

Bureau of Land Management, California

***Cultural Resources Arch Edit/Copy Tool
Utility
User Manual***

September, 2005

Gnomon, Inc.
Carson City, Nevada

Overview

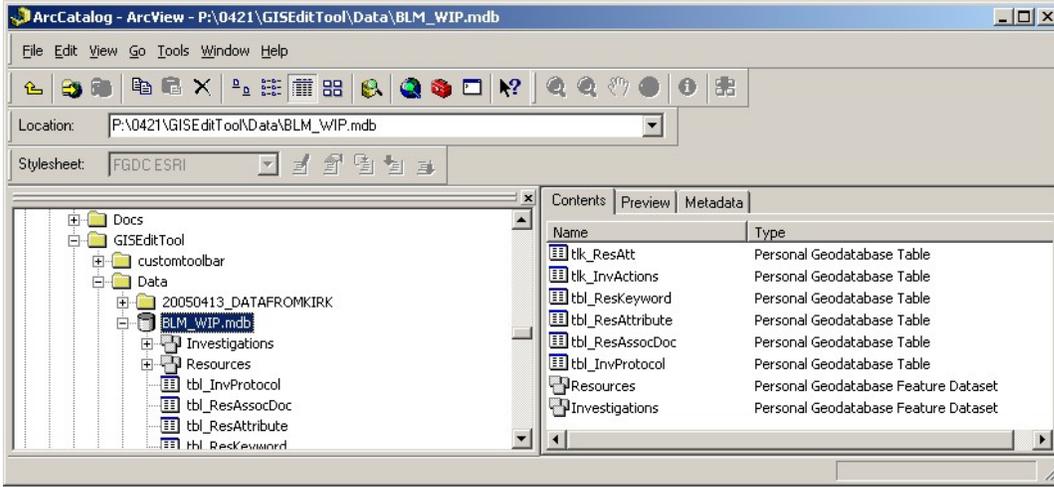
This document describes how to use the California BLM's ArcGIS Cultural Resources Toolbar. The Toolbar is an add-in software component for Environmental Systems Research Institute (ESRI) ArcGIS 9.x software. It combines several useful functions for cultural resource specialists who need to create, edit, and view GIS data pertaining to cultural resources. The BLM Cultural Resources Toolbar was created to standardize the archaeological spatial and aspatial data at each of the BLM's field offices.

The toolbar consists of two major components: a software component that comprises the toolbar itself and an associated geodatabase file that stores the data in an appropriate format and provides necessary lists of values for data entry and editing. The tool allows for seamless entry and editing of investigation (inventory) and resource (sites, buildings, etc.) attribute data into a geodatabase by employing a pop-up attribute form for ease of entry and data consistency.

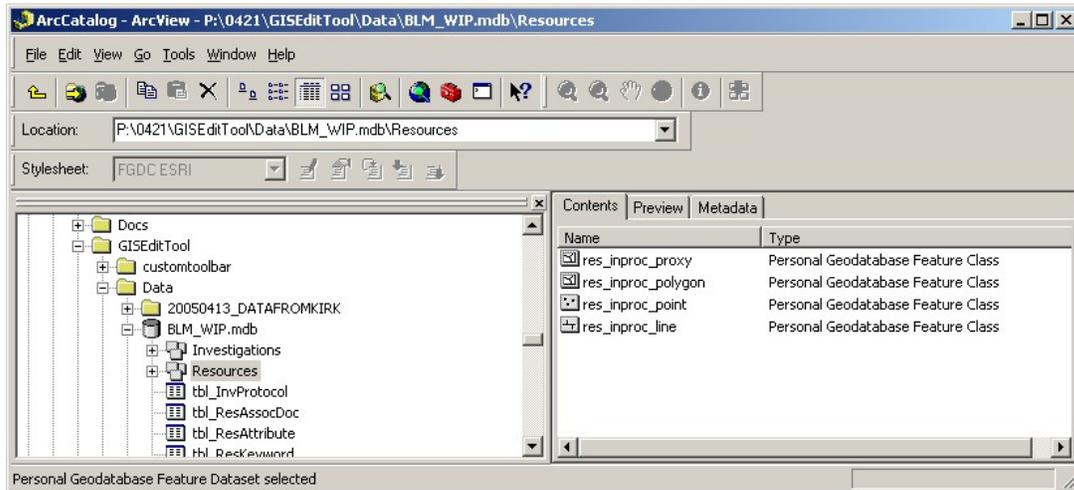
Geodatabase Format

A Personal Geodatabase is distributed along with the toolbar, named BLM_CULTURAL.mdb. The geodatabase contains lookup tables and feature datasets for Investigations and Resources. Each feature dataset contains four feature classes. There are point, line, and polygon feature classes and a proxy polygon feature class. The proxy class contains a combination of all of the point, line, and polygon features. Combining all of these features into one single class allows the user to query a single map layer rather than all of the layers separately. The proxy layer is populated with the spatial and aspatial data each time the user uses the cultural tool to edit an investigation or resource feature.

The ESRI feature datasets within the geodatabase are shown below.



Feature classes within the feature datasets are the same for both datasets. The screen below shows one set of feature classes for resources. There are four feature classes within each of the feature datasets of Investigations and Resources. The Resources feature classes are shown here and include point, line, polygon and proxy features. The feature classes are the same for Investigations.



Toolbar

The toolbar is distributed as a Windows data linked library (DLL). It must be registered and installed in order to work with the ArcMap version 9.x software. Installation is described in a separate manual.

Data versus Metadata – What’s the Difference?

The attributes for resources and investigations consist of two kinds of information: data and metadata. *Data* are primary pieces of information about the resource or investigation itself. For example, the site trinomial is a primary piece of information about a site. *Metadata* are simply additional pieces of information that allow the user of *data* to better understand the primary information (i.e., *data*) that they are using. For example, knowing that the site *data* (primary attributes) were entered from field notes rather than a formal site record (such as the DPR 523) might lead you to consider it less reliable for fixed values (like the historic and prehistoric resource attribute lists).

Metadata are particularly useful when it comes to spatial information, and many of the metadata values requested in the Toolbar are spatial in nature. For instance, estimating the likely accuracy (or inaccuracy) of a resource’s spatial location is very useful when using a map that shows where the resource is (or is said to be).

In the following discussion, of the attributes for resources and investigations, we try to separate out data and metadata. However, one must recognize that the distinction is artificial in some important ways. For example, is knowing the date a site record was filled out *data* or is it *metadata*? It is fairly obviously the former, but isn’t it also the latter because terms, field methods, and standards for recording change over time?

Using the Toolbar

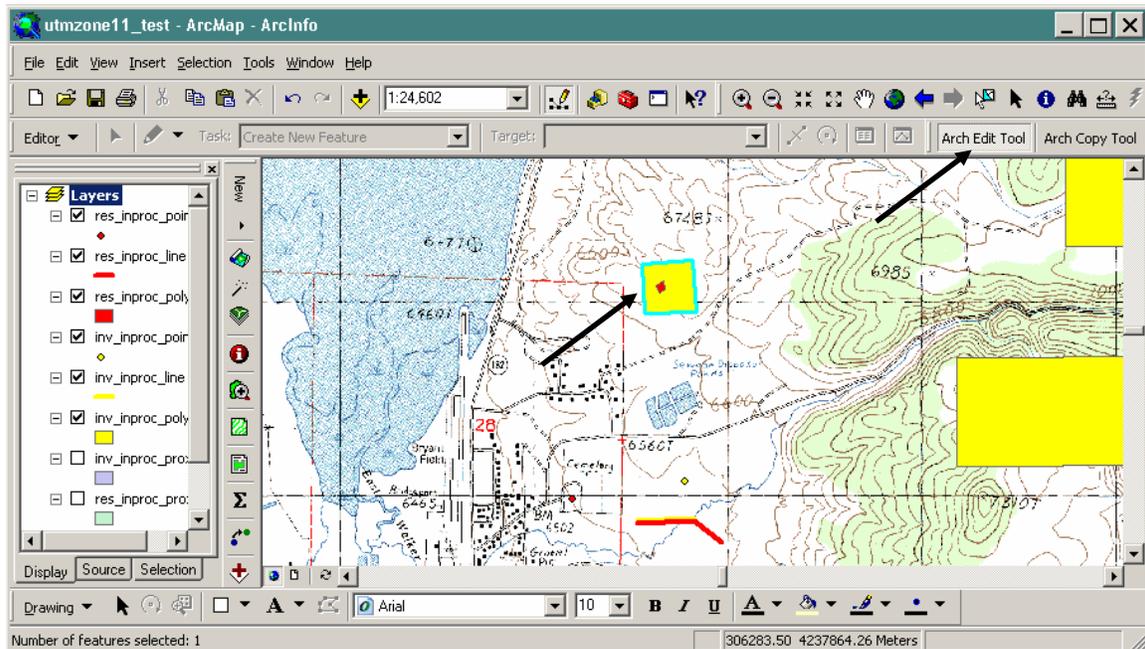
The toolbar appears on the top of the screen after installation, as shown below. It has two choices: Arch Edit and Arch Copy.



