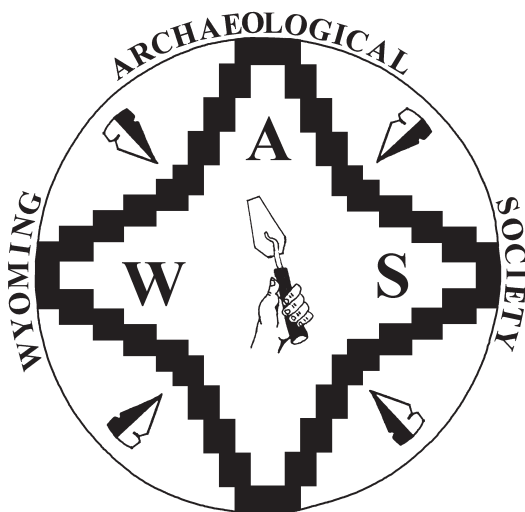


THE WYOMING ARCHAEOLOGIST



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THE WYOMING ARCHAEOLOGIST

VOLUME 50(2), FALL 2006

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THIS ISSUE PUBLISHED JANUARY 2009

**WYOMING ARCHAEOLOGICAL SOCIETY
MEMORIAL GIFT or CONTRIBUTION FORM**

Given by: Miss, Mrs., Mr., Ms., Dr. \$ _____
(Amount)

Name: Last First Middle

Address: City & State Zip

Donor phone number () _____

TYPE OF GIFT: General Contribution [] Specific Contribution []

In Memory of: _____
Name City & State

In Honor of: _____
Name City & State

Specify where you would like your money to go (e.g., Mulloy or Frison Scholarship Funds, The Wyoming Archaeologist, ????????)

Please make your check payable to THE WYOMING ARCHAEOLOGICAL SOCIETY
Send to Carolyn Buff, Executive Secretary/Treasurer, 1617 Westridge Terrace, Casper, WY 82604

**WYOMING ARCHAEOLOGICAL FOUNDATION
MEMORIAL GIFT or CONTRIBUTION FORM**

Given by: Miss, Mrs., Mr., Ms., Dr. \$ _____
Amount

Name Last first Middle

Address City & State Zip

Donor phone number () _____

TYPE OF GIFT: General Contribution [] Specific Contribution []

In Memory of: _____
Name City & State

In Honor of: _____
Name City & State

Specify where you would like your money to go _____
(e.g., Hell Gap Site Research, other, ????????)

Please make your check payable to THE WYOMING ARCHAEOLOGICAL FOUNDATION
Send to Barbara Nahas, WAF Treasurer, PO Box 3146 – Cody 82414-3146 – 307-868-2685

IN MEMORIUM CAROL JEAN AGARD 1950-2008

Carol Jean Agard, 58, of Albany, Oregon passed away on Thursday, December 25th, after a short battle with cancer. Carol was born in Salem, Oregon to John and Donna (Vanderfeen) Agard Jr. She lived in several places during her life and most recently moved to Albany, Oregon from Sundance, Wyoming. Carol graduated from Thurston High School in Springfield, Oregon in 1969; she graduated from University of Oregon with a Bachelor's of Science in Anthropology in 1974 and received her master's degree from Oregon College of Education (WOU) in Monmouth, Oregon. She worked for the US Forest Service as an archeologist for the past 24 years, most recently in Sundance, Wyoming.

In excavating Carol's desk, thus exploring the stratigraphy of her life, I have come to know her much better than she ever intended. For instance, once she was a pizza cook and later a teaching assistant for children with learning disabilities – all before becoming an archaeologist. Subsequently, Carol worked with Ken and Sherri Deaver and then on the Malheur National Forest in Oregon.

In November of 1991, Carol came to the Black Hills National Forest, living and working first in Custer and later in Sundance. Carol received many awards including a Windows on the Past National Award in 1996. As I moved her things, I found enough awards to literally fill a packing box.



The editors of the Wyoming Archaeologist encourage members and other readers of the journal to submit obituary information about WAS members to the editorial staff in Laramie when such notices appear in local papers. We will then recognize the accomplishments of these members in the journal. Thank you.

Carol first began to participate in Passport in Time projects in 1992 with the Martin Draw PIT Project. Her last PIT project was the recent Williams Spring Projects. Many members of the Wyoming Archaeological Society will remember her from these projects.

Besides Carol's archaeological interests, she was an expert quilter, especially appreciating batik fabrics. Several pieces of her handiwork decorated Carol's office through her time in Sundance. The personal address labels remaining in her office feature quilts.

Carol also loved gems, and crafted them into jewelry. Her travel around the country often enabled Carol to pick up gems and stones as souvenirs. When I finished my term at Northern Hills District of the Black Hills National Forest several years ago, Carol gave me a necklace with a gem that she had set herself.

Carol was also a Star Trek fan. I found a Star Trek costume guide in one file drawer and many other references to Star Trek in the files. She kept up with some Trekkies on-line, and once told a friend there were some fairly odd and entertaining folks in Star Trek on-line chat rooms. Her file cabinet also held a page of observations from Dave Marinaccio's book "All I Really Need to Know I Learned from Star Trek."

In fact, many of the reports and books she was studying held notes and pithy sayings in Carol's handwriting. I have saved several of my favorites and placed them on her bulletin board, along with cartoons she had stuffed everywhere. I am certain that at some point, they will put me back on the right track or at least make me smile.

As I move into her office, I am not only intimidated by the knowledge base she had, but also by the way she kept her job in perspective. Leaving her chunks of homely wisdom on the wall may be instrumental in helping me to acclimate...at least that is my hope. I am storing her Star Trek patterns and others in a folder she had labeled "Groovey Stuff" (sic). It will be a reminder not to take myself too seriously as I look to Carol for a lesson now and again, grateful that she left them behind for me.

Carol was preceded in death by her parents John and Donna Agard.

She is survived by her sister Kathy Agard of Albany, sister and brother in law Karen and Ron Wiard of Albany and brother and sister in law John and Carol Anne Agard of Monmouth; a niece Traci Elliott of Monmouth, nephews Matt Agard and John McLain of Salem, Oregon; three great nephews, two great nieces and many aunts, uncles and cousins.

Cher Burgess
Bear Lodge District Archaeologist
Black Hills National Forest
Sundance, Wyoming

NEWS AND ANNOUNCEMENTS

WYOMING ARCHAEOLOGICAL SOCIETY, INC.

2007 ANNUAL MEETING MINUTES

8:10 a.m. – Whistle Pig Saloon, Saratoga, WY
Saturday, April 21, 2007

PRESIDING: Stuart Mackenzie, 1st Vice President

CALL TO ORDER: 8:10 a.m.

Mary Lou Larson announced that Rhoda Lewis has died and that a memorial service would be held at a later date in Laramie. She also announced that Tim Nowak and Dave Reese were struggling with serious illnesses.

ROLL CALL AND CERTIFICATION OF DELEGATES: Secretary/Treasurer Carolyn Buff certified the voting delegates: Absaroka, Sylvia Huber and Barbara Nahas-Keiry; Ancient Trails, Alice Tratebas; Casper, CK Adams and Audrey Fisher; Cherokee Trail, John Lund and Jan Soldan; Fremont, Larry Admundson and Tom Young; June Frison, Adam Wiewel and Dewey Baars; Sheridan, BJ Earle; and Sweetwater, Bill Current.

Roll call showed eight chapters represented: Absaroka, Ancient Trails, Casper, Cherokee Trail, Fremont, June Frison, Sheridan and Sweetwater. Not represented at the meeting were Cheyenne, High Plains, Rawlins and Teton. Cheyenne, High Plains and Rawlins are inactive.

MINUTES OF LAST ANNUAL MEETING April 8, 2006: Approved as published.

TREASURER'S REPORT: Secretary/Treasurer Carolyn Buff gave the treasurer's report showing a total net worth as of March 31, 2007 of \$56,936.46, a net increase of \$6,078.67 over 2006. Motion by B.J. Earle, second by Mary Lou Larson to file for audit. Carried.

AUDITOR'S REPORT: Dewey Baars, Sylvia Huber, and Danny Walker performed the annual audit and found the accounts to be in order.

EDITOR'S REPORT: Danny Walker: The next two issues of *The Wyoming Archaeologist* are ready as soon as the authors make editing changes. Manuscripts are still needed to get us caught up with publication.

LIBRARIAN'S REPORT: The library will be

moved into the new building and will be housed with the Institute library. Motion by Dewey Baars, second by Adam Wiewel to house the WAS library with the Frison Institute library in the new anthropology building. Carried.

SCHOLARSHIP COMMITTEE: Carolyn Buff announced that the committee will meet over lunch at the Hotel Wolf café to evaluate the scholarship applications.

SAA/COAS: Marcel Kornfeld: The Council of Affiliated Societies met in Puerto Rico the past year during the SAA meeting. COAS co-sponsors the poster contest and will have a booth at the next meeting in Austin. Copies of the newsletter were made available to the membership. The SAA Crabtree award went to Carl Herbert Mayer. Mary Lou Larson is the chair of the award committee and will be looking for nominations for the award. This award is given to an avocational each year.

CHAPTER REPORTS: The chapter reports will be printed in *The Wyoming Archaeologist* if there is enough room.

STATE ARCHAEOLOGIST'S REPORT: Mark Miller: reported that the archaeological survey section is extremely busy this year; and the Trapper's Point site has been forwarded for a National Register nomination. Current activities include writing a context for military sites; and an update on the move into the new anthropology building;

OLD BUSINESS: Wyoming Archaeology Awareness Month – Judy Wolf announced that the new poster is of Mummy Cave, with the copy having been written by Wil Husted. The Hell Gap poster took first place at the SAA meeting. Motion to donate \$250 toward production of the poster. Carried.

Wyoming History Day: Danny Walker announced that April 23 is the contest and that he would be there to judge any archaeological presentations. People in some towns have volunteered to mentor students who may be interested in doing an archaeological project.

Friends of the George C. Frison Institute: Marcel Kornfeld: The endowment funds total \$50,000, to be matched by the state. There is now a new state match available. The Institute now has

a \$100,000 endowment.

Wyoming Archaeological Foundation: Judy Wolf: report couldn't be heard on tape.

State Historic Preservation Office: Activities was given by Mary Hopkins.

Directory: A directory of current members will be published in *The Wyoming Archaeologist* if there is room. If no room and if chapters want the directory, they can contact the secretary/treasurer and the information will be forwarded.

NEW BUSINESS:

Fall Activities: Mark Miller and Marcel Kornfeld – A ribbon cutting ceremony will be held for the new building. Details will be announced later. Other activities will consist of morning presentations and a keynote speaker in the afternoon.

At Will Employee Contract (AWEC): The Survey Section of the Office of the Wyoming State Archaeologist (Dave Eckles) would like to hire, on a temporary basis, people who would like to work for small compensation to do survey, testing, and some excavation on an intermittent basis. Persons must be able to do physical labor and walk up to ten miles per day. It would be on a contract basis only, with no guarantees of continued employment and no benefits. There is no requirement that if you are called that you have to go at any particular time. There is a short interview and each person must apply for the position each fiscal year. Dave can be reached at 307-721-0882.

Ord Ranch: John Laughlin requested \$500 for a project in Goshen County at the Ord Ranch. He also inquired about having a joint meeting with Montana, which has been done in the past. It was suggested that conversations begin with the Absaroka Chapter for when they next host our annual meeting. In addition, he inquired about a web site for WAS. He was informed that this is an annual discussion. Motion by Sylvia Huber, second by ?? to award \$500 to Mr. Laughlin to begin work at the Ord Ranch. Carried.

Wyoming Rock Art Chapter: Mike Beis proposed starting a Wyoming Rock Art Chapter. After much discussion, Larry Loendorf, Carolyn Buff, Mark Miller, and Mike Beis will study the issue and report back at the 2008 meeting.

New Brochures: New membership brochures are available. Members are asked to take a handful and distribute them to rest areas, libraries, motels,

or any other place where the public may browse.

ELECTION OF OFFICERS: Dale Wedel, chair: President, Stuart Mackenzie; 1st Vice President, Dale Wedel; 2nd Vice President, Janice Baars. Motion by Dale Wedel, second by BJ Earle to cast a unanimous ballot. Carried.

2008 NOMINATING COMMITTEE: Janice Baars, chair, Barbara Nahas-Keiry, Absaroka, Mavis Greer, Casper, Eva Peden, Fremont County, and Marty Rogers, June Frison.

2007 SUMMER MEETING: Hell Gap June 15-17.

2008 ANNUAL MEETING SITE: Sweetwater Chapter, Rock Springs.

INTRODUCTION OF OFFICERS:

President – Stuart Mackenzie
1st Vice President – Dale Wedel
2nd Vice President – Janice Baars
Wyoming Archaeological Foundation
(term expires 2009)

ANNOUNCEMENTS:

Papers to begin at 10:30.

The 2008 Plains Conference will be held in Laramie.

Carolyn Buff mentioned that she has membership cards, brochures and stationery available.

The need for current names, addresses, phone numbers, and e-mail addresses from chapters was reiterated.

The Wyoming Archaeological Foundation will meet Sunday at 7:00 a.m. at the Warm Springs Cafe.

Carolyn Buff introduced Dan Barks from Gillette, a new State Parks and Cultural Resources Commissioner who has accepted appointment to the OWSA as a commission liaison.

Field Trip – Fort Fred Steele or the Saratoga Museum – meet at Hotel Wolf at 9:00 a.m. for Ft Steele.

Danny Walker announced that work will be done at Legend Rock for six weeks (three, ten-day sessions) beginning June 11. Volunteers are needed.

Sam Drucker, BLM Pinedale, announced that \$80,000 had been received to begin stabilization at the Wardell Site. In addition, site stewardship training will begin this summer.

Bill Scoggin announced that Bill Vasey has been appointed to fill a vacancy on the Frison Board.

Mavis Greer announced that the ARARA meet-

ing will be held in Billings, MT the last week of June. Larry Loendorf will be the keynote speaker.

ADJOURN: 9:55 a.m.

BANQUET SPEAKER: Dr. E. James Dixon

GOLDEN TROWEL AWARD: Judy Wolf

/s/ Carolyn M. Buff
Executive Secretary/Treasurer

/s/ Stuart Mackenzie
President

AUDITING COMMITTEE REPORT

March 31, 2007

In compliance with the bylaws, the Auditing Committee has reviewed the Treasurer's books and records for the Wyoming Archaeological Society, Inc. for fiscal 2006.

AUDITING COMMITTEE SUMMARY

March 31, 2007

The Wyoming Archaeological Society, Inc. owns a checking account, a savings account, a money market account, and a certificate of deposit account at the Reliant Federal Credit Union (formerly Natrona County School Employees Federal Credit Union), 900 Werner Ct, #100, Casper WY 82601.

Balance on hand March 31, 2006 - \$50,857.79

Receipts:

Interest Earned - \$1,153.73

Deposits - \$10,535.00

Disbursements - \$11,940.79

Balance on hand March 31, 2007 - \$56,936.46

Includes 0 outstanding check(s) and 0 outstanding deposit(s).

Audited and found correct.

/s/ Danny N Walker Date April 21, 2007
/s/ Sylvia Huber Date April 21, 2007
/s/ Dewey Baars Date April 21, 2007

**WYOMING ARCHAEOLOGICAL SOCIETY, INC.
SCHOLARSHIP COMMITTEE**

12:00 p.m. – Hotel Wolf, April 21, 2007

PRESIDING: Carolyn Buff, Chair

PRESENT: Dewey Baars, Carolyn Buff, Bill Current, Mary Lou Larson, Stuart Mackenzie, Mark

Miller, Barbara Nahas-Keiry, Dale Wedel

Moved and seconded to award \$650.00 to Patrick Mullen, the only applicant for any of the scholarships. Carried.

/s/ Carolyn M Buff, Chair

2007 WAS CHAPTER REPORTS

ABSAROKA

Public Education: Distributed Archaeology Awareness Month posters around Big Horn Basin and gave talks at schools about archaeology.

Publications/Reports: Platt Site report sent to Office of State Lands.

Programs Presented: Israel Archaeology – Dead Sea Scrolls by Doug Nelson; Big Horn Basin Petroglyphs by Gary Bingham; Trappers Point by Mark Miller; Wardell Site by Sam Drucker; Sand Draw by Danny Walker

CASPER

Programs Presented: Field trip to Hell's Half Acre; Dating of Ceramics in Israel by Douglas Davidson; Red Buttes Battlefield by Randy Bjorklund; Trip to Chauvet Cave in Southern France by Mavis Greer; Fort Casper Museum Expansion Project by Rick Young and Dana Schaar; Northwestern Plains Climate Change by John Albanese; Investigations at the Game Creek Site: A Paleoindian Occupation in Jackson Hole by Dan Eakin.

CHEROKEE TRAIL

Public Education: Had a booth at Saratoga Sustainability Conference

Work with Other Organizations: USDA Forest Service – assisted with recording a lithic scatter site

Programs Presented: Barger Gulch Site by Nicole Waguespack; Long-Term Habitation in the Green River Basin by Don Larson; European Neanderthals and Modern Human Origins by Jim Ahern; Wardell Site by Sam Drucker; Archaeology of the Black Hills by Dave McKee; Ord Ranch Site by John Laughlin; Archaeology of the Medicine Bow National Forest by Sarah Crump; and a video on Chaco Culture

Field Trip: Saratoga Museum Jade Exhibit

FREMONT COUNTY

Survey: Recording site in Sweetwater County; BLM GPS site location and graves near South Pass

City; GPS sites, trail markers and graves from Ice Slough along Seminole Cutoff

Testing/Excavation: Sand Draw, Ditch Creek Project, Barger Gulch

Public Education: delivered posters to schools and libraries in county; meeting notices posted at libraries, banks, senior citizen's centers, county newspapers, cable TV information channel

Work with Other Organizations: Donation of book to Hudson Grade School; service on Frison Institute Board; posters and notices of meetings to other organizations

Publications/Reports: club booklet

Programs Presented: New Mexico archaeology; Fremont County Petroglyphs; Chaco Canyon

JUNE FRISON

Survey: Dan Eakin conducted selective surveys of areas in the Sunlight Basin and Washakie Ranges. Richard Adams conducted survey on Whiskey Mountain in the Wind River Mountains with three Cherokee Trails Chapter members.

Public Education: Richard Adams taught Anthropology (4125/5125) Northwest Plains Prehistory for the University of Wyoming Outreach school in Riverton and Casper. There were 17 students including six Native Americans.

Work with Other Organizations: Dan Eakin's collaborative efforts were mainly focused on sheep traps and standing pole lodges. He assisted the Indiana University Field School for parts of two, ten-day sessions at two of the boulder Ridge sites. The United States Forest Service and State Parks and Cultural Resources both provided small grant monies for continued investigation of mountain sheep traps and related sites. Dan and his wife, Julie, spent about 10 days in the field with help from Chris Finley. In combined efforts, two sheep traps were documented that had not been previously recorded.

