INTERVIEW WITH DR. KEN WOLF
BY WENDELL OGDEN JULY 6, 1993

MR. OGDEN: I am Wendell Ogden. Today I am going to be interviewing Dr. Ken Wolf for the History Section of the American Fisheries Society. Dr. Wolf has a long career with the U. S. Fish and Wildlife Service and has been an international leader in the area of fish health research. Good morning, Dr. Wolf.

DR. WOLF: Good morning! I'd like to lead off with a little bit of history; very briefly. And that is at its inception, way back in the 1940's, 1950's, The Microbiological Laboratory was the name given to this activity. Later on that evolved into The Eastern Fish Disease Laboratory, with a counterpart in Seattle; The Western Fish Disease Laboratory. Then most recently the name has been given as The National Fish Health Research Laboratory. This is part of the history of this facility.

MR. OGDEN: I am sure that there have been a lot of name changes to the organization over the years Ken, but how did the tiny back-roads community of Leetown, West Virginia become such a significant contributor to the nation's fish health management program?

DR. WOLF: This was a timely coincidence of several different factors. One, this was the post, World War II era. The second is that we had a facility at Leetown, West Virginia that cultured warm water and cold-water fish. The quality of the water was ideal for the rearing of Trout. And there was a specific pathogen-free water source also. So this was, in the beginning, the set of factors that entered into it. Plus, in Washington, D.C. we had an enlightened Administration that could foresee the need for fish health research that could take care of the ninety or so Federal fish hatcheries that existed at that time to solve the problems of fish health.

MR. OGDEN: You obviously worked with a lot of very famous people at that time. Some of them were pioneers in the organization or in the research of fish diseases. Who were some of the early people, and how were you connected with them?

DR. WOLF: Some of the early people involved were the Hatchery Managers here at Leetown. There was a sequence of Hatchery Managers that shared their facility with the Fish Health personnel. The personnel involved were noted more for their Fisheries activities than for Fish Health. Gene Server was one of the early names. H. S. Davis was another. He wrote the first book on the culture of cold-water fishes and fish health. Then the real beginning came with Dr. S. Seneschoe. [Sic]

MR. OGDEN: Tell me a little about the work of H. S. Davis. Were you involved with him here?

DR. WOLF: No, I was not. He was hired, as I understand by the then FWS to compile a book which was the first North American edition of culturing diseases of fish.

MR. OGDEN: How did Dr. Seneschoe come to work at Leetown?

DR. WOLF: Well, this is an interesting story. Dr. Sneschoe was trained as a Bacteriologist or a Microbiologist in Poland. During the Second World War, he was hired, I suspect, for biological warfare results at nearby Fort Detrick in Frederick, Maryland. He had the qualifications of a researcher. In addition, he had been born and raised on a Carp farm, or a multifaceted farm in Poland. Part of the activities of which were rearing Carp as a food item. There was need as viewed by the administrators in Washington, D. C. for fish health research so it was a happy coincidence that Dr. Seneschoe was hired here.

MR. OGDEN: Why did they select Leetown as a research activity? You mentioned a little bit about the warm water, and cold water and the pathogen-free water. Were there any other reasons that they selected Leetown?

DR. WOLF: I think that proximity to Washington, D.C. was another factor. Plus, legislative support that provided funding for continuity of the research over the years.

MR. OGDEN: I have heard the name "Swamp" Walker associated with Leetown. What can you tell me about him?

DR. WOLF: Swamp Walker was probably the third Hatchery Manager here at Leetown. The Hatchery was established in the early 1930's. Gene Server was the first Hatchery Manager, as I understand it. He was followed by Bart Hazen and then Swamp Walker came on. Swamp Walker was a gentleman of the old school. He was in the gill type era of training where an apprentice had to start. Then he went to journeyman status and finally then he was recognized as a Manager. I tried, but was unable to find how the name "Swamp" was given. But his early training and activities were down in the mid-south and in the Deep South.

MR. OGDEN: When you arrived at Leetown, what was the Laboratory like?

DR. WOLF: The Laboratory was small, and was an activity under the host of the Hatchery Manager. The rooms were minimal. There were two or three rooms on the upper floor of the hatchery building itself. The limestone building that exists today. There were a few troughs in the hatchery facility, the wet labs downstairs. The toughs were engineered, and specifics given by Dr. Seneschoe so that one unit of depth was equivalent to one unit of volume. This made it easy to quantify fish treatments for external purposes. We were a very small activity. Bacteriology was the dominant work with some research on parasites.

MR. OGDEN: How have you seen the Research Lab grow over the years Ken?

DR. WOLF: The Research Lab has grown as thought it had been given a shot of 'vigorol' periodically. This was thanks to Senator Robert Byrd of West Virginia who maintained a flow of cash for the operation of this facility.

MR. OGDEN: What was your education and experience background that lead you to come to Leetown?

