

1 Mark Miller

INTERVIEW WITH: Mark Miller
INTERVIEWER: Marsha Holland
INTERVIEW NUMBER: one
DATE OF INTERVIEW: January 4, 2011
PLACE OF INTERVIEW: National Park Service Office, Moab, Utah
SUBJECT OF INTERVIEW: Monument History
TRANSCRIBER: Marsha Holland
DATE: November 18, 2011

Sony IC Recorder, converted to .wav file, transcribed with Start Stop system.

A part of the Southern Utah Oral History Project: Oral histories from people who were involved with the Grand Staircase-Escalante National Monument in the early days – from those who helped with designation of the Monument, to those who were the first to do research on the Monument after it was designated.

MH: It is January 4, 2011. I am Moab, Utah. I am meeting with Mark Miller. Thank you, Mark, for meeting me today. Please introduce yourself, full name, date of birth, the place you were born and a bit about the family you were born into.

MM: My name is Mark Eugene Miller, born May 23, 1961 in Espanola, New Mexico, which is a small town north of Santa Fe, New Mexico. My parents moved from Indiana, they were both from Indiana, in the 50s. My dad was in the Air Force and they fell in love with the place. They had lived in Albuquerque for some time and eventually through circumstances ended up in Espanola which is in the Rio Grande Valley. My father worked at the Los Alamos National Laboratory, a twenty-five mile commute from Espanola. My mother was a banker in town. My dad worked at Los Alamos for nearly thirty years and then retired in the middle or late 90s.

MH: What was the area like then, Espanola, Rio Grande Valley?

MM: Culturally or physically?

2 Mark Miller

MH: Let's start with culturally.

MM: It is described as a tri-cultural society, Hispanic, Native Americans, with many pueblos there, Santa Clara, San Juan, and then the Anglo population which is more recent. The Anglo residents came in the late nineteenth century at the earliest. Most of the Anglo component post dates World War II and is associated with Los Alamos National Lab.

MH: And how about the physical environs, was it an interesting place to grow up?

MM: As a kid growing up, you don't appreciate the environment as much as you do after you have left as an adult, then come back with a different eye on a thing. I was that way. We mostly grew up on a two acre ranchette, it would be called today, at the edge of town outside the city limits. Neighbors were not nearby. My parents, being from Indiana, were very much into gardening, and landscaping the place. My job as a kid was to take care of that, so summers were not recreational times, it was all about daily chores, weekly chores, and a summer full of assignments from my dad. Which was OK. It instilled in me quite a work ethic. I think my friends thought I was odd and we didn't socialize much. I was always at the house pulling weeds, irrigating and such.

We were not at the edge of Forest land or BLM land. It was a human impacted landscape, but still a rural setting. We would go out on the weekends. It was back in the day when the family Sunday afternoon drive was something that was still done. We toured quite a bit through Northern New Mexico and the surrounding regions. It is the landscape that is home for me. Over the Christmas holidays my wife and I went Santa Fe and spent a few days there, drove around to see familiar landscapes and if they had changed or were similar. We used to go to Taos, that was always fun. There was a high elevation highway through the mountains between two towns called Tierra Amarilla, the small county seat of Rio Arriba County, which leads over to another

3 Mark Miller

small town, Tres Piedras. It was a beautiful high elevation high mountain road in northern New Mexico. We would take that trip in the fall to see the aspen, always fun.

MH: During your high school years did you feel you had a direction, or particular interest that you want to pursue.

MM: Oh, no, not at all. Higher education was expected. I was the youngest of three children. I have an older sister, and a brother, five years older than I. They had both preceded me by going to college. Being the youngest, I was doing my own thing, so, instead of going straight away to college since I didn't know what I wanted to do, and very independent, wanting to get away and start doing my own thing, so from high school I got a job and worked in Espanola for nine months at local motel. I worked as a night auditor and worked nights. I then joined the Coast Guard and was in the Coast Guard for seven years before going back to school. It was my means of getting away, growing up and saving some money for school. There was a Veterans Educational Assistance Program, basically a matching savings program where I would contribute some portion of my salary and the government would contribute another portion up to some maximum. I began in the Coast Guard in 1980, over thirty- one years ago now, in the immediate post-Viet Nam era and educational benefits were pretty poor. It was probably the low spot for Federal Veterans educational benefits since World War II. I think I got like eight thousand dollars of educational benefits, which doesn't seem like much today. It helped pay for my Bachelors degree.

MH: What was your assigned in the Coast Guard?

MM: It was duty station in two different places, first was on an ice breaker in the Great Lakes on the Coast Guard cutter Mackinaw, in Northern Michigan.

4 Mark Miller

MH: Sounds cold.

MM: Yes, it was colder than Moab. We would go out and break ice on the Great Lakes to facilitate shipping traffic in the winter time. At the time, the early eighties, the shipping was grain shipments and iron ore pellets, Canadian and American Ships. Then from there I went to another cold place, Kodiak Island in the Gulf of Alaska. I was there for almost four years.

MH: You were on the water a lot; did you begin to develop educational interests then?

