GRSLE In-Field Documentation Guide:
Using Trimble with TerraSync

2023 Format

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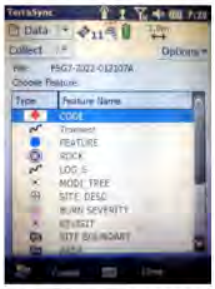
What do I want to record?
Which Feature Name to use?



The GRSLE data dictionary for Trimble TerraSync has 14 Feature Names to select when wanting to record something for the project. At first it may be a bit confusing of which to use for what, but you'll catch on quickly. Most objects (artifacts, both precontact and historic) use the top-of-the list CODE. Here are which ***Feature Name*** to select if when there are other sorts of things (points, lines, and areas) that you might be told to document.

Want to record?	Use
Chipped stone tools and debitage?	CODE
Pre-Contact features (hearths, cairns, etc.)?	FEATURE
A Forest Service maintained trail?	LINES
A tree with chop marks?	MODI_TREE
Stones in a rock wall or stone circle?	ROCK
A cabin?	FEATURE
An intensive survey transect?	TRANSECT
The location of test excavation grid corners?	SurveyControl
Some fire-cracked rock?	CODE
A wooden sheep-trap?	LOG_S
Basic information for SHPO site form?	SITE_DESC
How badly did the fire impact this area?	BURN_SEVERITY
A Forest Service Trail marker?	FEATURE
A piece of worked steatite?	CODE
Retaking an older photo?	REVISIT
Location of a site datum?	SurveyControl
A fence?	LINES
A recent fire hearth?	FEATURE
A contact period metal arrow point?	CODE
An outhouse?	FEATURE
An intermountain ware ceramic rim sherd?	CODE
Just the location and basic desciption of a bone?	CODE
Detailed, in-field faunal coding?	BONE
A 30-06 cartridge casing?	CODE

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GRSLE Trimble Data Dictionary Structure
GRSLE_BAER23.ddf

In-field documentation uses Trimble Geo7 or GeoXH receivers using TerraSync with a standard data dictionary structure created in GPS Pathfinder Office (Figure 1). The dictionary has a variety of point, line, and area features to record aspects of the project such as artifacts, features, survey transects, trail systems, burn intensity, datum point locations and the like. The structure and attribute values for these data features are described here.

CODE – BASIC_CODE

For recording most point locations, such as individual artifacts, the CODE feature class is used (Figure 2). This the feature used most often on day-to-day basis. The following attributes are available for each item recorded, although not all attributes used for each item. For example, there are many additional attributes used to capture information on projectile points that are not used for other types of chipped stone. Standard recording entails completing data entry for all attributes, which is FULL data documentation. In rare instances, often due to time constraints, a QUICK coding, which records item location and only the most basic descriptive attributes such as material CLAS. The goal, however is to gather the most detailed, artifact-based information on each prehistoric item encountered during the field season. As recoding teams become skilled and have internalized the codes, the CODE recording can be completed in about 30 seconds per item.

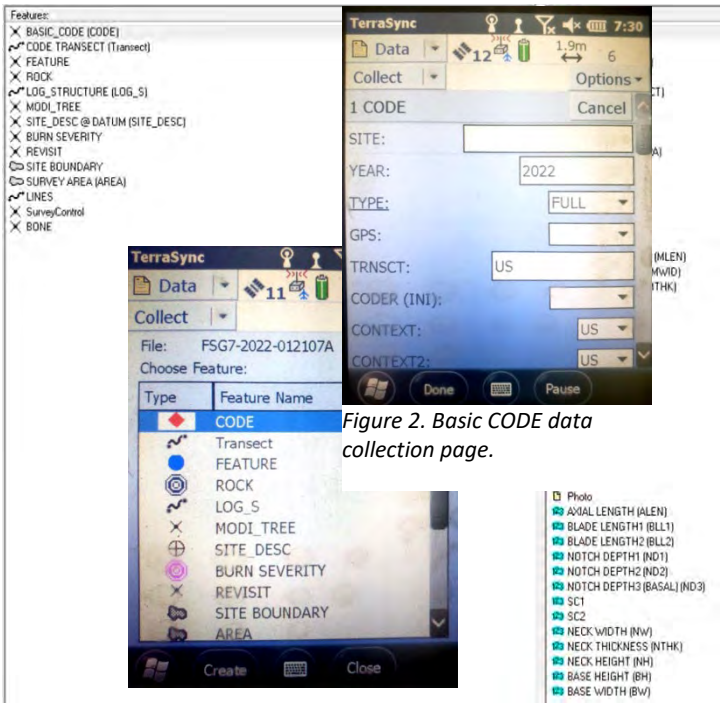


Figure 1. Data Dictionary editing view of GRSLE_BAER22.ddf file and TerraSync main data collection screen when dictionary in use.

Figure 2. Basic CODE data collection page.

CODE ATTRIBUTES

Site (Text; 8 characters limit): This is either the Smithsonian site number or a temporary field number assigned to artifact clusters when mapping. The current Wyoming SHPO definition of a site is 15 artifacts or more separated by less than 30 meters. Check with your team leader for appropriate number. If multiple field teams are working at the same time, make sure use the In-Reach to confirm that a temporary field sequence locality number had not already been assigned at another location.

Year (Text; 4 characters limit): The default setting should be set to the current project year, if not be sure to update.

Code Type (TYPE) (Menu): The default setting is **FULL**, which means that all relevant attributes are recorded on all items; in rare cases where time does not allow full documentation of all items, only location, and basic item type are recorded (measurements and the like omitted for most objects) – this is **QUICK** code. Within a cluster, when QUICK coding it may be the case that formal tools or diagnostic items are fully recorded, so be sure to use update the Code Type for that specific item.

- FULL – all attributes
- QUICK – omit metrics and some descriptions (use only if instructed by team leader)

GPS (Menu): Each field season, each GPS/GNSS receiver is given a unique identifier code (e.g., GHX-1, or FS-7) and the attribute is included for every individual item recorded in the database on that instrument. There should be an identification label on the receiver.

Transect (TRNSCT) (Text; 7 characters limit): Code to identify a survey transect. Used for nested mapping of individual items found during a transect inventory.

CODER (INI) (Menu): 3-4 letter 'official initial' unique identifier for the crew member that codes the item. The data dictionary is updated at the start of each season with initials of crew for that year.

CONTEXT (Menu): Description of the specific context/location where the mapped items was observed (see Figure 3 for examples).

- MTG – mountain grassland
- BRN – burned area
- BRNO – oxidized (reddened) burn area
- RBB – rodent burrow
- ATR – animal trail/game trail
- PKT – pack trail (either official or informal)
- RK – rock
- CB – cutbank
- CLP – collector's pile (see Figure 30)
- ERD – eroded patch or rill
- TIM – timbered/duff covered area
- 2TK – two-track road
- TTR – tree throw
- MED – moist meadow
- EXC – from excavation unit, no additional information
- EXS – from excavation unit, screened
- EXM – from excavation unit, mapped
- SHE – rock shelter/cave
- IP – on or in ice patch
- IPP – ice patch area (bare ground around ice patch)
- IPB – recently exposed at ice patch margin
- AUG - auger

Figure 3. Examples of CONTEXT type codes. Each artifact has its primary discovery context documented.

CONTEXT2 (Menu): Used to provide additional information for items found in burned areas (BRN or BRNO). Figure 4.

- TB – in base of burned tree, often oxidized
- TT – along patch of more intensely burned where downed tree trunk had lain
- ERDr – in a burned eroded rill
- ERDs – sheet erosion area
- MW* - indicates individual Modified-Whittaker plot (e.g., MW1 or MWA, etc)

Figure 4. CONTEXT2 examples for cases where primary CONTEXT is BRN: ERDr - erosional rills and in general sheet wash (EDRs).

G*NN*ARTIFACT (G*NN*A) (Numeric): The dictionary attribute heading is updated each field season with NN referring to the last two digits of year (e.g., G22A for the 2022 field season). Begins at 1 and automatically increases from there within each datafile. For each receiver (code GPS), there is a single sequence of artifact numbers each year, which becomes the field ID number to use in descriptions or on labels for collected items (e.g, GHX-1-432 would be 432nd item recorded on receiver GXH-1). The numbering system resets to 1 each time a new data file is started so the last number used each day needs to be recorded in field notes (or can be checked from the day before's file) to be sure that the next number is used as starting number for the day's mapping thus avoiding potential for duplicate numbers in the season's item number sequence.

MRK (Menu): Indicates if/how item marked or if it had been previously recorded

- SHP – Sharpie Dot
- RED – red flag
- BLU – blue flag/"bonus"
- US - unspecified

CLAS (Menu): A single line of data is used for each item mapped/documented and the CLAS code describes what sort of material is being recorded. The most common items recorded are chipped stone (CS).

- CS – chipped stone
- HS – historic/recent items (describe in comments)
- GB – glass bead
- OTR – other class of material (describe in comments)
- RK – rock
- CM – precontact ceramic
- CH – charcoal sample
- FCR – fire-cracked rock
- MTL – metal object (used for items like metal projectile points, general metal garbage is coded as HS)
- ST – steatite
- GS – groundstone
- GLS – glass or bottle
- BN – bone
- WD – wood

ART_ELE (Menu): further, more specific description of what is recorded. For example, if the CLAS is CS (chipped stone), the most common ART_ELE code is FK (flake) and the most information rich is often PP (projectile point).

- FK – flake
- FKU – utilized flake (irregular edge flake scars less than 3mm in length. Could be use or edge damage
- FKW – worked flake with regularly spaced/patterned group(s) of flake scars > 3 mm in length. Clearly an intentionally modified item
- PP – projectile point
- CR – core
- ANG – angular debris (by convention, if an item is described as angular debris, it's portion (POR, next code) is listed as complete (CO)
- BF – biface
- TES – teshoa
- SCE – end scraper
- SCS – side scraper
- UF – uniface
- NDW – worked nodule
- NDT – tested nodule
- FCR – fire cracked rock
- OF – other formal tool (describe in comments)
- BB – blue glass bead
- WB – white glass bead
- OB – other bead color
- HM – hammerstone
- MANO – mano handstone
- METAT – metate base grinding stone
- MAL – grooved maul
- AWL – awl
- KNF – knife
- PL – potlid
- US – unspecified
- CAN – historic metal can
- HIST – other historic item
- BOT – historic bottle
- CART – cartridge casing (describe in comments)

POR (Menu): Portion of object being coded.

- US – Unspecified, the default value
- CO – complete
- PT – portion of flake with platform present (proximal)
- PTN – any flake fragment without platform
- FR – unspecified fragment
- PR – proximal, used mostly for projectile points (PP) as base
- DS – distal, used mostly for projectile points (PP) as the tip
- BLD – blade/midsection portion of projectile point/biface

MAT (Menu): Lithic raw material for chipped stone items. For most other material classes, use the default US, code.

- CH – chert
- CL – chalcedony
- QT – quartzite
- OB – obsidian
- SLS – contact metamorphic
- PWD – petrified wood
- PH – red Phosphoria chert
- DMC – Dollar Mountain Chert
- QTM – Morrison Quartzite
- QTC – quartz crystal
- IR – green chalcedony
- BS – basalt
- VO – other volcanic
- EUR – European, used for historic items
- SS – sandstone

HEAT (Menu): Thermal alteration/heating used mostly for chipped stone items. These data used both to assess recent fire impacts, but also can be used to explore possible past burning (either wildland fires, or controlled hearth locations). Examples of several HEAT codes in Figure 5.

- NO – no thermal alteration noted
- CN – carbon residue (recent fires)
- CZ – crazing, many small, often intersecting cracks
- PL – potlid, round spalls detached from surface (note, the spalls themselves coded as ART_ELE)
- TFR – blocky, often discolored fracture
- M1 – multiple (CZ+PL)
- M2 – multiple (CZ+CN)
- M3 – multiple (CZ+PL+CN)
- M4 – multiple (PL+CN)
- M5 – multiple (TFR+CZ)
- 9 – not applicable (used for non-stone items)

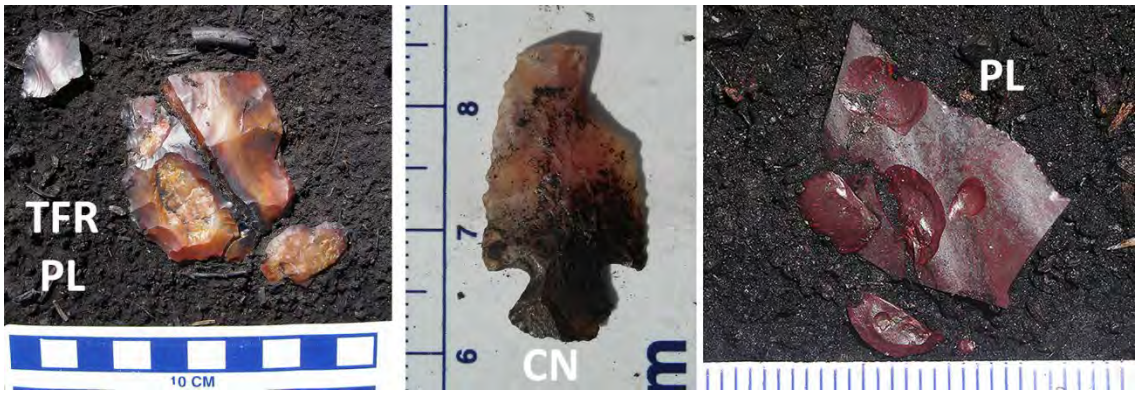


Figure 5. Examples of common thermal alteration (HEAT). Note that PL can also be used as an item code for the distinctive flakes the pop out when the potlid is formed as a thermal alteration to a larger piece.

CORTEX (Menu): Amount of dorsal cortex on chipped stone.

- 0 – none
- 1 – 1-25%
- 2 – 26-50%
- 3 – 51-75%
- 4 – 76-99%
- 5 – 100%
- 9 – N/A (for items other than chipped stone)

MLEN (Numeric, 2 decimal places, missing value=999): Maximum length of the item in mm. Measured with calipers.

MWID (Numeric, 2 decimal places, missing value=999): Maximum width of the item in mm. Measured with calipers.

MTHK (Numeric, 2 decimal places, missing value=999): Maximum thickness of the item in mm. Measured with calipers.

COMMENTS (Text, 50 characters): Additional information about item being recorded.

MOLD MADE (Menu): Records if a latex mold was made of the artifact.

- NO – default value
- YES

COLLECTED (Menu): Record if the item is collected.

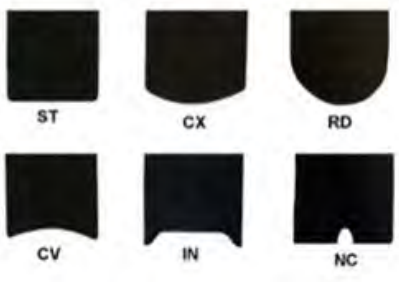
- NO = default value
- YES

PP_TYPE (Menu): A general morphological assessment of projectile point age (see Figure 6).

