

Cultural Resource Damage Assessment

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ABSTRACT

Unauthorized cultural resource alterations range from looting and grave robbing to contract violations and wildland fires. Such alterations degrade cultural resources' spiritual, communal, ecological, economic, and scientific values. Alterations often violate communal senses of place, security, and belonging. Alterations complicate jurisdiction-specific management, which is premised on up-to-date information on resource sizes, conditions, and significance. Cultural resource damage assessment protocols based on proven forensic practices distil to eight fieldwork steps: verify the alteration, assemble the team, survey the scene, document the evidence, gather the evidence, assess the archaeological value and the cost of repair and restoration, prescribe emergency remediation, and confirm evidence documentation and custody. The eight steps give special consideration to local communities and Indigenous Territories, where unauthorized alterations are as common as they are elsewhere, whereas impacts to spiritual and cultural values are generally greater. Adapted to jurisdiction- and incident-specific circumstances, the steps will guide responses to alterations by community leaders, land managers, regulators, law enforcement agents, and archaeologists, including preparation of excellent damage assessment reports. Damage assessment practitioners and land managers should refine these practices to deter alterations, engage Tribes and other affected communities, halt postalteration degradation, ensure accountability, and enable jurisdiction-scale curation of cultural resources and their unique value constellations.

Keywords: Archaeological Resources Protection Act, collaboration, cultural resources damage assessment, cultural resource management, curation model for jurisdictional CRM, forensic archaeology, historic property treatment plan, National Historic Preservation Act, Native American Graves Protection and Repatriation Act (NAGPRA), stewardship

El origen de las alteraciones de recursos culturales no autorizadas van desde saqueos y robos de tumbas hasta violaciones de contratos e incendios forestales. Tales alteraciones degradan los valores espirituales, comunitarios, ecológicos, económicos y científicos de los recursos culturales, violando a menudo el sentido comunitario de lugar, seguridad y pertenencia. Las alteraciones de recursos culturales no autorizadas también complican los sistemas de gestión específicos de la jurisdicción, que se basan en la premisa de tener información precisa sobre el tamaño, ubicación, condición e importancia de los recursos. Los protocolos basados en prácticas forenses comprobadas se dividen en ocho pasos recomendados en el trabajo de campo: verificar la alteración, reunir al equipo, sondear la escena, documentar la evidencia, recolectar la evidencia, recopilar la información para evaluar el valor arqueológico y el costo de reparación y restauración, proporcionar o prescribir remediación de emergencia y confirmar la documentación y custodia de la evidencia. Estos pasos deben adaptarse para guiar a los líderes comunitarios, administradores de tierras, reguladores, agentes de la ley y arqueólogos en respuesta a las alteraciones de los recursos culturales y a la preparación de reportes de evaluación de daños. Como se recomienda aquí, los ocho pasos dan consideración especial a las comunidades locales y a los territorios de los pueblos indígenas, en donde las alteraciones no autorizadas son tan comunes como en otros lugares, pero el impacto a los valores espirituales y culturales son generalmente mucho mayores. Los profesionales de la evaluación de daños deben personalizar y refinar estas prácticas recomendadas para desalentar las alteraciones no autorizadas, involucrar a las tribus y a otras comunidades afectadas, detener la erosión posterior a la alteración, garantizar la rendición de cuentas y promover un modelo de curación a escala de jurisdicción y a largo plazo para la administración de los recursos culturales y de su valor diverso y único.

Palabras clave: Ley de Protección de Recursos Arqueológicos, colaboración, evaluación de daños a los recursos culturales, gestión de recursos culturales, modelo de curación para CRM jurisdiccional, arqueología forense, plan de tratamiento de propiedad histórica, Ley Nacional de Preservación Histórica, Ley de Protección y Repatriación de Tumbas Nativo Americanas (NAGPRA), administración

CULTURAL RESOURCES AND UNAUTHORIZED ALTERATIONS

Cultural resources are objects, localities, and intangible traditions conserved across generations. Diverse, diversely valued, and

easily and often irrevocably damaged, "cultural resources" are wellsprings for communal and individual identities, vitalities, and senses of place, security, and belonging (Schaepe et al. 2017; Welch et al. 2011). Nations around the world maintain laws and cultural resource management (CRM) systems to assure that public benefits flow from cultural resources (Cleere 1990; Messenger and

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Smith 2010). Terms of reference in US law and policy—e.g., “cultural items,” “historic properties,” “sacred sites,” “archaeological resources”—emphasize cultural resources as material things with essential intangible dimensions (Table 1; Hutt et al. 2006; King 2008). Statutory and regulatory terminology is required in documents intended for government uses; in most other public-academic contexts, terms preferred by descendant community representatives are recommended (see Watson et al. 2022).

Despite global conservation mandates and well-developed CRM systems, cultural resources are altered by human and environmental agents hourly (Brodie and Renfrew 2005; Mackenzie et al. 2019). Some alterations are authorized in accordance with CRM processes and associated treatment plans, but unauthorized changes are frequent, unpredictable, and seldom beneficial to resources or those who care for and about them. In Arizona alone, between January 2009 and July 2021, the volunteer corps of Site Stewards, who monitor a small percentage of cultural resources located on a fraction of public lands, reported 2,157 incidents of looting and vandalism. Although land managers responded to many of these reports, funding and investigative priorities meant that only about 80 (~3.7%) of the altered resources received full damage assessments; only about 30 sites (~1.4%) prompted contract or permit reviews, civil or criminal investigations, or remediation treatments (Leonard et al. 2022). These sobering numbers are not confined to Arizona. Cultural resource crime is pervasive and effectively inseparable from poverty, terrorism, racism, addiction, and gun violence, thus earning a spot on the world’s roster of “wicked” problems (Welch 2020a).

Two examples bring substance to statistics. A January 2022 letter to Tribes from the US Army Corps of Engineers (Corps) reversed the “no adverse effect” determination for the 8,500-home “Lake Pleasant 5000 Master Planned Community” undertaking on private land near Phoenix (Harvard Investments 2022). The Corps’ reversal of its determination, and the additional consultations with affected Tribes and the State Historic Preservation Officer pursuant to the National Historic Preservation Act (NHPA), were required to address the supposedly inadvertent mechanical destruction of an Ancestral O’odham village set aside for protection in accordance with Clean Water Act permit stipulations.

The destruction obliged the Corps to resolve the adverse effects, through a historic property treatment plan, additional CRM investigations, or compensatory mitigation. One Tribe’s official identified this as the third major unauthorized cultural resource alteration of 2022.

A second Arizona case involved sustained looting of Ancestral O’odham-Pueblo homes and burial locations on Tonto National Forest (United States v. Herrick, 3:21-mj-04172, PACER [D. Ariz. 2021]; United States v. Epperson, 3:21-mj-04223, PACER [D. Ariz. 2021]; United States v. Jochim, 3:21-mj-04224, PACER [D. Ariz. 2021]). Between May 2020 and April 2021, Gail A. Herrick, Joshua E. Epperson, and Patrick A. Jochim excavated at least 13 m³ of cultural resource sediments, desecrated at least two funerary features, and removed hundreds of cultural items and archaeological resources. Federal law enforcement officers apprehended Epperson at the scene, Mirandized him, and obtained admissions that implicated two other men as perpetrators of one of the most destructive nonmechanized looting cases in US history. Despite prospects for precedent-affirming and deterrent-creating convictions under the criminal provisions of the Native American Graves Protection and Repatriation Act (NAGPRA) and the Archaeological Resources Protection Act (ARPA), the US Attorney for Arizona endorsed plea agreements and allowed all three looters to receive minor citations and probation in exchange for returning the looted resources and paying for partial remediation. Several Tribes, the National Association of Tribal Historic Preservation Officers, and the Society for American Archaeology (2022) asked the judge to reject the plea agreements and instruct the US Attorney to follow pertinent prosecutorial rules by charging the perpetrators with the “most serious readily provable offense” (US Department of Justice 2015). Available evidence suggests that the perpetrators should have been charged with multiple felonies.

