lifestyle is based on the sustainable harvest of the oceans' gifts. It is by no choice of theirs that we have reached such an unfortunate state. Fishermen, however, are also businessmen and operate in a highly competitive environment. In order to survive, they must maximize their production of salable fish, and that all too often means they must concentrate on one species, lest they lose ground to their competitors," said Murkowski.

we have reached such an unfortunate state. However, fishermen are also businessmen, and operate in a highly competitive environment. In order to survive, they must maximize their production of salable fish, and that all too often means they must concentrate on one species, lest they lose ground to their competitors.

This sad state of affairs is virtually forced on our fishermen because harvests are generally capped, and like the late bird who finds no worm, the slow fisherman will find his season closed willy-nilly, without regard to any effort he may have made to minimize waste.

There are all kinds of proposals that have been made to deal with this problem, from penalties, to incentives, to privatizing the fisheries. None of them will work in all situations. It is for that reason that I believe the answers must come from the industry itself, through the regional management council structure established by the Magnuson Act.

This approach will provide the greatest flexibility, on a region by region basis, to deal with the various facets of what has become a national disgrace. And make no mistake about it, flexibility will be the key to resolving this matter successfully, using methods that are equitable for all concerned.

Make no mistake; flexibility does not mean we should be undecided. We must take action. We can no longer afford to regard fisheries waste as an inevitable cost of doing business. It is no such thing.

However, we must beware of simplistic solutions which could drive our fishermen out of business, or which will fail to have adequate impacts, or which may create environmental problems we cannot now foresee. For example, some people advocate the concept of "full utilization," meaning anything and everything captured must be retained for use. They argue that by-caught fish will die anyway, so if we cannot turn them into edible seafood products, we should be making fish meal and oil from them, at the very least. However, we are far from knowing how such a change in policy might affect the ocean. Is it better to put those fish back in the ocean where they can feed others, or should we turn them into meal that might fertilize a farm field in the midwest?

In short, Mr. President, we must accept that we do not have all the answers.

That is why this bill emphasizes the need to reduce the number of mortalities that occur as a result of bycatch, rather than on more drastic measures, and on reducing the level at which we discard unused fish and fish parts from our target species. These focal points, when addressed on a national scale but with real sensitivity to local differences, are the most likely to result in real change. And I submit, Mr. President, that real change is what we need today.

Statement

by Senator Frank H. Murkowski
on

S. 1756

a bill

To encourage the optimum utilization of fisheries resources, to reduce waste in commercial fish harvesting and processing, and for other purposes.

Mr. PRESIDENT. I rise today to introduce a measure designed to encourage the regional fishery management councils created by the Magnuson Fishery Conservation and Management Act to take control of, and resolve one of the most pressing problems of modern fisheries.

Under Magnuson, we have successfully developed the capability to harvest vast amounts of this nation's fish resources, and today, United States vessels have almost completely supplanted the foreign vessels that once took the bulk of the resources in our exclusive economic zone.

What we have not done, however, is to take adequate steps to ensure that we control the level of waste that occurs in our fisheries.

Today, I am introducing legislation that will direct regional fishery management councils throughout the country to identify waste levels in the fisheries they manage, and to adopt measures to reduce it. My bill will amend the Magnuson Act to require that waste reduction become one of the purposes of the Act, and be treated as an integral part of federal fisheries planning throughout the country.

To those who unfamiliar with the fishing industry, this may sound like a simple thing -- an obvious thing -- a thing that should have been taken care of long ago. Unfortunately, because each fishery, each gear type, each target species and each style of processing may yield different levels of waste, it is not at all a simple issue.

I know that my colleague, the senior Senator from Alaska, shares my concerns about the management of our fishery resources and will carefully consider all proposals including his own and those of other members when the Senate Commerce Committee begins work on the Magnuson Act reauthorization next year. He has indeed shown great leadership in this area. I am not a member of the Senate Commerce Committee and so I introduce this bill today to express my concern for the wise use and management of our fishery resources and to add my proposals to

those that may be considered by the Committee when it addresses waste in our fisheries during consideration of amendment to the Magnuson Act.

Although it is late in this session, it is my hope that introducing this legislation now will encourage interested parties to accept that Congress is indeed serious about addressing the issue of waste, and to use the opportunity of the Congressional recess to discuss both this proposal and any others that may be offered. It is my firm belief that the time has come for action.

Mr. President, there are several different kinds of waste that occurs in modern fishing. First, there is the waste that occurs through the incidental catch of fish and other creatures that are not the target species of the fishermen. Although many of these fish are edible and some are of relatively high value, they are most often discarded either because we are concentrating solely on a specific species or because our management rules require it. This is what we call "bycatch," and very few of those discarded fish survive to be caught another day.

Second, there are what we call "economic discards." These are fish that, although of the target species, are unsuited for processing by virtue of their size, sex or other reasons. They, too, go overboard, and again, very few survive the experience.

Finally, there are discards of unprocessed fish parts that might be turned into useful fish meal and oil, but are not considered worth the extra effort of doing so.

Taken as a whole, Mr. President, these discards achieve a level of overall waste in commercial fisheries that is absolutely appalling. In a world where millions of people are starving, this is a disgrace of unparalleled proportions.

In some U.S. fisheries, the bycatch rate is estimated to be as high as nine pounds for every one pound of fish retained for processing. Globally, some sources estimate that bycatch is in the realm of 10 to 20 billion pounds of non-target sea creatures per year. Even my home state of Alaska, where authorities have been far more progressive than the national average, some fisheries result in bycatch and economic discard levels so high that less than half the harvested fish is actually processed for consumption.

Back home in Alaska, we have a term for what we see in the nation's fisheries today. We call it "wanton waste" when it occurs in state-regulated activities, and "wanton waste" it is indeed.

Despite all this, Mr. President, let me be very clear: it is not this nation's fishermen who are at fault for this problem. Indeed, the clearest and most audible calls for change have come from within the fishing industry itself. Fishermen tend to be, both by inclination and profession, conservationists. Their whole lifestyle is based on the sustainable harvest of the oceans' gifts. It is by no choice of theirs that

1 prepared, and to encourage the use of target species in a
2 manner which minimizes the discard of fish and fish
3 parts;" ; and

4 (9) In section 1853 by adding at the end the following
5 new subsection:

6 "(g) REQUIRED AMENDMENT OF MANAGEMENT PLANS.

7 Each council shall---

8 "(1) within one year from the date of enactment of this
9 subsection, submit to the Secretary such amendments for each
10 management plan under its jurisdiction as are needed to comply
11 with subsections (a)(4) and (5) of this section; and

12 "(2) thereafter submit annually to the Secretary a report
13 identifying any changes to the estimates and descriptions
14 required in subsections (a)(4) and (5) and in paragraph (1) of this
15 subsection, and providing an explanation of the cause or causes
16 of such changes."

WBW11/15/93.1115

1 non-target fish species and of unutilized portions of targeted
2 species.

3 (8) It is in the national interest both environmentally and
4 economically to minimize mortalities among non-target species
5 taken incidentally to the various directed fisheries.

6 (9) It is in the national interest to encourage the
7 utilization where practicable of all parts of fish harvested in
8 directed fisheries for that species.

9 **SEC. 3. AMENDMENTS TO MAGNUSON ACT**

10 The Fisheries Conservation and Management Act (16 U.S.C.
11 1801 et. seq.) is amended---

12 (1) In subsection 1801(b)(4) by inserting "in a non-
13 wasteful manner and" after "maintain,";

14 (2) In subsection 1801(b)(6) by inserting "in a non-
15 wasteful manner" after "such development";

16 (3) In subsection 1802(21)(B) by inserting ", including
17 efforts to limit mortality in non-target species for the
18 purposes of resource conservation and food production"
19 after "ecological factor";

20 (4) In section 1802 by adding at the end the following
21 new paragraph:

22 "(33) The term "non-target species" means fish caught
23 incidentally to fishing for a particular species or group of
24 species and which may or may not be retained aboard the
25 fishing vessel for subsequent processing and/or sale.";

26 (5) In section 1851(a)(1) by adding "and encourage

1 the minimization of mortalities among non-target
2 species" after "prevent overfishing";

3 (6) In section 1851(a)(5) by striking the word
4 "promote" and inserting in its place the word "consider";

5 (7) In section 1851(a) by adding at the end the
6 following new paragraph:

7 "(8) Conservation and management measures shall
8 encourage the non-wasteful taking of fishery resources,
9 including the the reduction of discards of fish and fish parts,
10 and the minimization of mortalities among non-target
11 species.";

12 (8) In section 1853(a) by redesignating paragraph (4) as
13 paragraph (6) and renumbering the subsequent paragraphs
14 accordingly; and by inserting the following new paragraphs:

15 "(4) assess and specify--

16 "(A) to the maximum extent practicable an
17 estimate by numbers of fish or weight thereof of the
18 extent of anticipated mortalities among non-target
19 species taken incidentally to the fishery or fisheries for
20 which the plan is prepared, and

21 "(B) to the maximum extent practicable, an
22 estimate by numbers of fish or weight thereof of
23 anticipated discard levels of fish and fish parts taken
24 pursuant to the fishery, but not utilized;

25 "(5) contain a description of measures intended to
26 reduce mortalities among non-target species taken
27 incidentally to the fishery or fisheries for which the plan is

103D CONGRESS
1ST SESSION

S. 1756

IN THE SENATE OF THE UNITED STATES

Mr. MURKOWSKI introduced the following bill; which was read twice and referred to the Committee on Commerce, Science & Transportation.