Arch Edit Tool

The Arch Edit Tool is used to attribute investigations and resources. When selected, the cursor becomes the Arch Edit tool. To use:

- select the Arch Edit tool on the menu (the cursor is now the tool)
- left click on a resource (site, isolate, survey, project, etc.) GIS entity. This selects the entity.
- right click (anywhere). This opens the attribute form for either Resources or Investigations.



Resource Attribute Form – GIS Data Tab

The Resource Attribute form requests identifying information, spatial metadata, and site data. The first tab on the form consists of identifying information and spatial metadata.

The screenshot shows the 'Cultural Resource GIS Attributes for Sites' form, specifically the 'GIS Data' tab. The form is divided into several sections:

- Header:** 'Enter the site data for linking (colored fields) then press LOOK UP to link'. Includes a 'Delete Features' button.
- Identification Fields:** State (dropdown), County (dropdown), Number (text), Suffix (dropdown), Segment # (text). Example values: SBR, 887, 0, SBR-887.
- Resource Info:** Record info section with fields: FieldID (0), DataSource, LayerName, InvestResourceID (0), Investig_ID, EntityType (POLYGON), EntAttID (880512059).
- Primary #:** Text field with value 36 887.
- Agcy Site #:** Text field.
- CRMTracker #:** Text field with a 'LOOK UP' button.
- Resource Name:** Text field with value 'Valley Wells Shelter'.
- Buffer dist. (m):** Text field with value 0.
- Horiz. pos. accuracy:** Dropdown menu with value 'UnkUnk'.
- Horiz. pos. source:** Dropdown menu with value 'Unknown'.
- Boundary precision:** Dropdown menu with value 'UnkUnk'.
- Checkboxes:** 'Is boundary complete?' (checked), 'Only partially digitized?' (unchecked), 'No meaningful centroid?' (checked).
- Notes (digitizing comments):** Text field with value 'Northing 929 m off'.
- Attributed by:** Dropdown menu with value 'mdrews'.
- Date:** Text field with value '8/25/2005' and format 'mm/dd/yyyy'.
- PRINTED MAP CENTROID - point and polygons (excludes multipolygons):** UTM E (617503), UTM N (3924929), Datum (NAD27), Zone (11).
- Buttons:** 'Next Screen >', 'Write Data', 'Write Data & Close', 'Cancel & Close'.
- Legend:** 'Required fields in bold'.

Resource identifiers

Trinomial #: Smithsonian number, in standard California format. Many resources will lack a trinomial when first recorded.

Primary # (P-number): The P Number formatted as county number, then number portion. Many resources will lack a P-number when first recorded.

Agcy Site #: Agency site number. This is the number given to the resource by the managing agency for the resource. Typically, this will be a U.S. Forest Service number or a BLM number. If a resource has multiple managers, there may be more than one agency number. Multiple agency numbers should be separated by a semicolon.

CRMTracker #: CRMTracker identifier. Not currently used. This identifier is a key value to the CRMTracker web-based tracking tool for cultural resource projects.

Resource Name: The name of the resource. This may be an actual name (“My Favorite Site”) or a field identifier or temporary number (“05-151-12”).

Note: Some identifier is mandatory. At least one of the above attributes must be completed.

Resource metadata

Buffer dist (m): Buffer distance in meters. Each feature has a buffer distance associated with it. This value is used to create a polygon that represents the resource, if it is not already stored as a polygon. In other words, for points and polygons, this represents a maximum extent or average width. For polygonal GIS entities, a typical distance is zero. The proxy layer contains polygon representation of all entities. It is automatically created by the Toolbar. The buffer distance is used to determine the size of the polygon created in the proxy layer. The width, or distance, requested should be entered in meters and should represent the entire width (or diameter) of the resulting polygon.

Remember, the proxy layer contains polygon representation of all entities. In order to create a polygon representation of point and line features they must be buffered to be added to the proxy feature layer. The buffer is automatically created by the Toolbar. The buffer distance is used to determine the size of the polygon created in the proxy layer. The width, or distance, requested should be entered in meters and should represent the entire width (or diameter) of the resulting polygon. The default distance is 15 m which is viewed as an appropriate buffer distance. This buffer measure may be changed by the user, but the default is accepted as the standard.

Horiz. Pos. accuracy: Horizontal positional accuracy. This attribute describes the *horizontal* positional accuracy of the GIS entity. Accuracy can be conceptualized as the likelihood that a stated coordinate is the true coordinate of a position. Hence, accuracy is the converse of positional error. The values for this attribute are probable positional error circles – the root mean square (RMS) error of a position. The following table shows both values and typical field or cartographic methods associated with them.

Values and methods for horizontal positional accuracy:

Value	Example methods used to determine coordinate(s)
<1m	Averaged, differentially corrected high-end resource grade GPS; Survey-grade GPS; Experienced operator using 10" or more precise total station or theodolite and EDM traversing from a known coordinate monument less than 5000m distant
<10m	Single position of high-end resource grade GPS; multi-position averaging of sports-grade GPS without differential correction
<20m	Typical sportsman grade GPS – single position fix; USGS 1:24,000 map (National Map Accuracy Standard is approximately 13m)
<100m	USGS 1:36,000 to USGS 1:125,000 map
UnkLow	Unknown – low confidence in horizontal positional accuracy; likely error is not known, location is only an estimate quite likely to be erroneous
UnkHi	Unknown – high confidence in horizontal positional accuracy; likely error is not known, but coordinates are likely to be correct on a 1:24,000 scale map
UnkUnk	Likely error is not known and no estimate of reliability of horizontal position is possible

Horiz. Pos. source: Horizontal positional source. This attribute describes the source of the coordinates used to place the GIS entity into coordinate space. The attribute values in the table below describe only the most common sources and are not intended to be comprehensive. Horizontal positional source is useful as a means to segregate GIS entities derived from different sources, especially in data derived from plots on paper maps.

Attribute values: Attribute value is determined by the *source* of the horizontal coordinates. A GIS entity may have multiple sources, in which case one should state the predominant source. Multiple source entities that have no dominant source should receive an attribute value of "other".

Values and methods for horizontal positional source:

Value	Example methods used to determine coordinate(s)
SurvInst	A GPS unit, total station or other survey instrument (GPS unit, transit, alidade, theodolite, electronic distance meter, stadia rod, or chain/tape), was used
USGS24000	Horizontal position coordinates were derived from USGS map at 1:24,000 scale
USGS62500	Horizontal position coordinates were derived from USGS map at 1:62,500 scale
USGS100000	Horizontal position coordinates were derived from USGS map at 1:100,000 scale
Aliquot	Derived from an aliquot (cadastral) location. This depends upon the size of the aliquot part relative to the entity coordinate. At best, since an aliquot must be mapped to be converted to coordinates, the horizontal positional accuracy is that of the associated map
Asserted	Horizontal position is an assertion with no other source information (e.g., a site record). In this case, horizontal positional accuracy will probably be unknown
Other	Some other source, known but not among choices above
Unknown	Source is not known

Boundary Precision: Boundary Precision is the “fuzziness” or uncertainty of a reported boundary. It applies only to polygonal GIS entities (those having the geometric property of area). “Fuzziness” can be thought of as how sharply a bounding line should be drawn. An inaccurate boundary would be represented as a wide gray line, a very accurate boundary as a thin, darker, line.