- EA Early Archaic
- LA Late Archaic
- LP Late Prehistoric
- LPS Late Prehistoric side-notched
- LPT Late Prehistoric tri-notched
- LPU Late Prehistoric un-notched
- MA Middle Archaic
- PL Paleoindian
- UA Unidentified Archaic
- UNK Unidentified (default value)

BASE (Menu): Shape of projectile point base.

- CX Convex
- IN Indented
- NC Notched
- RD Round
- ST Straight
- US Unspecified (default value)



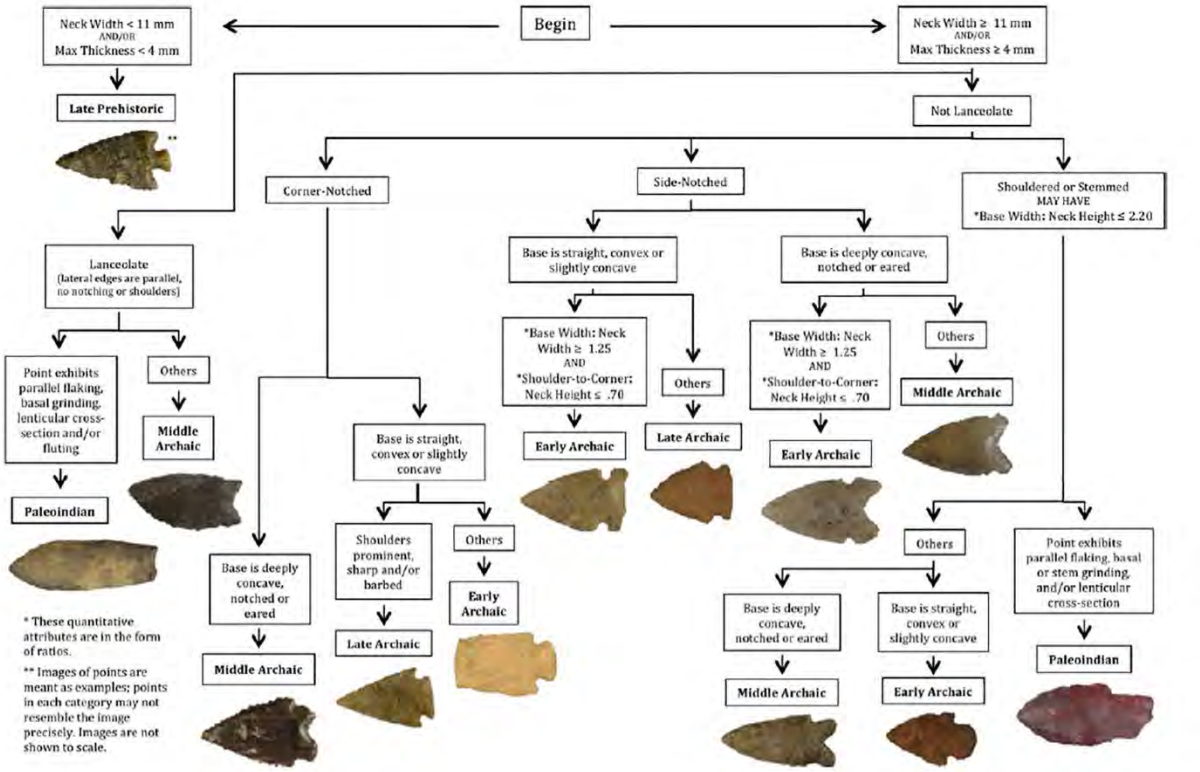


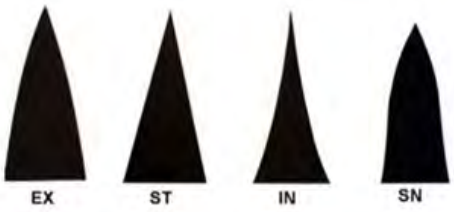
Figure 6. Morphological dichotomous key for chronologically typing points from the northern GYE and the Bighorn Basin, Wyoming (From Reckin and Todd 2020:Figure 2)

OUTL (Menu): Projectile point outline.

- BN Base notched
- CN Corner notched
- LNC Lanceolate
- SHS Shouldered/stemmed
- SN Side notched
- TLN Triangular lanceolate
- US Unspecified (default value)

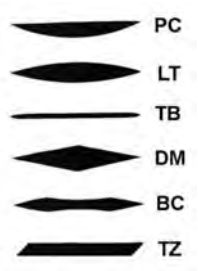
BLD (Menu): Projectile point blade shape.

- EX Excurvate
- ST Straight
- IN Incurvate
- SN Sinuous
- US Unspecified (default value)



XSEC (Menu): Projectile point blade cross section.

- BC Bi-convex
- DM Diamond
- LT Lenticular
- PC Plano-convex
- TB Tabular
- TZ Trapazoidal
- UN Indeterminate



BGRD (Menu): Projectile point basal grinding.

- Y – yes
- N – no
- US – default (unspecified)

SGRD (Menu): Projectile point stem grinding.

- Y – yes
- N – no
- US – default (unspecified)

IFRAC (Menu): Projectile point impact fracture.

- Y – yes
- N – no
- US – default (unspecified)

RSHRP (Menu): Projectile point resharpened.

- Y – yes
- N – no
- US – default (unspecified)

WEIGHT (Numeric, 2 decimal places): Weight (g). This is rarely taken in the field given the small size of most items, even a bit of wind makes measurements difficult.

PHOTO (file): Associates photo taken with the Trimble with the item. Rarely used for artifact photos, but can provide good reference to find spot location (overview) to aid in relocating an item.

PROJECTILE POINT SPECIFIC MEASUREMENTS (Figure 7)

ALEN (Numeric, 2 decimal places: missing = 999). **Axial length**, length from the tip of the point to middle of the base. Taken only on complete points in mm.

BLL1 (Numeric, 2 decimal places: missing = 999). **Blade Length 1**, length of blade from notch or stem to tip, can be either side of the point. Taken only on points with complete blades in mm.

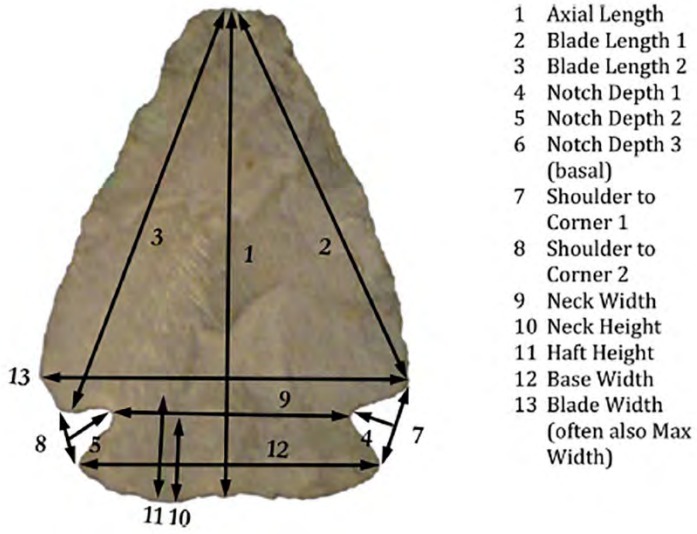


Figure 7. Graphic demonstrating attributes measured on each point, not including qualitative categories like side-notched, corner-notched or stemmed (from Reckin and Todd 2020: Figure 4).

BLL2 (Numeric, 2 decimal places: missing = 999). **Blade Length 2,** length of blade from notch or stem to tip, taken on the other side from BLL1. Taken only on points with complete blades in mm.

ND1 (Numeric, 2 decimal places: missing = 999). **Notch depth 1**, depth from a point midway between shoulder and margin of base to the notch center in mm. Take on the same side of the point as BLL1.

ND2 (Numeric, 2 decimal places: missing = 999). **Notch depth 2**, depth from a point midway between shoulder and margin of base to the notch center in mm. Take on the same side of the point as BLL2.

ND3 (Numeric, 2 decimal places: missing = 999). **Notch depth 3 (basal notch)**, taken only on tri-notched points. Depth from a point midway between shoulder and margin of base to the notch center in mm.

SC1 (Numeric, 2 decimal places: missing = 999). **Shoulder to Corner 1**, the width of the notch, taken on same side as BLL1 and ND1 in mm.

SC2 (Numeric, 2 decimal places: missing = 999). **Shoulder to Corner 2**, the width of the notch, taken on same side as BLL2 and ND2 in mm.

NW (Numeric, 2 decimal places: missing = 999). **Neck Width**, taken been between notches or at the stem of the point in mm.

NTHK (Numeric, 2 decimal places: missing = 999). **Neck Thickness**, not shown in Figure 6, but at the intersection of lines 1 (axial length) and 9 (neck width).

NH (Numeric, 2 decimal places: missing = 999). **Neck Heigh**t, measured from the neck width to base of point taken at the furthest extent of the point's base, not necessarily from its center point in mm.

BH (Numeric, 2 decimal places: missing = 999). **Base Heigh**t, measured from the upper margins of haft portion of point to furthest extent of the point's base, not necessarily from its center point in mm.

BW (Numeric, 2 decimal places: missing = 999). **Base Width,** width of base in mm.

BLW (Numeric, 2 decimal places: missing = 999). **Blade Width**, maximum width of point blade in mm (is often the same as the MLEN measurement).

Figure 8. Three 2-person teams recording surface artifacts using the CODE Feature and attribute list. The standing crew member runs the receiver and prompts the coder for next attribute to describe/measure. Coder, picks up, describes, measures, Sharpie dots, and returns documented item to its discovery spot. Not only are the previously flagged items coded, but the coder who is close to ground with better visibility is also tasked with noting and recording all "bonus" objects.

TRANSECT – CODE TRANSECT

This line feature is used to record transect lines, and in current survey methods, most commonly a 3-person, 2m wide transect used either as a general survey or to complete a focused examination of a trail corridor. The attributes for transect provide information on where, when, and how the inventory was conducted.
There are options for recording 14 attributes for each linear transect data entry. When starting a transect (Figure 9), first Create the new entry, then PAUSE to complete the basic attribute data entry. Take a photo (Attribute 14) along the transect in the direction of travel (Figure 10), and then RESUME and begin moving. If artifacts are encountered PAUSE, mark location with pin flag and then use the ***Options, Nest, and CODE*** to code as many as present. When artifacts coding completed, return to the pin flag used to mark transect interruption point, and **Resume** transect (Figure 11).

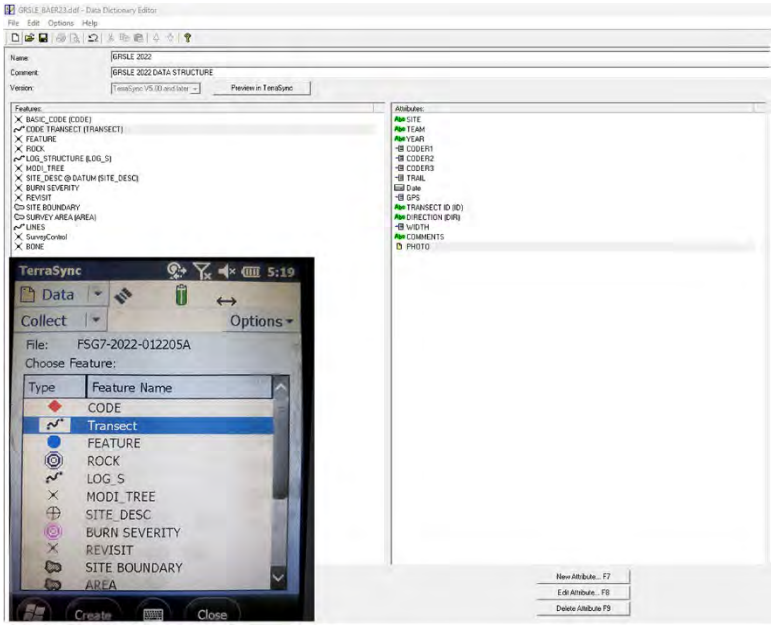


Figure 9. Transect data dictionary structure and TerraSync selection screen.

Figure 10. Example of PHOTO taken as part of coding a Forest Trail 2m wide transect inventory.

As noted, two primary recent uses of the Transect feature class are to provide systematic mapping of 2-m wide trail corridor inventories (and also actual trail locations) and to use to provide an evaluation of recovery/coverage rates in block areas that have been previously inventoried. Since the project is an artifact-based rather than site-based, it is fairly straightforward to conduct sample transects through previously inventoried areas and examine for specific cluster identification, but also a more general attribute such as artifact density (artifacts/ha) documented using a variety of inventory methods.

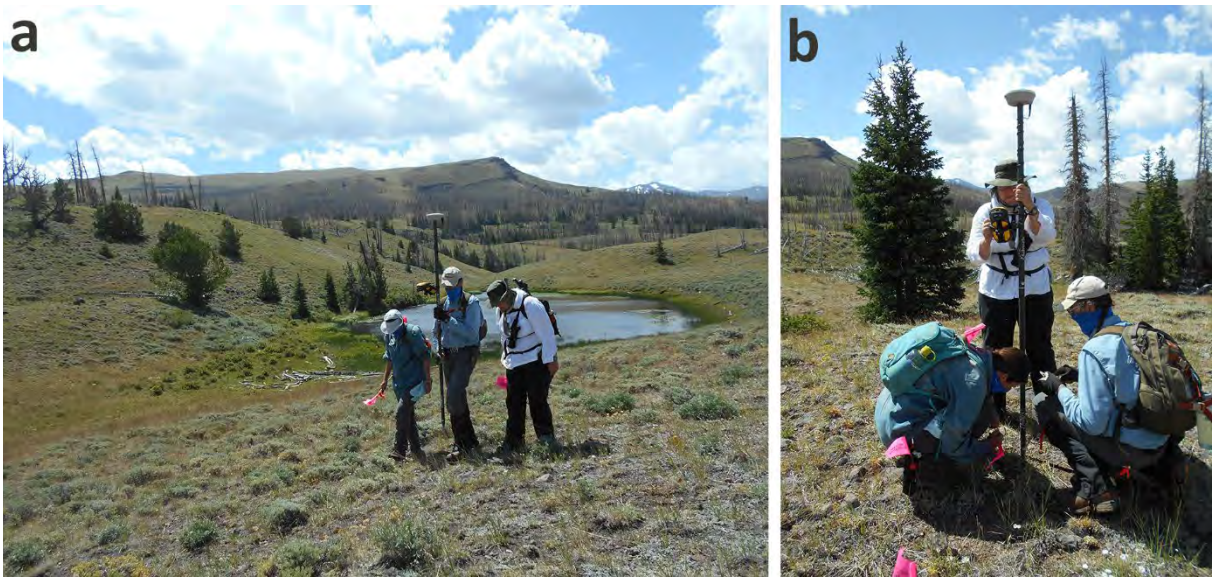


Figure 11. Using Transect feature to a) record 2m inventory path route, and b) record artifacts encountered along the inventory using the Nest option. The Transect shown here was not along a trail, but rather as a series of survey lines across areas previously inventoried at less intensive transect spacing.