A BILL

To encourage the optimum utilization of fisheries resources, to reduce waste in commercial fish harvesting and processing, and for other purposes.

1 *Be it enacted by the Senate and House of Representatives of*
2 *the United States of America in Congress assembled.*

3 SECTION 1. SHORT TITLE

4 This Act may be cited as the "Commercial Fisheries Waste
5 Reduction Act of 1993".

6 SEC. 2. FINDINGS

7 The Congress finds that---

8 (1) Current commercial fisheries practices in the United
9 States and world wide contribute to a significant waste of edible
10 food resources which are harvested, but discarded without
11 processing for human consumption or other uses.

1 (2) Fish currently harvested but discarded without
2 processing include in some fisheries large numbers of juvenile
3 fish which would have significantly greater value both as an
4 economic asset to the fishery and to the maintenance of the
5 species if they were allowed to reach maturity before harvesting.

6 (3) Fish currently harvested but discarded without
7 processing include in some commercial fisheries significant
8 numbers of adult fish or fish parts which could be processed for
9 human consumption, but which are required to be discarded for
10 various fisheries management purposes, or which are
11 considered unsuitable for a particular market of immediate
12 interest to the fishing vessel operator.

13 (4) Fish currently harvested but discarded without
14 processing include significant numbers of fish of species for
15 which there is presently no viable market, but which, if they
16 remained unharvested, could form the basis for future fisheries
17 as new markets and processing techniques are developed.

18 (5) There is cause for concern that current levels of
19 mortalities among non-target fish species may have adverse
20 environmental consequences.

21 (6) High discard levels, if concentrated geographically,
22 may cause damage to the productivity of the resources using the
23 ocean bottom and near-bottom areas

24 (7) The current level of scientific knowledge is insufficient
25 to determine if adverse impacts may result from the removal of
26 nutrients presently returned to the ocean through the discard of

1993 Groundfish Discards by Gear and Target Species

* From Blended Data Through 11/13/93

Bering Sea and Aleutian Islands

GEAR	TARGET	SPECIES	TOTAL CATCH	TOTAL DISCARD	PERCENTAGE DISCARDED	PERCENTAGE OF TOTAL DISCARD
Jig	PCOD	PCOD	35	0	0.0	0.0
TOTAL			35	0	0.0	0
Pot	PCOD	AMCK	3	3	100.0	3.7
	PCOD	OTHR	46	44	95.7	54.3
	PCOD	PCOD	2098	25	1.2	30.9
	PCOD	PLCK	2	2	100.0	2.5
	PCOD	YSOL	7	7	100.0	8.6
TOTAL			2156	81	3.8	100.0

1993 Groundfish Discards by Gear and Target Species

* From Blended Data Through 11/13/93

Gulf of Alaska

GEAR	TARGET	SPECIES	TOTAL CATCH	TOTAL DISCARD	PERCENTAGE DISCARDED	PERCENTAGE OF TOTAL DISCARD
Jig	PCOD	DEMS	1	0	0.0	0.0
	PCOD	PCOD	5	0	0.0	0.0
	PCOD	PELS	1	0	0.0	0.0
	PCOD	SLPR	1	0	0.0	0.0
TOTAL			8	0	0.0	0.0
Jig	ROCK	DEMS	11	1	9.1	100.0
	ROCK	PCOD	2	0	0.0	0.0
	ROCK	PELS	101	0	0.0	0.0
	ROCK	SLPR	1	0	0.0	0.0
TOTAL			115	1	0.9	100.0
Pot	PCOD	ARTH	3	3	100.0	1.3
	PCOD	OTHR	196	124	63.3	54.6
	PCOD	PCOD	9708	81	0.8	35.7
	PCOD	PLCK	14	14	100.0	6.2
	PCOD	SFLT	5	5	100.0	2.2
TOTAL			9926	227	2.3	100.0

Code Table

TARGET CODE Species or Species Group

AMCK	Atka Mackerel
ARTH	Arrowtooth Flounder
RSOL/OFLAT	Rock Sole & Other Flatfish
GTRB	Greenland Turbot
ROCK	Rockfish
PCOD	Pacific Cod
PLCK-Mid	Midwater Pollock
PLCK-Bot	Bottom Pollock
SABL	Sablefish
YSOL	Yellowfin Sole
DFLT	Deepwater Flatfish
SFLT	Shallowwater Flatfish
OTHR	Other Species

SPECIES CODE Species or Species Group

AMCK	Atka Mackerel
ARTH	Arrowtooth Flounder
DEMS	Demersal Shelf Rockfish
FLOU	Other Flatfish
FSOL	Flathead Sole
GTRB	Greenland Turbot
NORK	Northern Rockfish
OTHR	Other Species
PCOD	Pacific Cod
PELS	Pelagic Shelf Rockfish
PLCK	Pollock
POP	Pacific Ocean Perch
ROCK	Other Rockfish
RSOL	Rock Sole
SABL	Sablefish
SCNO	Sharpchin & Northern Rockfish
SLPR	Slope Rockfish
SQID	Squid
SRRE	Shortraker & Roughey Rockfish
SRSN	Shortraker, Roughey, Sharpchin, & Northern Rockfish
THDS	Thornyheads
YSOL	Yellowfin Sole

1993 Groundfish Discards by Gear and Target Species

* From Blended Data Through 11/13/93

Bering Sea and Aleutian Islands

GEAR	TARGET	SPECIES	TOTAL CATCH	TOTAL DISCARD	PERCENTAGE DISCARDED	PERCENTAGE OF TOTAL DISCARD
Hook and Line	GTRB	ARTH	555	469	84.5	31.9
	GTRB	FLOU	102	100	98.0	6.8
	GTRB	GTRB	5995	326	5.4	22.1
	GTRB	OTHR	530	493	93.0	33.5
	GTRB	PCOD	113	27	23.9	1.8
	GTRB	PLCK	5	1	20.0	0.1
	GTRB	POP	1	0	0.0	0.0
	GTRB	ROCK	76	3	3.9	0.2
	GTRB	SABL	573	10	1.7	0.7
	GTRB	SRRE	100	42	42.0	2.9
	GTRB	SRSN	97	1	1.0	0.1
TOTAL			8147	1472	18.1	100.0

1993 Groundfish Discards by Gear and Target Species

* From Blended Data Through 11/13/93

Gulf of Alaska

GEAR	TARGET	SPECIES	TOTAL CATCH	TOTAL DISCARD	PERCENTAGE DISCARDED	PERCENTAGE OF TOTAL DISCARD	
Hook and Line	PCOD	ARTH	144	144	100.0	14.0	
	PCOD	DEMS	34	3	8.8	0.3	
	PCOD	OTHR	648	646	99.7	62.9	
	PCOD	PCOD	8188	204	2.5	19.9	
	PCOD	PELS	3	0	0.0	0.0	
	PCOD	PLCK	27	24	88.9	2.3	
	PCOD	SABL	29	4	13.8	0.4	
	PCOD	SFLT	1	1	100.0	0.1	
	PCOD	SLPR	3	0	0.0	0.0	
	PCOD	SRRE	11	1	9.1	0.1	
	PCOD	THDS	3	0	0.0	0.0	
	TOTAL			9091	1027	11.3	100.0
Hook and Line	ROCK	ARTH	2	2	100.0	5.0	
	ROCK	DEMS	538	8	1.5	20.0	
	ROCK	OTHR	13	12	92.3	30.0	
	ROCK	PCOD	37	5	13.5	12.5	
	ROCK	PELS	65	0	0.0	0.0	
	ROCK	POP	1	0	0.0	0.0	
	ROCK	SABL	39	13	33.3	32.5	
	ROCK	SFLT	2	0	0.0	0.0	
	ROCK	SLPR	6	0	0.0	0.0	
	ROCK	SRRE	34	0	0.0	0.0	
	ROCK	THDS	5	0	0.0	0.0	
	TOTAL			742	40	5.4	100.0
Hook and Line	SABL	ARTH	1726	1693	98.1	31.5	
	SABL	DEMS	90	18	20.0	0.3	
	SABL	DFLT	53	50	94.3	0.9	
	SABL	FSOL	1	0	0.0	0.0	
	SABL	GTRB	1036	1036	100.0	19.3	
	SABL	NORK	5	0	0.0	0.0	
	SABL	OTHR	1113	1095	98.4	20.4	
	SABL	PCOD	667	484	72.6	9.0	
	SABL	PELS	8	0	0.0	0.0	
	SABL	PLCK	2	2	100.0	0.0	
	SABL	POP	2	0	0.0	0.0	
	SABL	ROCK	83	83	100.0	1.5	
	SABL	SABL	22001	358	1.6	6.7	
	SABL	SFLT	3	3	100.0	0.1	
	SABL	SLPR	5	5	100.0	0.1	
	SABL	SRRE	594	243	40.9	4.5	
	SABL	THDS	688	305	44.3	5.7	
	TOTAL			28077	5375	19.1	100.0

