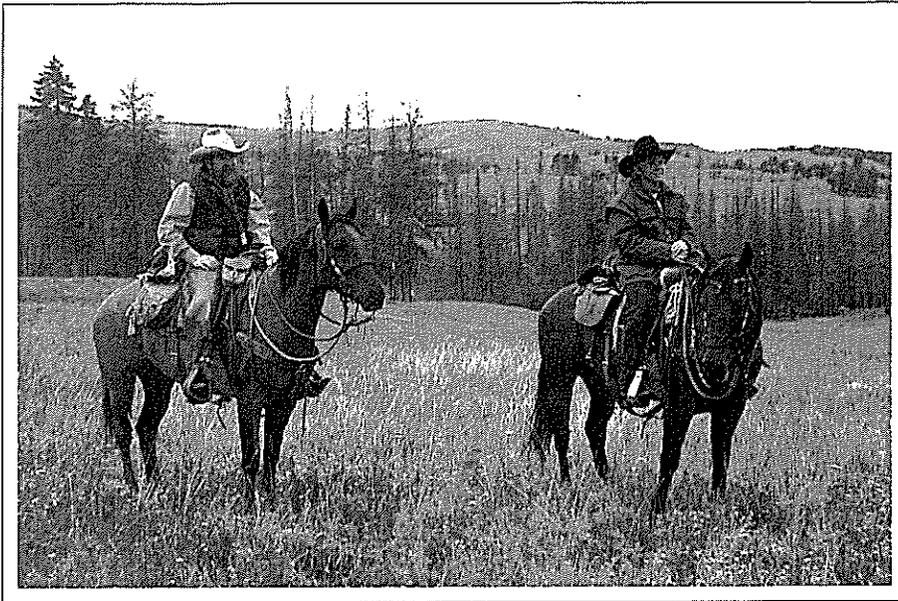


Yellowstone Science Interview: Steve and Marilynn French



Getting Past “Wow”

Grizzly Bear Natural History Goes High-Tech in Yellowstone

Yellowstone National Park has been the site of several important bear studies, starting with Olaus Murie's brief but foresighted study of the "bear problem" in the 1940s, and including the pioneering Craighead project of the 1960s and the long-running Interagency Grizzly Bear Study Team project that has been underway since 1973.

Steve and Marilynn French, founders of the Yellowstone Grizzly Foundation, have been conducting research on the grizzly bears of the Greater Yellowstone Ecosystem since 1983. The Frenches have become very well known in both scientific and popular circles, and have received numerous awards and honors for their work on behalf of bear conservation through public education. This interview, conducted in October 1994, explores many aspects of their project, especially the unique mixing of traditional natural history studies with the latest wildlife monitoring and research techniques. It only touches lightly on some of their recent work, such as their involvement in mitochondrial and nuclear DNA analysis of bears. We hope to persuade Steve and Marilynn to write something

for us on that and other subjects as more of their work is published. Ed.

YS: Unlike most researchers who come to Yellowstone with a pretty clear plan of how they want to proceed, you kind of grew into your study. You just started out with an interest in bears, and eventually it turned into a scientific study. In the long run, did that help?

SF: Yes. It helped because we didn't come in with the traditional formal training; we didn't know what we were supposed to be seeing. We came into this whole thing sort of innocently, and we started out with the tools that we had available: the seat of our pants which we sit on while we watch bears. Our eyes and our butts, and that was about it.

YS: How did you get from abject ignorance to accomplishing something?

SF: We went through a stage in the early days where our first response to each bear we saw was "Wow." That's what most people go through at first, just the amazement of seeing the bear at all. From that we progressed, and instead of just seeing the bears we started *observing* the bears; that transition came about almost uncon-

sciously. After so many "Wows" not only did our resolution get better, but also our peripheral vision got really good and we started seeing things that were happening *around* the bears.

YS: But that's still a long way from doing science. How did it go from intelligent observation to active analysis?

SF: We both have scientific backgrounds; science isn't the exclusive domain of wildlife ecologists. After a while, we decided that this is great that we're seeing these bears, but it's a shame if the process is limited only to our personal emotional reactions. We realized that we should collect these observations in a scientific manner, so that they could be shared in a way that would mean something to others.