Attribute values: Attribute values are the estimated, appropriate values for a “gray” line to represent the boundary of a phenomenon, were a GIS to draw the boundary as a zone of probability. The values are intended to be best judgment, realizing that in most cases one will probably be combining different error widths.

Values and methods for boundary precision:

Value	Example methods used to determine boundary
<1m	Averaged, differentially corrected high-end resource grade GPS; Survey-grade GPS; Experienced operator using 10" or more precise total station or theodolite and EDM traversing from a known coordinate monument less than 5000m distant
<10m	Single position of high-end resource grade GPS; multi-position averaging of sports-grade GPS without differential correction
<20m	Typical sportsman grade GPS – single position fix; USGS 1:24,000 map (National Map Accuracy Standard is approximately 13m)
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UnkLow	Unknown – low confidence in horizontal positional accuracy; likely error is not known, location is only an estimate quite likely to be erroneous
UnkHi	Unknown – high confidence in horizontal positional accuracy; likely error is not known, but coordinates are likely to be correct on a 1:24,000 scale map
UnkUnk	Likely error is not known and no estimate of the accuracy of horizontal position is possible

Is boundary complete?: The Boundary Observation Completeness Attribute describes whether the boundary as shown in the data represents the entirety of the boundary of the entity being mapped or only part of the entity boundary. The attribute is particularly useful in situations where only part of a phenomenon (e.g., a resource, an investigation) is mapped in the field. The attribute flags the observational completeness of the phenomenon boundary representation, not the logical completeness of the boundary. A boundary is logically complete simply by closure (for a polygonal entity); observational completeness means that the logical boundary matches the actual boundary. For example, perhaps only part of the site has been mapped at all – thus yielding an incompletely observed boundary. Checking the box indicates that the boundary is both logically and actually complete.

Only partially digitized?: If yes, indicates that the GIS entity does not represent the entire site or feature being mapped. For example, perhaps the site is a long linear phenomenon like a railroad grade. One may digitize only the portion of it lying within one's project area, so that it is *only*

partially digitized. Note that a resource can have both an incomplete boundary and be only partially digitized, or have a complete boundary and be only partially digitized.

No meaningful centroid?: A centroid is a single point location at the center of a feature. The centroid is useful in representing the feature as a single point location for cartographic purposes (typically at smaller map scales). This value is almost always TRUE for lines, multi-lines, and multi-polygons that have no meaningful centroid.

Notes: Any applicable notes about the digitization of this feature. An example would be “Source map hard to read”.

Attributed by: The user who entered the attribute information.

Date: Current date.

UTM E: The UTM (East) Coordinate value of the centroid. Calculated automatically by the edit tool.

UTM N: The UTM (North) Coordinate value of the centroid. Calculated automatically by the edit tool.

Datum: The datum for the UTM E and UTM N values above. Either NAD27 or NAD83.

Zone: The UTM zone for the UTM E and UTM N values above. Zones 10 and 11 encompass California. Northern California resides entirely in UTM Zone 10, while southern California resides almost entirely in UTM Zone 11.

Resource Attribute Form – Site Data Tab

The Site Data Tab contains identifiers and *data* attributes of resources (usually sites). The resource attributes follow the California Office of Historic Preservation *Instructions for Recording Historical Resources* (March, 1995). The instructions cover the use of the Department of Parks and Recreation Form 523. Other sources of site information may require careful scrutiny to translate in to the DPR 523 terms.

Cultural Resource GIS Attributes for Sites

GIS Data | Site Data

Trinomial: SBR-887 Other ID: Agcy Site #

Resource Name: Valley Wells Shelter

P3b. Resource Attributes:
AP14 - Rock shelter/cave

Edit Attributes

P4. Resources Present: Site **Element of District?** U

P6. Date Constructed/Age and Source: P

P9. Date recorded: 10/15/1972 Unknown...

A6. Specimens Collected? U

NRHP Status: Consultant Agency SHPO

7 7 7

Keywords:

Edit Keywords

Notes:

QCBy: 0
QCStatus:
QCDate: 1/11/1900

< Previous Screen

Required fields in bold

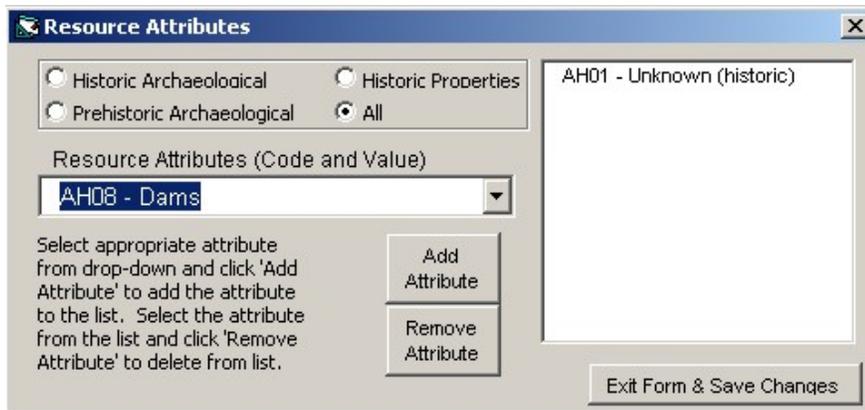
Write Data Write Data & Close Cancel & Close

Resource Identifiers

The resource identifiers from the “GIS Data” tab are restated here and the resource name is available here for edit. Changes to the resource name made here will also be reflected on the GIS Data tab.

P3b. Resource Attributes: Resource attributes are general characterizations of the cultural resources phenomena present at a site, building, or other historic resource. *Instructions for Recording Historical Resources* provides details on appropriate values.

Adding and editing values for P3b. Resource Attributes is done through a subform that opens when the “Edit Attributes” button is clicked.



The Resource Attributing form is used to associate any applicable Historic Archaeological, Prehistoric Archaeological, or Historic Properties attributes to a resource. Upon opening, the subform displays all attributes. To use:

- select the type of attribute (Historic Archaeological, Prehistoric Archaeological, or Historic Properties).
- chose the attribute from the drop-down list.
- click the Add Attribute button.
- click the Exit Form & Save Changes button after all attributes have been added.

P4. Resources Present: The resource type (per National Register Bulletin 16 and the 800 Series manuals).

Element of District? If the resource is a member of a historic district (local, state, or national), then that should be indicated here. Note that the *contributing status* is *not* stated here, but simply whether the resource is a member of a district (i.e., “Y”), known to not be a member of a district (i.e., “N”) or it is not known whether the resource is or is not a district member (i.e., “U”).

P9. Date Constructed/Age and Source: This is the general age of the resource. Possible terms are “Prehistoric”, “Historic”, or “Both”. The last term means that both historic and prehistoric materials are present. For further guidance, see the Office of Historic Preservation *Instructions for Recording Historical Resources*.

Date recorded: Date on which the resource was recorded. For further guidance, see the Office of Historic Preservation *Instructions for Recording Historical Resources*.

A6. Specimens Collected? If artifacts, specimens, or samples were collected, choose “Y”. Other possible values are “N” to indicate that

nothing was collected or “U” to indicate that it is not known whether anything was collected.

NRHP Status – Consultant/Fieldworker: This dropdown box requests the fieldworker (typically a consultant, but also agency staff doing fieldwork) *recommendation* regarding National Register status. For further guidance, see the Office of Historic Preservation *Instructions for Recording Historical Resources*. This will usually be known from the site record.

