

## Course 3: Survey Evidence Analysis Study Guide

**COURSE DESCRIPTION:**

This set of videos and other teaching aids addresses one of the most complex tasks in cadastral surveying, the analysis of the field evidence and it's correlation with the written record. The course is essentially presented with three unique sessions on the subject from instructors of varying backgrounds and experiences. Practical on-the-ground advice is offered, as well as a thorough discussion of the legal concepts and issues involved in the analysis of corner evidence.

**COURSE OBJECTIVES:**

Upon completion of this course, students will be able to:

- Provide legal and historical backgrounds for evidence analysis procedures
- Discuss proper use of evidence, including confusing evidence situations
- Practice reading of and interpretation of field notes and plats
- Present proper markings on monuments

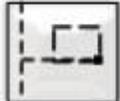
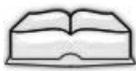
**COURSE INSTRUCTOR(S):**

Stan French, Bureau of Land Management  
 Dennis Mouland, Bureau of Land Management  
 Robert Dahl, Bureau of Land Management  
 Ron Scherler, Bureau of Land Management

**VIDEO LECTURE TITLE:**

Evaluating Corner Evidence – Part 6 (61 minutes)

**ICON LEGEND**

 WEB COURSE	 EXERCISE	 DIAGRAM	 READING ASSIGNMENT	 PROBLEM	 HANDOUT	 2009 BLM MANUAL	 QUIZ
---	---	--	---	---	--	---	---

## EVALUATING CORNER EVIDENCE – PART 6

---

### How we approached Evidence for CFEDS

Hello everyone. Dennis Mouland here once again. This time with one of my favorite topics corner evidence analysis.

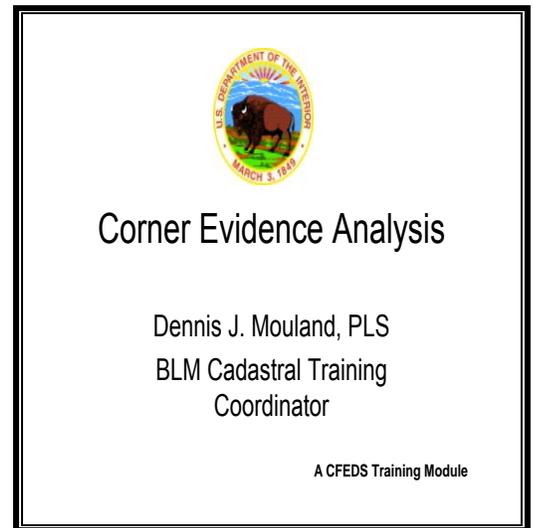
Actually in this corner evidence evaluation course that we have – let’s face it, we could talk about this for 120 hours just on this subject. It’s always a fascinating subject. I find that there’s almost always something to learn from someone and their corner search experience, that sort of thing.

And rather than try to totally formalize this not-so-formalized subject, the way we chose to do it in the CFedS training was to simply expose you to three different persons from different parts of the country and their experiences. And so you are hearing from me on this and I’m primarily a Southwestern person.

We have Stan French also doing a session and he’s got a lot of experience, although some in the West, a lot of his stories and experiences he gives you are from the Midwest, especially Missouri.

And then we have Bob Dahl who will speak more esoterically about corner search and some of the legal ramifications here and there and what kind of things we ought to think about. And although Bob is currently in the Washington office, his experience is mostly in the Northwest so we tried to provide a little bit of geographic variety but more important three different personalities and approaches to the same subject and you’ll see that there’s very little overlap.

While there might be some, you might even hear some disagreement, don’t let that bother you. Evidence analysis is not a black and white thing. If it was, if it was that simple and easy, I don’t suppose we’d license land surveyors, would we? So it certainly is something that we have to pay attention to. It’s the heart and core of what we do.



## EVALUATING CORNER EVIDENCE – PART 6

### Objectives

So, given a survey request, CFedS can better analyze survey evidence and conformance with the 2009 Manual of Surveying Instructions and general boundary law principles. And, of course, any subsequent manual that comes out that would certainly apply as well but that's our objective.

### Course Objective

- Given a survey request, students can better analyze survey evidence in conformance with the 1973 Manual of surveying Instructions, and general boundary law principles.



### Course Pathway

Now, let's take a quick look at the pathway we're going to take then to get there. First, we will review the need for evidence search. That might seem obvious but that's a good thing to talk about.

We will review tools for records research. We'll discuss uses of field evidence in the process of corner point identification. And we will explore some keys to resolving some conflicting evidence. So that's kind of the path we will take on this course. And perhaps we should talk about this.

The first thing on the list there was the need for evidence search. We need to understand how fundamental that is. I think you've heard plenty of that already up until this point in CFedS and you probably already knew about it anyway as a land surveyor.

But again, we're in a day and age where evidence search seems to have fallen off and we're more interested in mathematical solutions which is not where the law goes and we need to realize that in spite of all the fancy gadgets we have and I'm all for it.

I'm all for the technology and the software and the processes that

### Course Pathway

1. Review the need for evidence search
2. Review tools for records research
3. Discuss uses of field evidence in corner point identification
4. Explore some keys to resolving conflicting evidence

## EVALUATING CORNER EVIDENCE – PART 6

we've developed. It's great, but we still have to dig holes, we still have to get the metal detector out, we still have to analyze scratches on rocks, we still need to look at things.

Now, we need to understand that much of that is a **common law** principle. And the common law, at least the definition of it, is the system of jurisprudence based on custom traditional usage and precedent from previously heard cases rather than a codified system of law.

So it's not statutory law, it's this common law. And on this planet, we have 5000 years of pretty consistent basic principles of boundary law and I've got some of them listed there. That the original point holds forever, that natural monuments will generally hold over others, and that we are always interested in the intent of the parties as you can see on the picture there on the right.

That's the famous rope stretchers drawing found in the pyramids showing the ancient Egyptian surveyors using a rope to measure distances and really the Egyptians were some of the first ones to give this, if you want to call it, common law.

The principle especially that corner points aren't supposed to move, that they have to be returned to their original position even if the monument is destroyed. The Egyptians did that with a system of witness corners or reference monuments up on the banks of the Nile up away from where the Nile would flood.

And that's really where that concept came from and we find it throughout history, we find it in the Bible, we find it in Europe and Africa and as those countries migrated and moved to other places, why they just took those principles with them.

Now we need to realize that, as I hinted here a minute ago, we need to remember who we are and what we are as professional surveyors and as a CFedS, what we're really doing. And I'm going to encourage you to not sell your professional soul.

### Common Law

- A system of jurisprudence based on custom, traditional usage, and precedent from previously heard cases, rather than a codified system of laws
- 5000 years of very consistent basics:
  - Original point holds forever
  - Natural monuments generally hold over others
  - Intent of the parties



## EVALUATING CORNER EVIDENCE – PART 6

### Two Basic Sides to Surveying

Let's not forget that we have two sides to surveying really. We have the art side, which a bunch of things listed here: legal research, records research – that's kind of an art – corner research, evidence analysis, unwritten rights, boundary law, title issues.

