BLM Arizona

District Archaeological Technician

Participant's Guide

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Preamble of the 1966 National Historic Preservation Act

Section 1 of the National Historic Preservation Act, Pub. L. No. 89-665, as amended by Pub. L. No. 96-515:

… (b) The Congress finds and declares that—

(1) the spirit and direction of the Nation are founded upon and reflected in its historic heritage;

(2) the historical and cultural foundations of the Nation should be preserved as a living part of our community life and development in order to give a sense of orientation to the American people;

(3) historic properties significant to the Nation's heritage are being lost or substantially altered, often inadvertently, with increasing frequency;

(4) the preservation of this irreplaceable heritage is in the public interest so that its vital legacy of cultural, educational, aesthetic, inspirational, economic, and energy benefits will be maintained and enriched for future generations of Americans;

(5) in the face of ever-increasing extensions of urban centers, highways, and residential, commercial, and industrial developments, the present governmental and nongovernmental historic preservation programs and activities are inadequate to insure future generations a genuine opportunity to appreciate and enjoy the rich heritage of our Nation;

(6) the increased knowledge of our historic resources, the establishment of better means of identifying and administering them, and the encouragement of their preservation will improve the planning and execution of Federal and federally assisted projects and will assist economic growth and development; and

(7) although the major burdens of historic preservation have been borne and major efforts initiated by private agencies and individuals, and both should continue to play a vital role, it is nevertheless necessary and appropriate for the Federal Government to accelerate its historic preservation programs and activities, to give maximum encouragement to agencies and individuals undertaking preservation by private means, and to assist State and local governments and the National Trust for Historic Preservation in the United States to expand and accelerate their historic preservation programs and activities.

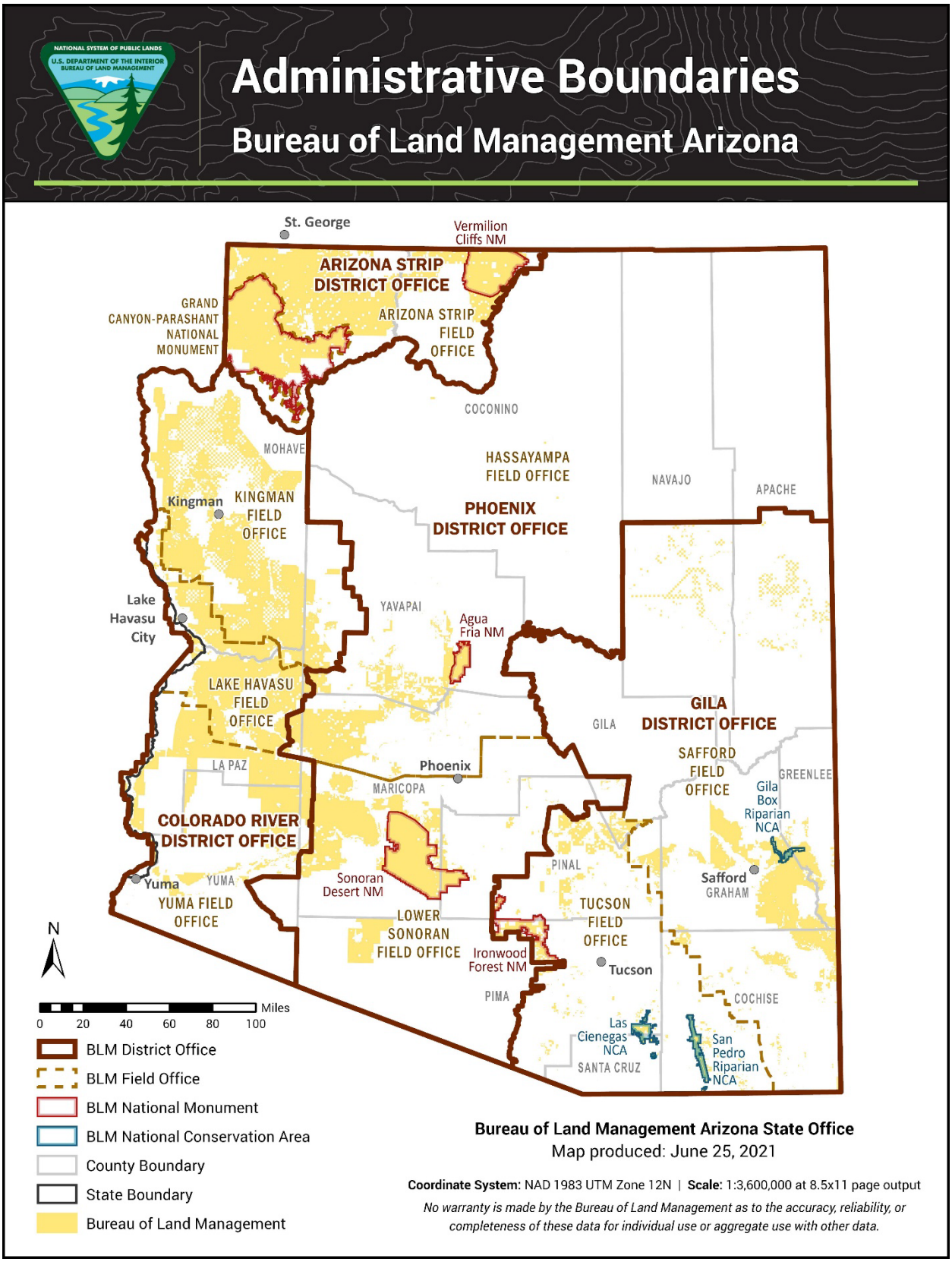

Figure 1. Map depicting the BLM Arizona administrative units discussed in this guide.

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Introduction to the Cultural Heritage Program

The Bureau of Land Management (BLM), Arizona administers 12.2 million surface acres of public lands, and another 17.5 million subsurface acres within the State. With offices throughout the State providing on-the-ground field management, the BLM Arizona balances recreational, commercial, scientific, and cultural interests, striving for the long-term protection of renewable and nonrenewable resources, including range, timber, minerals, recreation, watershed, fish and wildlife, wilderness, wild horses and burros, and natural, scenic, scientific, and cultural values.

The BLM Arizona's public lands contain a wealth of cultural resources that are important to our understanding of both recorded history and prehistory. The BLM Arizona's public lands are also the ancestral homelands to 37 federally recognized Indian tribes who ascribe traditional cultural values and sacredness to the Arizona landscape. These resources and the lands they are tied to represent a priceless heritage which must be protected for future generations. As of October 2021, 4,432 investigations have surveyed 918,830 acres and recorded 16,755 cultural resource sites on Arizona's public lands. Of these cultural resources, two are National Historic Landmarks, 21 historic properties are listed on the National Register of Historic Places, and 18 historic properties are interpreted and developed for public visitation.

The Arizona Cultural Heritage Program manages perhaps the most significant, best preserved, and dense concentrations of cultural resources in the BLM. The cultural resources located on the BLM Arizona's public lands are diverse and representative of nearly every period studied by archaeologists. Evidence for human use of Arizona's public lands date back 12,000 years to the Paleoindian period (12,000 B.P.–9500 B.P.) and provides us with valuable data regarding the peopling of the New World and megafaunal extinction. Two National Historic Landmarks, the Lehner Mammoth Kill Site and the Murray Springs Clovis Site (Figure 2), are well-studied Paleoindian period sites managed by the Tucson Field Office (TFO). Located throughout the BLM Arizona's public lands there is a pronounced Archaic Period (9500 B.P.–A.D. 200) component that provides valuable evidence of the transition to agriculture when early humans abandoned hunting and gathering and adopted new subsistence strategies. Arizona's public lands contain thousands of Ceramic Period (A.D. 200–A.D. 1500) sites representing major archaeological traditions such as the Hohokam, Patayan, Sinagua, Mogollon, Salado, and Anasazi. Evidence of these archaeological traditions are located throughout the BLM Arizona and are highlighted by the Blythe Intaglios and Sears Point Petroglyph sites located on the Yuma Field Office (YFO), Painted Rock Petroglyph site located on the Lower Sonoran Field Office (LSFO), Turkey Creek located on the Safford Field Office (SFO), Pueblo La Plata located on the Hassayampa Field Office (HFO), and Uinkaret Pueblo within the Grand Canyon-Parashant National Monument (GCPNM).

Historical period archaeological sites managed by the Cultural Heritage Program are equally impressive. The Spanish Period (A.D. 1540–1821) is characterized by the search for wealth and the political and religious mission to convert Native American groups to Christianity. The Juan Bautista de Anza National Historic Trail administered by the YFO and LSFO, and the Presidio Santa Cruz de Terranate managed by the TFO are two noteworthy Spanish Period cultural resources located on public lands. The SFO has numerous sites that date to the Mexican Period (A.D. 1821–1854) which witnessed the first contact between Apache and Anglo-Americans. The Anglo-American Period (A.D. 1854 to present) is quite a fascinating era in Arizona's

history. The spirt of the Old West comes alive at the Fairbank Historic Town Site, an interpretive site expertly managed by the TFO. Fairbank is a "ghost town" dating back to 1881 and was the closest railroad stop to Tombstone and could have very likely seen the likes of Wyatt Earp and Doc Holliday.