These cases offer glimpses of the variation in cultural resource alterations and hints of unsettling trends toward tolerance—at least by some US federal government offices—of even massive and heinous alterations. For present purposes, the cases exemplify situations in which damage assessments are indispensable foundations for effective responses by archaeologists, land

Table 1. Cultural Resources, as Defined in US Federal Law.

Term and Definition	Statute or Rule
Elements of the human environment: “the natural and physical environment [including historic and cultural aspects of national heritage] and the relationship of present and future generations of Americans with that environment”	National Environmental Policy Act (42 USC 4331 (4); 40 CFR 1508.1[m])
Historic properties: “any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion on, the National Register of Historic Places.” This includes properties associated with practices, beliefs, and lifeways of traditional communities.	National Historic Preservation Act (54 USC 300308)
Cultural items: human remains, funerary objects, sacred objects, and objects of cultural patrimony.	Native American Graves Protection and Repatriation Act (25 USC 3001)
Sacred sites: “any specific, discrete, narrowly delineated location on Federal land that is identified by an Indian tribe, or Indian individual determined to be an appropriately authoritative representative of an Indian religion, as sacred by virtue of its established religious significance to, or ceremonial use by, an Indian religion”	Executive Order 13007(Sec. 1 (b)[iii])
Archaeological resources: “any material remains of past human life or activities which are of archaeological interest . . . [and] at least 100 years of age”	Archaeological Resources Protection Act (USC 470bb(1); 43 CFR 7.3[a])

managers, compliance regulators, law enforcement professionals, descendant community leaders, and prosecutors.

This article argues for more consistent use of cultural resource damage assessment (CRDA) to respond to cultural resource alterations. Part one outlines general roles for CRDA in land management and specific roles in CRDA for archaeologists and law enforcement officers (LEOs). Part two presents an eight-step approach to CRDA fieldwork. These recommended practices, initially developed to support ARPA and NAGPRA violations, are also applicable to unauthorized alterations linked to violations of construction contracts and NHPA Section 106 agreements and to alterations resulting from fires, floods, and other environmental agents. The article concludes with a recommendation to shift federal, tribal, state, and local government CRM policies and practices toward a curation model in which resource management decisions and investments are systematically based in reliable information on resource conditions and threat assessments.

DAMAGE ASSESSMENT IS INTEGRAL TO LAND AND RESOURCE MANAGEMENT

As systematic means for gathering, organizing, and mobilizing information about changing resource conditions and remediation options, damage assessments are integral to legal, administrative, and communal responses to unauthorized alterations of lands, waters, and cultural resources. Damage assessments describe and quantify the types, extents, sequences, and distinctive or patterned attributes of resource changes and losses. Damage assessments illuminate the background circumstances and specific agents, events, and processes causing or constituting the alteration. Damage assessments provide information needed by resource managers to facilitate consultations with those affected by the alterations, to identify human or environmental agents responsible for alterations, and to prescribe treatments to halt further losses and to provide longer-term remediation and conservation.

Despite the importance of damage assessment in CRM, land management, and law enforcement, protocols for assessing damages to natural and cultural resources are generally underdeveloped. Because these alterations are axiomatically unique in terms of jurisdiction, causes, and consequences, there can be no uniform procedural prescription (Conti 2017). Published guidance for natural resource damage assessment (NRDA) primarily addresses the aftermaths of floods and hazardous material releases, providing few models pertinent to cultural resource damage assessment (Barnthouse and Stahl 2017; Robichaud et al. 2009). Arizona's Site Stewards program is not the only commendable example of jurisdiction-scale site monitoring (e.g., BC Hydro 2018; Fairley and Sondossi 2008). The US interagency Burned Area Emergency Response (BAER) program includes protocols for identifying and stabilizing cultural resources affected by wildland fires, but BAER's 20-day planning and budgeting windows inhibit contributions to broader management goals and practices (Grover 2021). Aside from guidance grounded in investigations of cultural resource crime—incidents more akin to wild-life poaching than to disasters—there are no widely applicable CRDA protocols. For the simple reason that land owner/managers

and law enforcement officials need information on resource conditions documented prior to unauthorized alterations in order to attribute changes to specific incidents or processes, jurisdiction-specific CRM systems will languish in impotence until policies require CRDA in response to all unauthorized alterations, not just likely ARPA violations.

ARPA PROVIDES A STURDY FRAMEWORK FOR CULTURAL RESOURCE DAMAGE ASSESSMENT

ARPA investigations since 1980 have produced and tested a suite of principles and methods adaptable for use in CRDA. The framework supports ARPA's core provisions: it is a crime in the United States to alter or remove archaeological resources from Indian lands or federal public lands without a permit, to sponsor such alterations or removals, or to traffic in archaeological resources. ARPA violators face fines, forfeitures of equipment and vehicles used in violations, felony prosecutions for first offenses, and civil penalties for violations not suited for criminal prosecution (McManamon 2000; National Park Service 2006). NAGPRA includes similar provisions, and may soon authorize felony prosecutions for first offenders. ARPA does not apply to cultural resources less than 100 years of age, located on private or state lands, or consisting only of arrowheads found on the ground surface.

In just three years—1985–1987—federal agencies reported 1,720 ARPA violations, resulting in 57 misdemeanor and 16 felony convictions under ARPA (Carnett 1991). Later, from 1996 to 2005, ARPA investigations produced indictments for 259 suspects, ARPA convictions for 83 defendants, and incarceration for 20 convicted felons (Palmer 2007). Recently, of the estimated 2,000 ARPA and NAGPRA violations between 2009 and 2018, only 77 cases were referred to the Department of Justice for prosecution (US Government Accountability Office 2021). In Arizona, between 2009 and 2022, 17 ARPA cases were referred to the US Attorney's Office (Cowell et al. 2023). Prosecutors declined 10 (59%) of these cases; two defendants pled guilty to ARPA misdemeanors; one misdemeanor ARPA charge and four felony ARPA charges were dismissed. The last successful felony conviction of ARPA in the District of Arizona was in 2011 (United States v. Ganey, 3:10-cr-08221, PACER [D. Ariz. 2011]).

These statistics underscore the variable complexity and cost of ARPA investigations. Some involve misguided but otherwise reputable citizens; others involve repeated violations, weapons, drugs, and other aggravating factors (Moriarty et al. 2019; Patel 2009; Proulx 2011). Although ARPA is a "general intent" law, few prosecutors pursue cases that lack evidence for both criminal intent and for damage to the archaeological value of the affected resources in excess of \$500 (or for commercial value plus the cost of restoration and repair for those resources exceeding \$500). For these reasons, and because Western law generally discounts Indigenous Peoples' rights while elevating private property rights, ARPA cases are seldom instantly compelling to courts. Archaeologists and representatives of descendant communities, usually Tribes in the United States, are often obliged to educate LEOs, prosecutors, and judges regarding the profound harms stemming from what are seen by some as minor resource alterations and victimless indiscretions (Goddard 2011; Rothberg 2022).

