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such investigations with increasingly refined methods.

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The wet years of 1982-84 and 1986 flooded much of the Carson and Humboldt sinks in western Nevada; when the waters receded, a remarkable and unexpected archaeological record lay exposed. The remains of houses, storage pits, middens, and many burials demonstrate that prehistoric peoples had frequently made their residences, livelihoods, and last days in the wetlands of the Carson Desert. These discoveries, and the research and management problems they generated, spurred a host of new archaeological studies in the Carson Desert.

One such program is sponsored by the U.S. Fish and Wildlife Service (USFWS), the agency responsible for management of the Stillwater

Wildlife Management Area (SWMA). Survey of shorelines and islands (begun by the Nevada State Museum) was continued, and intensive mapping and inventory of over fifty known sites was begun (Raymond and Parks 1990). Test excavations were conducted at several sites (Raven and Elston 1988). These studies demonstrated the range of residential features, the abundance of subsistence remains, fire-broken rock and ground stone, and the relative dearth of chipped stone tools, to be found in the marshside middens. In addition, they have fostered an interesting and useful debate about the timing of residential occupation of marsh settings in the Carson Sink (more on this later).

Although these studies have resulted in the recovery of a lot of information and sparked much interest, most of that information is restricted in scope to marsh-side middens, and does not encompass the potpourri of environments that make up the SWMA, much less the Carson Desert as a whole. The survey by Kelly (1985, 1988) of the Carson Sink and adjacent Stillwater Range provides valuable information about the overall regional context, but Kelly did not distinguish separate environments within the Carson Sink, and he had to deal with a substantially different "pre-flood" surface archaeological record (Thomas 1990:280-281).

The two volumes reviewed here reduce the gap in archaeological knowledge of the varied environments within the Carson Sink. Raven and Elston develop and then test a predictive model of prehistoric land-use covering the entire SWMA. The study is an excellent example of the method used in predictive modelling, and is innovative both in its use of available environmental information and the use of foraging theory to translate that information into a set of expectations about land-use patterns.

In Part 1, the predictive model is developed. This method consists of three steps: (1) identify the analytically important components of the environment; (2) derive expected behaviors for the distinct environmental units obtained; and (3) translate these into archaeological units suitable for testing. To begin, the environment is described and analytically broken apart in detail (chapters 2-4). In Chapter 2, Elston summarizes the dynamics of climate, surface hydrology, eolian processes, and tectonics in the Carson Sink, drawing conclusions about how those conditions might affect the visibility of the archaeological records in the Carson Desert. These insights are important both for the present and for future explorations, but they are not well-integrated into the present study, in part because they occur at a scale larger than the scope of the present study.

In the next two chapters, Raven combines soil surveys, evidence of perennial or seasonal water accumulations, and corresponding range site descriptions to develop a mosaic of reconstructed habitats over the entire SWMA. A total of 30 different "habitat types" are defined for the study area, mapped as 1-km.^{2} study units. These "habitat types," the main environmental units of analysis, differ in overall productivity of various plants and animals available and in environmental complexity, or "patchiness."

Once the region has been divided into habitat types, the prehistoric behavior expected in each habitat type is derived. Likely food resources in the habitat types are described and their seasonal abundance distributions are mapped (Chapter 5). Then, the habitat types most likely to be foraged are deduced, using the precepts of foraging theory and Simms' (1985) cost/benefit analyses of different Great Basin food types. Foraging theory contributes ideas about which foods would be most economical to use in each habitat type, what type of use would be expected in each habitat type, and how transport costs might affect food choice and occupation patterns. Expectations of habitat use are cast in terms of three main classes of behaviors: residential occupation, "male-oriented" hunting patterns, and "female-oriented" gathering patterns. It is

suggested that hunting males should reside in locales central to their best hunting range, and gathering females should reside in locales adjacent to their best gathering habitats. This is assumed because gathering involves bulky foods (in the sense of volume per calorie), because women also have children to tend, and because hunted animals are more or less distributed homogeneously in a wide variety of habitats (relative to gathered resources such as seeds and roots). A simulation study (in an appendix) substantiates that this pattern of short-distance female foraging and long-distance male foraging would not be uneconomical in the habitats of the SWMA. Residential occupation is expected to be most frequent in locales where high-ranked resources of both types are available for more than a single season.

These behavioral expectations are the basis for a series of qualitative hypotheses about the relative archaeological complexity expected for different habitat types and the relative importance of residing, hunting, and gathering in those habitat types. The translation from behavioral expectations to archaeological signatures is perhaps the weakest link in the whole chain of reasoning of the predictive model, but the lack of adequate "bridging argumentation" between behavior and archaeology is symptomatic of many applications of this approach. Because we do not know, *a priori*, the range of archaeological signatures that various behaviors may take, we cannot predict the archaeological record, *a priori*, with the kind of rigor or precision we would wish. The authors "solve" this problem empirically, by classifying what was found into settlement categories, and then assigning patterns of behavior to those categories. This task is part of a test of the hypothesized land-use model.

