

# VIDEO-TAPE PROGRAMS FOR FISHERIES AND WILDLIFE EDUCATION

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*Abstract:* Fisheries and wildlife education is plagued by the impossibility of giving students the extensive field experience which future employers desire. A practical solution is the creation of specially prepared videotape programs illustrating actual field techniques. A series of approximately 10 programs in each discipline would provide a standardized instructional unit for undergraduate training at more than 500 colleges and universities and for in-service training in state and federal agencies. Such programs offer several advantages over traditional lectures or slide programs. Video-tape programs can be used in both auto-tutorial and standard format classes. Slide programs and films can be put in video-tape format, eliminating technical and theft problems. Current cost of professional services and materials for producing a 10-20 minute program, including field taping, editing, narration, and special effects is approximately \$4,500. Costs of study carrels equipped for video-tape programs is currently \$2,000, but will decline in future years. The cost of each copy of a 30-minute program is less than \$20.

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A common complaint of fisheries and wildlife administrators is that newly-graduated professionals lack practical experience, especially with field techniques. This deficiency reflects the inability of undergraduate programs to provide extensive field experience for students. The amounts of time, personnel, equipment, field facilities, and travel necessary for providing broad field experience are incompatible with the scheduling and financial constraints of the university.

Video-tape programs designed and produced specifically for practical instruction provide a partial solution to this problem. In conjunction with standard field and laboratory courses, video-tapes can give students exposure to the wide variety of techniques which they may eventually use. Video-tapes are not suggested as a replacement for the "hands on" experience which is clearly the best method of acquiring technical skills, but as a way to provide supplementary experience in related techniques.

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## ADVANTAGES OF PREPARED PROGRAMS

The potential advantages of video-tape programs fall into 2 major categories, the advantages of prepared programs and the advantages of the video-tape format.

The premise for using prepared programs, including educational films and laboratory manuals, is that mass-produced aids are efficient and effective means for transmitting fairly standard technical information. Such programs are used extensively in medical and military fields (Barwick and Kranz 1973), both of which require wide-ranging technical skills. Similar use for instruction in fisheries and wildlife techniques is appropriate, especially because the practical and technical aspects of management may be treated superficially by professors who would rather concentrate on ecological principles, mathematical treatment of data, or philosophies of management. In practice, the visual aids necessary for transmitting both the detail and overview of technical procedures generally are scavenged from random collections of slides and photographs. Such slide sets are certain to be incomplete, with the possible result that which slides are available dictate the content of a class, rather than the reverse. These deficiencies can be corrected by the preparation of permanent programs which can be duplicated and distributed on a national or international basis.

Prepared programs, however, must enjoy a wide audience to justify the costs, in time and money, of production. Table 1 lists over 500 potential users of such programs in fisheries and wildlife, although utilization and purchase of programs is likely for only an unknown proportion of these users. Additional users include Canadian institutions

and agencies, environmental consulting firms, and agencies in foreign countries. The expansion of vocational training for fisheries and wildlife in junior and community colleges suggests that this outlet for prepared programs also will expand. Use of standardized programs in smaller institutions and agencies is particularly valuable because the experience and expertise of instructors or administrators may be restricted to a few techniques used in a local area.

Table 1. Potential U.S. users of prepared programs covering fisheries and wildlife management techniques.

<i>Type of user</i>	<i>Number</i>	<i>Source</i>
College/University		
B.S. or higher in fisheries and wildlife	125	Hoagman (1977)
B.S. in related fields <sup>a</sup>	110	Anon. (1977)
A.A. in fisheries and wildlife	25	Anon. (1977)
A.A. in related fields <sup>a</sup>	50	Anon. (1977)
Management/Research Agencies		
Federal	175	Arakie (1968)
State	50	
<b>Total</b>	<b>535</b>	

<sup>a</sup>Related fields include programs labeled Marine Science and Technology, Natural Resources, and Environmental Studies.

#### ADVANTAGES OF VIDEO-TAPE FORMAT

While the major advantages of the video-tape format relate to its overall utility in instructional programs, several characteristics make video-tapes desirable during the production process. Remote shooting of field activities using video-tapes is more complicated than using film, but video-tapes are less expensive to process and are immediately available for review and re-taping. Since the major costs of field shooting are in travel and salaries, the capacity to review tapes the same day eliminates the possible need for return trips and the loss of time if taped activities occur only seasonally or annually. Additionally, editing of video-tapes is easier than films, and extensive development of electronic editing features for commercial television constantly improves the editing capabilities and quality for video-tapes.

From the viewpoint of classroom instruction, video-tape cassettes offer numerous advantages over film or slide formats. First, the video-tape format can incorporate other formats so that all visual aids can be shown with a single system (Gordon and Falk 1972). Films can be transferred to video-tape, and problems with breaking and sprocket wear are eliminated. Slide presentations also can be taped into video-cassettes, along with narration if desired. This eliminates the mechanical problems of slide programs, including inverted slides, jammed machines, upset slide trays, and upset students.