When ARPA cases do move ahead, felony prosecutions require proof, beyond a reasonable doubt, for six elements:

- (1) Defendant affected an archaeological resource as defined in ARPA.
- (2) Violation occurred on federal public lands or Indian lands (US Department of the Interior 2017).
- (3) Defendant excavated, removed, damaged, defaced, or trafficked in an archaeological resource, attempted to do so, or counseled, solicited, or employed another person to do so.
- (4) Prohibited act occurred without a permit or outside the scope of an ARPA permit.
- (5) Sum of the archaeological value and the cost of restoration and repair, or the sum of the commercial value and the cost of restoration and repair, exceeds \$500.
- (6) Defendant acted knowingly.

As suggested by the above-cited evidence for declining frequency of ARPA convictions, especially deterrent-inducing felony sentences with prison terms, demonstrating all six elements is challenging. ARPA’s authors anticipated these challenges by requiring a unique, three-way forensic collaboration: LEOs direct the assessment team and investigation, archaeologists provide expertise in resource documentation, and prosecutors package and deliver cases to courts. Figure 1 depicts parallels between archaeological and forensic procedures that facilitate collaborations between archaeologists, LEOs, and landowner/managers.

Collaborative responses to ARPA’s challenges have enhanced damage assessment procedures. Archaeologists play core roles in investigating ARPA Elements 1–5. LEOs are uniquely qualified to document evidence for criminal intent (Element 6), usually through background checks and interviews. For Element 6, archaeologists assist LEOs by documenting perpetrator coordination (e.g., systematic or repeated looting) and inattention to warning and educational messages. For cases in which Elements 1–5 are evident but criminal intent is not, perpetrators remain subject to civil prosecution under ARPA and laws prohibiting theft or destruction of federal and tribal property (Hutt 1994; Hutt et al. 2006). NHPA Section 110(k) also directs attention to intent by

prohibiting federal agencies from funding or assisting any applicant who intentionally alters a historic property in seeking to avoid responsibilities for Section 106 compliance—that is, *anticipatory demolition*.

ARCHAEOLOGICAL ETHICS ARE INTEGRAL TO CULTURAL RESOURCE DAMAGE ASSESSMENT

This article’s core recommendation—to apply ARPA’s CRDA framework to investigations of violations of NHPA agreement documents and other alterations that merit administrative, personnel, or community response—accords with recent shifts in CRM policy and practice toward respectful considerations of Indigenous Peoples’ sovereignties and interests in wider ranges of cultural resources and associated values (Atalay et al. 2014; Hogg et al. 2017; McManamon et al. 2016; Poullos 2010). The legal prerogatives and social licenses possessed by CRM professionals are contingent on weighty responsibilities to benefit society by conserving and mobilizing cultural resources, principally through research, public outreach, and cooperation in community and economic development initiatives (Welch 2020b). Archaeologists’ generally constructive responses to feminist and Indigenous demands for proportional participation and authority in disciplinary and CRM processes (Hodgetts et al. 2020; Voss 2021; White and Draycott 2020) have allowed archaeologists to retain many prerogatives in assessing cultural resource values and in guiding CRM efforts to compensate for the losses of cultural resources to enable land modification and commodity extraction (Ferris and Welch 2014; Welch and Ferris 2014).

Archaeologists alone cannot halt unauthorized cultural resource alteration, but core elements of archaeological ethics (Table 2) prohibit professionals from ignoring alterations or associated harms to descendant communities and others. One such mandate, NHPA Section 110, requires federal agency preservation programs to identify, evaluate, nominate, and protect historic properties eligible for listing in the National Register in

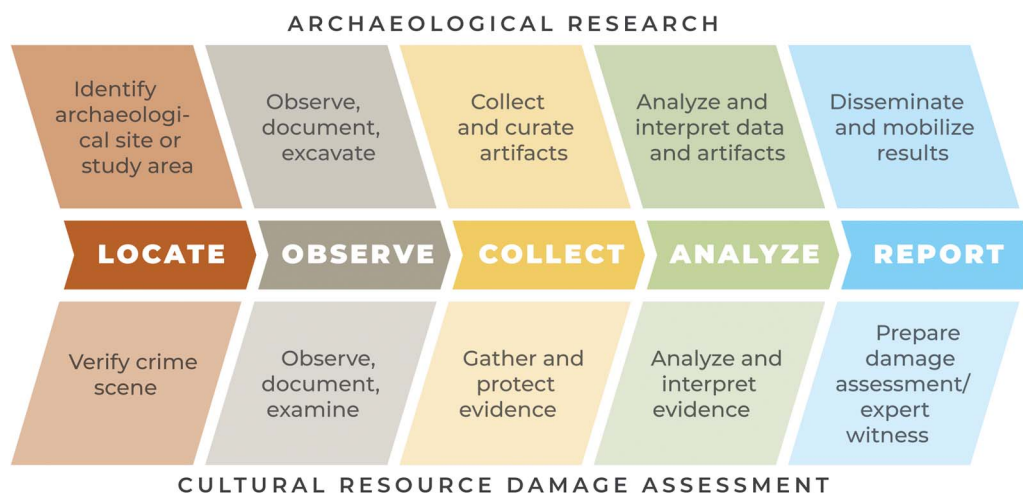


Figure 1. Procedural parallelism in archaeology and cultural resource damage assessment.

Table 2. Some Ethical Mandates for Archaeologists to Pursue CRDA.

Source	Guidance for Professional Archaeologists
Society for American Archaeology's Principles of Archaeological Ethics (Society for American Archaeology 1996)	"work for the long-term conservation and protection of the archaeological record" (Principle No. 1: Stewardship); "discourage [and] avoid, activities that enhance the commercial value of archaeological objects, especially objects that are not curated in public institutions" (Principle No. 3: Commercialization)
World Archaeological Congress (1990)	"become involved in work fostering cultural heritage protection."
Register of Professional Archaeologists' Code of Conduct (Register of Professional Archaeologists 2020)	"Actively support conservation of the archaeological resource base. . . . [R]espect the legitimate concerns of groups whose culture histories are the subjects of archaeological investigations. . . . [S]upport and comply with the terms of the UNESCO Convention on the means of prohibiting and preventing the illicit import, export, and transfer of ownership of cultural property."

consultation with Tribes, other government agencies, and the public. It is not possible, of course, to maintain either information regarding National Register status or readiness to respond to unauthorized alterations without completing CRDA in the wake of prior alterations. Systematic, context-sensitive applications of CRDA principles and methods will help archaeologists meet obligations to curate sites and associated documentation in accord with evolving standards for professional practice.

In recognition of the severity of harms cultural resource alterations cause to Indigenous Peoples and of mandates to more effectively address unauthorized alterations, the [SaveHistory.org](https://www.savehistory.org) campaign exists to eliminate cultural resource crime on US tribal lands (see also Welch et al. 2019). The Bureau of Indian Affairs, the Tucson-based nonprofit Archaeology Southwest, and collaborating Tribes are working to prevent, detect, prosecute, and remediate cultural resource crimes using training, monitoring, sedimentology, and related tools (Ryan 2021; Welch et al. 2021).¹ This article's recommendations for CRDA practice are grounded in previous suggestions for improving ARPA implementation (Fetterman 2012; McAllister 2007) and in the authors' experience with about 50 damage assessments since 1991. Our technical guide to ARPA damage assessment fieldwork is available to bona fide government personnel and contractors (US Bureau of Indian Affairs 2020).

DAMAGE ASSESSMENT FIELDWORK IS THE ESSENTIAL LINK BETWEEN HARM AND REMEDIATION

CRDA fieldwork is the irreplaceable basis for producing a damage assessment report (DAR). The DAR documents, at a minimum, the following: (1) the cultural resource, (2) the land ownership and jurisdiction, (3) the methods and person hours employed in CRDA, (4) the nature and extent of the resource alteration or loss, and (5) the projected costs of cultural resource losses and of necessary resource stabilization and remediation. ARPA requires attention to "emergency restoration and repair," but because true restoration of cultural resources is seldom possible, we use "remediation" as the gloss for stabilization, rehabilitation, restoration, and community responses to resource alterations.