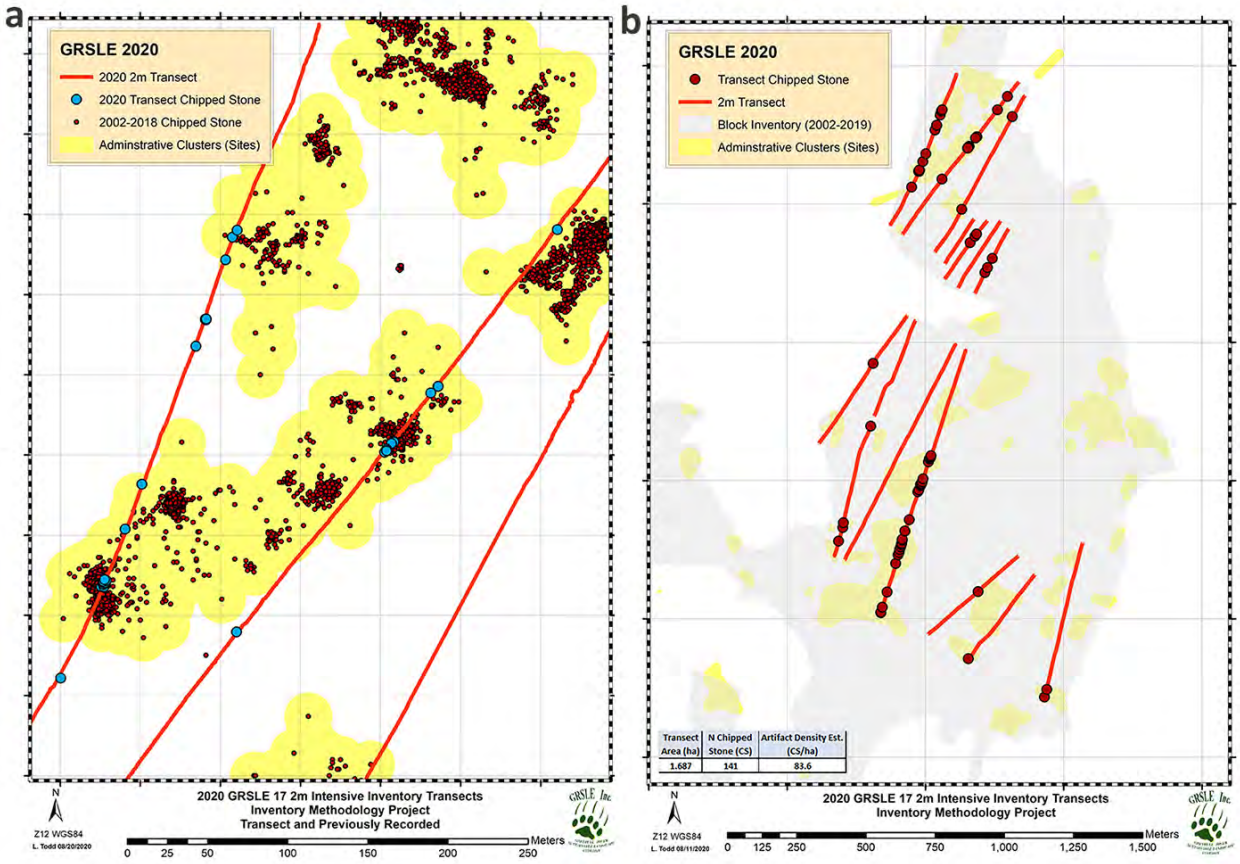


Figure 12. Examples of Transect path data (a) showing both artifacts recorded in 2m inventory and in prior work and b) cumulative results of group of 14 2m 3-person transects across previously inventoried block.

TRANSECT Attributes

Site (Text, 8 characters): If a transect is being placed through a know artifact cluster enter a designation number (either SI or Temporary number). Otherwise leave blank, or enter NONE.

TEAM (Text, 4 characters): During some field projects specific teams will be assigned designations, if this is the case, enter designation here, or leave blank.

YEAR (Text, 4 characters): The default value should be set to the project year, and should not have to enter, but can update if needed.

CODER1 (Menu): Each year, the official initials of crew members participating should be updated in the dictionary and can be selected from the list. If someone is coding not on list use the VOL (volunteer) code.

CODER2 (Menu): Each year, the official initials of crew members participating should be updated in the dictionary and can be selected from the list. If someone is coding not on list use the VOL (volunteer) code.

CODER3 (Menu): Each year, the official initials of crew members participating should be updated in the dictionary and can be selected from the list. If someone is coding not on list use the VOL (volunteer) code.

TRAIL (Menu): Forest Service Trail number designations for the year's project area should be entered in the attribute's menu. In addition:

- OTH – other Forest Service Trail not in menu (list in comments)
- NOTR – Not a trail, default listing used for open terrain inventory transects

DATE (Month-Day-Year): Auto generated on feature creation. No need to enter.

GPS (Menu): Each field season, each GPS/GNSS receiver is given a unique identifier code (e.g., GHX-1, or FS-7) and the attribute is included for every individual item recorded in the database on that instrument. There should be an identification label on the receiver.

ID (Transect ID: Text, 10 characters): Individual transects or transect segments may be given specific identifiers by team leader.

DIR (Direction: Text, 30 characters): a general description of direction of travel; can be compass bearing (e.g., NW), or narrative (e.g., up-stream).

WIDTH (Menu): Identifies width of the recorded transect:

- 50 cm
- 1 m
- 2 m
- 5 m
- 10 m
- OTR

COMMENTS (Text; 30 characters): Additional notes on the transect.

PHOTO (File): Photo taken while GNSS readings paused. Take at least one at beginning of transect (Figure 9) and at end (look back along path transect had taken to endpoint). May also take other photos during the transect (such at distinctive point such as stream crossing, or dense artifact cluster). Each image file will be linked to the TRANSECT attribute.

FEATURE

In addition to individual artifacts, features (fixed, humanly constructed objects such as hearths, walls, cabins) are recorded. Twelve attributes are available to describe each feature (Figure 13).

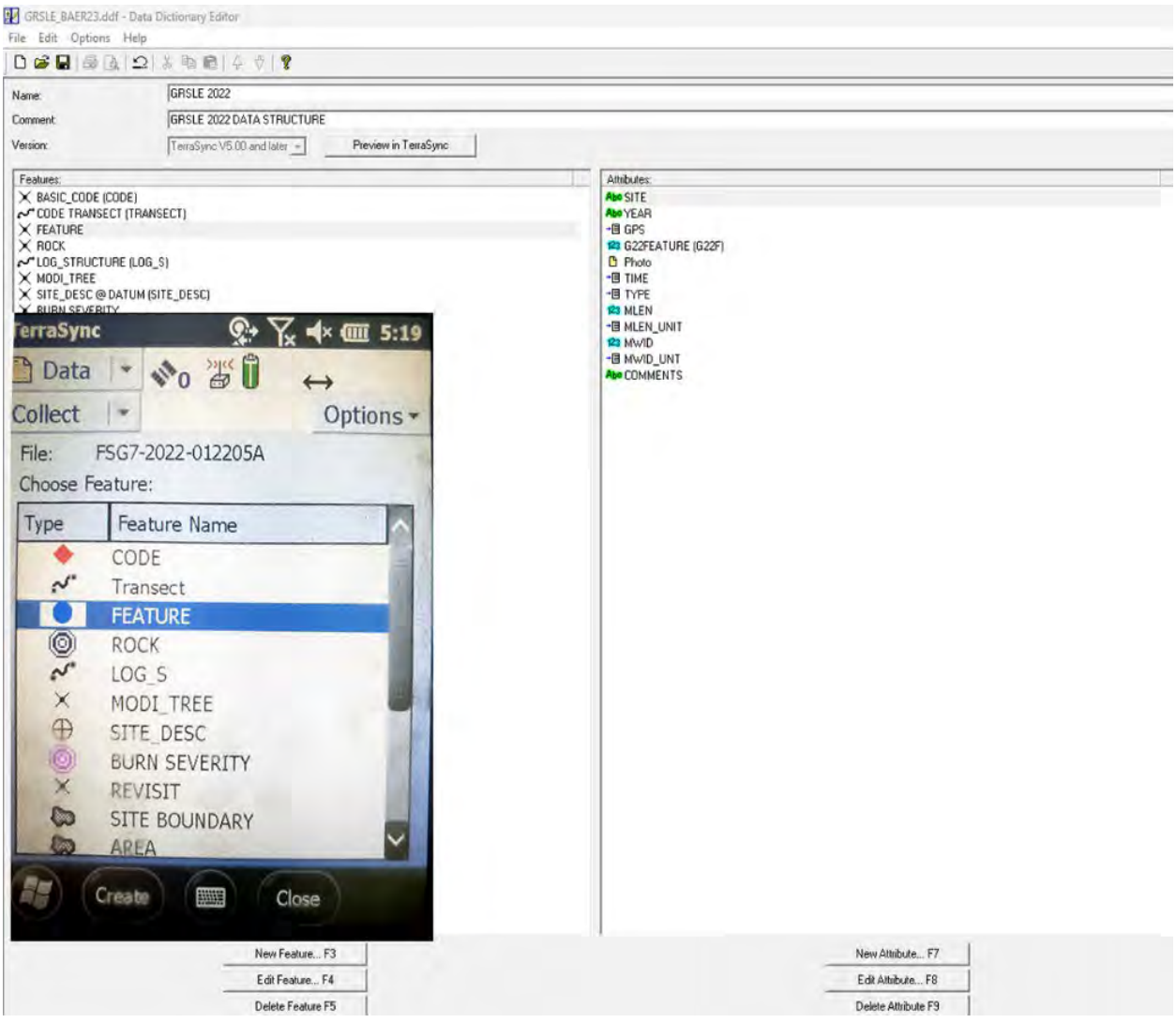


Figure 13. FEATURE data dictionary structure and TerraSync selection screen.

Each feature recorded in each datafile is assigned a sequence number that can be used to describe it in the notes. For some features, such as stone circles, individual elements (ROCKS) may be mapped using another feature class, or may be given multiple feature readings (such as the four corners of a cabin). Generally, the Feature attribute is recorded at the center of the feature. Photos of the Feature (with photo scale and north arrows) should be taken from several directions with the attribute paused.

FEATURE Attributes

Site (Text; 8 characters limit): This is either the Smithsonian site number or a temporary field number assigned to artifact clusters when mapping. Check with your team leader for an appropriate number.

YEAR (Text, 4 characters): The default value should be set to the project year, and should not have to enter, but can update if needed.

GPS (Menu): Each field season, each GPS/GNSS receiver is given a unique identifier code (e.g., GHX-1, or FS-7) and the attribute is included for every individual item recorded in the database on that instrument. There should be an identification label on the receiver.

G*NN*Feature (G*NN*F) (Numeric): The dictionary attribute heading is updated each field season with NN referring to the last two digits of year (e.g., G22F for the 2022 field season). Begins at 1 and automatically increases from there within each datafile. For each receiver (code GPS), there is a single sequence of artifact numbers each year, which becomes the field ID number to use in descriptions. The numbering system resets to 1 each time a new data file is started so if continuing to work on the same artifact cluster, the last number used each day needs to be recorded in field notes (or can be checked from the day before's file) to be sure that the next number is used as starting number for the day's mapping thus avoiding potential for duplicate feature numbers in the season's item number sequence.

PHOTO (File): Photo taken while GNSS readings paused. Take photos with photo scale and north arrow showing location of feature. Each image file will be linked to the TRANSECT attribute.

TIME (Menu): Record the best estimate of relative age of the Feature.

- H – Historic/Recent
- P – Precontact
- UNK – Indeterminate/unknown

TYPE (Menu): Record the general type of the Feature. Use the G*NN*F number in conjunction with the GPS code to refer to Features in notes. See Figure 14 for examples of some of the Feature types.

- FS **TRAIL MARKER –** sign or trail marker cairn
- **FS TRAIL WATERBAR** – wood or stone used to divert water from trial, may also channel water onto archaeological deposits or be excavated into an archaeological deposit.
- **CAIRN** – stone pile

- **HEARTH** – stone ringed or surface hearth, can be either pre-contact or recent (recorded in the TIME attribute: recent are referred to as REC hearths in notes).
- **STONE CIRCLE** – circular or oval arrangement of stone, larger than the ring around a hearth (usually several meters in diameter) that could have had domestic ('tipi-ring") or other uses.
- **BONE CLUSTER** – concentration of either whole or fragmentary bones
- **CHIPPED STONE CLUSTER** – dense concentration of chipped stone, may either pre-contact component of the site, or a recent "collector's" pile, or deflation/erosion feature.
- **WALL** – alignment of either stone or wood
- **CABIN** – historic period structure, usually log. If roofed and cannot take reading at Feature center, take in the center of wall with door.
- **ADIT** – opening for an historic mine shaft
- **DUMP** – cluster of historic materials thought to represent intentional discard
- **OTHER** – any other sort of constructed Feature, describe in COMMENTS and notes.

MLEN (Numeric, 1 decimal place): Measure the maximum dimension of the Feature, you can measure in meters or centimeter depending on the overall size of the Feature – the unit is coded in the next attribute.

MLEN_UNIT (Menu): The metric unit used to record Feature MLEN.

- M – meter
- CM – centimeter
- MM – millimeter

MWID (Numeric, 1 decimal place): Measure the dimension perpendicular to the MLEN of the Feature, you can measure in meters or centimeter depending on the overall size of the Feature – the unit is coded in the next attribute.

MWID_UNIT (Menu): The metric unit used to record Feature MWID, should usually be the same unit as used from MLEN.

- M – meter
- CM – centimeter
- MM – millimeter

COMMENTS (Text, 30 characters): Enter key additional information about the Feature. Information that exceeds the character limit should be written into field notebook.

Figure 14. Examples of Feature types used in the GRSLE data dictionary.

ROCK

The ROCK point feature is used to capture greater detail on the internal structure of features, for example recording individual stones in a stone circle or cairn (Figure 15). The individual ROCK coding takes place after an initial FEATURE designation/number has been coded, and that designation is included in on of the ROCK attributes (FEAT). The ROCK attribute is recorded at top of the rock in its center. In order not to lessen the potential for research such as OSL dating, the rock should not be picked up or moved.

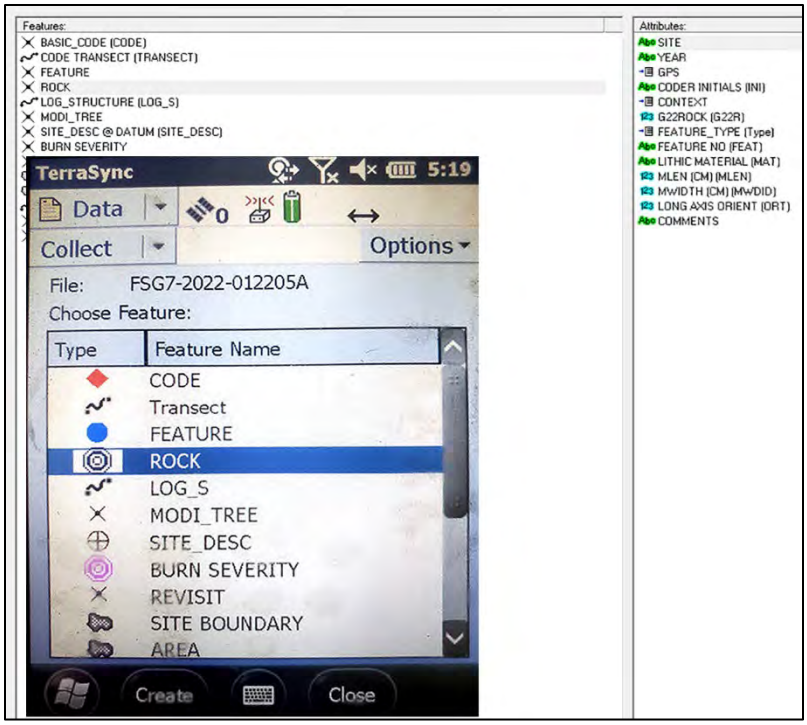


Figure 15. ROCK data dictionary structure and TerraSync selection screen.

