ample. We had Andrew Pursley make a case on hunting doves with the aid of bait. I think he had nine people (of that he and the State agent disposed of all but two in the State Court and we got the other two). It's the kind of case, marginal case, where the individual is some distance from the bait, and the bait happened to be corn. Andy did a good job. He sampled the bait he had previously discovered before the season opened. He had photographed the birds as they came in, he had checked it carefully, he had determined the only way these individuals could get to their position was by walking through corn on the ground, something that should be obvious. I think we will be successful in that case because we are going to be able to show that while this individual was some distance from it he must have known the bait was there and while that may not be legally necessary we still think it is practically necessary. We think we will be able to make that case all right. I advise you to use as many crutches, as many aids as you can to make your testimony more effective in court. Now, we feel in this District that the key to successful game prosecutions is the complete cooperation of the agent with the lawyer and that enough time should be devoted to their conference and their work together before the trial that the case can be presented effectively.

We are proud that we have had a hand in this effort in handling these cases and we certainly have a high regard for our commission in this state and our agents. They certainly do a marvelous job and we want to be in there pitching with them and helping them.

Thank you.

DEVELOPMENT OF TENNESSEE FISH PROTECTION SURVEILLANCE SYSTEM

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ABSTRACT

Increased population and industrial pressures have focused attention on the need for an accelerated and effective program to prevent and control pollution-caused fish kills in Tennessee waters. A training program to facilitate more rapid and accurate determination of the extent, severity, and probable cause or causes has been developed by the Tennessee Game and Fish Commission.

Game and Fish Officers are located in each of Tennessee's 95 counties, and they comprise a readily available source of manpower to implement the program. The Officers must be specially trained in fish welfare so that they will react quickly and efficiently in the event of a fish kill.

A training program and manual for investigation of pollution and fish kills for Game and Fish Officers have been developed. All Officers in Tennessee have completed the first two-day pollution school of a proposed series of courses. The school was conducted by personnel from both the Game and Fish Commission and the Tennessee Stream Pollution Control Board.

DEVELOPMENT OF TENNESSEE FISH PROTECTION SURVEILLANCE SYSTEM

The pressures of industrial and population expansion in Tennessee have focused attention on the need for an accelerated and effective program to prevent and control pollution-caused fish kills. A training

program to facilitate a more rapid and accurate determination of the extent, severity, and probable cause of such occurrences has been developed by the Tennessee Game and Fish Commission.

In January, 1962, Forrest V. Durand, Director of the Tennessee Game and Fish Commission went to Washington, to discuss the possibilities of obtaining a federal grant to investigate pollution problems in the State of Tennessee. In March of the same year, Mr. Ralph Holtje, of the Public Health Service, came to Nashville to assist us in setting up a Demonstration Project Grant. This grant is entitled "The Development of Tennessee Fish Protection Surveillance System," and will continue for two and one-half years. The initial period of the grant was for six months, April 1 to September 30, 1962. (The second and final period of the grant is from October 1 to September 30 of 1963 and 1964.) In order to obtain this Public Health Service Grant, the State of Tennessee contributed twenty-five percent over and above the allotted $50,000 for each year's grant. The Public Health Service will allot the Tennessee Game and Fish Commission a total of $125,000, and the State will add an additional $31,250; together this represents a total of $156,250 for the development of a surveillance program.

A fish kill is an acute situation in which immediate action is imperative. Unfortunately, many fish kills are not reported, and in other instances the lack of trained personnel prevents a thorough investigation of the occurrence.

To establish an effective fish welfare surveillance program, a training school and manual for the investigation of pollution and fish kills for Game and Fish Law Enforcement Officers were developed. This school was designed to utilize existing knowledge and obtain additional information pertaining to the condition of Tennessee streams, along with instructions in the knowledge required to assist in the investigation of fish kills attributed to water pollution. The need for a manual to serve as a field guide was imperative. This manual includes: (1) standard procedures for collecting water samples; (2) instruction for stream bank analyses, such as pH and dissolved oxygen; (3) methods of estimating species and number of fish killed, and (4) systematized observation and recording.