Dan Eakin and Richard Adams assisted National Park Service personnel in locating various pole lodges in the Absaroka, Washakie and Wind River Ranges.

Publications/Reports: Dan Eakin submitted a summary of the Boulder Ridge report to the University of Wyoming/National Park Service Research Center.

Richard Adams had an article entitled, "The Greater Yellowstone Ecosystem, Soapstone Bowls

and the Mountain Shoshone" published in *World Archaeology*.

Programs Presented: Richard Adams presented two research papers at the Plains Anthropological Conference: "The High Rise Village Site: Whitebark Pine Nut Processing and Sheep Hunting at 10,800 Feet" (with Ruth Shepherd, Tory Taylor and John Lund) and "The Greater Yellowstone Ecosystem, Soapstone Bowls and the Mountain Shoshone." He also gave presentations to the Albany County Historic Society and the Cherokee Trails Chapter.

Dan Eakin attended the National Park Service Information Exchange Conference at Jackson Lake Lodge and the AMK Ranch and gave a presentation of the significance of the Boulder Ridge sites to land management agencies and fire management policy. Dan gave a presentation at the Plains Anthropological Conference, "A Cultural and Temporal Context for Bighorn Sheep Trapping in the Absaroka Mountains, Northwest Wyoming," as well as a program to the chapter.

Other programs included Early Archaic Bighorn Hunting at Trappers Point: Zooarchaeological Clues to Conservation Biology by Mark Miller; Paleoindian Faunal Exploitation: The Myth and Reality of Big Game Hunters by Matt Hill; The Wyoming Cultural Records Office Archaeological and Historic Sites Information System: What does SHPO maintain in all of those files on a computer that might aid in my research project? by Mary Hopkins; Archaeological and Geophysical Investigations at the Box Elder Springs Site 48PL11 by Adam Wiewel; Excavations at a Dump and a Depot by Danny Walker; Early Paleoindian Mountaineers at the Helen Lookingbill Site in Northwest Wyoming: Site Structure and Formation by Norbert Wasilik; research related to bighorn sheep traps in the Sunlight Basin, Absaroka and Washakie ranges by Dan Eakin; and Indigenous Site Revisited – 10,000 Years of Camping at We'ptes Pa'axat Along the Clearwater River in Idaho by Dori Ridenour.

Other: Dan Eakin received a Wyoming Cultural Trust Fund grant for historic preservation work related to bighorn sheep traps; Shoshone National Forest cost share funding for historic preservation work on sheep traps; received a State Parks and Cultural Resources grant to assist Eastern Shoshone in production of a documentary; submitted a grant proposal with Paul Sanders to the Jonah Field Off-

site Mitigation Project to survey the Pronghorn Migrations Corridor from the upper Green River Basin to Grand Teton National Park. In July he will perform a National Park Service inventory of high altitude areas in Yellowstone National Park.

Richard Adams received Shoshone National Forest cost share funding for high-elevation investigations in the Wind River Mountains.

MINUTES, 2006

**WYOMING ARCHAEOLOGICAL
FOUNDATION BOARD MEETING**

Sunday, April 9, 2006 - Cheyenne, Wyoming

The annual meeting of the Wyoming Archaeological Foundation Board of Directors was held in conjunction with the 53rd Annual Wyoming Archaeological Society Meetings 7 a.m., April 9, 2006 at the Plains Hotel in Cheyenne, Wyoming. Board members in attendance included Dewey Baars (President). Barb Nahas (Treasurer), Mary Lou Larson (Secretary, ex-officio, University of Wyoming), George C. Frison, Mark Miller (ex Officio, State Archaeologist), Eva Peden (Past President of the WAS), Don Bailey (President WAS). Marcel Kornfeld, Judy Wolf (new board member). Guests included Dale Wedel, Janice Baars, and June Frison. Terry Wilson (Board member) was absent. The terms of members are listed at the end of these minutes. President Dewey Baars called the meeting to order at 7:15 a.m.

Minutes of the Last Meeting. Barb handed out copies of the minutes from the last WAF board meeting. Barb moved that the minutes be accepted, and Eva seconded the motion. Motion passed unanimously by voice vote.

TREASURER'S REPORT

Barb presented the Treasurer's Report. This year's audit was completed by Janice Baars, Don Bailey, and Eva Peden. Eva reported that the books were in order. WAF income 2005-2006 was \$3778.99 and expenditures \$4724.41. The balance in the checking account April 30, 2005 was \$5736.66; balance as of today is \$4,791.24. Total net worth as of today is \$108,515.12. This includes reserve fund money in a CD (112,527.85), funds with the Henry E. Jensen Trust (\$41,612.35), and George C. Frison Paleoindian Endowment (\$49,583.68). Although the amount reported in the Institute endowment is

not at \$50,000, Barb reported that the Foundation met its goal of \$50,000 (after she closed the books), the total promised to the University of Wyoming to guarantee dollar-for-dollar state matching funds. Mark moved and Mary Lou seconded the motion that the Treasurer's report be accepted. Voice vote was unanimous in favor of accepting the report. Barb noted that she discovered that the Foundation's fiscal year is April through March in working with the By-laws and Articles of Incorporation. She will now begin working on that fiscal year.

OLD BUSINESS

Foundation Grant Guidelines. Barb reminded everyone about the Grant guidelines that we began discussion on last year. Last year, Chris Lippincott banded out the South Dakota guidelines for their grant program. Mark, Barb, and Mary Lou came up with ideas about such a grant for WAF. Barb then argued that the foundation should not be in the business of giving out grants, given that running Hell Gap costs about \$2400/year. And we need to keep about 10 years of money in reserve funds in order to accommodate shortfalls in income. Our income keeps going down and our expenses keep coming up. Barb handed out the grant guidelines to the Board. Discussion ensued.

Mark recommended that we decide to table voting on the guidelines until after we decide on how (and if) we should do such a grant program. The Board might want to wait a few years to see if our funding stabilizes. Barb reminded everyone that there are other expected costs associated with Hell Gap, such as drilling a new well that could keep us from giving out grants. Mark stated that it was good to have an emergency fund in the past, but the ownership of Hell Gap changes the dynamic. Marcel noted that since the Institute is the main user of Hell Gap that it should be the responsibility of the Institute to supply maintenance money as part of the Institute's research costs. Eva said that even with what Marcel has said that because we are taxed as ranch land we need to keep it as such. Mark moved that we table the decision and postpone a decision on the award fund until the next spring meeting, look over, and decide at the next meeting, Barb seconded the motion. Voice vote was unanimous. Barb then asked the Board to email suggestions to Barb and she'll get the information out to the Board. George remembered that buying Hen Gap was an idea of

his and Milford Hansen's, as a rallying point for the Society - he wasn't sure if that has happened. If Hell Gap isn't working out for WAS, perhaps it should be rethought. He stated that whatever the Foundation wanted to do with Hell Gap that the Society should feel free to do with it whatever they want to. Mark reminded the Board that at the time the site was purchased, that was the only viable option for the site. Marcel noted that shifting Hell Gap to another foundation would complicate things. Barb stated that her primary obligation is to keep the Foundation solvent. George then said that at the time the decision was made, Allen Korell stated that while a lot of people probably wouldn't like it now, but 50-100 years from now people will look back and think that was one of the greatest things the Society ever did. George hopes that the Foundation can keep it and maintain it. Barb said that the Foundation is on the road, especially with the royalties from Henry's oil leases and help from the Institute on maintenance will keep it running. Henry Jensen said that buying Hell Gap was a good idea, but that it would bring back much more to the Society.

Changes in the By-Law and Articles of Incorporation. Barb discussed the proposed changes and amendments to create a position of Executive Treasurer. The By-Laws and Articles that she passed out have changes written in red. Dewey explained that because Barb has volunteered to do the job permanently the Board decided last year to institute the office of Executive Treasurer as an alternative to Treasurer. The treasurer's job is an extremely hard job to do and Barb is currently doing a great job. Mark pointed out the necessity for continuity is where the Foundation is now, with Hell Gap and all.

Mark moved and Eva seconded that the Board accept the proposed changes in the by-laws. Marcel noted that Plains Anthropological Society changed the position from non-voting ex-officio to a voting ex-officio so that they could vote. He thinks that such a move would be a good idea in this situation as well because Barb is part of the WAS community. Mary Lou clarified that the board cannot vote on the changes at this meeting, but has to wait 30 days between handing out the by-laws and articles and the vote. What she and Barb had decided to do was to give everyone the changes now and then get back to them at the end of the 30 days for a vote because

there is nothing in the By-laws that says such a vote has to be done in a face to face meeting, but that the 30 day wait is necessary. Mary Lou and Barb will make all of the changes in the By-laws and the articles, and then send them out to the Board for a vote within 30 days of receipt of the changes. Mark withdrew his motion.

Discussion then turned to the number of people on the Board with the change in permanent members. If Barb moves into the Executive Treasurer position and can still vote, do we want to accept a new person onto the Board so that the voting members of the Board go to six, rather than five? The changes in the By-laws and Articles do not do away with the office of treasurer, in case WAF ever needs to return to an elected treasurer - and may be the simplest way to make the changes is to leave the office of Executive Treasurer as a voting member. Mary Lou and Barb will draft the changes to solve these problems, and will email out advice and suggestions to the rest of the Board.

Hell Gap.

Tree Thinning -- Marcel reported that the effort has been started. Some of the worst piles of brush have been cleared. Dewey and Marcel will need to gather up brush and burn it once they get some students to help them. Marcel told everyone that they are welcome to come get wood.

Condition Report -- Dewey reported that the house was painted and roofed for a cost of \$3200 and the building has been improved quite a bit.

Hell Gap Outdoor Museum -- Marcel handed out copies of the 2003 and 2005 Hell Gap technical reports. The 2005 has a proposal for the museum. Victoria Rose gave a paper on the proposal and there was a poster up yesterday. He noted that both Phil Noble and Milward Simpson mentioned the \$10 million Wyoming state Cultural Trust fund and that the outdoor museum would be a great way to get some money to do the museum. He also suggested that after coming up with a plan that the idea should be taken to professional planners to set a good one. He also reminded the Board that they could decide what they want to do. Judy reported that the guidelines for the grants are out on the State Parks and Cultural Resources web site. Mark thought that the fund could also be used for long-term site stewardship, but he thought that the property should be listed on the National Register. Judy reminded the Board that

by having it on the register that Hen Gap would be eligible for other sources of funding. George thought that putting the site on the Register would be a good idea. Mark and Judy thought a start on a nomination would look good to the Cultural Trust. Mary Lou suggested that writing the NRHP nomination could be wrapped into a grant to the Cultural Trust for the museum. Barb wondered what the insurance costs would be to cover the site. Costs of liability insurance would probably go up (to cover people coming to visit the Outdoor Museum). Marcel suggested that we need to talk to planners who know about all of these pitfalls, and that the Board should consider developing a proposal for the trust.

NEW BUSINESS

Oil Company Lease. Encana (lease holder on the Jensen estate oil) has sent out information on the leases, the income is good. Barb has a letter from Howell Petroleum which she has not opened. She also noted that Henry preferred that we not sell the lease or the land, and that we keep them within the foundation. Barb reported the leases are at the Salt Creek field. WAF shares these leases with the Wyoming Historical Society and the UW Foundation.

Hell Gap Use in 2006. There is a student tour that visits Hell Gap every year as usual. Albert's lease is good for about another five years (Albert is paying the electric bill for his grazing of the land). As long as we have it leased for grazing, it keeps it in agricultural use. Marcel reported that the only UW use of the site would be backfilling and some tree thinning during 2006.

Marcel talked a little about the Hell Gap research. UW's primary research work in 2005 was under the building at Locality I. This year we got into a good Cody level. There is at least another meter of cultural deposits to dig though. Last summer was the first time we opened the east side of Locality I (East), and discovered a cut and fill sequence. This area needs to be investigated. The Baars Clovis locality hasn't yield much but the 1/16" hasn't been picked yet. They also tried to use ground penetrating radar to find the bedrock, but it appears that it won't work in the summer. They will try to use the GPR in the winter with frozen ground.

Frison Institute Endowment Fund. Barb reported that we met our \$50,000 goal. Eva asked whether or not any money above the \$50,000 would be matched - Marcel reported that anything above

the \$50,000 pledge would be matched. Some of the extra funds have come from memorial contributions for Ray Gossett, which comes to an additional \$5,000 or so. He is planning to ask the Board of the Friends of the Frison Institute if they would like to pledge another set amount for the endowment. If the WAF Board agrees to collect the money, that would lock in the State match for a given period of time. Dewey asked about the transfer of the first \$50,000 from WAF to the UW Foundation. Marcel reported that he hopes that something can be arranged in mid-May where UW could receive the \$50,000 so the Institute can start accruing interest on the endowment. He would like to have an official ceremony in front of the new building's sign. Barb asked that Marcel give her the information on where to send the money.

Jensen Trust Travel Award. Barb read the letter that she sends out to the recipients of the Henry E. and Clara T. Jensen Doctoral Travel Award Fund that explains where the money comes from and Henry and Clara's philosophy about Wyoming archaeology. Barb would like to insert a sentence that asks the recipient to acknowledge the donors. She also wondered if she was the correct person to be signing the letter. It was suggested that she should sign the letter Barb Nahas, representative of the Board of WAF. Rory Becker and Mary Prasciunas will split \$750 for their 2006 travel to the Society for American Archaeology meetings in San Jan, Puerto Rico at the end of April.

Upkeep Needs at Hell Gap. Dewey reported on the upgrade needs at Hell Gap for this year which, as usual, includes fences, auto gates that need to be dug out and a poor well. Before the 2007 field season the septic tank will need to be pumped and recharged with a starter. Barb will budget money for that.

Election of Officers for Next Year. Barb nominated Judy Wolf (President), Mary Lou Larson (Secretary) and Barb Nahas (Treasurer). Don moved nominations cease. Officers elected for the next year unanimously.

Dewey asked if there was any other new business - of which there was none.

Mark moved and Barb seconded that we adjourn. Passed unanimously by voice vote.

Adjournment 8:25 a.m.

WYOMING ARCHAEOLOGICAL FOUNDATION JENSEN RESEARCH GRANT

The Wyoming Archaeological Foundation announces the Jensen Research Grant program now available to members of the Wyoming Archaeological Society for projects consistent with the purposes of WAF. Qualified applicants interested in project support should apply to this program rather than submit general requests to either WAS or WAF at the annual meeting as was done in the past. This new grant program is intended to be the WAF/WAS source of support for research projects, so other society/foundation funds may be directed to other worthwhile activities.

The cumulative amount awarded to successful Jensen Research Grant applicants will not exceed \$1,000 in any single year. An application form and guidelines are printed with this notification, and available from the WAF Executive Treasurer (see back cover of this issue of the Wyoming Archaeologist). Please read the forms carefully before mailing an application. Completed applications and all attachments must be submitted to the WAF Treasurer for consideration by the WAF board, and postmarked to her no later than March 15 of the year in which grant support is requested.

AWARD AMOUNT

The Wyoming Archaeological Foundation – Jensen Research Grant will be in the amount of \$1,000.00 given annually at the WAS state meeting held in the spring of each year. (A year is defined as the period of time from one annual state meeting to the next.) The amount to be granted per application is at the discretion of the board and may be more or less than the actual requested figure, but not more than the maximum limit of \$1,000.00. The award must be used within the year granted.

The following guidelines are given to assist, chapters and members, in designing archaeological projects that are eligible for funding through the Wyoming Archaeological Foundation.

DEFINITIONS

1. “WAF or Board” means the Wyoming Archaeological Foundation.
2. “WAS” means Wyoming Archaeological Society.
3. “Chapter” means any WAS Chapter.
4. “Member” means any WAS paid member.

PURPOSES OF WYOMING ARCHAEOLOGICAL FOUNDATION

The purposes of WAF shall be: to foster and encourage the preservation of all manner of things having archaeological or historical value or interest within the State of Wyoming; to discover, restore, preserve, maintain, own, repair, construct, equip or otherwise place in condition, sites, properties both real and personal, areas, buildings, fixtures and other improvements and personal property having archaeological or historical interest or value.

ELIGIBILITY

Any paid member, or chapter, of the Wyoming Archaeological Society is eligible to apply for the annual grant.

SPECIAL CONSIDERATION

Decisions about emergency funds can be made at any other time during the year, and will be reviewed at the discretion of the board with a quorum of board members and officers.

APPLICATION

One completed, signed, and dated WAF application form must be submitted that includes the following information:

Formal Proposal, not to exceed two pages, of the project to include:

- (a.) A concise narrative overview of the project which must be related to archaeology;
- (b.) Reasons, goals and objectives of the project;
- (c.) Proposed timeline with dates for beginning and ending the project;
- (d.) Detailed budget and budget justification showing expected cost;
- (e.) Project Director;
- (f.) An explanation of how the project will enhance or benefit archaeology and WAF;
- (g.) An explanation of cooperative efforts with other organizations, which could benefit from the project.

All above information will be considered as part of the official application and will be submitted to the WAF Board of Directors. WAF will retain this information for the official files.

The application is to be postmarked or delivered to WAF on or before March 15th of the year applying for grant.

The completed application form, with the above information, is to be submitted to the current Wyoming Archaeological Foundation Executive Treasurer as found on the inside back cover of this issue of *The Wyoming Archaeologist*.

SPECIFIC GUIDELINES

Costs specifically excluded from funding are:

- (a) No indirect costs;
- (b) Purchase of equipment;
- (c) Communication systems;
- (d) Administration – salary, over run, overhead, entertainment, supplies;
- (e) Any non-budgeted expense that is not presented in the budget and approved contract.

No contingency can be allowed.

EVALUATION OF APPLICATIONS

The Board will receive, review and make recommendations on the application(s) and will make the award(s) from among the applicant(s) by a majority vote. If the decision to grant or deny funding is not unanimous the president and board will “consult and discuss” until a consensus is reached. Some of the questions will be asked pertaining to each application, and the answer will be evaluated:

- (a) Is the project compatible with WAF’s existing or proposed programs and stated purposes?
- (b) Is there a recognizable benefit to WAF beyond the organizations direct involvement?
- (c) Is the project designed to draw interest to the archaeology community and the society?

- (d) Does the project stand a good chance of satisfying its stated objectives? Is it effective and feasible?
- (e) Is the project new or is it one that has been undertaken before?
- (f) Is the application thorough and complete? Has the applicant overlooked some costs that appear imminent or necessary for the successful completion of the proposed project? Is the extent and operation of the project clearly outlined?
- (g) Does the applicant have the financial ability to provide the funds necessary to carry the project to its successful completion?
- (h) Does the applicant have the wherewithal to provide accounting and reporting?
- (i) Has this project been submitted to WAF before?

DISBURSEMENTS OF FUNDS

Decisions on the funding of proposals will be made at the WAF board meeting held every spring in conjunction with the annual meeting of the Wyoming Archaeological Society.

If at any time, WAF runs low of funds, the annual project award will be temporarily suspended at the advice of the current treasurer / Executive Treasurer, until the treasury is again able to sustain the maximum \$1,000.00 annual outflow.

