Survey Task Force Charge

Archaeological survey data have taken on ever increasing importance over the last decade and archaeologists need to better understand the uses, durability, and quality of existing data, as well as to improve future data collection. Federal land managing agencies, State Historic Preservation Offices (SHPOs), Native American tribes and communities, and other stakeholders all rely on archaeological survey data to make decisions affecting cultural resources. Similarly, scholars utilize large, disparate survey datasets to perform micro- and macro-regional analyses to better understand the histories and effects of past human migrations, climate change, human adaptations, and cultural transformations.

In all cases we have to assume to some degree that these survey data are sufficiently reliable and accurate for the tasks we put them to, yet because archaeological methods and standards have generally increased in rigor and quality, we have to question the adequacy of “old” survey data. How can we help the agencies which fund or mandate inventories to decide when it is appropriate to re-survey areas? This question assumes singular importance as government budgets become tighter and as decisions about land use are under accelerating pressure from industry and the public. In addition, we must find methods and practices to ensure the shelf life of new survey data for anticipated future uses, whether it be focused primarily on research on the past, long-term management of present landscapes, or near-term future developments.

To examine these issues in October of 2014 the SAA approved the formation of an Archaeological Survey Data Task Force with a charge to address key questions such as:

1. What are generally accepted standards of survey quality?
2. What factors influence survey data quality, reliability, and longevity?
3. What are best practices in terms of assessing survey quality short of re-survey?
4. When is re-survey necessary?

By early December 2014 a charge for the task force had been finalized and five-person task force assembled.

Our task force originally intended to also address the role and proper use of predictive models in federal land management of archaeological resources (Green et al. 2012), but this was too large an issue to be covered during the few months we had to pull together our findings. Good survey data will be required to construct predictive models and to define the uses and limitations of these models, so we kept our emphasis on understanding the assets and limits of our present survey data, with an additional emphasis on exploring how to improve future survey data collection and use.

We approached our task from two angles. First we considered the nature and quality of the largest storehouse of survey data in the nation: the survey databases managed by
Archaeological Survey Practice Across the U.S.

A short questionnaire (attached) was designed to examine the guidelines and practices employed by SHPOs and/or Offices of State Archaeologists. We queried key archaeologists and data managers in the 50 states and District of Columbia (D.C.), as well as five territorial or commonwealth preservation offices. A total of 41 offices responded (40 states and D.C., plus one territory) from all across the U.S (Figure 1). We did not query Tribal Historic Preservation Offices or Certified Local Governments, given the short time we had to assemble our task force findings. In our analysis we note how many of the 41 answered each of our questions. We sometimes use “states” in place of “respondents,” as it carries more meaning and states represent more than 95% of the respondents.

Without a doubt state offices of archaeology and historic preservation routinely handle extraordinary amounts of survey data and make more daily decisions using these data than any other group of cultural resource managers we know of in the world. For example, if we just look at Federal undertakings in the 2012 fiscal year, SHPOs rendered decisions on National Register eligibility for almost 105,000 historic sites, objects, buildings, or districts (NPS 2012). This represents only a fraction of the total number of historic resources known to SHPOs, given it represents only those resources that might have been affected by Federal projects in a single year.

Figure 1. Regional distribution of the 41 respondents to the survey.
The responses clearly demonstrated the importance of survey data to state offices. At least 76% of the states that responded have somewhat detailed survey guidance to state-specific survey manuals, in addition to existing federal guidance. Only 7% noted that they deferred to federal standards instead of state-specific guidance. Based on the range of estimates we received, we project there were an absolute minimum of 24,000 surveys (41 responses) and at least 58,000 site forms (37 responses) reviewed last year. The survey and site data required by states are typically very detailed, with the vast majority of state offices collecting specific information such as the location of the survey, number of acres surveyed, site number (Smithsonian or state equivalent), site type (e.g., lithic scatter, homestead, etc.), field recommendations of National Register eligibility, management suggestions, and so forth. In addition, 25 respondents also require recording clusters of smaller numbers of artifacts, often called “isolated finds,” that do not meet a state’s definition of an archaeological site.

In the midst of this deluge of data, most SHPOs are also transitioning from paper documentation to digital records. At least 28 of the responding states regularly manage and share digital archaeological survey data, including GIS or site data. Most of the others either have plans in the works or are moving to systems to allow the exchange, review, and management of digital information. Yet, given our ongoing dependence on paper records only nine of the states that responded are actively limiting the amount of paper data submitted to their offices. It is clear that archaeologists, SHPOs, and the SAA must pursue digital solutions in all aspects of our work, especially as more and more archaeological data are “born digital.” Given current state and federal budget challenges, this is going to require a focused and coordinated effort at state, regional, and national levels.

