

## II. RESEARCH DESIGN

The 1981 investigations at 41 JW 8 and the subsequent analysis were carried out according to research plans specified in the proposal (Hester, Eaton, and Black 1980). These plans addressed both the RFP specifications and the research interests of the principal investigator and the project archaeologist. Field conditions made certain minor changes in the research plans necessary, as will be discussed. The overall research design will be discussed in four segments: major problems at 41 JW 8, research hypotheses, excavation strategy, and additional problems.

### MAJOR PROBLEMS AT 41 JW 8

The proposal specified seven problem areas to be addressed by the investigations at 41 JW 8. These problem areas focused on questions raised by the 1975 testing and questions pertinent to regional problems.

1. Site Limits: The boundaries of the site needed further definition, especially the southern limits.
2. Site Depth: Were earlier components present below the extensive Late Prehistoric deposits?
3. Bone Bed: What did the "bone bed" actually represent in terms of Late Prehistoric activities at the site?
4. Seasonality: Was the site exclusively occupied during the winter and spring months?
5. Occupational Span and Frequency: Over what periods of time was the site occupied, how intensively, and at what intervals? How did these relate to the regional cultural-historical sequence? Did the rock clusters and bone bed, along with other aspects of intrasite variability, help solve this problem?
6. Faunal Exploitation: Did the faunal materials actually indicate a bison emphasis? Were the faunal remains of species expected in the immediate site vicinity? What kinds of exploitative patterns were represented?
7. Cultural Pattern: How did the Late Prehistoric component compare with the regionally defined cultural patterns for the period? What was the nature of the tool kit? What kind of functional or adaptive pattern is indicated (e.g., bison hunting[?]).

### RESEARCH HYPOTHESES

In an effort to answer the previously stated questions concerning the Hinojosa site, four research hypotheses were formulated. Following each hypothesis is a list of expectations that were to be tested through the proposed field and laboratory methodology. These hypotheses were based on

previous work at the site, previous work in the region, and the personal experience of the principal investigator and the author.

#### **HYPOTHESIS #1: SITE FUNCTION**

The majority of the cultural debris present at 41 JW 8 is related to the Late Prehistoric component. The Late Prehistoric component resulted from a pattern of repeated seasonal occupations emphasizing a specialized resource. Specifically, Late Prehistoric groups periodically visited 41 JW 8 during the winter-spring months while herd animals (bison, and to a lesser extent, antelope) were present in the general area. While men hunted herd animals around and away from the base camp, women and children stayed near the camp and hunted and gathered a variety of small animals and botanical resources which supplemented the less reliable herd animal resources.

##### Expectations:

1. Block excavations would reveal similar overlying features, including bison processing areas, refuse discard areas, cooking areas, and occupational floors (indicative of repeated occupations).
2. Meat weight analysis would show bison and, to a lesser extent, antelope were the most important food resources (bison emphasis).
3. Minimum individual analysis would illustrate a large number of smaller faunal species (supplemental resources).
4. Bison bone distributional studies would reveal processing patterns that served to maximize the resource (see Hypothesis #2).
5. Faunal analysis of species present and age groups present would indicate a winter-spring occupation (seasonality).
6. Continuation of select excavation units below the upper 50-60 cm containing exclusively Late Prehistoric material might evidence occasional earlier occupation. The earlier occupation if present would not follow the seasonal bison hunting pattern and would be of a much lesser extent.
7. Upon comparison of the Late Prehistoric cultural material to other Late Prehistoric sites in the region the closest similarities would be found to the north in sites within the proposed "bison corridor" (see Section XI). Sites south, east, and west of 41 JW 8 would evidence fewer similarities, although some contact with coastal groups was expected.