You notice, quite a few of those are what we're talking about today. And then we have the science side, which is just really the math: the measurements, the calculations, adjustments, how we use GPS or AutoCAD or other data collector software, that sort of thing.

So, those are two sides to our surveying profession. But we need to realize that much of our profession in the last 20-30 years has been selling and sold to the science side and ignoring the art side. And that is something that each of you as an individual needs to think about yourself and examine your own situation and circumstance, your background, your training, even your attitude.

I'll talk about that later in this course too. So, be aware of your professional soul because we are supposed to be experts of both those lists. We're supposed to be experts of the measurements, the calculations and the adjustments, the gadgets and the software and all that, but we're also supposed to be experts at the art side of things and those are the things that most of us were never formally trained in.

It's pretty tough to find a course. I mean we're trying to do it here, but you don't find a lot of classes that are on that. You can read some text books but some of that's not very practical or it's limited to certain parts of the country, that sort of thing.

### Don't sell your "professional soul"

#### • ART

- Legal Research
- Records research
- Corner Search
- Evidence Analysis
- Unwritten rights
- Boundary law
- Title Issues

#### • SCIENCE

- Measurements
- Calculations
- Adjustments
- GPS-Geodesy
- AutoCAD, etc.

## EVALUATING CORNER EVIDENCE – PART 6

---

Now, sometimes, depending on what lawyer you're talking to, the common law includes the case law or vice versa. But, I want to talk about **case law** for a moment.

First of all, I'm talking about the need for evidence search, corner search, that sort of thing. Let's define case law. It is that body of law based on judicial decisions as distinguished from laws created by legislators or congress, the latter being known as statutory law.

### Case Law

- The body of law based on judicial decisions, as distinguished from laws created by legislatures or Congress, the latter being known as statutory law.
- Case law is often considered part of the common law
- Survey-related case law very consistent

Case law is often considered part of the common law and you will find that survey related case law is incredibly consistent in this country.

Now I'm going to just read you a sentence or two from several court cases that none of them involved federal land. They're just private court cases that went on appeal or higher and I just find a few sentences here quite interesting. I'll just tell you the name of the case – **Beltz v. Mathiowitz**.

The court said, listen to this carefully, "*The true corner of a government subdivision is where the United States surveyor established it, whether this location is right or wrong.*"

We understand this principle comes all the way from the Egyptians and now we see here is a court case. This is actually an 1898 case somewhere up in the Midwest, Upper Midwest, that heard this case and somebody was saying yes that is the original evidence over there but it didn't measure right.

The government didn't put it in the right place and the courts are saying it doesn't matter. Wherever the government put it is it. That's why it is so important that you and I are out there searching for that evidence because that is it and nowhere else is it, whatever that corner is you're looking for.

## EVALUATING CORNER EVIDENCE – PART 6

---

Another case, a 1911 case, it's called **State vs. Ball**. *“Monuments erected by the government surveyor to mark section corners of a survey will control even if they are in conflict with the field notes.”* That's interesting.

Of course, we use the field notes to help evaluate the evidence but what they're saying, what the case was about, was the measurements and the bearings, the distances weren't the same and yet we found the original monument in its original position.

Another case, I'll give you **Puget Mill vs. North Seattle** that I quoted in another part of the CFedS training and I actually go into it in a little more detail, but it's got a very similar line here and I'm just showing you this consistency. *“True corner of a government survey is where the government survey located it and one that is known that controls over bearings, distances, blazes and even the calls in the field notes.”*

Then they added this, *“Error in the location of the corner (where the government didn't put it where the measurement said, but that's where the government put it) however plainly shown is not subject to correction in the courts.”* See, that was an appellate court telling the lower court, this is actually on the 9<sup>th</sup> circuit, you can't move survey corners, you can't move the GLO's corners.

And then another one, **Vaught v. McClymond**, is a 1945 case if I remember right, was an Oregon case. *“Errors of location of original corners as established by the federal government (so we're still talking errors where they didn't measure right is what we're talking about, so those measurements and those corners, the section isn't square, it's not the way the plat shows but yet we found the original evidence) that cannot be corrected by the courts nor can it be corrected by a surveyor called on to locate government corners and lines.”*

So there again is another appellate level case that is chastising the lower court for trying to move section lines or whatever or corners (therefore, the lines). And also pointing out – surveyor, you can't do that either.

Now, I won't quote it now because we've used it previously and perhaps another time, but I'm going to recommend that in the

## EVALUATING CORNER EVIDENCE – PART 6

---

Manual, and I just need to grab it and remind you what you need to look at 5-15, which is where the Manual basically defines what a resurvey is and what damage also a poorly done retracement causes to an area.

And they actually quote from the Supreme Court case **Cragin v. Powell**. So, I'm trying to show you that there is this incredible amount of consistency in the law and so we have common law that backs it up that we need to be out there doing corner search and evidence analysis and we also have case law, which tells us very specifically that's what we're supposed to do.

At the risk of repeating myself from another module, I'll just simply say all of us studied some case law. You may not have realized it, but that is the foundation of most of the books that have been written by Walt Robillard, Curt Brown, Don Wilson, Gurdon Wattles.

In fact, there's all sorts of footnotes in those textbooks that give us case after case after case. So, they didn't make that up, or that it isn't just unique to some area of the country. Those are our basic fundamental rules.

There are changes or differences from one state to another but you're supposed to know that already. You're a licensed land surveyor in those states. That is basically my discussion on the need, you see it's not just that it's fun to do; it's not just that we have this tradition to go out there – no, it is absolutely required.

It is, if you will, the most fundamental task that a land surveyor must perform. And to fail to find evidence is a failure to your client and to your profession and to the society as a whole. You've caused chaos and confusion. It may not be discovered for a few years, but certainly in most situations, it can create liability.

I'm one of those that I don't want to do a good survey just because I don't want to get sued, I want to do a good survey because that's the right thing to do.

## EVALUATING CORNER EVIDENCE – PART 6

### Research the Record

The fundamental of doing the right thing is to do the evidence analysis. But prior to evidence analysis, or actually I suppose you could say it's part of the evidence analysis, before you go to the field, we want to **research the record**.

You hear that over and over again and just about every speaker we have in the CFedS program is talking about researching the record because that's the foundation of what we do.

Now, there are really some primary sources of researching the record that I think are pretty necessary. Of course, on any project, you want to look at what's going on in there, who's been in there, what kind of activities or what kind of structures or improvements or what kind of things have happened there.

Because a lot of times that will define who you might want to talk to for survey records, but some of the primary sources we have, obviously if you're in the public lands is the General Land Office and the BLM's notes.

You'll also have your county records. And let's realize that your county records are really in maybe two different types or two different sources.

You have county records, you have what the county has done as an entity, like the county surveyor or the county road department or whatever as an entity that they've done, but in most jurisdictions the county is where private survey plats are recorded, subdivision plats, records of survey, or various other forms of things. I realize that's different in a few states, some that's done at the state level.

But the county records realize that you really have two sources that are officially done by the county, but then things that private surveyors have officially recorded or filed or deposited, depending on which state calls that.