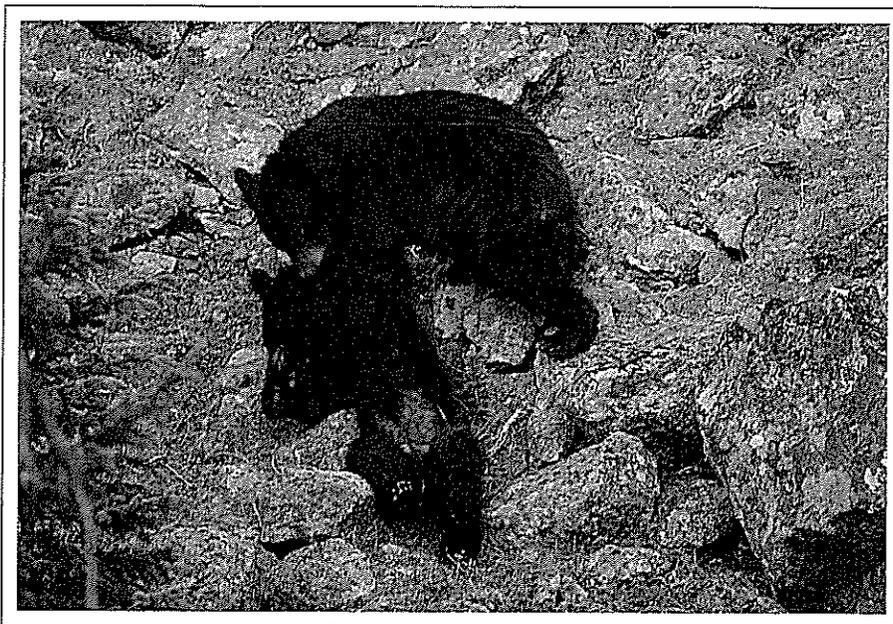
I think that after so many years of doing this we are probably in a better position to see the true deficiencies not only of our own methodology, which is based on observing individual unmarked animals behaving, but also of other methodologies, like those employed by a computer jock somewhere in a lab analyzing radio relocations on a map.

MF: There's an analogy involving how you see a house. If you look at one side

Opposite: Marilyn and Steve French on their horses, Buster and Bandit, doing field work on Blacktail Plateau, 1994.

Right: The male black bear described below, dragging the female black bear it had just killed.

All photos accompanying this article are courtesy of Marilyn French and the Yellowstone Grizzly Foundation, unless otherwise noted.



of that house, you're only seeing a part of it. But if you have somebody over here looking at this side, somebody over there looking at this side, and somebody on top, and they share what they're learning from all those different perspectives, you end up with a pretty good picture of the whole house.

SF: So we're learning about social dynamics of grizzly bear through many hours of direct observation...

MF: ...and at the same time, Dick Knight's [*Leader of the U.S. Interagency Grizzly Bear Study Team*] analyzing demographic data from all the years of radio relocations, and somebody else is looking at habitat and vegetation. When we're all communicating and everybody puts their findings together, we get a much better picture of the whole thing.

And there are still so many other unknown aspects of the picture. What about anatomy? How does the anatomy of the bear reflect what's going on the field? What's inside this bear? What kind of bugs are in it? How does it fight off those bugs? There's so much more.

SF: You've got to keep it open minded; that's the key.

MF: Never assume anything, and never get defensive.

YS: How does defensiveness happen?

SF: If somebody challenges you, you tend to get defensive. In fact, if somebody challenges you, the best response is to challenge your own thoughts, instead of being so defensive. We've probably

learned more from having people challenge us. When we give talks, and offer our opinions, if everybody just sits there and says, "Oh that's great, that's wonderful," we haven't learned anything from that presentation. Three or four years into this study, we were sure we knew about bears. I mean, we had short concise answers for everything. But since then our answers have gotten longer and fuzzier, with a lot of conditions.

YS: Give us an example of how that learning process has worked.

SF: We can tell you a story on ourselves that we haven't admitted to many people. Researchers may have scientific principles as guidelines, but remember that we're human. We're subject to our own cultural biases, and we still do our research in an aura of human emotions. We experience our world and our research on a visceral level, and we can never deny that. I don't care how good of a scientist you are, you'll always have that within you.

YS: So what's this story on yourselves that you're so embarrassed about?