It is clear by this abbreviated cultural history that the cultural resources managed by the BLM Arizona's Cultural Heritage Program are significant. What is not universally understood is that cultural resources – especially archaeological data – are also environmental data. Archaeological data provides land managers with the longest available record of human interaction with a changing environment. Archaeological data provides a temporal context for environmental conditions reflected in charred plant remains, animal bone, soil deposition, carbon isotopes, and pollen that can be bracketed in time by the presence of artifacts and living surfaces altered by human occupation. Cultural Resources provide a record of human behavior within the ecosystem and a meaningful context for the BLM to assess the existing condition of a landscape.

The Cultural Heritage Program's primary purpose is to identify, protect and preserve the cultural and paleontological resources on the BLM Arizona's public lands. These cultural resources hold clues to past ecosystems, add richness and depth to our landscapes, provide links to modern living traditions, and help transform a visit to our public lands into an unforgettable encounter with the past. Arizona Cultural Heritage Program archaeologists strive to protect these significant resources, communicate the value and meaning of cultural resources with the American people, and contribute relevant information and perspectives to natural resource management. In so doing, we will ensure that future generations will have an opportunity to discover the human story etched on our public lands, make the past come alive as a vibrant part of our recreational experiences and community life, and connect people to the land in a way that will help us manage all resources, both natural and cultural, on public lands in Arizona.

District Archaeological Technician Program Objectives

The District Archaeological Technician Program (DATP) was established to increase capacity of the cultural heritage program in the identification, protection, and preservation of cultural and paleontological resources located on Arizona's public lands. A certified District Archaeological Technician (DAT) can increase the capacity of the cultural heritage program by:

- Added field capacity in the identification and recordation of resources
- Perform small inventories
- Record small sites
- Prepare site records and maps
- Prepare draft reports
- Perform reconnaissance checks to verify presence/absence of resources
- Perform archaeological monitoring of limited ground disturbing activities
- Assist field office cultural specialists in achieving program elements

DATP Stipulations

To participate in the DATP, District and Field Managers agree to the following Stipulations:

1. District Managers and Field Managers must approve participation in the DATP.
2. Personnel must receive the approval of their direct supervisor to participate in the DATP.
3. Field Office cultural specialists will administer and oversee the DATP.
4. For offices with more than one cultural specialist, the Field Manager shall designate one cultural specialist to administer and oversee the DATP.
5. Field offices must have at least one permanent cultural specialist (i.e., GS-0193-11 or higher) on staff to participate in the DATP.
6. Field Office cultural specialists must concur with the proposed use of the DATP on a project-by-project basis in consultation with the appropriate manager.
7. Field Office cultural specialists will conduct a yearly 3-day training to certify new and/or existing DATs. The certification of a DAT is at the discretion of the cultural specialist.
8. DATs receive annual certification by successful completion of the yearly 3-day training consisting of one day of classroom study and two days of field training.
9. Fieldwork completed during the two days of field training may be used to achieve District/Field Office L1050 Subactivity program elements (i.e., "targets") such as BC – Acres of Heritage Resources Inventoried and FD – Heritage Resources Intensively Recorded.
10. The use of non-BLM employees is not authorized with one exception. A District or Field Office may consider the use of Site Stewards or Tribal members provided that a volunteer agreement is appropriately issued.
11. DATs will not evaluate cultural resources for National Register of Historic Places (NRHP) significance or make determinations of eligibility for the NRHP.
12. DATs will not conduct condition assessments under the Archaeological Resources Protection Act or make findings of effect under the National Historic Preservation Act.
13. DATs will not collect or perform any mitigation.
14. DATs will not survey in high-site density areas or record large or complex sites unless the cultural specialist concurs with use of the DATP in those situations.
15. DATs will be directly supervised by the field office cultural specialist or an archaeologist who meets the Secretary of the Interior's professional standards, or an archaeologist who meets the Office of Personnel Management GS-0193-series grade 11 or higher, for all fieldwork and preparation of documentation or draft reports.
16. At the discretion of the field office cultural specialist, a DAT who has successfully participated in the DATP with good performance for two years, may perform small surveys of less than one acre unsupervised, or monitor ground disturbance within small projects less than one acre unsupervised (e.g., installation of a cattle guard, performing a reconnaissance survey of an AIM plot, etc.).
17. BLM offices should consider potential conflict of interest or ethics violations when using the DATP (e.g., a Range Specialist who performs DAT duties for a range improvement project).

18. DATs may be removed from the DATP for poor performance at the discretion of the field office cultural specialist with approval from the appropriate manager.
19. The DATP and DAT are subject to all other Federal, State, and local laws and regulations applicable to the public lands and resources.
20. Archeological project design, literature review, development of the regional historic context framework, site evaluation, and recommendations for subsequent investigations must be developed with direct involvement of an archeologist who meets the Secretary of the Interior's Standards for Archeology and Historic Preservation; fieldwork must be overseen by an individual who meets the Secretary of the Interior's Standards for Archeology and Historic Preservation.

What is Archaeology?

Archaeology is the scientific study of past cultures through analysis of material remains. In the United States, archaeology is most commonly a subfield of anthropology. ***Anthropology*** is the study of human origins and evolution, present conditions of human life, and future prospects. It considers human beings as biological and social entities and seeks to explain both diversities and commonalities of peoples and cultures. Archaeology helps us understand the past more thoroughly. Written history is often focused on the opinions and experiences of the person writing or creating the documents. Since most writers in the past were affluent white males, historic documents typically reflect their view of the world, knowingly or unknowingly. Archaeology allows for others, such as descendent communities, to be included in the understanding we have of the past.

Survey and excavation are only a small part of what an archaeologist does. In addition to fieldwork, archaeologists spend a great deal of time conducting research and scientific inquiry, writing, illustration and photography, computer analysis, artifact and ecofacts analysis, and statistical analysis. A large portion of a federal archaeologist's time is devoted to regulatory compliance which involves consultation with diverse stakeholders such as State and Tribal Historic Preservation Officers (SHPO/THPO), federally recognized Indian Tribes, other federal, state, and municipal agencies, and members of the public.

Material remains, sometimes referred to as material culture, consist of artifacts, architecture, biofacts or ecofacts, and landscapes. An ***artifact*** is any object made, modified, or used by humans. In common usage, artifacts are portable items such as implements made of stone, bone, pottery, or other durable material. Artifacts can include prehistoric tools and debris, bone tools, ceramics, groundstone, shell beads and pendants. Historic artifacts can include metal cans and containers, nails and tacks, glass bottles, porcelain plates and bowls, and spent munitions. ***Features*** are non-portable cultural components such as hearths, campfire rings, roasting pits, or wells. ***Ecofacts*** or ***Biofacts*** are non-artifactual objects that have not been technologically altered by humans but have relevance for archaeological research, such as non-modified shell, seeds, pollen, animal bone, pollen, insects, packrat middens, charcoal, etc.

Cultural resources include archaeological, historic, or architectural sites, structures, or places with important public and scientific uses, and may include definite locations (sites or places) of

traditional cultural or religious importance to specified social and/or cultural groups. The Federal Land Policy and Management Act of 1976 recognizes cultural resources as fragile, irreplaceable resources with potential public and scientific uses, representing an important and integral part of our Nation's heritage. More importantly, cultural resources represent the cultural heritage to 37 federally recognized Indian Tribes with ancestral ties to Arizona.

According to the National Park Service, a ***cultural landscape*** is a geographic area that contains a variety of cultural and natural resources that culturally affiliated groups define as possessing cultural value. A cultural landscape has prominent or distinctive aspects, qualities, or characteristics that contribute significantly to its physical character. Cultural landscapes include human-modified ecosystems such as forests, grasslands, plant communities, and animal habitat. Landscapes have significance in American history through characteristics such as natural systems and features, topography, land use, cultural traditions, views and vistas, archaeology, and spatial organization.

The most common cultural resource present on Arizona's public lands are archaeological sites. An ***archaeological site*** is a discrete location on the Earth where some sort of human activity took place, and the material remains of that activity are preserved. There are many types of archaeological sites in Arizona, the most common are artifact scatters. Other common archaeological sites in Arizona include rock circles and rock alignments, standing walls and architecture, intaglios and cleared circles, trails, shrines, petroglyphs and pictographs, and rock shelters. Historic buildings and structures associated with historic period mining are also common in Arizona.

Goals of Archaeology

The goals of archaeology are limitless. Some of the more common goals are to reconstruct past lifeways and behaviors, establish chronologies, examine how humans interacted with their natural environments, and to understand how cultures have adapted and changed over time. Modern archaeology is considered a multidisciplinary science using methods of inquiry from other scientific fields such as biology, chemistry, geology, mathematics, and physics to achieve the goals of archaeology.

Historic Contexts

In archaeology, context is everything. Artifacts, features, and ecofacts are integral to an archaeologists' understanding of historic context. The historic ***context*** organizes information based on a cultural theme and its geographical and chronological limits. Contexts describe the significant broad patterns of development in an area that may be represented by archaeological resources. Historic contexts are the foundation for decisions about identification, evaluation, and treatment of archaeological resources. When artifacts are looted or when sites are illegally excavated, the historic context is compromised and the relationship of one cultural resource to another harder to understand.