1993 Groundfish Discards by Gear and Target Species

* From Blended Data Through 11/13/93

Gulf of Alaska

GEAR	TARGET	SPECIES	TOTAL CATCH	TOTAL DISCARD	PERCENTAGE DISCARDED	PERCENTAGE OF TOTAL DISCARD
Trawl	PLCK-Mid	AMCK	2	2	100.0	0.0
	PLCK-Mid	ARTH	285	256	89.8	4.9
	PLCK-Mid	DFLT	5	2	40.0	0.0
	PLCK-Mid	FSOL	16	14	87.5	0.3
	PLCK-Mid	NORK	7	0	0.0	0.0
	PLCK-Mid	OTHR	346	342	98.8	6.6
	PLCK-Mid	PCOD	499	308	61.7	5.9
	PLCK-Mid	PELS	2	2	100.0	0.0
	PLCK-Mid	PLCK	86215	4246	4.9	81.3
	PLCK-Mid	POP	1	0	0.0	0.0
	PLCK-Mid	SABL	16	1	6.3	0.0
	PLCK-Mid	SFLT	103	38	36.9	0.7
	PLCK-Mid	SRRE	10	9	90.0	0.2
	PLCK-Mid	THDS	1	0	0.0	0.0
	TOTAL			87508	5220	6.0
Trawl	ARTH	ARTH	1717	691	40.2	68.7
	ARTH	DEMS	2	1	50.0	0.1
	ARTH	DFLT	97	33	34.0	3.3
	ARTH	FSOL	55	28	50.9	2.8
	ARTH	NORK	1	1	100.0	0.1
	ARTH	OTHR	73	68	93.2	6.8
	ARTH	PCOD	114	20	17.5	2.0
	ARTH	PELS	24	5	20.8	0.5
	ARTH	PLCK	39	37	94.9	3.7
	ARTH	POP	56	41	73.2	4.1
	ARTH	SABL	90	20	22.2	2.0
	ARTH	SFLT	6	1	16.7	0.1
	ARTH	SLPR	24	22	91.7	2.2
	ARTH	SRRE	70	34	48.6	3.4
	ARTH	THDS	25	4	16.0	0.4
TOTAL			2393	1006	42.0	100.0

1993 Groundfish Discards by Gear and Target Species

* From Blended Data Through 11/13/93

Bering Sea and Aleutian Islands

GEAR	TARGET	SPECIES	TOTAL CATCH	TOTAL DISCARD	PERCENTAGE DISCARDED	PERCENTAGE OF TOTAL DISCARD
Hook and Line	PCOD	AMCK	21	17	81.0	0.1
	PCOD	ARTH	747	661	88.5	4.7
	PCOD	FLOU	206	197	95.6	1.4
	PCOD	GTRB	203	65	32.0	0.5
	PCOD	OTHR	8079	7037	87.1	49.7
	PCOD	PCOD	65609	4145	6.3	29.3
	PCOD	PLCK	2063	1809	87.7	12.8
	PCOD	POP	7	5	71.4	0.0
	PCOD	ROCK	51	34	66.7	0.2
	PCOD	RSOL	19	18	94.7	0.1
	PCOD	SABL	74	12	16.2	0.1
	PCOD	SCNO	21	18	85.7	0.1
	PCOD	SRRE	196	140	71.4	1.0
	PCOD	SRSN	10	3	30.0	0.0
	PCOD	YSOL	5	5	100.0	0.0
TOTAL			77311	14166	18.3	100.0
Hook and Line	ROCK	ARTH	13	13	100.0	20.0
	ROCK	GTRB	14	8	57.1	12.3
	ROCK	OTHR	6	6	100.0	9.2
	ROCK	PCOD	19	14	73.7	21.5
	ROCK	PLCK	1	1	100.0	1.5
	ROCK	POP	1	1	100.0	1.5
	ROCK	ROCK	49	8	16.3	12.3
	ROCK	SABL	22	2	9.1	3.1
	ROCK	SCNO	1	1	100.0	1.5
	ROCK	SRRE	25	11	44.0	16.9
	ROCK	SRSN	4	0	0.0	0.0
TOTAL			155	65	41.9	100.0
Hook and Line	SABL	ARTH	172	170	98.8	13.1
	SABL	FLOU	1	1	100.0	0.1
	SABL	GTRB	1035	800	77.3	61.6
	SABL	OTHR	183	179	97.8	13.8
	SABL	PCOD	32	15	46.9	1.2
	SABL	POP	2	2	100.0	0.2
	SABL	ROCK	268	25	9.3	1.9
	SABL	SABL	1903	22	1.2	1.7
	SABL	SCNO	4	0	0.0	0.0
	SABL	SRRE	101	83	82.2	6.4
	SABL	SRSN	1	1	100.0	0.1
	SABL	THDS	1	1	100.0	0.1
TOTAL			3703	1299	35.1	100.0

1993 Groundfish Discards by Gear and Target Species

* From Blended Data Through 11/13/93

Gulf of Alaska

GEAR	TARGET	SPECIES	TOTAL CATCH	TOTAL DISCARD	PERCENTAGE DISCARDED	PERCENTAGE OF TOTAL DISCARD
Trawl	DFLT	ARTH	7095	7012	98.8	70.9
	DFLT	DEMS	9	4	44.4	0.0
	DFLT	DFLT	4521	546	12.1	5.5
	DFLT	FSOL	895	350	39.1	3.5
	DFLT	NORK	2	1	50.0	0.0
	DFLT	OTHR	545	536	98.3	5.4
	DFLT	PCOD	1104	491	44.5	5.0
	DFLT	PELS	17	12	70.6	0.1
	DFLT	PLCK	298	284	95.3	2.9
	DFLT	POP	222	112	50.5	1.1
	DFLT	SABL	698	236	33.8	2.4
	DFLT	SFLT	386	88	22.8	0.9
	DFLT	SLPR	167	163	97.6	1.6
	DFLT	SRRE	219	22	10.0	0.2
	DFLT	THDS	200	30	15.0	0.3
TOTAL			16378	9887	60.4	100.0
Trawl	SFLT	AMCK	4	4	100.0	0.1
	SFLT	ARTH	2501	2385	95.4	37.9
	SFLT	DEMS	1	1	100.0	0.0
	SFLT	DFLT	634	135	21.3	2.1
	SFLT	FSOL	858	214	24.9	3.4
	SFLT	NORK	15	5	33.3	0.1
	SFLT	OTHR	708	704	99.4	11.2
	SFLT	PCOD	1775	868	48.9	13.8
	SFLT	PELS	21	14	66.7	0.2
	SFLT	PLCK	578	386	66.8	6.1
	SFLT	POP	35	33	94.3	0.5
	SFLT	SABL	160	47	29.4	0.7
	SFLT	SFLT	5240	1355	25.9	21.5
	SFLT	SLPR	7	7	100.0	0.1
	SFLT	SRRE	109	97	89.0	1.5
	SFLT	THDS	73	35	47.9	0.6
TOTAL			12719	6290	49.5	100.0

1993 Groundfish Discards by Gear and Target Species

* From Blended Data Through 11/13/93

Gulf of Alaska

GEAR	TARGET	SPECIES	TOTAL CATCH	TOTAL DISCARD	PERCENTAGE DISCARDED	PERCENTAGE OF TOTAL DISCARD
Trawl	PLCK-Bot	ARTH	573	573	100.0	11.2
	PLCK-Bot	DFLT	347	102	29.4	2.0
	PLCK-Bot	FSOL	347	87	25.1	1.7
	PLCK-Bot	NORK	1	0	0.0	0.0
	PLCK-Bot	OTHR	549	548	99.8	10.7
	PLCK-Bot	PCOD	2446	1225	50.1	24.0
	PLCK-Bot	PLCK	18533	1741	9.4	34.1
	PLCK-Bot	POP	17	8	47.1	0.2
	PLCK-Bot	RSOL	546	546	100.0	10.7
	PLCK-Bot	SABL	107	9	8.4	0.2
	PLCK-Bot	SFLT	935	259	27.7	5.1
	PLCK-Bot	SLPR	2	2	100.0	0.0
	PLCK-Bot	SRRE	17	2	11.8	0.0
	PLCK-Bot	THDS	11	4	36.4	0.1
TOTAL			24431	5106	20.9	100.0
Trawl	PCOD	ARTH	2167	2166	100.0	34.8
	PCOD	DEMS	5	5	100.0	0.1
	PCOD	DFLT	126	34	27.0	0.5
	PCOD	FSOL	221	130	58.8	2.1
	PCOD	NORK	6	3	50.0	0.0
	PCOD	OTHR	453	450	99.3	7.2
	PCOD	PCOD	30709	1388	4.5	22.3
	PCOD	PELS	57	54	94.7	0.9
	PCOD	PLCK	2253	963	42.7	15.5
	PCOD	POP	26	23	88.5	0.4
	PCOD	SABL	64	20	31.3	0.3
	PCOD	SFLT	1202	700	58.2	11.2
	PCOD	SLPR	280	279	99.6	4.5
	PCOD	SRRE	12	4	33.3	0.1
	PCOD	THDS	15	6	40.0	0.1
TOTAL			37596	6225	16.6	100.0

