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A BLM PALEONTOLOGICAL SITE STEWARDSHIP PROGRAM FOR WASHINGTON COUNTY, SOUTHWESTERN UTAH: THE BEGINNING OF A NATIONWIDE PROGRAM?

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Abstract—Archeological Site Stewardship Programs, sponsored by federal agencies like the U.S. Department of the Interior's Bureau of Land Management (BLM), are well established in the western United States. These Site Steward Programs are designed to utilize volunteers to monitor significant archaeological sites for signs of vandalism, the looting of artifacts, natural impacts, such as erosion and general public activities at each locality. The St. George [Utah] Field Office of BLM is initiating what we believe to be the first Paleontological Site Stewardship Program (PSSP) in the nation to monitor paleontological and will focus on localities on public domain lands in Washington County, Utah. The overall goal of this volunteer program is to monitor significant and irreplaceable fossil localities for signs of erosion, vandalism, theft and general public activities in a similar manner to the Archaeological Site Stewardship Program. Other uses for a PSSP could include utilizing volunteers to aid professionals in the discovery and recording of new localities, preservation and conservation of existing sites and increasing public awareness regarding the preservation of fossil resources.

INTRODUCTION

The discovery of an amazing dinosaur track site within St. George city limits by Dr. Sheldon Johnson in February 2000 resulted in the 1st phase of museum construction over the original locality within Washington County, Utah (Fig. 1). The site has gained worldwide recognition by both researchers and the general public (Hayden, 2000; Kirkland et al., 2002). Since the site's discovery and construction of the on-site museum, now called the St. George Dinosaur Discovery Site at Johnson Farm (SGDS) (Fig. 2A), public interest in the paleontological resources of southwestern Utah has increased dramatically. This has resulted in an increase in volunteers and a rise in the membership of the Southwest Chapter of Utah Friends of Paleontology (UFOP), which is now the largest chapter in the state.

Increased excitement over the SGDS has contributed considerably to the discovery of many new track and body fossil sites in Washington County and surrounding areas (e.g. Iron County, Utah; Clark and Lincoln counties, Nevada; northwestern Utah, etc). These localities are being reported from BLM, Dixie National Forest, the Red Cliffs Desert Reserve, other federal lands, state parks, Utah State Institutional Trust Lands and private properties. All of these new fossil localities are reported to the SGDS, BLM, other landowners and to the State Paleontologist's Office at the Utah Geological Survey (UGS) in Salt Lake City. However, the long-term protection of significant sites, discovered or undiscovered, is of great concern, particularly as Washington County is the fifth fastest growing county in the United States.

THE PROBLEMS

Fossil Theft

Fossil collectors are noticeably on the increase at and around the SGDS since its discovery. The presence of fossil thefts is more noticeable within the area, and some thefts on federal lands have been reported to the BLM and UGS. Additionally, fossil tracks from the area often appear for sale on e-Bay, where, unfortunately, the provenance of these tracks is nearly impossible to discern. Although many examples of fossil thefts are known from throughout the nation and around the world, to keep in focus, we will briefly mention three recent examples of fossil theft in southwestern Utah:

(1) Stolen bones from a metoposaur locality (Figs. 2B-C) in the Petrified Forest Formation, Chinle Group on Hurricane Mesa, along with the disappearance of many fossil trees trunks in the same area (Fig. 2D). This occurred within a three-month period between March and June 2003. This site was discovered by ARCM on June 11, 2002 and reported as a theft by the Yale-Peabody Museum and ARCM in 2003 to the BLM Regional Paleontologist.

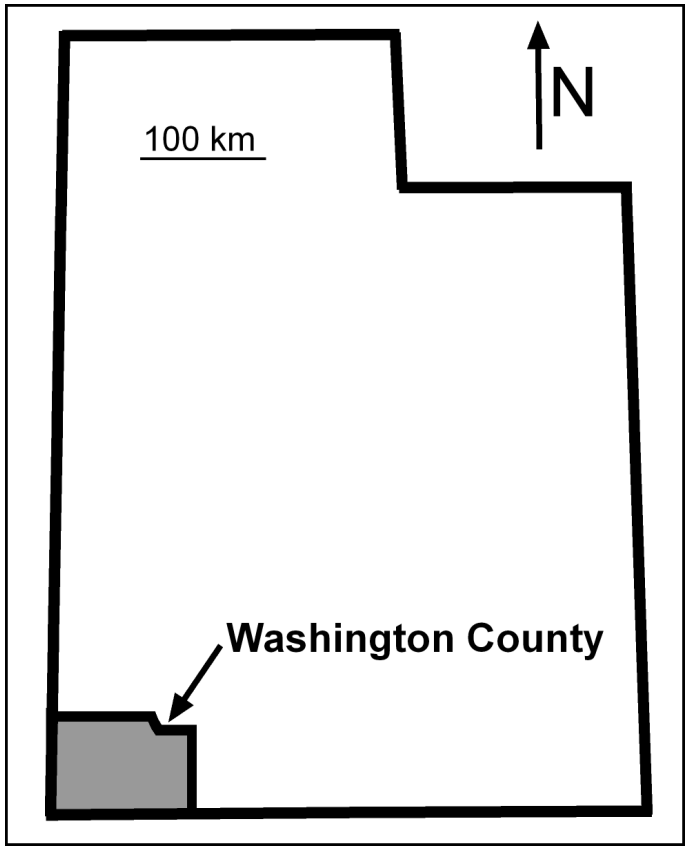

FIGURE 1. Map of Utah showing the location of Washington County.