National Park Service Technical Brief 20 provides standards for DAR preparation for ARPA cases, including guidance for

calculating Archaeological Value, Commercial Value, and the Cost of Restoration and Repair (McAllister 2007; see also Society for American Archaeology 2003). In most years, fewer than 100 DARs are produced in the US for use as evidence in criminal cases and civil adjudications and, less frequently, as bases for historic property treatment plans completed to facilitate NHPA compliance. Most DARs are prepared at the behest of federal land managers. DARs prepared "for the file" (i.e., *legacy DARs*) provide especially useful foundations for responses to subsequent alterations affecting the same cultural resource.

Regardless of the source and location of the alteration—and regardless of whether the DAR is likely to be used in pursuit of legal and financial accountability—all DARs should present unambiguous evidentiary standards and clear descriptions of alteration- and site-specific circumstances using consistent terminology. The most useful DARs are prepared to document alterations objectively rather than to support any party to a dispute. To maintain neutrality, DARs should be grounded in fieldwork that is systematic, logically sequenced, well documented, context sensitive, and professional beyond reproach. DARs should present steps taken by the CRDA team from the time a resource alteration is reported until the field assessment and stabilization treatments are completed. DAR preparation—including calculations of archaeological value, commercial value, and the cost of postemergency restoration and repair—builds upon and mobilizes the results of CRDA fieldwork (McAllister et al. 2019).

Eight essential steps in CRDA fieldwork are listed in [Figure 2](#), which depicts a sequence of overlapping phases that begins with confirmation of an unauthorized alteration and ends with CRDA team departure from the location of the alteration with all pertinent evidence and documentation secured. Throughout CRDA, but especially in early steps, archaeologists, LEOs, landowner/managers (including Tribes and Nations, where applicable), and other parties should refine or resequence these steps in response to (1) emerging evidence, (2) results from initial steps, and (3) case-specific jurisdictional, logistical, cultural, and resource concerns and preferences. The following sections describe each of the eight steps, including when to begin, who to involve, what information to capture, and when to initiate subsequent steps. As an essential means for impeding further harms and initiating healing, CRDA should prioritize treatments planned and conducted in consultation with affected land and resource owners, especially Tribes and other Indigenous Territory Owners, whether resident or not.

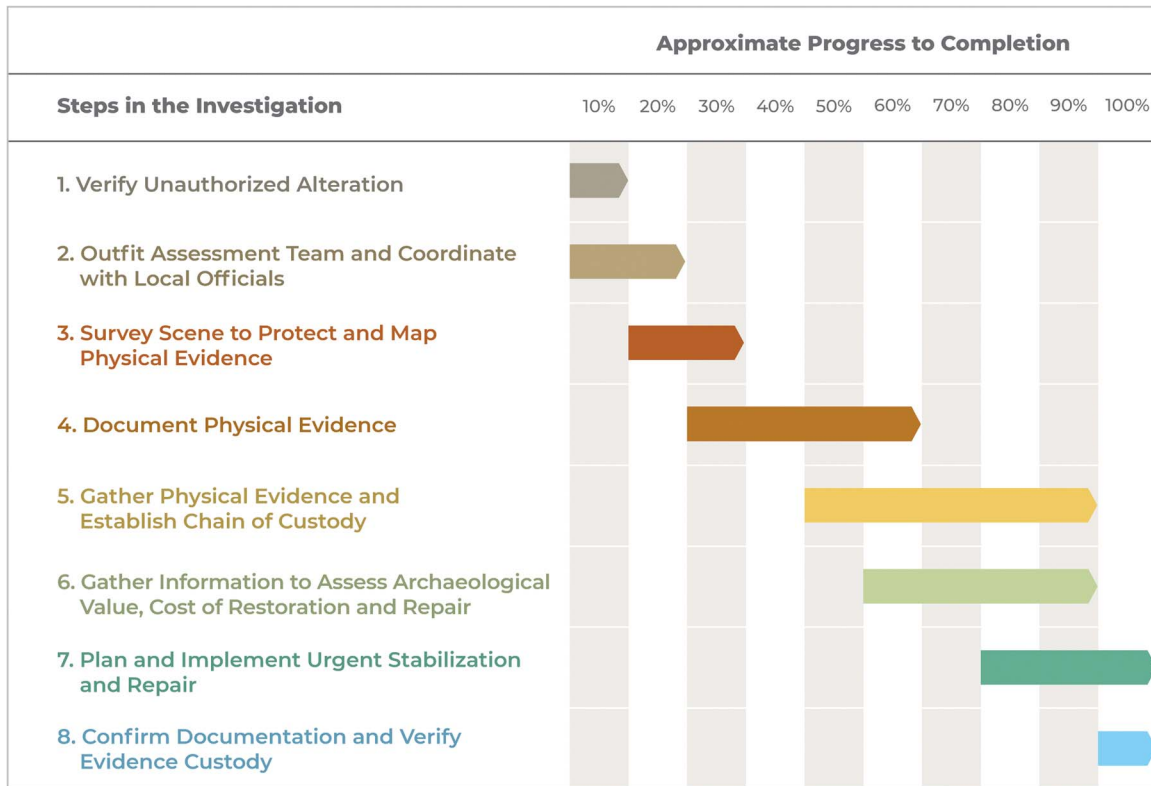


Figure 2. Eight steps in cultural resource damage assessment fieldwork.

Step 1: Verify ARPA Violation or Other Unauthorized Alteration

Notification of a cultural resource alteration may come via a site monitor, witness, LEO, or other individual. Regardless of the source, the receiving archaeologist should expeditiously gather, evaluate, and document evidence. Answers to Step 1 questions guide all subsequent CRDA steps:

- What land jurisdiction(s) is involved?
- Is a cultural resource, an archaeological resource (sensu ARPA), or both present?
- Has that resource been altered?
- Was the alteration duly authorized?

A visit by a two-person team—that is, LEO and cultural resource professional—is the best way to assess a reported alteration. The initial visit should use notes and photographs to document resource conditions and to answer at least three more focused questions: First and foremost, has a cultural resource, particularly an archaeological resource, been excavated, removed, damaged, defaced, or otherwise altered? If so, the second key question is whether surveillance should be conducted (typically done if there are indications that additional alterations are likely in the near term). If not, the question becomes when and how to initiate CRDA fieldwork. Third, should an LEO be assigned to maintain scene integrity and site security, as indicated for cases with high potential for felony prosecution or those in high-traffic areas? If the alterations have not created significant hazards or threats, and if the prospects for accountability are low, then the landowner/

manager may, in effect, answer “no” to all of the above and opt instead to make the best of the lamentable situation by scheduling opportunities for community engagement, CRDA training, interagency cooperation, or remediation. Figure 3 presents factors relevant to planning the type and level of CRDA response to a reported alteration. Information about alterations is best restricted to government officials, including tribal representatives, and col-laborators bound by nondisclosure agreements.

Where available evidence indicates that an unauthorized alteration has occurred, findings from the initial visit will inform follow-up contacts with landowner/managers, other responsible official(s), knowledgeable professionals, and prospective members of the CRDA team. Written documentation at this and all subsequent CRDA steps should emphasize facts and descriptions—*who, what, when, where, how much*—rather than “*why*” interpretations or value judgments of any sort. Notes and other records should be prepared with foreknowledge that these may be scrutinized by regulators, LEOs, prosecutors and defense attorneys, and judges.

