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Interviewer: Wendy Hall

Interviewee: John J. Craighead

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Wendy Hall: Interview with John Craighead on March 20, 1992, at the Craighead Wildlife Wildlands Institute. My first question for you, John, is where did you grow up?

John Craighead: I grew up in the District of Columbia. We had a home there in the suburbs of Washington D.C.

WH: What was it like where you grew up?

JC: Well at the time I grew up, Washington was a pretty small city even though it was the capitol of the nation. There were a lot of wildlife species still in the area. There were a lot of wildlife habitats and it was really a very pleasant place to live.

WH: When were you born?

JC: I was born August 14, 1916, and I had a twin brother born at the same time, Frank Craighead.

WH: What did your parents do?

JC: My father was chief of the Bureau of Forest Entomology and that was under the Department of Agriculture. He was in charge of research on most insects. My mother was one of the first women to be given a technical science work. I think it was at the national museum in Washington D.C. Anyway, she was one of the women pioneers in doing scientific work.

WH: What kind of activities were you involved in while you were growing up?

JC: I didn't catch that.

WH: What kind of activities were you involved in while you were growing up?

JC: Most kids are involved in all kinds. I believe we did have some rather unique activities because living in Washington we had access to the National Museum, to the National Zoo, to the laboratories, Fish and Wildlife Service, and other agencies that were related to wildlife and the environment. Early on we had an interest in that. Some of the activities...we learned to make blow guns by going down to the American Museum and we used those- we killed starlings, which were in great abundance and doing damage in the capitol at the time. Then to

find some use for the starlings, we got interested in falconry. We were among the first to introduce the sport of falconry up in this country. We learned through Colonel (?), who was one of the various pioneers.

That led us to an interest in photographing birds of prey, first our own raptors that we trained and hunted and secondly visit the nests and photograph the birds at the nest. The Potomac River was fairly close, so we went up there as boys, did a bit of fishing and the fishing led to canoeing and canoeing led to making our own canoes and kayaks, which we did at an early age. We had a lot of activities (unintelligible) in the out of doors when we were quite young.

WH: What kinds of activities did you do with your parents?

JC: We were encouraged by our parents and my father and mother both enjoyed the out of doors. They bought a little piece of land up on the Potomac River north of Great Falls near Seneca. They built a little, what we call, a shack. It was just a little dascha, to use the Russian term, on the edge of the river and nearly every weekend we'd go up there and work on it for a little while. Then we'd ride into the rather wild part of the river. It was called the Seneca Breaks. We'd take a canoe and go out and look for birds and for water fowl and eagles. We did a lot of fishing for smallmouth bass and catfish. At this time, the river was very clean. We didn't think anything of- when we got good and thirsty, we'd drink out of the river. Many years later, it was very different situation.

WH: Where were your parents originally from?

JC: My father was from Cumberland Valley in Pennsylvania. His ancestors had come over with William Penn and they lived in the valley for quite a little while and were mostly farmers, doctors, and ministers. My mother's family came from Virginia and they were more or less business-oriented. I think the background of both families were English-Scotch or Scotch. My mother's family was a fairly large family of seven children and my father's family were five.

WH: Who got you interested in and influenced you to study wildlife biology or wildlife management?

JC: Well I obviously was very interested in the out of doors and wildlife all through my high school years. I decided to go to Pennsylvania State College, which is now Pennsylvania State University to take training because my father had gone there. Both my brother and I went there. We took a combination of liberal arts and science. No one at that time was particularly influential in directing me towards wildlife and the environment. I was actually more interested in philosophy or things of that kind except for the outdoor work I had been doing prior to that. Also, when I went to the university, I had been training falcons for quite a number of years with my brother. So we took a couple of our trained falcons to Penn State and kept them there during the four years we attended the university.

Penn State was located, really almost what you'd say in the sticks. It was out in the mountains

and a lot of streams ran so we had a chance to carry our interests there, going out into the country and we liked to hunt and fish and to observe and photograph. We (unintelligible) a falcon at that time was becoming scarce eventually because of the egg collectors, which there were many at that time. They ran around to the aeries and to those of the bald eagle as well and collecting them. So we spent quite a bit of time locating aeries and photographing the birds at the nest.

The first one we photographed was an aerie on the Potomac River and several on the Susquehanna that were in Pennsylvania. We carried that work on just as a hobby while we were going to the university. We both went out for the wrestling team and both made the varsity team four years. After graduating Penn State, we went to the University of Michigan and at the time, I didn't know precisely what I wanted to do. I wanted to do something with wildlife and in the out of doors. My father continued to influence both of us because he encouraged us to go and in fact, he helped us with money in the first four years of college. Each of us got a scholarship from the University of Michigan to attend there.

There was a Professor White there at the time that did influence very strongly my outlook on nature and the environment and also another professor named Dr. Samuel Graham who was an entomologist and a plant ecologist. It took one year to get my Master's there because I was going in directly for a Ph.D. I had just gotten started on a Ph.D. program, aside from what I wanted to do. I got an opportunity to go to (unintelligible) for the National Geographic Society, my brother and I. At that time, my brother and I did most things together being twins. Before going to Penn State, we had written a book called *Fox and the Hare*, which were experiences with the birds that we trained and with the birds that we photographed. We also had written an article to *The National Geographic* entitled "Adventures with Birds of Prey."

