

# Twenty Per cent of the World Fisheries Catch is Discarded

In a landmark study of the annual quantity of incidental organisms discarded during fishing operations, a new estimate of 27 million tonnes worldwide has been determined.

Results of the study by D.A. Alverson, M.H. Freeberg, J.G. Pope and J.A. Murawski for Natural Resources Consultants of Seattle, were presented at the Conference on Fisheries Management: Global Trends, Seattle, 14-16 June 1994.

The authors examined over 800 papers containing quantitative and qualitative information to characterize the nature and scope of regional and global incidental catch and discard problems. Mortalities associated with discarding practices were also reviewed. Following are excerpts from their paper.

The authors provided a provisional estimate of global discards in commercial fisheries of 27.0 million t with a range of 17.9 to 39.5 million t. The region with the highest discard estimate is the Northwest Pacific. Shrimp trawl fisheries, particularly for tropical species, were found to generate more discards than any other fishery type and account for just over one-third of the global total. On a weight-per-weight basis, fourteen of the highest twenty discard ratios were associated with shrimp trawls. The fisheries associated with the twenty highest numbers-based ratios represented a variety of shrimp trawl, pot, fish trawl, and longline fishery gear types. At the opposite end of the scale, fish trawl, seine, and high seas driftnet fisheries accounted for the majority of the gear types in the

authors' list of the ten lowest discard ratios.

Although the data are tremendously variable, four major gear groups stand out. Shrimp trawls are alone at the top of the list, while relatively low levels are recorded for pelagic trawls, purse seines targeting on menhaden, sardines, and anchoveta, and some of the high seas driftnet fisheries. Between these two extremes lie two other groups. The first of these is comprised of bottom trawls, unspecified trawls, longline gear, and the majority of the pot fisheries. The final

group fits between the very low ratios of the pelagic trawl group and the moderate ratios of the aforementioned bottom trawl/pot/line assemblage. Fisheries in this last group include the Japanese high seas driftnet fisheries, Danish seines, and purse seines for capelin.

The authors note there is in most instances inadequate data to determine the biological, ecological, economic, or sociocultural impact of discards. Nevertheless, data do suggest that survival of most discarded species is low, declines in some nontarget species have been significant, overfishing often involves a significant bycatch component, and shifts in species dominance and the occupation of certain ecological niches have been in part due to discarding. The extent to which discarding alone and not the fishing process as a whole is

responsible for these shifts is, however, unclear.

Economic losses tied to the act of discarding and objectives of monitoring or preventing discards presently run into billions of dollars. Such losses include those associated with discards of species of commercial value to other fisheries, discards of nonlegal individuals (for reasons of sex, size, or management policy), and indirect costs related to discarding of nontarget species of little commercial value. Included in the bundle of monitoring and prevention costs are bycatch-

related marine fisheries management expenditures, lost fishing opportunity due to premature target fishery closures following the attainment of bycatch caps, observer costs, enforcement expenses, modifications to fishing behavior, and increases in sorting and handling times.

Voluntary bycatch reduction measures are unlikely to be successful if they are

not in the short-term economic interest of the affected fisher.

A variety of techniques have been attempted by managers, engineers, and scientists to reduce discard levels. These have included traditional net selectivity approaches, the development of fishing gear taking advantage of differential species behavior, and time/area fishing restrictions. These methodologies have worked with varying degrees of success depending

**Annual discard weight by major region as estimated by the authors.**

Area	Discard weight (t)
Northwest Pacific	9,131,752
Northeast Atlantic	3,671,346
West Central Pacific	2,776,726
Southeast Pacific	2,601,640
West Central Atlantic	1,600,897
West Indian Ocean	1,471,274
Northeast Pacific	924,783
Southwest Atlantic	802,884
East Indian Ocean	802,189
East Central Pacific	767,444
Northwest Atlantic	685,949
East Central Atlantic	594,232
Mediterranean and Black Sea	564,613
Southwest Pacific	293,394
Southeast Atlantic	277,730
Atlantic Antarctic	35,119
Indian Ocean Antarctic	10,018
Pacific Antarctic	109
<b>Total</b>	<b>27,012,099</b>


on the species being managed and the willingness of industry to work together for positive solutions.