If a member of the board applies for funding, they must withdraw from voting on all applications and one of the non-voting board members will be selected by the president to cast the other vote.

The applicant will be informed of the board's final decision to grant or deny the request by email or regular mail.

If the award is granted, a check for the funds will be sent to the applicant with information required for a "Project Completion and Expenditure Report" to be sent back to WAF after the stated project completion date.

Any project extension beyond the one-year allotment must be requested in writing and sent to the WAF President. The president will review with the Board of Directors and officers for approval.

The grantee is responsible for acknowledging WAF – Jensen Research Grant in any publication stemming from the project. The grantee will also submit a short article about the project to the *Wyoming Archaeologist*.

WYOMING ARCHAEOLOGICAL FOUNDATION APPLICATION OR FUNDING YEAR _____

PLEASE NOTE: APPLICATION AND ALL ATTACHMENTS MUST BE SUBMITTED FOR CONSIDERATION BY THE WAF BOARD.

WAS MEMBER / CHAPTER: _____

ADDRESS: _____

CONTACT PERSON: _____ DAYTIME PHONE: _____

ADDRESS: _____

PROJECT TITLE: _____

AMOUNT OF FUNDING REQUESTED FROM WAF: _____

WILL YOU BE REQUESTING FUNDING FROM OTHER SOURCES: _____

IF SO, FROM WHOM AND IN WHAT AMOUNT? _____

DO NOT FILL IN BELOW. FOR WAF USE ONLY:

DATE RECEIVED BY WAF: _____

SCHEDULED FOR _____ MEETING _____

APPLICANT NOTIFIED OF MEETING: _____

APPROVED / DENIED: _____

DATE: _____ AMOUNT: _____

LITHIC ANALYSIS FROM TWO PREHISTORIC SITES (48NA312 AND 48NA2516) NEAR MARTIN'S COVE, NATRONA COUNTY, WYOMING

by

DANNY N. WALKER, MEEGAN SANDERSON,
AND RICK WEATHERMON

ABSTRACT

Extensive lithic collections have been made from the surface of two archaeological sites (48NA312 and 48NA2516) near Martin's Cove, Natrona County, Wyoming. Contrary to the original archaeological assessment of the two sites (Griffiths and Talbot 1996), these two sites now appear to contain significant archaeological data concerning the prehistory of the central Wyoming area (NRHP Criterion D). Additional archaeological evaluation of the sites has become necessary to properly evaluate these two sites.

INTRODUCTION

In 1996, as part of an archaeological survey of the Martin's Cove area (Griffiths and Talbot 1996), two prehistoric sites (Figure 1) were recorded along the proposed walking path from the Martin's Cove Visitor's Center to Martin's Cove itself, about two miles west of the Visitor's Center. These prehistoric sites appeared to be surface in nature and were described as consisting of a thin scatter of lithic debris (see detailed discussions below). Recommendations were made that no further investigations need be conducted on either site. The following spring, BLM archaeologists from the Lander Resource Area revisited the site and conducted a detailed surface collection of artifacts. This visit revealed the sites and their artifacts were more extensive than originally recorded in 1996. Additional artifact collections by BLM archaeologists were made on the two sites in 1998 and 2001. Based on the 1997 and subsequent visits to the two prehistoric sites, the original

recommendations of the two sites as not eligible to the National Register of Historic Places needed to be reevaluated. This report provides a description and analysis of the lithic and other artifacts collected in 1997 and 1998. The 2001 collections were made after this analysis project was initiated and so are not included. This analysis and discussion will be followed by additional recommendations for future work at the sites.

SITE DESCRIPTIONS

The 1996 survey recorded three historic sites and two prehistoric sites. Recommendations for preservation and management of the historic sites were made elsewhere (Bromley 1997) and have been followed through the intervening years. The two prehistoric sites continue to be of management concern. They were originally described as follows:

48NA312 (Figures 2-3):

"This site was originally recorded by Daniel J. Hutchinson [BLM] in 1973 as a small 30 by 30 meter lithic scatter. In 1974 it was re-recorded by John Bellar [also BLM], and site boundaries remained 30 by 30. The third recording of the site was completed by M. Ostrogorsky in 1980 [National Trails Project], and site boundaries were expanded to the west to include cultural material found on an adjacent and much higher dune, and with new site boundaries of 350 meters (NW/SE) by 200 meters NE/SW). During the current project we [BYU]

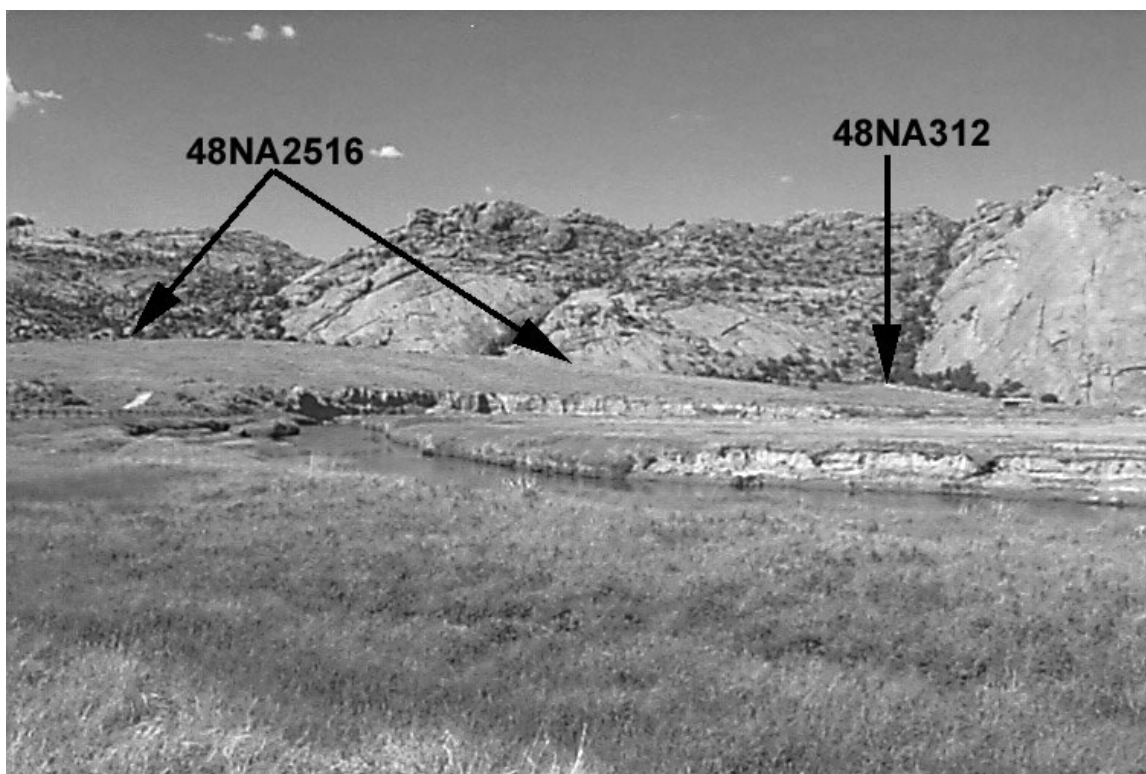


Figure 1: Overview of sites 48NA2516 and 48NA312.

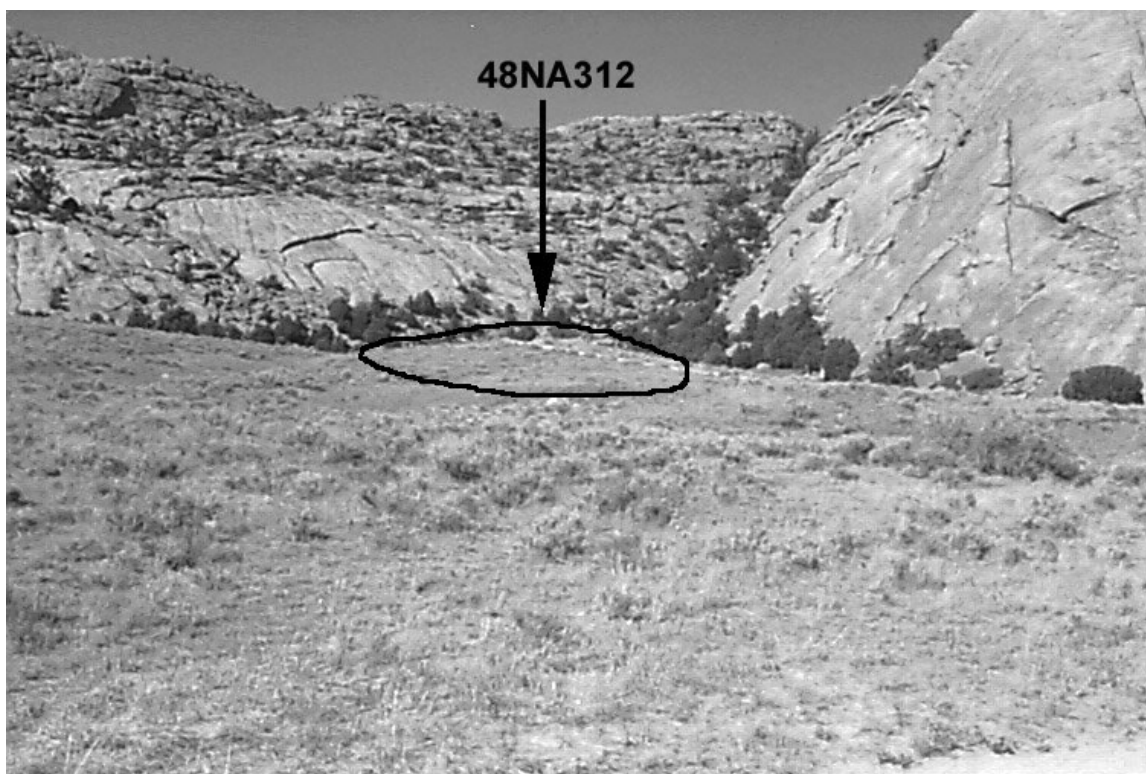


Figure 2: 48NA312, to north.



Figure 3: 48NA312, to east.

examined closely the relationship between the artifacts on the original small dune and those on the larger adjacent dune. There is a deep drainage between the two with a zone about 120 meters wide where no cultural material is present [Figure 6]. Therefore, we decided to re-assign the original site number, 48NA312, to the smaller dune area, and assign a new site number, 48NA2516, to the larger dune.”

“The site [48NA312] currently measures approximately 85 m north-south by 45 m east-west. It consists of a small scatter of about 75-100 secondary and tertiary stage lithic debitage. Material is quartzite and various colors of chert. The debitage is distributed over the top and upper slopes of the small dune. No concentrations were found, although the majority of the flakes were found on the dune’s northwest side. Other artifacts include a stage-two biface fragment made of grey chert, a biface fragment of black chert, a white/red chert hammerstone fragment, and three pieces

of ground stone, probably small fragments of sandstone metates, and one containing some charcoal blackening on one side” (Talbot 1996a).

Based on the 1997 collection conducted the year after this description was written, additional artifact types are now known to exist from the site (Table 1). These include projectile points, bifaces, ground stone, a scraper, one piece of fire-altered rock and at least two hearths. The distribution of these artifacts and features show the site activities were probably more extensive than indicated by the initial 1996 survey and testing. The total site area (Figures 4 and 5) has also increased based on the 1997 collection, from 85 m north-south by 45 m east-west (3825 sq m) in 1996 to 77 m north-south and 64 m east-west (4928 sq m) in 1997. Any additional change in size based on the 2001 surface collection and mapping is unknown at this time. It must also be noted that five specimens (three flakes and two projectile points) mapped in 1997 were not submitted to these authors for analysis.

Table 1: Summary of artifact type counts from 48NA312 and 48NA2516.

ARTIFACT TYPE	NA312		NA2516	
Whole Flake	43	24.4%	48	24.7%
Proximal Flake	36	20.4%	35	18.0%
Distal/medial Flake	62	35.2%	64	33.0%
Split Flake	12	6.8%	4	2.1%
Shatter	13	7.4%	20	10.3%
Ground Stone	3	1.7%	6	3.1%
Distal Projectile Point	1	0.6%	0	0%
Medial Projectile Point	0	0.0%	2	1.0%
Proximal Projectile Point	0	0.05%	3	1.5%
Scraper	1	0.6%	1	0.5%
Biface Fragment	5	2.8%	6	3.1%
Retouched Flake	0	0.0%	3	1.5%
Preform	0	0.0%	1	0.5%
Hammerstone	0	0.0%	1	0.5%
TOTAL	176	99.9%	194	99.8%
Hearth	2		1	
Fire Altered Rock	7		39	

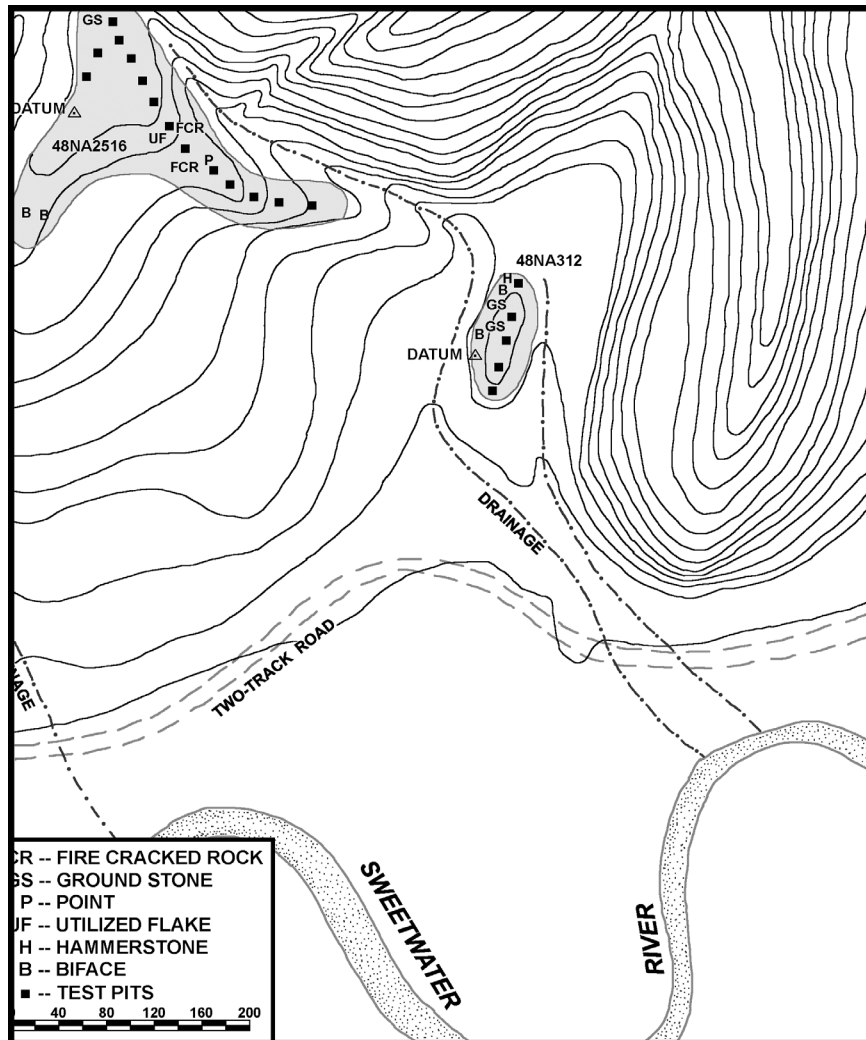


Figure 4: 1996 site layout map of 48NA312 and 48NA2516 (from Griffiths and Talbot 1996).

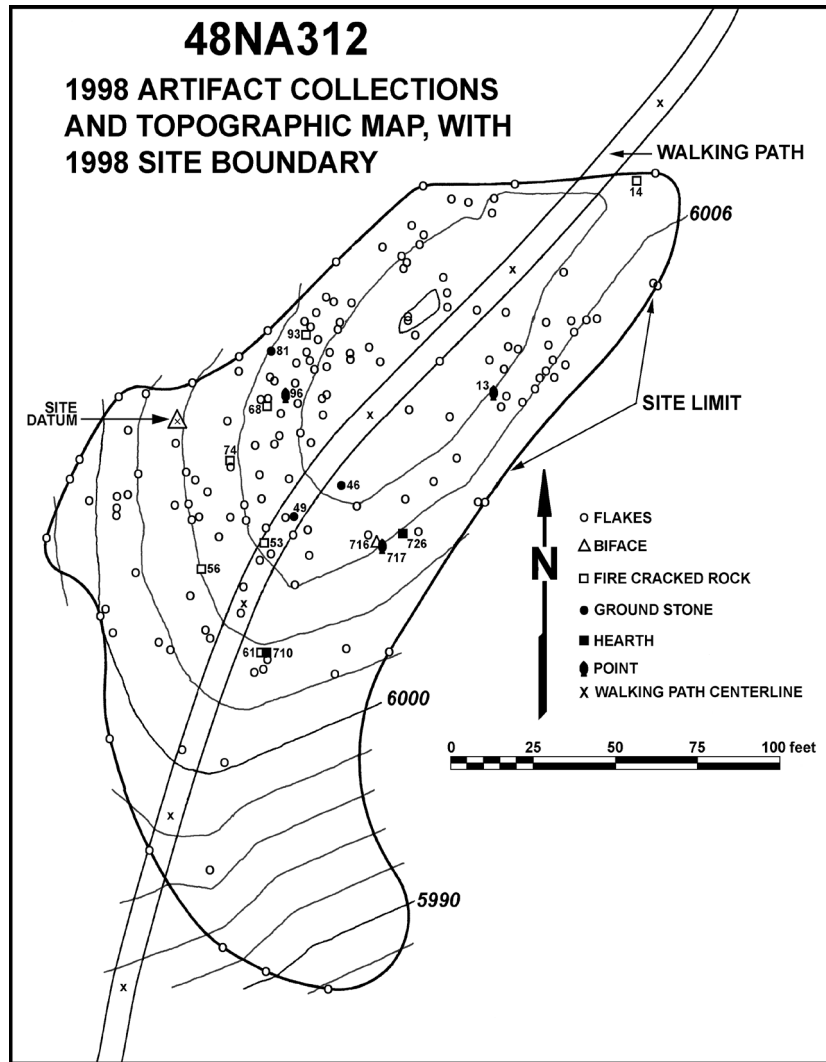


Figure 5: Topographic map of 48NA312, showing site limits, artifact distributions and walking path.

48NA2516 (Figures 6-7):

“This site was originally recorded by M. Ostrogorsky [National Trails Project] in 1980, as part of site 48NA312, when he expanded the site boundaries to the west to include cultural material found on an adjacent, and much higher dune, making the new site boundaries 350 meters (NW/SE) by 200 meters (NE/SW). During the current project we [BYU] examined closely the relationship between the artifacts on the original small dune (48NA312) and those on the larger adjacent dune. There is a deep drainage between the two with a zone about 120 meters wide where no cultural

material is present [Figure 6]. Therefore, we decided to re-assign the original site number, 48NA312, to the smaller dune area, and assign a new site number, 48NA2516, to the larger dune.