The responses also revealed a noticeable percentage of resurvey of sites and areas that had already been recorded. A total of 35 respondents had some sense of the number of sites or amount of area being resurveyed: 11 states reported that 1-10% of the annual site surveys in their states involved some level of re-documentation, 17 that the resurvey rate is 11-20%, and 7 that resurvey of sites accounted for more than 20% of their site reviews. Given that many states began accumulating site data more 40 years ago, the need for new site inventories and forms is obvious in some cases, a fact born out by our results. When asked to rank the most common reasons for needing resurveys 30 respondents answered as follows: (1) too much time had passed since the previous inventory, (2) state survey standards had been made more rigorous since the time of the previous work, and (3) previous surveys were inadequate due to a lack of professional training or standards. Other responses included poor ground visibility or disturbance at the time of the original reconnaissance necessitated a resurvey, time and budgetary limitations hindered earlier work, and the state office was now using a historic landscape approach in their planning efforts and previous surveys were inadequate for this level of planning. The most common time trigger for necessitating a new survey, based on 24 specific replies, was the lapse of 10-20 years (16 responses), with four offices asking for a resurvey if the previous work was older than 5 years, three stating the earlier survey had to be 25 years or more in age, and one noting that they were reevaluating their standards.
It is clear that the states do feel a responsibility to ensure survey data quality. In fact, a surprising 51% of 35 respondents noted that their offices periodically spot-check the quality of surveys in their states. Quality control measures ranged from states using their own staff to hiring third parties to double check survey work. There was a wide range in the amount and kind of data required for site resurvey documentation, with the vast majority wanting at least a re-recording (or confirmation) of site location, extent, and condition and more than half of the offices asking for new photography and site maps. Over one third required new in-field artifact and feature inventories, as well as new National Register eligibility recommendations.

When all the questions and comments are considered, it is clear that SHPOs have “upped their game” over the last two decades with most requiring much higher quality surveys, better reporting, and greater consistency in the overall professionalism of crews than was the norm 20-25 years ago. A variety of improvements have been seen over this time and we will list a few here:

- There is greater reliability in the mapping of sites and establishing their locations, given the adoption of widely used programs such as GIS and more precise and reliable field instrumentation. Granted many challenges and errors remain, and instrumentation introduces new variables; but overall the quality of maps and site locations has improved.
- Survey and shovel-testing intervals appear to have become more standardized, and 26 of the 36 states addressing this question stated that pedestrian survey intervals of 19 m or less have become the norm. Shovel testing intervals varied regionally with tighter intervals (7.5-15 m) in the east and greater intervals in the west. This is not surprising given that shovel testing is most commonly applied for site discovery when terrain, surface visibility, or surface disturbances preclude effective identification of site features and materials through regular pedestrian survey.
- The widespread adoption of various methods employed for site detection has dramatically increased over the decades; over 85% of the respondents noted that shovel testing is regularly used, 57% stated that geomorphological analysis was common, 51% mentioned the use of various geophysical detection methods, and 43% cited metal detection for site identification.
- We did not consider the challenges of coastal, marine, or wetland survey, as these issues were too complicated for our cursory review. More than a few SHPOs have specialists focused on just these settings.

Our task force also received extensive suggestions regarding how to improve the quality, durability, and uses of survey data. Proposals were wide ranging in their topical focus, but many SHPOs cited the need for better “professional” training of archaeologists; they noted the need for universal standardization and integration of new technologies in both field work and report submission and review; and a few mentioned a trend towards a perceived decreasing quality of work and lack of regional archaeological understanding as regional CRM firms became more nationally integrated into larger corporate entities. As planning initiatives become wider in their scope, areas of potential effect also need to be enlarged. These suggestions and others pushed our task force to consider the literature and recent research on how to improve our present survey methods and data.
Assessing Our Survey Methods and Results

As noted above, for decades we as archaeologists have grappled with the question of which data to collect during survey and how to collect them. Ideally, the data requirements for mandated archaeological survey should be tied to how those data will be used. Will survey data be needed for developing historic contexts, archaeological modeling, managing impacts? Will survey data be used to make a determination of eligibility (DOE) or will they be used simply to flag and avoid sites? How many data are needed and how accurate and reliable should they be? What is their shelf life?

Our questionnaire made clear that SHPOs and planning organizations still struggle with basic issues in archaeological data quality. For example, resources noted from older surveys may not be located precisely where they have been recorded; site boundaries often change when sites are re-recorded; and the reliability of previous survey data are sometimes unclear or in doubt. A common, yet not always tested, assumption is that the most recently recorded data are accurate, while data recorded earlier in the history of survey are likely to be in error. The problem is not necessarily whether such data are accurate or inaccurate, but how accurate they are in relation to how accurate they need to be. Moreover, what are the sources of variation in data quality and reliability? How do we deal with them to derive the information needed to interpret and manage archaeological resources?

Multiple studies have shown that survey methods have a strong effect on data quality (e.g., Banning 2002; Kintigh 1988; Shott 1985). Fundamentally, the probability of detecting an archaeological resource is determined by survey methods, ground conditions, surveyor training/bias, and the characteristics of the resource (e.g., Hilton 2003; Palumbo 2015). Although surveys are sometimes referred to as 100 percent or full-coverage survey, some archaeological resources will always fail to be detected through survey, regardless of the approach; there will be bias in what is detected and what is not. We need to consistently estimate survey error and evaluate the representativeness of our surveys, as well as the number and kinds of resources likely missed by a survey (Heilen, Nagel, and Altschul 2008). We do this all too rarely and we need to increasingly find ways to measure the effectiveness of our surveys.