### Researching the Record

<ul style="list-style-type: none"><li>• PRIMARY SOURCES</li><li>– GLO/BLM Notes</li><li>– County Records</li><li>– City</li><li>– State</li><li>– Special Districts</li><li>– NOAA</li><li>– Railroads</li><li>– Utilities</li><li>– Highway Departments</li><li>– Resource Mgt companies</li></ul>	<ul style="list-style-type: none"><li>• SECONDARY</li><li>– Title Companies</li><li>– Assessor's Offices</li><li>– GIS data</li><li>– Court Cases in area</li></ul>
---	---



## EVALUATING CORNER EVIDENCE – PART 6

---

And then you look at where else you are – the city that you're in, did they have a survey department or did they in the past – the state, what kind of records do they have. What kind of special districts might there be? If you're in an area and there's a bunch of irrigation ditches, there's probably an irrigation district. Or flood control, there's probably surveyors there or at least they've paid for surveys. And some of that may not be in the county records so you want to look for that.

And even NOAA, the old Coast and Geodetic Survey, not always, but once in a while, they set a tri station really close to a section corner or quarter corner and it's very possible that they tied, sometimes even first order tie from the triangulation station over to this corner that was a couple hundred feet away and used it as an RM perhaps or at least tied it in.

My point being that if corner is lost or you're not quite sure about it, but you've got a tri station within a few hundred feet. That doesn't hurt to contact NOAA, most of that stuff is online now. Look at that and see if they made a tie to your corner because I'd rather use that tie to set the corner than proportion it.

And as you hear over and over, proportioning is the last resort – it really is the last resort. Some other ideas here – if you've got a railroad in the area, contact the railroad.

Sometimes that's difficult to figure out where their records are, but keep calling and find out. And then keep track of where that was. Each company has their records in different places. Utilities – you got a big power line crossing the area or a sewer line the city has that may have had a survey done for the right of ways.

There may be records that they have that would be of great use to you. Another one – the highway department that could be a state or county highway department, or even a city street department for that matter.

Every highway department I've ever dealt with, especially with the state, there's some big old room full of all the old maps, all the old plans for the right of ways and for the highways that they built. There's always somebody in that office that knows where

## EVALUATING CORNER EVIDENCE – PART 6

---

everything is. You know what I'm talking about. I go there and I say I need Highway 4, but not where it is now, I need it where it was back in the '50's. And they say, "Oh yea, come on over here and go through these (usually hanging) files and pull out here this is it."

You look on it and low and behold, there's a tie from one of their PC's that they monumented over to a section corner that you're having trouble finding or that you're about to go out and look for. Great information. I'll tell you what, you don't want to miss that because if that sort of information is available, and you have to assess it's reliability, but if it's available and reliable, you need to use that before you do any proportioning - that is part of evidence analysis. And obviously any resource management agency or company that's in the area.

A big timber company that's in the area, I know that Weyerhaeuser and Boise Cascade have had their own survey departments. They have huge land record systems. Some of them have their own GIS's. All kinds of stuff.

In some areas where you're at, where you work, there may be other entities or things I've never even thought of. But, you just kind of look at the area to see who's been in here, who would have had a need for a survey in the last 100 years. Did they survey? Do they have records? That's what you're looking for.

Now, there's a secondary source of records and they're not all that good and so I just list them here because they're not surveying records, they're other information records. Some examples – title companies, you might be able to get a title policy or commitment and it might have information, but usually nothing you can really use. Your Assessor's Office, GIS data. You can pick a book and page and there may be other information there but you're not going to get what you really need.

I even mention court cases in the area because it's extremely difficult to research court cases in any area unless you or your client happen to know about the court case or there is some evidence of it.

Because normally court cases, the results of those, are not

## EVALUATING CORNER EVIDENCE – PART 6

recorded in the grantor/grantee record system, they are not recorded in the record of surveys or subdivision files and so, unfortunately, there's a lot of things that happen in court, be it law suit, divorce, probate, that just never ends up in the true public record in the sense of where you and I and the title insurance companies normally go.

### The "Other Record"

So, we need to realize those are secondary and normally they are not going to provide you with much information, but they might.

Now, there's one other source I want to generally make reference to and it's what I call the "other" record or maybe we ought to say it in some kind of a dark tone like "the other record" because it's all that data that's unrecorded by local private surveyors. Unrecorded plats, notes or other documents that a private surveyor has.

We need to ask – can you use them?

Yes, you can. In fact, I think it pays off to talk to surveyors that have worked in an area, even if they're out of business. Talk to them to see what's going on. You do need to look at it, as with anything you need to analyze whether it's reliable. But I will just mention that sometimes you have to deal with uncooperative persons.

I know many of private surveyors, who's retired, or maybe they're not even retired but they don't want to share that information. And they think they're protecting their client or they're protecting their own liability.

A lot of times that's what's going on in their minds. I try to encourage them to share it with me because I want to protect their client too. I want to see what the survey was. If they really don't want to let you have it, you need to make a note in your file, very simple note that says I contacted Joe Blow land surveyor and he told me to drop dead. At least it's in the record that you did make

### Don't forget the "other" record

- Unrecorded plats, notes, and other documents of private surveyors
- Can you use them?
- Dealing with un-cooperative persons



## EVALUATING CORNER EVIDENCE – PART 6

---

an attempt to contact that person just in case something were to come out later. But, really, these uncooperative people, a lot of times you can talk to them.

In fact, I've found a really good trick I just might mention is I'll say, "Can I just see it? I won't make a copy or anything. Can I just see it?" Well, ok. And they let me see it and when you look at it you see all these things on it that tell you that their survey is probably worthless. I'm not saying that's always the case, I'm just saying a couple of minutes at glancing at it and a lot of times you can figure out.

I've got a slide on that here in a minute about that, part of your analysis of that record. So, these unrecorded things, people say, "Well, it's unrecorded, it's in that private surveyors office so I can't use it." No, you can use anything that will help identify a corner point.

You sure don't want to miss something whether it was the survey the guy did and he found the stone you can't find because it's been destroyed since then, but he took ties to the fence corners and other things out there.

You want to know that if at all possible. Because any other solution you come up with will probably be in a different position and that will eventually come out, will eventually be found.

Now, when we get the private record, we do need to analyze it. Now, obviously, the ideal goal that we have is boy it'd be nice if I could just assemble the entire history of every corner I'm working on this project and it's evidence through time.

### Analyzing the private records

- Ideal Goal: Assemble the entire history of each corner and it's evidence thru time
- Watch for signs of poor surveys/dumb assumptions:
  1. 330, 660, 1320
  2. Aliquot acreages
  3. Bad proportions
  4. Lack of evidence calls
  5. Conversions to metes and bounds from PLSS

## EVALUATING CORNER EVIDENCE – PART 6

---

Let's think about that for a moment. It'd be nice if, let me make one up here, I found the GLO or even if it isn't on public lands, I understand, whoever did the original survey, here's the record, let's just say the GLO's set a stone and two bearing trees and that was 1850 let's say.