Second, video-tapes offer several operational advantages (Barwick and Kranz 1973). Video-tapes are projected through a television monitor at ambient light, allowing students to take notes and avoiding the general distraction of a darkened room. Disruptive noise levels of film and slide projectors are eliminated. Instructors have the option to start, stop, and hold tapes so that explanations and questions can be addressed at appropriate times. Rapid rewind and fast forward features, along with indexing of the tape, allow the instructor to repeat, skip, or change the order of specific tape segments.

Third, video-cassettes and video-taping capabilities accommodate non-traditional teaching-learning situations. The same advantages listed for classroom teaching exist for the use of video-tapes in auto-tutorial modes. The single video-tape system makes possible the inclusion and mixture of slide programs, film segments, instructor narration, and student evaluation. Slide-audio cassette programs, which may go out of synchrony with use, can be combined on a video-tape. Theft of slides from study carrels is eliminated. In the unlikely event that video-cassettes are stolen (types used in institutional program-

ming are incompatible with units sold for personal use), they can be duplicated in a matter of minutes from a master copy kept on file. The use of video-tapes for observing and evaluating student and instructor performances can be accomplished with an inexpensive camera and the same record-playback equipment used for display of other visual aids.

### SUBJECT MATTER OF PREPARED PROGRAMS

The instructional value of prepared programs derives from the need for fisheries and wildlife professionals to be familiar with routine technical methods. Specific situations and employers generally will require deviation from standard techniques, but exposure to a technique in a general form will greatly improve the ability of new personnel to appreciate both the general and detailed aspects of specific techniques.

The goal of technical programs is to replace "hands-on" experience when such experience is incompatible with the overall instructional program. Video-tapes prepared to achieve that goal should give detailed information on how various procedures are accomplished and rely on accompanying texts or lectures for such things as why and when to use the procedures and how such procedures fit into a management program. In this regard, films or video-tapes previously produced for distribution to mass audiences are inappropriate.

Potential subjects include techniques which are limited in geographical area, require much time and equipment, need specific authorization beyond a collector's permit, rely on the capture or presence of significant numbers of animals, or are limited to certain times of the year. Cove rotenone sampling, for example, fits most of these conditions. The procedure is done generally in southeastern reservoirs, requires several people and boats, takes 2 or 3 days, and may not be authorized on collector's permits issued to university personnel.

Table 2 lists potential subjects for a series of video-tape programs oriented toward technical training. Programs suggested for fisheries generally are those which require large amounts of equipment, time or personnel. Because aquatic habitats are similar over broad geographic ranges and because fish faunas have similar characteristics regardless of specific taxonomic status, techniques tend to be standard across geographic and taxonomic gradients. Wildlife management, however, varies greatly among geographic areas and taxonomic categories in response to major differences among terrestrial biomes and to the greater taxonomic diversity of wildlife. Consequently, subject areas suggested for wildlife have a strong regional and taxonomic basis.

Table 2. Potential subject matter for prepared programs covering fisheries and wildlife techniques.

<i>Fisheries</i>	<i>Wildlife</i>
Lake Sampling	Biotelemetry
Pond Sampling	Capturing Small Mammals
Stream Sampling	Capturing Large Mammals
Cove Rotenone	Capturing Birds
Acoustic Sampling	Habitat Analysis
Fish Marking	Habitat Management Operations
Aging Fish	Field Autopsy
Biotelemetry	Marking Animals
Creel Census	Field Counts
Fish Stocking and Transportation	Animal Transportation and Stocking

### CAPABILITIES AND COSTS OF VIDEO-TAPES

A detailed description of either the cost or operational capabilities of video-tape systems is inappropriate because technologies change continuously. Generally, however, costs can be expected to decline and operational performance to increase, parallel to the general trends shown by electronic calculators and computer-based equipment.

Video-tape systems offer considerable flexibility in operational formats. Present tapes contain two sound tracks, so that, for example, the same video track can be used with one

audio track for a technical audience and one for a more general audience (Barwick and Kranz 1973). Alternatively, the second sound track could be used for a second language (e.g., French, for use in parts of Canada). One video player can be wired to several television monitors, so that larger audiences can be reached at a lower per viewer cost. Video-tape systems may be wired to computers which display questions, evaluate student answers, and automatically rewind or advance video-tapes to repeat or skip tape segments based on student responses (J. Moore, personal communication).

Costs of producing and using video-tapes varies according to the system used and activities filmed. Study carrels for use by individual students cost approximately \$2,000, including tape player, television monitor, audio head-set, and the carrel itself. A video-tape for a 30-minute program, which may actually hold several shorter programs, costs under \$20, less than the costs of duplicating a set of 80 slides and storing them in a slide tray.

Production of prepared programs for video-tapes is expensive. Writing, field taping, and editing for a 10-minute tape made at Virginia Tech required about 230 man-hours, costing about \$3,700 including overhead. Expenses for travel, tapes, and other miscellaneous items raised total cost of the program to about \$4,500. Obviously, video-tapes produced in this manner must be broadly useful to justify this expense.

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