Documenting context is a primary responsibility of agency archaeologists and DATs. A primary objective of the BLM cultural heritage program and the DATP is precise data collection, making

detailed notes of observations, producing accurate maps, and taking high-resolution photographs. Archaeologists are keen observers of the environment when identifying and recording cultural resources. In addition to the material culture observed at a site, it is important to note the physiographic and environmental settings present, including but not limited to topography, soils and vegetation, wildlife, and weather patterns. As land managers, BLM archaeologists and DATs must also make detailed observations of site impacts, both natural and human caused. Impacts to observe include natural erosion such as alluvial, aeolian, and colluvial forces. ***Aeolian*** is erosion caused by wind. ***Alluvial*** is erosion is caused by water. ***Colluvial*** is erosion caused by gravity seen in rock detritus and soil accumulation at the foot of a slope. The sun emits a broad range of wavelengths such as x-rays and ultraviolet light that can accelerate decay in wood, plastics, rubber, and other materials. These natural phenomena constitute the ravages of time, slowly but surely erasing our past.

Human caused impacts are the most damaging to cultural resources. There are two types of human cause impacts to cultural resources: 1) inadvertent, and 2) malicious. ***Inadvertent*** impacts are the result of a person being unaware of the presence of cultural resources and their value, and most commonly lack malice. ***Malicious*** impacts are caused by a bad actor who does not share the same values as others in society. Other than development, recreation represents the number one threat to cultural resources. One of the most prominent impacts observed by cultural resource managers are caused by off-road vehicles. People often ride through archaeological sites on off-road vehicles, crushing and displacing artifacts and features, and inadvertently diminishing the historic context of the site. Cultural resource managers have documented damage caused by rock climbers – a group usually associated with leave no trace environmental ethics – who unwittingly drive climbing bolts into faint pictographs. In Arizona, recreational shooting is a problem that frequently damages petroglyph sites, historic buildings, and artifacts. Looting and defacing are examples of malicious impacts. ***Looting*** is the willful theft of artifacts or other types of cultural resources for personal use or monetary gain; looting can consist of surface artifact collection to subsurface excavation. ***Defacing*** may consist of carving initials or modern images in a prehistoric petroglyph panel or spraying graffiti on historic buildings.

Archaeology as Science

Archaeology can address a wide range of questions about the past. For instance, archaeologists can determine the age of site, learn about subsistence, human diet and health, technology, settlement patterns, trade and economic systems, mobility, religion, mortuary practices, social organization, transportation, and better understand the physical and sociopolitical environment of the past. As mentioned previously, archaeology uses the tools and methods of other sciences such as biology, chemistry, geology, mathematics, and physics to investigate these questions.

Archaeologists commonly develop typologies to understand patterns and deviations of the past. A ***typology*** is the systematic classification of a specific artifact, feature, or site type, usually related to timescale. Typologies allow archaeologists to organize archaeological materials into useful categories for study, comparison, and debate. A common typology used in Arizona involves organizing projectile points by shape and size and correlating the resulting typology to age. Generally speaking, the earliest spear points were larger, followed by smaller atlatl dart points. Arrowheads, being a relatively late invention technologically, are much smaller than dart

points. Archaeologists also organize pottery and ceramics into typologies, sometimes based on the designs painted on the vessel, or the shape of the vessel and rim forms.

Determining Age

Chronometry is the science of the measurement of time. ***Chronology*** is the science of measuring time by regular divisions that assigns events or objects to their proper dates. Determining the age of a site is critical for placing a site within a regional chronology and for answering other archaeological questions. There are two types of archaeological dating: 1) relative dating, and 2) absolute dating. ***Relative*** dating is simply determining whether something is older or younger than another thing. ***Absolute*** dating is assigning a calendar date to an artifact or stratum. There are two common methods of relative dating used by archaeologists: 1) cross dating, and 2) stratigraphic location. ***Cross-dating*** works on the principle that a diagnostic artifact dated at one archaeological site will be of the same approximate age as one found elsewhere. Because projectile point styles/types changed over time we can roughly date the age of a site or strata within a site based on the types of artifacts present. ***Stratigraphic location*** dating relies on the law of superposition. In depositional environments, soil may be deposited in layers called strata. In undisturbed deposits, the youngest strata are located on top and the oldest at the bottom. Thus, artifacts nearest the surface are considered younger than artifacts buried deeper.

Absolute dating uses various different methods – often using multidisciplinary approaches – to assign a date or age to an artifact or feature. Common methods used in archaeology include dendrochronology (i.e., tree-ring dating), radiocarbon dating, thermoluminescence dating, and obsidian hydration. ***Dendrochronology*** is based on the principle that many tree species put on a single growth ring every year and the age of the tree can be determined by counting the number of rings. In archaeology, dendrochronology serves the purpose of dating materials and artifacts made from wood, or when used in conjunction with other methods such as radiocarbon dating, tree rings can be used to plot events. ***Radiocarbon*** dating, or carbon-14 dating (C-14), is based on the ratio of carbon-14 to carbon-12 in the remains of dead plants and animals. C-14 decays to nitrogen-14 by emitting an electron and an antineutrino, while changing one of its neutrons to a proton. It takes 5,730 years for half the C-14 in an object to decay into nitrogen-14. By determining the ratio of C-14 to C-12 it is possible to determine when the object or organism died.

Radiocarbon dating is an example of chemistry and physics as multidisciplinary approaches to archaeology. Other examples include thermoluminescence, archaeomagnetic, and obsidian hydration dating. ***Thermoluminescence*** dating is used for artifacts like ceramics with crystalline structures that have been previously heated. Objects emit electrons when heated "zeroing out" the number of trapped free electrons. Over time these objects again slowly absorb electrons from their surroundings at a known rate. In the laboratory these artifacts are reheated under controlled conditions, releasing the trapped electrons and emitting light. The released radiation dose is measured providing a date when the artifact was last heated. ***Archaeomagnetic*** dating is especially useful for dating hearths and commonly used by archaeologists studying the Hohokam in the Phoenix and Tucson basins. Microscopic iron particles in soil align with the north pole which shifts positions over time. Particles in clay soils like an ancient hearth are frozen in place if heated above the curie point, allowing calculation of the age of the hearth based on known

orientation of the north pole thru time. ***Obsidian hydration*** dating is useful due the fact that obsidian lithic artifacts, or stone tools, are frequently present in Arizona's archaeological record. Obsidian absorbs water at the molecular level, creating a microscopically visible band. Older artifacts have a thicker band than younger artifacts allowing archaeologists another method of dating artifacts. Archaeologists, as with most scientists, prefer multiple lines of evidence, when supporting their theories and hypotheses. Therefore, it is common for archaeologists to use multiple types of absolute dating methods if appropriate.

Subsistence

Subsistence is the study of how people acquired food and procured other resources necessary for survival. How do archaeologists learn about subsistence? There are many clues left behind at archaeological sites to help answer questions about subsistence. Archaeologists can examine the food that people ate and the tools used to process those foods. Fortunately for archaeologists, the arid climate of Arizona preserves many of these clues.

The presence of certain tools can suggest at a general level that people processed plant foods. Plant foods in the form of roots, nuts, berries, seeds, and pollen preserve remarkably well in Arizona. A mortar and pestle were usually used with roots or hard nuts, while manos and metates were typically used for grinding hard shelled seeds. Remnants of plant remains are often found on these types of tools and within other features at archaeological sites that are suitable for laboratory analysis. Micro and macro plant remains as well as chemical residues may survive in hearths, house floors, storage pits, other features, and coprolites. Arizona archaeologists frequently document corn cobs, prickly pear pads, and *quids* (fiber from chewed plant leaves, roots, or stems) at archaeological sites, especially rock shelter sites.

Once in the laboratory, archaeologists can study microscopic plant remains consisting of pollen grains, starch granules, and phytoliths recovered from archaeological sites. Plant remains, such as seeds and fruiting body fragments, are frequently preserved in coprolites. The term ***coprolite***, commonly used to describe archaeological feces, originates in geology, where it is used to refer to feces which have undergone true fossilization. Archaeological samples are not true fossils, being preserved either through desiccation or partial mineralization. Coprolites can provide fine resolution, at times even seasonal, information on changes in diet, health, and environment over time. Archaeologists also document plant remains on other materials remains such as grinding stones, pottery, stone tools, and in the sediment and soils at archaeological sites.

As with plant foods, certain tools can lead archaeologists to infer that animal foods were used by ancient humans. Animal bones and shell documented at archaeological sites are solid evidence of hunting and meat consumption. Archaeologists study both small and large animals by analyzing burned bones, butchering cut marks, and bones smashed to extract marrow recovered from archaeological contexts.

Technology and Tool Use

Humans are not particularly strong or fast when compared to other animals, but we have been able to conquer the world through technology. An important part of archaeology is the study of

the many technologies and approaches people have used to adapt to various environments. Archaeologists can make generalizations regarding technology based on the types of artifacts present at archaeological sites. Perhaps the most prevalent material in the archaeological record are stone tools.

People around the world used stone to produce tools for every-day use. Stones such as obsidian, chert, basalt, rhyolite, quartzite, and quartz crystal that break with a conchoidal fracture were used to make flaked stone tools such as spear points, knives, and scrapers. Archaeologists refer to stone tools as *lithics*, or artifacts made of stone. ***Lithic analysis*** involves the study of stone tools such as an axe, projectile point, awl, hammerstone, or the tiny flakes of stone called debitage, which resulted from the construction of those tools.