MM: A good question. My interests at the time were economics. I had some friendships in Michigan, my first duty station, with some young Coast Guard officers who had come out of the academy and we had common interests, politics and social science. I became interested in economics. In Kodiak I started taking correspondence courses in Economics and some math trying to accumulate some credits. I had determined at that time, being a native of the Southwest, I was interested in returning to the Southwest, coming back to school here. I had decided that Northern Arizona University in Flagstaff was where I wanted to go. So, I was taking correspondence courses from NAU when I was in Alaska, in the mid-eighties. I moved to Flagstaff in January of 1987 with a major in Economics. Half way through my bachelors program in economics, taking some elective courses in Environmental Studies and ecology class I immediately learned that was really what I was interested in. It is common, starting on a particular educational pathway and diverge. I was far enough along in my degree program I thought the best thing to at that point was to continue forth and complete the Economics Degree. After that I would pursue other opportunities to build the other interests. I graduated with a Bachelors degree in December of 1989, and got through it in three years going through the summers and with some correspondence credits. I was a real hard charger, more focused. IN

December of 1989 I moved to Anchorage because I was offered a job with a consulting company up there.

I mentioned the environmental study work at NAU; at that time I had met an instructor at NAU, Joe Truett, who became a mentor for me. He worked for an environmental consulting company in Alaska. This was 1989; March of 1989 was the Exxon Valdez oil spill in Alaska. The oil industry looked at that episode and determined they should invest more money in environmental studies to make them... Well, with my cynical, but realistic perspective, it was a marketing decision to invest in environmental studies, to increase the credibility of their environmental work. In the late eighties, early nineties there was big pulse of money being spent on environmental work in Alaska. I went up to participate in that. I never worked in Prince William Sound on the Valdez oil spill stuff, but I worked on the North Slope, Prudhoe Bay oil field and some other oil fields up there for a few years while living in Anchorage. This was during that transition period when I had gotten a degree in Economics and was very science oriented and basically doing environmental impact studies; looking at oil field impacts mostly on wildlife, birds and caribou and to a lesser extent vegetation. It was mostly about birds in those early days.

MH: So you had all this practical knowledge before actually...

MM: Exactly. So, I had this experience doing ecology stuff, with a degree in Economics and casting about for what I was going to do in graduate school. I was motivated to go to graduate school but I wasn't going to get into a program in biology or ecology with a Bachelors degree in Economics. Though some investigation I found I could get into a Geography graduate program because Geography is a broad enough discipline. I was told once by one of my faculty mentor in Geography is that you can basically do anything as long as you include a map. (laughter) I am all about maps, so...Within geography there are Marxist social scientists and there are full on

ecologists, soil scientists and geologist. It was a perfect fit for me because I had a social science background but I had an interest in doing environmental studies in ecology. It was actually pretty good. That program was at New Mexico State University in Los Cruces. I did my master's research in the Gila National Forest in Southwestern New Mexico, looking at vegetation over time. It was an historic vegetation study.

From there I went on to the University of Colorado and continues my work at got a PhD in Geography at the University of Colorado which at the time was the best, highest rated graduate program in physical geography or more specifically the ecology side of geography. I focused on plant ecology and soils and got my PhD there in 2000. My PhD research, moving closer to the Grand Staircase, was actually done at Canyonlands here where I lived. I had applied for a fellowship with the Environmental Protection Agency when I was in Boulder at the University of Colorado. I was awarded a Star Fellowship which was an amazing thing because the EPA Star fellowships come with a lot of money, basically free money. It enabled me to cut my ties to the University. Once I satisfied my course requirements I no longer had to be in Boulder. My girlfriend at the time, who later became my wife, basically moved from Boulder to the Needles District of Canyonlands, south of Moab and lived there from January of '97 until 2000. During that time I did my entire dissertation and wrote it up and participated in a whole range of other research projects. That is when I became affiliated with Jayne Belnap. She was based in Moab with US Geological Survey.

The project I had proposed to do for my EPA Fellowship was a project based in Sonora Mexico which was looking at some issues related to exotic plant proliferation and spread and the impacts on plant communities there. It became impossible to do that work because the sites were plowed over or had been incorporated to housing developments. It was sort of out-of-

control down there at the time. The funding, however, was not tied to a specific project, so I started casting about for another project and got hooked up with Jayne because she had this project looking at cheat grass patterns in Canyonlands, and what caused spatial patterns, why do we find cheat grass here and not there in the landscape, looking at it from soil perspective. This really interested me. I focused on that kind of work at Canyonlands and Needles, my dissertation which I had wrapped up by in the end of 1999.

In January of 2000 I got the job with BLM at Grand Staircase. My recollection is the plan was signed around January of 2000, right at the cusp of this transition period when they were going from the planning phase into implementation phase. During planning, the team was located in Cedar City. They were going through the big move; many were leaving the Monument all together or the folks that were staying were moving to Kanab. There was a botanist on the planning team, Tom Leatherman. He was among those that left after the planning effort was completed. He had come originally from the Park Service then worked on the planning team for BLM and then went back to the Park Service. He was moving on in his career. I filled the void that he left since there was no one left qualified as a botanist other than the range management staff. There were some range specialists in Escalante and Kanab. When I was hired and moved to Kanab, I was sort of filling that vacant niche left by the botanist.

MH: Was it an application process then or were you referred?