MF: We were out in the field one day, and we heard a ranger on the park radio report that a black bear cub had been hit by a car at Gibbon Falls, and that the mother was carrying it away. We knew we had to see this. Well, we got there, and sat down and started making notes and watching. As we watched, we kept saying, "Oh my God, this is terrible; look at that poor thing..."

SF: We even told each other we could see the sorrow in her eyes as she was dragging her cub....

MF: I hate to admit this.

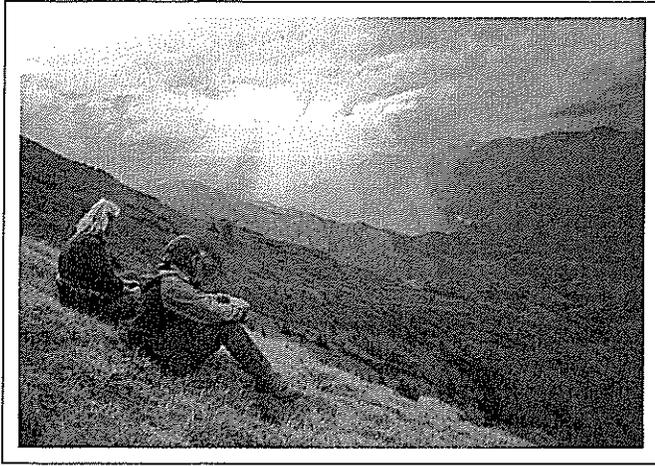
YS: But our readers will love it.

SF: Yeah, well, there we were, watching through our spotting scope, talking about the sorrow in the eyes of this mother bear, and how sad she must be, and then all of a sudden she turns, and her crotch is exposed, and I said, "Marilynn, that sow's got an erection." For the last hour we'd been sitting there imagining all this motherhood stuff, and now we see she's not a mother bear at all. We believed she was a sow because of the report by the ranger, so we saw what we thought we were supposed to see.

Later, we actually found a guy, a park visitor, who saw what really happened. The male black bear encountered this smaller black bear, which we later determined was a female; the two bears had a fight, and the male dumped her in the river and drowned her. He held her head under the water, and when she was dead he proceeded to drag her body up the hill, where over the course of the next three days he consumed her.

YS: One of the things we try to achieve in *Yellowstone Science* is a little less sanitized version of how scientists actually go about their work. Through stories like that one, we sometimes succeed beyond our wildest expectations.

SF: Let me keep this in perspective. When I started studying bears here, I was



In recent years, the French's study of bears feeding on moths at high-elevation sites has taken the researchers and their crews to some of the most spectacular country in the ecosystem.



a scientist, but that didn't mean I knew what I was doing around bears. I had worked in nuclear physics before I decided to go back to school in medicine, and so I have a really strong scientific background, but when it came to bears I only knew a little more than the tourists.

MF: Remember some of our first hikes in Yellowstone?

SF: Oh, God! We'd do really stupid things: we'd find dead carcasses and walk right up to them. I'm sure we ran bears off some of those carcasses and we didn't even know it.

YS: Speaking of not knowing things, didn't you stumble into the middle of the grizzly bear controversy the same way?

MF: In about 1979, we came to park headquarters at Mammoth, wanting to learn more about bears. We found the research office in the administration building, and we told them that we wanted to see all the recent scientific papers on the grizzly bears in Yellowstone. Needless to say we were treated rather coldly. Frank Craighead's book *Track of the Grizzly* had just come out, and we got this response, like, "Who the hell are you?"

SF: But we kept asking questions. We were told by a ranger-naturalist at a campfire program that there were 400 grizzly bears in Yellowstone. We didn't know whether that was true or not; our only question was, where are they? We just wanted to see them. We were out there looking for them, and we couldn't find them. We weren't part of anybody's political agenda, we just wanted to know.

YS: From such a rocky start, how did you finally start learning about bears?

MF: Eventually we were able to gather more information, and finally we came upon a catalog from the Yellowstone Institute, which said that Steve Mealey [former *Interagency Grizzly Bear Study Team* member who wrote his M.A. research on Yellowstone grizzly bear food habits in the 1970s] was teaching a course about grizzly bears, so we tried to sign up.

SF: But by the time we found out about it, it was the week of the course, so we had to wait a year before we took it.