NRHP Status – Agency: The managing agency for a resource typically has the right and duty to determine the status of the resource with regard to the National Register of Historic Places. Thus, this dropdown box requests the managing agency’s National Register *determination* about the status of the resource. For further guidance, see the Office of Historic Preservation *Instructions for Recording Historical Resources*. This will often be known from the site record.

NRHP Status – SHPO: The State Historic Preservation Office typically consults upon the legal status of a resource. This dropdown box requests the SHPO *statement* regarding the status of the resource. For further guidance, see the Office of Historic Preservation *Instructions for Recording Historical Resources*. This will probably not be available from a site record but will require further research to determine.

Keywords: Keywords are useful, short, summaries of resource characteristics, contents, or setting. They are stored in a separate table within the personal geodatabase so that they can be searched in the master dataset. Typical, useful, keywords are common search terms. For example, a site containing a Clovis projectile point found on a stream terrace might have the following keywords: “Clovis”; “paleoindian”; “terrace”; “projectile point”.

Keywords are entered in a separate form, entering the keyword or phrase in its own row.

Select appropriate keyword from drop-down or type in your own. Then click 'Add Keyword' to add the keyword to the list. Select the keyword from the list and click 'Remove Keyword' to delete from list.

projectile point

Add Keyword Remove Keyword

Clovis
paleoindian
terrace

Exit Form & Save Changes

The Resource Keywords form shown above is used to associate any applicable keywords or phrases. Upon opening, the subform loads any previously entered keywords into the drop-down list. To use:

- select an existing keyword or phrase from the drop-down list or enter in a new value.
- click the Add Keyword button.
- click the Exit Form & Save Changes button after all keywords have been added.

Notes: Notes pertain to the resource itself, or to the data entry process.

Using the Site Data Form

The Site Data Form attributes and values described above should be familiar to most cultural resource specialists.

As mentioned at the start of the Toolbar description, after choosing the tool the cursor becomes a new tool:

- Left-click to select an entity
- Right-click to bring up the resource form

Using the Form itself is easy – fill in all appropriate information. Then choose:

Write Data: Write the information to the database but leave the current form open.

Write Data and Close: Write the information to the database and close the form.

Cancel and Close: Do not write any new or changed information to the database, close the form.

It is important to recognize and understand what happens when data are written. For each resource, two spatial entities are saved in the database: the source spatial data which will be a line, a point, or a polygon and a *proxy* polygon that represents the same entity as a polygon. The buffer value entered in the resource form is used to create the proxy polygon. Proxy polygon creation is automatic and requires no action by the GIS operator to occur. Edits to a source GIS entity always result in re-creation of the proxy polygon.

Investigations Attribute Form – GIS Data Tab

The Investigations form is opened when the chosen GIS entity is a source entity for a cultural resource investigation rather than a cultural resource. Like the Resource Attribute Form, the first tab of the Investigation Attribute Form contains identifiers and spatial metadata. The screen below shows the investigation attributing form with the GIS Data Tab shown.

The screenshot shows a software window titled "Cultural Resource GIS Attributes for Surveys" with a "GIS Data" tab selected. The window contains several input fields and controls:

- Buttons: "Delete Features" (top right), "LOOK UP" (below CRMTracker #), "Next Screen >" (bottom right), and "Write Data", "Write Data & Close", "Cancel & Close" (bottom center).
- Fields: "Consultant Project #", "Agency Report #", "IC/SHPO Tracking #", "CRMTracker # (from CRM Tracker)", "Buffer dist. (m)" (value: 0), "Horiz. pos. accuracy" (value: <20m), "Horiz. pos. source" (value: USGS24000), "Boundary precision" (value: <20m), "Notes (digitizing comments)", "Attributed by" (dropdown), "Date" (value: 9/22/2005), "UTM E" (value: 512488), "UTM N" (value: 4505714), "Datum" (value: NAD27), "Zone" (value: 10).
- Record info: "DataSource", "LayerName", "Investig. ID", "EntityType: POLYGON", "iEntAttID: 865269959".
- Checkboxes: "Is boundary complete?", "Only partially digitized?", "No meaningful centroid?" (checked).
- Footer: "Required fields in bold".

Investigation Identifiers

Consultant Project #: Consultant project number. Typically this may be something like “Gnomon 2004-045”. If an agency did the fieldwork itself, it may be the same as the agency report number.

Agency Report #: Agency report number. This is the number assigned to the investigation by one or more agencies. Multiple report numbers should be separated with semicolons.

IC/SHPO Tracking #: If the investigation record has been accessioned by an information center or by OHP itself, it may have one or more identifiers from these sources.

CRMTracker #: CRM Tracker identifier. Not currently used.

Investigation metadata

Buffer dist (m): Buffer distance in meters. Each feature has a buffer distanced associated with it. This value is used to create a polygon that represents the resource, if it is not already stored as a polygon. In other words, for points and polygons, this represents a maximum extent or average width. For polygonal GIS entities, a typical distance is zero. The proxy layer contains polygon representation of all entities. It is automatically created by the Toolbar. The buffer distance is used to determine the size of the polygon created in the proxy layer. The width, or distance, requested should be entered in meters and should represent the entire width (or diameter) of the resulting polygon.

Horiz. Pos. accuracy: Horizontal positional accuracy. This attribute describes the *horizontal* positional accuracy of the GIS entity. Accuracy can be conceptualized as the likelihood that a stated coordinate is the true coordinate of a position. Hence, accuracy is the converse of positional error. The values for this attribute are probable positional error circles – the root mean square (RMS) error of a position. The following table shows both values and typical field or cartographic methods associated with them.

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<20m	Typical sportsman grade GPS – single position fix; USGS 1:24,000 map (National Map Accuracy Standard is approximately 13m)
<100m	USGS 1:36,000 to USGS 1:125,000 map
UnkLow	Unknown – low confidence in horizontal positional accuracy; likely error is not known, location is only an estimate quite likely to be erroneous
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Attribute values: Attribute value is determined by the *source* of the horizontal coordinates. A GIS entity may have multiple sources, in which case one should state the predominant source. Multiple source entities that have no dominant source should receive an attribute value of "other".

Values and methods for horizontal positional accuracy:

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USGS100000	Horizontal position coordinates were derived from USGS map at 1:100,000 scale
Aliquot	Derived from an aliquot (cadastral) location. This depends upon the size of the aliquot part relative to the entity coordinate. At best, since an aliquot must be mapped to be converted to coordinates, the horizontal positional accuracy is that of the associated map
Asserted	Horizontal position is an assertion with no other source information (e.g., a site record). In this case, horizontal positional accuracy will probably be unknown
Other	Some other source, known but not among choices above
Unknown	Source is not known

Boundary Precision: Boundary Precision is the “fuzziness” or uncertainty of a reported boundary. It applies only to polygonal GIS entities (those having the geometric property of area) GIS entities. “Fuzziness” can be thought of as how sharply a bounding line should be drawn. An inaccurate boundary would be represented as a wide gray line, a very accurate boundary as a thin, darker, line.

Attribute values: Attribute values are the estimated, appropriate values for a “gray” line to represent the boundary of a phenomenon, were a GIS to draw the boundary as a zone of probability. The values are intended to be best judgment, realizing that one will probably be combining different error widths in most cases.

Values and methods for boundary precision:

Value	Example methods used to determine boundary
<1m	Averaged, differentially corrected high-end resource grade GPS; Survey-grade GPS; Experienced operator using 10" or more precise total station or theodolite and EDM traversing from a known coordinate monument less than 5000m distant
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UnkUnk	Likely error is not known and no estimate of the accuracy of horizontal position is possible

Is boundary complete?: The Boundary Observation Completeness Attribute describes whether the boundary in the shown in the data represents the entirety of the boundary of the entity being mapped or only part of the entity boundary. The attribute is particularly useful in situations where only part of a phenomenon (e.g., a resource, an investigation) is mapped in the field. The attribute flags the observational completeness of the phenomenon boundary representation, not the logical completeness of the boundary. A boundary is logically complete simply by closure (for a polygonal entity); observational completeness means that the logical boundary matches the actual boundary. Checking the box indicates that the boundary is both logically and actually complete.