MM: That is a good question. The way I came to work for the Monument was, which relates to the earlier part of the story, I was a veteran and [benefitted from a Veterans Readjustment Appointment \(VRA\)](#), which allows qualified veterans to be placed non- competitively into vacant positions. This was a vacant position that I was qualified for. I was interviewed by Kate Cannon

for the position, but basically it was facilitated by relationships between USGS and BLM, and the Veterans status.

MH: Excellent. Who would have known? You certainly could never plan anything like that.

MM: It is an amazing pathway. I felt really fortunate at the time. There were consequences in the sense that there were perceptions among Monuments staff at the time, that [this](#) hire was possibly a shady deal. Here is this guy from who knows where, I don't know and he suddenly shows up and has a nice permanent BLM job. It is an argument that can be made.

MH: So, you are starting this work with a level of defensiveness.

MH: Here is a great opportunity; I was very excited and enthusiastic. And that is another piece of the story at that time, a great deal of excitement about the opportunity. Another factor at the time was that there were some internal issues that I had to deal with professionally and personally to get past perceptions about I might have got the job and my qualifications, was I going to be a slacker.

MH: So, let's put the dates on the tenure.

MM: I think I was appointed to the position in late December 1999, was physically still located in Canyonlands for a few months. I immediately starting making visits over to Kanab and Escalante in January 2000. We did a field trip with Tom Leatherman. He had an office in Kanab but was not living in Kanab and had already accepted his new Park Service job. He was going to be there for a limited time, so I needed to go over and interact with him as much as I could. WE had a whirlwind tour of the monument. I met my new supervisor who was Chris Killingsworth. She was the Assistant Monument Manager for biological Sciences, within that division was the botanist the range staff the wildlife folks. There were a lot of vacant positions because through the

planning process they had developed an organizational structure which had yet to be populated with people , with the exception of some positions which were filled by BLM employees. We were housed in a temporary facility leased by the City. It is still some sort of Leased facility. The office space situation was not great and they put a modular building in the back of the permanent structure. When I physically moved over in April of 2000, my office was in the modular. The modular was mostly empty, just me and a couple of other people, the staff archeologist and maybe the staff geologist and me.

The position I was filling was for a botanist and I am not really a botanist. When people asked me what I did I would say I am an ecologist filling a botany position. There was an organization structure to be filled yet it had some flexibility in the way the structure was framed. It didn't take long to convince Chris and Kate that it really should be an ecologist position.

MH: But doesn't that cover some botany in ways?

MM: It does. Ecology is the science that seeks to understand the factors that cause variations in the abundance and distribution of organisms across the landscape or through time. Many ecologists have an organismal focus. Some focus on birds, I focus on plants and soils. I focus on what are the factors that cause patterns in the distribution of different plants across the landscape and through time with a pretty strong emphasis on soil related things.

MH: If I may ask you before I forget, you took a couple of field trips with Tom, what were you discovering on those field trips? Had you had much experience on the Monument before then?

MM: No. When I was an undergraduate in Flagstaff had driven across the Monument in the pre-Monument days. I had been to Kanab, hwy 89 and east though Hatch and Hwy 12, probably in the summer of 1988. That was my only experience on the monument. I was aware of the

monument being in the region I was in touch with the news and aware of the designation. I had experience on the Colorado Plateau because I had been working on the Colorado Plateau, not the Monument per say.

The original duties I had, based on the organization structure not yet populated by people, there were two things I was tasked with; one was to hire people related to ecology and the biological sciences. We started recruiting to fill positions. We started recruiting to fill the actual botanist position, the botanist in the Monument. We hired Laura Welp. She had experience working in Arches and Natural Bridges with the Park Service with Jayne years before, unbeknownst to me at the time. She had a lot of experience and had a Masters in Botany, the best person for the job. We hired another plant ecologist and GIS specialists, a number of positions filled. There were a couple of wildlife biologist positions filled that I was not involved with. There was that process that was a big part of my work. And more importantly, what was going on was, during the planning phase there was an EIS that was being prepared in conjunction with the plan. Livestock grazing was a big component being commented upon by people during scoping from both sides.

There were lots of reasons for controversy with the establishment of the Monument, but one of the fears was it was going to be a higher level of protection which would exclude livestock, or what were the implications for livestock grazing from local land user perspective. From the other side, the conservation side, it was here is an opportunity to place more stringent controls over livestock grazing due to impacts on natural and cultural resources. What they determined during the planning process was that they would not deal with livestock grazing, postponing the pain. The outcome was, when the plan was signed in 'Januaryish' of 2000, [it was stated] that within a three year period they would complete a second EIS focusing on livestock management.

That was really why I was brought in. There were other factors such as vacancies, but really I was brought in as envisioned by Chris Killingsworth and Kate Cannon as being the point man to lead the resource component of this EIS.