Understand that by now we had spent five summers in Yellowstone looking for grizzly bears and never seen one. And we weren't looking the way the average tourist would. We truly were getting up at the crack of dawn, and we were staying out until pitch dark. We ate most of our meals at 10 o'clock at night after we'd gotten back. But we didn't have a search image, and we didn't know where to look.

MF: We were actually looking in the lodgepole forest.

SF: Right. We would drive from Canyon to Norris, because we had this idea that the road went through woods and bears live in the woods. We spent hours driving along looking in the woods for bears. We had no idea how to look for bears. To this day we've only ever seen one grizzly bear on that road. Of course, we just had a pair of \$29.95 K-Mart special 7X35 binoculars that were unfocused and smudgy, and we didn't have the search image in our minds to allow us

to see bears even if they were out there.

YS: But that first Yellowstone Institute class was what got you on the right track?

SF: That week we got to know Steve Mealey, and we really hit it off. He took the class out to look for bears, and he knew where they were and how to see them. Right away we started seeing bears, and it was all different for us: "Oh, so that's where you look for them! Oh, so that's what they look like!" We hadn't seen any bears in five years, and in five days I think we saw 32.

MF: Steve put us onto the right places, and he also gave us a better understanding of management, and how it works, and how to work with it, so we didn't get crosswise of people for no good reason.

YS: After that, it seemed to happen very quickly that you became well known for finding and filming bears.

SF: I think the precipitating event that led to what we do today was one of those incredibly fortuitous accidents. I don't know why, but in 1983 we bought one of the first home video cameras, a big heavy one. I don't even know why we had it. And for some strange reason we had bought this Celestron telescope for looking at stars, and just the week before we got to the park that year, I happened to see that there was this attachment you could use to hook it up to a video camera. I bought it, and it was still in the box in the van. When the bear class was over, we said our good-byes and we went up Antelope Creek [the Antelope Creek drainage is east of the road on the north side of

Mount Washburn] to look for bears.

Now that we knew what we were doing, all of a sudden grizzly bears were everywhere. There was this one bear with a limp; he had an injured front paw. He was still pretty good at chasing elk calves, but he was a little scrawny; probably a young adult male. We pulled up at Antelope that day, and looked out, and there was this little male and another bear and they're fixin' to mate!

This male was only about half the size of this female, and we saw how he probably got injured, because she was really biting him and giving him a hard time. I was frantically trying to get this adaptor unpacked and figure out how it worked. I finally got it together and put it on the tripod, and videotaped mating bears for 37 minutes. Well, right away the word got out that we were filming bears. The new park superintendent, Bob Barbee, asked if we would mind bringing the tape over to headquarters and showing it to a few people.

MF: When you look at it now you wonder, how could these people be excited about this?

SF: But it was great natural history footage. And now that we knew how to find bears, and we had all this time on our hands, we could go out with this contraption and film these bears. We were invited to more meetings, and we got to know Dick Knight and John Varley [*then Chief of Research*], and they were really great, and offered to help us however they could.

YS: When did your observations and filming turn into what could be called

data collection?

SF: The year after that class we started to see things like elk calf predation by grizzly bears, and we decided we ought to keep a journal. It gradually evolved and got more formalized. I keep going back to this, but one of our assets was that we had a lot of free time. We knew how to find bears and we got better at it as time went on.

MF: I think one of the things that was kind of neat was that we were dispelling some of the myths.

YS: The late 1970s and early 1980s were a time when it was very fashionable to say that there were no grizzly bears left in Yellowstone. When you appeared with all this amazing footage, it did tend to quiet that extreme rhetoric down.

MF: And you know, people would probably not have believed us if we didn't have the proof on film.

SF: Neither one of us had any formal training with cameras. We didn't even have a still camera for three or four years after that! We saw film as a research tool.

YS: But didn't those visual images tend to overwhelm the information you were gathering?

SF: To this day, even after we've been published in respected scientific publications, and presented papers at two of the international bear conferences, somebody will say, "Oh, the Frenches; they're bear photographers."

MF: One of the things that really helped change that was when we met Steve Herrero [*University of Calgary ecologist and bear researcher, author of the book Bear Attacks*].

SF: We had heard about Steve, and he came to Yellowstone to participate in a Yellowstone Institute Class. He had heard that we were seeing a lot of bears, and he asked if he could spend some time with us. He said that what he'd like to do is see some bears preying on elk calves, because he had seen it a couple times in Canada and had found a couple other calves that he thought bears had killed, and he was thinking of writing a paper about it.