In January and February of 1963, four training sessions for Game and Fish Officers were completed. Each course was attended by at least 30 Officers, and was conducted by personnel from both the Game and Fish Commission and the Tennessee Stream Pollution Control Board.

The first of two days was spent in the classroom discussing and studying the following procedures: techniques involved in collecting water samples at the time a fish kill occurs in such a manner as to yield maximum useful data; systematize observations and recording of data for collecting water samples and investigating fish kills; simplified streamside water analysis adaptable to field use as indicated by the manner of the fish kill; how to collect and preserve fish for bio-assay and parasitic work; and, the development of the ability to present in an irrefutable, convincing manner the data that have been collected from the investigating fish kill. The second day was spent in the field getting first-hand experience and learning the techniques of taking a water sample and "fixing" it for dissolved oxygen analysis, collecting a water sample with the Kemmerer water bottle, and learning how to use a Hellige pH meter. All the 120 Law Enforcement Officers were individually instructed and each carried out the above. Upon completion of the pollution school, each officer was issued a suitable certificate for having completed the course. In the future, the project director and the pollution biologist will set up monitoring stations in critical and suspected polluted areas throughout the state, and conduct refresher courses on the district level.

The Supervisors of the eight Law Enforcement districts were issued a pollution kit which contained: (1) *Pollution Manual for Investigation of Pollution and Fish Kills;* (2) forms for investigating and reporting a fish kill and collecting water samples; (3) Taylor Fahrenheit thermometer; (4) Hellige pH kit with color discs and reagents ranging from 2.5 to 10.6 pH; (5) Kemmerer water bottle; (6) four one-gallon jars for collecting water samples; (7) quart plastic water bottle for collecting

metal samples; and (8) chemicals and equipment to "fix" a dissolved oxygen sample by the modified Winkler method.

There are 95 counties in Tennessee and at least one Game and Fish Officer is located in each. With this readily available source of manpower, each man in the 95 counties was issued the following equipment: (1) *Pollution Manual for Investigation of Pollution and Fish Kills;* (2) forms for investigating and reporting a fish kill and collecting water samples; (3) Hellige pH kit, with color discs ranging from 5.0 to 9.6 pH; (4) Taylor Fahrenheit thermometer; (5) gallon water sample jars; and (6) chemicals and equipment to "fix" a dissolved oxygen sample by the modified Winkler method.

The cooperation of the Tennessee Stream Pollution Control Board, S. Leary Jones, Director, has been a tremendous asset in the realization of our program. With their help, a contract between the two state organizations was developed. This contract includes the period from October 1, 1962 to the present, with the understanding that the contract will continue or stop by mutual agreement between the two agencies.

The Project Director of the Grant anticipates that a large amount of chemical analyses and consultations by chemists or other technical personnel of the Stream Pollution Control Board will be required. The staff of the Board is glad to cooperate in this work insofar as it does not require staff members to depart from their regular assigned duties in the program adopted by the Board.

The work and number of analyses anticipated will require the services of at least one additional chemist on the Board's staff. Compensation for such services will be made on the following basis:

a. A base payment of seven hundred fifty dollars ($750.00) per month will be paid to the Stream Pollution Control Board by the Game and Fish Commission for the chemical and physical analyses in the Board's laboratory in Nashville for a maximum of thirty (30) routine stream samples per month. This cost includes personnel, maintenance of equipment, depreciation of equipment, laboratory glassware, and chemicals.
b. Routine stream analyses shall include: pH, apparent color, centrifuged color, turbidity, M.O. alkalinity, acidity, phenolphthalein alkalinity, hardness, chlorides, settleable solids, suspended solids, and total solids. Dissolved oxygen determination will be made when indicated.
c. Other chemical analyses not listed in "b" above will be made at a charge of five dollars ($5.00) to twenty dollars ($20.00) each, depending upon the time required for each analysis.
d. The samples shall be delivered to the central laboratory of the Board, Room 736, Cordell Hull Building, Nashville. The samples shall be properly identified and a written list of specific analyses shall accompany each sample. Analyses will be made only on written order of the Game and Fish Commission Project Director.
e. Some samples require preservation between time of collection and analysis. Instructions on needed preservation will be furnised by the Board's chief chemist.
f. Any time the Game and Fish Commission needs a chemist for training personnel and/or field work on a project, a request will be made by the Project Director to the Director of the Stream Pollution Control Board. Advance notice for such service must be given. A charge of twenty-five ($25.00) per day or part of a day per chemist or other technical personnel plus actual cost of travel, room and meals will be made for this service.
g. The contract does not include field sampling equipment for field analyses to be made by the Game and Fish Commission personnel. Reagents for such field analyses will be furnished at cost upon request of the Project Director.
h. An invoice will be prepared at the end of each quarter by the Tennessee Department of Public Health to include the base charge and other charges listed above, and submitted to the Game and Fish Commission. Payment will be made each quarter to the Tennessee Department of Public Health.

The past months that the grant has been operative have not been without problems. Fortunately, most of these have been of a minor nature. At present, the program is proceeding smoothly and efficiently, and those connected with the project are enthusiastic about all aspects of the program.

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RADIO IN MISSOURI

By Herschel Bledsoe
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Delivered at Southeastern Fish and Game Conference, Hot Springs, Arkansas, 1963.

Last June while attending the annual meeting of the AACI in Omaha, I was approached by George Purvis and Gus Albright regarding this presentation. I readily accepted the assignment when I learned that the theme of this program was How and Why. Of course it isn't any mystery as to *how* we produce radio shows in Missouri, well at least not to me, but I must confess that I don't divulge all my trade secrets to my bosses . . . after all, a man must have a little job security.

Now as to the how of producing radio shows in our field of conservation . . . I'm going to by-pass the mechanical aspects and deal with the techniques we employ. First of all, our present productions are an outgrowth of a plan developed about 14 years ago. Prior to 1949 our department's only venture into the radio media was an occasional guest appearance on an established sports or outdoor show by the Information Chief or one of the administrators. In 1950 the Information Chief, now our Assistant Director, Dan Saults, convinced the administration that we were passing up a very important public relations tool by not employing heavy use of radio. At that particular time, the big freeze by the FCC on TV stations was holding that *medium* from developing, thus radio was enjoying a terrific upswing.

So, having decided to utilize radio on a mass scale, the next step was the method of operation. Again, the universal use of tape had not appeared on the electronics scene, so in order to produce a complete show, it was necessary to make transcriptions and mail them to the various radio stations. This of course would have taken a great deal of equipment, technical know-how or they could have been contracted. In either case it was considerably more costly than our limited budget would allow. So, this idea was immediately dropped. The next alternative considered was live shows. These would be accomplished by our Conservation Agents (perhaps you call 'em game wardens) Field Service Agents or Foresters. Since we have Agents in nearly every county and within easy access of every radio station in the state, this seemed like a sound approach. Of course, it was realized that our Agents were not radio personalities or announcers, but most of them at least had the potential. So, to encourage and get them started, a weekly radio script was to be prepared and mailed to each Agent. These scripts were written as a two-man dialogue featuring a local announcer and the local conservation agent. The announcer of course playing the role of interviewer and our agent answering questions on wildlife and conservation. Naturally, there were some shortcomings to this type production. First of all, only a top professional announcer can read a script and make it sound natural and off the cuff . . . for this is a matter of training and experience. Secondly, anyone who writes a script . . . does it in his own particular style . . . in other words most of us write as we talk. So, the script which I may write fits my vocabulary and mannerisms . . . but not necessarily that of another person. Another disadvantage, is that a script written for use