ROCK Attributes

Site (Text; 8 characters limit): This is either the Smithsonian site number or a temporary field number assigned to artifact clusters when mapping. Check with your team leader for appropriate number.

YEAR (Text, 4 characters): The default value should be set to the project year, and should not have to enter, but can update if needed.

GPS (Menu): Each field season, each GPS/GNSS receiver is given a unique identifier code (e.g., GHX-1, or FS-7) and the attribute is included for every individual item recorded in the database on that instrument. There should be an identification label on the receiver.

CODER (INI) (Menu): 3-4 letter 'official initial' unique identifier for the crew member that codes the item. The data dictionary is updated at the start of each season with initials of crew for that year.

CONTEXT (Menu): Description of the specific context/location where the rock was observed (see Figure 3 for context examples).

- MTG – mountain grassland
- BRN – burned area
- RBB – rodent burrow
- ATR – animal trail/game trail
- PKT – pack trail (either official or informal)
- RK – rock
- CB – cutbank
- CLP – collector's pile

- ERD – eroded patch or rill
- TIM – timbered/duff covered area
- 2TK – two-track road
- TTR – tree throw
- MED – moist meadow
- EXC – from excavation unit, no additional information
- SHE – rock shelter/cave
- US – Unspecified (default value)

G*NN*ROCK (G*NN*R) (Numeric): The dictionary attribute heading is updated each field season with NN referring to the last two digits of year (e.g., G22F for the 2022 field season). Rock numbers begin at 1 and automatically increases from there within each datafile. Rocks are number in sequence of 1 to N (total number present) within each feature.

Type (FEATURE_TYPE: Menu): The type of stone feature being recorded is noted.

- Cairn – pile of stones
- Wall – linear stones, often several layers high
- StoneCircle – circle or oral, usually several meters in diameter.

FEAT (FEATURE_NO: Text, 15 characters): include the Feature designation assigned when the full FEATURE was recorded.

MAT (LITHIC MATERIAL: Test, 15 characters): Describe the type of stone (e.g., basalt, volcanic, sandstone, etc.)

MLEN (Numeric, 1 decimal place): record the longest dimension of the stone in centimeters.

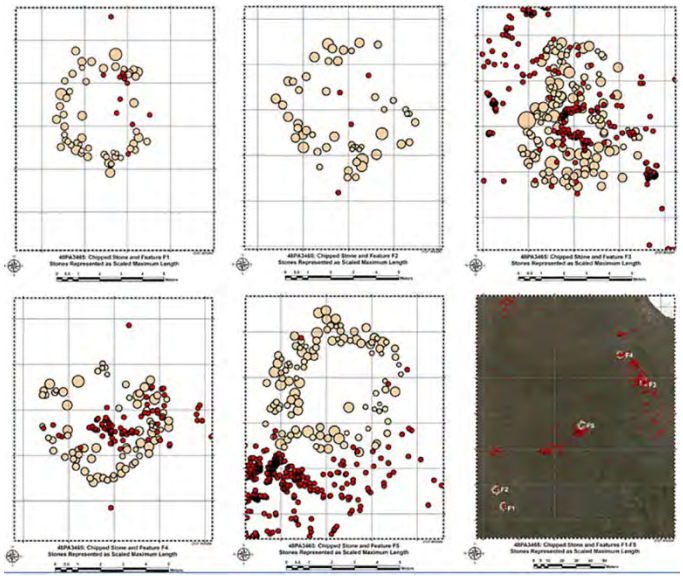


Figure 16. Examples of ROCK (and CODEd chipped stone) maps of stone circle features.

MWID (Numeric, 1 decimal place): record the dimension perpendicular to the MLEN of the stone in centimeters.

ORT (LONG AXIS, Numeric, 1 decimal place): use Brunton or other compass with magnetic declination set to record the long axis (the MLEN dimension) of the stone to nearest degree.

COMMENTS (Text, 30 characters)**:** Enter key additional information about the stone. Information that exceeds the character limit should be written into field notebook.

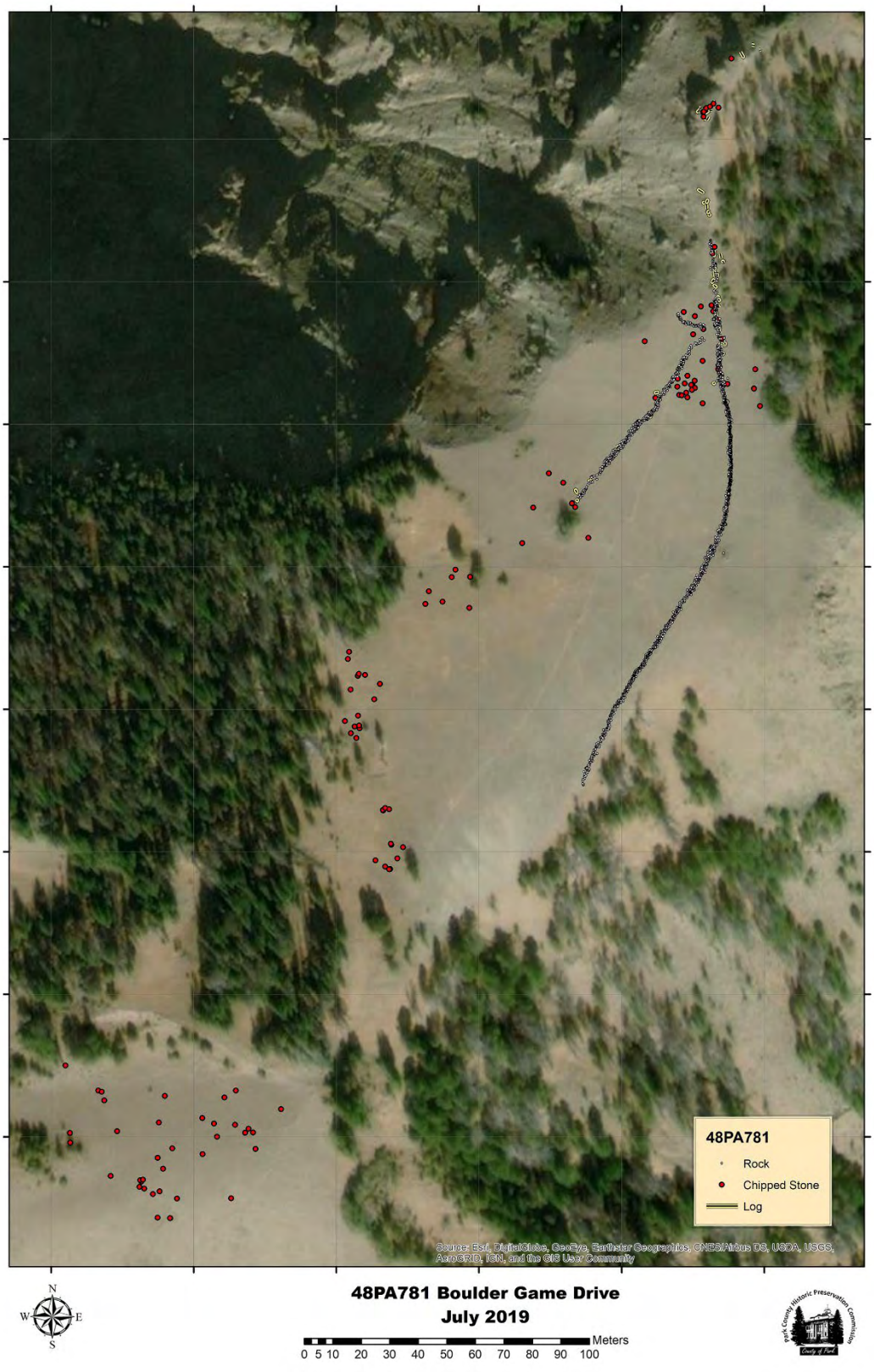


Figure17. Example of complex of stone walls and chipped stone recorded using CODE and ROCK features shows how the individual data points combine to create a more comprehensive overview.

LOG_S (LOG_STRUCTURE

Some of the rare, but complex and information rich features encountered are walls and other large constructions made primarily of wooden logs (and sometimes incorporating stone).

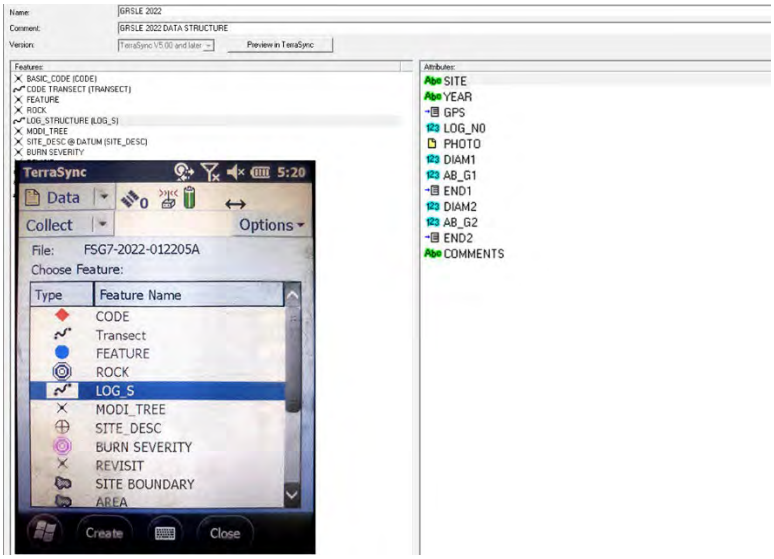


Figure 18. LOG_S data dictionary structure and TerraSync selection screen.

Our method of recording these has developed into an approach were locational and descriptive data a collected on each log component. The LOG_S line Feature data collection (Figure 18) provides information on log length, diameters, position in the structure), and modifications such as saw or ax cut ends.

Recording begins at the highest end of the an individual log, the with the tip of range pole place on top of log, the recording started, 10 positions recorded, recording PAUSED and data on that end entered (DIAM1, AB_G1, and END1). The range pole is then placed at the other end of the log, RESUME for 10 more readings, then PAUSED and DIAM2, AB_G2, and END2 observations recorded. While paused a photo may be taken, and additional comments added and then the reading for that log DONE and move on to the next. In complex structures, it may be necessary to use flagging tape or Sharpie marks to indicate which logs have been recorded and avoid duplication. Composite, individual log maps (Figure 19) provide structure documentation.

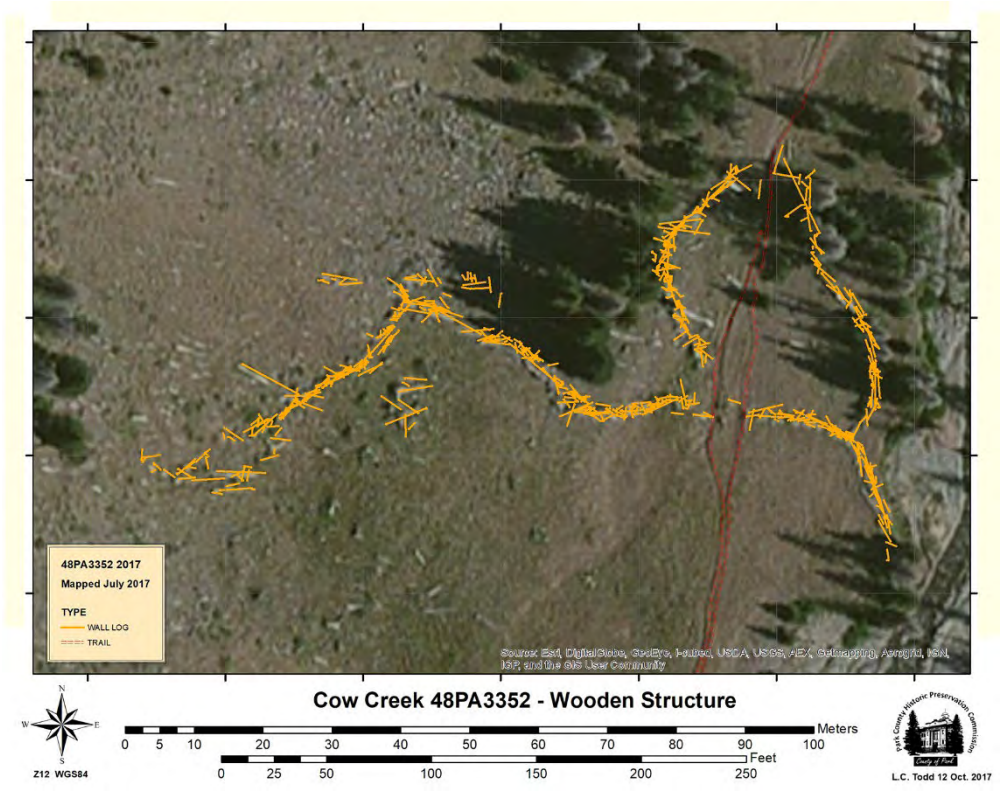


Figure 19. Example of results of mapping individual logs in a complex structure using LOG_S attributes.

LOG_S Attributes

Site (Text; 8 characters limit): This is either the Smithsonian site number or a temporary field number assigned to artifact clusters when mapping. The current Wyoming SHPO definition of a site is 15 artifacts or more separated by less than 30 meters. Check with your team leader for appropriate number.

YEAR (Text, 4 characters): The default value should be set to the project year, and should not have to enter, but can update if needed.

GPS (Menu): Each field season, each GPS/GNSS receiver is given a unique identifier code (e.g., GHX-1, or FS-7) and the attribute is included for every individual item recorded in the database on that instrument. There should be an identification label on the receiver.

LOG_NO (Numeric, 0 decimal places): Each log in a structure is assigned an individual number, which is used both for additional notes are needed, or if samples from dendrochronology or other analyses are taken. Within each structure, log number begins with 1 and continues until completed. If multiple teams are working simultaneously, each team will be assigned blocks of numbers to assure that duplicate numbers are not assigned. Figure 20 shows documentation of a complex structure with many overlapping logs.

PHOTO (File): Photo taken while GNSS readings paused. Take photos with photo scale and north arrow showing location of feature. Each image file will be linked to the individual log attributes. If needed, multiple photos should be taken (for example, if there are distinctive markings or damage to the log). Although in sequence after before the first recorded end, either or both ends of a log can be photographed with photo scale and north arrow.

DIAM1 (Numeric, 0 decimal places): diameter of the highest end of the log taken to nearest centimeter.

