An Experiment with Time Control in Intensive Site Survey

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The last three decades have seen a rapid and systematic development of more rigorous controls in all aspects of archaeological method. The earlier efforts were directed toward improving excavation and data recovery and preservation techniques. These developments were followed by increasingly precise and complex methods of analysis of excavated material. Most recently, perhaps in part stimulated by the needs of cultural resource management, attention has been directed to the improvement of the methods of archaeological site reconnaissance and survey.

The questions asked of site survey research are phrased at many different levels. Some questions have a broad regional focus with such goals as the derivation of prehistoric settlement patterns. Others are phrased at the level of the assessment of the individual site, attempting to discover intrasite patterns such as specialized activity areas within a site. The present paper addresses itself to certain aspects of the intensive single site survey.

Often the pre-excavation assessment of the surface debris scattered on a site is limited to the simple pedestrian "walk over" survey. In its least complex form this approach has the archaeologist spending enough time on the site to gain a sense of familiarity. If excavation is planned to follow the survey, then this intuitive familiarity will be the basis for placement of the excavation units. The result of such an informal method can range from excellent (in which case the archaeologist will be said to have a "good nose") to the disastrous (in which case the archaeologist will be said to have defined what must be done during the next field season).

Many problems result from such an unstructured approach to site survey. The most obvious are the short range problems which come from having to base the excavation strategy of any site on such a haphazard body of data. Also resulting from such unsystematic site surveys are problems with long range implications. For example, the result of the original survey cannot be replicated even by the original investigator. Therefore it is impossible for other investigators to either systematically follow the original research strategy at the same site or to conduct meaningful comparative studies at other sites. In short, the results of unsystematic surveys are incomparable.

Two general strategies have developed as solution to the problems created by the unsystematic survey. The most obvious solution is literally to pick up everything present on the surface of a site. The primary methodological concern in applying this total "vacuum cleaner" approach is to systematize the pick up by some means of spatial controls (e.g. a grid system) so that the patterns of surface scatter can be reconstructed accurately in the laboratory. The other strategy for resolving the problems of the unsystematic survey is to select, by means of some systematic sampling procedure, a representative portion of the total site surface for survey. In this second approach, the area sampled also is treated characteristically with a total surface pick up.

In either of these two approaches, enormous amounts of man hours are required for the actual pick up operation. The present study demonstrates that a refinement of the actual pick up procedure by means of imposing a time control can increase greatly the efficiency of the use of the field labor crew without decreasing the accuracy of the sample or the replicability of the results. It is proposed that the first 30 minutes of surface pick up in small finite areas can be done in such a way that it will repeatedly produce data sets which are accurate representations of the data sets produced by total surface pick ups of the same areas. That is to say that once the sampling strategy has been chosen for a given site surface, it should be possible to gather in 30 minutes, a sample of surface material which is accurately representative from each of the surface units designated for pick up, and that therefore a total "vacuum cleaner" pick up is unnecessary.

The Mound House Site, a Middle Woodland village site on the lower Illinois River valley, was chosen for a test site. This site is quite large, with over 40,000 M^2 exposed by cultivation at the time of the survey. The amount and type of cultural material scattered on the surface of the site varied from one area to another. On the basis of a cursory walk over the surface of the site, five sub-areas were defined. Each of these sub-areas exhibited a distinct type and density of surface material present. Three of these were isolated zones of extremely dark organically stained soil which had very intense amounts of debris including large amounts of pottery, bone, fire-cracked rock and burned limestone. For purposes of this report these are labeled Areas 1, 2 and 3. Area 4 was a large Middle Woodland mound and the adjacent slope or apron of the mound down to the level of the original surface. This mound and its immediate environs exhibited the lowest amount of surface debris of any area within the site. Finally, the remaining portion of the site around and amongst Areas 1, 2, 3 and 4 uniformly exhibited a moderate scatter of chert and pottery, but showed very little organic staining, fire-cracked rock or burned limestone. This general area has been labeled Area 5. A test unit was placed in each of these five areas.

To each one of these units, a survey crew member was assigned. Each crew member was instructed to collect a sample of the surface material which would, in his judgment, be an accurate representation of the total population of cultural material present in that unit. In conducting site surveys with both professional and student archaeologists, it has been my experience that the representative quality of the sample collected by most workers is increased as the size of the surface area to be covered is decreased. Therefore relatively small units (6M x 6M) were used in the present study. The size of the unit used is ultimately arbitrary but influenced by such factors as the nature of the terrain, the type of site, the condition of the site surface, and the general level of experience of the crew.