YS: At that time, most people thought it was an unusual thing to see.

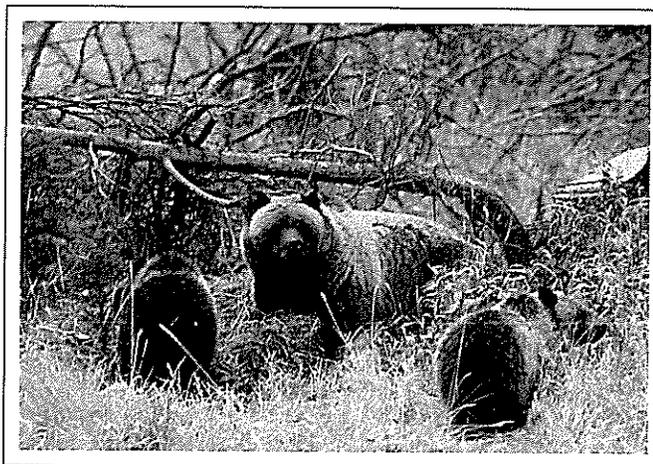
SF: Right. He asked us if we'd seen elk calf predation, and we said we'd seen 30 or 40 episodes. He was amazed.

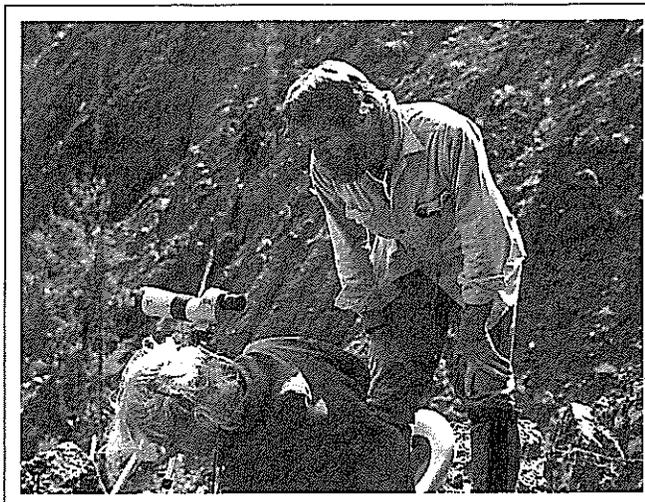
MF: So we told him, "Yeah, we'll do that."

SF: I think we saw two episodes the very first morning we took him out. It doubled his data base just like that. So he asked us, "Why don't you write this up?" We said, "Well when we get enough data we will." He couldn't understand that because it was so unusual for anyone to see it at all, and here we were with all these unpub-

Below, left: Bear savvy, patience, and very powerful spotting scopes and camera lenses have enabled the Frenches to capture the home lives of grizzly bears to an extent never before achieved in Yellowstone.

Below, right: Since the 1960s, when the trout population of Yellowstone Lake was collapsed by overfishing, stricter fishing regulations have resulted in a dramatic recovery of trout, adding an important item to the diet of grizzly bears.





In wildlife observation, patience is a virtue, whether in watching for bears (left) or waiting out a hailstorm at 11,000 feet (right).

lished observations. But from our perspective, we wanted to have 100 or 200 episodes before we presented a paper.

MF: I think by that point we had read just about everything that was available on grizzly bears, and we felt that there were some real problems in writing up conclusions based on just a few examples.

SF: So we decided that when we presented a paper it would be based on a lot more observations, because we knew that three or four observations really would get you into trouble about drawing conclusions. Steve Herrero kept hounding us, saying that "You guys have more data on this than anybody anywhere," so at the bear conference in 1989 we finally presented our first paper. It turned out that Kerry Gunther [*NPS biologist in Yellowstone*] was gathering similar observations at the same time, so suddenly Yellowstone was contributing a huge amount of new information on predation.

YS: Have you continued to add more observations since then?

SF: We're now up to more than 300 predation episode observations, and we will eventually write an addendum to that first paper.

YS: That first presentation at a scientific conference must have seemed like a big step for people who had started out as hobbyists.