It is often impossible in the early stages of an investigation to ascertain whether the response to an unauthorized alteration will be administrative, civil, or criminal. To optimize opportunities for assigning accountability, conclusions about incident disposition should be deferred. This means that archaeologists and other CRDA participants should treat all alteration loci as crime scenes. Until the LEO or the landowner/manager directs otherwise, evidence should be identified, documented, gathered, and reported in accordance with protocols for crime scene management and the eight CRDA steps prescribed here.



Figure 3. Factors affecting cultural resource damage assessment timing and scale.

Step 1 continues until the LEO or landowner/manager determines either that CRDA is unnecessary or that a CRDA team of requisite size and expertise should be fielded. The LEO or regulator is responsible for follow-up interviews with those who report alterations and other persons of interest. These interviews may help to determine the alteration sequence and the types of evidence likely present. For example, if the reporting party states that the alteration occurred after a recent rain, the LEO will look for footwear or vehicle tire impressions. If the perpetrators may have come from a particular community, the LEO may contact that community’s law enforcement. If a construction contractor is responsible, then the permit regulator should inspect agreement documents to determine who should have informed the equipment operator or subcontractor of the presence of protected cultural resources.

If it becomes clear that there is no evidence for criminal activity or civil liability, and that there is no or low potential to use the case as a context for capacity building, the LEO will usually withdraw from the CRDA team. When that happens, the landowner/manager should designate another lead investigator—often the lead archaeologist—to complete the CRDA fieldwork and DAR. For purely administrative, nonforensic cases, readers should substitute “lead archaeologist” for “LEO” in Steps 2–8.

Step 2: Outfit Damage Assessment Team and Coordinate with Pertinent Officials

Information gathered through initial visits and interviews should be used to determine CRDA team size, expertise, equipment, and funding. Relevant findings from Step 1 also include site

accessibility, travel times and other logistical concerns, the type and approximate age of the altered resource, the type and extent of the alterations, estimates of the types and amounts of evidence to be gathered, and the identification of hazards to CRDA personnel and cultural resources. CRDA team size and composition should “fit” the type, scale, attributes, and jurisdiction of the alteration, the level of LEO experience, and directives from the landowner/manager (Figure 4).

A LEO and experienced archaeologist may be able to complete in one day the fieldwork and evidence collection for an alteration episode involving up to three small looter’s holes not disturbing human remains. At the other extreme, it may be necessary on the basis of case-specific circumstances to expand the CRDA team to include experts in such fields as human osteology, Indigenous history and culture, pottery, shell, botany, mapping, geoarchaeology, architecture. Supplemental experts may author sections of the DAR or provide stand-alone reports. The role of experts, including the lead archaeologist, is to assist decision-makers—possibly including judges—by gathering, analyzing, and interpreting evidence that may be challenging for nonexperts to understand. The recommendation is to staff the CRDA team with the minimum number of professionals required to complete the work within a week.

The LEO directs the CRDA and coordinates with local or tribal law enforcement. The lead archaeologist or another cultural resource professional typically guides consultations with historic preservation officers, landowner/managers, and nonlocal Indigenous

Territory Owners. Tasks required to prepare for CRDA fieldwork mirror those for other archaeological investigations: compile site records, secure rights of entry and other permissions, and craft safety plans that anticipate risks and comply with regulations. The significance and status of the altered cultural resource should not determine whether to proceed with CRDA fieldwork, although previous assessments of resource significance should be compiled and made available to enable discussion in the DAR of the effects of the alterations on the values embedded in the affected resources.

The lead archaeologist typically assembles CRDA equipment and supplies, including tools, materials, and forms needed to map the scene, process alteration area sediments, gather archaeological evidence, and compile written and photographic records of all alterations. The CRDA team should seek guidance, as needed, to safeguard disturbed human remains or other affected cultural items, preferably in conjunction with descendant community or family consultations.

Once the CRDA team is assembled, the LEO and lead archaeologist should brief the team on how to avoid and mitigate threats to personnel safety, and how to maintain the integrity of the alteration scene and evidence. The LEO should assign responsibilities to each team member and affirm mandates for uninterrupted, intrateam communications. The LEO should also set rules for extrateam communications, including prohibitions against discussion of the case in any context, especially social media. Damage assessments can have profound effects on both responsible parties and those who are harmed. Lives, livelihoods, and senses of family, community, and justice are often at stake, and CRDA team members must behave with utmost cognizance of the potential consequences of their work and words.

Step 3: Map the Alteration Scene and Identify Physical Evidence

With the CRDA team assembled, equipped, and briefed, essential next steps include defining the boundaries of the alteration scene and identifying the evidence associated with the actions that resulted in the alteration. Initial reconnaissance is the basis for CRDA team planning to design and implement an alteration scene survey. Scenes that are large, are complex, or have undefined boundaries should be surveyed using systematic strip or grid techniques employed in cultural resource inventories, but with less than 3 m separating individual surveyors. Regardless of methods used, the survey goals are to compile an initial inventory of archaeological and nonarchaeological evidence and to establish directions for in-field evidence collection, analysis, and interpretation, including possible future laboratory analyses. Attributes associated with cultural resource alteration scenes are depicted in Figure 5.

The survey should be guided by case-specific factors and general forensic principles. As the Step 3 survey proceeds, the CRDA team should be refining Step 4 and 5 plans to gather evidence to address the following fundamental questions:

- Who (or what) is responsible for the alteration? How many parties (or agents) were involved? Are there differences among footwear or tire impressions, implements used, looter’s holes, styles of graffiti, etc.?



Figure 4. Idealized damage assessment team and lines of authority and input.

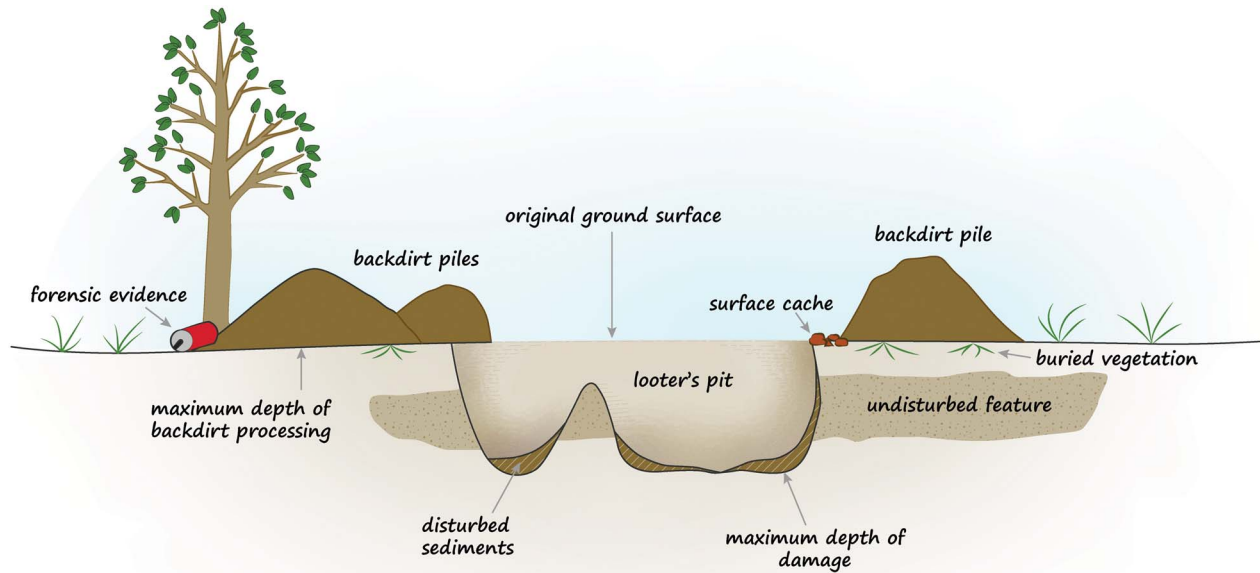


Figure 5. Attributes of one common type of unauthorized cultural resource alteration.