Only partially digitized?: If yes, indicates that the GIS entity does not represent the entire site or feature being mapped. For example, perhaps the site is a long linear phenomenon like a railroad grade. One may digitize only the portion of it lying within one's project area, so that it is *only partially digitized*. Note that a resource can have both an incomplete boundary and be only partially digitized, or have a complete boundary and be only partially digitized.

No meaningful centroid?: A centroid is a single point location at the center of a feature. The centroid is useful in representing the feature as a single point location for cartographic purposes (typically at smaller map scales). This value is almost always TRUE for lines, multi-lines, and multi-polygons that have no meaningful centroid. If checked, the feature has no meaningful centroid.

Notes: Any applicable notes about the digitization of this feature. An example would be "Source map hard to read".

Attributed by: The user who entered the attribute information.

Date: Current date.

UTM E: The UTM (East) Coordinate value of the centroid. Calculated automatically by the edit tool.

UTM N: The UTM (North) Coordinate value of the centroid. Calculated automatically by the edit tool.

Datum: The datum for the UTM E and UTM N values above. Either NAD27 or NAD83.

Zone: The UTM zone for the UTM E and UTM N values above. Zones 10 and 11 encompass California. Northern California resides entirely in UTM Zone 10, while southern California resides almost entirely in UTM Zone 11.

Investigations Attribute Form – Survey Data Tab

The screenshot shows a software window titled "Cultural Resource GIS Attributes for Surveys" with a "Survey Data" tab selected. The form contains several input fields and controls:

- Consultant Project # (text box)
- Agency Report # (text box)
- SHPO Tracking # (text box)
- DBI # (text box) with "(from CRM Tracker)" label
- Survey Organization: (text box)
- Bibliography section with:
 - Author: (text box)
 - Title: (text box)
 - Date of Report: (text box) with "mm/dd/yyyy" format indicator
- Negative report (Nothing found)? (checkbox)
- Counters: Sites(n) 0, Structure Finds(n) 0, Isolated Finds(n) 0, Building Finds(n) 0, Associated activity count 1
- Enter Program and EA or Case File #: (text box)
- Investigation action: (dropdown menu) set to "Archaeological Survey"
- Start date: (text box) with "mm/dd/yyyy" format indicator
- Scope/bias (surveys only): (dropdown menu) set to "All resources"
- End date: (text box) with "mm/dd/yyyy" format indicator
- Buttons: "Survey Protocol", "< Previous Screen", "Write Data", "Write Data & Close", "Cancel & Close"
- Text: "Required fields in bold"

Investigation Identifiers

Consultant Project #: Consultant Project number

Agency Report #: Agency Report number

SHPO Tracking #: State Historic Preservation Office identifier number

DBI #: CRMTracker identifier. Not currently used

Survey Organization: The name of the organization that performed the survey

Bibliography Author: The author of the bibliographic report

Bibliography Title: The title of the bibliographic report

Bibliography Date of Report: The date of the bibliographic report

Negative report: Indicates that nothing was found as part of this survey

Sites(n): The number of sites associated with the investigation

Isolated Finds(n): The number of isolated finds associated with the investigation

Structure Finds(n): The number of structures found associated with the investigation

Building Finds(n): The number of buildings found associated with the investigation

Associated activity count: The associated activity count for Section 106 purposes. Defaults to 1.

Program and EA or Case File #: Program and EA or Case File #

Investigation Action: The investigation action. Attribute value options are:

- Cultural Resource Survey
- Architectural Survey
- Evaluation only
- Monitoring
- Discovery Visit
- Condition Assessment
- Testing/ Excavation
- Sample Collection
- Data Recovery – Mitigation
- Other

Scope/bias: The Survey scope/ bias. Attribute value options are:

- All cultural resources
- Only buildings and structures
- Historic Sites only
- Prehistoric Sites only
- Other Survey Focus

Start date: Survey start date

End date: Survey end date

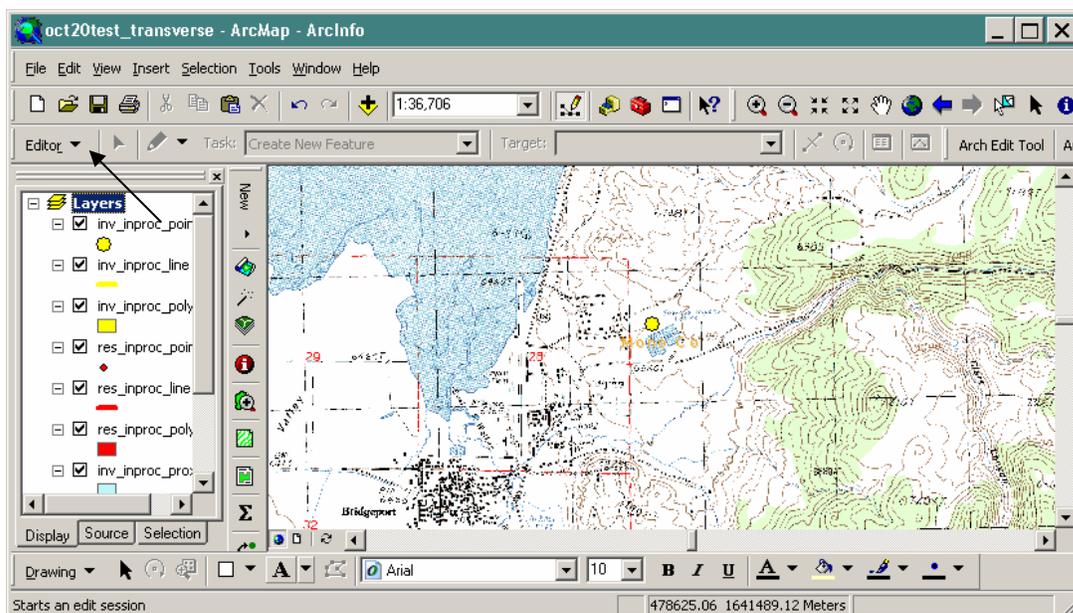
Survey Protocol: Includes survey protocol, land owner, and acres.
Attribute value options are:

- Class I
- Class II
- Class III
- Haphazard
- Reconnaissance
- Other, Unknown
- 100_Foot_Corridor
- 150_Foot_Corridor
- 200_Foot_Corridor
- Other_Corridor
- Records_Only
- Exclusion
- Not Applicable
- No inventory - disturbed surface
- No inventory - low resource likelihood
- No inventory - prior investigations

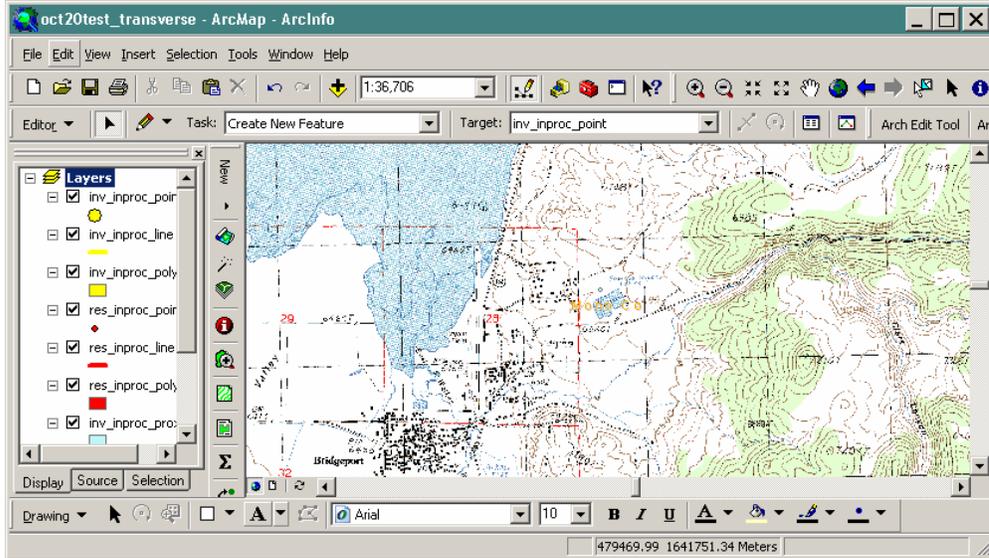
Running an Edit Session – Creating New Features

Previous sections discussed the functions and use of the Resource and Investigation Attribute forms and the Arch Edit Tool on the Cultural Resources Tool Bar. In this section the creation of new resource or investigation features is shown. This is accomplished by running an edit session and heads-up or on screen digitizing. This step will be needed whenever one receives data that is not in a digital format, such as contractor reports and site records

On the ArcMap toolbar go to the drop down menu within the Editor toolbar and start an editing session.