1993 Groundfish Discards by Gear and Target Species

* From Blended Data Through 11/13/93

Bering Sea and Aleutian Islands

GEAR	TARGET	SPECIES	TOTAL CATCH	TOTAL DISCARD	PERCENTAGE DISCARDED	PERCENTAGE OF TOTAL DISCARD
Trawl	PLCK-Mid	AMCK	41	40	97.6	0.1
	PLCK-Mid	ARTH	519	461	88.8	0.9
	PLCK-Mid	FLOU	2449	2300	93.9	4.3
	PLCK-Mid	GTRB	64	64	100.0	0.1
	PLCK-Mid	OTHR	1593	1561	98.0	2.9
	PLCK-Mid	PCOD	8236	6675	81.0	12.6
	PLCK-Mid	PLCK	1188893	38713	3.3	72.8
	PLCK-Mid	POP	200	194	97.0	0.4
	PLCK-Mid	ROCK	3	3	100.0	0.0
	PLCK-Mid	RSOL	2153	2132	99.0	4.0
	PLCK-Mid	SCNO	20	20	100.0	0.0
	PLCK-Mid	SQID	552	485	87.9	0.9
	PLCK-Mid	SRRE	2	2	100.0	0.0
	PLCK-Mid	SRSN	2	2	100.0	0.0
	PLCK-Mid	YSOL	523	500	95.6	0.9
TOTAL			1205250	53152	4.4	100.0
Trawl	PCOD	AMCK	3140	2760	87.9	5.4
	PCOD	ARTH	1752	1671	95.4	3.3
	PCOD	FLOU	2681	2520	94.0	5.0
	PCOD	GTRB	63	41	65.1	0.1
	PCOD	OTHR	2926	2746	93.8	5.4
	PCOD	PCOD	54775	7006	12.8	13.8
	PCOD	PLCK	29733	27294	91.8	53.7
	PCOD	POP	742	447	60.2	0.9
	PCOD	ROCK	26	24	92.3	0.0
	PCOD	RSOL	5735	5171	90.2	10.2
	PCOD	SABL	3	0	0.0	0.0
	PCOD	SCNO	360	265	73.6	0.5
	PCOD	SQID	4	3	75.0	0.0
	PCOD	SRRE	9	9	100.0	0.0
	PCOD	SRSN	17	17	100.0	0.0
	PCOD	YSOL	840	837	99.6	1.6
	TOTAL			102806	50811	49.4

1993 Groundfish Discards by Gear and Target Species

* From Blended Data Through 11/13/93

Gulf of Alaska

GEAR	TARGET	SPECIES	TOTAL CATCH	TOTAL DISCARD	PERCENTAGE DISCARDED	PERCENTAGE OF TOTAL DISCARD
Trawl	ROCK	AMCK	84	38	45.2	0.6
	ROCK	ARTH	1673	1536	91.8	25.7
	ROCK	DEMS	173	21	12.1	0.4
	ROCK	DFLT	196	138	70.4	2.3
	ROCK	FSOL	24	17	70.8	0.3
	ROCK	NORK	4289	805	18.8	13.5
	ROCK	OTHR	307	203	66.1	3.4
	ROCK	PCOD	288	195	67.7	3.3
	ROCK	PELS	2518	107	4.2	1.8
	ROCK	PLCK	130	130	100.0	2.2
	ROCK	POP	1245	985	79.1	16.5
	ROCK	SABL	1037	50	4.8	0.8
	ROCK	SFLT	15	11	73.3	0.2
	ROCK	SLPR	2961	1632	55.1	27.3
	ROCK	SRRE	766	73	9.5	1.2
	ROCK	THDS	238	40	16.8	0.7
TOTAL			15944	5981	37.5	100.0
Trawl	OTHR	AMCK	1718	87	5.1	2.6
	OTHR	ARTH	662	657	99.2	19.3
	OTHR	DEMS	66	61	92.4	1.8
	OTHR	DFLT	140	61	43.6	1.8
	OTHR	FSOL	312	53	17.0	1.6
	OTHR	NORK	464	412	88.8	12.1
	OTHR	OTHR	5146	397	7.7	11.6
	OTHR	PCOD	546	339	62.1	9.9
	OTHR	PELS	370	290	78.4	8.5
	OTHR	PLCK	64	61	95.3	1.8
	OTHR	POP	325	282	86.8	8.3
	OTHR	SABL	121	9	7.4	0.3
	OTHR	SFLT	60	41	68.3	1.2
	OTHR	SLPR	1644	598	36.4	17.5
	OTHR	SRRE	43	12	27.9	0.4
	OTHR	THDS	72	49	68.1	1.4
TOTAL			11753	3409	29.0	100.0

1993 Groundfish Discards by Gear and Target Species

* From Blended Data Through 11/13/93

Bering Sea and Aleutian Islands

GEAR	TARGET	SPECIES	TOTAL CATCH	TOTAL DISCARD	PERCENTAGE DISCARDED	PERCENTAGE OF TOTAL DISCARD
Trawl	RSOL/OFLAT	AMCK	15	8	53.3	0.0
	RSOL/OFLAT	ARTH	2314	2309	99.8	3.4
	RSOL/OFLAT	FLOU	11876	5532	46.6	8.1
	RSOL/OFLAT	GTRB	196	178	90.8	0.3
	RSOL/OFLAT	OTHR	4110	3978	96.8	5.9
	RSOL/OFLAT	PCOD	9541	6340	66.5	9.3
	RSOL/OFLAT	PLCK	21087	19337	91.7	28.5
	RSOL/OFLAT	POP	112	105	93.8	0.2
	RSOL/OFLAT	ROCK	4	4	100.0	0.0
	RSOL/OFLAT	RSOL	41982	24068	57.3	35.4
	RSOL/OFLAT	SABL	13	9	69.2	0.0
	RSOL/OFLAT	SCNO	2	1	50.0	0.0
	RSOL/OFLAT	SQID	2	2	100.0	0.0
	RSOL/OFLAT	SRRE	2	1	50.0	0.0
	RSOL/OFLAT	YSOL	11937	6095	51.1	9.0
TOTAL			103193	67967	65.9	100.0
Trawl	ROCK	AMCK	2916	1215	41.7	16.9
	ROCK	ARTH	1263	1123	88.9	15.6
	ROCK	FLOU	252	140	55.6	2.0
	ROCK	GTRB	644	78	12.1	1.1
	ROCK	OTHR	684	567	82.9	7.9
	ROCK	PCOD	976	260	26.6	3.6
	ROCK	PLCK	1610	1463	90.9	20.4
	ROCK	POP	15067	1673	11.1	23.3
	ROCK	ROCK	130	60	46.2	0.8
	ROCK	RSOL	63	59	93.7	0.8
	ROCK	SABL	55	5	9.1	0.1
	ROCK	SCNO	805	288	35.8	4.0
	ROCK	SQID	27	27	100.0	0.4
	ROCK	SRRE	180	148	82.2	2.1
	ROCK	SRSN	356	71	19.9	1.0
TOTAL			25028	7177	28.7	100.0
Trawl	YSOL	ARTH	901	864	95.9	1.7
	YSOL	FLOU	8908	6549	73.5	12.8
	YSOL	GTRB	5	5	100.0	0.0
	YSOL	OTHR	3566	3509	98.4	6.8
	YSOL	PCOD	7686	4207	54.7	8.2
	YSOL	PLCK	14789	13435	90.8	26.2
	YSOL	POP	5	5	100.0	0.0
	YSOL	RSOL	7104	4319	60.8	8.4
	YSOL	YSOL	81129	18355	22.6	35.8
TOTAL			124093	51248	41.3	100.0

1993 Groundfish Discards by Gear and Target Species

* From Blended Data Through 11/13/93

Bering Sea and Aleutian Islands

GEAR	TARGET	SPECIES	TOTAL CATCH	TOTAL DISCARD	PERCENTAGE DISCARDED	PERCENTAGE OF TOTAL DISCARD	
Trawl	AMCK	AMCK	58110	11617	20.0	63.0	
	AMCK	ARTH	168	168	100.0	0.9	
	AMCK	FLOU	5	4	80.0	0.0	
	AMCK	GTRB	118	116	98.3	0.6	
	AMCK	OTHR	309	309	100.0	1.7	
	AMCK	PCOD	4091	1980	48.4	10.7	
	AMCK	PLCK	141	104	73.8	0.6	
	AMCK	POP	840	526	62.6	2.9	
	AMCK	ROCK	66	43	65.2	0.2	
	AMCK	RSOL	100	90	90.0	0.5	
	AMCK	SABL	4	0	0.0	0.0	
	AMCK	SCNO	3538	3487	98.6	18.9	
	AMCK	SQID	1	1	100.0	0.0	
	AMCK	SRRE	654	5	0.8	0.0	
	TOTAL			68145	18450	27.1	100.0
Trawl	PLCK-Bot	AMCK	2	2	100.0	0.0	
	PLCK-Bot	ARTH	567	436	76.9	2.1	
	PLCK-Bot	FLOU	1570	1081	68.9	5.3	
	PLCK-Bot	GTRB	18	10	55.6	0.0	
	PLCK-Bot	OTHR	1405	1231	87.6	6.0	
	PLCK-Bot	PCOD	11997	4642	38.7	22.8	
	PLCK-Bot	PLCK	85140	7091	8.3	34.8	
	PLCK-Bot	POP	97	87	89.7	0.4	
	PLCK-Bot	RSOL	6576	5355	81.4	26.3	
	PLCK-Bot	SABL	1	0	0.0	0.0	
	PLCK-Bot	SCNO	9	7	77.8	0.0	
	PLCK-Bot	SQID	36	0	0.0	0.0	
	PLCK-Bot	YSOL	530	416	78.5	2.0	
	TOTAL			107948	20358	18.9	100.0
	Trawl	SABL	ARTH	13	13	100.0	23.6
SABL		GTRB	20	20	100.0	36.4	
SABL		PLCK	15	15	100.0	27.3	
SABL		ROCK	1	1	100.0	1.8	
SABL		SABL	19	0	0.0	0.0	
SABL		SQID	5	5	100.0	9.1	
SABL		SRRE	1	1	100.0	1.8	
TOTAL				74	55	74.3	100.0