Not all stones are suitable for tool manufacture and sources of suitable tool stone are not ubiquitous on the landscape. Many stone tools discovered by archaeologists are classified as cryptocrystalline silicates, or rock composed of extremely fine silica (quartz) crystals. Cryptocrystalline silicates are known by a variety of different names (generally based on differences in translucence, color, texture, or presumed geological origin) including chert, chalcedony, jasper, agate, flint, and petrified wood. Stones with large or irregular inclusions are not suitable for tool production because the energy wave that travels through the stone when struck with a percussor may hit an inclusion and deflect in an uncontrolled or undesired way rendering the stone unusable for the desired purpose.

The production of stone tools is called ***flintknapping***. Stone tool manufacturing requires the proper amount of force at the proper angle to remove flakes from a piece of stone, shaping it into the desired tool. Fine-grained rocks fracture conchoidally and when sufficient force is applied to the center of a piece, such as a BB striking a window, a perfect cone is produced. But when the force is applied to the edge of a piece of stone, only the edge of the cone is produced. This is what archaeologists call a flake. Flakes are the foundation for making stone tools such as points, arrowheads, awls, drills, and scrapers.

There are several techniques that people in the past may have used to create flakes, including direct percussion, indirect percussion, and pressure flaking. Direct percussion uses a percussor consisting of a hammerstone or an antler billet to strike suitable stone material called a *core.* Indirect percussion uses two implements, such as two antler billets with one used as a punch to remove a flake. Pressure flaking, as the name implies, does not entail striking the stone but applying steady pressure with an antler tine to remove a flake. Early in the lithic reduction sequence, the flintknapper removes the outer layer of rock called the *cortex* resulting in a ***primary*** or ***cortical flake***. The next stage in lithic reduction sequence produces ***secondary flakes*** that display dorsal flake scars, which are simply the markings left behind by flakes detached prior to the detachment of the subject flake. Some archaeologists classify a third type of flake, called a ***tertiary flake***, which exhibit no cortex.

A common lithic technology in Arizona and elsewhere is the use of bifaces, or bifacial technology. A ***biface*** is a type of stone tool where flakes are removed from both sides of the stone. Archaeologists suggest that the bifaces had several advantages. Removing the cortex reduced the weight of the stone for transport which increased the mobility of the hunter. Once

away from the tool stone source, the hunter could remove flakes from the biface to create a wide range of tools such as spear points, dart points, arrowheads, or scrapers. A well-executed biface could produce dozens of flakes providing the hunter with options to produce a wide array of tools to address various tasks including killing the prey, dressing the downed animal, cutting sinew, and scraping hides. This flexibility and utility have led archaeologists to refer to bifaces as the "Swiss army knife of prehistory".

Grinding stones were used by most cultures for processing foods, particularly plant foods. Differences in form, manufacture and wear patterns can inform us of cultural and functional differences, and the types of resources that were processed. Microscopic analysis can determine how stone tools were used and on what substrate. Microscopically, archaeologists can distinguish between wear produced from working fresh bone from the polish produced from cutting grass or reeds, or the types of foods processed in ground stone tools such as trough metates, mortars and pestles, block basin metates, and slab metates.

As mentioned previously, the arid climate of Arizona results in the remarkable preservation of softer, organic items such as textiles. Basket making and weaving techniques for important items like sandals were handed down from generation to generation. In Arizona, yucca fibers were used to make baskets, sandals, and rope. In modern times, yucca is important to Indigenous Americans for traditional use gathering and maintaining cultural heritage and identity.

Archaeologists can study ceramics to learn more about how people in the past lived. Vessel form, rims, and design elements provide important information. Archaeologists can also source the clay, temper, minerals, and other organic materials to learn more about the past through examination of ceramics. Ceramic analysis can provide insight into trade or in the migrations of past populations. It is common to find black on white ceramics from northern Arizona at Hohokam archaeological sites in southern Arizona. However, archaeologists must be careful interpreting artifacts assemblages due to a concept called transcultural diffusion. ***Transcultural diffusion*** is the principle that people travel, objects travel, and ideas travel. Discerning one from the other can be challenging without multiple lines of evidence.

The preceding discussion presented a high-level introduction to archaeology. Professional archaeologists have devoted hundreds of university credit hours learning about archaeological method and theory and to the study of past cultures and civilizations. In summary, we discussed that Federally recognized Indian Tribes are deeply connected to the archaeology of Arizona, and it represents their cultural heritage and ancestry. This makes the responsibilities as archaeologists and DATs even more critical because of this fact. We also discussed the goals of archaeology, the importance of historic contexts, material culture, sites, methods of dating, and the many types of analyses conducted by archaeologists. Hopefully, readers will find this rudimentary introduction enlightening and useful fulfilling the duties of a DAT.

Cultural Resource Laws and Practice

Managing cultural resources in the BLM is viewed as an integrated system of identifying and evaluating cultural resources, deciding on their appropriate uses, and administering them

accordingly, both on public lands and on other lands where BLM decisions could affect cultural resources. The objectives of this integrated management system are to:

A. Respond in a legally sufficient and professional manner to (1) the legal authorities concerning historic preservation and cultural resource protection, and (2) the principles of multiple use.

B. Recognize the potential public and scientific uses of, and the values attributed to, cultural resources on the public lands, and manage the lands and cultural resources so that these uses and values are appropriately protected.

C. Contribute to land use planning and the multiple use management of the public lands in ways that make optimum use of the thousands of years of land use history inherent in cultural resource information, and that safeguard opportunities for achieving appropriate uses of cultural resources.

D. Protect and preserve in place representative examples of the full array of cultural resources on public lands for the benefit of scientific and public use by present and future generations.

E. Ensure that proposed land uses avoid inadvertent damage to Federal and non-Federal cultural resources.

F. Further the goals and priorities of the Department's and the BLM's mission.

The authorities that obligate the BLM to manage cultural resources are described in the following cultural resource laws and executive orders:

Antiquities Act of 1906 (P.L. 59-209; 34 Stat. 225; 16 U.S.C. 432, 433), is chronologically and philosophically the basic legislation for the protection and preservation of cultural properties (archaeological and historic, without regard to minimum age) on Federal lands. It provides for permits to authorize scholarly use of properties, for misdemeanor-level penalties to control unauthorized use, and for presidential designation of outstanding properties as national monuments for long-term preservation. The act is implemented by uniform regulations at 43 CFR Part 3. Both broader in scope than and superseded in part by the Archaeological Resources Protection Act, it remains a fully active statutory authority.

Recreation and Public Purposes Act of 1926 (P.L. 69-386; 44 Stat. 741; 43 U.S.C. 869) authorizes the lease or sale of historic properties under certain conditions. (See 43 CFR Subpart 2741 and BLM Manual Section 2740.)

Historic Sites Act of 1935 (P.L. 74-292; 49 Stat. 666; 16 U.S.C. 461) declares national policy to identify and preserve "historic sites, buildings, objects and antiquities" of national significance, authorizing the National Historic Landmarks program of the National Park Service and providing a foundation for the later National Register of Historic Places. Regulations implementing the Landmarks program are at 36 CFR Part 65.

Reservoir Salvage Act of 1960, as amended by **Archeological and Historic Preservation Act of 1974** (P.L. 86-523; 74 Stat. 220, 221; 16 U.S.C. 469; P.L. 93-291; 88 Stat. 174; 16 U.S.C. 469) provides for the preservation of historical and archaeological data that might otherwise be lost as the result of a federal construction project or a federally licensed or assisted project, activity, or program having an effect on cultural resources. Although amended and broadened after 1966, the act makes no distinction regarding National Register eligibility. The act provides that up to one percent of funds the Congress authorizes to be appropriated for a project may be spent to recover, preserve, and protect archaeological and historical data. Because BLM projects are rarely subject to line-item authorization and appropriation, this provision generally does not apply to BLM.

National Historic Preservation Act of 1966 (P.L. 89-665; 80 Stat. 915; 54 U.S.C. § 300101 et seq.), as amended, extends the policy in the Historic Sites Act to include State and local as well as national significance, expands the National Register of Historic Places, and establishes the Advisory Council on Historic Preservation, State Historic Preservation Officers, Tribal Historic Preservation Officers, and a preservation grants-in-aid program. Section 106 directs all Federal agencies to take into account effects of their undertakings (actions and authorizations) on properties included in or eligible for the National Register of Historic Places, and Section 110 sets inventory, nomination, protection, and preservation responsibilities for federally owned cultural properties. Section 110(c) requires each Federal agency to designate a Preservation Officer to coordinate activities under the act. Section 106 of the act is implemented by regulations of the Advisory Council on Historic Preservation, 36 CFR Part 800.

National Environmental Policy Act of 1969 (P.L. 91-190; 83 Stat. 852; 42 U.S.C. 4321) establishes national policy for the protection and enhancement of the environment. Part of the function of the Federal Government in protecting the environment is to "preserve important historic, cultural, and natural aspects of our national heritage." Cultural resources need not be determined eligible for the National Register of Historic Places (as in the National Historic Preservation Act) to receive consideration under the National Environmental Policy Act. The act is implemented by regulations of the Council on Environmental Quality, 40 CFR 1500-1508. A procedural statute, the act provides for public participation in the consideration of cultural resource issues, among others, during agency decision making.

Executive Order 11593 ("Protection and Enhancement of the Cultural Environment," 36 F.R. 8921, May 13, 1971) directs Federal agencies to inventory cultural properties under their jurisdiction, to nominate to the National Register of Historic Places all federally owned properties that meet the criteria, to use due caution until the inventory and nomination processes are completed, and also to assure that Federal plans and programs contribute to preservation and enhancement of non-federally owned properties. Some of the provisions of the Executive Order are also found in Section 110 of the National Historic Preservation Act.