A young prince in India by the name of K.S. Dharmakumarsinhji happened to read that article and wrote to us and invited us over. It happened that he came over here first. We took him around and showed him what was going on here, the falcons we were training and so on. (Unintelligible). He returned to India but he said, "Someday you'll have to come over and see my house." He trained birds of prey on a tremendous scale. He had all kinds of help. So we got this letter inviting us over. We finished our master's degrees but we decided to go and see him. We talked to Doctor Grovener in the National Geographic Society. He was very enthusiastic about it. So they put up the money in 1940. My brother and I took off crossing the country. We drove to San Francisco and we took off for India. That's a pretty long story in itself. It was almost a year there.

Then when we returned from that trip, we wrote an article on our experiences called "The Life of an Indian Prince." We also had prepared a motion picture titled *Life of an Indian Prince*. It was all color. At that time, color film was just coming out. We gave a lecture at Constitution Hall on our experiences. Then we went back to the university to complete our degree. We hadn't much more than gotten back when Pearl Harbor arrived. And we got into the military, the Navy. We were put in charge of developing the naval aviation survival training program. So four years

or so, we first wrote a manual for the training and then we set up the training in the various stations through it, the United States and then South America, and then eventually the Pacific. That's a long story in itself. After the war- well I won't go on any further because you've probably got some questions.

WH: Oh that's fine. Okay, why did you continue on? Why did you go on to graduate school to obtain a higher degree?

JC: It was obvious to me that if I was going to be able to do the kind of work I wanted to do, I had to get an advanced degree. I learned that all the people in the agencies had those kinds of credentials. My father had also. Michigan was one of the few schools that offered a program in wildlife work at the time. It was associated with the School of Forestry just as it had been here for many years. The Professor White had- his real contribution I think to the appeal of the college was in getting his students to study an area of land, and physically map it, the vegetation, and then determine the kind of animals and the numbers and study it over a period of years. This was done as a course.

It was carried over many years so that you got the feel of the land and what was on it, what kind of things were interrelated. I think this was an extremely good turning point in my professional view of just what I wanted to do and could do. Unfortunately he died of lung cancer before I could name my thesis. I had sort of enough that I knew what I wanted to do. My brother and I decided to team up and study birds of prey, which we were always familiar with on an area the size of a township. It was 36 square miles in Michigan and trying to determine some of the dynamics of raptor predation. At that time, everybody thought in terms of good raptors and bad raptors. Most of them were considered bad raptors. There were still bounties on them.

At the same time there had been a lot of food habits work done by people in the whole Bureau of Biological Survey showing that not all birds of prey were necessarily bad. Anyway, we spent a number of years and a lot of intensive work, got our degrees in bio-ecology and a minor thesis which was published and is still available in the form of *Hawks, Owls, and Wildlife: Ecology of Raptor Predation*. So a little earlier, my brother and I had also made the acquaintance of two people, one Adolf Muir. We learned what they were doing and began to realize that there was a future in this kind of work as well as being enjoyable.

We also had a close friend, a Doctor Brigs who was a botanist at The University of George Washington. He discovered that it was valued (unintelligible) smokes in Alaska and more or less brought that before the public through publications and movies just about the time we were getting interested (unintelligible). So those people all sort of did influence us, but most of all my father, because he was really well versed as an entomologist and ecologist and he was able to tell us a lot of things about the out-of-doors when we were still quite young, the birds and the trees, the fish. They just became part of our everyday lives.

WH: What types of courses did you take when you were going to school?

JC: Well, like every student, I tried to get the ones I could and took the ones I had to. I took a lot of English and English literature. I took a great deal of philosophy. I did major in zoology. There were the usual courses. I don't know if there's any point in going through them. The thing that was different was that when we got to The University of Michigan, I was able to take a combination of zoological courses and things, courses in forestry, especially those that related to the plant base, plant ecology. Otherwise, I didn't take as much math as I should. I realized that later. If I had to make a choice between taking a broad course, which I had courses in animal and plant biology and ecology to lessen the math, I think I still would have learned my way. Today, we realize more that math is important, statistics and math.

WH: What difficulties did you have to overcome while being a student?

JC: Well, like every student, I had to earn my way. I was fortunate in that Wildlife Management Institute was still a growing concern...about my brother and I, the scholarships, those fellowships at the University of Michigan. Then we also took on some teaching responsibilities. We were able to get through okay, but the thing that amazes me is that in all the work that I did at getting my PhD and field work and so on, we had so little to work with and it was so difficult to get something at the time. Nobody would give money to students or to environmental issues or anything else. I think that over the years, they didn't associate with students most of my life, what they have at their disposal to get work done, I sometimes feel pretty bad when I see one that is simply not taking advantage of the opportunity that they had because residents that started that early certainly didn't begin to get the opportunities available to students today.

WH: I think you answered the next question already. Have you ever been married?

JC: Sure have. That's why I can (unintelligible).

WH: What is her name?

JC: Margaret Smith. I met her on one of my early trips out into the West. Before I went to college I got- my brother and I- jobs out in the west with the Forest Service. It was on one of those trips that I met her in the Tetons. She was just pulling up for a climb on the mountains and carrying her skis out. I offered to carry the skis up for her and that was my downfall.

WH: Do you remember what date that was?

JC: It must have been- I have it in notes. It was about- it was either late 1930s or 1940.

WH: When were you married?

JC: 19- when did we get in the war? It was maybe 1944. I'll have to check that out. One of the

dates I don't remember to easy (unintelligible).

WH: What are your wife's interests?