#### **HYPOTHESIS #2: BISON-HUNTER'S CHIPPED STONE TOOL KIT**

During the Late Prehistoric period, within the "bison corridor" in portions of south and central Texas, a specific bison hunting and processing technology existed utilizing a distinctive chipped stone tool kit. The chipped stone tool kit is the preserved portion of a total tool kit which would have included wood, leather, and other perishable components. The chipped stone

tool kit consisted of **Perdiz** arrow points, small unifaces (end scrapers), and beveled bifaces (knives). **Perdiz** points functioned as hafted projectile points and were used to hunt and kill bison. The end scrapers were probably hafted and were used to deflesh bison hides. The beveled bifaces were knives that were probably hand-held and used to butcher bison (cutting hide, flesh, and sinew).

Expectations:

1. All three tools would be found in direct and indirect association with bison remains, although end scrapers might be found in clusters away from the main butchering localities (separate activity area).
2. All three tools have distinctive morphologies and would exhibit similarly distinctive wear and breakage patterns consistent with the hypothesized functions.

**HYPOTHESIS #3: FUNCTION OF CLUSTER FEATURES**

Burned rock or caliche cluster features have been accorded very little careful examination in most south Texas site excavations. The cluster features at 41 JW 8 represent several different functional activities, including cooking hearths, warmth hearths, and discard piles. These might have occurred as intact features buried fairly rapidly, or dispersed features exposed on the surface for a period of time, or purposefully scattered. Cooking and warmth hearths would have served as focal points for specific subgroups such as family activity areas.

Expectations:

1. Systematic field excavation methods, recording, and subsequent laboratory analysis of cluster features would reveal subtle and perhaps obvious differences related to function. The following types of clusters were expected to occur:
  - a. Hearths would evidence direct burning (stained soil), charcoal and/or ash, and a high percentage of burned flakes inadvertently present around the hearth. Cooking hearths as opposed to warmth hearths would also evidence charred food resources such as seeds or bones and very high phosphate levels.
  - b. Discard piles from hearths or possible stone boiling would evidence lack of direct burning, i.e., absence of charcoal, ash, and charred food remains; and low or average percentages of burned flakes. In addition, discard piles would tend to be more dispersed or scattered than hearths.
2. Analysis of artifact patterning around hearths would reveal functionally related clusters such as flintknapping or plant processing areas. Similar patterns would not occur around discard piles.

#### **HYPOTHESIS #4: THE "BONE BED" ACTIVITY AREA**

The "bone bed" area of 41 JW 8 functioned as an activity area where bison butchering and bone disposal occurred. Bison butchering or processing occurred on the edges or banks of a southwest to northeast trending erosional gully. The gully floor was used as a refuse discard dump for bison bone, other bone, and broken tools.

Expectations:

1. Careful exposure and recording of the "bone bed" would reveal in plan and profile an erosional gully.
2. The gully would contain refuse, as previously mentioned. Partially articulated bison bone segments might have been present.
3. Adjacent to the gully but at a slightly higher elevation (on the gully banks) the bone concentration would be noticeably less. Some discarded butchering tools might have been present. Some rock clusters might have occurred which served as warming fires rather than cooking fires (see Hypothesis #3).

#### **EXCAVATION STRATEGY**

In order to address the major site problems and most effectively test the hypotheses, the general approach to the excavation strategy was carefully considered. In general, the proposal called for the excavation of specific portions of the site, emphasizing careful and consistent excavation techniques, recording procedures, and collection of supplementary nonartifactual data. Rather than maximizing the amount of excavated area at the expense of adequate analysis, the proposal called for the excavation of only as large an area (and obtain as large a sample) as could be thoroughly analyzed.

The consideration of the specific excavation strategy to be employed at 41 JW 8 took into account two important RFP specifications. Section IV,B of the RFP stated that "If in the event that less than 100% of the available data from the site is to be recovered, the contractor must insure that the sample drawn is both adequate and representative." Given the monetary limits set forth in Section VIII,A of the RFP (\$50,000), it was obvious that only a relatively small fraction of the site could be excavated. The site surface area had been estimated at 3000 m<sup>2</sup> (Hester 1977:6). The area of the site containing subsurface (buried) deposits was unknown but probably covered an area of less than 3000 m<sup>2</sup>.

