

# *San Nicolas Island*

**ARCHAEOLOGY FIELD AND LABORATORY MANUAL**



**BY**

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**CALIFORNIA STATE UNIVERSITY, LOS ANGELES**

## I. ARCHAEOLOGY FIELD PROGRAM 2002

### **San Nicolas Island Field School Schedule:**

1. April 19 - 22
2. May 3 - 6
3. May 17 - 20
4. May 31 – June 3

### **Tools that you will need to have in your "dig kit"**

#### **Required:**

1. 4.5" or 5" pointed cement masons Trowel - preferably Marshalltown, not the rounded gardening variety
2. 3-meter minimum length measuring tape (metric only)
3. Line level - preferably Stanley
4. Metric ruler
5. Sharpie - indelible black marking pen
6. No. 2 pencils with pencil sharpener
7. Water bottle(s)
8. Small toolbox or daypack to carry your tools in
9. Safety goggles
10. Tube of rubber cement

#### **Optional but highly recommended:**

11. Ice pick
12. Compass (the Silva Ranger is the most popular model for archaeological use)
13. Additional measuring tape
14. Metric folding wooden rule
15. Allergy medicine if needed
16. Personal first-aid kit
17. Sun screen (SPF-15 minimum)
18. Hat
19. Cotton work gloves

## II. FIELD EQUIPMENT CHECK LIST

1. Shovels (Round Nose) \_\_\_\_\_
  2. Shovels (Square Nose) \_\_\_\_\_
  3. Screens \_\_\_\_\_
  4. Soil/sand Augur (do not need until excavation unit is completed) \_\_\_\_\_
  5. Picks (Hand or railroad) (do not need unless soil is exceptionally hard) \_\_\_\_\_
  6. Wooden Stakes \_\_\_\_\_
  7. String \_\_\_\_\_
  8. Hammer \_\_\_\_\_
  9. Tape Measures \_\_\_\_\_
  10. Compass \_\_\_\_\_
  11. Chaining Pins \_\_\_\_\_
  12. Level Boxes \_\_\_\_\_
  13. Dig Kits \_\_\_\_\_
  14. Pin Flags \_\_\_\_\_
  15. Flagging Tape \_\_\_\_\_
  16. Munsell Soil Chart \_\_\_\_\_
  17. Notebooks \_\_\_\_\_
  18. Clipboards \_\_\_\_\_
  19. Level, Continuation and Soil Forms \_\_\_\_\_
  20. Camera and Film \_\_\_\_\_
  21. Dust Pan or Scoops \_\_\_\_\_
  22. Whisk Broom, Paint Brushes \_\_\_\_\_
  23. Line Level \_\_\_\_\_
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- 24. Markers and Sharpies \_\_\_\_\_
- 25. Water Bottles \_\_\_\_\_
- 26. Buckets \_\_\_\_\_
- 27. Grocery Size Paper Bags \_\_\_\_\_
- 28. Small, Medium, and Large Baggies \_\_\_\_\_
- 29. Vials (Film Canisters or Pill Bottles) \_\_\_\_\_
- 30. Foil \_\_\_\_\_
- 31. Tarps \_\_\_\_\_

## NOTES

### III. METHODS

#### Personnel

Most excavations are staffed by three levels of supervisors, who will guide and oversee the mechanics of excavation. The person who is responsible for the overall project and the report is known as the Principal Investigator or P.I. The P.I. is usually a professor or advanced graduate student who is doing research, or the contract archaeologist who is responsible for guiding the project from inception to completion. P.I.'s generally write the research designs and synthesize the excavated data for the final report. The second in command is the Field Director. Their role is to insure that the research design is implemented in the field. Field Directors guide the fieldwork and set the policy for the field procedures. They are usually the ones that do the hiring of personnel, give excavation instructions to the Crew Chiefs, and determine the pace that the excavation should be moving. Under the Field Director are several Crew Chiefs. Their job is to run the excavation teams by passing on excavation strategy and assignments. They will also implement the field policy that the Field Director has generated. Some larger projects may have assistant Crew Chiefs.

For this field school project, each unit will be excavated by a team of three - one excavator and two screeners. The excavator and the screeners will rotate after completing each level to ensure that everyone has an equal opportunity to dig and screen. There will be an effort to have at least one student with prior archaeological experience on each unit. This person will act as a "Crew Chief" for that unit.

All members of the team are equally responsible for entering the data and their observations on the field forms. Field notes documenting the excavation techniques and recovered data from a team's unit are to be made **during** the excavation and **at the time** of discovery. Field notes are to be kept in your field journal. At the completion of each level, the team will also jointly summarize their observations and fill out the level forms. You will be given instructions regarding which materials are to be saved. All saved materials shall be sorted, placed into the appropriate containers and labeled for transport to the lab. During the excavation, the screeners and the excavator should be telling each other what they are finding. This active communication can alert each team member to changes or discoveries within each level that might relate to interpreting cultural activities, recognizing features, and recording changes in occupation strata.

#### Field Journals

The process of archaeological fieldwork relies heavily on accurate provenience systems, careful observations, and meticulous recording. Archeological research involves much more than the collection of artifacts. The artifacts themselves are only important to the extent that they may be used to make inferences, test hypotheses about past cultures and prehistoric human behavior, or in some other way contribute to the understanding of specific research topics. This is not to diminish the aesthetic quality of artifacts, but from a research perspective, the context of artifacts is as important as the items themselves. The context is a result of a variety of cultural, natural, and post abandonment processes and the archeologist must consider all of these processes while excavating.

We are faced with the difficult task of trying to look at the material remains of a site and making inferences about the behavior, ideology, social organization, religion, symbolic structure, etc.

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of an extinct society. Remember that excavation is the controlled destruction of the site. You and each member of your excavation team are the primary observers of the data as it is recovered. What you observe will never be seen by anyone again and you are, therefore, our most valuable source of information. Your systematic observations make the difference between a pile of artifacts and ecofacts and a reconstruction of prehistoric human lifeways. Therefore, you have an obligation to take great care in recording your work, observations, interpretations and finds. Logical, legible, and comprehensive notes are essential to the research process.

For ease of locating each day's entry, start each page with the date, site, level, and activity (field, lab, or general observations). Under the activity heading, be sure to state the unit and level you are working on, if appropriate. Sketches are very informative and should include some sort of measure scale for unit size, or artifact size.