(2) A large dinosaur track was stolen from "The Spectrum Tracksite" on Utah State Institutional Trust Land (SITLA) near Washington, Utah. A large block from an edge portion of the tracksite was pulled out by someone using an ATV and dragged away from the site. SITLA plans on preserving this site, with development of the surrounding property.

(3) An, as yet, undescribed tracksite north of Kanab, Kane County, Utah located in the Kayenta Formation has been victim of several dinosaur track thefts in recent years (A. Titus, personal commun., 2003). As with most *in situ* track thefts, the person(s) responsible chiseled or saw-cut around the footprints, then splits it out from below. The result of this kind of theft leaves behind a circular hole often in the middle of a pre-existing trackway. A well-documented example of this can be seen at the famous Dinosaur Ridge Tracksite near Denver, Colorado (Lockley, 2001) (Fig. 2E).

By making the public aware of an existing PSSP in Washington County and promoting an awareness that Site Stewards are watching significant fossil localities should act as a deterrent and hopefully reduce further fossil thefts in the county.

A common problem is unintentional removal of significant fossils from federal, state and even private lands without owner permission. On several occasions, dinosaur tracks and fossil bones have been brought into the SGDS museum for identification; however, these persons claim they were not aware that a permit is required to legally collect vertebrate fossils on public lands. At the SGDS, we try to inform the public about what they should and should not do without discouraging or intimidating them. Public awareness is definitely beneficial and can be of considerable assistance in identifying new localities.

Site Vandalism

Graffiti

Like fossil theft from federal lands vandalism, in the form of graffiti, is on the increase in Washington County and surrounding areas. This is also a very common problem at archaeological sites, particularly highly visible aboriginal rock art sites (petroglyphs and pictographs) (Fig.3A). One such case has recently been reported from west of Ivins, Utah in the Santa Clara River Reserve, where vandalism to a rock art site on BLM-administered lands was successfully prosecuted, resulting in convictions and the levying of fines and restitution costs. Ironically, this very same petroglyph site is adjacent to a recently studied tracksite in the top of the Shinarump Formation of the Chinle Group (Lockley and Milner, in press).

Another recent example involves the vandalism of an important archaeological site associated with a well-known Kayenta Formation theropod dinosaur tracksite in Grand Staircase-Escalante National Monument (GSENM). Here Native Americans painted pictures of the nearby *Eubrontes* tracks on a rock wall. The vandalism took the form of initials carved into the rock wall next to the pictographs (A. Titus, personal commun., 2005). The nearby tracksite, though never properly described, has been briefly mention in publication by Hamblin and Foster (2000), featured on the cover of the UGS Survey Notes (anonymous, 2001), and graces the poster promoting Utah Prehistory Week, 2006.

Plaster Casts

Another kind of vandalism can happen either intentionally or accidentally. A common problem associated with dinosaur tracksites occurs when members of the public attempt to replicate tracks by making plaster casts of them. Some people are aware that it is against the law to do this on federal (U.S. Department of the Interior and Bureau of Land Management, 2002) and state lands. A majority of the public is unaware of any laws pertaining to this type of activity. Trying to replicate tracks by directly applying plaster to them can cause extensive damage. Here are a couple of recent examples from southwestern Utah:

(1) A well-known dinosaur tracksite in the Late Cretaceous Iron Springs Formation on the east side of Parowan Gap in Iron County preserves many tracks (Milner et al., in press). One particular ornithopod track often visited by the public, receives at least one attempt at replicating it with plaster each year! Damage to the specimen is becoming more and more obvious (Fig. 3B).

(2) A second plaster cast was discovered within a *Eubrontes* track in November 2005 by ARCM and Dr. Martin Lockley (Dino saur Tracks Museum, University of Colorado at Denver) while researching an Early Jurassic tracksite near Washington, Utah (Figs. 3C-E). Before the discovery of the plaster-filled foot prints, we noticed the track had been intentionally covered with sand after the person(s) were unable to remove the plas ter from the track. Obvious chisel marks can be seen in the plaster, produced in an attempt to extract the plaster cast from the track (Fig. 3C). Lockley, a qualified professional, removed the plaster from the track (Figs. 3D-E). Despite care taken during the removal of the plaster obvious damage to the speci men occurred from the plaster binding to the track surface and infilling pre-existing cracks. Unfortunately, not all of the plaster could be completely removed from the trace fossil, defacing the track (Fig. 3E). This is an excellent example of a criminal action of vandalism to a paleontological site.