When I started in April of 2000, by May or June of 2000 we had our first EIS core team meeting. I was on the "core team" with maybe half a dozen of us; Chris Killingsworth (Assistant Manager GSENM), [Kezia](#) Neilsen (EIS team lead) whose expertise was National Environmental Policy Act (NEPA) compliance and planning, myself, Andrew Dubrasky, (GIS specialist) with BLM in Cedar City. He had been deeply involved with the GIS, geography component; there is a lot of geography involved in land management planning. He was a key player during the planning process with respect to GIS; he was brought in from a continuity perspective to continue that for the EIS. He was in BLM at the time of Monument designation, on the planning team. The way the BLM is structure sort of evolved over there, he continued close interaction with the Monument for a number of years, that sort of evolved over time. From his vantage point in Cedar City I think he had an interesting perspective on how the Monument developed and evolved over time in relation to lots of factors.

That was the core team. There was one other individual named Greg Christensen who was the lead range management specialist. He had been a long there BLM employee, lived in Escalante and been on the range staff, a key member of the range staff in Escalante for years and years. He brought the range management, livestock user perspective to the EIS team.

MH: Was the team able to find some common ground?

MM: That is an obvious question. A lot of the work we did beginning in the May-June period [2000](#) was controversial, inherently controversial because it was related to livestock grazing. By its nature it is controversial from a cultural values perspective, perceived impacts on resources, and the fact

that they deferred it during the planning process indicates that. The conflicts, the social-cultural conflicts, related to livestock grazing, the way I think of it, were inherently imbedded in the Monument itself. Your question is right-on because, here you have this core team; [one], the long-term range management specialist who lives in Escalante and who came from a BLM tradition which at that time was the range management staff was to help the local livestock operators produce livestock. BLM's primary job was not to protect the resource, it was part of it, but their job was to facilitate livestock use on public land, not first to protect soil, vegetation, diversity, natural values. In the context of this land use, their perceived mission was to facilitate use first.

MH: And that is the conflict with BLM becoming managers of a special place, with their historical mission always having been resource use and extraction. It was going to be tough to balance the mission.

MM: There is of course in [FLPMA](#), the federal land policy management act of 1976, the governing act for the BLM to this day, there is multiple use. Within FLIPMA there is a strong conservation mandate. Legislative mandates, policy and so forth are interpreted by people. Interpretations reflect value sets so; there is a variability [among](#) interpreters. Even though there is a strong conservation ethic within FLIPMA, there is multiple use component of FLIPMA which can be interpreted as saying; Use is first, conservation in the context of uses rather than conservation first and those uses in the context of conservation. That is in FLIPMA. In fact the mission of BLM is to sustain the health, diversity and productivity of the landscapes for current and future uses. That is a conservation mission. So, yes, the BLM proclamation and the BLM management plan have a strong conservation focus in it but it is on top of an already existing conservation focus that can validly be interpreted out of FLIPMA, but was not traditionally emphasized. BLM is

really local-user oriented. A lot of the staff comes from the local communities. There is a lot of value in that from a local land management perspective, but it definitely flavors perspective on users and management emphases. All of those different value sets were embedded right in the Monument. From the outside looking in, that might not be obvious. The outside observers would perceive the resource conflicts as ranchers vs. environmentalists outside BLM, but that very same conflict was within the agency, particularly at that time.

MH: And is that really about the politics at the time? In the end, who is interpreting the policies and who is pushing the legislation? That is always in flux.

MM: Yes, the interpretations are in flux and open. The Monument management plan prepared developed by one set of folks who then had relatively short tenure in the Monument after the plan itself was signed. The plan was signed in January 2000; Kate was gone by November 2001, in two years. Chris Killingsworth was gone, Kezia Neilsen was gone, other members of the planning staff were gone which enabled other interpretations of the management plan, different emphases on different components. Some components have not been emphasized or carried forward at all.

MH: When you took your tour with Tom, what were your impressions?

MM: It was so fast. We drove Hwy 12 to Cannonville, down the Cottonwood Road, up the Smoky Mountain Road and back to Escalante one day. The next day, Glen Canyon had a aircraft and a pilot who would periodically fly around and look at stuff. They would do periodic surveys and we managed to get aboard that flight and flew over the Monument. My impression at the time was that there was a lot of pinyon, juniper and sagebrush, not much grass. It is still the same, but there were variations across the landscape, a lot of variability, a lot of heterogeneities as is typical of Colorado Plateau in general. There is a strong imprint of geology and soil,

geomorphology, these factors generate an amazing mosaic of plant communities and ecosystems, it is really interesting from an ecological perspective, just to see from an aerial view. One of my favorite image from the *Learning from the Land* symposium in 1998, a number of posters were produced from that and a big thick volume of appears and an aerial image of the Escalante area, the river and Calf Creek, an oblique aerial that showed this really diverse geology, soil, plant, riparian; it is one of my favorite images so I have used it myself. So, one of my impressions was, "Wow, this is really cool, lots of different types of systems, not much grass, or more grass in the Escalante area, very general impressions.

MH: It sounds like you were excited.

MM: Oh, absolutely, sort of overwhelmed by the scale of it; two million acres. When I had taken this whirl wind tour with Tom, Chris McElly was on the tour, he was the first lead interpreter. In the Park Service, they are called Interpretive Specialist. He was involved in working in the early years on the themes to be presented in the visitors' centers that were being developed at the time. It was Chris, myself, and Tom. At the time I had no idea I would be sucked into the grazing EIS, which would consume me for the whole tenure. But I had no inkling of it. There was a definite undercurrent of, again this, cultural conflict between new comers vs. old timers; People of the local culture of the institution of the agency itself versus other who came in from outside like myself, coming from an academic Park Service background. Tom came from the Park Service, Kate came from the Park Service, and others from the planning team were from the Park Service. Marietta had Forest Service background, a whole host of others.