Be sure to include lab observations and discoveries in your journal (not counts, but comparative or presence and absence statements). Sometimes, your day's cogitations in the field produce fabulous insights by evening's lab. It is a good idea to write your notes as if you were explaining your observations to an archeologist who has not seen the site at all.

### **Some things to include in your field journals:**

1. Date and your name
  2. Provenance: Site number; Site name, if applicable; Level.
  3. Supervisor
  4. Excavators
  5. Activity (field, lab, or general observations)
  6. Description of the general conditions of the site (environment, terrain, natural or modern disturbance, and anything else of note).
  7. When applicable, the relationship of your unit to the others at the site. How does it compare in terms of location, depth of cultural deposit, soil hardness, color, features and artifact yield?
  8. Changes in the soil, artifacts, shell types or sizes of fragments, numbers of whole shells, kinds and sizes of flakes, lithic raw materials used at the site, sizes and types of bone, etc, from one level or part of your unit to another.
  9. Interpretation of archeological context. Does the deposit represent natural or cultural deposition? Is there evidence of mixing or disturbance? What processes occurred that help explain the origin and formation of the unit you are excavating? What is the source of the artifacts and the sediments in the unit? What kinds of interpretative statements can you make about what you are finding in terms of the past human behavior that resulted in the deposition of the things you are finding and observing? Why did people live/camp here? (view? water? resources? shelter?). What did they do here?
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10. What are you saving? What are you throwing away and why?
11. How are you excavating? (dental pick and brush? trowel? shovel?) why?
12. Problems you encounter and how you deal with them.

## Excavation Units

1. The units will be 2 X 2 m or 3 X 3 meters square and may be expanded depending upon what is found. The units will be oriented to magnetic north (MN).
2. A **unit-datum stake** will be placed by the highest corner of the unit. The *unit datum* is the point from which all measurements are taken. The *datum stake* is set so that its sides are at right angles to the sides of the unit when it is driven into the ground. Because of the sandy soils on San Nicolas Island, the datum stake should be set back from the actual corner of the unit - at least eight to ten centimeters - to prevent subsequent collapse of the excavated walls.
3. A string, the *datum line*, will be tied to the datum stake and will be cut long enough (approximately 2.5 m) to over-extend across the diagonal measurement of the unit. This string acts as the arbitrary and horizontal zero-line from which all depth measurements, below datum (BD) and above datum (AD), are taken. The datum line is kept horizontal by attaching a bubble line-level to the string. Ideally, the string should be secured at ground level and its location notched and marked on the datum stake. Ground-surface (GS) irregularities, however, often necessitate that the datum line be marked, notched, and securely tied 5 or 10 centimeters above the actual level of the ground. Measurements are still taken from zero and the 5 or 10 cm difference will be subtracted when the sidewall is mapped at the conclusion of excavation. Always note on the level form and in your field journal the distance of the datum string from the ground.

Although the practice is not currently used on San Nicolas Island, some archaeologists measure depths from the surface and not from a leveled datum-line. Below-surface measurements are abbreviated as **BS**. This measurement technique is generally associated with a method of digging known as **contour excavation**, in which the excavation of levels follows the contour of a slope.

The actual direction and distance of the unit-datum stake and the elevation of the datum line above ground-surface will be recorded on the Unit Level Form for both the surface and the first subsurface (stratigraphic) levels. The unit datum will also be shot in from the *site datum* (the control point from which all measurements for the site are made) for distance, elevation, and compass direction.

## Field Forms

Current excavation protocol on San Nicolas Island involves two primary field methods - **excavation by arbitrary levels** and **excavation by natural stratigraphy**. For this project the levels will be excavated using the stratigraphic method. Stratigraphy refers to layers that represent natural deposition and cultural development that are associated both spatially and temporally. Where a deposit is more than 10 cm thick, it will be divided into 10 cm levels that will be collected, bagged,

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and labeled separately. A level form will be completed for each stratigraphic layer, and if the layer is thicker than 10 cm, for each 10 cm level within the stratigraphic layer.

The floor plan of the unit's surface-level and subsequent excavated levels will include to-scale information on surface or stratigraphic **topography** (relief features or surface and base configurations of each stratum), soil colors and types, and the **provenience** (three-dimensional location) of **artifacts** (anything made or modified by human beings) and important **ecofacts** (loosely defined as unmodified bone, shell, and plant remains found in an archaeological context). The different midden and feature soils defined and drawn on each level's floor plan will be sampled for color and texture using a glue stick or rubber cement and recorded on the Soil-Sample Record Form (see Forms - 3 for further details).

1. Four different forms will be used to document the data recovered during excavations. These multipurpose records include the **Unit Feature/Level Form**, **Unit/Feature Continuation Form**, **Soil Sample Record Form**, and the **Excavation Unit Summary Form**.

1a. **Unit Feature/Level Form** This record is used to document the basic information - physical data and primary observations - taken during the excavation of each level. The information to be documented on this form includes all data pertinent to the excavation - **Site Number**, **Unit Designation**, **Stratigraphic layer**, **Depth** of the Stratigraphic layer (in centimeters) ; and where applicable, the 10 cm **Depth** within the stratigraphic layer, **Feature Numbers**, **Date**, **Beginning Elevations** (the depth above or below datum inside each corner of the unit), **Unit Size** (in meters), **Crew** (the excavation team). **Level Complete** versus **Partial** refers to whether a complete stratigraphic layer was excavated, or whether the stratigraphic layer was thicker than 10 cm and the remainder is recorded on one or more additional forms. A separate form for recording the unit's surface prior to beginning excavation will be filled out first. Even though some of the recorded information will be duplicated on the form for the first stratigraphic layer, include as much information as possible from this beginning point. **Datum Corner** asks in which corner - by compass orientation -the datum stake is located. The field mapping team will provide the **Distance/Direction From the Site Datum**.

The **Unit Feature/Level Form** is the primary log for the materials that were recovered and recorded. **Recovered materials** refer to physical objects such as artifacts, ecofacts, and collected soil-samples. **Recorded observations** involve descriptions and plan-view locations of soil types, features, and intrusive items that disturb the integrity of the unit such as roots, sow bugs, and - in some regions - rodent burrows.