The site is located on a long aeolian dune at the base of the Sweetwater Rocks, measuring about 237 m northwest-southeast by 200 m southwest-northeast. It consists of a sparse scatter of about 150 flakes. Flaking stages are comprised primarily of secondary flakes, with tertiary, shatter, and decortication stages common. The materials present are quartzite, chalcedony, and various colors of chert. The debitage is distributed

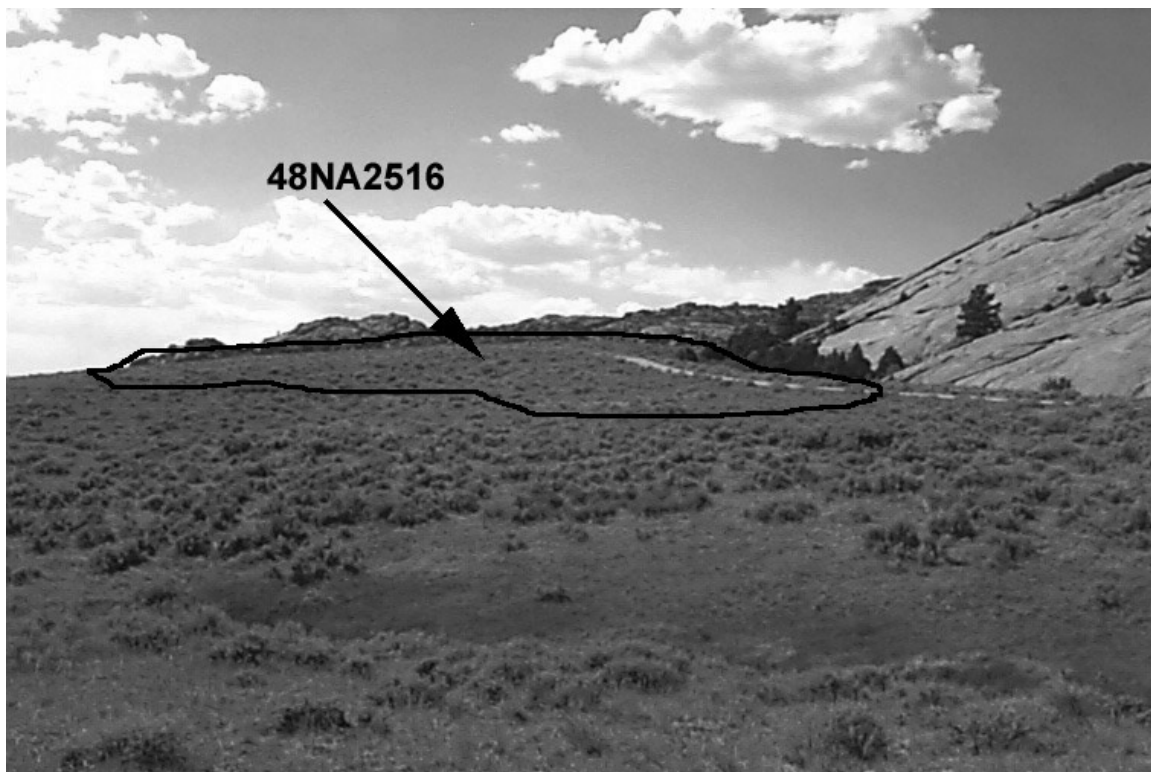


Figure 6: Site 48NA2516, looking west.



Figure 7: Site 48NA2516, looking south. Site lies on terrace in immediate foreground of picture.

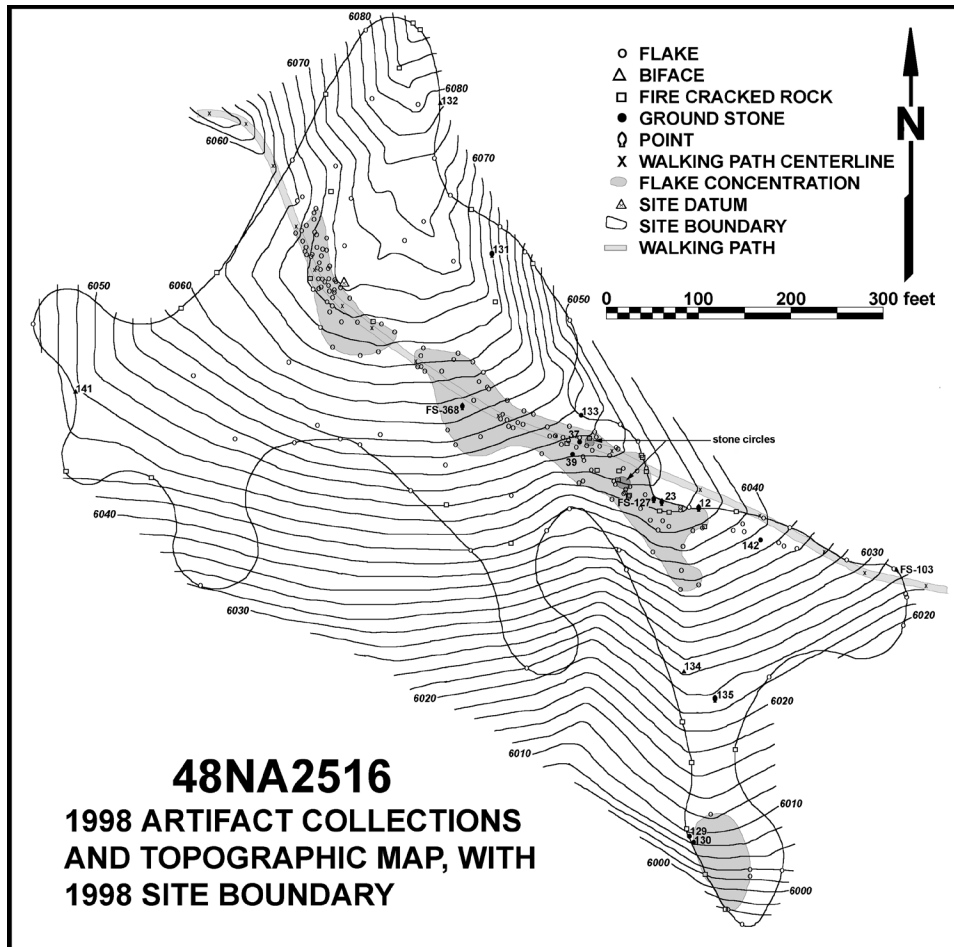


Figure 8: Topographic map of 48NA2516, showing site limits, artifact distributions and walking path.

over the top and upper slopes of the dune, with no concentrations, although the majority of the flakes were found on the top of the dune. Other artifacts include one white chalcedony corner notched projectile point base, two stage-two biface fragments, one of white/tan chalcedony and the other of brown/cream chert, one stage-three biface of brown/cream chert, one utilized flake, and one fragment of a sandstone metate. (Talbot 1996b).

As with 48NA312, data concerning the site size and activities changed following the 1997 collection project by the BLM. Several areas of high concentrations of flakes were recorded (Figure 8), along with at least two stone circles. The 1997 and 1998 mapping resulted in collection of 194 lithic pieces (Table 1), including flakes, projectile points,

bifaces/preforms, scrapers, retouched flakes, and hammerstones. A relatively large number of fire-altered rock pieces (39) were also recorded over the surface of the site, suggesting several hearths are present, although not formally recorded. An additional 200-300 pieces of lithic material were collected from the two sites in 2001 (Craig Bromley, personal communication, 2002). Both these collecting events show many more pieces of lithic material were present on site than originally recorded in 1996. Apparently, additional materials continue to erode from the site's ground surface, indicating a more intensive site than originally determine. As with 48NA312, the total site area also increased with the 1997 investigations at the site (Figure 10) from 237 m northwest-southeast by 200 m southwest-northeast (47,400 sq m) in 1996 to 305 m northwest-southeast by 183 m southwest-northeast (55,815 sq m) in 1997. Any additional change in

Table 2: Projectile point data summary from 48NA312 and 48NA2516.

CATALOG	PORTION	CULTURAL AFFILIATION	MATERIAL TYPE	NORTHING	EASTING	ELEVATION	USE	BURNED	FIGURE NUMBER
48NA312-086	complete	Late Archaic	Madison chert, white	12121.78	9099.80	6007.32	no	no	11-F
48NA312-111	distal	Late Archaic	cobble chert	12163.37	9058.30	6006.50	no	no	11-G
48NA2516-012	medial	Late Archaic	other chert	11702.35	9415.06	6045.17	yes	yes	12-G
48NA2516-023	medial	Late Archaic	other chert	11663.06	9422.42	6046.98	no	no	12-H
48NA2516-135	medial	Late Archaic	other chert	11721.77	9208.59	6023.65	yes	no	12-I
48NA2516-182	proximal	Late Archaic	Goose Egg Chert	11379.01	9601.89	6068.11	no	no	12-J
48NA2516-183	complete	Late Archaic	other chert	11339.31	9602.14	6062.38	no	no	12-K
48NA2516-184a	proximal	Late Archaic	other chert	11349.66	9613.74	6065.08	no	no	12-L

size based on the 1999 and 2001 surface collection and mapping at 48NA2516 is unknown at this time. It must also be noted that numerous specimens (77 flakes and two projectile points) mapped in 1997 were not submitted to these authors for analysis (Appendix B).

LITHIC ARTIFACT DISCUSSION AND COMPARISONS

Lithic analysis methodology for the present study basically follows that presented by Kelly (2001). That report should be consulted for discussions on why the various lithic attributes presented below should be examined.

Fourteen different categories of artifact types were defined for this project (Table 1; Figure 9). However, seven of these categories were refinements of a more basic type, leaving eight actual categories.

PROJECTILE POINTS

Two projectile points from 48NA312 and six projectile points from 48NA2516 were submitted for analysis as part of this project (Table 2; Figures 10 and 11). Based on field data, two additional points were initially collected from each of the two sites, but are not submitted for analysis. All these projectile points are made from various chert varieties (Table 2). This might suggest a preference for this material type by the prehistoric inhabitants of these sites. However, the material type of the four missing projectile points is unknown. Likewise, presence of projectile points in the 2001 collection from the sites is not known. There may be additional material types present in these additional specimens.

All analyzed diagnostic projectile points appear to represent some form of Late Archaic style (see Frison 1978, 1991), although specimen 48NA312-111 may be the base from a Middle Archaic Duncan/Hanna variant (Marcel Kornfeld, personal communication, 2002). The various projectile points also appear to be scattered over the site areas, and not concentrated in any one area (Figures 5 and 8).

BIFACES

Five formal bifaces were recovered from 48NA312 and six were recovered from 48NA2516 (Table 3, Figures 9 and 10). These were all made from a variety of lithic materials, primarily variants

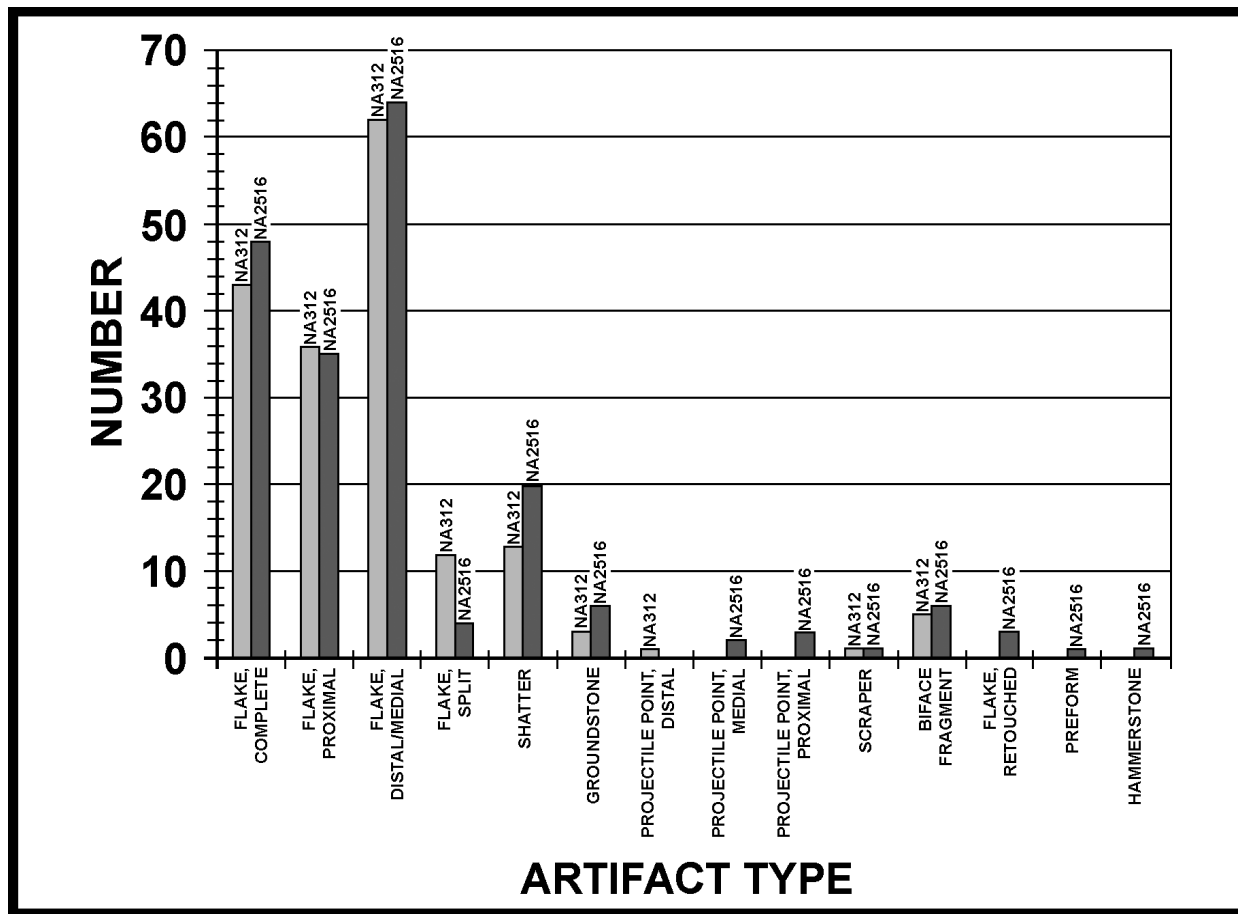


Figure 9: Graphic representation of various artifact types collected from 48NA312 and 48NA2516.

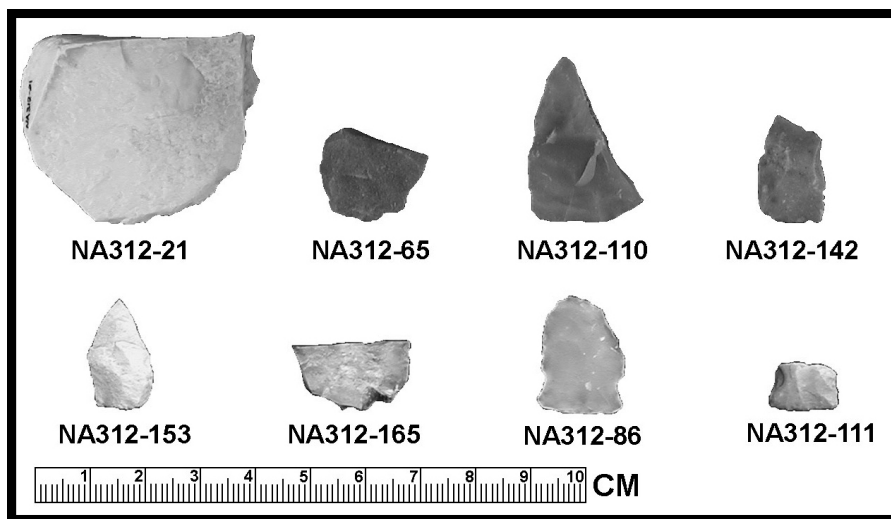


Figure 10: Formal tools recovered from surface collection at 48NA312.

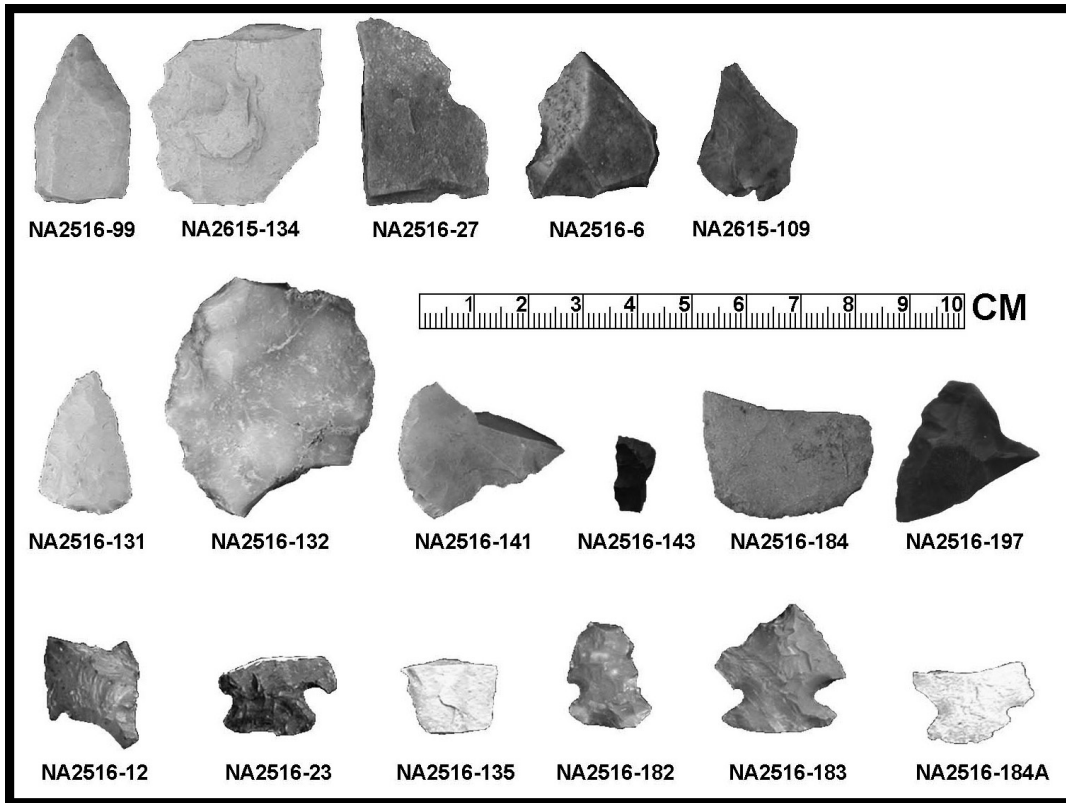


Figure 11: Formal lithic tools recovered from surface collections at 48NA2516.