MH: The major challenge for you during your tenure with the Monument? Was it developing this second EIS?

MM: Yes, so my assignment within the EIS was to come up with a way to collect some information.

This is an Environmental Impact Statement; inherent is the assessment of environmental impacts across the landscape. When I think of some of the other scientist in the Monument, some of my colleagues from those days are still there, like the Monument Archeologist, or the Monument Paleontologist who does great work. Their work is historical in nature and their interface with current management is to protect the resources from theft and vandalism, whereas the job of the ecologist is to examine past and current land uses that are being permitted on the Monument and evaluating how they are impacting monument resources or not. It is inherently more controversial.

What I was to do was come up with an approach, develop and approach and implement this approach for collecting data, assessing the condition and health of the Monument. That began in the early summer of 2000 and by August 2000 we had an approach lined out based on a BLM technique, actually an interagency technique developed by a team of scientists from BLM, USGS, Department of Agriculture called interpreting indicators of rangeland health which is basically a tool, a technique for going out and collecting data and interpreting data to make inferences about conditions or health of the landscape and how condition and health sort of vary in relation to different plant communities or different soils. We adopted this technique, sort of tweaked it a little bit for our purposes, figured out how we were going to sample this huge two million acre space. Andrew and Dubrasky and I worked quite a bit on that. Within the Monument there is a large number of grazing allotments, greater than seventy, between seventy and ninety. Allotment are subdivided into pastures and pastures are the smallest management unit, the smallest until at which livestock can be managed on a practical basis, they are fenced and you can move animals in and out. The idea was that we would subdivide the Monument by these management units, allotments and pastures, and then as well, we would

subdivide the Monument by ecological land units, the landscape units that related more the ecological properties we were trying to access or evaluate. We settled upon to subdivide the allotments and pastures by soil type because there is a close relationship of soil to potential plant community. That approach for landscape classification is closely linked with this tool, this assessment tool, interpreting indicators of rangeland health. It was a natural fit. There was an existing data set, special data set by which I mean, a bunch of polygons in GIS, a polygon representing a different soil map unit, soils map unit being composed on one or more [soils](#) associated with a particular kind of plant community. You might have map unit 45 might consist of two different soil types predominately 60% of this particular soil, shallow sandstone which supports a pinyon-juniper community and 40% of this other soil which is in adjacent valley bottoms which is a deep loamy soil that supports sage brush for example. That is how the Monument was divided. That was an existing soil survey that had been conducted by BLM staff in the 80s, I think. There was a fellow, still in Kanab at the time, his name was Paul Chapman. He had been involved in the preparation of that early work, and I think Greg Christensen might have been involved in similar work that had been done up n Escalante. So, that was the data set we started off with, subdividing the Monument and then going out and doing the rangeland health assessments. Simultaneous to that in the early years before it was fully staffed and before the visitor centers had been built, before a lot of facility costs, there was more money available in the Monument budget to be spent on research and on contacting for the development of data sets. Marietta was closely involved with this, one of the early things they did even during the planning phase, was they invested a lot of money in an agreement with the Natural Resources Conservation Service, NRCS, who was the soil survey group. Even though there was this existing older soil information, NRCS, at the same time in the field developing a brand new, more detailed, more information-rich, up-to-date, state of the art soil survey. We

had a close working relationship with them because the soil survey was based out of Cedar City, mostly Andre Dubrasky being the GIS guy, and I developed a close relationship with NRCS, Kent Sutcliffe. They would periodically provide us with soil survey updates so we could gradually, as the rangeland assessment project was chunking its way across the Monument, replace the old soils survey information with new soil survey information, the basic tool by which we were subdividing the landscape.

MH: So, updating and getting new information on the soil units?

MM: The soil survey itself was published in about 2005, so there were the very early years when we were doing the rangeland assessment and still operating off of existing older data and then draft versions of new data.

MH: So, if I may ask, since this was about the same time I moved to the area and there was a drought going on, which seemed to create or exacerbate a set of problems with the ranchers on leased lands. How did that impact your work and do you believe it contributed to the contentiousness?

MM: It is a great question, I am glad you brought that up. As an ecologist, what are the factors that drive changes in eco-system properties and the vegetation properties? The two most important things are climate and human land uses. On top of these land use things, well, climate and land use interact and there is always a contention that if you evaluate a piece of ground and think it is in poor condition, on the basis of soils and vegetations properties, our questions are is it more related to climate or more related to use of the land by a particular [use or use or](#) an interaction of those. That complicates the analysis, something that needs to be addressed [and](#) resolved from an analytical perspective. It is difficult to resolve with certainty because grazing in the west, or anywhere, it is not typically set up as an experiment where you have control landscapes and used landscapes to compare; the exact same landscape with the land use, or the exact same

landscape without the land use. That enables us to tease apart the relative influence of climate versus use.

