ELEFAN I AND II LIVE ON SCREEN

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Users of ELEFAN I generally need much time to become acquainted and achieve reasonable results with this program. And, unless even the experienced user has transformed his or her sample data into bar diagrams on the time axis and painstakingly drawn the growth curve he or she will hardly know whether the computed growth parameters lead to a satisfactory description of growth of the stock under investigation.

A revised and enhanced* version of the ELEFAN I and II program package was developed which reduces the time needed for tutorial inputs for beginners and to shorten the actual working time both for the beginner and the experienced user.

Once the sample data are keyed into the computer through the ELEFAN 0 routine of this new program version, the user has the option to view the "restructured" samples on the screen, as shown in the example in fig. 1. In restructured samples, the peaks and troughs of the original length-frequency distribution are expressed in the form of positive (= shaded) and

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* This version incorporates the changes suggested in Pauly (1984).

negative (= unshaded) bars, respectively. This routine, called "fitting of growth curve by eye", allows the user to make a first approximation of the growth parameters and to decide whether or not growth should best be decribed through a seasonally oscillating growth curve. He or she can decide further what starting length and starting sample should be used for the searching routine of ELEFAN I.

In our example, the user decided that the growth parameters should be in the neighborhood of $K = 0.9$ and $L_\infty = 19$ cm, that the oscillating form of the von Bertalanffy growth equation is not necessary and that the starting sample should be 1 and the starting length should be 9.0 cm. Upon entering these values into the computer, the corresponding growth curve was superimposed on the screen (fig. 2).

At this point the user can either rerun this routine and try another combination of parameters, or step into the "normal" ELEFAN I searching routine, which was also revised in order to cut down computation time. The new version is faster by a factor of about 10 compared to the original. It is also more user-friendly than the original version.

The possibility of tentatively trying one or more parameters combinations on screen appears to be an extremely useful tool because the input of good estimates of seeded values will drastically shorten the running time of ELEFAN I.

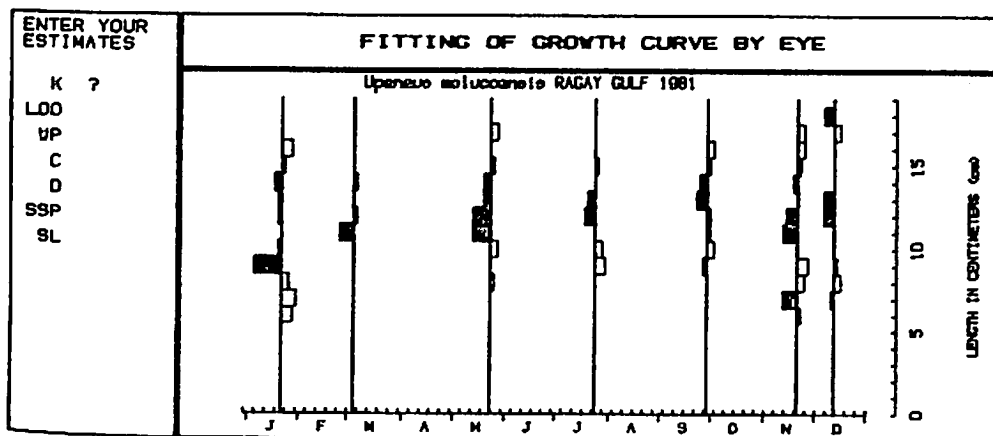The searching routine of ELEFAN I, using the "seeds" mentioned above,

Fig. 1. Screen display of restructured samples. Computer is waiting for input of parameters.

yields the parameters K = 0.825 and L_{oo} = 20 cm. The available Sum of Peaks (ASP) is 9.29 and the Explained Sum of Peaks is 5.64, with an ESP/ASP ratio of R = 0.607. Again the user has the option to call the restructured samples back on screen and to have the growth curve superimposed - in this case the curve that corresponds to the computed parameters (fig. 3).

As an option the user can obtain a hard copy of the restructured samples plus superimposed growth curve through a plotter connected to the microcomputer system.

In the next step the computer will chain to the ELEFAN II routine and allow for an output via plotter of the catch curve, the recruitment pattern and the selection pattern (see e.g. Ingles and Pauly 1984 for definitions of these).

The program package was developed for use on Hewlett Packard model 86

and 87 microcomputers with a peripheral HP 7470A plotter.

A detailed program description, flowcharts, manuals, examples and program listings will be presented as Technical Reports of the Department of Marine Fisheries No. 7. The report, which can be obtained by writing to the address given above, is a contribution of the Philippine German Fisheries Project, a bilateral project of Technical Cooperation between the Government of the Republic of the Philippines and the Government of the Federal Republic of Germany.

REFERENCES

Ingles, J. and D. Pauly. 1984. An Atlas of the growth, mortality and recruitment of Philippine fishes. ICLARM Tech. Rep. 13, 127 p.

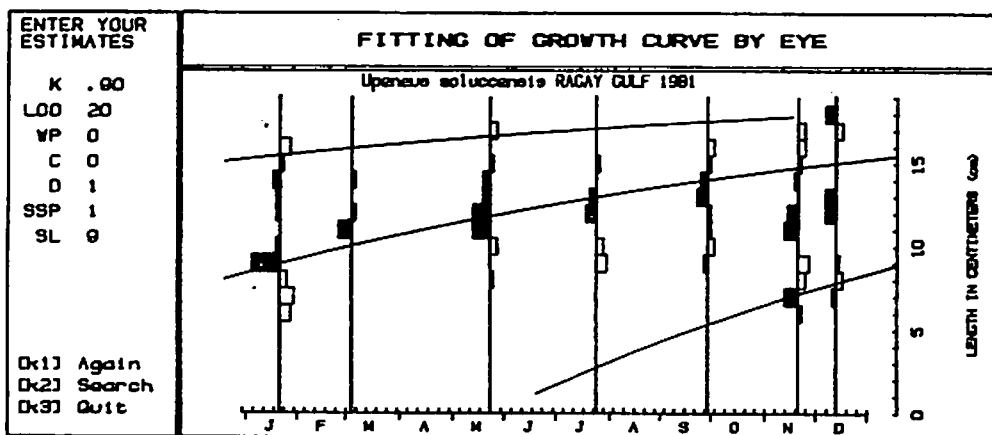Pauly, D. 1984. An update on the ELEFAN programs. Fishbyte 2(3):17-18.

Fig. 2. Screen display of restructured samples and superimposed growth curve with parameters entered by user.

Fig. 3. Screen display of restructured samples and growth curve computed through ELEFAN I routine.