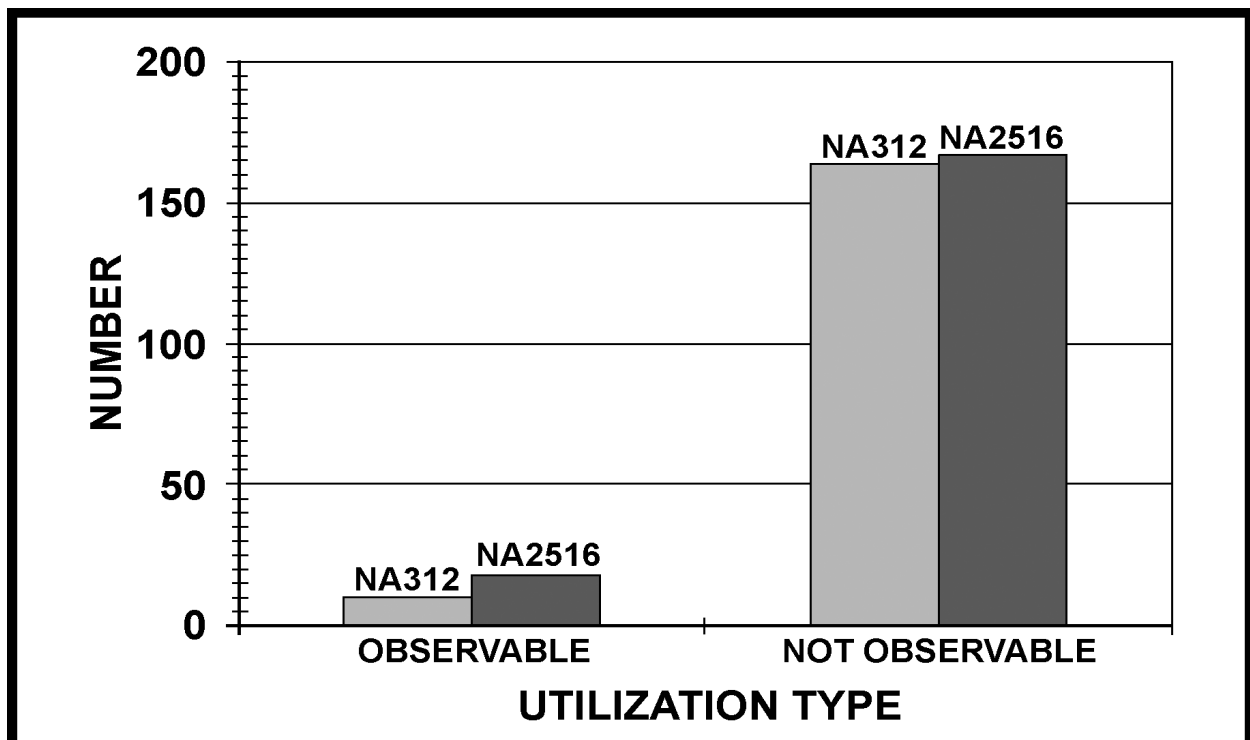


Figure 12: Observed utilization counts on formal flakes and flake tools from 48NA312 and 48NA2516.

of chert and quartzite (Table 3). Four (80%) of the 48NA312 bifaces show utilization on their edges (Table 3) while half of the 48NA2516 bifaces show signs of utilization. Again, the bifaces from the two sites appear to be scattered over the two site areas and not concentrated (Table 3, Figures 5 and 8).

PREFORMS

One chert preform was recovered from 48NA2516 (Table 3, Figure 10). This generally appears to be an almost finished projectile point of the general Later Archaic style seen in the remainder of the projectile points from the two sites.

SCRAPERS

One scraper was recovered from each of the two sites (Table 3). These appear to resemble typical

scrapers from other Archaic period sites throughout Wyoming (Figure 9 and 10).

UTILIZED AND RETOUCHEDED FLAKES

Only a small proportion of the total flakes, other than deliberate tools, showed any use wear or other utilization (Figures 11 and 12; Table 3 and 4), although three flakes from 48NA2516 did exhibit definitive signs of retouching of the edge(s) (Table 3). Six percent of the flakes from 48NA312 and ten percent of analyzed flakes from 48NA2516 showed such wear. Without knowing similar use on other prehistoric sites of similar age in the immediate region, we do not know if these figures are high or low.

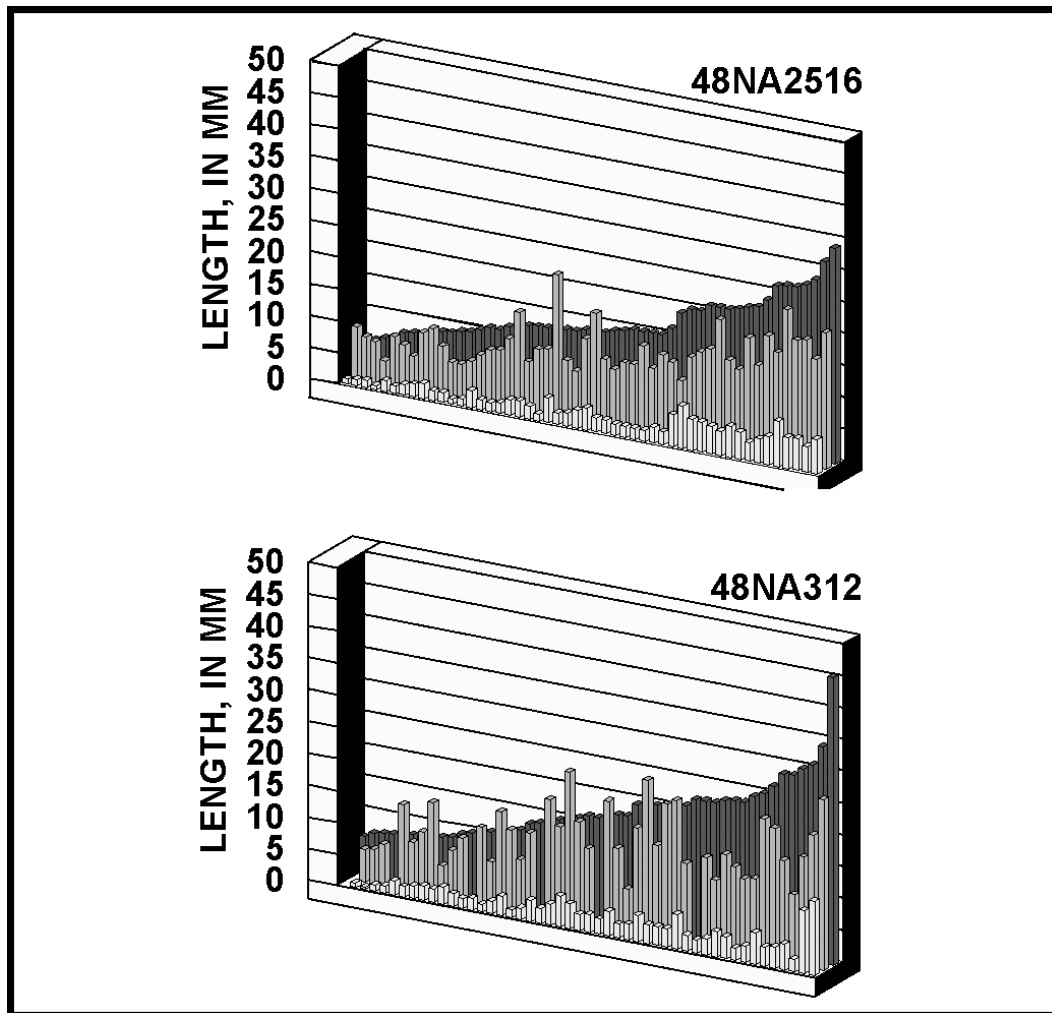


Figure 13: Graphic representation of formal flake measurements from 48NA312 and 48NA2516.

Table 3: Summary of formal lithic tool data from 48NA312 and 48NA2516.

CATALOG	ARTIFACT TYPE	MATERIAL TYPE	NORTHING	EASTING	ELEVATION	USED	BURN	FIGURE NUMBER
48NA312-021	scraper	Tertiary formation chert	12127.78	9122.14	6006.76	yes	no	11-#
48NA312-065	biface fragment	Cloverly quartzite	12068.69	9066.15	6001.17	yes	no	11-A
48NA312-110	biface fragment	Madison chert, brown	12150.20	9054.68	6006.91	yes	yes	11-B
48NA312-142	biface fragment	cobble chert	12112.18	9084.60	6006.65	yes	yes	11-C
48NA312-153	biface fragment	Morrison quartzite	12075.47	9075.69	6002.13	yes	yes	11-D
48NA312-165	biface fragment	Madison chert, white	12195.87	9097.57	6006.29	no	yes	11-E
48NA312-017	ground stone	sandstone	12117.31	9113.13	6006.04	yes	no	17-#
48NA312-041	ground stone	sandstone	12139.19	9072.30	6008.30	yes	no	17-#
48NA312-045	ground stone	sandstone	12124.11	9062.99	6007.46	yes	no	17-#
48NA2516-099	scraper	Cloverly quartzite	11290.70	9685.80	6068.95	yes	no	12-#
48NA2516-132	biface fragment	other chert	11419.22	9850.90	6078.46	yes	no	12-B
48NA2516-134	biface fragment	light siltstone	11687.92	9236.82	6026.35	yes	no	12-#
48NA2516-141	biface fragment	Madison quartzite	11026.14	9526.50	6047.68	no	no	12-C
48NA2516-143	biface fragment	Madison quartzite	11443.86	9629.57	9070.74	yes	no	12-D
48NA2516-184	biface fragment	Cloverly quartzite	11312.86	9613.18	6058.42	no	no	12-E
48NA2516-197	biface fragment	Goose Egg chert	11400.11	9604.57	6069.65	no	no	12-F
48NA2516-131	preform	other chert	11476.02	9688.95	6066.07	no	no	12-A
48NA2516-006	retouched flake	Goose Egg chert	11808.57	9371.23	6036.21	no	no	12-#
48NA2516-027	retouched flake	Cloverly quartzite	11629.92	9429.26	6046.92	no	no	12-#
48NA2516-109	retouched flake	light siltstone	11290.52	9685.80	6068.87	yes	no	12-#
48NA2516-142	hammerstone	granite	11769.14	9380.87	6039.19	yes	no	17-#
48NA2516-037	ground stone	sandstone	11572.23	9484.63	6051.45	yes	no	17-#
48NA2516-039	ground stone	sandstone	11564.86	9471.83	6050.26	yes	no	17-#
48NA2516-129	ground stone	sandstone	11694.20	9058.92	6009.39	yes	no	17-#
48NA2516-130	ground stone	sandstone	11699.81	9053.31	6008.83	yes	no	17-#
48NA2516-133	ground stone	sandstone	11573.79	9513.52	6053.10	yes	no	17-#
48NA2516-146	ground stone	sandstone	11413.13	9616.15	6070.46	yes	no	17-#

Table 4: Observed utilization counts on formal flakes and flake tools from 48NA312 and 48NA2516.

	NA312		NA2516	
Observable	10	5.7%	18	9.7%
Not Observable	164	94.3%	167	90.2%
TOTALS	174	100.0%	185	99.9%

FLAKES

All complete, formal flakes were measured and several attributes noted during this study. These included platform type, termination type, number of dorsal flake scars and type of cortex present, if present.

Measurements

Metric attributes of the formal flakes from the two sites were compared (Table 5; Figure 13). Perhaps the main point to discuss here is that it appears the formal flakes from 48NA312 were overall

slightly larger than those flakes from 48NA2516. It also appears there may be more variability in length/width proportions of these flakes from 48NA312 than seen in 48NA2516 (Figure 12).

Platform Type

There also appears to be major differences in the platform type exhibited on the formal flakes from these two sites (Table 6; Figure 14). This is especially seen in the numbers of facets shown on the flake platforms. 48NA312 has a higher percentage of its flakes showing no formal facet on the platform (50% to 8%), whereas 48NA2516 shows a higher percentage of its flakes having four or more facets (17% to 3%). 48NA312 also shows a larger percentage of flakes with crushed platforms (18%) when compared to 48NA2516 (1.3%). An equal number of flakes from both sites had snapped platforms (n=4) and neither site had any lipped platforms.

Termination Type

Two-thirds of the flakes from 48NA312 showed

Table 5: Summary statistic on formal flake measurement data from 48NA312 and 48NA2516.

GREATEST LENGTH	NA312	NA2516	GREATEST WIDTH	NA312	NA2516	GREATEST THICKNESS	NA312	NA2516
Mean	17.21	15.41	Mean	14.01	11.92	Mean	2.95	2.77
Standard Error	1.20	1.02	Standard Error	0.85	0.73	Standard Error	0.29	0.23
Median	16.00	13.60	Median	13.40	10.60	Median	2.55	2.15
Mode	16.00	21.00	Mode	14.60	10.60	Mode	2.00	4.90
Standard Deviation	8.38	7.09	Standard Deviation	5.59	5.04	Standard Deviation	1.99	1.63
Sample Variance	70.19	50.23	Sample Variance	31.29	25.43	Sample Variance	3.96	2.64
Kurtosis	1.12	-0.12	Kurtosis	-0.51	-0.47	Kurtosis	9.77	0.03
Skewness	0.92	0.76	Skewness	0.35	0.62	Skewness	2.75	0.90
Range	39.10	28.50	Range	21.80	20.10	Range	11.30	6.60
Minimum	6.00	5.30	Minimum	5.00	3.70	Minimum	0.40	0.60
Maximum	45.10	33.80	Maximum	26.80	23.80	Maximum	11.70	7.20
Count	49.00	48.00	Count	43.00	48.00	Count	48.00	48.00

Table 6: Summary data on platform type, formal flakes from 48NA312 and 48NA2516.

	NA312		NA2516	
No Facets (flat)	33	50.0%	6	8.0%
Three or Fewer	31	47.0%	56	74.7%
Four or More	2	3.0%	13	17.3%
TOTALS	66	100%	75	100.0%
Split	1	1.5%	2	2.7%
Crushed	18	27.3%	1	1.3%
Lipped	0	0.0%	0	0.0%
Snapped	4	6.1%	4	5.3%
Indeterminate	0	0.0%	1	1.3%

a feathered termination (Table 7; Figure 15), while 92% of the flakes from 48NA2516 showed this type of flake termination. Naturally then, there is also a difference in the hinge/step type of flake termination between these two sites as well (Table 7; Figure 15).

Dorsal Scar Counts

Dorsal scar counts were based on dorsal scars greater than two millimeters in length. There doesn't appear to be any statistical differences between the two sites in this attribute (Table 8), with a general peak in the counts at three scars per flake (Figure 16).

Shatter

The smallest grouping of artifacts from the flake category are those specimens identified as shatter. These specimens did not exhibit any of the attributes of a formal tool, but still appear as part of the overall lithic assemblage from the two sites. Thirteen pieces of shatter were recovered from 48NA312 and 29 pieces from 48NA2516 (Table 9). The higher shatter count from 48NA2516 is probably from the greater site area and larger number of artifacts from

Table 7: Flake termination type data from 48NA312 and 48NA2516.

	NA312		NA2516	
Feather	31	66.0%	45	91.8%
Hinge/Step	15	31.9%	3	6.1%
Indeterminate	1	2.1%	1	2.0%
TOTALS	47	100.0%	49	99.9%

Table 8: Summary of dorsal scar counts from formal flakes, 48NA312 and 48NA2516.

NUMBER OF DORSAL SCARS	NA312		NA2516	
0	3	6.4%	0	0.0%
1	7	14.9%	6	13.0%
2	9	19.1%	8	17.4%
3	12	25.5%	13	28.3%
4	8	17.0%	8	17.4%
5	4	8.5%	7	15.2%
6	2	4.3%	2	4.3%
7	2	4.3%	2	4.3%
TOTALS	47	100.0%	46	99.9%

that site, and not from any cultural source.

GROUND STONE

Three fragments of sandstone ground stone pieces were recovered from 48N312 and six from 48NA2516 (Table 3; Figure 17)

HAMMERSTONE

A single hammerstone was recovered from 48NA2516 (Table 3; Figure 17). This appeared to be made from a local granite source (i.e., Sweetwater Range). Several areas of battering were present on the specimen.

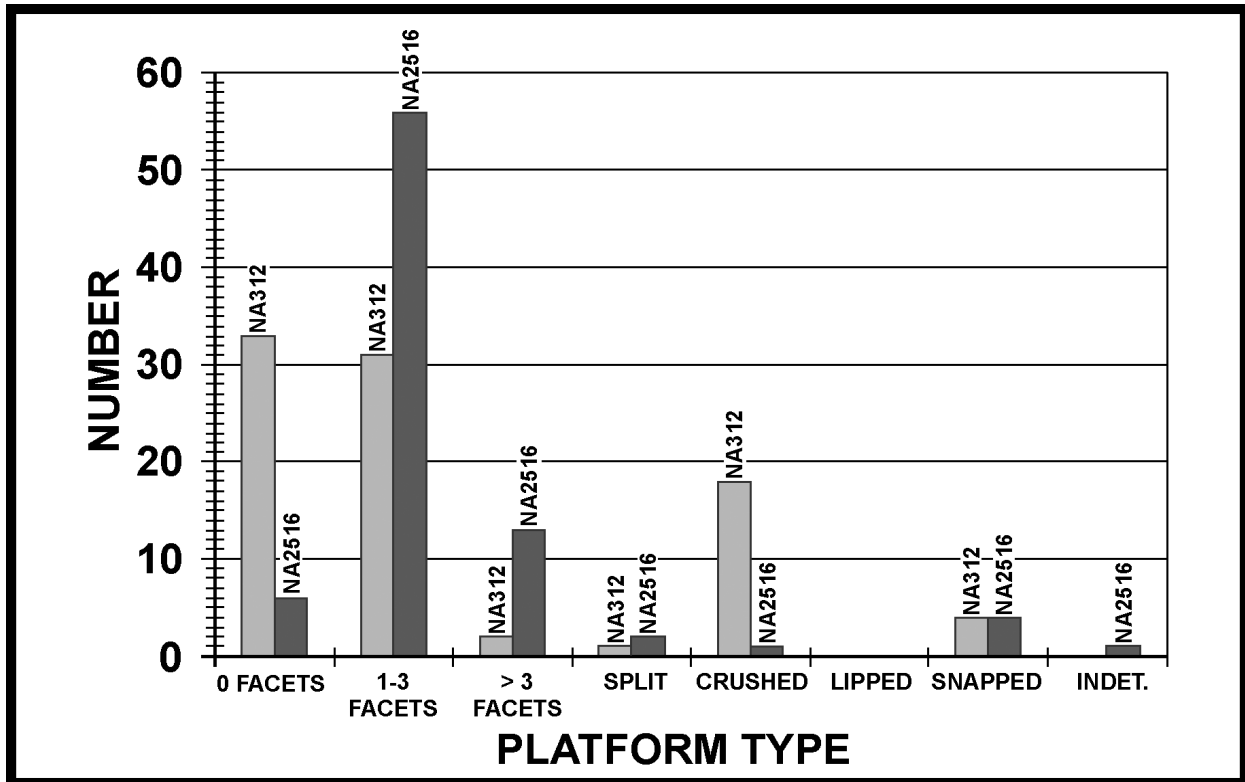


Figure 14: Summary data on platform type, formal flakes from 48NA312 and 48NA2516.