1992 Groundfish Discards by Gear and Target Species

* From Blended Data

Gulf of Alaska

GEAR	TARGET	SPECIES	TOTAL CATCH (MT)	TOTAL DISCARD (MT)	PERCENTAGE DISCARDED	PERCENTAGE OF TOTAL DISCARD
Trawl	DFLT	AMCK	2	0	0.0	0.00
	DFLT	ARTH	9378	9279	98.9	72.08
	DFLT	DEMS	8	1	12.5	0.01
	DFLT	DFLT	6413	742	11.6	5.76
	DFLT	FSOL	784	169	21.6	1.31
	DFLT	OTHR	672	669	99.6	5.20
	DFLT	PCOD	1113	237	21.3	1.84
	DFLT	PELS	55	24	43.6	0.19
	DFLT	PLCK	1404	1086	77.4	8.44
	DFLT	POP	313	281	89.8	2.18
	DFLT	SABL	619	127	20.5	0.99
	DFLT	SFLT	485	84	17.3	0.65
	DFLT	SLPR	169	90	53.3	0.70
	DFLT	SRRE	130	22	16.9	0.17
	DFLT	THDS	326	63	19.3	0.49
TOTAL			21871	12874	58.9	100.00
Trawl	SFLT	ARTH	1660	1660	100.0	46.23
	SFLT	DEMS	2	1	50.0	0.03
	SFLT	DFLT	476	163	34.2	4.54
	SFLT	FSOL	469	24	5.1	0.67
	SFLT	OTHR	574	571	99.5	15.90
	SFLT	PCOD	1116	333	29.8	9.27
	SFLT	PELS	19	2	10.5	0.06
	SFLT	PLCK	711	395	55.6	11.00
	SFLT	POP	7	7	100.0	0.19
	SFLT	SABL	125	13	10.4	0.36
	SFLT	SFLT	3903	409	10.5	11.39
	SFLT	SLPR	63	8	12.7	0.22
	SFLT	SRRE	36	4	11.1	0.11
	SFLT	THDS	42	1	2.4	0.03
	TOTAL			9203	3591	39.0

Table 2. Calculated discard mortality rates (percent) for halibut in 1990 through 1992 groundfish fisheries. Alternatives for projecting 1994 discard mortality rates are also shown, along with the rates used by NMFS for 1993 fishery management.

Region/Fishery	Disc. Mortality Rate			1994 Alternatives ¹			Used In'93
	1990	1991	1992	Alt. A	Alt. B	Alt. C	
BSAI TRAWL							
MWT Pollock	81	81	87	84	83	83	80
Atka mackerel	69	73	62	68	68	70	70
Rocksole/O. flats	58	68	78	73	68	65	70
Yellowfin sole	73	74	78	76	75	75	70
Pacific cod	68	60	67	63	65	65	60
BT Pollock	65	59	76	68	67	66	60
Rockfish	62	54	59	56	58	59	60
Arrowtooth	57	41	68	54	55	48	40
Gmld. turbot	58	38	-	38	48	53	40
Other sp.	36	29	75	52	46	54	40
GOA TRAWL							
MWT Pollock	63	74	69	72	69	66	75
Rockfish	61	65	69	67	65	62	60
Shallwtr flats	63	61	62	62	62	62	60
Other sp.	65	59	64	61	62	62	60
BT Pollock	62	56	70	63	63	63	55
Pacific cod	61	55	60	58	59	58	55
Deepwtr flats	57	52	59	56	56	57	55
BSAI H&L							
Pacific cod	17	21	19	20	19	18	18
Sablefish	12	17	19	18	16	14	12.5/15
Rockfish	19	29	9	19	19	21	12.5/15
Gmld. turbot	12	42	17	30	24	17	12.5/15
GOA H&L							
Pacific cod	13	17	30	23	20	17	16
Sablefish	11	28	23	25	20	13	14/17
Rockfish	15	20	-	20	17	15	11.5/14
BSAI POT							
Pacific cod	7	3	12	8	8	10	5
GOA POT							
Pacific cod	10	4	16	10	10	13	5

¹Alt. A = 2-year running average; Alt. B = 3-year running average; Alt. C = pooled 1990-92 data.

1992 Groundfish Discards by Gear and Target Species

* From Blended Data

State of Alaska

GEAR	TARGET	SPECIES	TOTAL CATCH (MT)	TOTAL DISCARD (MT)	PERCENTAGE DISCARDED	PERCENTAGE OF TOTAL DISCARD
Trawl	PLCK-Bot	ARTH	692	681	98.4	24.18
	PLCK-Bot	DEMS	2	2	100.0	0.07
	PLCK-Bot	DFLT	255	39	15.3	1.38
	PLCK-Bot	FLOU	1	1	100.0	0.04
	PLCK-Bot	FSOL	185	43	23.2	1.53
	PLCK-Bot	GTRB	1	1	100.0	0.04
	PLCK-Bot	OTHR	150	146	97.3	5.18
	PLCK-Bot	PCOD	791	69	8.7	2.45
	PLCK-Bot	PELS	8	2	25.0	0.07
	PLCK-Bot	PLCK	20843	1629	7.8	57.85
	PLCK-Bot	POP	102	97	95.1	3.44
	PLCK-Bot	ROCK	1	1	100.0	0.04
	PLCK-Bot	SABL	66	10	15.2	0.36
	PLCK-Bot	SFLT	308	86	27.9	3.05
	PLCK-Bot	SLPR	8	5	62.5	0.18
	PLCK-Bot	SQID	3	1	33.3	0.04
	PLCK-Bot	SRRE	9	2	22.2	0.07
PLCK-Bot	THDS	12	1	8.3	0.04	
TOTAL			23437	2816	12.0	100.00
Trawl	PCOD	AMCK	3	1	33.3	0.01
	PCOD	ARTH	2303	2276	98.8	15.29
	PCOD	DEMS	12	9	75.0	0.06
	PCOD	DFLT	412	60	14.6	0.40
	PCOD	FLOU	507	507	100.0	3.41
	PCOD	FSOL	470	201	42.8	1.35
	PCOD	OTHR	1281	1279	99.8	8.59
	PCOD	PCOD	49458	1624	3.3	10.91
	PCOD	PELS	121	50	41.3	0.34
	PCOD	PLCK	7921	6836	86.3	45.93
	PCOD	POP	32	26	81.3	0.17
	PCOD	RSOL	491	491	100.0	3.30
	PCOD	SABL	74	21	28.4	0.14
	PCOD	SCNO	5	5	100.0	0.03
	PCOD	SFLT	2858	1383	48.4	9.29
	PCOD	SLPR	167	113	67.7	0.76
	PCOD	SRRE	45	1	2.2	0.01
PCOD	THDS	19	2	10.5	0.01	
TOTAL			66179	14885	22.5	100.00

1992 Groundfish Discards by Gear and Target Species

* From Blended Data

Gulf of Alaska

GEAR	TARGET	SPECIES	TOTAL CATCH (MT)	TOTAL DISCARD (MT)	PERCENTAGE DISCARDED	PERCENTAGE OF TOTAL DISCARD
Trawl	ROCK	AMCK	115	64	55.7	0.72
	ROCK	ARTH	4176	3937	94.3	44.04
	ROCK	DEMS	101	22	21.8	0.25
	ROCK	DFLT	418	237	56.7	2.65
	ROCK	FSOL	68	22	32.4	0.25
	ROCK	OTHR	387	295	76.2	3.30
	ROCK	PCOD	580	182	31.4	2.04
	ROCK	PELS	2887	145	5.0	1.62
	ROCK	PLCK	545	406	74.5	4.54
	ROCK	POP	5241	957	18.3	10.71
	ROCK	SABL	1717	370	21.5	4.14
	ROCK	SFLT	64	30	46.9	0.34
	ROCK	SLPR	8335	2084	25.0	23.31
	ROCK	SQID	6	6	100.0	0.07
	ROCK	SRRE	1480	141	9.5	1.58
	ROCK	THDS	736	41	5.6	0.46
TOTAL			26856	8939	33.3	100.00
	OTHR	DFLT	296	228	77.0	1.13
	OTHR	FSOL	182	8	4.4	0.04
	OTHR	OTHR	5029	392	7.8	1.94
	OTHR	PCOD	971	544	56.0	2.69
	OTHR	PELS	65	31	47.7	0.15
	OTHR	PLCK	229	184	80.3	0.91
	OTHR	POP	640	328	51.3	1.62
	OTHR	SABL	36	13	36.1	0.06
	OTHR	SFLT	57	22	38.6	0.11
	OTHR	SLPR	729	614	84.2	3.03
	OTHR	SRRE	45	7	15.6	0.03
	OTHR	THDS	19	6	31.6	0.03
TOTAL			62010	20255	32.7	100.00
Trawl	PLCK-Mid	ARTH	300	288	96.0	5.02
	PLCK-Mid	DFLT	13	12	92.3	0.21
	PLCK-Mid	FLOU	13	13	100.0	0.23
	PLCK-Mid	FSOL	23	20	87.0	0.35
	PLCK-Mid	GTRB	1	1	100.0	0.02
	PLCK-Mid	OTHR	330	326	98.8	5.69
	PLCK-Mid	PCOD	238	54	22.7	0.94
	PLCK-Mid	PELS	4	4	100.0	0.07
	PLCK-Mid	PLCK	61646	4940	8.0	86.18
	PLCK-Mid	POP	8	1	12.5	0.02
	PLCK-Mid	ROCK	1	1	100.0	0.02
	PLCK-Mid	SABL	11	0	0.0	0.00
	PLCK-Mid	SFLT	63	61	96.8	1.06
	PLCK-Mid	SLPR	1	1	100.0	0.02
	PLCK-Mid	SQID	16	9	56.3	0.16
	PLCK-Mid	SRRE	1	1	100.0	0.02
TOTAL			62669	5732	9.1	100.00