AB_G1 (Numeric, 0 decimal places): distance of the base of the log above the ground recorded to the nearest centimeter. A value of 0 given to logs on or embedded in the ground).

END1 (Menu): Description of the highest log end (Figure 21).

- CHP – chopped, ax damaged
- SAW – sawed
- BRK – broken
- UNK – unknown, when end not visible or severely decayed
- OTR – other, record in comments

DIAM2 (Numeric, 0 decimal places): diameter of the lowest end of the log taken to nearest centimeter.

AB_G2 (Numeric, 0 decimal places): distance of the base of the log above the ground recorded to the nearest centimeter. A value of 0 given to logs on or embedded in the ground).

END2 (Menu): Description of the lowest log end (Figure 21).

- CHP – chopped, ax damaged
- SAW – sawed
- BRK – broken
- UNK – unknown, when end not visible or severely decayed
- OTR – other, record in comments

COMMENTS (Text, 50 characters)**:** Enter key additional information about the log, such as if samples were taken. Information that exceeds the character limit should be written into field notebook (Figure 22).

Figure 20. Recording complex structure using LOG_S attribute group.

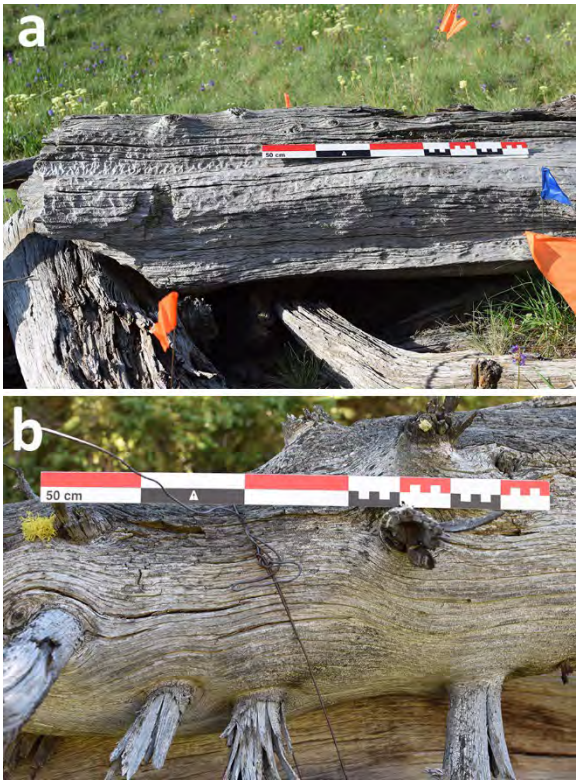


Figure 22. Examples of log attributes to be noted in comments: a) ax damage and b) wired.

Figure 21. Examples of END1 and END2 possible codes: a) BRK, b) CHP, c & d) SAW.

MODI_TREE

Largely through the work of Marcy Reiser[1], the project has began to more systematically record a variety of culturally modified trees (CMT) as part of our inventory and expanded with Abe Thompson's work with fire history[2]. The GNSS location data and data dictionary entry is minimally structured (only six attributes: Figure 23), with emphasis mostly on recording tree location and systematic numbering system to tie location to photographs, notes, and samples for dendrochronology. The research questions of Reiser and Thompson (Figure 24) required each to record specific attributes of the trees and their samples.

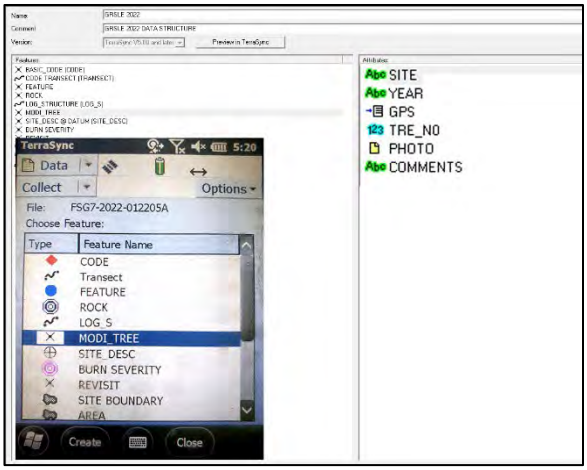


Figure 23. MODI_TREE data dictionary structure and TerraSync selection screen.

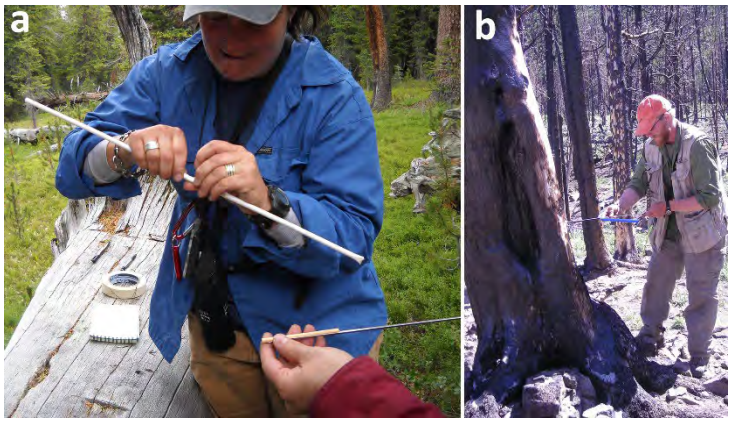


Figure 24. Recording modified trees, both a) culturally modified (Reiser 2009, 2010) and b) fire scarred (Thompson 2012).

Examples of some modified trees are shown in Figure 25. Although the diversity of modifications encountered merits expansion of our basic field data collection attributes for modified trees, the current location plus additional notes provides information for landscape scale studies.

MODI_TREE Attributes

Site (Text; 8 characters limit): This is either the Smithsonian site number or a temporary field number assigned to artifact clusters when mapping. The current Wyoming SHPO definition of a site is 15 artifacts or more separated by less than 30 meters. Check with your team leader for an appropriate number.

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[1] Reiser, M
2009 *A Preliminary Report on Tree-Ring Crossdating of the Stockade Site, 48PA256 and Nearby Peeled Trees in the Beartooth Mountains*. Submitted to GRSLE Report Submitted to Shoshone National Forest, Cody, Wyoming Fort Collins Colorado.
, 2010 Tree-Rings, Historic Documents, and Interpreting Past Landuse and Environments in the Upper Greybull River Watershed, Northwestern Wyoming. MA Anthropology, Colorado State University, Fort Collins.

[2] Thompson, A.K.
2012 Dead Trees Do Tell Tales: Investigations into the Role of Fires on Archaeological Site Location and Recognition in the Piney Creek Drainage of the Greater Yellowstone Ecosystem. M.A. Ibid.

YEAR (Text, 4 characters): The default value should be set to the project year, and should not have to enter, but can update if needed.

GPS (Menu): Each field season, each GPS/GNSS receiver is given a unique identifier code (e.g., GHX-1, or FS-7) and the attribute is included for every individual item recorded in the database on that instrument. There should be an identification label on the receiver.

TRE_NO (Numeric, 0 decimal places): Sequential number of modified tree.

PHOTO (File): Photo taken while GNSS readings paused. Take photos with photo scale and north arrow. Each image file will be linked to the individual tree attributes. If needed, multiple photos should be taken (for example, if there are distinctive markings or damage).

COMMENTS (Text, 50 characters)**:** Enter key additional information about the tree, such as if samples were taken. Information that exceeds the character limit should be written into field notebook (Figure 26).

Figure 25. Examples of modified trees; a, c, and d are clearly culturally modified (tool marks present), and b is likely (location, shape, and size).

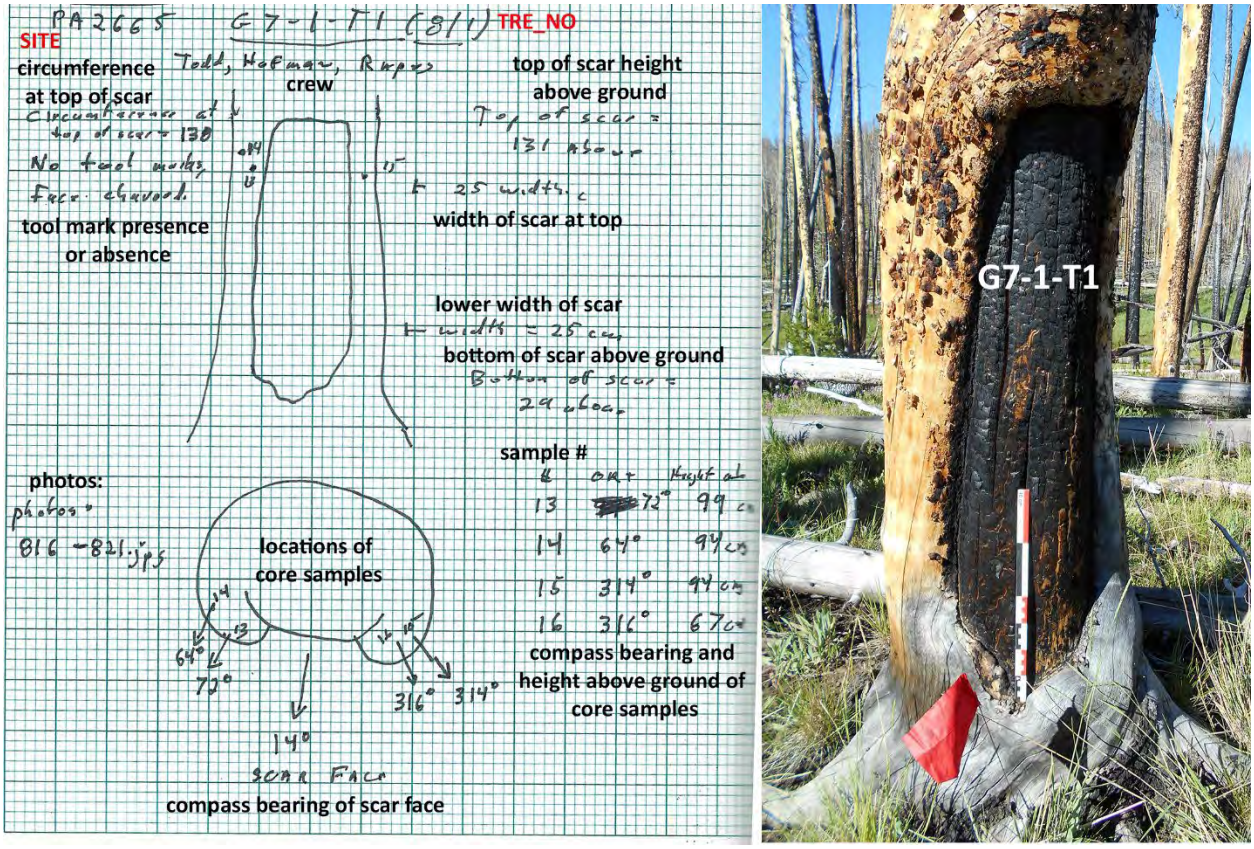


Figure 26. Field notes (original and translation) and image of modified tree with dendrochronological core samples taken.

SITE_DESC (SITE_DESC @ DATUM)

This point feature is used to collect basic information needed to complete a Wyoming SHPO Cultural Property Form. This is used to supplement and standardize basic descriptions of artifact clusters with >15 prehistoric items separated by less then 30 m. Since full site boundaries and properties are developed through post-field GIS work, the site description may be changed due to subsequent processing. If there is a permanent datum place in the cluster, complete the SITE_DESC on that marker. In most cases, no marker will be present, so selection a distinctive spot (large rock, trail marker cairn, etc.) near the center of the cluster for the SITE_DESC. This option has one of the largest numbers of any in the GRSLE dictionary entries (N = 36), but many are simple YES/NO responses that can be completed quickly on site. Others

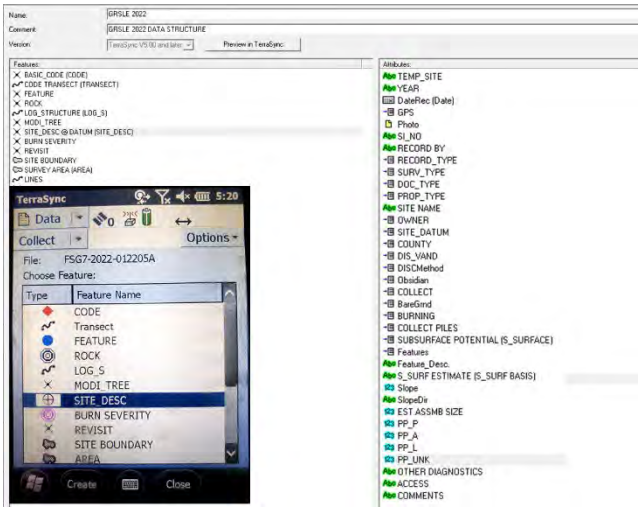


Figure 27. SITE_DESC data dictionary structure and TerraSync selection screen.

such as estimated assemblage size and number of projectile points, may have to await full documentation of the cluster, but can be added in a feature update (without location logging) later, and off-site. The information recorded in the Feature will aid preparing submission of to the WyoTrack system (Figure 28).

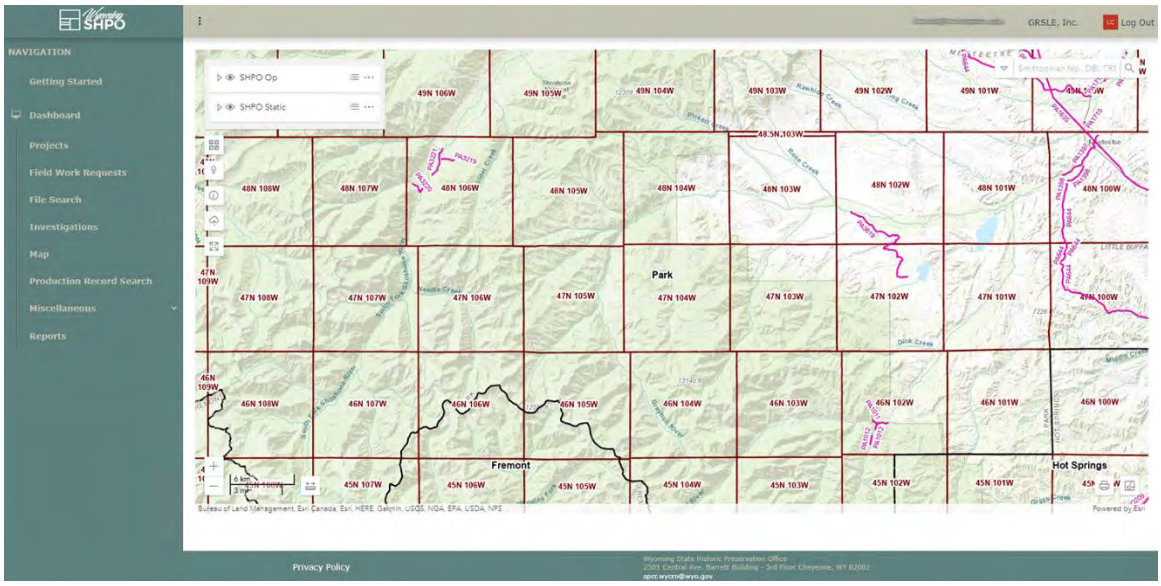


Figure 28. Data collected as SITE_DESC attributes aid in preparation and submission of cultural property forms to the Wyoming SHPO WyoTrack on-line system.