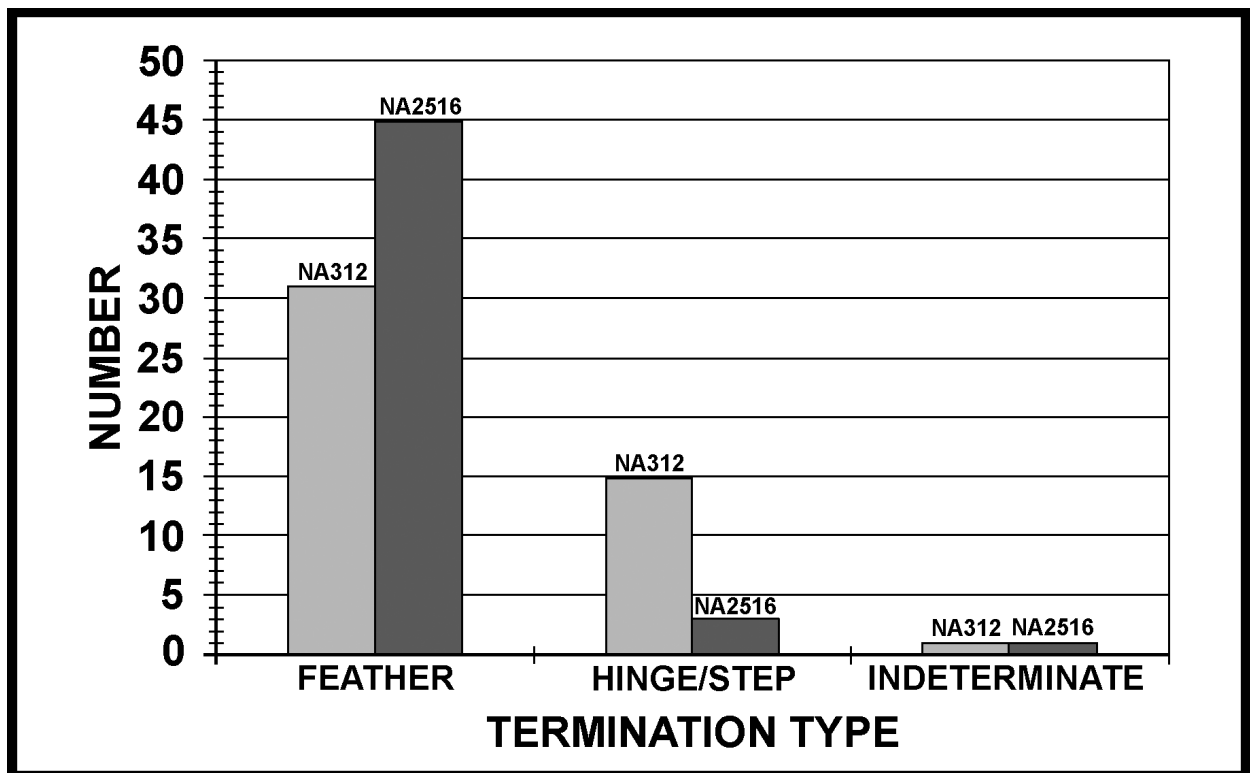


Figure 15: Flake termination type data from 48NA312 and 48NA2516.

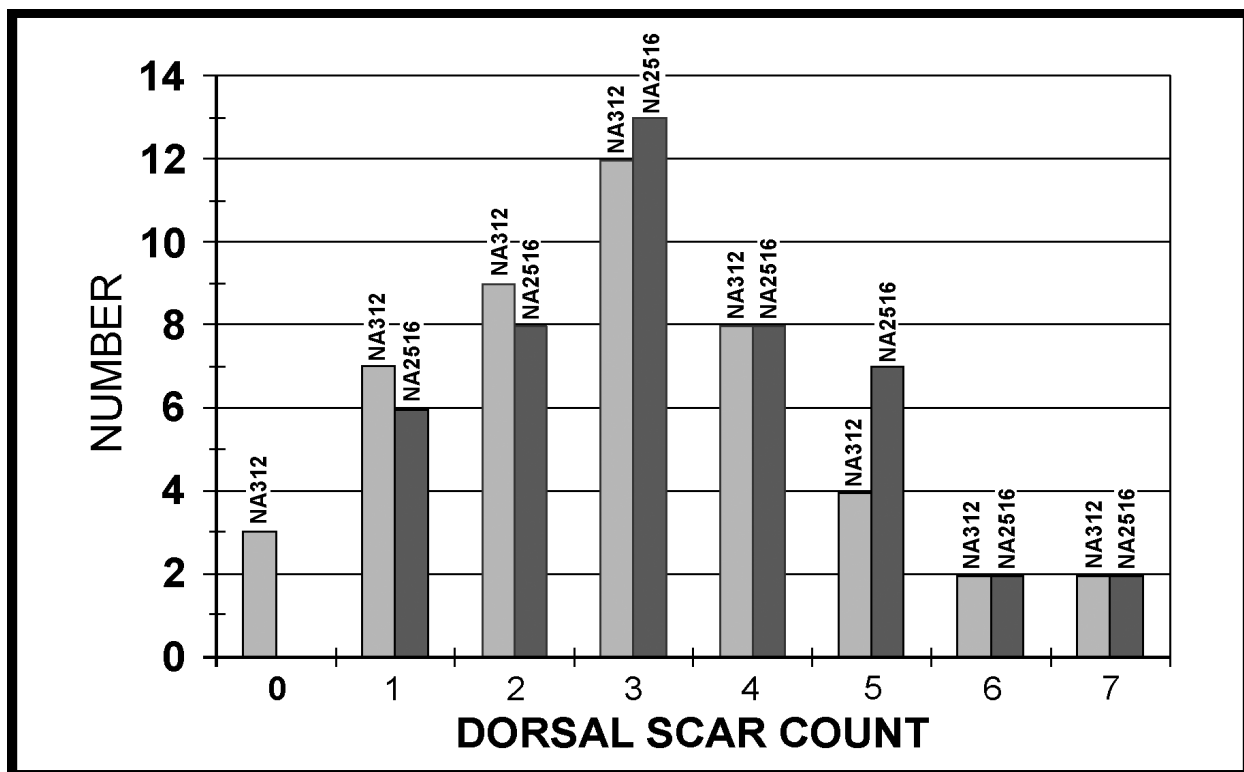


Figure 16: Summary of dorsal scar counts from formal flakes, 48NA312 and 48NA2516.

Table 9: Summary of shatter flake data from 48NA312 and 48NA2516.

CATALOG NUMBER	NORTHING	EASTING	ELEVATION	ITEM	COUNT	MATERIAL
48NA312-002	12046.59	9056.99	5997.54	shatter	1	chert, Goose Egg
48NA312-006	12114.79	8925.44	5990.60	shatter	1	chert, red, Madison
48NA312-024	12072.31	9089.07	6001.60	shatter	1	chert, Tertiary Formation
48NA312-027	12171.33	9135.12	6009.95	shatter	1	chert, cobble
48NA312-063	12074.54	9045.98	6001.78	shatter	1	chert, Goose Egg
48NA312-079	12136.79	9128.30	6007.02	shatter	1	chert, moss agate, Madison
48NA312-082	12151.40	9109.82	6009.73	shatter	1	chert, gray, Madison
48NA312-089	12107.14	9111.60	6005.07	shatter	1	quartzite, red, Madison
48NA312-115	12185.90	9110.29	6008.89	shatter	1	quartzite, red, Madison
48NA312-132	12138.10	9119.91	6007.96	shatter	1	chert, cobble
48NA312-133	12138.10	9119.91	6007.96	shatter	1	quartzite, Cloverly
48NA312-136	12134.56	9108.59	6008.43	shatter	1	quartzite, unknown
48NA312-154	12072.23	9069.53	6000.60	shatter	1	chert, cobble
SITE TOTAL COUNT				13		
48NA2516-013	11691.13	9414.53	6045.98	shatter	1	chert, other
48NA2516-014	11691.13	9414.36	6046.36	shatter	1	chert, other
48NA2516-035	11585.21	9476.74	6050.66	shatter	1	chert, other
48NA2516-065	11356.61	9612.55	6067.40	shatter	1	chert, other
48NA2516-070	11300.52	9625.52	6067.61	shatter	1	chert, Madison
48NA2516-076	11305.62	9646.21	6068.80	shatter	1	siltstone, dark
48NA2516-083	11300.17	9648.14	6068.64	shatter	1	chert, other
48NA2516-096	11287.72	9661.08	6068.54	shatter	1	siltstone, dark
48NA2516-097	11292.28	9660.73	6068.81	shatter	1	siltstone, dark
48NA2516-100	11290.70	9685.80	6068.95	shatter	1	chert, other
48NA2516-113	11298.24	9671.77	6069.12	shatter	1	chert, other
48NA2516-119	11272.98	9690.71	6067.33	shatter	1	chert, other
48NA2516-120	11274.39	9695.27	6067.35	shatter	1	siltstone, dark
48NA2516-125	11285.26	9708.94	6068.32	shatter	1	mud stone

Table 9: (continued).

CATALOG NUMBER	NORTHING	EASTING	ELEVATION	ITEM	COUNT	MATERIAL
48NA2516-164	11393.24	9618.81	6070.07	shatter	6	chert, other
48NA2516-174	11393.08	9617.05	6070.02	shatter	2	chert, other
48NA2516-180	11392.35	9613.59	6069.85	shatter	1	quartzite, Wind River
48NA2516-187	11420.94	9610.28	6070.35	shatter	1	silicified wood
48NA2516-191	11409.19	9606.63	6070.07	shatter	1	chert, Goose Egg
48NA2516-192	11407.26	9605.60	6069.99	shatter	1	obsidian
48NA2516-193	11406.60	9604.90	6069.93	shatter	1	quartzite, Morrison
48NA2516-194	11403.67	9603.38	6069.73	shatter	1	chert, Goose Egg
48NA2516-201	11789.14	9377.19	6037.72	shatter	1	quartzite, Morrison
SITE TOTAL COUNT					29	

Table 10: Summary of cortex presence data from 48NA312 and 48NA2516.

	NA312		NA2516	
Cortex Present	32	18.6%	18	9.5%
No Cortex Present	132	76.7%	161	85.2%
Cobble Cortex	8	4.6%	10	5.3%
TOTALS	172	99.9%	189	100%

Table 11: Summary of lithic material burning, from 48NA312 and 48NA2516.

	NA312		NA2516	
No Burning	6	3.4%	1	0.5%
Burning	169	96.6%	187	99.5%
TOTAL	175	100.0%	188	100.0%

Table 12: Summary of all lithic material source data from 48NA312 and 48NA2516.

LITHIC SOURCE TYPE	NA312		NA2516	
Goose Egg Chert	16	8.9%	11	4.1%
Madison Chert	8	4.5%	74	27.7%
Red Chert	25	14.0%	2	0.7%
Other Chert	72	40.2%	75	28.1%
Light Siltstone	10	5.6%	15	5.6%
Dark Siltstone	0	0.0%	7	2.6%
Madison Quartzite	0	0.0%	27	10.1%
Morrison Quartzite	14	7.8%	17	6.4%
Cloverly Quartzite	17	9.5%	17	6.4%
Wind River Quartzite	2	1.1%	2	0.7%
Obsidian	0	0.0%	1	0.4%
Opal	0	0.0%	3	1.1%
Silicified Wood	0	0.0%	4	1.5%
Moss Agate	12	6.7%	2	0.7%
Mud Stone	0	0.0%	2	0.7%
Silicified Iron Stone	0	0.0%	1	0.4%
Red Granite	0	0.0%	1	0.4%
Sandstone	3	1.7%	6	2.3%
TOTAL	179	100.0%	267	99.9%

Table 13: Summary of major lithic source types from 48NA312 and 48NA2516.

	NA312		NA2516	
Cherts	113	63.1%	87	44.8%
Quartzites	38	21.2%	63	32.5%
Other Materials	28	15.6%	44	22.7%
TOTAL	179	99.9%	194	100.0%

**OTHER EXAMINED ATTRIBUTES
CORTEX TYPE**

Three categories were defined for examining cortex type. The first two were basically presence or absence (Table 10; Figure 18). The third category was defined as cobble cortex. This was designed to see if some raw materials came mainly from ground cobbles versus material from other source localities. It appears relatively few lithic artifacts from either site exhibited any cortex, showing the relative completeness of these artifacts. Less than five percent of the artifacts from either site showed any sign of cobble cortex. This suggests most lithic sources were probably bedrock quarries in nature.

BURNING

Relatively few (less than 5%) of the total number of analyzed artifacts (Table 11, Figure 19) from these two sites showed any sign of burning (differentiated from heat treatment). In fact, at 48NA2516, only a single lithic piece showed burning, out of 188 pieces examined.

RAW MATERIAL TYPES

Seventeen categories of lithic raw material types were established for this study (Table 12). Fifteen of these were present in the various tools or other flakable debitage from the sites, while the last two

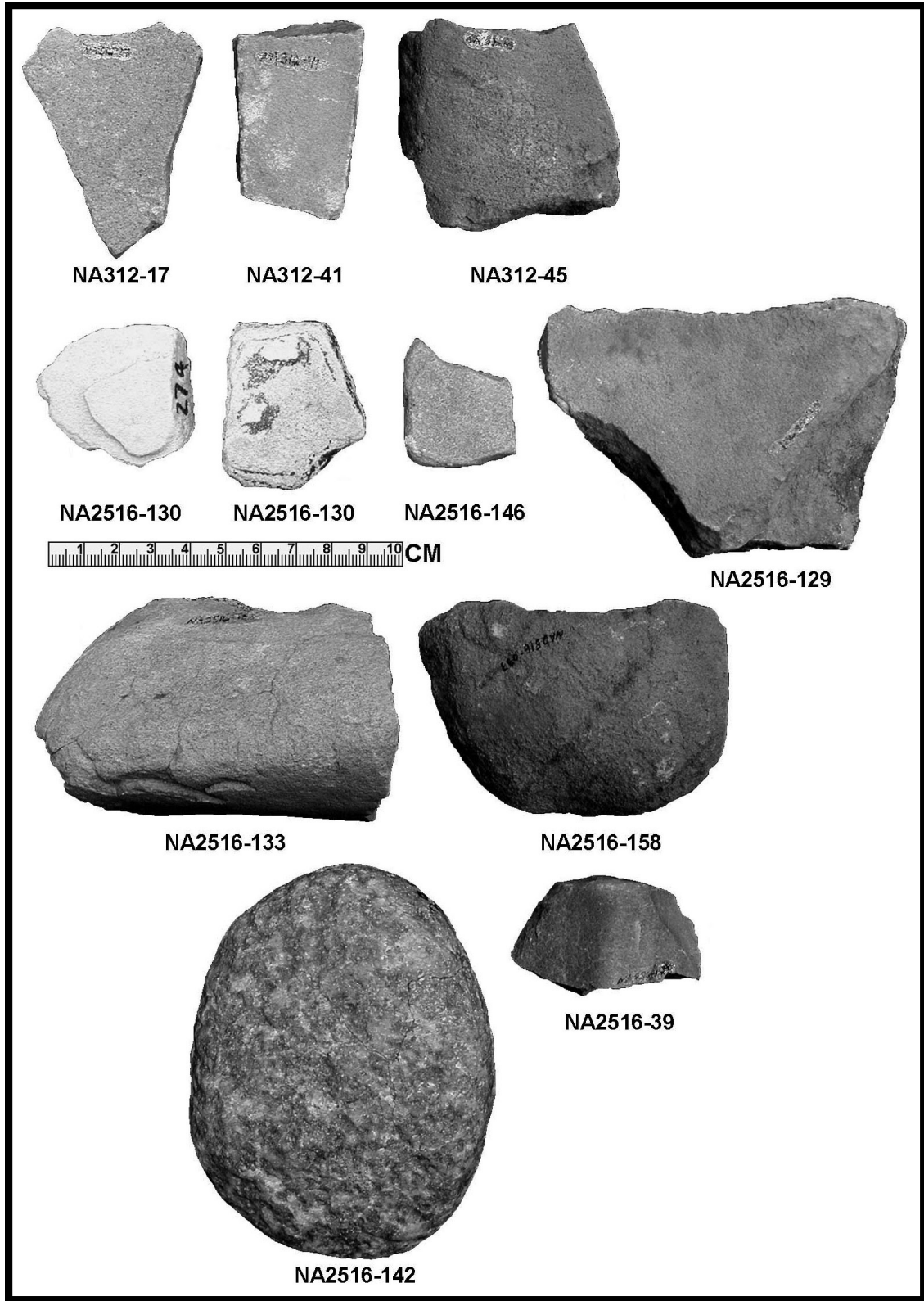


Figure 17: Ground stone and hammerstone artifacts from 48NA312 and 48NA2516.

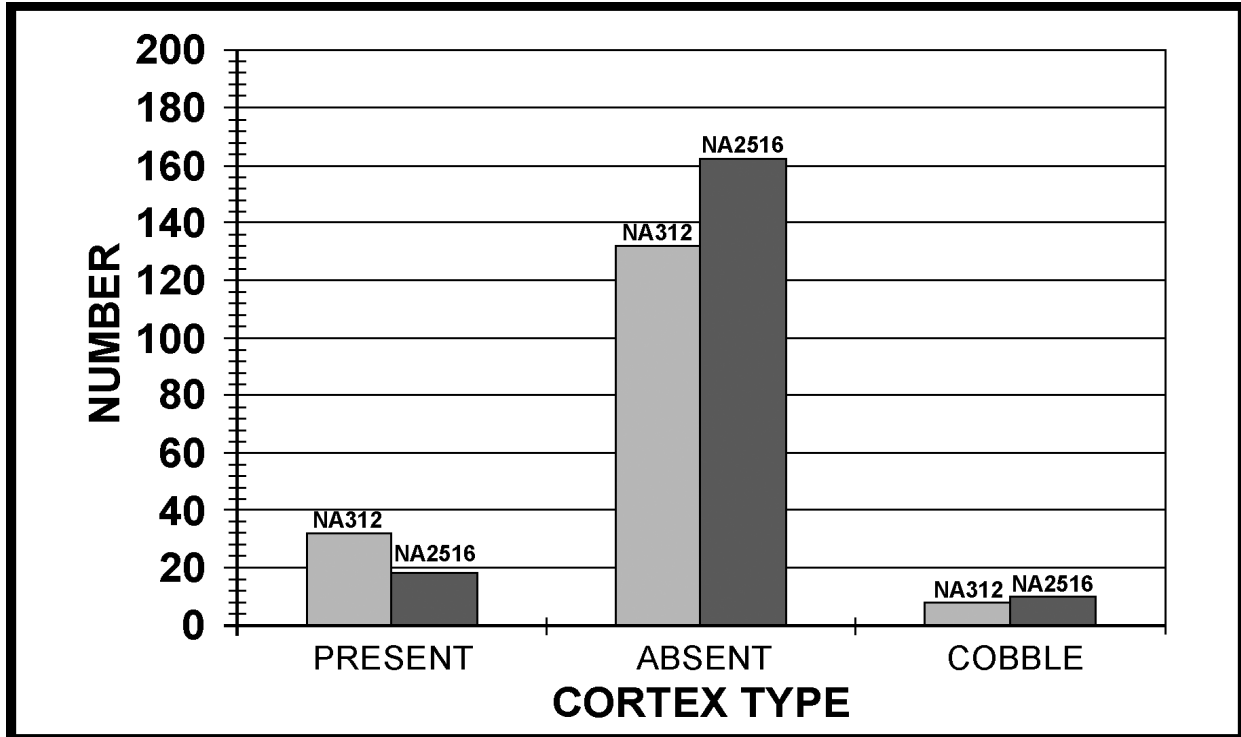


Figure 18: Summary of cortex presence data from 48NA312 and 48NA2516.