Note that latex and silicon molds of tracks can be made safely without damage to the tracks and can help fully document and preservation tracks and tracksites that could eventually be lost to natural erosion and/or vandalism. However, *in situ* track replication should only be attempted by a qualified researcher under permit.

Privatization of Lands, Rapid Development, Population Growth and Tourism

St. George (Figs. 4A-B) was the second fastest growing city, per capita, in the USA in 2005 (Mackun, 2005), and a recent survey shows Washington County is the 5th largest growing county in United States per capita (Canham, 2006). The demand for lands suitable for development has increased dramatically in the past decade. Utah State Institutional Trust Lands within the St. George Basin are being sold off and developed for residential and commercial purposes. Legislation is also poised to be introduced in this Congressional session that could require the sale or transfer of as much as 90,000 acres of BLM-administered public land to the county for future development ("Washington County Public Lands Act"). If legislatively approved federal land disposals do not require compliance with federal environmental protection or heritage preservation laws, such as the National Environmental Policy Act or the National Historic Preservation Act, significant archeological, biological and plaeontological resources and values could be destroyed by subsequent development.

Enormous areas of previously unexplored vertebrate fossil-bearing formations are present in Washington County. Untold scientific and interpretative opportunities will be lost to development, possibly with no scientific documentation or any efforts at salvage or preservation. Mesozoic stratigraphy including the Triassic Moenkopi Formation and Chinle Group; Early Jurassic Moenave, Kayenta and Navajo formations; and Late Cretaceous Iron Springs Formation have all produced vertebrate body fossil sites and/or significant tracksites. It is extremely important to locate, document, and preserve fossils from these undiscovered localities before they are lost forever!

Population growth and increasing tourism to the region also place significant fossil localities at greater risk of theft or vandalism. Federal agencies, like BLM, lack adequate staff and law enforcement rangers to effectively monitor remote fossil sites on public lands. Volunteer site stewards can greatly increase the capabilities of the agencies to monitor