In 1901 the county surveyor found the stone and it was crumbling and he found one of the bearing trees and he set a new monument there and took some new bearing trees, but then 1952 a developer hired a land surveyor who came in there and he found that and they were going to build a big brick fence in there where the corner is so he took some different references to it, and then in 1979, the highway department came through and tied one of those references was still there and they remonumented it. I'm just making this up but that's the sort of history that you'd like to have or maybe we could call it a pedigree of the corners on a project. That's the ideal goal. I realize that you don't get that.

In fact, one of the last things I'll discuss with you in this module is that **uncalled for monument**. You go out there and it's supposed to be the GLO stone or some original monument or something and you go out there and there's some rebar, no number on it, you don't know where it came from, where they set it, how they set it.

So, we'll discuss that a little bit as do our other speakers also. But that's our goal. Now, when I am analyzing the private record, those plats and even deeds often, I'm looking for signs of a really poor survey or maybe what we'll just call dumb assumptions that they made.

If it's public lands and you see a bunch of numbers like 330, 660, 1320, 2640 all that, then you know that they didn't subdivide that section. That this is one of those what we call "1320 specials". I look for acreages in deeds or on surveys where everything happens to turn out to be the aliquot acreages and the public lands. 5 acres, 10, 20, 40s, 80s, 120, 160, those kind of acreages because you know that it's very rare that that would ever happen.

I'm also looking for bad proportions, I've seen quite a few places where a surveyor claims he did a double proportion and in reality all he did was a bearing bearing intersection which is quite

## EVALUATING CORNER EVIDENCE – PART 6

---

different and can drastically move a corner position. So I look for that and you know what else?

You can have a survey where they actually did a good job but if there's a lack of evidence calls, it doesn't help you all that much. See I'd like to find these old plats or even field notes perhaps, mostly plats, where they actually say I found the stone here or I set a rebar here so that I know what their footprint is so I can go out and look for it. And, as always, when you chain a title, be careful about conversions to metes and bounds from a public lands description.

If it was the Northwest to the Northwest of section 10, but now it's been rewritten as East 1320 then South 1320 and now West 1320, you have a problem and there's even greater problems that can be done by that same kind of a practice. So, let's just be aware of those issues.

### Use of Quad Sheets

Now I want to mention for a moment one of the surveyors favorite tools and it is a fabulous tool. I don't know who dreamed of doing topographic maps in this country. I think they were done far before John Wesley Powell.

I know he was very involved in mapping of the West and worked with the USGS, but one of our basic tools in surveying is the USGS quadrangle map, right? And they are fabulous tools for figuring out access for laying out plans of how you're going to doing this, that and the other. But, what I want to remind you of is that they are not necessarily a great corner search tool.

They're great to help you get into a general area, especially in the West. I've seen quite a few places over the years where the quads were anywhere from 300 to 1000 feet off. And we need to understand how that's done.

## EVALUATING CORNER EVIDENCE – PART 6

On the slide here I've got a portion of a quad sheet from the Ft. Apache Indian Reservation, which is out in eastern Arizona here. Beautiful country out there in the higher elevations and this is about 5000 or 6000 feet here where this is.

So, we're all used to looking at quad sheets and all that stuff. But you notice this red circle here. We have, and if you look really close, you can get a quad sheet of your own and take a look at it, but when there's a little tick mark there, a little red tick mark, that means that at some point in the past, somebody with USGS or another federal agency usually or perhaps a state agency found something there that they think might could kind of be the corner.

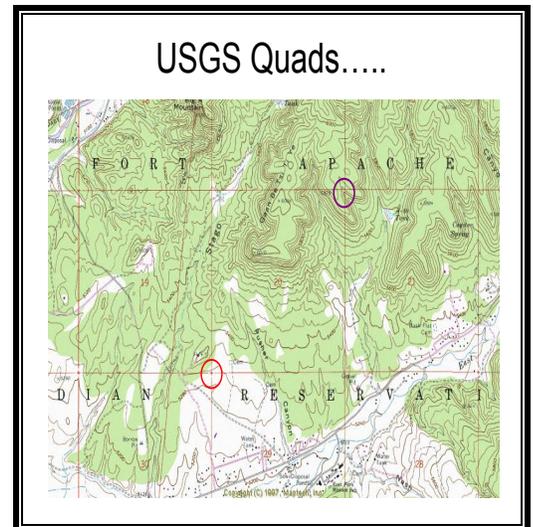
I say that because you need to realize that most of the folks with the USGS and with other agencies that might have identified a corner or even photo identified it are not experts in cadastral survey evidence analysis so I've seen quite a few of those where I get there, the tick mark is just a doggone fence corner. I find the evidence a couple hundred feet away. So, understand that even that is not a guarantee of anything.

Now, on the other hand, where the purple circle is up here, you see that there is no tick mark there. The red lines that are the section lines just cross and let's understand how was that point determined. The USGS in cooperation more recently with whatever federal agency has jurisdiction in the area.

For instance, if it was on a National Forest, the Forest Service assists them in figuring out what's going on out there. But, what essentially is done is it was proportioned. So, at the purple circle here, they never found anything there. No one even looked there probably. They might have looked and not found anything, whereas at the red circle they looked and they found something.

And if you're following me here, we just need to realize that neither of those are as reliable a source as we want. I still think that they are pretty good search area tools.

For instance, if I want to search for this corner here, well I can look on the quad sheet and see I need to come up the highway, up this dirt road here approximately so much it's over here near kind of where the tree line is and all those things that we surveyors



**DIAGRAM** A full size version can be found in the Diagrams section at the end of this study guide.

## EVALUATING CORNER EVIDENCE – PART 6

---

would look at on a quad to get us to the right area. To at least drive to the right area. But even then, be careful that there are situations where that doesn't work very well and, in fact, I believe the quad sheet is simply a fabulous way to get in to the right neighborhood, but it is not a corner search tool of and by itself.

I mention that because one of the jobs I ever had in surveying – that company never did their research, they never got the field notes, they never got even go the plats. They had the quads for the whole area – they worked in the whole county. So they pulled out the quad and we'd just go out there. We'd walk to that place or drive to it and we'd look and we don't even know what we're looking for. Is it a stone? Is it a brass cap? Are there bearing trees? Was it a big X on a rock? What is it? We had no idea. The party chief would say just look around and see if you see anything.

So we'd look around and don't see anything and don't know what we're looking for and I was just brand new to it. I saw some numbers scraped on a tree; I didn't mention that because I didn't know that was it.

But here was the scary part, this guy (the surveyor in charge at this company), his policy was if you looked around for a couple of minutes and you didn't see it, you get yourself right to where those red lines crossed and drive something in and say that's it. Well, folks, that is not only bogus, it's illegal, it's unethical, it's unprofessional. You ought to have your license revoked for that. I saw that done a lot. Just imagine the chaos that's created when other surveyors come in – they don't do their records research, they just find that rebar that we just slammed in, just pulled it out of thin air basically.

Wow and yet here's the stone some 100 feet away or bearing trees or whatever. So we got to be careful with that.

## EVALUATING CORNER EVIDENCE – PART 6

So understand the proper use of the USGS quads. Now, I want to speak specifically to public lands and the GLO and BLM record.