Both instruction and supervision were important to the success of the method, and should not be slighted in the preparation of a crew. The idea of a representative sample was clearly explained, and an example chosen from another collection was illustrated in the laboratory. In the field the crew was instructed to keep moving within their assigned 6M x 6M unit during the pick up periods, and cautioned not to "settle down" to exhaustively pick up any one part of the unit. These goals and instructions were repeated as often as necessary during the supervision of the actual field work. The actual pick up procedure was conducted in 30 minute intervals. At the end of each 30 minute pick-up period the bags of collected material were closed and labeled for the test unit and period. This process was repeated until the surface material from each of the 6M x 6M test units had been totally collected.

The material was then separated in the laboratory into the following six gross classes of material: limestone, chert, pottery, fire-cracked rock, bone/shell and miscellaneous. For each test unit the collected material was cumulatively quantified by weight at the end of every 30 minute pick up period. These figures were then converted to a percentage value for each of the gross classes of material as a part of the total material collected. For example, by consulting Table 1, Unit 1 the figures entered for the 90 minute period represent the cumulative total of each class of material collected in the first 90 minutes of pick up, stated both in terms of absolute weight and in terms of the percentage that each material class made up of the total collection.

The results of this experiment are presented below in both tabular (Tables 1-5) and graphic (Figures 1-5) form. An examination of this data demonstrates that in three (Units 1, 2 and 3) of the five units tested the relative proportions of the gross classes of material remained extremely regular from the first 30 minutes through the completion of the total pick up. It should be noted that these three units represent the areas with the most intense amount of materials present on the surface. It should also be noted that the units which produced the most erratic results, Units 4 and 5 were the areas of the lowest density of debris on the surface. It is suggested that this positive correlation between debris density and patterns of regularity in the collected surface material is due to the fact that in a low density area the difference of only a few pieces of material has an exaggerated statistical impact on the small body of data. It is further suggested that the problem of these irregularities could be minimized by experimentally enlarging the pick up unit when the density of surface material is relatively low.

The data are divided into gross classes of material and are presented in the following tables as both the absolute weight in grams then as a percentage of the total weight of all material collected at the end of each time period. Percentages are calculated to the nearest 0.5%.

TABLE 1. (*Area 1*)

time elapsed	limestone		chert		pottery		fire-cracked rock		bone/shell		miscellaneous	
	g.	%	g.	%	g.	%	g.	%	g.	%	g.	%
30	1049	19	2722	49	687	12.5	737	13.5	298	5.5	43	1
60	1517	20	3430	45	1042	13.5	1148	15	369	5	106	1.5
90	1644	19.5	3771	44.5	1226	14.5	1304	15.5	411	5	128	1.5
120	1729	19	4012	44	1453	16	1304	14.5	475	5	149	1.5
150	1814	19.5	4111	44	1488	16	1304	14	496	5	168	2

FIGURE 1 (AREA 1)

TIME ELAPSED	% LIMESTONE	% CHERT	% POTTERY	% FIRE-CRACKED ROCK	% BONE/SHELL	% MISC.
30	19	49	12.5	13.5	5.5	1
60	20	45	13.5	15	5	1.5
90	19.5	44.5	14.5	15.5	5	1.5
120	19	44	16	14.5	5	1.5
150	19.5	44	16	14	5	2

TABLE 2. (*Area 2*)

time elapsed	limestone g.	limestone %	chert g.	chert %	pottery g.	pottery %	fire-cracked rock g.	fire-cracked rock %	bone/shell g.	bone/shell %	miscellaneous g.	miscellaneous %
30	3274	52.5	1418	23	524	8.5	794	13	189	3	14	.5
60	5316	51.5	2098	20.5	1006	9.5	1588	15.5	317	3	24	.5
90	5493	50.5	2230	20.5	1097	10	1666	15.5	359	3.5	43	.5
120	5939	50.5	2393	20.5	1225	10.5	1694	14.5	416	3.5	48	.5
150	6322	51	2512	20	1374	11	1694	13.5	458	3.5	54	.5
180	6443	50.5	2569	20	1452	11.5	1751	13.5	501	4	60	.5
210	6684	50.5	2588	19.5	1551	12	1751	13.5	548	4	65	.5
240	6740	49.5	2723	20	1735	12.5	1821	13.5	548	4.5	71	.5

FIGURE 2 (AREA 2)