Federal Land Policy and Management Act of 1976 (P.L. 94-579; 90 Stat. 2743; 43 U.S.C. 1701; "FLPMA") directs the Bureau of Land Management to manage public lands on the basis of multiple use, in a manner that "recognizes the Nation's need for domestic sources of minerals, food, timber, and fiber from the public lands" and that will "protect the quality of . . . historical . . . resources, and archeological values." Cultural resources need not be determined eligible for the National Register of Historic Places (as in the National Historic Preservation Act) to receive consideration under the FLPMA. The act provides for the periodic inventory of public lands and resources, for long-range, comprehensive land use planning, for permits to regulate use of the

public lands, and for the enforcement of public land laws and regulations. FLPMA provides the broadest framework for managing cultural resources on the public lands.

Archaeological Resources Protection Act of 1979 (P.L. 96-95; 93 Stat. 721; 16 U.S.C. 470aa et seq.) as amended (P.L. 100-555; P.L. 100-588) provides felony-level penalties, more severe than those of the Antiquities Act of 1906 (see .O3A), for the unauthorized excavation, removal, damage, alteration, defacement, or the attempted unauthorized removal, damage, alteration, or defacement of any archaeological resource, more than 100 years of age, found on public lands or Indian lands. The act also prohibits the sale, purchase, exchange, transportation, receipt, or offering of any archaeological resource obtained from public lands or Indian lands in violation of any provision, rule, regulation, ordinance, or permit under the act, or under any Federal, State, or local law. Archaeological resources need not be determined eligible for the National Register of Historic Places (as in the National Historic Preservation Act) to receive consideration under the ARPA. The act establishes definitions, permit requirements, and criminal and civil penalties, among other provisions. The act overlaps with and partially supersedes the Antiquities Act, in its provisions for permits and penalties. It is implemented by uniform regulations and departmental regulations, both at 43 CFR Part 7. An amendment in 1988 gives Federal agencies explicit direction to establish educational programs explaining the importance of archaeology, to help members of the public understand why archaeological resources are protected from unauthorized removal or damage.

Native American Graves Protection and Repatriation Act of 1990 (P.L. 101-601; 104 Stat. 3048; 25 U.S.C. 3001) establishes rights of Indian tribes and Native Hawaiian organizations to claim ownership of certain "cultural items," including human remains, funerary objects, sacred objects, and objects of cultural patrimony held or controlled by Federal agencies and museums that receive Federal funds. The act requires agencies and museums to identify holdings of such remains and objects and to work with appropriate Native American groups toward their repatriation. Permits for the excavation and/or removal of “cultural items” protected by the act require Native American consultation, as do discoveries of “cultural items” made during land use activities. The Secretary of the Interior’s implementing regulations are at 43 CFR Part 10.

National Trails System Act of 1968 (P.L. 90-543; 16 U.S.C. 1241 et. seq. as amended through P.L. 107-325, December 4, 2002) established a national trails system to promote preservation of public access to, travel within, and enjoyment of the open-air, outdoor areas, and historic resources of the nation. The Act designated initial trail system components and established methods and standards for adding additional components. Trails are added to the system only by act of Congress. Historic Trails, trail sites, and trail segments must be evaluated against the National Register criteria at 36 CFR Part 60, whether congressionally designated or not, to determine National Register qualification (See Manual Section 8110.3; Departmental Manual 710; National Register Bulletin #30) and related NHPA Section 106 responsibilities.

Executive Order 13007 ("Indian Sacred Sites," 61 F.R. 104, May 24, 1996) provides that in managing Federal lands, agencies–to the extent practicable, permitted by law, and not clearly inconsistent with essential agency functions–shall accommodate Indian religious practitioners' access to and ceremonial use of Indian sacred sites, shall avoid adversely affecting the physical integrity of such sites and shall maintain the confidentiality of sacred sites. The responsibility to identify such sacred sites to the managing agency resides with the Indian tribe or appropriately authoritative representative of an Indian religion. The responsibility to inform tribes, where practicable and appropriate, of proposed actions or land management policies that could restrict future access to or ceremonial use of, or adversely affect the physical integrity of, sacred sites, rests with the agency. The Order directs agencies to comply with the Executive Memorandum of

April 29, 1994, "Government-to-Government Relations with Native American Tribal Governments." It explicitly does not create any new right or benefit for Indian tribes, nor any new trust responsibility for the Federal Government.

Executive Order 13287 ("Preserve America" 68 F.R. 43, March 5, 2003) orders the Federal Government to take a leadership role in protection, enhancement, and contemporary use of historic properties owned by the Federal Government and promote intergovernmental cooperation and partnerships for preservation and use of historic properties. The order establishes new accountability for agencies with regard to inventories and stewardship.

Section 106

Section 106 of the National Historic Preservation Act of 1966 (NHPA) requires federal agencies to take into account the effects on historic properties of projects they carry out, assist, fund, permit, license, or approve throughout the country. If a federal or federally assisted project has the potential to affect historic properties, a Section 106 review will take place. Section 106 gives the ACHP, interested parties, and the public the chance to weigh in on these matters before a final decision is made. This process is an important tool for citizens to lend their voice in protecting and maintaining historic properties in their communities. The field office manager is the agency official responsible for compliance with Section 106, and the field office cultural specialist is the person responsible for advising the agency official. However, an overview of Section 106 is presented below since DATs may be asked to conduct field work or other tasks used in the agency's Section 106 compliance efforts.

The regulations that implement Section 106 are found at 36 C.F.R. part 800 – Protection of Historic Properties. The Section 106 process has four basic steps: initiate the undertaking, identify, and evaluate historic properties, assess effects to historic properties, and resolve any adverse effects. The steps must be carried out sequentially. For example, an agency cannot assess the effects of the undertaking on historic properties until it has identified and evaluated historic properties within the APE. The federal agency must consult with the SHPO; THPO; appropriate state, local, and tribal officials; Indian tribes; NHOs; applicants; and any other consulting parties in identifying historic properties, assessing effects, and resolving adverse effects, and provide for public involvement.

Step 1: Initiate the Undertaking

- The agency identifies who should participate in the review, called consulting parties. **Consulting parties** may include the State (or Tribal) Historic Preservation Officer, the local government, an applicant for federal assistance (if one is involved) and interested federally recognized Indian tribes. Historic preservation organizations and others with an interest in the preservation outcomes of the project or those with a legal or economic interest may also be invited to join consultation. The agency also plans how it will involve the public.
- The BLM will mail certified letters to consulting parties to initiate the undertaking. The letters should describe the undertaking, decision to be made and level of NEPA, list the consulting parties, provide maps, and provide other pertinent information. It is best to

initiate the undertaking as early in the project schedule, preferably before issuing a Notice of Intent or Notice of Realty Action in the federal register. Initiating the undertaking is perhaps the most important step of the process. Disagreements or lack of clarity at this stage will result in procedural problems during subsequent stages of the process.

Step 2: Identify Historic Properties

- Before conducting identification efforts, the agency must establish an Area of Potential Effect (APE) that is appropriate for the undertaking that considers direct, indirect, and cumulative effects. The regulations require that an agency establish the APE in consultation with SHPO/THPO and Tribes.
- The agency gathers information to decide if any properties in the area that may be affected by the project are listed, or are eligible for listing, in the National Register of Historic Places. This usually begins with conducting an existing information review. If no historic properties are present, or if those present will not be affected by the project, the review may conclude here.
- The agency must meet a reasonable and good faith effort threshold to identify historic properties. The reasonable and good faith effort is largely based on the scope and magnitude of the undertaking, and the undertaking's potential to impact historic properties, if any such properties exist.
- An agency has many options to identify historic properties, including class I, II, and III archaeological surveys, ethnographic studies, oral histories, predictive modeling, aerial imagery, and remote sensing. An agency can use any combination of these methods to meet the good faith effort.
- If at least one historic property is found that could be affected by the project, the federal agency must proceed to the assessment of effects. The agency must notify all consulting parties and invite their views. If no historic properties are present, the Section 106 review may conclude here.

Step 3: Assess Effects

- The federal agency determines how historic properties might be affected by the project and whether any of those effects would be considered adverse. The agency does so in consultation with other participants in the review. It is important to consider the views of consulting parties before the agency makes a finding of effect. Disagreements on effects will result in difficulties on achieving resolution. "Adverse effects" are those that diminish characteristics qualifying a property for inclusion in the National Register. If there are no potential adverse effects to a historic property, the review may conclude here.
- There are three possible outcomes to the Section 106 process: adverse effect, no adverse effect, and no historic properties affected. A finding of no adverse effect or no historic properties affected requires a 30-day consultation with the SHPO/THPO for concurrence and if received the review may conclude here. A finding of adverse effect requires further consultation on ways to resolve them and the agency moves on to the fourth and final step.

Step 4: Resolve Adverse Effects

- In the final step of the process, the agency explores measures to avoid, minimize, or mitigate adverse effects to historic properties and reach agreement with the State (or Tribal) Historic Preservation Officer (and the ACHP in some cases) on measures to resolve them.
- If the agency was able to achieve resolution, a Memorandum of Agreement (MOA) or Programmatic Agreement (PA), which records the resolution measures agreed upon to resolve adverse effects, is developed in consultation and executed prior to approval of the project. MOAs and PAs usually have associated documents such as Historic Properties Treatment Plans and/or Historic Property Management Plans which must be implemented prior to issuing a notice to proceed.