At a landscape scale those sort of comparisons control versus impact studies don't exist very well and only exist in little patches in the landscape where there are fences, so you can draw some inferences from fence line contrast or where there are natural topographic features that have prevented uses from occurring, like No Man's Mesa which is the classic one on the Monument. The problem with the isolating topographic feature is that they are characteristically not representative of other portions of the landscapes. On the Colorado Plateau there are a lot of isolated mesa tops, but they don't really say much about the bottoms, the adjacent valley bottoms that have different soils and different plant communities. They give you some insights about the dynamics of Pinyon-Juniper communities in the absence of human use, but they don't really say much about the effects of grazing on land more commonly used for grazing, like sagebrush and grasslands, because they do not occur on the mesa tops much.

MH: Now, I tried to cross No Man's Mesa and it astounded me how big it was. Wasn't that a buck pasture at one time?

MM: There is a paper published in *Journal of Rangeland Management* from decades ago which documented that there had been goat use up there. If you remember there is a narrow route you climb to the top and right when you peak-out on the edge of the sandstone, there is some fencing where they kept the goats from running back down the trail. So, it is not pristine.

MH: Jayne and I talked about that, the non-pristine nature of the Monument. I look at it as there has been so much use and so thin resources.

MM: Which is absolutely the case. There is this climate which varies from season to season from year to year and livestock management on top of that and in a physically complex landscape, with canyons and topography where you can lose animals...rugged landscapes. How do you control the use of the landscape closely in such a way as to minimize resource impact in years of drought? There was an event occurring at that time, at the same time we had started doing these rangeland assessments. We had come up with this technique, assembled teams, trained teams, starting off on this big venture of field work while at the same time it was drought. I can't remember exactly, some of the dates might be wrong, but it happened around the fall of 2000, where there were some trespass livestock issues on Fifty Mile Mountain, it was a big management priority because it was a drought period and because there were trespass livestock which means there were livestock in an area and a time when they were not permitted to be there, which exacerbated risk to resource conditions because of the drought at the same time. There was a big concerted effort to get the cows off Fifty Mile.

MH: My understanding was that many of those cows were rogue, left up there for years.

MM: Yes, there had been trespass for years.

MH: And I understand that the cows come down at a certain time of year, almost instinctively, moving to their exit point when the temperatures change. But that didn't happen because they were set to move weeks before they would normally be brought off the range. For the ranchers it was a push to get the cows rounded up and out of there, they weren't ready.

MM: There were reports in the file from Utah Division of Wildlife Resource, UDWR, from the 90s, I think, that had remarked about long-term year round trespass grazing on Fifty Mile. It was not just an issue that came up out of the blue in 2000. What happened in 2000 was management

determined that they wanted to try and resolve the issue whereas prior to that there had been less management resolve to resolve the issue.

MH: A new management layer on top of other things going on.

MM: Right, so another thing I was doing in conjunction with that at the time was flying up to Fifty Mile in a helicopter to various places describing, documenting impacts, livestock impacts in different settings, like at the springs. One of the interesting things about Fifty Mile is that there are a lot moist meadow settings because of the particular geology. The geology affects the way the water moves through the soil and where it pops out in these springs. These meadows that form are preferred livestock hangouts because it is good forage availability and typically water there, so, cow magnets. There were severe persistent impacts. Long term impacts of livestock use on meadow systems there, by that I mean trampling and grazing effects on vegetative cover and soil stability which then reduced erosion resistance which contributed to formation of gullies and that kind of thing, which when then be exacerbated by trampling impacts, they become routes of travel, this feedback. And this is on top of drought. That was what I was doing. The BLM State office sent down a photographer and he and I flew around and he was taking pictures and I was writing field notes that went into a report that went into the file to document the condition.

MH: And it was not in good condition.

MM: It was not in good condition.

MH: We have talked about some of your challenges, land and condition. But physically you had no problems getting out into the field.

MM: Yes, it so big. On the one hand no. It was a wonderful time for an ecologist. It was an amazing opportunity to learn, so, I was in the field all the time, but within relatively small areas because it is a two million acre monument. I spent a lot of time in the field, in the Grand Staircase section, Vermillion Cliffs, east of highway 89, Mollies Nipple allotment, Kitchen corral, and a lot of time on Fifty Mile, very little time in Escalante area with the exception of Fifty Mile. It was just too far. I mostly got up there for meetings. I did get around through the Circle Cliffs on a couple of occasions, again looking at range condition, primarily in relation to climate-livestock interactions on land condition, evaluating the impacts; what are the impacts what should we be doing. There were some exclosures as I recall. I think Greg Christensen and [HJ](#) and maybe one or two others, took soils samples to evaluate compaction inside and outside exclosures.

MH: So, these would be plots out in the middle of nowhere?

MM: They are not real big, and they were typically...there are a number of exclosures on the Monument, called exclosures because they designed to exclude mostly livestock. They are on the size scale of an acre or two. There are some exclosures that were built in cooperation with the Utah Division of Wildlife and so they are designed to have multiple compartments, a side designed to exclude livestock, but it has a low fence so that mule deer can jump in and then directly adjacent there is an exclosure with a high fence that excludes both livestock and mule deer. Then they subdivide each of those and put in chicken wire fence to keep the rabbits out, so they are trying to tease apart the relative effects of these different classes of herbivores on vegetation conditions. The problems are the exclosures were put in at a time when grazing impacts had already occurred widely across the landscape so there is that. They were often put in subjectively imposed on a particular vegetation type that was chosen for particular reason that is maybe not documented anywhere; why did they put it here?