SF: It was. I mean, who were we to be in the midst of this crowd of world-famous bear biologists? So we did something different. You're only given 20 minutes to talk, so we gave them 10 minutes of solid background and then I

said, "The bear will tell you more about elk calf predation than we could possibly tell you." Then we showed them 10 minutes of 16 mm movies of bears taking elk calves. Predation after predation.

MF: The response was overwhelming. People were writing about it but had never seen it. At the conclusion of the conference, five papers were cited as being especially noteworthy, for being groundbreaking, and ours was one of them. That was really neat.

YS: It seems that for all the problems you've had with people confusing you with photographers, rather than recognizing that you're doing research, those films you've made are going to be invaluable.

SF: One of our projects when we get so old and rickety that we can't get out into the field is to go back and produce volumes, maybe digitally, on certain aspects of bears. The idea is that you could go to the library and check out this book and an accompanying tape, or CDROM or whatever the technology is by then, and get all the background information as well as seeing it take place. So the film will continue to be a research tool for a long time, as well as an educational tool. However, having said that, I will tell you that I have not filmed a bear in two years. When is the last time we took a picture of a bear?

MF: Last year. I think it has become less important as a tool for us in getting our point across to different kinds of audiences. It was vital when we started.

YS: Are you reaching the point where

you've filmed so much, and taken so many still photographs, that there isn't that much new to photograph?

MF: That's part of it. You quickly realize that there are only certain kinds of pictures that will be useful for audiences. On the other hand, you know that even a picture of a bear at a great distance still has lots of reference values.

SF: We have literally thousands and thousands of slides that no one has ever seen that really mean a lot to us and have some scientific meaning as well. The same is true with the movies. We've probably got 200 hours of film, but I've never shown more than 30 minutes of what I have.

MF: And we're always saying to each other, "I will not spend another dime on another picture of a black dot in the field. I will not do that." And every time we take a camera out we do just that.

SF: On our 16 mm movie camera, every time I push the button, just to get a work print is \$20.00 a minute.

YS: Speaking of the black dots, the hardest part for most people is still finding them in the first place. You had the advantage of experience, but the IGBST made radiotracking equipment available to you, so you could locate the bears that they had collars on. Did that help much?

SF: When Dick Knight first gave us the telemetry gear and asked if we would mind keeping track of any of his bears we happened to locate, we thought we'd struck gold. But we found out real quick that chasing a radio signal to get a bear's general location isn't the same as actually

seeing that bear. We discovered we were much better off to stay with a bear we knew, because maybe we'll just watch him feeding and digging all day, but maybe he'll give us that 10 minutes of absolutely incredible, once-in-a-lifetime information.

MF: We were much better off without the radiotelemetry. It was useful in other ways, like allowing us to identify a radio-collared bear if we were already watching it, but it didn't help us find many bears.

SF: We would miss twenty bears trying to find this one radio collared bear. We got so damn tired of hearing that little beep. It told us the bear was right out there, but we couldn't see it. It just didn't work in the real world, when you're trying to see the animal.

YS: Let's get back to watching a bear. Things can happen pretty fast among wild animals. How did you learn to distinguish what you needed to write down, and what wasn't important?

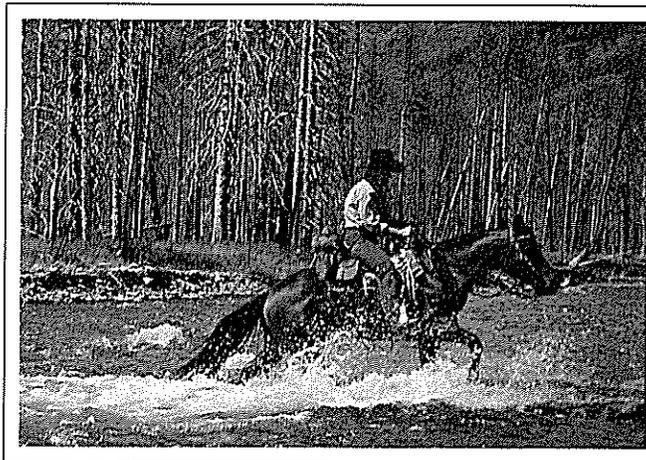
SF: A good example is elk calf predation. We knew we could go to certain locations and see bears preying on elk calves. But we soon realized that we also needed to understand what those same bears were doing when they were not eating elk calves. And we learned that there is so much that you might not see the first time. When we started filming bears, and had the chance to sit down later and literally hand crank the film through frame by frame, we could see so much more. We could actually look at a sequence of events and see all the things that happened; it really unclutters your mind.