Under "Task" choose "Create New Feature". Toggle the "Target" dropdown menu and select the feature class for the new feature. Create a new point, line or polygon feature and then the appropriate Resource or Investigation attribute form will become active. Fill out the form, and press "Write Data and Close." Now, close your edit session by first saving the edits, then stopping the edit session. The new feature is stored in the geodatabase and may be further edited through the Arch Edit Tool as already described.



Cultural Resource GIS Attributes for Surveys

GIS Data | Survey Data

Enter the site data for linking (colored fields) then press LOOK UP to link

Delete Features

Consultant Project #

Agency Report #

IC/SHPO Tracking #

CRMTracker # (from CRM Tracker)

LOOK UP

Record Info
 DataSource
 LayerName
 Investigator ID
 Entity Type POINT
 EntAttID 225604701

Buffer dist. (m)

Horiz. pos. accuracy

Horiz. pos. source

Boundary precision

Is boundary complete?
 Only partially digitized?
 No meaningful centroid?

Notes (digitizing comments)

Attributed by

Date
mm/dd/yyyy

PRINTED MAP CENTROID - point and polygons (excludes multipolygons)

UTM E UTM N Datum Zone

Next Screen >

Required fields in bold

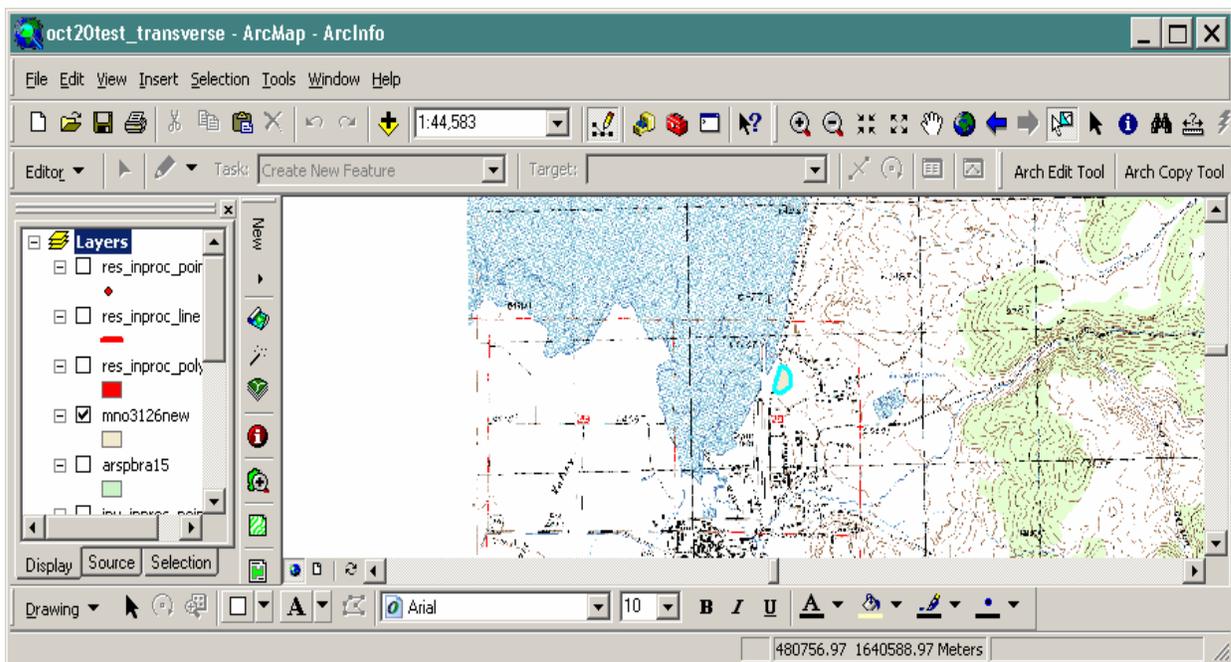
Write Data Write Data & Close Cancel & Close

Arch Copy Tool

The Arch Copy Tool is used to copy data from externally generated layers or shapefiles into the BLM_CULTURAL geodatabase. For instance, if the user has shapefile data in their GIS that they want to enter into the geodatabase, the Arch Copy Tool copies that data into the database and allows the user to populate the attributes through the attributing form. In instances where there are multiple lines or polygons represented by one investigation or survey (such as the 1970s Desert District sample surveys) the copy tool allows the user to create one feature. This way, the user only needs to enter attribute data one time for multiple polygons or lines represented by one investigation. Multiple point features within one investigation must be exported into a polygon feature class as the ESRI software only recognizes points as singular GIS entities.

To use:

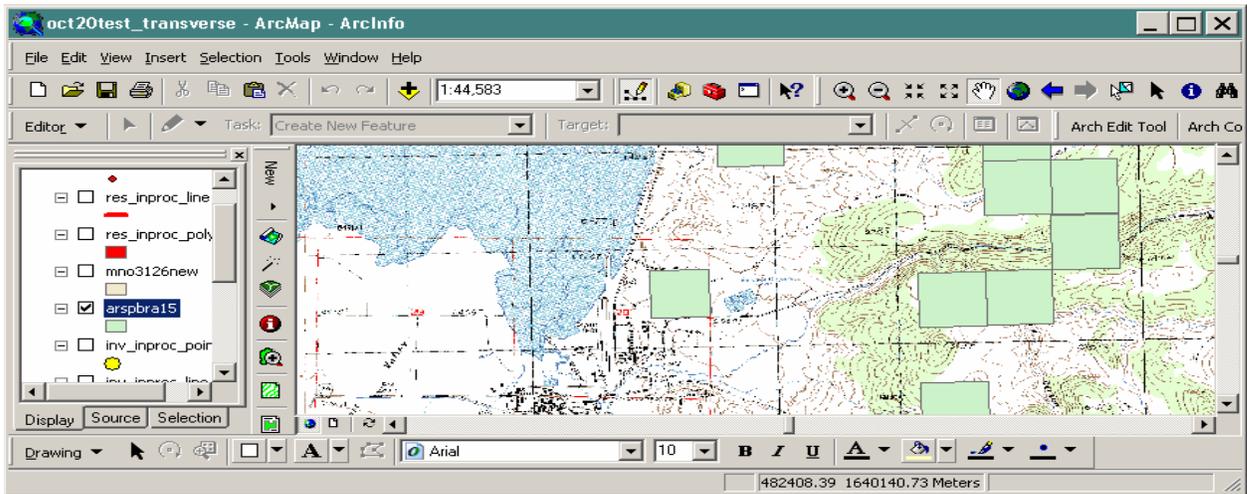
First, bring in the feature that requires copying into the ArcMap project (in this case it is mno3126new). Next, select the features in the layer that need to be



copied. The multiple methods for selecting features for copying are discussed below. To avoid unintentionally copying multiple features that are not needed, it is recommended to turn on only the layers in which the user is copying features from. This will prevent the user from copying any unintended features by mistake. It is recommended to set the appropriate selectable layers as indicated later in this document. Use the Selection tool  located on the main toolbar to

select the feature(s) to be copied. Once a feature is selected, it will be highlighted. Then, as discussed in detail below, the user may open the Arch Copy Tool to copy the feature into the geodatabase. Once copied the Arch Edit Tool may be employed to enter data on the Attribute Form as detailed previously.