**Plan View.** Prior to excavation and at the end of each excavated level, a Plan View (the to-scale representation of the top view or horizontal section of a surface or structure) of the unit's ground- or floor-surface will be recorded on the back, gridded side of the Unit Level/Feature Form and will follow a standard format. Draw the square outline of the unit against the upper-left margins of the grid to scale (do not sketch). Indicate the scale used on the grid sheet. For the standard floor-plan of each level, one centimeter represents a scaled measure of 10 cm. In the left margin, draw a north arrow pointing to the top of the sheet. The majority of units on SNI will be laid out to magnetic north (MN), and writing MN under the drawn "north" arrow will reflect this orientation. Using the north arrow as a reference, identify and mark the NW, NE, SW, and SE corners of the unit.

Identify the unit datum-corner using the conventional symbol of a cross within a circle. If the datum line is set at ground level, mark the datum corner measurement as 0 cm. Most datum lines, however, are set a few centimeters above the ground to avoid snagging on vegetation and/or hanging up on surface-contour irregularities. If this is done it is preferable to raise the string off the ground in 10 cm increments. This makes it easier for converting the beginning level back to 0 on your sidewall profiles. Using the datum line, measure the level of each corner within the boundaries of the unit, and mark their relative elevations on the plan drawing. All elevation or depth measurements taken from the unit datum are abbreviated as either AD (above datum) or BD (below datum). The **provenience** of artifacts, principal ecofacts, and samples located *in situ* (in original position) will be plotted by shape and to scale on the level's plan-view. The **provenience** of each find and sample will be determined by using the three-dimensional measuring method of **triangulation** in which two horizontal directions are measured off of the guide strings, or walls of a reference corner, to the center of the specimen. The vertical direction (depth) is measured from the datum line to the **bottom** of the item, or the floor that the specimen is resting upon. The horizontal measurements are made from the designated reference corner along two perpendicular cardinal directions. Measurements for the north/south axis should proceed the distance for the east/west axis. Proveniences should be written in the format of the following example: (2) Pestle: from NW corner / 15 cm S / 62 cm E / 32 cm BD.

Some precautions should be taken to prevent erosion of the surface and sidewalls of the excavation unit. Avoid standing on the edge of the unit, especially in soft sand. When covering up the unit at the end of the day spread a piece of canvass over the top carefully and weight it down with rocks or buckets full of sand or dirt. In extremely fragile soil situations draw a contour of the surface on the back of the level form prior to excavation. This way there will be a record of the surface measurements. If the sidewalls cave in .

**Excavation Method** On San Nicolas Island, excavation is done with tools ranging from dental tools, brushes, and trowels to shovels and picks. Initial exploratory digging with a trowel is generally recommended because of the potential for encountering complex stratigraphy and the need to carefully define each stratum within the given arbitrary level. When levels are encountered that contain relatively thick strata with low densities of constituents, shovels may be more expedient for excavation. Large picks should only be employed when the soil hardness defies the use of trowels or shovels.

**Screen Size** All excavated materials will be dry-screened in the field using  $\frac{1}{8}$ -inch mesh "shaker" screens.

**Stratigraphic Observations** Due to the lack of burrowing animals on San Nicolas Island, the natural layers of earth - deposited over the millennia through wind, rain, and wave actions (physical and chemical forces) - are still extensively interbedded with midden strata that retain a variety of marbled and banded soils, deposited from generations of cultural activities. These layers - **strata** - combine soil color and composition with content (cultural and ecological constituents) and unusual features to form the **stratigraphy** of a site. The stratigraphic record can be simple or be composed of numerous and interbedded layers that take on the appearance of a layered pastry.

The definition of these strata is critical to the investigations of chronology and adaptation at sites on San Nicolas Island since each cultural stratum represents a distinct occupation and/or activity that is superimposed and/or offset in position to the next midden deposit.

Within the section for **Stratigraphic Observations**, each soil deposit in a level will be defined and described according to its color, composition, general content, distinctive features, stratum thickness, and slope. The boundaries of each stratum, **lens** (a body of soil within a larger stratum that is relatively thick in the middle and is thin at its edges), or feature will be plotted and described on the level's plan view. A soil color/texture sample from each stratum will be collected and more fully described on the Soil Sample Record Form (see Forms - 3). All constituents (artifacts, ecofacts, and soil samples) from each defined stratum, lens, or feature located within the given level will be bagged separately by stratigraphic layer. Each specimen/sample bag will be labeled according to unit, stratum and level using the hierarchical format of Site, Unit, Feature, Stratum, Level, Specimen/Sample Category, and Date: i.e.: SNI-289, Unit 2, Feature 4. - ash lens, 90-100cm, bone awl, 6/12/02. In addition, the excavators names will be placed on the main level bag, but not on the small individual bags: Vellanoweth, Martz, and Perry (see figure 1, page 18). Not all excavation units will be this complex; you will probably not routinely need the feature and matrix notations. The zip top artifact bags and larger level bags will be filled out with a Sharpie or other similar sharp-pointed indelible marking pen. **NO PENCILS!**

**Features** Each feature (an association of artifacts, ecofacts, structural evidence and/or specific soils) defined within the given level will be listed in the **Features** section by number and summarized according to provenience, content, context, and the probable cultural or natural activity. A detailed description, per level, of any features will be documented on the Feature Level-Form (see 5b).

**Samples Collected** for study will be recorded according to type - soil Ph, bulk soil, pollen, carbon, or blood residue - quantity, and their assigned number. On the plan view, each sample will be plotted and listed under the legend by its field-collection number, sample type, and provenience.

**Faunal Remains**, unmodified bone and shell, will be listed according to the relative abundance of each vertebrate class (the bones of mammals, fishes, birds, and reptiles) and of each major invertebrate species (see 11b). The team should be observant of - and record - changes in species and their abundance between levels and within areas of each level.

**Floral Remains** will be logged as unmodified seeds, plant fibers, or wood. The presence and relative quantities of each of these categories will be described and, when possible, plotted on the plan-view.

**Artifacts** will be recorded under their general section - **Chipped Stone, Groundstone, Bone and shell tools**, or **Miscellaneous Artifacts** [including woven items (basketry, matting, braided cordage), pigments, fire affected rock (FAR)] and listed by type (see Catalogue Menu), material, and quantity. Artifacts that have been found *in situ* during excavation will be logged by their field number and type under the appropriate artifact section. These same

artifacts will be plotted to shape and scale on the plan-view and, under the plan-view legend, be listed by field number, type, and provenience.