DR. WOLF: This is a long story that I will try to keep short. During the war years I kept contact with a friend of mine. We had worked together in the CCC back in the 1930's. We agreed that after the War, if we were available we'd take an extended hunting and fishing trip, which we did. During this time we contacted people who had been in the old Biological Survey. We extended our hunting and fishing for about nine months. Then I was not satisfied with what I was accomplishing so I back to work with FWS in the Refuge Division. I spent a couple of years in the Refuge Division on waterfowl refuges during which time I made contact with biological people who coaxed me into considering College. I qualified for the GI Bill. I intended to be a Refuge Biologist. That was the goal that I had at that time. I took a degree in Zoology for my bachelors and Wildlife Management for my master's degree. I still had GI Bill time coming so I moved into Fisheries intending to do the life history of the Lake Trout in Bear Lake, Utah and Idaho. The population of two hundred thousand Cut Throat Trout that I was interested in developed a disease that was known as 'blue sack' [sic] disease. That turned out to be the Doctoral dissertation that was the tail that wagged the dog eventually. So with the Blue sack disease research I was in contact, or I made contact with Dr. Ducker and Dr. Seneschal and had the opportunity of going to work, which led me to Lee town.

MR. OGDEN: You worked for well over thirty years in Fisheries Research, or in biological research of some kind. What do you consider your major achievements as a scientist?

DR. WOLF: There is a list or a litany of achievements, that I feel are worth mentioning at least. The one on the cause of the Blue sack disease that was one. We developed the first methods of growing the fish cells in-vitro. We had the latitude to expand our research. We took in reptiles, painted turtles and amphibians such as the Bullfrog, Ampheoma [Sic]. We isolated and identified the first fish virus. That was the infectious pancreatic necrosis agent. We isolated the first of several other fish viruses. In addition, as a goal with IPN, or Infectious Pancreatic Necrosis, we also found the origin of the virus. This turned out to be the adult population of Trout. We were able to develop methods of screening those fish. We culled out the carriers and propagated only those that were a specific pathogen free. Our fish cell lines were the first to be developed, and they are in their thirtieth, some odd year now. In 1960, I believe was the first year that we isolated

the first fish cell line that used on the lunar explorations as a method for testing for possible extraterrestrial pathogens. I think that participating in the training program here at Leetown was another accomplishment.

MR. OGDEN: Your background was principally in bacteriology, but you did a lot of work in virology. How did you come to become a virologist after studying so hard to be a bacteriologist?

DR. WOLF: Well, this had it's origins in the term 'microbiology' which takes in bacteriology, virology, mycology, and the basic science is one of asking questions and looking for approaches to provide answers and judging the quality of the answer. So it's a natural development from microbiology into virology. The methods for biological study were largely developed in the 1950's. This was another timely coincidence of available information, funding and interesting work here.

MR. OGDEN: Leetown has always had a highly regarded library, an internationally recognized library. How did it get started, and how did it develop?

DR. WOLF: This again, we thank Dr. Seneschoe for. When he came here, one of the first things he did was to develop a decimal type of cataloging. He took much of the literature that was here which had accumulated, but had not been indexed or cataloged by the Hatchery Managers and personnel that worked here. He then developed the Fish Disease Library as it is, or has been known. Mary Ann Strider was the Librarian at that time. This was one of the early contributions to pull together the available information and to make that available for this own use and for the use of other people elsewhere.

MR. OGDEN: How does the Library stand today?

DR. WOLF: The Library stands today as the foremost, I think, in the world in the quality and accessibility.

MR. OGDEN: You mentioned training as being one of your prime achievements. What role did training play in Leetowns growth?

DR. WOLF: It played a very important role. In that the first people that were brought in to give them experience in this research area. Those people were recognized then as having specialized information. Some of them motivated by administrators and legislators in Washington moved them into administrative roles where they were very effective. Others became the practitioners, the counterpart to the Veterinarians in effecting control, identification and other aspects of fish diseases.

MR. OGDEN: The Center has always had an international connection. How did these come about?

DR. WOLF: I think the word that best describes the situation is that this was "publication". As research answers were found, the results were published. That made them available to people elsewhere in the world, especially in the western world. They were able to apply facts and information available to minimize, or reduce the impact of fish diseases on culture that was underway.

MR. OGDEN: You personally have spoken about many of your accomplishments and contributions to our knowledge of fish health. Would you please describe for us how you attacked the Whirling disease problem?

DR. WOLF: The Whirling disease problem was probably the most difficult of the research goals that we sought. We tried to break that down into units by tailoring questions that would answer the problems as we saw it. As an example: one of the first, we knew that this was a pathogen of Trout, that was recognized, and that in order to be infectious the organism itself had to undergo a period of several months duration in the aquatic environment. So we asked the question basically, 'Is this infectivity inherent in the organism or is there something else involved?' And in time we learned the answer that something else was involved. The spore that was recognized as the so-called "cause" of Whirling disease was not, in itself infectious. Then we follow with a series of questions, all logical and easily understood. 'What then takes place to cause this spore to be infectious?' So we had to sort out questions like, 'is it an active biological substrate or an environment in which this infectivity occurs? Or, is it something artificial?' As an artificial environment we chose just plain sand. The spores were put in sand, and they did not develop infectivity. But they did develop infectivity in the pond type or earthen raceway environment. And so, on we carried this research by a series of questions and answers, which is generally the approach of researchers everywhere.