SITE_DESC Attributes

TEMP_SITE (Text, 10 characters): Temporary cluster designation. Each field season, and distinctive format for designating artifact clusters that may become official sites after GPS processing. For example, in 2022 clusters were identified with sequential numbers with a W22 (Warhouse 2022) prefix (e.g., W22-01, W22-02, etc.). Since multiple crews may be at different locations at the same time, the cluster sequence should always be checked with other teams (use the Garmin In-Reach text option) to be sure of the correct sequence number before moving to documentation.

YEAR (Text, 4 characters): The default value should be set to the project year, and should not have to enter, but can update if needed.

DateRec (Date): Date recorded: Month-Day-Year): Auto generated on feature creation. No need to enter.

GPS (Menu): Each field season, each GPS/GNSS receiver is given a unique identifier code (e.g., GHX-1, or FS-7) and the attribute is included for every individual item recorded in the database on that instrument. There should be an identification label on the receiver.

PHOTO (File): Use the Trimble Camera to take geo-referenced cardinal direction images (N=4) of the cluster. If there is a datum, take a photo of marker location from a position that will aid in future relocation of the datum. The multiple file names will all be associated with the TEMP_SITE data.

SI_NO (Text, 8 Characters). Smithsonian site number assigned by Wyoming SHPO. In cases where a previously recorded cluster is being revisited or data updated, you may have a SI number, which is entered here. Otherwise, leave blank.

RECORDED BY (Text, 10 Character). Official initials of person completing the data entry, the default value (LCT) can be changed as needed.

RECORD_TYPE (Menu): Type of recording (e.g., is this the first description when cluster is initially encountered, or has it been given attention before and already has a cultural property form).

- 1st – initial/first recording. This is the default value in our data dictionary.
- ReRe – a full re-recording of the location
- UpD – an update of an existing record
- COND – a condition assessment of previously recorded location
- LEAD – as much information as possible collected from a site lead (e.g., someone tells you about "tons of chips, points, and bones up where the trail crosses X-Creek".

SURV_TYPE (Menu): The type of inventory being undertaken when the locality was recognized.

- RECON – found in a non-systematic small team or individual reconnaissance of an area (default value).
- 1M – 1 meter transect spacing
- 5M – 5 meter transect spacing
- 10M – 10 meter transect spacing
- 30M – 30 meter transect spacing

DOV_TYPE (Menu): The standard practice is to complete documentation of 100% of surface artifacts in a cluster, but time or crew size constraints may require that less than full documentation is done.

- FULL – 100% surface artifact mapping and coding (default value)
- SAMPLE – a systematic sample (transects, grids, etc) is recorded. Describe in notes
- QUICK – locational data collected on all surface items, but not full descriptive attributes
- MIN – minimum documentation, cluster quickly visited, artifacts noted, but no systematic recording

PROP_TYPE (Menu): What type of cultural property is it – these attributes are from the SHPO cultural property form.

- PREHIST
- HIST
- BUILDING
- STRUC
- OBJECT
- DISTRICT
- LANDSCP
- LITH_LAND
- TCP

SITE NAME (Text, 25 characters): If a previously recorded site has a name, enter it here. This is usually left blank for new sites we record.

OWNER (Menu): Owner of the property on which the cluster is located. Most of the GRSLE work is done on the Shoshone National Forest.

- USFS – United States Forest Service (default value)
- BLM – Bureau of Land Management
- STATE – State of Wyoming
- PRIVATE – private landowner, record name and address in the notes

SITE_DATUM (Menu): Record the type of datum marker (Figure 29). If there is a datum, record its location both with **SITE_DESC** and with **SurveyControl**.

- NO – no datum marker left, the default value
- FS TAG – in the mid-late 2000's the project was given aluminum tags pre-stamped with official Shoshone National Forest property numbers, which were placed on site.
- REBAR – metal rebar stake
- PCV – plastic PCV pipe segment
- OTHER – some sites, where have done testing have other, more permanent datum markers, describe in notes.

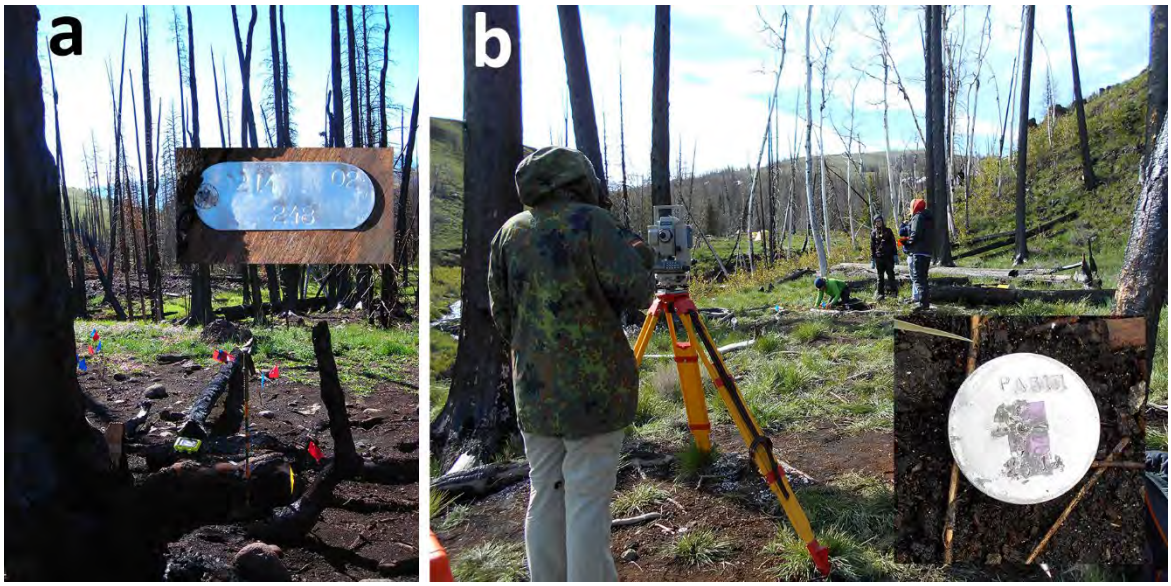


Figure 29. *Several types of datum markers: a) aluminum Shoshone Forest tag (FS TAG) nailed to burned tree and b) metal rebar (REBAR) driven into the ground with aluminum cap stamped with site Smithsonian number. In addition to recording location of a datum, also take a photo(s) or its setting to make future relocation easier – or in the case of the FS TAG (a), to confirm that it was later missing. In the case of the site shown with this FS TAG, it is assumed the tag was taken as one of the "trophies" when the site was looted soon after it was initially discovered but before it could be fully documented.*

COUNTY (Menu): Wyoming County where the site is located, only those counties where GRSLE usually works are listed.

- PA – Park County, default value
- FR – Fremont County
- HO – Hot Springs County

DIS_VAND (Menu): Disturbance or vandalism observed or inferred (for example, if collector piles present assume that artifacts were taken in addition to the spatial patterning of the items in the pile damaged) on the site.

- US – Unspecified, no clear indication one way or another (default value)
- None – no indication that of site damage of any sort
- Erosion – part of the site removed or repositioned
- Vand – vandalism, for example spray-painting names on a rock art panel
- Collect – artifact collection/theft
- Stuct_Dam – structural damage, such as removing the door of a cabin for fire wood
- ManExc – manual excavation, some sort of digging with shovels
- MecExs – mechanical excavation such a backhoe trench through the site

DISCMethod (Menu): Discovery method – how was the locality identified.

- EXP_Surf – exposed on the surface
- SubSurf – test excavation
- Construct – exposed during construction activities
- Doc Source – documentary indication of locality
- Informant – someone told you a site was there

Obsidian (Menu): Is there obsidian at the locality?

- Yes – obsidian present
- No – no obsidian observed

COLLECT (Menu): Were items/samples collected?

- No – nothing collected (default)
- Yes – some material collected

BareGrnd (Menu): The overall, locality estimate of percentage of bare ground, which impacts surface artifact visibility. Ranges from 0% such as heavily vegetated we meadow to 100%, which would be common soon after a fire.

- 0% - fully vegetation covered, no bare ground visible
- 1-25% - limited amount of bare ground
- 26-50% - moderate amount of bare ground
- 51-75% - good surface visibility with some vegetation cover
- 76-99% - very little vegetation cover, mostly bare surface
- 100% - no vegetation cover

BURNING (Menu): Even when within a burn perimeter, not all areas are burned. When doing post-fire work, record an estimate of the percentage of the locality that was directly impacted by the fire.

- 0 – no burning (the default)
- 1-25% - light, partial burning
- 26-50% - up to half the locality burned
- 51-75% - much of the locality burned
- 76-99% - mostly all burned
- 100% - fully burned

COLLECT PILES (Menu): Collector's piles are good indications that artifacts have been taken from the site, or a minimum, spatial patterning has been altered by selection and aggregation of usually larger items (Figure 30).

- NO – site surface documented fully and no piles observed
- YES – pile(s) observed and artifacts in them recorded (CODE with CONTEXT CLP)
- US – unspecified/unknown, default value. Use when have not give the area sufficient coverage to determine if piles present or not.

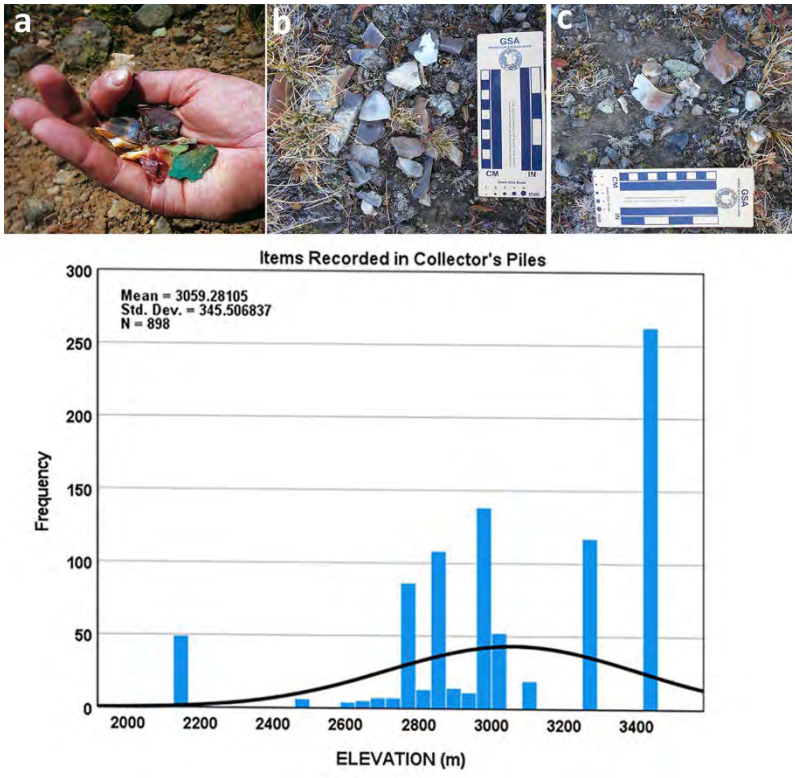


Figure 30. Collector's piles are one of the most frequent indicators of damage caused by artifact repositioning (destroying spatial integrity) and content (artifact theft) that occur when a) handful of things picked up are dumped in one spot (image from recent publication on ungulate migrations), and can occur even in high, remote (b & c) alpine settings (d, above 3000m).

S_SURFACE (Menu): Potential for subsurface/buried materials.

- NOT DETERMINED – no assessment made (default)
- NONE – located on rock or other area with no deposition (rare)
- 5-10 CM – shallow burial of smaller items possible. Given the dynamics of surface soils, when artifacts are visible on the ground surface there is always a potential of shallow burial of at least a few more.
- 10-30 CM – artifacts visible in rodent burrows or erosional rills are good indicators of slightly deeper buried materials.
- >30 CM – exposed artifacts in cutbanks or other deeper exposures or from test excavations can indicate that deeper buried materials are likely.

S_SURF BASIS (Text, 30 characters): Describe the way the subsurface potential estimate was made, for example "in situ debitage in cutbank"

FEATURES (Menu): Have features been noted within the locality – things like hearths, cairns, walls, etc.

- Yes – features present
- No – features not observed
-

FEAT_DESC (Text, 40 characters)**:** A brief narrative description of features observed, such as "7 stone circles" or "3 cairns and heath hearth ring." Provide further detain in notes and record each with FEATURE (page 15).

SLOPE (Numeric, 0 decimal places): Make an estimate of general surface slope of the locality – Brunton is handy here. If area combines multiple very different slope types, describe in notes. This in-field reading can often be replaced with GIS based slope values, which provide a more uniform, systematic overview of the polygon.

SlopDR (Text, 4 characters): Give a general direction the locality slope (e.g., N for north, SW for southwest, etc.).

EST ASSEMB SIZE (Numeric, no decimal places – maximum value of 20,000): If the locality has been given FULL documentation, provide a count of recorded items).

PP_P (Numeric, 0 decimal places): Number Paleoindian projectile points documented.

PP_A (Numeric, 0 decimal places): Number Archaic projectile points documented.

PP_L (Numeric, 0 decimal places): Number Late Prehistoric projectile points documented.

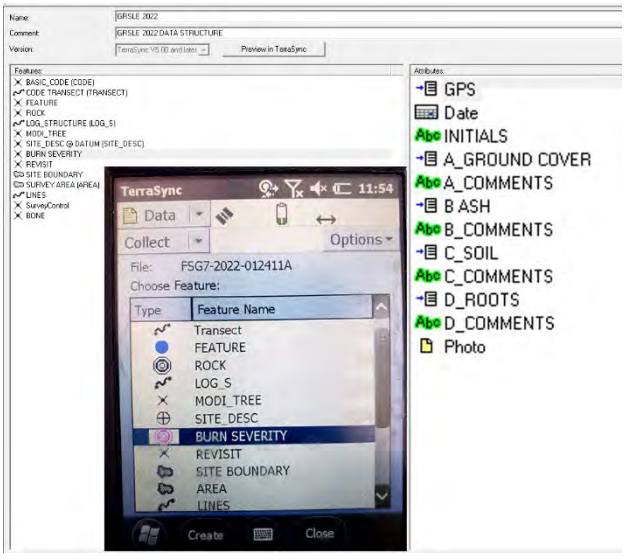
OTHER DIAGNOSTICS (Text, 40 characters): note any other temporally diagnostic items such as ceramics, glass trade beads, etc. Also note if materials collected for potential C14 dating.

ACCESS (Text, 50 characters): Brief 'how to find site' narrative. Use things like FS Trail numbers, stream names, trailhead, etc.

COMMENTS (Text, 50 characters): Other key comments, thoughts such as "great potential for testing" or "in danger of further looting"

BURN SEVERITY

Depending on when and where wildland fires occur on the Shoshone National Forest, the GRSLE team may take advantage of the increased post-burn surface visibility and the likelihood that looting and artifact theft will increase dramatically in order to conduct post-fire inventories. Since 2006, GRSLE teams have worked on the Little Venus, Norton Point, Hardluck (see Figure 31 for location, post-fire inventory area, and artifact densities for the Hardluck and Norton Point fires), and Hunter Peak fires (all on the Shoshone National Forest). In 2022, GRSLE team members aided the Wyoming State Archaeologist's Office in beginning to do post-fire work on the Mullen Fire near Laramie.