The team's **Observations and Comments** are of critical importance to the accuracy and quality of all data recovered during the excavation. **!!! Each member** of the excavation team is the primary information source - the first-hand witness - and the data you observe can **not** be reconstructed unless you write down *what you found, how you found it, where you found it, and what, from the evidence, you think it means !!!*

The bottom of the form provides a section to record photographic information - **Photos**, how many artifact/ecofact bags were generated in the unit - **Total Number of Artifact Bags**, and a space for the **Field Supervisor's Initials** and the **Date** signed. The back of the Unit/Feature Level Form has a full-size metric-grid on which the plan view of the given level can be drawn. The excavation team may not proceed to the next level until the field director or an appointed crew-chief has checked the form and initialed it.

1b. **Feature Level Form option** While similar in content to the Unit Level Form, this form is specific to recording features. **Features** are localized points of cultural activity - a fire pit, buried cache of artifacts, work area, or food preparation area. Features are not restricted to these examples but can be represented by numerous other activities. Again, there is a full-size metric grid on the back to map in the feature.

Features will be assigned reference numbers on a site-wide basis by the principal investigator(s). The forms are also designed to accommodate features that extend into more than one level or unit. Features will be designated by the following format of Site, Unit, Feature, and Stratigraphic layer and Depth, i.e., SNI-38, Unit 4, Feature 10, Stratigraphic designation (to be assigned by the P.I.), 110-120 cm. If the feature exceeds 10 cm, it will be necessary to excavate and record it using a separate form for each 10 cm level. When the form is used either as a Unit Level or Feature Level Form, check off the option - unit or feature - that is being recorded.

2. **Unit/Feature Continuation Form** As the name implies, this form is used when the level form is not long enough for the materials or information being recorded. If it becomes necessary to go to this form, mark the end of the line that needs continuing with a C enclosed in a square. This symbol cues the reader to refer to the Unit/Feature Continuation Form. Write out the category being continued on the beginning of the line so there is no question of what you have in mind.

3. **Soil Sample Record Form** Record the soil types found per stratigraphic layer for either the unit, the feature, or the **auger** (a tool used for drilling holes into the ground for soil collection) on this form. Check off the type/location of sample you have, and whether it is on-site or off-site. You will be advised in the field regarding the number and placement of the soil. Three soil samples can be recorded on each sheet, and some levels may require more than one form. Each recorded sample will be assigned a field number by the excavation team. Spaces are provided for recording whether bulk samples of screened soils were collected and mapped on the plan view, the number and volume of bags, and who collected them.

The texture and color of each soil type will be documented according to relative composition of grain sizes (silt, clay, and/or sand) and Munsell Soil Color designation. The collection number and provenience of each sample recorded on the soil form will be mapped on the plan views of their respective level/ feature forms.

A small sample of each distinctive soil will be glued in one of the circles provided on this form. Spread a moderately thick layer of glue from a glue stick or rubber cement within the circle, sprinkle the soil onto the glue, and press it into the glue with a clean finger or trowel. Because wet clay will not adhere to the glue, clay samples must first be dried and pulverized. Again, identify which unit option is being recorded on the form.

4. **Excavation Unit Summary Form** This form will provide a summary of the number stratigraphic layers and 10 cm levels excavated, soil changes, and a basic inventory of artifact bags and samples recovered from the excavation. Some units may require more than one Unit Summary Form to complete their documentation. The final unit sidewall profile(s) will be mapped on the back of this type of form.

5. **All the forms required to document a given level will be completed prior to beginning the next level.** Refer to this manual routinely to review instructions on procedures. Fill out each form as completely as possible. If you do not understand a category or are having trouble filling out the form, consult with the crew chief or field director. The field director will check all forms and will initial them when they are complete.

## **General Methods of Field Excavation**

Archaeological field methods and techniques have become increasingly sophisticated over the last forty years. Excavation strategies may vary from region to region based on the different characteristics and contents of each site and the research objectives of the investigation team. Certain basic skills and concepts, however, have become standards that should be followed by any archaeologist who wants to ensure that the data recovered during excavation is consistently accurate, relevant, and of value to the stated research.

In 1958, beginning students in California field archaeology were presented with a series of standards to follow which have stood the test of time. With some modifications by the editors, Meighan's (1958) introductory advice is presented under General Instructions, Points of Major importance For the Beginner, and Twenty Points of Good Field Method.

## **General Instructions**

1. **All field records are to be completed on a daily basis.** Each worker will carry a Field notebook with them during the day's work so that they can jot down the observations of the day during their excavation work. At the end of the level, these full notes should be entered on the Unit Level/Feature Form and continuation sheet with as much detail as possible.

2. Do not put off this completion of the daily notes - many details of importance will be forgotten if the record keeping is postponed. Get into the habit of stopping your work and

writing down your observations at the first possible moment. Also strive to develop the habit of writing up the day's work in full at the end of each working day. Such systematic and routine recording is the basis for preparing the finished archaeological report, and careful and complete reporting cannot be overemphasized. Good field notes make it easy to produce a scholarly report; slipshod field notes may nullify much of the value of an excavation that was carefully done in other respects.

3. Be **accurate**. Don't guess at distances, depths, and other facts that can be simply verified by measurement. Above all, describe what you see when it is before you - don't try to write a report from memory after the pit has been filled in.

4. Be **neat**. Neatness is a real problem on an archaeological site because of dirt, wind, and other factors, which make it difficult to sit down and do careful work. However, neatness and accuracy go together, and sloppy recording is careless recording. Take time to wash your hands and sharpen the pencil before writing up the daily records.

5. Be **specific**. Use terminology as precise as possible - thus "obsidian" rather than "stone"; "mammal bone" rather than bone." Avoid terms like "several" when the items can be easily counted and recorded. Notes should not be full of loose estimates requiring qualifiers like "approximately."

### **Points of Major Importance for the Beginner**

1. It is considered unethical for an archaeologist to maintain a private collection of relics if that person is associated with a museum or university. Every item, without exception, is turned in to become a part of the study collection.

2. Two ideas which inevitably occur and which are considered to be very poor archaeologically are:

(a) The manufacture of artifacts on the site. Most people have the urge to duplicate some aboriginal object they have seen or found. Save this urge for some place other than an archaeological site, since the manufactured object may get mixed in with site material and lead to a great deal of confusion later on.