And while you may have many sources to get the record of the old original public land surveys, and it depends on what state you're in, but you need to realize that the only reliable, totally reliable, source is the public room, which is a function of every BLM state office. And in the first course, you heard Dominica talk about where those state offices were. And there's one for eastern states in Springfield, VA that covers quite a few, 25 states or so.

### Getting the GLO/BLM Record

- Your **only** reliable source is the "Public Room", a function of each BLM State Office
- Micro-filmed (through 1998) and/or scanned records are available of plats, notes, patents, and other records
- Contact your BILS if you need any help or direction!

### The GLO Records and County Records

But you see here's the point, in many locations your county surveyor might have the record and yet I don't know that they have the complete record. Especially newer things that have been done.

I know of quite a few counties I've worked in over the years where they have all the old stuff, but when BLM sends them a dependent resurvey, they don't know what to do with it. They throw it out or they stick it in some corner in the vault. They don't realize that they need something complete.

Now the BLM went in and microfilmed everything through 1998. Since that time, they've scanned the records of the plats and the notes and even the patents and some other records. So a lot of that stuff is available through 1998 in a microfilm format and then scanned in others. Some of them are on the Internet. Not all of them and we have a lot of issues with that.

But here's my bottom line if you're working as a CFed or just working in something that you need public lands information, I would talk to your BILS first. I think that's your best contact. That person would be able to tell you I'll help you order that stuff from the state office or they may know the county surveyors office here has a fabulous record and it is complete.

## EVALUATING CORNER EVIDENCE – PART 6

---

You want to check that out before you get started. There are many other sources, in areas that I've worked I know of places, I know which counties I can trust. I know some other BLM offices that have the complete record in scanned format. Locally, you get to know those things. But for some of you if it's your first time doing that, I'd talk to your BILS especially if it's Indian related stuff. And any kind of survey room related stuff, if you're needing the record you should contact the BLM.

Now, sometimes those records aren't free, sometimes you may have to go a ways to get those, you may have to even go do your own research. I've found personally that that's best because a lot of times when you call the public room, in most cases cadastral survey is not involved with them. And so as time goes on here we seem to be having less and less expertise in the public room that really knows how to research your needs.

I have found that in the past when I was in the private sector, it was best that either I or I trained somebody to be able to go do that kind of research for us and just go down there do it. Then you know for sure you got everything rather than relying on a secretary or a technician there that doesn't really know cadastral at all or know what to look for. So that's just some thoughts about that.

Now when you do get the GLO notes or newer surveys BLM from 1946 on, there's a lot of things we want to understand.

## EVALUATING CORNER EVIDENCE – PART 6

The first of them is that we want to understand how running notes work. Now let's talk about how running notes work. We need to digress on that for a minute.

First of all, whenever you do get a set of notes, and again I've seen some great sources for some of the states we call closed states where the BLM doesn't have an active program operating. In fact, I was recently on the state of Florida's web site. They've got a great web site with all the field notes and all the plats.

### About the notes....

- Understand how "running notes" work
- Evidence calls (corners and accessories)
- Controlling Intermediate Monuments
- Topo calls and passing calls
- Other info in introductions, closing comments/certifications
- Transcribe older notes carefully!!
- Lots of info not on the plat

### Order of Field Notes

Find out what your state has and, I'll tell you what, if your one of those states that has not done this with the GLO record, then you ought to be pushing for that to be funded by a grant from your state association of surveyors or some volunteer effort. It's just so fundamental to doing a survey.

Well, when you look in a set of field notes, I'm going to go over to the yellow model here, usually you're going to start with a first page that looks like this. A front cover and it's just going to say field notes, blah, blah, blah, zoom in a little bit on it and it's going to give the surveyor's name and maybe the contract number he's working on and what township it is and the dates that he did the survey, that sort of thing. That's going to be on the front cover of any set of notes.

And then there will be an index of some kind (and I'm using a very generic one here) that in the older surveys is handwritten or hand drawn but it tells you what page number in that set of notes each line is. You can go very quickly.

To find some, just for instance, assuming these are like page numbers, these are actually showing you the order in which they are in, but if I was after this section here, whatever it is, I would need page 14 right there and 15, 26, 16, 17, 18, 28, 29, 39, 27. Can you see what I'm doing?



#### HANDOUT

A copy of the Order of Writing Field Notes can be found in the Handouts section at the end of this study guide.

## EVALUATING CORNER EVIDENCE – PART 6

---

I'm getting all four sides of it, plus the lines that come into it. That's one of the tricks if you were just working in one section. Get a mile out each way from your section. That way, if you've got a lost corner, you've got that information. Plus, you pick up topo calls, that sort of thing, which on these lines that are outside your section but might help you find your corner that you're going to use.

Once you get inside a set of notes, let's understand how running notes work. They're called running notes because they run.

### Reading Field Notes

They run along the line that the surveyor is describing. Let's take a look at this one here.

This is on page 3 of his running notes, notice that there's a column over here on the left and it says chains and links, a lot of times it just says chains, that's where the chainage is from the last corner that he started from.

If you're not familiar with this, you really need to pay attention. Of course, we have a web-based exercise you'll be working on to test how well you read the note so be sure you pay attention. Now he's going to talk about the subdivision of this township, whatever it is. And you commence November 3, 1851. This is up in Oregon actually, north.

So now we know his bearing, between sections 35 and 36, so now we know which line it is. He gives us the variation, now what is that? 20 degrees, 10 minutes East. That is the magnetic declination. He's running true north. We know that, we've been studying that, right? He's running true north but the variation here is what he's giving us.

There are some historical reasons why they did that. I won't go into those now. Let's just read as he runs, the running notes. At 9.50, so that's 9 ½ chains, to a footpath from Portland to Vancouver, course North 45 East so this must be right in our Portland area. From this section corner, up the section line at 9 ½ chains across a footpath that goes from Portland to Vancouver. I

## EVALUATING CORNER EVIDENCE – PART 6

---

imagine that topo call is gone now.

At 15 chains, a ravine, and he tells us that it runs or flows South 80 degrees West. At 37.80 to the Southeast corner of a log cabin but partly finished so it wasn't a finished log cabin, that's 37.80. So, you see, all of this coming from 0 is where we begin at a section corner in this case and ran North. At 39.30 to a road from the lower ferry at Portland to Sandy, isn't this realistic, right? And it's course is North 45 East. And then after we've run what we call all these topographic calls running along, then we actually get the footprint of the quarter corner that he set.

Let's take a look at that. At 40 chains, and that's what you'd expect on an original survey, 40 chains. Set the quarter section post, so we know that it's a wood post, from which, so now we know what the monument is, and now a fir 20" diameter bears North 46 degrees East 153 links there is an accessory, a bearing tree. We'll be discussing how to use those here in a bit.

And then a do (**ditto**), a fir 16" diameter is South 34 West 142 links. So we now know exactly what it is that he set, exactly what the footprint is at that quarter corner. That's the evidence we're going to look for and if we're having trouble finding it we might use his topographic calls.