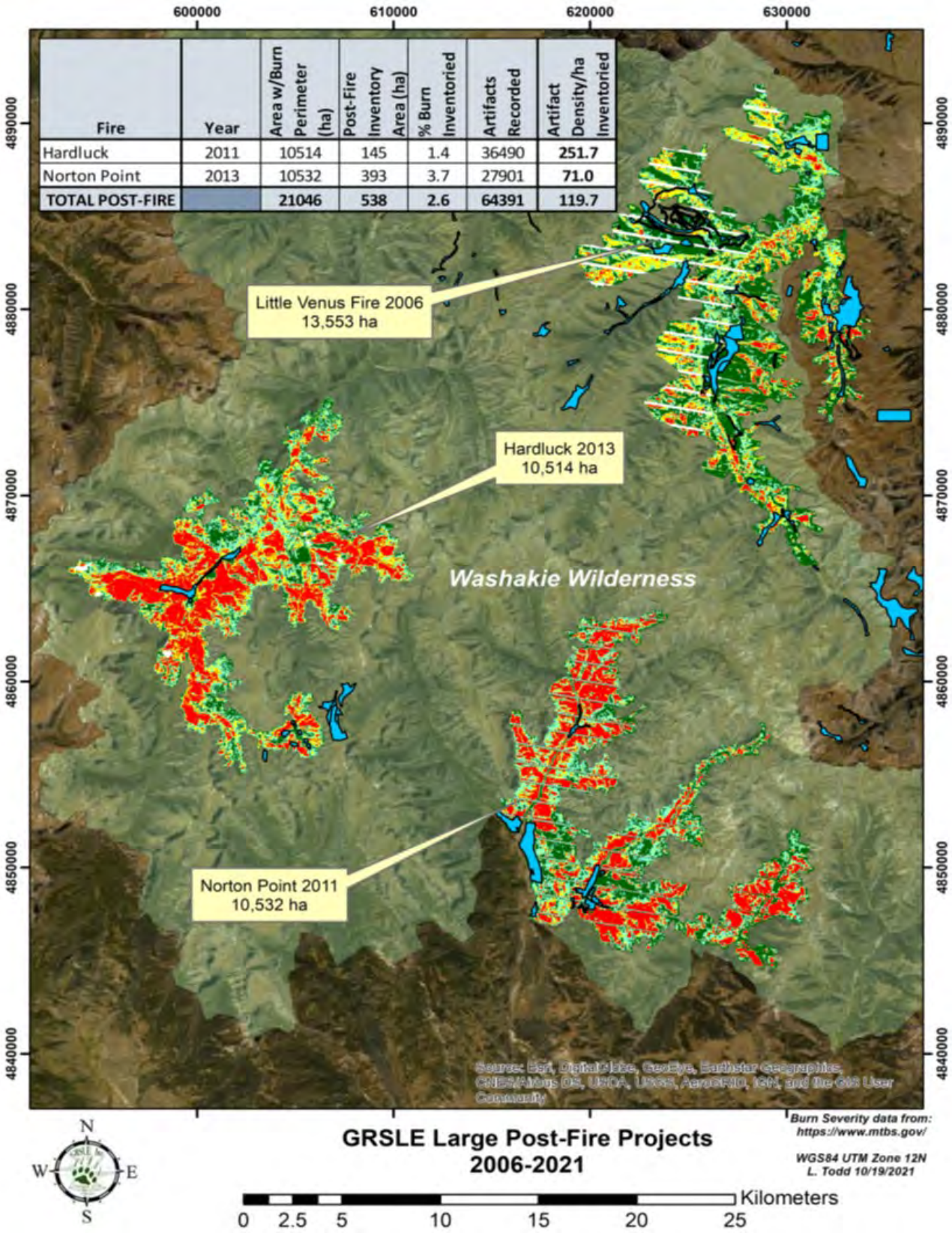


Figure 31. Locations and USDA Forest Service burn severity ratings of the Little Venus, Norton Point, and Hardluck fires along with summary data on GRSLE post-fire inventory at Norton Point and Hardluck (inventory blocks are the blue polygons).

As part of this work, we sometimes record point specific data on burn severity of areas with exposed artifacts. These data, along with the HEAT attribute in CODE provide information on the fire's impact on the archaeological record. For recording burn severity, we use the Rocky Mountain Research Station *Field Guide for Mapping Post-Fire Soil Burn Severity* (Figure 32; available for download at https://www.fs.usda.gov/research/treesearch/36236).

*Figure 32. **BURN SEVERITY** uses the Field Guide for Mapping Post-Fire Soil Burn Severity to record locality-specific burn fire intensity.*

Date (Date, Month-Day-Year): Date observations are made is recorded Auto generated.

INITIALS (Text, 5 characters): Enter the official initials of team member making the burn severity assessment.

A_GROUND_COVER (Menu: Figure 33):

- LOW – little or no change
- MOD – incomplete burning
- HIGH – almost no ground cover

We have used the burn severity mapping of artifact clusters both within small, scattered sample plots or as NESTED observations along TRANSECTS (see page 12) across clusters and also outside clusters where no artifacts have been observed to develop a more comprehensive overview of the fire's impact on our inventory areas and potential changes in artifact visibility.

BURN SEVERITY Attributes

GPS (Menu): Each field season, each GPS/GNSS receiver is given a unique identifier code (e.g., GHX-1, or FS-7) and the attribute is included for every individual item recorded in the database on that instrument. There should be an identification label on the receiver.

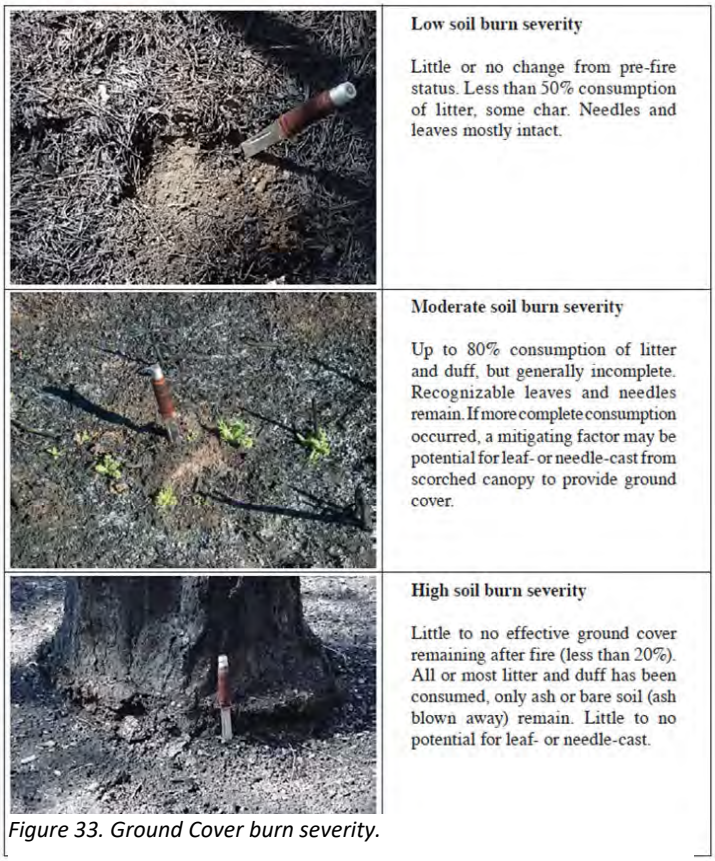


Figure 33. Ground Cover burn severity.

A_COMMENTS (Text 50 characters): comments about ground cover burn severity.

B ASH (Menu: Figure 34):

- LOW – blackened, but organic remains
- MOD – surface covered with black to gray ash
- HIGH – 3-6 cm gray or white ash layer.

B_COMMENTS (Text 50 characters): comments about ash color and depth burn severity.

C_SOIL (Menu): Soil Structure (Figure 35).

- LOW – structure unchanged
- MOD - Slightly or unaltered
- HIGH - Structure destroyed

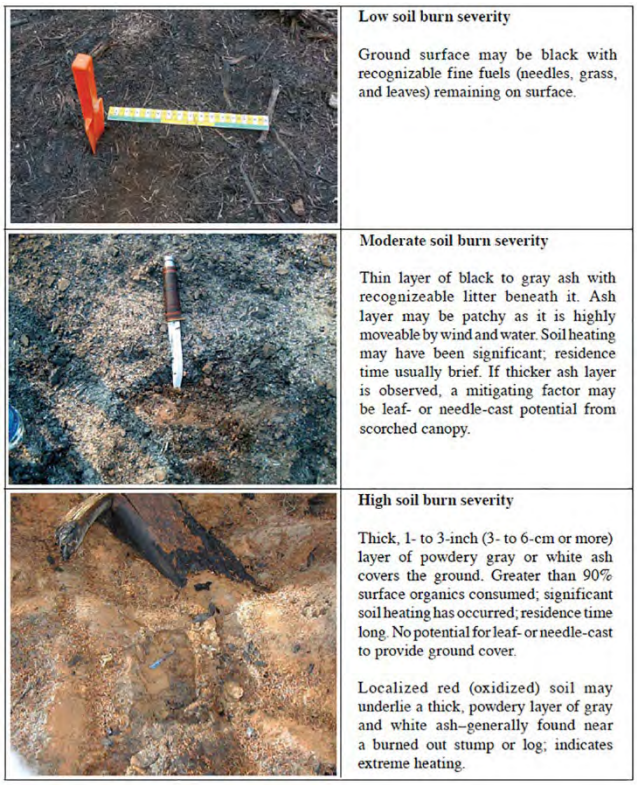


*Figure 34. Ash Color and depth **ASH** severity ranking.*

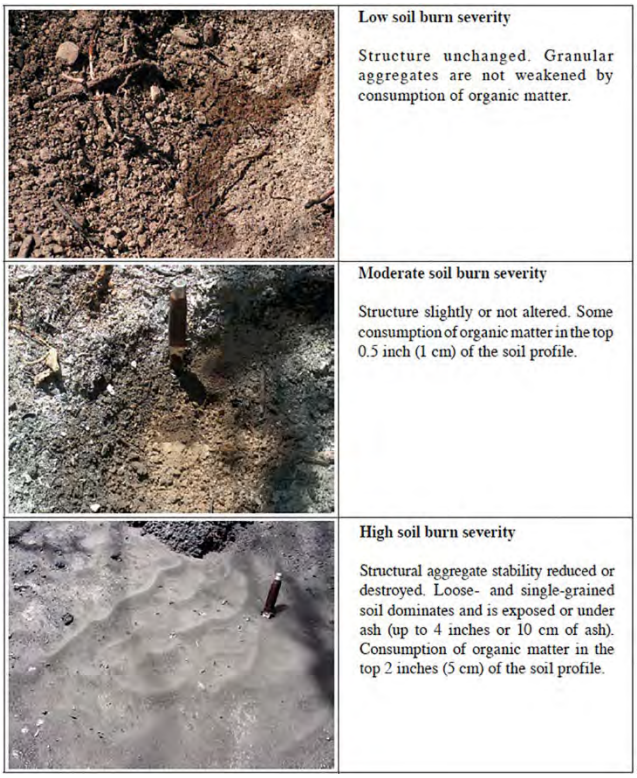


*Figure 35. Soil structure burn severity rankings **(C_SOIL)**.*

C_COMMENTS (Text 50 characters): comments about soil structure burn severity.

D_ROOTS (Menu): Plant root burn severity (Figure 36).

- LOW – fine roots intact
- MOD – fine roots near surface charred
- HIGH – Many/most fine roots burned or charred; some charring on large roots.

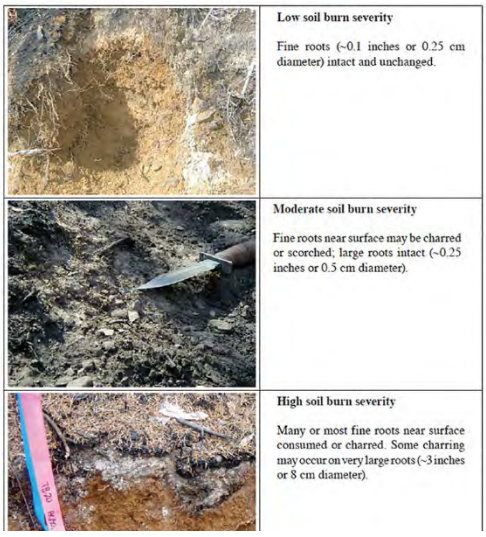


*Figure 36. Burn Severity on plant roots (**D_Roots**).*

REVISIT

This Feature (Figure 37) is rarely used, but helps insure that when potential to recreate a previous/older photograph exists (Figure 38), the spatial data about the re-take can be systematically collected. While the primary use is to replicate older images, it is also occasionally used to for site revisits.

*Figure 37. **REVISIT** data dictionary structure and TerraSync selection screen.*

REVISIT ATTRIBUTES

TYPE (Menu): Type of revisit, to assess site or re-take older photograph.

- SITE – site visit
- PHOTO – replicate photo (Figure 38)

GPS (Menu): Each field season, each GPS/GNSS receiver is given a unique identifier code (e.g., GHX-1, or FS-7) and the attribute is included for every individual item recorded in the database on that instrument. There should be an identification label on the receiver.

SITE (Text, 30 characters): Brief description of the image to be taken.

Date (Date, Month/Day/Years): Date photo is taken is auto-generated.

TIME (24 hour format): Auto-generated on creation.

PHOTO (file): Image recorded with the Trimble with geo-referencing. This is primarily just for basic documentation, and other images are taken with higher resolution camera to capture the final image. The PHOTO .jpg file is linked to the REVISIT.

BEARING (Numeric, 0 decimal places): Use Brunton (with declination set, true north) to record the direction of the image.

COMMENTS (Text, 50 characters): Other observations about the image location.

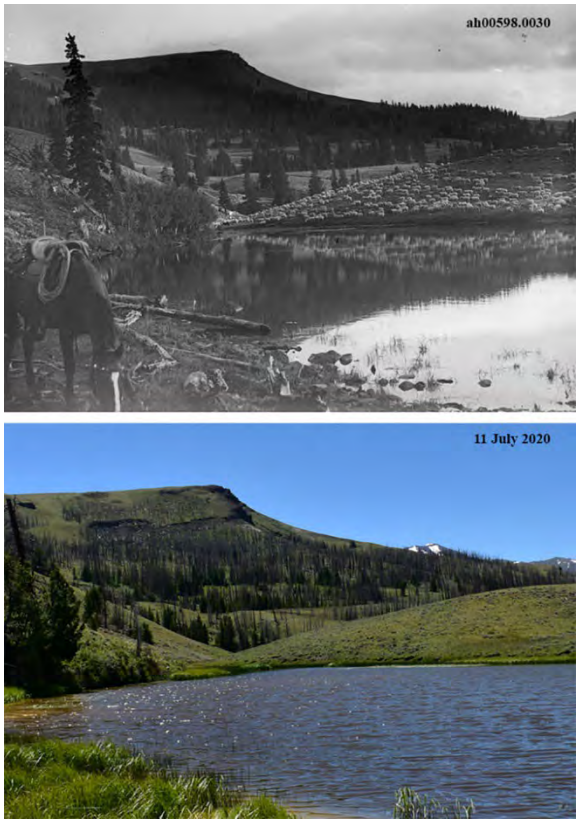


Figure 38. Example of a photo setting re-location: upper Charles Belden photo from 1930s and lower photo taken by GRSLE. The REVISIT feature records specific information on where the new image was taken.