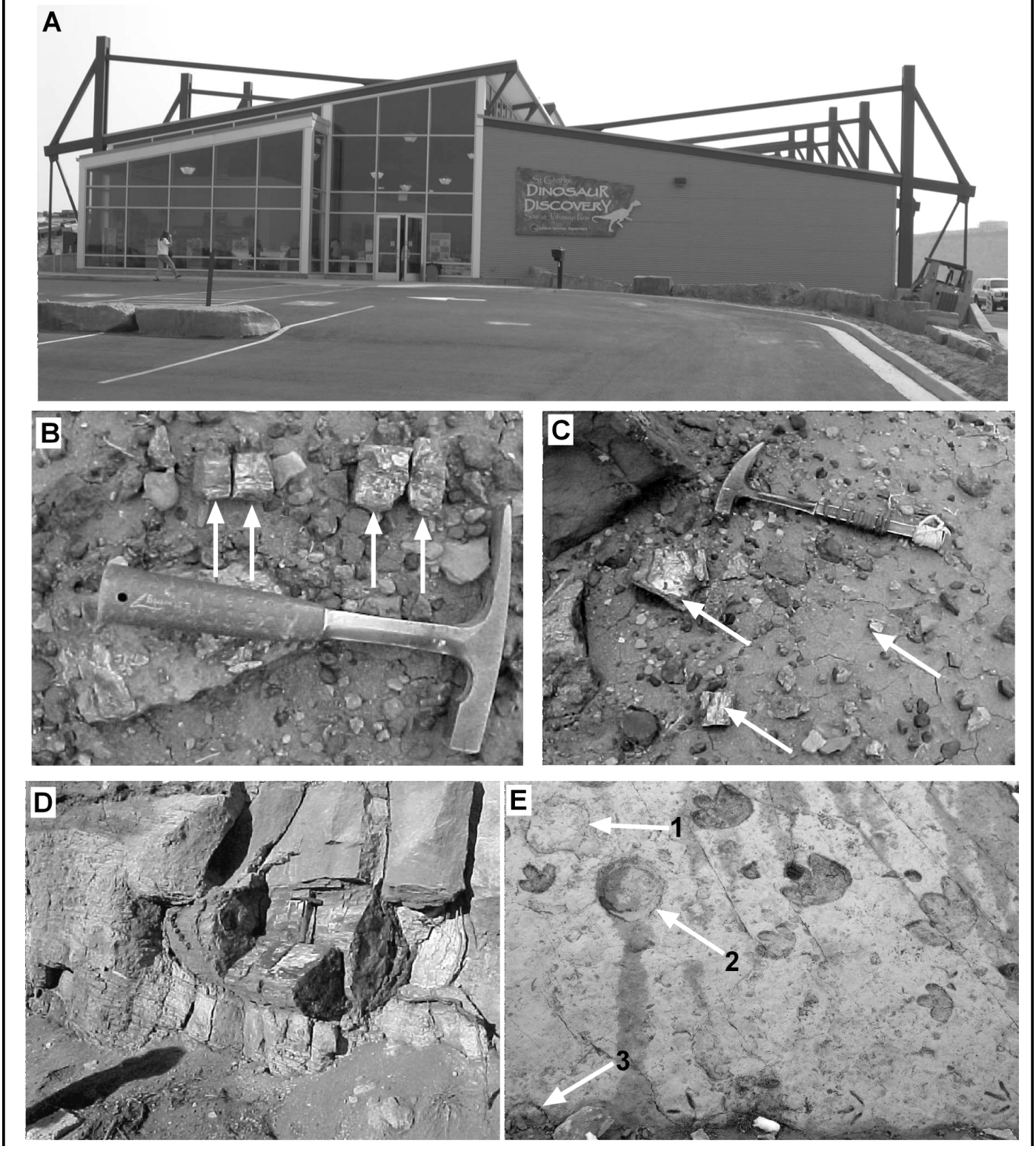

FIGURE 2. **A,** The new museum covering an *in situ* dinosaur tracksite at the St. George Dinosaur Discovery Site at Johnson Farm, St. George, Washington County, Utah. **B,** Arrows point to metoposaur jaw fragments stolen from a Petrified Forest Formation, Chinle Group site on Hurricane Mesa west of Zion National Park in Washington County. **C,** Large skull sections (white arrows) from the same metoposaur as in B, also stolen. **D,** Large petrified tree from Hurricane Mesa – also stolen. **E,** Dakota Group ornithopod and theropod dinosaur tracks at Dinosaur Ridge near Denver, Colorado. 1 points to chisel marks around an ornithopod track; 2 indicated where an ornithopod track was stolen from; and 3 points to a theropod track surrounded by chisel marks from an attempted theft.

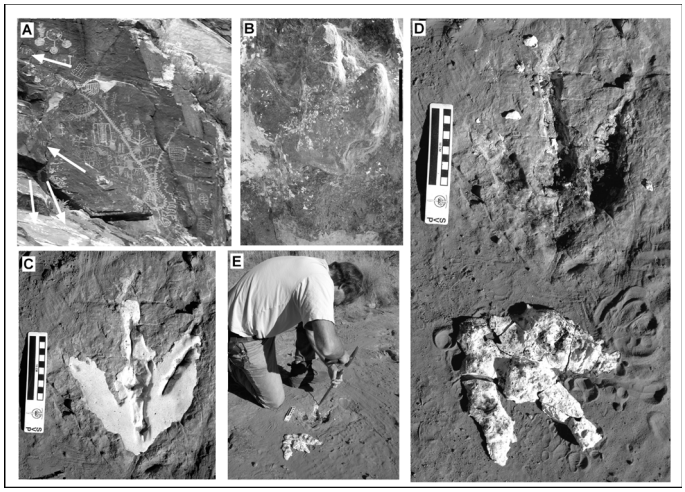

FIGURE 3. **A,** 3,000 year old American Indian petroglyphs on outcrops of Early Jurassic Navajo Sandstone on the west side of Parowan Gap, Iron County, Utah. White arrows point to modern graffiti (i.e. site vandalism). **B,** Beautifully preserved ornithopod natural cast track in the Upper Cretaceous Iron Springs Formation, Parowan Gap, Iron County, Utah. The white material all over and around this footprint is adhered plaster to the sandstone – another case of site vandalism. **C,** Plaster-filled *Eubrontes* theropod track in the lower Kayenta Formation (Early Jurassic) near Washington, Washington County, Utah. Notice the chisel marks within the solidified plaster in an attempt to remove it by the person(s) responsible for the vandalism. **D,** Dr. Martin Lockley carefully removing the plaster cast infilling the track in **C**. **E,** Photograph of the same track in **C**-**D** showing the plaster infill removed. Plaster is still attached to the inside of the track and matrix has been pulled away from the track resulting in permanent damage.

sites, document new localities, and assist with public outreach and education.

Erosion

Erosion to significant paleontological sites is a serious problem. Important body fossil sites can usually be collected prior to erosion destroying a site; however, most *in situ* tracksites are at constant risk to weathering. Efforts to preserve tracksites in Washington County and other areas should be seriously considered, especially sites displaying unique features or holding type specimens.

Many body fossil sites in the region and neighboring states still remain uncollected. Several of these localities in Washington County hold vertebrate fossils that are first reports for the area and/or potentially unique taxa. One such example of an "at risk" site is the "Millie Phytosaur Site" in the Petrified Forest Formation of the Chinle Group (Fig. 4C). The locality holds a partially articulated phytosaur skeleton near the base of a steep wash. The skeleton lies in a slumped section of mudstone, and *in situ* bones have been identified in the outcrop above. The site was discovered by UFOP member Kolene Granger in 2005 and represents the first articulated skeleton from the St. George area. The slumped portion of the skeleton is at great risk of being washed away unless collected.

POSSIBLE SOLUTIONS

Site Sensitivity: Should a Site be Monitored or Not?