Copying multiple features as one feature into the geodatabase can be easily accomplished by setting the selectable layers and using the selection tool as described above. In this case, we have added to and selected “arspbra15” in the Table of Contents. This layer includes all of the polygon investigation/survey data for the Bishop Field Office derived from 15’ maps.



To select and copy one multi-block survey for addition to the geodatabase as one feature, right click on the layer in the Table of Contents and select “Open the Attribute Table” from the drop down menu. In this example there are 354 records. We want to copy all survey blocks associated with survey 1420 into one feature record in the geodatabase. Click the “Options” menu tab and left click on “Select By Attributes...”

FID	Shape*	AREA	PERIMETER	ARSPBRA15L	ARSPBRA15I	SURVEY
0	Polygon	9457437.948	12398.781	2	0	1359
1	Polygon	648036.028	3220.027	17	0	547
2	Polygon	187659.649	1732.789	27	0	1420
3	Polygon	187663.2	1732.805	28	0	1420
4	Polygon	187485.841	1731.985	29	0	1420
5	Polygon	187730.596	1733.117	30	0	1420
6	Polygon	187986.631	1734.299	31	0	1420
7	Polygon	187728.443	1733.109	32	0	1420
8	Polygon	185511.38	1722.738	33	0	1420
9	Polygon	187812.175	1733.495	35	0	1420
10	Polygon	186497.789	1732.946	38	0	1420
11	Polygon	187638.67	1732.692	41	0	1420
12	Polygon	647971.51	3219.867	46	0	312

Record: 1 Show: All Selected Records (0 out of 354 Selected.) Options

A SQL query form opens as shown below. Select the appropriate field, in this case "Survey." Add the = sign and type in the survey number '1420' and hit Apply (note that syntax is important when conducting an SQL query. Enter as shown below). The records associated with survey 1420 are selected and are now ready to be copied into the geodatabase as one feature as discussed in the following section "Copy Features Form". Notice on the screen shot below that only the features associated with survey 1420 are highlighted in the Data or Map view. They are now ready to be copied as one feature.

Select by Attributes

Enter a WHERE clause to select records in the table window.

Method: Create a new selection

Fields: "FID", "AREA", "PERIMETER", "ARSPBRA15L", "ARSPBRA15I", "SURVEY"

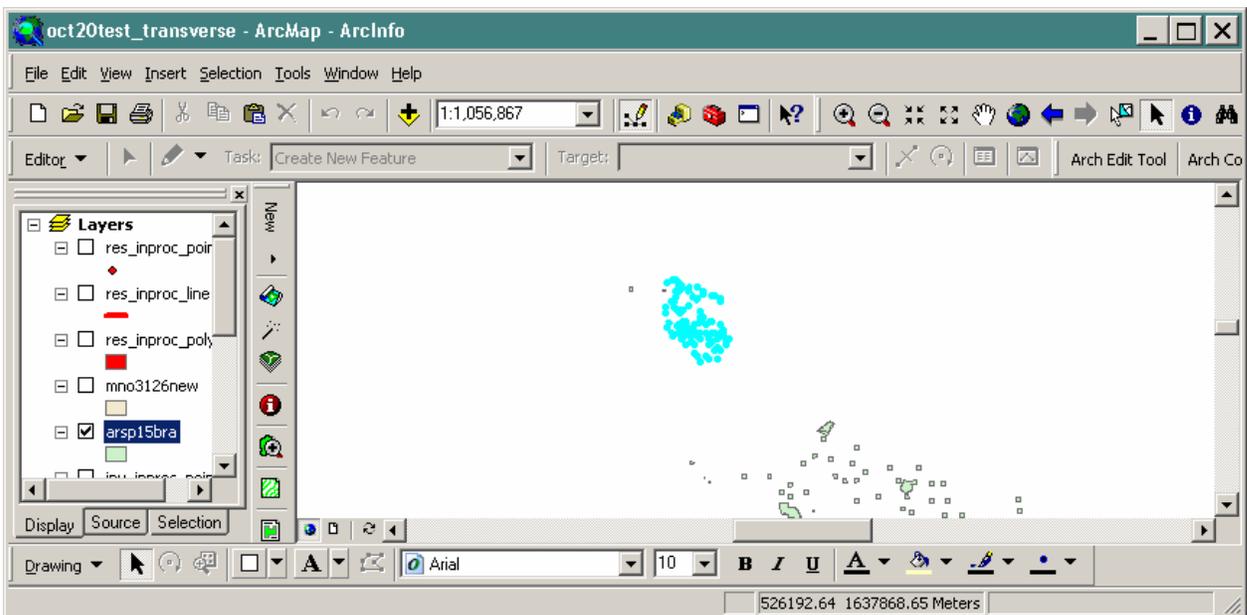
Unique Values

SELECT * FROM arspbra15 WHERE:
"SURVEY" = '1420'

Buttons: Clear, Verify, Help, Load..., Save..., Apply, Close

FID	Shape*	AREA	PERIMETER	ARSPBRA15L	ARSPBRA15I	SURVEY
0	Polygon	9457437.948	12398.781	2	0	1359
1	Polygon	648036.028	3220.027	17	0	547
2	Polygon	187659.649	1732.789	27	0	1420
3	Polygon	187663.2	1732.805	28	0	1420
4	Polygon	187485.841	1731.985	29	0	1420
5	Polygon	187730.596	1733.117	30	0	1420
6	Polygon	187986.631	1734.299	31	0	1420
7	Polygon	187728.443	1733.109	32	0	1420
8	Polygon	185511.38	1722.738	33	0	1420
9	Polygon	187812.175	1733.495	35	0	1420
10	Polygon	186497.789	1732.946	38	0	1420
11	Polygon	187638.67	1732.692	41	0	1420
12	Polygon	647971.51	3219.867	46	0	312

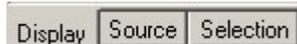
Record: 3 Show: All Selected Records (90 out of 354 Selected.) Options



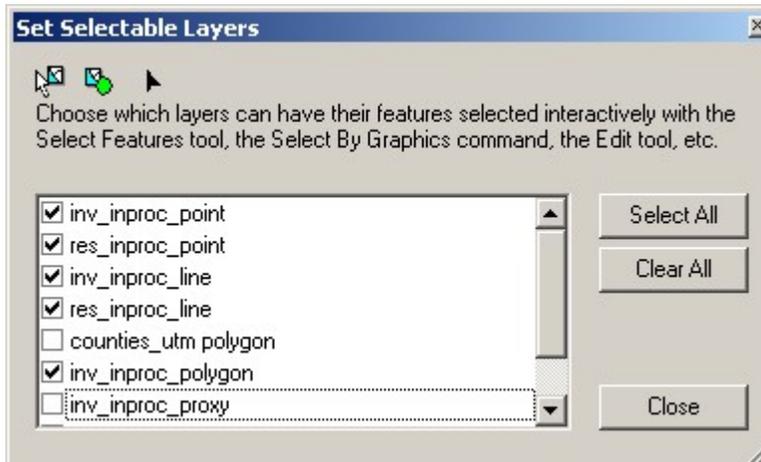
To Use the Interactive Selection Method:

Select the features in the layer that need to be copied

- To select features by dragging a box around them
- Click the Selection tab at the bottom of the table of contents, or click the Selection menu and click Set Selectable Layers.