Emerging ideas include effort reduction, incentive programs, and individual transferable quotas that move the responsibility for bycatch reduction to the individual vessel level. The authors feel major gains against the global bycatch problem are likely to occur as such shifts towards individual responsibility take place. Progress may be impeded, however, because observer programs, an uncommon characteristic of today's fisheries, are nec-

essary to audit progress toward bycatch goals adequately. For many fisheries suffering from growth overfishing, a reduction in effort may be the most straightforward means of reducing bycatch and improving fisheries conservation and management. Because the solution to global discard problems will vary between fisheries and regions, a clear understanding of the nature and scope of specific fishery problems should precede the introduction of management and other measures.

Quick solutions to the bycatch problem are unlikely. Instead, a concerted na-

tional and international effort that will take money and time is necessary. A critical component of such action will be the reduction in effort levels from today's excessive amounts to quantities which will avoid conservation and ecological problems and will efficiently harvest the sea's resources.

The full paper *A global assessment of fisheries bycatch and discards* has been published in FAO Technical Paper No. 339 (1994), 233 p. 

# USA Rethinks Fisheries Management

**F**isheries in the USA are managed under the Magnuson Fishery Conservation and Management Act of 1976 (MFCMA).

By 1991, it was reported that fish stocks had declined considerably since the Act came into force. A national Committee in Fisheries was set up in 1992 to investigate ways of improving fisheries management regimes.

The 13-member Committee, led by John

Magnuson, was convened under the auspices of the Ocean Studies Board of the National Research Council. Their task was to make recommendations while the US Congress is considering changes in the MFCMA. The report, entitled *Improving the Management of U.S. Marine Fisheries*, was published this year by the National Academy of Sciences.

The Committee's seven recommendations "are designed to enhance the most

effective aspects of the present MFCMA and to introduce critically needed clarifications and structural improvements."

We reproduce their recommendations here because the recommendations reflect current thinking in the USA on subjects of interest to fishing nations worldwide. The text of the report elaborates on the background to and implication of the recommendations, which were framed in four broad areas:

## Prevent Overfishing

**Recommendation 1:** Fishery management should promote full realization of optimum yields as originally envisioned in the MFCMA by ensuring that harvest does not reduce stock abundance below levels that can sustain maximum yields over the long term. For currently overfished stocks, harvest levels must allow rebuilding the stock over specified periods of time to a level that can support sustainable maximum yields. Any departure from the above must be supported by persuasive evidence regarding natural variability, ecosystem interdependence, sustainable national income gains, or truly exceptional socio-cultural considerations.

**Recommendation 2:** Fishery management should control entry into and wasteful deployment of capital, labor, and equipment in marine fisheries.

## Improve the Institutional Structure

**Recommendation 3:** Congress should clarify the authority and responsibility of the Secretary of Commerce and of regional fishery management councils with respect to allocation and capitalization controls, implementation and enforcement of fisheries management plans, strategic planning, review of management decisions and actions, and conflict resolution.

## Improve the Quality of Fishery Science and Data

**Recommendation 4:** The Secretary of Commerce should improve the NOAA/National Marine Fisheries Service's scientific programs by making them responsive to management needs and to possible societal and economic effects. Improved data collection, analysis, and dissemination are needed to make evaluations and policy decisions.

## Move Toward an Ecosystem Approach to Fishery Management

**Recommendation 5:** Fishery management should increase the use of the ecosystem approach to management, and include environmental protection goals in the development of fishery management plans.

**Recommendation 6:** The Secretary should provide adequate funding for collection of reliable discard data and for a major new fishery technology program to improve gear and fishing techniques needed to reduce the bycatch/discard problem.

**Recommendation 7:** The Secretary of Commerce, through the NOAA/National Marine Fisheries Service and under advisement from regional fishery management councils, should be empowered to protect the habitats necessary to sustain fishery resources. A major national program should be developed to determine what habitats are critical for fish reproduction and growth, and how they can be protected. 