(b) The planting of objects for someone else to find. To prevent any possible confusion with site material, do not plant artifacts with the notion of laughing at the excitement of your co-worker when he finds them. Such plants often go into the backdirt pile (are overlooked and thrown out by the "victim") and thus become part the site material to confuse the future worker.

3. When you encounter an object in digging, **STOP**. Do not yield to the temptation to grab the find and pull it out of the ground. Remember that the object has been in the ground for a long time - it will stay there for another short time while you make the proper investigations and records. Use a trowel and brush to expose and pedestal the object and to investigate the surrounding area for at least 10 cm in every direction. When you are sure the object is an isolated find and not associated with

other artifacts, it may be removed from the ground. If rocks, artifacts or other objects appear, excavation will proceed with care. Use the trowel and brush to expose and pedestal the specimens (remove all of the remaining material in the unit to level without disturbing the exposed materials). If the crew chief determines that you have exposed a feature (e.g., toolkit, hearth, cairn, housepit, trashpit, or important diagnostic artifact) the crew chief will supervise the collection of radiocarbon (<sup>14</sup>C), pollen and soil samples; and the feature, etc. will be measured, drawn to scale and photographed before removal.

4. Use extreme care in cleaning objects. Do not rub them vigorously on your jeans to get the dirt off, or bang them on the shovel handle, or plunge them into a bucket of water and go over them with a wire brush. Many perishable surface features (painted designs, pitch or tar with impressions, applique ornaments) can be immediately obliterated by overeager cleaning. Such surface treatment can occur on almost anything (bone whistles, pipes, pestles, shell pendants, etc.).

5. **Remember that the scientific record of the pit you dig is dependent on you.** Everything you miss will be lost forever. Get in the habit of thinking about what you are doing. Always "read" the soil matrix and the configuration of cultural constituents for possible clues to what activity is occurring in your level and unit and write them down promptly. When something new turns up, or you are in doubt as to how to proceed, **STOP** and call the crew chief or field director for advice. Don't wait until you have dug away 30 cm of wall before asking the crew chief what all those rocks mean.

## **Twenty Points of Good Field Method**

It is easy to evaluate the professional quality of an individual archaeologist (or of an over-all excavation) by checking to see how many of the twenty points listed below are observed. Experienced diggers will conform to all twenty points automatically as the way to maximum competence.

### **Records**

1. Pencil and necessary recording materials *at hand*, not back in your room
2. Notes and record forms clean, neat, and written up as work progresses.

### **Unit Excavation**

3. Side walls straight and vertical
4. All pits will have corners at 90-degree angles
5. Unit floors horizontal and clean with no loose dirt at completion of excavation
6. Not more than a few shovels of loose dirt in the pit during excavation
7. Correct level maintained

8. Objects not dug out of wall
9. Correct dimensions of the pit maintained. Maintain the dimensions by measuring the interior of each side of a completed level. Routinely check each level for the prevention of "bathtubbing". Excavation of the correct volume of dirt is very important. If the walls tend to slope inward or outward, the volumetric control is lost.
10. Guide strings tight and straight
11. No shovels or gear on top of guide strings
12. All level bags labeled before anything is put into them
13. Artifacts and ecofacts put inside the level bag, not piled by the side of the unit or screen
14. Heavy items should not be placed on top of fragile items. Fragile items should be carefully packaged
15. Features and level bags protected against being walked upon
16. Finished level bags, sorted, quantified, and recorded on level sheet before beginning new level

### **Backdirt**

17. Backdirt at least 30 cm from edge of unit
18. All back dirt in one place
19. No small field tools on backdirt pile to be accidentally buried and lost
20. Backdirt placed for most efficient backfill, not scattered all over field
21. No artifacts or ecofacts in the backdirt

### **Excavation Tools and Methodologies**

The stratigraphy of San Nicolas Island sites tends to be complex. The initial digging, therefore, should be exploratory and generally carried out using a four- to six-inch pointing trowel (mason's trowel) - preferably a "Marshalltown." Dental and ice picks, paint brushes, and whisk brooms may also prove handy for delicate work. Long-handled, square-nose shovels, and pick-mattocks are useful for excavating when the density of artifacts and ecofacts is not high and when the stratigraphy of the soil is relatively homogenous (few layers) or simple.

One of the primary goals during excavation is to define strata of different cultural activities and occupations. On mainland southern California, where cultural deposits are frequently churned and homogenized by the burrowing activities of rodents, midden deposits are effectively excavated in

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arbitrary 10-cm deep levels with shovels and picks in order to recognize chronological information. On San Nicolas Island, excavation by purely arbitrary levels with large-bladed implements would tend to obscure many well preserved and distinct cultural deposits, as well as strata produced by environmental processes. These complex strata may represent superimposed sequences of occupation periods intermixed with seasons of abandonment.

Archaeologists employ a variety of methods to excavate sites. It is useful to distinguish between excavation strategy and excavation process. Excavation strategy refers to the manner in which sites are sampled. Different strategies might include: augering and coring, to examine the general internal structure of a site; trenching, to obtain a large cross section; quadrant sampling, to test various loci; and, open-area excavation, to expose features and stratigraphic associations. These methods are not mutually exclusive and can be combined to form a complex sampling strategy depending on the size of the site and the research design. At CA-SNI-25, for instance, we will use a combination of open-area and quadrant excavation. Although our main objective is to isolate features and understand relative stratification, the site is rather big, forcing us to sample fairly large sections of various areas. We want to know what types of features are located in different parts of the site without excavating the entire site. To accomplish this we will excavate a series of 2 x 2 or 3 x 3 meter units and expand them according to what we find. This way we obtain a relatively large horizontal coverage, increase our chances of encountering features, and document the stratigraphic structure of the site.