You've got there 70 links away, that's not very far, is this road or ravine that's 2 links or 2 chains away. That's not too bad. You could use that to look for things. Now continuing then, because this is an original survey so he's going 40.80, random and true, this stuff that we showed you in an earlier course.

Let's go back to it and finish out this mile. At 53.36 a fir 12" diameter. Notice this is not a bearing tree. These were bearing trees. This is actually online at 53.36. That means that this is a line tree. And you heard Ron Scherler already talk to you about controlling intermediate monuments.

There's an example, a 12" fir at that specific distance – that is a controlling intermediate monument – a true line tree. At 60 chains, enter thick timber, 64 foot of a ravine. And then I'm going to change pages on you here. Notice we're still running along that line. At 72.67 we have another line tree, a fir 16" diameter. And

## EVALUATING CORNER EVIDENCE – PART 6

---

then at 80 chains, we get to the mile and now he's going to give us the footprint for the corner he's going to set here. Set post corner sections 25, 26, 35, 36 from which.

Now he's going to have to take 4 bearing trees or **accessories** here because the rule was you took 1 per section. A quarter corner would get 2. Section corner or township corner would get 4. So we have a cedar at this bearing distance, a fir, another cedar, another fir, so we've got 4 bearing trees here. See the odds of finding one of those even to this day, although this might be in downtown Portland, but once you get out of a downtown area, the odds of finding at least one of those are pretty good. There's also in a set of running notes some other requirements that they had to address.

Let's just read those there for a moment just so you understand. Land gently rolling, soil good, second rate clay loam. They had to report on this for homesteaders to kind of get an idea before they went out. The South 60 chains are open. Then there's scattered timber and firs, blah, blah, blah. So he gives some other information in there. And then as we discussed in a previous class, notice then the next thing he's going to do is across the North line at section 36.

So what is the very next thing we get here? Then he's going to run East on a random between sections 25 and 36, 40 chains set a temporary corner, finds a section corner and then (switching pages for you again) now he's going to come back on the true line. And this is where he gives us his topo calls, which is what you hope for. We'll discuss that later. At 12.80, a road from Portland to Sandy River.

He set the actual quarter corner, it takes two bearing trees. At 40.15, he's also at the southeast corner of Thomas Kelly's Claim so there might be some other records available about that. And then continuing, we got 43.80, a footpath, well that's the same one that was on the North South line. Enter timber.

Here's another line tree, 61.47, a fir 12" diameter and then back to the corner that he began at. So you know the running notes are tremendously important information for us because they are literally the footprints of that surveyor and you hear it all the time

## EVALUATING CORNER EVIDENCE – PART 6

---

– well our job is to walk on the footsteps of the surveyor before us, yes it is. And I don't know how you can do that without looking at the footprints.

Now I have some other notes that I want to run by you because when you do the research, you come across all sorts of other record information or other surveys. It's not just the original survey. And I want to show you a couple of other interesting things just so you recognize the kind of data you can find out from a set of notes. Here's an interesting one that I believe it's in Wyoming, I don't remember, but I'm going to zoom in on that a bit and it's real hard to read and that makes it very realistic. Let's just take a look at this; I want you to notice the little thing I noticed about this.

He's just run North to a corner so now he's going to go East on a random line. Fine, we would expect that but notice he picks up his topo calls on the random line. This is a wagon road, this is a telegraph line, this is a draw or a ravine. He picks up his topo calls on the random line which he wasn't supposed to do. But you know what, here's this piece of information in here that tells me he was pretty open about the fact that he didn't do it right and you will find out later in this module why that's important to us to be aware of something like that. Now, after a while, the General Land Office started using typewriters and so some of the older notes, not oldest, but newer notes of original surveys.

Here's just an example, this is from township 30 North range 14 West, up here in northwestern Arizona. But that's South 89.59 West on a random line in a temporary point for this and as he comes back, see in this case he's going to do it right, he's going to do topo calls on the true line. So he intersects that other line as he comes back on 89.57 East on the true line, he ascending so he's going up a hill.

Here's the edge of the hill at 30 chains, here at 40.15 here's the footprint set a sand stone 18x8x5 10" in the ground for the one quarter marked 1 / 4 on the North face so we're getting all kinds of information here.

And he raises a mound of stones two foot at the base a foot high and it's North of the corner so it tells us the pits are impracticable

## EVALUATING CORNER EVIDENCE – PART 6

---

because they were required to take accessories but he didn't have any bearing trees here and when they say pits impracticable it means either they couldn't dig the holes or, what I found most often, they weren't going to bother to dig the pits.

And we'll talk about the pits here in a little bit. Topo calls 51 chains at the bottom of a canyon, 55 highest point. Sixty-five in canyon that runs Southwest and then back to the corner.

### Dependent Resurvey Notes

Once again, we've got running notes. The typed ones are still in the exact same format with the chains running in the direction that he's going and him giving us data as he crosses it, once again fulfilling our definition of running notes and how they work. Now if you are working in an area where the GLO or BLM did dependent resurveys, you are going to find information about those as well in those notes.

Let's take a look at this page. This is in Arkansas. Notice we have topo calls here to sand and a river bottom. Here's the left bank of the Wachtaw River, right bank of that river. Of course, that's not very reliable topo calls, we'll talk about that later, but at 40.325 chains.

Now notice here they couldn't find this quarter corner so in this resurvey they're going to proportion it so they say point it for the quarter corner of section 36 only (so we're on a tension line) at proportionate distance, there is no remaining evidence of original corner. So he's telling us exactly what he did and what he found, what he didn't find and he's telling us what he left.

So here's what this surveyor said. At our post 28" long, 2½" diameter, 24" in the ground, has a brass cap on it marked just like that and then he took 2 new bearing trees, a post oak, gave us the bearing distance. Notice in later surveys they tell us exactly how they scribed the tree, the exact numbers.

There's a pine, how it's done, and then he continues on. Seventy-three chains into the end of a lane, a driveway, 74.55 a creek, 79.60 the lane turns South so he has to run along the lane is what it looks like. And then here, take a look at this set of information.

## EVALUATING CORNER EVIDENCE – PART 6

---

At 80.65 point for the corner of sections 35, 36 determined longitudinally by proportionate measurement and latitudinally by an old fence.

There's a interesting combination of information. All evidence that are remaining are original monument. He set a monument; he took new bearing trees, etc.

### Remonumentation Notes

So you see even on dependent resurvey, frankly you actually get a whole lot more information on dependent resurveying because they kind of standardized the process that they would use and that works pretty good.

Now in an earlier module of another course when we're talking about the public land system and how it basically works, I mention to you that there are things that are called remonumentation projects. And if you recall, those are situations where the BLM did not actually run lines.

We just went out and looked for evidence and if we found that we perpetuated it somehow and remonumented it, took new accessories, whatever. And I wanted to just show you a sample of the set of notes from a remonument project because there's no bearings and distances and that sort of thing. Now interestingly, they still use the same form for the notes.

Notice that it has the word chains up here. It's a form that the government uses now. This is from Colorado. But that's blank. That whole column is blank. But here's just an example that I want to give you. Let's zoom in there a bit – I know it's out of focus.