Site attribute data derived from survey are often needed for DOEs, developing management recommendations, and building regional syntheses and predictive models. It can be difficult to compare the results of multiple surveys, however, due to variation in data standards, analysis procedures, and recording techniques. For example, to limit curation costs, survey protocols in certain areas have begun to emphasize in-field artifact analysis in place of laboratory analysis, but little is understood about the accuracy of such assessments. A recent study demonstrated a low level of agreement among infiel and laboratory analysis in identifying commonly recorded artifact attributes (Heilen and Altschul 2013). Further, the more specific the artifact type or attribute, the less likely that an artifact will be correctly identified. The study concluded that the accuracy of many common field observations on artifact types and attributes is surprisingly limited and that
an acceptable level of accuracy is only achievable using current methods for some of the most basic artifact types and attributes.

Clearly we need to test other key assumptions in our current survey policies and to more actively address questions such as those we raise above if we are to ensure the quality of our current survey data. As we consider any refinements or improvements in current survey methodology or data, we also need to evaluate our older survey data and consider ways in which we can make it more usable and durable.

Conclusions and Recommendations

Our compressed examination of current archaeological survey methods and data demonstrate that current survey policies—whatever their faults—have notably improved and somewhat standardized archaeological survey practices over the last decades. It is also clear that both SHPOs and archaeological researchers recognize the need for ongoing improvements in survey data to make them more useful and durable. This need takes on additional urgency as more and more of our survey and excavation data are born digital and as there are progressive moves towards a fully digital Section 106 review process.

Our research identified a variety of metrics and analytical tools that are available to assess data quality, including estimates of discovery probabilities, numbers and kinds of sites likely to be missed by survey, and the accuracy of in-field artifact identification. Other methods for assessing data quality are also needed so that we can flag questionable data, standardize data from multiple projects, and evaluate the effects of variation in data quality on our interpretations.

To ensure that data remain durable and their quality can be assessed, appropriate metadata are needed. These might include technical information such as survey intervals, shovel-test design and actual tests dug, ground conditions, and site definition protocols. Information on mapping instruments, GPS units, and GIS technology used in creating survey data would also be useful. To prevent loss or degradation of data, it is important to choose appropriate storage formats and mediums. To achieve these goals, we recommend that SHPOs develop data management plans specifying data requirements and standards, quality control measures, digitization of old records, curation and access protocols and data integration and updating strategies.

Improving our field and lab analyses will take a combination of both new methods and technologies and increasing attention to addressing how our data will be used and how to ensure their quality. We must continue to refine our methods for estimating and controlling error in archaeological observations and for standardizing information from multiple surveys to improve data reliability and utility for either planning (Laurenzi, Peeples, and Doelle 2013) or research (Mills et al. 2015; Ortman, Varien, and Gripp 2007). In addition, our SHPOs and federal agencies must find dependable ways to better monitor, control, and enforce the quality of work done by permitted field archaeologists, as well as to increasingly standardize and ensure the quality and durability of the survey data we collect, manage, and use. SHPOs and federal agencies should be strongly encouraged to
develop remotely accessible and up-to-date digital interfaces for sharing archaeological survey data and reports. The increasingly national and international scale of many CRM firms makes the availability and quality of regional survey resources all the more critical.

To bring additional focus to these issues, we recommend over the next year that the SAA Board consider the following actions:

1. Issue a call to action to more precisely assess and measure current SHPO survey data quality and survey guidelines nationwide. We urge that key leaders of SAA, the National Council of SHPOs (NCSHPO), and the American Cultural Resources Association (ACRA), along with representatives of our main federal land managing partners, come together to decide the most expedient way to conduct this assessment. Depending on the results of the assessment, it may be necessary to recommend updated survey guidelines to ensure durable, high quality, usable survey data for the future. If this is the case, then it may be most effective to allow for nuanced guidelines sensitive to regional needs. We could distinguish regional differences in survey practices reflecting a range of influences, such as the percentage of federal land in a state, the nature of the archaeological record, and the amount urban and agricultural development.

2. Co-sponsor with ACRA, the Society for Historical Archaeology (SHA), and NCSHPO two or more symposia or panels on key survey issues at appropriate annual meetings of these societies or at the next SAA annual meeting. The presenters should be drawn from a mix of CRM, federal, state, not-for-profit, tribal, and academic institutions to work together to find common solutions and coauthor presentations. Each gathering should result in specific plans or publishable papers to improve current survey data or practice. The symposia or panels should build upon one another and result in an integrated action plan. These tasks are beyond the influence of our task force membership, but we are glad to aid as we can.

3. Request the editor of Advances in Archaeological Practice to organize a special issue that brings together and synthesizes important survey and landscape planning concerns.

Our task force has more data and information than could be presented here. If additional information is needed or concerns are raised, we will do our best to address them.

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