I have actually done a lot of this enclosure sampling in some of my other work including around south of Canyonlands found that there, some of the long term enclosures put in during the 50s by DWR, mostly by DWR, with permission from BLM. They were sort of put in to lasso a vegetation type, like here is a patch of sagebrush in the landscape, let's put an enclosure over the top of it. One of my interests is soil, even at the time we were doing the Monument [work](#); we would do a lot of soil sampling. Wherever we did these rangeland assessments we would carry a soil auger and auger down through the soil to get an understanding of what the soil properties were, which helps us understand what the potential plant community type is. IN doing this in relation to these enclosures what we find, not so much on the Monument, but in other places, within the enclosures it is a totally different soil inside the enclosure than it is outside. IN some cases if you have an enclosure with tow compartments, a low fence and a high fence, sometimes we saw a different soil in one compartment than you have in another compartment. And both of those are different than you have outside the enclosure.

MH: Does that develop, because there is a certain type of vegetation allowed to grow there, or is it static?

MM: That is a good question. It could that the soils are different because there was a fence put there and the impacts have been lessened. But, the soil properties that we look at in the soil profile are properties that are not affected by, very much, by what is happening at the very surface. They are properties that develop over tens of thousands of years.

MH: What were some of your results or what do you feel like you accomplished during your tenure on the Monument?

MM: In order to get to that....I would have to say I left the monument...well, we initiated this big rangeland assessment project to support the development of the EIS which originally was

envisioned as being completed, *completed*, within a three year process, because that was what was stipulated in the management plan. It was envisioned that it would be done in 2003. I left the Monument in April of 2002, I took a job in Moab with the Park Service, so my accomplishments during my basically two year tenure, a little bit more than two years, the accomplish was hiring some good staff, working out this process and getting it implemented and creating inertia so that when I left there was sufficient inertia that it was carried through and continued until the data set was completed. When I left I think we had done on the order of a couple of hundred of these rangeland assessments. I had done half of those. By the time the project was completed, the data collection portion of the project, and there were some different iterations of it, there were over six hundred...different methods used in a couple of different occasions, but basically over six hundred of these assessment plots were done over a multi-year period. That was a huge thing, a pretty massive data set that has been used. In addition, some other things I was doing were facilitating some other research. There was another researcher that was there at the time, Matt [Bowker](#) who was doing his PhD at Northern Arizona University. He is an ecologist who focuses on biological soil crusts. He was doing a modeling exercise, doing a lot of field work, collecting data on biological soil crust distribution patterns in relation to climate and geology and soil with the intent of developing a model to help managers understand how crust composition and structure vary across the landscape in relation to these things. We cared about crust because it is important from an ecological perspective in terms of the things it does ecologically. That was another accomplishment, in addition this big rangeland assessment project that was ultimately completed, [a]huge data set that has then been used by myself and some other researchers to support research. There is Matt [Bowker's](#) research, who has used the data set and done quite a bit of related research using the data and biological soil crust kinds of things.

MH: That was one thing that Alan Titus spoke about, doing certain kinds of research on the Monument and then many other researches wanting to come and do their own research. You can't just let them come in and work willy-nilly, but it must be coordinated and supervised to some extent.

MM: Coordinating research projects was less of a job for me as it is for him. Maybe there were more people doing smaller kind of all over the place projects related to paleontology relative to ecology. For the ecology there have really been a small number of major projects. There was a lot of work, some stuff that I haven't mentioned was in the early years, even before I got there, there was a lot of investment into some work done by Tom Stohlgren who is with US Geological Survey and Colorado State University. They did another kind, a different kind broad scale landscape level sampling; vegetation and soil sampling across the Monument which resulted in another bunch of data sets. It was a different approach, different sampling design, different methods, good projects. Another important thing going on for a number of years was that there were annual floristic surveys being done by the botanists or plant systemists from BYU, Stan Welsh and Duane Atwood. They are the guys who wrote the flora, sort of the bible of Utah plants, great explorers discoverers of unknown plants. They were doing a lot of work in the early years collecting and finding new plant specimens. I was not involved with them very much except from a permitting and coordination stand point because they were self-directed. I had a applied management oriented assignment, actually a number of these that I was working on. They were doing good stuff, but it wasn't going to be used much in the EIS.

MH: Well, so you left the Monument, but have kept track of what is going on over there, what are your impressions now, after being there for a few years? Do you see some progress or is it languishing?