The test, described in Part 2, involves comparison of the surface archaeology of 39 1-km.^{2} units representing each habitat type. Most habitat types had only one square representing it in the survey, a few habitat types had as many as three. The surface archaeology of each survey unit is described in Chapter 2. The results show clearly that identical habitat types may have very different archaeological records, and consequently that the sample size of each habitat type presented here is far too small to make statistically significant comparisons, or even to adequately assess the range of variability within habitat types. The data collected, however, do show interesting patterns relating to the tempo and mode of human life in the Carson Sink and to the predicted land-use model.

Chapter 3 presents much of the archaeological analysis of the study. In it, settlement categories are defined and their constituents analyzed, and chronological patterns of settlement are considered. These chronological patterns are directly pertinent to an ongoing debate on the tempo of occupation of marsh areas in the Carson Sink. Kelly has argued, on the basis of lithic technology and associated projectile point distributions, that residential use of the Carson Desert lowlands prior to 1,500 years ago either was negligible (Kelly 1990) or was fairly short-term (Kelly 1988). After that time, occupation of the Carson Valley increased significantly. Raymond and Parks (1990:58), on the other hand, suggest that "there appears to be no significant change in settlement at the cusp between Elko and Rose Spring/Eastgate periods around 1500 B.P." The results of the present study are directly pertinent to this issue. Raven uses an ogival curve to argue that the relative proportions of different projectile point time-markers found in the study area (Gatecliff, Elko, Rosegate, and Desert) imply a continuous temporal pattern of projectile point deposition "for at least five, and perhaps as many as seven, millennia." But ordinal measures such as ogives cannot yield ratio-level results, since the projectile point series were not extant for the same lengths of time. If the number of points represented in each series is corrected by the length of time that series was assumed to be

Table 1
DISTRIBUTION OF PROJECTILE POINT TIME MARKERS IN THE SWMA[a]

	Projectile Point Series			
	Gatecliff	**Elko**	**Rosegate**	**Desert**
Number of Occurrances	22	17	32	29
Estimated Time Range (centuries)	17	20	6	5.5
Number/Century	1.3	0.9	5.3	5.3
Number of Habitations Containing Points	3	2	5	4
Number of Habitations per Century	0.18	0.10	0.83	0.73

[a] Data from Raven (1990:114-116).

extant (Table 1), a very different picture emerges of the tempo of projectile point deposition, and (by association) overall trends in occupation, a picture that supports a model of increasing residential use (e.g., Kelly 1988) rather than a model of continuity through long periods of time. (Raven caveats the use of point frequencies as measures of regional occupational intensity, but until more and better dates are available for different classes of settlements, we are unhappily stuck with the points.)

The survey results tend to confirm the model predictions (Chapter 4). As expected, site types considered to represent residential occupations are most commonly found in near-marsh settings and in ecologically productive and complex environments. The remains of hunting and plant food processing activities generally conform to expectations, but appear less predictable than residential habitation. Some deviations from model expectations are attributed to misidentified habitat types, and some are from apparent behavior patterns not anticipated by the original model. Revisions to the model suggest that, among other things, transport costs were more important in patterns of foraging for some seed resources than originally thought.

Predictive modelling is by now a prominent tradition in Great Basin archaeology, and the knowledge we have gained about Great Basin prehistory as a result is enormous. The value of this approach seems to matter not whether our initial model predicts well; rather, we learn a great deal about the shape of the archaeological record, and about prehistory, simply by making the effort in a systematic way. In this respect the present study is an unequivocally successful first step. The authors have produced a thoughtful and innovative way to combine range site data with estimated costs of foraging for different resources to develop a behavioral model of land use in a previously little-known setting. A test of the model reveals its value in predicting the archaeological record of that region, and provides a wealth of other information about prehistoric use of the Carson Sink. Great Basin prehistorians, and students of hunter-gatherer land use generally, will doubtless find the results stimulating and the approach worthy of emulation. The USFWS and Bureau of Reclamation should also be praised for supporting this achievement and for making it available to scholars at an unbeatable price.

However, the present study should be considered a beginning, not an end. What specific factors in the model account for its predictive success is not yet clear, nor is it known whether other scenarios might predict as well or better. Understanding prehistoric land use patterning in the Carson Sink will require more rigorous specification of environmental variables, expected foraging behavior, and

archaeological consequences. It will also require a detailed comparative analysis of a sufficient sample of the archaeology of selected habitats to test, variable by variable, whether the expected archaeological differences are found (cf. Simms 1988). It is very much hoped that continued research in the SWMA will build upon the foundations of this study in reaching this goal.

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This monograph represents an expansion and elaboration of an earlier analysis (Haldeman 1987) of the human skeletal remains recovered from Stillwater Marsh, Churchill County, Nevada, under contract with the U.S. Fish and Wildlife Service. These remains consist of 144 relatively complete skeletons and 272 incomplete skeletons (or single bone elements) exposed by recent flooding in the Carson Sink area of west-central Nevada. As such, the Stillwater skeletal series represents the largest single skeletal series recovered to date from the Great Basin. Brooks et al. have done a solid descriptive analysis of these remains.

The authors seek to accomplish six major objectives in this report. These objectives are: (1) to derive age and sex mortality profiles; (2) to provide an anthropometric examination of these remains to permit comparison between skeletons derived from different archaeological contexts at Stillwater, and between the Stillwater