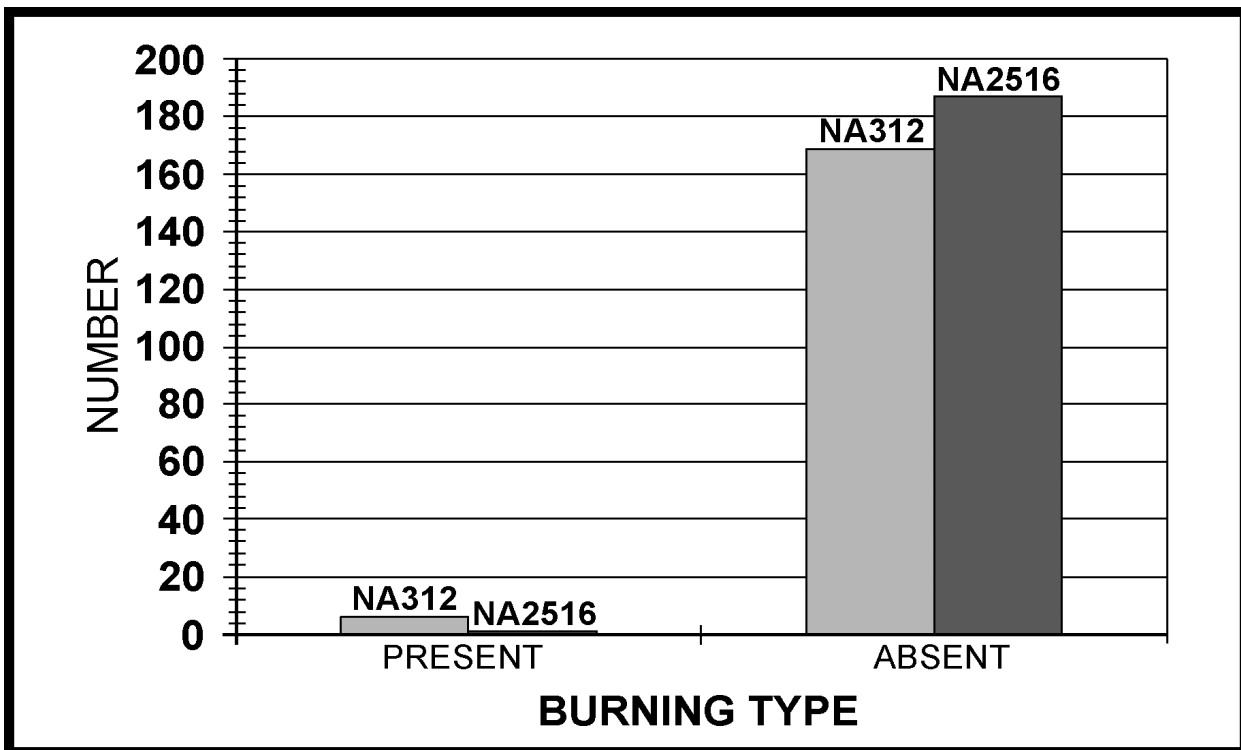


FIGURE 19: Summary of lithic material burning, from 48NA312 and 48NA2516.

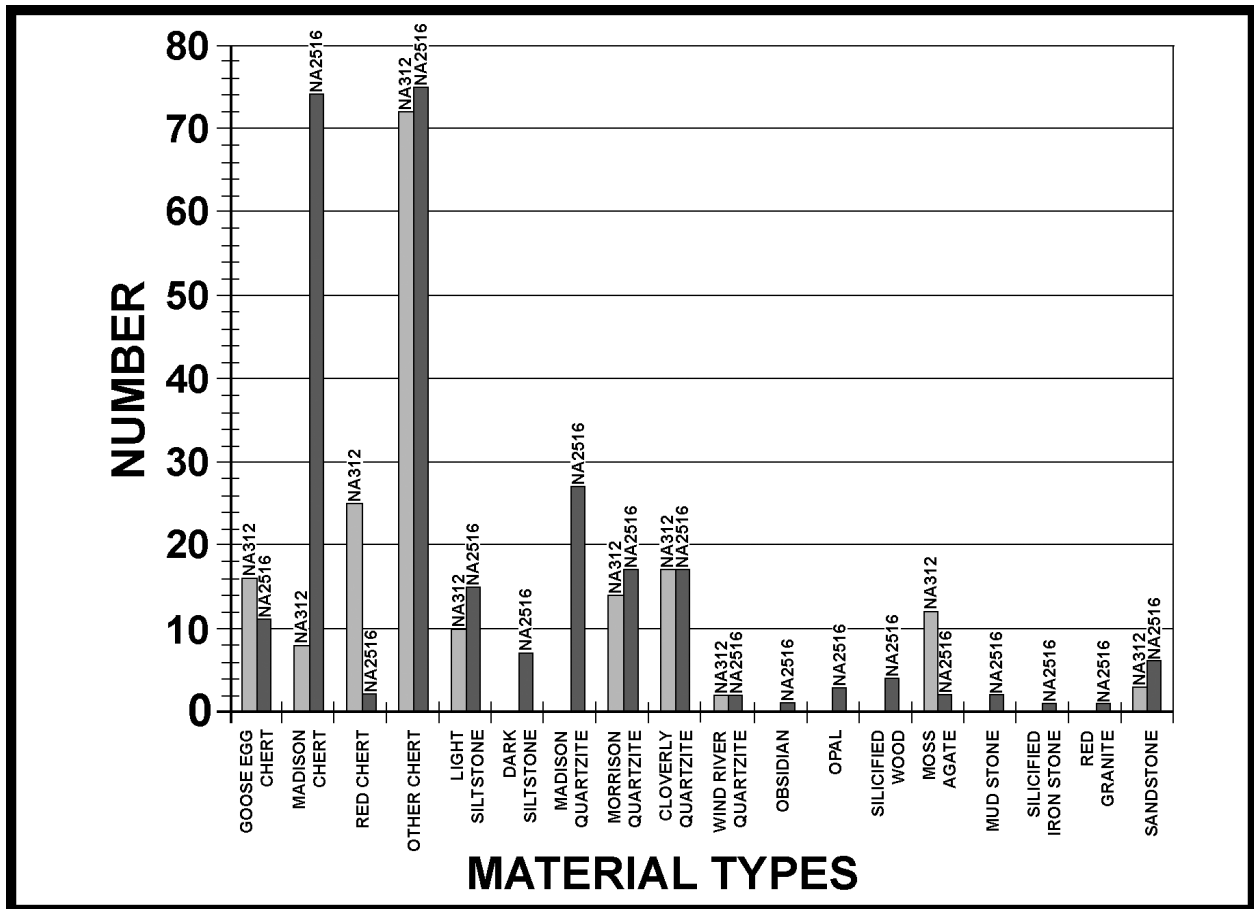


Figure 20: Summary of all lithic material source data from 48NA312 and 48NA2516.

were used as a source for hammerstones or grinding stones. While subtle, there are differences between the two sites in what type of materials were used to any extent (Table 12, Figure 19). Generally, various cherts predominate, followed by several varieties of fine-grained quartzites (Table 13, Figure 20). Several additional materials types form the remainder of those present at the sites. Cherts predominate more at 48NA312 (63% of all lithic material compared to 45% at 48NA2516), while a higher proportion of lithic material used at 48NA2516 were quartzites, but with cherts still predominating (Table 13). There were also more Madison quartzites used at 48NA2516, and more red cherts and moss agates used at 48NA312.

SUMMARY

Extensive lithic collections have been made from the surface of two archaeological sites (48NA312 and 48NA2516) near Martin’s Cove, Natrona County, Wyoming. Contrary to the original

archaeological assessment of the two sites (Griffiths and Talbot 1996), these two sites now appear to contain significant archaeological data concerning the prehistory of the central Wyoming area (NRHP Criterion D). Additional archaeological evaluation of the sites has become necessary to properly evaluate these two sites. The following recommendations are made, based on the results of this present study.

1. Additional surface collections should be made of the lithic artifacts appearing to continue to erode from the sediments.
2. Detailed lithic analyses of those collections should be conducted, following the initial procedures used in the present study. The analyses should begin with the material collected in 2001 by BLM archaeologists as soon as funding becomes available.
3. These analyses should also include more detailed studies on possible source locations for the various lithic material types recovered from the sites, including, but not

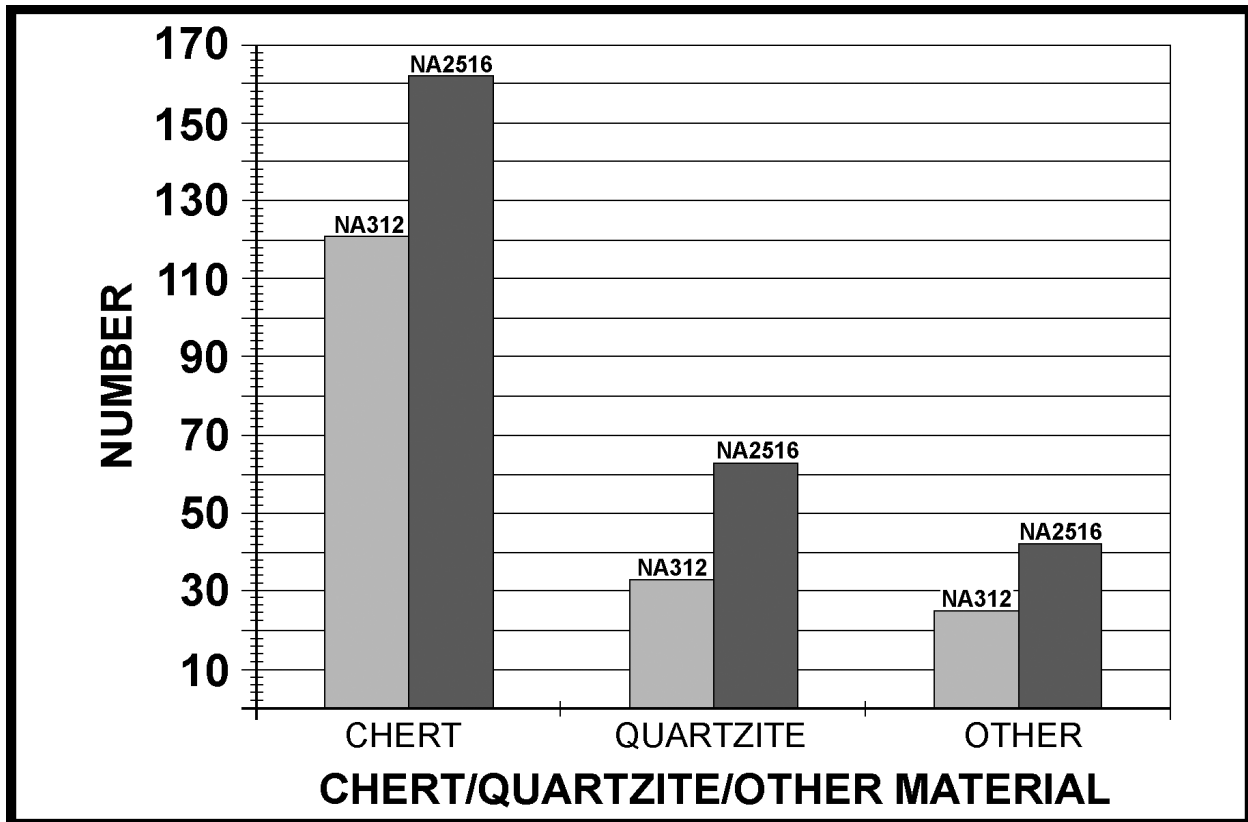


Figure 21: Summary of major lithic source types from 48NA312 and 48NA2516.

limited to, attempts to determine how far such source areas are from Martin’s Cove. Obsidian from the sites should be sourced to their origin as part of this phase.

4. The material collected in 1997 and 1999 from 48NA312 and 48NA2516, but not included in the present study, should be located and analyzed.
5. Likewise, new artifact distribution maps should be made for the two sites, incorporating all mapping data from 1997, 1999, and 2001, to look for additional artifact distribution patterns.
6. A formal testing program (treatment plan) should be developed for further evaluating the two sites. This should include, at a minimum, excavation of several block areas, not isolated 1x1 or smaller test units, examining the following concepts, but not limited to these.
 - A. These block areas should be initially placed over the known flake concentration areas determined in 1997 or other concentrations determined from

the combined artifact distribution maps (see #5 above).

- B. Block area excavations should also be placed over the recorded hearth area(s) or fire-cracked rock concentrations. Any charcoal recovered from excavated features should be carbon-dated, to examine the relationships between such features and the apparent Late Archaic age of the sites based on the projectile points.
- C. Block area excavations should also be placed over the two stone circles recorded in 1999. This will aid in determining the relationships of these two features to the remainder of the site features and artifacts.
- D. Detailed geomorphic and geologic studies should be conducted on the two sites during this testing, to examine why these two sites were preserved in the geomorphic position on which they were found.
- E. Serious consideration should be made

concerning geophysical remote sensing of the two site areas (see Walker 1999) as an integral part of this treatment plan, specifically magnetometer and soil resistance. Site sediments appear to be amenable to such studies. With proper evaluation of the remote sensing data, other specific areas for block excavation can be proposed, especially if any geophysical anomalies appear to overlap surface flake concentrations or features.

This proposed testing plan should result in sufficient data to properly evaluate the archaeological significance of sites 48NA312 and 48NA2516. Previous attempts to do so have shown this significance has not been properly evaluated. Sites 48NA312 AND 48NA2516 serve as classic examples of why subsurface evaluation of surface lithic scatters should not be based on apparent surface appearances or the random placement of scattered shovel tests. The testing strategy employed in 1996 (a series of shovel probes every 20 meters along a transect) has been shown several times over the past 10 years of Wyoming archaeology to be inadequate. Even the random placement of 1x1 meter test units over site areas has been shown to be inadequate (see Walker 1999).

The history of the archaeological investigations at the Sand Draw Dump site (Walker 1999) just north of Martin's Cove in the Wind River Basin appears similar to the sequence of studies conducted here. Initial surface indications at the Sand Draw Dump site suggested little or no soil deposition and all artifacts had been eroded to their present (1992) positions, similar to the conclusions reached by Griffiths and Talbot (1996) at the Martin's Cove sites. Archaeological excavations at Sand Draw Dump site showed that while the extant soil sediments were shallow (often less than 5-10 cm), the site also contained at least eight lodge features excavated into the Eocene bedrock below those surface soil sediments and a vast amount of data (Walker, in prep). Similar geomorphic and site preservation processes could be present at 48NA312 and 48NA2516. Geomorphic, soil and sediment types are similar between the Martin's Cove sites and the Sand Draw Dump site.

In summary, this preliminary lithic analysis of

artifacts, and the accompanying collection of additional material in 2001 has shown there is more to these two sites than at first apparent in 1996. The true archaeological significance of the two sites has not been adequately determined and additional testing must be accomplished.

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DIFFERENTIATING BETWEEN HUMAN AND NON-HUMAN PREDATION OF SMALL MAMMALS IN THE ARCHAEOLOGICAL RECORD

by
MARIT BOVEE

Small mammal remains, rodents, lagomorphs and insectivores, are commonly found within archaeological sites. However, presence does not equate to cultural use. Small mammals can become part of the archaeological record because of natural death, pitfalls, raptors and mammalian carnivores; as well as human use. Here these processes are compared and three main criteria are suggested for differentiating the cultural from non-cultural processes – environmental, archaeological context, and bone modification.

INTRODUCTION

Small mammals are commonly found on archaeological sites. These animals (Figure 1) are usually defined as being 5kg or less (Andrews 1990) and consist of the orders Rodentia (i.e. squirrels, gophers, mice) and Insectivora (i.e. shrews) and, in some cases, Lagomorphs (rabbits and hares). Most often their existence is cursed by the excavator for their tendency to disturb and severely alter the context of the site. Numerous studies have cited the destructive power of burrowing rodents; they reduce resolution on a site by blurring stratigraphic layers and feature boundaries (Erlandson 1984) and have been known to move stones up to 7cm in length (Johnson 1989). However, despite their destructive nature small mammals can be useful sources of information for the interpretation of a site. For instance they have been used successfully to reconstruct paleoenvironments (e.g. Walker 1986b) and can be used to determine subsistence strategies of past inhabitants. The difficulty with

the later is distinguishing between cultural small mammal remains and non-cultural. Though numerous ethnographic accounts provide evidence for the use of small mammals as a food use (e.g. Kroeber 1925), they are also the preferred food source of many mammalian carnivores and raptors (Andrews 1990). The objective of this paper is to outline possible criteria for differentiating between cultural small mammal assemblages and non-cultural assemblages.

SMALL MAMMALS IN THE

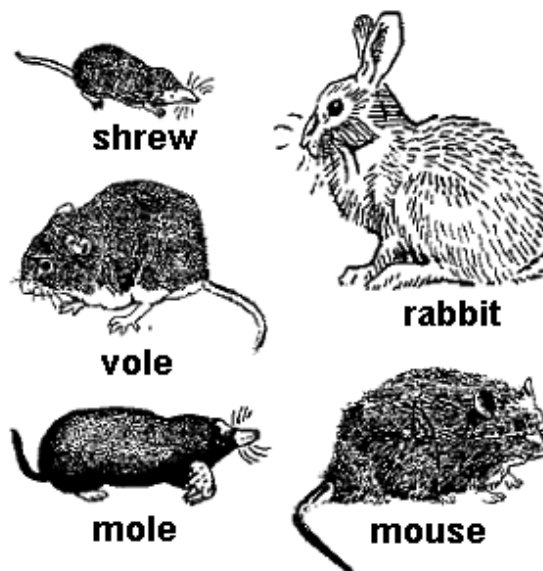


Figure 1. Examples of small mammals: mole, rabbit, common shrew, field vole, unstriped grass mouse, and hedgehog (adapted from Andrews 1990).