The standard corner sections 33, 34 on the South boundary of the township. Now this is what they found monumented by the original sand stone 18x10x6 and it was marked 3 notches on the East, 3 notches on the West. It had the letters SC on the North face. It's firmly set in the ground and had a mound of stones north of it and from which he's telling you when I got there that this time I even found an original bearing tree or two. Really, he found the stump hole of one of them and he found one that was

## EVALUATING CORNER EVIDENCE – PART 6

---

still alive apparently.

Then he tells us now here's what I did at the corner point I set an iron post so he removed that stone and in that exact same position set an iron post 30", 2 1/2" diameter, 10" long in the ground to underlying rocks in a supporting mound of stones so he couldn't get it in very deep because bedrock was real close. It's a big mound of stones, 4 foot base, comes up to the top and it has a brass cap marked – there's how it's marked. And then notice that he went ahead while he was there and took a new bearing tree. Then he tells us, "I buried the marked stone alongside." So he didn't take the stone home.

Keep this in mind CFedS, this is very important. He didn't take the stone home as a souvenir, put it in his personal museum, used it as a door stop, or anything else. This is what you're supposed to do – leave that evidence there. So he buries the marked stone. Why would he bury it? Because we don't want two monuments out there for the same corner. This is a remonument so we're not running any section lines. But notice that they did still give us, if you want to call it, a topo call.

The corner is situated on near level terrain and scattered aspen and pine timber and it's 152 links East of Divide Road, which bears Southeast and Northwest. At least we even get a little bit more information in there as to what he found, what he left, what you and I should be looking for.

Now if you want to see some additional examples of field notes, the back of your 2009 BLM Manual has just an incredible array of corners and that's in the appendix. Appendix 2, Sample Field Notes. They've got almost every possibility, almost every combination in there. And it's good practice to take a look at that if you're not familiar with these and get used to that.

So that was, if you will, a little bit of a tour of how running notes work and how to read those. And again you're going to have opportunity to practice that a little bit after this lecture.

Let's continue our discussion about the running notes for a few minutes. What you're really interested in as we just saw is the evidence calls. You want to see the corners and the accessories.

## EVALUATING CORNER EVIDENCE – PART 6

---

You want to see that stuff. You're going to see his calls for corner controlling and intermediate monuments. We saw 2 or 3 examples of line trees in there and I don't think we had any meander corners.

That whole list that you've been given of things that would qualify for that. We saw topo calls and, by the way, we even saw a passing call. I should have pointed it out, but a passing call... let's digress for a minute here.

A **topo call** is where we're running the section line and you cross something. A **passing call** is you're running the section line and you pass by something and so they give you a station, if you will, they tell you how many chains up and how far over.

So let's say that there's a cabin over here at (I'll just make this up) 30.50 chains on this line from the section corner, 50 links East is the Southeast corner of Joe Blow's cabin. That's a passing call. And, at a minimum, that's good information. If you're not quite sure where the line ran through there but you'll find the rotting remains of that old cabin, pull 50 links over, you'll probably be really close to the line he ran and now you'll have a better idea of where to search for the evidence. That's what we do with this kind of stuff.

You want to realize you don't just go to the corner descriptions, you want all that information and it will help you immensely in your search or even in your resolution of confusing evidence situations. Also in the notes then, there's other information in the introductions. They might tell you why they're doing the survey. They will definitely tell you when they did it, what time of the year they did it.

I find that very interesting in really snowy, icy cold places like the Upper Midwest where they're out doing a survey in January then it helps you understand why his meander corners aren't good on the lake because everything was frozen.

Enough snow and you're not even quite sure where the lake, the pond, or the swamp was. It also tells you something about perhaps the monuments they were setting where they didn't last very well. If you're driving through snow, the ground is frozen and you can't

## EVALUATING CORNER EVIDENCE – PART 6

---

get into the ground that well, that sort of thing.

You'll also find in the back of the notes closing comments and the certifications. And I've even occasionally found things of interest in there. When you have older notes like the first two sets that I showed you in the handwriting, you want to be very careful, transcribe them, get to know some of those. I showed the one to get to know the DO ditto. There's another one that I just learned here recently, the ampersand sign.

When you see that symbol and the letter c, that's an abbreviation for etcetera. And it was used extensively in some of the old GLO notes. I was wondering about it and a couple of us started researching it and finally found someone who knew about it showed it to us. But transcribe those notes carefully, realize you're trying to put it into something that the crew can read and not make mistakes.

You want to carefully look at those handwritten notes. I might mention for corner search it's really important that you know and/or your crew, whoever is doing the work, that you leave the data in chains and links, especially at the corners. If your crew is given transcribed and it's also been converted to feet or meters or anything else, then you lose the opportunity to find transposed numbers and other issues that inevitably occur with the notes.

It's very important that you learn to think in chains and links and especially when it comes to your evidence search because that's what the records in and if they made a mistake, if they switched some numbers around, if he did it in those units. If something was 76 links and he should have written 67 links, you're not going to catch that if you change that to feet. Because the feet you can switch those numbers around but it's irrelevant so keep that in mind.

And realize that in the notes, there's a tremendous amount of information that is not on the plat. I mention that folks because I have been amazed over the years how many times a surveyor says he's done his records research on the public lands and all he got was the plats. He's always trying to save a few bucks because he doesn't want to pay for the notes. I don't know how you can do the survey with just the plat. I mean the plat just gives you some

## EVALUATING CORNER EVIDENCE – PART 6

measurements and some areas and stuff.

All the data, all the information about the corner and its accessories and topo calls, other information at the beginning of the notes and the end of the notes. How do you do that? How do you do a survey without that? Don't be cheap because all you're going to do is put it to yourself and your client.

And future surveyors and the public in general are going to have a very difficult time of resolving what it is you actually did out there on the ground because you didn't know what to look for. Now, there are a few things we want to talk about, some techniques, for corner search.

The first question I'm going to ask you is what is your attitude?

Now that might seem like a strange question to ask but I find that your attitude about corner search in general and about (and this applies to public lands or any other kind of survey) your attitude really makes a big difference.

If you've got people working for you, coming to work "it's not worth going up there and digging that hole" or "climbing up that hill" and they got to whine about it – those are dangerous people. You need to fire them. You don't want those people making evidence searches for you on behalf of you and your license. And sometimes they reflect your attitude too. Here's a problem – I see this all the time. There's this "all those surveys were done at a bar". Get rid of that. That's so rare. That attitude is just part of this "we're not going to find it". You need to hate to proportion.

We train you here on how to do proportioning, but you need to hate it. And I mean just like it's like going to the dentist without novocain. You don't want to proportion. You need to develop then that positive attitude in your staff about finding evidence. We're going to find it. I'd make this your motto. There's no such thing as a point not found. I know that's not true, but that's a much better point of view to start the morning with than "we're not going to find it". So keep that in mind. You need to be persistent but not overly.

We're going to talk a little bit about some of those things when

### Corner Search Techniques

- What is your attitude?
- Avoid the "surveys done in a bar" theories
- Hate proportioning!
- Develop positive attitudes in your staff about finding evidence
- Be persistent
- Can you see the big picture?