- Where is evidence located? Color-coded pin flags are recommended to delineate scene boundaries and to differentiate among sources of alterations, types of evidence, routes of site ingress/egress, etc.
- When did the alteration occur? How many episodes were there? Where there is evidence for multiple episodes, the CRDA team should attend to the most recently created evidence while also seeking to differentiate among evidence for prior alteration episodes.
- How, specifically, did the alteration occur? The CRDA team should informally share observations about evidence for specific equipment and techniques responsible for specific alterations and losses.
- What steps are needed to complete the assessment, and which CRDA team members are responsible for each? The scene survey provides the context for refining plans for subsequent steps.

Except as otherwise indicated, all evidence for recent alterations should be flagged for documentation and included within the scene boundary. Based on local geology and on the type, size, and complexity of (1) the cultural resource, (2) the alteration(s), and (3) the evidence, a decision should be made whether to collect sediments for possible comparison to confiscated tools, footwear, and other items potentially linked to the alteration. Sediments are unconsolidated particles transported by water, wind, people, or other agents. In contrast, soils develop over time in the absence of movement or disturbance. CRDA investigators must identify the difference between disturbed and undisturbed soils or sediments and mobilize this distinction to understand the timing and sequence of violations involving excavations. Variations in sediment textures, colors, inclusions, and other attributes can help define excavation and removal episodes and associated behaviors

(Bowen and Caven 2013; Welch et al. 2019). Sediment sample collection is addressed in Step 5.

Step 4: Document Physical Evidence

After the scene survey is completed, the team should select areas for further investigation, then develop plans for evidence documentation, collection, and processing. Unless redirected by the LEO or landowner/manager, the CRDA team must treat all evidence from or about alteration scenes as forensic evidence. Written notes, photographs, and maps are required to document all observed or gathered evidence. Team member misjudgment or incomplete training—as manifested in faulty or erroneous notes, photograph logs, or chain of custody forms—are primary and recurring threats to evidence integrity. The LEO should confirm that all team members both grasp the significance of chain of custody and know how to complete the paperwork required to collect and transfer evidence.

The lead archaeologist should take systematic notes to document all CRDA observations and actions. Notes should use specific, descriptive terms linked to direct observation and to statutory and regulatory language (Table 3). Opinion, interpretation, speculation, and jargon should be avoided. Priority should be given to accuracy over precision—especially when precision is superfluous and potentially falsifiable (e.g., use “about 1 m” in lieu of “98.7 cm”). Mistakes should be crossed out with a single strike-through. Notes and photos should never be erased or deleted, because this encourages parties responsible for the alteration to raise difficult-to-answer questions regarding whether exculpatory evidence may have been eliminated.

Photographs are irreplaceable elements of CRDA evidence packages. Damage assessment photographs should systematically

Table 3. ARPA-Defined Terms for Cultural Resource Damage Cost Assessment.

Term and Citation	Definition
Archaeological Value (43 CFR 7.14[a]).	“This value shall be appraised in terms of the costs of the retrieval of the scientific information which would have been obtainable prior to the violation. . . . may include, but need not be limited to, the cost of preparing a research design, conducting field work, carrying out laboratory analysis, and preparing reports as would be necessary to realize the information potential”
Commercial Value (43 CFR 7.14[b])	“the fair market value . . . determined using the condition of the archaeological resource prior to the violation”
Cost of Restoration and Repair (36 CFR 296.14)	“the sum of the costs already incurred for emergency restoration or repair work, plus those costs projected to be necessary to complete restoration or repair, which may include . . . : (1) reconstruction of the archaeological resource; (2) stabilization of the archaeological resource; (3) ground contour reconstruction and surface stabilization; (4) research necessary to carry out reconstruction or surface stabilization; (5) physical barriers or other protective devices, necessitated by the disturbance of the archaeological resource . . . ; (6) examination and analysis of the archaeological resource . . . to salvage remaining values which cannot be otherwise conserved; (7) reinterment of human remains . . . ; (8) preparation of reports relating to any of the above activities”

depict resource conditions for specified times and locations (e.g., for a particular backdirt pile, “as found” and “postprocessing”). Most compilations will benefit from “as found” overviews, midrange shots, and close-ups of all identified and potential evidence. Documentary aids (e.g., scales, directional arrows, and alteration area identifiers) should be used in a series of shots that follow and complement the initial series. The photographer’s name, date, time, and location should be systematically recorded in a photo log. Each day should begin and end with a photograph of a photo board that depicts the date/time, agency, case number, subject, and photographer. Cameras’ date/time stamps should be turned off to avoid metadata inconsistencies among multiple cameras and photo logs. Inclusion of individuals, vehicles, and tools in photographs should be avoided, and an untinted plastic sheet should be used overhead, as needed, to eliminate stark shadows. The LEO and lead archaeologist may also decide to video the scene, following parallel recommendations to document evidence and scene features.

Alteration scene sketches (usually not to scale) by the LEO or LEO designee should document the locations of evidence and depict schematic spatial relations among evidence and inferred alteration processes and sequences. Archaeological site maps (scaled) may be produced or compiled from previous site records by the lead archaeologist for use in fieldwork and inclusion in the DAR. CRDA maps should depict artifacts involved in the alteration, other archaeological evidence, nonarchaeological evidence, backdirt piles, and other alteration scene features. Nonarchaeological evidence—for example, cigarette butts, food wrappers, residues—found outside of backdirt piles should be point mapped and photographed. DARs should also include a portion of the relevant US Geological Survey 7.5-minute quadrangle map (or equivalent) that accurately depicts the location of the altered cultural resource.

Step 5: Gather Physical Evidence and Establish Chain of Custody

Locard’s Exchange Principle holds that a criminal will introduce something into the scene and leave with something from it (Constantakis 2016). Material evidence, such as objects and residues, should be documented and gathered when appropriate.

Nonmaterial evidence can indicate activity areas or alteration methods and may include broken branches, footpaths, cut roots, tool marks, and impressions of fingerprints, footwear, and tires. Many LEOs are qualified to document nonmaterial evidence through fingerprinting, impression casting, DNA sampling, and expert photography. Lead archaeologists should be prepared to identify additional experts as needed to fill gaps in CRDA team capacity.

All evidence is to be treated as if integral to complete and just incident disposition. Evidence and associated documentation should be gathered without alteration, removal, or supplement. Forensic evidence includes both archaeological evidence (e.g., artifacts affected by violation) and nonarchaeological evidence (e.g., looter equipment, caches, food and beverage containers, and biological residues). Perishable evidence—such as DNA and fingerprint evidence from tools, food and beverage containers, and other objects with smooth surfaces—should be handled with clean gloves. Disturbed sediments should be screened to assess the presence of evidence. As a general rule, 1.89 liter (2 qt.) sediment samples should be gathered from each looter’s hole to improve opportunities to match sediments from the scene to items or equipment traceable to a current or future suspect. DAR use of English volumetrics (with metric equivalents) generally boosts comprehension by judges and juries and facilitates the bucket tallies used to estimate the amount of damage from unauthorized excavations, as discussed in Step 6.