Excavation process refers to how the actual digging is done. There are basically two processes of excavation, the arbitrary and the stratigraphic. Arbitrary excavation is the removal of soil by controlled excavation in measured levels of a predetermined thickness. Stratigraphic excavation is the peeling off of successive layers in conformity with their natural deposition and development. Because we usually do not know before hand the extent and thickness of deposits within a site, excavating stratigraphically ensures that the material we collect and analyze is associated both spatially and temporally. These associations are important for developing meaningful units of analysis. At CA-SNI-25, we will combine these two processes of excavation. Our primary emphasis will be to excavate this site stratigraphically (i.e., by natural layers), but in cases where a deposit is more than 10 cm thick, we will divide it into 10 cm levels that will be collected and bagged separately. Combining these two excavation processes allows us to remove deposits as they were deposited yet retain an even finer level of detail within each deposit

## Screening Methods

1. All excavated soil is screened in the field through 1/8" mesh.
2. Screeners will save all artifacts, bone, charred plant remains, and charcoal. Some fragments of shells are frequently found to be artifacts. All large chunks of shell (especially abalone, mussel, and olivella) should be saved for inspection in the lab.
3. You may be required to include some observations regarding the relative frequencies of various shellfish species within each stratigraphic level. Common species found in the shell middens on San Nicolas Island include:
  - a. Abalone (*Haliotis* sp.)

- b. Mussel (*Mytilus californianus*)
  - c. Tegula snail (*Tegula sp.*)
  - d. Norris topshell (*Norrisia Norrisi*)
  - e. Wavy turban snail (*Astrea Undosa*)
  - f. Giant keyhole limpet (*Megathura crenulata*)
  - g. Owl limpet (*Lottia gigantea*)
  - h. Olive snail (*Olivella sp.*)
  - i. Chiton
  - k. Miscellaneous shell
3. Screeners will save lithic materials (flaked or ground). Prior to starting a new level, these shall be sorted, counted, bagged, and labeled according to the following categories:
- a. projectile point
  - b. other formed flaked stone tool or implement (bag each separately)
  - c. flaked stone
  - d. ground stone
  - e. tarring pebbles
  - f. obsidian flakes
4. Screeners will save all other artifacts - any lithic, shell, bone, plant or material that has been manufactured or modified by humans, such as awls, beads, basketry impressions, asphaltum, pigments. Prior to starting a new level, these shall be sorted, counted, bagged, and labeled according to the following categories and entered on the level form:
- a. shell beads
  - b. other shell artifacts (bag each separately)
  - c. stone beads
  - d. bone awl
  - e. other bone artifacts (bag each separately)
  - f. pigments (red and yellow ocher)
  - j. asphaltum
  - g. cordage/woven materials or impressions
5. Screeners will save all bone faunal remains. Obvious bird and mammal bones will be sorted, counted, and bagged separately from fish bone and entered on the level form.
6. Screeners will save floral remains that are not modern (carbonized seeds, charcoal).
7. The remaining materials ("drek") will be placed in a separate bag for lab sorting and marked accordingly.

The above categories will be sorted, bagged (placed in small vials if necessary), counted (except the drek), entered on the level form, and labeled according to site, unit, feature, stratum, level, material, date. Last names of crew (on large level bag(s) only), and bag number for level as shown in Figure 1. All of the bags for one level shall be placed in a larger level bag(s) and labeled as indicated above.

CA-SNI-289
Unit 2
Feature 4 - ash lens
90 - 100 cm
Bone awl
4/12/98
Vellanoweth, Martz, Perry
Bag #4 of 6

Figure 1. Information to be included on all artifact bags in the field

8. Soil samples will be taken from features and from the wall only after all maps and soil profiles have been drawn.

9. Pollen samples will be taken from features, from enclosed situations - such as beneath a large abalone shell, and from the unit's wall after the soil profile has been drawn and prior to back filling. Care must be taken to avoid contamination from contemporary air-blown pollen. The crew chief or field director will provide materials for sampling. (Refer to Section III, "Soil Collection for Pollen and Seeds")

10. Column samples will always be taken from the sidewall. In order to avoid sampling biases due to the large-size animal species present in the shell middens, the column samples should measure a volume 20 X 20 cm square and 10 cm deep and correspond to the excavated level/stratigraphic layer.. The samples, which are fine screened, are used to obtain a representative proportion of all the constituents (artifacts, ecofacts, and soil matrix) within each excavated level and will be compared to show changes in densities and relative proportions of each constituent type between levels.

11. Charcoal for radiocarbon, <sup>14</sup>C samples will be collected, preferably, from features and other well-associated contexts. Large pieces will be saved from the screen and stored in labeled vials. Large chunks that are found *in situ* should be carefully removed after being mapped on the level plan-view. Avoid handling the charcoal. The samples should be carefully collected with your trowel

and wrapped in aluminum foil for protection. Be very cautious to ensure that the whole pieces of charcoal are kept intact and not crushed.

Also it is very important to keep especially detailed field notes on the location of the sample and the nature of the context that it was found in. What was it associated with? Was it exposed to the elements or was it completely buried? Was it in context with shell or some other organic, datable material? Was it isolated or was it part of a feature?

12. Unless previous excavations or geomorphological studies have clearly established the fact that sterile soil has been reached, continue excavation through two levels (20 cm) of sterile deposits. After two levels of sterile deposits have been removed, the unit should then be systematically augered as deeply as possible to confirm that buried cultural materials are not present (See Augering Methods).

13. When excavation of a unit has been completed, a profile of the most representative sidewall will be drawn. Some units, which exhibit complex stratigraphy and features in more than one sidewall, may require additional wall profiles. Contact the crew chief for assistance, and refer to Section IV, "Soils and Stratigraphy."

14. Place a "time capsule" (a datable object such as a penny or soda can) in the unit. Backfill the pit, and mound the sediments to allow for settling. As a final step cover the backfilled unit with a ground cloth.

15. All completed level bags will be returned to the lab and stored in a place designated by the instructor. All completed forms will be placed in the level formbook behind the tab set aside for your site and unit. All uncompleted forms will be placed in the level formbook and reissued on the following field day. All incomplete level bags will be stored in a place assigned by the instructor and reissued on the following field day.

### **Augering Methods**

An auger hole will be set in the middle of the excavation unit after the unit has been determined to be sterile. Auger samples will be collected in 10 cm increments. These materials will be screened through the small hand screens, and auger levels will collect any artifacts and ecofacts recovered. The screened soil from the unit auger-tests will be discarded into the unit. This auger test serves to verify that the unit has reached sterile soil and does not overlie additional cultural deposits. The auger hole should be drilled to bedrock or to the maximum extent of the auger shaft. If no cultural evidence is found during augering, the pit may then be backfilled. If, however, the auger encounters a buried midden, excavation of the unit continues. See your crew chief for further instructions. If the augering will go deeper than 150 cm consult with the Field Director who may elect to halt excavation. If the unit could go deeper, it may be perilous to dig further without proper shoring for safety.