JC: Same as mine. She was a great mountain climber. She was one of the first women to make an all women climb to the Grand Teton and she did a lot of climbing when I first met her. She climbed with Jack Durance(?) and some of the great climbers of that time. She climbed the Grant Teton 12 times and a lot of climbing in the Twin Rivers. Then she was a good botanist. She studied geology. It was her major. We had a great deal in common. We both liked the out of doors and everything went well then and still is.

WH: I'm going to turn the tape over now.

[End of Tape 1, Side A]

[Tape 1, Side B]

WH: Okay, my next question is what role has your wife played in your career?

JC: Well, besides being the mother of our children, she's played a major role. There's no way I could have done the things that I have done in the out-of-doors and in the professional without her full support and help. There were years when I was away for a long time in the field. In fact, nearly every year when I was here, I'd be working in the wilderness areas and sometimes she was with me. When the children were small, she wasn't. Right after World War II, I bought some land in Jackson Hole, both Margaret and I did.

We built a log cabin there. Then when I went on to other jobs, we used that as a summer home. So she'd go there with the children for the summer and I'd be out in the field. As they got older, both Margaret and the children would go in the field with me when it was possible to do so. The benefit of students going into this field- there's nothing more important, no greater asset than getting that kind of a wife. I know from my own personal experience and I know it from dozens of students who have seen who had a lot of ability and a lot of drive who got the wrong wife.

WH: What role did your family play in your career?

JC: They were both part of it. When I was home, I'd take them outdoors fishing and hunting and camping as my father had done for me. I was in a much better position than my father was in being able to take them out on wilderness trips. A lot of my work dealt with wilderness species. We've been- we were a very close family all through the early years and still are. The children all come home and spend a lot of time. We still go out in the mountains and on the rivers together. I'd say it would be hard to get a family that did more together in the outdoors than our family did, my brother's family too. As we were growing up, we had one big family. When my sister was also indoctrinating the out-of-doors, we got together with her and her family. She has written nature books for children. So she followed a career in the biological sciences too.

WH: How many children do you have?

JC: Three. One daughter was the first and two boys, Karen, Derrick, and John. All of them majored in biology at The University of Montana and are still very much interested in biology and conservation in the environment. My oldest boy is the president of the institute here. He's doing that kind of (unintelligible) after eight years of working in Alaska and then became the director. He's now president (unintelligible) now is the institute director. They've all pretty much followed along. Karen accompanied me on a lot of my field trips and she's an excellent photographer and observer. As (unintelligible), still her great love is the out-of-doors. She loves to go out with her children. Her children do too. It's in the blood.

WH: Do you have any other siblings besides your brother?

JC: My sister that I mentioned, Jean Craighead George. She writes children's books. She's written a large number of them and has been very successful at it. That's it. There were three of us.

WH: Did you play any sports when you were going to school?

JC: Oh yes. I played in the lightweight football team from high school. When I went to college I started at soccer, but the wrestling coach got a hold of me and my brother and I switched from soccer to wrestling. We both wrestled varsity for four years at Pennsylvania State University. Then as a graduate student I did some wrestling at Michigan. I enjoyed all the sports, intramural sports that kids do- sandlot sports- baseball and basketball. I tended more towards the outdoor sports of hunting, fishing, and canoeing, and, later when I moved to the west, skiing.

All our children took up those sports too on the ranch. Any sport in the out of doors, as closely related to nature, we liked. We never got involved with mechanical things, snowmobiles or motorboats or anything like that. We use the outdoors a lot and respect it. We tried to preserve it and I think certainly there are people that work the way we did. Many of them feel it's an obligation to try and preserve (unintelligible). It's not just a job. It's a crusade.

WH: What department appointed you to The University of Montana?

JC: Okay well let me go back a little bit. After World War II and after I got my degree at The University, PhD, I went to Jackson Hole where I built a cabin. I had a job for a year with the New York Zoological Society. At that time jobs were real scarce. There wasn't much wildlife work going. It all stopped during the war. So the job opened up just about that time anyway we got into the Korean War and the strategic air command, the Air Force asked my brother and I if we would consider getting back into the military to set up for them, survival training courses that we set up for the Navy in World War II. We agreed to do it if they allowed us to do it as civilians. We didn't want to get caught in the middle.

So we spent a couple of years during the Korean War setting up and administering programs that trained the crews at its strategic air command. About the time that the war was drawing to a close, I got a call from D.L. Cheading (?), who was the first man to have a- be in charge of the wildlife community. He asked me if I'd be interested in a job over here because he was taking another job. I said I would so I came over and I liked what I saw. I said that I'd accept the job and I got it. So I came here and I came as the leader- that's what the title was- of the Montana Cooperative Wildlife Research Unit. So (unintelligible) was the title of the professor of zoology and forestry.

I worked with mostly both those departments all through my career, then of course the Montana Fish and Game Department. It was a member of the wildlife unit. There were three, the state, the federal people, and the university. I began my career here and I stayed here even though I had many other opportunities with the (unintelligible) the country because I got into

long-term work with- even from the very beginning, I thought it was especially important to deal with the wildlife (unintelligible) to get results that could be applied practically to the environment.

WH: What kinds of methods or techniques did you use when conducting your studies?

JC: Well of course in the wildlife field there are all kinds of- even then in the early days, there was quite a number of techniques. As the science developed, it developed in response to more and more techniques that enabled the researcher to do more sophisticated things. I developed quite a few techniques myself. I was among the first individuals to individually color-morph big game animals so that we could observe and know that an animal was a certain individual.