YS: You've mentioned developing a "search image," which is a mental knack that allows someone to pick a certain thing—in this case a bear—out of a landscape. Did reviewing the films help sharpen that image?

SF: It did, but it also helped us to improve our peripheral vision when an event takes place. We'd watch a film, and suddenly one of us would say, "Did you see that calf? That other calf that was only 10 feet away when the bear took the

calf we were watching?" We were so absorbed in watching part of the action that we didn't see the other things the animals were doing.

YS: You two have been credited with bringing traditional natural history study back to Yellowstone bear biology. By spending hundreds of hours observing the animals, you remind people of an earlier generation of researchers, especially Adolph and Olaus Murie, who did so much important research in national parks earlier in the century. But though you have revived interest in those traditional methods, and have proven their



value, you've also discovered the limitations of just sitting and watching. Now it seems that you're working in both worlds: the traditional observations and the modern high-tech methods, including radiotracking of some of the bears that eat moths at high-elevation sites. How did that happen?

SF: After observing bears for several years, we understood that there were incredible limitations to what information we could obtain. We worked as closely as we could with the other bear researchers; for example, we went out with the habitat analysis specialists and their crews so that we could learn more about what they were doing, and we spent a lot of time with the various trapping crews—the IGBST, Montana Department of Fish, Wildlife and Parks, Wyoming Game and Fish—so that we understood bear handling. That really helped a lot, and we traded a lot of ideas and information.

But there were two things that really bugged us about the limitations of our

approach. One was that though we could identify some bears as individuals, there were others that we couldn't. We didn't see them often enough, and so if we saw them the next day, we couldn't always be sure if it was a bear we knew. We didn't know where they went and what they were doing when we weren't watching them.

The second thing that really threw us was that most of what these bears do happens either in the woods or at night, where we just couldn't see them. Spending as much time as we did watching the bears made us all the more aware of all the things we just couldn't know about them.

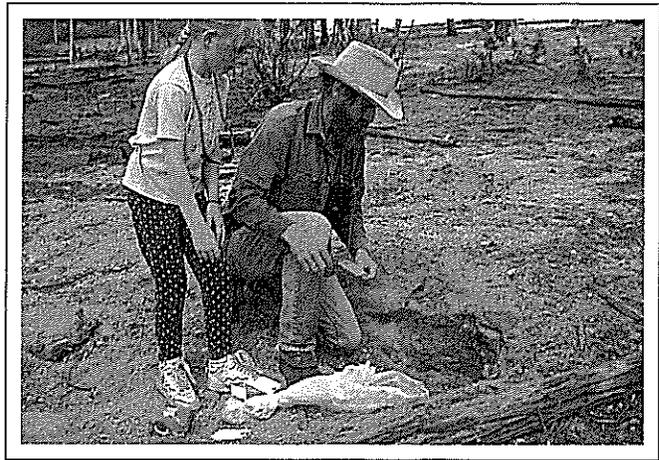
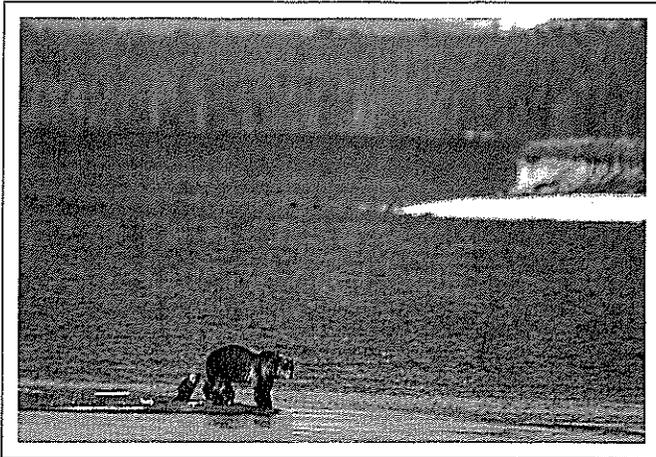
And so we started looking around trying to figure out how to cover all that time when we couldn't see them. It's a complicated question, because the answer that seems obvious is that you radiotrack them. But the radio relocation data is all collected during daylight, when bears are most likely to be inactive. It's great information for establishing the overall home range of a bear, and what a bear does during the day, but it misses a whole

world of details. Besides that, the weather tells you when you get to fly. I don't care what your study design says, if the weather doesn't cooperate you won't get the data.