At present, only localities on BLM-administered lands will be monitored by Paleontological Site Stewards. Before Site Stewards can be assigned localities to monitor, the significance of each site must be accessed on a case-by-case basis. Additionally, the proximity of a site to

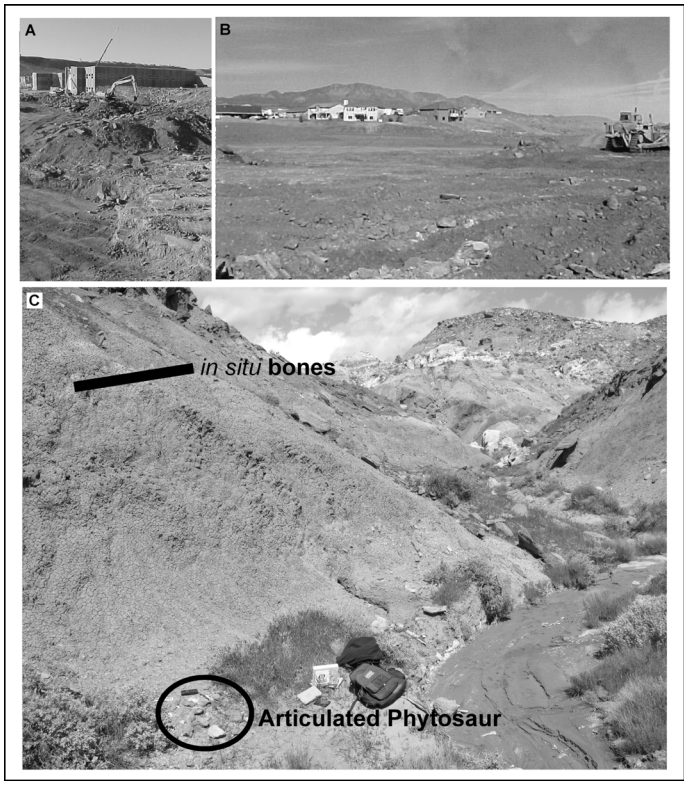

FIGURE 4. **A-B,** Excavation for development in and around the St. George area of Washington County, Utah. **C,** The "Millie Phytosaur Site" in Washington County, Utah. This site is contained within the Petrified Forest Formation, Chinle Group. An articulated skeleton of a phytosaur was found on a slumped section of outcrop into the base of the wash. *In situ* bones still remain in the outcrop above where the skeleton was first found. Potential flash-flooding could jeopardize this site.

areas of human activity also needs to be taken into account.

Fossil localities in Utah are managed for their scientific, educational and recreational values (U.S. Secretary of the Interior, 2000; Hayden, 2005; Kirkland et al., this volume). The BLM has suggested three levels of fossil locality classification (Raup, 1987; U.S. Bureau of Land Management, 1998); however, due to the great diversity of fossil-bearing rocks in Washington County, we find the six-tiered classification system ranking the sensitivity of geological formations that contain fossils derived from DeBlieux et al. (2003) and Kirkland et al. (this volume) to be more effective. These formation rankings can be applied to individual sites and are fully explained in Kirkland et al. (this volume).

A list of criteria was created by the BLM and U.S. Forest Service to define "fossils of scientific value" (Raup, 1987; DeBlieux et al., 2003):

a) Preservation of soft body parts.
b) All vertebrate body fossils and traces
c) Preservation of uncommon invertebrate fossils.
d) Close or intimate association of plants with animals.
e) Preservation of the skull, whole isolated bones or other diagnostic materials.
f) A concentration and diversity of plants and animals of restricted geologic or geographic range.
g) Fossils poorly known to science.
h) Unique or significant geographic, stratigraphic or paleontologic position such as type locality, only known occurrence, reptile-mammal transition, etc.

In order for localities in Washington County or elsewhere to be considered of critical scientific paleontological value, they must exhibit one or more of the above criteria.

Trained Paleontological Site Stewards

Interview and Screening Process

All potential volunteers for the PSSP must go through a four-stage screening process in order to become Site Stewards. The process begins with the completion and submission of an application form. The volunteers must undergo an interview with qualified BLM employees (Site Stewardship Administrator, Geologist and/or Archaeologist), Site Steward Coordinator(s), and/or paleontologist(s) familiar with the program. If accepted, volunteers must become familiar with proper paleontological procedures either by volunteering at the SGDS, or participating in a UFOP Certification program. This will assist the volunteers in gaining a basic knowledge of the regional geology and paleontology, simplified fossil identification, basic understanding of field and laboratory techniques, collections management and an appreciation for the importance of preserving important fossil localities and their surroundings. This will allow the SGDS paleontologist to become more acquainted with candidates and make a final recommendation on their suitability for the PSSP. In addition, the SGDS would benefit from the extra assistance at the museum. This could also benefit the state should the volunteers become UFOP members, resulting in assistance to the local UFOP chapter and potentially to other paleontologist in the state or surrounding states. Volunteers will also receive training in Outdoor Survival Skills, Leave No Trace Principles, Orienteering, use of GPS systems and Personal Safety during site monitoring duties. Those accepted to the PSSP will sign BLM Volunteer Agreements that outline the nature of the volunteer duties and the responsibilities of each volunteer. The acceptance of volunteer services by BLM provides federal legal protection for each volunteer, should they be injured or killed while performing their official volunteer functions.

