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Status of Pre-Recruit Abundance Estimates for

Major Species in SA 5 and 6¹

by

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The present ICNAF management framework of establishing annual total allowable catches (TAC's) for selected species stocks requires that some estimate be made of the size of the recruiting year classes in any given year. These estimates generally take the form of a relative abundance index as calculated from some type of research survey. Because of the importance of these estimates and the large number of species stocks involved, 20 in SA 5 and 6 alone, it was felt that a general outline of the pre-recruit abundance indices as currently developed might serve to emphasize the critical need for additional studies in this area. In addition to identifying existing indices, brief comments were included as to the accuracy in statistical terms of each respective index, the data required to improve the index together with a generalized estimate of the cost involved in acquiring the additional data. Critical evaluations of the accuracy and usefulness of each index for setting TAC's have yet to be fully developed using the original source documents.

References

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¹ Revision of Res.Doc.74/33 presented to the Special Commission Meeting, FAO, Rome, January 1974.

Status of pre-recruit abundance estimates for major species in Subarea 5 and Statistical Area 6.

SPECIES	TYPE OF INDEX	ACCURACY OF EXISTING INDEX	DATA REQUIRED FOR IMPROVING INDEX	MINIMUM ^{1/} ANNUAL COST OF INDEX
HADDOCK	Catch/tow of 0-group from selected U.S. fall groundfish survey stations vs landings/day of the same year class 2-3 and 5-6 years later on Georges Bank and Browns Bank, respectively.	Significant positive correlation between Research (0-group) and commercial (age groups 2-3, and 5-6) abundance indices on Georges and Browns Banks. Accuracy acceptable prior to late 1960's. See Res. Doc. 69/89.	0-group indices from fall surveys appear adequate as relative index, however extreme low population level since late 1960's precludes calculation of commercial index comparable to that of earlier years; further refinement of 0-group index requires conversion from relative to absolute measure of pre-recruits.	\$150,000 for U.S. autumn survey from Cape Hatteras to Central Nova Scotia.
COD	Linear regression between pre-recruit cod (<37 cm) in U.S.A. fall groundfish survey on Georges Bank and adjusted commercial landings/day 3 years later.	95% C.L. show + 10-30 % in predicting commercial landings/day 3 years in advance.	Very limited age data for commercial catch. Relationship expected to hold only under relatively stable conditions. Survey Index probably unbiased, but need to convert to absolute measure.	Included in above.
YELLOWTAIL	No. of 1+ fish caught in fall survey related to the relative abundance of the available total population at the beginning of any year through a modified type of virtual population analysis.	Comm. catch in Numbers vs. survey cruise index contains too few data points to evaluate accuracy of index.	Data base available to refine the estimator U.S. Survey and Commercial catch samples adequate.	Included in above.
SILVER HAKE	Y-0-Y catch/tow of >10 cm fish in fall groundfish survey.	Qualitative measure of changes in recruitment.	Survey data on pre-recruits available but samples of commercial catch/haul limited-Particularly need more refined U.S.S.R. commercial catch/haul data for comparison with U.S. and U.S.S.R. survey data.	Probably can be based on U.S. fall survey; but must add cost of more detailed sampling of U.S.S.R. commercial fishery - add \$50,000 for sea samples?
RED HAKE	Y-0-Y catch/tow of >10 cm fish in fall groundfish survey	Qualitative measure of changes in recruitment.	Same as above.	Same as for Silver hake - probably would be included in sampling program.
HERRING	INDEX NOT YET ESTABLISHED	NONE	Good age data on commercial landings but effort data not adequate --survey techniques not yet developed for pelagic species. Some limited application may be found with groundfish surveys.	Assuming special spring survey required would cost at least \$100,000 particularly if acoustic equipment & personnel involved in quantitative way - also perhaps \$50,000 for improved catch/effort sampling on commercial vessels.
MACKEREL			Age data limited, small U.S. catch so commercial samples must be submitted by other country efforts. Survey techniques not yet developed.	Probably can be accomplished with same spring survey noted above - and included with increased commercial sampling for herring.
POLLOCK			Neither survey nor commercial abundance indices available as yet-special survey probably required for accurate results.	May require inshore survey for reliable pre-recruit index; perhaps cost \$50,000. However, difficult to monitor effort in commercial fishery.
REDFISH			Data probably adequate from standard U.S. groundfish surveys for pre-recruit index, at least on basis of length frequency; age sampling limited to data on U.S. fishery.	Probably can be included with U.S. fall survey.
SQUID			Survey catch data for length frequencies and catch/tow available--Need to compare these with commercial abundance data (preferably Japanese).	Possibly can be obtained with U.S. fall survey at least for Loligo - ultimately may require inshore survey as for pollock. Improved catch/effort data needed from offshore fisheries particularly Japanese.
MISC. A. (Groundfishes)			Multispecies surveys show general applicability for providing data on relatively sedentary species that can be used to measure the relative abundance of pre-recruits.	Most species probably can be included in U.S. fall survey.
MISC. B. (Pelagic fishes)			Spring bottom trawl (and/or acoustic-midwater trawl) surveys may yield adequate indices for more than one "pelagic" species - need to continue evaluation of this approach.	Possibly can be covered by spring survey noted for sea herring.

^{1/} Includes only cost of field work - i.e. vessel and crew at approximately \$3000/day - does not include salaries of scientists or costs of processing and analyzing data.