1992 Groundfish Discards by Gear and Target Species

* From Blended Data

Ring Sea and Aleutian Islands

GEAR	TARGET	SPECIES	TOTAL CATCH (MT)	TOTAL DISCARD (MT)	PERCENTAGE DISCARDED	PERCENTAGE OF TOTAL DISCARD
Trawl	AMCK	AMCK	43844	6375	14.5	63.99
	AMCK	ARTH	205	196	95.6	1.97
	AMCK	FLOU	39	29	74.4	0.29
	AMCK	GTRB	34	11	32.4	0.11
	AMCK	OTHR	191	191	100.0	1.92
	AMCK	PCOD	3390	861	25.4	8.64
	AMCK	PLCK	566	299	52.8	3.00
	AMCK	POP	1923	808	42.0	8.11
	AMCK	ROCK	141	107	75.9	1.07
	AMCK	RSOL	44	33	75.0	0.33
	AMCK	SABL	5	0	0.0	0.00
	AMCK	SCNO	1143	1017	89.0	10.21
	AMCK	SQID	2	2	100.0	0.02
	AMCK	SRRE	194	30	15.5	0.30
	AMCK	SRSN	4	3	75.0	0.03
TOTAL			51725	9962	19.3	100.00
Trawl	PLCK-Bot	AMCK	19	2	10.5	0.01
	PLCK-Bot	ARTH	1275	1002	78.6	5.16
	PLCK-Bot	FLOU	2959	2445	82.6	12.58
	PLCK-Bot	FSOL	9	9	100.0	0.05
	PLCK-Bot	GTRB	57	44	77.2	0.23
	PLCK-Bot	OTHR	1709	1432	83.8	7.37
	PLCK-Bot	PCOD	9693	1409	14.5	7.25
	PLCK-Bot	PLCK	96582	10139	10.5	52.19
	PLCK-Bot	POP	8	5	62.5	0.03
	PLCK-Bot	ROCK	393	3	0.8	0.02
	PLCK-Bot	RSOL	3715	2424	65.2	12.48
	PLCK-Bot	SCNO	11	1	9.1	0.01
	PLCK-Bot	SQID	52	8	15.4	0.04
	PLCK-Bot	YSOL	653	505	77.3	2.60
TOTAL			117135	19428	16.6	100.00
Trawl	YSOL	AMCK	1	1	100.0	0.00
	YSOL	ARTH	437	418	95.7	0.48
	YSOL	FLOU	17115	14311	83.6	16.57
	YSOL	GTRB	1	1	100.0	0.00
	YSOL	OTHR	7924	7640	96.4	8.85
	YSOL	PCOD	8539	4650	54.5	5.38
	YSOL	PLCK	12804	11053	86.3	12.80
	YSOL	RSOL	14462	9964	68.9	11.54
	YSOL	YSOL	138009	38314	27.8	44.37
TOTAL			199292	86352	43.3	100.00

1992 Groundfish Discards by Gear and Target Species

* From Blended Data

Bering Sea and Aleutian Islands

GEAR	TARGET	SPECIES	TOTAL CATCH (MT)	TOTAL DISCARD (MT)	PERCENTAGE DISCARDED	PERCENTAGE OF TOTAL DISCARD
Trawl	PCOD	AMCK	3071	2168	70.6	7.09
	PCOD	ARTH	2865	2724	95.1	8.91
	PCOD	FLOU	2379	2045	86.0	6.69
	PCOD	FSOL	17	17	100.0	0.06
	PCOD	GTRB	81	67	82.7	0.22
	PCOD	OTHR	2989	2865	95.9	9.37
	PCOD	PCOD	47913	3343	7.0	10.94
	PCOD	PLCK	16617	13936	83.9	45.59
	PCOD	POP	616	288	46.8	0.94
	PCOD	ROCK	79	76	96.2	0.25
	PCOD	RSOL	3501	2381	68.0	7.79
	PCOD	SABL	10	1	10.0	0.00
	PCOD	SCNO	376	323	85.9	1.06
	PCOD	SQID	13	13	100.0	0.04
	PCOD	SRRE	30	5	16.7	0.02
	PCOD	SRSN	55	45	81.8	0.15
	PCOD	YSOL	276	274	99.3	0.90
TOTAL			80888	30571	37.8	100.00
Trawl	RSOL/OFLAT	AMCK	10	3	30.0	0.01
	RSOL/OFLAT	ARTH	770	768	99.7	2.06
	RSOL/OFLAT	FLOU	6067	4277	70.5	11.47
	RSOL/OFLAT	GTRB	4	0	0.0	0.00
	RSOL/OFLAT	OTHR	3531	3484	98.7	9.34
	RSOL/OFLAT	PCOD	5766	2472	42.9	6.63
	RSOL/OFLAT	PLCK	11346	10173	89.7	27.29
	RSOL/OFLAT	POP	22	22	100.0	0.06
	RSOL/OFLAT	RSOL	26843	12686	47.3	34.03
	RSOL/OFLAT	YSOL	7539	3398	45.1	9.11
TOTAL			61898	37283	60.2	100.00
Trawl	ROCK	AMCK	2164	806	37.2	14.01
	ROCK	ARTH	1556	1543	99.2	26.82
	ROCK	FLOU	243	122	50.2	2.12
	ROCK	GTRB	220	33	15.0	0.57
	ROCK	OTHR	537	530	98.7	9.21
	ROCK	PCOD	1241	330	26.6	5.74
	ROCK	PLCK	1338	1239	92.6	21.53
	ROCK	POP	10708	743	6.9	12.91
	ROCK	ROCK	133	104	78.2	1.81
	ROCK	RSOL	61	40	65.6	0.70
	ROCK	SABL	25	2	8.0	0.03
	ROCK	SCNO	273	156	57.1	2.71
	ROCK	SQID	14	14	100.0	0.24
	ROCK	SRRE	766	66	8.6	1.15
	ROCK	SRSN	65	26	40.0	0.45
TOTAL			19344	5754	29.7	100.00

1992 Groundfish Discards by Gear and Target Species

AGENDA D-2(b)(1)
JANUARY 1994

* From Blended Data

Bering Sea and Aleutian Islands

GEAR	TARGET	SPECIES	TOTAL CATCH (MT)	TOTAL DISCARD (MT)	PERCENTAGE DISCARDED	PERCENTAGE OF TOTAL DISCARD
Hook and Line	PCOD	AMCK	57	31	54.4	0.17
	PCOD	ARTH	1671	1611	96.4	8.79
	PCOD	FLOU	279	261	93.5	1.42
	PCOD	GTRB	577	460	79.7	2.51
	PCOD	OTHR	11259	10459	92.9	57.04
	PCOD	PCOD	101710	1866	1.8	10.18
	PCOD	PLCK	3222	3116	96.7	16.99
	PCOD	POP	114	98	86.0	0.53
	PCOD	ROCK	199	46	23.1	0.25
	PCOD	RSOL	28	25	89.3	0.14
	PCOD	SABL	179	20	11.2	0.11
	PCOD	SCNO	45	39	86.7	0.21
	PCOD	SRRE	462	215	46.5	1.17
	PCOD	YSOL	91	90	98.9	0.49
	TOTAL			119893	18337	15.3
Hook and Line	SABL	ARTH	268	265	98.9	14.20
	SABL	FLOU	1	1	100.0	0.05
	SABL	GTRB	1445	1256	86.9	67.31
	SABL	OTHR	146	144	98.6	7.72
	SABL	PCOD	139	100	71.9	5.36
	SABL	PLCK	1	1	100.0	0.05
	SABL	ROCK	225	30	13.3	1.61
	SABL	SABL	1807	19	1.1	1.02
	SABL	SCNO	3	2	66.7	0.11
	SABL	SRRE	30	24	80.0	1.29
	SABL	SRSN	16	9	56.3	0.48
	SABL	THDS	30	15	50.0	0.80
	TOTAL			4111	1866	45.4
Hook and Line	GTRB	ARTH	4	4	100.0	14.29
	GTRB	GTRB	75	13	17.3	46.43
	GTRB	OTHR	10	10	100.0	35.71
	GTRB	PCOD	12	0	0.0	0.00
	GTRB	ROCK	2	0	0.0	0.00
	GTRB	SABL	28	0	0.0	0.00
	GTRB	SRRE	2	1	50.0	3.57
TOTAL			133	28	21.1	100.00

1992 Groundfish Discards by Gear and Target Species

* From Blended Data

Bering Sea and Aleutian Islands

GEAR	TARGET	SPECIES	TOTAL CATCH (MT)	TOTAL DISCARD (MT)	PERCENTAGE DISCARDED	PERCENTAGE OF TOTAL DISCARD
Pot	PCOD	AMCK	12	12	100.0	1.59
	PCOD	ARTH	3	3	100.0	0.40
	PCOD	FLOU	1	1	100.0	0.13
	PCOD	GTRB	9	9	100.0	1.19
	PCOD	OTHR	670	591	88.2	78.28
	PCOD	PCOD	13680	103	0.8	13.64
	PCOD	PLCK	7	7	100.0	0.93
	PCOD	ROCK	2	2	100.0	0.26
	PCOD	RSOL	2	2	100.0	0.26
	PCOD	SABL	13	0	0.0	0.00
	PCOD	SCNO	1	1	100.0	0.13
	PCOD	YSOL	24	24	100.0	3.18
TOTAL			14424	755	5.2	100.00