Monitoring Localities and Locality Records

Once a Site Steward is accepted into the program, he/she will be assigned a locality or localities to monitor periodically, preferably on a monthly basis. Site Stewards will be provided with a site folder with information on each locality they monitor. These site folders are confidential and are the property of the federal government and land manager. These site folders will include:

- A copy of the necessary portion of a 7 1/2 minute topographic map showing the best access to the locality.
- A larger scale map showing land ownership and route into the vicinity of the locality to monitor.
- Written directions on how to find the site.
- Latitude and longitude coordinates or Township and Range of the locality.
- Routine and emergency reporting instructions.
- Site description; type of site; geologic description; list of fossil types found at site; possible tracksite maps.
- Portion of geologic map(s) relevant to the locality.
- Stratigraphic data relevant to the locality and surrounding rock formations.
- Spare data sheets to record information on any new localities discovered while monitoring your site (see below).

This information will assist Site Stewards in identifying the characteristics of the site, becoming familiar with the detailed history of the locality (such as *in situ* fossils or sites they have been found), possible erosion problems and other information specific to that site. The goal is twofold: to deter vandalism or theft and to monitor for other sources of potentially damage (such as erosion). Thorough the early detection of potential hazards to the locality from vandalism, theft or erosion and, in the case of illegal activities, the safeguarding of evidence, important fossil localities can be more effectively protected.

Reporting Locality Problems

Site Stewards will be trained on appropriate site etiquette, the procedure for approaching their site(s), what to look for when at a locality and what to do when encountering people visiting, vandalizing or stealing from a site.

Each site folder will contain a list of the proper contacts, detailed instructions on what to do if problems are encountered, information on the local geology and what would constitute new discoveries (see below). Site Stewards are recommended to carry a camera and GPS unit with them to periodically photograph and record the monitored site, any potential problems with it or to help document new fossils they may encounter.

Site Stewards should not bring other people with them unless they are pre-authorized by the BLM office. They are not authorized to carry or use firearms during volunteer duties or travel off-road or off-trail to the localities by motorized or non-motorized vehicles. If encountering other visitors at the site, they **should not** inform them of their position with the PSSP, provide information on the site or attempt to act in a law enforcement-type manor. These behaviors will NOT be tolerated by the BLM in a Site Stewardship Program.

Volunteer safety comes first! If vandalism or theft is encountered, the appropriate law enforcement officer(s) should be contacted along with the BLM Site Coordinator overseeing the PSSP. If any problems are encountered, the Site Steward should move away without disturbing the site or potential violators and contact the appropriate person(s) as soon as possible.

Volunteers Assist in the Discovery and Recording of New Localities

Searching for New Localities

Training volunteers to assist in monitoring significant paleontological localities on land managed by the BLM is needed. In addition these volunteers could be including in conservation efforts to preserve important tracksites for future generations of researchers to study and for the enjoyment and education of the public.

BLM Site Stewards along with organized/trained groups, such as UFOP, can assist researchers in surveying for potentially significant sites within the region (Fig. 5A-B). The discovery of new sites can also lead to other volunteer opportunities, such as participating in site excavations (Fig. 5C) and fossil preparation training in the lab (Fig. 5D).

Standard for Recording Localities

All Site Stewards will be trained on the proper recording of information on locality data sheets (see Appendix). This will include how to correctly photograph a site and fossils, plotting localities on topographic maps, identification of primary stratigraphic units and using a GPS unit to pin-point exact locality coordinates.

The Washington County PSSP will use locality data sheets developed by the State Paleontologists office at the Utah Geological Survey. Other institutions have also adopted these locality data sheets, including the SGDS (Appendix). Locality data sheets include the following: locality description, types of fossils, with a brief description, an area to sketch specimens, geologic information, map coordinates, GPS and map information, depositional environment, collection date and who found the specimen(s), associated photographs, permit, and repository information, name of the person recording the data and a section for publication information on the specimens that can be added on later to go along with additional specimen information.

All of the recorded information on any localities on public lands will be submitted to BLM's St. George Field Office and to the State Paleontologists office at the UGS. This information is entered into a comprehensive database maintained by the UGS containing most fossil localities within the state of Utah. Access to the information contained in