MM: It is a difficult question. To answer that, and the fact that I subsequently went back to the Monument in a different capacity as a USGS scientist, so I was in Moab from 2002 until 2005, working [first](#) for the Park Service inventory and monitoring program and then took a position [in 2003](#) as a research ecologist with the US Geological Survey and then as a USGS scientist was subsequently reassigned back to Kanab to be duty station with the Monument, and again located in the office in Kanab with the same phone number I had previously from 2005 until April of 2010. That whole exercise was all about trying to facilitate greater collaboration between BLM and USGS in the development of research, applied research projects. That was the vision. There was a Memorandum of Understanding, a feel good document that was developed between BLM, US Geological Survey and the Park Service as well because Zion National Park was a partner. Zion and Grand Staircase had both expressed interest to USGS that a USGS scientist be duty stationed at that corner of the state to work with them on research needs related to management. When I was reassigned it was in response to requests from BLM and from the Park Service as well. It was a three-way MOU. While I was in Kanab I developed a lot of collaborations with the Park Service and Zion, it was very active and continue to have seen now while I am in Moab, continue to have project work in Zion, continue good collaborations. It was frustrating in the Monument, despite my being located there, because there continued to be internal schisms from a cultural perspective, I think that is largely what it was. By that time the staff had turned over, the nature of the Monument staff changed. The initial influx of outsider phenomenon we talked about [earlier](#) had departed. Monument staff was much different than it had been in the early years. It was during 2005 until 2010, it was difficult to establish good partnerships that resulted in significant research collaborations. I was involved in some things, but mostly I felt like I sat in a lot of meetings talking about research strategies and the kind of things that rarely got implemented. It was a time of trying to redevelop a science program in the

context of fewer resources, different perspectives of the managers, a different suite of staff. It was different and a little frustrating.

MH: To wrap it up, what is your current assignment?

MM: Right now I work for the National Park Service. I am the ecologist and Natural resource program manager and science coordinator for what is called the Southeast Utah Group. That consists of Canyonlands National Park, Arches National Park, Hovenweep National Monument, and Natural Bridges National Monument. Accumulatively much less area than the Monument though. Together those four units are about 500,000 acres, maybe a bit more.

MH: Any good adventures on the Monument? Epic adventures?

MM: The time I had doing these rangeland health assessments, they were all adventures. Great from the perspective, I learned a lot of ecology, I learned a lot about the role of cultural value sets and land management. It forever shaped the kind of things I will be interested in doing. I am a scientist. I am very management oriented, but because I worked for BLM and because I worked as a USGS scientist embedded in a BLM office in which all of my project work was invariably very management applied oriented with individual field offices, working with Zion or the Fillmore field office, the St. George field office. I left USGS because I felt that I had gotten to the point that I needed to carry the science into the management agency from within the management agency rather being sort of an outsider embedded in another agency and frustrated by the inability to cross that management boundary. During the 2005-2010 time period, that was always my frustration; how do we manage this interface of science and management. USGS, as Department of Interior Science Agency, their mission is to work at that interface but they have a very strong control over the direction they give their scientists, and not to venture too far over that management line. And with good reason. The USGS, their role is

to provide the science and to hand it over to the management agency. What I have felt since I was BLM employee was that it really was not enough. The weak link is not the science, the weak link is then taking that science, handing it off, incorporating the science into actual practice. That is the frustration, the weak link. That is why I love my job right now. I fooled myself when I considered taking this job, and ultimately taking this job; I thought I was simplifying my life but it wasn't simplifying my life at all. I continue to work on a lot of different research projects and then at the same time I am trying to sort of rebuild the natural resource program here, to do that very thing of trying to incorporate more of the science into the management practice.

MH: But at least you are within the same agency, right?

MM: Absolutely. My ability to accomplish this is totally a function of how much energy I have.

MH: Which is exciting. And with some diversity, four major units to work within, beautiful places.

MM: Yes, it is pretty good, I like it.

MH: Any parting comments? The adventures?

MM: Well, we did a lot of flying around, but without incidents. In my previous job working in Alaska, I had done a lot of aerial surveys, and was accustomed to doing aerial work.

MH: Did you do any multi-day trips into the backcountry?

MM: That is a great question. My wife, when I worked as a BLM employee in Kanab the first time, was also a BLM employee and was a backcountry ranger. During her time she got to do all these backcountry patrols all through the Escalante country, saw a lot of country I never got to see because I was doing rangeland assessments and I was mostly looking at land condition issues related to livestock grazing and when it came to my free time, sort of the last thing I wanted to

do was go on a backpacking trip into the backcountry. I have some favorite places in the Monument. I love the Monument.

MH: And how do you view the Monument now, a place to visit. Would you consider it unique?

MM: I think it is unique in a couple of ways. Primarily it is unique as an experiment. I spoke about the excitement of the early years especially 2000. , I was still working in Moab at the time, in March of 2000 when Bruce Babbitt gave a speech to all BLM employees in which he announced...Well, first, the Monument was designated in 1996 and it wasn't until 2000, four years later, that this additional concept of the National Landscape Conservation System was announced. When he announced that in March of 2000, I was in the Moab BLM field office watching him on television, it was really exciting. It was describing a new vision for BLM; a new sort of conservation oriented land management entity that I think is still sort of struggling to figure out what it is all about. It has made a lot of progress, particularly recently. Bringing that back to is the Monument unique, it was the first, it is the biggest and probably the most controversial. It is often described; the Monument folks describe it as the flagship of NLCS. The challenge continues to be realizing that vision of, yes, you are the flagship, what does that really mean, just the first and the biggest or does it mean it is a leader and in what way.

MH: Thank you very much Mark, I appreciate you doing this, great information.

MM: You are very welcome.