I guess the thing that was the most important in terms of techniques were- my brother and I developed a technique of radio tracking large mammals. It actually was almost ten years later before other wildlife biologists began using that technique in extent we developed in our study of grizzly bears in Yellowstone. And then I later got in other techniques that were related to use of satellites, the mapping of vegetation, tracking mammals by satellite and all of these. My brother and I found (unintelligible).

WH: What types of classes have you taught at the U of M?

JC: Well most of my teaching was- one of the directives that I got from the federal government that paid was to try and do as much research as I could, direct research of the graduate students- administratively run the unit, but specifically not to engage in formal teaching. They felt that isn't what the unit (unintelligible) receptive for the university of their own. They could hire the teachers, but they couldn't hire people like (unintelligible). So I didn't teach any formal classes. Teaching was all with graduate students actually out in the field and going over their research and dissertations with them. That constituted most of it.

Then I was involved in a lot of this conservation work throughout the state. At the time the early movement of conservation, the early period in the conservation movement, people like us, Pengally and Dr. Sedley(?), myself and others- there was hardly a weekend that we weren't at meetings first to help get the (unintelligible) that fast. I got very much involved in (unintelligible). In fact, so did my brother. Then the basic management of species (unintelligible) elk, and bighorn sheep, and mule deer, and that. So that aspect of my job took quite a lot of time.

WH: What challenges did you face while you were at the university?

JC: That's a good question. The first challenge I had- stake out your job and try to keep it the way you want it from all the things that will encroach on it in the university system. Everybody liked to put you on something that was their pet job. So I guess the greatest challenge is to forge a niche for your doing what you think is important. Secondly, I think it was maintaining a

good and cooperative relationship with three major organizations, the university, the federal government, and the State Fish and Game Department. That's not an easy job because they all have different issues, different objectives. And when they put money into a program they want different things out of it. In general, there were a lot of agreements. So the job was possible. You had to fight to hold it otherwise it would become what somebody else wanted to make it.

WH: What was it like working for those agencies?

JC: Well it was certainly challenging and I learned a great deal because I was pretty naïve. When I started in, I thought that certainly everybody loved the outdoors as much as I did. I thought that you worked trying to salvage as most of us did and putting in the time we did when you have information that you obtain through rigorous long-term service at agencies would welcome it. Apparently they don't welcome it. Many others felt the same. We learned that the managing of wildlife resources is as much a political task as it is a biological. Politics usually overrides the biological.

WH: How were your projects funded?

JC: Well we practically weren't funded in the early days except for a salary. The Wildlife Management Institute gave us \$1500 a year. The Fish and Wildlife service sometimes bought about a hundred thousand dollars. They did provide us with a vehicle. The university was no matter. They put on this for the place to operate and a few hundred, maybe as much as \$1,000 (unintelligible) hours for operation. All these groups, somewhat over the years, but never amounted to much and never- up until the time I began studying the grizzly bear, we just operated on (unintelligible). We did have money for student stipends, which enabled students to research. Even that was very meager. You couldn't even begin to do the kind of work during the day with the kind of money that we got at that time. There was- the state really put in most of the funding through the Pittman-Robertson Act.

Again, there were real limitations on what you could do. In the late 1950s, it began to be more concerned with the environment and more work with pesticides had been noticed, then curating environment including the inclusion of rivers. So I decided, well, I got a request from the Park Service to take a look at the grizzly bears in Yellowstone because they were having problems with them, especially at that time as more and more people began coming into the park on their way up. So I went over and I decided it was a unique opportunity to study an animal like that. There certainly wasn't, at that time, any information on either the biology of the species, forage habitat, or how to manage it.

They didn't even know how they dened or how many they produced in a birth, how long they lived, or any of the things that we know about bears today. I decided to do a project on that and it happened to be one that created a great deal of interest. So the National Science Foundation- I asked my brother if he wanted to, he was working in Washington at the time, come back and work with me. The both of us worked together and some of the students would

be on as graduate students. I wished that the undergraduates who were taught in the aspects of field work and the National Geographic took an interest. They provided funds. It wasn't long before we had nearly half a million dollars a year spending on the project where up until that time a few thousand. That was all we had to work with.

The work went very well. It went for 12 years and we were well funded in all that time. I won't try to bring in all the groups and agencies that supported. The State Fish and Game put up quite a bit of money. During that period, the whole concept of funding wildlife research moved dramatically especially from the time that (unintelligible). It was tremendously helpful but it also had its drawbacks because the agencies wanted you to be what they want you to do. In getting funding from their side, it may mean getting a lot of independence that I hadn't had earlier or do the things I thought needed being done and doing them on a much larger scale.

WH: Which students of yours were the most memorable?

JC: Well that's a hard one to answer. Actually there aren't a whole lot that are memorable, not that you don't have a lot of pleasant thoughts about them, but outstandingly there are few and far between. You have to remember the students became attracted to the program (unintelligible) two professors in zoology, professors in forestry, and myself at the institute. So none of us had access to all students and among the ones that I worked with most closely, I'd say the most memorable ones were Morris (unintelligible) who has his own research unit in (unintelligible), Bob Rotford (?) who took over the chairman of the wildlife department at the University of Wisconsin. He worked with me for a while on the bears.

There was Jerry Madan (?) who worked on golden eagles and later got his PhD at Wisconsin but then decided that he didn't really want to. Although he was an outstanding student, he didn't finish the work and went into writing and beekeeping. Harry Reynolds III did the most extensive work on grizzly bears of anybody in Alaska. He was a student. He worked on the golden eagle. He did his master's degree and then worked on the grizzly bear project in Yellowstone for a few years. I'd say offhand that those four or five were outstanding. It's something that's hard to pick right off the bat. There were a lot of other good students.