SITE BOUNDARY

In general, site boundaries for GIS polygons are generated post-field based on mapped artifact distributions and this data dictionary feature is seldom used (Figure 39). Occasionally, especially when there is not enough time to fully document an artifact cluster, the SITE BOUNDARY may be used to provide an area record of the best estimate of likely cluster boundaries. The BOUNDARY is also useful when it is clear that an artifact scatter crosses geomorphological gradients that could reasonably be used to make a site boundary distinction that differs from standard 30m separation. For example if artifacts were on multiple stream terraces, or on opposite banks of a stream, it is prudent to have a record.

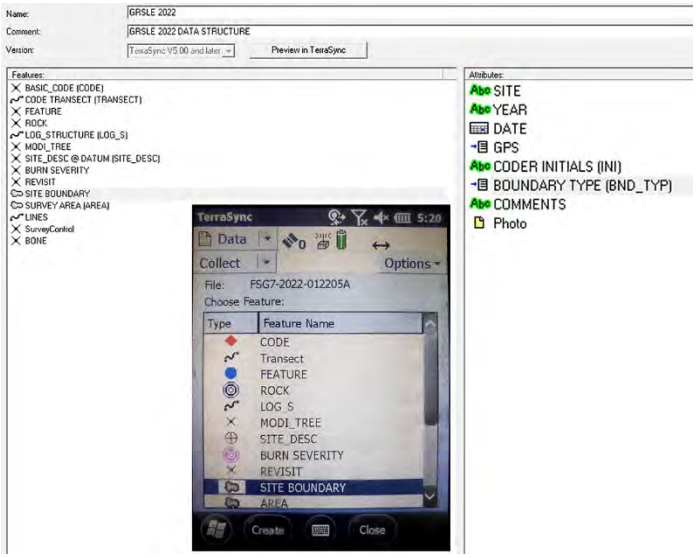


*Figure 39. **SITE BOUNDARY** data dictionary structure and TerraSync selection screen.*

Another use of the BOUNDARY feature is to record margins of specific types of landscape features, for examples the extent of an ice patch (Figure 40), or the size of a seasonal pond. These and other types of boundary being documented are indicated in the **BND_TYPE** attribute.

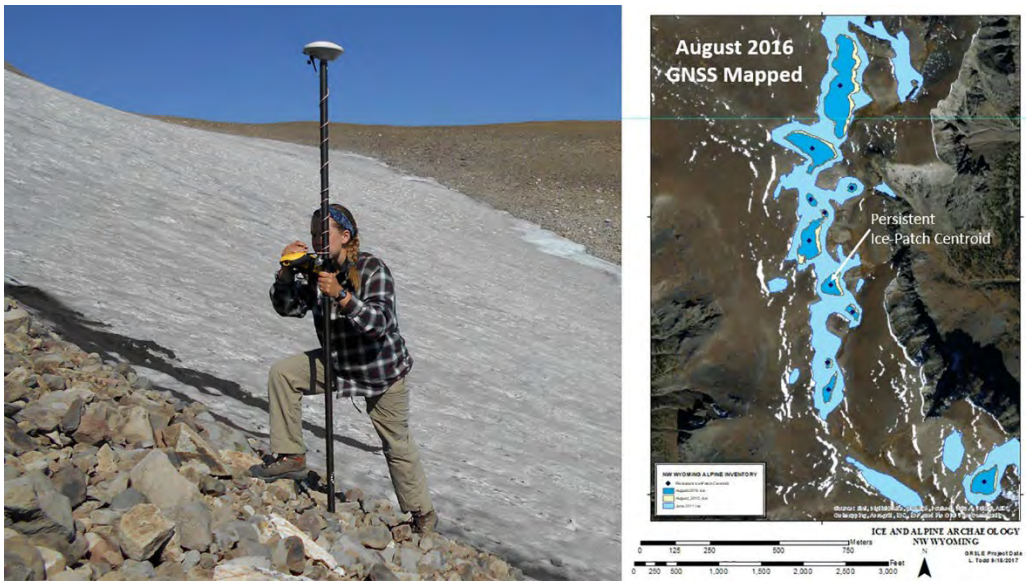


Figure 40. Using SITE BOUNDARY to record ice patch margins.

SITE BOUNDARY ATTRIBUTES

Site (Text; 8 characters limit): This is either the Smithsonian site number or a temporary field number assigned to artifact clusters when mapping. The current Wyoming SHPO definition of a site is 15 artifacts or more separated by less than 30 meters. Check with your team leader for an appropriate number.

YEAR (Text, 4 characters): The default value should be set to the project year, and should not have to enter, but can update if needed.

Date (Date, Month/Day/Years): Date the area is documented. This is auto-generated.

GPS (Menu): Each field season, each GPS/GNSS receiver is given a unique identifier code (e.g., GHX-1, or FS-7) and the attribute is included for every individual item recorded in the database on that instrument. There should be an identification label on the receiver.

INI (Text, 5 characters): Enter the official initials of team member walking the boundary.

BND_TYP (Menu): Record what type of area is being delineated by the boundary

- FLAGGED – extent of flagged artifacts
- GEOMORPH – distinct geomorphological areas
- ESTIMATED ARTIFACT SCATTER – best assessment of artifact scatter when full flagging and documentation not possible
- ICE PATCH – edges of high elevation ice patch
- POND – edge of water at seasonal pond
- OTHER – note what is being recorded in the comments

PHOTO (file): you may PAUSE and take photos at several points along the boundary path to capture salient geo-referenced views.

AREA – SURVEY AREA

This is seldom used in the GRSLE project since inventory block areas are currently recorded by merging individual GPS track-log paths for each member of the survey team. Before all members had units with easy to access track-log data, a boundary around the edges of an inventory was walked (Figure 41).

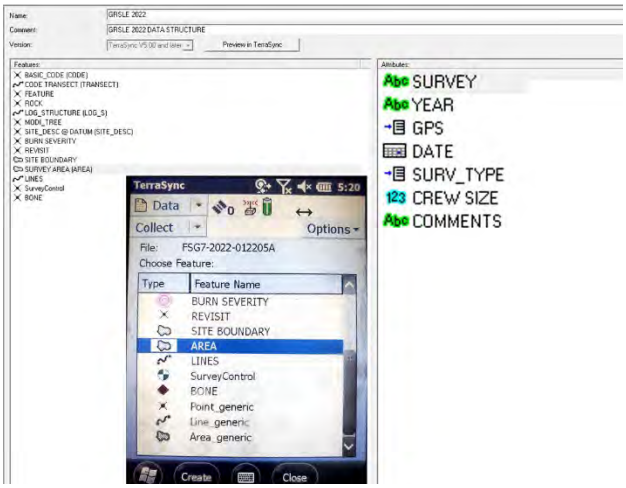


Figure 41. AREA (SURVEY AREA) data dictionary structure and TerraSync selection screen.

AREA ATTRIBUTES

SURVEY (Text, 30 characters): Each survey block is assigned an unique descriptor, consult team leader and enter block designation.

YEAR (Text, 4 characters): The default value should be set to the project year, and should not have to enter, but can update if needed.

GPS (Menu): Each field season, each GPS/GNSS receiver is given a unique identifier code (e.g., GHX-1, or FS-7) and the attribute is included for every individual item recorded in the database on that instrument. There should be an identification label on the receiver.

Date (Date, Month/Day/Years): Date the area is documented. This is auto-generated.

SURV_TYPE (Menu): Describes the transect spacing used to cover the area. The type of inventory being undertaken when the locality was recognized.

- RECON – found in a non-systematic small team or individual reconnaissance of an area (default value).
- 1M – 1 meter transect spacing
- 5M – 5 meter transect spacing
- 10M – 10 meter transect spacing
- 30M – 30 meter transect spacing
- OTHER – describe in notes and comments

CREW SIZE (Numeric, 0 decimal places): Enter the total number of individual crew members in the survey line (e.g., Figure 42, 14 person, 5m transect spacing survey).

Figure 42. Block survey line GRSLE 2006 - the edges of the inventory block are marked with pin flags and when block completed, AREA is used to connect-the-pin-flag-dots to have an inventory boundary polygon.

LINES

Field documentation often requires collection of information on a variety of linear features like trails of roads. For the LINES (Figure 43), a record is created at the start point, PAUSED after 5 readings logged and the basic descriptive information entered and a photograph PHOTO is taken along the linear feature. Once the information entered, the logging is resumed and the line is walked. Logging should be paused and then resumed in places where it is not possible to follow the linear feature directly – for example if there is a big log across a trail that you need to walk around. Use the NEXT option to record items associated with the line, such as a trail marker cairn located next to a trail you are recording.

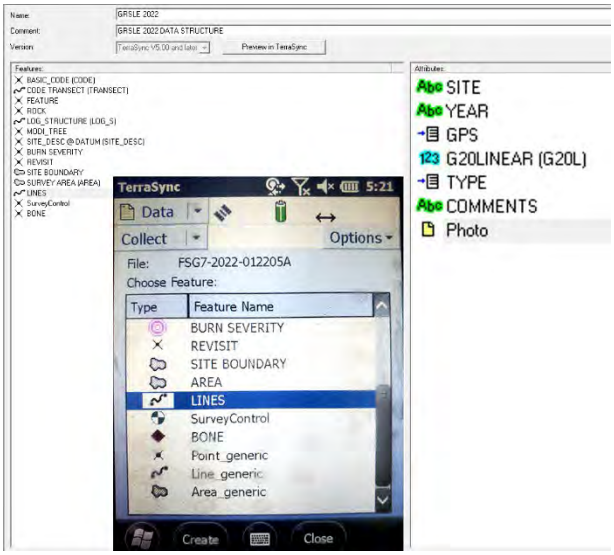


Figure 43. LINES data dictionary structure and TerraSync selection screen.

LINES ATTRIBUTES

SITE (Text; 8 characters limit): This is either the Smithsonian site number or a temporary field number assigned to artifact clusters when mapping. The current Wyoming SHPO definition of a site is 15 artifacts or more separated by less than 30 meters. Check with your team leader for an appropriate number. The SITE attribute would be used in cases such as when a Forest Trail passes though or next to an artifact cluster and the relationship needs to be recorded.

YEAR (Text, 4 characters): The default value should be set to the project year, and should not have to enter, but can update if needed.

GPS (Menu): Each field season, each GPS/GNSS receiver is given a unique identifier code (e.g., GHX-1, or FS-7) and the attribute is included for every individual item recorded in the database on that instrument. There should be an identification label on the receiver.

G*NN*LINEAR (G*NN*L) (Numeric): The dictionary attribute heading is updated each field season with NN referring to the last two digits of year (e.g., G22L for the 2022 field season). Begins at 1 and automatically increases from there within each datafile. For each receiver (code GPS), there is a single sequence of linear feature numbers each year. The numbering system resets to 1 each time a new data file is started so the last number used each day needs to be recorded in field notes (or can be checked from the day before's file) to be sure that the next number is used as starting number for the day's mapping thus avoiding potential for duplicate numbers in the season's item number sequence.

TYPE (Menu): Records what basic type of linear feature being recorded. The most common types have individual attribute codes, but if you encounter a line of another sort code at OTH (other) and describe in COMMENTS.

- TRAIL – can be either an official Forest Service trail or an informal trail or game trail, describe in comments
- TERRACE EDGE/CUTBANK – if there is a clear erosional line, use this attribute to describe
- STREAM – note in comments whether the line represents stream edge or thalweg
- WALL – could be a stone or wooden wall, describe in comments and notes
- FENCE – if there is a fence in or near an artifact cluster, use this code to record
- 2TRK – 2-track road. Walk the linear logging along the center-line of the road
- IMPROVED ROAD – a graded, gravel, or paved road. Log center-line.
- OTH – Other, use for linear features not listed above and describe in comments

COMMENTS (text, 30 characters): Concise descriptive notes. If need provide more complete comments in field notebook.

PHOTO (File): Photo taken while GNSS readings paused. Take at least one at beginning of the linear feature and at end. May also take other photos during the line (such as distinctive point such as stream crossing). Each image file will be linked to the LINE attribute.

SurveyControl

During field investigation, there are times when individual control points for mapping or establishing grid systems are needed. In some cases, this may be a site datum (see Figure 29) and in others it may be the corner of a text unit, or a sample block area. The SurveyControl point feature is used to document such control markers (Figure 44).

SurveyControl ATTRIBUTES

SITE (Text; 8 characters limit): This is either the Smithsonian site number or a temporary field number assigned to artifact clusters when mapping.

YEAR (Text, 4 characters): The default value should be set to the project year, and should not have to enter, but can update if needed.

GPS (Menu): Each field season, each GPS/GNSS receiver is given a unique identifier code (e.g., GHX-1, or FS-7) and the attribute is included for every individual item recorded in the database on that instrument. There should be an identification label on the receiver.

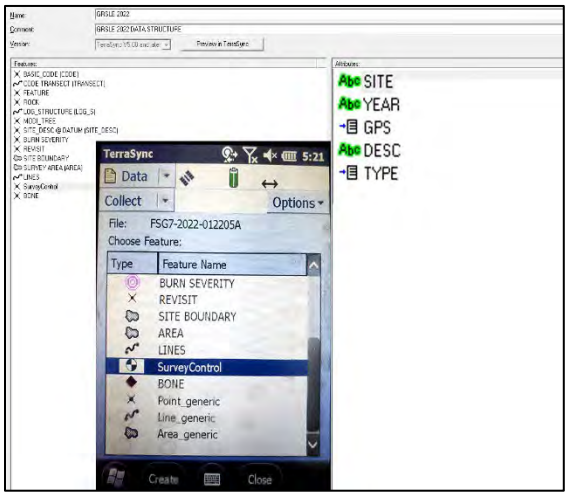


Figure 44. ***SurveyControl*** *data dictionary structure and TerraSync selection screen.*

DESC (Text, 30 characters). Notes on what the marker is (rebar, nail, etc.)

TYPE (Menu): Describes the type of spatial control point being recorded.

- DATUM – a site datum marker (see Figure 44 for examples)
- UNIT CORNER – corner of a sample block, excavation, or test unit (describe in DESC, for example "SW corner of test test"
- SURVEY BOUNDARY – beginning or endpoints, or corners of survey block areas. Describe in DESC.
- TRANSECT MARKER – survey blocks may be delineated by crew members placing flags at key points along a transect. Describe in DESC.

Thanks for helping GRSLE
Assemble a unique
Artifact-based landscape scale data set!

Your time, effort, and tenacity in mapping and coding are essential and greatly appreciated.