### **IV. Soil Collection for Pollen and Seeds**

Pollen and seeds in archaeological sites are very small and are not usually visible while excavating a unit. Their presence will hopefully provide information on the cultural use of plants.

Questions examined through the analysis of plant remains can relate to studies of subsistence patterns and changing environments. The cultural implications for the presence of floral ecofacts cannot be understood until site analysis is complete. During excavation, standard collection of soil is needed to provide data from each stratigraphic source for clues to the patterns in the site.

### **Instructions for Sampling Pollen, Phytolith, and Macroflorals (Seeds and Plant Remains)**

1. Surface samples. Collected to provide data for comparing the contemporary environment with the past. If instructed to do so, take a sample from around the site before clearing or archaeological excavation begins. A spoonful of soil from various places within a diameter of 100 feet from the site is recommended.
2. Archaeological Samples. Samples for pollen and plant parts are collected from stratigraphic columns, features, living surfaces, hearths, mano and metate surfaces, and interiors of vessels.

### **Bulk Samples For Seeds and Plant Parts**

1. 4-6 liters of soil are needed for an adequate sample. Damp soils require that samples should be collected in large plastic bags.
2. Sample should be from the same level at a specific provenience (27 cm, not 10-20 cm).
3. Samples should be labeled with site number, unit, feature, stratum, depth, date and initials of collectors. Feature numbers, when sampled, should also be on bags. Level forms and field notes should record the sample number and type that was taken, and the sample's provenience should be plotted on the level-form map.
4. Samples collected from one provenience should be placed together in large paper bags labeled with the information stated on collection bags. If there is breakage or spilling from plastic bags, any mixing will be from the same cultural context.

### **Pollen and Phytoliths**

1. Remove the surface soil of an area to be collected to provide a fresh surface free of environmental contamination.
2. Collection trowel should be cleaned. Cummings (1991) recommends that the trowel be scraped clean, sprayed with distilled water, and wiped with a paper towel. An alternative is to use disposable plastic scoops or large plastic spoons. Use once, and discard. Store the spoons in their original pack, and shield from contamination by outside pollen.
3. Quickly remove pollen sample - at least 1/2 cup for pollen, 1 cup for combined phytolith and pollen. Sandy soils require the collection of at least 50% more volume. Place into a sealed plastic bag, such as a zip top or Whirl-pak, and close tightly. Label the bag with the same information as the artifact bags, except write the three-point provenience data on the bag. Remember to take your

three-point provenience from the unit datum. For example: Charcoal sample: from NW corner / 75 cm S / 15 cm E / 45 cm BD.

4. Place plastic bag into a second secured plastic bag to prevent accidental opening or puncture. Seal.
5. Groundstone, manos, metates, and projectile points can be analyzed for pollen and phytoliths. All artifacts taken for analysis should be bagged in the field, labeled, and sent to the lab. Do not remove any dirt from the artifact. Garbage bags work well for large items.

**Contexts to be Sampled:** (1) Hearths; (2) Floors; (3) Features; (4) Groundstone, manos, metates, projectile points; and (5) Column samples. All samples should be taken from natural stratigraphic layers, if possible.

Field notes should include associations and cultural interpretations of floral remains. Observations of contexts and awareness of possible sampling situations will be useful in obtaining a successful sampling of the site.

**Reference:**

Cummings, Linda Scott  
1991 *Manual for Pollen, Phytolith and Macrofloral Sampling*. Paleo Research Laboratories, Lakewood, Colorado.

## V. Stratigraphy

### Munsell Soil Colors

To describe the strata within the level or on the unit wall-profile, the soil colors are systematically described by using the Munsell Color System. The Munsell color system is a universal method, which allows for correctly matching colors. It is used primarily in soil colors and matching paint colors. The Munsell system is based on three color-criteria - hue, value, and chroma. The *hue* is the base color, the *value* is the intensity of the color, and *chroma* is the light reflectivity of a color. The color codes and names are standardized so that someone who does not have the soil available to look at may describe a soil color. The color names are standardized to avoid subjectivity of naming. The Munsell color guide acts as an aid to interpreting types of deposition and determining change from a sterile layer to a cultural layer or vice versa. Frequently, color change in sediments is the key factor that forewarns an excavator that a feature may be ready to emerge. Correlating colors of soil also aids in keying excavation units to one another, even though the measured levels are different.

1. Munsell color readings will be taken from both the top and the bottom of all levels and when soil changes (texture and color) are observed.
2. Record soil color formula and color name. For example 7.5 YR 3/4 dark brown. Only use the color name given in the Munsell book, never use another name to describe the color.

3. On level and soil sample forms, describe soil texture, compaction, and composition - silt, clay, sand, gravel, pebbles, or cobbles (Example: black sandy midden with pea-sized gravel).
4. Munsell colors are obtained by taking a small amount of soil with your trowel or using the glue-stick soil sample and holding it under the correct page of the Munsell Color Chart book. Each page of the book has a series of colors graduated from the lightest to the darkest. Between each row and column of color chips is a hole. Hold the sample under the holes until you find the color that "best" matches your sample.
5. Never flatten out the book page on the ground. That position will make it very difficult to differentiate colors and can ruin a very expensive book. Hold the book in one hand, and move the soil sample on your soil sample form or trowel tip under the page until you find the color match. Consult with the crew chief or field director to verify your color selection.

### **Plan Views or Top Views**

1. Draw at the completion of every level. It is unacceptable merely to describe the plan view as "the same as last level".
2. If the soil is uniformly sterile, the plan view will still be drawn. Give the information on the soil and clearly state that it is sterile.
3. Draw to scale.
4. Orient correctly towards north.
5. Include north arrow.
6. Write compass orientation and ending measurement in each corner.
7. Accurately plot artifacts, soil changes, features, and deposits and all other exposed items in the floor.
8. Indicate datum corner with a cross inside of a circle - a standard unit-datum symbol.