## EVALUATING CORNER EVIDENCE – PART 6

---

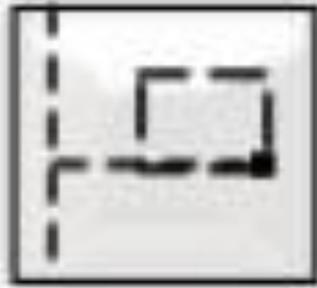
people say, “Well, we searched for that corner for 3 weeks and then finally gave up.” Who can afford to do that? That’s not realistic. Even the government can’t afford to do that. But persistence and then and even more important question, “Can you see the big picture?” And that’s where we’re going to go in our next video lecture because I’m going to start talking about actually now that we’ve gathered all this field notes for the record, we’re going to go to the field and start looking for corners and that sort of thing.

We’re going to talk about that process. Not the way I’ve done it – well, I’ve done some dumb things and I’ll share a couple of those with you too. Not that I’ve got the primo method and there’s different things for different parts of the country too – terrain and all that.

But your general attitude and your big picture approach to evidence search is the key to finding evidence that others have not. I’m going to end this here and I’ll see you on the next video lecture. We’ll pick it up with this actual process of searching for evidence in the field.

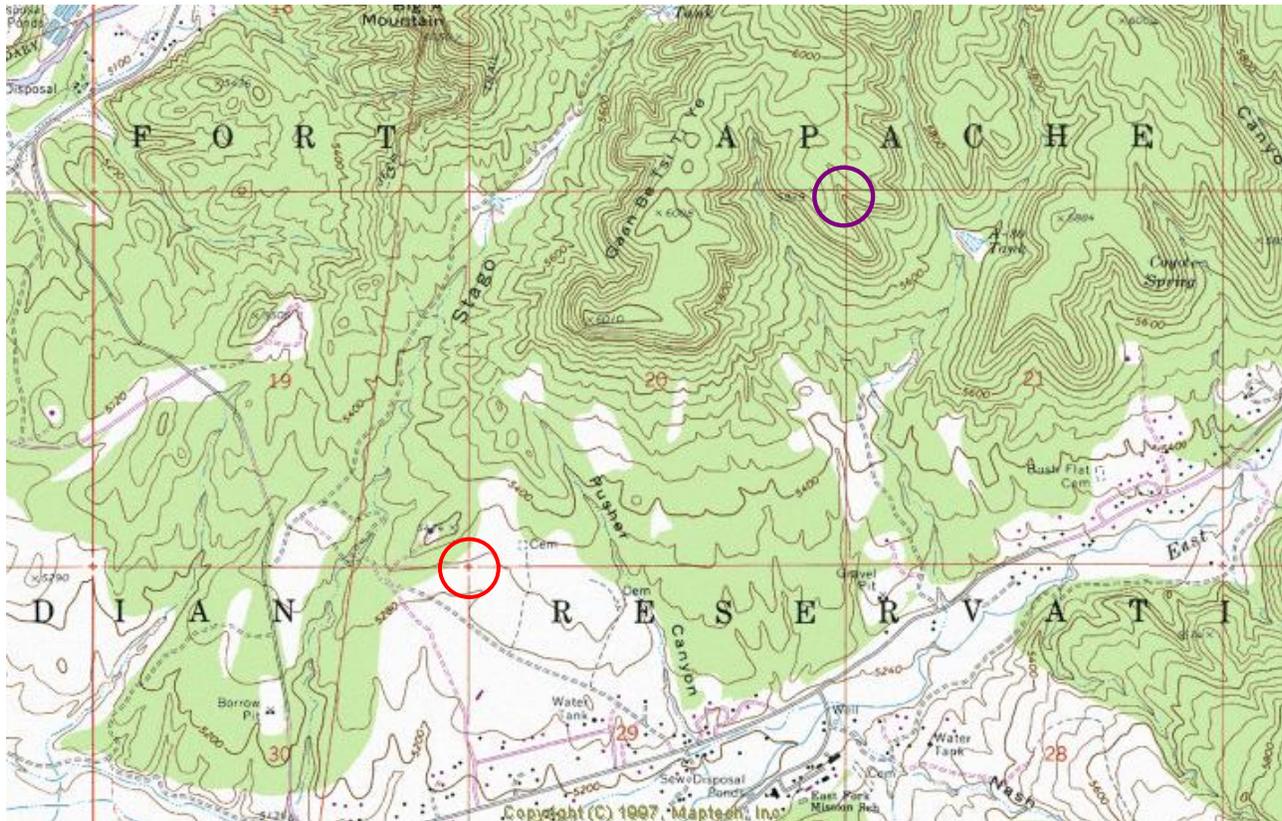


**PROBLEM** Before moving on to the next topic, complete the “Determine Proper Cap Marking for a Corner” problem which you can access from the course description page.



**DIAGRAM**

# USGS Quads.....



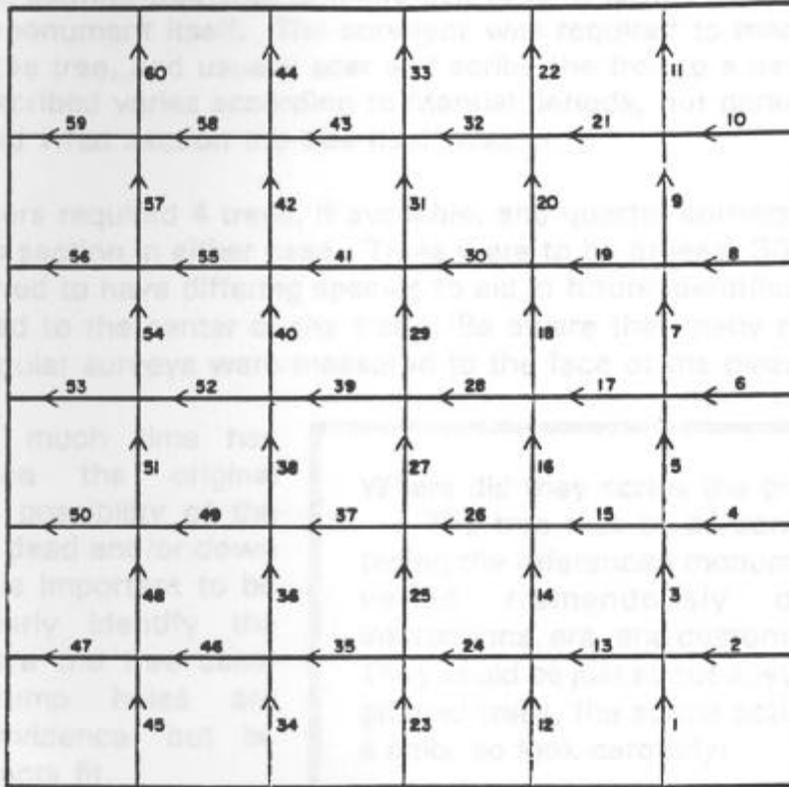


**HANDOUT**

# Order of Writing Field Notes

## Bearing Trees

### Normal Township Subdivision



### Section Subdivision