MF: Because we and our crews spend so much time watching bears at some high-elevation sites, we know that all sorts of things happen to a bear on the ground between those airplane flights that give you a few radio locations.

YS: You have now spent several summers observing the feeding activities of grizzly bears who feed at army cutworm moth concentrations, especially at high-elevation sites on the east side of the Greater Yellowstone Ecosystem, and it seems to have been this work, more than any other aspect of your study, that made you realize you needed a more comprehensive way of gathering information.

SF: We thought that there had to be a better way to combine the information that was being gathered. Therefore, on our moth study, it's not that we've given up on the behavior observations, because



Left: Sow grizzly with two cubs, on shore of Yellowstone Lake. Above: Steve and daughter McKenzie examining a site where grizzly bears were digging in mineral soils.

we're going to continue that, but we have a lot more to work with. Between the IGBST, the Yellowstone Grizzly Foundation, Montana Department of Fish, Wildlife and Parks, and the Wyoming Game and Fish Department, we had an incredible data base on the grizzly bears of Greater Yellowstone. This bear population has the most thoroughly documented demographics of any bear population ever studied; we really know a lot about where they go and what they do. But amazingly enough, we had practically no demographic data on all these dozens of bears that were eating moths. After all these years of study and trapping and radiocollaring by all these researchers, we had only ever seen one collared bear at the moth-feeding sites.

YS: That is pretty amazing, when several dozen bears in a well-studied population congregate like that and none of them has a collar. You'd expect more of them to be collared, in proportion to the number of bears that are collared in the whole population.

SF: It does kind of make us wonder what is going on there. That's why we've expanded into that arena. Dick Knight trapped some of these moth-eating bears for us, so we can get some data on them.

MF: But we're not limited to our own observations and the radiotelemetry. One of the things that we're going to do now is get into GPS [*Global Positioning Satellite*] tracking even more. That's one of the things we hope to have next year. We're going to get involved

with a Wyoming Game and Fish GPS project down in the Tetons this year.

YS: How much more precise is GPS than radiotracking?

SF: It's infinitely better. You can get within 3.5 meters sometimes, and you can get your locations within 15 minutes.

MF: That's really important, because one of the things that has really frustrated us in trying to understand what these bears are doing is that so many things happen between any two points as they travel. A lot of the radio relocations are pretty imprecise, and when you get out to the area where the bear was located, and you find evidence of bear activity, you really don't know if it was left by the bear you're radiotracking.

SF: We have always tried really hard not to interfere with the bear's activities. That's why we use spotting scopes and long lenses. We don't want to influence what we're seeing. And so, even if it was safe to do so, we can't follow a grizzly bear around 10 feet away and record what it is doing 24 hours a day. This technology will get us as close to that as we possibly can.

So we're going to purchase two GPS collars next year for some preliminary work. We'll put one on a bear and use the other one as the control. We'll carry it out into different habitats and test the satellite's ability to locate it accurately.

YS: So what you are really doing is using all of that technology to improve your ability to do what you wanted to do in the first place: get the most accurate possible

natural history information.

SF: That's right. Technology is necessary because we can't follow a grizzly bear all year from the time it leaves the den until it enters it again.

YS: Or have a video camera mounted on its forehead.

SF: A "grizzly cam." We thought about that. In fact, we checked into that technology. We thought about that because David Letterman has a "monkey cam" on his television show. He's got a trained monkey that comes roller skating out every now and then with the camera on his back. We still think that a "grizzly cam" might be possible some day, but the technological problems with doing it in a wilderness with a live feed are pretty formidable.

YS: There would probably be some esthetic objections out there too; a grizzly bear wouldn't look much like the traditional monarch of the wilderness with a little TV camera perched on top of its head.

In the past couple of years, you've become very involved with a team of DNA researchers at the University of Utah, in efforts to clarify the family tree of the bears. That has some really exciting applications for Yellowstone.

SF: Not just for Yellowstone, but for bears worldwide. This technology is going to result in a whole new understanding of bears. But in Yellowstone, there's this question that has seemed urgent to a lot of people, about the genetic health of this isolated population. There's