WH: The tape's about to end so—

[End of Tape 1, Side B]

[Tape 2, Side A]

WH: Continuation of the interview with John Craighead on March 20, 1992. My next question is: how have the ethical standards in the wildlife field changed during your career?

JC: Well, the whole subject of ethical standards is a really important one and especially more now because the laboratories have a lot of variables (?) and it's very seldom that you can set up controls for an experiment. Therefore, it's very seldom that another scientist can completely verify your results by doing a similar study. So it's much more important to have integrity for a student or researcher in wildlife rather than any other science that I can think of, any biological field of science. I don't think this has been sufficiently recognized by any of the schools of higher education. It's something that needs to be drilled into a student.

It's something that especially those that are (unintelligible) committed and so on to their degrees need to emphasize even more than the subject matter. There's a lot that goes on in the wildlife field that certainly doesn't meet the standards of what most of us think of as scientific standards, or ethical for that matter. Yet there are some great people and some great work too. Part of the problem is that not all- or not even most- of the people in the field of resource management are trained in science. Many of them are trained as administrators and many of them have training as managers and some of them are trained as scientists, but they don't go beyond a master's.

Some of them don't even get that far. They simply don't really get immersed in the code of ethics that a scientist needs to have. It's made problems in research results that were found in relationship between scientists and people in agencies that are responsible for administering the resource. I don't know whether it's gotten better or worse. I think it's gotten worse because there are a lot more biologists doing their work than 30 years ago and so more and more things can get into the literature or can get into the practice that have an unethical source than in the early days.

WH: How have the trends in the wildlife field affected the projects that you have done?

JC: The trends?

WH: Yes, the trends.

JC: The trends in wildlife you say?

WH: Yes, referring to like maybe it was popular to do one sort of thing for wildlife and the trend in the field to do something else.

JC: Well I think the trend has been more and more towards—what do you call it?—towards synecology rather than autoecology. We're trying to get a holistic view of things. That's a

natural process that first boomed studies on individual species, both plant and animal, and then kind of being able to bring that together to study and understand interactions from one animal to another and look at plant base- what's the chemical and physical environment too? So I think the tendency has been to paint with a bigger brush and I think that with the electronic technology of our times it vastly changes not only our field but every field of science.

The development of radio tracking- anything's possible. We never even thought about it in the early days. We use satellites that enable us to map wilderness ecosystems in detail, quantitative detail. That was absolutely impossible before the advent of satellites and all the spectral imagery. Of course, the development of computers kept the pace or exceeded the pace in which you could get data in the field. So now we can- just an example at our own institute, we can radio collar bears in Alaska with satellite collars- with radio collars that contact the satellite.

The data comes here. Once we go into the field, most of our data comes in here and we process it. We can relate the location of our animals and certain physiological parameters that we measure by radio, habitat that's been mastered electronically. We digitize all of this so we get a much better idea of how animals use their habitats especially on a broad scale over an entire wilderness ecosystem. On almost any aspect of field biology, these kinds of changes have occurred. So we're getting not only much more precise data, but a great deal more of it. We're able to process it in a much better way than in the early days.

WH: How have these trends- have they had a positive or a negative effect in what you've accomplished?

JC: I think they've had a definite positive affect because you learn things that would be impossible to learn otherwise. We can know what an animal was doing at night, such as a bear, from radio collar. We can know how the animal's doing during aggravation from radio collar meter data. This is occurring all over the world. There's hardly a species in Africa- mammal species- that haven't been radio collared and tracked and observed. It enables- you can observe more often because you can locate animals at your convenience.

That's particularly true in this country. Africa's ideal for observing. It's mostly open country and there's no comparison between trying to observe animals in Africa and the problems of trying to observe them in this country. So the radio was a real blessing. I think we're swinging more and more to looking, as I said, at the whole resource. This means that we're going to manage the whole resource. The thing of the future is going to be the management of these large ecosystems holistically rather than piecemeal, the way we've done that. That's only possible because of the fact that we can map the entire areas in detail, usually with these sophisticated techniques. We can observe the animals and how they use their habitat with these sophisticated techniques. We can process it in a way and present it to administrators so that they can understand it. It's all for the good.

WH: How has the university changed since you arrived?

JC: Well, everything else in western Montana has grown. It's grown quite a lot, maybe not as fast as some of us would like to see. It's hard to say whether the faculty quality has improved or not. I think in view of the low salaries, that it certainly hasn't improved at the rate that faculties have at other institutions. I think the quality is probably higher because a lot of the professors come here because of the lifestyle. They're willing to accept less and yet they're in a position to demand more if they wanted it somewhere else. The local environment has been tremendously changed I guess by more and more people and development. These are changes that are in nature because of the people moving from the little town to a big town where you hardly see someone you know during the week or two. The valley was essentially free of any inhabitants except for the ranchers. Now it's a big suburban area.

You go up to Flathead and the same way up the Clark Fork so those demographic changes have been tremendous. Fortunately, we have the Selway Bitterroot Wilderness on one side, the northern county on the divide Scapegoat, Great Bear, and Bob Marshall to the north and a little further east and you have Yellowstone. So we're situated in an extremely enviable position. We have these three really large wilderness ecosystems, although they're not invulnerable. At the rate we're going, we'd be lucky to hold all of them. At least for a long time these areas won't be developed, they're being developed more than most of us would like to see. They still remain relatively uninhabited compared to these valleys with their repairing habitat, where most of the population (unintelligible) centers.