The CRDA team should manage human remains and other cultural items (per NAGPRA) as evidence while also demonstrating utmost respect for cultural items, including complete avoidance if possible. Where necessary to CRDA, documentation of identifying and locational information for each cultural item is required. Cultural items that appear to have been removed from their prealteration location may be gathered as evidence at the LEO’s discretion. The LEO or lead archaeologist should consult with affiliated Tribes and obtain guidance regarding photography, other documentation preferences, recovery, housing requirements, and plans for repatriation following case disposition. The goal is to resolve all concerns regarding CRDA procedures respectfully while maintaining the integrity of the investigation

and evidence. Trained osteologists or forensic anthropologists should recover and document human remains. Until there is reliable confirmation that all human remains are not Native American, recovery and documentation should be done in consultation or collaboration with designated tribal representatives.

The LEO is likely to establish chain of custody procedures to keep track of evidence removed from alteration scenes. Gathered materials that may be used in criminal or civil litigation should be shielded from tampering using locked containers and evidence tape to secure packaging.

Step 6: Gather Information to Assess Archaeological Value and Cost of Restoration and Repair

Once evidence susceptible to relocation or other disturbance has been gathered, the CRDA team should compile the information required, pursuant to ARPA, to assess the lost archaeological value and the costs of “restoration and repair.” Table 3 provides ARPA’s definition of this and other terms to be used in Step 6 and the DAR. In the context of most CRDA fieldwork, the cost of “restoration and repair” is the cost of resource stabilization and other remediation required to reduce hazards and avert further resource losses. As an alternative to assessing archaeological value, ARPA authorizes combined assessments of the commercial value of removed or degraded archaeological resources *plus* the cost of restoration and repair. This procedure is not detailed here, both because it is less common and because it almost invariably follows investigative fieldwork. Archaeological value assessment involves systematic, quantitative documentation of each alteration area, typically focused on the collection of information on the numbers, sizes, and volumes of damaged cultural resource alterations—a procedure referred to here as alteration area “processing.”

“Processing” starts when the LEO or lead archaeologist defines, verifies, and assures protection of each looter’s hole, other alteration area, and all associated evidence. A sequential numeric system should be used to designate alteration areas in order of investigative priority, and therefore of processing. Unless both the number of alteration areas and the CRDA team is large, areas should be processed one at a time and in priority order.

The lead archaeologist should assign personnel to each alteration area and specify processing procedures. Procedures often include the establishment of a ground-tarped station for screening altered sediments, with designated stations for screeners, baggers, and note takers. Following the lead archaeologist’s briefing about known and suspected evidence, the processors should proceed with documenting all evidence, including any indications linking the alteration area to either the most recent alteration episode or to a prior episode in the alteration sequence. The lead archaeologist or their designee should take photographs of each alteration area, before and after processing, with and without documentary aids, using high-visibility string, as appropriate, to outline looter’s holes, other alteration areas, and the boundaries of each backdirt pile.

For CRDA addressing unauthorized excavations, processors should use a single, systematic method to measure the volume of

disturbance. Either direct measures (i.e., length × width × depth of excavations) or tallies of buckets of backdirt sediment can be employed to infer alteration volumes. For relatively simple incidents involving smaller numbers of clearly defined excavations, direct measures are generally preferred; for complex cases with many irregular or deeply recessed holes, the tally method is preferable. For the tally method, buckets are filled with backdirt from the alteration area being processed, then counted as conveyed to the screen. Use 11.6 or 13.25 liter (3 or 3.5 gal.) buckets to ensure consistency. Rocks too large for buckets should be stacked in tight piles, and the dimensions of each pile recorded (length × width × height) for inclusion in volumetric calculations of looter’s holes. Photographs of each rock pile should be taken, with and without documentary aids. Sampling—that is, documenting a specified percentage of the alteration as a basis for inferring the total amount of alteration—is discouraged, but it may be used where alterations are extensive and where a good argument can be made that the sample is accurately representative.

Regardless of whether the volume of damage is measured directly or inferred, processing should treat each backdirt pile as a discrete unit, starting at the top and working down to the previolation ground surface (usually identifiable based on forest litter or rooted plants). Processors should take special care to define the previolation surface and the boundaries of looter’s holes and other altered areas. Processors should take notes and representative photographs of screen contents. Backdirt processing only occasionally requires stratigraphic documentation of soils, sediments, or artifacts. Artifacts and other evidence should be recorded in association with individual backdirt piles or other contexts.

Once a backdirt pile has been processed, the next step is to assess its looter’s hole. This involves

- (1) Taking preprocessing photos and recording the size, shape, and depth of holes.
- (2) Using a brush and dustpan or other equipment unlikely to gouge (i.e., wooden or plastic tools) to define the limits of the looter’s hole by removing disturbed sediment.
- (3) Documenting changes in sediment texture, tool scars, cut roots, and tunneling.
- (4) Recording observations that distinguish sediments in the looter’s hole produced by natural processes (e.g., slump or wind) from backfilling episodes.
- (5) Reviewing with team members and documenting all evidence and logic used to define each alteration area.
- (6) Taking midrange photographs of each alteration area and close-up photographs of each looter’s hole, tool scar, and other evidence, with and without documentary aids.
- (7) Drawing plan view and cross-section maps of the alteration area.
- (8) Setting four map nails and using line levels to measure at least two axes for cross-section maps.

Step 6 concludes when all alteration areas have been processed and all documentation compiled.

Step 7: Plan and Implement Emergency Restoration and Repair

Once the alteration areas are processed, the extent of the cultural resource excavations and other damages are documented, and the

evidence is secured, most scenes require the design of a remediation plan in consultation with the landowner/manager and affiliated Tribes. If an LEO has thus far maintained control of the scene, that individual may at this juncture yield that authority to the lead archaeologist or an ecological restoration specialist. Regardless of who is in charge, restoration and repair work should be designed to (a) reverse alterations; (b) discourage further alterations to the resource, the environment, and the community; and (c) support the preferences of landowner/managers and affiliated Tribes.

McAllister (2007) discusses the two types of restoration and repair enabled by ARPA's regulations: (1) the emergency restoration and repair needed immediately to prevent further alteration or loss, and (2) the restoration and repair needed to enable additional healing after CRDA fieldwork. Based on the nature of the alteration, emergency restoration and repair may entail backfilling, wall stabilization, erosion control, fence repair, removal of hazardous materials, and other remedial treatments. Postfieldwork remediation could include graffiti removal, vehicle barricade installation, vegetation thinning or planting, deployment of advisory-educational signs, or some combination. Treatments for resources or alterations other than those documented by the CRDA team cannot be included in emergency restoration and repair. Except where threats to people or resources are imminent, the CRDA team, or successor specialists, should only implement remediation plans after all alteration areas are processed and all evidence is gathered.

Regardless of whether the CRDA fieldwork team implements treatments or outlines a remediation plan for future implementation by the landowner/manager, the prescribed treatments must be practical, justifiable, and explicitly responsive to the recently documented alterations. The lead archaeologist should track time and financial costs for all team personnel, equipment, supplies, and other expenses required for restoration and repair. This accounting is generally compiled and presented as a section of the DAR, thereby providing bases for budgeting for future work, for obtaining compensatory payment, or for both.

Backfilling—the intentional reintroduction of sediments to replace materials removed during the alteration—is the obvious emergency restoration and repair treatment for unauthorized excavations. Backfilling can range from a small team using the available disturbed sediments in order to stabilize the resource and conclude CRDA fieldwork to larger efforts involving additional crews, outside materials, mechanized equipment, or technical experts.