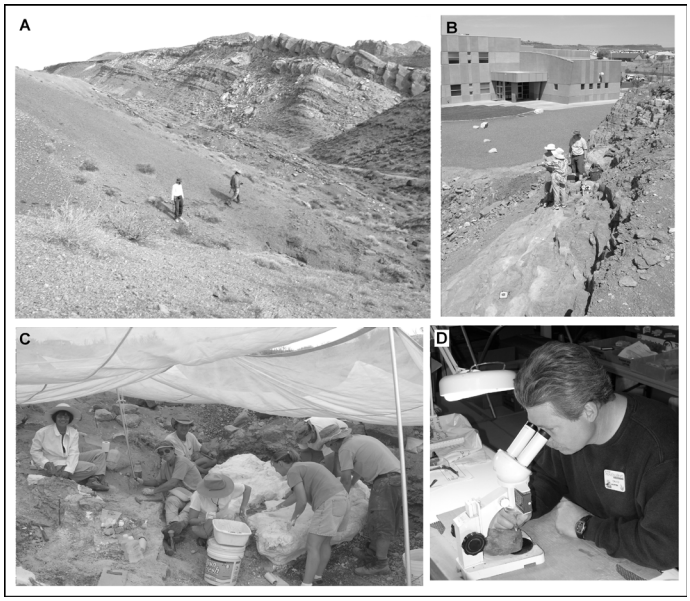

FIGURE 5. **A,** Volunteers exploring portions of the upper Chinle Group in the St. George area. **B,** UFOP members search outcrops of Moenave Formation for dinosaur tracks and vertebrate body fossils near the SGDS in St. George. **C,** UFOP members assisting UGS staff excavating an iguanodont dinosaur in the Lower Cretaceous Cedar Mountain Formation in 2005 at "Andrew's Yellow Cat Site". **D,** David Slauf, an SGDS volunteer and UGS member preparing a fish fossil in the lab.

this database is restricted to qualified researchers and institutions (Kirkland et al., this volume).

In Situ Preservation and Interpretation of Sites

In situ interpreted "public use" fossil sites in Washington County currently include only the SGDS museum and a remote tracksite on BLM-administered public lands, south of St.George in the Warner Valley. At this site, the tracks are located in an ephemeral drainage. Approximately 10 years ago, BLM constructed a low retaining wall in the drainage, in an effort to divert seasonal run-off away from the dinosaur tracksite. This locality occurs in the lower portion of the Early Jurassic Kayenta Formation, which lies unconformably below the Navajo Sandstone. Originally this locality was incorrectly described as being in the Moenave Formation (Miller et al., 1989). The St. George Field Office plans to address the deficiencies in both the protection and interpretation of the Warner Valley site, as funding and staff time permit. Assistance from volunteer Site Stewards could expedite the completion of needed improvements and changes to this public use site.

In the past year, approximately 15 new tracksites have been discovered within 15 km of St. George, most on BLM-administered public lands. Several of these sites are on very delicate surfaces and in order to preserve them for future research and potential public viewing, consolidation of the outcrops through chemical applications may be needed. Certain non-reversible consolidates that have been tested on historic masonry buildings and shown to be successful at preserving the fabric of the buildings may be suitable for this purpose. Ethyl silicate has been tried on natural outcrops and has stood up to the test thus far, but long-term effects are unknown; also it very expensive (Grisafe, 2000, 2001, 2002). Silane-based chemicals have proven reliable in the preservation of historic buildings over the past century (R. Denton, personal commun., 2006). Some of these chemicals may prove valuable in the long-term preservation of dinosaur tracksites (Mason III, 2005). The use of artificial consolidates or preservatives on *in situ* fossil sites will require extensive research and testing. A cadre of trained site stewards could assistBLM with projects to conserve and interpret *in situ* fossil localities.

Another method for documenting dinosaur tracksites involves detailed three-dimensional photogrammetry techniques and remote sensing of sites, a procedure already in use by the BLM in some areas (Breithaupt et al., 2004; Matthews et al., this volume).

Increasing Public Awareness

Site Stewards would also be capable of assisting BLM and other agencies with public outreach and education. Due to their training and experiences gained as volunteers they would be particularly effective at communicating the value and importance of fossil resources to other users of public land. Their passion for the resource and its protection/preservation will enhance their ability to commutate to others. As an example, an Education sub-committee of BLM-St. George Field Office's Color Country Site [archeological] Steward Program has developed an hour-long Power Point program and script that speaks to the need for young people to practice stewardship for a wide array of public land resources. This "curriculum" is targeted at the 7th grade level and is presented by volunteer Site Stewards in the classrooms of Washington County schools, to very favorable reviews from students and teachers. A module specific to archeological site protection and site etiquette is under development by this group, as part of a series to educate young people about their responsibilities as resource stewards for future generations. This series could easily include a module on paleontology and the legal and ethical reasons for the protection of important fossil localities.

CONCLUSION: POSSIBLE PALEONTOLOGICAL SITE STEWARDSHIP PROGRAM EXPANSION AND THE FUTURE

The St. George area is now home to many educated and physically active retirees, as well as seasonal residents, "snow-birds", who enthusiastically seek out volunteer opportunities and donate many volunteer hours to public service. It is anticipated that the PSSP program will be in place within the next few months and will be highly successful as volunteers are already "in line" to be trained as Site Stewards. This program should also prove to be a useful management tool and other federal and state land managers will be interested in having volunteer Site Stewards monitoring resources for them. Strong similarities exist in both the training and functionality for paleontological and archeological Site Stewards, with the difference being mainly in the resource they monitor. Cross-pollination of these two programs could streamline the administrative tasks for BLM and would likely increase volunteers for both programs. We have every reason to believe that the introduction of the Paleontological Site Stewardship Program will make a difference in furthering the protection of paleontological resources in southwestern Utah.