National Register of Historic Places

The National Register of Historic Places is the official list of the Nation's historic places worthy of preservation. Authorized by the National Historic Preservation Act of 1966, the National Park Service's National Register of Historic Places is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect America's historic and archeological resources. The regulations implementing the National Register of Historic Places are found in **35 C.F.R. part 60**.

As of 2020, there are more than 96,000 properties listed in the National Register. There are five property types that can be evaluated for National Register significance: buildings, sites, districts, structures, and objects. A **building** is a structure created to shelter any form of human activity, such as a house, barn, church, hotel, or similar structure. Building may refer to a historically related complex such as a courthouse and jail or a house and barn. A **site** is the location of a significant event, a prehistoric or historic occupation or activity, or a building or structure, whether standing, ruined, or vanished, where the location itself maintains historical or archeological value regardless of the value of any existing structure. A **district** is a geographically definable area, urban or rural, possessing a significant concentration, linkage, or continuity of sites, buildings, structures, or objects united by past events or aesthetically by plan or physical development. A district may also comprise individual elements separated geographically but linked by association or history. A **structure** is a work made up of interdependent and interrelated parts in a definite pattern of organization. Constructed by man, it is often an engineering project large in scale, such as a bridge, lighthouse, or missile silo. An **object** is a material thing of functional, aesthetic, cultural, historical, or scientific value that may be, by nature or design, movable yet related to a specific setting or environment. An example of an object is the historic locomotive located on Route 66 in Flagstaff, Arizona.

The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, artisanship, feeling, and association and

> (a) that are associated with events that have made a significant contribution to the broad patterns of our history; or
>
> (b) that are associated with the lives of persons significant in our past; or

(c) that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

(d) that have yielded, or may be likely to yield, information important in prehistory or history.

Kinds of Inventories

Assisting the cultural heritage program with inventories is a primary responsibility of a DAT. The BLM policy on identifying and evaluating cultural resources is found in MS-8110. This manual section provides general direction for identifying, evaluating, categorizing, and allocating to uses all the cultural resources that occur on public lands within a Field Office manager's jurisdiction. The objectives of the identification component of the cultural resource management program is to ensure that BLM Field Office managers accomplish the following:

A. Locate and record cultural resources on lands they administer and in areas affected by undertakings they authorize.

B. Establish the resources' National Register significance and their scientific, cultural, public, traditional, and conservation values as the basis for managing the resources and the surrounding land area over the long term.

C. Prepare to enter into land use planning with sound qualitative, quantitative, and geographical information about known and anticipated cultural resources, and with definite goals for their short- and long-term management.

D. Maintain permanent, up-to-date records through cooperation with the State Historic Preservation Officer, and encourage their use for appropriate educational, research, and other learning purposes.

The timely and adequate professional identification of cultural resources on public lands and in areas affected by BLM's undertakings is essential to making informed resource management and land use decisions. Inventory, evaluation, and documentation are the three main elements of identification. Each has a critical role to play in enabling the long-term management and use of cultural resources. **Inventory** is meant to ensure that the nature and distribution of cultural resources on BLM-administered lands (and in areas affected by BLM undertakings) are identified by professional cultural resource staff and made known to the responsible Field Office manager. **Evaluation** is meant to ensure that the significance and use potential of the cultural resources are analyzed and recommended by professional cultural resource staff and approved by the responsible Field Office manager, after appropriate consultation with the State Historic Preservation Officer and tribal officials. **Documentation** is meant to record adequately the resources' location, geographical settings, physical characteristics, and scientific, historical, architectural, traditional, educational, interpretive, and conservation values. Documentation is not done as a separate step but occurs throughout the identification process. Qualified

professionals prepare documentation in the course of inventorying and evaluating cultural resources. DATs will assist in the preparation of documentation in the course of inventories but will not perform evaluation.

The BLM cultural resource inventory system is composed of three kinds of inventory: class I - existing information inventory; class II - probabilistic field survey; and class III - intensive field survey. Each is designed to provide specific kinds of cultural resource information for various planning and resource management needs. The most frequently employed method of inventory is class III survey carried out for specific projects to enable BLM to comply with Section 106 of the NHPA before making decisions about proposed land and resource uses. In those cases, unless specifically prohibited in regulations, the cost of inventories shall be the responsibility of the land-use applicant or the benefiting BLM activity, as authorized in Section 110(g) of NHPA.

A **class I inventory** is most useful for gaining a comprehensive view of all the known archaeological, historic, cultural, and traditional places within a large area, such as the area to be covered by a land-use plan or an EIS. A class I inventory is a professionally prepared study that includes a compilation and analysis of all reasonably available cultural resource data and literature, and a management-focused, interpretive, narrative overview, and synthesis of the data. A class I inventory is not a mere records check. A class I inventory is a detailed study consisting of all the elements described in MS-8110.21.A3 and A4. In contrast, a "literature review," "existing data review," "file search," or "records check" is generally the brief first step before initiating a field survey.

A **class II survey** is most useful for improving cultural resource information in a large area, such as for planning or EIS purposes, where insufficient systematic identification work has been done in the past. A class II probabilistic field survey is a statistically based sample survey, designed to aid in characterizing the probable density, diversity, and distribution of cultural properties in an area, to develop and test predictive models, and to answer certain kinds of research questions. Within individual sample units, survey aims, methods, and intensity are the same as those applied in class III survey.

A **class III intensive survey** is most useful when it is necessary to know precisely what historic properties exist in a given area or when information sufficient for later evaluation and treatment decisions is needed on individual historic properties. Intensive survey describes the distribution of properties in an area; determines the number, location, and condition of properties; determines the types of properties actually present within the area; permits classification of individual properties; and records the physical extent of specific properties.

Fieldwork Standards and Guidelines

These standards and guidelines for inventorying and evaluating cultural resources on lands administered by the Bureau of Land Management (BLM) or affected by Bureau actions in Arizona. The purpose is to ensure the use of consistent, statewide inventory and evaluation procedures and to provide guidance for the proper recording and maintenance of cultural resource data. These standards and guidelines supplement the policy found in Bureau Manual Section 8110, Identifying Cultural Resources, the Arizona State Museum (ASM) Archaeological

Site Recording Manual, and the State Historic Preservation Office (SHPO) survey report standards.

As required by the BLM Permits for Archaeological Investigations, the BLM Arizona's expectation regarding cultural resource inventory and evaluation is:

- Maintain consistent communication with the appropriate BLM archaeologist throughout the project.
- Conduct thorough existing data reviews referencing all available sources prior to fieldwork.
- Conduct quality field surveys led by archaeologists who meet the Secretary of the Interior's professional qualification standards.
- Evaluate cultural resources according to the National Register criteria and National Register Bulletin 15.
- Conduct condition assessments to ascertain if a resource retains integrity as the basis for management recommendations.
- Identify and complete site records according to the ASM Archaeological Site Recording Manual.
- Record geospatial data according to the BLM National Cultural Resource Data Management Standard (NCRDMS).
- Complete an inventory report that meets or exceeds the SHPO survey report standards.

Existing Data Review Minimum Standards

At a minimum, inventory efforts for compliance purposes must be sufficient to identify potentially significant cultural resources (i.e., cultural resources potentially eligible for the National Register) within the Area of Potential Effects. The level of inventory and field methodology should be commensurate with the number and kinds of cultural properties known or expected to occur, the specific environmental conditions in the area to be inventoried, and the nature of the proposed land use activity.

The main objective of an existing data review is to understand of the nature, density, and distribution of cultural resources, and the natural settings where the various known kinds of cultural resources might be expected to occur or not to occur within the study area, based on present information. Existing cultural resource information must be reviewed for all undertakings at a level commensurate with the size and nature of the proposed action. This includes review of

Class I Regional Overviews and appropriate historic contexts and checking site record files to determine whether previous inventories were conducted, and sites recorded within or near the Area of Potential Effects. Ethnographic literature should also be reviewed to identify potential places of traditional cultural importance to Native Americans or other cultural groups.

Existing data reviews should analyze an area that is buffered one mile surrounding the study area (regardless of land jurisdiction), or a half-mile buffer on both sides of the centerline for liner study areas (regardless of land jurisdiction). Please consult the appropriate BLM archaeologist to discuss any deviations of analysis areas.

Field Survey Minimum Standards

1. Survey transects should be compass or GPS-controlled and will not exceed 20-meter spacing unless otherwise stated and approved by the field office cultural specialist. Post-field GPS or GIS should be used for quality assurance purposes to ensure that the appropriate survey acreage is thoroughly surveyed and there are no gaps in survey coverage.

2. If surveying in the winter months at higher altitudes, contact the local BLM archaeologist for approval to survey in snowy conditions. Failure to contact appropriate BLM archaeologist regarding ground visibility may result in a request to re-survey portions of the project acreage.

3. Archaeologists are expected to relocate all previously documented cultural resources. If cultural resources are not relocated:

- Expand search radius around supposed coordinates several hundred meters.
- Consider datum conversions (i.e., the offset between NAD 1927 and 1983).NAD 1927 to 1983 conversion errors result in approximately 200-m south of the original Northing, and approximately 50-m east of the original Easting.
- Contact local Field Office archaeologists before going into field regarding their knowledge of site locations.
- Use photographs or other documentation to locate sites based on topography or major landmarks.