The questions of sample adequacy and representativeness are complex problems that have no fixed answers. A review of regional and North American approaches to sampling finds a great deal of controversy and a wide range of approaches. Most discussions of sampling are oriented toward surface surveys, although similar techniques can often be applied to excavation. One of the better discussions of sampling strategy is Mallouf's review of the literature in Mallouf, Baskin, and Killen (1977:89-93). The most important

schools of thought can perhaps be divided into two groups: those who favor probability or statistical sampling (cf. Redman 1974; Mueller 1974) and those who favor judgement sampling (cf. Jelks 1975). The view taken here is that judicious, nonrandom, systematic procedures of exploration and observation are far more useful in solving archaeological problems than random sampling particularly with regard to the problems at 41 JW 8. This is especially apparent when one considers that purported random samples are not truly random, as Jelks (1975:6) points out. A true random sample can only be obtained if and only if the total sample (sample universe) is known. The only way that the sample universe of a buried site can be determined is by excavation of the entire sample. Otherwise, the random sample is only a sample of an arbitrary grid system, NOT the cultural deposits under consideration.

In south Texas, two principal excavation methods have been employed: sondage or test pit excavations, and block or horizontal excavations. The most often used technique is the sondage method which, while useful for preliminary testing, results in comparatively little information on spatial patterning. Block excavations, also referred to as open area or horizontal excavations (Hester, Heizer, and Graham 1975:76-78), have been increasingly used in south Texas and elsewhere. By excavating a block of contiguous excavation units, one is sometimes able to detect spatial relationships such as that existing between hearth features and related activity areas which are not apparent in small test units. An example of the usefulness of this technique is provided by 41 LK 67, a site excavated by the CAR-UTSA during the Nueces River Project (Brown et al. 1982). By opening up a large area, archaeologists were able to plot artifact patterning in relation to small rock clusters or hearths. Similar techniques have also been successfully employed at the Mariposa site (Montgomery 1978) in Zavala County, the Loma Sandia site in Live Oak County, and at several sites in Bexar County, such as the Panther Springs Creek site (Black and McGraw 1985).

The proposal called for the use of the block excavation technique (discussed previously) at 41 JW 8. The 1975 testing had revealed areas of the site with a high probability of intact cultural features. Opening a large excavation block in one or more of these areas would allow the exposure of several cultural features and related artifact patterning. The "bone bed" was one area of the site with proven research potential (see Hypothesis #4). An excavation block in this vicinity, containing a minimum of 16 contiguous square meter units, was proposed. In order to address the problem of site limits, especially in the southern periphery, additional testing in the form of shovel testing and 2-m<sup>2</sup> units was proposed. If another area containing significant deposits was revealed during the additional testing, a second block of at least 16 m<sup>2</sup> would be excavated. Flexibility of the exact excavation strategy was considered an absolute necessity. In order to emphasize the exposure and recording of cultural features, the features would have to be followed by opening more excavation units. It was recognized that at the Hinojosa site, like at most sites with limited prior testing, the exact configuration of the excavation areas should be determined as the excavations progressed.

Additional methodological aspects of the site research design are discussed in Section III.

### ADDITIONAL PROBLEMS

Several problems were addressed during the analysis that were not considered in the research proposal. These represent research questions or hypotheses that were formulated as the analysis progressed. The two problems are listed here and are further discussed elsewhere in this report.

1. Lithic Sources: Where were the source areas for the lithics at the site? How far was the material transported? Was the material brought in as intact cobbles or flake blanks?

2. Fawcett's Neck Width Hypothesis: The author became aware of a reference to 41 JW 8 during the analysis phase of the project (Fawcett 1978). Fawcett has hypothesized that projectile point neck width measurements could be used to estimate the occupation date of single components in southern and central Texas. This hypothesis was initially tested using data derived from the 1975 testing at 41 JW 8 (Hester 1977). Does the 1981 projectile point data support Fawcett's hypothesis? Can the hypothesis be used to estimate the length of occupation for the Hinojosa site? Is the hypothesis useful for dating other sites in the region?