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We dedicate this paper to all of the loyal volunteers who have helped the BLM, the St. George Dinosaur Discovery Site at Johnson Farm and Utah Friends of Paleontology. Without them, the field of paleontology would probably be decades behind where it is today. Our deepest thanks for all of your great work!

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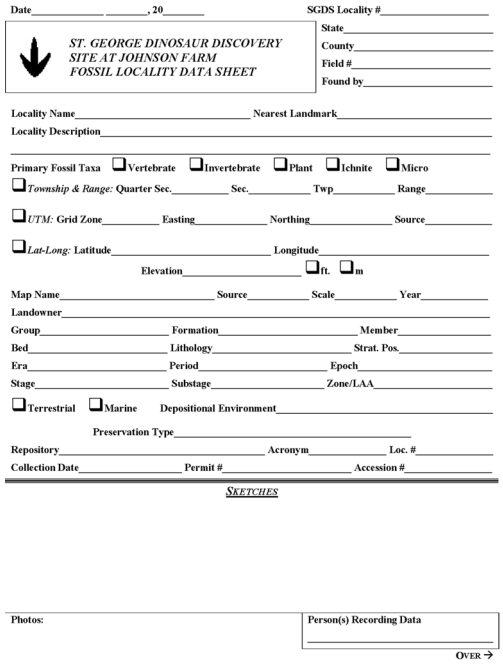
APPENDIX

An example of the locality data sheets used at the St. George Dinosaur Discovery Site at Johnson Farm.



Date_____ _____, 20_____ SGDS Locality #_____

ST. GEORGE DINOSAUR DISCOVERY SITE AT JOHNSON FARM FOSSIL LOCALITY DATA SHEET

State_____
County_____
Field #_____
Found by_____

Locality Name_____ Nearest Landmark_____
Locality Description_____

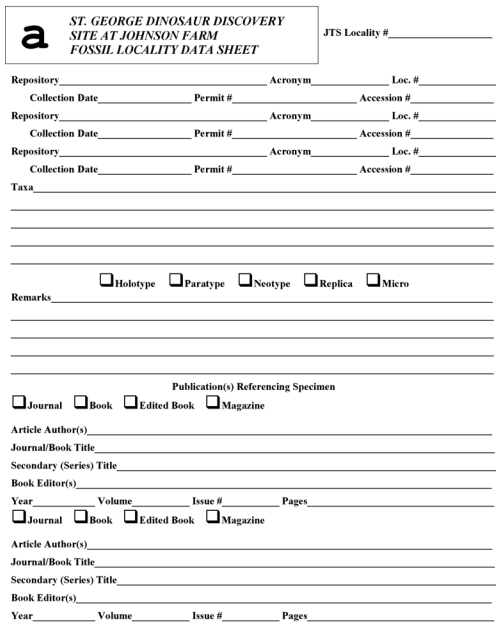
Primary Fossil Taxa ❑Vertebrate ❑Invertebrate ❑Plant ❑Ichnite ❑Micro
❑*Township & Range:* Quarter Sec._____ Sec._____ Twp_____ Range_____
❑*UTM:* Grid Zone_____ Easting_____ Northing_____ Source_____
❑*Lat-Long:* Latitude_____ Longitude_____
Elevation_____ ❑ft. ❑m
Map Name_____ Source_____ Scale_____ Year_____
Landowner_____
Group_____ Formation_____ Member_____
Bed_____ Lithology_____ Strat. Pos._____
Era_____ Period_____ Epoch_____
Stage_____ Substage_____ Zone/LAA_____
❑Terrestrial ❑Marine Depositional Environment_____
Preservation Type_____
Repository_____ Acronym_____ Loc. #_____
Collection Date_____ Permit #_____ Accession #_____

SKETCHES

Photos:

Person(s) Recording Data

OVER →



a *ST. GEORGE DINOSAUR DISCOVERY SITE AT JOHNSON FARM FOSSIL LOCALITY DATA SHEET*

JTS Locality #_____

Repository_____ Acronym_____ Loc. #_____
Collection Date_____ Permit #_____ Accession #_____
Repository_____ Acronym_____ Loc. #_____
Collection Date_____ Permit #_____ Accession #_____
Repository_____ Acronym_____ Loc. #_____
Collection Date_____ Permit #_____ Accession #_____
Taxa_____

❑Holotype ❑Paratype ❑Neotype ❑Replica ❑Micro
Remarks_____

Publication(s) Referencing Specimen
❑Journal ❑Book ❑Edited Book ❑Magazine
Article Author(s)_____
Journal/Book Title_____
Secondary (Series) Title_____
Book Editor(s)_____
Year_____ Volume_____ Issue #_____ Pages_____
❑Journal ❑Book ❑Edited Book ❑Magazine
Article Author(s)_____
Journal/Book Title_____
Secondary (Series) Title_____
Book Editor(s)_____
Year_____ Volume_____ Issue #_____ Pages_____