### **Sidewall profiles**

1. Are always done at the conclusion of excavating a trench or unit!
  2. Must be done on site!
  3. As a general rule, all sidewall-profile depths are measured from a leveled line established from the unit datum at zero centimeters. When dealing with deep units, a secondary datum line may be established on the wall being profiled at an even increment below datum.
  4. All measurements are read from the level line and are to be made with extreme accuracy.
-

5. If there is little variability in the uniformity of the level, measurements may be taken in 10 cm horizontal increments. For uneven levels or levels with a lot of within-level variability record the measurements at intervals that accurately reflect the stratigraphy.
6. Each excavator must work closely on interpreting, measuring, plotting, and verifying the accuracy of the reproduced profile.
7. Always measure in the floor of the unit from the level line. The floor is not totally flat!
8. There is variation in the way archaeologists profile sidewalls. The method used on San Nicolas Island is a common technique.
9. The purpose of the profile is to detail changes in stratigraphy and show the relationship of the layers, lenses, and deposits to each other. It is also a method of clarifying whether sediments are wind or water borne or are cultural. This information is critical to understanding site formation processes.
11. If soil columns or pollen samples are taken from the wall, profile and plot them in.

Legends - Always provide a legend at the bottom of the map or profile which accurately depicts the individual soil type and color for each stratum or soil change within a stratum. Record a description of the soil characteristics and its name from the Munsell book. Do this by drawing a square and putting in the chosen graphic symbol. Then outside the box verbally give the descriptive information.

## **VI. Instructions for Laboratory Sorting of Excavated Materials (Field Sorted and Drek) from San Nicolas Island**

1. The most important thing to remember is to maintain the provenience (site, unit, depth) of the material while you are sorting. This means that every bag containing the materials must have a label indicating the provenience.
2. For each 10 cm level separate bone, shell, stone, plant remains, etc. from one another.
  - A. Shell
    1. Sort as specified by the Principal Investigator.
    2. Place all of the specimens of listed species into a plastic bag with a label. Do not write directly on the bag!
    3. Examine large pieces of abalone rim for evidence of use as pries, scrapers, or fishhook or ornament blanks.
    4. Place each shell tool, bead, or ornament in a separate bag with a label. Fishhooks, beads, and other small, fragile artifacts should be placed in a vial with tissue packing and then bagged to avoid breakage.
  - B. Bone
    1. Separate fish, mammal, bird, and reptile from one another, putting each category in a separate plastic bag with a label. Teeth are included with bone.
    2. Place otoliths in a separate bag with a label.

3. Examine all bone for use as tools or ornaments.
4. Place each tool or ornament in a separate bag with a label.

C. Stone

1. Separate flaked stone from groundstone, pebbles, and unmodified pieces.
2. Wash (in water only) flaked stone specimens. This will aid in determining material type and edge wear.
3. Sort flaked stone according to type of material (e.g. metavolcanic = no inclusions; porphyritic metavolcanic = more than 5 but less than 50% inclusions; metavolcanic porphyry = more than 50% inclusions; obsidian; chert; quartz; quartzite; etc.).
4. Sort the flaked stone within each material category according to whether they are formed tools (projectile points, bifaces, drills, reamers, etc.); flakes; debitage (a broken flake); or shatter (a splinter or piece that resulted from the flintknapping process, but lacks the characteristics of a flake).
5. Examine the flakes to determine whether they were used as scrapers or knives, or were retouched.
6. Place artifacts, tools, utilized flakes, and retouched flakes in a separate plastic bag with a label.
7. Place all flakes of the same material in a plastic bag with a label.
8. Place all debitage of the same material in a plastic bag with a label.
9. Place all shatter of the same material in a plastic bag with a label.
10. Sort through remaining stone material and separate out ochre (or other pigments) and asphaltum. Examine pebbles to see if they are stained with asphaltum. Place each category in a separate plastic bag with a label.

D. Plant Materials

1. Save all charred seeds and charcoal. Other plant remains, if not charred, are modern and can be discarded.
2. Separate seeds and charcoal, place seeds in a plastic bag with a label. Charcoal should be placed in a film canister.
3. Save sea grass if it is twisted or woven, place specimens in plastic bag with a label.

E. Radiocarbon Samples

1. Leave in foil pouches and place in a clean bag with a label.

F. Asphaltum

1. Asphaltum is frequently found in very small pieces. Put small pieces in vials, and larger ones in a baggy.

3. The contents of each plastic bag must be quantified. The number of specimens in the bag are to be counted and the contents weighed. Plant materials are weighed only. All weights are in grams and are taken from a triple beam or electronic scale. Weights are recorded to one decimal place. When weighing bags of materials it is important to deduct

the weight of the plastic bag itself from the measurement. Plastic bag weights in grams are as follows:

4x4	.....	2.00
6x6	.....	4.35
8x8	.....	6.50
10x10	.....	10.30
12x12	.....	15.20

Artifacts are also measured for length, width, and thickness. Measurements are in cm to one decimal place. Be sure to include all measurements on the appropriate label.




















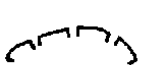






### Recording

4. Each bag must include a label. Always use the full trinomial on the labels (CA-SNI-25). Do not write on the clean bags. Fill out labels in pencil only. On the label "note" is used for the catalogue number. Always use size appropriate bags in the lab as well as in the field. A teaspoon of material does not warrant a baggy larger than 4 X 4 (If the smaller baggy fills up, move the material to the next bigger bag.

5. When a given stratigraphic level is completed, place the labeled bags in a box for curation. When making up a new box fold according to instructions on box. Do not use tape. Do not write directly on the box place a clear label holder on the box and insert a completed box label.

**Map symbols** - Use the symbols for your plan views and sidewall profiles from the examples provided in Figure 2. If necessary, supplement these symbols with standard U.S.G.S. map symbols; or, if you find the need to create your own symbol, explain the symbol in your map's legend. Also bring the need for additional symbols to the attention of your field director. If someone else has a similar need the symbol can be accepted to maintain continuity on all site maps.

Figure 2. Map symbols to be used on all sidewall profiles and plan view maps

	UNDIFFERENTIATED MIDDEN		ROOTS
	ASH		CHARCOAL
	OXIDIZED EARTH		WOOD
	BEDROCK		BARK
	LOOSE ROCK		CONCRETE
	FIRE ALTERED ROCK		STERILE SOIL
	EARTHEN OR CLAY FLOOR		DEPRESSION CONTOUR
	SAND		STONE ALIGNMENT
	CLAY		BRICK ALIGNMENT
	GRAVEL		LIMIT OF FEATURE
	RODENT DISTURBANCE		ARTIFACT
	POST		DATUM
	POST MOLD		AUGER OR PROBE BORE

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