You say what other changes at the university? Well, of course, I've been away for almost ten years. There were a lot of changes (unintelligible). I think we still have a really fine student body and a real fine academic and administrative body. I think it's obvious to everyone that what we need is more money, but so does our institute and so does everybody else that's trying to make this a better world. So we can only keep trying and hope for it. I think this university will eventually get by with the funding they need.

One of the first grants here (unintelligible) would be to more strongly support the whole wilderness movement because of outdoor recreation and all those things associated with the tourist trade. It's obviously going to be the business in Montana for a good many of years into the future. It's not going to be how it used to be where minerals, the logs, even the water was a combination of the landscape that we need to protect.

WH: How was the wildlife program started at the university?

JC: Let's see. Well, I arrived pretty close to when it first started. I'm not sure the people most directly involved- well, I think it began when the Wildlife Management Institute and the Fish and Wildlife Service- when they decided to set up the Wildlife Units at certain universities. Montana happened to be selected as one. It wasn't one of the first, but it was fairly close. Once that was decided, they had to get a director or head of the unit. There was quite a battle over

whether it would come here or to Bozeman. The feud lasted for many years and resulted in it coming here. There's even still some at Montana State College who felt that they should have had it.

I think things (unintelligible). They have their own biology, wildlife biology, we had ours. It's made the state ecologically stronger. Anyway, with the passage of that- I don't know if it was legislation or not, but in establishing the units, that was the beginning here. D.L. Cheatum (?) was the first. Then those professors that were all on hand that wanted to be involved and that had the background to be involved became essentially the nucleus of what is now the Wildlife Biology program.

WH: How did the program work when it was split into the two majors of zoology and forestry?

JC: Well, there was quite a bit of competition between the two, really between forestry and botany and zoology. It wasn't the best kind of competition. It really didn't help the program. This was finally recognized and it was- then the Forestry Department had their program. Zoology had theirs. Both of them utilized the Botany Department. Later the wildlife program was unified. That happened a few years before I left the university. I think it's worked very well. I think it's better than when things were divided. I don't know. I just haven't been participant.

WH: Who led the two programs?

JC: Well, there wasn't really any- the head of the Wildlife Unit had an awful lot to do with providing leadership and keeping the factions together, getting money, setting up the projects for graduate students, and there really wasn't anyone heading it up in zoology. There wasn't anyone heading it up in forestry. There were people in those departments, Phil Wright, Lud Browman, (unintelligible) in zoology, and Les Pengelly, and quite a few others in forestry that came and went. Les was probably the most prominent. They all played very important roles. I wouldn't say that I wasn't any real leadership until everything went under one blanket so to speak.

WH: Who taught the courses in the two programs?

JC: You certainly have got lists of those. I don't- I could give you some of it, but there were a lot of courses taught and by a lot of able people. I don't think I'm good to comment on who taught what. There were a lot of very good teachers in both teaching biological subjects, teaching botany, teaching forestry, teaching plant ecology, teaching physiology, and so on. Anyone taking the course that got the best of these teachers got a really fine education.

WH: How were the two programs different?

JC: Well, they were quite different, but together they- if a student was able to get some from both, he was in a much stronger position when he went out as a professional. Both tended, in

my estimation, emphasized too much the classical zoology and not enough zoology that would be really applicable to studying wildlife in the field. They did a very good job at what they did. Forestry tended to see it the other way, to do more practical stuff and less on the fundamentals of ecology and biology. It was more how to apply it in the field. It would be hard to say which was best.

If someone wanted to go into some kind of physiological and in wildlife, he'd be better off taking- if he had to make a choice, taking the zoological program. If he wanted to study the wildlife environment that animals lived in, he was better off taking what he could get under forestry. Unfortunately, these were never blended when I was there. I'm not sure that they are today. I feel that I was fortunate to have that type of blending at the University of Michigan at the time I went there.

It has its weaknesses in that there are some things that you don't get to take that you'd like to take. If you do it tends to give you much a much broader picture. Some people are better off with a broader view and some are better off with tunnel vision depending on their personalities and knowing what they want to do. So it's not anything I think you can weigh or judge very easily.

WH: How did the merger between the two majors come about?

JC: The majors?

WH: Yes there was a major in zoology and a major in forestry. How did that merger come about?

JC: Well, I think it came about when they recognized the competition they had from other schools. They weren't in a position to say, "This is what a student ought to have," and it being more often forced and, "This is what a student ought to have," and it was allowed. It was a natural evolution that brought all of that together. The same occurred in most other universities so that today, a student does get a really thorough training and he can direct it more towards the botanical side or more towards the animal side or more along strictly physiological lines. He can direct it almost any way he wants by the kind of courses that are available to him to take. That's about all I can say. I don't really- I'm not too familiar with the political and administrative aspects that brought it all together.

WH: What was lost or gained by the merger?

JC: I don't know that I know or could even comment on that. My own feeling is that a student should be given as much freedom as can be given to decide what he thinks is most important for him as an individual in where he thinks he's headed. That's not an easy thing to do when you're dealing with the institution of higher education. I think that at least on the field projects, field biology, that it's really important to emphasize the long-term commitment of doing this

sort of thing. There's no way you can go out into the environment and in that year or two learn it, except very rarely, learn anything of great significance or contribute. Over a long period of time you can. Not only does it take a long time to get there, but it takes a long time to understand what it all means.

I don't think the universities are steering for that kind of thing and the State Fish and Game Department is definitely not and the federal government isn't. That's one of the reasons we set up this institute so that we could support people who wanted to devote eight or ten years to doing really good and intensive study with the hope that there'd also be an important or scientific endpoint but also important that it could be applied in the actual management of resources.