If site cannot be relocated, thoroughly document the effort exerted by the field crews and the steps taken to relocate. Provide some explanation as to why the site cannot be relocated. For instance, perhaps site was misplotted originally. Or perhaps the site has since been buried or obscured by heavy vegetation growth, etc. The AZ SHPO may ask for this information when reviewing reports submitted for compliance purposes.

Site Documentation Standards

4. Use the ASM Site Recording Manual for guidance on filling out the ASM site cards.

5. Use the ASM revised site definition policy:

- Physical remains of past human activity are at least 50 years old.

- 30+ artifacts of a single class (e.g., 30 sherds, 30 lithics, 30 tin cans) within and area 15 meters (50 feet) in diameter, except when all pieces appear to originate from a single source (i.e., once ceramic pot, one core, one glass bottle).
- 20+ artifacts which include at least 2 classes of artifact types (i.e., sherds, groundstone, nails, glass) within an area 15 meters (50 feet) in diameter.
- One or more archaeological features in temporal association with any number of artifacts.
- Two or more temporally associated archaeological features without artifacts.
- Isolated features are defined as a feature that does not have any other features within a 100-meter (325 feet) diameter (e.g., isolated rock piles, mine shafts, prospecting pits, or unidentified depressions without artifact associations.

Note: The BLM, as the federal agency responsible for the management of cultural resources, reserves the right to deviate from the above site definition based on consultation with Tribes and other consulting parties. For instance, sites or isolated features may be merged into another site boundary based on consultation. Or an isolated feature may be determined eligible after information obtained during consultation. This discretion resides with the field office manager based on recommendations from the field office cultural specialist.

6. All previously documented historic properties within the Area of Potential Effect (APE) will be visited and a site update performed. If a revisited site does not appear as originally recorded (e.g., artifact density or distribution has changed significantly, new features are observed, site condition has changed significantly, etc.) a full re-record must be performed. At a minimum, a full re-record consists of:

- ASM Site Card completed. Procedures and quality standards for ASM Site Cards must conform to the ASM Site Recording Manual and the most current SHPO Reporting Standards.
- Plan view drawing/map of the site.
- Plan view drawing/map of structures, buildings, and prominent features.
- Photographic documentation with photographic log.
- Site location map with site plotted on a USGS 7.5' quadrangle at 1:24,000 scale.
- An assessment of the site's current condition describing natural and human-related impacts.
- A recommendation of site's National Register of Eligibility.

7. Plan view drawings/maps should minimally include (if present at site):

- Site boundary that depicts the geographic extent of surficial material remains.
- Site boundary depicted on plan view drawing should have an accompanying GIS polygon shape file (i.e., the two should be the same).
- Site datum (NAD 1983 and appropriate Zone).
- Point-provenience for diagnostic artifacts.

- Location(s) of features and structures.
- Location of artifact concentrations or loci.
- Location of artifact sampling or testing units.
- Location of photographic points.
- Location of old growth vegetation or tree species (e.g., Saguaro, old growth ponderosa, etc.).
- Location of drainage(s) within or near site or any other natural areas of erosion.
- Location(s) of human-caused impacts (e.g., modern campfires rings, off-road vehicle tracks, modern trash, collector's piles, unauthorized excavations, any evidence of human visitation).
- Location of other impacts such as cattle trailing or de-vegetated areas.
- Contour lines.
- Existing roads or trails.
- Date, scale text, scale bar, north arrow, site number, project name, site recorders, legend of symbols.

For a site located in flat, barren, non-descript areas, draw two or more arrows on the map depicting distance and azimuth from the datum to major markers on the landscape such as named topographic features, roads, power lines, campgrounds, washes, etc. For example, "Face Mountain 245 meters at 185˚ or County Road 18 600 meters at 45˚."

8. Structures or prominent features should be mapped at a larger scale in a separate drawing using the Cartesian grid method (x and y coordinates plotted with metric reel tapes) or GPS units with submeter accuracy. Structure or feature plan view drawings will minimally include:

- Mapping datum.
- Point-provenience for diagnostics artifacts.
- Location(s) of human-caused impacts (e.g., modern trash, collector's piles, unauthorized excavations).
- Date, scale text, scale bar, north arrow, site number, project name, site recorders, legend of symbols.

9. Interestingly, photographic documentation of cultural resources during the age of digital cameras has become sloppy. Photographic documentation is essential to the thorough recording of cultural resources, prominent features, and diagnostic artifacts. Good photographic documentation can assist future archaeologists in relocating a site, supporting National Register determinations, and facilitate meaningful consultation. Photographic documentation at each site will minimally include:

<u>Site overviews:</u>

- Site overview from a minimum of two locations.

- Site overview photographs should contain pin flags to illustrate the distribution of artifacts.
- Site overview photographs should be framed in such a way that prominent land features (e.g., distant mountain peaks, mesas, rock out crops, old growth vegetation, major drainages, or arroyos) are included within the view. This technique facilitates relocation of the site for future archaeological investigations.
- Site overview photographs should include a north arrow; photo board is advisable.

Features and structures:

- From a minimum of two views.
- Include a close-up that depicts details.
- Include a contextual overview photograph.
- Photographs of features and structures should be framed in such a way that prominent land features (e.g., distant mountain peaks, mesas, rock out crops, old growth vegetation, major drainages, or arroyos) are included within the view. This technique facilitates relocation of the features and structures for future archaeological investigations.
- Photographs of structures and features should include a photo board and a north arrow or use technology to accomplish the same result.

Photography supporting National Register determinations:

- Try to document details that relate to National Register eligibility and illustrates the resources' ability to convey significance under one or more of the four criteria.
- For cultural resources that are recommended as Not Eligible for inclusion in the NRHP, try to photographically document evidence that the site does not convey integrity of location, design, setting, feeling, materials, artisanship, or association that supports a Not Eligible recommendation.
- Evidence of impacts (human and natural) that support a Not Eligible recommendation.

Note: While this might seem like a big ask, Not Eligible determinations of eligibility are subjected to the most scrutiny by SHPO, Tribes, and other consulting parties. The BLM requires ample justification for Not Eligible determinations for compliance purposes.

Photographic log:

Each photograph must be listed on a photographic log that describes:

- Date and time.
- Photographic identification number.
- Description of the photograph.
- Direction of photograph.
- Light conditions (i.e., full sun, partly cloudy, full overcast).

- Relevant site information (site number, feature, or structure number).
- Photographer's name.

Site location maps:

Each cultural resource will include a site location map that depicts:

- Location of the site on a USGS 7.5' Quadrangle at 1:24,000 scale
- Legend that communicates to the reader: 1. Site number
- Name of Quadrangle
- Datum (Should be NAD 1983, appropriate Zone).
- County
- Township, Range, Section
- Contour interval
- North arrow
- Scale text
- Scale bar
- Date map was made
- Name or initials of person who made the map
- Disclosure of site location prohibited disclaimer in Bold Font on all accompanying maps and cover pages: "For Official Use Only. Disclosure of site location prohibited (43 CFR 7.18)".

Site condition assessment:

The BLM is a federal land manager, and to manage cultural resources the field offices must be aware of the current condition of resources under their jurisdiction. As part of recording cultural resources, archaeologists must observe, and document impacts and disturbances to sites. If the physical evidence is localized, as in potholes or arroyo cuts, include this information on the site plan view drawing. Describe the observations on site condition in the site description narrative on the site card. Please also assess whether the site retains any of the aspects of integrity (location, design, setting, feeling, association, materials, workmanship) that convey the site's significance for inclusion in the National Register of Historic Places (See NRB15).

The BLM is interested in documenting the following disturbance sources:

- *Wind erosion*. Indicate whether or not the site has been subject to significant wind erosion (e.g., dune blowouts or "lag" artifact scatters).
- *Water erosion*. Indicate whether the site has been subject to significant water erosion (e.g., arroyo cutting or sheet washing).
- *Bioturbation*. Indicate if burrowing rodents, birds, insects have disturbed subsurface deposits.

- *Grazing*. Indicate whether there is evidence of grazing impacts (trailing, wallow areas, crushed or displaced artifacts, etc.) by domestic or feral livestock (cattle, sheep, goats, horses, etc.) or other large non-domestic game such as deer, elk, or antelope.
- *Fire*. Indicate whether the site has sustained impacts from wild land fire, wild land fire suppression efforts, or prescribed burning.
- *Vandalism*. Indicate any evidence of malicious behavior such as unauthorized excavations, graffiti, or other incidents where cultural material remains have been intentionally destroyed or defaced.
- *Looting*. Indicate if there is evidence of looting, such as unauthorized excavation, unauthorized collection, collector piles, etc.
- *Construction/land development*. Indicate if construction or land development (including BLM activities such as timber cutting, road, or trail maintenance) activities have damaged the site.
- *Recreation/motorized impacts*. Indicate whether there are any impacts attributed to off-road motorized vehicles (ATVs, UTVs, motorcycles etc.), camping, or recreational shooting activities. Observe and document impacts such as displaced artifacts, crushing of artifacts, damage to features or architecture, rutting, or the creation of hardened user-created roads or paths. Observe and document signs of human visitation such as the creation of modern campfire rings within site, creation of a hardened campsite, modern trash, or spent ammunition.