ETHNOGRAPHIC RECORD

The use of small mammals for food is documented where ever they and humans are sympatric (e.g. Beals 1945; Cordell 1977; Dodge 1883; Heizer 1952; Kroeber 1925; Lupo and Schmitt 2002; Lyon 1970; Shimkin 1947; Steward 1938; Swanton 1946). Small mammal use has been documented from components as early as Olduvai (Yellen 1991b) to recent ethnographic accounts (Henshilwood 1997). However, small mammal use has not been consistent, either in quantity or species through time. One variable that has been suggested as a factor for the increased use of small animals has been population (Stiner et al. 2000). Small animals were used throughout the Paleolithic in the Mediterranean, however from the Middle Paleolithic to the Late Paleolithic the type of small game shifted from tortoises and shellfish to hares and partridges. Considering tortoises and shellfish are the higher ranked species because of their larger size and ease of capture, this shift does not make much sense until the ecology of these animals is taken into account. Though higher ranked, tortoises and shellfish have a long maturation cycle and do not recover quickly from predation. In contrast rabbits and partridges mature quickly and rebound quickly. Because of this, though lower ranked and not always easy to capture, hares and partridges (and by extension other small mammals/rodents) are preferred/necessary to meet the needs of a rising human population (Stiner et al. 2000).

Though rodents are rarely considered by many people when choosing a meal, they have much to offer as a food source. Not only does the high reproduction rate of small mammals produce a high and sustainable population (den Hartog and de Vos 1974; Stiner et al. 2000) but they have a high ratio of edible meat to live weight (Stahl 1982; White 1953). One study on the edible meat of small mammals estimates that 67-76% of the animal is edible after the removal of the head and skin (Stahl 1982). This percentage is comparable to larger animals making small mammals no less productive.

Methods used to capture small mammals are varied and include nets, bows and arrows, and snares. Steward (1938) describes the use of nets in communal rabbit hunts,

“the usual plan was to place a number of long, low nets end to end in a vast semi-circle many hundred yards in diameter. A large crowd, including women and children, then beat the brush, driving the animals into the nets where they were dispatched (38-39).”

Methods of dispatchment included sticks or bows and arrows. Occasionally fire is used to capture small mammals (Steward 1938; Swanton 1946), probably to help herd the animals into a net or other trap. There are also accounts of digging into burrows after the animals (Steward 1938; Yellen 1991b), and using a hook to pull them out. A third common method for capturing small mammals is the use of a trap, either a dead fall or snare. Wood rats, ground squirrels, and mice were captured by the Luiseño of California in a “deadfall of two stones held apart by a short stick on an acorn (Kroeber 1925:652). Heizer (1952:16-17) describes a noose used by the Koniag in Alaska to capture small mammals:

“fine two-ply ... sinew cord, 49cm long, is tied to a small round shaft of wood. Under this cord is run one end of a split feather or quill 2mm wide which has a simple overhand knot tied in it to prevent its being drawn back under the cord. The noose is then formed by tying the other end of the quill in an open slip-knot around the quill shaft.”

Finally, if all else fails, small mammals can be captured with bows and arrows (Beals 1945) or simply by throwing a rock at them (Steward 1938).

Despite the size of small mammals (<5kg), it is worth the time to capture them because it often takes little effort and attempts are often successful. While nets are time consuming to make and are only effective when communally used (Bailey and Auger 1989; Lupo and Schmitt 2002), large numbers of animals can be taken in a relatively short period of time. During the net hunt described by Steward (1938:39), the group involved procured all the animals they wanted in half a day. When done communally, net hunting is more efficient, in the sense of number of animals taken in relation to

time, than individual hand capture. However, there is a higher chance of individual failure with net hunting (Lupo and Schmitt 2002:157). Because of the effort involved in net hunting, traps and snares are the most efficient means of small mammal capture (Lupo and Schmitt 2002:159). Traps and snares can be set along likely travel routes and then left, coming back occasionally to see if anything has been caught.

Individual hand capture is also fairly common and appears to be the most effective when the behavior of the animal is taken into account. Two commonly hunted small mammals by the !Kung are the springhare (an animal with an average weight of 3kg resembling a small kangaroo) and porcupine. Both of these animals are nocturnal, essentially stationary during daylight hours and construct underground burrows (Yellen 1991b). Porcupine burrows are easy to spot, by those who know what they are looking for, and are often noted while engaged in other tasks and then returned to at a more convenient time. Though it often requires a great deal of digging (up to 2 cubic meters), a single burrow can yield as many as four individuals (Yellen 1991b:8). Though not as easy to capture because of their extensive burrows and the need for specialized equipment, there is also a high rate of success for the springhare (Yellen 1991b:14).

Besides relative ease of capture, small mammals also require little (if any) processing/butchering. Yellen (1991b) describes the butchering of a springhare by the !Kung:

“The animal is skinned and eviscerated... the skull is cooked and the rear smashed with a stick to facilitated brain removal... scapulae and forelimbs are removed from the body and boiled... hindlimb is disarticulated at the acetabulum and the femur is separated from the tibia and fibula at the intervening joint...rib packages are cut from the backbone with a knife and separated at the manubrium (16)...”

None of the bones are cracked for marrow, because there is not enough to make it worthwhile. Also, most of the butchering appears to be done by hand (with the exception of the use of a knife on the ribs) for the purpose of dividing the animal

into portions that will fit in a pot. Bones such as the tibia and femur are usually broken during processing, but not intentionally.

Compared to other accounts of small mammal processing, the !Kung's treatment of the springhare, though done rather quickly, seems time consuming. In contrast, according to Dodge (1883:278), to cook/processes small game the Comanche,

“raked a hole into the ashes... the animal is placed in it and covered over with ashes and coals. After half an hour, or less, it is taken out, beaten a few times against the ground to get rid of the ashes... and devoured, entrails and all.”

A similar method was also described for the Keyauwee (Swanton 1946:368) and Luiseño (Kroeber 1925:652). These accounts mention no butchering what so ever; including no removal of the skin or entrails. Besides decreasing processing time, this method would also increase the nutritional value of the animal.

Accounts of processing with groundstone are also occasionally mentioned, usually in connection with roasting or boiling the animal. As Kroeber (1925) describes the use of groundstone by California groups, “small game was broiled on coals... whatever was not immediately eaten being crushed in a mortar – bones included in the case of rabbits – dried and stored (625).” The use of groundstone processing would also increase the nutritional value of small mammals, resulting in nearly 100% utilization of the carcass.

SOURCES OF SMALL MAMMAL ASSEMBLAGES

Besides human consumption, small mammals can become a part of an archaeological assemblage through a wide range of processes, including natural death, pit falls, and the result of accumulation by raptors or mammalian predators. Each of these processes affect the bones in slightly different ways and can often be identified by looking at archaeological context, bone modification, and environmental context (Table 1).

Here archaeological context refers to the location on the site small mammal bones are found. Though rare it is possible for animals to die in a

burrowing failure. These failures can be caused by intraspecific fighting, flooding or other catastrophic event, or during hibernation (Andrews 1990; Morlan 1994). Unless scavenged, natural deaths result in complete skeletons that are usually isolated (except in the case of a catastrophic event) and will typically be found in the collapsed burrows.

Small mammal remains can also be found in both natural and cultural pit features. As most archaeologists who know, it is not uncommon to find mice and other small critters in test excavation units. Besides commonsensical observation, there are documented instances of small mammals entering pits both accidentally and on purpose, having been attracted by the contents of the pit (Whyte 1991). Also, given the ethnographic use of small mammals it is entirely possible that remains could be found in refuse pits. Cultural versus natural entrapment can be distinguished with a number of characteristics. In cases of natural entrapment small mammal remains are more likely to be concentrated at the bottom of a pit (Whyte 1991) at least 40 cm deep (most species are able to escape anything shallower). The skeletons would also be complete and biased toward non jumping species and younger individuals without the experience to avoid the pit in the first place (Andrews 1990:3). Along the floor and lower walls of the pit there also may be evidence of digging, where the animal tried to get out. In contrast, cultural remains are more likely to be disarticulated, partial skeletons found throughout the pit (not concentrated in one particular strata), rather than complete skeletons.

Also they would be mixed in with other refuse (Whyte 1991), part of an assemblage containing multiple species. Concentrations consisting only of small mammals are not uncommon but none of these caches have ever been reported as cultural. A quick search of the ethnographic record showed no evidence for small mammal caches or storage, on the other hand, smaller predators have been known to cache up to 70 or 80 individuals of the same species (Andrews 1990:26). These caches, if not returned to, would create a large assemblage of complete skeletons that would resemble cultural storage, if it did occur.

Besides context, non-cultural sources of small mammals on archaeological sites can be identified by modification to the bone. Mammalian predators, including animals in the canid, mustelid, and felid families, cause a great deal of bone modification because of shearing teeth that break up the bone before digestion. Diurnal birds of prey such as falcons and eagles also cause a great deal of breakage while owls, by swallowing their prey whole cause very little breakage (Andrews 1990). However, in all cases, small mammal prey the skulls rarely survive intact, at the very least the back of the skulls are broken (Andrews 1990:53). Humans also cause breakage to the bone (Hockett 1991, 2000; Yellen 1991a, b) and in some cases can be distinguishable from other predators. Unlike other predators, human breakage focuses on the joints (distal and proximal ends of bones) where it is easier to dismember the carcass into pieces that will fit in a pot (Frison and Stanford 1982; Yellen 1991b). Also,

Table 1: Comparison of characteristics of cultural and non-cultural assemblages, may or may not be present (\pm), not present (--), present (+).

	Cultural	Non-cultural
Complete Skeleton	--	\pm
Partial Skeleton	\pm	\pm
Breakage – all elements	\pm	\pm
Breakage – isolated elements	\pm	\pm
Cut marks	\pm	--
Tooth Marks	\pm	\pm
Digestive damage	\pm	\pm
Burning – patterned	\pm	--
Burning – random or complete	\pm	\pm
Environmental niche – several	\pm	\pm (unlikely)
Environmental niche – single	\pm	+

though not common because of their small size, marrow extraction of lagomorph long bones often results in tube like cylinders (Hockett 1991, 2000).

“Bone marrow was available by removing epiphyses of long bones and either sucking out the contents, or pushing marrow out of the diaphysis with a slender object such as a stick. This behavior produces open-ended diaphysis cylinders with jagged or spirally fractured ends (Hockett 1991:668).”

With the exception of larger members of the order rodentia (e.g. porcupines (Yellen 1991b) and beavers), cut marks are not common on small mammal bones. As seen in the ethnographic examples above, small mammals require little butchering prior to consumption. Though when they do occur, cut marks are a clear indication of cultural used.

A recent study showed that human mastication of small mammal bones during consumption leaves marks on the bone in the form of pits and scoring (Landt 2007). The damage is focused on the proximal and distal ends of long bone elements, caused during the removal of cancellous bone tissue. However these marks are superficial and only occur on larger sized species in the small mammal spectrum; the bones of microtines are more likely to disintegrate under pressure than preserve tooth damage (Landt 2007). Also, while the occurrence of human tooth marks may be noteworthy under certain circumstances, it is not here. Non-human mammalian carnivores leave similar marks on bone (Andrews 1990; Landt 2007), making the two processes indistinguishable from each other. More often than not, puncture marks left by raptors and felids (Andrews 1990) would be easier to identify.

Burning is another type of bone modification that has been used to distinguish cultural assemblages (Frison and Stanford 1982; Henshilwood 1997; Kysely 2008; Simonetti and Cornejo 1991; Walker 1986a). A study of mole-rats in South Africa revealed distinctive burning patterns on both archaeological and ethnographic specimens (Henshilwood 1997). Ethnographic observations showed that mole-rats were cooked by placing the carcass on its back in hot coals, covered with more

coals and left to bake for 30 minutes. Because they were cooked whole, thick fur protected the skeleton from burning except on the lower incisor and premaxilla (which is covered with a thin layer of hairless skin). This pattern of charring on the exposed elements was also found in archaeological contexts, making the conclusion that they were the result of cultural activities highly plausible. Because natural fires can also char small mammal remains, burning must be used cautiously to indicate cultural deposits. It is more important to look for patterns of burning rather than charring itself. For instance, natural fires would be more likely to burn elements more homogeneously, rather than selected elements.

Finally, digestive damage occurs to a certain extent with all carnivores (Andrews and Nesbit Evans 1983; Crandall and Stahl 1995; Mellett 1974). When the bones are swallowed, digestive acids in the stomach (and intestines of mammals) cause distinctive corrosion and pitting of the bone (Andrews 1990:32). A study conducted fairly recently, showed that this digestive damage also occurs on small mammal bones consumed by humans (Crandall and Stahl 1995); a shrew was trapped, eviscerated, segmented into manageable portions, boiled for 2 minutes and swallowed with as little mastication as possible. Two days later the bones were examined for digestive damage. Unfortunately the bones only showed that humans were large carnivores; digestive damage done by humans is comparable to other mammalian carnivores and not diagnostic (Crandall and Stahl 1995). However, it is more likely that any small mammal bones found on an archaeological site with digestive damage are the result of mammalian carnivores rather than humans, unless context suggests otherwise. Though the ethnographic corroboration was not sought out, personal experience suggests humans are likely to move some distance away from the immediate activity area before depositing digested small mammal bones.

Environmental context is a final indicator sometimes used to determine whether or not an assemblage is cultural. The term is used here to refer to the overall make-up of the assemblage, the species that are represented and their ecological/behavioral characteristics. Small mammals, particularly microtines have very specialized niches.

While it is plausible that a species could be deposited out of their natural environment within carnivore scat (Mellett 1974) that same carcass is more likely to be cultural if it is part of an assemblage rather than an isolated find. For instance at the Medicine Lodge Creek site in Wyoming, pika (*Ochotona princeps*), was found in the assemblage. This species occupies coniferous montane forests rather than the niche of the site (Walker in press). While it could be argued that it is intrusive or indicates a vegetational change, because it was part of an assemblage composed of animals from multiple life zones, it was argued to be cultural.

Also, assemblages left by humans are likely to be more heterogeneous than those left by mammalian carnivores and raptors. Though non-human predators are largely opportunistic in the species taken as prey, the predator's own habitat and behavior affect the composition of their associated assemblages (Andrews 1990:29). For instance, nocturnal hunters including owls and most mammalian carnivores will catch only those species active during the night and vice versa regardless of what is available in the area. In the Serengeti, the grass mouse (*Arvicanthis niloticus*) is the most common rodent in the region but is not present in eagle owl assemblages because the mouse is diurnal while the owl is active only at night (Andrews 1990:29-30). Habitat will also affect the assemblage, for instance, species that prefer thick undergrowth (i.e. voles) will not be represented in predator assemblages that hunt in open country (i.e. buzzard). Though opportunistic, many predators show a preference for specific prey. During the summer months, examination of coyote (*Canis latrans*) scat showed it dominated by lagomorphs (Andrews 1990:205). If anything, humans are even more opportunistic hunters than non-human predators. By using a wide variety of hunting techniques and ranging far afield they come into contact with more species than the average owl or coyote. What is not caught in a net can be caught by hand or in a snare. This has implications beyond the capture of small mammals and often results in assemblages that contain both large and small animals. For instance, the Rodent Level Faunal assemblage at the Medicine Lodge Creek site in Wyoming is clearly a cultural assemblage (Walker in press). This assemblage contains a large amount of rodent re-

mains but it also includes fish, reptiles, birds, and artiodactyls; creating an assemblage that is much more diverse than anything a non-human predator could produce.

DISCUSSION

Examples of rodent assemblages in the archaeological record show how these criteria have been applied. More than anything else, Table 1 shows that it is impossible to simply point to an assemblage and conclude that it is cultural based on one characteristic. In Wyoming, sites that have good evidence for small mammal use include Medicine Lodge Creek and Agate Basin. At Medicine Lodge Creek, the assemblages were considered cultural unless there was reason to believe otherwise but there were a number of factors that indicated human use as well (Walker 1986a, in press). In addition to its large size, which included a minimum of 101 pocket gophers (*Thomomys talpoides*), 135 bushy-tailed wood rats (*Neotoma cinerea*), 134 long-tailed voles (*Microtus longicaudus*), and 180 sagebrush voles (*Lagurus curtatus*); the faunal assemblage contained species from multiple habitats, suggesting collection over a wide area. The context of the assemblage within the site itself, association with lithic artifacts and fire hearths, also suggests it is cultural.

At the Agate Basin Site multiple lines of evidence were used to determine that the faunal assemblages from the Folsom and Hell Gap components were cultural. The first clue to human consumption was the high concentration of small mammal, both rodent and lagomorph, in these components compared to other components of the site. Besides cut marks on the jack rabbit (*Lepus*) bones, there was a pattern of bone breakage at the distal end of tibiae (Frison and Stanford 1982:273-274). Though the rodent bones showed no evidence of cut marks (probably because of their size), patterned burning was evident. The mandibles of masked shrews (*Sorex cinereus*), long-tailed vole (*Mifotus longicaudus*), and striped skunk (*Mephitis mephitis*) were described as burned (Frison and Stanford 1982). The lack of charring on other elements suggests that the carcasses were roasted, thick skin and flesh preventing further bone modification (Henshilwood 1997).

CONCLUSION

With careful excavation, small mammals can be found on nearly every carefully excavated archaeological site. While it is tempting to either dismiss them all as intrusive or as culture, as the previous discussion shows, the mere presence of small mammal bones is not enough to draw either conclusion.

Three important criteria are the archaeological context, modification to the bone, and environmental context. All three provide another piece to the puzzle and can be used to eliminate remains and assemblages that are the result of non-cultural factors. Though it is easy to make a checklist of criteria (Table 2), there is no foolproof method available to determine whether an assemblage is cultural or not. With the exception of cut marks on the bone, there is no single cultural indicator. In order to determine if an assemblage is the result of human activities, each assemblage needs to be carefully evaluated independently within context.

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Table 2: Cultural or not checklist.

1. Species represented
 - a. Are they from the same ecotone?
 - b. Are they from different ecotones?

 2. Are the specimens located in or near a pit feature or hearth?
 - a. No
 - i. Is it an isolated carcass? -- STOP
 - ii. Are there multiple individuals represented?
 - b. Yes

 3. What is the condition of the skeleton?
 - a. Complete? -- STOP
 - b. Partial?

 4. Is there bone modification?
 - a. Digestive damage? – STOP
 - b. Breakage?
 - c. Burning?

 5. Is there any pattern to the bone modification?
 - a. No -- STOP
 - b. Yes – for example specific elements are overrepresented or consistently show charring

 6. Congratulations – the assemblage might be cultural!
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ARCHAEOLOGISTS MEET: Members of the state executive board of the Wyoming Archaeological Society met with a Casper group Saturday night to launch the organization of a Natrona County chapter of the society. The meeting was held at the Steakhouse. Left to right: Al Damont, editor; Don Grey, vice president; G. D. Sweem, president, and Dr. R. C. Bentzen, secretary-treasurer, all of Sheridan --- (Tribune-Herald Photo).