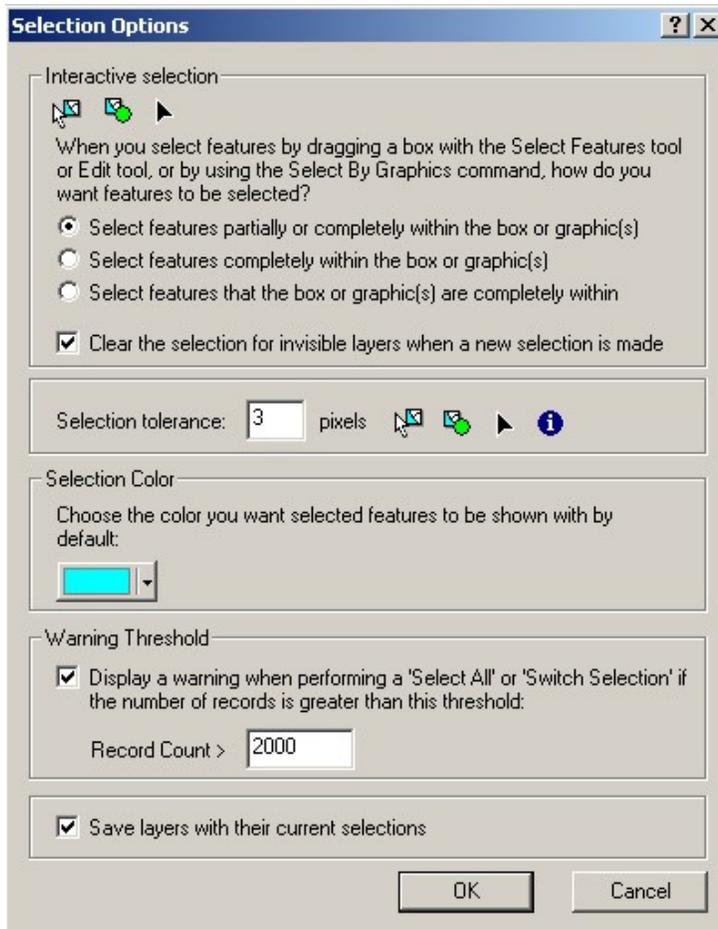
- Check the boxes next to the layers from which you want to select and uncheck the boxes you don't want to select.



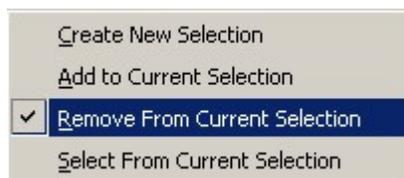
- Click Selection, point to Interactive Selection Method, then click Create New Selection.



- Click Selection in the Main menu and click Options.
- Specify how you'd like to select features with the box and click OK.



- Click the Select Features button from the Tools toolbar.
- 
- Click and drag a box around the features you want to select.
- Hold down the Shift key as you drag the box to select additional features.
- To remove a feature from the selected set, click the Selection menu, point to Interactive Selection Method, and click Remove From Current Selection. Drag a box around the features you want to deselect.



- To select features by clicking them in a table

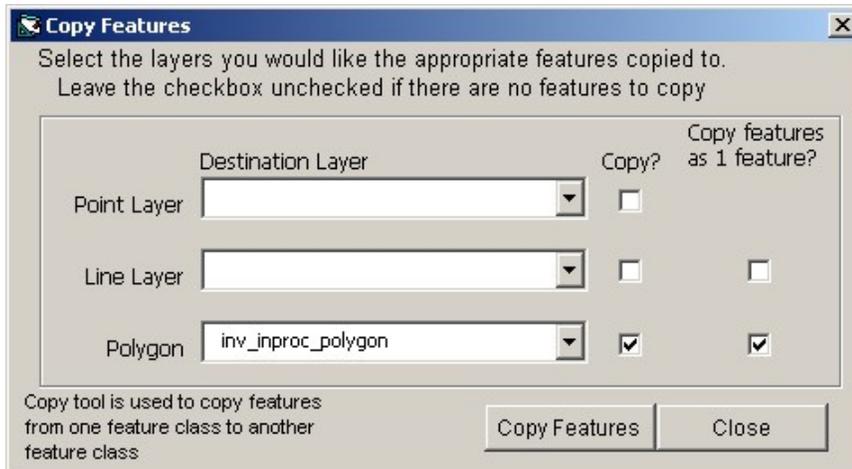
- Right-click a layer in the table of contents and click Open Attribute Table.



- Select a feature in the table by clicking to the left of a record.
- Hold down the Ctrl key and click additional features to select them.
- To deselect a feature, hold down the Ctrl key and click the feature.
- After the features have been selected, the User clicks the Arch Copy Tool. This brings up the copy tool interface.

Copy Features Form

The screen below shows the Copy Features form. The user needs to specify which layer to copy the features to. If polygon features are selected, then they should select a polygon layer to copy to. Optionally, the user can also check to copy multiple features as 1 feature. This would be in the case of a feature record having multiple survey blocks.



Copy Tool Fields

Point Layer: The point feature class layer in which to copy selected features to. Drop-down box is populated with any point layers loaded in the table of contents.

Line Layer: The line feature class layer in which to copy selected features to. Drop-down box is populated with any line layers loaded in the table of contents.

Polygon Layer: The polygon feature class layer in which to copy selected features to. Drop-down box is populated with any polygon layers loaded in the table of contents.

Copy?: A yes/no indicator specifying whether or not to copy to the specified layer.

Copy features as 1 feature?: A yes/no indicator specifying whether or not to combine the multiple polygons or lines selected into one multi-polygon or multi-line. This should only be selected in a case where all of the features being copied over share identical attribute information.

Using the Copy Features Form

Fill in appropriate information. Specify which layer to copy to, check the copy checkbox, and possibly check to copy as a multi-feature. Then choose:

Copy Features: Copies the selected features to the destination layer

Close: Closes the form

Terms

Attribute - Information about a geographic feature in a GIS, generally stored in a table and linked to the feature by a unique identifier. For example, attributes of a river might include its name, length, and average depth.

Attribute Domain - In a geodatabase, a mechanism for enforcing data integrity. Attribute domains define what values are allowed in a field in a feature class or nonspatial attribute table. If the features or nonspatial objects have been grouped into subtypes, different attribute domains can be assigned to each of the subtypes.

Buffer - A zone around a map feature measured in units of distance or time.

DLL - dynamic link library (DLL). Modules of code containing a set of routines that are called from procedures. A DLL is loaded and linked to an application at run time by its calling modules (EXE or DLL).

Feature Class - A collection of geographic features with the same geometry type (such as point, line, or polygon), the same attributes, and the same spatial reference. Feature classes can stand alone within a geodatabase or be contained within shapefiles, coverages, or other feature datasets. Feature classes allow homogeneous features to be grouped into a single unit for data storage purposes. For example, highways, primary roads, and secondary roads can be grouped into a line feature class named "roads." In a geodatabase, feature classes can also store annotation and dimensions.

Feature Dataset - A collection of feature classes stored together that share the same spatial reference; that is, they have the same coordinate system, and their features fall within a common geographic area. Feature classes with different geometry types may be stored in a feature dataset.

Geodatabase – An object-oriented data model introduced by ESRI that represents geographic features and attributes as objects and the relationships between objects, but is hosted inside a relational database management system. A geodatabase can store objects, such as feature classes, feature datasets, nonspatial tables, and relationship classes.

GIS - Geographic information system. An arrangement of computer hardware, software, and geographic data that people interact with to integrate, analyze, and visualize the data; identify relationships, patterns, and trends; and find solutions to problems. The system is designed to capture, store, update, manipulate, analyze, and display the geographic information. A GIS is typically used to represent maps as data layers that can be studied and used to perform analyses.

Metadata - Information about the content, quality, condition, and other characteristics of data. Metadata for geographical data may document its subject matter; how, when, where, and by whom the data was collected; accuracy of the data; availability and distribution information; its projection, scale, resolution, and accuracy; and its reliability with regard to some standard. Metadata consists of properties and documentation. Properties are derived from the data source (for example, the coordinate system and projection of the data), while documentation is entered by a person (for example, keywords used to describe the data).