WH: It's the end of this side of the tape.

[End of Tape 2, Side A]

[Tape 2, Side B]

WH: Why was the program named wildlife biology instead of wildlife management or wildlife ecology or wildlife science?

JC: I can't tell you that from any firsthand knowledge. Biology is a term that encompasses both plant and animal. I think it's more suitable than calling it neurological or- of course wildlife ecology would probably have been just as good, maybe better. It would have put more emphasis on the plant life than most wildlife departments did at the time that was set up. It's only been in recent years that we've been able to study animal life in large areas in relation to the habitat, the wilderness. There's been so much else to learn first. Most of the effort was put on the zoological aspects.

Now, if anything, the emphasis is placed on the botanical aspects partly because we've become reasonably familiar with the animal information, but also because we really began to realize more and more that even in large wilderness areas that having an intricate knowledge of the habitat and what it's composed of both qualitative and quantitative and how it's utilized by a wide range of animals, it's key to managing. I think it's going to true more so in the future.

WH: What problems and advantages were there between the forestry, arts and sciences, and environmental study programs were there?

JC: Well, I think probably the answer that you've gotten from other members that were more involved in that- do you know the date when that occurred? I think it was just about at the time when I was leaving the university in 1977. I really didn't get involved. You can be sure that when any major changes occur in the university, that there are two sides to the question and it can be very- a lot of disagreement and a lot of friction until the thing is decided. I suspect that a lot of the players involved, that was the case.

WH: When did the co-op unit arrive?

JC: I don't think it's gone now—

WH: When did it arrive?

JC: Oh, arrive?

WH: Yes.

JC: I think it was 1950. I think that D.L. Cheatum (?) had been here only two years, that or very close anyway. I came in 1952. I stayed until 1977 when I retired. My assistant at the time I recommended his appointment for (unintelligible). Since that time the units have changed quite a lot. They've gotten a lot more federal help and have considerably more- the number of

students involved is greater as you'd expect at a university. There are more members of the faculty involved. The faculty has also grown. Otherwise, I can't see a great deal of a difference. The master's students are still working on short-term projects, which they should. They are being supported in various sources. PhD candidates are working on a longer term basis and are often better financed. It's gotten into more sophisticated research. Again, since it's evolved that way (unintelligible). I guess that's about all I can contribute to that.

WH: What was the early focus of the unit?

JC: Well the early focus was just to get students on a project with enough money to do a worthwhile piece of research and to get their degree, get published, and get out into the field. I think it's still the major focus of- there wasn't a PhD program in wildlife biology here when I began and so we had to send our best students elsewhere. Sometimes that's the best thing to do anyways. Later in my career we began to take on PhDs and more and more money began coming in to assist those students. What was that question again?

WH: What was the early focus of the unit?

JC: The early focus in terms of subject matter was on water fowl because the federal government was particularly interested in that. I very much wanted to get started some research on raptors and birds of prey. There was absolutely no interest on the part of the federal agencies and there wasn't any money for it. Most of our early work was on birds simply because it required a lot more money to work with mammals. And really there's been very little work on that other than the kind of work that the Murrays (?) have done, which is mostly observation. The projects in which animals were captured and marked, I planned some of the first of those.

They came after we worked out techniques on birds. You can catch an elk or if you can catch a bear, you can mark it. You can learn the same kind of things about the (unintelligible), and carnivores as you can from studying birds. Most of the emphasis was on birds. There was also emphasis more on political management, a lot of concern that all of our wildlife resources were being managed politically by groups, in State Fish and Game Departments. It was the Wildlife Management Institute that really turned that around. So the states got good commissioners and began to look for the information coming out of the research units to start finding biological information into managing the resources. The state of Montana was particularly anxious to get this kind of information.

They went to almost any extent to cooperate. Then in time they developed their own staff and more and more took over the management. More and more began to hire their own biologists to take on projects that they felt needed to be researched. Some of that, they had their own program of research and management. The university and the unit were involved only in research and education. They had no management function since they were mandated for that. (unintelligible).

WH: Who were the first leaders and assistant leaders of the unit?

JC: Well D.L. Cheatum (?) was the first leader. I don't think he had an assistant. I was the second one here, following Cheatum. I had an assistant after a number of years, Jerry Atwater. When he left for a job in Alaska, I hired Battel Garrett (?), who is still with us. Bartel Garrett hired Joe Rolf (?). These appointments all had to be okay by the university, Fish and Game Department, and Fish and Wildlife Service.

WH: How well did the unit integrate with the wildlife biology program?

JC: Well it's essentially a part of it. So it knew that it had to integrate. Practically the only wildlife biology program for many years was what the unit would do plus courses that the wildlife students took in order to do their theses through the Wildlife Unit. So it just naturally integrated. Even today, the role of the unit is to help get funds for students, to supervise their research, get them started, check what they're doing in the field, and view their data as it comes in, and help them put it into a suitable form that a committee accepts as a thesis. This is all a teaching process. It's not typical. Whenever somebody gives you a lecture every time you go into a room, but it is teaching and it's very effective teaching.

WH: How did the unit change over the years?

JC: It's changed in many ways. It's changed certainly in size and the way it was financed. I think there was a shift from short term projects to long term projects when I was there. I think that's been carried out in certain fields such as water fowl, not so much so in the large mammals. I don't really see a great deal of change that isn't associated with the normal thing you'd expect with the development of ever more precise techniques, of gathering information, and interpreting it. There may be more a tendency to try to solve problems than to make just the basic study to get new information about a species or a population simply because there are so many problems arising that we can't act as fast as they come to life but also even when we get the information, it's not always used to solve the problem anyway. It's solved politically.