National Register eligibility evaluations

Archaeologists will evaluate each site for its National Register eligibility and make a professional quality recommendation to the BLM. *How to Apply the National Register Criteria for Evaluation*. Evaluate each cultural resource site and make a recommendation regarding its eligibility for inclusion in the NRHP using all criteria listed in 36 CFR 60.6, Department of the Interior National Register Bulletin 15 - *How to Apply the National Register Criteria for Evaluation*. At a minimum, National Register evaluations will contain the following three components:

a. Theme (e.g., Mormon settlement)
b. Location (e.g., St. George basin)
c. Time period (e.g., late 19th century)

The following types of cultural resources, provided they are 50 years old or older, and clearly retain integrity, may be considered eligible for the National Register of Historic Places:

- Properties with clear evidence for the presence of structures (historic structures, pueblos, pithouses, field houses, etc.).
- Properties with hundreds of surface artifacts (provided it is not a single episode can dump).
- Properties with clearly visible evidence of in-tact subsurface deposits.
- Properties that clearly meet the National Register listing requirements in State historic contexts, or SHPO-approved BLM-level historic contexts.

The SHPO has many Arizona thematic studies that may serve as historic contexts for NRHP evaluation located on their website at: https://azstateparks.com/SHPO. Also, contact the appropriate BLM archaeologist for appropriate historic contexts useful in National Register evaluations.

Protecting Cultural Resources

DATs may also assist cultural heritage program archaeologists in the protection of cultural resources. The Manual Section 8130 provides general guidance for protecting cultural resources from natural or human-caused deterioration; for making decisions about recovering significant cultural resource data when it is impossible or impractical to maintain cultural resources in a nondeteriorating condition; for protecting cultural resources from inadvertent adverse effects associated with BLM land use decisions, pursuant to the NHPA.

The protection component of the cultural resource management program is aimed toward protecting the significance of cultural resources by ensuring that they are managed in a manner suited to the characteristics, attributes, and uses that contribute to their public importance; toward giving adequate consideration to the effects of BLM land use decisions on cultural properties; toward meeting legal and regulatory obligations through a system of compliance fitted to BLM's management systems; and toward ensuring that cultural resources on public land are safeguarded from improper use and responsibly maintained in the public interest.

Field Office managers employ the following physical and administration conservation measures as management tools to protect historic properties as required by the National Historic Preservation Act, related Secretary of Interior Standards and Guidelines, and Executive Order 13287:

Physical conservation measures

Physical conservation measures may be applied directly to the cultural property, as in stabilization, or indirectly to the general area, such as in signing, fencing, or patrolling.

A. Indirect Methods. These methods refer to physical conservation measures that do not modify the resource. For this reason, they are often preferable to direct methods.

1. *Signing*. Under conditions of active or potential vandalism, cultural properties should be adequately signed, identifying the protection afforded by law. Signs should be placed so as not to intrude upon the property or to draw unwanted attention to it. Interpretive signs may also be appropriate for some properties and may protect them by promoting conservation ethics.
2. *Fencing/Gating*. Fences, barriers, and gates of various materials can be used alone or in combination with other methods to restrict access. The selection of designs and materials must avoid unwarranted intrusion on the property. Maintenance and safety requirements must also be considered in the design.
3. *Patrol/Surveillance*. Patrol and surveillance are determined by and scheduled according to the nature of the resource, degree of threat present, and the uses appropriate for the cultural resources involved. Irregularly scheduled patrols are among the best means of deterring looting, vandalism, and other unauthorized uses. Besides staking out a site, surveillance can be accomplished through detection systems; however, installation of surveillance equipment should not impair or compromise the integrity of the cultural resources.
4. *Erosion Control* (off-site). Cultural resources are frequently threatened by various

types of erosion. Flooding, seepage, major runoff areas, movement of soils by wind action, and other potential erosion problems can be monitored and controlled. Erosion control performed off-site can generally be accomplished at lower cost, with less disturbance to the resource, than on-site erosion control. Recontouring to improve drainage, construction of catch basins, diversion or check dams, revegetation, windbreaks, and other protection measures can reduce erosion.

5. *Fire Control* (off-site). An active fire protection program for cultural resources should include pre-suppression, suppression, and post-suppression activities. Periodic inspections may be undertaken to determine potential fire hazards. Pre-suppression measures include fire retardant treatments, reduction of fuel, construction of fuel breaks, and site-specific fire action plans. When implementing fire control measures, care should be taken to preserve the cultural resource's visual and environmental setting. Post-suppression analysis should consider physical conservation measures needed to restore the setting and rehabilitate the cultural resource damaged by fire and suppression activities.

B. Direct Methods. These methods refer to physical conservation measures that modify the resource.

1. *Stabilization*. Structural and material stabilization techniques introduce chemical, mechanical, or structural elements to retard the deterioration of a variety of cultural resources. For example, chemical measures include the application of polymers to protect rock art; structural measures include the replacement of mortar; mechanical measures include the jacking of floors. Detailed specifications for stabilization work should include individual fieldwork tasks required, specific locations requiring stabilization, methods and materials used, and types of expertise required. Maps, scale drawings and photos should be used liberally to illustrate work requirements. All stabilization work must be accurately and adequately documented to provide a clear "before and after" record of the property.

2. *Erosion Control* (on-site). When erosion control is necessary within the physical boundaries of a cultural property, the effects of the control measures on resource values should be carefully limited. Standard engineering construction practices must be modified to allow the proper recovery and recording of information that would be disturbed by the implementation of the erosion control measures. Examples of on-site erosion control measures include recontouring the site surface to promote better drainage and backfilling illegally excavated areas.

3. *Fire Control* (on-site). Effective on-site fire control is limited primarily to preventive measures. For example, wooden structures can be treated with fire retardant, trash and litter can be reduced, and in areas of public use, restrictions can be placed on campfires in the immediate vicinity of cultural resources. Fire arrest equipment can be provided inside structures for visitor safety and protection of the resource. Fire suppression handlines and bulldozer lines should be located to protect cultural properties.

4. *Detailed Recording*. The intent of detailed recording is to document those aspects of a cultural property that contribute to historical or scientific studies without substantially modifying the resource. This non-destructive technique may include the use of detailed mapping using surveying equipment, photogrammetry, aerial and standard photography, use of electronic equipment such as magnetometers or metal detectors, and narrative descriptions.

5. *Relocation*. Some cultural resources can be relocated with minimal impact to their inherent significance. This alternative is largely limited to structures and to some forms of rock art, such as boulders containing petroglyphs. Relocation of structures usually is expensive and requires special skills and equipment. Efforts to relocate properties should be carefully planned after full consideration of alternative conservation methods.

6. *Adaptive Reuse of Structures.* The adaptive reuse of historic structures should be considered before selecting some more potentially destructive methods (such as relocation). After rehabilitating a structure consistent with its historic character, it may be usable in its original location.
7. *Archaeological Data Recovery Techniques*. Archaeological data recovery includes those techniques that maximize controlled collection and/or excavation of cultural materials and data analysis. Excavation should be attempted only when other protection alternatives are not adequate or feasible to protect the scientific information contained in the property. Appropriate data recovery techniques are based on a formal research design carried out by qualified, trained specialists. Resulting collections and records should be curated at a qualified repository within the geographic region.

Administrative conservation measures

1. *Withdrawal.* Protective withdrawal of lands (see 43 CFR 2300-2370; BLM Manual Section 2321.6) means withholding an area from settlement, sale, location or entry under the general land laws and mining laws. Withdrawals usually do not cover discretionary actions such as those taken under the mineral leasing laws or the Recreation and Public Purposes Act. Administrative withdrawal allows transfer of jurisdiction to other Federal agencies.
2. *Closure to Public Access and Off-Highway Vehicles*. Areas may be temporarily closed to public use and travel (43 CFR 8364 and 8340) to facilitate special cultural uses or to protect scientific studies. Public lands may also be designated as indefinitely limited or closed to the use of off-highway vehicles.
3. *Special Designations*. Individual cultural properties or districts may be nominated to and listed on the National Register of Historic Places to recognize and reinforce their special management status (36 CFR 60 and 65; BLM Manual Section 1613). Limited protection through national recognition is also afforded when a property is listed as a National Historic Landmark. Areas of Critical Environmental Concern (ACEC) may also be designated to address special management needs for cultural resources.
4. *Land Acquisition*. State-owned or privately owned portions of Federal cultural properties or adjacent State or private lands may be acquired through exchange, purchase or deed to maintain site integrity or to provide buffer areas (43 CFR 2200).
5. *Recreation and Public Purposes Act*. This Act allows transfer of land to State or local government agencies or other entities (such as historical societies, conservation groups) under a conditional lease or patent (43 CFR 2740). This tool can be used to allow other entities to protect and develop cultural properties for public use when it is impractical or infeasible for BLM to do so.
6. *Easements*. Easements are authorizations for non-possessory, non-exclusive use of lands. BLM may acquire an easement to ensure administrative access to a cultural property (such as for patrolling) or to install physical conservation measures (such as fences or dikes) on nonfederal lands to protect BLM-administered cultural properties (BLM Manual Section 2130).
7. *Public Information and Education* (See BLM Manual Section 8170). Efforts to inform and educate the public about local cultural resource significance and conservation ethics may help decrease vandalism and ensure compliance with use restrictions.