The lead archaeologist should review expert guidance (e.g., Balenquah 2020; Demas 2004) and consider the following issues in planning to backfill:

- Avoid unnecessary alterations. Larger backfilling efforts may require the construction of temporary, non-ground-disturbing barriers to reduce the impacts of foot and equipment traffic.
- Unless full and recent documentation is available, photograph conditions before and after backfilling.
- Document the rationales for the processes and materials used, personnel time, and related considerations and investments.
- Where possible, backfill with the sediments removed during the alteration. Use displaced cobbles to buttress exposed walls or otherwise protect structures.

- If additional backfill is needed, sediments introduced to the site should have low clay content (to facilitate drainage) and be free of cultural material and nonnative seeds.
- Contingent on landowner/manager approval, consider using a horizon marker of sterile sand or plastic mesh at the bottom of looter's holes to differentiate the backfill from undisturbed deposits.
- If walls or other sensitive elements are exposed or at risk, consult with specialists to assess treatment needs and options.

Once backfilling is complete, looter's holes and other altered land surfaces should be "blended" into surrounding terrain by raking or sweeping affected areas and by redistributing local cobbles and organic debris. Larger cobbles and boulders may be used, in backfilled contexts or on ground surfaces, to mantle alteration areas and impede erosion and future digging. Disturbance areas larger than a few square meters should be reseeded using a native seed mix approved by the landowner/manager. Final photos of the backfilled areas or other treatments, with and without documentary aids, should be taken before closing out the fieldwork.

Step 8: Confirm Documentation and Verify Evidence Custody

Once all alteration areas have been processed and all emergency treatments applied, the lead archaeologist reexamines, refines, and validates documented descriptions of both the affected cultural resources and the CRDA fieldwork. CRDA team members should participate in a final walk-through of the alteration scene to ensure that all evidence, equipment, and supplies have been accounted for. The LEO and lead archaeologist will verify that forensic evidence is properly packaged, sealed, labeled, and secured for transport, and that chain of custody forms are initiated. The LEO will retain custody of the evidence or will transfer custody of specified evidence for specialized analyses. The photo log should be reviewed, and final photographs captured, to document conditions at the termination of the CRDA fieldwork.

A summative debriefing should be conducted in concert with the final walk-through, affording opportunities for discussion of CRDA team decisions, actions, findings, and areas for improvement. The LEO and lead archaeologist should clarify, as appropriate, continuing team obligations to maintain incident confidentiality and evidence chain of custody and to complete postfieldwork evidence examination, any additional resource remediation, and DAR preparation. Each team member should comment on the strengths of the guidance and procedures used in the CRDA fieldwork and on opportunities to refine the practices recommended here.

CONCLUDING RECOMMENDATIONS: TOWARD A CURATION MODEL IN JURISDICTION-SCALE CRM

The global truth that humanity shares authorship and stewardship for our forebears' cultural resource legacies has given rise to CRM systems that promote conservation and regulate cultural resource professionals. Despite significant investments in these CRM systems, unauthorized alterations remain clear and present threats to

the diverse values embedded in cultural resources and to the communities who care about and derive senses of identity, place, security, and belonging from these resources (Hart and Chilton 2015; Kersel 2007, 2017). Nowhere are the consequences of unauthorized cultural resource alterations more harmful than in Indigenous Territories and communities, where people depend on these resources for cultural, spiritual, and historical identity, vitality, and health (Nicholas and Smith 2020).

CRM systems are only as good as the information available to guide management decisions and investments, and there is much room for improvement. Museum collection curation practices offer guidance for upgrades to jurisdiction-specific CRM policy and action. The four essential constituents of a museum are (1) a collection, (2) collection documentation, (3) secure and continuous storage of the collection and documentation, and (4) a curator(s) to safeguard and use the collection and documentation (Campbell and Baars 2019). Price (2019:63–64) offers a commonsense rationale for completing condition assessments following any cultural resource alteration:

the precise location, nature and causes of the damage should be described, photographed and documented. Good documentation enhances the potential for conservation. Documentation of incidents may also result in the identification of patterns or environmental problems, and encourage a review of established collection care practice.

US government regulations (36 CFR 79.11[b][9]; US Department of the Interior 2022) require federal curators to submit, within “five (5) days of the discovery . . . a written notification of the circumstances surrounding the loss, theft, deterioration, damage or destruction.” The same regulations, at 36 CFR 79.11[b][4], require federally owned collections to be periodically inspected “for the purposes of assessing the condition of the material remains and associated records, and of monitoring those remains and records for possible deterioration and damage.”

Examined through the lens of museum collection curation, ARPA, NHPA, and other statutes that guide CRM in the United States exist in large part to address one essential difference between land and collection management—that is, secure storage. Wherever environmental forces or human caprice or greed overcome legal, educational, and practical provisions for cultural resource protection, it falls to the actual curators of jurisdiction-specific cultural resource site collections—namely, to archaeologists and landowner/managers—to maintain the accuracy and currency of site-specific documentation.

The CRDA practices recommended here—inspired primarily by lessons learned through ARPA investigations—offer guidance on what landowner/managers and archaeologists should do in response to unauthorized cultural resource alterations, using specific tools and procedures, in collaboration with professional colleagues, and in consultation with Indigenous Territory Owners and other affected parties. Properly applied, these protocols provide sturdy foundations for the just, efficient, and effective resolution of unauthorized cultural resources alterations and for the management of cultural resources as precious and fragile collections. This guidance is also offered to inspire colleagues to refine the still-nascent field of CRDA. Realization of a vision for CRM systems and personnel prepared to respond to changing threats, to community interests, and to innovations in CRDA procedures and technologies

is contingent on upgrades to these eight steps—especially in response to evolving ethical and technical considerations.

Several limitations to these recommendations stem from the concentration of the authors’ experience on ARPA and on unauthorized excavations in the US Southwest. Our recommendations are less directly pertinent to underwater sites, wetland sites, or pictographs or petroglyphs. Such contexts typically require specialized assessment and remediation procedures and technologies. Regardless of the CRDA location, setting, or focus, however, the eight steps offer foundations for assembling, equipping, and mobilizing CRDA teams. Members of those teams are strongly encouraged to attune the recommended approaches and steps to the values and preferences of affected communities and to local environmental and resource conditions.

There is no intention here to dilute or overgeneralize the specialized and consequential field of ARPA investigations. Instead, our proposition is that the framework of principles and methods stemming from four decades of ARPA damage assessment fieldwork are sturdy bases for enhancing and expanding CRDA and CRM more generally. There is also no intention to discount the political and financial obstacles to enabling CRDA responses to all unauthorized cultural resource alterations. Such topics deserve concerted attention in other venues. Indeed, the ultimate goal of CRDA, and of these recommendations to improve it, is to increase broadly distributed willingness and capacity on the part of archaeologists and CRM systems to respond to unauthorized cultural resource alterations and to maintain current documentation on cultural resources as the irreplaceable knowledge base for management, especially treatment prescriptions. When completed in collaboration with the representatives of affected communities and with respectful attention to the values embedded in affected cultural resources, CRDA promises to deter ego- and profit-driven alterations of cultural resources, to boost accountability for such alterations, and to usher CRM practice toward contextually and culturally appropriate curation.

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Data Availability Statement

No original data were used in this article.

Competing Interests

The authors declare none.

NOTE

1. The Bureau of Indian Affairs (BIA) administers ARPA permits per the regulations at 43 CFR 7.5 and 25 CFR Part 262. The BIA Western Region Office assists federally recognized Tribes and communities in managing about 50,586 km² (12,500,000 acres) of tribal trust lands, mostly in Arizona, Nevada, and Utah. Archaeology Southwest (ASW) is a nonprofit organization dedicated to protecting and exploring heritage places through outreach, research, and preservation collaborations with Tribes and collaborators (<http://www.archaeologysouthwest.org/>).

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