WH: How did your role in the co-op unit change?

JC: Well during my tenure, the main changes came about when I was there was one of funding. Funding especially from outside sources other than the Fish and Game Department, the university, and Fish and Wildlife Service- this made a tremendous change because it made money available in quantities that weren't possible before. Therefore it made possible more intensive research and more long term research. During my tenure, the National Research Foundation came into being and they made money available. A whole lot of private agencies began to be concerned about the environment. I think that's probably what the greatest change was. There were some changes in the commitment of students. There was one period when the students were so politically active that they didn't get the time. During the sixties, I think there was less of a commitment to getting into the field and doing a really good job. I

don't have any date (unintelligible) in judging the kind of students that I had at the time.

WH: How has the wildlife field changed during your career?

JC: Well it's changed in focus and it's far more environmentally oriented than it was. The university pretty much oriented it to gain management. Then it was oriented to studying specific species. I think it's just keeping up with the times. Things change. Pericles, the Greek, expressed it best when he said, "You can't skip into the same river twice." That's the sense of where it is with ecology, with biological processes, and therefore with the people and institutes in biology that there's constant change and I see that it's all for the better because we're getting more and more pressures on the environment. Whole populations are increasing and the future prospects are certainly not all that good. I think many of us feel that we could devote a life to what we've done. If things continue to go the way they're going, I think years down the line we've lost everything we worked for so many years. Hopefully that won't happen.

WH: What role have you taken in making and influencing the management policies on Yellowstone National Park?

JC: That's a big question. You need to get two or three more of these before the end of the interview for that. I had a lot of effect on it, whether good or bad, and still do. We'll have even more, I think, when we get a graph out on 30 years (unintelligible) in Yellowstone. I think it's all a part of the business. The differences of opinion and controversy are really at the heart of democracy. The problems I had were not so much controversy as those people who didn't want to have any controversy. They didn't want the issues examined and still don't. I think what Yellowstone- and I've written a good deal on it- I'd refer to that rather than try worry much here.

The Yellowstone Park administration, over the years, had not done the kind of a job that many of us think they should do for the first national park in terms of managing both the habitat resource and the animals inhabiting the ecosystem. I've discussed (unintelligible) of the management of the grizzly bear because certain things occurred during the course of my research there. Afterwards, we tried to get some of our information applied to some very crucial problems. So what was that question again?

WH: What role did you take in making or influencing the management policies at Yellowstone?

JC: Just briefly, the role I took was providing them with a tremendous amount of new information that could be applied in the management of the grizzly bear but also of the (unintelligible) resource, the habitats and the animals that interrelate. I played a role in that when much of this information was not applied- and not only not applied but disparaging things said about it- I became involved in controversy which lasted a good many years, but which certainly justified our positions eventually. It still hasn't solved the problem. There's still a big problem in Yellowstone with getting information out about what really goes on, or giving

people information—biological information—put into practical management, getting coordination between the agencies that are responsible for the resources that the greater Yellowstone needed.

These are things that we inspect. It's just a matter of evolution. We do have to come to the point in the near future when we manage these ecosystems as a home, with similar objectives with the same concepts of what has to be done, and with an understanding of those things that are involved in extracting the resource versus those that have no extracted use of the visitation of the people to see wildlife. These all have to be integrated in a way that we maintain the environment and where the wildlife population is associated with those environments and still allow visitors to enjoy the park as intended. So that's a difficult undertaking but it will only be done if two things are followed. One is that man has to be considered as part of the biology, along with the elk there and treated as such.

The other is that it has to be viewed as a whole and managed as an entire ecosystem. All of this means that a lot of the in-house maneuvers that go on today have got to cease. There has to be a lot more cooperative action both within the agencies and acceptance of information from the outside. There has to be a recognition also that people in these (unintelligible) ecosystems have to make a living. So there has to be some use of the resources or extractive uses probably and even the viewing (unintelligible) visitors. There's got to be part of it and integrated. That's going to be a really difficult job.

WH: What impacts have the different federal administrations affected the wildlife field during your career?

JC: The agencies—well that's a tremendous question. You've got the Forest Service, the Fish and Wildlife Service, the Bureau of Land Management, the Park Service in addition to the Fish and Game Departments. They've all played a role in different ways and different places. To take our stance to answer that kind of a question, if you look at it in a world perspective, we've got the finest forests- the management of forests and parks and Fish and Game practically than anywhere in the world. We're not anywhere close to doing it the best that we can or in a way that's going to maintain these resources into the future. So the extracted uses of the Forest Service, and there are (unintelligible) of those, play a major role in the way resources are managed. In-house attitudes of the Forest Service and the lack of highly qualified research biologists in those agencies have also had their cut. The Fish and Wildlife Service is a small organization that hasn't had much progress. It has a responsibility for the management of wildlife or public lands but it's never had the money to do it. So the National Park Service and the Forest Service tend to usurp these. Since they are also responsible for the land itself, they are anything but objective in their management of wildlife. Fish and Wildlife was given that responsibility because it didn't have the responsibility to the land and can be more objective in the management of wildlife. You could go on and on. They've all had affect, some good, some not so good. The one thing that is overriding is that if- much more in the future an overall harmonious and holistic management of entire ecosystems.

WH: That's my last question for now.

[End of Interview]