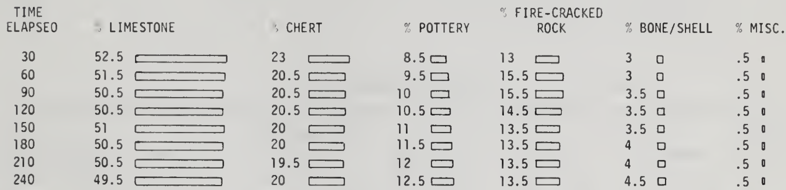

TABLE 3. (*Area 3*)

time elapsed	limestone g.	limestone %	chert g.	chert %	pottery g.	pottery %	fire-cracked rock g.	fire-cracked rock %	bone/shell g.	bone/shell %	miscellaneous g.	miscellaneous %
30	992	29.5	1190	35.5	383	11.5	680	20	57	1.5	57	1.5
60	1758	35	1758	35	517	10	872	17.5	85	1.5	62	1
90	1871	34.5	1970	36	553	10	879	16	106	2	81	1.5
120	2070	35.5	2065	35.5	602	10.5	879	15	120	2	87	1.5
150	2145	34	2334	37	659	10.5	879	14	142	2.5	125	2
180	2202	34	2398	37	702	11	888	13.5	163	2.5	139	2
210	2301	33.5	2582	37.5	773	11.5	888	13	163	2.5	139	2
240	2320	33	2674	38	810	11.5	888	12.5	170	2.5	148	2
270	2356	32	2887	39	909	12.5	894	12	204	3	158	2
300	2448	32	2958	38.5	938	12.5	900	12	238	3	172	2
330	2476	31.5	3000	38.5	987	12.5	905	11.5	266	3.5	186	2.5
360	2767	32	3255	37.5	1186	13.5	953	11	316	3.5	222	2.5

FIGURE 3 (AREA 3)

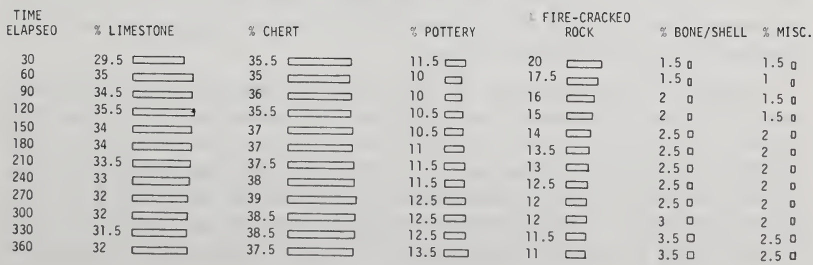

TABLE 4. (*Area 4*)

time elapsed	limestone		chert		pottery		fire-cracked rock		bone/shell		miscellaneous	
	g.	%	g.	%	g.	%	g.	%	g.	%	g.	%
30	64	11	354	61	9	1.5	57	10	6	1	92	16
60	517	39	503	38	24	2	128	10	11	1	135	10
90	536	38	522	37	29	2	128	9	18	1.5	170	12

FIGURE 4 (AREA 4)

TIME ELAPSED	%LIMESTONE	% CHERT	% POTTERY	% FIRE-CRACKED ROCK	% BONE/SHELL	% MISC.
30	11	61	1.5	10	1	16
60	39	38	2	10	1	10
90	38	37	2	9	1.5	12

TABLE 5. (*Area 5*)

time elapsed	limestone		chert		pottery		fire-cracked rock		bone/shell		miscellaneous	
	g.	%	g.	%	g.	%	g.	%	g.	%	g.	%
30	28	3	652	69	28	3	220	23	6	.5	14	1.5
60	28	2.5	758	67	50	4.5	255	22.5	6	.5	35	3
90	34	2.5	836	59.5	71	5	397	28.5	6	.5	57	4
120	34	2.5	851	57	77	5	461	31	11	.5	62	4

FIGURE 5 (AREA 5)

TIME ELAPSED	% LIMESTONE	% CHERT	% POTTERY	% FIRE-CRACKED ROCK	% BONE/SHELL	% MISC.
30	3	69	3	23	.5	1.5
60	2.5	67	4.5	22.5	.5	3
90	2.5	59.5	5	28.5	.5	4
120	2.5	57	5	31	.5	4

It is the conclusion of this study that if the conditions are properly controlled, and if a knowledge of the gross classes of material present on the site is the goal of an intensive site survey, then the first 30 minutes spent in each grid unit during an intensive surface survey will produce essentially the same set of data as does a total surface pick up. It also should be mentioned here that the preliminary analysis conducted on the recovered material indicates that over 90% of all diagnostic pieces (e.g. rim sherds, decorated sherds and projectile points) were collected in the first 30 minute period.

Finally, it is concluded that the use of this procedure will save substantial amounts of time in situations requiring either an intensive survey of a total site surface or in situations calling for an intensive survey of a systematically chosen sample of a site surface. In the present experiment the five 6M x 6M test units required 2.5 man hours for a time-controlled pick up and 16 man hours for a total surface pick up. The time-controlled method yielded the same results with an 84% savings in the required man hours. If one were to generalize this figure to the thousands of square meters covered annually with intensive surveys, the potential savings in man hours are staggering. It is the hope of the present author that these potential savings will merit further experiment and refinement of this method by other archaeologists in the field.