MR. OGDEN: Certainly during all years, money was always money was short supply. How were you able to conduct world-class research under such extreme financial limitations?

DR. WOLF: That's an historical view. At the time, we did not consider this extreme. We thought we were lucky. We had a few dollars to spend to meet our needs. Some of the biological research is expensive, like the electron microscopy, and other activities like that. But because of interest at universities and other teaching establishments and research laboratories elsewhere, we were able to carry out cooperative work, even with industry, to produce answers that we needed. So that we did not have the multi thousand dollars electron microscopes, but other elsewhere did. They were interested in our material, and that is one answer to how we got high cost money without having "in pocket".

MR. OGDEN: Ken, you've always had the reputation of the practical joker. How did you get that title?

DR. WOLF: I kind of think that I inherited a gene for mischief. My Dad was a practical joker. My paternal grandfather was not. I saw my Dad pull a practical joke on my grandfather, and he was not very appreciative of that. I pulled the same kind of thing on my Dad, an exploding cigar, and he was not very happy about that either! But this has continued through the years.

MR. OGDEN: Tell me a little bit about some of the things you got involved with.

DR. WOLF: As practical jokes?

MR. OGDEN: Yes, as practical jokes.

DR. WOLF: Here is one that was interesting; Dr. Seneschoe always kept a bowl of candy in the office so that when visitors came they were made welcome with a piece of sweet candy. At the particular time of this tale, we were using sponge rubber cotton plugs for closing bacteriological tubes. We had left the era of cotton, and gone into foam rubber. So with this particular approach, I took some of the sponge rubber closures and coated them with chocolate and put them in Dr. Seneschoe's candy bowl. Dr. Seneschoe picked up one of the pieces and couldn't bite through it. We kind of watched through the crack in the door as he pulled on the "candy" and didn't get through it. That was the downfall of other people also. Another candy bowl "contribution" was the rock candy, not the crystal candy, but the hard candy that was coated and made to look like gravel. We had visitors that picked up some of the gravel appearing candy, which *was* gravel. They managed to fall prey to that one too.

MR. OGDEN: It's kind of interesting that even though world-class research was conducted at Leetown, you also obviously had a good time among yourselves.

DR. WOLF: Yes we did. It was what we considered to be the golden era of Leetown. It was small enough that we had a good group, and it was productive enough to be significant.

MR. OGDEN: We know that the Fish Health program was the grand beneficiary of your research. What personal satisfaction did you get from the research and from working for the Fish and Wildlife Service?

DR. WOLF: One word covers much of what I felt. That was the concept of discovery. Finding information and facts that no one else ever before had known. This was the satisfaction of doing the work. I never felt that it was a job, per say, but that Leetown

was an opportunity. By carrying out the research, the answers that were obtained were worthwhile. Other people could use them. And that resulted from the research effort.

MR. OGDEN: Ken, it's been a delight talking with you here today. Are there any other comments that you would like to make about your career, or your association with the Fish Health program or with the Fish Health Research Laboratory?

DR. WOLF: Yes, I was going to bring this in as an introductory comment, or two; one of the big features that typified the research era of the 1940's and 1950's, 1960's and 1970's was that there was a great deal of latitude in what we were permitted to do. It was not stringently targeted. As examples, I had mentioned earlier that we were able to do fish cell cultures, not only with fish, which had a target in itself, but also with associated animals; reptiles and invertebrates even, and amphibians. We were even able to do considerable work with Sharks. Now that seems foreign to research on freshwater fish, but the idea was that if we could grow shark cells in-vitro and grow fish viruses, we might be able to alert the fish viruses sufficiently so that we could infect fish without producing disease. That was our hope for our work with the sharks. We were also able to work with Duck plague, which again explains the latitude of research in virology. The practice and information that we learned with fish translated to solving problems with the duck plague agent, which was a problem on some of out National Waterfowl Refuges.

MR. OGDEN: During your forty years did you see a change in the government's attitude towards that? Did you see a move toward move directed research, rather than the freelance research?

DR. WOLF: Very definitely. In the earlier years we had broad acceptance and permission for this latitude that we enjoyed. Later on, pressures evolved, and these were understandable, but the directions or targets of the research were no longer the purview of the bench-type researcher. But these came down as directives from Washington, D.C. And I am sure that political pressure on the administrators was another factor.

MR. OGDEN: O.K. well it's certainly been a joy talking with you here today. Do you have any other comments you'd like to make to wrap it up?

DR. WOLF: No.

MR. OGDEN: O.K. It's really been fun. Thanks Ken!