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AN UPDATE ON THE ELEFAN PROGRAMS

by

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Introduction

Since 1980, when the ELEFAN I (Electronic LEngth Frequency ANalysis) program was completed, over 200 sets of user's instructions and program listings for various ELEFAN programs have been distributed throughout the world.

Presently, the ELEFAN suite of program consists of the following elements:

- ELEFAN O: a program for entry of length-frequency data and creation of files for use with the other ELEFAN programs.

- ELEFAN I: the original program for estimation of growth parameters from length-frequency data, in situations where growth oscillated seasonally or not,

- ELEFAN II: a program for estimation of total mortality and mean length at first capture from length-converted catch curves, and for expressing the seasonality of recruitment into a stock in the form of "recruitment patterns",

- ELEFAN III: a program, developed by J.G. Pope (Lowestoft), Noel David and this author for application of Virtual Population Analysis to catch-at-length data, and

- ELEFAN IV: a program, based on a paper by J.L. Munro in Fishbyte (Vol.2(1):11-14) to estimate natural mortality from catch samples and selection curves.

Of these, ELEFAN I has been distributed most widely (its early versions incorporated ELEFAN O as a subroutine), and well over 30 papers and reports based predominantly on application of this programs have been published by authors not associated with ICLARM, with more in the pipeline (see below references to some of these papers). ELEFAN II has also been applied widely, notably by staff of the Kuwait Institute of Scientific Research, which has become one of the leading centers in length-based assessments.

ELEFAN III was witheld from distribution until recently, pending a detailed assessment of the accuracy of its output by J. Majkowski and J. Hampton, CSIRO, Australia, the results of which will be presented at our Conference on length-based assessments, in February 1985 (see p. 15).

Preparation of completely revised version of ELEFAN O to IV, to be published with user's instruction and full program listings as an ICLARM Technical Report was delayed considerably, mainly by our inability to identify a suitable programmer to replace N. David, who left ICLARM and the Philippines. These delays have a positive aspect however, in that they will allow us to consider, when preparing final versions the comments and critiques that can be expected to be aired at the conference mentioned above.

Two important improvements which we have already incorporated into our versions of ELEFAN O, I and II (and which readers using these programs might also wish to implement) are:

- a new routine has been written for ELEFAN 0 which allows for entering, for each length in a file the probability of capture (as estimated using ELEFAN II or through a selection experiment); this routine then allows division of each frequency in the file by its probability of capture, and hence to create lengthfrequency data files corrected for selection effects,
- the routine to compute "ESP" in ELEFAN I has been modified such that it counts only <u>once</u> the points of a peak (i.e. in a run of positive points) that has been "hit" by a growth curve. This new approach to estimating ESP overcomes completely the problem of the frequent "drifting" toward, and sub-

sequent output, of ridiculously low values of K.

Other changes involved the elimination of minor bugs, improved presentation of outputs and the like. The next issues of Fishbyte will contain details on this, along with addresses of colleagues from whom various hardwarespecific versions of the ELEFAN programs, (notably O, I and II) can be obtained (see also p. 15).

The following are references of some papers and reports (excluding ICLARM Contributions) presenting applications of ELEFAN I and II:

- Gjøsaeter, J. and M.I. Sousa. 1983. Reproduction, age and growth of the Russel's scad, <u>Decapterus russel-</u> <u>lii</u>(Rüppel, 1829) (Carangidae) from Sofala Bank, Mozambique. Rev. Invest, Pesq., (Maputo) No. 8:83-103.
- Morgan, G.R. 1983. Application of length-based stock assessments to Kuwait's Fish Stocks. ICLARM Newsletter, 6(4):3-4.
- Rohde, J. 1982. Wachstumsuntersuchungen an Nordseefischen. MS Thesis, Kiel University, 133 p.
- Sadhotomo, B., S.A. Banon and S. Nurhakim. 1983. Estimates of growth parameters, instantaneous mortality and yield per recruit of roundscads, <u>Decapterus maruadsi</u> (Temminck & Schlegel) in the Java Sea [in Indonesian with English abstract] Jakarta, Mar. Fish. Res. Rep. No. 27:1-8.
- Samuel, M. and G.R. Morgan. (in press) A comparison of length-related and age-related stock assessments of newaiby (<u>Otolithes</u> argenteus) in Kuwait waters. Can. J. Fish. Aquat. Sci.
- White, T.F. 1982. The Philippine tuna fishery and aspects of the population dynamics of tunas in Philippine waters. IPTP/82/WP/5 and SCS/82/WP/114, South China Sea Fisheries Program, Manila, 64 p.

18