1992 Groundfish Discards by Gear and Target Species

* From Blended Data

Gulf of Alaska

GEAR	TARGET	SPECIES	TOTAL CATCH (MT)	TOTAL DISCARD (MT)	PERCENTAGE DISCARDED	PERCENTAGE OF TOTAL DISCARD
Jig	PCOD	PCOD	154	0	0.0	0.00
	PCOD	PELS	3	0	0.0	0.00
TOTAL			157	0	0.0	0.00
Pot	PCOD	ARTH	1	1	100.0	0.39
	PCOD	OTHR	174	98	56.3	37.84
	PCOD	PCOD	9984	158	1.6	61.00
	PCOD	PLCK	2	1	50.0	0.39
	PCOD	SFLT	1	1	100.0	0.39
	PCOD	SRRE	1	0	0.0	0.00
TOTAL			10163	259	2.5	100.00

1992 Groundfish Discards by Gear and Target Species

* From Blended Data

State of Alaska

GEAR	TARGET	SPECIES	TOTAL CATCH (MT)	TOTAL DISCARD (MT)	PERCENTAGE DISCARDED	PERCENTAGE OF TOTAL DISCARD
Hook and Line	PCOD	AMCK	1	1	100.0	0.08
	PCOD	ARTH	209	208	99.5	17.35
	PCOD	DEMS	49	3	6.1	0.25
	PCOD	DFLT	3	1	33.3	0.08
	PCOD	FSOL	3	3	100.0	0.25
	PCOD	GTRB	13	13	100.0	1.08
	PCOD	OTHR	618	610	98.7	50.88
	PCOD	PCOD	14891	194	1.3	16.18
	PCOD	PELS	17	4	23.5	0.33
	PCOD	PLCK	60	51	85.0	4.25
	PCOD	ROCK	1	1	100.0	0.08
	PCOD	SABL	138	81	58.7	6.76
	PCOD	SFLT	10	10	100.0	0.83
	PCOD	SLPR	7	0	0.0	0.00
	PCOD	SRRE	20	14	70.0	1.17
	PCOD	THDS	24	5	20.8	0.42
TOTAL			16064	1199	7.5	100.00
Hook and Line	ROCK	ARTH	3	3	100.0	16.67
	ROCK	DEMS	516	0	0.0	0.00
	ROCK	OTHR	4	2	50.0	11.11
	ROCK	PCOD	56	2	3.6	11.11
	ROCK	PELS	106	0	0.0	0.00
	ROCK	SABL	44	10	22.7	55.56
	ROCK	SLPR	10	0	0.0	0.00
	ROCK	SRRE	98	1	1.0	5.56
	ROCK	THDS	9	0	0.0	0.00
TOTAL			846	18	2.1	100.00
Hook and Line	SABL	ARTH	1266	1259	99.4	19.23
	SABL	DEMS	213	6	2.8	0.09
	SABL	DFLT	61	41	67.2	0.63
	SABL	FSOL	3	3	100.0	0.05
	SABL	GTRB	3176	3176	100.0	48.51
	SABL	OTHR	815	813	99.8	12.42
	SABL	PCOD	510	335	65.7	5.12
	SABL	PELS	45	0	0.0	0.00
	SABL	PLCK	13	13	100.0	0.20
	SABL	POP	6	0	0.0	0.00
	SABL	ROCK	11	2	18.2	0.03
	SABL	SABL	20477	287	1.4	4.38
	SABL	SFLT	1	1	100.0	0.02
	SABL	SLPR	57	0	0.0	0.00
	SABL	SRRE	545	286	52.5	4.37
	SABL	THDS	830	325	39.2	4.96
	TOTAL			28029	6547	23.4

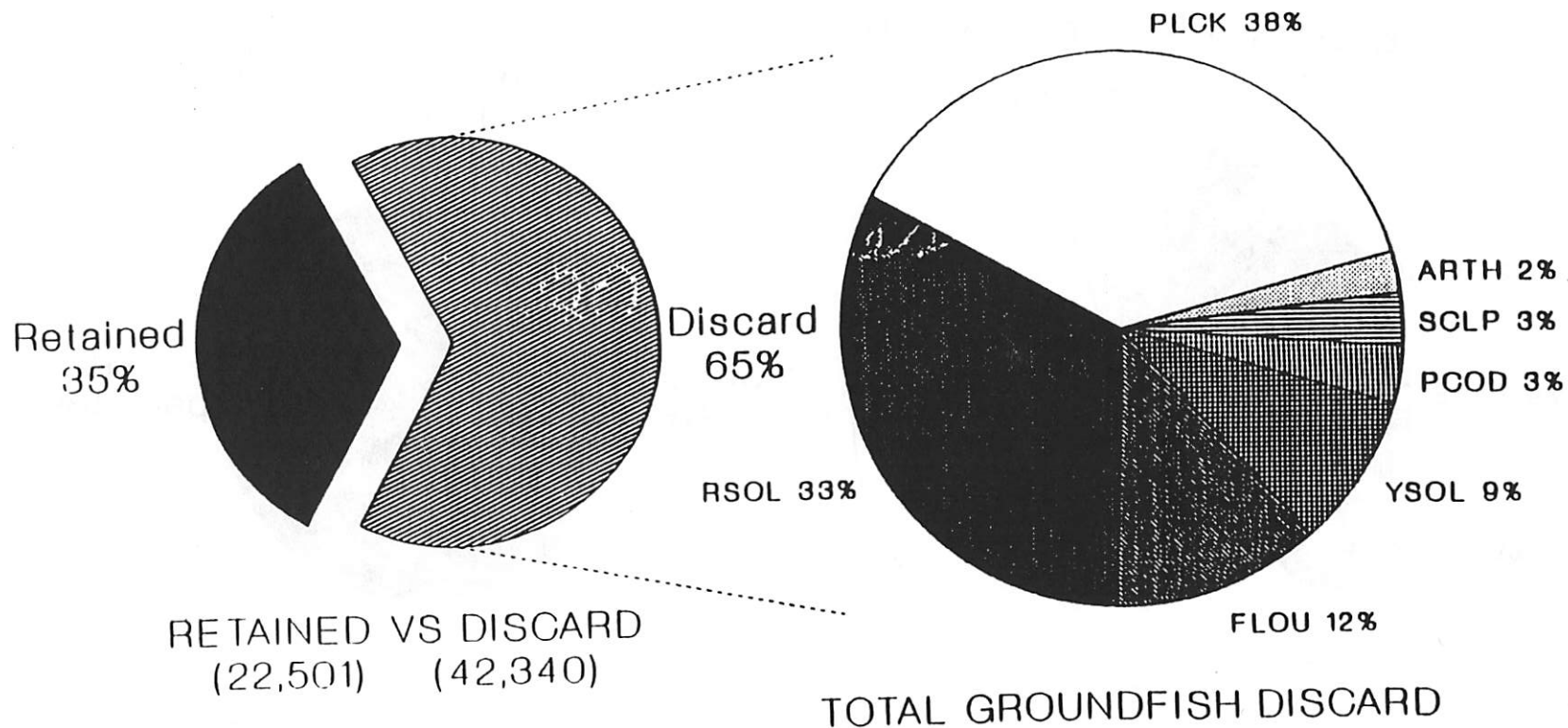
1992 Groundfish Discards by Gear and Target Species

* From Blended Data

Bering Sea and Aleutian Islands

GEAR	TARGET	SPECIES	TOTAL CATCH (MT)	TOTAL DISCARD (MT)	PERCENTAGE DISCARDED	PERCENTAGE OF TOTAL DISCARD
Trawl	PLCK-Mid	AMCK	242	219	90.5	0.21
	PLCK-Mid	ARTH	2798	2635	94.2	2.52
	PLCK-Mid	FLOU	5627	5065	90.0	4.85
	PLCK-Mid	FSOL	1	1	100.0	0.00
	PLCK-Mid	GTRB	251	187	74.5	0.18
	PLCK-Mid	OTHR	3361	3190	94.9	3.05
	PLCK-Mid	PCOD	13492	8658	64.2	8.28
	PLCK-Mid	PLCK	1295473	80653	6.2	77.15
	PLCK-Mid	POP	165	145	87.9	0.14
	PLCK-Mid	ROCK	20	17	85.0	0.02
	PLCK-Mid	RSOL	3268	3061	93.7	2.93
	PLCK-Mid	SABL	8	4	50.0	0.00
	PLCK-Mid	SCNO	9	8	88.9	0.01
	PLCK-Mid	SQID	798	505	63.3	0.48
	PLCK-Mid	SRRE	9	9	100.0	0.01
	PLCK-Mid	SRSN	2	1	50.0	0.00
	PLCK-Mid	YSOL	186	176	94.6	0.17
TOTAL			1325710	104534	7.9	100.00

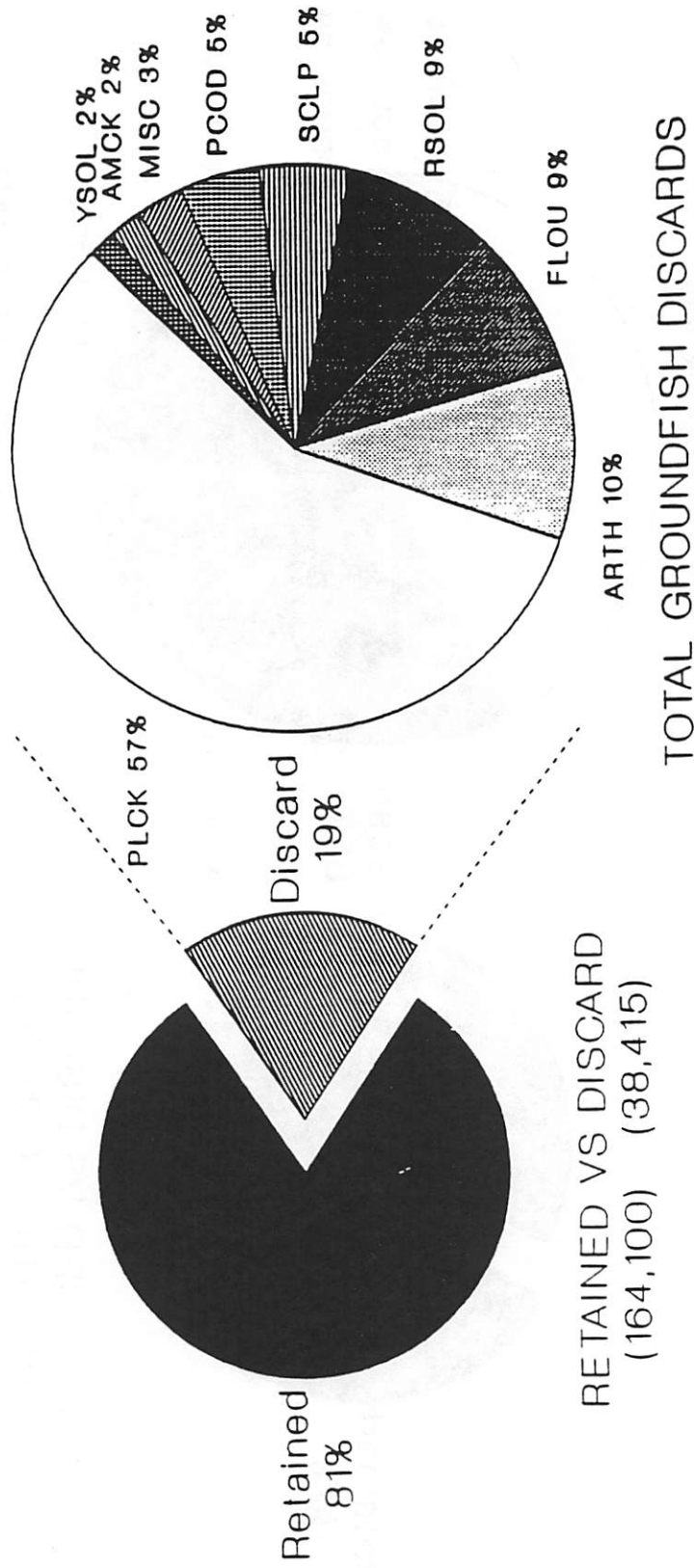
1991 GROUND FISH DISCARD, RSOL FISHERY BERING SEA/ALEUTIAN ISLANDS, ALL GEAR



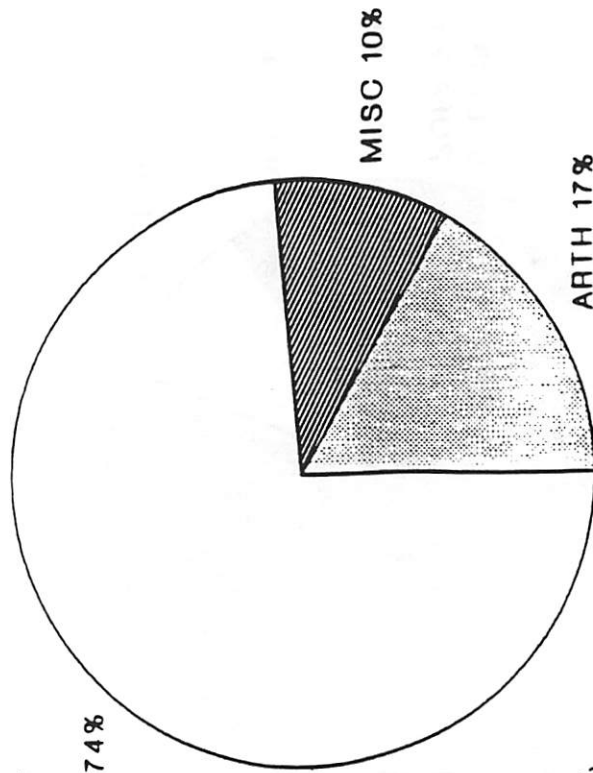
PLCK -- pollock
 RSOL -- rocksole
 ARTH -- arrowtooth flounder
 PCOD -- Pacific cod
 FLOU -- flounder (flatfishes)
 YSOL -- yellowfin sole
 SCLP -- sculpins

5/28/92

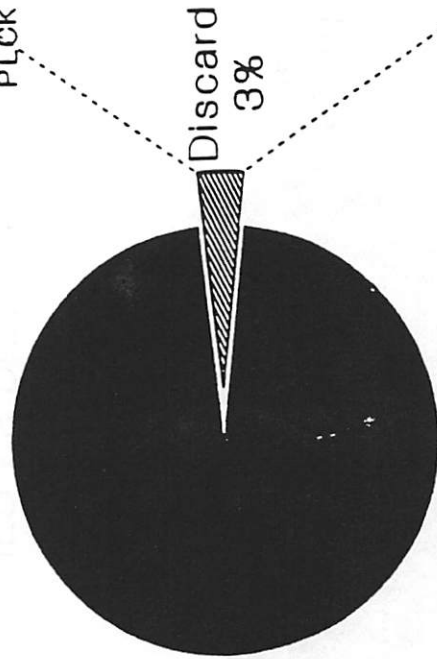
1991 GROUNDFISH DISCARD, PCOD FISHERY BERING SEA/ALEUTIAN ISLANDS, ALL GEAR



1991 GROUNDFISH DISCARD, PLCK FISHERY GULF OF ALASKA, ALL GEAR

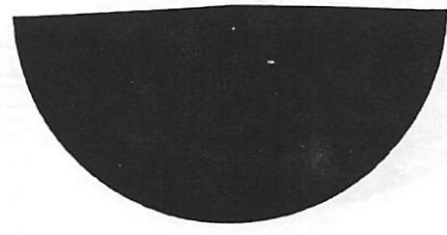
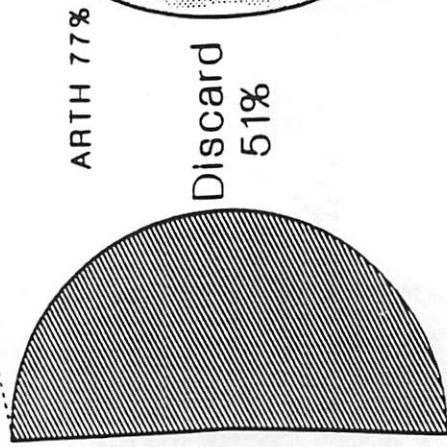
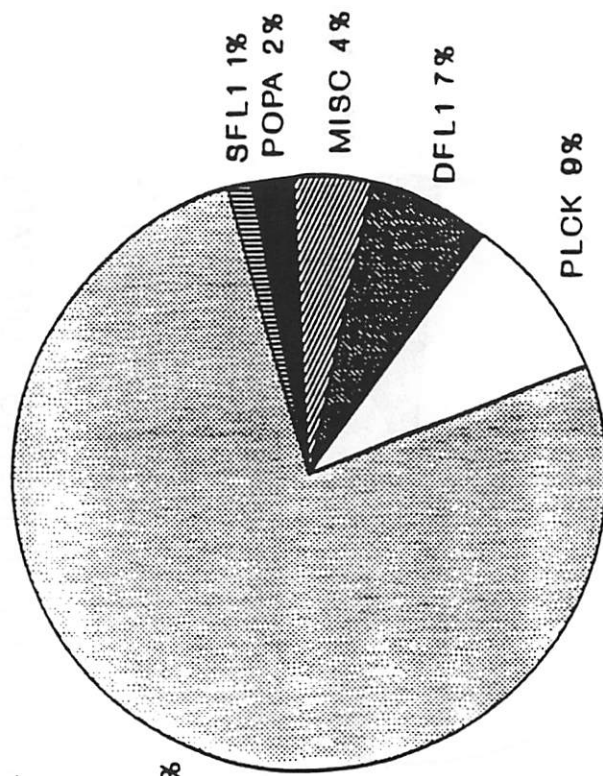


TOTAL GROUNDFISH DISCARDS



RETAINED VS DISCARD
(87,041) (3,089)

1991 GROUND FISH DISCARD, DFL1 FISHERY GULF OF ALASKA, ALL GEAR



Retained
49%

Discard
51%

RETAINED VS DISCARD
(10,952) (11,493)

- PLCK -- pollock
- DFL1 -- deep water flatfish
- SFL1 -- shallow water flatfish
- ARTH -- arrowtooth flounder
- PCOD -- Pacific cod
- MISC -- miscellaneous
- POPA -- Pacific ocean perch

6/28/92